



METTLER TOLEDO Service

Congratulations on choosing the quality and precision of METTLER TOLEDO. Proper use of your new equipment according to this Manual and regular calibration and maintenance by our factory-trained service team ensures dependable and accurate operation, protecting your investment. Contact us about a service agreement tailored to your needs and budget. Further information is available at ► www.mt.com/service.

There are several important ways to ensure you maximize the performance of your investment:

- 1 **Register your product:** We invite you to register your product at www.mt.com/productregistration so we can contact you about enhancements, updates and important notifications concerning your product.
- 2 **Contact METTLER TOLEDO for service:** The value of a measurement is proportional to its accuracy – an out of specification scale can diminish quality, reduce profits and increase liability. Timely service from METTLER TOLEDO will ensure accuracy and optimize uptime and equipment life.
 - ➔ **Installation, Configuration, Integration and Training:** Our service representatives are factory-trained weighing equipment experts. We make certain that your weighing equipment is ready for production in a cost effective and timely fashion and that personnel are trained for success.
 - ➔ **Initial Calibration Documentation:** The installation environment and application requirements are unique for every industrial scale so performance must be tested and certified. Our calibration services and certificates document accuracy to ensure production quality and provide a quality system record of performance.
 - ➔ **Periodic Calibration Maintenance:** A Calibration Service Agreement provides on-going confidence in your weighing process and documentation of compliance with requirements. We offer a variety of service plans that are scheduled to meet your needs and designed to fit your budget.

Safety Instructions

Compliance information

National approval documents, e.g. the FCC Supplier Declaration of Conformity, are available online and/or included in the packaging.

► www.mt.com/ComplianceSearch

Manuals download

Please scan the QR code below and download from ► www.mt.com/IND700-downloads.



⚠ WARNING

Use the device only for weighing in accordance with its corresponding user manual. Any other type of use and operation beyond the limits of technical specifications is considered as not intended.



⚠ WARNING

Only permit qualified personnel to service the equipment. Exercise care when making checks, tests and adjustments that must be made with power on. Failure to observe this precaution could result in bodily harm and/ or property damage.



⚠ WARNING

Keep the equipment away from processes that generate high charging potential such as electrostatic coating, rapid transfer of non-conductive materials, rapid air jets, and high pressure aerosols.



⚠ WARNING

Avoid plastic covers over the equipment. The protection cover used must be officially approved by METTLER TOLEDO.



⚠ WARNING

Ensure proper equipotential grounding of the equipment, mounting accessories, and the scale base.



⚠ WARNING

If the keyboard, display lens or enclosure is damaged, the defective component must be repaired immediately. Remove power immediately and do not reapply power until the display lens, keyboard or enclosure has been repaired or replaced by qualified service personnel. Failure to do so could result in bodily harm and/or property damage.



⚠ WARNING

Only the components specified in the user manual can be used in this device. All equipment must be installed in accordance with the installation instructions detailed in the user manual. Incorrect or substitute components and/or deviation from these instructions can impair the intrinsic safety of the equipment and could result in bodily injury and/or property damage.



⚠ WARNING

For continued protection against shock hazard, connect to properly grounded power source only. Do not remove the grounding connection.



⚠ WARNING

When this equipment is included as a component part of a system, the resulting design must be reviewed by qualified personnel who are familiar with the construction and operation of all components in the system and the potential hazards involved. Failure to observe this precaution could result in bodily harm and/ or property damage.



⚠ WARNING

All equipment must be installed in accordance with the installation instructions detailed in its corresponding user manual. Deviation from the instructions can impair the intrinsic safety of the equipment and void the agency approval.



⚠ WARNING

Before connecting/disconnecting any internal electronic components or inter-connecting wiring between electronic equipment always remove power and wait at least thirty (30) seconds before any connections or disconnections are made. Failure to observe these precautions could result in damage to or destruction of the equipment and/or bodily harm.



⚠ WARNING

Replacing equipment components with non-original parts can lead to performance losses and property damage. Use only original or compatible spare parts and accessories from METTLER TOLEDO.



⚠ WARNING

Be certain that the communication circuits are wired exactly as shown in the installation section of its corresponding user manual. If the wires are not connected correctly, the equipment or interface board may be damaged.



⚠ WARNING

Observe precautions for handling electrostatic sensitive devices.

**⚠ WARNING**

Avoid direct exposure to sunlight.

**⚠ WARNING**

The mains connection of the power supply unit must be made by a professional electrician authorized by the owner and in accordance with the respective terminal diagram, the accompanying installation instructions as well as the country-specific regulations.

**⚠ WARNING**

Before service, disconnect power from this device.

**⚠ WARNING**

The protective ground connection must be checked after service work is performed. Perform the check between the protective ground contact on the power plug and the housing. This test must be documented in the service report.

In conformance with the European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in domestic waste. This also applies to countries outside the EU, per their specific requirements.

Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment. If you have any questions, please contact the responsible authority or the distributor from which you purchased this device. Should this device be passed on to other parties, the content of this regulation must also be related.



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1 Introduction

The IND700 is a PC-based weighing terminal with a color touchscreen. It represents the latest weighing technology from METTLER TOLEDO and is the most versatile weighing terminal for multi-scale non-hazardous area applications.

The terminal is a high-performance single- or multiple-range weighing indicator designed for use with High Speed Analog Load Cells, digital POWERCELL/PowerDeck networks, and Precision scale bases. Precision measurement data from milligrams to tons is provided by a single cost-effective package that easily integrates into existing systems.

The internal power supply connects to line-level AC voltage using a standard power cord appropriate for the region in which it is used.

Enhanced Industrial Network and PC communication interfaces are available, and discrete I/O options are included provide control for process applications such as filling. The versatile IND700 can be upgraded with a variety of special application software packages that add performance features where needed. These features make the terminal a perfect match for nearly any weighing application in many industries, including:

- Pharmaceuticals
- Petrochemicals
- Refining
- Milling
- Agriculture
- Cosmetics and Fragrance
- Specialty Chemical
- Coatings and Inks

1.1 IND700 Overview

Mechanical

- Two types of enclosure to suit different uses and locations
 - Harsh environment (desk/wall mounted) terminal with M12 connectors
 - Harsh environment (desk/wall mounted) terminal with cable glands
 - Wedge terminal with M12 connectors
 - Wedge terminal for hygienic application



Figure 1: Harsh Environment (rear) and Wedge (front) IND700 Enclosures

- Type 304 stainless steel enclosure
- 7" TFT color display, touch screen (800 x 480)
- Intuitive color touchscreen user interface
- Capacitive touch function keys with backlight feedback -- Clear, Tare, Zero, Transfer

Interface

- Connect one or two scale bases using High Speed Analog, POWERCELL[®], PowerDeck[™], or Precision interface
- Scale interface boards add options:
 - High Speed Analog interface with 2 in/2 out DIO interface
 - POWERCELL/PowerDeck scale interface with 2 in/2 out DIO
 - Precision scale interface with 2 in/2 out DIO and COMx (RS232/RS422/RS485)
- Several communication interface options, including serial ports and Digital Input/Output:
 - Standard 1x COM1 (RS232/RS422/RS485), 1 x Ethernet 1000 Base-T Protocol, 1 x USB 3.0, 1 x USB 2.0, 1 x Discrete I/O (2I/2O)
 - Optional RS232/RS422/RS485 serial port
- Support for the following Industrial Network interfaces:
 - PROFINET
 - EtherNet/IP

Function

- Basic weighing including zero, tare, and data transfer
- Real-time clock with battery backup
- Alibi memory storage for up to 100,000 records
- Unit switching between three different units, including custom units (Not supported in phase 1.)
- Ten customizable templates to support production and transfer of reports
- CalFREE[™] calibration without test weights
- Up to four logical scales with POWERCELL scale interface

Application

- Standard Application capability: ID Forms
- The following Application Software Modules, enabled by ProWorks Multi-Tools license:
 - Counting
 - Manual Target - Classification
 - Manual Target - Filling
 - Manual Target - Over/Under
 - Totalization

Note: Totalization and Counting can be combined with any of the manual target applications.

1.2 Specifications IND700

Specifications	
Enclosure Type	Type 304 stainless steel enclosure
Dimensions	Refer to [Physical Dimensions ▶ Page 10]
Shipping Weight	<ul style="list-style-type: none">• Wedge: 3.6 kg• Harsh environment: 3.8 kg
Environment Protection	Wedge: IP68; Harsh environment: IP69K
Environment Conditions	For indoor or outdoor use (Type 4)
Altitude	Up to 5000 meter above sea level
Operating Environment	-10° to 40° C (14° to 104°F), 10% to 95% relative humidity, non-condensing.
Pollution Degree	2
Power	100 – 240 VAC, -15% to +10%, 50 - 60 Hz, 650 – 275 mA
Overvoltage Category	II
Display	17.75 cm (7") TFT color display, touch screen (800 x 480)

Specifications	
Weight Display	HSALC display resolution: 7-digits POWERCELL®, PowerMount™, PowerDeck™, or Precision bases (PBD, PBK, PFK) display resolution: determined by specific base in use
Scale Types	Analog, POWERCELL, PowerMount, PowerDeck, Precision
Number of Analog Cells	Up to 8 x 350 Ohms, 2 or 3 mV/V
Analog/Digital Update Rates	HSALC option: internal analog 1,000 Hz, target comparison 1,000 Hz POWERCELL option: 100 Hz per scale, 50 Hz dual scales, 25 Hz four scales Precision bases: determined by base
Analog Load Cell Excitation Voltage	10 VDC
Keypad	4 keys: Clear, Tare, Zero, Transfer
Communications	<p>Standard Interfaces:</p> <ul style="list-style-type: none"> • One COM1 (RS-232/RS-422/RS-485), 2400 to 115,200 baud • Ethernet 1000 Base-T Protocol • USB 3.0 • USB 2.0 • Discrete IO (2I2O) <p>Optional Interfaces:</p> <ul style="list-style-type: none"> • HSALC* • POWERCELL/PowerDeck* • Precision** • PROFINET or EtherNet/IP • Serial port, RS232/422/485 • COMx serial port on Precision option board, RS232/422/485 <p>* Scale interfaces also include Discrete IO, 2 in/2 out ** Scale interface also includes COMx (RS232/RS422/RS485) serial port and Discrete IO, 2I/2O</p> <p>Protocols</p> <ul style="list-style-type: none"> • Serial Inputs: SICS (most level 0 and level 1 commands, select advanced commands from levels 2 and 3), Transfer • Serial Outputs: Demand with up to ten configurable templates or SICS host protocol; interface with up to 8 ARM100 Input/Output modules
Approvals	<p>Weights and Measures</p> <ul style="list-style-type: none"> • USA: NTEP - No. 22-083 <ul style="list-style-type: none"> – Class II 100,000d – Class III, IIIL 10,000d • Canada: MC - AM-6203 <ul style="list-style-type: none"> – Class II 100,000d – Class III 10,000d, and Class IIIHD 10, 000d • Europe: TC11060 <ul style="list-style-type: none"> – Class II, approved divisions determined by platform – Class III, IIIL, HSALC 6,000e; POWERCELL 10,000e <p>Product Safety</p> <ul style="list-style-type: none"> • CSA

1.3 Operating Environment

- Use the weighing terminal only when electrostatic processes leading to propagation brush discharge is impossible.

- Keep the terminal away from processes that generate high charging potential such as electrostatic coating, rapid transfer of non-conductive materials, rapid air jets, and high pressure aerosols.
- Choose a stable, vibration-free surface to mount the terminal.
- Ensure there are no excessive fluctuations in temperature and no direct exposure to sunlight.
- Avoid drafts on the weighing platform (for example, from open windows or air conditioning).
- Calibrate the terminal after any major change of geographical location.

1.3.1 Temperature and Humidity

The terminal can be stored and operated at temperatures and relative humidity conditions as listed in Specifications old

1.3.2 Environmental Protection

The terminal has environment protection as listed in [Specifications IND700 ▶ Page 8].

1.4 Inspection and Contents Checklist

Verify the contents and inspect the package immediately upon delivery. If the shipping container is damaged, check for internal damage and file a freight claim with the carrier if necessary. If the container is not damaged, remove the product from its protective package, noting how it was packed, and inspect each component for damage.

If shipping the product is required, it is best to use the original shipping container. The product must be packed correctly to ensure its safe transportation.

The product package should include the below items but may vary by region:

- IND700 terminal
- Safety Instructions
- Bag of miscellaneous parts

1.5 Physical Dimensions

Dimensions of the two versions of the IND700 enclosure are given in mm and inches.

1.5.1 Enclosure for Harsh Environments

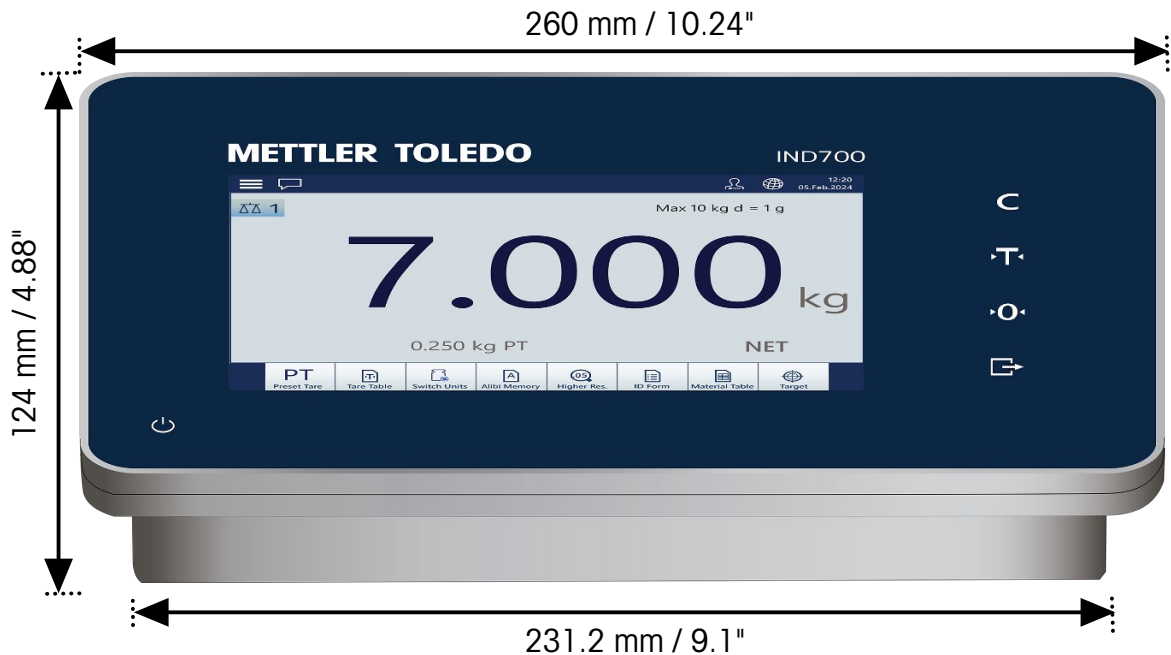


Figure 2: Front View

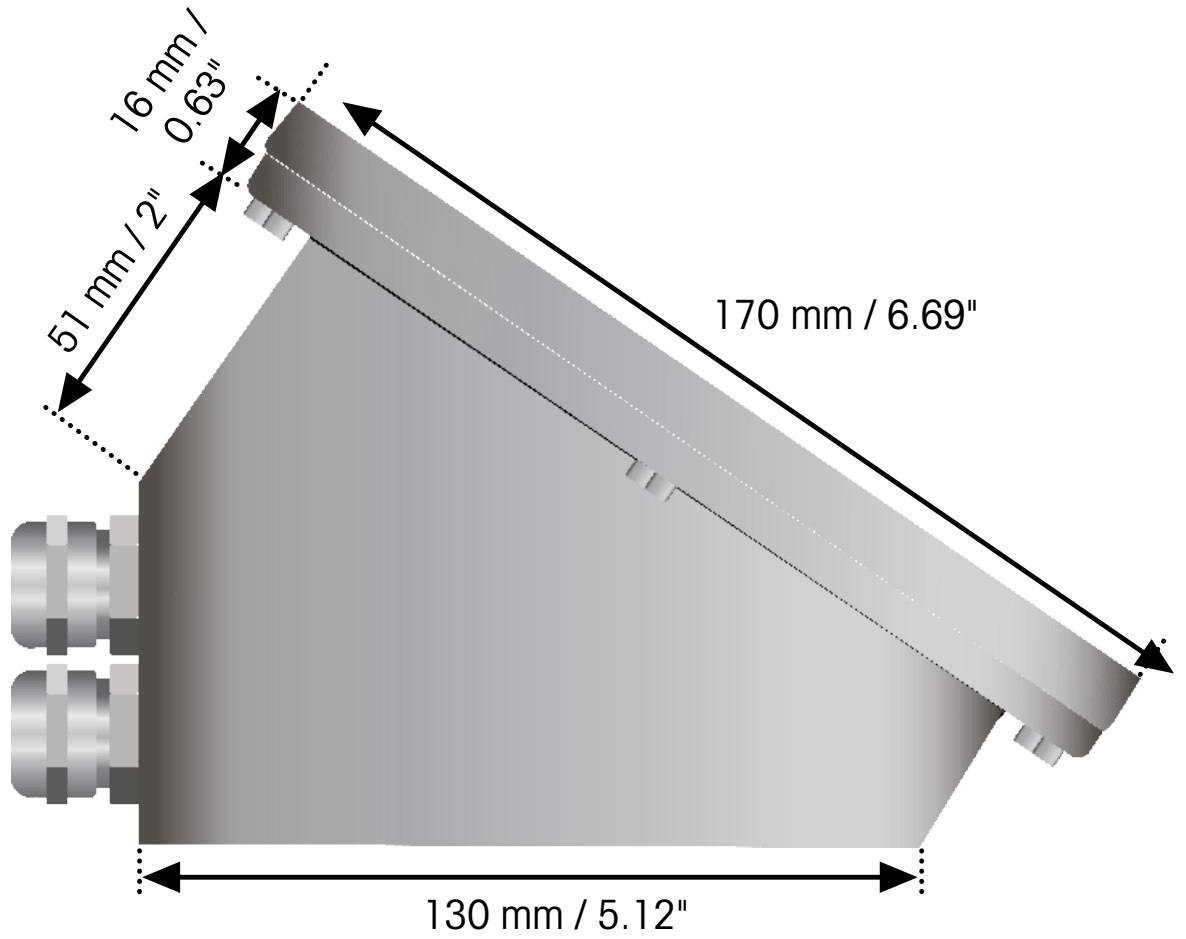


Figure 3: Side View

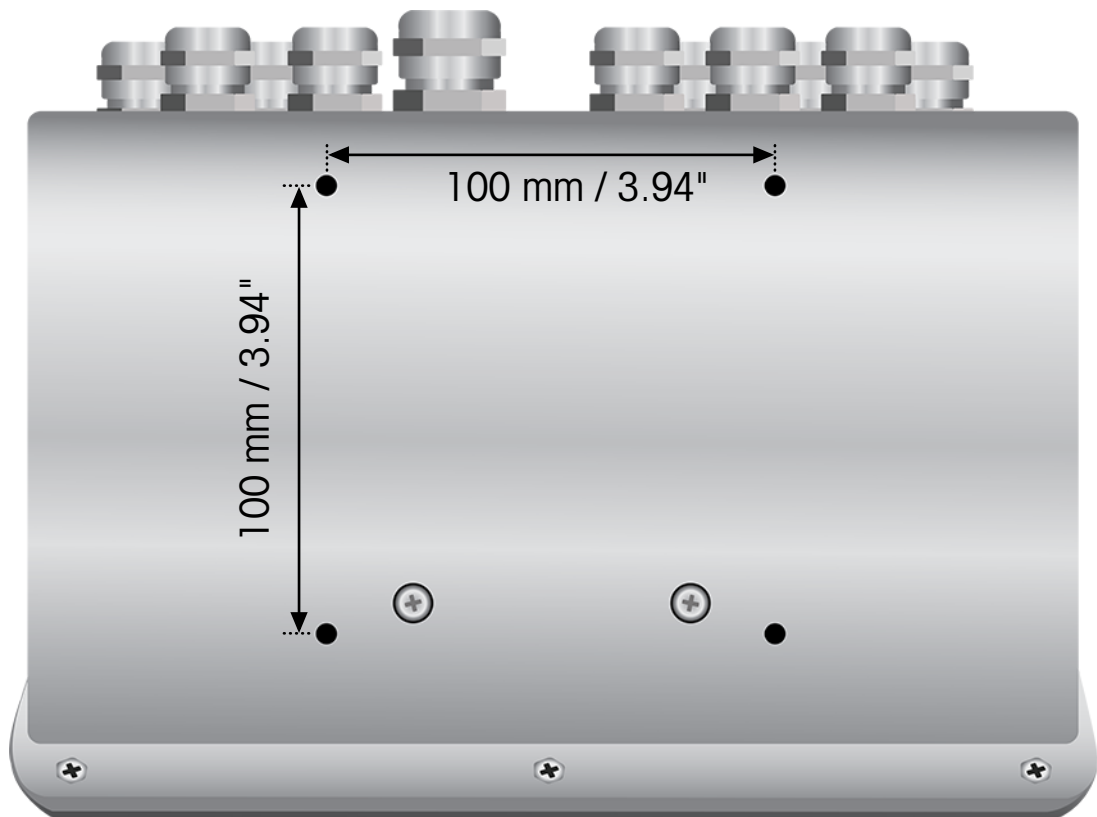


Figure 4: Bottom View, Showing Mounting Holes

1.5.2 Wedge Enclosure

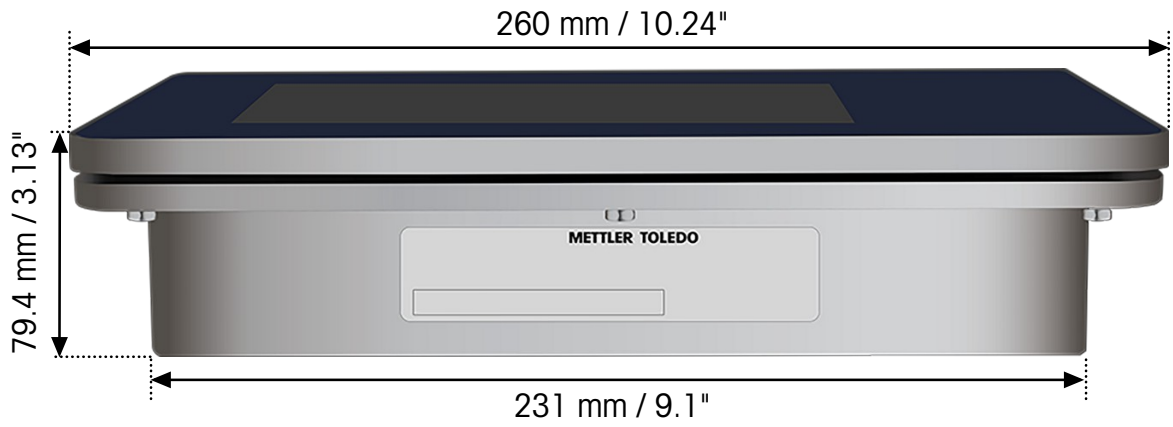


Figure 5: Front View

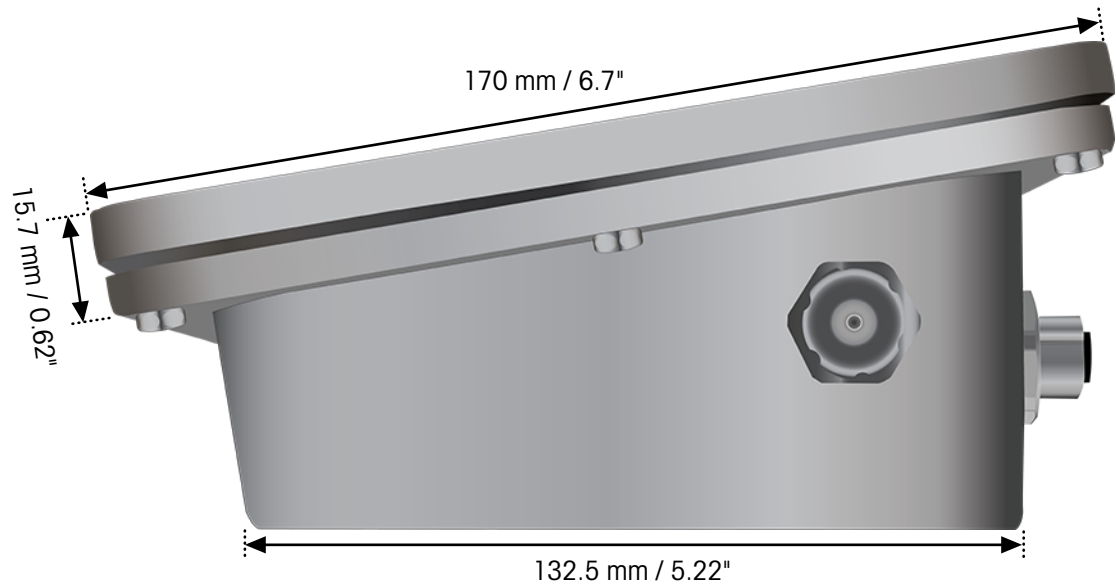


Figure 6: Side View

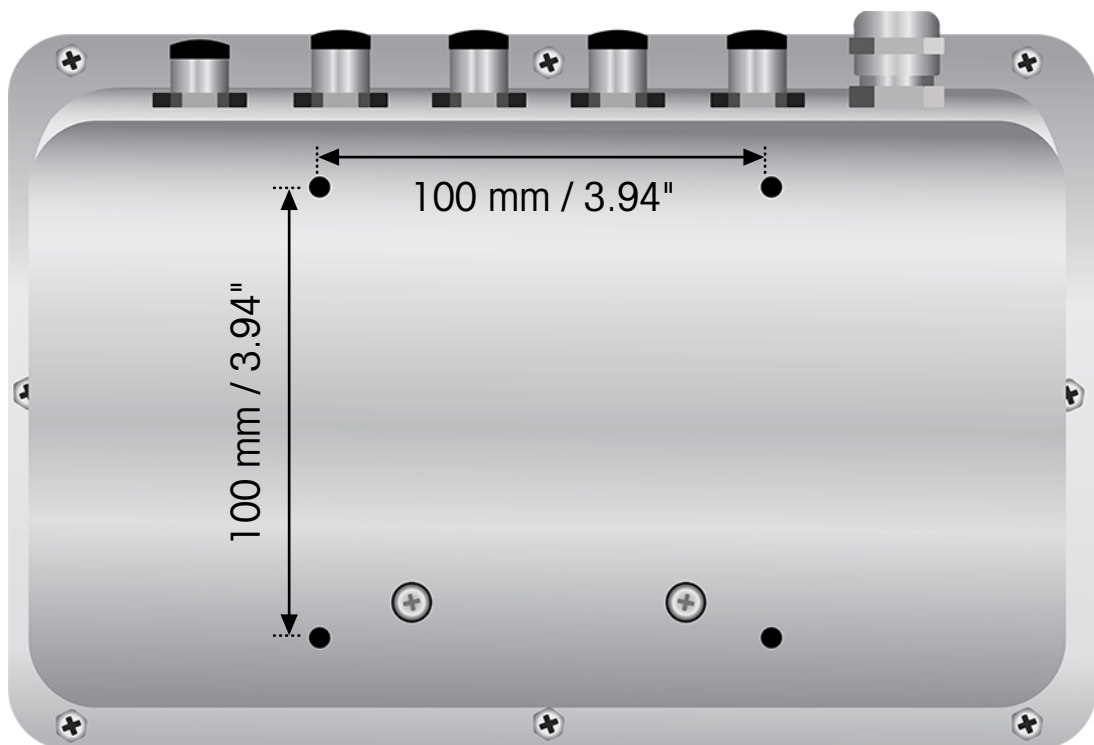


Figure 7: Bottom View, Showing Mounting Holes

1.6 Date of Manufacture

A terminal's date of manufacture is available to MT technicians in an internal databases.

1.7 Model Identification

Refer to the following chart to confirm the model and configuration of the IND700 terminal.

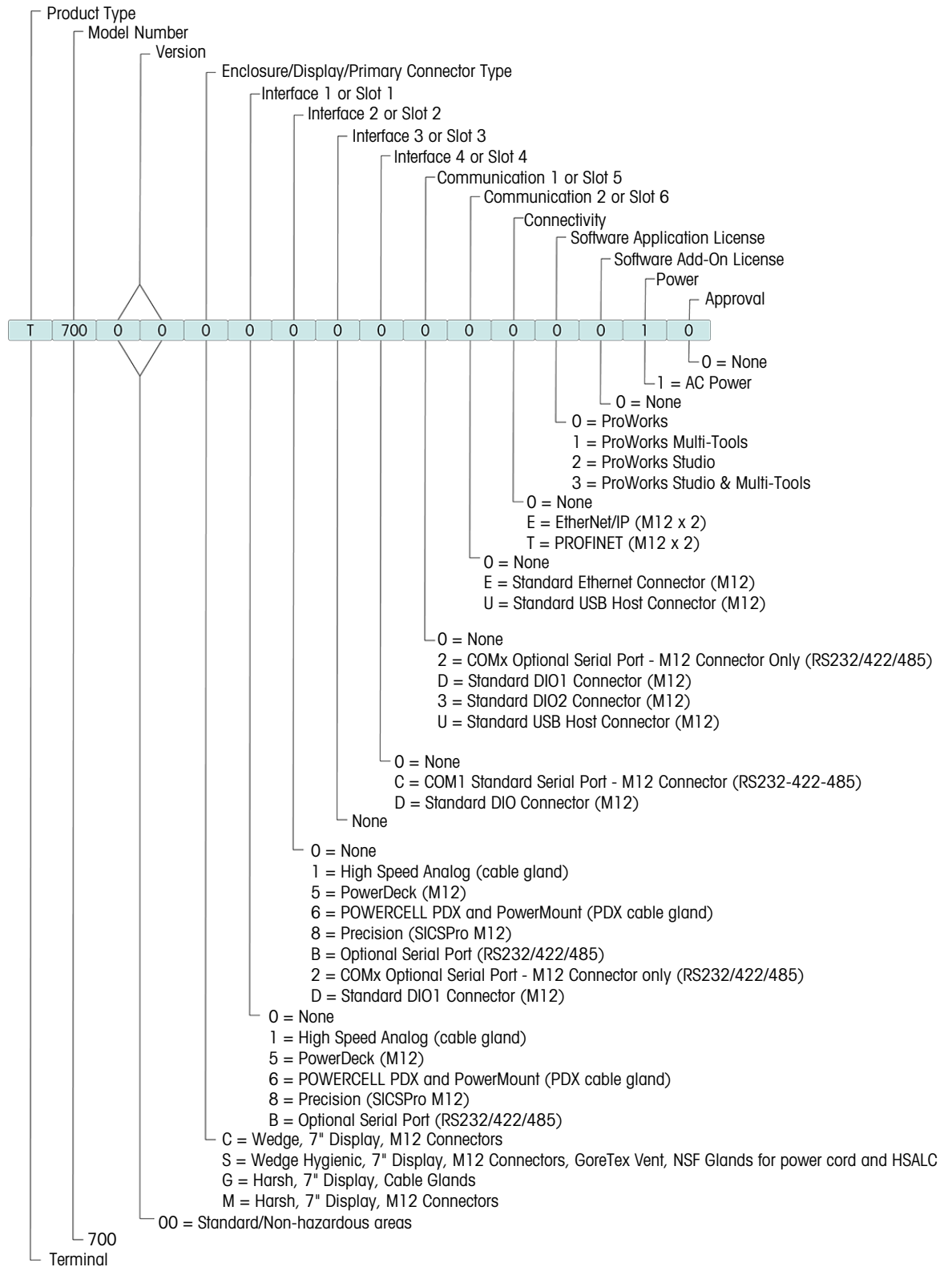


Figure 8: IND700 Model Identification

1.8 Touchscreen

Main screen – Main Screen View

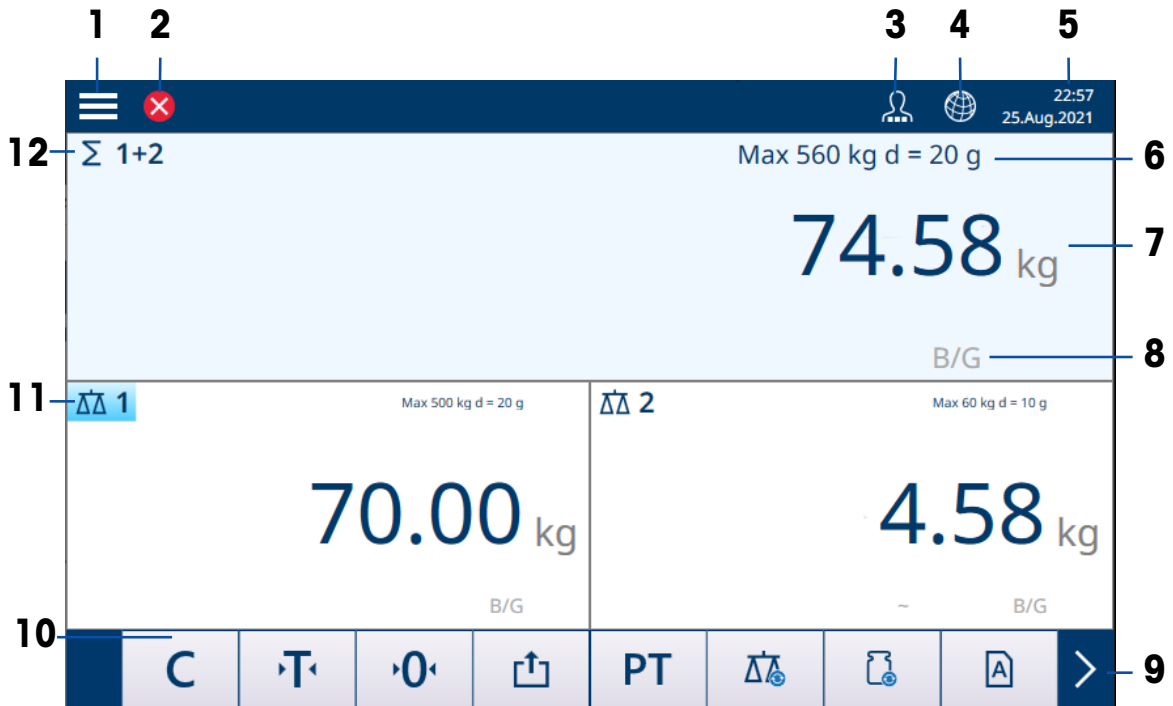


Figure 9: Elements of the Main Screen

- | | | | |
|---|--|----|----------------------------|
| 1 | Menu button | 7 | Weight display with unit |
| 2 | Message box | 8 | Status line |
| 3 | Access level | 9 | To next softkey ribbon |
| 4 | Language selection | 10 | Softkey line |
| 5 | Time and date | 11 | Number of the active scale |
| 6 | Metrological information, alternating with the permissible temperature range | 12 | Sum Scale indicator |

Main screen – Application View

When an application is active, the screen is divided into the weight display (top) and the application display (bottom).

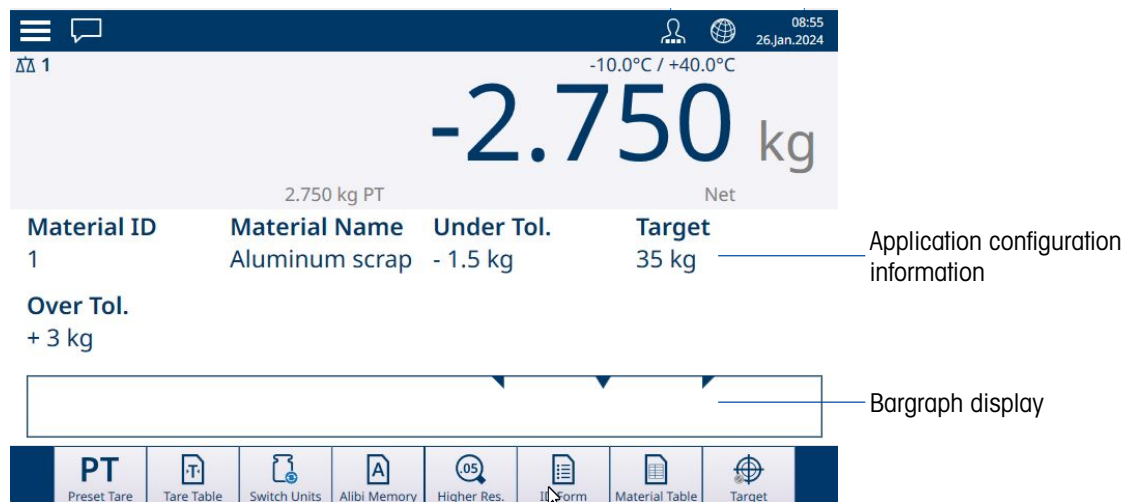



Figure 10: Application View Example

- | | |
|----|--|
| 13 | Application information |
| 14 | Application display elements -- e.g. piece counting information, bar graph for Filling and Over/Under applications |

Menu button

Touching  opens the following menu:

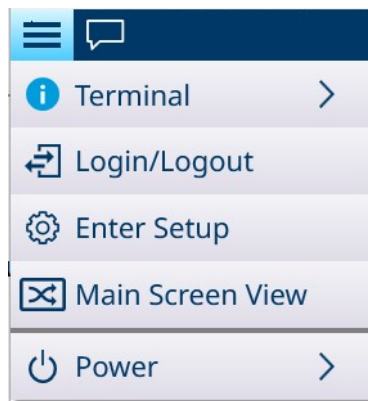






Figure 11: Top Menu

- Note that the Power item only appears if the login level is Supervisor or Admin.
- Terminal – Shows the terminal's IP address, detailed metrology information and detailed terminal information. Refer to [Accessing Terminal Information ▶ Page 45].
- Login/Logout– refer to [Logging In and Logging Out ▶ Page 32].
- Enter Setup – Enter IND700 setup. Refer to Operating the setup.
- Switch between Application View and Main Screen View:
Example: Counting is active and simple weighing is needed to weigh another sample. Switch to Main Screen View, perform the simple weighing operation, then touch the menu item again to return to Application View.
- Exit application (supervisor or administrator level only) – Exit the IND700 application. The Windows desktop will appear.

Message box

- The message box status icon varies depending on the last logged message.
- Messages are classified with the same icons.

	Severe error
	Warning
	Information
	No new message since the message box was last viewed

Sample of message box contents:

Icon	Message	Time
	Scale 2 not responding.	23/Feb/2021 9:09 AM
	Scale not calibrated	23/Feb/2021 9:08 AM
	Scale 2 not responding.	22/Feb/2021 10:16 AM
	Scale not calibrated	22/Feb/2021 10:16 AM
	Scale 2 not responding.	22/Feb/2021 10:11 AM
	Scale not calibrated	22/Feb/2021 10:10 AM
	Scale 2 not responding.	22/Feb/2021 10:07 AM
	Init zero could not be done	22/Feb/2021 10:07 AM

Access level display

The IND700 offers three access levels. The current level is indicated by the small squares included in the operator symbol on the system bar:

Operator	Supervisor	Administrator
Operation level only, no setup rights	Full rights, except approval and calibration rights	Full rights, including approval and calibration rights

For user setup, refer to [User Security ▶ Page 29].

All access levels can change the terminal language by touching the globe icon:



NOTICE

Setup Access

Note that if the current Access Level is changed to a higher or lower level while Setup is displayed, changes to access to configuration parameters will **not** be changed until setup is closed and re-opened. Thus, if an Admin login is replaced by an Operator login while a configuration screen is displayed, the terminal system line will indicate an Operator login level but will grant Admin level access.
























Status line

The status line can display the following symbols:

>0<	Set to zero	x.xxx kg T	Current tare weight
B/G	Gross weight	x.xxx kg PT	Current tare preset
NET	Net weight	x.xxx kg M	Tare weight with net sign correction (Memory), POWERCELL/PowerDeck scales only
	MinWeigh function active		MinWeigh error
>I1<, >I2<, >I3<	Current weighing range, multiple range/interval scales only		Stability monitor

Softkeys

The following softkeys are available, separated in up to 3 softkey ribbons. Note that some of these softkeys display when an application is in use, and do not appear in the [Softkey Ribbon Editor ▶ Page 197].

	Clear		Transfer data
	Tare		Preset Tare
	Zero		View Tare table
	Switch scale		Higher resolution -- toggles between standard and high resolution weight displays
	Switch units		Target
	View Alibi memory		View Transaction Table
	Fix reference number		View Identification form (ID Form)
 Switch Weight	Switch weight display between weight value and number of pieces		Variable reference number
	Add to total	 Switch Weight	Switch weight display between weight value and number of pieces inactive
 Input Template	Input Template -- displays pop-up list of available templates. Softkey will appear only if at least one template is assigned to a [Connection ▶ Page 215], and the connection is configured with Selectable by Softkey enabled.		Call up / clear total
  Home	Apps -- toggle between Application View and Main Screen View	 Repeat Tr.	Repeat Transaction (reprint)

Data entry can be carried out either by connecting an external keyboard and mouse, or by using the system's keypads. Refer to [Data Entry ▶ Page 43] for details on the use of these screens.

1.9 Main PCB Connections, Ports and Switches

Connectors and other features on the IND700 main PCB are indicated in the illustration below.

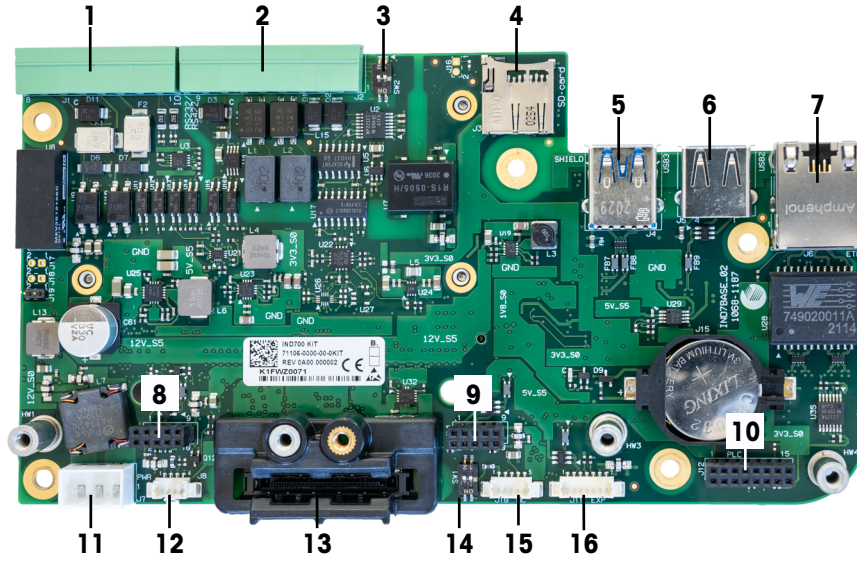


Figure 12: IND700 Main PCB Connections and Switches

1	Discrete I/O	2	COM1 (RS232/422/485)
3	SW2	4	SD Card Slot (not used)
5	USB 3.0	6	USB 2.0
7	1000Base-T LAN	8	Slot 1
9	Slot 2	10	Industrial Network
11	12 VDC input	12	Fan connector
13	HMI interface	14	SW1
15	Debug (do not use)	16	USB extension connector

1.10 Scale Interfaces and Option Boards

The IND700 terminal provides the following option boards for connection of different types of scales, and for Industrial Network communication. The figure below indicates locations for these options.

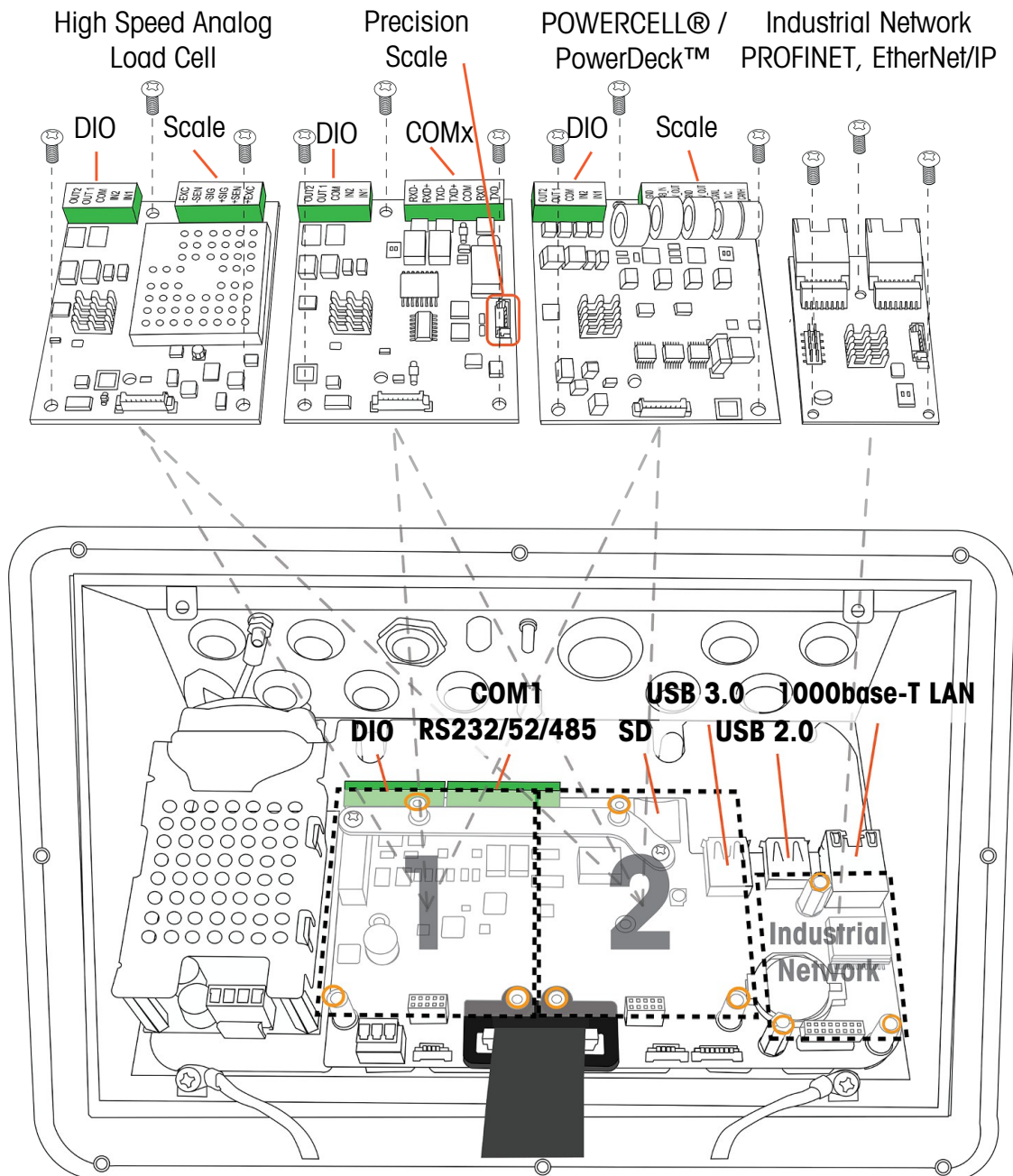


Figure 13: IND700 Interface and Option Installation Locations

Scale interface option boards are mounted in either Slot 1 or Slot 2. The Industrial Network interface board mounts to the connector indicated in the figure above.

High Speed Analog (HSALC) Scale Interface Board

The HSALC board, part number 30554297, allows connection of analog load cells. Each HSALC interface is able to drive up to eight 350 ohm analog load cells. The board also provides 2 discrete inputs and 2 discrete outputs.

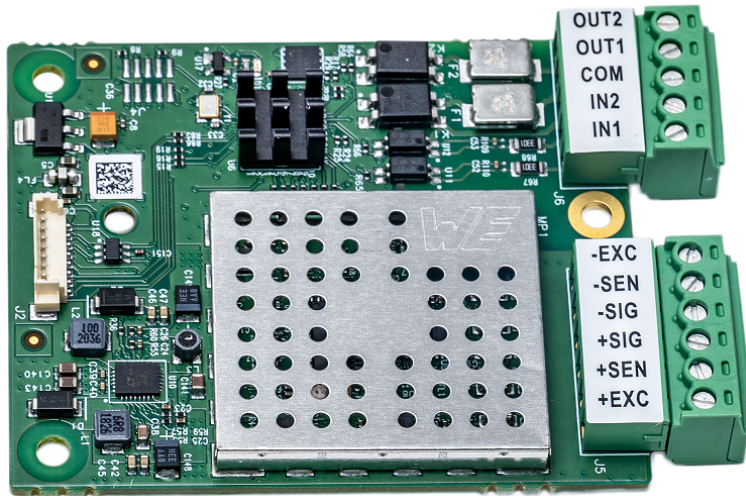


Figure 14: HSALC Scale Board

POWERCELL® Scale Interface Board

The POWERCELL scale interface board, part number 30521649, is used with METTLER TOLEDO POWERCELL PDX/PowerMount load cells, installed in large tank and vehicle weighing systems, or with PowerDeck scales. The board also provides two discrete inputs and two discrete outputs.

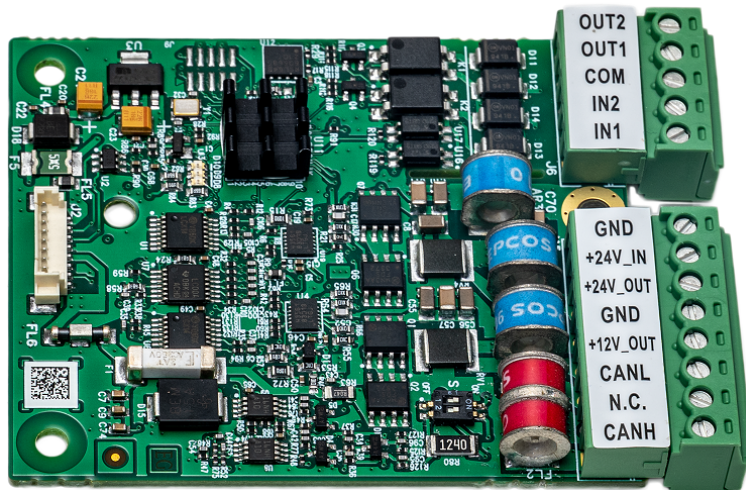


Figure 15: POWERCELL Board

Precision Scale Interface Board

The Precision scale interface board, part number 30529386, supplies 12 VDC for precision weighing platforms. This option board has two additional features -- an interface for two discrete inputs and two discrete outputs, and an additional RS232/RS422/RS485 serial port named COMx. The 7-pin serial port on the interface board does **not** provide +5V and GND connections.

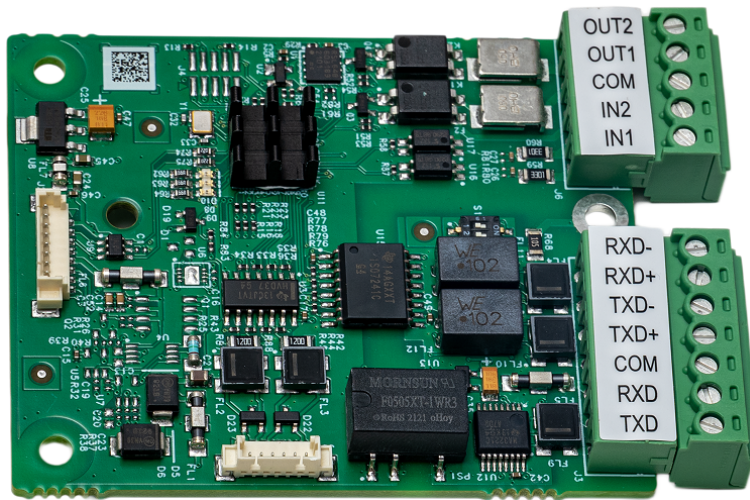


Figure 16: Precision Scale Board

Industrial Network Option Board

The Industrial Network option board can be configured for PROFINET (part number 30529337) or EtherNet/IP (part number 30708327). The dual RJ45 ports (Port A and Port B) enable the Media Redundancy Protocol (MRP) or Device Level Ring (DLR).

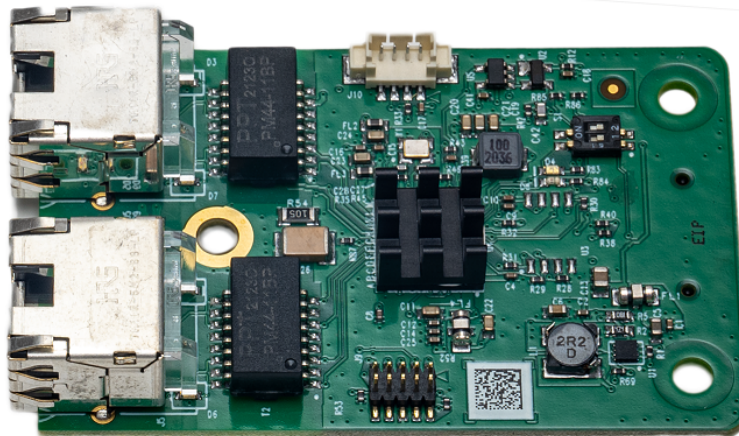


Figure 17: Industrial Network Option Board

Industrial Ethernet Update Rates

Industrial Ethernet Option Update rates

System Configuration	PROFINET	EtherNet/IP
HSALC, 1 scale	66 Hz	64 Hz
HSALC, 2 scales	50 Hz	49 Hz
POWERCELL, 4 scales	15 Hz	14 Hz

1.11 Connections

Connections are made using the openings on the rear of the IND700 enclosures. Openings are assigned as indicated below.

1.11.1 IND700 Wedge Model



Figure 18: IND700 Wedge Model with Cable Openings

Wedge Model Cable Opening Assignments

Position	Connector Size	Cable Diameter	Function
1	M12 x 1.5 connector	-	<ul style="list-style-type: none"> Ethernet USB
2	M12 x 1.5 connector	-	<ul style="list-style-type: none"> USB DIO1 (all IO from main board and Scale 1), DIO2 on Scale 2 (5-pin) COMx
3	Depends on scale interface	-	<ul style="list-style-type: none"> Scale 2
	M12 x 1.5 connector	-	<ul style="list-style-type: none"> Serial M12 connector only for COMx (7-pin) DIO1 (all IO from main board and scale 1, 12-pin)
4	M12 x 1.5 connector	-	<ul style="list-style-type: none"> Optional COM Scale 1
	M16 x 1.5 gland	5-10mm	<ul style="list-style-type: none"> Scale 1, if High Speed Analog Load Cell (HSALC)
5	M12 x 1.5 connector	-	<ul style="list-style-type: none"> DIO1 (all IO from main board and Scale 1) COM 1 from main board
6	M16 x 1.5 gland	5-10mm	<ul style="list-style-type: none"> Power
7	M12 vent	-	<ul style="list-style-type: none"> GORE-TEX vent; not standard for wedge model

Notes

- COMx in position 2 uses a cable harness with an M12 connector. This assignment is possible only if a Precision interface is installed as Scale 1
- M12 connectors are used in all locations unless otherwise required by the scale interface
- The wedge model does not support Industrial Network options
- The GORE-TEX vent (7) is optional, and is not included in the default configuration
- Due to the physical layout and length of internal harnesses, only the following connector locations are possible:

DIO M12	Positions 2, 3 or 5
USB M12	Positions 1 or 2
Ethernet M12	Position 1
COM1 M12	Position 5
COMx M12 (Precision Scale)	Positions 2 or 3

1.11.2 IND700 Wedge Model, Hygienic Option



Figure 19: IND700 Wedge Model (Hygienic Option) with Cable Openings

Wedge Model (Hygienic Option) Cable Opening Assignments

Position	Connector Size	Cable Diameter	Function
1	M12 x 1.5 connector	-	<ul style="list-style-type: none"> Ethernet USB
2	M12 x 1.5 connector	-	<ul style="list-style-type: none"> USB Standard DIO1 on main board, or scale 1 (12-pin) DIO2 on scale 2 (5-pin) Serial M12 connector only for COMx (7-pin)
3	See position 4 for scale connectors	-	<ul style="list-style-type: none"> Scale 2 (see position 4 for scale connectors to use)
	M12 x 1.5 connector	-	<ul style="list-style-type: none"> Serial M12 connector only for COMx (7-pin) Standard DIO1 on main board, or scale 1 (12-pin)
4	M12 x 1.5 connector	-	<ul style="list-style-type: none"> POWERCELL/PowerDeck Precision Optional serial port M12 (7-pin) (RS232/RS422/RS485)
	M16 x 1.5 NSF gland	5.5-7mm or 7-10mm	<ul style="list-style-type: none"> High Speed Analog Load Cell (HSALC)
5	M12 x 1.5 connector	-	<ul style="list-style-type: none"> Standard COM1 M12 connector only (RS232/RS422/RS485) Standard DIO1 on main board, or scale 1 (12-pin)
6	M16 x 1.5 NSF gland	5.5-7mm	<ul style="list-style-type: none"> Power
7	M12 x 1.5 Vent	-	<ul style="list-style-type: none"> GORE-TEX vent; not installed at factory but included in installation kit, noted as "NOT NSF" in documentation

Note

- The wedge model does not support Industrial Network options

Notes

- Special NSF glands are used for the HSALC and power connectors
- A GORE-TEX vent is included in the installation kit. This vent is **not** NSF approved
- PET cover is added in touch panel



Figure 20: GORE-TEX Vent in side of Wedge Model

1.11.3 IND700 Harsh Environment 7" Model, M12 Option

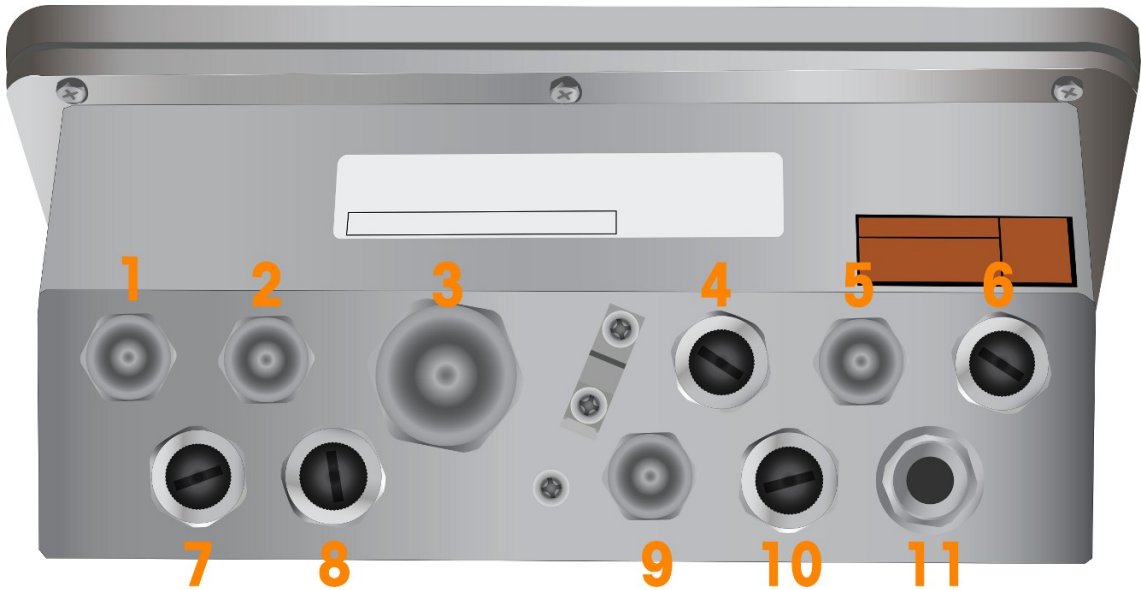


Figure 21: IND700 Harsh Environment 7" Model (M12 Option) with Cable Openings

Harsh Environment 7" Model (M12 Option) Cable Opening Assignments

Position	Size	Cable Diameter	Function
1	M12 x 1.5 connector	-	<ul style="list-style-type: none"> M12 cable for Industrial Network
2	M12 x 1.5 connector	-	<ul style="list-style-type: none"> M12 cable for Industrial Network
3	Reserved	-	-
4	M12 x 1.5 connector	-	<ul style="list-style-type: none"> Scale 1: PowerDeck Scale 1: Precision Optional serial port M12 (7-pin) (RS232/RS422/RS485)
	M16 x 1.5 gland	5-10mm	<ul style="list-style-type: none"> Scale 1: High Speed Analog Load Cell (HSALC)
	M16 x 1.5 PDX gland	5-10mm	<ul style="list-style-type: none"> Scale 1: POWERCELL (Vehicle)
5	M12 x 1.5 connector	-	<ul style="list-style-type: none"> DIO2 on scale 2 (5-pin) Serial M12 connector only for COMx (7-pin) -- only if Scale 1 is a Precision interface
6	M12 x 1.5 connector	-	<ul style="list-style-type: none"> DIO (all IO from main board and scale 1, 12-pin)
7	M12 x 1.5 connector	-	<ul style="list-style-type: none"> Ethernet
8	M12 x 1.5 connector	-	<ul style="list-style-type: none"> USB

9	M12 x 1.5 connector	-	<ul style="list-style-type: none"> Scale 2: PowerDeck Scale 2: Precision Scale 2: Serial (RS232/RS422/RS485)
	M16 x 1.5 connector	5-10mm	<ul style="list-style-type: none"> Scale 2: High Speed Analog Load Cell (HSALC)
	M16 x 1.5 connector	-	<ul style="list-style-type: none"> Scale 2: POWERCELL (Vehicle)
10	M12 x 1.5 connector	-	<ul style="list-style-type: none"> COM1 Serial (RS232/RS422/RS485) M12 (8-pin)
11	M16 x 1.5 connector	5-10mm	<ul style="list-style-type: none"> Power

Notes

- M12 connectors are used in all locations except for the power cord and HSALC, which always use cable glands
- M12 connectors for USB, Ethernet, COM1 and standard DIO are all included. There is no need to select them in the SCK
- M12 connectors for COM2 and DIO2 are not included. There is no need to select them in the SCK
- The M12 connector can support up to 12 total DIO. If a second scale is installed, the terminal will be configured with all DIO connected except for INPUT 2 on the second scale board.
- All Harsh environment 7" versions support only M12 cable for the EtherNet/IP and PROFINET options

1.11.4 IND700 Harsh Environment 7" Model, Gland Option

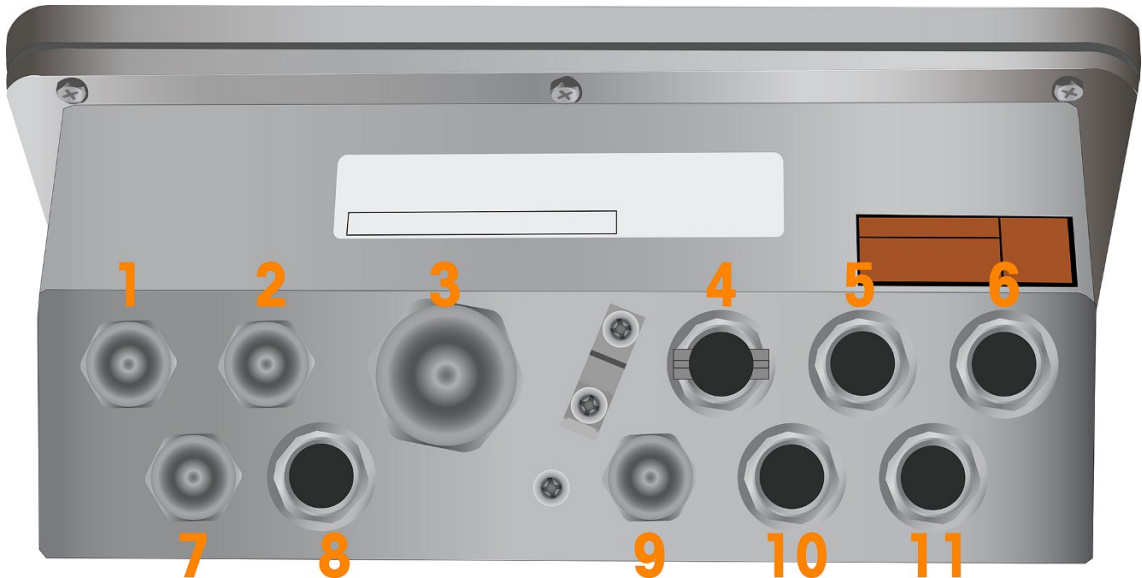


Figure 22: IND700 Harsh Environment 7" Version (Gland Option) with Cable Openings

Harsh Environment 7" Model (Gland Option) Cable Opening Assignments

Position	Size	Cable Diameter	Function
1	M12 x 1.5 connector	-	<ul style="list-style-type: none"> M12 cable for Industrial Network
2	M12 x 1.5 connector	-	<ul style="list-style-type: none"> M12 cable for Industrial Network
3	M25 x 1.5 gland	13-18mm; requires a 1- and 2-hole grommet	<ul style="list-style-type: none"> USB Ethernet
4	M12 x 1.5 connector	-	<ul style="list-style-type: none"> Scale 1: PowerDeck Scale 1: Precision
	M16 x 1.5 gland	5-10mm	<ul style="list-style-type: none"> Scale 1: High Speed Analog Load Cell (HSALC) Optional Serial port (RS232/RS422/RS485)
	M16 x 1.5 PDX gland	5-10mm	<ul style="list-style-type: none"> Scale 1: POWERCELL (Vehicle)
5	M16 x 1.5 gland	5-10 mm	<ul style="list-style-type: none"> DIO2 on scale 2

6	M16 x 1.5 connector	5-10 mm	<ul style="list-style-type: none"> DIO1 (all IO from on main board and scale 1, 12-pin)
7	Reserved: M16 plug	-	-
8	M16 x 1.5 connector	5-10mm	<ul style="list-style-type: none"> COM2 from Precision scale, if installed as Scale 2
9	M12 x 1.5 connector	-	For optional second slot: <ul style="list-style-type: none"> Scale 2: PowerDeck Scale 2: Precision
	M16 x 1.5 connector	5-10mm	<ul style="list-style-type: none"> Scale 2: High Speed Analog Load Cell (HSALC) Optional serial port (RS232/RS422/RS485) Additional DIO option board
	M16 x 1.5 gland	5-10mm	<ul style="list-style-type: none"> Scale 2: POWERCELL
10	M16 x 1.5 connector	5-10mm	<ul style="list-style-type: none"> COM1
11	M16 x 1.5 connector	5-10mm	<ul style="list-style-type: none"> Power

Notes

- The harsh environment 7" version with cable glands uses **only** cable glands for connections except for the Precision scale, PowerDeck scale, and PLC option, which always use M12 connectors
- In the harsh environment 7" version with cable glands, the M25 gland is installed with single- and double-hole grommets, available in the installation kit for the USB and Ethernet options. Cable glands are also included for COM1, COM2 and the standard DIO1 and DIO2; it is not necessary to select these in the SCK
- All harsh environment 7" versions support only M12 cable for the EtherNet/IP and PROFINET options.

2 Operation

This section provides information about navigating the Human-Machine Interface, and basic features and functions of the IND700.

Specific operation of each IND700 terminal depends on enabled functions and parameters that are configured in setup. These setup parameters are described in [Configuration ▶ Page 72]. The configuration and operation of optional Applications are described in the **IND700 ProWorks Multi-Tools User's Manual** (30753893).

2.1 Non-Weighing Operation

2.1.1 Turning the Terminal On and Off

Turning the Terminal On

If the terminal is not connected to power, plugging it in will initiate the start-up process. The function key highlights will flash, and a start-up screen will display. When the start-up process is complete, the home screen will appear.

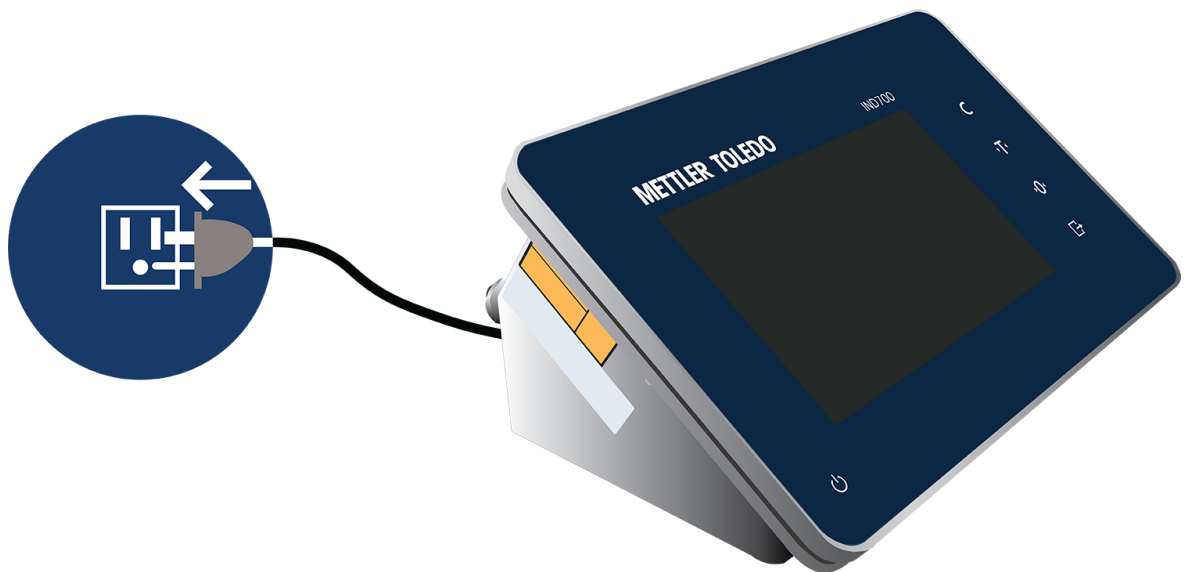


Figure 23: Connect Terminal to Power



Figure 24: Startup Screen

If the terminal is off, but already plugged in, touch the Power button to initiate startup. The same start-up sequence will begin.

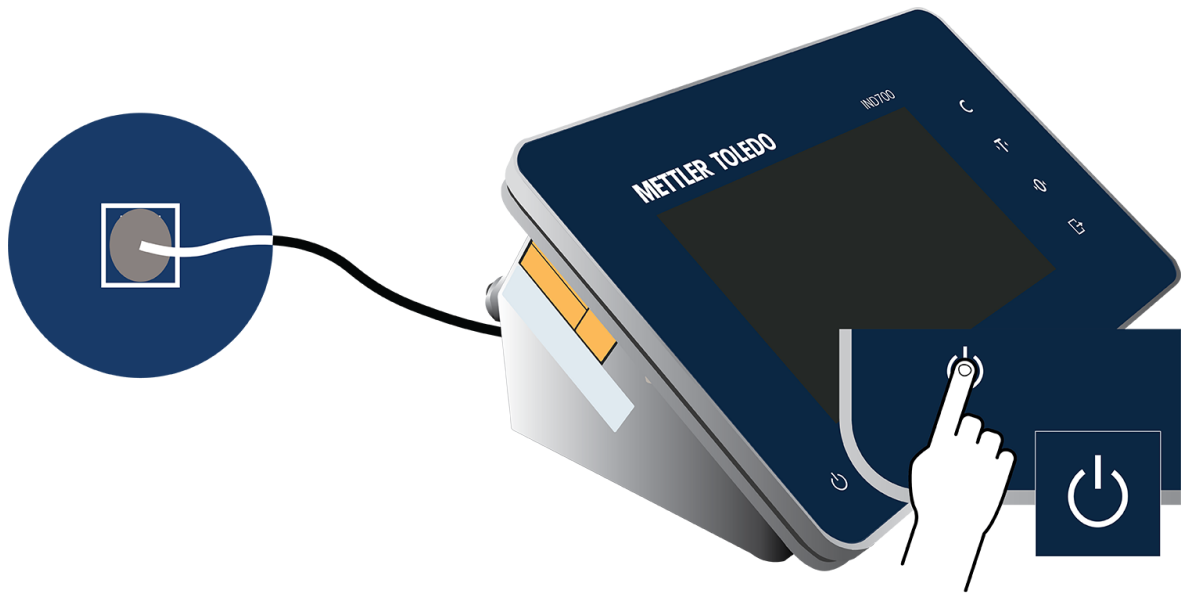



Figure 25: Start-up Using Power Button

Shutting Down

To shut down the terminal, either touch the Power button on the fascia, or access the menu  and touch **Power | Shut Down**. Note that shut-down from the menu is only possible with a Admin level login.

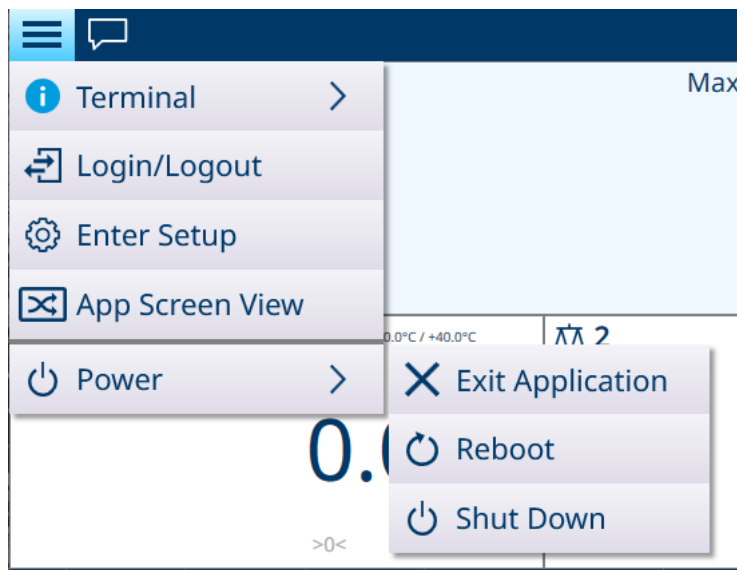


Figure 26: Shutdown from Menu

In either case, a confirmation message will display.

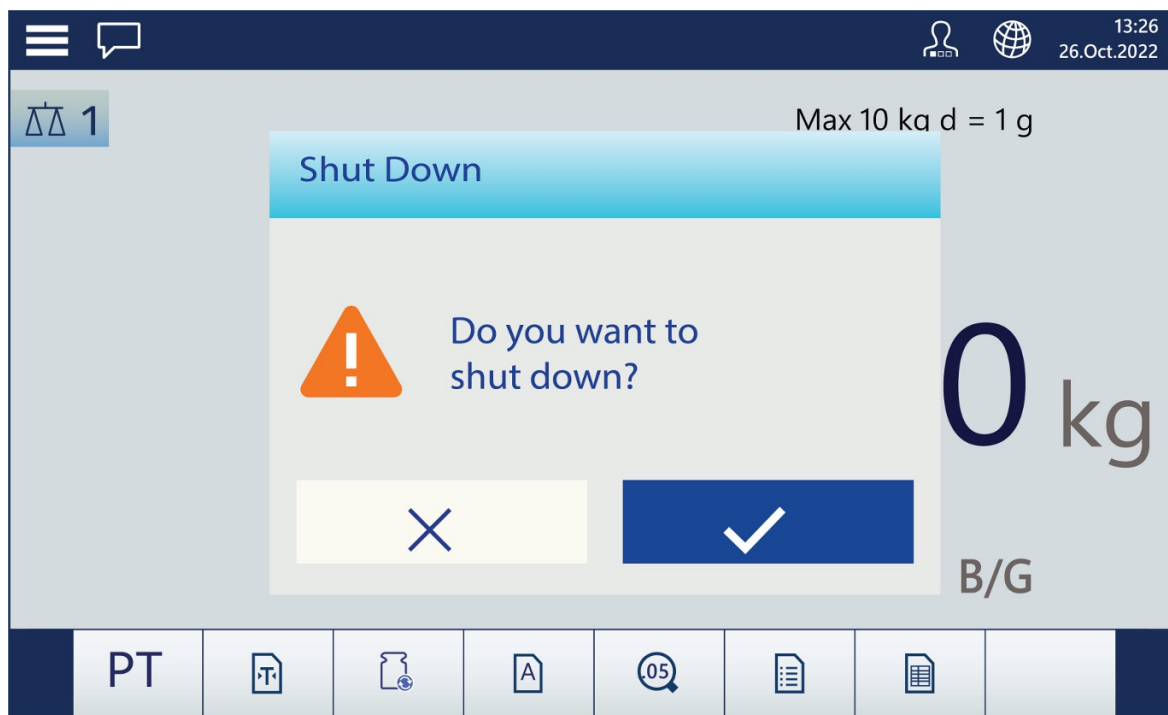


Figure 27: Shutdown Confirmation

Touch the check mark to complete the shut-down procedure.

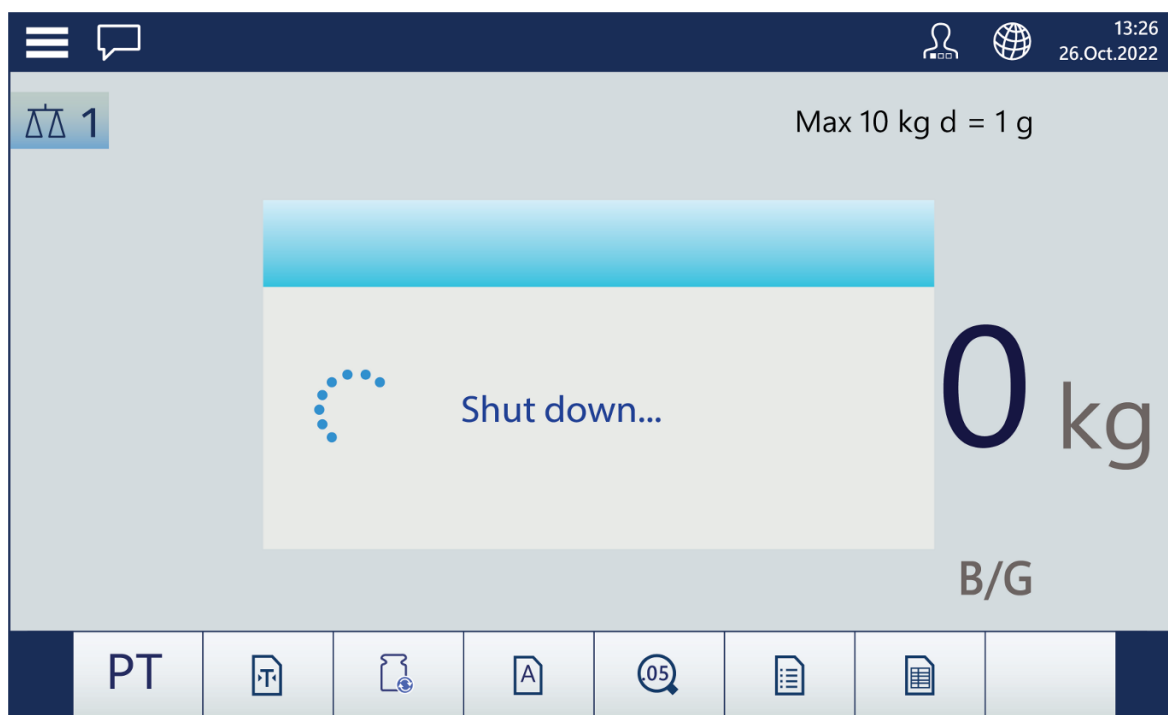


Figure 28: Shutdown in Progress

2.1.2 User Security



NOTICE

Terminal Access

When the terminal is in its factory default state, no passwords are set for users at any login level. It is strongly recommended that the terminal's configuration be protected by setting a password for the Admin user, as described below.

For an overview of User Security, refer to [Touchscreen ▶ Page 16].

Access level control is important for safeguarding the terminal's configuration and weighing data. This control may also be due to legal regulations or to customer preference. Some installations operate in a "trusted" environment, where security is managed within the scope of the operation perimeter and no additional security is required from the weighing terminal. The opposite extreme may be found in highly-regulated industries where every operation must be recorded and authorized by signature or login.

The terminal allows the creation of three types of user -- Operator, Supervisor and Admin. These are configured in Setup at **Terminal > Users**.

An **Operator** can operate the terminal and view tables, but cannot change the configuration or add table records. An Operator login may or may not be password-protected, and it is possible to configure many different Operators. By default, the terminal has one Operator login configured, with the user name **Operator** and no password.

A **Supervisor** can add or modify table records (including Users at Supervisor or Operator level), but cannot enable or disable tables.

An **Admin** user has complete access to, and can modify, all terminal configuration screens and tables. By default, the terminal has one Admin operator configured, with the user name **Admin** and password. It is recommended that a password be assigned to protect administrative functions and configurations from being altered without authorization.



NOTICE

Password Management

When setting a password for a user, be sure to remember it and protect it from access by unauthorized personnel. If the password is changed or forgotten, access to the setup menu and some terminal functions will be lost. To regain access and functionality, a master reset of the terminal must be performed. This will reset all user names and passwords, but will also remove any custom configuration. Note that configurations can be backed up from, and restored to, the terminal, to recover custom settings.

User Management

To manage terminal users, access **Setup > Terminal > Users**. The **Users** list will display.

User Name	Access Level	Default User
Admin	Administrator	
Operator	Operator	✓
Jean	Administrator	

Figure 29: User's List

To select a user, touch the table row. A popup will appear.

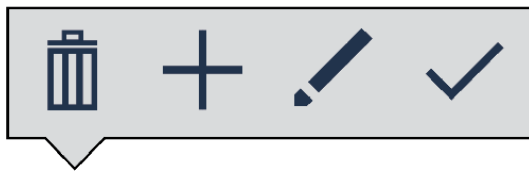




Figure 30: Table Record Management Popup

The options are delete  or modify  the selected user, or create  a new user.

If Delete is touched, a warning will display. Touch the checkmark to continue, or the X to cancel the deletion.

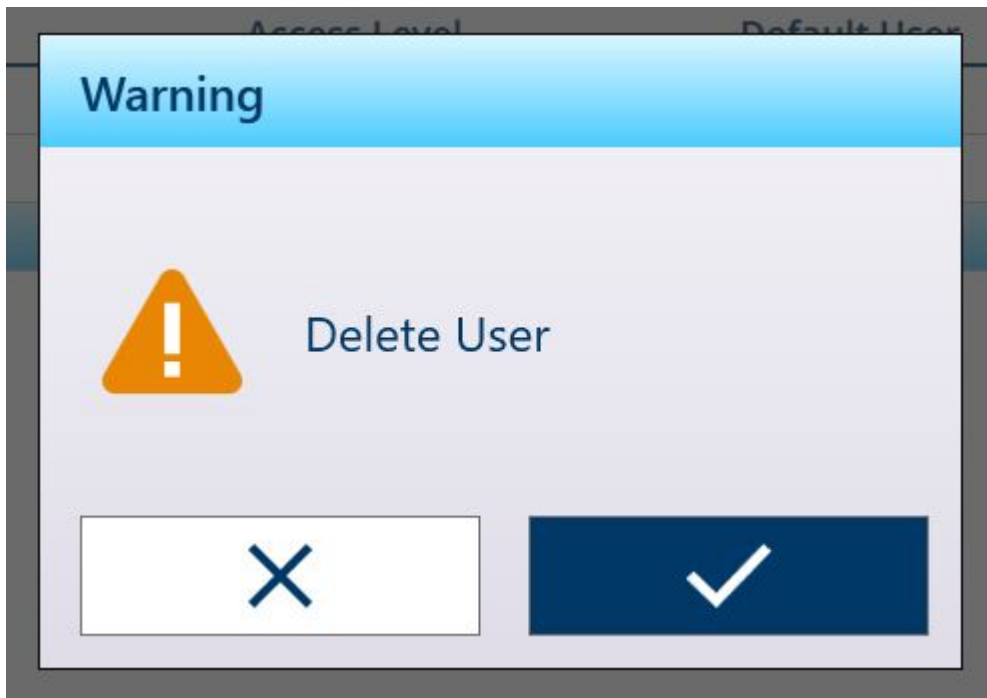


Figure 31: Delete User Warning

If Add is touched, and the current login level is Supervisor or Admin, the Add User screen will display.

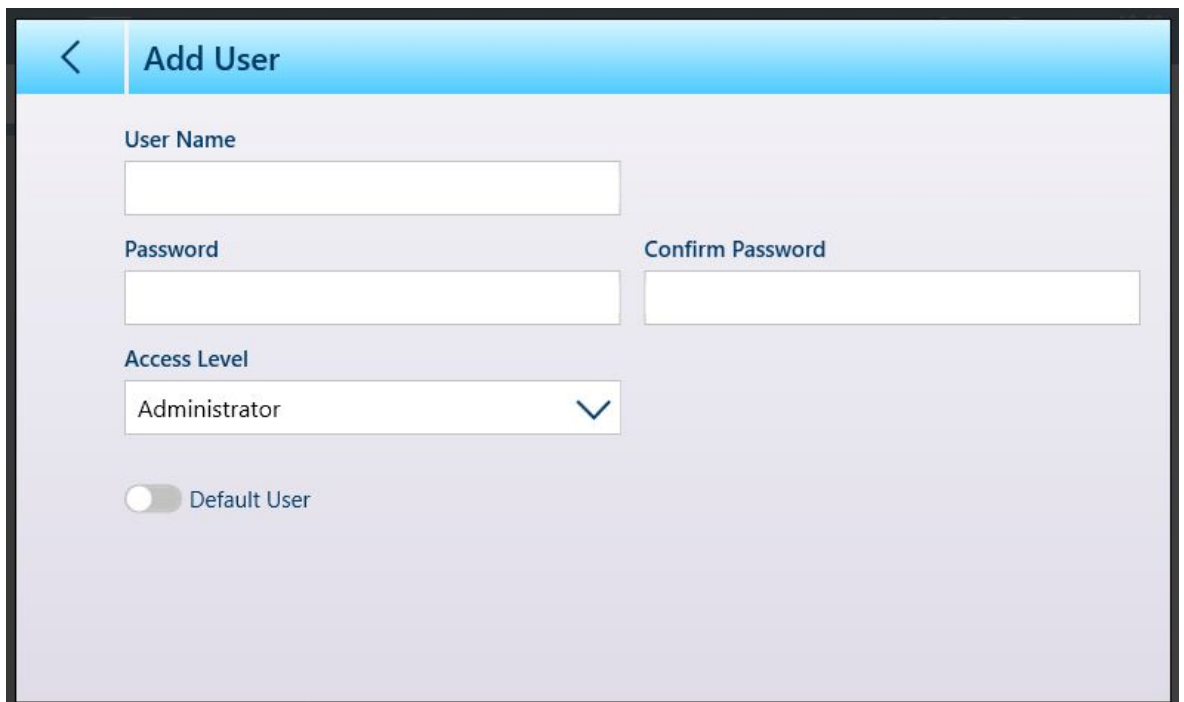


Figure 32: New User Screen

Here, a new user's name, password and access level can be configured. If the current login is Admin, the **Default User** slider will be active. The login dialog for the default user will display automatically at system start-up or, if no password is assigned (for an Operator, for instance), the terminal will start up with that user logged in by default.

If Modify is touched, the Edit User screen will display with the same configuration options as the Add User screen.

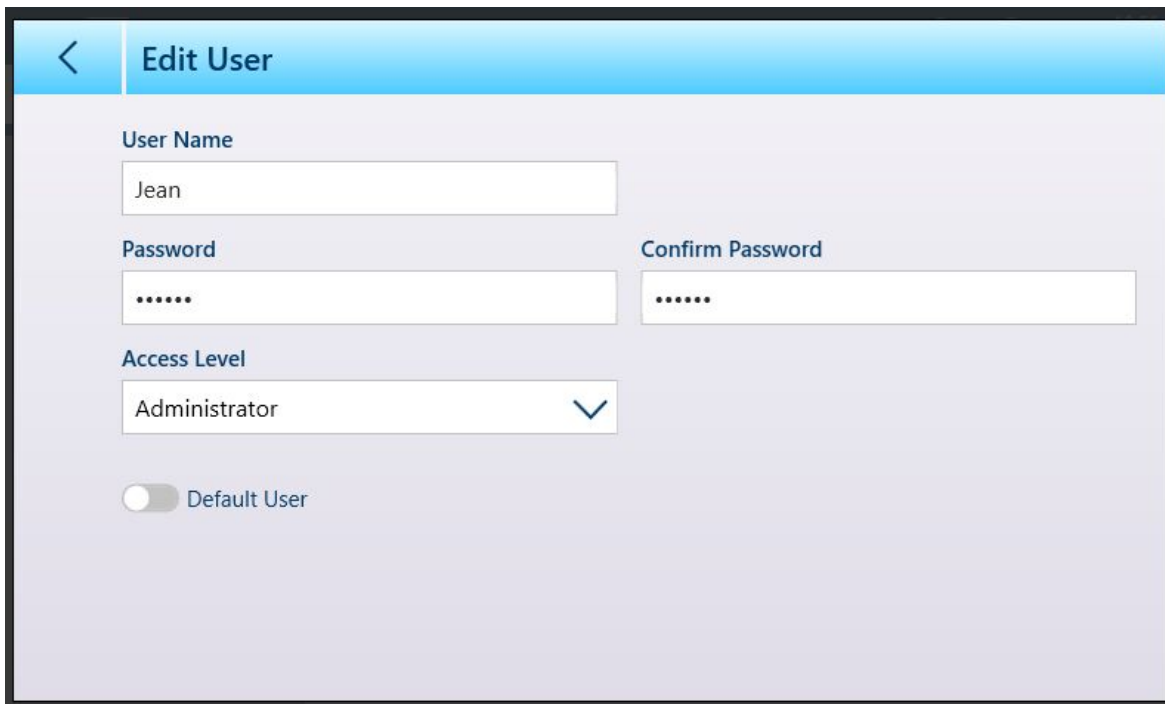


Figure 33: Edit User Screen

The Access Level options dropdown list is shown below.

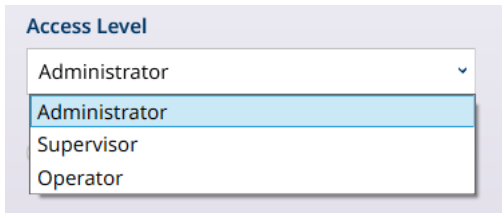


Figure 34: Access Level Options

When user configuration is complete, touch the Back arrow to return to the **Setup > Terminal** menu.



2.1.3 Logging In and Logging Out



NOTICE

User Configuration

This section assumes that users have been configured with names and, as required, passwords, in Setup at **Terminal > Users**. Refer to [Users ▶ Page 190] for details.

The user login screen can be accessed either by touching the Login/Logout item from the main menu  or by touching the user icon  in the system line. In either case, the user account screen will display.

When the terminal is turned on, the login status shows the user configured as **Default User**. Typically, the default user will be an Operator-level login, and the initial user account screen will appear as shown below. The **User Name** drop-down list will contain all configured users, but will always include the default users **Admin** and **Operator**. In this case, **Operator 1** is the default user and is currently logged-in.

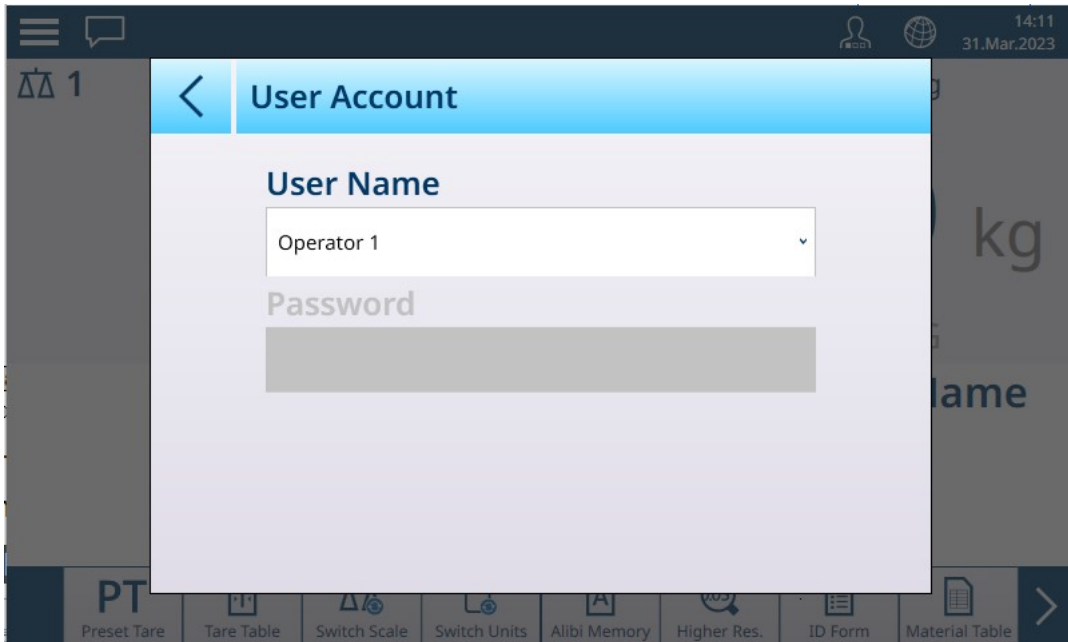


Figure 35: User Account Screen - No Password Configured

Note that, because the currently logged-in user is displayed, the password field is blank, and the logout icon is not shown.

In the example shown below, the default **Admin** user has been selected from the **User Name** dropdown list. The **Password** field is displayed and, if a password is configured for Admin, must be completed before touching the OK icon.

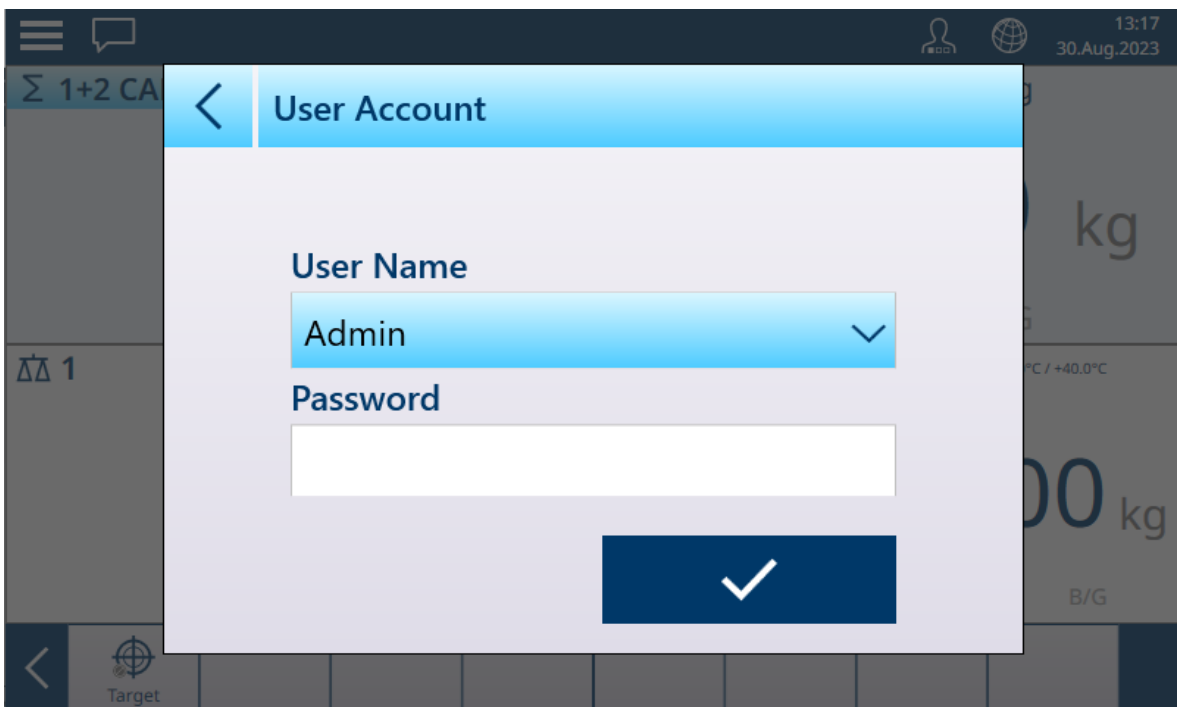


Figure 36: User Account Screen with Logout Button

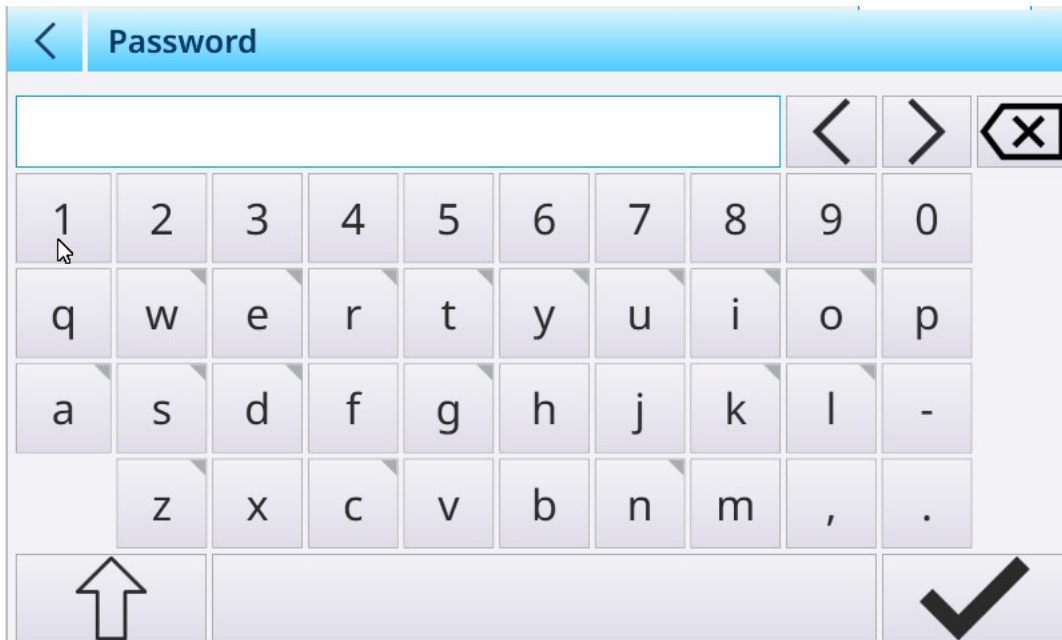


Figure 37: Password Entry Screen

Note that the password characters are not displayed in the entry field.

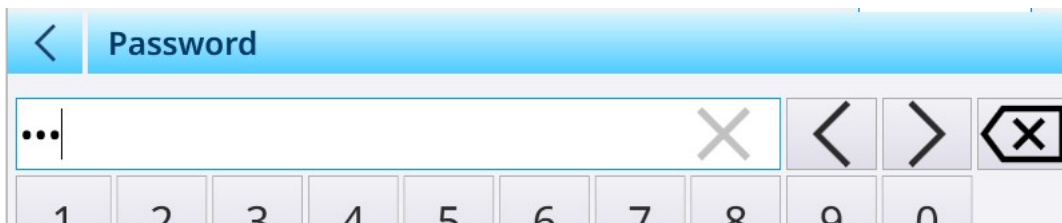


Figure 38: Password Entered, not Displayed

When the password has been entered, press to confirm it. If the password is correct, the User Account screen appears with the Password field populated.

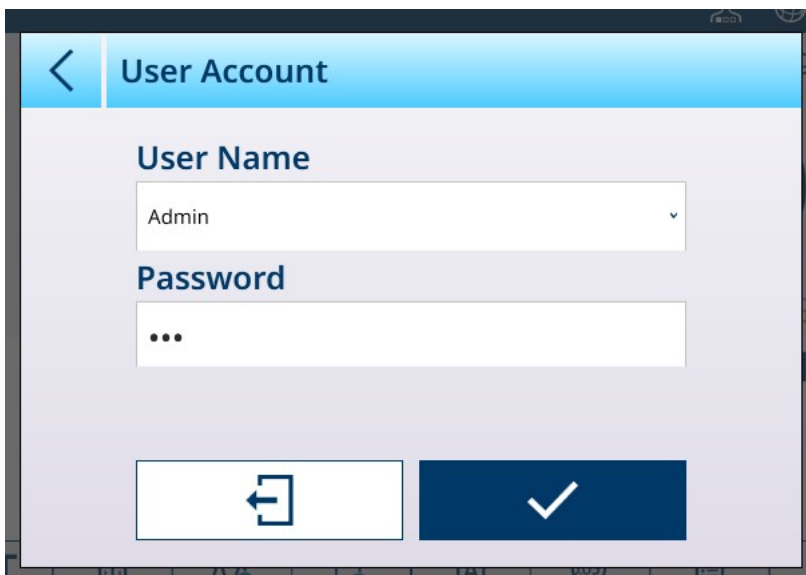


Figure 39: User Account Screen Completed

Touch the check button to complete the login, or the logout button to exit the screen the leave the login status as it was before.

If a password is not entered, or is entered incorrectly, an Error message will display:

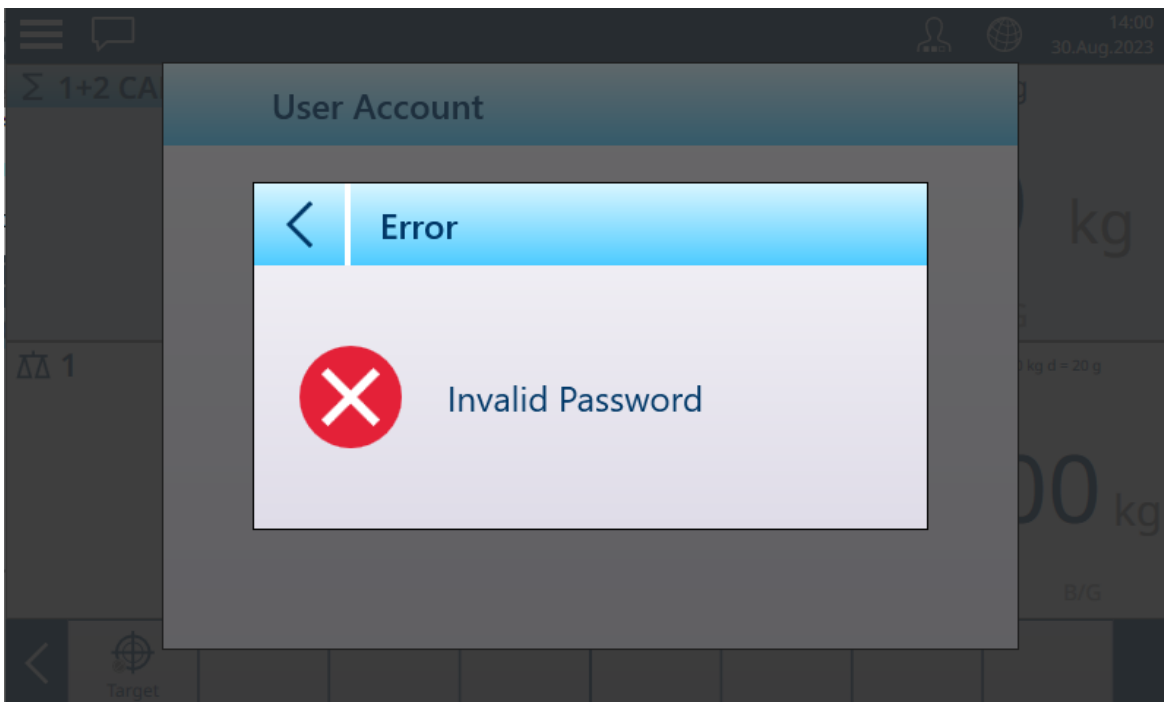


Figure 40: User Account - Invalid Password Message

To change users, touch the User Name field to display a list of existing users.

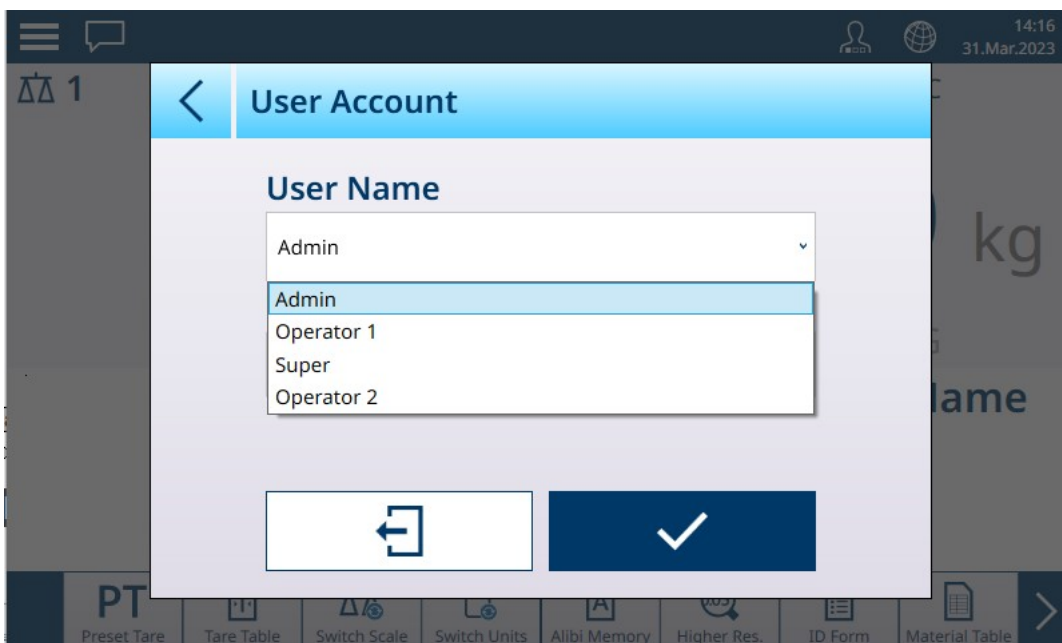



Figure 41: User Name Dropdown List

With the exception of the default Operator user, the currently logged-in user can be logged out by touching the log-out icon . The system then reverts to the default login.

2.1.4 Changing language temporarily

You can change the terminal's display language temporarily, as required.



NOTICE

Terminal Language Selection

The terminal's default language is configured in Setup at **Terminal > Region > Language**.

Touch the globe  on the system bar. A list of available languages is displayed.



Figure 42: Temporary Language Selection Drop-Down List

Touch the required language to select it. The language will remain selected until it is changed from this drop-down list, or the terminal is restarted.

2.1.5 Understanding the HMI (Human-Machine Interface)



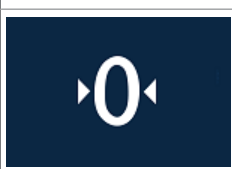



The following are used to navigate within applications and to configure the terminal:

- Softkeys on the touchscreen
- On-screen data entry fields (alphanumeric or numeric) on the touchscreen
- Scale Function keys on the terminal's fascia



Figure 43: IND700 Fascia and Touchscreen

Scale Function Keys

	Clear	In net weight mode , clears the current tare value; the display will revert to B/G mode. In data entry mode , functions as backspace/delete or escape.
	Tare	When touched, weighs container on scale, switches display to NET mode, and displays zero weight.
	Zero	Captures a new gross zero reference point. Function depends on settings configured for each scale interface at [Scale Setup ▶ Page 73].
	Transfer	Transmits data from the terminal to a printer or external storage, or registers a transaction. [Connections ▶ Page 215] must be correctly configured. [Output templates ▶ Page 227] can be used to format the exported information.
	Highlight	When a scale function key is touched a highlight appears briefly to confirm the operation.
	Power	Switches the terminal on and off.

Screen Areas

The following images identify the main components of the touchscreen interface, in sequence from top to bottom.




The system bar includes access to the main menu , a messages inbox , a current user display , a language selection icon , and the time and date (if the [display ▶ Page 188] is configured to show them).



Figure 44: System Bar

The messages inbox displays information, warnings and cautions detailing the state of the terminal.

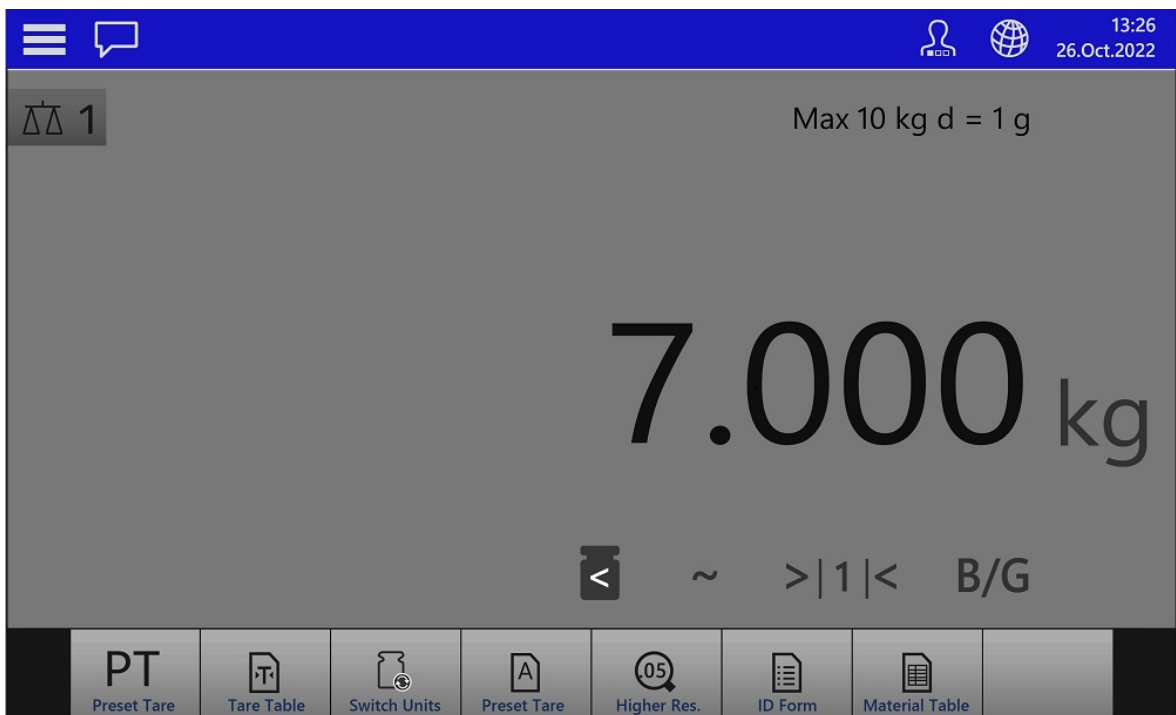


Figure 45: Messages Display

Metrological information, including capacity and increment, appears just under the menu bar.



Figure 46: Metrology Display Area

In a terminal with a single scale, the weight display area occupies the middle of the screen.

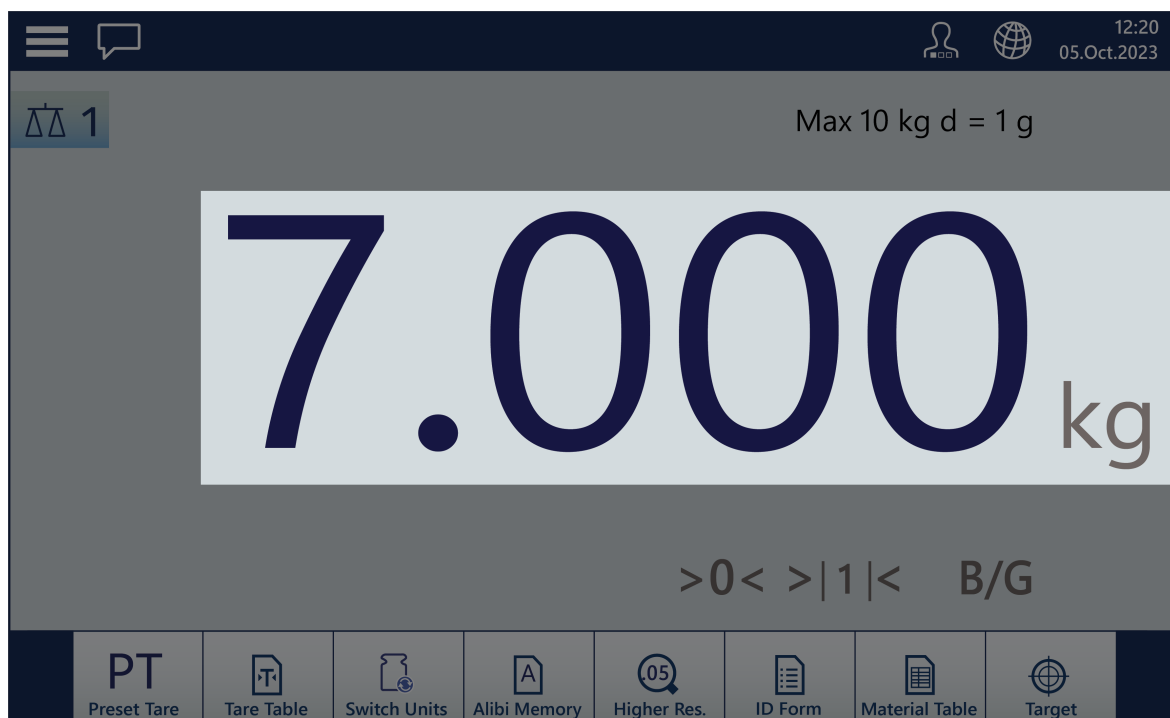


Figure 47: Weight Display

When a tare has been taken, its value is displayed below the main weight display, and the B/G indications changes to NET.



Figure 48: Tare

The legend area displays information about items such as MinWeigh, scale motion, when the scale is at zero, the currently operative range, and the net/gross indication.

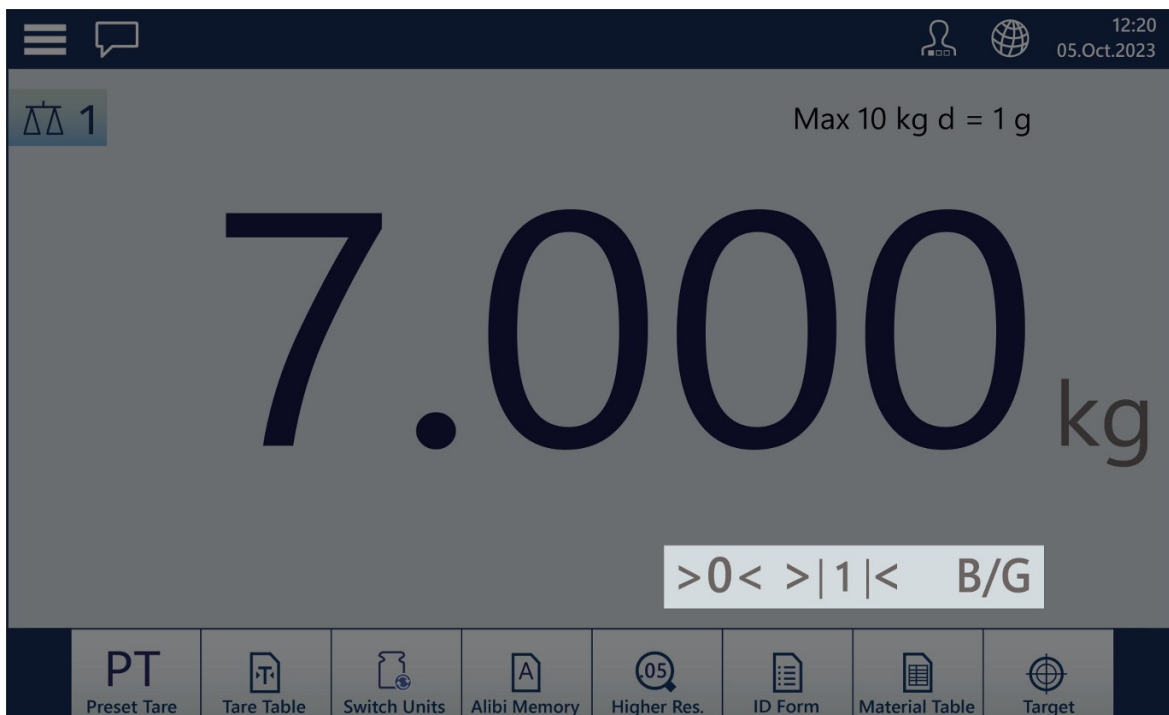


Figure 49: Legend Area

The softkey display will vary depending on the application in use, and on [terminal configuration ▶ Page 197].



Figure 50: Softkeys

2.1.5.1 Switching from multi-scale to single-scale view

Including Sum Scale, the IND700 HMI may display as many as three weight display areas. The image below shows a display from a terminal configured with two HSALC interfaces and a Sum Scale display.



Figure 51: IND700 Displaying Two HSALC Scales and a Sum Scale

Any scale can be selected for full-screen display simply by double-tapping on its display area. In the image below, the Sum Scale has been selected. This format provides maximum readability in cases where the focus is a single scale.



Figure 52: IND700 Focused on One of Three Weight Display Areas

Note that, in this display mode, the softkey ribbon is not available.

To return to the multi-scale display, simply double tap the screen again.

2.1.5.2 Weight Display Only Mode

It is possible to display weight information for the currently-selected scale as a window against the Windows desktop, as in the example below.

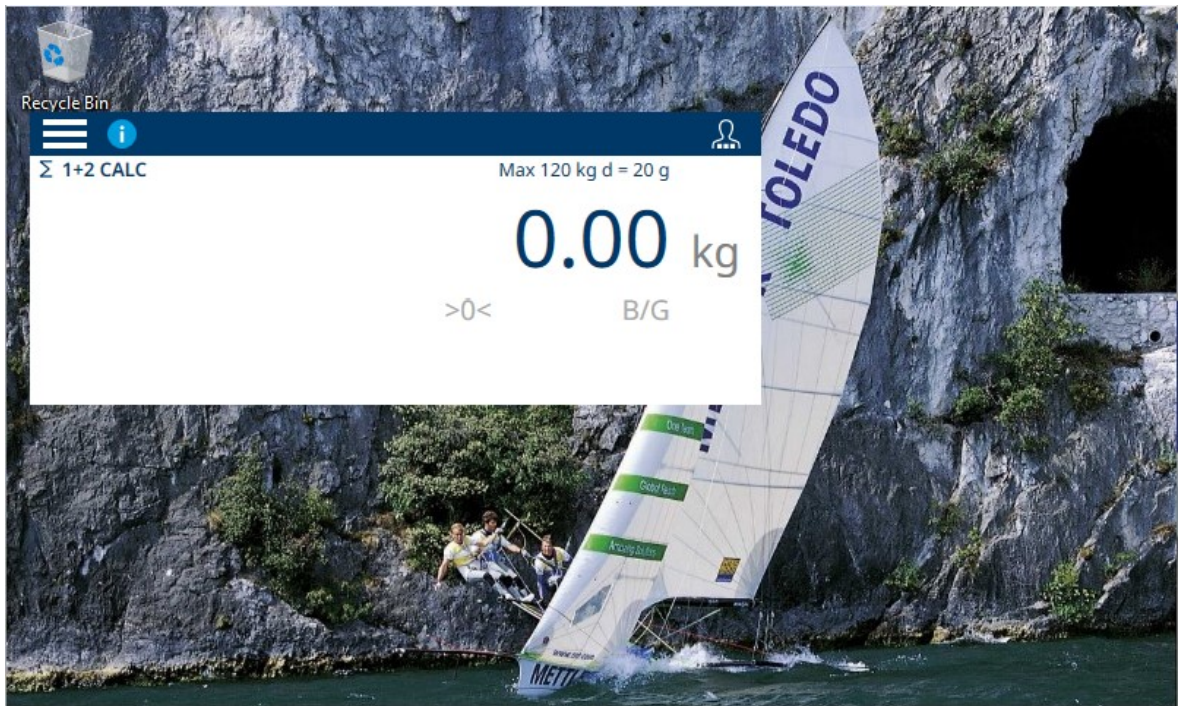


Figure 53: Weight Display Only Mode, Example

The size and behavior of this window is configured in setup at [Application mode ▶ Page 205]. Configuration of this behavior must be performed by a user with the necessary access rights to modify setup parameters.

2.1.6 Data Entry

When an input of numbers or text is required, touch the corresponding input field. Depending on the required input type, one of the two keypads shown below will display on the screen.

Alphanumeric Data Entry

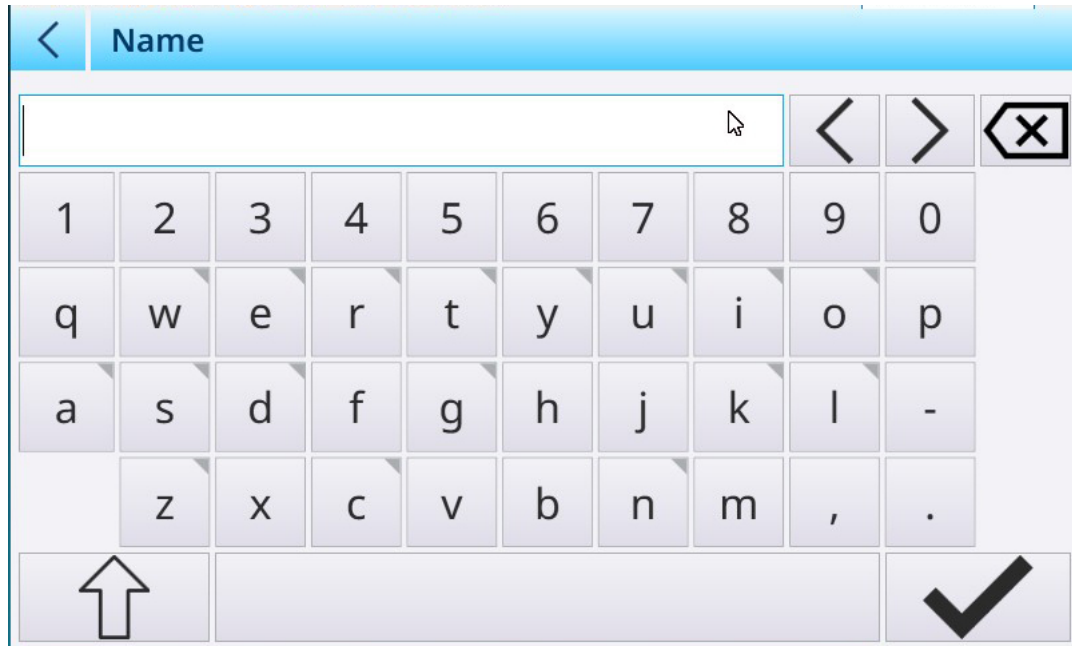


Figure 54: Alphanumeric Keyboard, Default (Lower Case) Display

- 1 A small triangle at the top right corner of a key indicates that special characters are available. To access these, touch and hold the character.
- 2 For example, when "s" is touched and held, a pop-up displays showing the available variants.
- 3 Touch the desired variant to add the letter or symbol to the text entry field.



Touch the shift key to display the letters in upper case. Note that when it is touched, the key is colored blue to indicate that it is active.

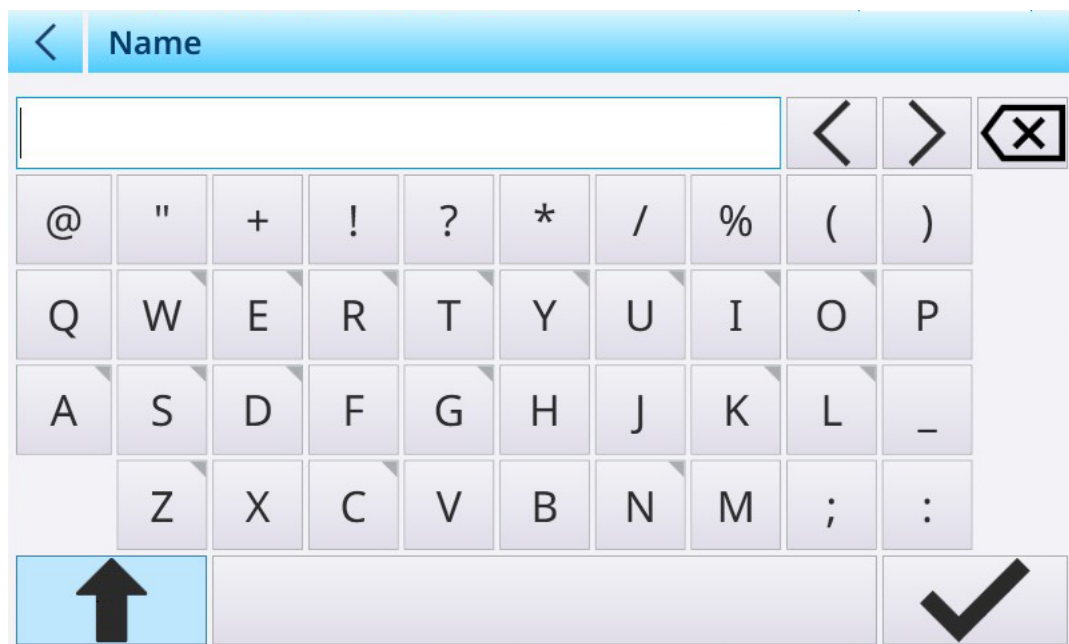



Figure 55: Alphanumeric Keyboard, Upper Case Displayed

Error Correction and Cursor Control

Note that when an entry has been made, an X  appears at the right of the entry field. Touch this X to clear the field's contents completely.

If an error is made in the entry, two methods are available to make a correction:




- Use the delete key  to backspace through the entry to the point where the error was made, deleting characters.
- Use the cursor left and right keys   to position the cursor at the error, and then add or delete characters to make the correction.



Figure 56: Correction of Erroneous Entry

Numeric Data Entry

When the user touches an entry field for a numeric value, the numeric keypad displays.

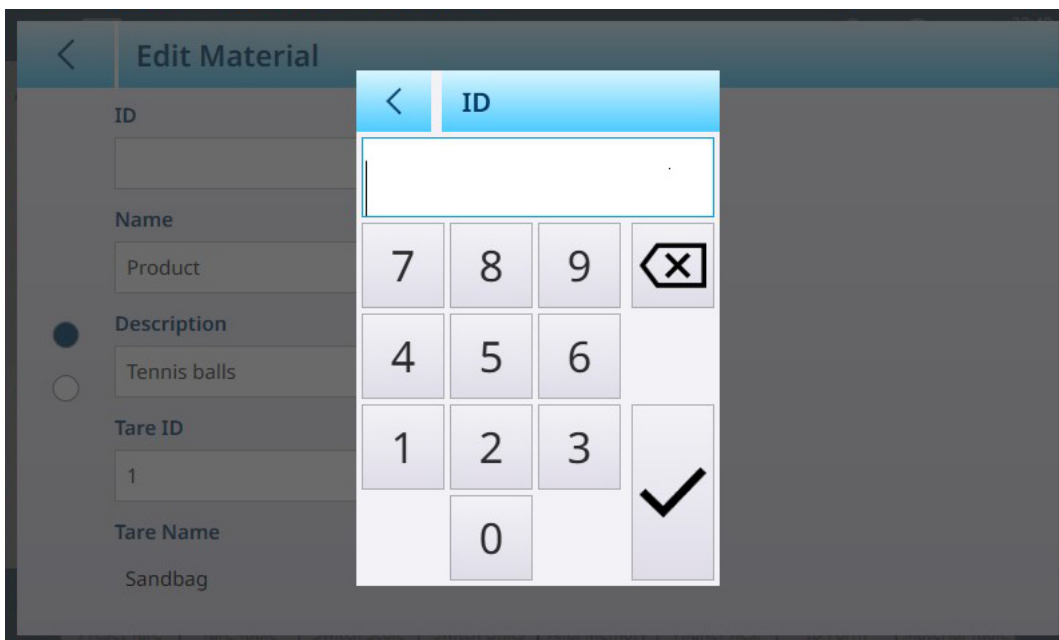


Figure 57: Numeric Data Entry Keypad

When an entry has been made, note the X which appears in the entry field. Touch this X to clear the entry.

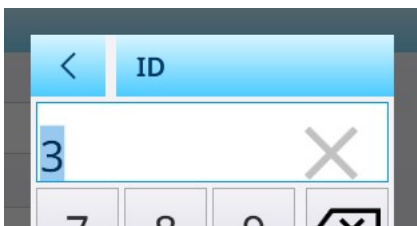



Figure 58: Numeric Entry in Keypad

2.1.7 Accessing Terminal Information

Information about the terminal and its configuration can be viewed by touching the menu access icon  and selecting Terminal.

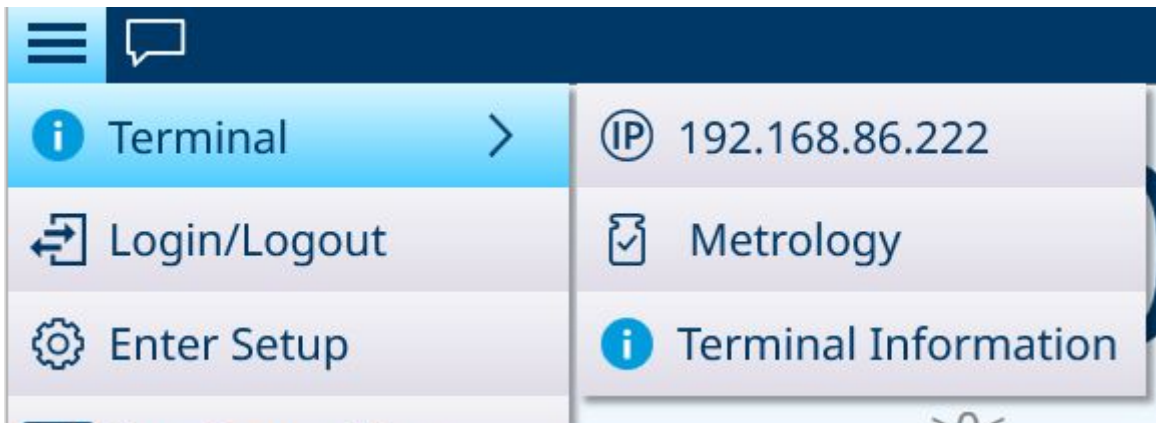


Figure 59: Terminal Information Menu

The options on the sub-menu include information about the terminal's network configuration, metrology, and hard and software characteristics.

2.1.7.1 IP

The sub-menu shows the terminal's IP address; touch the address shown in the Terminal Information Menu to display a screen showing more detail about the connection.

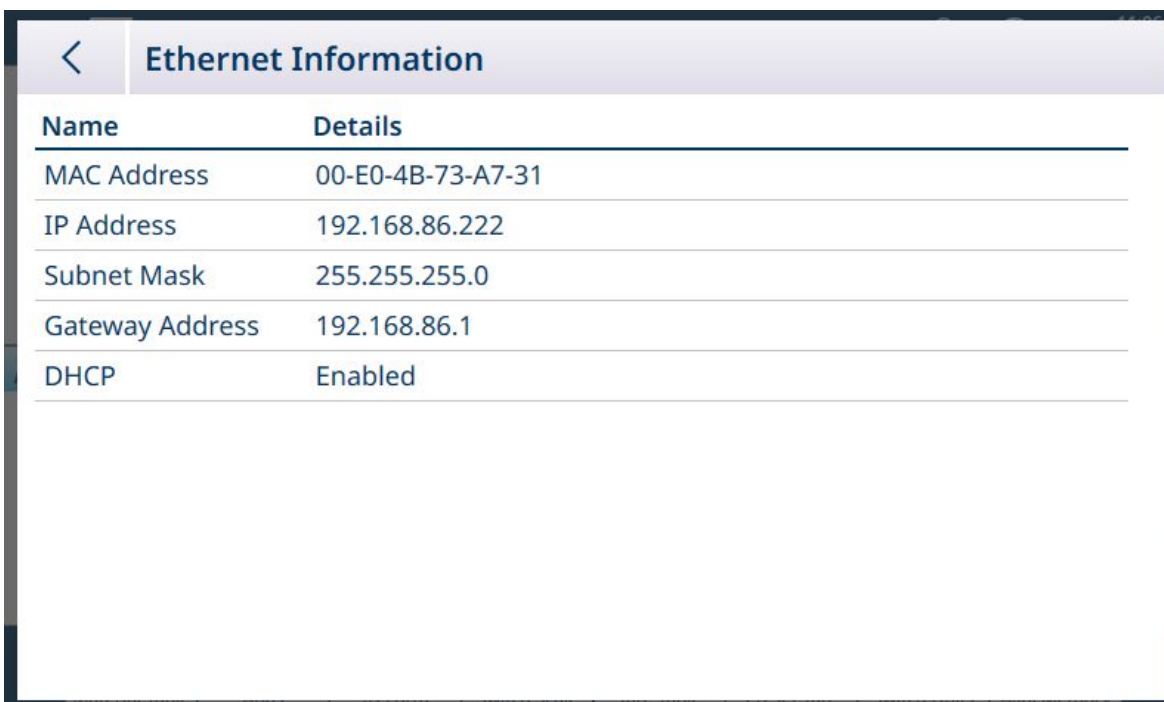


Figure 60: Terminal Network Information

Touch the Back arrow to return to the home screen.

2.1.7.2 Metrology

Touch Metrology to view the W&M Information screen.

Status	Log Time	Name	Version	Serial I
		Boot Service Version	5.41.150	
		Boot Service Thumbprint ID	B827409295	
		Scale Server	5.41.150	
		Scale Lock	V1.0.40	
⚠	26.Jan.2024	Scale Module 1 - HSAL (1.0.40)	V1.0.40	
⚠	26.Jan.2024	Scale Module 2 - HSAL (1.0.40)	V1.0.40	8765431
		Scale Module 3		
		Scale Module 4		
⚠		Scale Module 5 - Sum Scale		

Figure 61: W&M Information Screen

Touch the back arrow to return to the W&M Information screen. Note the icons in the W&M Information screen header row; a number of functions can be performed from here:

Pairing History


Touch to display the Pairing History screen.

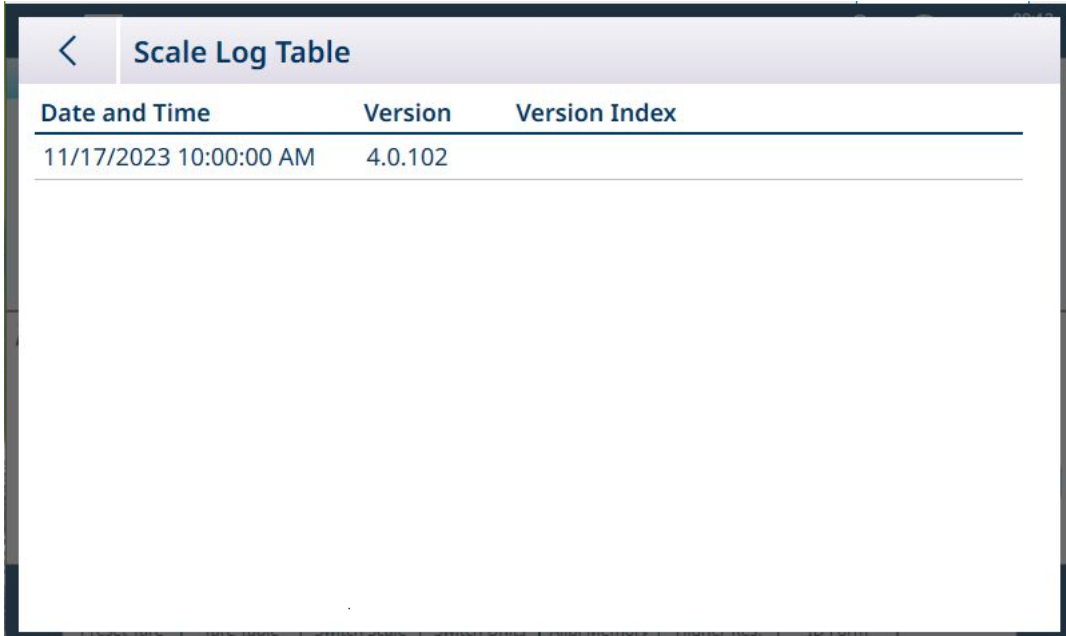
ID ^	Log Time	Terminal Serial No.	Pairing Information
1	18.Jan.2024 10:53	69569416DZ	S1(, 355C4524)
2	18.Jan.2024 11:47	69569416DZ	S1(, 98BEBE37)
3	18.Jan.2024 11:47	69569416DZ	S1(, 98BEBE37)
	19.Jan.2024 12:18		S2(8765431, F293E1A5)
4	26.Jan.2024 08:37	69569416DZ	S1(, A593598F)
	26.Jan.2024 08:37		S2(8765431, 1A37B7A0)
5	26.Jan.2024 08:38	69569416DZ	S1(, 4D370F8A)
	26.Jan.2024 08:37		S2(8765431, 1A37B7A0)
6	26.Jan.2024 08:38	69569416DZ	S1(, 4D370F8A)
	26.Jan.2024 08:39		S2(8765431, 88C82ED5)

Figure 62: Pairing History File

This file shows pairing information for each installed scale, together with the terminal's serial identifier. Touch the back arrow to return to the W&M Information screen.

Scale Log Table

Touch  to display the Scale Log table.



Date and Time	Version	Version Index
11/17/2023 10:00:00 AM	4.0.102	


Figure 63: Scale Log Table

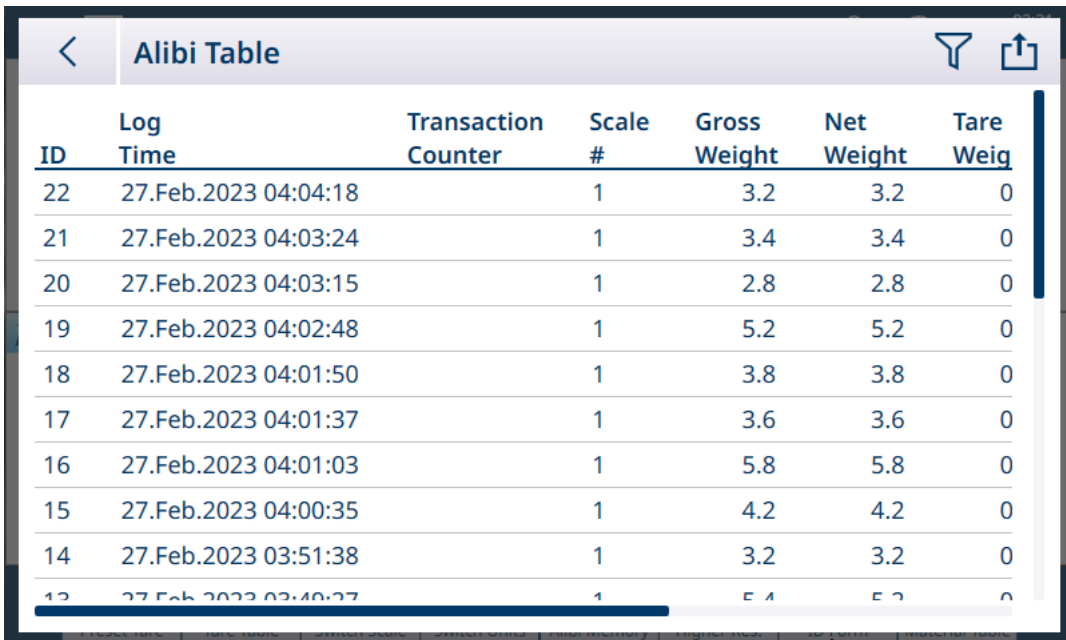
Touch the back arrow to return to the W&M Information screen.

Calibration Test

The Calibration Test  is not currently implemented in the IND700.

Alibi Table

Touch  to display the Alibi Table view. The Search and Export functions work in the same way as described in [Table Functions: Filter, Export, Import, Clear ▶ Page 307].



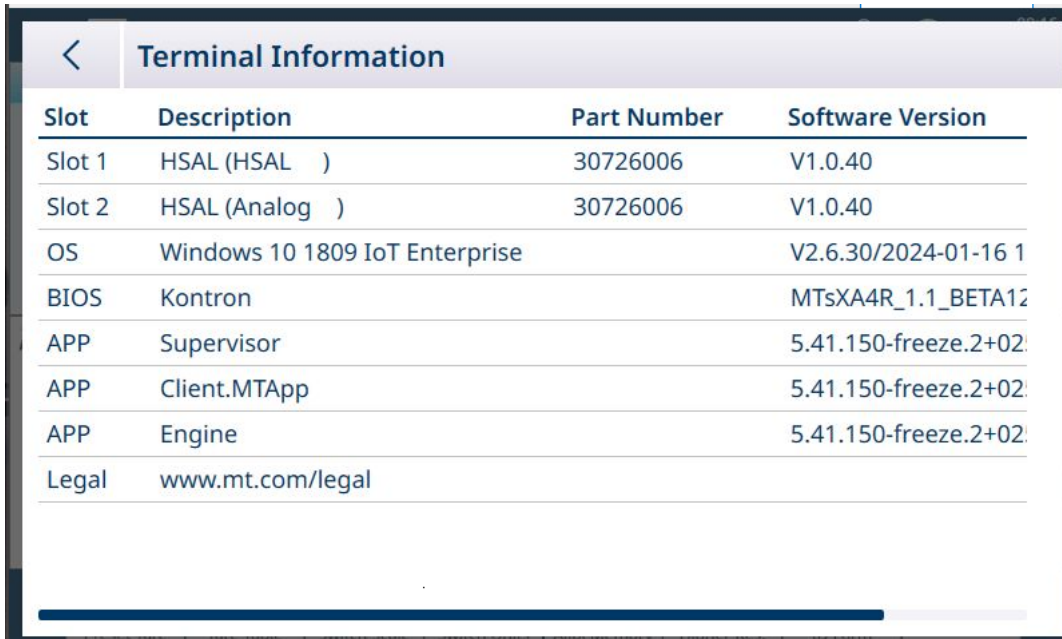
ID	Log Time	Transaction Counter	Scale #	Gross Weight	Net Weight	Tare Weig
22	27.Feb.2023 04:04:18		1	3.2	3.2	0
21	27.Feb.2023 04:03:24		1	3.4	3.4	0
20	27.Feb.2023 04:03:15		1	2.8	2.8	0
19	27.Feb.2023 04:02:48		1	5.2	5.2	0
18	27.Feb.2023 04:01:50		1	3.8	3.8	0
17	27.Feb.2023 04:01:37		1	3.6	3.6	0
16	27.Feb.2023 04:01:03		1	5.8	5.8	0
15	27.Feb.2023 04:00:35		1	4.2	4.2	0
14	27.Feb.2023 03:51:38		1	3.2	3.2	0
13	27.Feb.2023 03:40:27		1	5.4	5.2	0

Figure 64: Alibi Table View

Touch the back arrow to return to the W&M Information screen.

2.1.7.3 Terminal Information

Touch Terminal Information to display the terminal's hardware configuration, together with software version numbers where applicable:







Slot	Description	Part Number	Software Version
Slot 1	HSAL (HSAL)	30726006	V1.0.40
Slot 2	HSAL (Analog)	30726006	V1.0.40
OS	Windows 10 1809 IoT Enterprise		V2.6.30/2024-01-16 1
BIOS	Kontron		MTsXA4R_1.1_BETA12
APP	Supervisor		5.41.150-freeze.2+02.
APP	Client.MTApp		5.41.150-freeze.2+02.
APP	Engine		5.41.150-freeze.2+02.
Legal	www.mt.com/legal		

Figure 65: Terminal Information Screen

2.1.8 Table Functions: Filter, Export, Import, Clear

Enabled tables include a number of functions, accessed by touching an icon in the table's header row.

The **Alibi Table** is read-only, and its contents can be  filtered and  exported. Alibi data cannot be imported , records cannot be deleted, and the table cannot be cleared . Once the Alibi Table has reached its maximum capacity, the terminal begins to overwrite the oldest data. To avoid loss of Alibi Table data, it is recommended that an export schedule be implemented.


The contents of the **Material Table** and **Tare Table** can be filtered, exported to a file, imported from a file, and cleared. The import function permits table contents to be configured outside the terminal, or shared between terminals performing the same function.

The contents of the **Transaction Table** can be filtered, exported and cleared.

Exported table contents are stored on the terminal in the **C:\Export** folder. Data to be imported must be placed in the **C:\Import** folder. For details on file transfers in and out of the terminal, refer to [File Transfer ▶ Page 348].

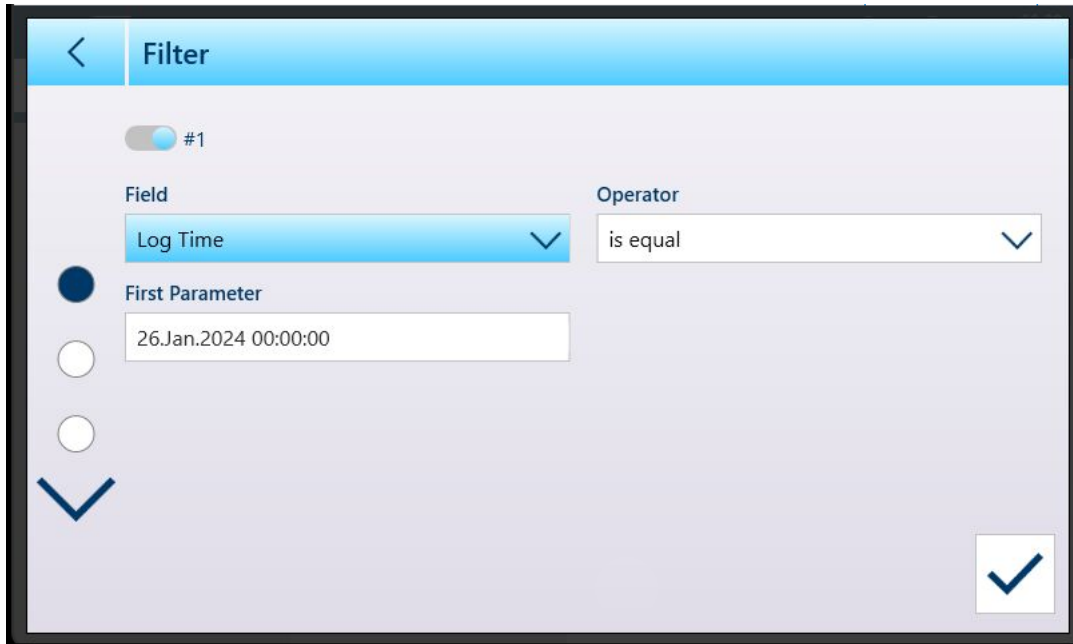
2.1.8.1 Filter

For an account of the filter entry methods, refer to [Data Entry ▶ Page 43].

Because it accumulates many records, the Alibi Table has a **Filter** function  which filters the visible records depending on up to three conditions.

Search Condition

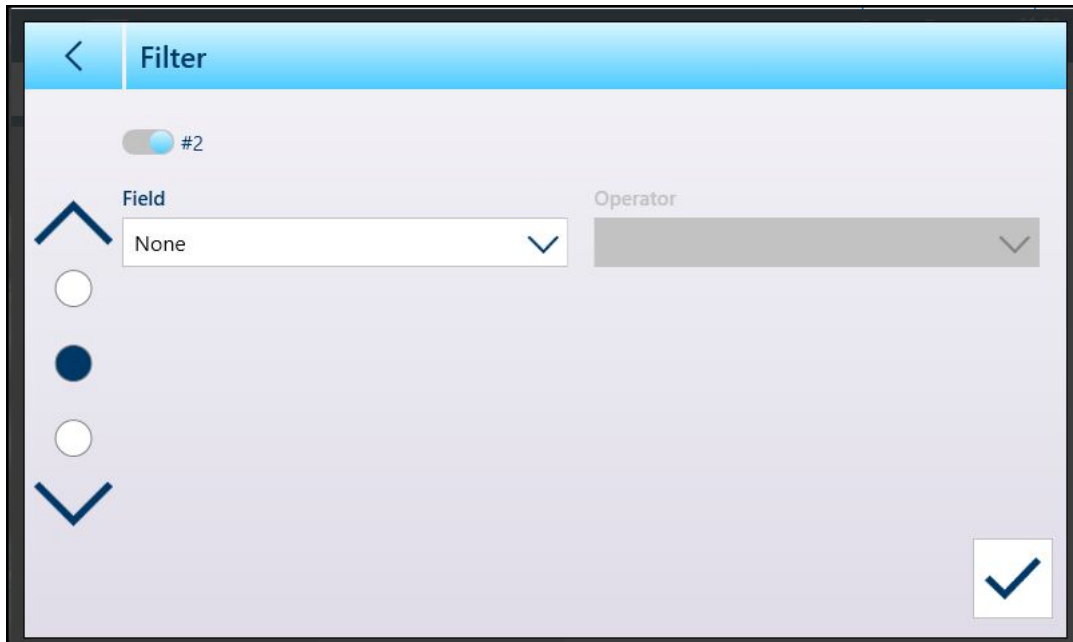
The Search Condition fields permit the definition of three search criteria. The three filters screens are shown below. Note the screen indicator dots and up/down arrows at left.



The screenshot shows a mobile application interface for configuring a filter. At the top, there is a blue header with a back arrow and the title "Filter". Below the header, a toggle switch labeled "#1" is turned on. The "Field" dropdown menu is set to "Log Time", and the "Operator" dropdown menu is set to "is equal". Underneath, the "First Parameter" text input field contains the date and time "26.Jan.2024 00:00:00". On the left side, there are three radio buttons; the top one is selected. Below the radio buttons are two large blue arrows pointing up and down. In the bottom right corner, there is a white square button with a blue checkmark.

Figure 66: First Table Filter Screen

The second and third Filter screens are shown with no Field selected. **Filter #2** is shown enabled but not configured. **Filter #3** is shown disabled. The other filter options -- **Operator** and **Parameter** -- are not accessible until a Filter Field is selected.



The screenshot shows the second filter screen. The header is the same as in Figure 66. The toggle switch labeled "#2" is turned on. The "Field" dropdown menu is set to "None". The "Operator" dropdown menu is disabled and has a grey background. On the left side, there are three radio buttons; the middle one is selected. Below the radio buttons are two large blue arrows pointing up and down. In the bottom right corner, there is a white square button with a blue checkmark.

Figure 67: Second Table Filter Screen

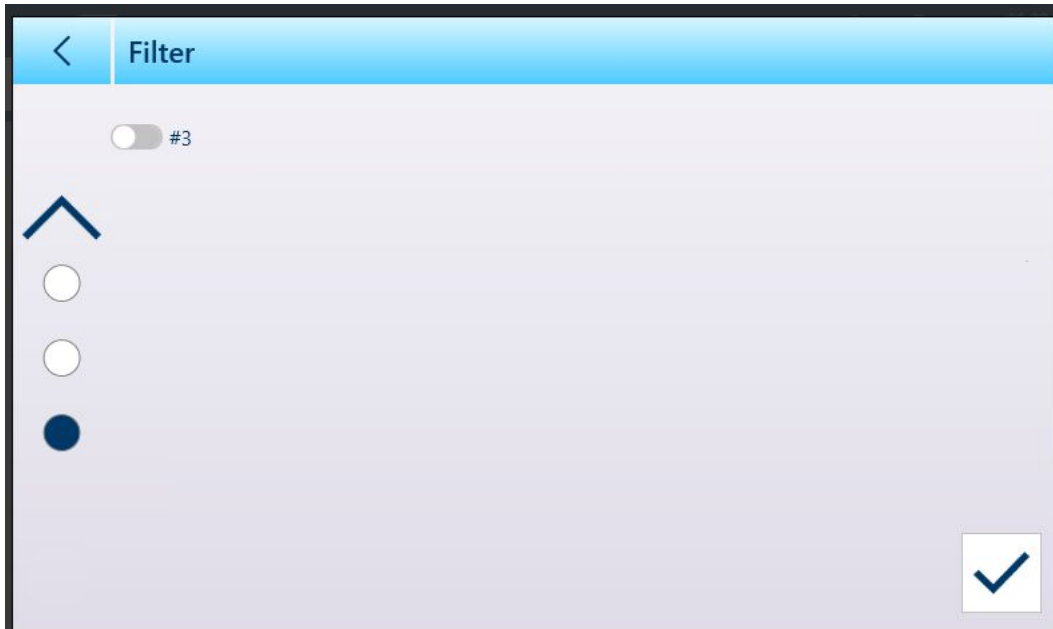


Figure 68: Third Table Filter Screen

Field options are:

- None (filter not operational)
- ID
- Log Time
- Transaction Counter
- Scale #
- Tare Type
- Unit

The options provided by the **Parameter** value depend on the **Field** type selected. For example, if **Scale #** is chosen, the **Parameter** field is a drop-down list of all available scales plus Sum Scale.

When a filter **Field** has been selected, the **Operator** field and a **Parameter** field becomes available -- two **Parameter** fields, if **in the range** is selected as the **Operator**. Touch the **Parameter** field to display its associated entry method. ([Data Entry ▶ Page 43]). The Parameter entry dialog shown below is for a numeric parameter, in this case **ID**.

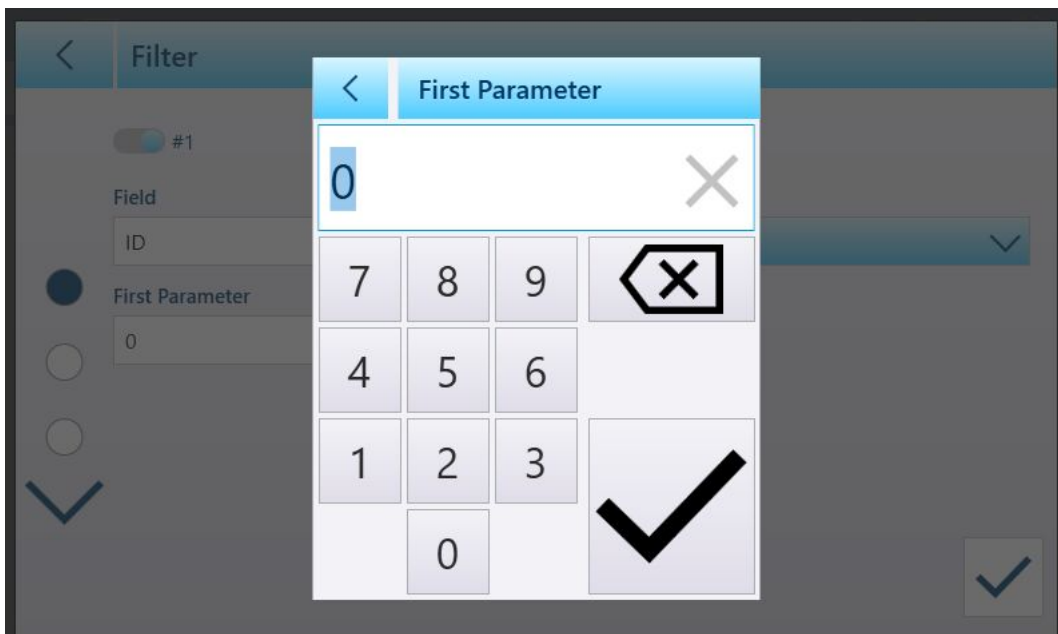


Figure 69: Example Filter Parameter Entry

Other Field types are associated with other entry types. For example, if **Log Time** is selected under **Field**, the Parameter field will display a calendar and Hour : Minute input dialog.

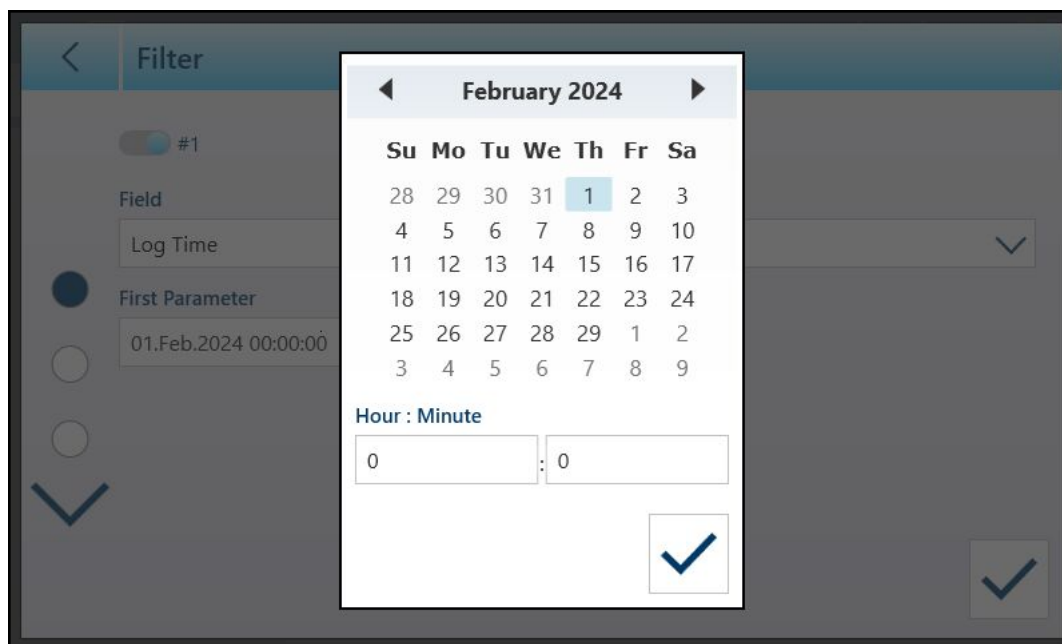


Figure 70: Calendar Dialog for Log Time Field Parameter

Parameter options are:

- is equal
- freater
- greater or equal
- less than
- in the range

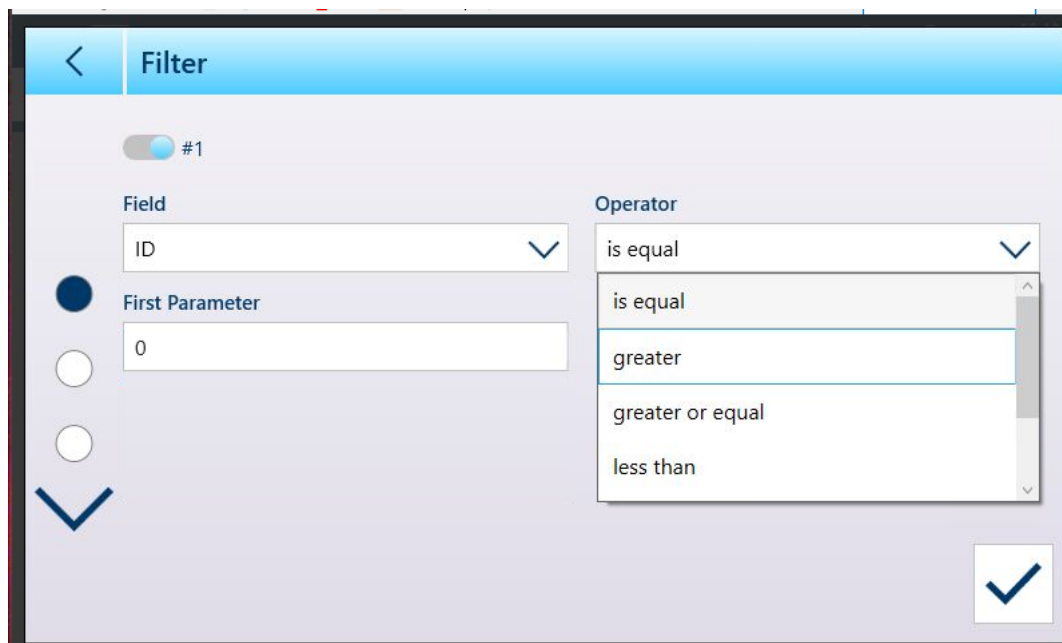



Figure 71: Filter Condition Operators

2.1.8.2 Export

All tables permit the export  of data. The export screen requires the selection of a File Type, and the choice of a File Name. The default form of the filename has the form [terminal]_[Year_Month_Day]_[time]_[Table name], but this can be modified by touching the File Name field to display an alphanumeric entry screen ([Data Entry ▶ Page 43]).

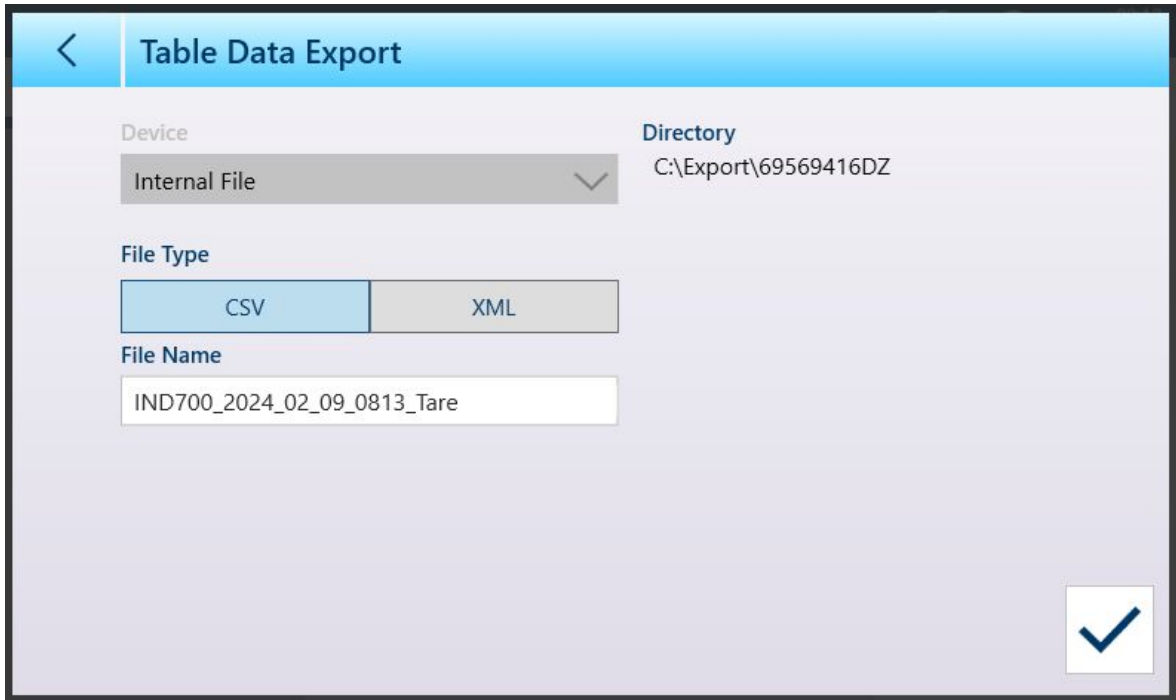



Figure 72: Table Data Export Screen

Touch the blue check mark to confirm the export and return to the Table view screen.

2.1.8.3 Import

The Material and Tare tables both permit data to be imported. Data for import to a table must be contained in a file of the appropriate format, either .csv or .xml. Touch the Import icon  to display the Table Data Import screen.

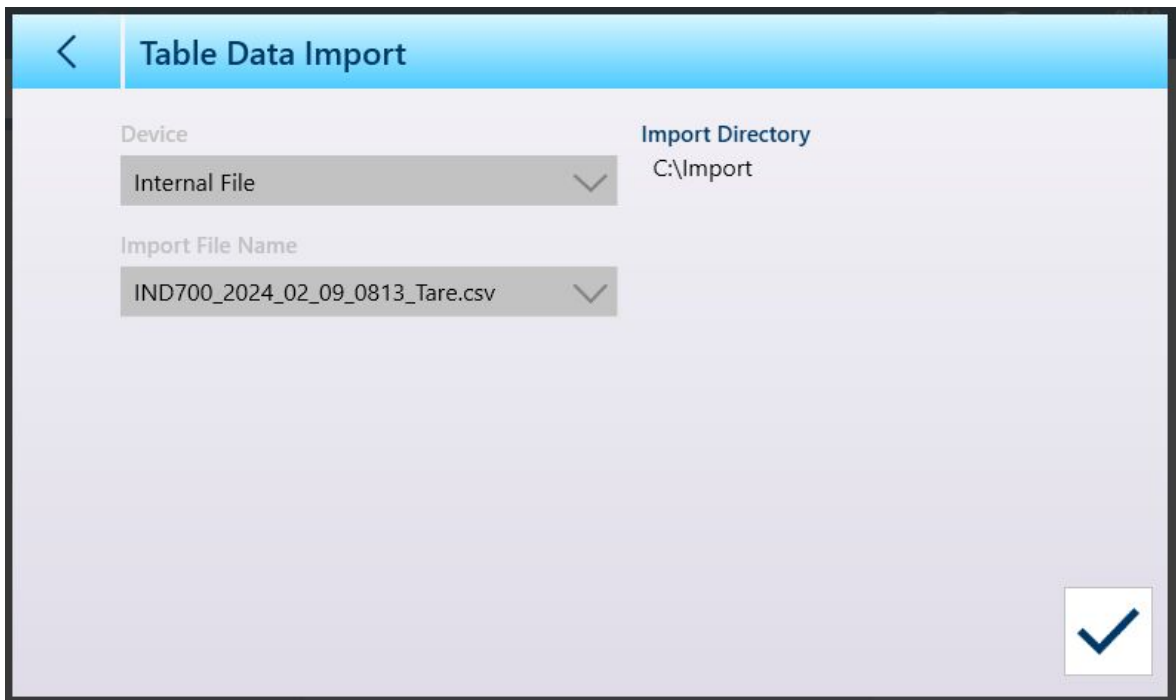


Figure 73: Table Data Import Screen

Touch the blue check mark to confirm the import. The Table view screen will appear, with the new data displayed.

2.1.8.4 Clear

To manage space in the terminal's memory, it may be necessary to clear a table. Before clearing a table, it is recommended that a table export be performed. The data can be stored outside the terminal. This will prevent unwanted data loss.

When the clear icon  is touched, a warning displays indicating that the entire table will be cleared.

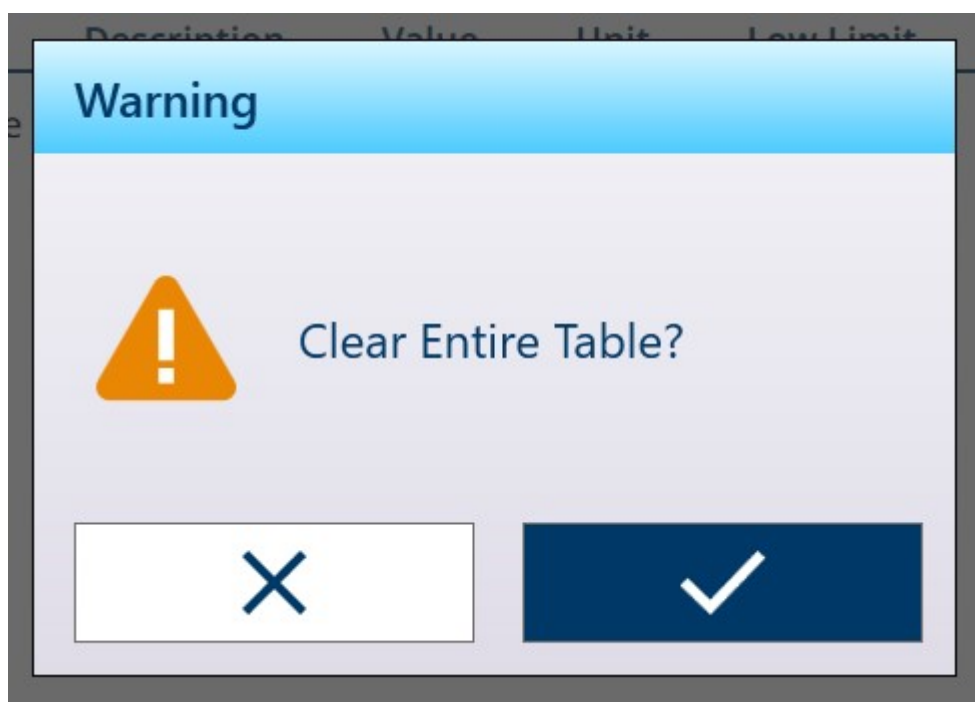



Figure 74: Table Clear Warning

Touch the check mark to confirm the deletion, or the X to return to the table view.

2.1.9 Transferring Data

The print function (demand output) can be initiated by:

- Pressing the TRANSFER function key 
- Through the automatic transfer function

Demand output of data may also be initiated as part of a particular sequence of operation or special application software.

A system message appears for 3 seconds when the terminal is carrying out a demand output command.

2.1.9.1 Enabling Data Transfer


To execute a data transfer successfully, a serial, USB or Ethernet connection must be configured with a Demand Output assignment and linked to a template and trigger associated with the selected serial or Ethernet port. If a transfer command fails because a Demand Output assignment is not programmed on any port, the synchronous error message "Print Failed-No Demand Output" is displayed.

2.1.9.2 Transfer Interlock

A Transfer Interlock can be configured in setup at [Log or Transfer ▶ Page 161]. It is designed to enforce a single demand output per transaction. The Interlock function can be disabled or enabled. If it is enabled, the transfer command is ignored until the measured gross weight exceeds the interlock threshold. After the first transfer command is executed, subsequent transfer commands are ignored until the gross weight indication falls below the interlock reset threshold.

If a transfer command is blocked by the Interlock function, a synchronous "Print Not Ready" error is generated.

2.1.9.3 Repeat Transfer

The Repeat Tr. soffkey  permits the data output of the most recent demand output to be transferred again with a DUPLICATE header or footer to distinguish it from the original transfer. To enable the Repeat Transfer function, simply add the soffkey to the Home Page soffkey ribbon, in setup at [Soffkeys ▶ Page 197]. Pressing this soffkey will initiate a repeat transfer of the last Demand Output connection listed in the assignments found in Connections.

The repeat output template can be flagged with a "DUPLICATE" header or footer to indicate that the data in the output template was generated as a repeat of a previous communication.

2.1.9.4 Auto Transfer

Automatic initiation of a demand output occurs after the gross weight exceeds the minimum threshold and there is no motion on the scale. After initiation, the gross weight must return below the reset threshold before the next automatic transfer can occur.

Auto Transfer may be disabled or enabled. It can be triggered and reset by weight exceeding set thresholds, or by weight deviation from a previously stable reading.

2.1.9.5 Report Transfer

The IND700 does not include any standard Report formats. However, when a [Connection ▶ Page 215] is configured with the Assignment **Transfer**, and a Template is configured for use with the connection, the selected template can be configured ([Output Templates ▶ Page 227]) to include whatever data the report requires.

2.1.10 Selecting an Input Template

Different data inputs require differently configured input templates. For example, the input from a barcode reader will differ from the input from a keyboard. The IND700 allows up to ten input templates to be configured. The basic method for selecting a template to use is to access [Setup > Communication > Connections ▶

Page 215], and configure a connection with the required template associated with it. However, there is a simpler and more direct way to switch between input templates, using a softkey in the ribbon on the screen. Follow these steps to configure quick access to input templates:



1. First, ensure that each of the input templates to be used is [configured ▶ Page 238], and associated with a connection.
2. In setup, access [Terminal > Softkeys ▶ Page 197].
3. Drag the **Input Template** softkey  to the ribbon.
4. Return to the weighing screen. If at least one input template is properly configured, the softkey will now show it as currently selected -- .
5. To switch between input templates, as well as between the configured connections, touch the **Input Template** softkey to display a list of available templates.



Figure 75: Input Template Softkey Pop-Up List

2.1.11 Automatic Standard (Output) Template


For details on configuring templates, refer to [Output Templates ▶ Page 227] and [Input Template ▶ Page 238].

During weighing operations, Output Template 1 provides a powerful and convenient tool. This template is automatically configured, in real time, to adjust its contents to capture information displayed on the main screen. This information includes basic weighing data, application parameters, and the labels and contents of any ID forms in use. If the template is assigned to a [Connection ▶ Page 215], a Transfer operation will produce output in the format specified by the template. This functionality means that it is not necessary to look up the relevant Shared Data variables and enter template elements manually.

However, different weighing operations will require different output content. The **Automatic Standard Template** provides a simple way to reflect these differences in transferred data, and to switch quickly between output formats.

Follow these steps:

1. Configure the terminal as appropriate for one type of weighing operation. This will set Output Template 1 to capture the data generated by this operation.
2. Enter Setup and access **Communication > Output Templates**.
3. From the menu, select Template 1 in order to view its content.

4. Touch the Duplicate icon  in the menu bar. The Copy Template screen will display. In the example shown below, the **To** field template selection list has been expanded.

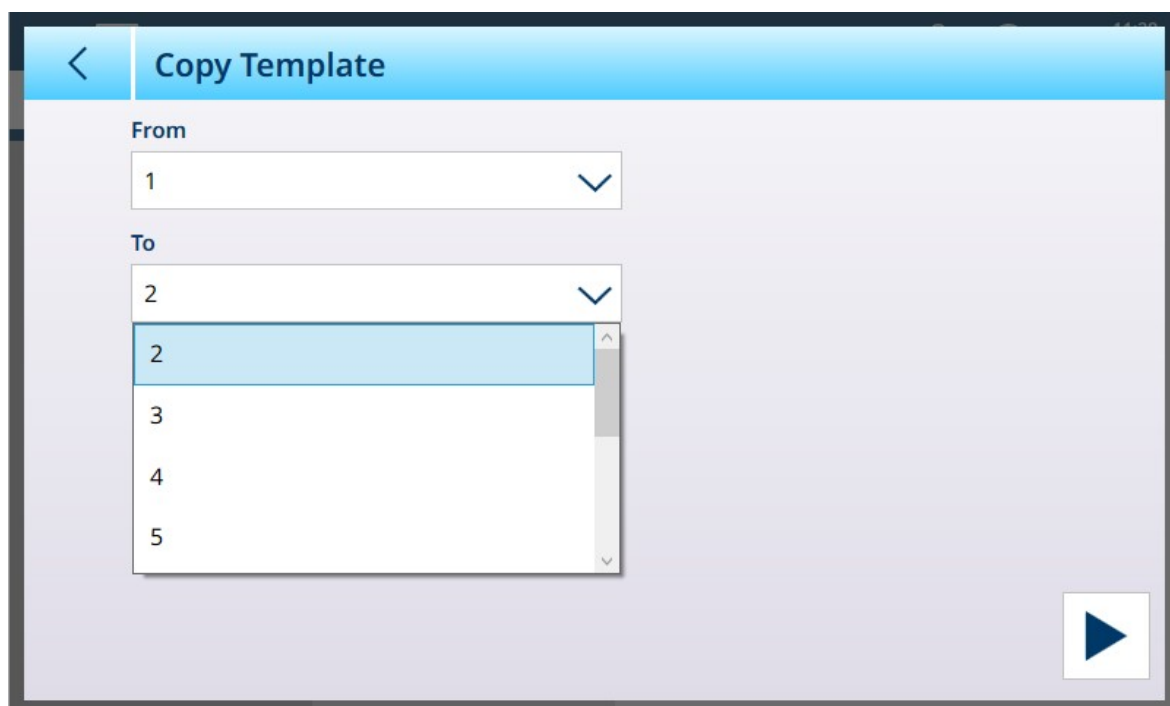




Figure 76: Copy Template Screen

5. The current template, Template 1, will be shown in the **From** field. Touch the **To** field and select an unused template, then touch the RUN icon  at lower right.
6. Touch the BACK arrow twice to return to the setup menu view, and access Connections. Either create or edit a connection so that its Assignment is Transfer, with the newly-configured Output Template named in the **Template** field.
7. Select **Exit Setup**  from the dropdown menu at upper left.
8. Configure the terminal for a second type of weighing operation, then repeat steps 2 to 7, again copying Output Template 1 to an unused template (e.g. Template 3).
9. Assign the newly-created Template to another Connection.
10. Repeat these steps until all required types of weigh operation are represented by one Output Template.

2.1.12 Alibi Memory Direct Access

The Alibi Memory stores individual transaction data that can be retrieved for verification purposes. Information stored in the Alibi Memory includes:

- Transaction counter value
- Date and time of transaction
- Gross, net, and tare weights including units of measure



NOTICE

If the IND700 terminal has been programmed as “approved”, Alibi memory enabling or disabling is only accessible if the security switch (SW1-1) is in the OFF position.

The Alibi memory can not be cleared unless a Factory Reset is implement. Refer to PCB Switch Settings for more information on Factory Reset.


2.1.12.1 Creating an Alibi Memory Record

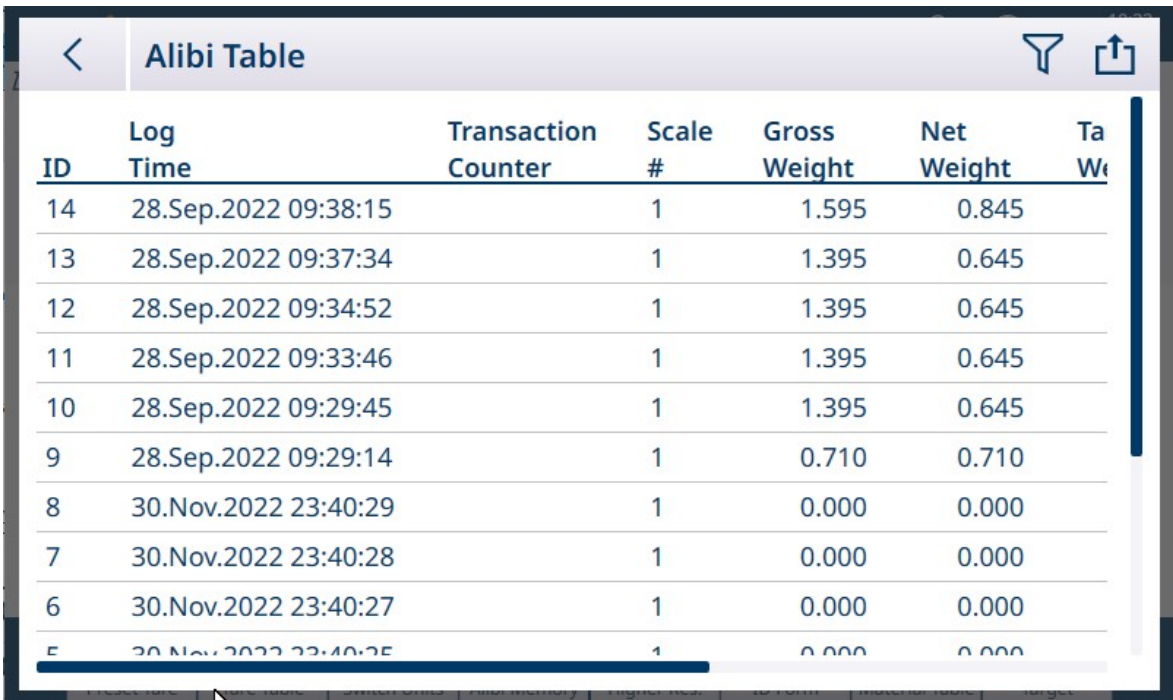
Alibi memory records can be created automatically or manually:

- **Auto Transfer:** Through an automatic initiation of a demand output print request
- **Semi-automatic Transfer - Pushbutton:** By pressing the Transfer scale key .

- **Semi-automatic Transfer - Remote:** Through a transfer command initiated via a discrete input, an ASCII P serial command or an Industrial Network interface.


2.1.12.2 View, Search and Transfer Alibi Memory

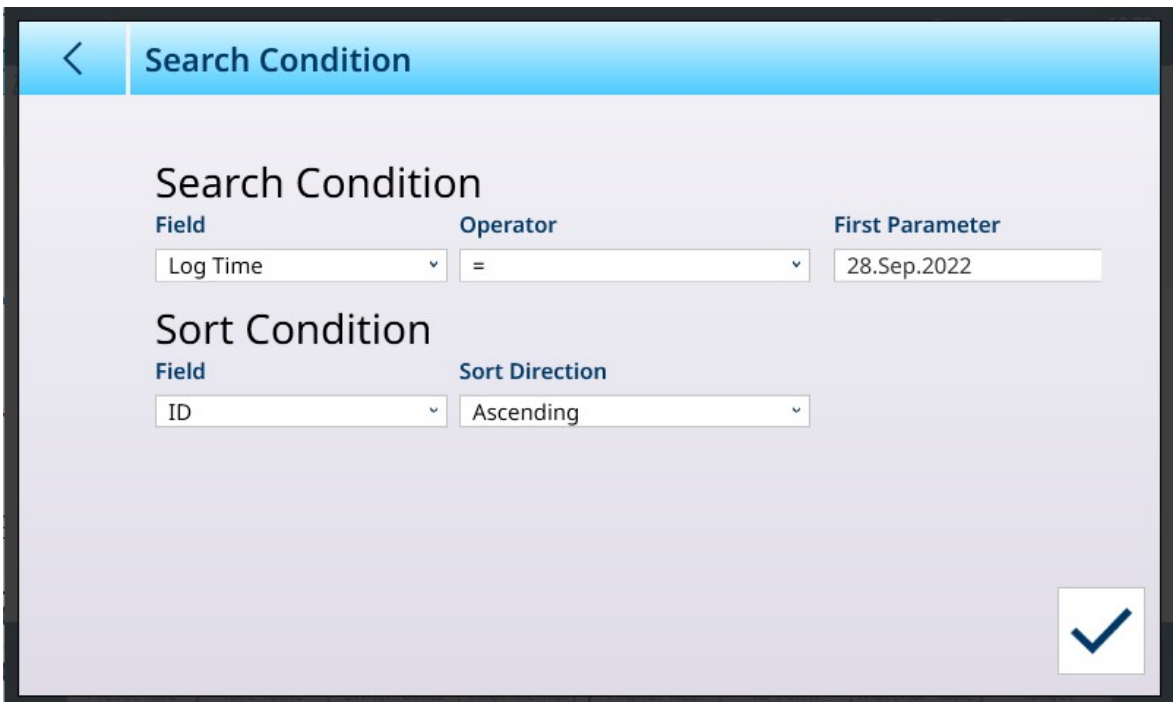
- 1 Press the ALIBI TABLE softkey .
 - ➔ The Alibi screen displays.



ID	Log Time	Transaction Counter	Scale #	Gross Weight	Net Weight	Ta Wt
14	28.Sep.2022 09:38:15		1	1.595	0.845	
13	28.Sep.2022 09:37:34		1	1.395	0.645	
12	28.Sep.2022 09:34:52		1	1.395	0.645	
11	28.Sep.2022 09:33:46		1	1.395	0.645	
10	28.Sep.2022 09:29:45		1	1.395	0.645	
9	28.Sep.2022 09:29:14		1	0.710	0.710	
8	30.Nov.2022 23:40:29		1	0.000	0.000	
7	30.Nov.2022 23:40:28		1	0.000	0.000	
6	30.Nov.2022 23:40:27		1	0.000	0.000	
5	30.Nov.2022 23:40:25		1	0.000	0.000	

Figure 77: Alibi Table View

- 2 Touch the FILTER softkey .
- 3 Use the selection boxes and data entry fields to enter specific search information to limit the search, or do not enter any search limits to view all Alibi Memory Table information.



Search Condition

Field	Operator	First Parameter
Log Time	=	28.Sep.2022

Sort Condition

Field	Sort Direction
ID	Ascending







Figure 78: Setting Alibi Table Search Conditions

- 4 Press the OK softkey .

- ➔ The filtered search results are shown. Records are ordered by date and time with the most recent record shown last.

ID	Log Time	Transaction Counter	Scale #	Gross Weight	Net Weight	Tare Weight
9	28.Sep.2022 09:29:14		1	0.710	0.710	
10	28.Sep.2022 09:29:45		1	1.395	0.645	
11	28.Sep.2022 09:33:46		1	1.395	0.645	
12	28.Sep.2022 09:34:52		1	1.395	0.645	
13	28.Sep.2022 09:37:34		1	1.395	0.645	
14	28.Sep.2022 09:38:15		1	1.595	0.845	

Figure 79: Alibi Table Search Results

- Use the navigation keys to view the records: Date, Time, Transaction, Gross Weight, Net Weight, Tare Weight, Calculated, Tare Type, and Unit. Note: In the Tare Type column, "PT" is shown if the transaction uses a preset tare.
In this screen, touch the Filter softkey , which is filled to indicate that a search has been carried out, to renew the search information, or press the Filter Clear softkey  to clear the search information.
- To output the entire Alibi Table, or a filtered part of it, touch the TRANSFER softkey  on this screen.

Export

Target For Export
Internal File

Type For Export
XML

Export File Name
IND700_69569326DZ_2023_04_17_1033

Export Directory
C:\Export





Figure 80: Alibi Table Export

2.1.13 Quick Access to Input Templates by Softkey

When a **Connection** is defined with an Input Template **Assignment**, the **Selectable by Softkey** slider will display.



Figure 81: New Connection, Input Template Assignment

When at least one connection has been assigned to an input template, the Template softkey  can be seen in the softkey ribbon, if it has been added in setup at [Terminal > Softkeys ▶ Page 197]. When it appears on the home screen, this softkey displays Template 1 by default:  When multiple templates are configured and assigned to connections, touching the softkey will display a context menu, listing all available templates:

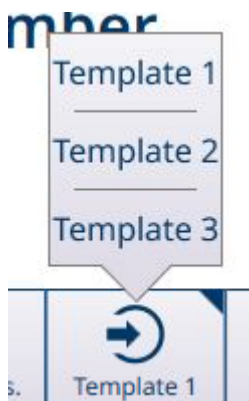



Figure 82: Templates Softkey with Context Menu


Touch the desired template to load it. The softkey will show the number of the currently selected template: 

2.2 Basic Weighing Operation

This section provides information about the basic weighing functionality of the IND700 terminal. For details on the use of Applications, refer to the **ProWorks Multi-Tools User's Manual**.

2.2.1 Simple weighing

In its most basic form, the weighing operation consists of the following:

1. Zero the scale.
2. Place the item to be weighed on the scale.
3. Wait for the instability indication  to disappear from the display.
4. Read the result of the weighment from the screen.

The illustration shows the result of a simple weighing operation in a terminal configured with two analog (HSALC) scales installed and configured to provide a Sum Scale display.



Figure 83: Example Simple Weighing Display

The digit size of the weight display adjusts dynamically depending on the resolution of the scale.

Simplified Large Weight Display

Any of the scales displayed on screen can be viewed in a larger, simplified format by double-tapping anywhere within the desired scale's display area. The larger display will appear:

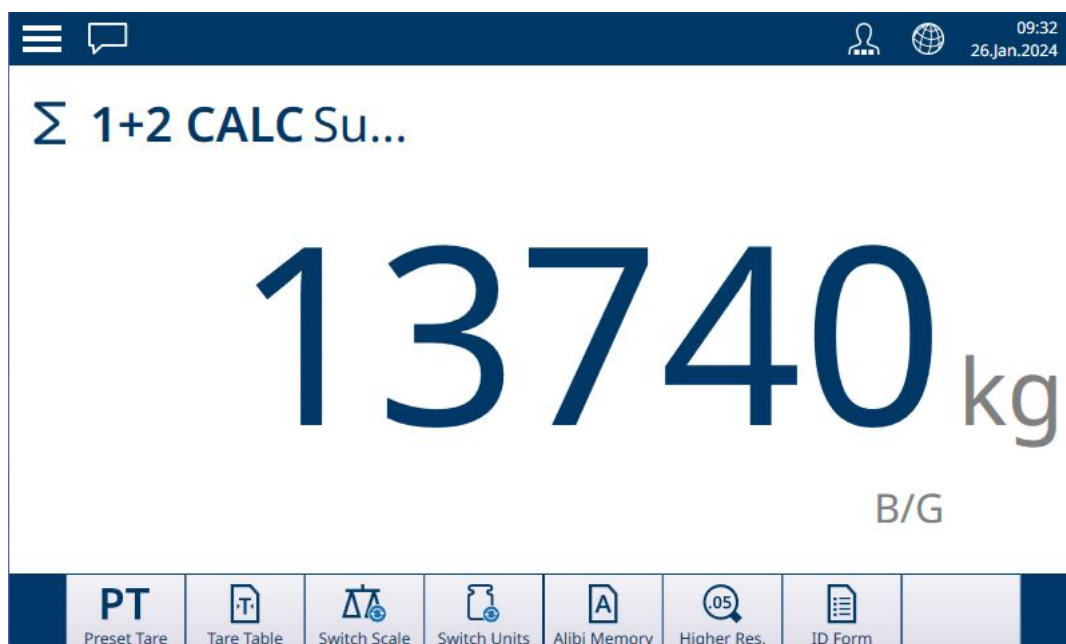


Figure 84: Simplified Large Weight Display

To return to the standard weight display, simply double-tap anywhere on the screen.

2.2.2 Zero

Before performing a weighing, it is important that the scale or scales be precisely at their zero point. If the weight value has deviated from zero, it can be restored to zero by either of two methods:

1. Touch the Zero function key **0** on the terminal's fascia. The key's surround will illuminate briefly to confirm the action **0**.
2. Touch the Zero softkey icon **0**, if it is configured to display in the softkey ribbon.

The Zero operation functions depending on the parameters configured in setup at **Scales > Scale ↔ > ASM > Zero**. If the current scale weight is outside the range set there, the Zero operation will fail. Refer to [POWERCELL - Zero ▶ Page 124] for details on these settings for the various scale types used with the IND700.

2.2.2.1 Automatic Zero Maintenance

Automatic Zero Maintenance (AZM) enables the terminal to compensate for the buildup of small amounts of weight and track itself back to the center of zero. Within the AZM operating range (programmable from 0.00 to 10.00 divisions), when the terminal is in a no motion condition, it makes small adjustments to the current zero reading to drive the weight reading toward the true center-of-zero. When the weight is outside of the programmed AZM range, this feature is not functional.

2.2.2.2 Power-Up Zero

Power-Up Zero enables the terminal to capture a new zero reference point after power is applied. If the terminal detects motion during a power-up zero capture function, it will continue to check for a no-motion condition until zero is captured. Power-up zero can be disabled or enabled, and the acceptable range above and below calibrated zero configured. The range is programmable from 0% to 100% of capacity and can include a positive range and also a range below calibrated zero.

2.2.2.3 Pushbutton Zero

The pushbutton (semi-automatic) zero function can be accomplished by:

- Pressing the ZERO scale function key **0** or the ZERO softkey **0**, if configured.
- Programming a discrete input for zero and then activating this discrete input
- Industrial Network command to the terminal
- Serial command (SICS or CTPZ protocols)
- A custom application

The range for all types of pushbutton zero is selectable (0% to 100%) plus or minus from either the calibrated zero point (if power-up zero is disabled) or from the initial zero setting point (if power-up zero is enabled).

Remote initiation of the pushbutton zero command is possible via a discrete input, an ASCII 'Z' command sent serially (CPTZ and SICS), a command initiated by the Industrial Network interface, or from an application.

2.2.3 Tare

The use of a tare value switches the terminal's weight display from Gross mode, in which the absolute weight on the scale is displayed, to Net mode, in which the displayed weight accounts for the weight of a container, for example, and shows only the weight of material or items added to the container.

When a tare is loaded, the weight display's indication changes from B/G (gross weight display) to NET, the weight display shows zero weight on the scale, and a tare indication at lower left of the main screen shows the tare value and its type (T or PT).

A Tare value can be loaded in several different ways:

- Manually, from the terminal's function button or from a softkey in the softkey ribbon
 - Manually, by entering a Preset Tare value
- Manually, by selecting a Tare record from the Tare Table
 - Automatically

Similarly, a tare can be cleared by:

- Touching the terminal's Clear function key
 - Automatically

See also

[Data Entry ▶ Page 43](#)

2.2.3.1 Pushbutton Tare

The simplest way to take a tare is to place an empty container on the scale



Figure 85: Weight Display in Gross Mode

With the container on the scale, touch either the terminal's Tare function key **T** or the Tare softkey **T**, if it is configured to display in the softkey ribbon.

The display will change from gross weight on the scale to net mode, and display a tare indication with T, showing that the tare was taken by pushbutton

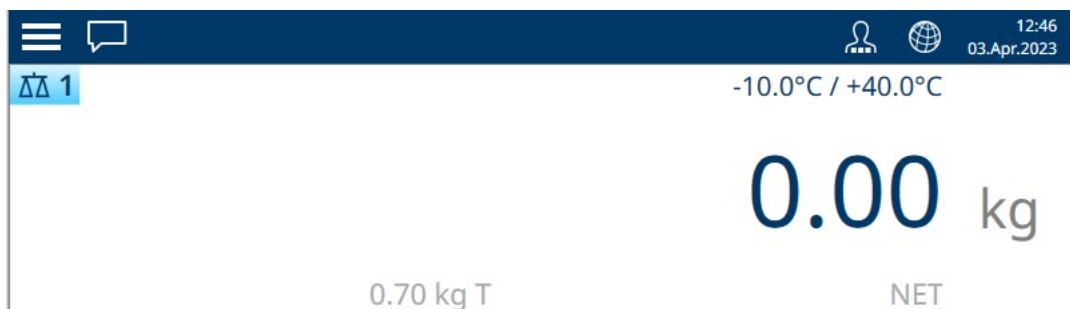


Figure 86: Weight Display in Net Mode, with T Indication

2.2.3.2 Keyboard Tare

A Keyboard tare, also called a preset tare, is a numeric tare value that is entered manually through the numeric keypad, received serially or via Ethernet from a peripheral device, or retrieved from the Tare Table memory. The preset tare value cannot exceed the capacity of the scale. A manually entered Tare value is interpreted to have the same units as the current displayed value. Motion does not impact the entry of preset tare values.

Keyboard tare can be configured in Setup as enabled or disabled. When disabled, the numeric keypad and the TARE scale function key **T** cannot be used to obtain a tare.

- To enter a keyboard tare or preset tare value manually, use the numeric keypad or external to enter the tare value (data entered will display just above the softkeys with a "Data:" label) and press the TARE scale function key **T**.

If configured in Setup, remote equipment can enter a Keyboard Tare or Preset Tare value using a serial command or Industrial Network command (refer to [Industrial Network ▶ Page 220] and [Communication Setup ▶ Page 208]).

If the Keyboard Tare or Preset Tare is successful, the display changes to a net weight indication, and the entered preset tare value is stored as the tare value in the active tare register. If Tare display is enabled, the pushbutton tare value will be shown with a PT label.

Several conditions could inhibit the keyboard tare or preset tare function:

Keyboard Tare Disabled If keyboard tare is disabled in setup, the numeric keypad and the TARE scale function key **T** cannot be used to obtain a tare.

Over-Capacity or Under-Zero Conditions Preset tare is not allowed when the weight display indicates over capacity or under zero conditions. Any preset tare attempted when the scale is over capacity is ignored and a "Tare Failed–Over Capacity" error displays. Any preset tare attempted when the weight display indicates a blanked under zero condition is ignored and a "Tare Failed–Below Zero" error displays.

Preset tare can be entered in free format. If the entered value does not match the displayed weight decimal point location or display interval, the entered tare value is rounded to the nearest display interval and the decimal point adjusted to match the gross weight. The rounding method is that 0.5 or more of a display interval (d) is increased to the next display interval and 0.49 or less of a display interval is decreased to the next lower display interval.

When entering a preset tare value less than 1.0, the operator can enter the data without the leading zero (left of the decimal point), but all subsequent display, storage, or printing of this value will include the leading zero. For example, a preset tare entry of .05 will display as 0.05.

If a preset tare has already been established and another preset tare is entered, the second preset tare replaces the previous value (it does not add to the previous value). The replacement tare can be larger or smaller than the original tare value.

2.2.3.3 Auto Tare

The terminal can be configured so that tare is automatically taken (auto tare) after the weight on the scale exceeds a programmed tare threshold weight. Auto tare can be configured in Setup as enabled or disabled. When auto tare is enabled, the display changes to a zero net weight indication after the weight exceeds the threshold value. The previous weight on the scale is stored in the tare register as the tare value.

Auto tare operations involve:

- | | |
|-------------------------------|--|
| Tare Threshold Weight | When weight on the scale platform exceeds the tare threshold value, the terminal automatically tares. |
| Reset Threshold Weight | The reset threshold weight must be less than the tare threshold weight. When the weight on the scale platform falls below the reset threshold value, such as when a load has been removed, the terminal automatically resets the auto tare trigger. |
| Motion Check | A motion check is provided to control the re-arming of the auto tare function. If disabled, the auto tare trigger will be reset as soon as the weight falls below the reset value. If enabled, the weight must settle to no-motion below the reset threshold before the next auto tare can be initiated. |

Several conditions could prevent the auto tare function from working:

- | | |
|---------------------------|---|
| Motion | Auto tare cannot be taken when the scale is in motion. If motion is detected after the weight on the scale exceeds a preset tare threshold weight, the terminal will wait for a no-motion condition. If a stable (no motion) weight condition occurs within 3 seconds, the auto tare command is executed. |
| Auto Tare Disabled | Auto tare can be configured in Setup as enabled or disabled. |

2.2.3.4 Special Tare Operation in Multi-interval Scale Applications

When the terminal is configured for multi-interval operation (refer to # Ranges/Intervals), the terminal only permits a preset tare to be taken in interval # 1. A preset tare, including the recall of a stored tare from the Tare Table (refer to [Tare Table ▶ Page 172]) must be a value in interval # 1 as well. If a tare is attempted with a weight value found in interval 2 or 3, a "Tare Failed – Over Range" error is given.

Note: Because of the way the terminal manages the tare, it is required that the final weighing system has a label displayed that indicates the maximum tare value within the capacity of interval # 1: T = nnn, where nnn is the capacity of interval 1.

The requirements for this marking are as follows:

- Required only for OIML approved terminals that are programmed for multi-interval (not multiple range).
- The descriptive markings shall be indelible and of a size, shape and clarity allowing easy reading.
- It shall be located in a clearly visible place on a sticker fixed permanently to the instrument.
- In case the sticker is not destroyed when removed, a means of securing shall be provided, e.g. a control mark that can be applied


2.2.3.5 Using the Tare Table

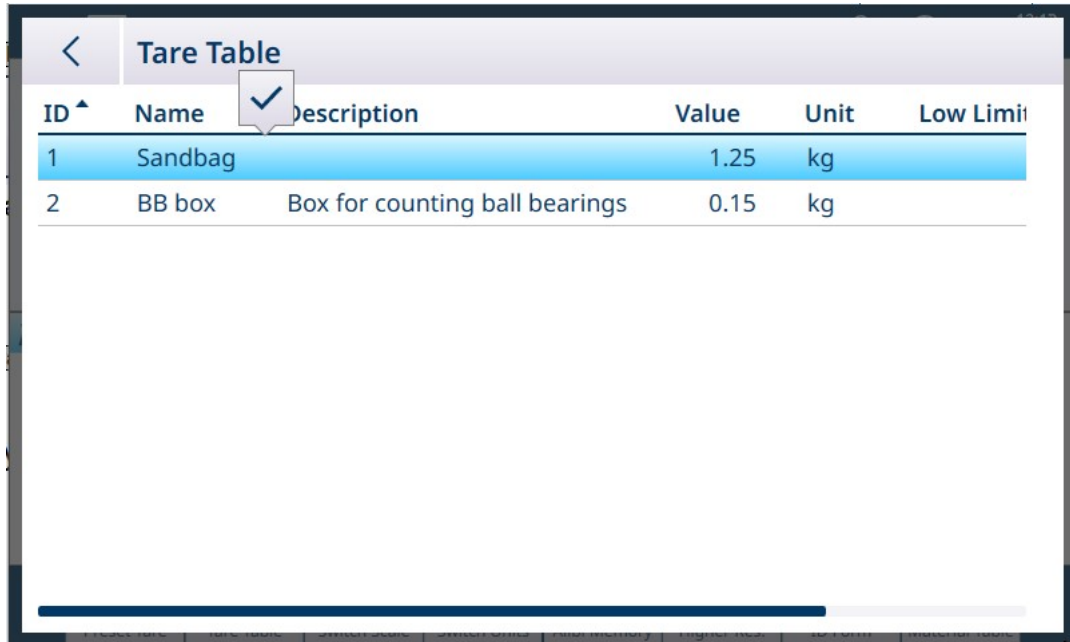


NOTICE

Tare Table Records

Tare records can be added, modified and deleted in the Tare Table view whether it is accessed via the softkey or in setup at **Application > Memory > Tare Table**, but only if the user's login level permits.

If tare records have been stored in the Tare Table, they can be recalled by touching the Tare Table softkey  and selecting a tare record from the list which appears.




ID ^	Name	Description	Value	Unit	Low Limit
1	Sandbag		1.25	kg	
2	BB box	Box for counting ball bearings	0.15	kg	

Figure 87: Tare Table with Record Selected





Touch the check mark to load the tare and return to the weighing screen, now in NET mode with a PT (preset tare) indication.

2.2.3.5.1 Loading Records from the Tare Table

The TARE MEMORY softkey  can be used in two ways to active records from the Tare Table.

Quick Access to Records When the ID of the Tare Table record to be used is known, use the Quick Recall method. Enter the ID using the numeric keypad and then press the TARE MEMORY softkey  to load the record into the active Tare register/memory. If the record is available, the data is loaded. If the record is not found, an "ID not found" error displays.

List Selection When the ID of the Tare Table record is unknown, use the List Selection method. To use the List Selection mode:

- 1 Press the TARE MEMORY softkey  without any preceding data entry. The Tare Search screen displays.
- 2 Enter any search restrictions required or leave selections as they are to retrieve all records.
- 3 Press the SEARCH softkey  to view the selected records in the table.
- 4 Use the UP and DOWN navigation keys to scroll through the list until the desired record is highlighted.
- 5 Press the OK softkey  to load the selected record from the list
- 6 Press the EXIT softkey  to return to the weighing operation screen without loading the record.

2.2.3.6 Clearing a Tare

Clearing Tare Manually

To clear a tare and return the terminal to B/G (gross) mode, either touch the Clear function key **C**, or the Clear softkey **T**, if it is configured to appear in the softkey ribbon.

The weight display will return to gross mode, and display the weight of the container as a positive value .

Clearing Tare Automatically

If **Auto clear tare** is configured in Setup at **Scales > Scale n > ASM > Tare**, the terminal will return to gross mode and display zero as soon as the container is removed from the scale. The **Auto clear tare threshold** must be lower than the weight of the container.

2.2.3.6.1 Manual Clear

Press the CLEAR function key **C** when the terminal is in the net mode and has completed the weighing operation. Motion on the scale will not impact a manual clear.

2.2.3.6.2 Auto Clear

The terminal can be configured to clear tare automatically when the weight returns to a value below a programmable threshold, or when a print command is issued. Once the tare is cleared, the display returns to the gross weighing mode.

Auto clear is disabled or enabled in Setup. If auto clear is enabled the following parameters, configured in Setup, affect the auto clear operation:

Clear Threshold Weight	The clear threshold weight is the gross weight value below which the terminal will automatically clear a tare after settling to a value above this threshold value.
Motion Check	A motion check is provided to control the automatic clearing of tare. If the motion check is disabled, the tare value is cleared as soon as the weight drops below the threshold weight (auto clear threshold), regardless of the motion status. If the motion check is enabled, after meeting the requirements for weight value above and then below the threshold weight (auto clear threshold), the IND700 waits for a no motion condition before automatically clearing the tare.
Clear After Transfer	If enabled, tare is automatically cleared and the scale returned to the gross mode after data has been transmitted by pressing the TRANSFER scale function key ⇨ or from a remote source.
Clear With Zero	If enabled, pressing the ZERO scale function key 0 will first clear the tare then issue a zero command.

Refer to Auto Tare for further information about configuring auto clear.

2.2.3.7 Checking a Container Tare

This function automatically detects and identifies different sizes of container by weight, using the Lower Limit and Upper Limit defined in the Tare Table record. Note that a tare record can either specify an absolute Tare Value **or** these limit values.

To use the checking function:

1. Place the empty container on the scale.
2. Touch the Tare Table softkey and load the required record ([Using the Tare Table ▶ Page 63]).
3. If the weight of the container falls within the range specified by the record, an automatic tare operation is performed.
4. If the weight of the container is not within the range, the terminal will remain in gross mode and an error message will display:

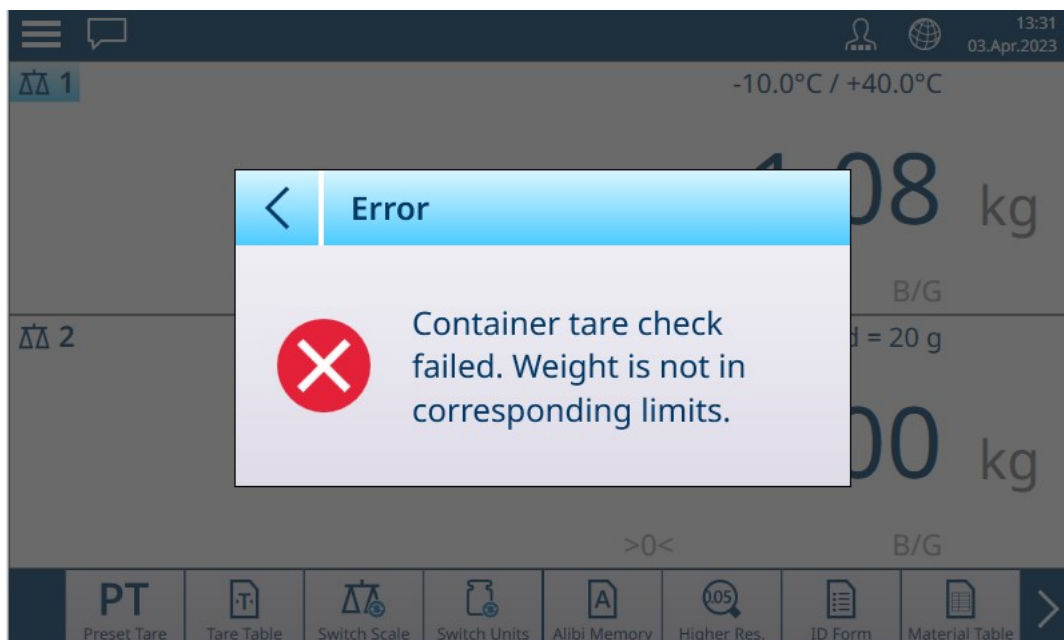


Figure 88: Container Tare Weight Outside Limits

2.2.3.8 Chain Tare

For analog (HSALC) scales only, when **Chain Tare** is enabled in setup it is possible to tare several times sequentially. This is useful, for instance, when multiple items are to be weighed, and are placed in a single container. Each item can be compared to the same tare without resetting the loaded tare value.

In the following example of a chain tare operation, a box is placed on the scale, and items added to it with packaging material between each item. The net weight of each of the added items is to be determined:

1. Place the container on the scale and touch Tare (function key or softkey).
2. The package weight is stored as the tare weight, and the NET mode display appears showing zero weight. The status line shows a tare value with the T indication.
3. Load the first item, and read or transfer (print) the resulting weight.
4. Place packing material in the container, to protect the first item, and touch Tare again. The total scale weight is saved as the new tare value (the status line tare value increases), and the display shows zero NET weight.
5. Load the second item, and read or transfer the resulting weight.
6. Repeat the process for the remaining packing materials and items.

2.2.4 Switching units


If a second unit is defined for the scale (in Setup at **Scales > Scale** ↔ **ASM > Units**), the display can be switched from the primary to the secondary unit and, if configured, a third unit, and back by touching . When the unit is switched, the capacity and increment display is also updated to reflect the change.



Figure 89: Example Primary Unit Display

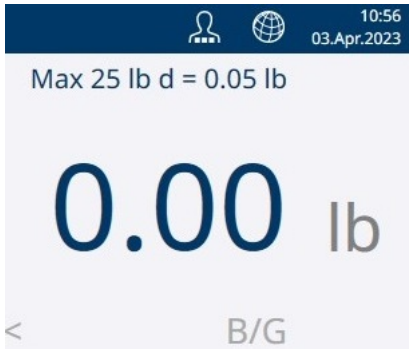


Figure 90: Example Secondary Unit Display

When switching units, the capacity of the converted units is dictated by the original number of divisions established in Capacity and Increments, in setup. In some situations, this may reduce the capacity of the terminal when converting to second or third units.

- Possible units depend on the active scale and the local Weight and Measures regulations.
- When in Counting mode, use the softkey to switch the display between weight and number of pieces.

PowerDeck scales

In the factory setting, the device offers the display unit kg. A second and third display unit can be defined in the Scales setup. Then it is possible to switch between weight units.

- 1 Touch .
 - ➔ The weight value is displayed in the second unit.
- 2 Touch again.
 - ➔ The weight value is displayed in the third unit, if defined.
 - Possible units depend on the active scale and the local Weight and Measures regulations.
 - To switch between weight unit and number of pieces, use the softkey.

2.2.5 Higher Resolution

The **Higher Res.** softkey is used to increase the selected weight display resolution by one additional digit. For example, a weight display of 40.96 could increase by one additional digit to display as 40.958. To indicate this increased resolution mode onscreen, the weight display digits turn orange, and an asterisk (*) is shown at the end of the weight value.

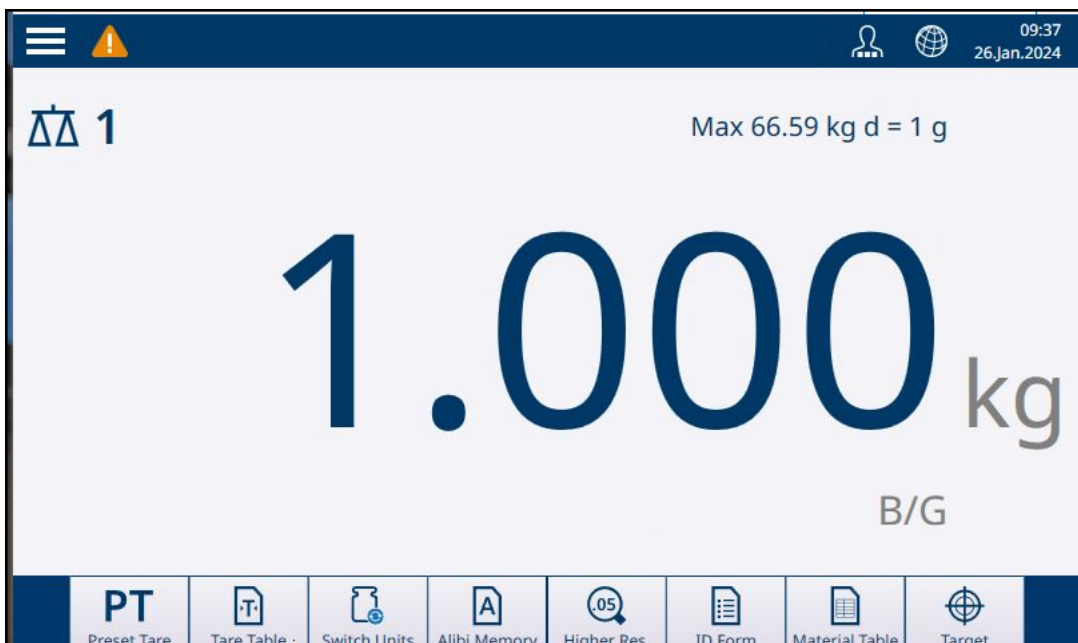


Figure 91: Standard Weight Display

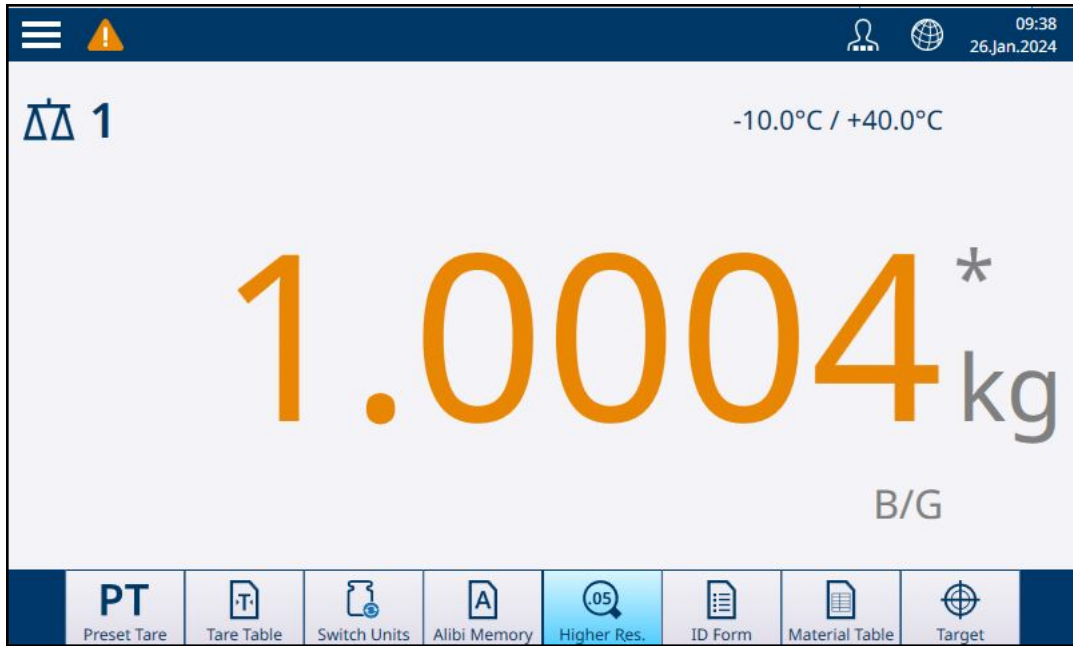


Figure 92: Higher Resolution Weight Display

Touch the **Higher Res.** soffkey  again to return to normal weight display.

Approved Scales

When the terminal is programmed as Approved with the metrology switch (SW1-1) ON, the Higher Resolution mode is displayed for five seconds, then automatically returns to normal resolution. The transfer of data is disabled when the weight is expanded and the terminal is approved.

2.2.6 Loading Alert (PowerDeck Platforms Only)

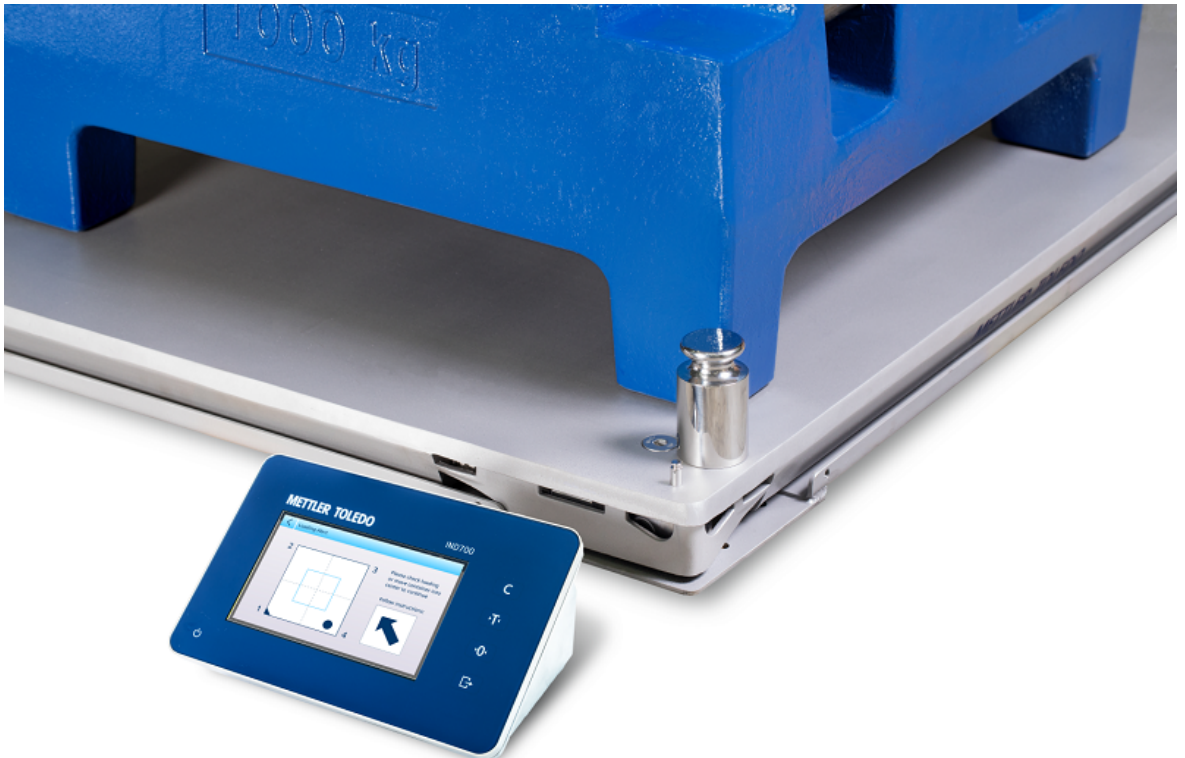



Figure 93: IND700 Displaying Loading Alert Screen

For accurate weighing, loads should be placed so that their center of gravity is near the geometric center of the platform's load cell arrangement. This is particularly important in cases where the platform is flush with the floor, and it is possible for part of the load to overhand the platform and be supported by the floor, reducing the measured weight.

When a PowerDeck platform is connected to the terminal, an additional operational feature is available to assist a user in centering the load on the platform. Once enabled and configured in Setup, whenever the center of gravity of the load is outside of the user configured "OK" Zone, a Loading Alert screen is shown.

The Loading Alert displays as a rectangle representing the scale base, keyed with load cell numbers 1 through 4. The acceptable zone, relative to the center of the scale, is indicated by a light blue box. If an off-center condition is detected, the loading alert displays with a dot indicating the quadrant experiencing the most extreme deviation, and an arrow indicating the direction in which the load should be moved. The operator should visibly inspect the load to make sure it is completely on the platform and if not, take steps to properly center the load or container for which a weight is to be captured.

Depending on how the Loading Alert feature is [configured ▶ Page 138], the loading alert display can either be dismissed by

- Removing the load from the scale.
- Repositioning the load within the OK zone.
- Pressing the left arrow  to dismiss the alert. This option may be suppressed, so that the alert will continue to display until the load is removed or its position is corrected.

Two example screens are shown below, one for a square platform, one for a rectangular platform. In both cases, the alert indicates the position of the load's center of gravity on the platform, and the direction in which the load should be moved for accurate weighing.

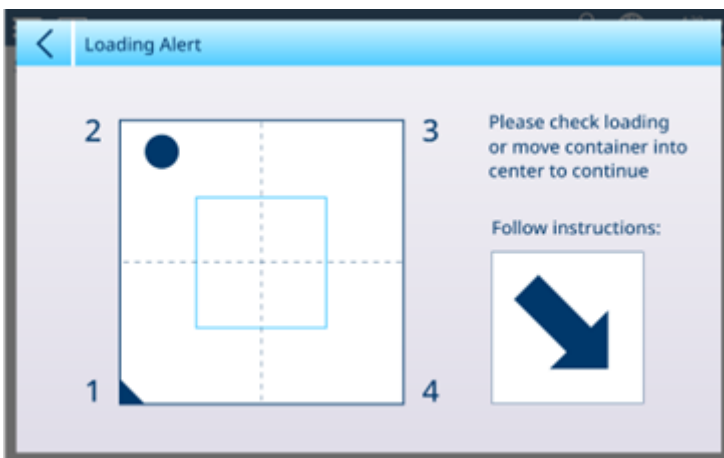


Figure 94: Loading Alert Display, Square Platform

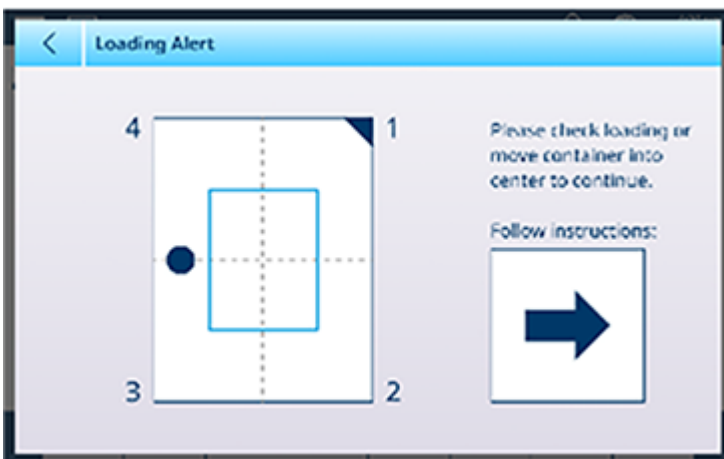


Figure 95: Loading Alert Display, Rectangular Platform


2.2.7 Run Flat Operation (POWERCELL Only)


When Run Flat is configured in setup (at [ASM > Maintenance > Predictive Maintenance ▶ Page 132]), when a load cell fails the system will temporarily compensate for the failure by estimating the total load on the scale based on the readings provided by the good load cells. When Run Flat is in operation, the weight display will show **E** after its last digit, indicating that the displayed value is estimated, and an alert message will appear in the Message area of the menu bar -- **Scale n Build adjustment needed**.

2.2.8 Transfer/Export

To print the results of a weighing operation, or to export them to an external storage location, the following must be true:

- An appropriate connection is defined in setup
- A template is associated with the connection
- The terminal is connected to a printer or to a network

If these conditions are fulfilled, touching the Transfer function key  will cause the terminal to transfer the information to the configured destination. The function key surround will illuminate briefly, and a message **Transferring** will appear at upper right on the screen.

An alternative way to export weighing data is to access the **Alibi Memory Table** . If this table is enabled in setup, a new record is created each time a weighing operation is transferred. The whole contents of this table can be transferred, or a selection of records defined by using the table's **Search Condition** options.

Refer to [Transferring Data ▶ Page 53] for further details.

2.2.9 Setting Region, Time and Date

Location information for the terminal, including its date and time settings, are configured in the Terminal branch of setup at [Region ▶ Page 194]. Local preferences such as date order and time delimiter can be selected, in addition to setting the current time and date. Time and date values can be set automatically if the terminal is connected to a network and Enable **NTP Network Time Protocol** is enabled.

2.2.10 Target Entry

Target operations are available only in IND700 terminals licensed to run the ProWorks Multi-Tools Applications. Refer to the **ProWorks Multi-Tools User's Manual** (30753893), which details the configuration and operation of the applications.

2.3 Applications

For details concerning IND700 applications, please refer to the **IND700 ProWorks Multi-Tools User's Manual** (30753893), which details the configuration and operation of the applications.

2.3.1 ID Forms

ID forms are an easy way to associate a weighing with specific data such as Product, Batch, Lot No., etc. The fields included in an ID Form are defined in setup at [Application > ID Form ▶ Page 175], where up to 10 values can be enabled and named. Data entered in an ID form and associated with a weighing operation is available in the Transaction Table, and can be transferred using a properly-configured output template.


The illustration below shows the ID Form which displays when the ID Form softkey  is touched. In this case, five fields are configured.



Figure 96: ID Form Example

Each field in the ID form can be configured either to preserve the previously entered value (useful when a series of similar items is weighed, each with a different serial number, or when a series of weighments is associated with a specific Operator), or to clear its value on each use.

Even if the previous value is preserved, touching the relevant field will allow it to be edited using either an [alphanumeric entry or a numeric entry keypad ▶ Page 43]. The type of entry keypad displayed depends on whether or not the field is configured (in setup at [Application > ID Form > Edit ID ▶ Page 175]) to accept only numeric data.

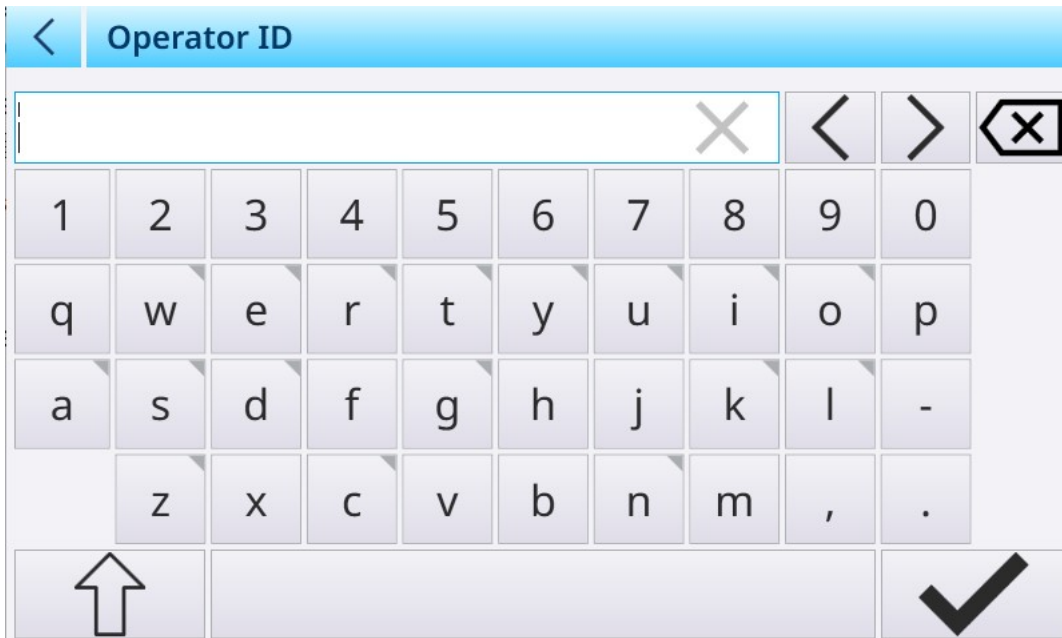


Figure 97: Alphanumeric Entry to ID Form Field

Fields in the ID form can also be defined as **Numeric Only**, in cases where an alphanumeric character would be an incorrect entry.

Transaction Table Display of ID Form Data

The Transaction Table records a number of items of data for each transaction; touch the screen and swipe left to show further columns, and swipe down to scroll through the rows.

Gross Weight	Net Weight	Tare Weight	Preset Tare	Unit	User Name	Material ID	Material Name
4.38	1.70	2.68	T	kg	Admin	4	Sand
9.28	8.02	1.26	PT	kg	Admin	4	Sand
10.04	4.98	5.06	T	kg	Admin	4	Sand
9.88	5.02	4.86	T	kg	Admin	4	Sand
6.22	4.96	1.26	PT	kg	Admin	4	Sand
6.26	5.00	1.26	PT	kg	Admin	4	Sand
0.00	0.00	0.00		kg	Admin		
0.00	0.00	0.00		kg	Admin		
3.2	3.2	0.0		kg	Admin	1	Cool
3.4	3.4	0.0		kg	Admin	1	Cool

Figure 98: Transaction Table, Example of Initial View

Material Name	Product	Batch	Lot No.	Shift	Operator ID	APW	pcs	Tare
Sand	5	55	3	2	Halliday			
Sand								

Figure 99: Transaction Table Scrolled to Show ID Form Data

3 Configuration

Overview

Access to the terminal's setup, or configuration, menus is provided in the drop-down list at top right of the home screen

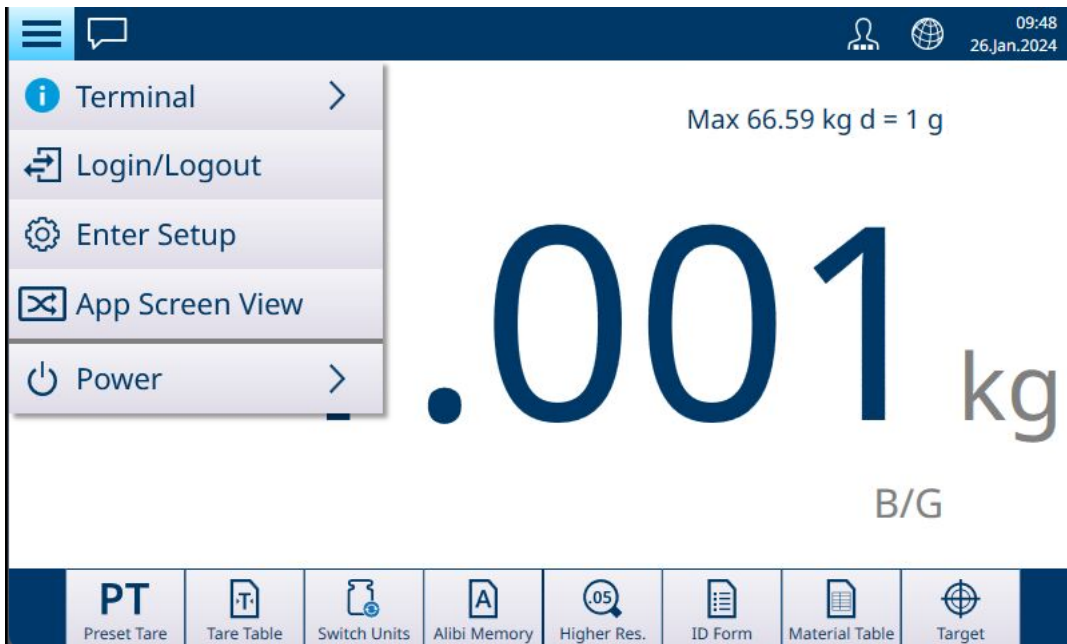


Figure 100: Home Screen with Drop-Down Menu

Touch **Enter Setup** to access the menu system. The main setup menu screen appears.

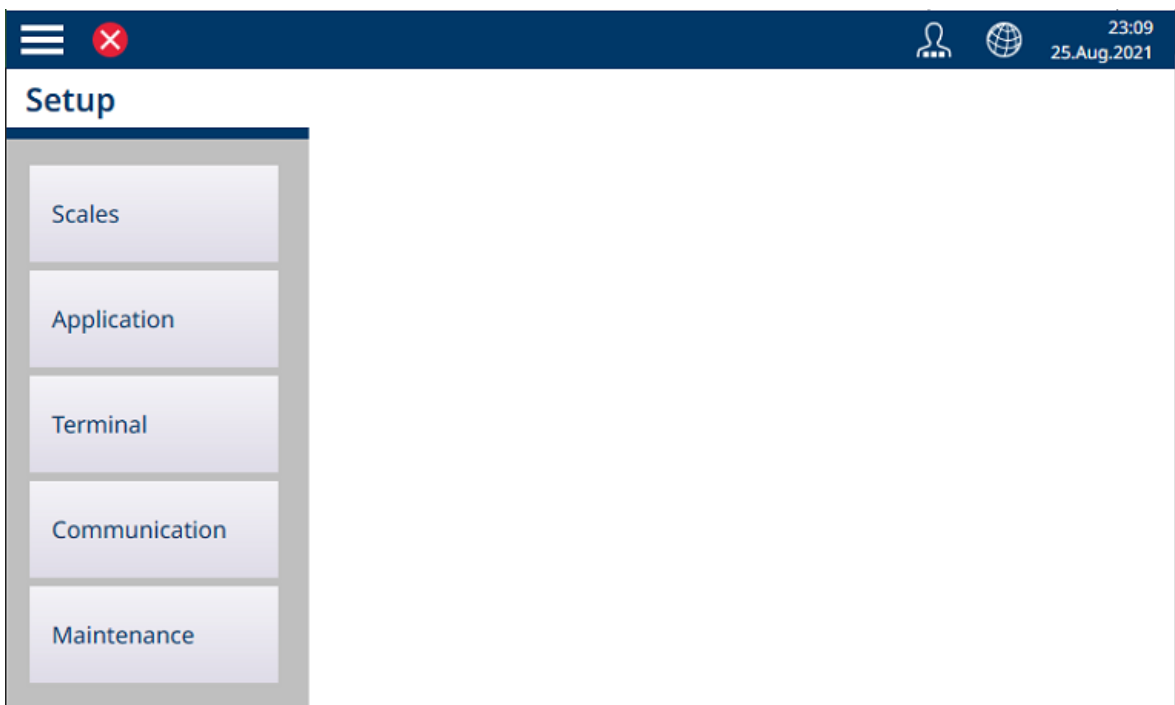


Figure 101: Main Setup Menu

Touch any of the setup items to access its options.

Data Entry in Configuration Screens

Various parameters require the entry of numeric or alphanumeric data. Refer to [Data Entry ▶ Page 43] for details on how to enter data using the IND700 HMI.

Confirming or Reverting Changes

When changes are made to a configuration screen, in most instances the terminal offers an option to confirm the changes by selecting a check mark, or revert them by selecting a circular arrow.



Figure 102: Change Confirmation/Reversion Icons

3.1 Scale Setup

The options available in the Scale Setup menu differ depending on the type of scale/s connected. The terminal supports one or two scales, which can be of a different types, and Sum Scale which totals the weight values from all included scales. Scale Setup is performed using the ASM (Advanced Setup Mode) embedded in the scale.

The main Scale setup menu includes Scale 1, Scale 2 (if installed), and Sum Scale.

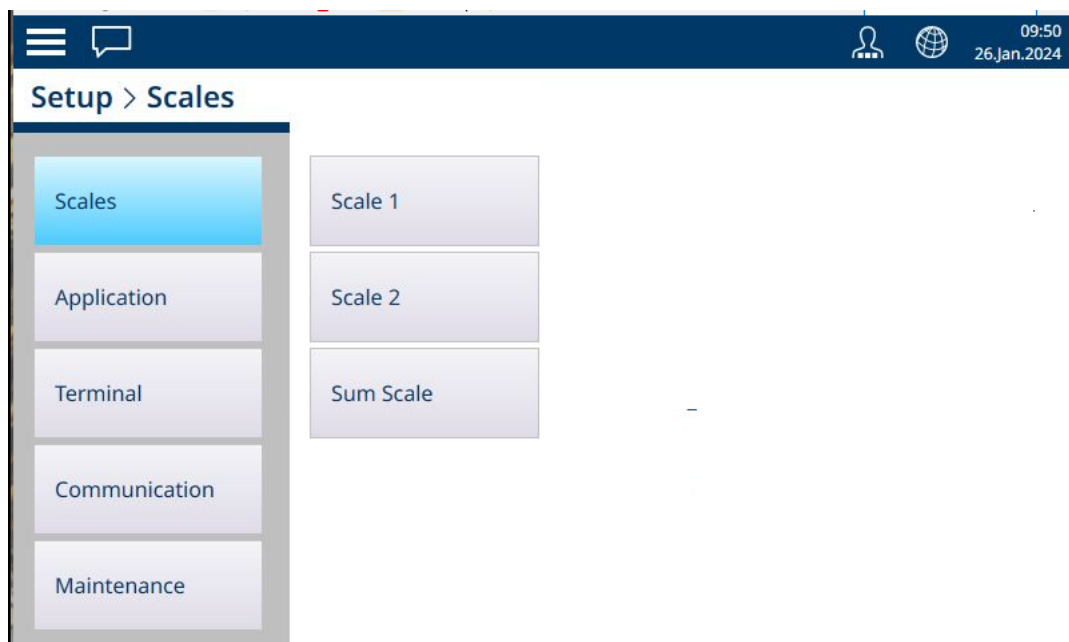


Figure 103: Setup Menu - Scales

In each of the setup screens, access the previous screen by touching the left arrow at upper left of the screen, or by touching the 'breadcrumbs' at the top of the menu. For example, in the screen shown above, touch **Setup** to close the **Scale** options view and return to the main setup view.

3.1.1 High Speed Analog Load Cell

3.1.1.1 Scale n

The Scales branch of the setup menu displays options for each scale (1 or 2, depending on how many interfaces are installed in the terminal) and for a Sum Scale.

When either scale is selected, two further options appear -- **ASM**, which provides access to all the scale configuration menus, and **Log or Transfer**, which determines whether and how each weighing operation is recorded or exported.

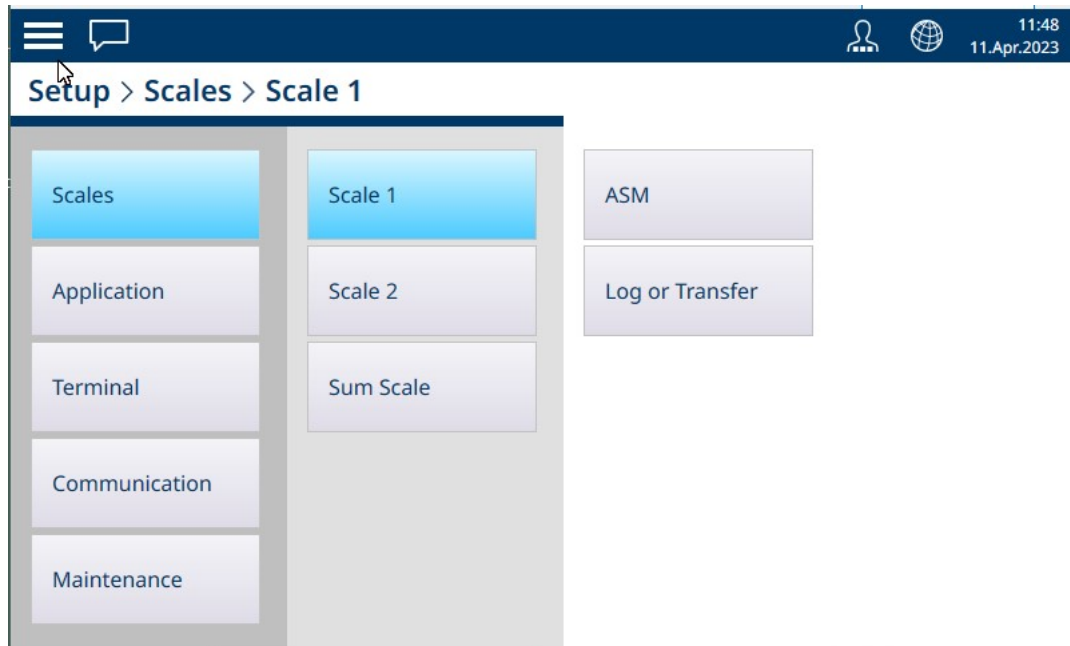


Figure 104: Scale n Menus, HSALC

3.1.1.1.1 ASM

The ASM (Advanced Setup Mode) menu includes the items show in the figure below.

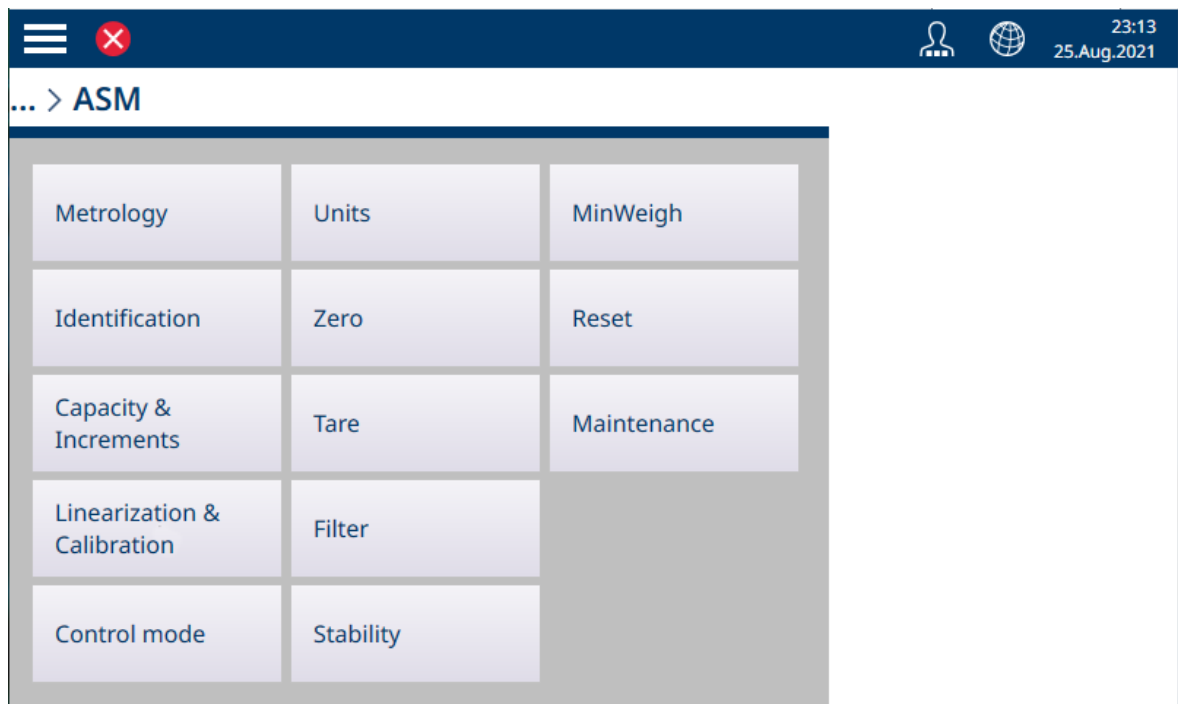


Figure 105: HSALC ASM Menus

The ASM system runs on the scale interface, and is separate from the terminal's own firmware which runs on the terminal's CPU.

Metrology

The Metrology screen allows the configuration of per-scale approvals and **GEO** values, as well as lower and upper operating **Temperature Limits**.

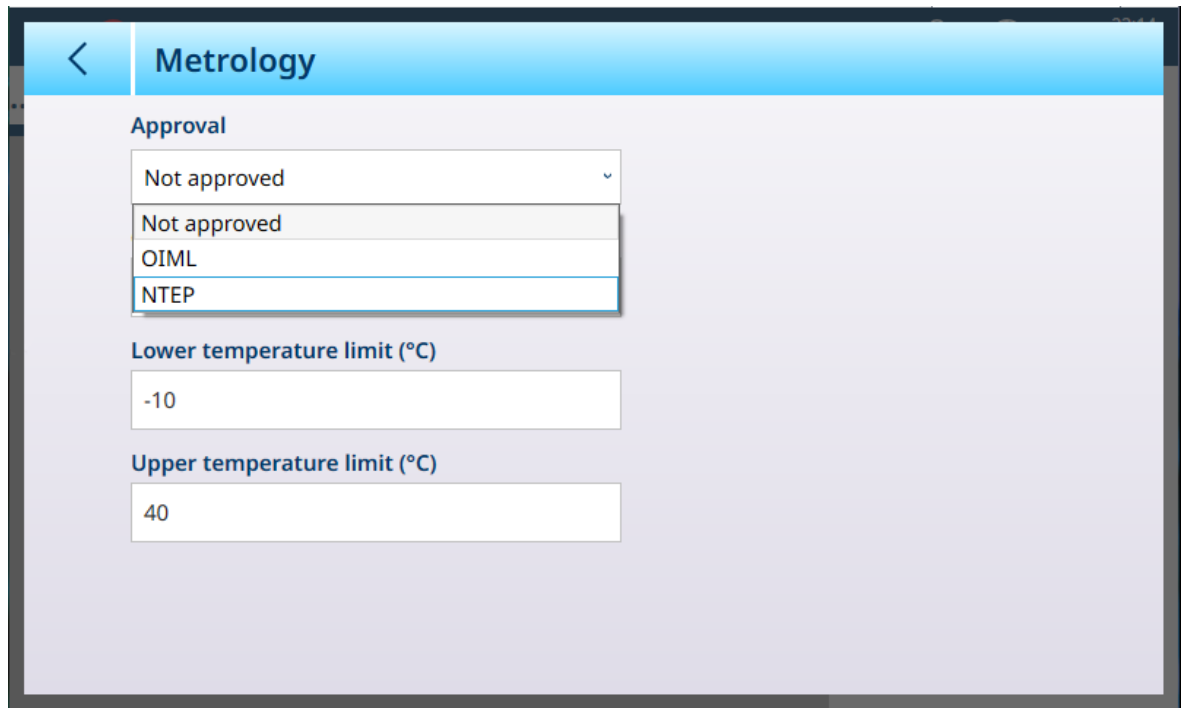


Figure 106: ASM - Metrology Screen

When an approval (**OIML** or **NTEP**) is selected, additional options are displayed.

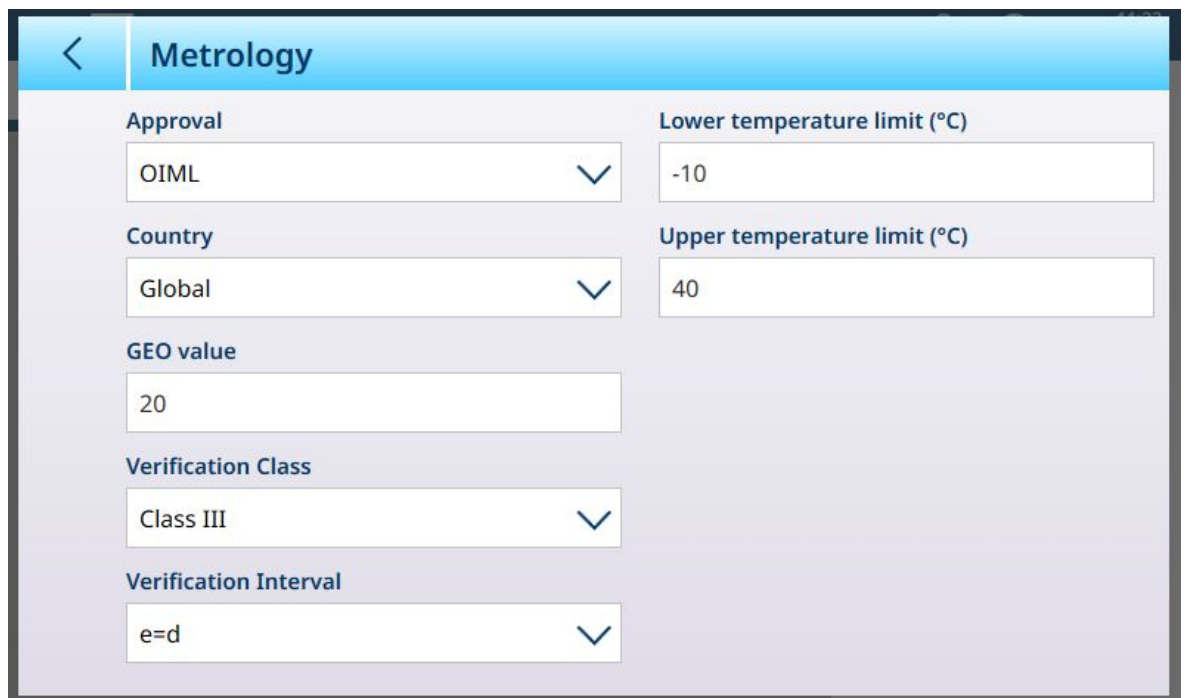


Figure 107: Approval Options

In addition to the GEO and temperature values, an approval requires the selection of **Country** and **Verification Class** values.

For both **OIML** and **NTEP** approvals, the **Country** options are **Global [default]**, Argentina, Australia, Korea, Thailand, and the **Verification Class** options are Class II, Class III, Class IIIA, Class IIIHD and Class IIII.

When the device has been set as Approved -- either OIML or NTEP -- and the metrological sealing screw has been installed, the fields on this page are greyed out and cannot be modified.

Identification

The **Identification** screen allows the scale's **Serial number**, **Scale model** and **Scale location** to be defined. It also provides an additional **Scale Identification** field. For analog scales, these fields are optional and must be completed manually. Touching any of the fields opens an alphanumeric entry dialog.

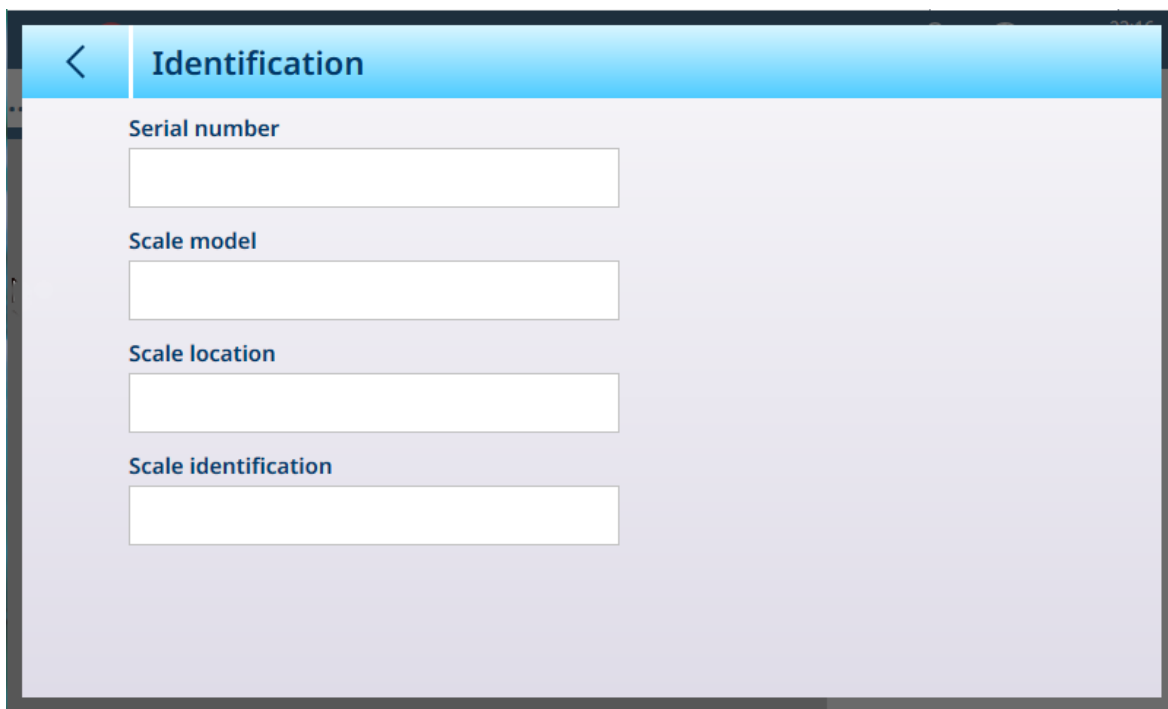
The image shows a mobile application screen titled "Identification". At the top left, there is a back arrow icon. The title "Identification" is centered at the top. Below the title, there are four vertically stacked input fields, each with a label above it: "Serial number", "Scale model", "Scale location", and "Scale identification". Each field is a simple white rectangle with a thin grey border.

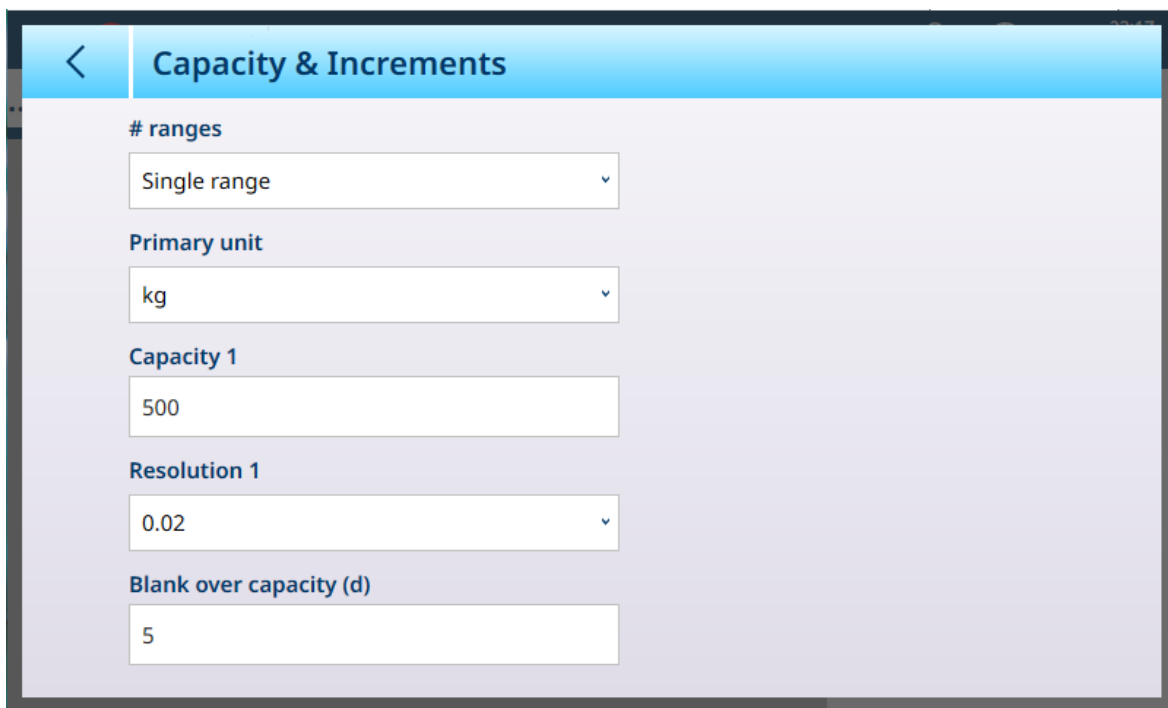
Figure 108: Identification

HSALC: Capacity and Increments

Capacity and increment values allow the weighing parameters to be set for each of a series of scale setups, depending on the **# ranges** value:

- Single range
- 2 multi interval
- 2 multi range
- 3 multi interval
- 3 multi range

The figure below shows the default **Single range** selected.



Capacity & Increments

ranges
Single range

Primary unit
kg

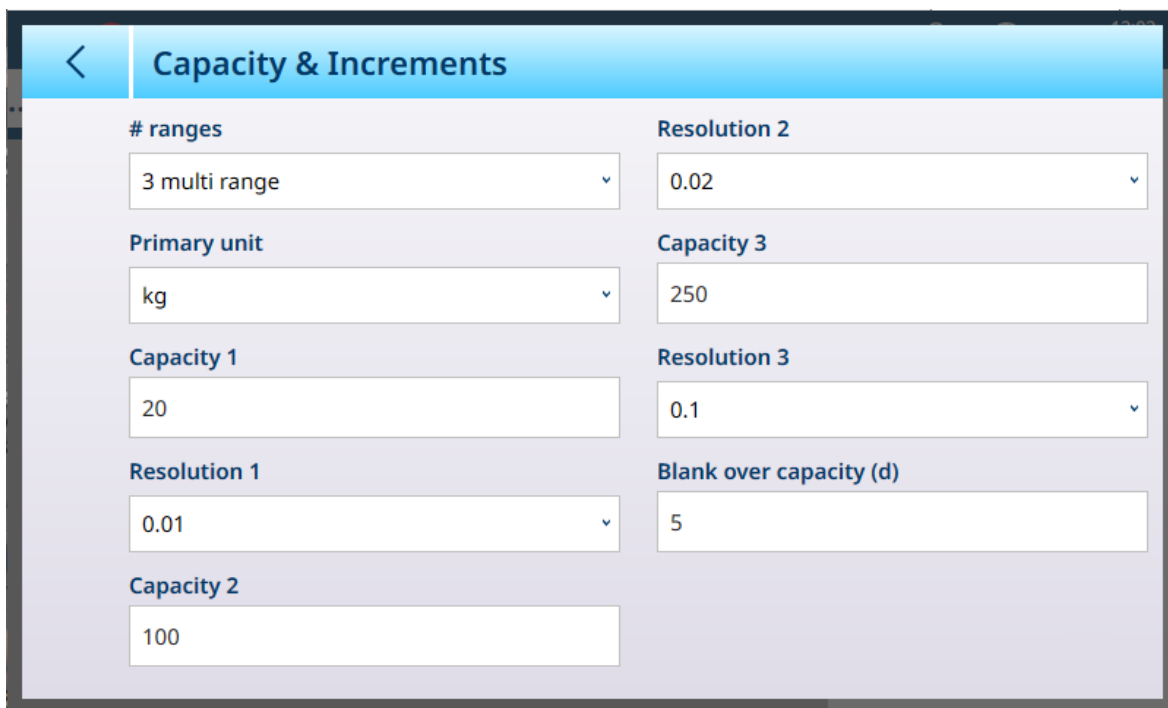
Capacity 1
500

Resolution 1
0.02

Blank over capacity (d)
5

Figure 109: ASM - Capacity and Increment

If either multi interval or multi range is selected, additional **Capacity** and **Resolution** fields display. The **Blank over capacity** field is always displayed last, and determines the weight value beyond scale capacity, measured in display increments, at which the terminal blanks the weight display..



Capacity & Increments

ranges
3 multi range

Primary unit
kg

Capacity 1
20

Resolution 1
0.01

Capacity 2
100

Resolution 2
0.02

Capacity 3
250

Resolution 3
0.1

Blank over capacity (d)
5

Figure 110: Capacity and Increment - Multi Range Example

If **3 multi interval** or **3 multi range** is selected, two sets of capacity and resolution fields are added.

Multi-Range and Multi-Interval Weighing



NOTICE

Precision Scales and Multi-Range, Multi-Interval Operation

PBK and FPK scale platforms support both multi-range and multi-interval operation. PDB platforms support only multi-range operation.

Both **Multi-Range** and **Multi-Interval** settings allow a scale to be used to weigh two or more types of item which differ significantly in weight. Each weight range can have its own **Capacity** and **Resolution** values, so that one scale can behave like two or more different scales.

For instance, for small and light items a finer resolution might be required, while for large and heavy items a coarser resolution is adequate. The scale changes the display increment size at the **Capacity** points defined in this screen. In the example shown here, three ranges are defined -- up to 50 kg, up to 500 kg, and up to 1,000 kg.

Figure 111: Capacity & Increments Screen Configured for Three Ranges

In **Multi-Range** mode, the range currently in use appears on screen beside the weigh mode (B/G or Net) indicator -- **>I1<**, **>I2<**, **>I3<** -- depending on how many ranges are configured.

The increment sizes, or **Resolutions**, are set to **0.01**, **0.5** and **1**, respectively. Thus, for items weighing up to 50 kg, the weight display will increment in 100 gram steps; between 50 kg and 500 kg of scale weight, the display will increment in half-kilogram steps; and for items weighing over 500 kg the resolution is reduced by a factor of 10 compared to the lowest range, and increases in 1 kg steps.

There is one significant difference between **Multi-Range** and **Multi-Interval** configurations, affecting how the terminal behaves as scale weight is reduced:

- Multi-Range: When scale weight is reduced, the terminal continues to display the Resolution size for the largest configured range.
- Multi-Interval: When scale weight is reduced, the display conforms to the configured intervals and shows Resolution sizes corresponding to current scale weight

In both cases, the terminal resets the display to the **Resolution** for the lowest range when the weight falls to zero.

Display

The two modes also differ in the way the IND700 indicates the capacity and increment settings for the displayed scale.

- Multi-Range: The terminal's metrology line cycles through a display of both capacity and increment for each configured range in sequence -- W1 Max 50 kg d = 0.1 kg , W2 Max 500 kg d = 0.5 kg , W3 Max 1 t d = 1 kg
- Multi-Interval: The terminal's metrology line cycles through a display of capacities for each configured range, and then increments for each -- Max 50 / 500 / 1 t , d = 2 / 500 / 1000 g

Example

The following diagram illustrates the distinction between Multi-Range and Multi-Interval modes, showing the behavior of the terminal configured as in the screen shown above, during one weighing operation:

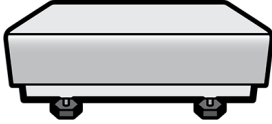

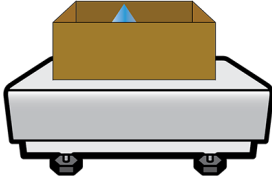

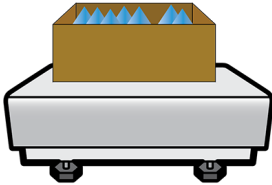

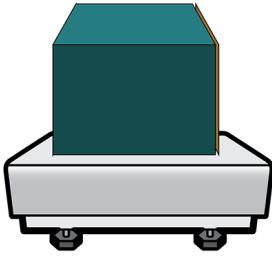

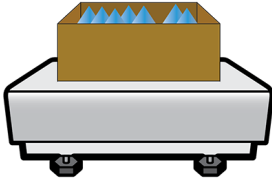
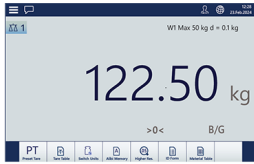


	Scale Status	Display Status	Resolution, Multi-Range	Resolution, Multi-Interval
1			0.002 kg >|1|<	0.002 kg
2			0.002 kg >|1|<	0.002 kg
3			0.05 kg >|2|<	0.05kg
4			1 kg >|3|<	1 kg
5			0.002 kg >|2|<	1 kg
6			0.002 kg >|1|<	0.002 kg

Figure 112: Multi-Range vs Multi-Interval



NOTICE

Scales with Multiple Ranges or Multiple Intervals have specific Approval requirements.

HSALC: Linearization and Calibration

The **Linearization and Calibration** menu offers four sub-menus.



Figure 113: ASM - Linearization and Calibration

Calibration

The settings available in this screen will change depending on the [Linearity ▶ Page 82] setting selected. The default screen is shown below, and then a screen showing additional fields used to capture linearization.

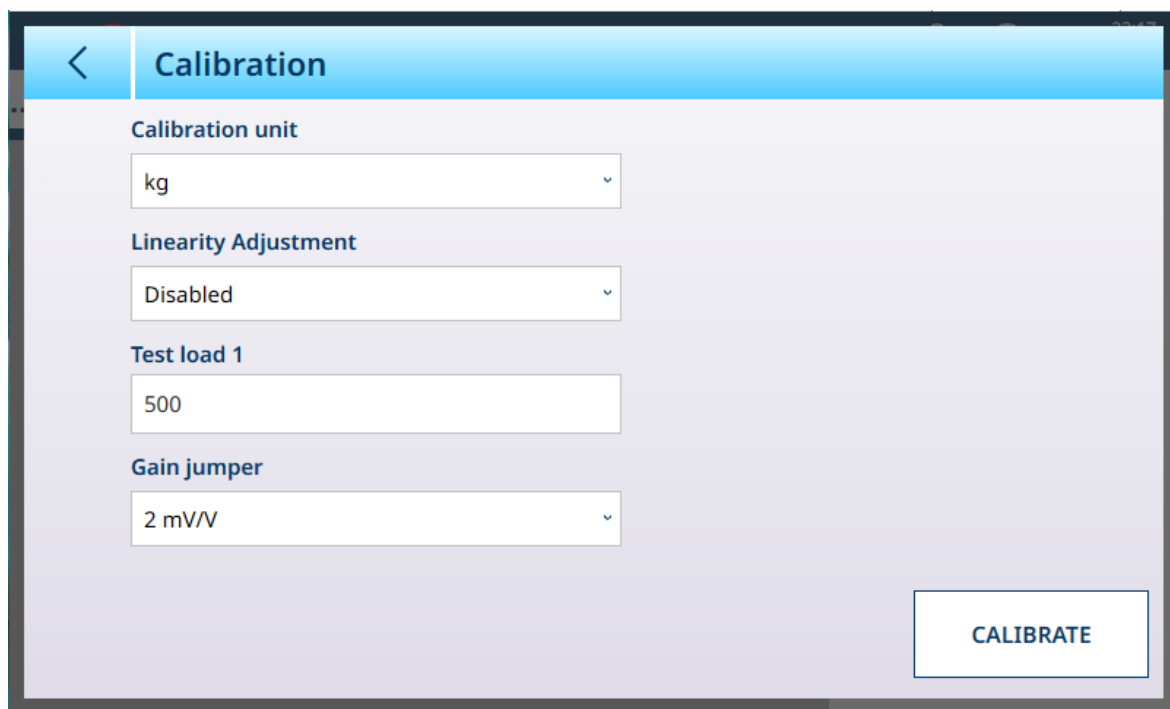


Figure 114: ASM - Linearization - Calibration

If [Linearity Adjustment ▶ Page 82] is enabled (i.e., not set to **Disabled**), additional **Test load** fields (2, 3 and 4, depending on the number of points selected) display. Note that when hysteresis is specified, after the highpoint is captured the calibration sequence includes unloading the scale to an intermediate test weight.

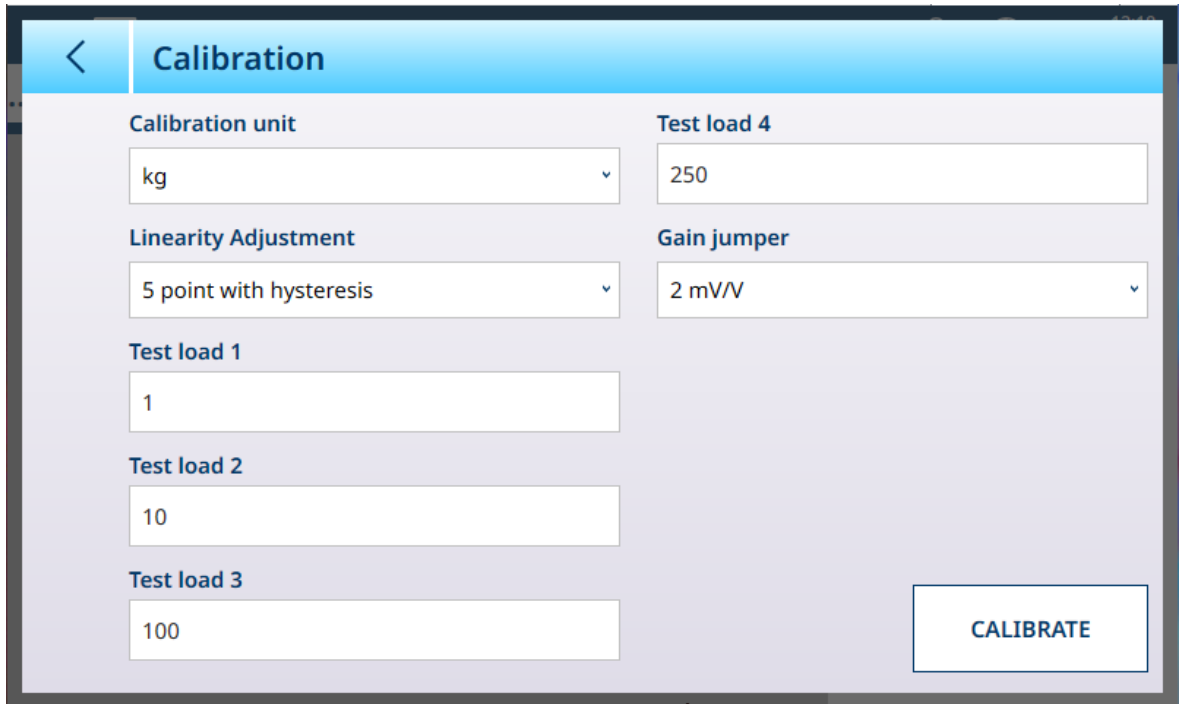


Figure 115: Calibration with Five-Point Linearization and Hysteresis

The **Calibration unit** is determined by the Primary Unit selected in [Capacity and Increments ▶ Page 114].

The [Gain Jumper ▶ Page 82] setting applies only to analog load cells

When the linearity settings have been entered, touch the **CALIBRATE** button to begin the calibration sequence. The sequence prompts for the placement and removal of the various test weights, depending on the Linearity Adjustment selected. A message will indicate when a calibration is missed.

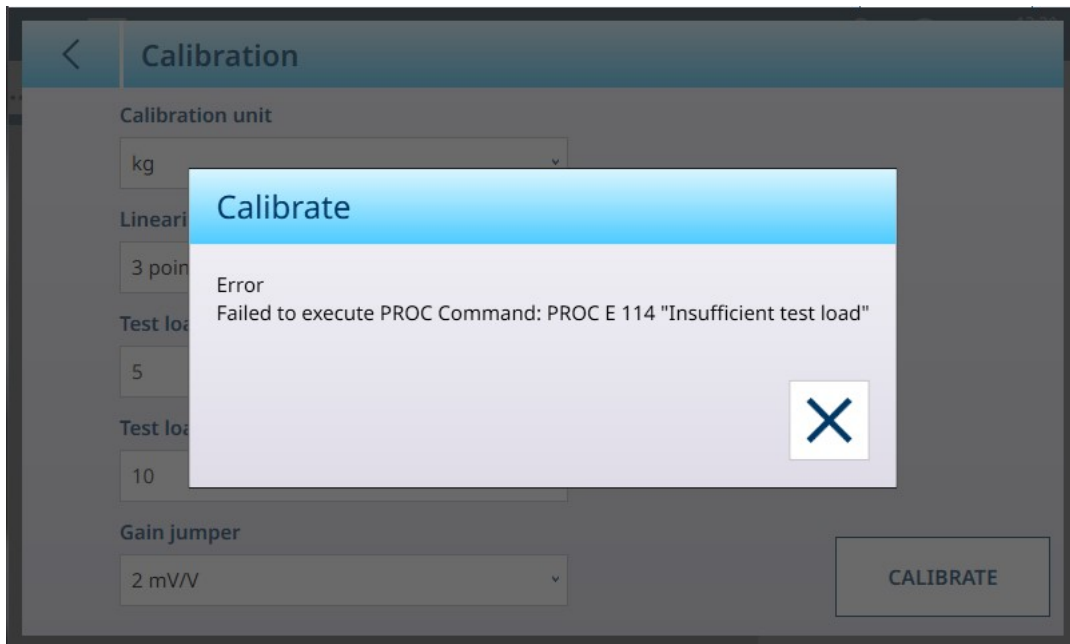


Figure 116: Calibration Error Message

When the calibration sequence is completed successfully, a message displays:

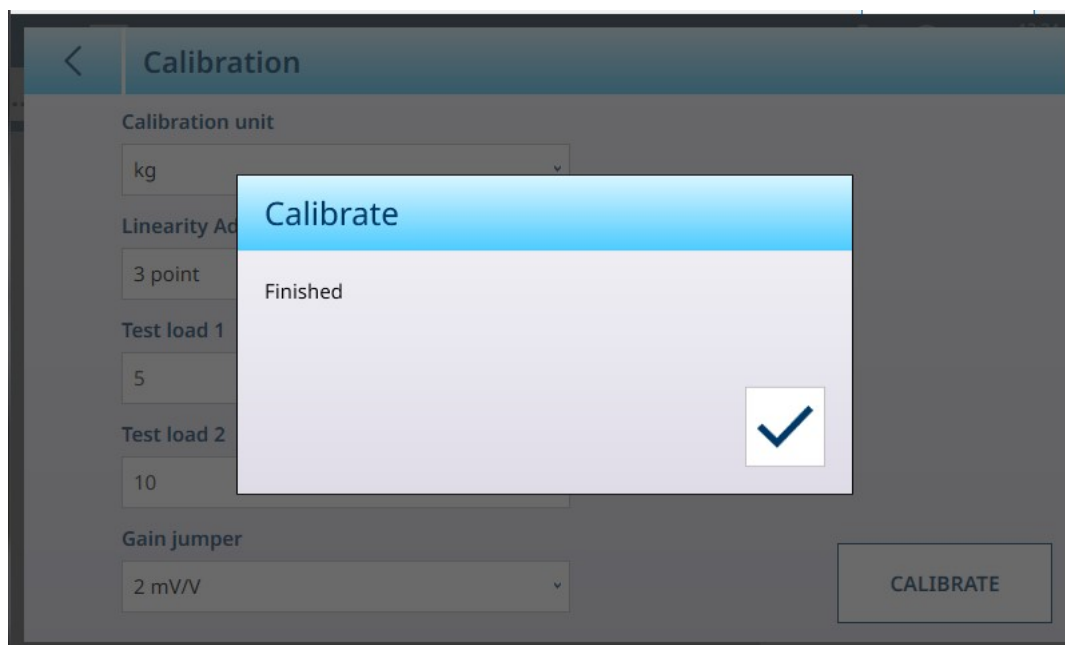


Figure 117: Calibration Complete Message

Linearity

Linearity Adjustment is used to adjust the maximum deviation between the scale indication and the linear value from zero to max. capacity. linearity adjustment with hysteresis compensation is recommended for better linearity in applications involving discharge or loss-in-weight,

The menu settings noted affect the calibration steps.

Disabled [default]	Use only zero and one span point (test load #1)
3 point	Use zero, midpoint (test load #1), and highpoint (test load #2)
4 point	Use zero, lowpoint (test load #1), midpoint (test load #2), and highpoint (test load #3)
5 point	Use zero, lowpoint (test load #1), midpoint (test load #2), mid-highpoint (test load #3), and highpoint (test load #4)
3 point with Hysteresis	Use zero, midpoint (test load #1), and highpoint (test load #2), then unload to midpoint (test load #1)
4 point with Hysteresis	Use zero, lowpoint (test load #1), midpoint (test load #2), and highpoint (test load #3), then unload to midpoint (test load #2) and lowpoint (test load #1)
5 point with Hysteresis	Use zero, lowpoint (test load #1), midpoint (test load #2), mid-highpoint (test load #3), and highpoint (test load #4), then unload to mid-highpoint (test load #3), midpoint (test load #2), and lowpoint (test load #1)

Analog Gain Jumper

The analog gain jumper setting on the Main PCB can be either 2 mV/V or 3 mV/V. The terminal is shipped from the factory in the 3 mV/V setting. In order for the CalFree \square feature to operate properly, the selected parameter must indicate the physical position of the jumper on the Main board.

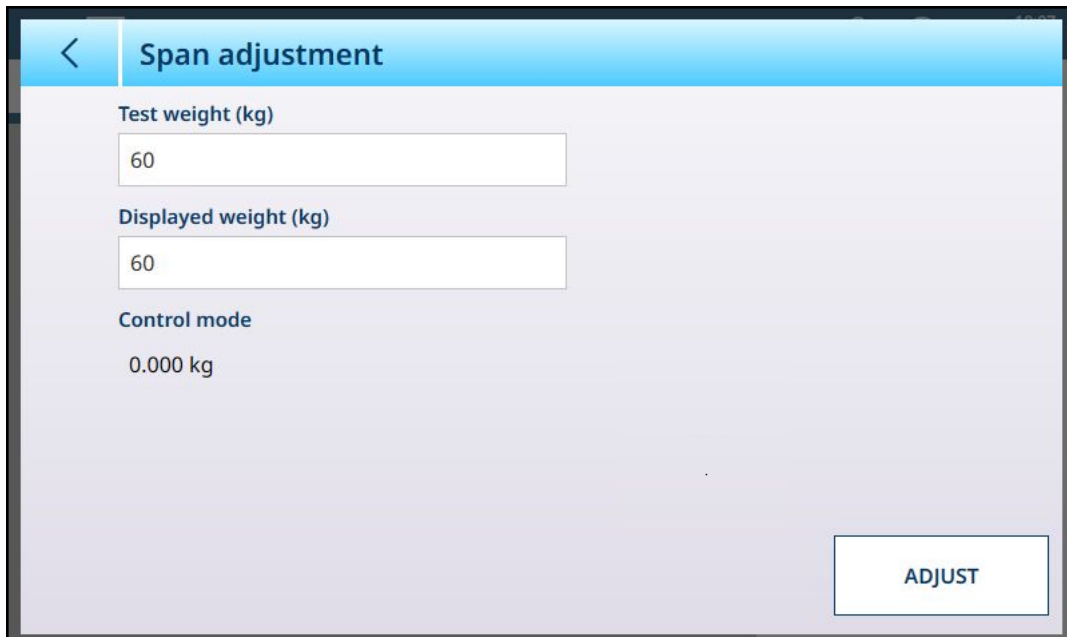
The jumper settings are:

Analog Gain Jumper Settings

2 mV/V	Jumper installed on both pins
3 mV/V [default]	Jumper installed on only one pin

Span Adjustment

The Span adjustment screen permits the scale's whole span to be defined. The units used for the parameters entered here are the Primary Unit set on the Capacity and Increments page.



The screenshot shows a mobile application interface for 'Span adjustment'. At the top, there is a blue header bar with a white back arrow on the left and the text 'Span adjustment' in white. Below the header, the background is a light gray. There are three input fields stacked vertically. The first is labeled 'Test weight (kg)' and contains the number '60'. The second is labeled 'Displayed weight (kg)' and also contains '60'. The third is labeled 'Control mode' and displays '0.000 kg'. In the bottom right corner, there is a white rectangular button with the text 'ADJUST' in blue.

Figure 118: ASM - Linearization and Calibration - Span Adjust

Enter the calibration test weight value in the **Test weight** field.

Enter the current weight reading from the scale, as shown in the **Control mode** display, in this field. The terminal will account for any difference between the test weight and the weight shown on screen, and adjust the displayed weight accordingly. Perform this adjustment before carrying out the linearity adjustments from the [Calibration ▶ Page 80] screen.

Note that the **Control mode** field is read-only, and displays the current scale weight.

To perform the span adjustment, place the test weight on the scale and touch **Adjust**. A message will appear to indicate that the adjustment is complete, and the **Control mode** will change to reflect the offset, displaying a corrected value.

See also

[HSALC: Capacity and Increments ▶ Page 76](#)

Step Calibration

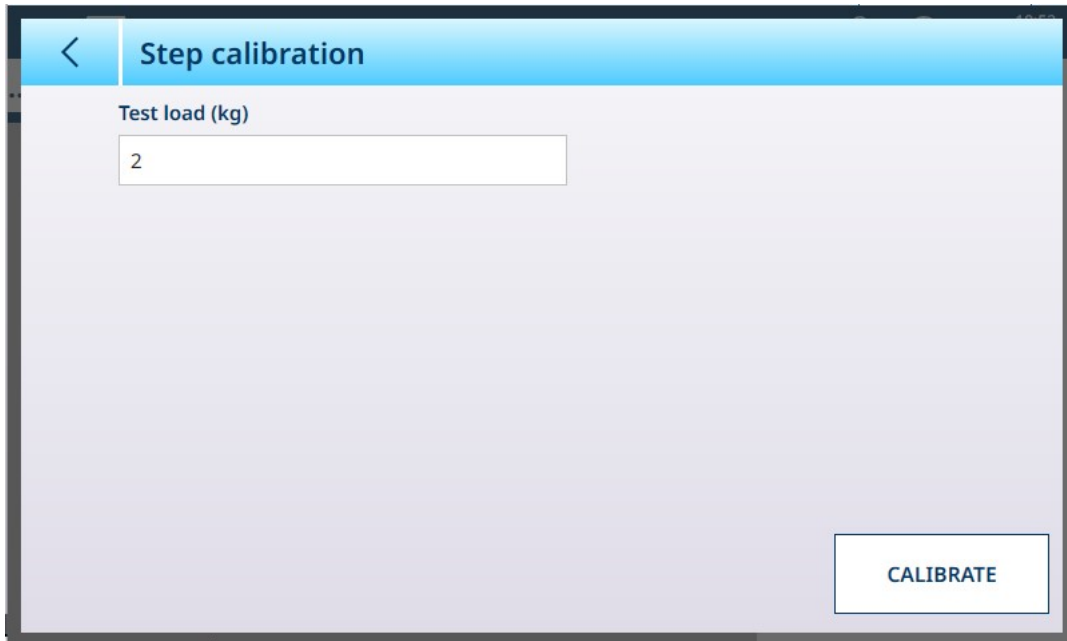


Figure 119: Step Calibration Screen

Step Calibration provides a way to calibrate tanks and hoppers with a "build up" method. In this procedure, the same amount of weight is added to the scale at each step of the procedure until the weight specified in the Test Load field is reached.

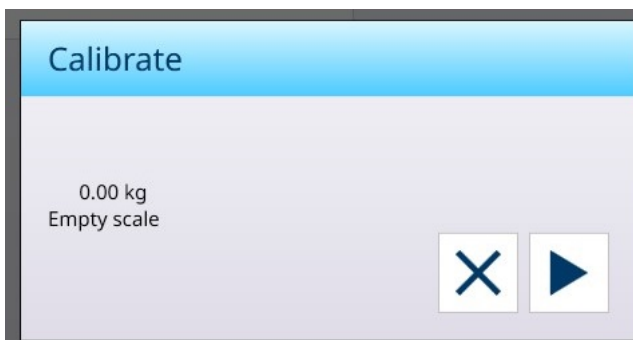
The Test load units are determined by Primary Unit set in [Capacity and Increments ▶ Page 114].

Step Calibration Procedure

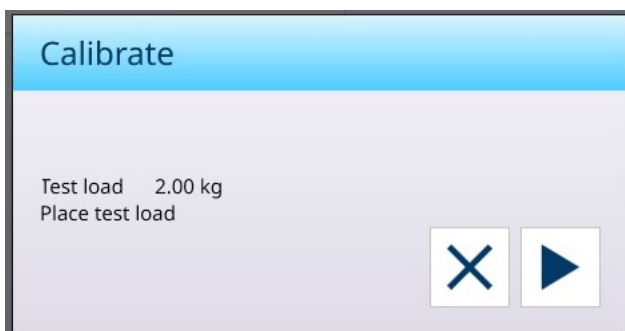
Note that test weight values in the images below are for illustration only, and do not correspond to values for a typical POWERCELL system.

The procedure involves placing and removing test weights of the size specified, and filling the tank or hopper to intermediate target weights. The sequence is prompted by messages on-screen, as shown here. When a prompted action is complete, touch the next icon to :

- 1 Set the zero value. At each screen, the procedure can be continued ▶, or cancelled ✕ to complete the procedure at the current step. Note that the current scale weight is shown as the first line in the screen.



- 2 Place the first test load.



3 Remove the first test load. The current scale weight is displayed again.



4 Fill the vessel to the indicated target.



Follow the steps indicated until the required span is reached, then touch the X (close) button. The **Step calibration** screen will display.

CalFree

The terminal provides a method to calibrate a scale without using test weights. This is based on manual entry of capacity and performance data from the load cell or load cell platform. This method of calibration can be used for initial check-out and testing of systems or when a large structure is used as the weighing vessel and it is not possible to apply test weights to the structure.



NOTICE

The analog gain jumper (refer to [Calibration ▶ Page 80]) must be set correctly for the cell type in use, or CalFree will not produce an accurate result.

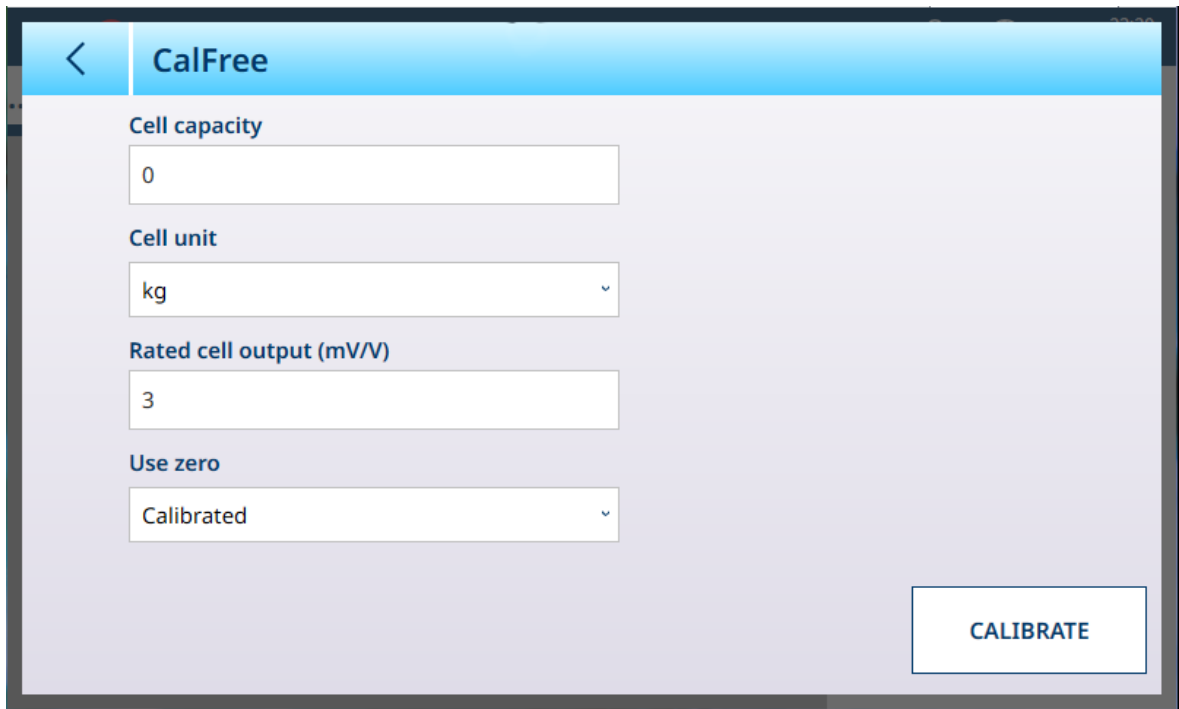


Figure 120: ASM - Linearization and Calibration - CalFree

For **Cell capacity**, the total load cell capacity should be entered. For example, for a tank with three 5000 kg cells, cell capacity would be 3 x 5000, or 15000 kg.

If **Use zero** is set to **Estimated**, enter an estimated value. The value entered here will be included in the terminal's calculation for analog load cell saturation. If this value is unknown, leave this field blank. This preload value is used only to determine overload conditions and is not used as a zero reference point.

Touch the CALIBRATE button to perform the procedure. If calibration succeeds, a message will appear to indicate this. Otherwise, an error message will display.

See also

[🔗 HSALC: Linearization and Calibration ▶ Page 80](#)

Control Mode

The Control Mode screen shows the current scale weight. This is useful for viewing the weight reading during setup and diagnostics without leaving the setup menu system.



Figure 121: Control Mode Screen

HSALC: Units

Figure 122: ASM - Units

Units Settings

Parameter	Options	Function
Secondary unit	g, kg, t, lb, oz, ton	Sets the Secondary unit .
Host / auxiliary unit	g, kg, t, lb, oz, ton	Sets unit type for Host / auxiliary unit .
Startup unit	Primary [default] , Restart	Determines whether, when the terminal is restarted, the units revert to the Primary unit defined in [Capacity and Increments ▶ Page 114], or remain as modified by the selection made from the home screen by touching Switch Units

HSALC: Zero

Figure 123: ASM - Zero

Zero Settings

Parameter	Options	Function
Startup zero	Use last [default] , Use calibrated, Capture new	Determines how the scale defines zero when it is restarted.
Power up zero -range (%)	Opens a numeric entry dialog; default value is 2%	These parameters appear if Startup zero is set to Capture new . Values define the range within which the terminal, at power up, will automatically zero the scale. If scale weight is outside the configured range, Startup zero will not execute.
Power up zero +range (%)	Opens a numeric entry dialog; default value is 18%	
Auto zero tracking	On [default] , Off	Auto zero tracking is an automatic zero maintenance function which tracks zero when the scale is empty, and compensates for conditions such as terminal or load cell drift, or slow debris buildup on a scale platform.
Auto zero range (d)	Opens a numeric entry dialog; default value is 0.5	Parameter appears if Auto zero tracking is set to On . Determines the range, in scale display units, within which Auto zero will be applied.
Blank under zero (d)	Opens a numeric entry dialog; default value is 20	Determines the sub-zero point, in scale display units, at which the terminal will blank its weight display.
Push button zero	On [default] , Off	When On , the terminal's zero softkey can be used to set the terminal to zero, if the current scale weight value is within the range defined by the -range and +range values. The push button zero softkey is visible if at least one connected scale has push button zero active. If push button zero is not activated for a scale, the Zero softkey will display greyed out when that scale is selected. If the Zero scale function key is touched when Push button zero is off for the selected scale, an error message will display indicating that Push button Zero is disabled.
Push button zero -range (%)	Opens a numeric entry dialog; default value is 2 .	Refer to Push button zero , above.
Push Button zero +range (%)	Opens a numeric entry dialog; default value is 2 .	Refer to Push button zero , above.

HSALC: Tare

The fields visible in this screen vary depending on the settings for **Auto tare mode**, **Auto tare reset threshold** and **Auto clear tare**. Each of these requires additional parameter settings

Figure 124: Tare Settings

Parameter	Options	Function
Startup tare	Use last [default] , Clear	Determines whether an existing tare value is preserved at system restart, or cleared.
Auto tare mode	Off [default] , On	Determines whether the terminal will automatically take a tare once the Auto tare threshold value is exceeded. An auto tare is cleared once the weight value falls below the Auto tare reset threshold .
Auto tare threshold (kg)	Displays a numeric entry dialog. Default is 0.	Refer to Auto tare mode , above.
Auto tare reset threshold (kg)	Displays a numeric entry dialog. Default is 0.	Refer to Auto tare mode , above.
Chain tare mode	Off [default] , On	When Chain tare mode is ON, it is possible to take multiple tares in sequence by touching the Tare softkey – for example, when filling multiple similar containers on a pallet. Once one container is filled, touch Tare again to reset the scale to Net zero.
Auto clear tare	Off [default] , On	Determines whether the terminal will preserve a tare value when scale weight returns to zero, or automatically clear it when the weight value falls below the Auto clear tare threshold .
Auto clear tare threshold (kg)	Displays a numeric entry dialog. Default is 0.	Refer to Auto clear tare , above.

Pushbutton tare	On [default] , Off	When Push button tare is On , the Tare softkey on the home screen is functional. Touch this softkey to create a tare value based on an empty container on the scale. The terminal then shows a zero weight and indicates that it is Net mode. When the container is filled, the terminal shows the net weight of the contents. The Tare softkey is visible if at least one connected scale has push button tare active. If push button tare is not activated for a scale, the Tare softkey will display greyed out when that scale is selected. If the Tare scale function key is touched when Push button tare is off for the selected scale, an error message will display indicating that Push button Tare is disabled.
Keyboard tare	On [default] , Off	When Keyboard tare is On , the known value for the empty weight of a container (tare) can be entered manually. The terminal will then display the net weight of the contents of the container. Keyboard tares are automatically rounded to the closest display division.
Clear with zero	On [default] , Off	When On , a scale zero command, issued by a softkey or any other input, will clear any stored tare value.

HSALC: Filter

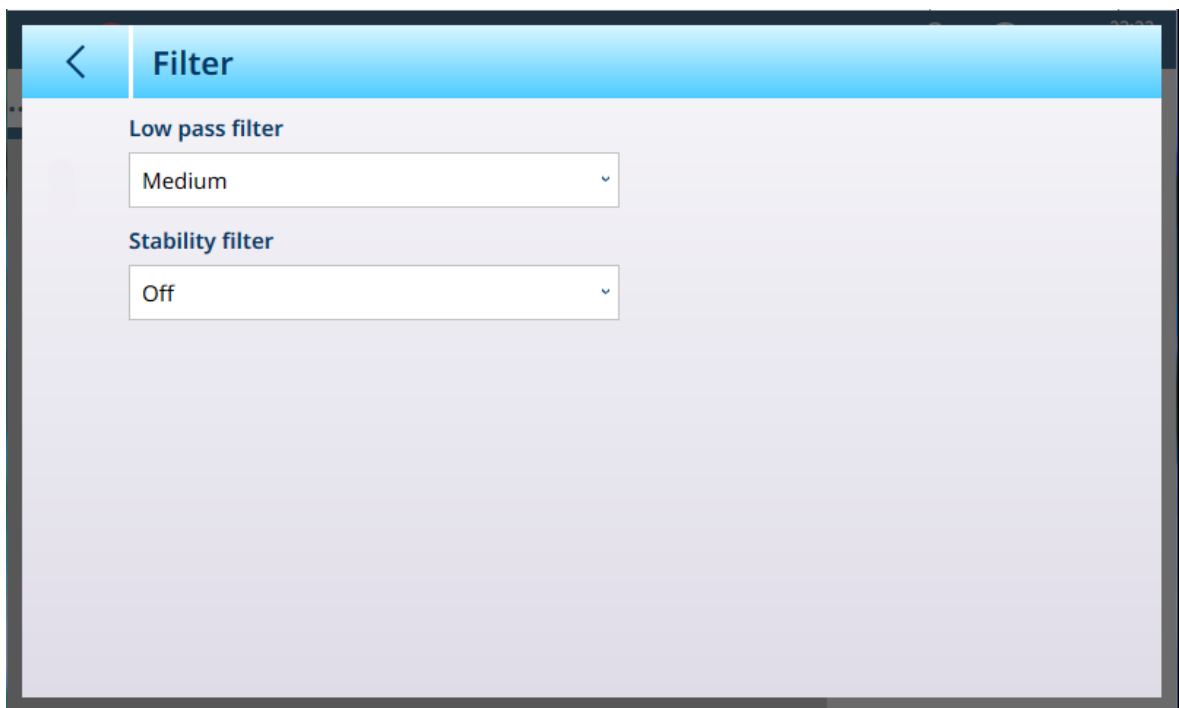


Figure 125: Filter Settings

The IND700 has a low-pass, multi-pole vibration filter that can be set for several conditions when using analog load cells. The heavier the filtering, the slower the display settling time will be.

Parameter	Options	Function
Low pass filter	Very light, Light, Medium [default] , Heavy, Very heavy	Determines how strongly the low pass filter is applied. The low pass frequency is the frequency above which all disturbances are filtered out. The heavier the low pass filter, the better the disturbance rejection, but the longer the settling time required for the scale.

Stability filter	Off [default] , On	The stability filter works in conjunction with the standard low pass filter to provide a more stable final weight reading. The stability filter should only be used in transaction weighing applications, since the nonlinear action of the filter switching may cause inaccurate cutoffs in batching or filling applications. Stability settings are made on the [Stability ▶ Page 128] screen.
------------------	---------------------------	--

Stability

Figure 126: HSALC Stability

The **Stability** parameters determine how the terminal responds to motion on the scale.

HSALC Stability Parameters

Parameter	Function
Motion range (d)	Sets the motion range to the weight value in divisions that the weight is permitted to fluctuate and still have a no-motion condition. Values from 0.1 to 99.9 are possible with the default value being 1.0 d.
No motion interval (seconds)	The no motion interval defines the amount of time in seconds that the scale weight must be within the motion range to have a no-motion condition. Values from 0.0 (motion detection disabled) to 2.0 are possible, the default value being 0.3 seconds. A shorter interval means that a no-motion condition is more likely, but may make weight measurement less precise.
Timeout (seconds)	Defines the period in seconds after which the terminal stops attempting to perform a function that requires a no-motion condition (such as a zero, tare or transfer command) and aborts the function. This timeout is used regardless of the source of the command such as the keypad, discrete input, Industrial Network or SICS. Values from 0 to 99 are possible with the default value being 3 seconds. A smaller value means that less time will be used to check for no-motion before aborting a command. When a value of 0 is entered, there must be no-motion when a command is given or it will fail immediately. A value of 99 is a special condition which permits the terminal to wait indefinitely for a no-motion condition - a command would never be aborted.

MinWeigh

Certain industries such as pharmaceuticals and food processing require a guarantee that the weighing equipment selected for a particular measurement is adequate for the task. One way to ensure that appropriate weighing equipment is selected is by the creation and use of a minimum weight value (MinWeigh), below which a particular piece of weighing equipment cannot be used.

The MinWeigh function compares the current weight with the programmed MinWeigh value. In the configuration screen shown below, MinWeigh has been enabled and its value set to 1 kg.

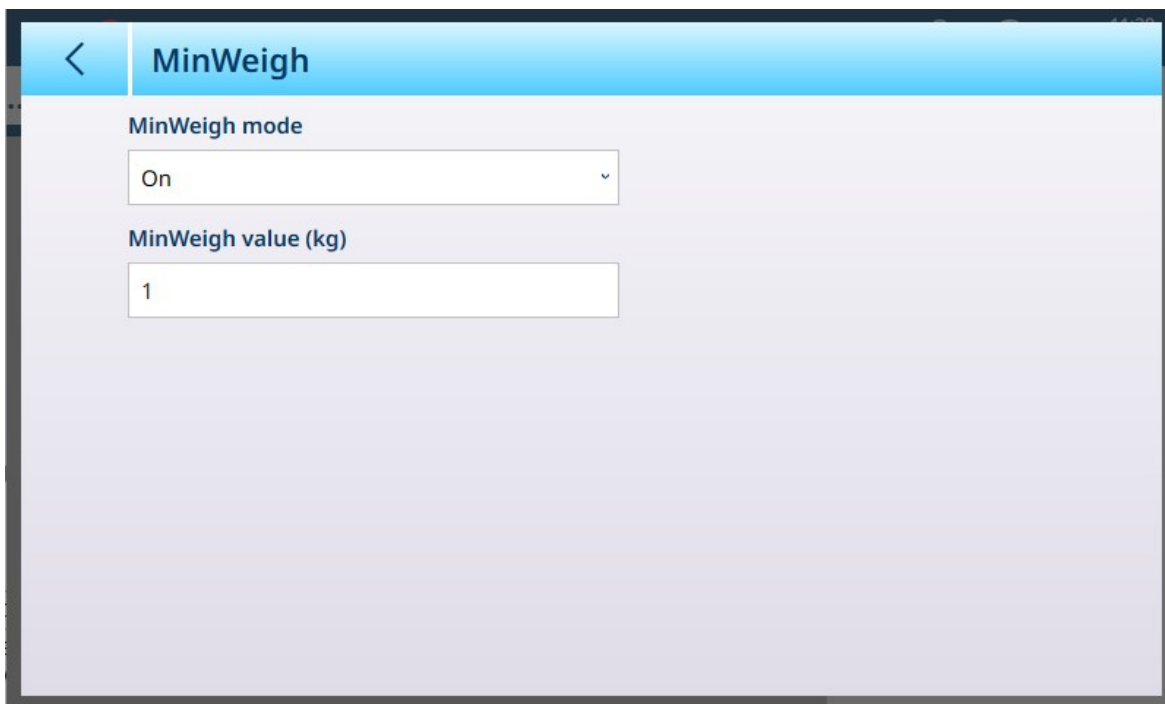
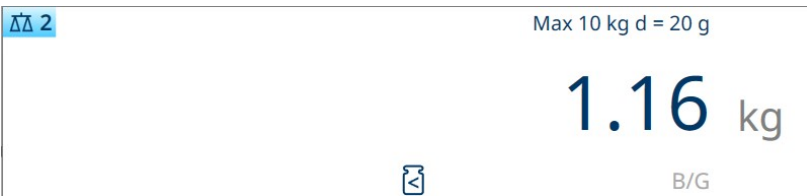



Figure 127: MinWeigh Setup Screen

Parameter	Options	Function
MinWeigh Mode	On [default], Off	If the displayed weight (B/G or NET) is greater than or equal to the MinWeigh value , the MinWeigh symbol appears below the weight display, to the right of the tare display. All terminal functions behave normally. 
MinWeigh value (kg)	Displays a numeric entry dialog. Default value is 0	This field displays if MinWeigh mode is set to On . The unit is the default unit set When the absolute value of the net weight is less than the MinWeigh value, the MinWeigh symbol flashes in red  .

Reset



NOTICE

Scale Branch Reset

Note that this Reset function refers only to parameters configured in the currently selected setup branch. For general Terminal reset options, refer to [Reset ▶ Page 264].

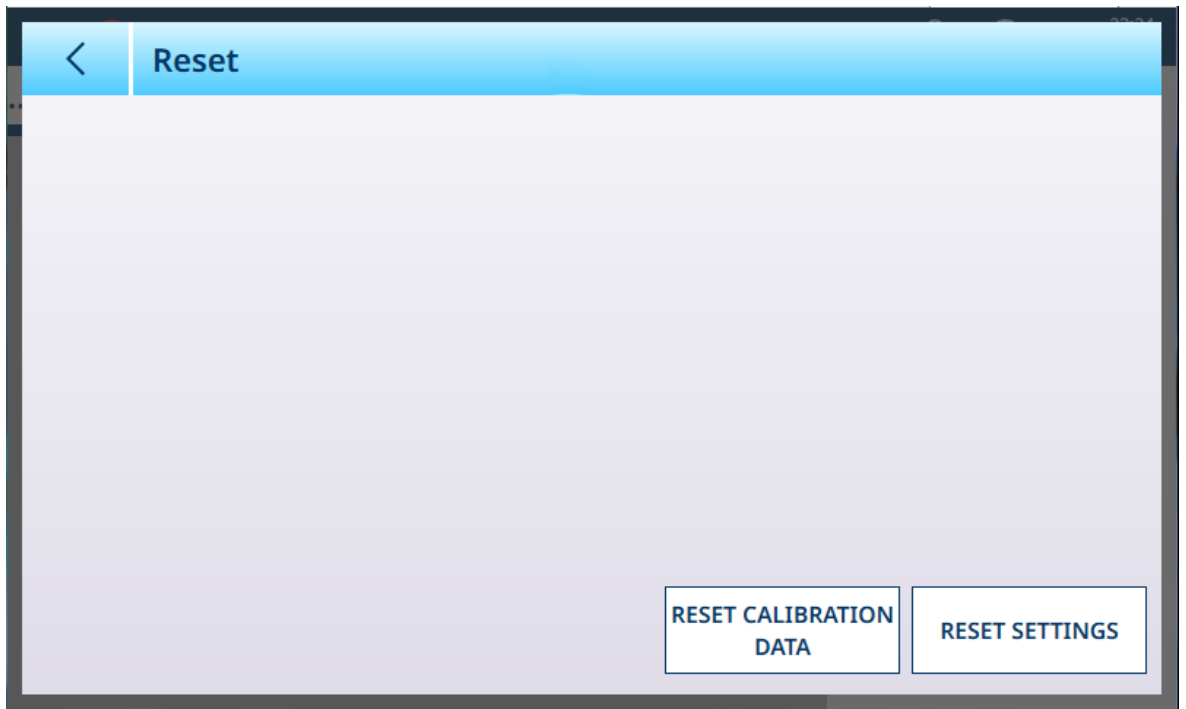


Figure 128: Scale Reset Options

This screen allows the user to reset either calibration data or settings. If settings is selected, calibration data are preserved. In either case, a confirmation dialog will appear and the operation can be continued or cancelled.

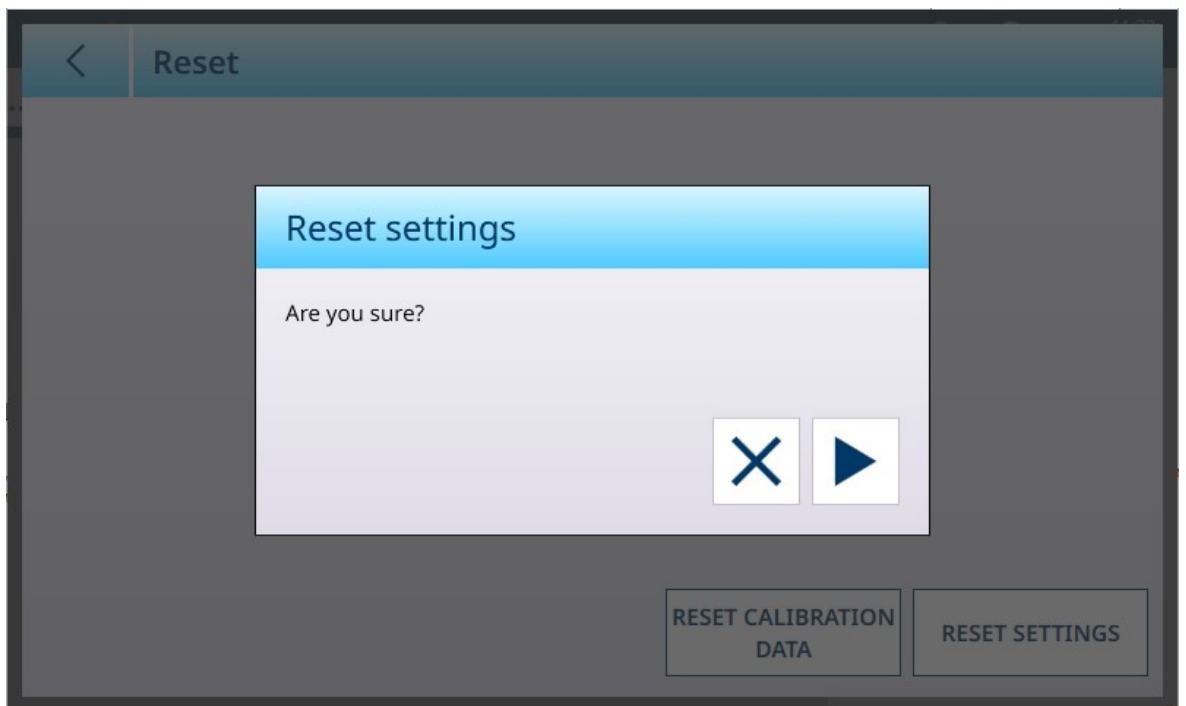


Figure 129: Reset Confirmation Dialog

See also

[Reset](#) ▶ Page 264

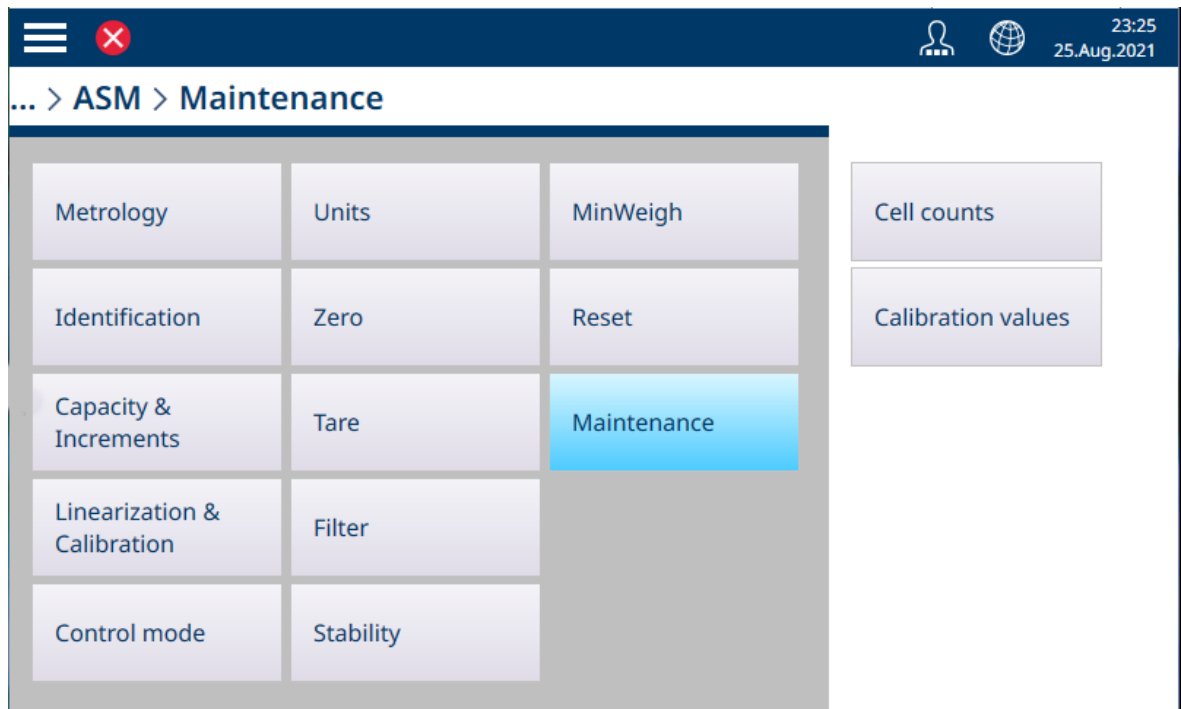


Figure 130: ASM - Maintenance Menu

Touch the **Cell counts** button to display a screen showing the scale's current reading in raw counts.

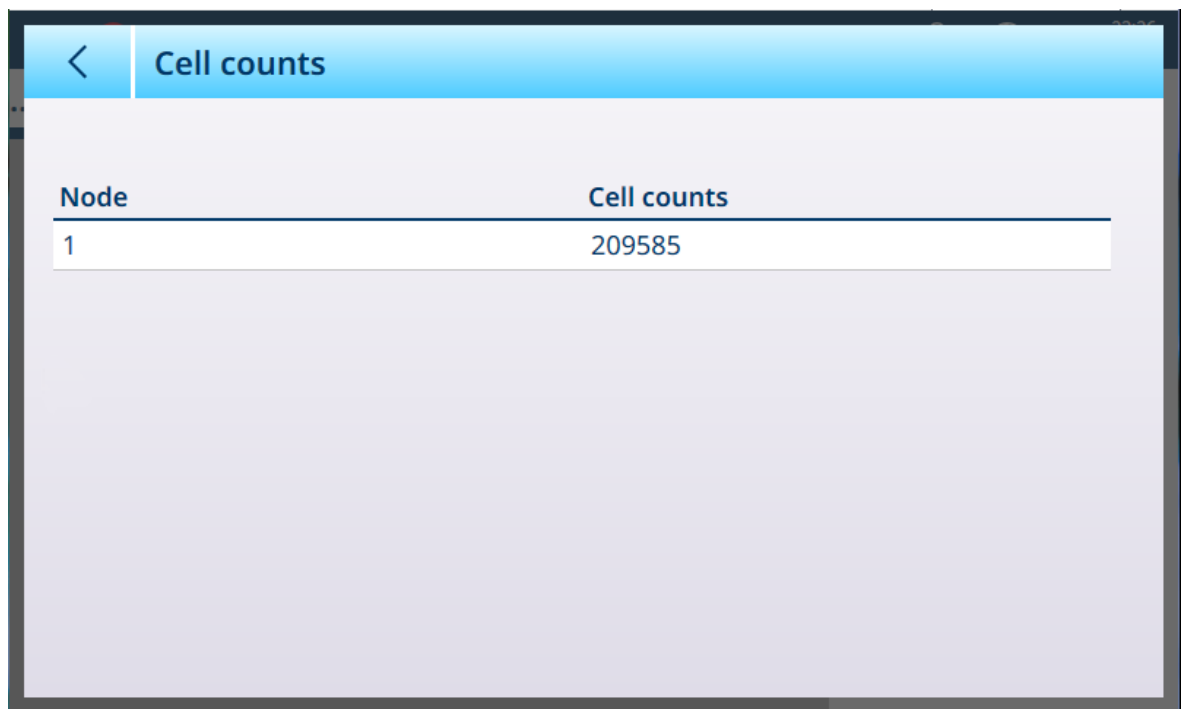
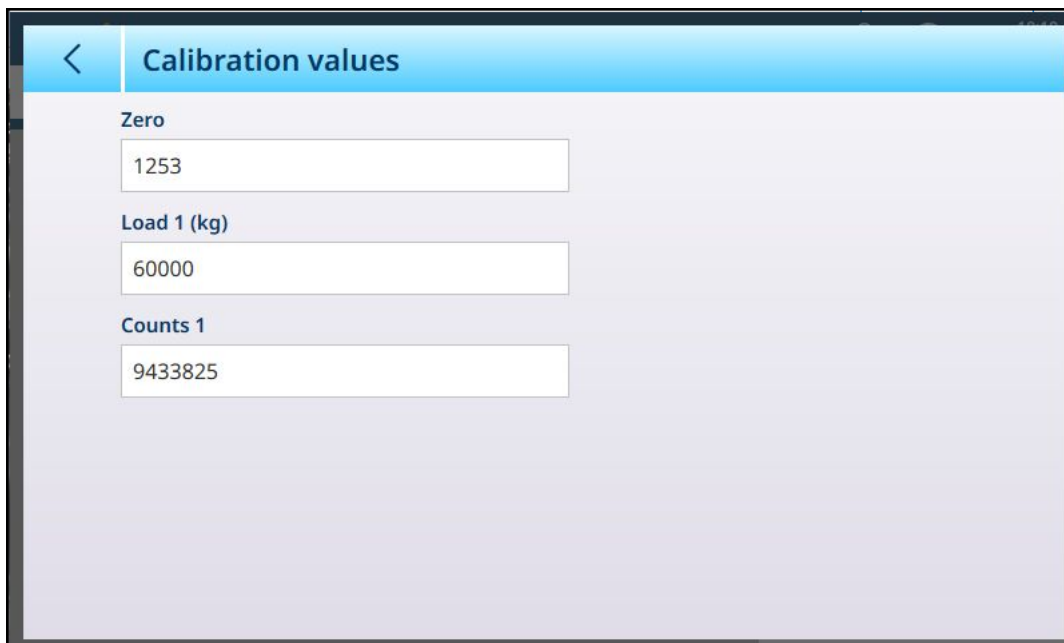


Figure 131: Cell Counts Screen

Touch the **Calibration Values** button to display raw count values for a variety of calibration settings. The number of load fields displayed will vary depending on the Linearity Adjustment selected at [Linearization and Calibration > Calibration ▶ Page 80].



The screenshot shows a mobile application screen titled "Calibration values". It features a blue header bar with a back arrow on the left and the title "Calibration values" in white. Below the header, there are three sections, each with a label and a corresponding text input field:

- Zero**: The input field contains the value "1253".
- Load 1 (kg)**: The input field contains the value "60000".
- Counts 1**: The input field contains the value "9433825".

Figure 132: Calibration Values Screen

When touched, each of the fields displayed on this screen opens a numeric entry dialog. The values displayed in the fields represent current settings; these settings can be over-ridden by direct entry.

3.1.1.1.2 Log or Transfer

The Log or Transfer menu sets the conditions which determine how and when a demand output is triggered. Normal demand mode transfer occurs whenever a transfer request is made, depending on the options selected here, and providing the scale is within the acceptable range configured in [Stability ▶ Page 128], and the weight is above gross zero (a negative gross weight will not be printed).

Data is sent to:

- Interfaces for which the Connection has been defined as Transfer
- The Alibi Table
- The Transaction Table

Weight values shown on this screen are gross weights in primary units.

When **Log or Transfer** is selected from the Scale n menu options, a default configuration screen appears, with no options selected.

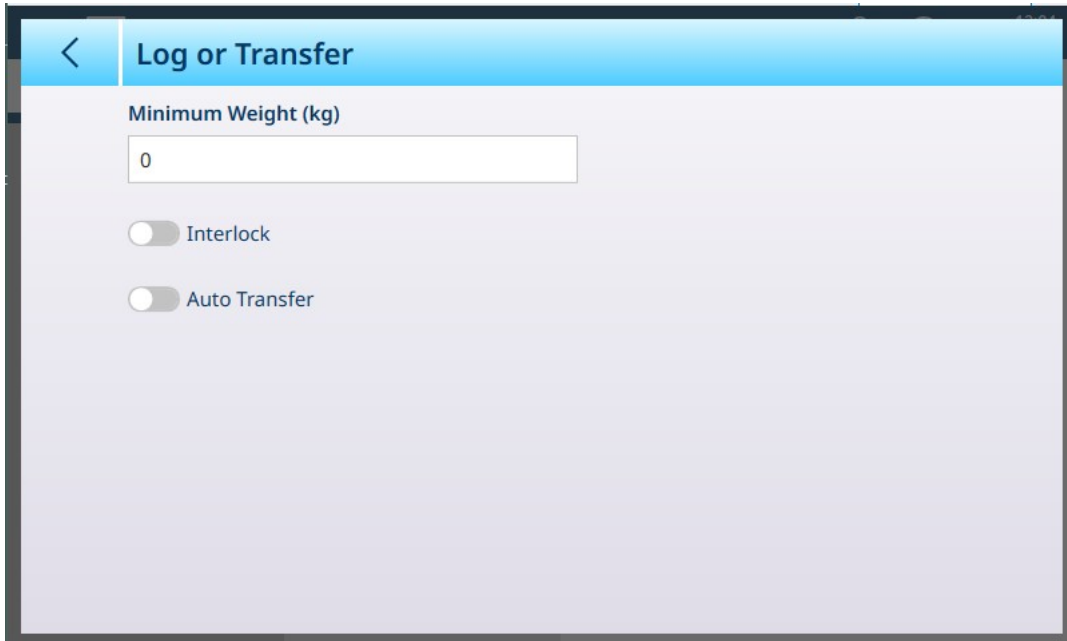


Figure 133: Log or Transfer Screen, Default View

Additional fields appear depending on the initial selections for **Interlock** and **Auto Transfer**. The follow illustration shows the menu with all options selected.

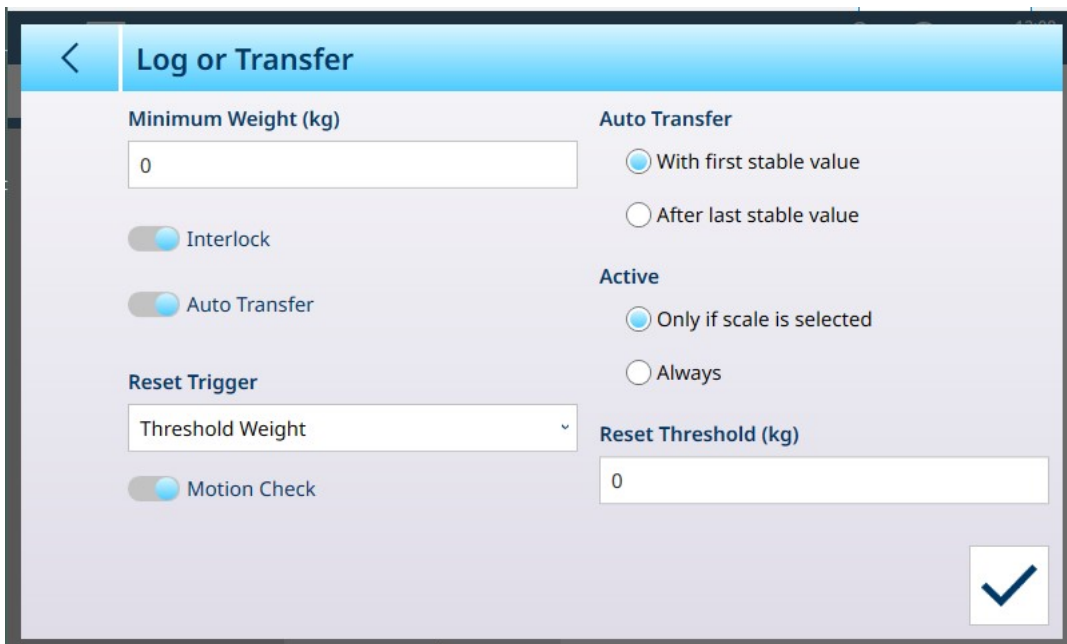


Figure 134: Log or Transfer, All Options Selected

Note that some of the **Auto Transfer** and **Active** sub-sections appear only if **Auto Transfer** is enabled.

Log or Transfer Options

Option	Settings
Minimum Weight (kg)	This value determines the minimum scale weight required to trigger the Interlock and/or Auto Transfer actions. The weight unit for this and the other fields on this screen is determined by the Primary Unit set in ASM at Capacity and Increments .

Option	Settings
Interlock	When enabled, the Interlock option responds to scale data to determine when a log action is performed. This prevents repeat logging of the same weighing operation. When enabled, this interlock requires that the live weight reading be reset according to the Reset Trigger parameter setting (see below). The live weight must then settle to a weight greater than the Minimum Weight value (see above) before the terminal will respond to the next log or transfer request.
If Interlock is enabled, or Auto Transfer and With first stable value is selected	
Reset Trigger	The Reset Trigger action can be performed in response to Threshold Weight [default] or Deviation . This trigger is defined either by an absolute value (Threshold Weight) or by a minimum change in weight (Deviation).
If either Interlock or Auto Transfer is enabled	
Reset Threshold (kg) or Reset Deviation (kg)	The weight value which triggers a reset and indicates the start of a new weighing operation and a new log entry.
Auto Transfer	When enabled, Auto Transfer causes data about each weighing operation to be sent to the destination defined in the [Communication ▶ Page 208] section of setup, depending on the parameters selected in Auto Transfer and Active .
If Auto Transfer is Enabled	
Auto Transfer	When enabled, the trigger conditions defined by the Interlock settings will automatically export data about each weighing operation either With first stable value or After last stable value . With first stable value: data is sent when the first stable weight is captured, even if the weight changes afterward. This selection would typically be used for static weighing. After last stable value: data is sent based on the last stable weight captured. This selection might be used for manual filling, where the scale weight will briefly be unstable after the last material is added. This selection determines whether the Reset Trigger option appears.
Active	The options to activate the Auto Transfer function are Only if scale is selected and Always .
Motion Check	When enabled, the Motion Check prevents the interlock from triggering a log or transfer action until scale weight display is within the parameters defined as stable at [ASM > Stability ▶ Page 128].

See also

[Communication Setup ▶ Page 208](#)

[Stability ▶ Page 128](#)

3.1.2 POWERCELL

3.1.2.1 Scale n

The Scales branch of the setup menu displays options for each scale (1 or 2, depending on how many interfaces are installed in the terminal) and for a **Sum Scale**.

When either scale is selected, two further options appear -- **ASM**, which provides access to all the scale configuration menus, and **Log or Transfer**, which determines whether and how each weighing operation is recorded or exported. For PowerDeck scale systems, two additional items appear: **Loading Alert** and **Leveling Guidance**.

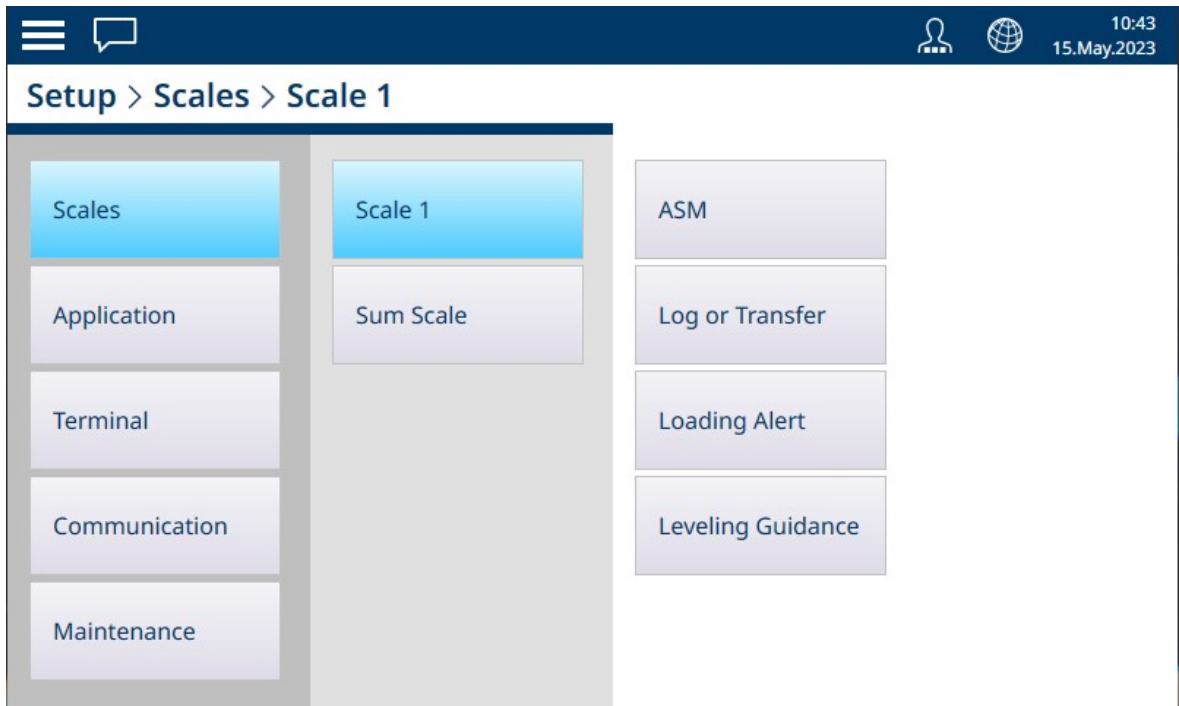


Figure 135: Scale n Menus, POWERCELL

3.1.2.1.1 ASM

The POWERCELL ASM screen shows the following menus:

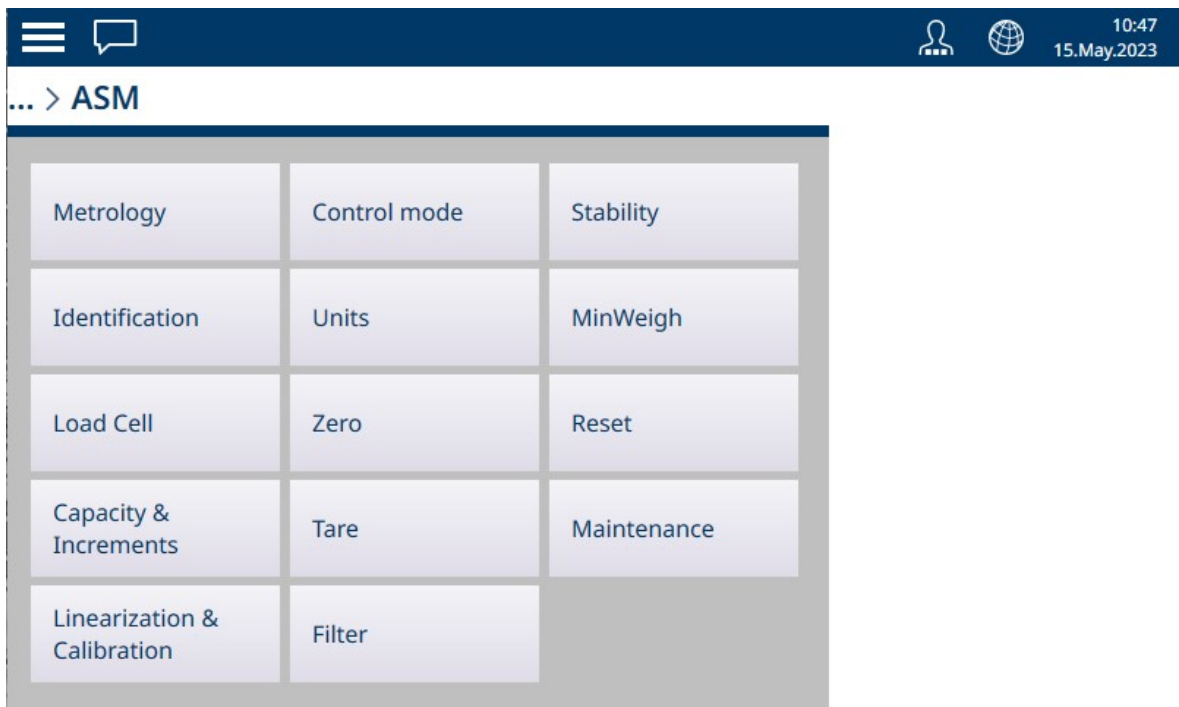


Figure 136: POWERCELL ASM Menus

The ASM system runs on the scale interface, and is separate from the terminal's own firmware which runs on its CPU.

Metrology

The Metrology screen allows the configuration of per-scale approvals and **GEO** values, as well as lower and upper operating **Temperature Limits**.

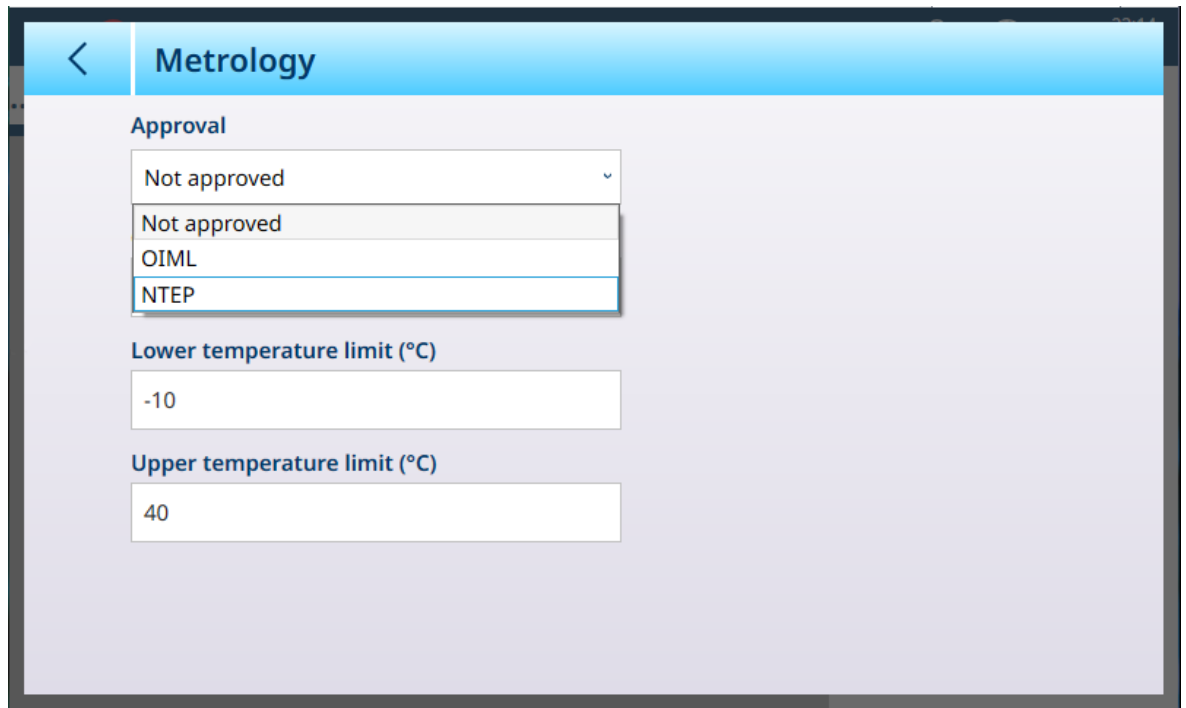


Figure 137: ASM - Metrology Screen

When an approval (**OIML** or **NTEP**) is selected, additional options are displayed.

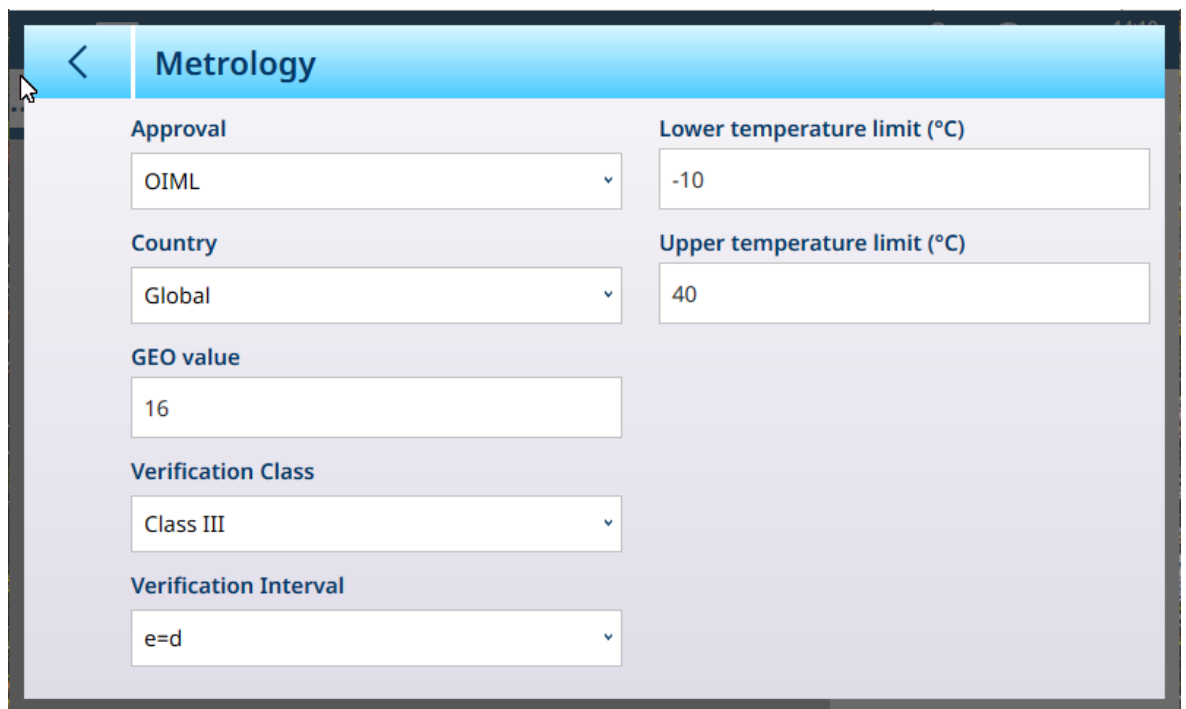


Figure 138: Approval Options

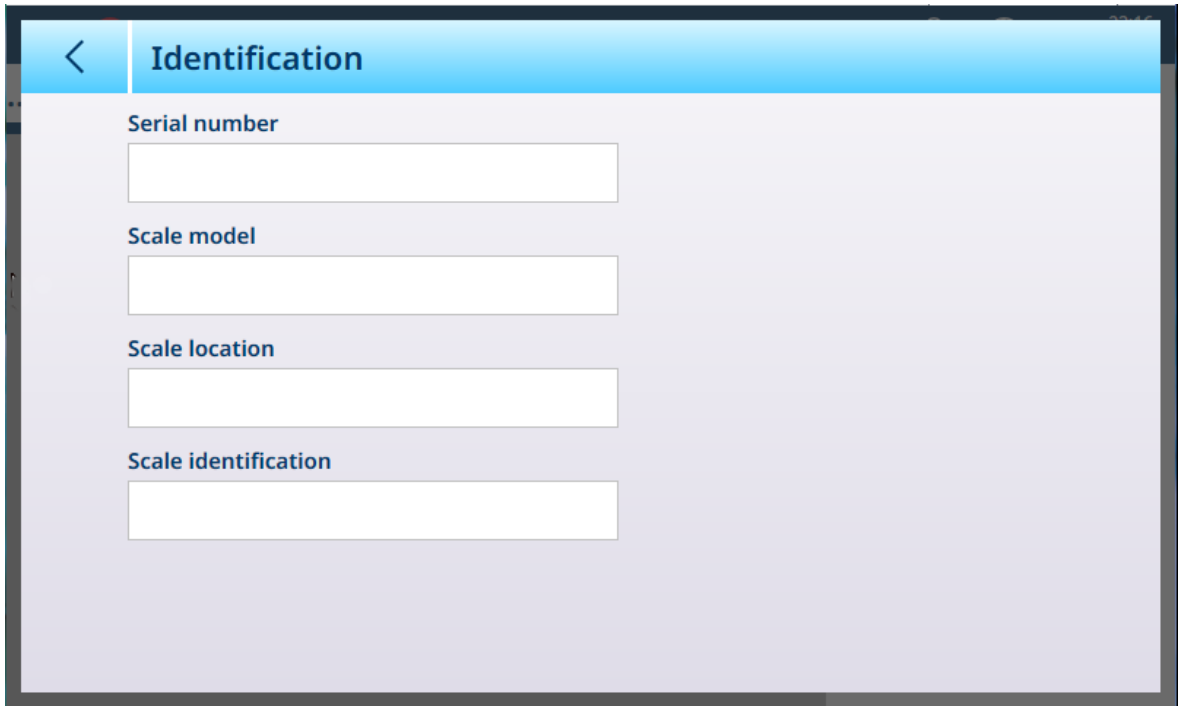
In addition to the GEO and temperature values, an approval requires the selection of **Country** and **Verification** values.

For both **OIML** and **NTEP** approvals, the **Country** options are **Global [default]**, Argentina, Australia, Korea, Thailand, and the **Verification Class** options are Class II, Class III, Class III L, Class III HD and Class III.

When the device has been set as Approved -- either OIML or NTEP -- and the metrological sealing screw has been installed, the fields on this page are greyed out and cannot be modified.

Identification

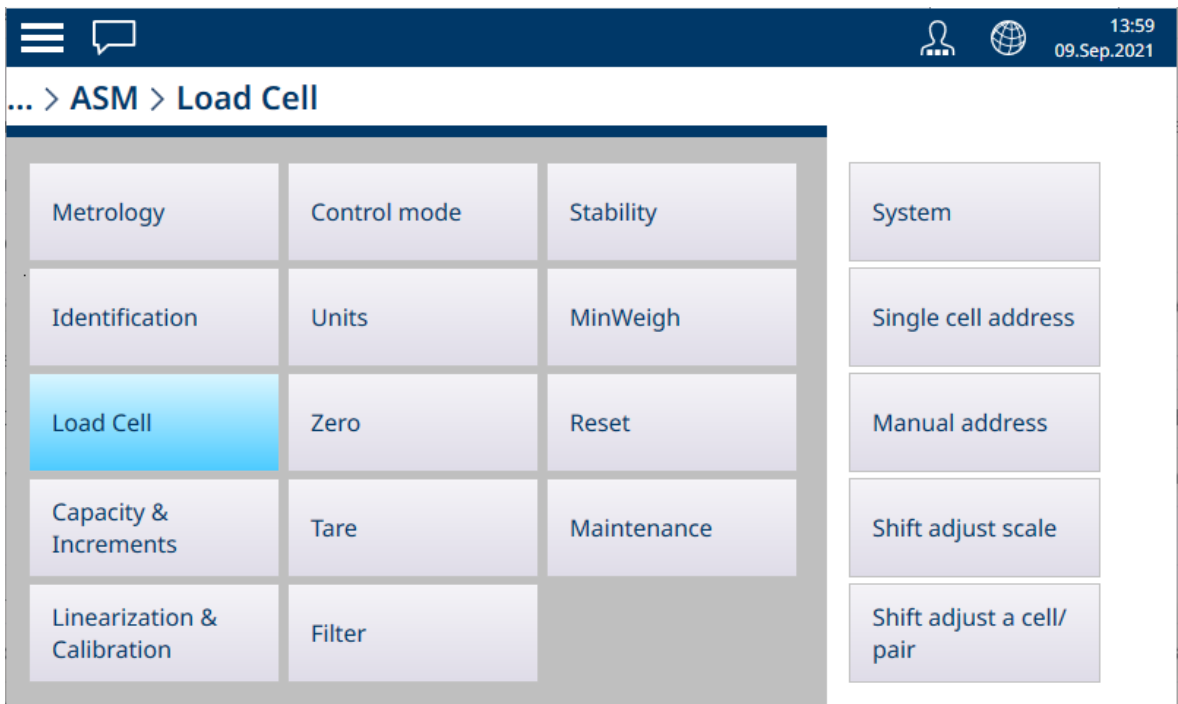
The **Identification** screen allows the scale's **Serial number**, **Scale model** and **Scale location** to be defined. It also provides an additional **Scale Identification** field. For analog scales, these fields are optional and must be completed manually. Touching any of the fields opens an alphanumeric entry dialog.



The screenshot shows a mobile application interface for the 'Identification' screen. At the top, there is a blue header with a back arrow and the title 'Identification'. Below the header, there are four input fields, each with a label above it: 'Serial number', 'Scale model', 'Scale location', and 'Scale identification'. Each field is a simple white rectangle with a thin border.

Figure 139: Identification

Load Cell



The screenshot shows the 'Load Cell' menu in a mobile application. At the top, there is a dark blue header with a hamburger menu icon, a speech bubble icon, a user profile icon, a globe icon, and the time '13:59' and date '09.Sep.2021'. Below the header, there is a breadcrumb trail: '... > ASM > Load Cell'. The main content is a grid of options and a list of actions. The 'Load Cell' option in the grid is highlighted in blue.

Metrology	Control mode	Stability	System
Identification	Units	MinWeigh	Single cell address
Load Cell	Zero	Reset	Manual address
Capacity & Increments	Tare	Maintenance	Shift adjust scale
Linearization & Calibration	Filter		Shift adjust a cell/ pair

Figure 140: Load Cell Menu

The POWERCELL **Load Cell** menu includes the following five items:

System

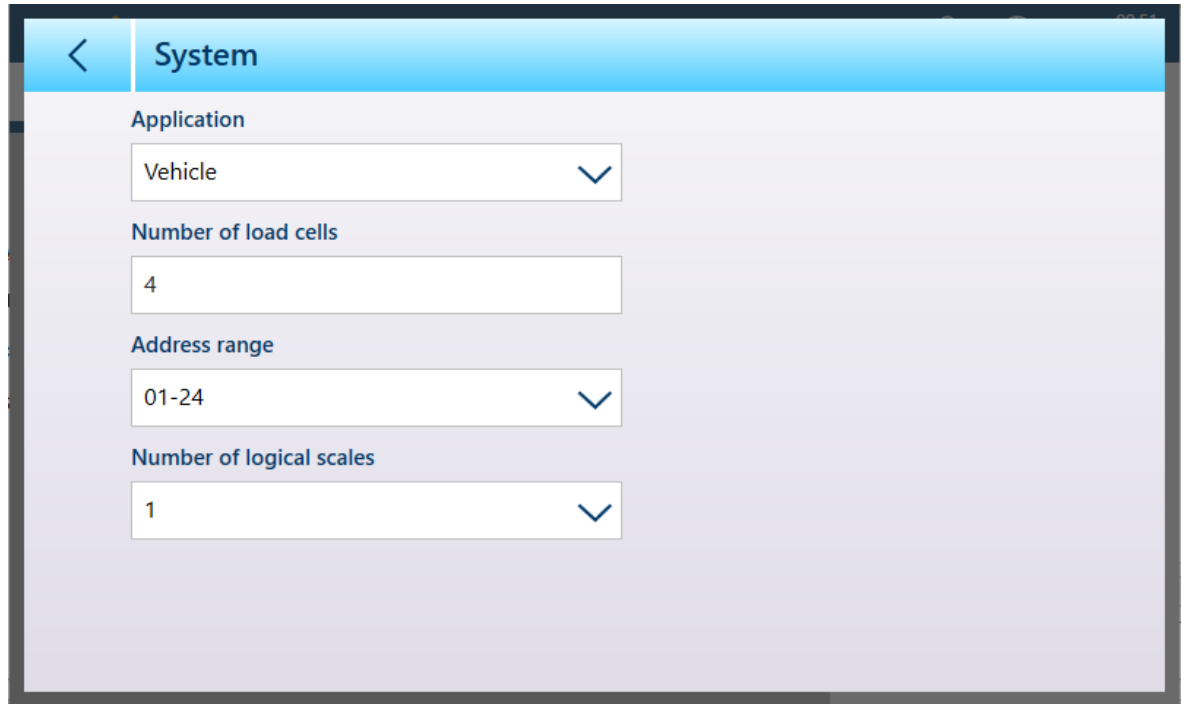


Figure 141: POWERCELL Load Cell - System

The **Application** options are **Floor**, **Tank / Hopper** and **Vehicle**.

Touch the **Number of load cells** field to display a numeric entry dialog.

Available **Address ranges** are **01-24**, **31-54**, **61-84** and **91-114**.

By default the **Number of logical scales** is 1. However, when using a POWERCELL multi-scale interface, from 1 to 4 logical scales can be configured. Refer to [POWERCELL Multi-Scale Capability ► Page 110].

Single cell address

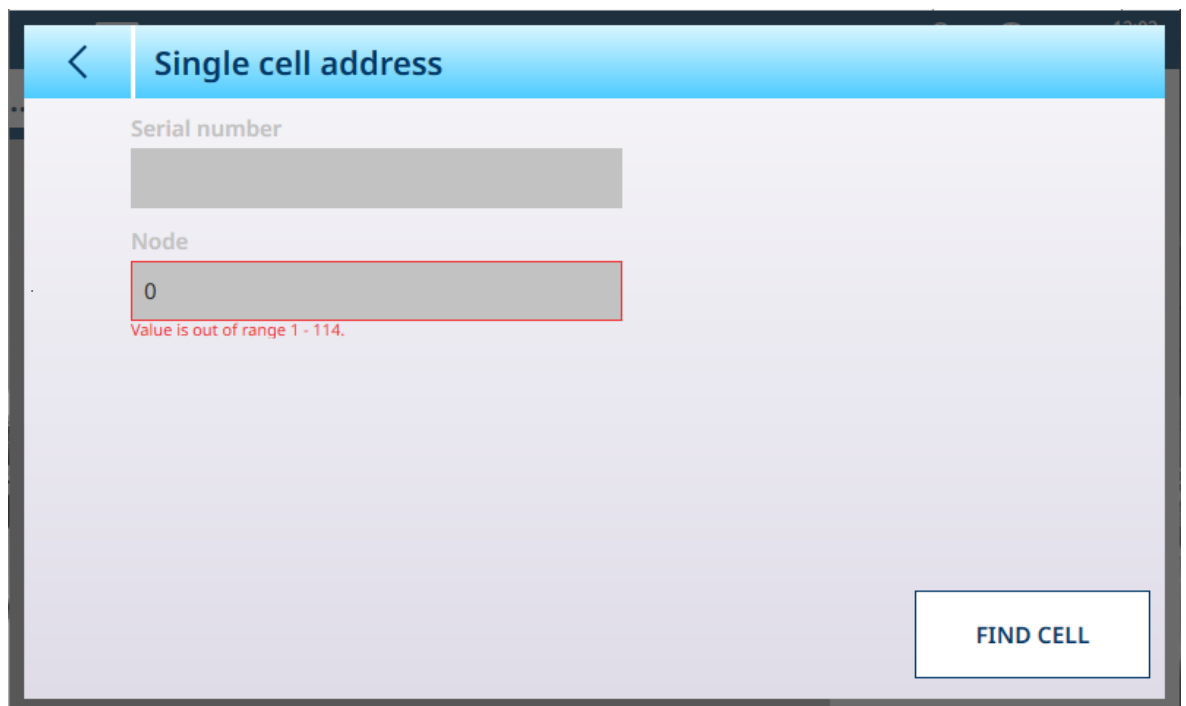


Figure 142: POWERCELL - Single cell address

When the **Single cell address** screen is first displayed, the **Serial number** and **Node** fields appear as above. Touch FIND CELL to start the addressing process. A confirmation dialog will display, indicating that the search has completed; touch ✓ to return to the Single cell address screen, which will now display a node number and the serial number of the cell at that node.

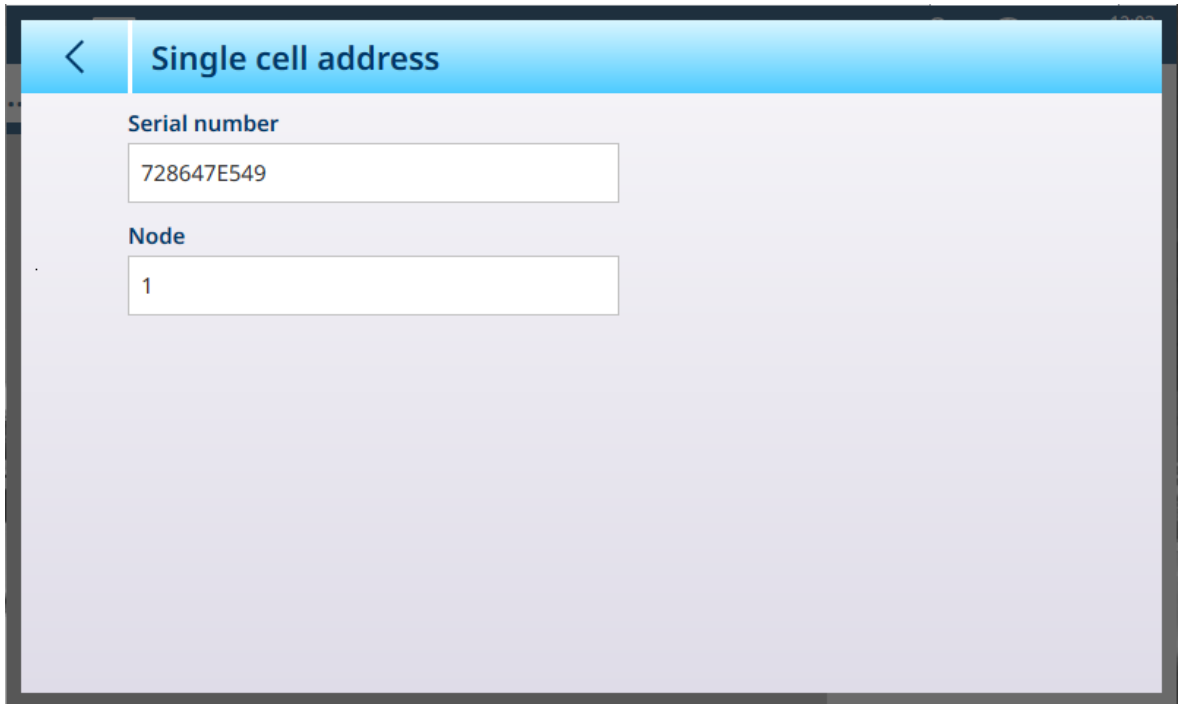


Figure 143: POWERCELL - Single cell address, cell found

Single Cell Address - detail

Single cell addressing can be performed manually or automatically at power-up, as required. In either case, the procedure cannot be performed if the terminal is in Weights and Measures Approved mode.

Manual Cell Address

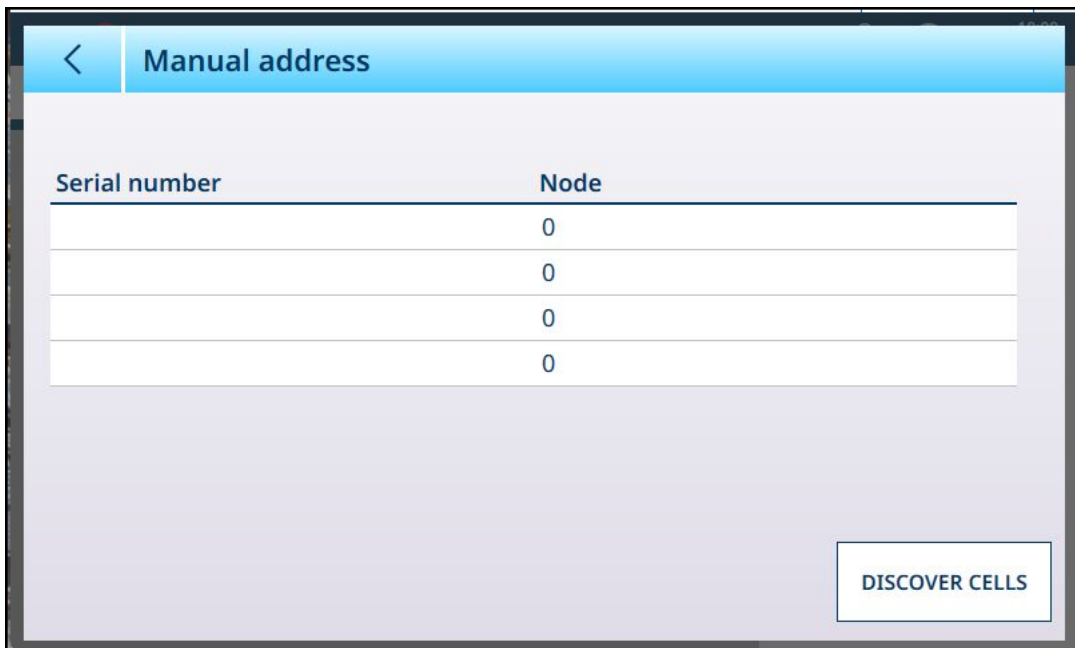


Figure 144: POWERCELL - Manual Address Screen

The **Manual Address** screen initially displays the connected cells' **Serial numbers** and **Node** numbers. Touch the **DISCOVER CELLS** button to begin discovery. If discovery is successful, a confirmation dialog will appear.

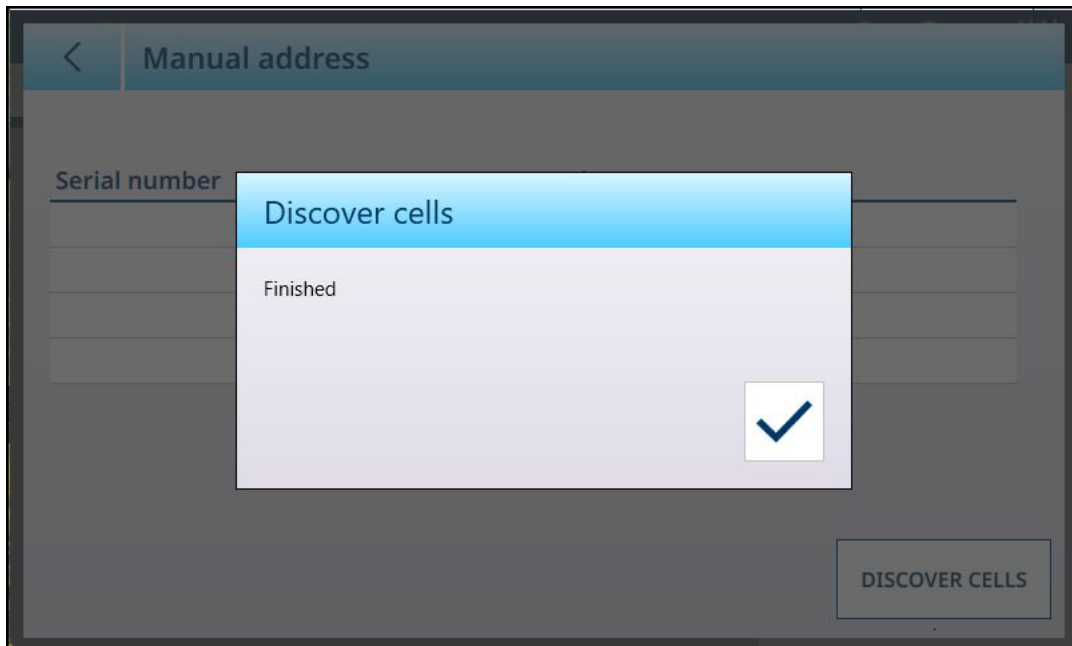



Figure 145: Cell Discovery Confirmation Dialog

Touch the check mark to acknowledge the confirmation. The original screen will reappear with an **EDIT**  button in place of the **DISCOVER CELLS** button.

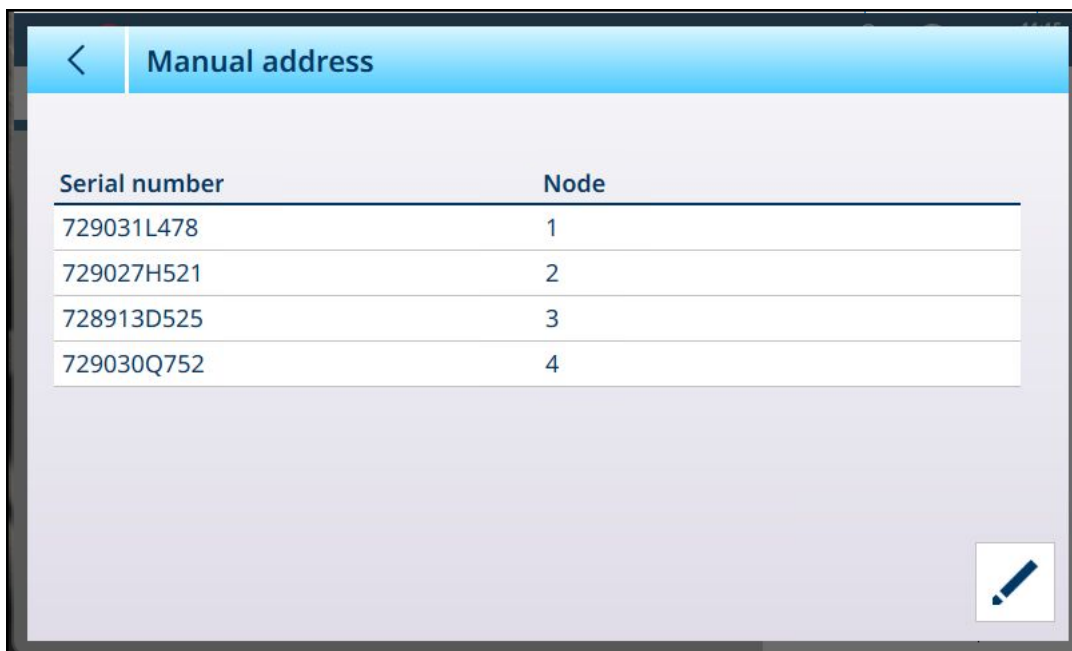


Figure 146: Cells Discovered

Node Address Editing

Touch a row to highlight a cell.

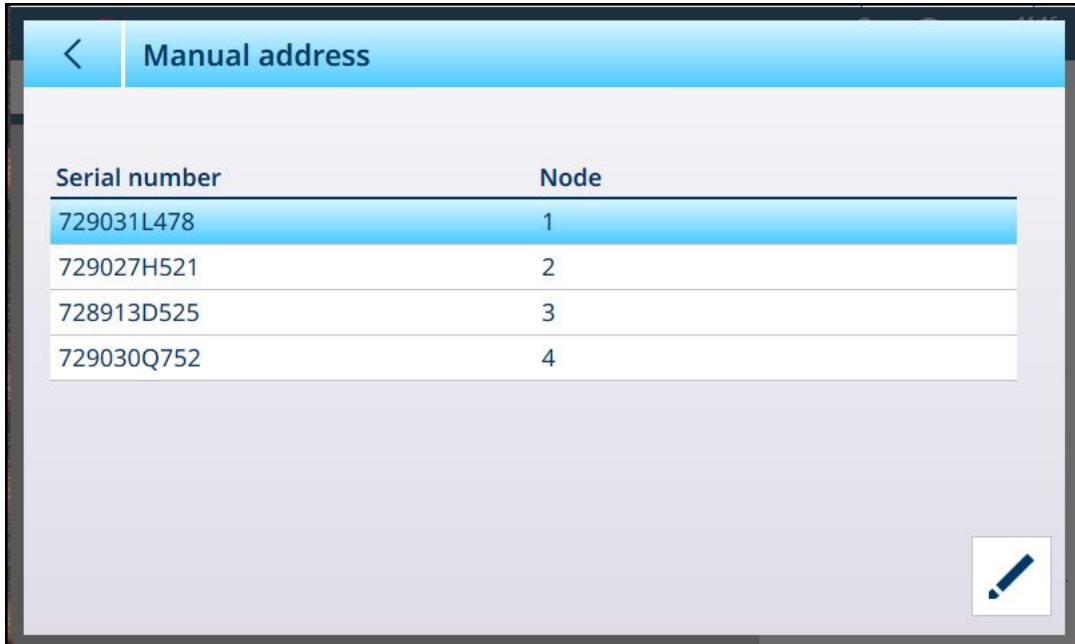


Figure 147: Cells Discovered, Node Selected

With the cell highlighted, touch the **EDIT** button to display the address **Edit** screen.



Figure 148: Cell Address Edit Dialog

Touch the Node field to display a numeric keypad. Enter the desired node address.

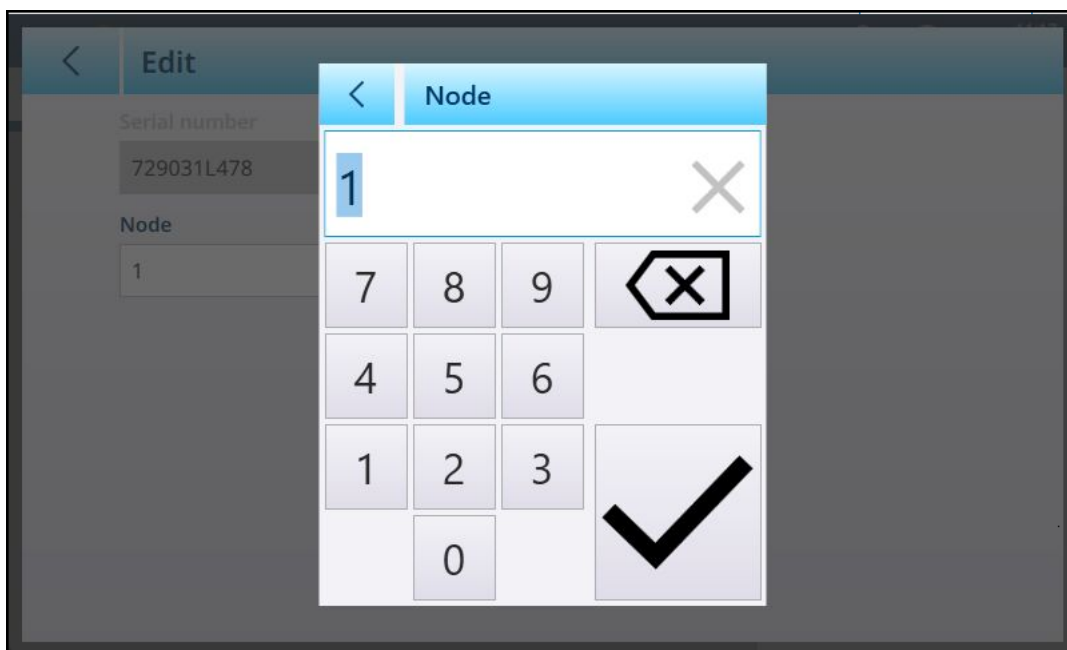


Figure 149: Node Address Entry

Finally, touch the **Back** arrow at upper left to return to the **Manual address** screen. In the example below, Node 1 from the discovery step above has been readdressed as Node 4, and the original Node 4 is now Node 1.

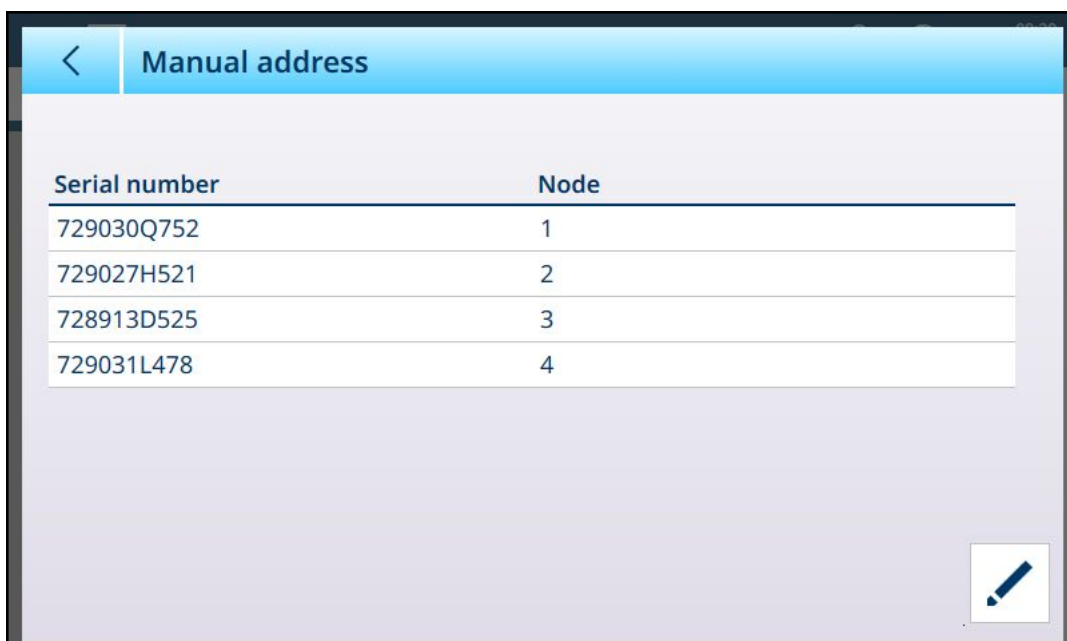


Figure 150: Node 1 Readdressed as Node 4

Manual address

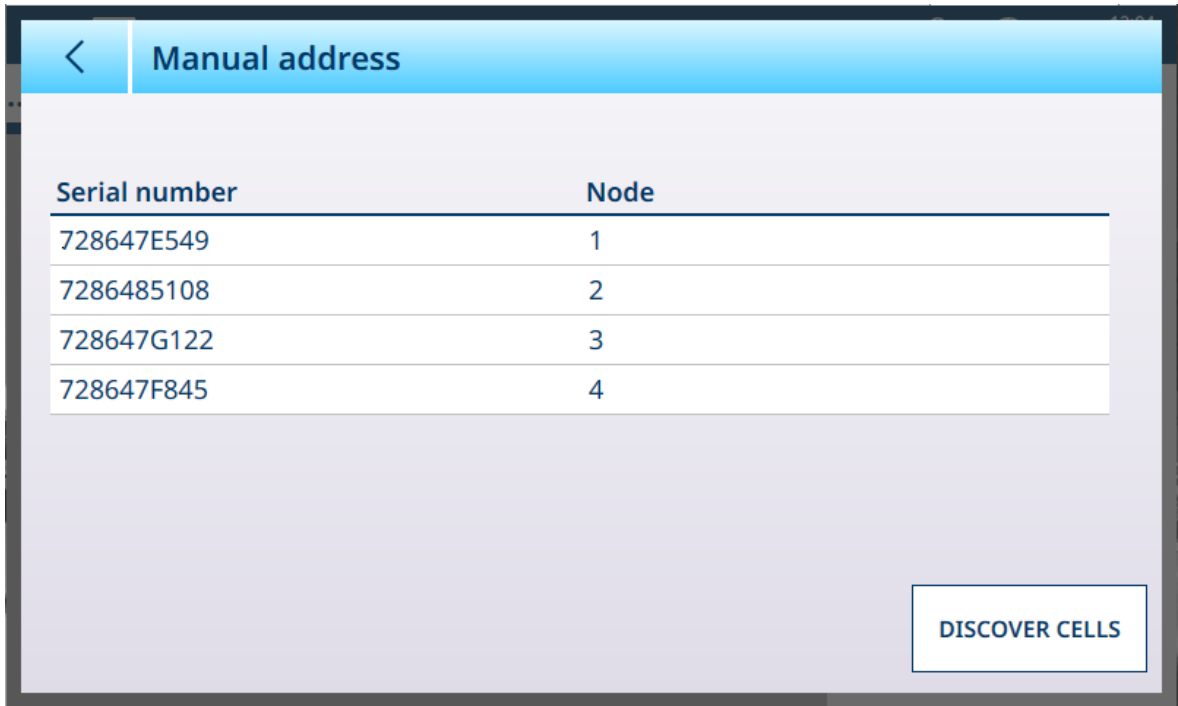


Figure 151: POWERCELL - Manual address

The **Manual address** screen initially displays the connected cells' **Serial numbers** and **Node** numbers. Touch a row to highlight it:

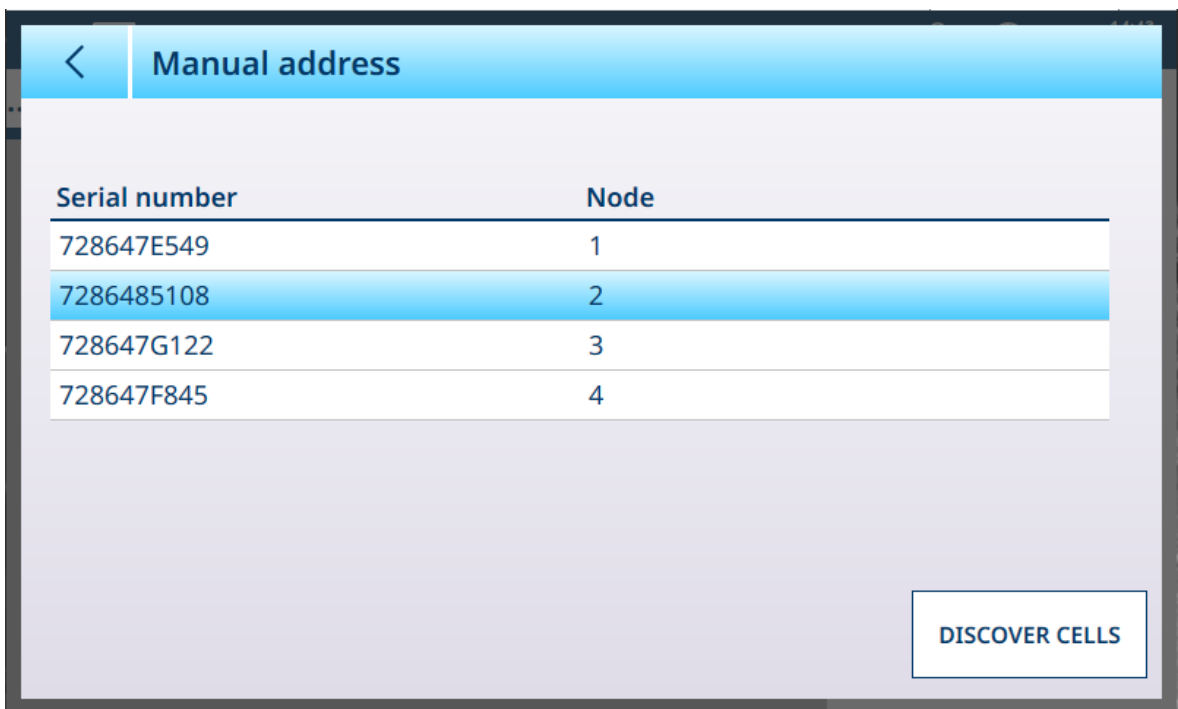
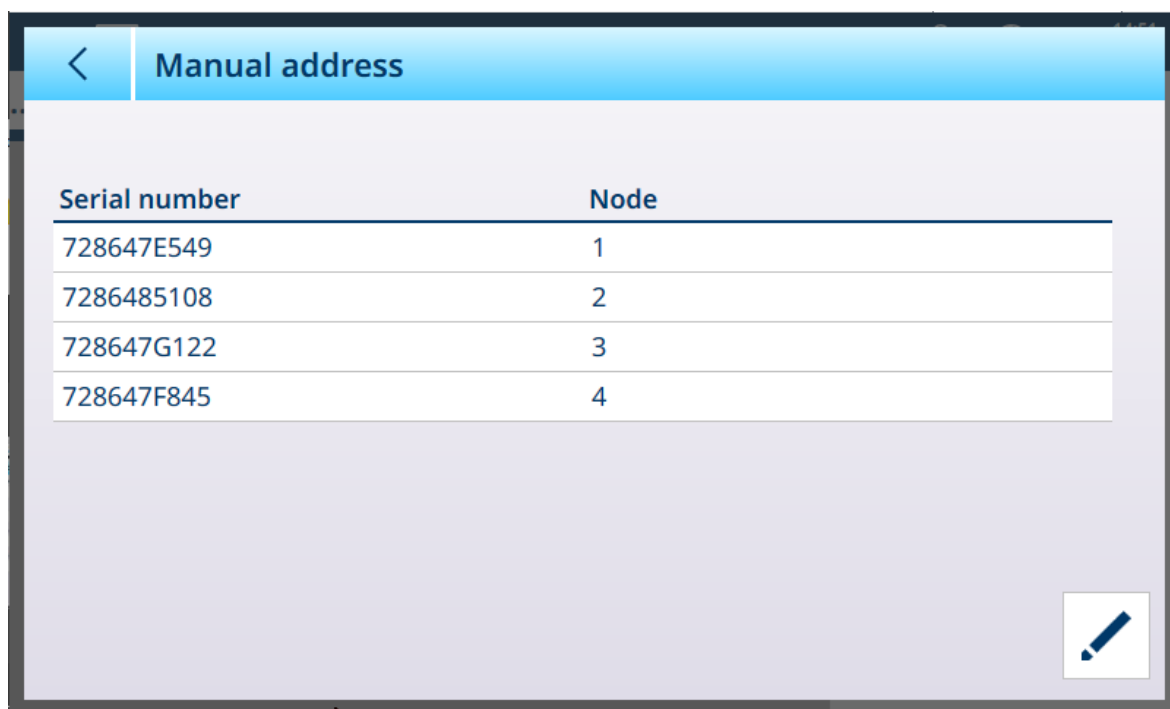



Figure 152: POWERCELL - Manual address, node selected

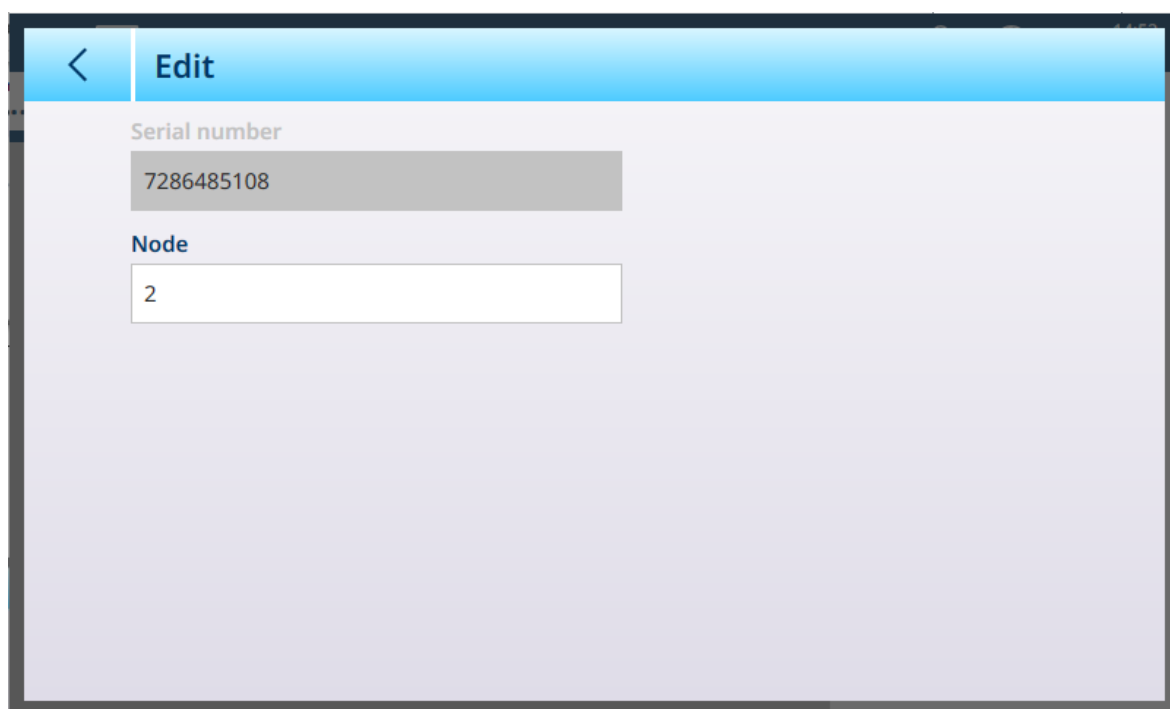
Touch the **DISCOVER CELLS** button to begin discovery. A confirmation dialog will appear; when it is dismissed, the original screen reappears with an edit button in place of the **DISCOVER CELLS** button.



Serial number	Node
728647E549	1
7286485108	2
728647G122	3
728647F845	4

Figure 153: POWERCELL - Manual address, cells discovered

Touch the **Edit** button  to display the screen shown below. Here, the **Node** number can be changed by touching the field to display a numeric entry dialog.



Serial number

7286485108

Node

2

Figure 154: POWERCELL - Manual address, edit screen

Shift adjust scale

Small mismatches in mechanical and electronic gain of the load sensing paths can cause the same test weight to produce slightly different readings, depending on the location of the test weight on the scale. The IND700 provides two types of adjustment – adjustment by individual cells or adjustment by pairs of cells.

The Shift Adjust by Cell or Pair parameter is preset to Cell and cannot be changed when a single load cell is used.

Adjust by Cell

Adjustment by Cell adds a factor to each load cell output to compensate for the slight differences between them. The scale will then output the same weight value regardless of the physical location of the weight on the scale.

Adjust by Pair

Adjustment by Pair ensures a constant reading from the scale regardless of where the load is placed on the long axis between pairs of cells – for instance, in vehicle weighing applications. Before beginning the shift adjustment procedure, select whether the adjustment will be done by cell or by pair. The procedure for shift adjusting by pair of cells is listed below. The procedure for shift adjusting by individual cell follows the same sequence, but cells are read and adjusted one at a time.

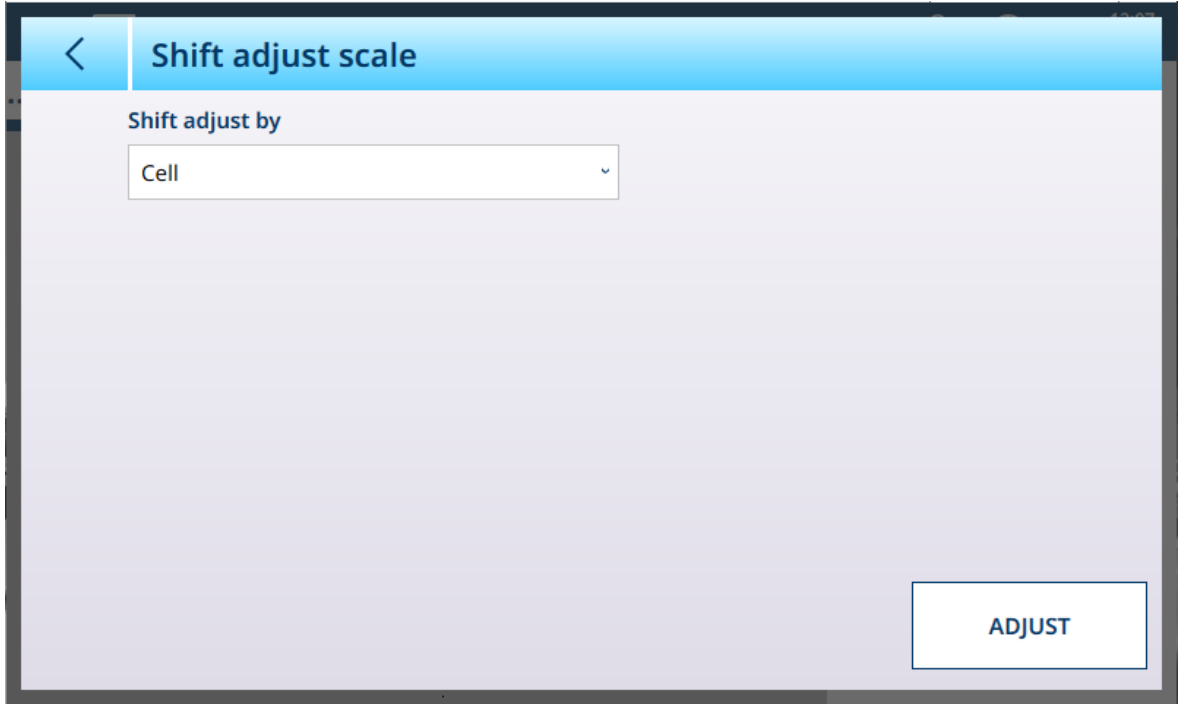


Figure 155: POWERCELL - Shift adjust scale

From the **Shift adjust by** drop-down list, select either **Cell** or **Pair**, then touch the **Adjust** button to begin the process. The **Adjust** dialog will appear.

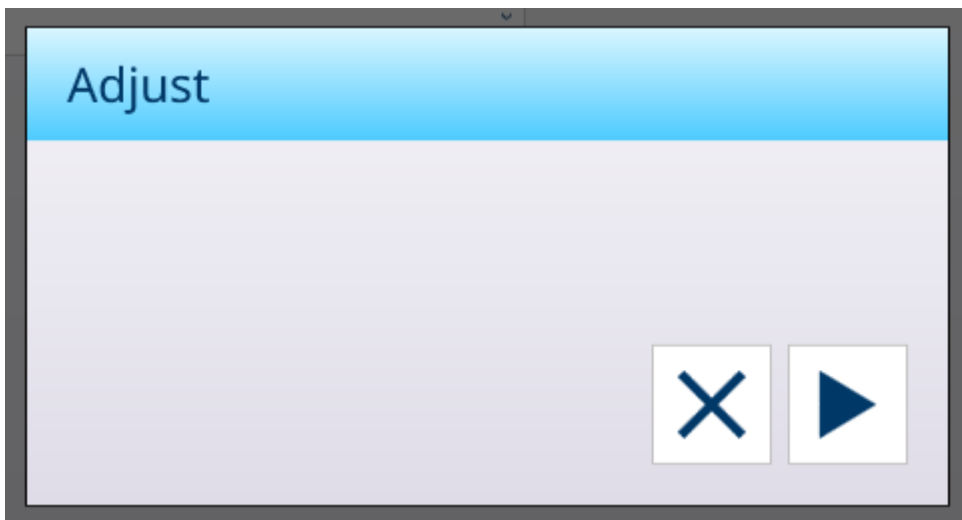


Figure 156: Shift Adjust - Ready to Execute

Touch ► to start the process, or ✕ to return to the **Shift adjust scale** screen.

The dialog will indicate the progress of the capture and, when the process has completed, the dialog will confirm capture.

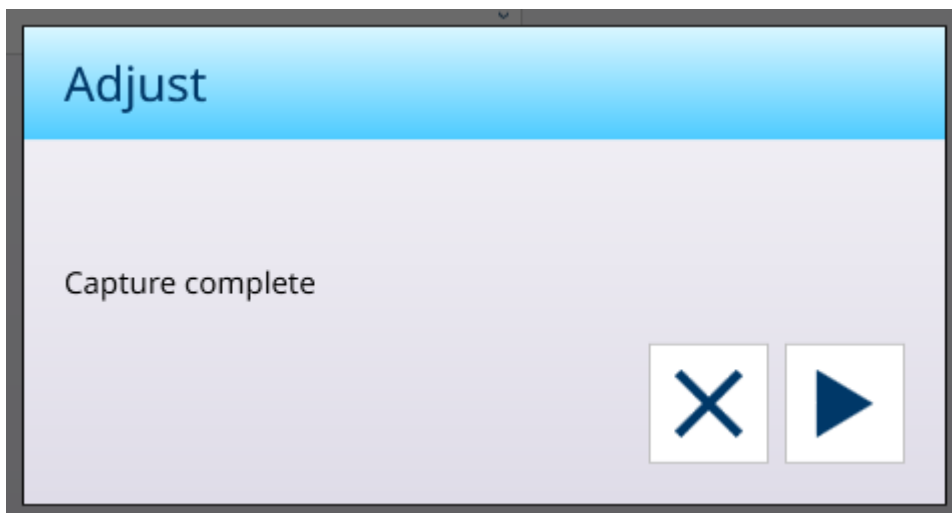


Figure 157: Shift Adjust, Capture Complete

Touch **X** to return to the **Shift adjust scale** screen.

See also

[Shift adjust a cell/pair](#) ▶ Page 109

Shift adjust a cell/pair

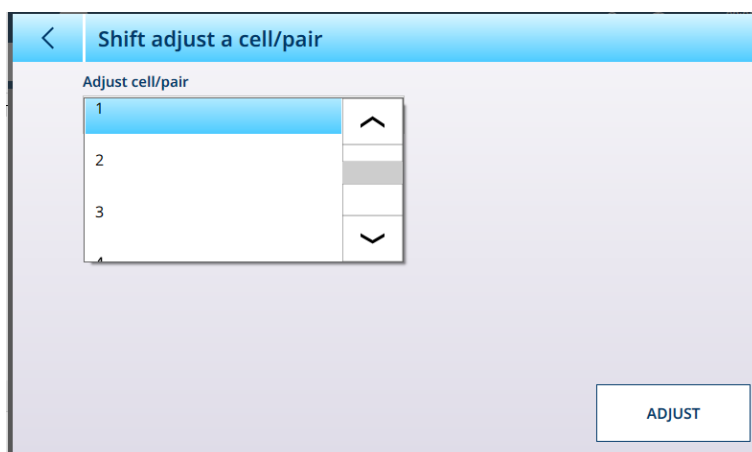


Figure 158: POWERCELL - Shift Adjust a Cell

The illustration above shows the options available in the **Adjust cell/pair** dropdown list on this page, when [Shift adjust scale ▶ Page 107] is set to **Cell**.

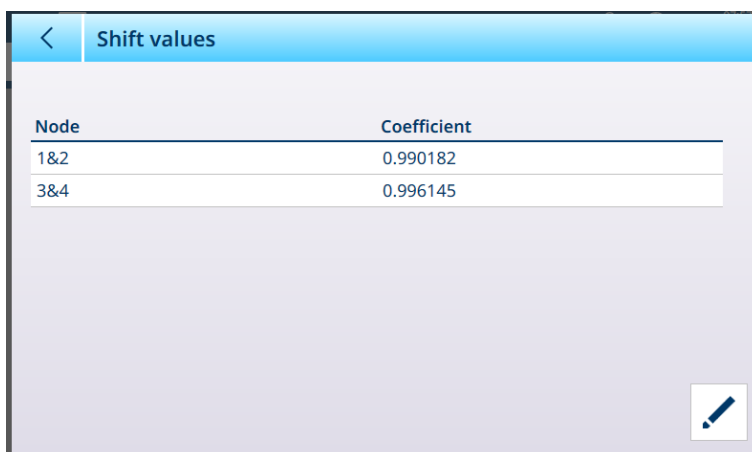


Figure 159: POWERCELL - Shift Adjust a Pair

When [Shift adjust scale ▶ Page 107] is set to **Pair**, the options become **1&2** and **3&4**.

Once an option is selected from the dropdown list, touch ADJUST to execute the adjustment. A confirmation dialog will appear:

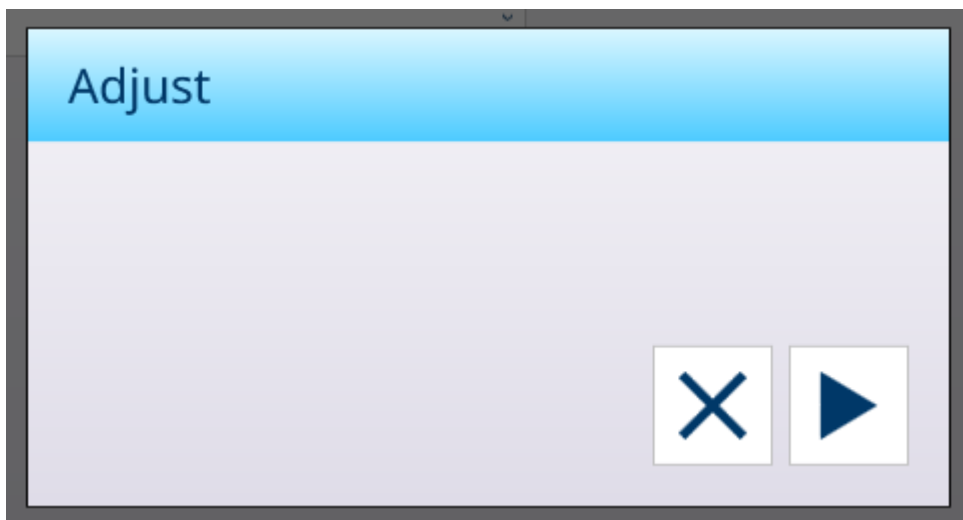


Figure 160: Shift Adjust Confirmation Dialog

Once the process has completed, touch **X** to return to the **Shift adjust a cell/pair** screen.

POWERCELL Multi-Scale Capability

The IND700 POWERCELL interface can support a network of up to 14 load cells (up to 24, with an external power supply). These load cells can be grouped into 2, 3, 4 or four logical scales. The number of logical scales is configured on the [Load Cells > System ▶ Page 101] page. In the examples shown in this section, a simple four-cell network is used to illustrate this functionality.



NOTICE

Logical Scale Configuration

When a single, multi-cell scale is divided into multiple logical scales, each logical scale will show the same configuration parameters as the original scale. However, each logical scale can be configured separately as required.

To confirm that the terminal has this capability, visit the [Terminal Information ▶ Page 45] screen.

 A screenshot of the "Terminal Information" screen. It features a table with four columns: Slot, Description, Part Number, and Software Version. The table lists various system components and their details.

Slot	Description	Part Number	Software Version
Slot 1	MultiscalePowercell (Powercell3)	30726003	V4.0.12
OS	Windows 10 1809 IoT Enterprise		V2.6.30/2024-01-16 1
BIOS	Kontron		MTsXA4R_1.1_BETA12
APP	Supervisor		5.41.150-freeze.2+02
APP	Client.MTApp		5.41.150-freeze.2+02
APP	Engine		5.41.150-freeze.2+02
Legal	www.mt.com/legal		

Figure 161: Terminal Information Showing Multi-Scale Capability

Configuring the System with Multiple Logical Scales

Before multiple scales are configured, the POWERCELL Scale Setup menu looks like this, with a single scale:

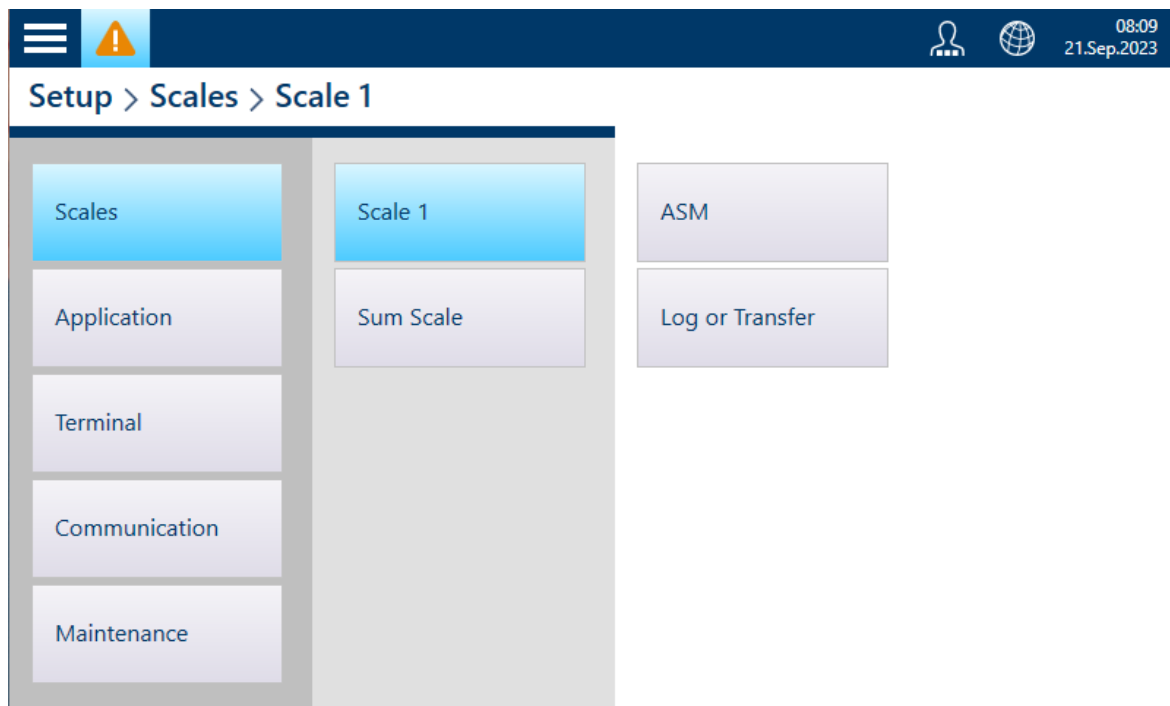


Figure 162: Scale Setup Menu

To create a system with multiple logical scales, the first step is to visit Scale 1 > ASM > Load Cell > System, and select **4 Logical scales**.



Figure 163: Load Cell System Screen, 4 Logical Scales Selected

Note that the **Address range** parameter indicates the addresses that can be assigned to this scale's load cells. Once multiple logical scales have been configured, each scale's **Load Cell > System** page will offer a different range of addresses.

Touching the BACK arrow at upper left will cause the terminal to display a message:

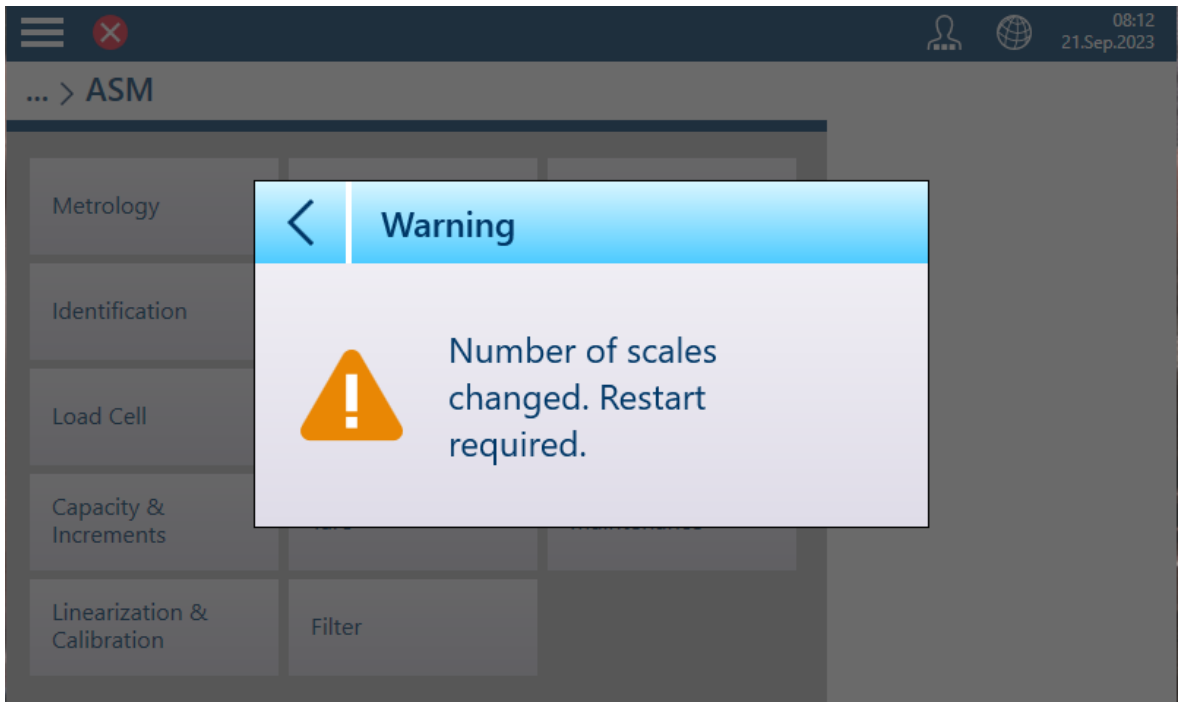


Figure 164: Reboot Warning

The terminal will automatically reboot. Once this process has completed the scale setup menu will show four scales:

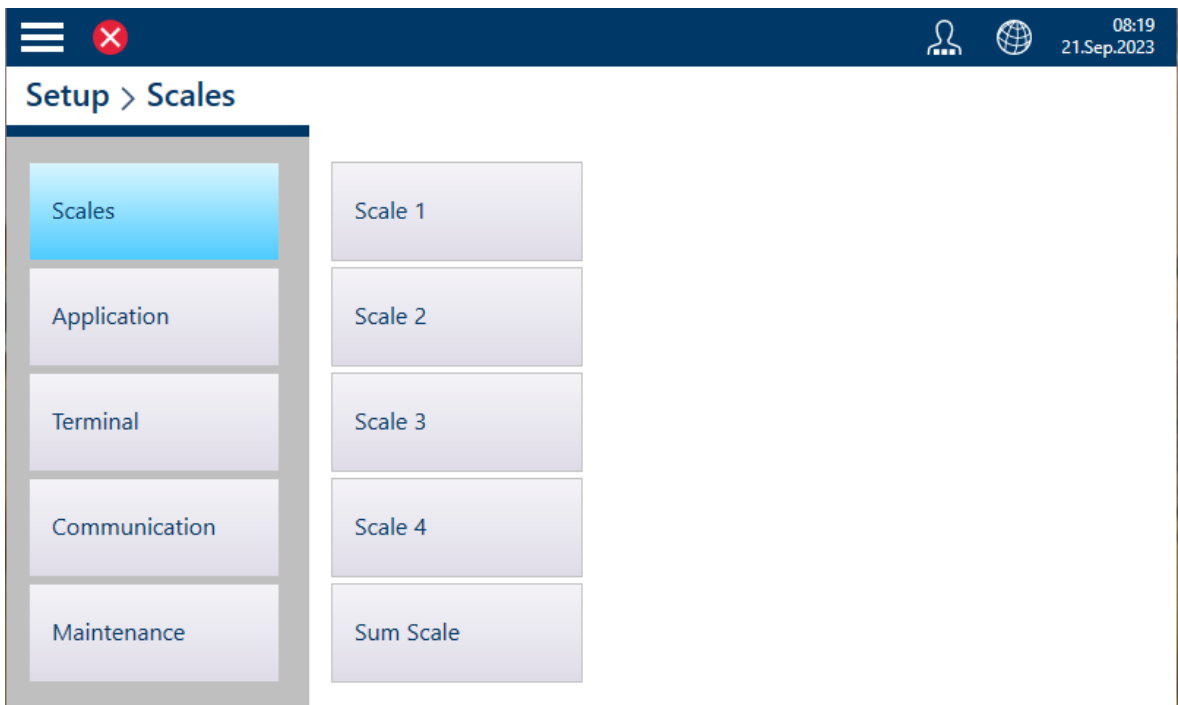


Figure 165: Scale Setup with Four Logical Scales Displayed

The [Sum Scale ▶ Page 113] can now be configured to display any or all of these logical scales.

Sum Scale in a System with Multiple Logical Scales

When multiple logical scales are configured, this is reflected in the options in the Sum Scale Settings page:

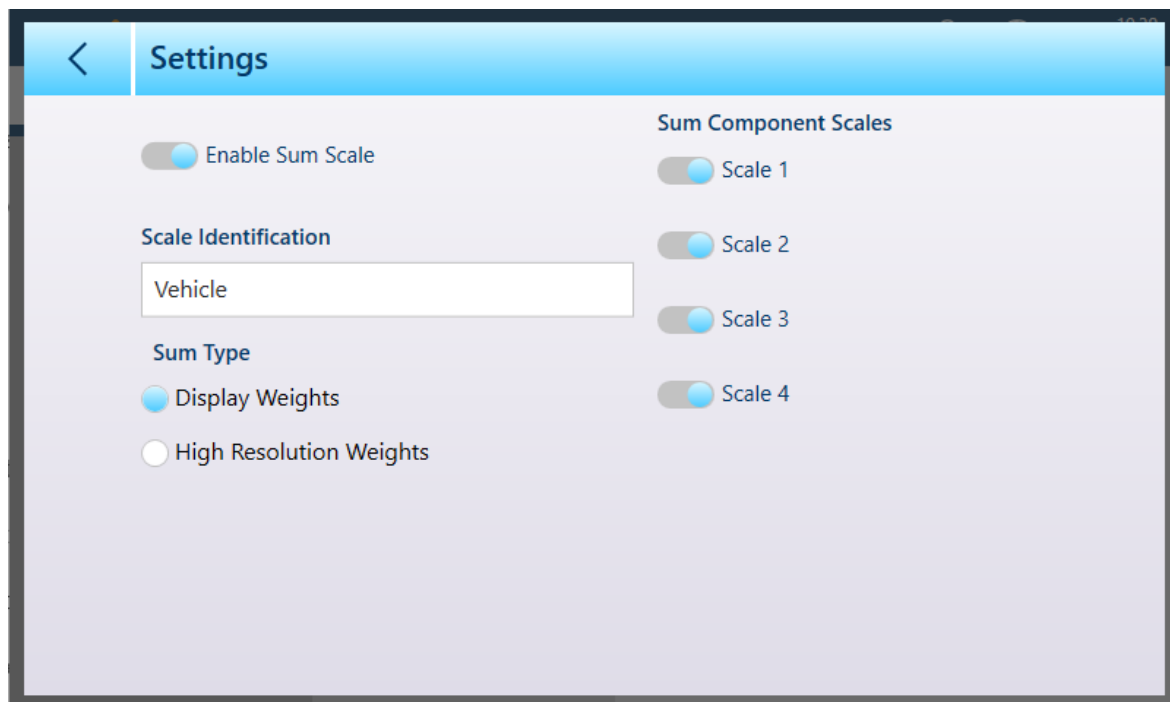


Figure 166: Sum Scale Settings with Multiple Logical Scales

As usual, a descriptive name can be included for the Sum Scale. In the configuration shown above, all logical scales are selected for display, and the weighing screen will appear like this:



Figure 167: Weight Display - Four Scales and Sum Scale

Note that any of the displayed scales, including the Sum Scale, can be viewed in a larger simplified format by double-tapping on the screen within the desired scale's weight information area:

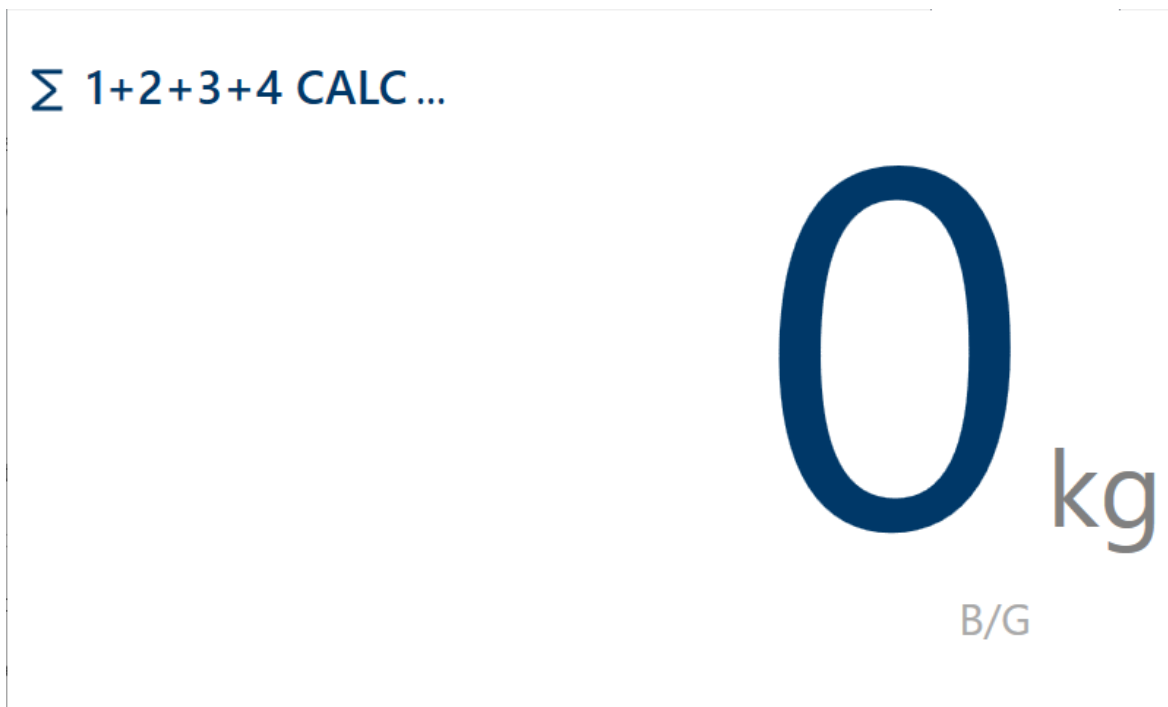


Figure 168: Sum Scale Large Format View



Figure 169: Single Scale Large Format View

To return to the normal display, double tap anywhere on the screen.

POWERCELL - Capacity and Increments

Capacity and increment values allow the weighing parameters to be set for each of a series of scale setups, depending on the **# ranges** value:

- Single range
- 2 multi interval
- 2 multi range
- 3 multi interval
- 3 multi range

The figure below shows the default **Single range** selected.

The screenshot shows a configuration screen titled "Capacity & Increments". It features a back arrow on the top left. The settings are as follows:

- # ranges:** Single range (selected)
- Primary unit:** kg
- Capacity 1:** 5000
- Resolution 1:** 1
- Blank over capacity (d):** 98

Figure 170: ASM - Capacity & Increments

If either multi interval or multi range is selected, additional **Capacity** and **Resolution** fields display. The **Blank over capacity** field is always displayed last, and determines the weight value beyond scale capacity, measured in display increments (d), at which the terminal blanks the weight display.

The screenshot shows a configuration screen titled "Capacity & Increments" with a back arrow on the top left. The settings are as follows:

- # ranges:** 3 multi range
- Primary unit:** kg
- Capacity 1:** 20
- Resolution 1:** 0.01
- Capacity 2:** 100
- Resolution 2:** 0.02
- Capacity 3:** 250
- Resolution 3:** 0.1
- Blank over capacity (d):** 5

Figure 171: Capacity and Increment - Multi Range Example

If **3 multi interval** or **3 multi range** is selected, two sets of capacity and resolution fields are added.

Multi-Range and Multi-Interval Weighing



NOTICE

Precision Scales and Multi-Range, Multi-Interval Operation

PBK and FPK scale platforms support both multi-range and multi-interval operation. PDB platforms support only multi-range operation.

Both **Multi-Range** and **Multi-Increment** settings allow a scale to be used to weigh two or more types of item which differ significantly in weight. Each weight range can have its own **Capacity** and **Resolution** values, so that one scale can behave like two or more different scales.

For instance, for small and light items a finer resolution might be required, while for large and heavy items a coarser resolution is adequate. The scale changes the display increment size at the **Capacity** points defined in this screen. In the example shown here, three ranges are defined -- up to 50 kg, up to 500 kg, and up to 1,000 kg.

Figure 172: Capacity & Increments Screen Configured for Three Ranges

In **Multi-Range** mode, the range currently in use appears on screen beside the weigh mode (B/G or Net) indicator -- **>I1<**, **>I2<**, **>I3<** -- depending on how many ranges are configured.

The increment sizes, or **Resolutions**, are set to **0.01**, **0.5** and **1**, respectively. Thus, for items weighing up to 50 kg, the weight display will increment in 100 gram steps; between 50 kg and 500 kg of scale weight, the display will increment in half-kilogram steps; and for items weighing over 500 kg the resolution is reduced by a factor of 10 compared to the lowest range, and increases in 1 kg steps.

There is one significant difference between **Multi-Range** and **Multi-Interval** configurations, affecting how the terminal behaves as scale weight is reduced:

- Multi-Range: When scale weight is reduced, the terminal continues to display the Resolution size for the largest configured range.
- Multi-Interval: When scale weight is reduced, the display conforms to the configured intervals and shows Resolution sizes corresponding to current scale weight

In both cases, the terminal resets the display to the **Resolution** for the lowest range when the weight falls to zero.

Display

The two modes also differ in the way the IND700 indicates the capacity and increment settings for the displayed scale.

- Multi-Range: The terminal's metrology line cycles through a display of both capacity and increment for each configured range in sequence -- W1 Max 50 kg d = 0.1 kg , W2 Max 500 kg d = 0.5 kg , W3 Max 1 t d = 1 kg
- Multi-Interval: The terminal's metrology line cycles through a display of capacities for each configured range, and then increments for each -- Max 50 / 500 / 1 t , d = 2 / 500 / 1000 g

Example

The following diagram illustrates the distinction between Multi-Range and Multi-Increment modes, showing the behavior of the terminal configured as in the screen shown above, during one weighing operation:

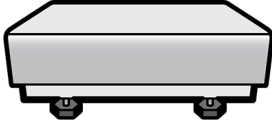

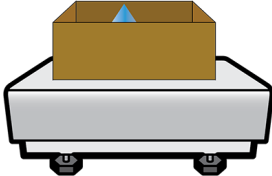

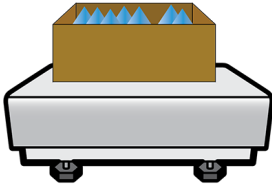

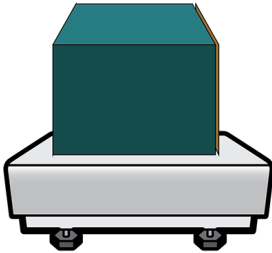

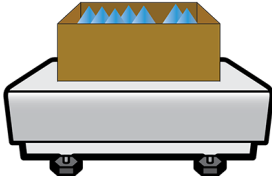



	Scale Status	Display Status	Resolution, Multi-Range	Resolution, Multi-Interval
1			0.002 kg >|1|<	0.002 kg
2			0.002 kg >|1|<	0.002 kg
3			0.05 kg >|2|<	0.05kg
4			1 kg >|3|<	1 kg
5			0.002 kg >|2|<	1 kg
6			0.002 kg >|1|<	0.002 kg

Figure 173: Multi-Range vs Multi-Interval



NOTICE

Scales with Multiple Ranges or Multiple Intervals have specific Approval requirements.

Linearization & Calibration



Figure 174: POWERCELL - Linearization and Calibration Menu

Calibration

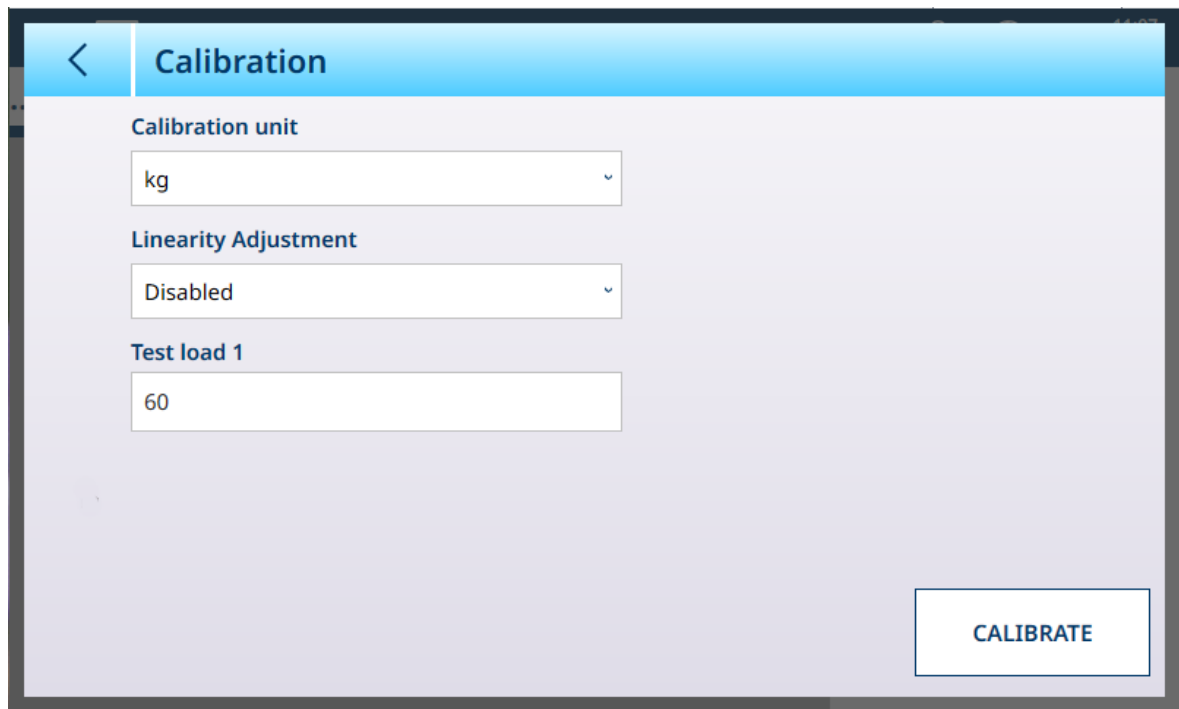


Figure 175: POWERCELL - Linearization and Calibration - Calibration

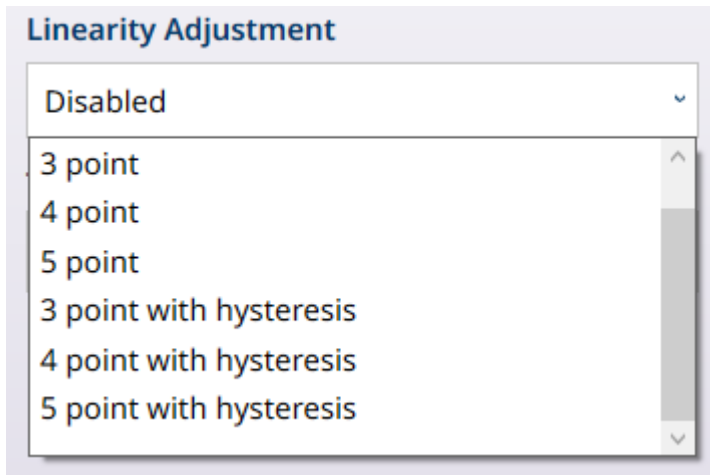


Figure 176: Linearity Adjustment Options

Linearization allows the terminal to account for variations in accuracy over the whole capacity of a scale, by calibrating performance at three or more points in the span. The fields displayed in the **Calibration** sub-menu vary depending on the **Linearity Adjustment** setting. Options are:

- **Disabled [Default]**
- 3 point
- 4 point
- 5 point
- 3 point with hysteresis
- 4 point with hysteresis
- 5 point with hysteresis

The number of points selected determines the number of calibrations taken between the scale's zero and span (highpoint) values. Depending on this setting, linearization may require as many as four intermediate measurements.

When linearization is enabled, additional fields are displayed, permitting the intermediate calibration points to be defined.

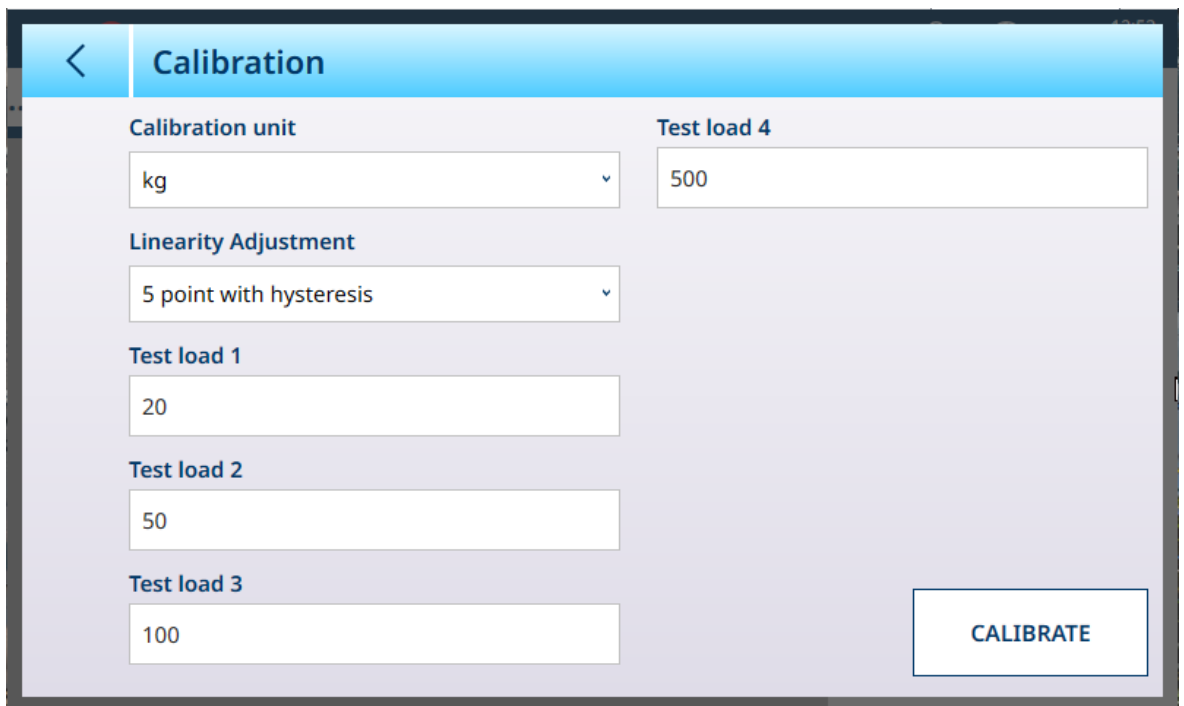
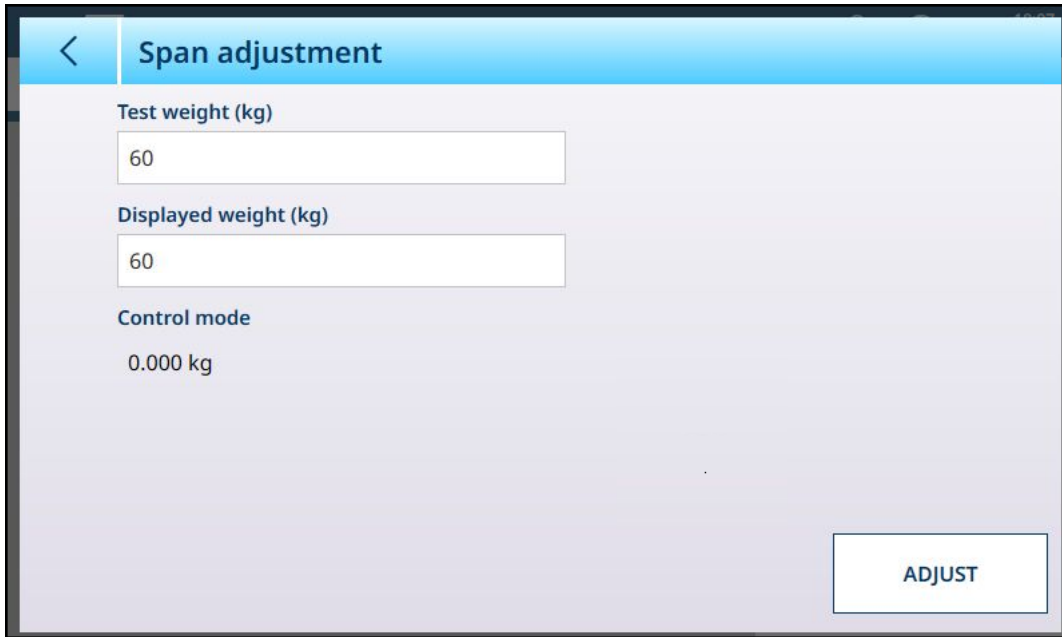


Figure 177: POWERCELL Linearization - 5 Points with Hysteresis

Span Adjustment

The Span adjustment screen permits the scale's whole span to be defined. The units used for the parameters entered here are the Primary Unit set on the Capacity and Increments page.



The screenshot shows a mobile application interface for 'Span adjustment'. At the top, there is a blue header bar with a white back arrow on the left and the text 'Span adjustment' in white. Below the header, the screen has a light gray background. There are three main sections: 1. 'Test weight (kg)' with a white text input field containing the number '60'. 2. 'Displayed weight (kg)' with a white text input field containing the number '60'. 3. 'Control mode' with the text '0.000 kg' displayed below it. In the bottom right corner, there is a white rectangular button with the text 'ADJUST' in blue.

Figure 178: ASM - Linearization and Calibration - Span Adjust

Enter the calibration test weight value in the **Test weight** field.

Enter the current weight reading from the scale, as shown in the **Control mode** display, in this field. The terminal will account for any difference between the test weight and the weight shown on screen, and adjust the displayed weight accordingly. Perform this adjustment before carrying out the linearity adjustments from the [Calibration ▶ Page 80] screen.

Note that the **Control mode** field is read-only, and displays the current scale weight.

To perform the span adjustment, place the test weight on the scale and touch **Adjust**. A message will appear to indicate that the adjustment is complete, and the **Control mode** will change to reflect the offset, displaying a corrected value.

See also

[🔗 HSALC: Capacity and Increments ▶ Page 76](#)

Step Calibration

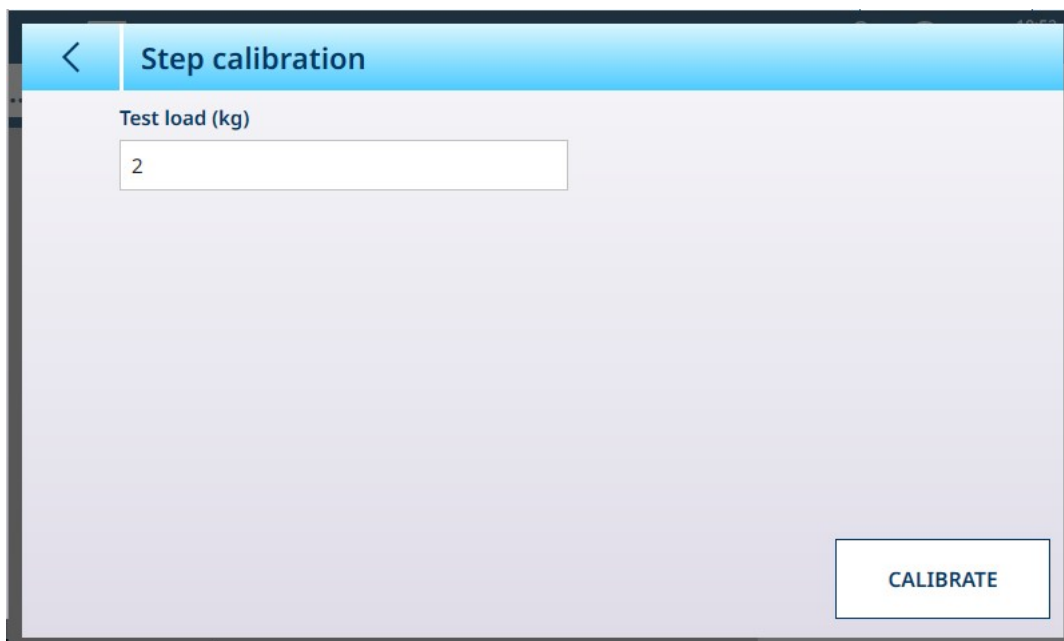


Figure 179: Step Calibration Screen

Step Calibration provides a way to calibrate tanks and hoppers with a "build up" method. In this procedure, the same amount of weight is added to the scale at each step of the procedure until the weight specified in the Test Load field is reached.

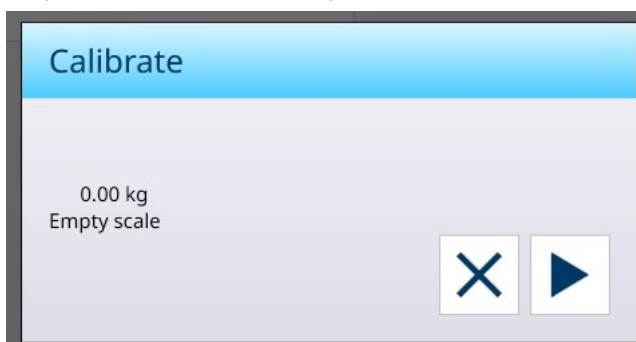
The Test load units are determined by Primary Unit set in [Capacity and Increments ▶ Page 114].

Step Calibration Procedure

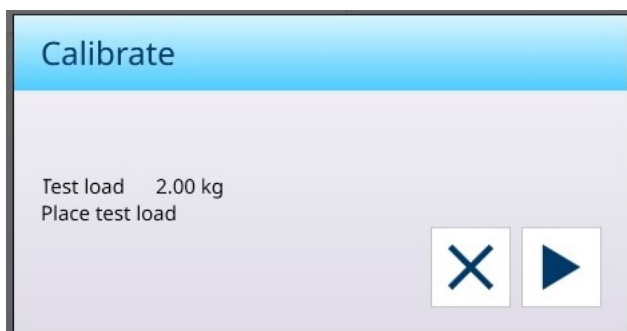
Note that test weight values in the images below are for illustration only, and do not correspond to values for a typical POWERCELL system.

The procedure involves placing and removing test weights of the size specified, and filling the tank or hopper to intermediate target weights. The sequence is prompted by messages on-screen, as shown here. When a prompted action is complete, touch the next icon to :

- 1 Set the zero value. At each screen, the procedure can be continued ▶, or cancelled ✕ to complete the procedure at the current step. Note that the current scale weight is shown as the first line in the screen.



- 2 Place the first test load.



3 Remove the first test load. The current scale weight is displayed again.



4 Fill the vessel to the indicated target.



Follow the steps indicated until the required span is reached, then touch the X (close) button. The **Step calibration** screen will display.

CalFree

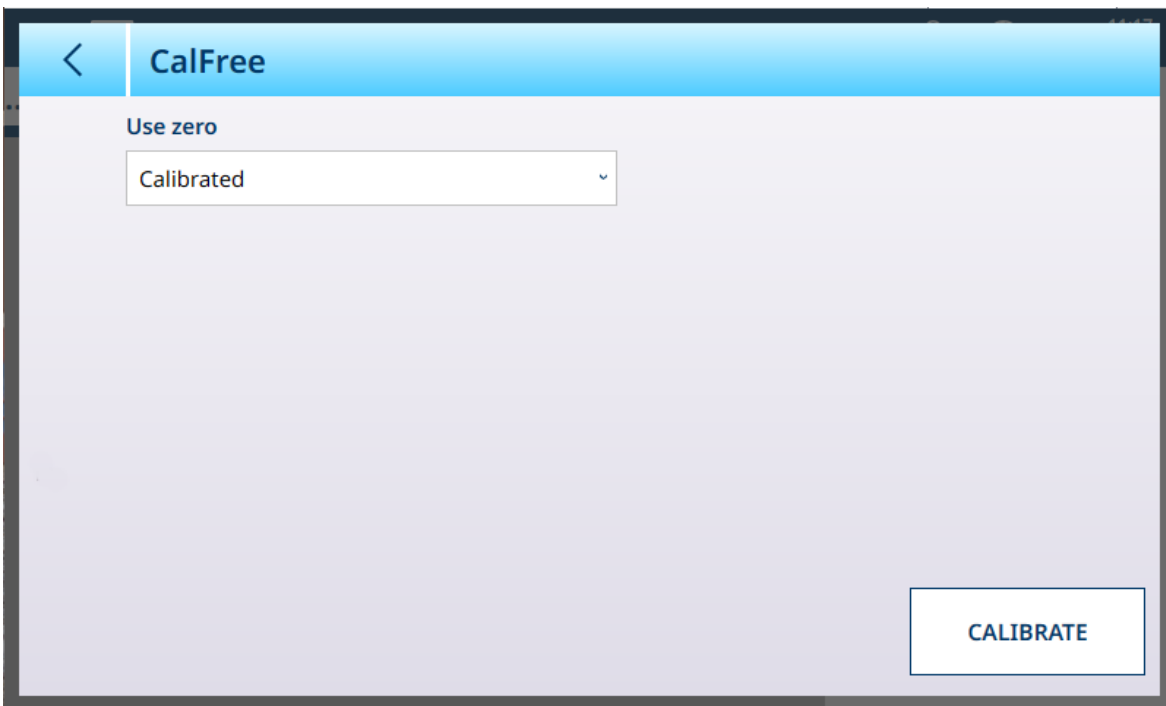
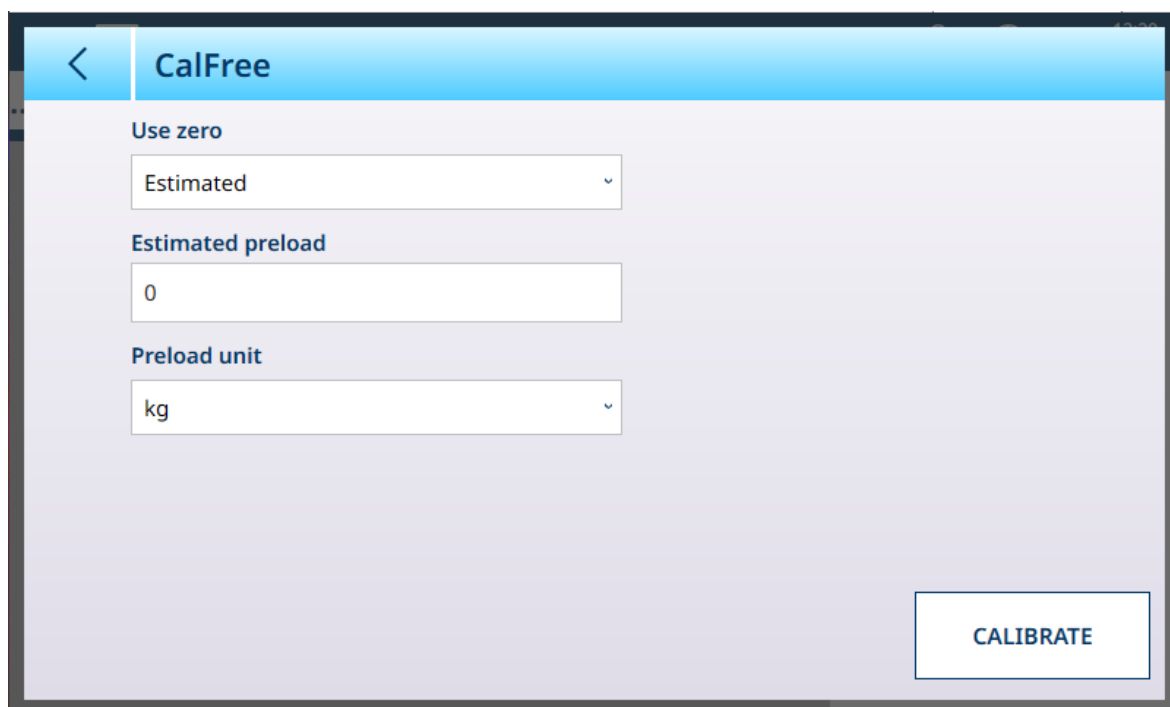


Figure 180: POWERCELL - Linearization and Calibration - CalFree

The **Zero** selection can be either **Calibrated [default]**, in which case the scale's currently calibrated zero is used, or **Estimated**. If **Estimated** is selected, additional fields display.



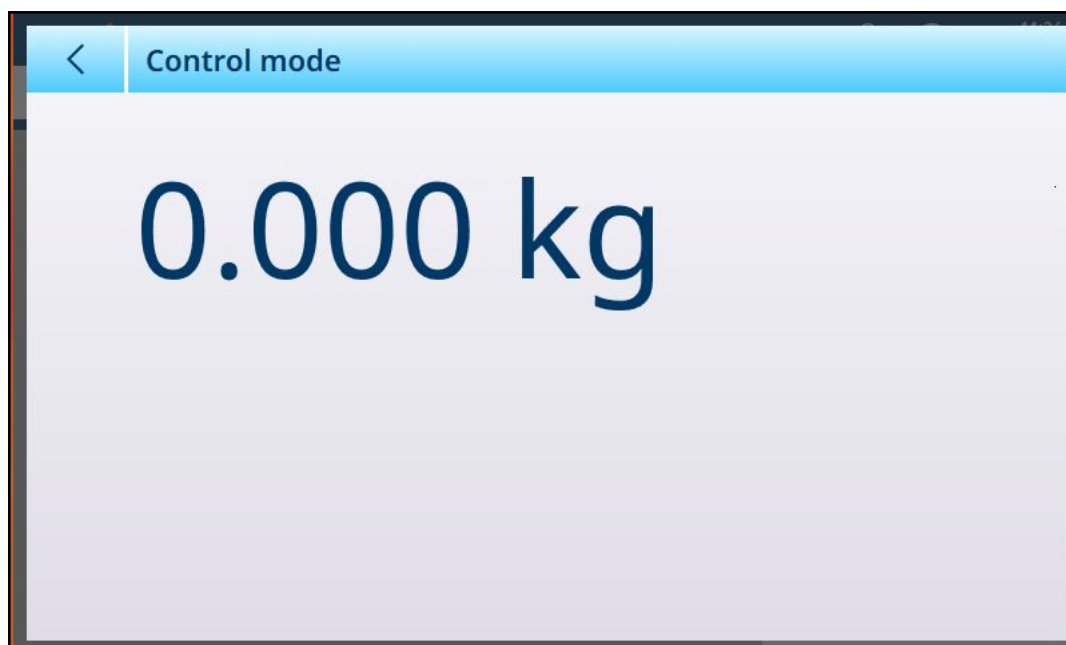
The screenshot shows a mobile application interface for configuring a scale. At the top, there is a blue header bar with a back arrow on the left and the text 'CalFree' in the center. Below the header, the screen is divided into several sections. The first section is labeled 'Use zero' and contains a dropdown menu with 'Estimated' selected. The second section is labeled 'Estimated preload' and contains a text input field with the value '0'. The third section is labeled 'Preload unit' and contains a dropdown menu with 'kg' selected. In the bottom right corner of the screen, there is a rectangular button with the text 'CALIBRATE' in blue capital letters.

Figure 181: CalFree with Estimated Zero

Touch the **Estimated preload** field to open a numeric entry dialog and define a value, and select a **Preload unit** from the dropdown list.

Control Mode

The Control Mode screen shows the current scale weight. This is useful for viewing the weight reading during setup and diagnostics without leaving the setup menu system.



The screenshot shows a mobile application interface for the Control Mode screen. At the top, there is a blue header bar with a back arrow on the left and the text 'Control mode' in the center. The main area of the screen is a light gray color and displays a large, dark blue weight reading of '0.000 kg' in the center.

Figure 182: Control Mode Screen

POWERCELL Units

Figure 183: ASM - Units

Units Settings

Parameter	Options	Function
Secondary unit	g, kg, t, lb, oz, ton	Sets the Secondary unit .
Host / auxiliary unit	g, kg, t, lb, oz, ton	Sets unit type for Host / auxiliary unit . The Host / auxiliary unit
Startup unit	Primary [default] , Restart	Determines whether, when the terminal is restarted, the units revert to the Primary unit defined in [Capacity and Increments ▶ Page 114], or remain as modified by the selection made from the home screen by touching Switch Units

POWERCELL - Zero

Figure 184: ASM - Zero

Zero Settings

Parameter	Options	Function
Startup zero	Use last [default] , Use calibrated, Capture new	Determines how the scale defines zero when it is restarted.
Auto zero tracking	On [default] , Off	When Auto tracking is On , the scale will automatically display zero, if the weight deviation does not exceed the Auto zero range value, measured in increments (d).
Auto zero range (d)	Opens a numeric entry dialog; default value is 0.5	
Blank under zero (d)	Opens a numeric entry dialog; default value is 20	Determines the sub-zero point, in increments (d), at which the terminal will blank its weight display.
Push button zero	On [default] , Off	When On , the terminal's zero softkey can be used to set the terminal to zero, if the current scale weight value is within the range defined by the -range and +range values. The push button zero softkey is visible if at least one connected scale has push button zero active. If push button zero is not activated for a scale, the Zero softkey will display greyed out when that scale is selected. If the Zero scale function key is touched when Push button zero is off for the selected scale, an error message will display indicating that Push button Zero is disabled.
Push button zero -range (%)	Opens a numeric entry dialog; default value is 2 .	
Push Button zero +range (%)	Opens a numeric entry dialog; default value is 2 .	

POWERCELL - Tare

The fields visible in this screen vary depending on the settings for **Auto tare mode**, **Auto tare reset threshold** and **Auto clear tare**. Each of these requires additional parameter settings

Figure 185: Tare Settings

Parameter	Options	Function
Startup tare	Use last [default] , Clear	Determines whether an existing tare value is preserved at system restart, or cleared.

Auto tare mode	Off [default] , On	Determines whether the terminal will automatically take a tare once the Auto tare threshold value is exceeded. An auto tare is cleared once the weight value falls below the Auto tare reset threshold .
Auto tare threshold (kg)	Displays a numeric entry dialog. Default is 0.	Refer to Auto tare mode , above.
Auto tare reset threshold (kg)	Displays a numeric entry dialog. Default is 0.	Refer to Auto tare mode , above.
Chain tare mode	Off [default] , On	When Chain tare mode is ON, it is possible to take multiple tares in sequence by touching the Tare softkey – for example, when filling multiple similar containers on a pallet. Once one container is filled, touch Tare again to reset the scale to Net zero.
Auto clear tare	Off [default] , On	Determines whether the terminal will preserve a tare value when scale weight returns to zero, or automatically clear it when the weight value falls below the Auto clear tare threshold .
Auto clear tare threshold (kg)	Displays a numeric entry dialog. Default is 0.	Refer to Auto clear tare , above.
Pushbutton tare	On [default] , Off	When Push button tare is On , the Tare softkey on the home screen is functional. Touch this softkey to create a tare value based on an empty container on the scale. The terminal then shows a zero weight and indicates that it is Net mode. When the container is filled, the terminal shows the net weight of the contents. The Tare softkey is visible if at least one connected scale has push button tare active. If push button tare is not activated for a scale, the Tare softkey will display greyed out when that scale is selected. If the Tare scale function key is touched when Push button tare is off for the selected scale, an error message will display indicating that Push button Tare is disabled.
Keyboard tare	On [default] , Off	When Keyboard tare is On , the known value for the empty weight of a container (tare) can be entered manually. The terminal will then display the net weight of the contents of the container. Keyboard tares are automatically rounded to the closest display division.
Clear with zero	On [default] , Off	When On , a scale zero command, issued by a softkey or any other input, will clear any stored tare value.

POWERCELL - Filter

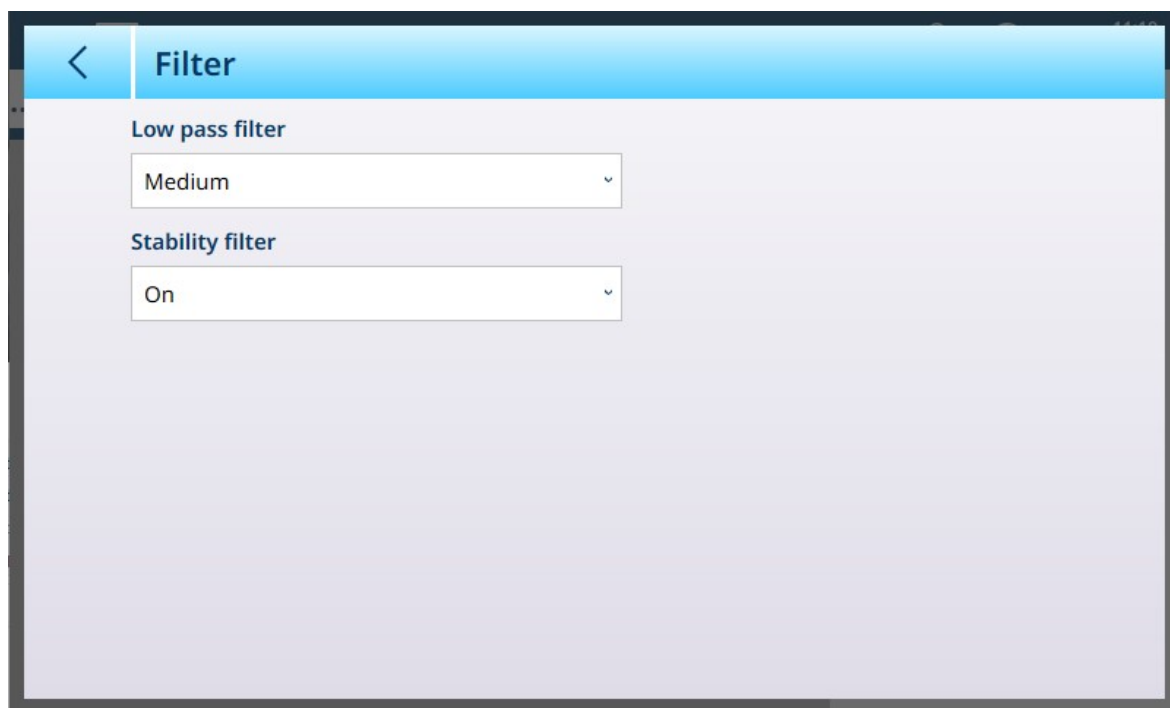


Figure 186: POWERCELL ASM - Filter

The IND700 has a low-pass, multi-pole vibration filter that can be set for several conditions when using analog load cells. The heavier the filtering, the slower the display settling time will be.

Parameter	Options	Function
Low pass filter	Very light, Light, Medium [default] , Heavy, Very heavy	Determines how strongly the low pass filter is applied. The low pass frequency is the frequency above which all disturbances are filtered out. The heavier the low pass filter, the better the disturbance rejection, but the longer the settling time required for the scale.
Stability filter	Off [default] , On	The stability filter works in conjunction with the standard low pass filter to provide a more stable final weight reading. The stability filter should only be used in transaction weighing applications, since the nonlinear action of the filter switching may cause inaccurate cutoffs in batching or filling applications. Stability settings are made on the [Stability ▶ Page 128] screen.

Stability

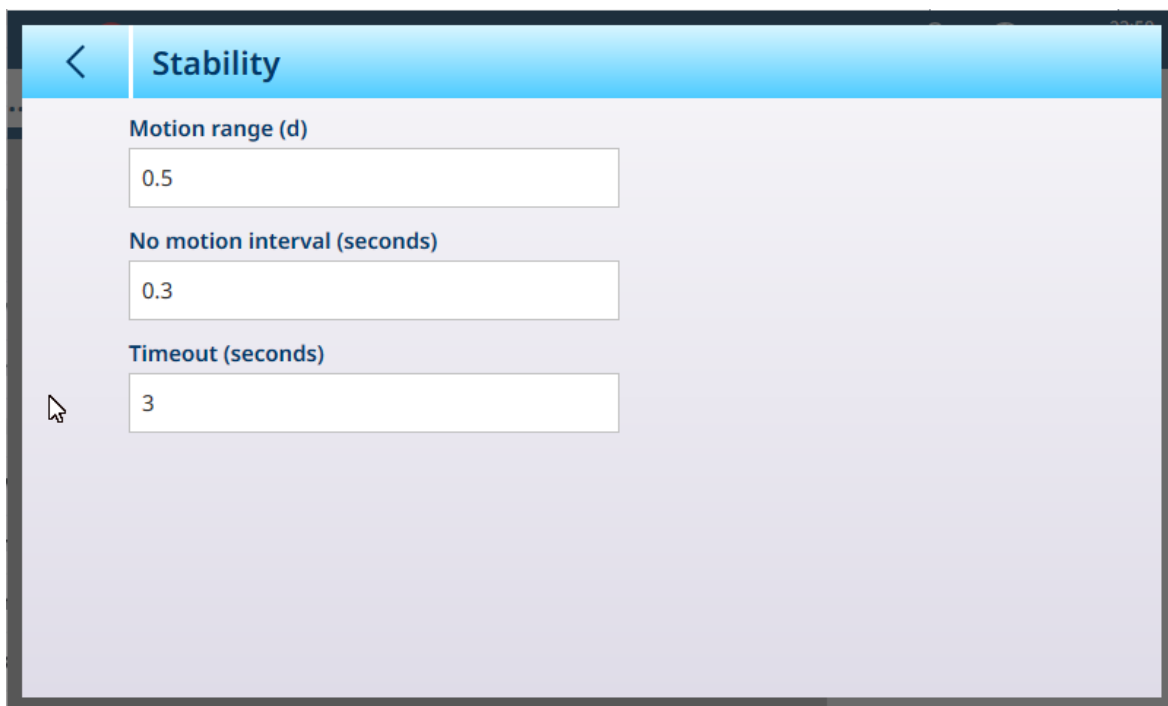


Figure 187: Stability Settings

Parameter	Options	Function
Motion range (d)	Displays a numeric entry dialog. Default is 0.5	Set the Motion range to the weight value (in divisions) within which the weight is permitted to fluctuate and still have a no-motion condition.
No motion interval (seconds)	Displays a numeric entry dialog. Default is 0.3	Defines the amount of time in seconds during which the scale weight must be within the motion range, for the scale to have a no-motion condition.
Timeout (seconds)	Displays a numeric entry dialog. Default is 3	Defines the period (in seconds) after which the terminal stops attempting to perform a function that requires a no-motion condition (such as a zero, tare or print command) and aborts the function. This timeout is used regardless of the source of the command, such as the keypad, discrete input, Industrial Network or serial input. Values from 0 to 99 are possible, the default value being 3. A smaller value means that less time will be spent checking for no-motion before the command is aborted.

MinWeigh

Certain industries such as pharmaceuticals and food processing require a guarantee that the weighing equipment selected for a particular measurement is adequate for the task. One way to ensure that appropriate weighing equipment is selected is by the creation and use of a minimum weight value (MinWeigh), below which a particular piece of weighing equipment cannot be used.

The MinWeigh function compares the current weight with the programmed MinWeigh value. In the configuration screen shown below, MinWeigh has been enabled and its value set to 1 kg.

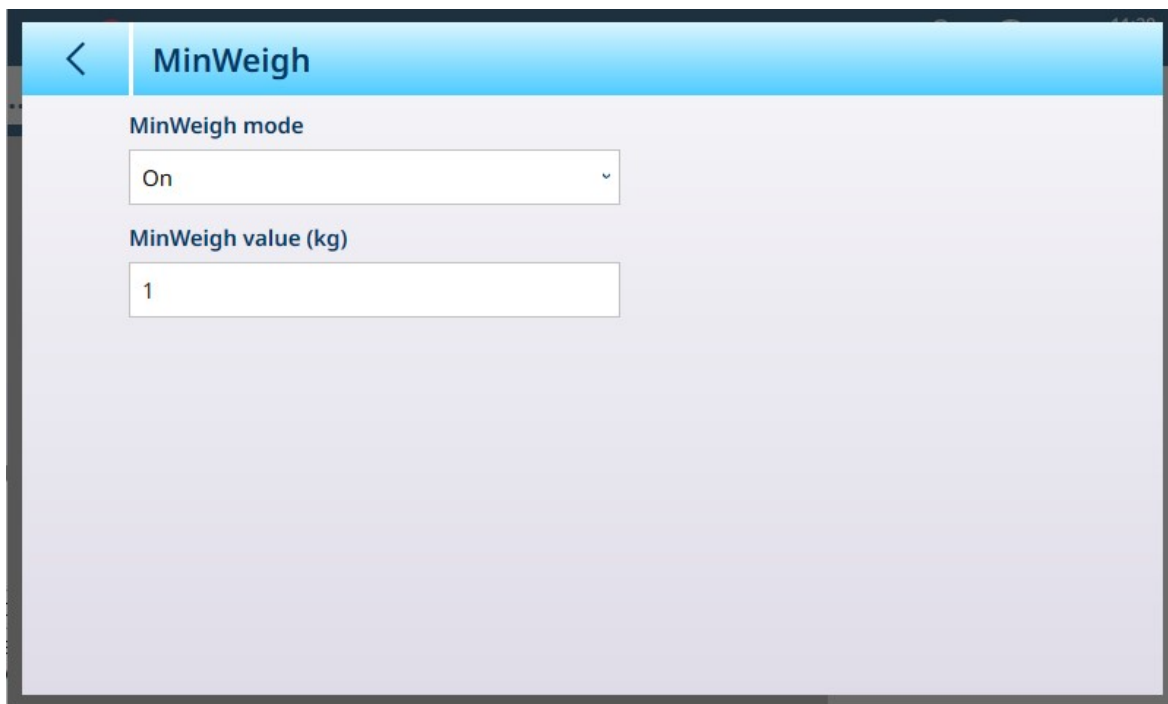
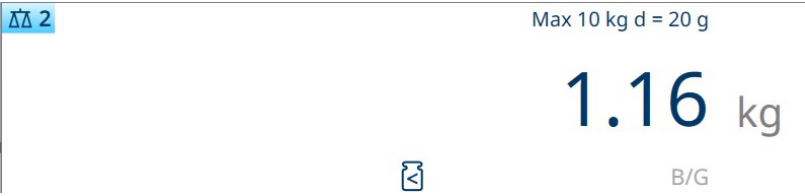



Figure 188: MinWeigh Setup Screen

Parameter	Options	Function
MinWeigh Mode	On [default] , Off	<p>If the displayed weight (B/G or NET) is greater than or equal to the MinWeigh value, the MinWeigh symbol appears below the weight display, to the right of the tare display. All terminal functions behave normally.</p>  <p>When the absolute value of the net weight is less than the MinWeigh value, the MinWeigh symbol flashes in red .</p>
MinWeigh value (kg)	Displays a numeric entry dialog. Default value is 0	This field displays if MinWeigh mode is set to On . The unit is the default unit set

Reset



NOTICE

Scale Branch Reset

Note that this Reset function refers only to parameters configured in the currently selected setup branch. For general Terminal reset options, refer to [Reset ▶ Page 264].

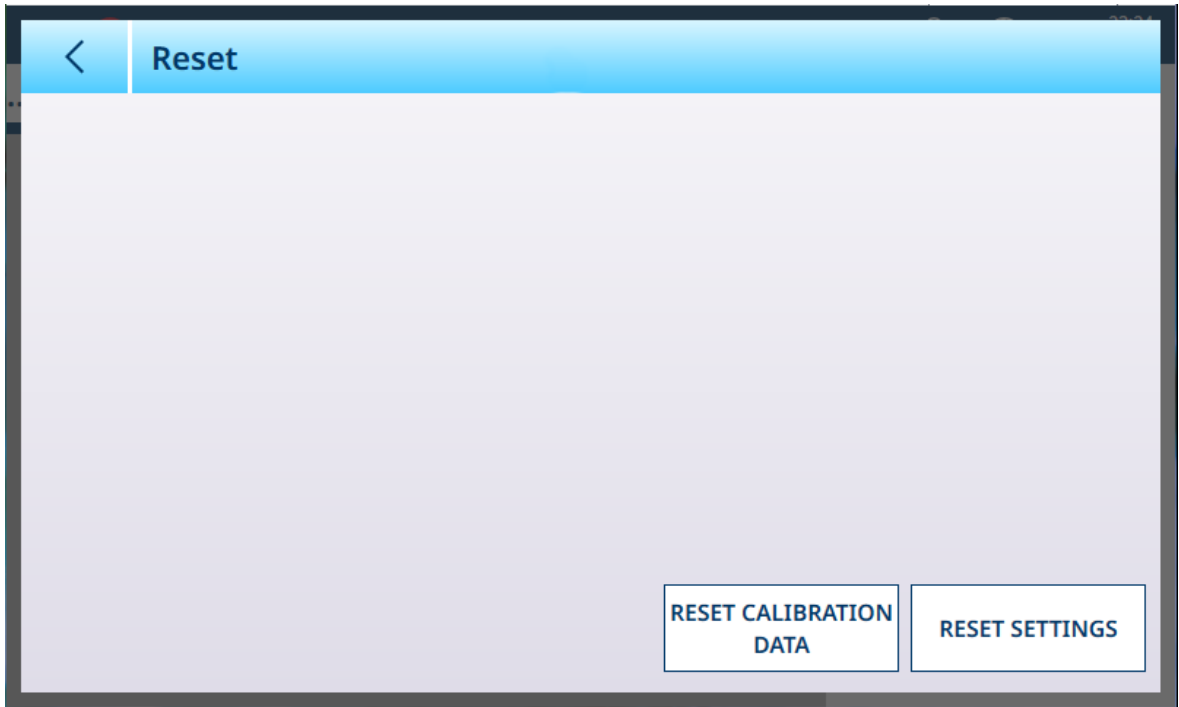


Figure 189: Scale Reset Options

This screen allows the user to reset either calibration data or settings. If settings is selected, calibration data are preserved. In either case, a confirmation dialog will appear and the operation can be continued or cancelled.

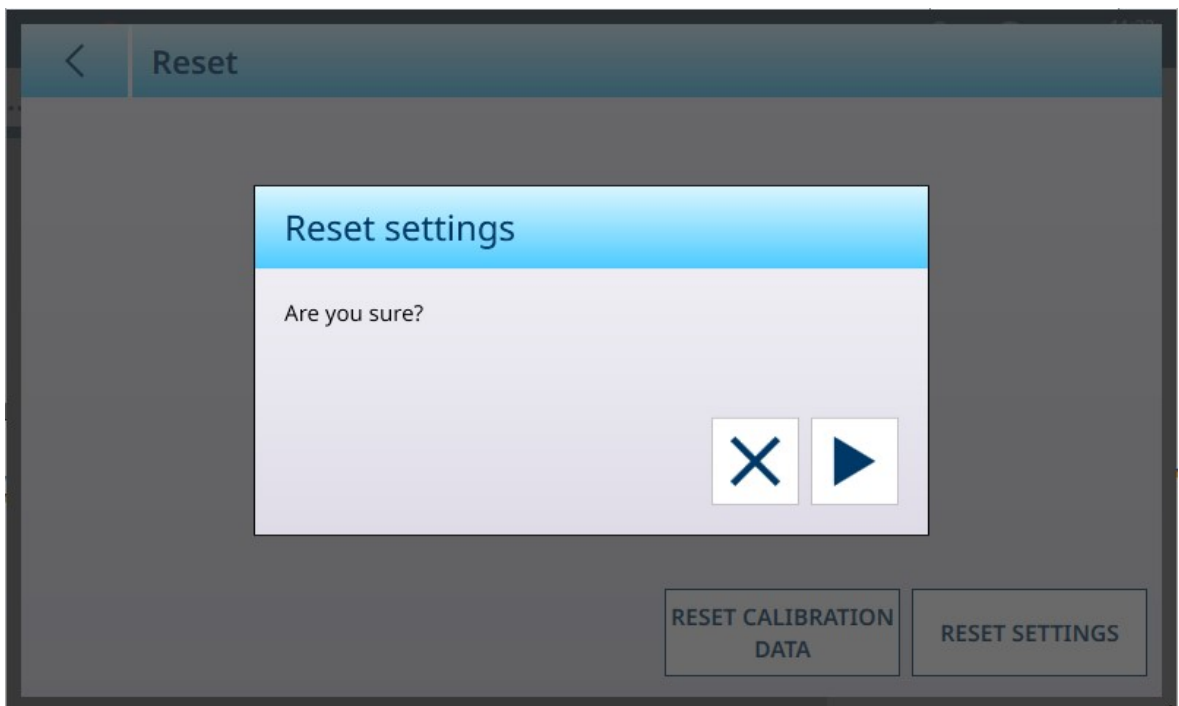


Figure 190: Reset Confirmation Dialog

POWERCELL - Maintenance

The POWERCELL ASM Maintenance option provides access to the menus shown below.

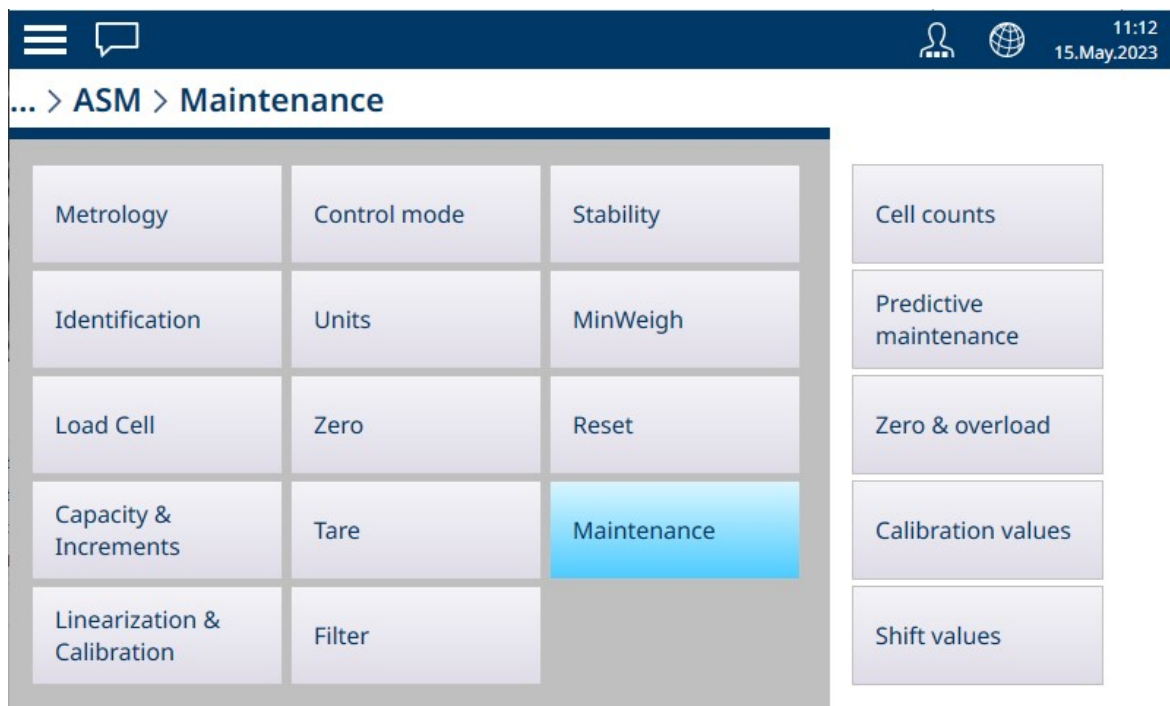


Figure 191: POWERCELL Maintenance Menu

Cell counts

The Cell counts maintenance screen displays current cell counts for each load cell in the scale system, providing a useful diagnostic tool.

The screenshot shows the 'Cell counts' maintenance screen. The title bar is blue with a back arrow and the text 'Cell counts'. Below the title bar is a table with two columns: 'Node' and 'Cell counts'. The table has four rows of data.

Node	Cell counts
1	8036
2	8977
3	8377
4	9612

Figure 192: POWERCELL Maintenance - Cell Counts

Predictive maintenance

By default, the **Predictive maintenance** screen opens with **Symmetry monitor** set to **Off**, in which case no further fields are visible.

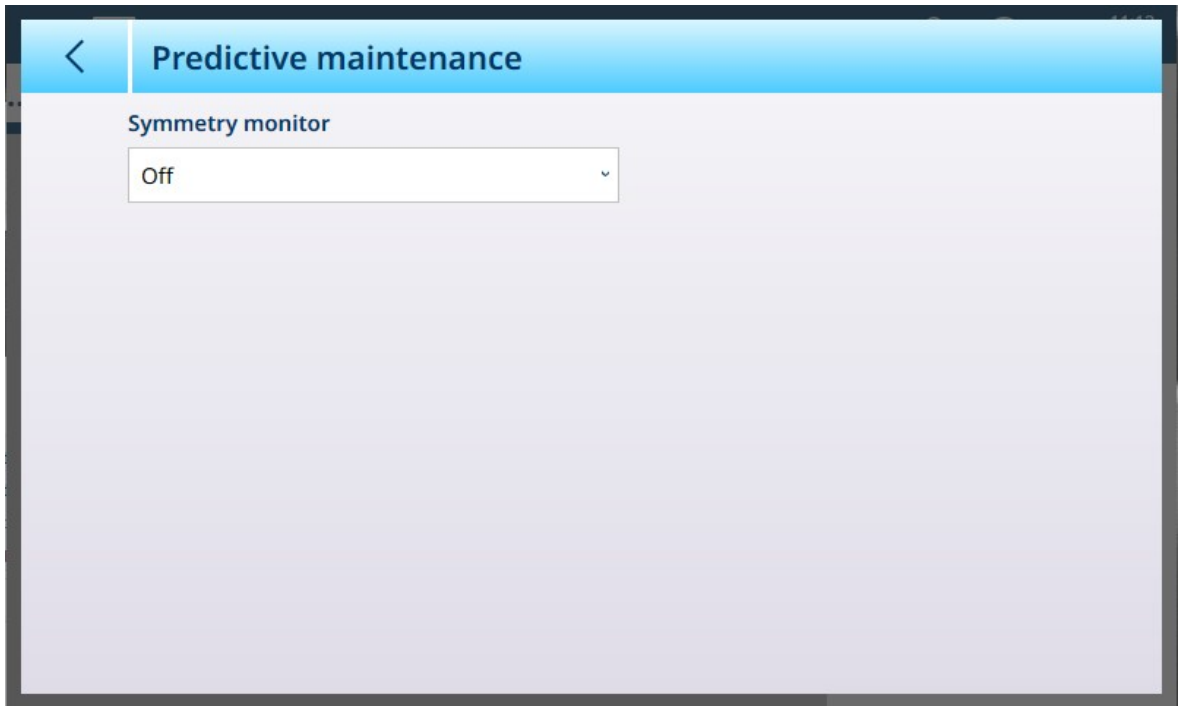


Figure 193: POWERCELL Maintenance - Predictive Maintenance, Default View

Radial symmetry should be used on any system where all the cells see almost identical loads (such as a cylindrical tank or hopper scale). Setting **Symmetry monitor** to **Radial** displays the fields shown below.



Figure 194: POWERCELL Maintenance - Predictive Maintenance

When **Symmetry monitor** is set to **Radial**, **Run flat** can be set to **Manual** or **Automatic**.

Symmetry Monitor Settings

To prevent a false trigger of a symmetry error due to light loads, the terminal allows for a symmetry check **Start threshold** value. This value is entered as a percentage of the calibrated scale capacity. The default value is 0%. Symmetry checking will be triggered only if the load on the scale exceeds the start threshold value.

In the **Difference threshold** field, enter the maximum permissible percent deviation in span between symmetrical cells. The default value is 0%. Execution of radial symmetry checking is based upon a comparison between the current distribution of values between load cells and the distribution at calibration. A symmetry error is triggered if the change in load distribution exceeds the Difference Threshold value.

The **Time Interval** determines how long the system will wait after a "no-motion" condition is achieved, before it can trigger a symmetry error. The alarm is triggered if the symmetry error occurs after the timer has expired. The time is measured in seconds, and valid values are from 0 to 120. 0 is the default setting, and means that the timer is disabled.

Set the **On failure** option to determine the alarm level when a possible failure is detected. The options are:

- Alarm only
- Disable and alarm

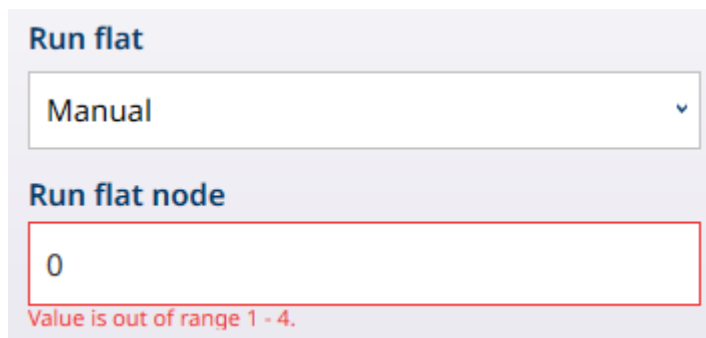
The [Maintenance Log ▶ Page 244] must be enabled for Alarms to be recorded. For Alarm Only conditions, the alarm message will remain on the display until the values fall to 90% of the parameters specified in setup. If the scale has been disabled, Symmetry Monitoring must be turned off or changed to Alarm Only (and the values fall to 90% of the parameters specified in Set Up), and the home screen displayed before the error will clear.

Run Flat

If the terminal determines that a load cell is operating out of tolerance or fails to detect communication with a single load cell, it can invoke the Run Flat algorithm to compensate for the cell's questionable readings until the cell can be replaced. Load cell symmetry monitoring is required for the algorithm to run properly. There are 3 options for Run Flat

- **Off:** Run Flat does not function
- **Manual:** The user selects which cell to replace
- **Automatic:** The Run Flat algorithm uses threshold settings to determine which cell to replace

The **Manual** mode of **Run flat** requires the entry of a node to ignore in the run flat calculation. This is used to exclude a failed POWERCELL, pending replacement.



The screenshot shows a configuration panel for 'Run flat'. At the top, the title 'Run flat' is displayed in blue. Below it is a dropdown menu with 'Manual' selected. Underneath, the title 'Run flat node' is displayed in blue, followed by a text input field containing the number '0'. A red border highlights the input field, and a red error message below it reads 'Value is out of range 1 - 4.'

Figure 195: Run Flat Mode - Manual

Click on the **Run flat node** field to display a numeric entry dialog which is used to designate the failed node.

When **Run flat** is set to **Automatic**, and **Temp. trigger run flat** is **On**, the function is set to trigger automatically when a failed cell is detected.



The screenshot shows a configuration panel for 'Run flat'. At the top, the title 'Run flat' is displayed in blue. Below it is a dropdown menu with 'Automatic' selected. Underneath, the title 'Temp. trigger run flat' is displayed in blue, followed by a dropdown menu with 'On' selected.

Figure 196: Run Flat Mode - Automatic

Zero and overload

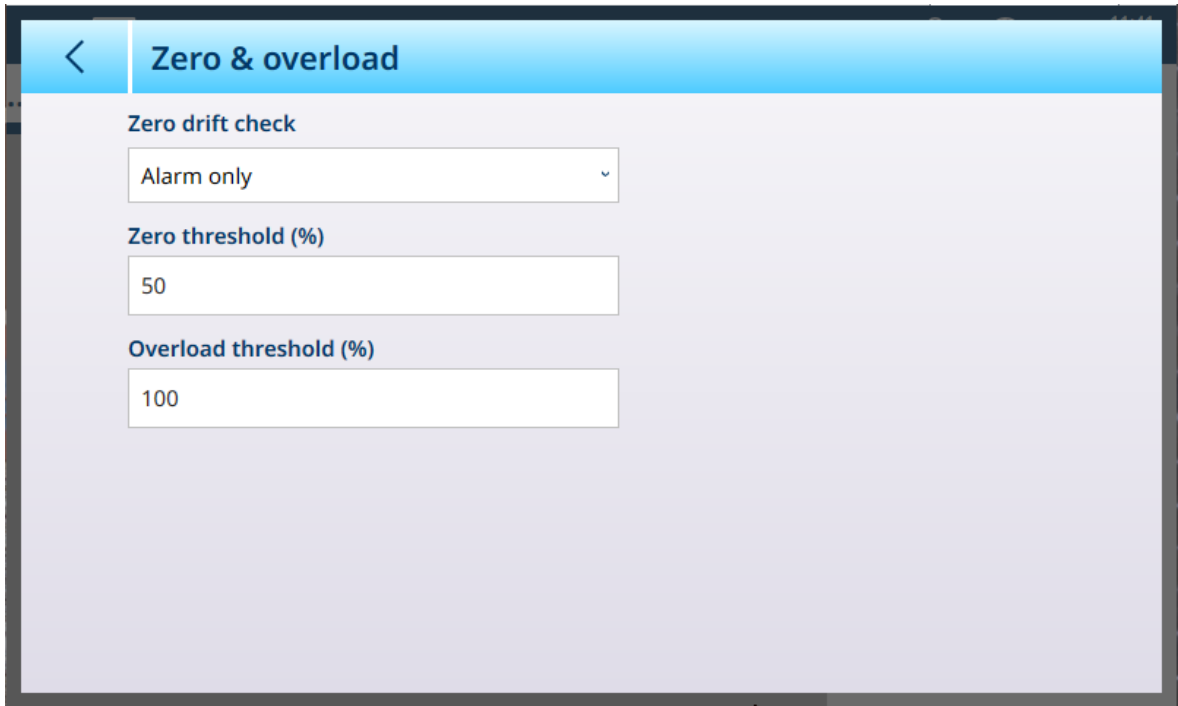
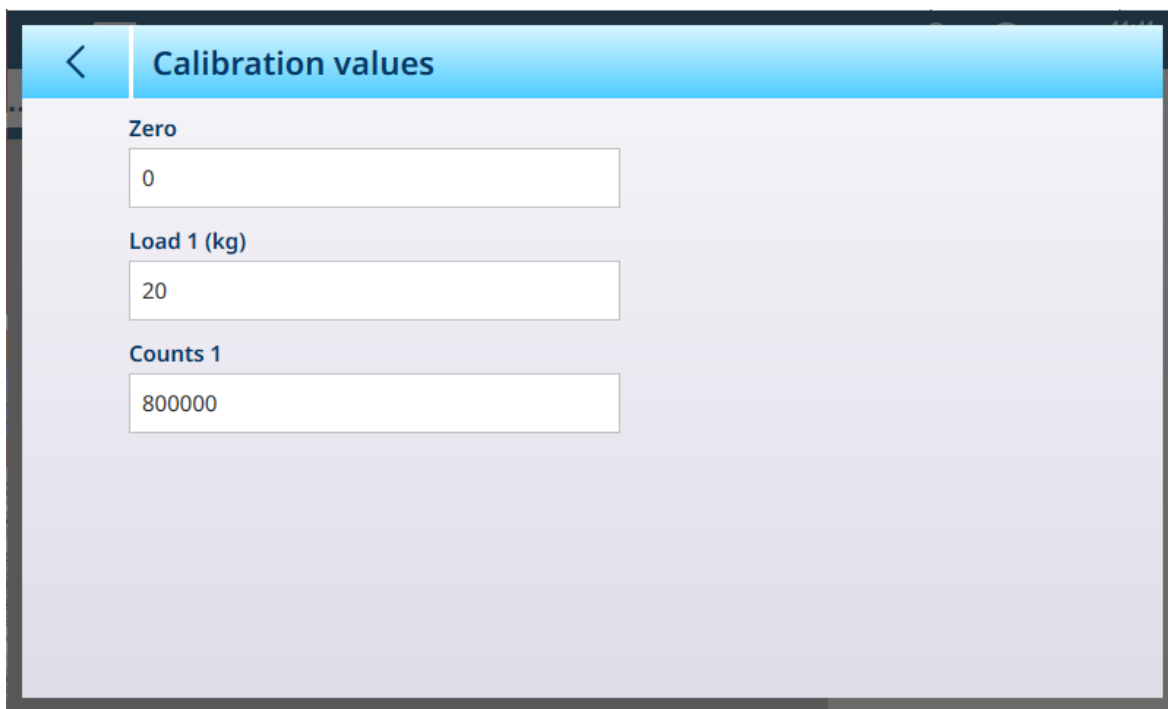


Figure 197: POWERCELL Maintenance - Zero and Overload

Parameter	Options	Function
Zero drift check	Alarm only [default] , No action, Disable & Alarm	Determines what the terminal does when a zero drift condition (defined by the Zero threshold parameter) is detected. By default, the terminal issues an alarm, but it can also be set to disable the scale.
Zero threshold (%)	When clicked, displays a numeric entry dialog.	Defines the value, expressed as a percentage of the configured [Auto Zero range ▶ Page 124], at which a deviation from zero is considered a drift.
Overload threshold (%)	When clicked, displays a numeric entry dialog.	Defines the value, expressed as a percentage of the configured [Span Adjustment ▶ Page 83], at which a value exceeding the scale capacity is considered an overload.

Calibration values



Calibration values

Zero
0

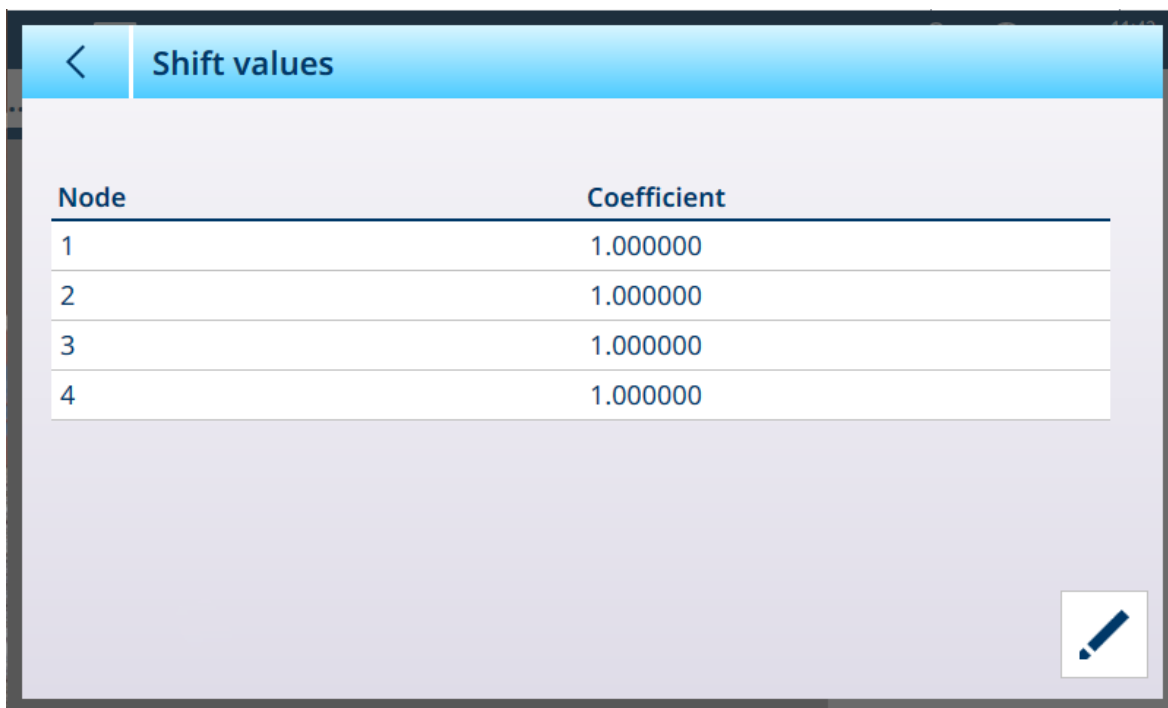
Load 1 (kg)
20

Counts 1
800000

Figure 198: POWERCELL Maintenance - Calibration Values

This screen allows each of the values to be entered manually, using a numeric entry dialog.

Shift values



Shift values

Node	Coefficient
1	1.000000
2	1.000000
3	1.000000
4	1.000000

Figure 199: POWERCELL Maintenance - Shift Values

To modify a cell's shift value, select the appropriate row, then click on the Edit icon at lower right.

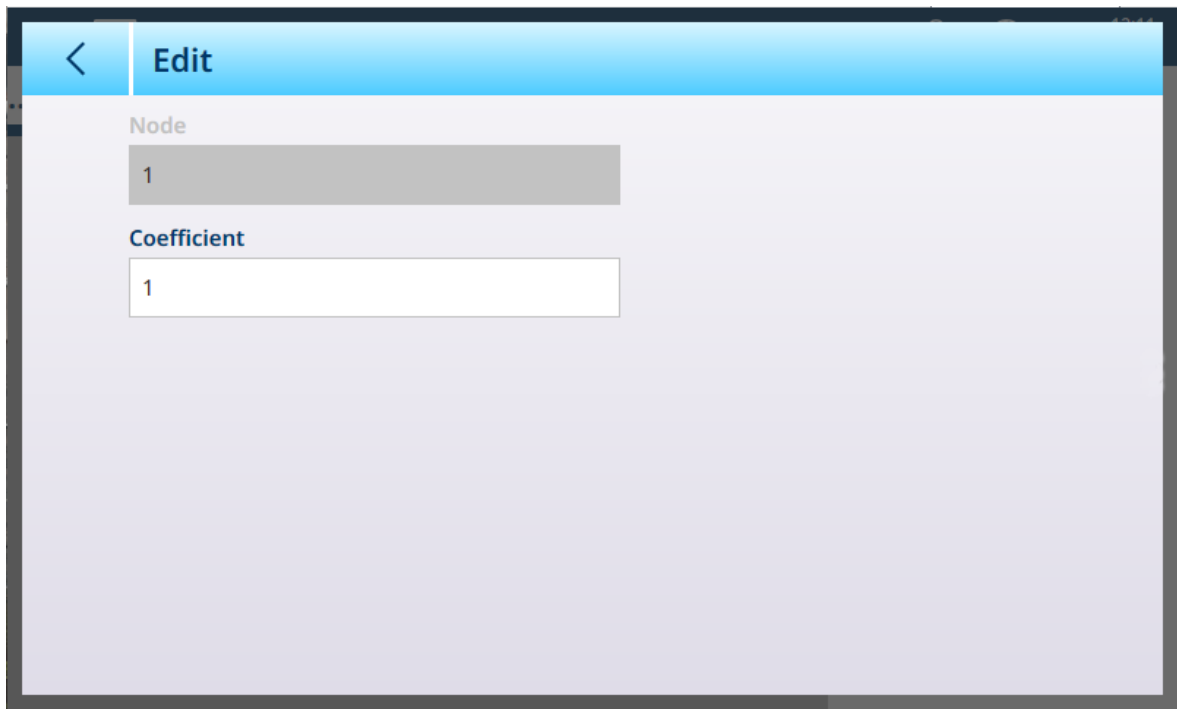


Figure 200: POWERCELL Maintenance - Edit Shift Value

The screen displays the number of the selected node; this value cannot be edited. Click the **Coefficient** field to display a numeric entry dialog where the value can be modified.

3.1.2.1.2 Log or Transfer

The Log or Transfer menu sets the conditions which determine how and when a demand output is triggered. Normal demand mode transfer occurs whenever a transfer request is made, depending on the options selected here, and providing there is no motion on the scale and the weight is above gross zero (a negative gross weight will not be printed).

Data is sent to:

- Interfaces for which the Connection has been defined as Transfer
- The Alibi Table
- The Transaction Table

Weight values shown on this screen are gross weights in primary units.

When **Log or Transfer** is selected from the Scale n menu options, a default configuration screen appears, with no options selected.

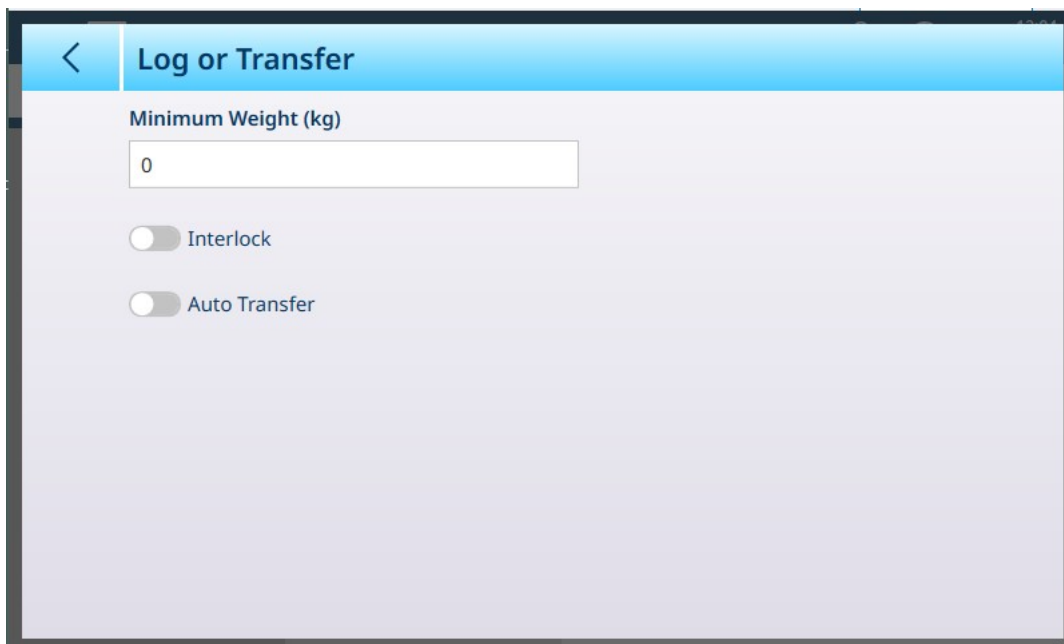


Figure 201: Log or Transfer Screen, Default View

Additional fields appear depending on the initial selections for **Interlock** and **Auto Transfer**. The following illustration shows the menu with all options selected.

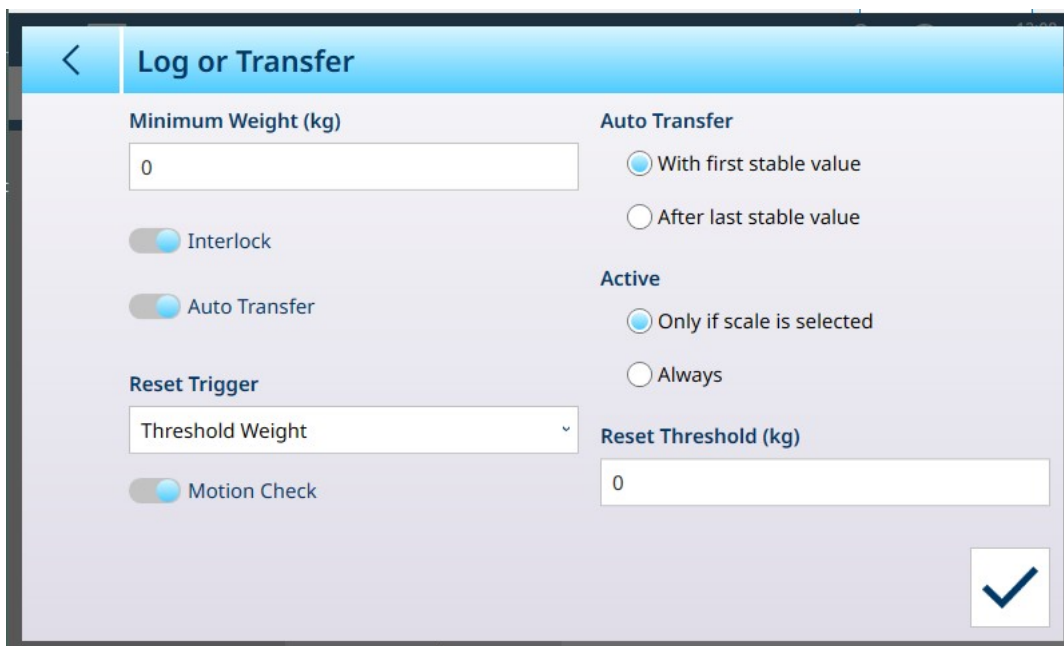


Figure 202: Log or Transfer, All Options Selected

Note that some the **Auto Transfer** and **Active** sub-sections appear only if **Auto Transfer** is enabled.

Log or Transfer Options

Option	Settings
Minimum Weight (kg)	This value determines the minimum scale weight required to trigger the Interlock and/or Auto Transfer actions. The weight unit for this and the other fields on this screen is determined by the Primary Unit set in ASM at Capacity and Increments .

Option	Settings
Interlock	<p>When enabled, the Interlock option responds to scale data to determine when a log action is performed. This prevents repeat logging of the same weighing operation.</p> <p>When enabled, this interlock requires that the live weight reading be reset according to the Reset Trigger parameter setting (see below). The live weight must then settle to a weight greater than the Minimum Weight value (see above) before the terminal will respond to the next log or transfer request.</p>
If Interlock is enabled, or Auto Transfer and With first stable value is selected	
Reset Trigger	The Reset Trigger action can be performed in response to Threshold Weight [default] or Deviation . This trigger is defined either by an absolute value (Threshold Weight) or by a minimum change in weight (Deviation).
If either Interlock or Auto Transfer is enabled	
Reset Threshold (kg) or Reset Deviation (kg)	The weight value which triggers a reset and indicates the start of a new weighing operation and a new log entry.
Auto Transfer	When enabled, Auto Transfer causes data about each weighing operation to be sent to the destination defined in the [Communication ▶ Page 208] section of setup, depending on the parameters selected in Auto Transfer and Active .
If Auto Transfer is Enabled	
Auto Transfer	<p>When enabled, the trigger conditions defined by the Interlock settings will automatically export data about each weighing operation either With first stable value or After last stable value.</p> <p>With first stable value: data is sent when the first stable weight is captured, even if the weight changes afterward. This selection would typically be used for static weighing.</p> <p>After last stable value: data is sent based on the last stable weight captured. This selection might be used for manual filling, where the scale weight will briefly be unstable after the last material is added.</p> <p>This selection determines whether the Reset Trigger option appears.</p>
Active	The options to activate the Auto Transfer function are Only if scale is selected and Always .
Motion Check	When enabled, the Motion Check prevents the interlock from triggering a log or transfer action until scale weight is within the parameters defined as stable at [ASM > Stability ▶ Page 128].

See also

[Communication Setup ▶ Page 208](#)

[Stability ▶ Page 128](#)

3.1.2.1.3 Loading Alert

When the IND700 is connected to a PowerDeck floor scale, the system can be configured to provide a loading alert. This alert appears on the weighing screen as a graphical warning, and offers guidance to the operator for correct loading. Weighing is most accurate when the load is placed in the center of the platform.

This branch of the scale setup menu system allows the configuration of the loading alert. By default, loading alert is disabled. The screen below shows the Loading Alert enabled.

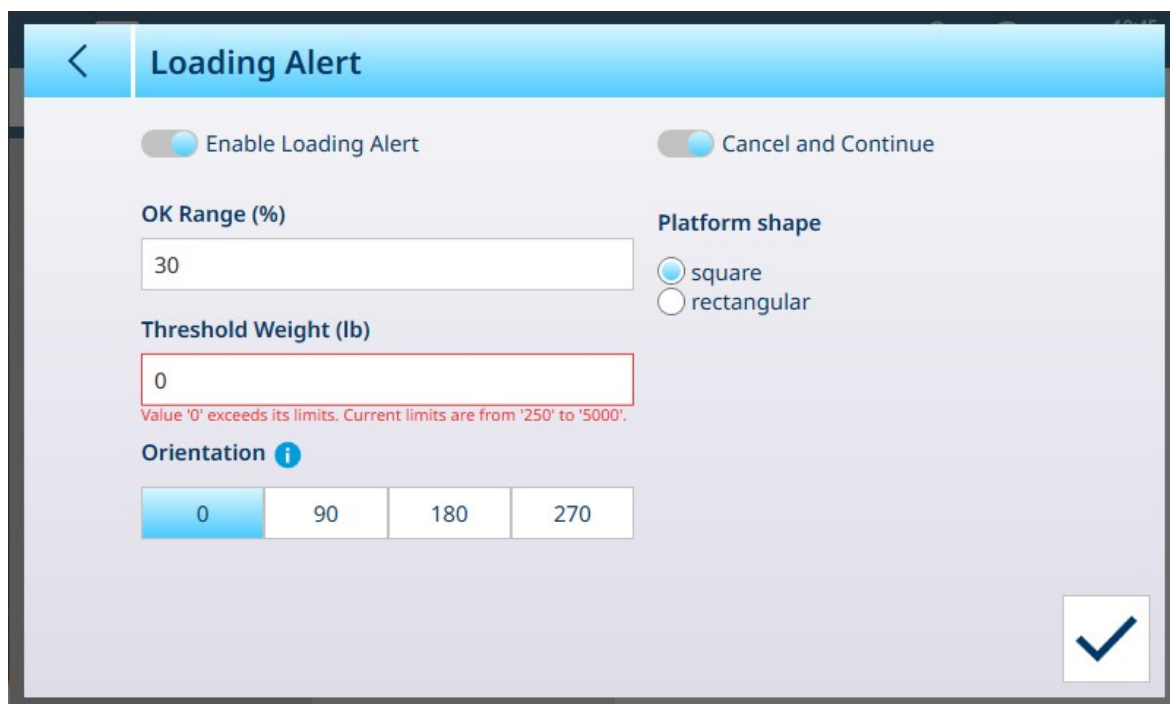

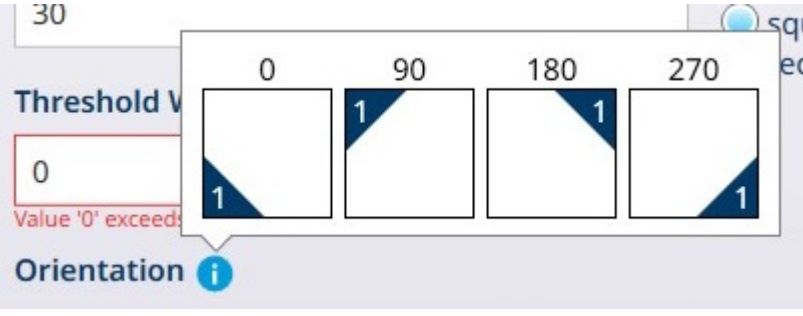
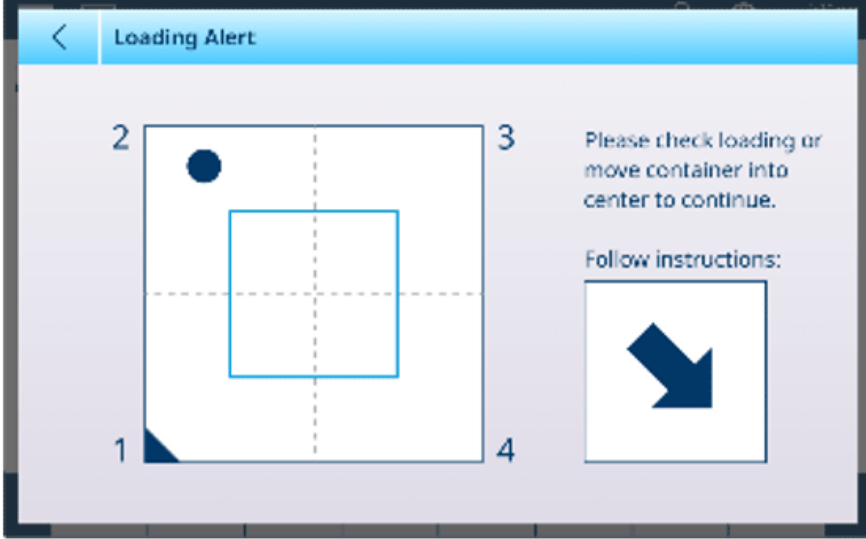
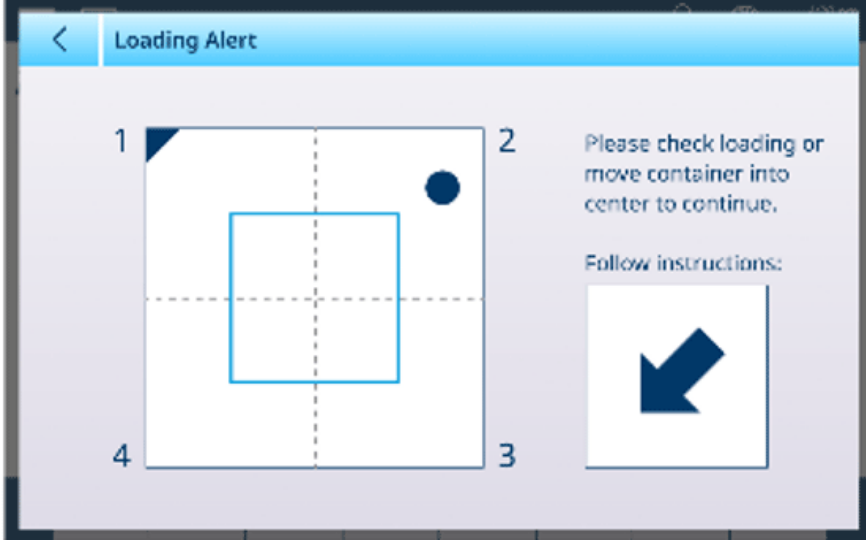


Figure 203: Loading Alert Enabled

The following parameters must be configured for the loading alert:

Loading Alert Parameters

Parameter	Settings
Enable Loading Alert	When enabled, the loading alert will function during weighing operations. By default, Loading Alert is disabled.
OK Range (%)	The range sets the positioning tolerance, and represents the relationship between the center of gravity of the load and the center of the scale. The value is expressed as a percentage of the distance between load cells. Valid range values are from 5% to 50%. The default value is 30% . The loading alert graphic shows the OK zone as a light blue rectangle, and the center of gravity of the load as a dark blue dot. The on-screen size of the light blue rectangle indicates the relationship between the OK zone and the overall distance between load cells. When a load is placed on the scale outside the OK range, the loading alert will display.
Threshold Weight (▶↔↓◀)	If the weight on the scale is below this threshold value, the loading alert will not trigger. The value selected should represent 5% of the scale capacity; this value is shown by default. The unit shown is the Primary Unit selected in ASM at [Capacity & Increment ▶ Page 114].
Cancel and Continue	If Loading Alert is enabled, and this option is selected, the operator can cancel the loading alert and continue working. If the option is not enabled, the < in the loading alert display is hidden, and the alert cannot be dismissed until the load is removed or properly centered.
Platform shape	Select either square or rectangular to define the platform shape. The selection made will modify the loading alert graphic.

Parameter	Settings
Orientation	<p>Rotate the scale image on-screen by the selected angle.</p> <p>Scale orientation on-screen should provide the operator with an intuitive understanding of the relationship between the loading alert display and the scale platform. E.g., if the #1 load cell is on the operator's side, and to the left, the correct selection is 0.</p> <p>Touch the information icon  to display an explanation of this function. In each case, the blue triangle labeled 1 represents the first load cell in the PowerDeck platform.</p>  <p>The following images show how the Orientation selection adjusts the Loading Alert display:</p>
0	
90	

Parameter	Settings
180	
270	

3.1.2.1.4 Leveling Guidance

The **Leveling Guidance** screen provides a real-time readout of count values for each load cell in the PowerDeck scale system. Values shown in the images below capture raw count values for scale platforms at Zero. In each case, the load cell with the lowest count is highlighted in cyan.



Figure 204: Leveling Guidance Screen, 4 Cells



Figure 205: Leveling Guidance Screen, 6 Cells

The information presented here allows the scale platform to be leveled more precisely than by traditional means. Shims may be used to level the scale so that the values shown on this screen are as close as possible to equal. The cyan highlight is used to determine which cell to shim first.

For further information about the use of this feature, refer to **Service and Maintenance**, [Leveling Guidance ▶ Page 283].

3.1.3 Precision Scale

3.1.3.1 Scale n

The Scales branch of the setup menu displays options for each scale (1 or 2, depending on how many interfaces are installed in the terminal) and for a Sum Scale.

When either scale is selected, two further options appear -- **ASM**, which provides access to all the scale configuration menus, and **Log or Transfer**, which determines whether and how each weighing operation is recorded or exported.

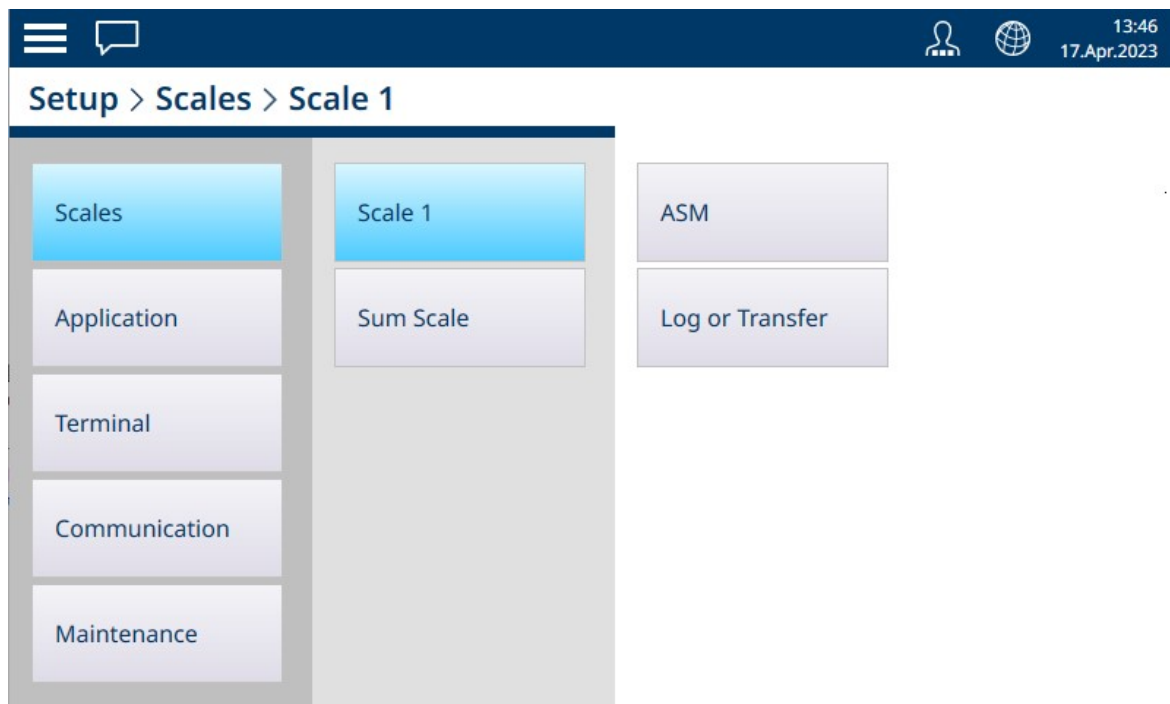


Figure 206: Scale n Menus, Precision

3.1.3.1.1 ASM

The Precision scale ASM shows the following menus:

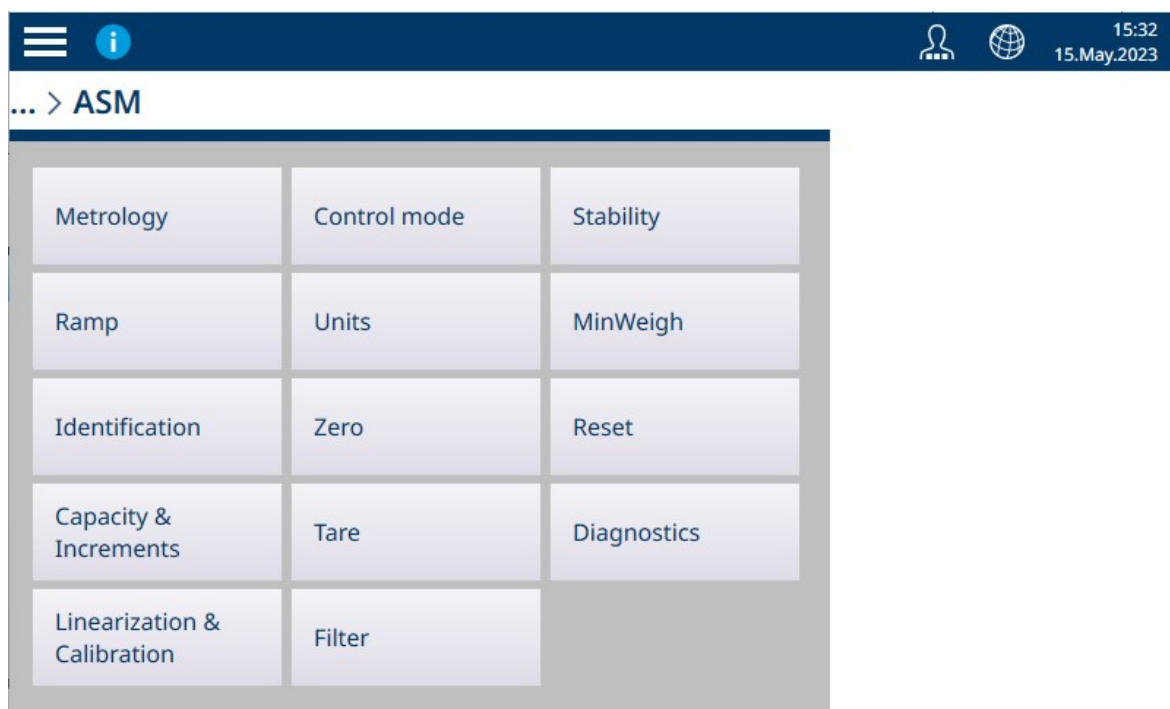
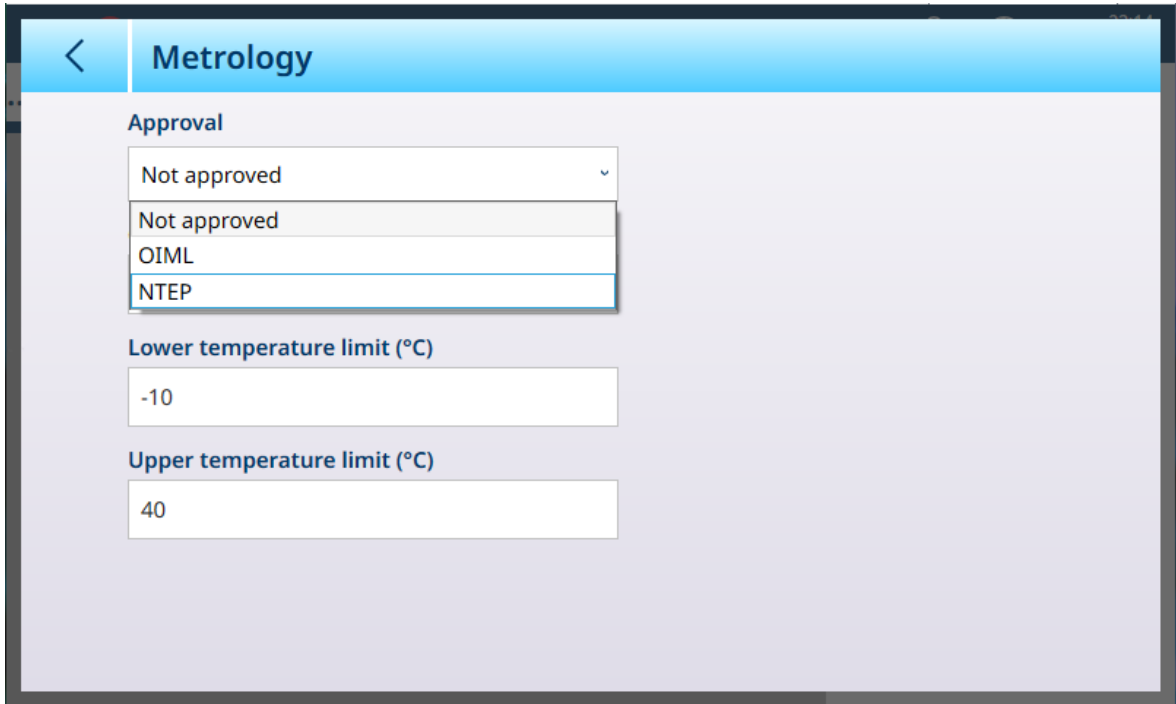


Figure 207: Precision Scale ASM Menus

Unlike HSALC and POWERCELL scale interfaces, the settings found in the Precision Scale ASM system are provided by, and configured on, the scale platform in use. Precision scales offer slightly different options from the other scale interfaces, and there are differences between different Precision platforms. The menu system shown here, and the settings described in this section, should be taken as examples.

Metrology

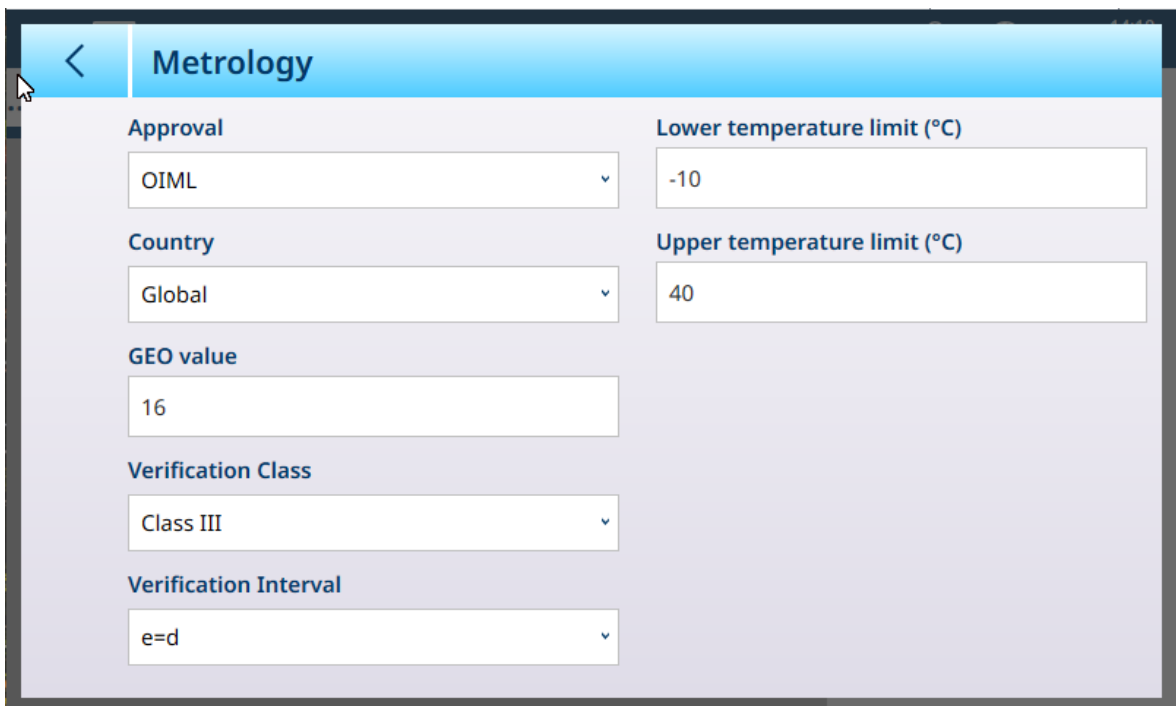
The Metrology screen allows the configuration of per-scale approvals and **GEO** values, as well as lower and upper operating **Temperature Limits**.



The screenshot shows the Metrology configuration screen. At the top, there is a blue header with a back arrow and the title "Metrology". Below the header, the "Approval" section has a dropdown menu that is open, showing three options: "Not approved", "OIML", and "NTEP". Below the approval dropdown, there are two input fields: "Lower temperature limit (°C)" with the value "-10" and "Upper temperature limit (°C)" with the value "40".

Figure 208: ASM - Metrology Screen

When an approval (**OIML** or **NTEP**) is selected, additional options are displayed.



The screenshot shows the Metrology configuration screen with the "Approval" dropdown menu set to "OIML". Below the approval dropdown, there are four more input fields: "Country" with the value "Global", "GEO value" with the value "16", "Verification Class" with the value "Class III", and "Verification Interval" with the value "e=d". The "Lower temperature limit (°C)" is still "-10" and the "Upper temperature limit (°C)" is still "40".

Figure 209: Approval Options

In addition to the GEO and temperature values, an approval requires the selection of **Country** and **Verification** values.

For both **OIML** and **NTEP** approvals, the **Country** options are **Global [default]**, Argentina, Australia, Korea, Thailand, and the **Verification Class** options are Class II, Class III, Class III L, Class III HD and Class III.

When the device has been set as Approved -- either OIML or NTEP -- and the metrological sealing screw has been installed, the fields on this page are greyed out and cannot be modified.

Precision Scale: Ramp

Ramp is the output of the load cell installed in the scale platform. The value shown is a percentage of the load cell's output in the scale system. If the ramp value shows an increase, this means that the load cell is detecting force on the scale. This value is used to adjust the load cell parameters as part of the whole platform. This information is available in METTLER TOLEDO PBK and PBD platforms.

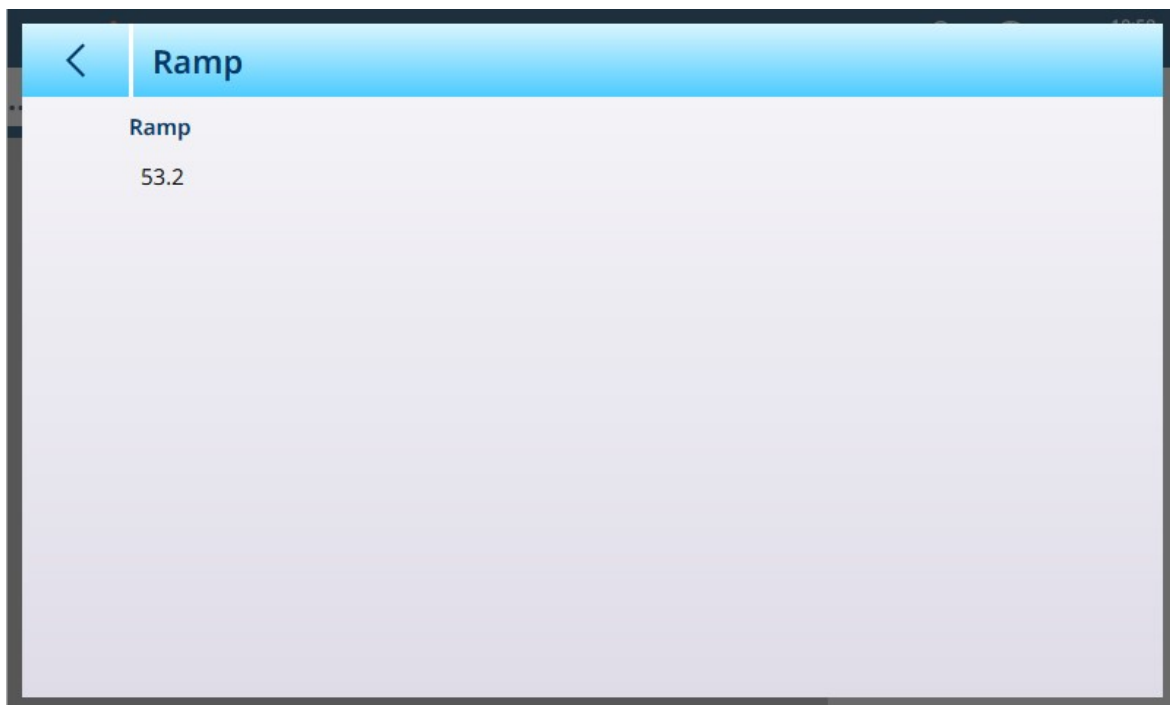


Figure 210: Ramp Screen

Identification

The **Identification** screen allows the scale's **Serial number**, **Scale model** and **Scale location to** be defined. It also provides an additional **Scale Identification** field. For analog scales, these fields are optional and must be completed manually. Touching any of the fields opens an alphanumeric entry dialog.

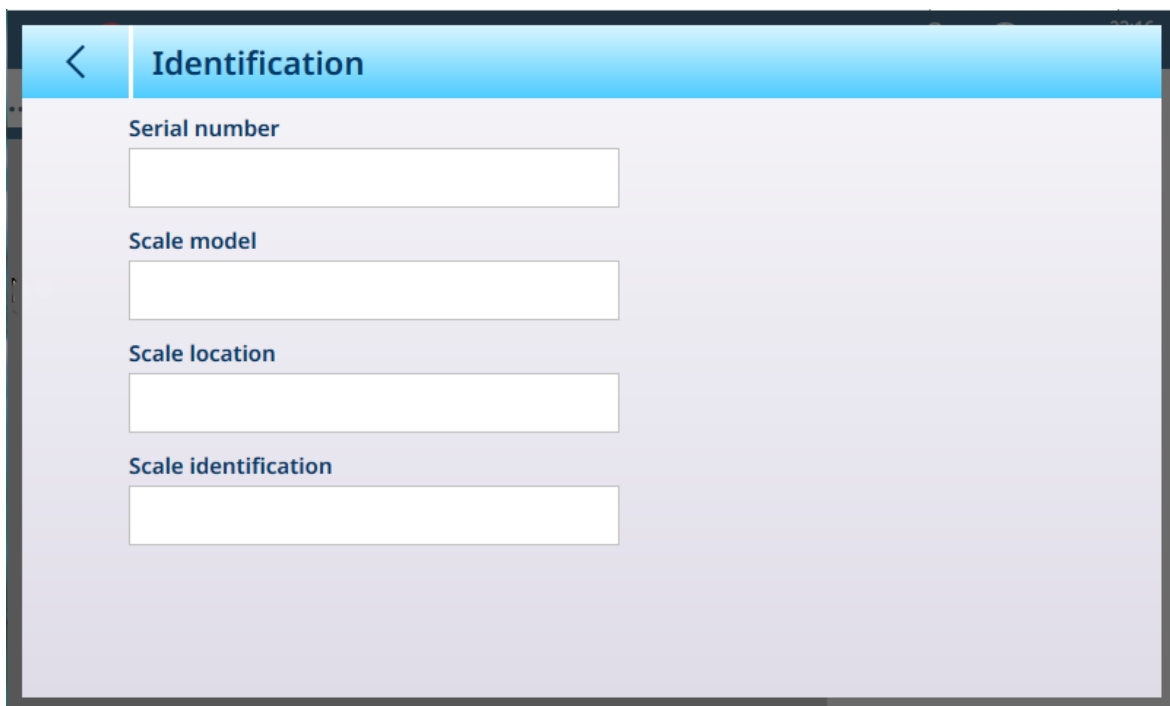


Figure 211: Identification

Precision Scale: Capacity and Increments

Capacity and increment values allow the weighing parameters to be set for each of a series of scale setups, depending on the **# ranges** value:

- Single range
- 2 multi interval
- 2 multi range
- 3 multi interval
- 3 multi range

The value selected here will affect the function of the Linearization and Calibration screens.

The figure below shows the default **Single range** selected.

The screenshot shows a configuration screen titled "Capacity & Increments". It features a blue header with a back arrow on the left. The main content area is light gray and contains several configuration fields:

- # ranges**: A dropdown menu with "Single range" selected.
- Capacity conversion**: A dropdown menu with "Fixed number of increments" selected.
- Primary unit**: A dropdown menu with "kg" selected.
- Capacity 1**: A text input field containing the value "10".
- Resolution 1**: A dropdown menu with "0.005" selected.
- Blank over capacity (d)**: A text input field containing the value "9".

Figure 212: Precision Scale ASM - Capacity and Increments Screen

If either multi interval or multi range is selected, additional **Capacity** and **Resolution** fields display. The **Blank over capacity** field is always displayed last, and determines the weight value beyond scale capacity, measured in display increments, at which the terminal blanks the weight display..

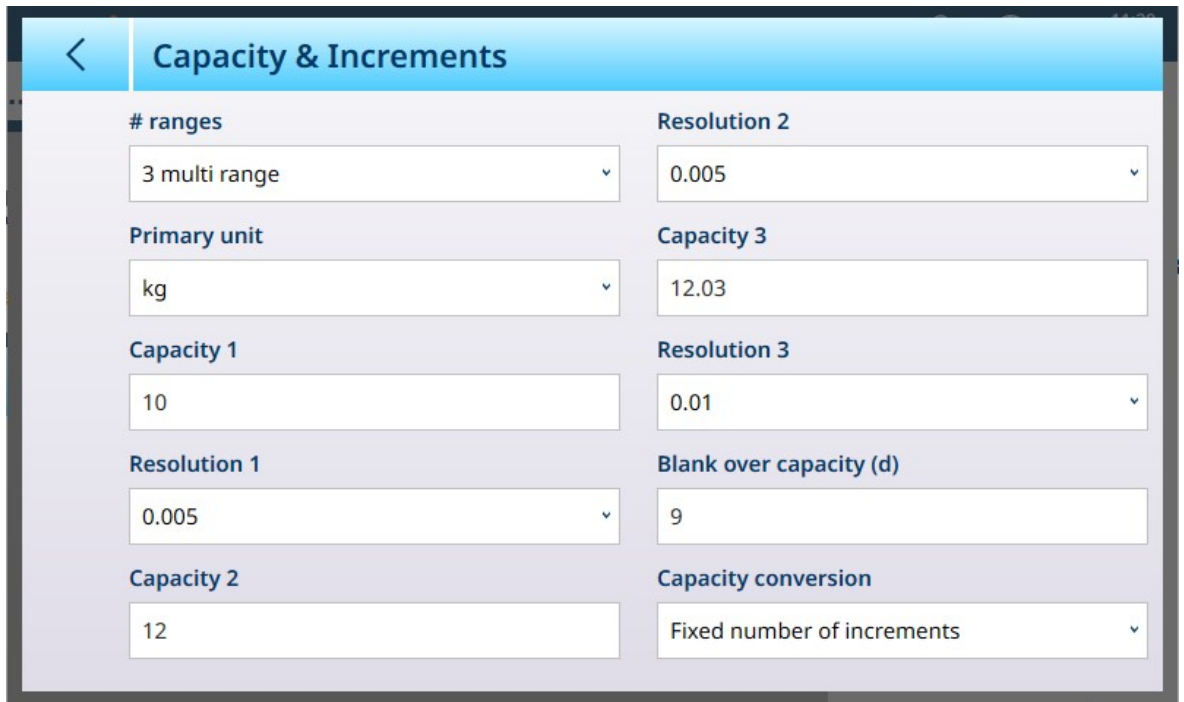


Figure 213: Precision Scale ASM - Capacity and Increments Screen with Multi-Range Fields Displayed

If **3 multi interval** or **3 multi range** is selected, two sets of capacity and resolution fields are added.

Capacity conversion is used in Precision scales with NTEP approval, when metric and avoirdupois units are used in parallel.

The following options are available from the drop-down list:

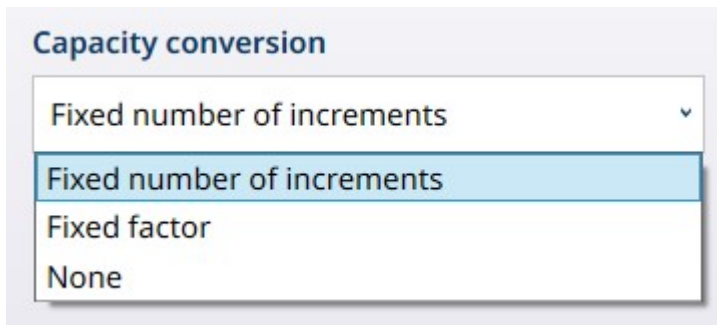


Figure 214: Capacity Conversion Options

Capacity Conversion Parameters

Setting	Purpose
Fixed number of increments	A legacy mode, not used in the IND700 terminal.
Fixed factor	The Weights and Measures line on the main screen displays Cap and d in the same unit as the weight value unit. Conversions are performed by the attached scale.
None	Used for non-approved systems. The Weights and Measures line on the main screen displays the unit configured as primary. Overload and range change occur at the same actual load on the scale.

Multi-Range and Multi-Interval Weighing



NOTICE

Precision Scales and Multi-Range, Multi-Interval Operation

PBK and FPK scale platforms support both multi-range and multi-interval operation. PDB platforms support only multi-range operation.

Both **Multi-Range** and **Multi-Increment** settings allow a scale to be used to weigh two or more types of item which differ significantly in weight. Each weight range can have its own **Capacity** and **Resolution** values, so that one scale can behave like two or more different scales.

For instance, for small and light items a finer resolution might be required, while for large and heavy items a coarser resolution is adequate. The scale changes the display increment size at the **Capacity** points defined in this screen. In the example shown here, three ranges are defined -- up to 50 kg, up to 500 kg, and up to 1,000 kg.

Figure 215: Capacity & Increments Screen Configured for Three Ranges

In **Multi-Range** mode, the range currently in use appears on screen beside the weigh mode (B/G or Net) indicator -- **>I1<**, **>I2<**, **>I3<** -- depending on how many ranges are configured.

The increment sizes, or **Resolutions**, are set to **0.01**, **0.5** and **1**, respectively. Thus, for items weighing up to 50 kg, the weight display will increment in 100 gram steps; between 50 kg and 500 kg of scale weight, the display will increment in half-kilogram steps; and for items weighing over 500 kg the resolution is reduced by a factor of 10 compared to the lowest range, and increases in 1 kg steps.

There is one significant difference between **Multi-Range** and **Multi-Interval** configurations, affecting how the terminal behaves as scale weight is reduced:

- Multi-Range: When scale weight is reduced, the terminal continues to display the Resolution size for the largest configured range.
- Multi-Interval: When scale weight is reduced, the display conforms to the configured intervals and shows Resolution sizes corresponding to current scale weight

In both cases, the terminal resets the display to the **Resolution** for the lowest range when the weight falls to zero.

Display

The two modes also differ in the way the IND700 indicates the capacity and increment settings for the displayed scale.

- Multi-Range: The terminal's metrology line cycles through a display of both capacity and increment for each configured range in sequence -- W1 Max 50 kg d = 0.1 kg , W2 Max 500 kg d = 0.5 kg , W3 Max 1 t d = 1 kg
- Multi-Interval: The terminal's metrology line cycles through a display of capacities for each configured range, and then increments for each -- Max 50 / 500 / 1 t , d = 2 / 500 / 1000 g

Example

The following diagram illustrates the distinction between Multi-Range and Multi-Increment modes, showing the behavior of the terminal configured as in the screen shown above, during one weighing operation:

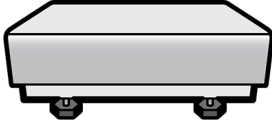

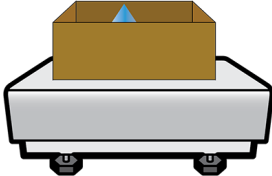

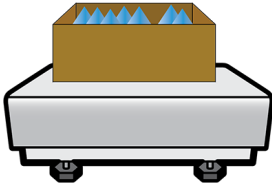

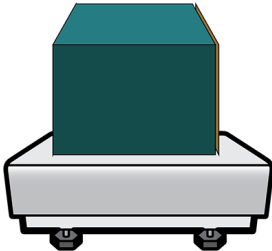

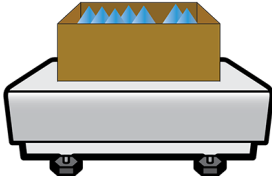



	Scale Status	Display Status	Resolution, Multi-Range	Resolution, Multi-Interval
1			0.002 kg >|1|<	0.002 kg
2			0.002 kg >|1|<	0.002 kg
3			0.05 kg >|2|<	0.05kg
4			1 kg >|3|<	1 kg
5			0.002 kg >|2|<	1 kg
6			0.002 kg >|1|<	0.002 kg

Figure 216: Multi-Range vs Multi-Interval



NOTICE

Scales with Multiple Ranges or Multiple Intervals have specific Approval requirements.

Precision Scale: Linearization and Calibration

The **Linearization and Calibration** menu offers five sub-menus.

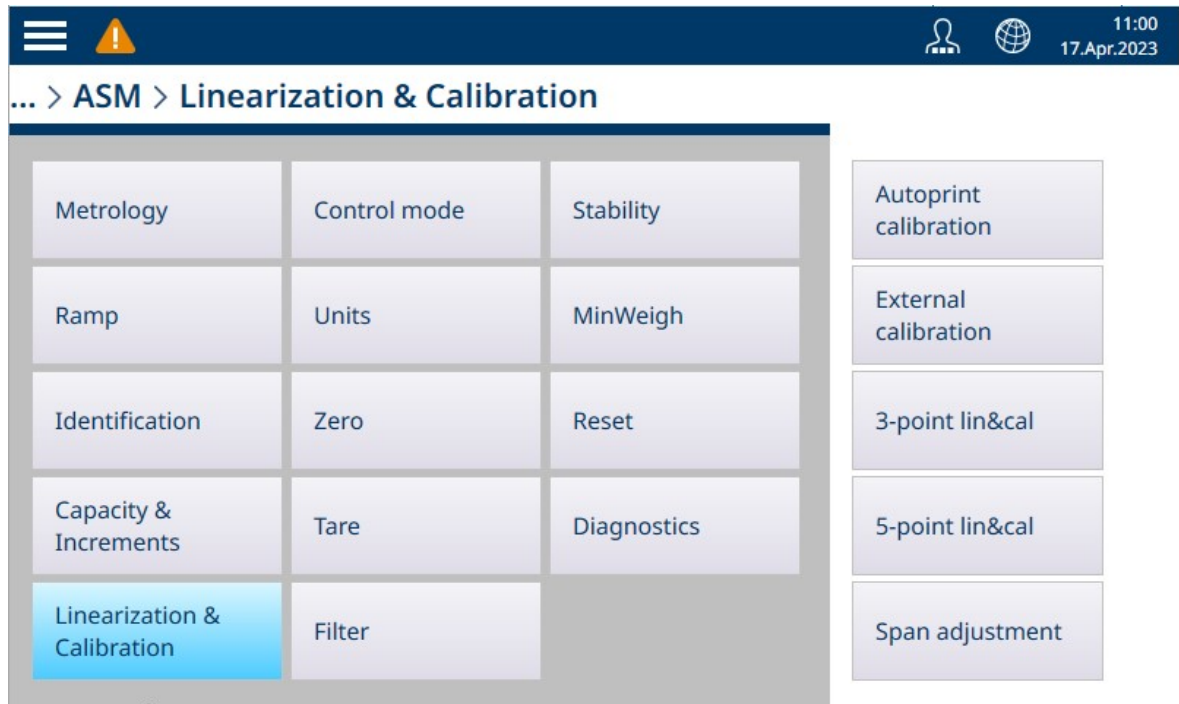


Figure 217: Precision Linearization and Calibration Menus

Autoprint Calibration

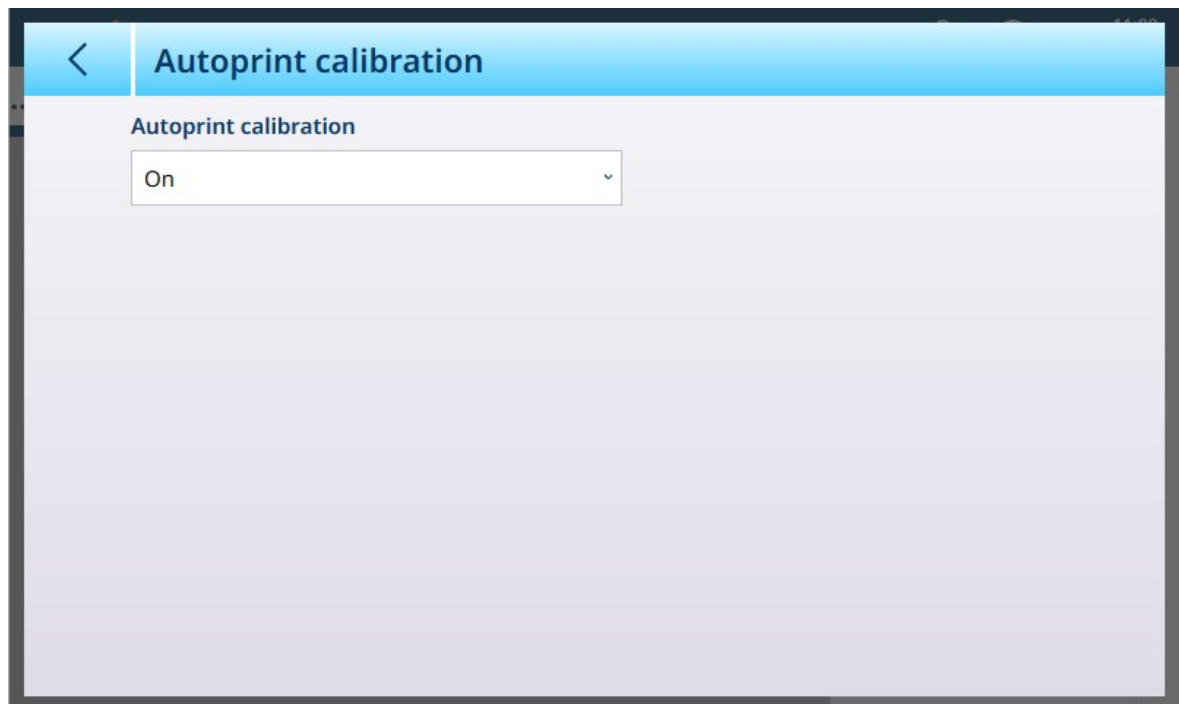


Figure 218: Autoprint Calibration Screen

Autoprint calibration can be **On** [default] or Off. **FUNCTION??**

External Calibration

The Precision Scale **External calibration** screen allows a standard calibration routine using test weights to be performed.

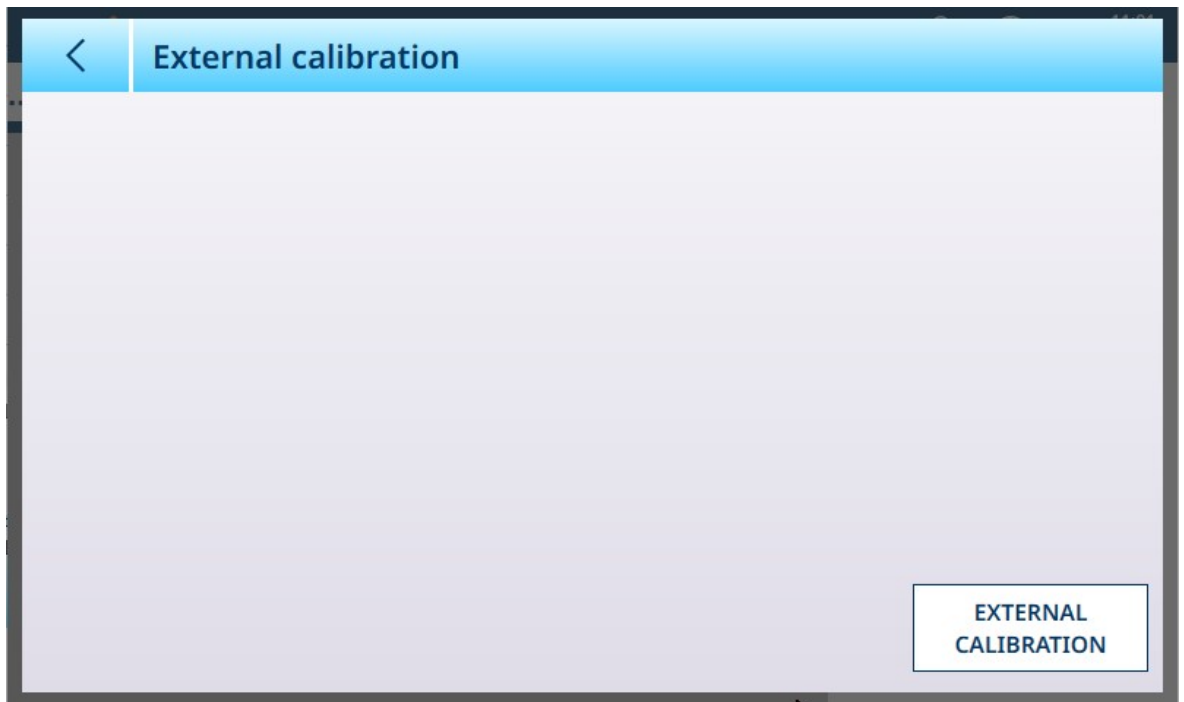


Figure 219: Precision Linearization and Calibration External Calibration Screen

Touch the EXTERNAL CALIBRATION button to start running the calibration routine. The number of steps performed during this process depends on the number of intervals or ranges specified in the [Capacity and Increments ▶ Page 146] screen.

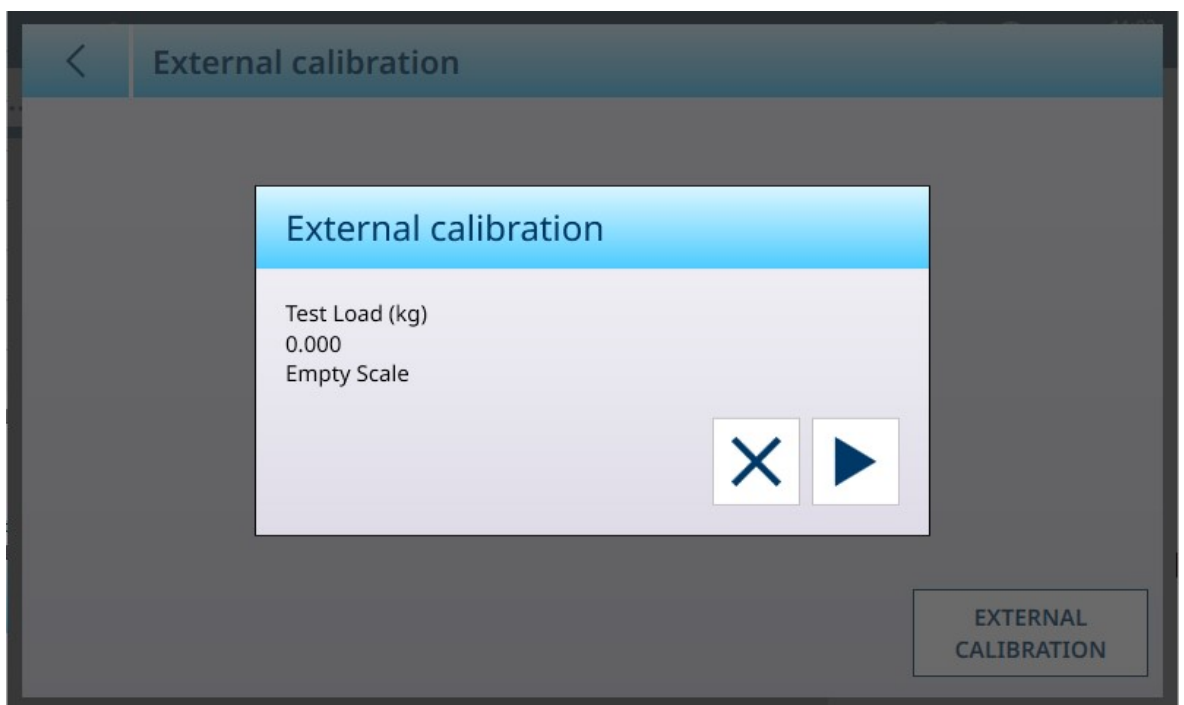


Figure 220: Precision External Calibration in Progress - Example Screen

3- and 5-Point Linearization and Calibration

The number of points selected determines the number of calibrations taken between the scale's zero and span (highpoint) values. Depending on this setting, linearization may require as many as four intermediate measurements.

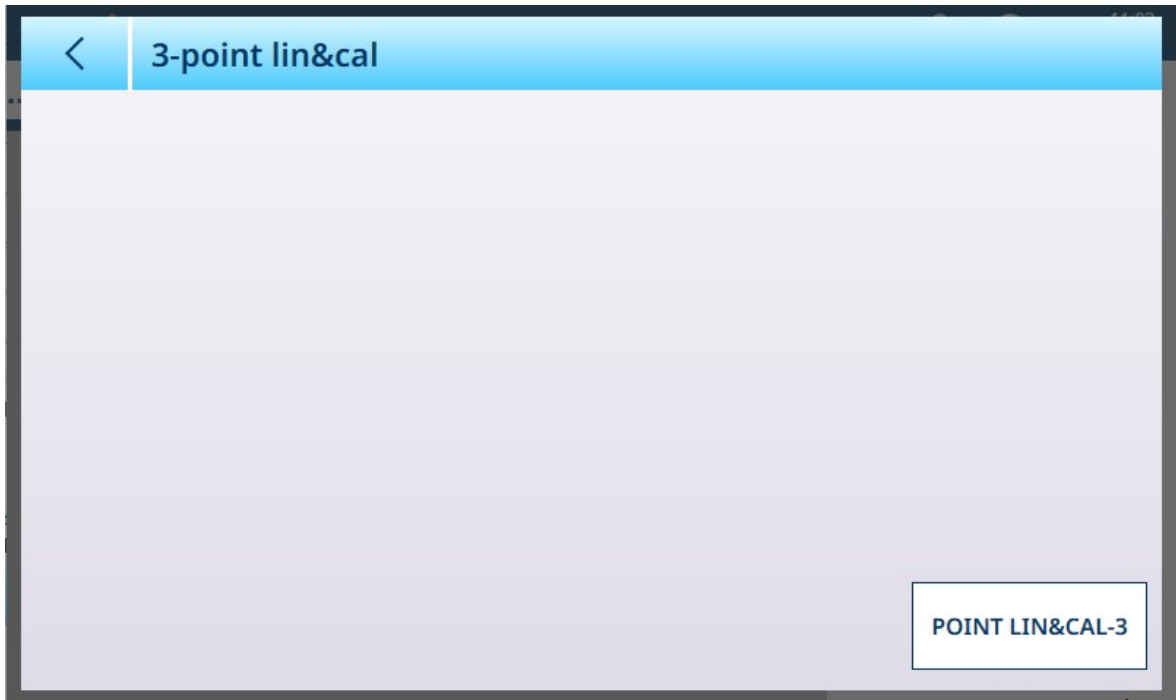


Figure 221: 3-Point Linearization and Calibration Screen

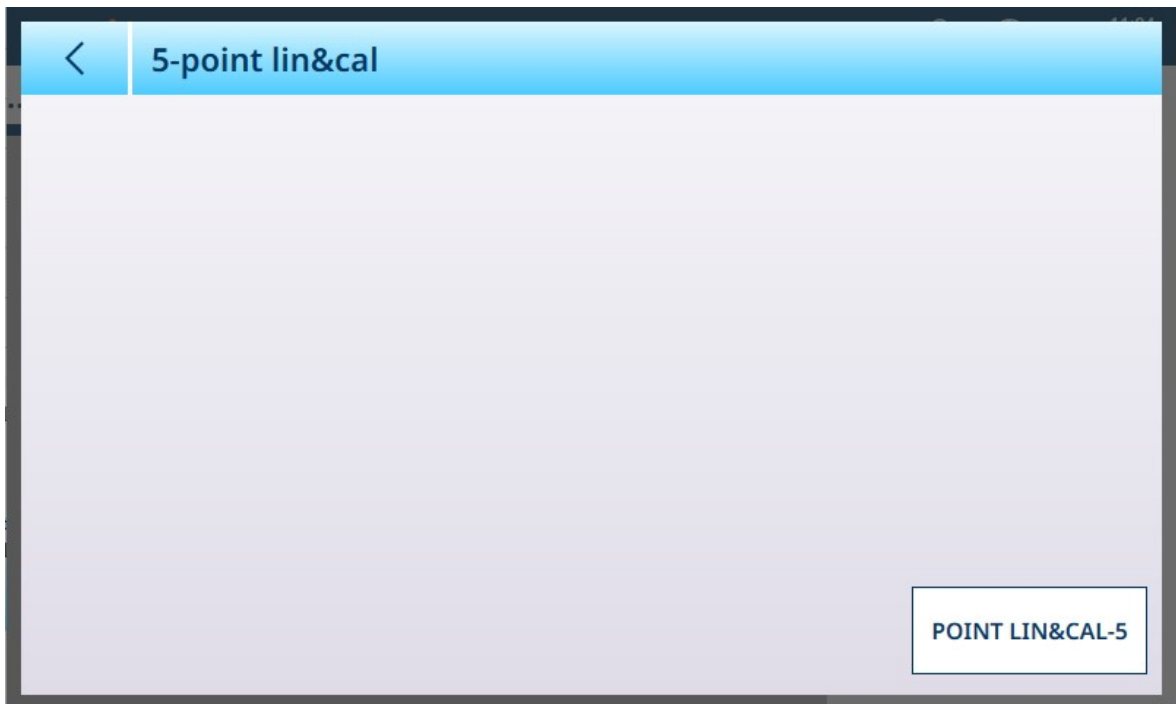


Figure 222: 5-Point Linearization and Calibration Screen

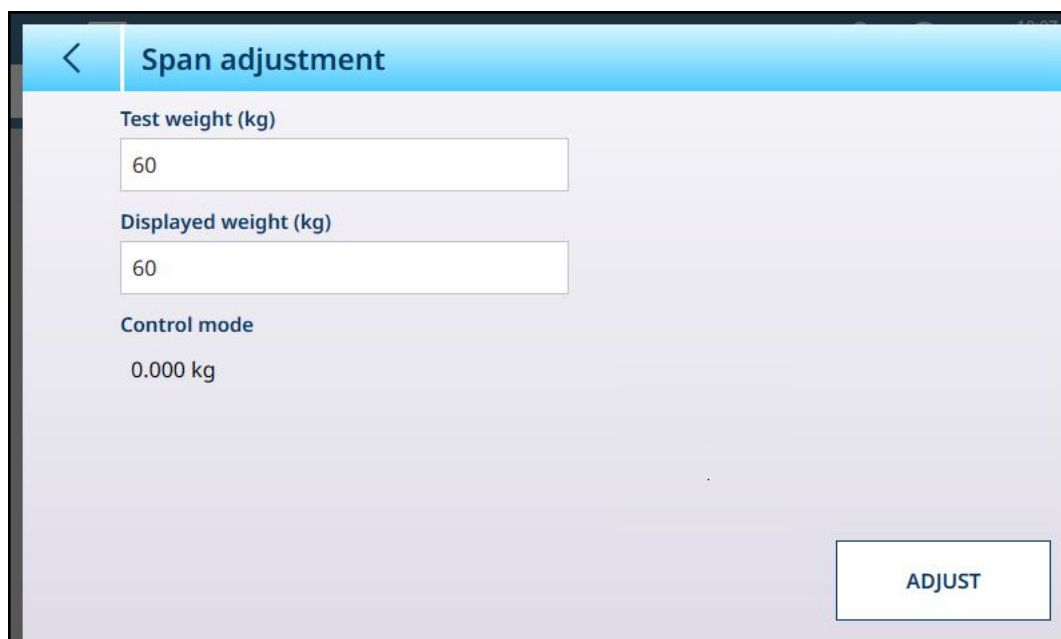
Touch the button at lower right to start the linearization and calibration process. The number of steps varies depending on how many intermediate measurements are required for linearization.

See also

[Precision Scale: Capacity and Increments](#) ▶ Page 146

Span Adjustment

The Span adjustment screen permits the scale's whole span to be defined. The units used for the parameters entered here are the Primary Unit set on the Capacity and Increments page.



The screenshot shows a mobile application interface for 'Span adjustment'. At the top, there is a blue header bar with a white back arrow on the left and the text 'Span adjustment' in white. Below the header, the background is light gray. There are three input fields: 'Test weight (kg)' with a white box containing '60', 'Displayed weight (kg)' with a white box containing '60', and 'Control mode' with the text '0.000 kg' below it. In the bottom right corner, there is a white button with a blue border and the text 'ADJUST' in blue.

Figure 223: ASM - Linearization and Calibration - Span Adjust

Enter the calibration test weight value in the **Test weight** field.

Enter the current weight reading from the scale, as shown in the **Control mode** display, in this field. The terminal will account for any difference between the test weight and the weight shown on screen, and adjust the displayed weight accordingly. Perform this adjustment before carrying out the linearity adjustments from the [Calibration ▶ Page 80] screen.

Note that the **Control mode** field is read-only, and displays the current scale weight.

To perform the span adjustment, place the test weight on the scale and touch **Adjust**. A message will appear to indicate that the adjustment is complete, and the **Control mode** will change to reflect the offset, displaying a corrected value.

See also

[Precision Scale: Capacity and Increments ▶ Page 146](#)

Control Mode

The **Control mode** screen shows the current scale weight. This is useful for viewing the weight reading during setup and diagnostics without leaving the setup menu system.



Figure 224: Control Mode Screen

Precision Scale: Units

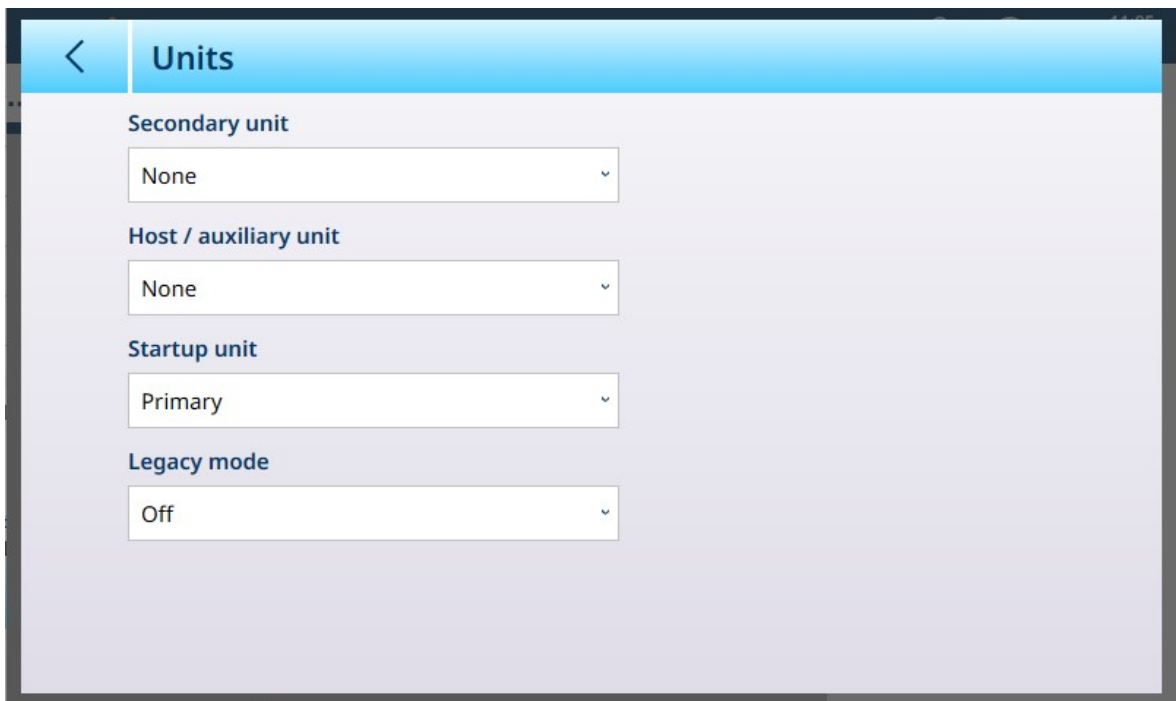


Figure 225: Precision Scale Units Screen

Units Settings

Parameter	Options	Function
Secondary unit	g, kg, t, lb, oz, ton	Sets the Secondary unit .
Host / auxiliary unit	g, kg, t, lb, oz, ton	Sets unit type for Host / auxiliary unit . The Host / auxiliary unit
Startup unit	Primary [default] , Use Last	Determines whether, when the terminal is restarted, the weight is displayed using the Primary unit, or in the unit most recently selected (e.g. secondary unit).

Legacy mode	Off [default], Version 2	This parameter is not used in IND700
-------------	-------------------------------------	--------------------------------------

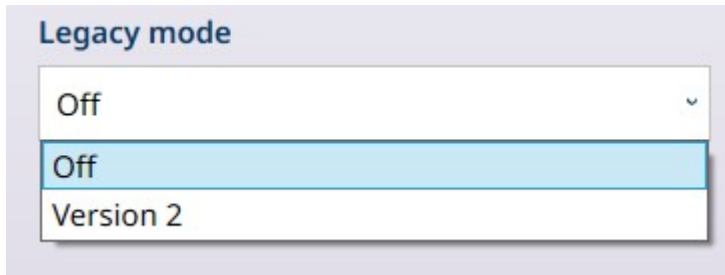


Figure 226: Precision Scale Units: Legacy Mode Options

Precision Scale: Zero

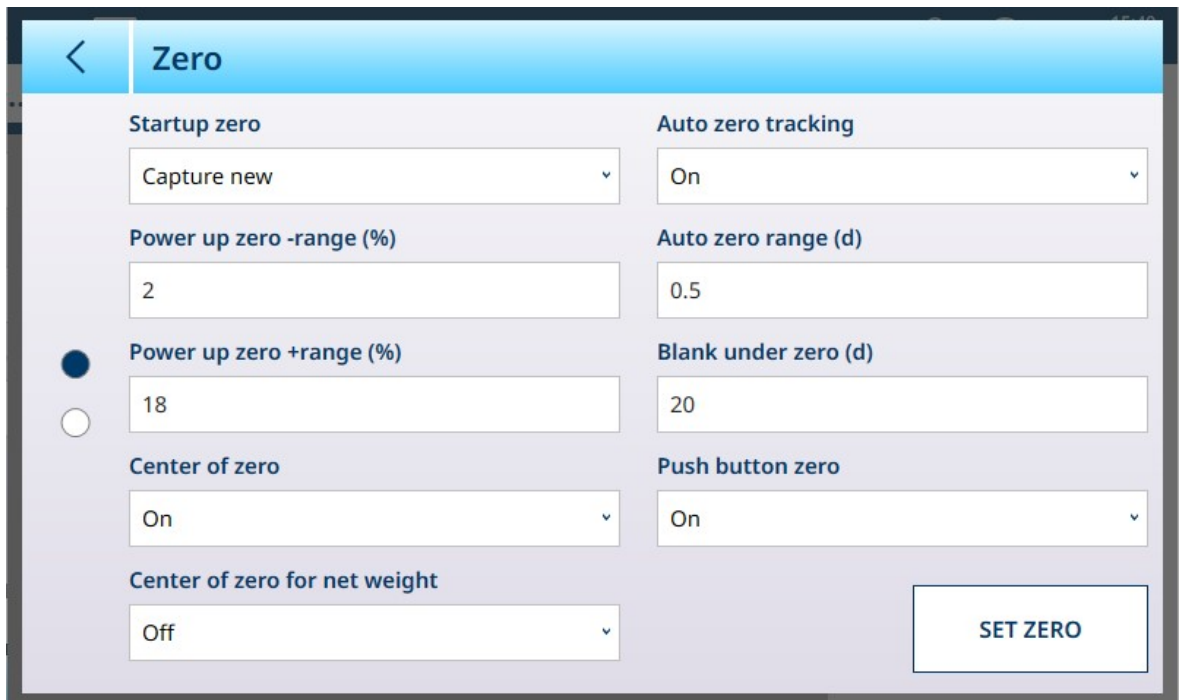


Figure 227: Precision Scale Zero Screen, Page 1

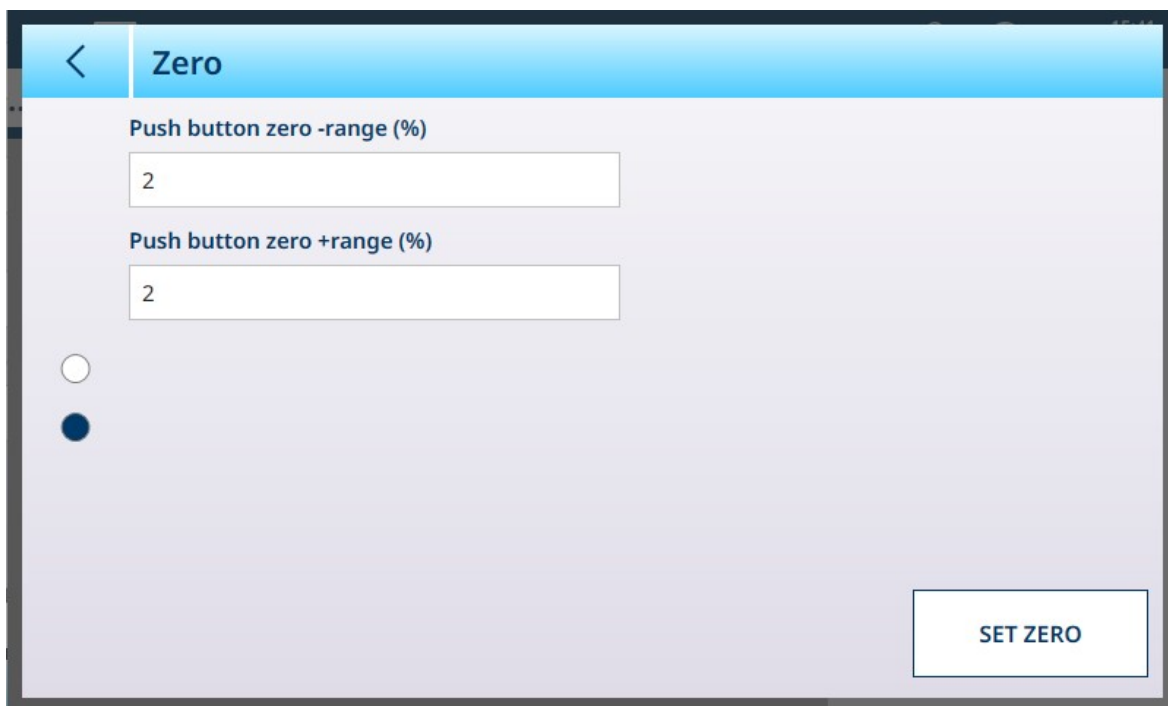


Figure 228: Precision Scale Zero Screen, Page 2

Zero Settings

Parameter	Options	Function
Startup zero	Capture new [default] , Use last	Determines how the scale handles zero when it is restarted.
Power up zero -range (%)	Opens a numeric entry dialog; default value is 2%	These parameters appear if Startup zero is set to Capture new . Values define the range within which the terminal, at power up, will automatically zero the scale. If scale weight is outside the configured range, Startup zero will not execute.
Power up zero +range (%)	Opens a numeric entry dialog; default value is 18%	
Center of zero	Off [default], On	When enabled, the >0< indicator will appear on screen when the scale gross weight is at zero.
Center of zero for net weight	On [default], Off	When enabled, the >0< indicator will appear on screen when the scale net weight is at zero.
Auto zero tracking	On [default] , Off	Auto zero tracking is an automatic zero maintenance function which tracks zero when the scale is empty, and compensates for conditions such as terminal or load cell drift, or slow debris buildup on a scale platform.
Auto zero range (d)	Opens a numeric entry dialog; default value is 0.5	Determines the range, in scale display units, within which Auto zero will be active.
Blank under zero (d)	Opens a numeric entry dialog; default value is 20	Determines the sub-zero point, in scale display units, at which the terminal will blank its weight display.
Push button zero	On [default] , Off	When On , the terminal's zero softkey can be used to set the terminal to zero, if the current scale weight value is within the range defined by the -range and +range values.
Push button zero -range (%)	Opens a numeric entry dialog; default value is 2 .	Refer to Push button zero , above.
Push Button zero +range (%)	Opens a numeric entry dialog; default value is 2 .	Refer to Push button zero , above.

Precision scale: Tare

The parameters available on this screen change depending on the **Auto tare mode**, **Auto tare reset mode** and **Auto clear tare** settings. The screen below shows these parameters all set to **On**.

Figure 229: Precision Scale Tare Screen

Parameter	Options	Function
Startup tare	Use last [default] , Clear	Determines whether an existing tare value is preserved at system restart, or cleared.
Auto tare mode	Off [default] , On	Determines whether the terminal will automatically take a tare once the Auto tare threshold value is exceeded. An auto tare is cleared once the weight value falls below the Auto tare reset threshold .
Auto tare threshold (kg) [if Auto tare mode = On]	Displays a numeric entry dialog. Default is 0.	Refer to Auto tare mode , above.
Auto tare reset mode [if Auto tare mode = On]	Off [default] , On	Determines whether tare is reset according to the value defined in Auto tare reset threshold .
Auto tare reset threshold (kg) [if Auto tare reset mode = On]	Displays a numeric entry dialog. Default is 0.	Refer to Auto tare mode , above.
Chain tare mode	Off [default] , On	When Chain tare mode is ON, it is possible to take multiple tares in sequence by touching the Tare softkey – for example, when filling multiple similar containers on a pallet. Once one container is filled, touch Tare again to reset the scale to Net zero.
Auto clear tare	Off [default] , On	Determines whether the terminal will preserve a tare value when scale weight returns to zero, or automatically clear it when the weight value falls below the Auto clear tare threshold .
Auto clear tare threshold (kg) [if Auto clear tare = On]	Displays a numeric entry dialog. Default is 0.	Refer to Auto clear tare , above.

Push button tare	On[default] , Off	When Push button tare is On , the Tare softkey on the home screen is functional. Touch this softkey to create a tare value based on an empty container on the scale. The terminal then shows a zero weight and indicates that it is Net mode. When the container is filled, the terminal shows the net weight of the contents.
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Precision Scale: Filter

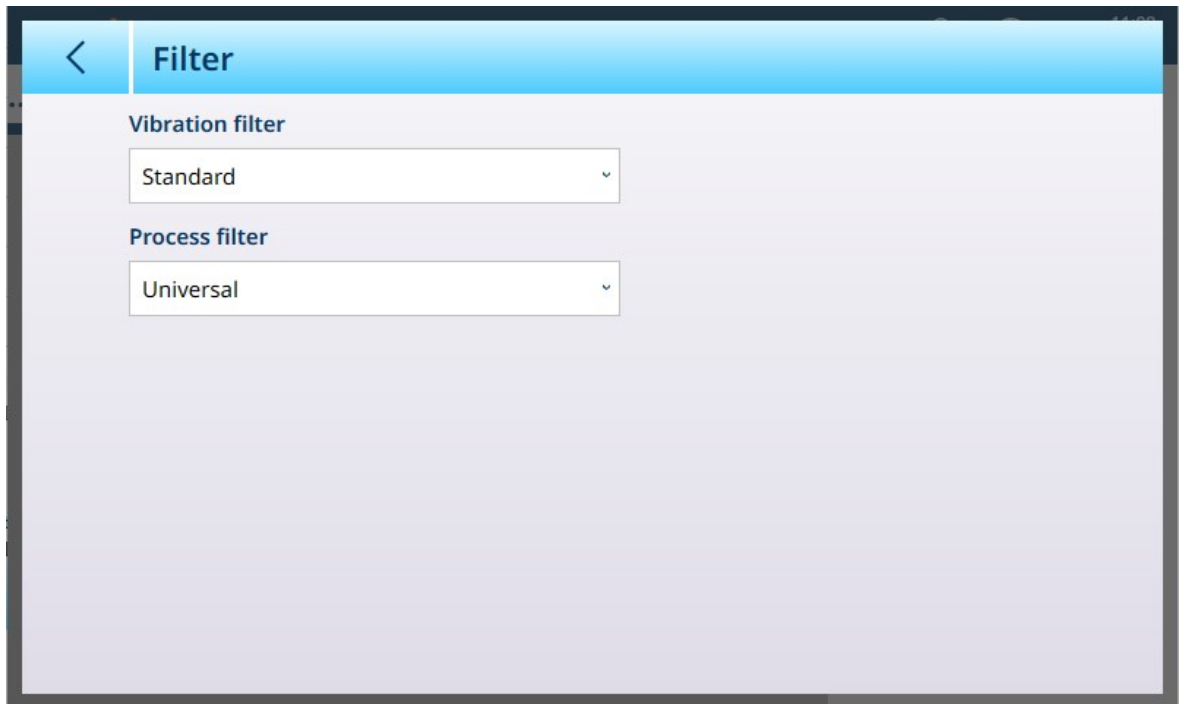


Figure 230: Precision Scale Filter Screen

Parameter	Options	Function
Vibration filter	<p>Vibration filter</p> <p>Standard</p> <p>Stable</p> <p>Standard</p> <p>Unstable</p>	<p>By default, the Vibration filter is set to Standard. This parameter is used to adapt the scale to ambient conditions. This setting determines how rapidly the scale will settle on a weight value when vibration is present.</p> <p>Stable: the scale works very rapidly, but its accuracy is extremely sensitive to external influences.</p> <p>Unstable: the scale works slowly, but its accuracy is relatively unaffected by external influences.</p>
Process filter	<p>Process filter</p> <p>Universal</p> <p>Universal</p> <p>Absolute</p>	<p>This parameter allows the scale to adapt to the weighing process in use.</p> <p>Universal: this setting is used for normal, transaction weighing.</p> <p>Absolute (Dosing): This setting is used for extreme conditions, such as when extreme vibration is present, or when the scale is measuring a filling process.</p>

See also

[Precision Scale: Stability](#) ▶ Page 159

Precision Scale: Stability

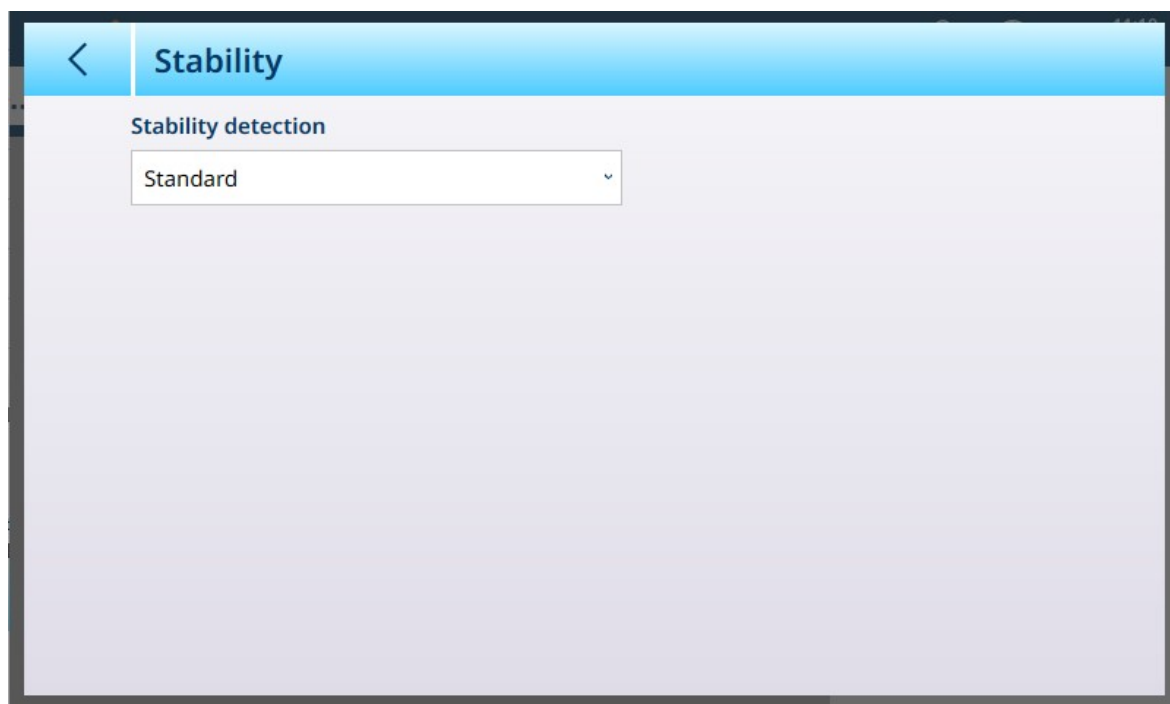


Figure 231: Precision Scale Stability Screen

Parameter	Options	Function
Stability detection	<p>Stability detection</p> <p>Standard</p> <p>Fast</p> <p>Standard</p> <p>Precise</p>	<p>The stability detection parameters determine the update rate of the displayed weight value. The appropriate update rate is related to the scale's stability. A Precise update rate will reflect smaller effects on scale stability, while a Fast rate will ignore small fluctuations and permit a transaction to proceed. For environments where external factors such as floor vibration do not disturb the scale, the Precise option can be selected. In noisy environments the Fast option ensures that the weighing process can continue despite some scale instability. In most circumstances, the Standard option is appropriate, unless scale instability interrupts the ability to perform a transaction.</p> <p>Note that this parameter does not [filter ▶ Page 158] vibration; it simply decides how the terminal's display responds to the vibration.</p>

MinWeigh

Certain industries such as pharmaceuticals and food processing require a guarantee that the weighing equipment selected for a particular measurement is adequate for the task. One way to ensure that appropriate weighing equipment is selected is by the creation and use of a minimum weight value (MinWeigh), below which a particular piece of weighing equipment cannot be used.

The MinWeigh function compares the current weight with the programmed MinWeigh value. In the configuration screen shown below, MinWeigh has been enabled and its value set to 1 kg.

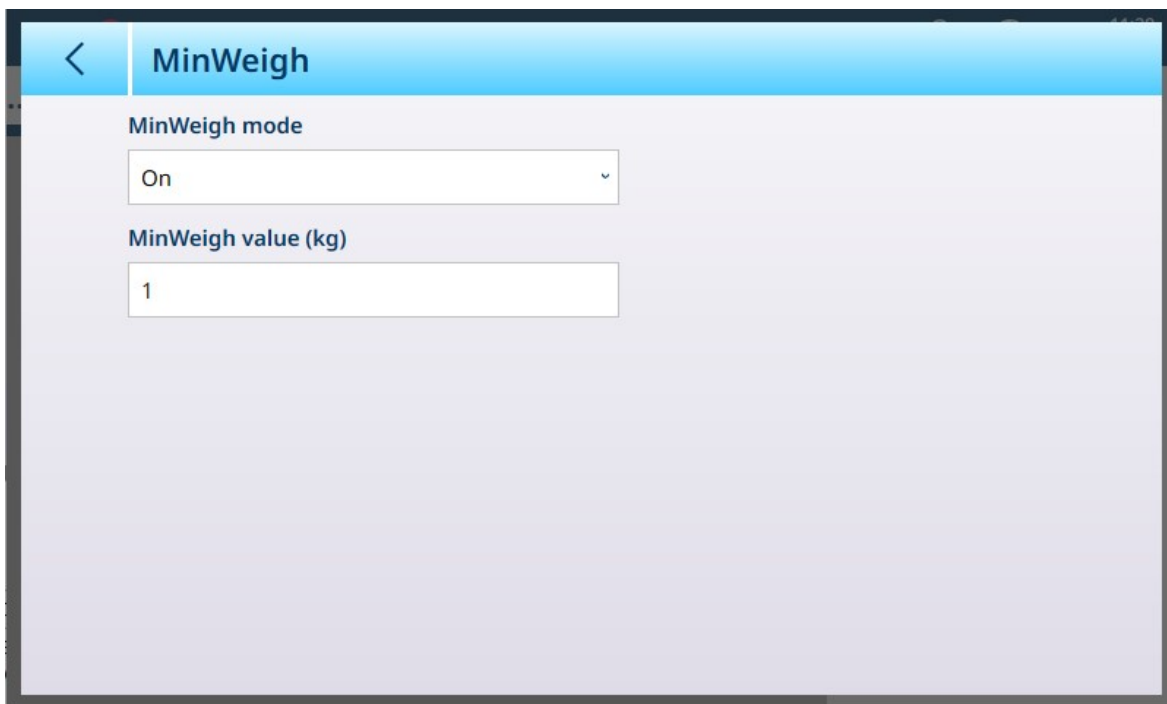
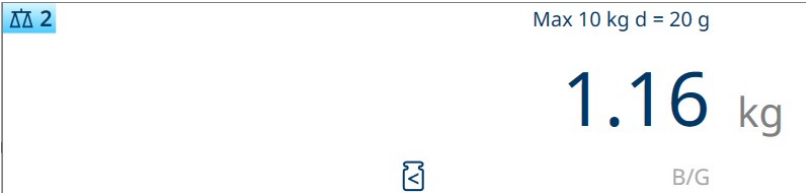



Figure 232: MinWeigh Setup Screen

Parameter	Options	Function
MinWeigh Mode	On [default] , Off	If the displayed weight (B/G or NET) is greater than or equal to the MinWeigh value , the MinWeigh symbol appears below the weight display, to the right of the tare display. All terminal functions behave normally.  When the absolute value of the net weight is less than the MinWeigh value, the MinWeigh symbol flashes in red  .
MinWeigh value (kg)	Displays a numeric entry dialog. Default value is 0	This field displays if MinWeigh mode is set to On . The unit is the default unit set

Reset



NOTICE

Scale Branch Reset

Note that this Reset function refers only to parameters configured in the currently selected setup branch. For general Terminal reset options, refer to [Reset ▶ Page 264].

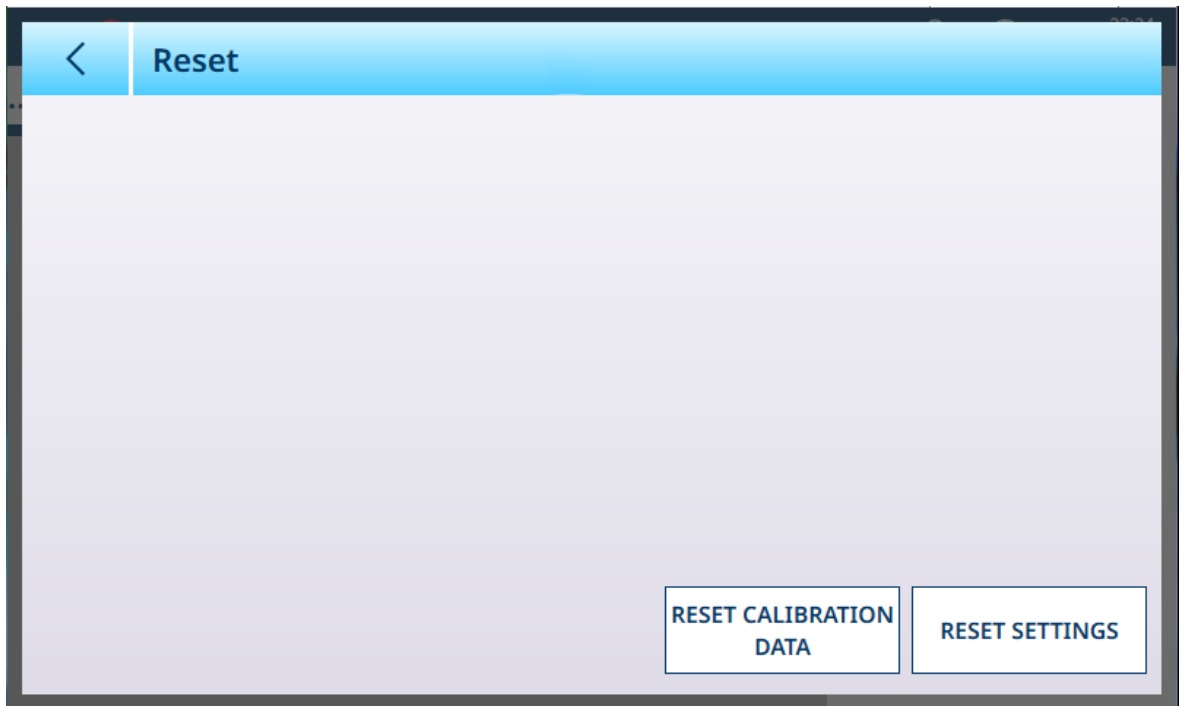


Figure 233: Scale Reset Options

This screen allows the user to reset either calibration data or settings. If settings is selected, calibration data are preserved. In either case, a confirmation dialog will appear and the operation can be continued or cancelled.

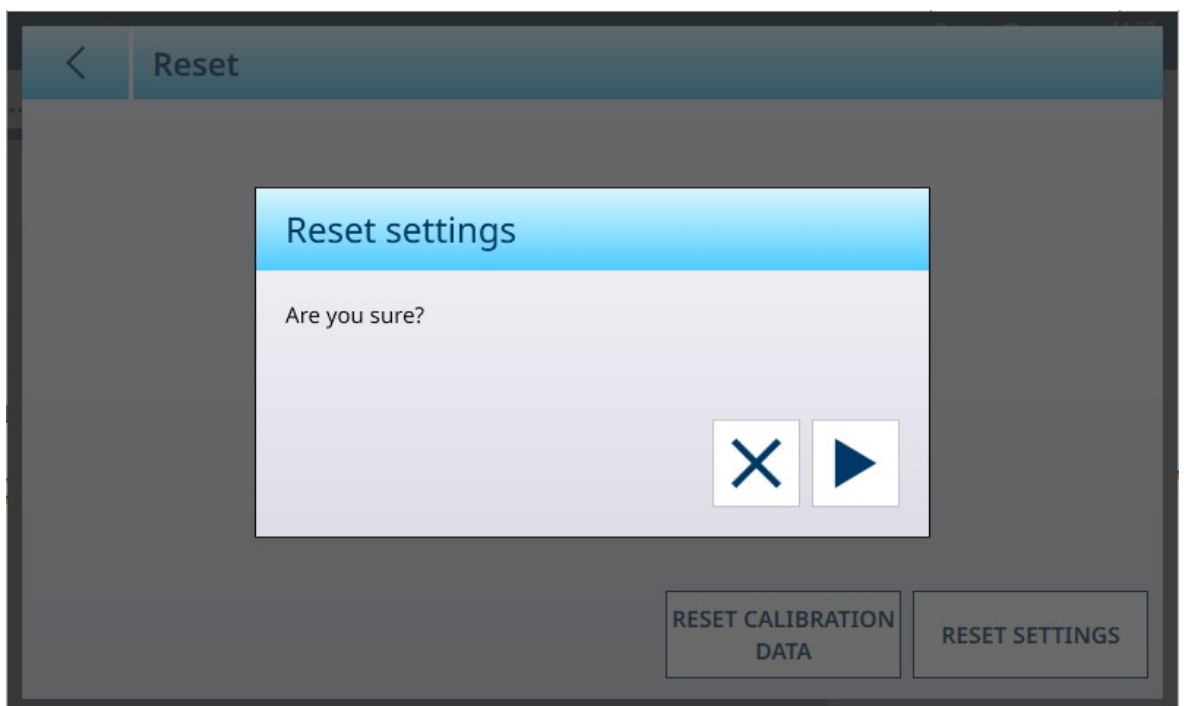


Figure 234: Reset Confirmation Dialog

3.1.3.1.2 Log or Transfer

The Log or Transfer menu sets the conditions which determine how and when a demand output is triggered. Normal demand mode transfer occurs whenever a transfer request is made, depending on the options selected here, and providing there is no motion on the scale and the weight is above gross zero (a negative gross weight will not be printed).

Data is sent to:

- Interfaces for which the Connection has been defined as Transfer
- The Alibi Table
- The Transaction Table

Weight values shown on this screen are gross weights in primary units.

When **Log or Transfer** is selected from the Scale n menu options, a default configuration screen appears, with no options selected.

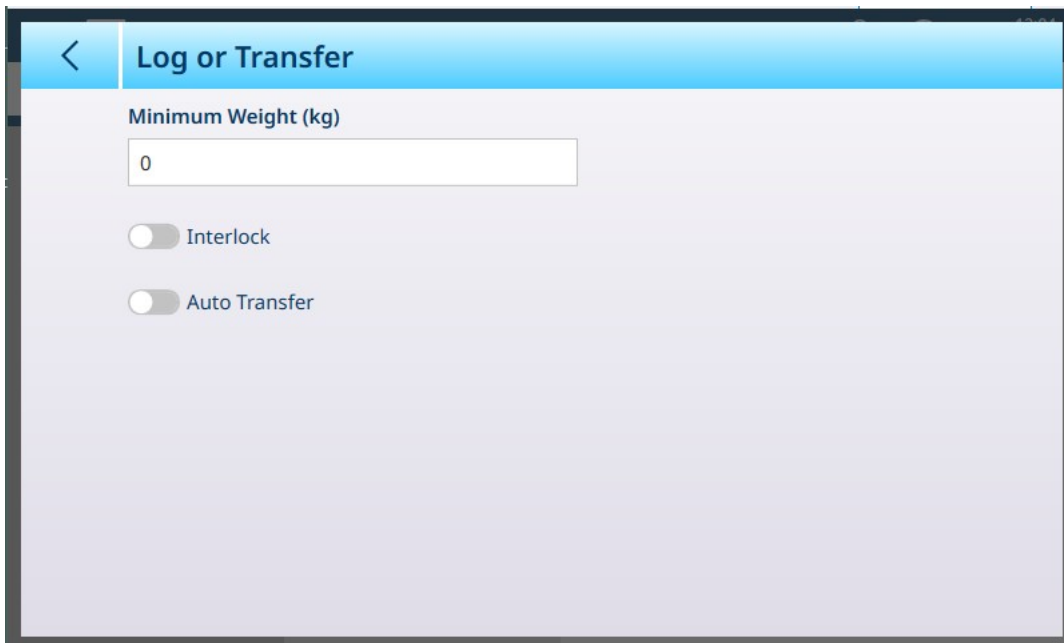


Figure 235: Log or Transfer Screen, Default View

Additional fields appear depending on the initial selections for **Interlock** and **Auto Transfer**. The follow illustration shows the menu with all options selected.

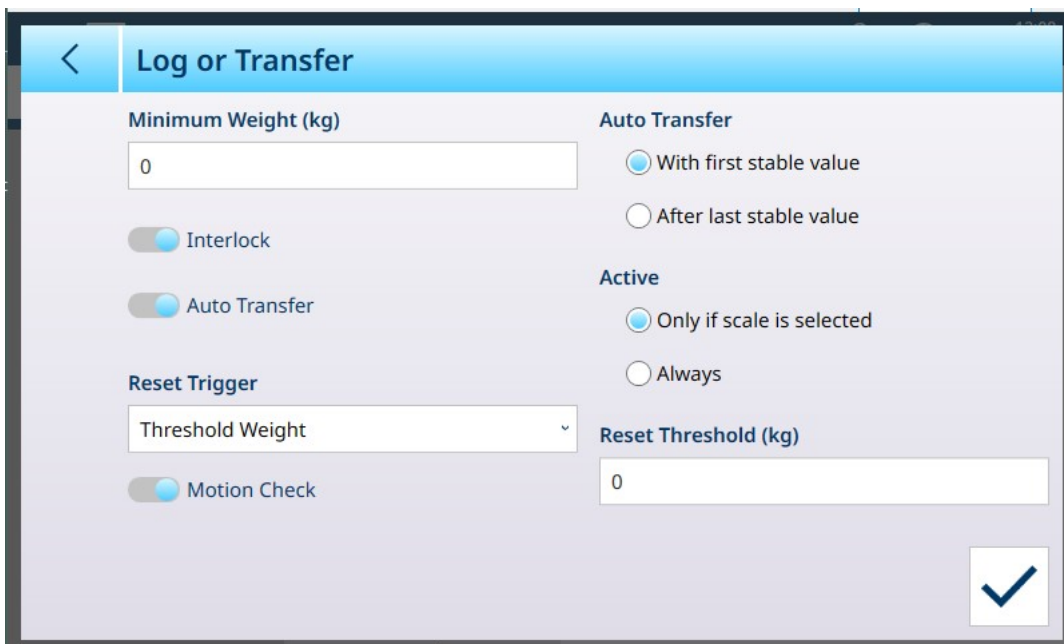


Figure 236: Log or Transfer, All Options Selected

Note that some the **Auto Transfer** and **Active** sub-sections appear only if **Auto Transfer** is enabled.

Log or Transfer Options

Option	Settings
Minimum Weight (kg)	This value determines the minimum scale weight required to trigger the Interlock and/or Auto Transfer actions. The weight unit for this and the other fields on this screen is determined by the Primary Unit set in ASM at Capacity and Increments .

Option	Settings
Interlock	<p>When enabled, the Interlock option responds to scale data to determine when a log action is performed. This prevents repeat logging of the same weighing operation.</p> <p>When enabled, this interlock requires that the live weight reading be reset according to the Reset Trigger parameter setting (see below). The live weight must then settle to a weight greater than the Minimum Weight value (see above) before the terminal will respond to the next log or transfer request.</p>
If Interlock is enabled, or Auto Transfer and With first stable value is selected	
Reset Trigger	The Reset Trigger action can be performed in response to Threshold Weight [default] or Deviation . This trigger is defined either by an absolute value (Threshold Weight) or by a minimum change in weight (Deviation).
If either Interlock or Auto Transfer is enabled	
Reset Threshold (kg) or Reset Deviation (kg)	The weight value which triggers a reset and indicates the start of a new weighing operation and a new log entry.
Auto Transfer	When enabled, Auto Transfer causes data about each weighing operation to be sent to the destination defined in the [Communication ▶ Page 208] section of setup, depending on the parameters selected in Auto Transfer and Active .
If Auto Transfer is Enabled	
Auto Transfer	<p>When enabled, the trigger conditions defined by the Interlock settings will automatically export data about each weighing operation either With first stable value or After last stable value.</p> <p>With first stable value: data is sent when the first stable weight is captured, even if the weight changes afterward. This selection would typically be used for static weighing.</p> <p>After last stable value: data is sent based on the last stable weight captured. This selection might be used for manual filling, where the scale weight will briefly be unstable after the last material is added.</p> <p>This selection determines whether the Reset Trigger option appears.</p>
Active	The options to activate the Auto Transfer function are Only if scale is selected and Always .
Motion Check	When enabled, the Motion Check prevents the interlock from triggering a log or transfer action until scale weight is within the parameters defined as stable at [ASM > Stability ▶ Page 128].

See also

[Communication Setup ▶ Page 208](#)

[Stability ▶ Page 128](#)

3.1.4 Sum Scale

For terminals with multiple scales connected, a Sum Scale can be configured. When the Sum Scale is enabled, a number of other screens become available, in which the Sum Scale parameters can be configured.

Note that the Sum Scale calculation affects the terminal's status if it is in an Approved mode -- either OIML or NTEP. This difference is reflected in the selection offered by the [Metrology ▶ Page 165] and [Capacity & Increment ▶ Page 166] screens.

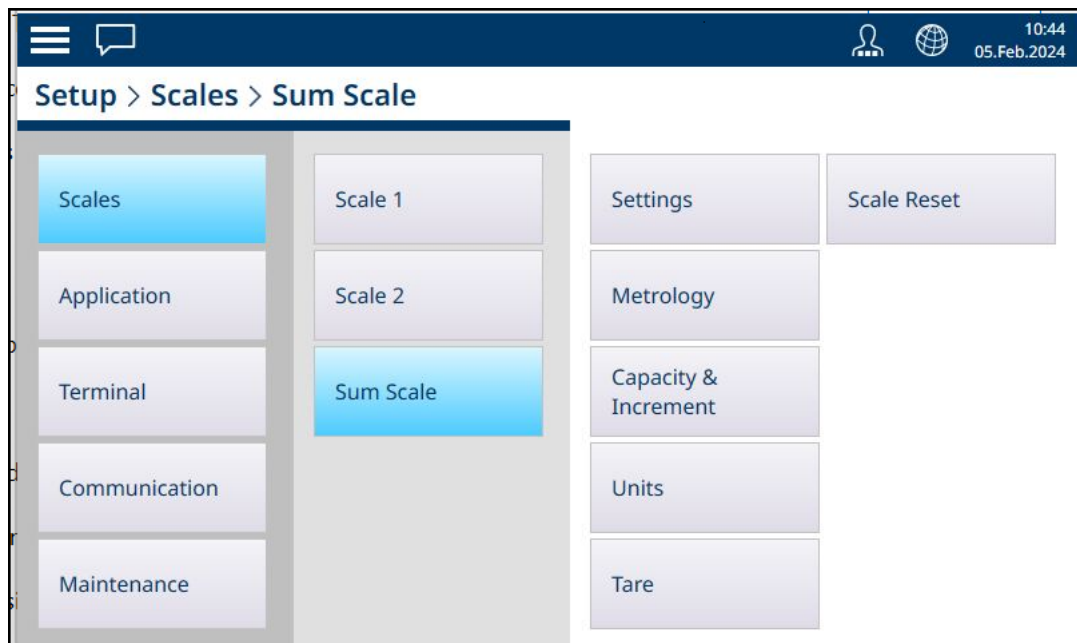


Figure 237: Sum Scale Menu System

3.1.4.1 Settings

The Identification screen is used to enable or disable Sum Scale, and to configure its name, component scales and type of sum.

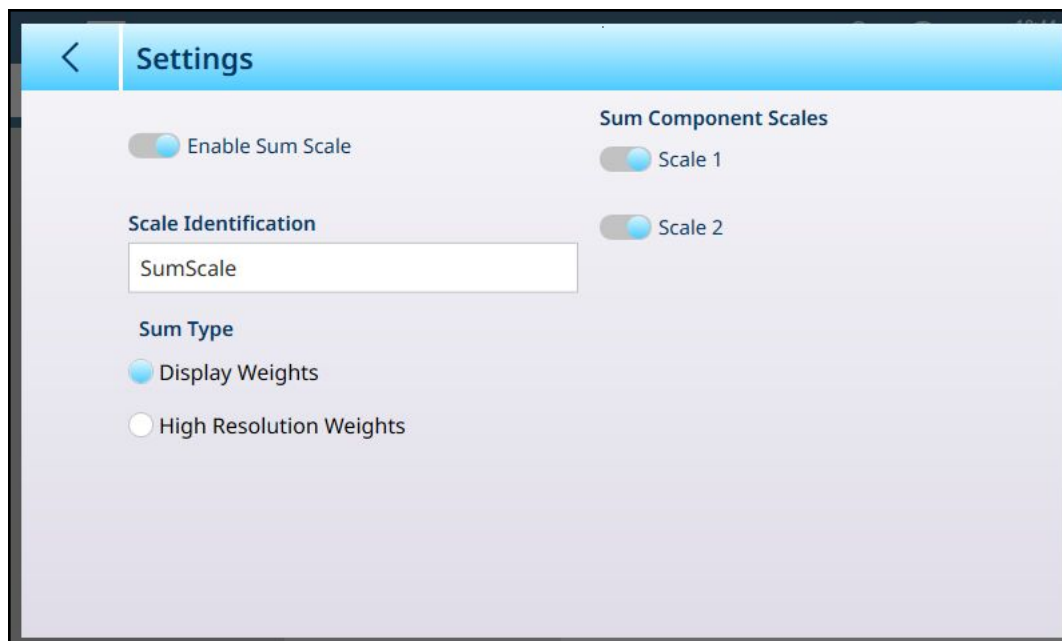


Figure 238: Sum Scale Settings

Parameter	Options	Function
Enable Sum Scale	Enabled, Disabled [default]	When Sum Scale is not enabled, touch this button to move the slider button to Enable Sum Scale and display the other items on this page.

Scale Identification	Sum Scale [default]	Touch the field to display an alphanumeric entry dialog, permitting the sum scale to be assigned a name other than the default.
Sum Type	Display Weights, High Resolution Weights	Choose the resolution of the Sum Scale. High Resolution Weights provides an arithmetic summation based on the included scales' internal fine resolution weight values. Display Weights provides an arithmetic summation based on the included scales' displayed gross weight values.
Sum Component Scales	Sliders display, representing each connected scale.	Determines which of the attached scales are included in the sum.

See also

[Scale Setup](#) ▶ Page 73

3.1.4.2 Metrology

The Metrology screen allows an approval to be set for the Sum Scale -- **OIML** or **NTEP**. This setting is independent of the **Metrology** settings for the component scales.

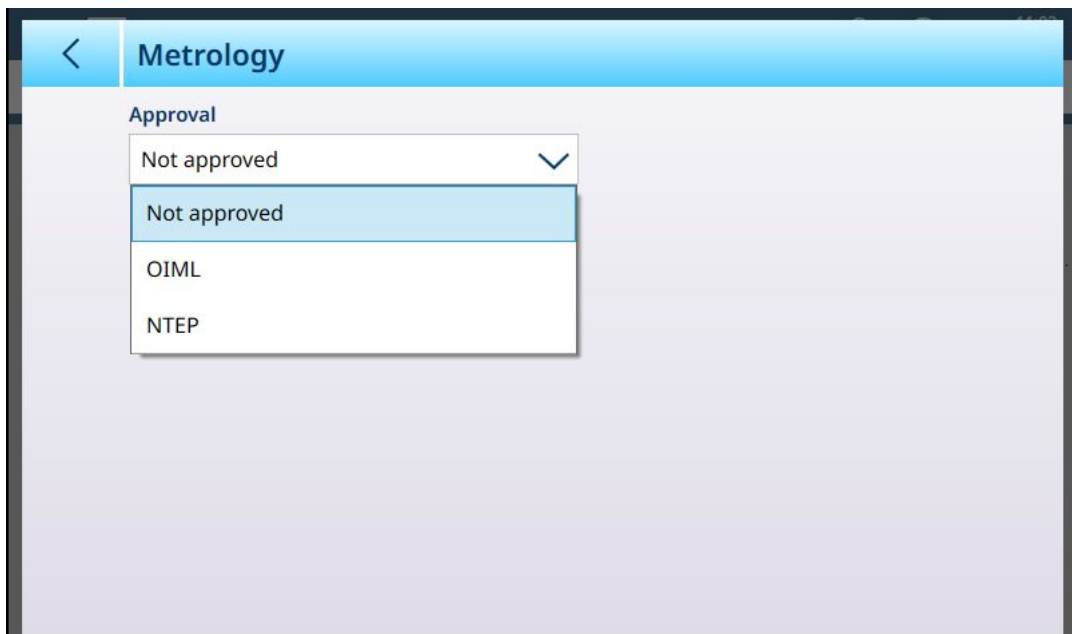
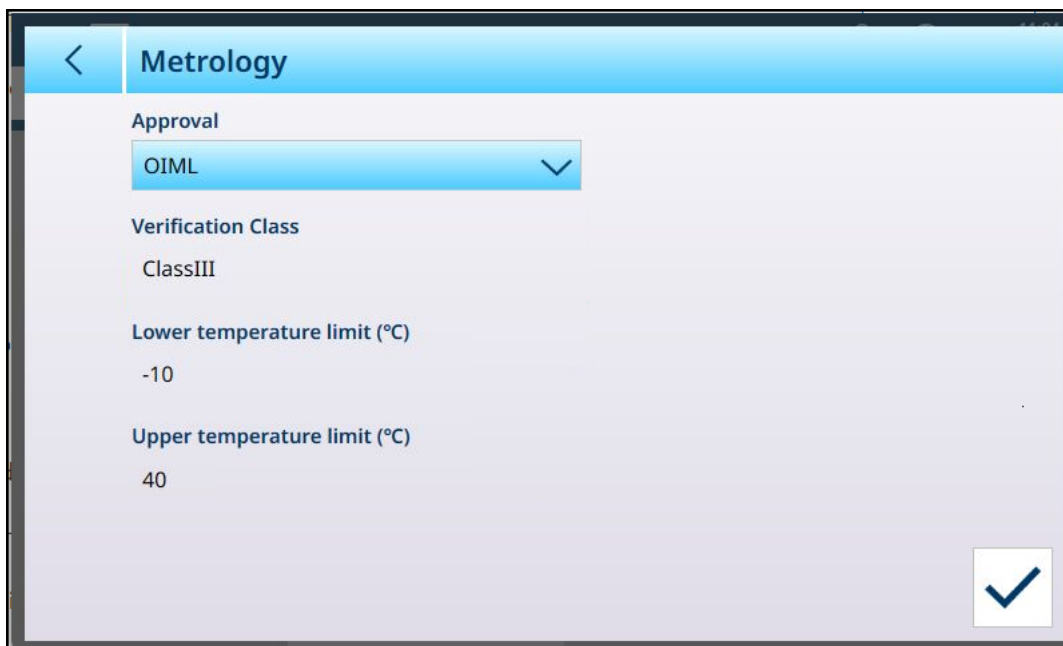


Figure 239: Sum Scale - Metrology

Once an approval type is selected, the parameters configured for it in the scales' ASM screens are displayed, but cannot be modified.

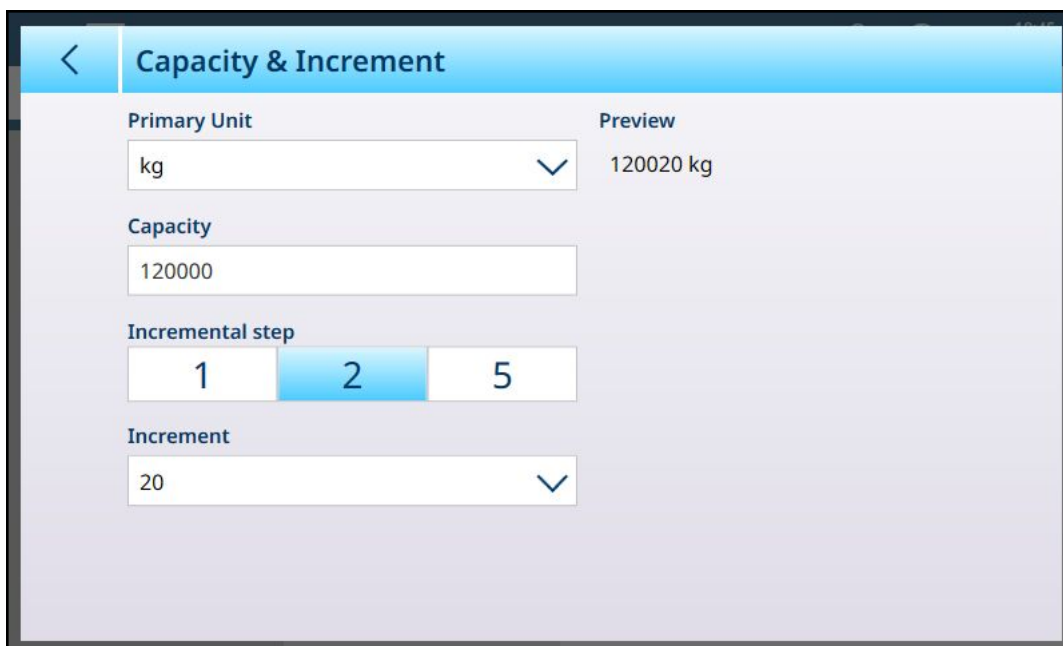


The screenshot shows a configuration screen titled "Metrology". It features a blue header with a back arrow and the title. Below the header, there are four configuration items: "Approval" with a dropdown menu showing "OIML", "Verification Class" with the text "ClassIII", "Lower temperature limit (°C)" with the value "-10", and "Upper temperature limit (°C)" with the value "40". A checkmark icon is located in the bottom right corner of the screen.

Figure 240: Sum Scale - Metrology: Approval Selected

3.1.4.3 Capacity & Increment

The Sum Scale's capacity and increment are configured in this screen.



The screenshot shows a configuration screen titled "Capacity & Increment". It features a blue header with a back arrow and the title. Below the header, there are several configuration items: "Primary Unit" with a dropdown menu showing "kg", "Capacity" with a text input field containing "120000", "Incremental step" with three radio button options (1, 2, 5) where "2" is selected, and "Increment" with a dropdown menu showing "20". A "Preview" field on the right side shows "120020 kg".

Figure 241: Sum Scale - Capacity & Increment

The **Primary Unit** and **Capacity** are set as for the component scales. In the screen shown above, the capacity is the sum of two scales with a capacity of 60,000 kg each. An **Incremental Step** parameter sets the magnitude of the differences between Sum Scale increments. In the example shown above, the step options are 1, 3 and 5.

If **1** is selected, the default Increment size is **10**, and the dropdown list offers options from 0.01 to 10000.

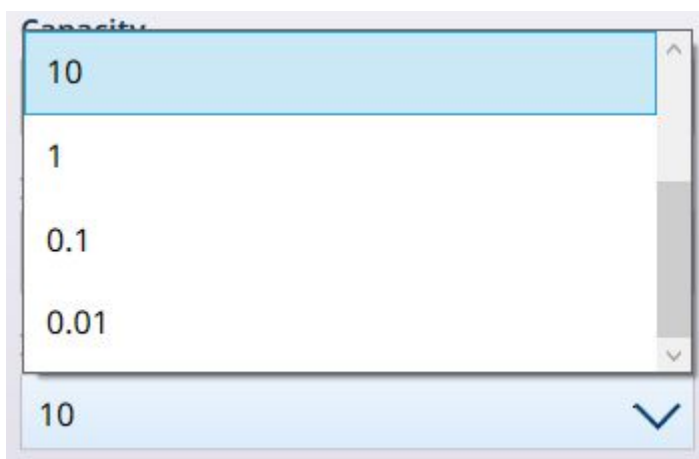


Figure 242: Drop-down List for Sum Scale Incremental Step 2

If **2** is selected, the default increment size is **20**, and the dropdown list offers options from 0.02 to 20000. Similarly, selecting **5** offers options from 0.05 to 50000, with a default value of **50**.

These incremental steps facilitate the sum scale calculation for Approved scales.

3.1.4.4 Units

The Sum Scale's **Units** screen displays the **Primary Units** selected in the Sum Scale [Capacity & Increment ▶ Page 166] screen -- which may differ from the **Primary Units** configured for the component scales. A **Secondary Unit** can be selected here, from the usual set of unit types -- g, kg, t, lb, oz, ton.

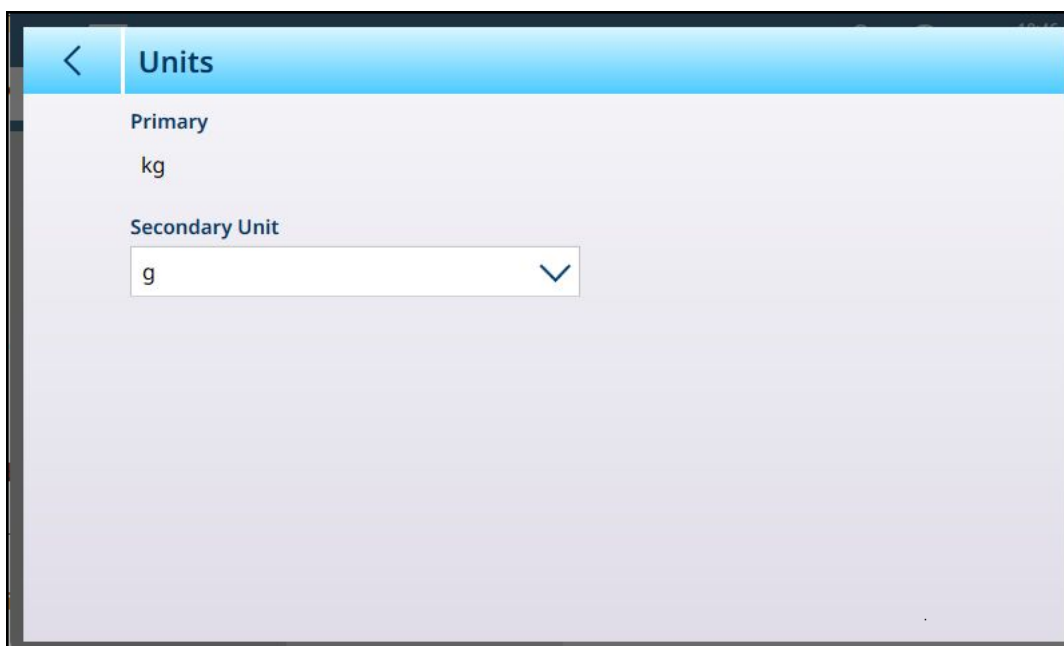


Figure 243: Sum Scale - Units

3.1.4.5 Tare

The Sum Scale's **Tare** options are configured in a series of screens, as seen in the image below.

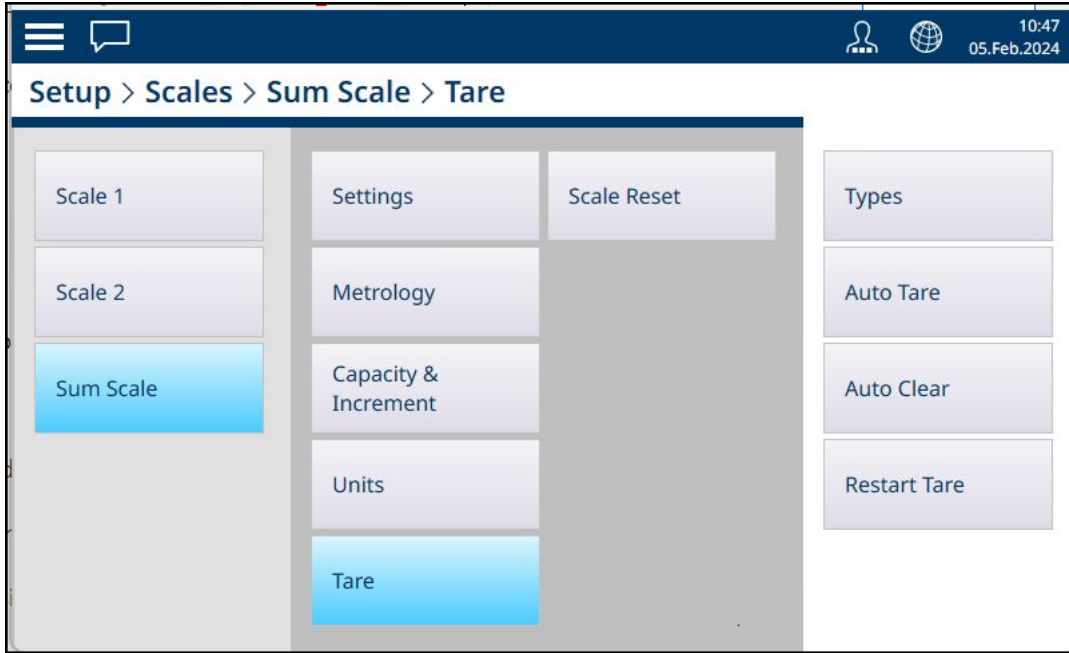


Figure 244: Sum Scale - Tare: Menu System

3.1.4.5.1 Types

Pushbutton Tare can be enabled or disabled using the slider displayed on this page. By default, it is disabled

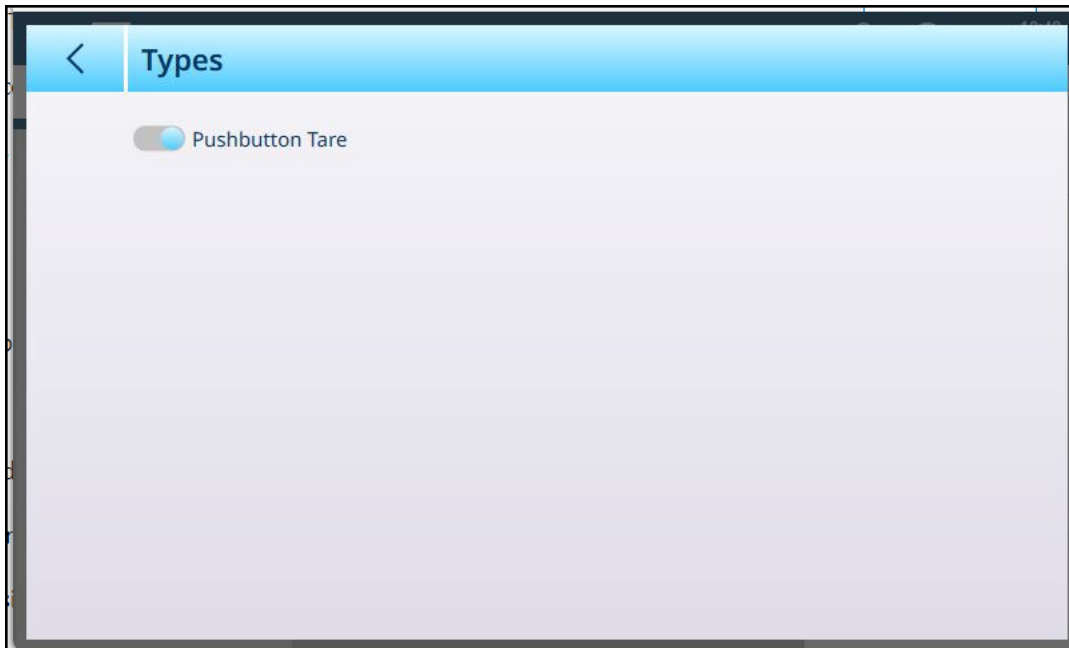




Figure 245: Sum Scale - Tare: Types

When **Types** is enabled, and Sum Scale is the active scale on the home screen, touching the **Tare** button  or the **Tare** softkey  (if configured) will set the current scale weight as the Sum Scale's tare value.

3.1.4.5.2 Auto Tare

By default, the Sum Scale - Auto Tare option is disabled. When it is enabled, additional fields appear.



Figure 246: Sum Scale - Tare: Auto Tare Enabled

The threshold and reset threshold parameters are the same as those shown for the respective component scales. The only additional option is a **Tare Reset Motion Check**. When this is enabled, the terminal will check for scale stability before clearing the tare after a transaction. This ensures that zero is captured correctly after a tared transaction completes.

3.1.4.5.3 Auto Clear

Tare can be cleared automatically after each transaction by enabling this parameter.



Figure 247: Sum Scale - Tare: Auto Clear

The threshold value functions in the same way as for the respective component scales and, like the [Auto Tare ▶ Page 169] option, **Auto Clear** includes an optional **Clear Tare Motion Check**, to ensure scale stability when tare is automatically cleared.

3.1.4.5.4 Restart Tare

The **Restart Tare** option...



Figure 248: Sum Scale - Tare: Restart Tare

When **Restart Tare** is enabled or disabled, an OK button appears at lower right. Click this button to confirm the change.

3.1.4.6 Scale Reset

3.2 Application Setup

The Application menu offers four items, which control various application-specific features of the terminal. For setup and operation of the optional ProWorks Multi-Tools applications, refer to the **ProWorks Multi-Tools User's Manual**, provided when the ProWorks license is purchased. The screen below shows the menu as it appears in a terminal without this license.

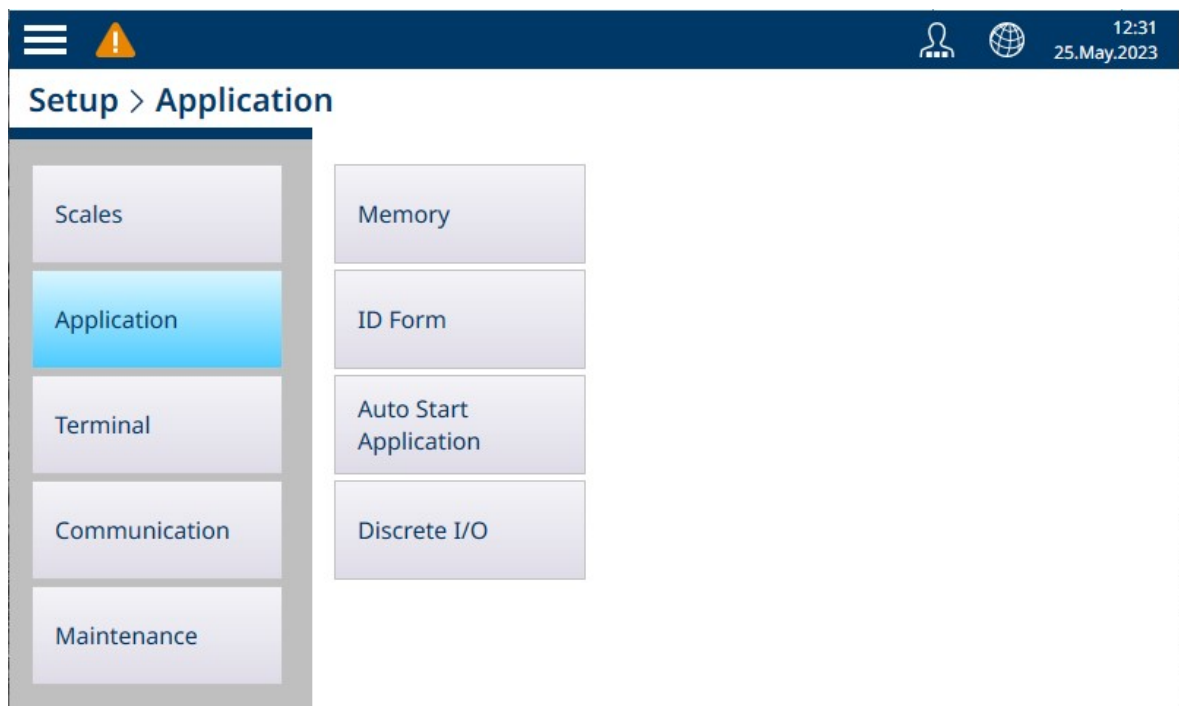


Figure 249: Application Menu

3.2.1 Memory

The **Application > Memory** menu offers the following options.

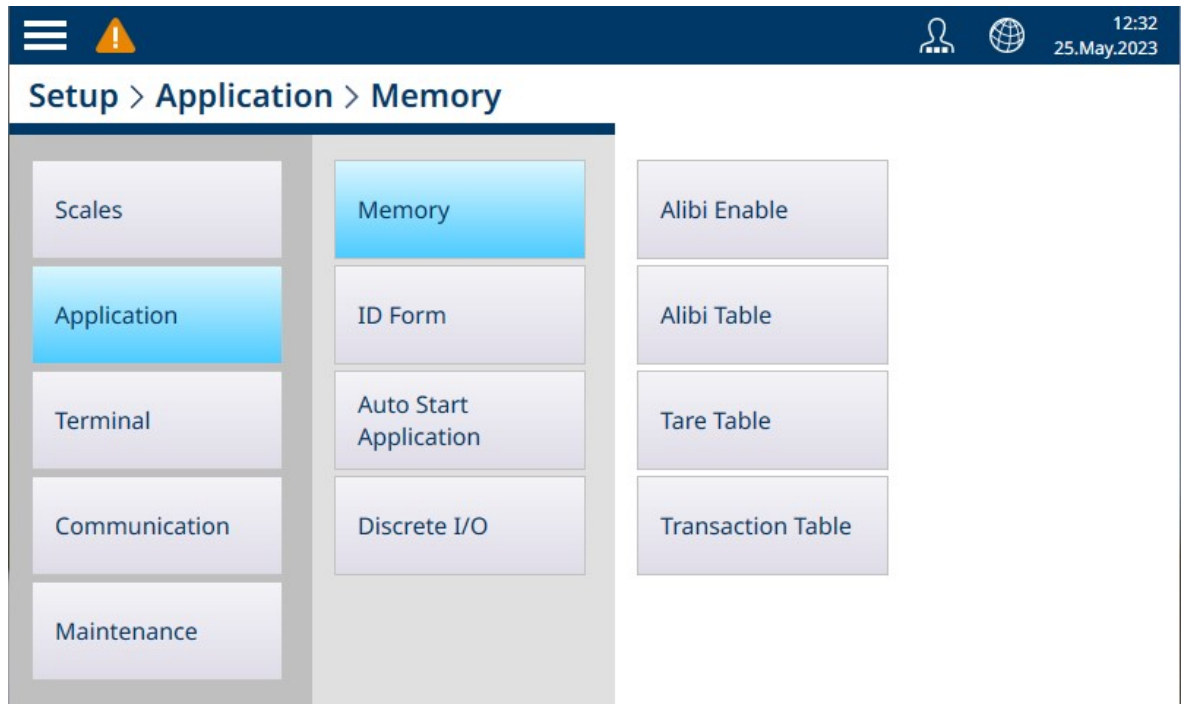


Figure 250: Application Memory Menus

3.2.1.1 Alibi Enable

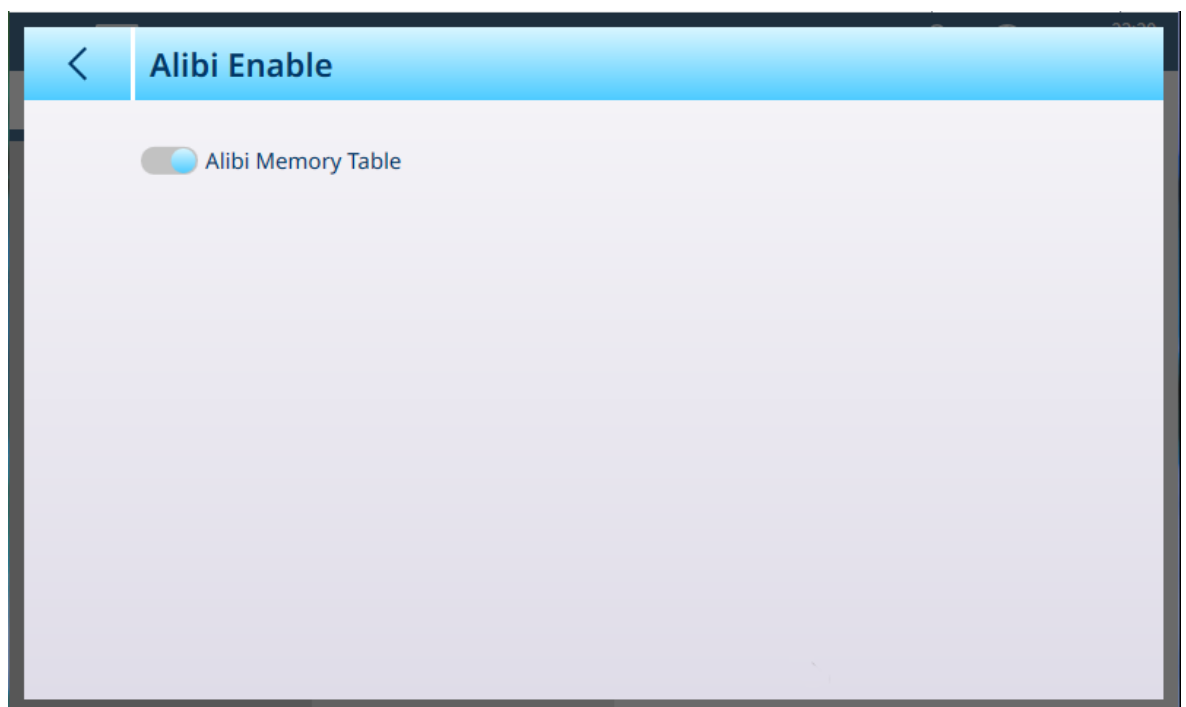


Figure 251: Application - Memory - Alibi Enable Screen

This screen simply determines whether Alibi memory is enabled (storing data) or disabled.

3.2.1.2 Alibi Table

ID	Log Time	Transaction Counter	Scale #	Gross Weight	Net Weight	Tare Weight
7	06.Feb.2024 09:39:08		1	2.139	1.989	0
6	06.Feb.2024 09:38:51		1	2.140	1.990	0
5	06.Feb.2024 09:38:46		1	2.140	1.990	0
4	06.Feb.2024 09:37:09		1	2.140	1.990	0
3	06.Feb.2024 09:36:52		1	2.139	1.989	0
2	06.Feb.2024 09:36:11		1	2.212	2.062	0
1	01.Feb.2024 20:12:45		1	0.000	0.000	0

Figure 252: Alibi Table View

This screen displays the current contents of the Alibi Table.

Alibi table data can be filtered and exported. For details on these functions, refer to [Table Functions: Filter, Export, Import, Clear ▶ Page 48].



3.2.1.3 Tare Table

Access the **Tare Table** screen to manage tare records. Records can be created, deleted, imported or exported from this screen.

ID	Name	Description	Value	Unit	Low Limit
1	RS-1	Sugar bin #1	1.5	kg	
2	Aggregate hopper	Medium container	15.0	kg	
3	Sand, fine			kg	9.
4	Cement, standard	Wheeled bin		kg	9.
5	Gravel, medium	Bedding gravel		kg	4.7
6	Box, SS screws		2.0	kg	
7	Cement, sp		10.0	kg	
8	Box, medium	Box for rubber balls	1.5	kg	

Figure 253: Tare Table

Figure 254: Add New Tare Record

Parameter	Setting
ID	These three fields can be modified to provide a user-friendly Name and functional Description of the tare, together with a tare ID number. If a duplicate tare ID is entered, the terminal will indicate this, and a different ID number must be entered.
Name	
Description	
Tare Value	The tare can be given an absolute weight value. The associated unit is also configured here.
Unit	
Lower Limit	Instead of an absolute value, the tare record can have upper and lower limit values, defining the acceptable range of variation in container weight. If the container's weight does not fall within this range, the terminal will indicate a tare failure.
Upper Limit	
Scale ↔	This field shows the current scale weight. When a container is on the scale, its weight will be displayed here, permitting the absolute or limit values to be set.
	Touch this button to use the current scale weight in the Tare Value field.
	Touch this button to switch between available scales for the source of the tare value.

For further information on configuring tare records, refer to [Tare Table ▶ Page 302] in [Table and Log File Structure ▶ Page 297].

For information on table operations, refer to [Table Functions: Filter, Export, Import, Clear ▶ Page 48].

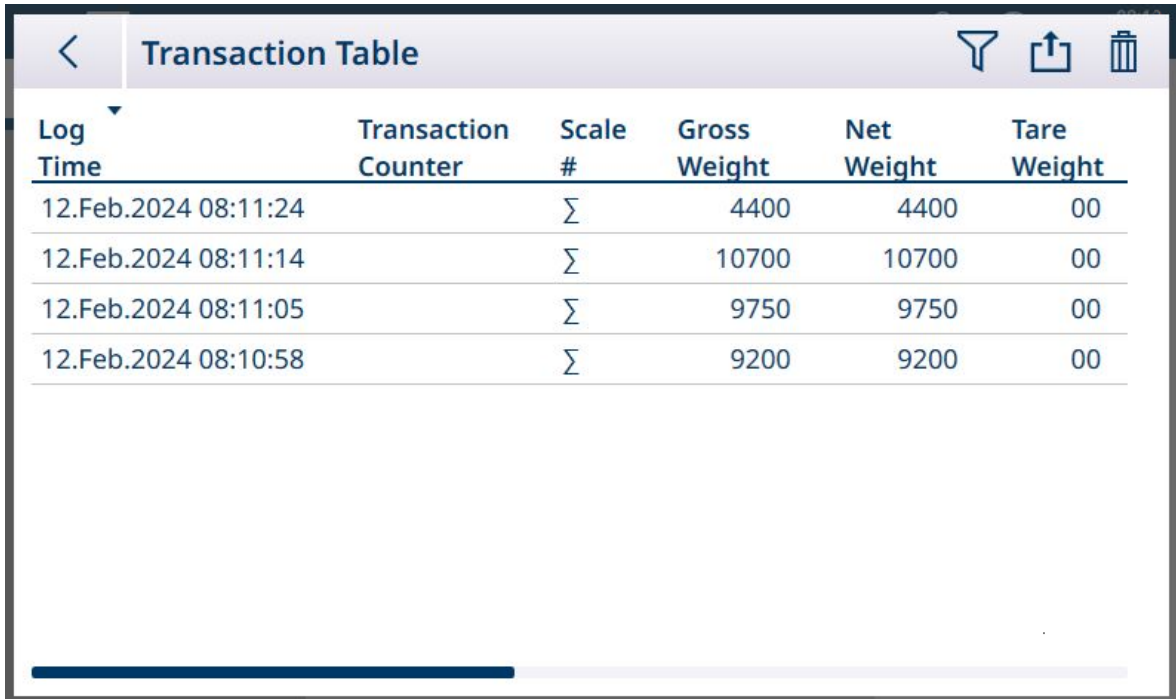
See also

[Tare Table ▶ Page 172](#)

3.2.1.4 Transaction Table

The Transaction Table is enabled by default, and cannot be disabled. Each transaction performed by the terminal is stored here, with one transaction per row. Access the Transaction Table either at **Setup > Application > Memory > Transaction Table**, or by touching the Transaction Table softkey, which can be added to the ribbon on the main screen at [Softkeys ▶ Page 197].

Transaction Table columns adapt to the terminal configuration dynamically, so that all available information is represented in the table. The image below shows a Transaction Table with the default columns.



Log Time	Transaction Counter	Scale #	Gross Weight	Net Weight	Tare Weight
12.Feb.2024 08:11:24		∑	4400	4400	00
12.Feb.2024 08:11:14		∑	10700	10700	00
12.Feb.2024 08:11:05		∑	9750	9750	00
12.Feb.2024 08:10:58		∑	9200	9200	00

Figure 255: Transaction Table with Default Columns

Table data can be exported and deleted, using the icons in the menu bar. Selecting delete displays a confirmation dialog:

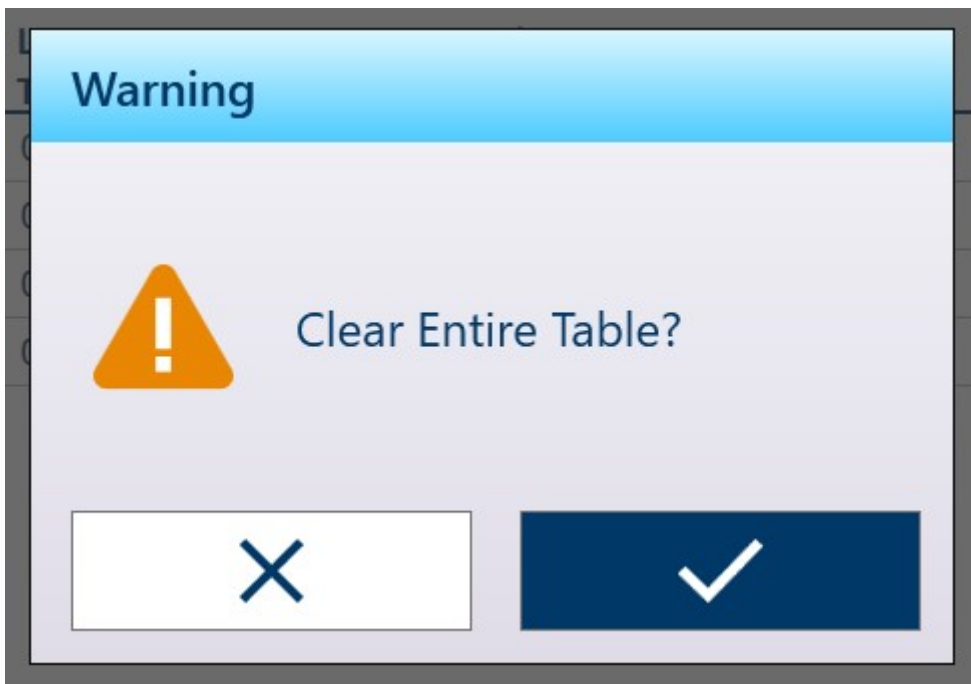


Figure 256: Confirmation Dialog for Clearing Transaction Table

The Export function displays the standard **Table Data Export** screen:

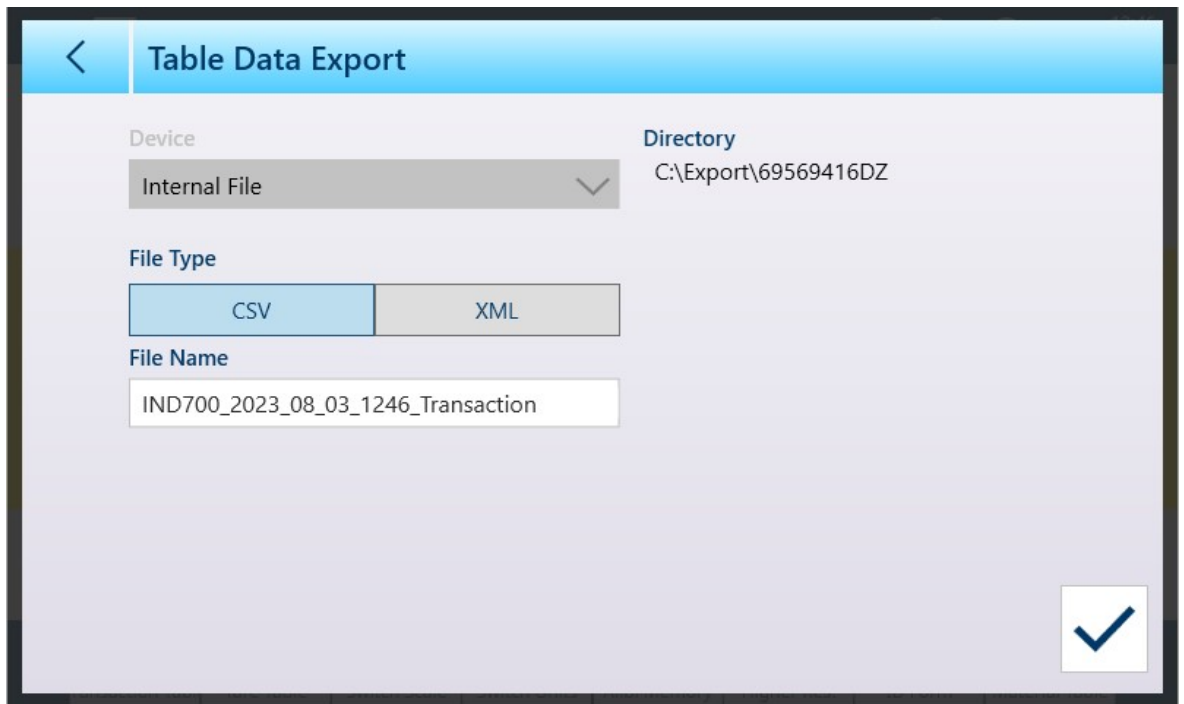



Figure 257: Table Data Export Screen

The type and name of the exported file can be changed; the Directory where the file is stored in the IND700 cannot be changed. Click the check icon at lower right to perform the export and return to the Transaction Table view.

3.2.1.5 Clearing Tables

The contents of the **Tare Table** and **Transaction Table** can be cleared by touching the CLEAR  icon at upper right in the table view screen. A confirmation dialog will display:

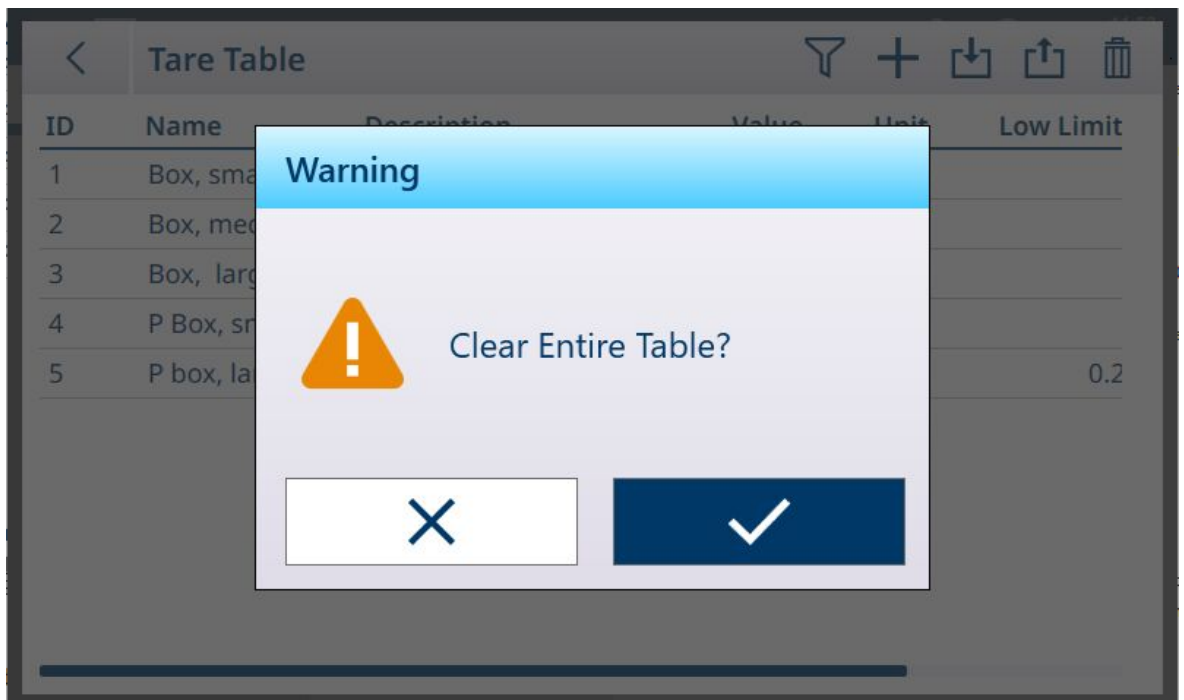



Figure 258: Clear Table Confirmation Dialog

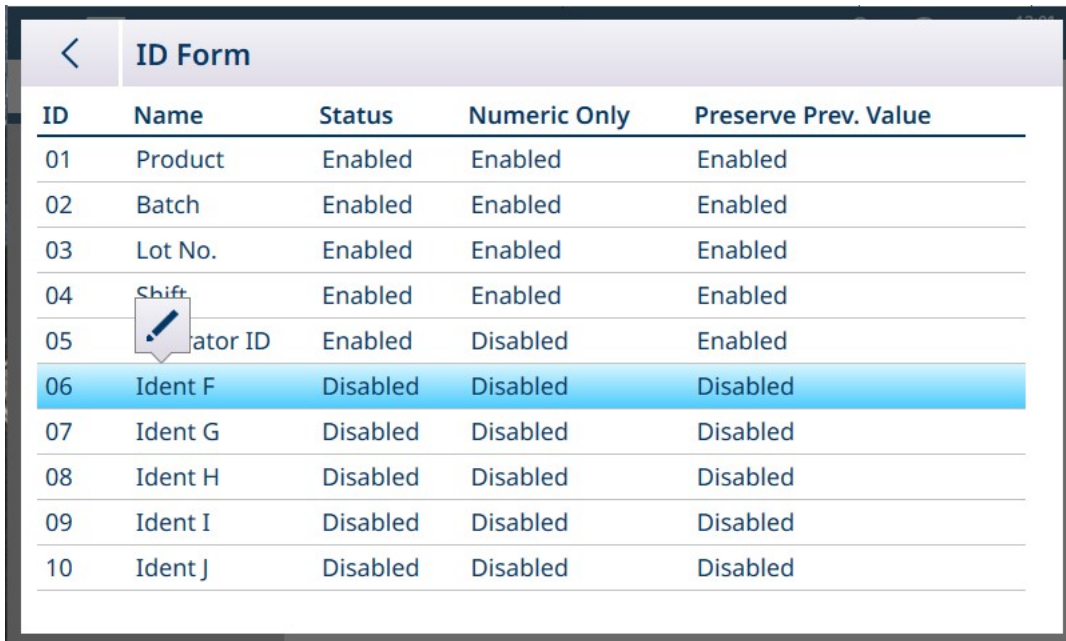
3.2.2 ID Form

The ID Form is configured by naming and enabling up to ten fields of data.

To modify the form, access **Setup > Application > ID Form**. A list of ID Form fields will display, indicating the name and configuration of each available field.

Fields will only appear in the ID Form accessed from the home screen by touching the ID Form softkey  if the **Status** column shows that it is **Enabled**.

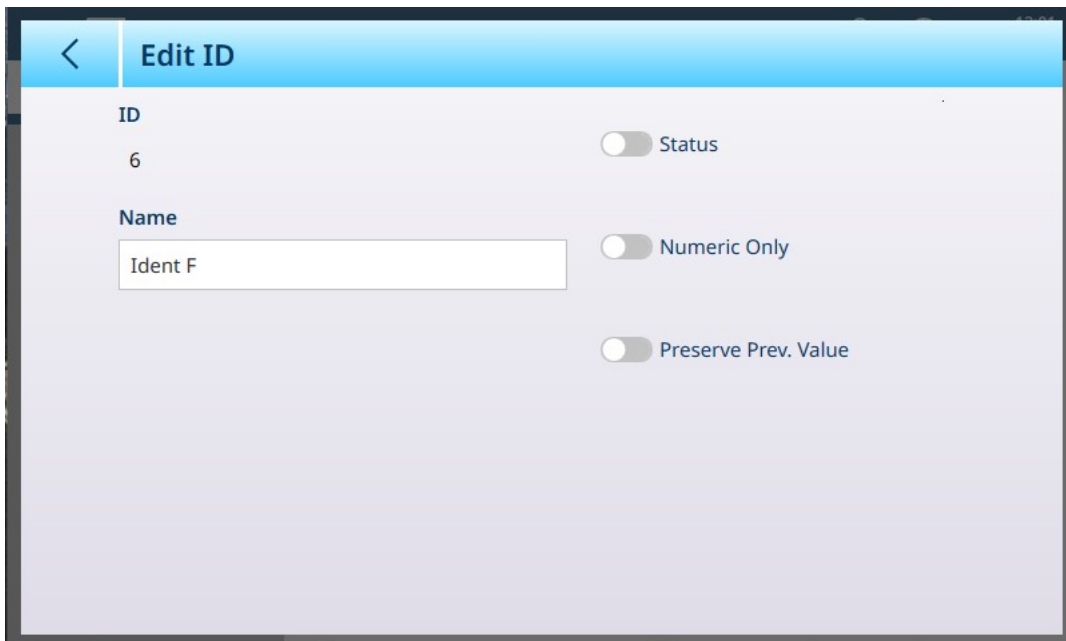
To edit a field, touch its row in the table. An edit icon will appear.



ID	Name	Status	Numeric Only	Preserve Prev. Value
01	Product	Enabled	Enabled	Enabled
02	Batch	Enabled	Enabled	Enabled
03	Lot No.	Enabled	Enabled	Enabled
04	Shift	Enabled	Enabled	Enabled
05	Indicator ID	Enabled	Disabled	Enabled
06	Ident F	Disabled	Disabled	Disabled
07	Ident G	Disabled	Disabled	Disabled
08	Ident H	Disabled	Disabled	Disabled
09	Ident I	Disabled	Disabled	Disabled
10	Ident J	Disabled	Disabled	Disabled

Figure 259: ID Form Edit Icon Pop-Up

Touch the edit icon to open the **Edit ID** screen in its default state.



Edit ID

ID: 6

Name: Ident F

Status:

Numeric Only:

Preserve Prev. Value:

Figure 260: Edit ID Screen

To give the field a descriptive name, touch the Name field. An alphanumeric entry screen will display.

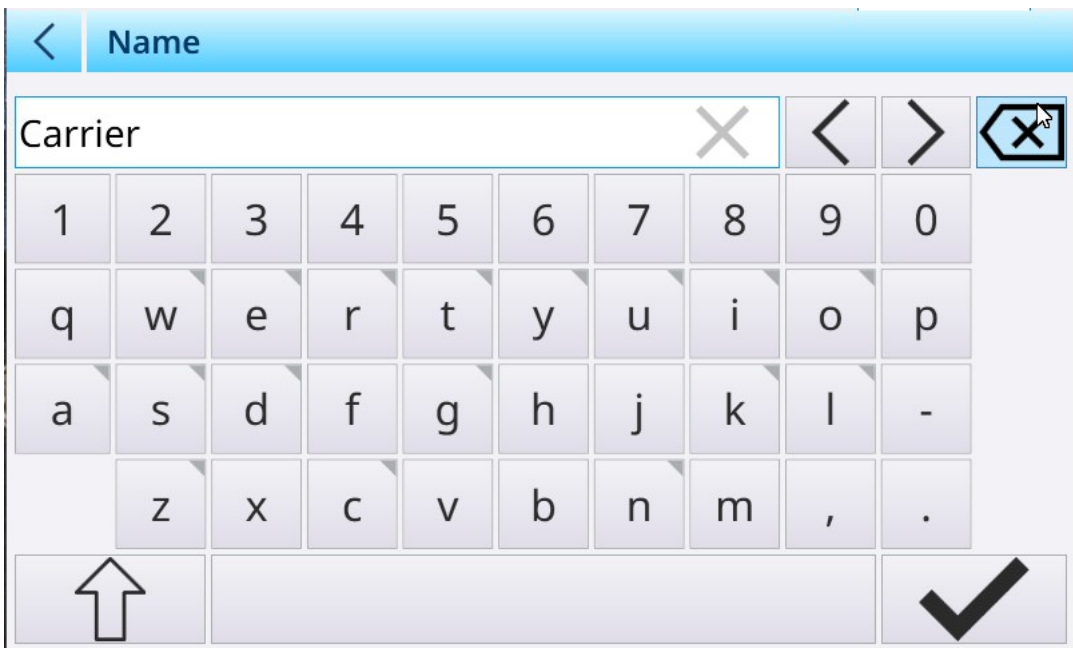


Figure 261: Naming the ID Form Field

Enter the name and touch the check mark to confirm the entry. The **Edit ID** screen will now show a check mark, indicating that there are changes to be saved.

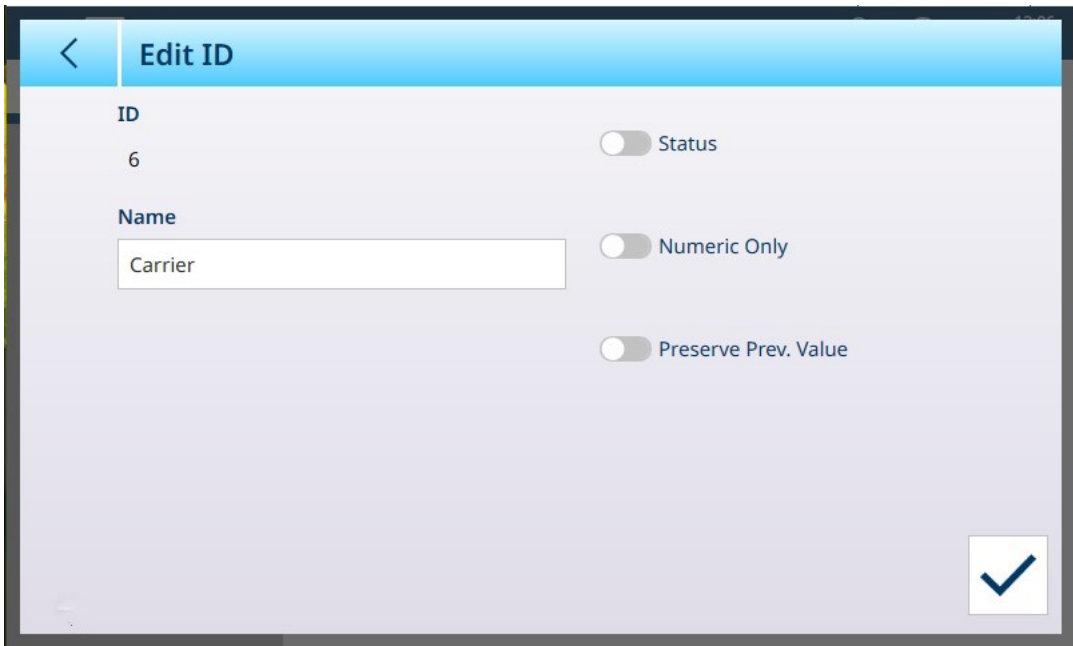


Figure 262: ID Field Named

The other fields in this screen are as follows.

Edit ID Options

Option	Function
Status	When active, this setting causes the ID field to appear in the ID Form.
Numeric Only	When active, this setting constraints the field's input options to a numeric value. This helps ensure the correct type of entry. When this setting is not active, field entry can be alphanumeric.

Option	Function
Preserve Prev. Value	When this setting is not active, field entries made during a transaction are cleared when a new transaction starts. In many cases, much of the ID Form content -- such as the name of the operator or the product -- will remain constant from one weighing operation to the next. When this setting is active, the fields remain filled-in. Each field can be modified as usual from the ID Form screen, simply by touching the field and making the appropriate entry to overwrite or simply delete the existing content.

Touch the check mark to confirm the changes and return to the **Application > ID Form** view.

3.2.3 Application-Specific Menus

In its default state, the Select Application menu shows only the standard application, [ID Form ▶ Page 175].

A ProWorks Multi-Tools license is necessary to enable the other applications -- **Counting, Classification, Filling, Over/Under** weighing and **Totalization**. For details on the configuration and use of these applications, refer to the **ProWorks Multi-Tools User's Manual**, which is provided when the application license is purchased.

3.2.4 Auto Start Application

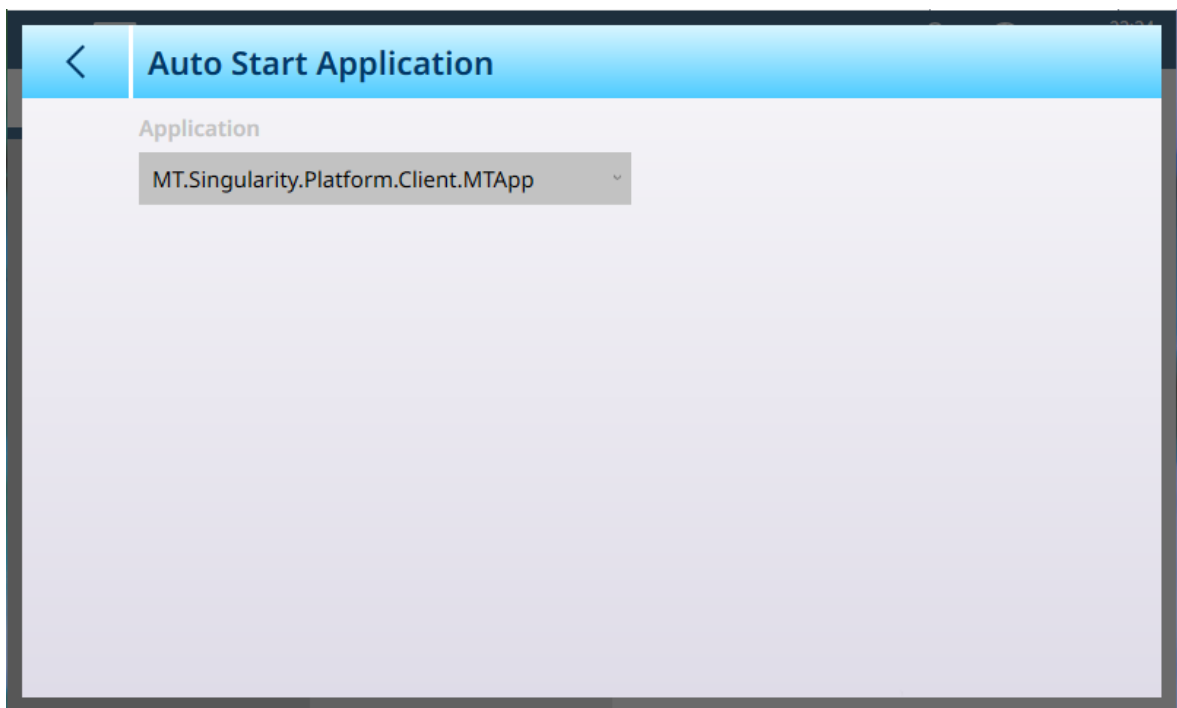


Figure 263: Application - Auto Start Application

This screen displays a drop-down list which includes all installed applications. Select Applications from this list to determine whether or not they start automatically when the terminal is started.

3.2.5 Discrete I/O

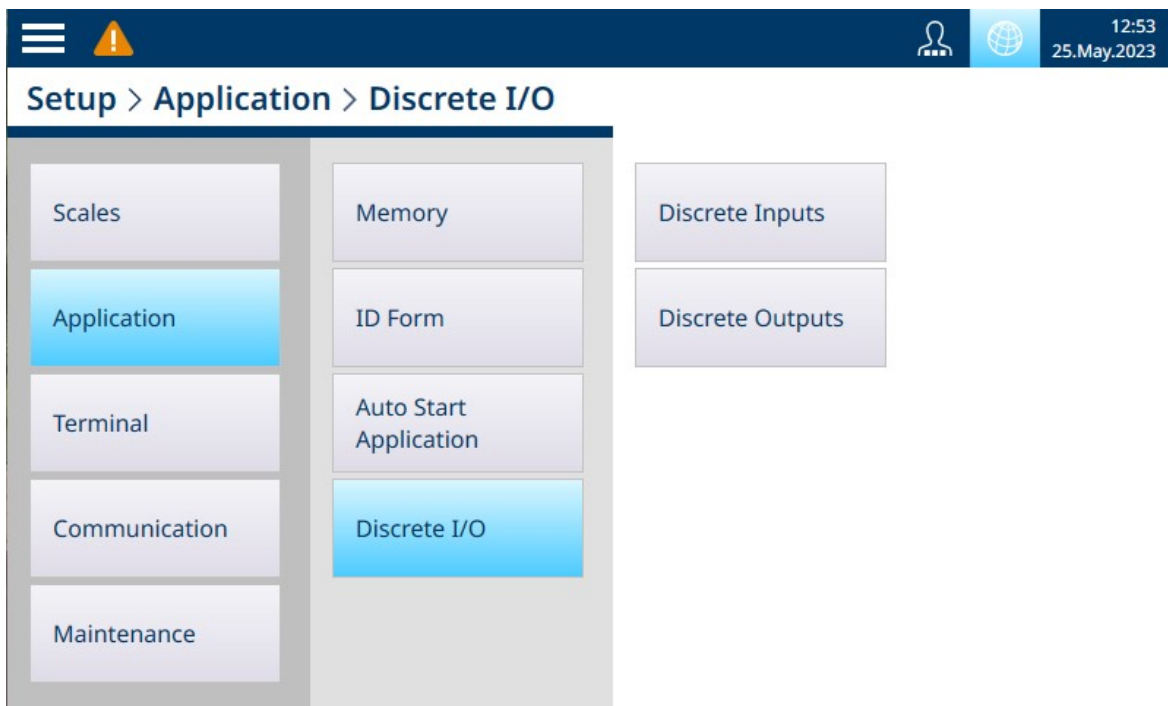


Figure 264: Discrete I/O Menus

Discrete Inputs and Discrete Outputs are configured from the Discrete I/O menus.

3.2.5.1 Discrete Inputs

The screen image below shows the Discrete Inputs screen in its default state, with no inputs configured.

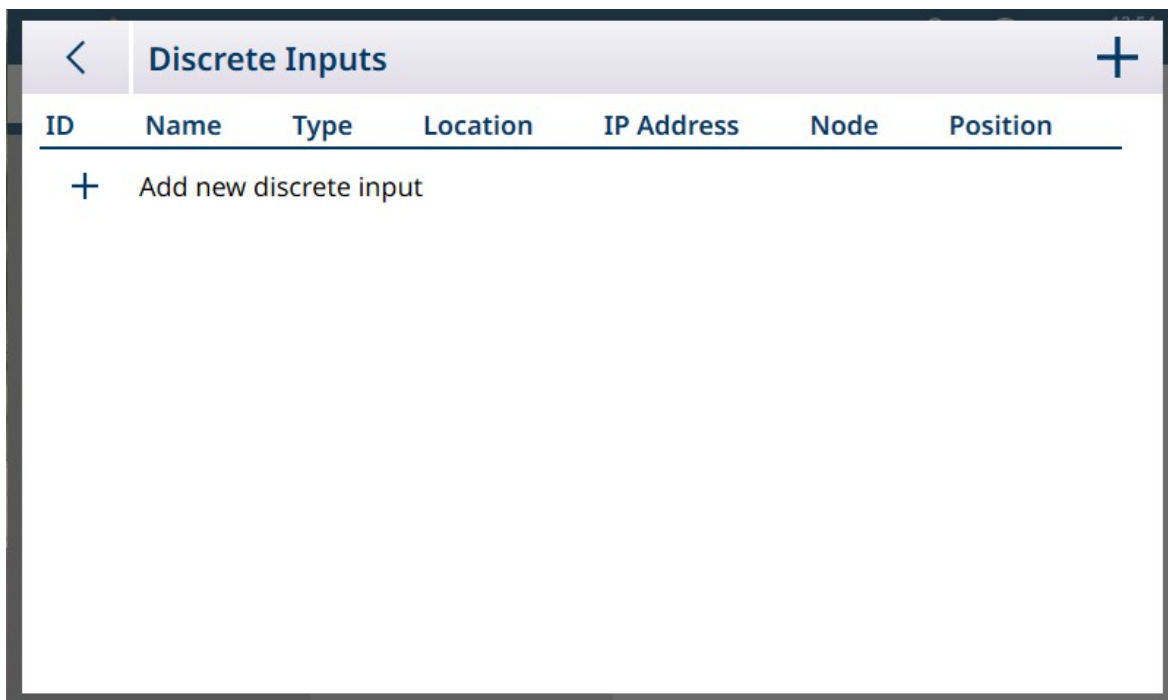


Figure 265: Discrete Inputs List

To add a Discrete Input, click on + in the list view. The following screen will appear:

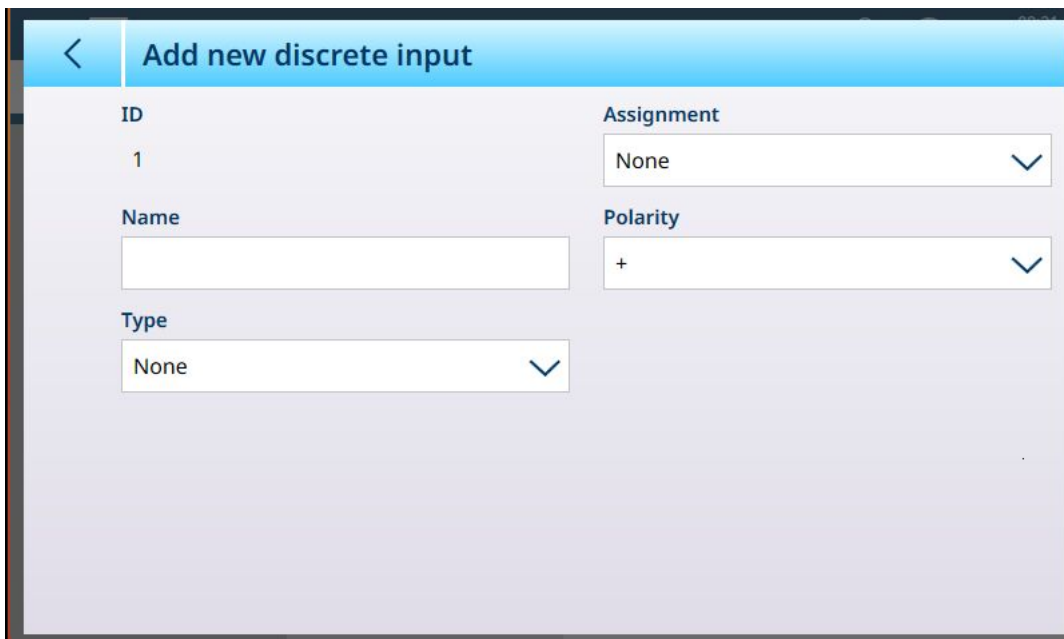


Figure 266: Discrete Inputs -- Add New

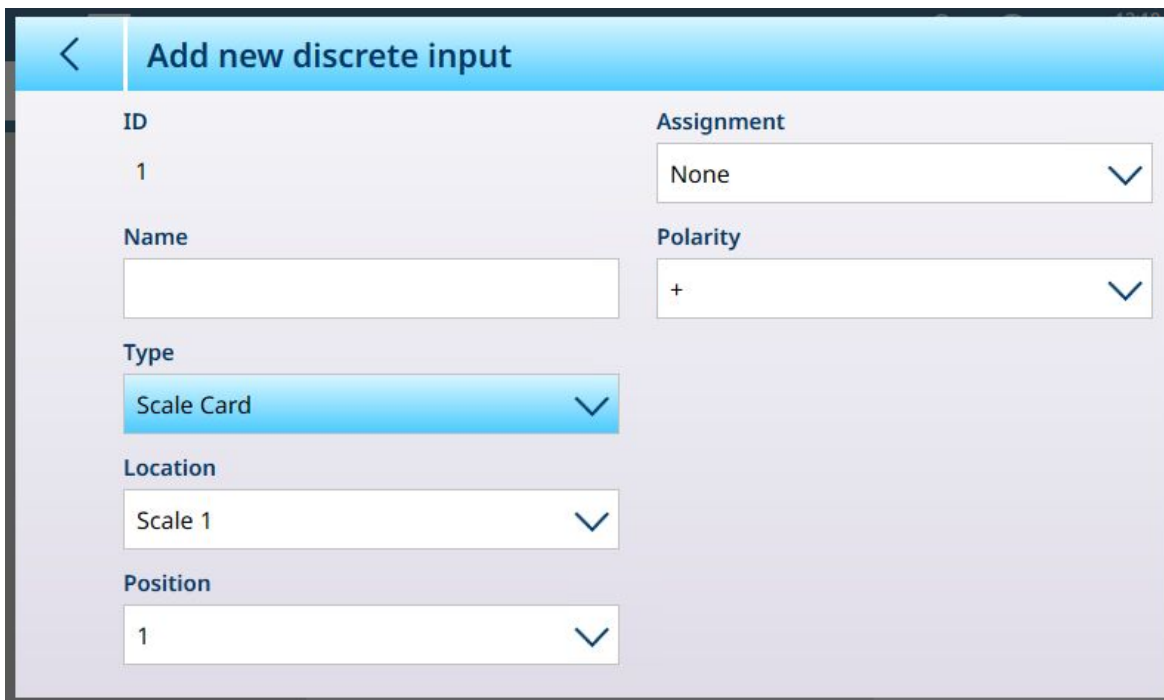
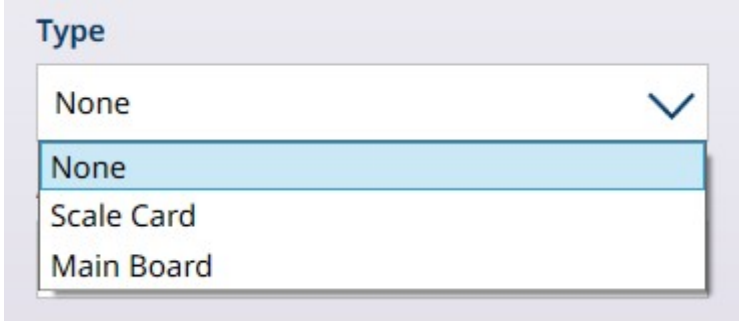
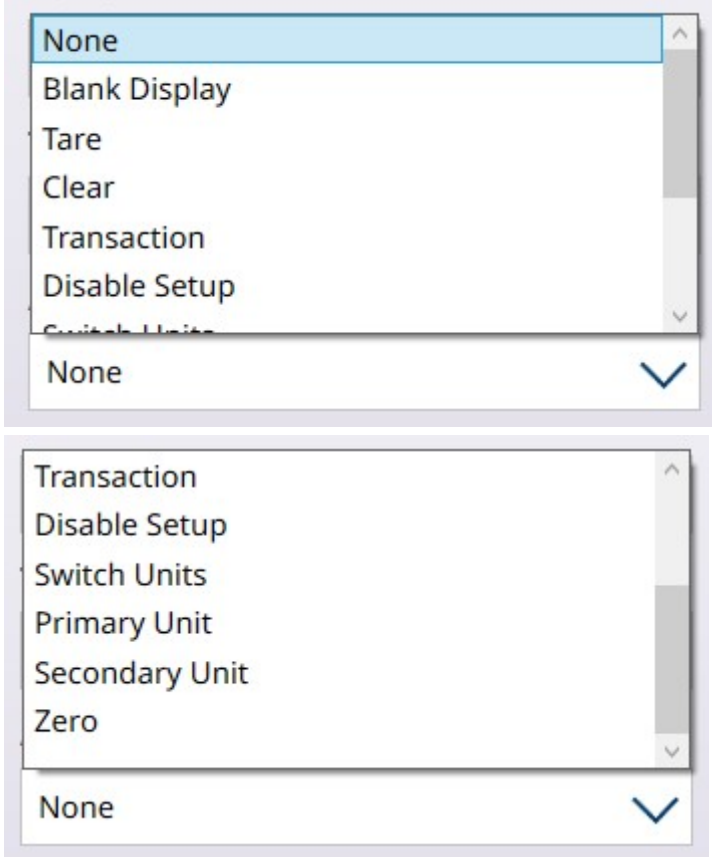


Figure 267: Discrete Inputs -- Add New, Scale Card Type Selected

The table below summarizes the options available in the **Add new discrete input screen**, which change depending on the **Type** and **Assignment** selected.

Parameter	Settings
ID	The Discrete Input ID is automatically set and cannot be changed, except by deleting existing inputs and re-creating them in the desired order.
Name	Touch the Name field to display an alphanumeric entry screen where a descriptive title for the input should be entered.

Parameter	Settings
Type	<p>Select from the Type list to determine the location of the input -- either on the main PCB, or on a scale interface, or in an ARM100 Remote I/O module (if connected).</p> 
Location	<p>Determines which set of DIO connections are to be used by this input. If Main Board is selected, this field does not appear. If Scale Card or ARM100 is selected, Location permits the selection of one of the scale interfaces or modules.</p>
Position	<p>The Main Board and each of the scale interface cards includes 2 digital inputs and 2 digital outputs. Position refers to these; 1 selects output 1, 2 output 2. ARM100 module output addresses include a module designator.</p>
Assignment	<p>The input's Assignment can be selected from this dropdown list. The input will be triggered by the selected assignment:</p> 
Channel	<p>If the input's Assignment is Tare, Switch Units, Primary Unit, Secondary Unit or Zero a Channel field appears. Touch this field to display a drop-down list of available scale channels, including Active Scale, Scales 1, 2, 3 and 4.</p>
Polarity	<p>Polarity can be either positive (+) or negative (-). This setting determines which state of the assigned trigger causes the input to be active.</p>

3.2.5.2 Discrete Outputs

The screen image below shows the Discrete Outputs screen in its default state, with no outputs configured.

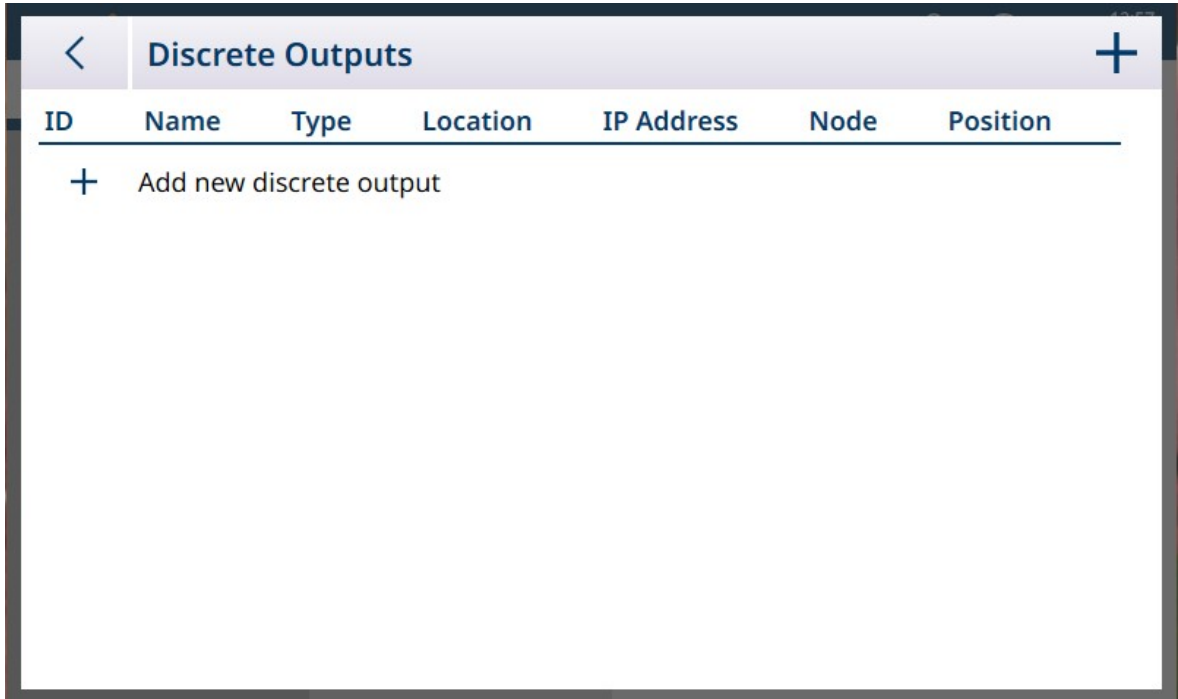


Figure 268: Discrete Outputs List

To add a Discrete Output, click on the + in the list view. The following screen will appear:

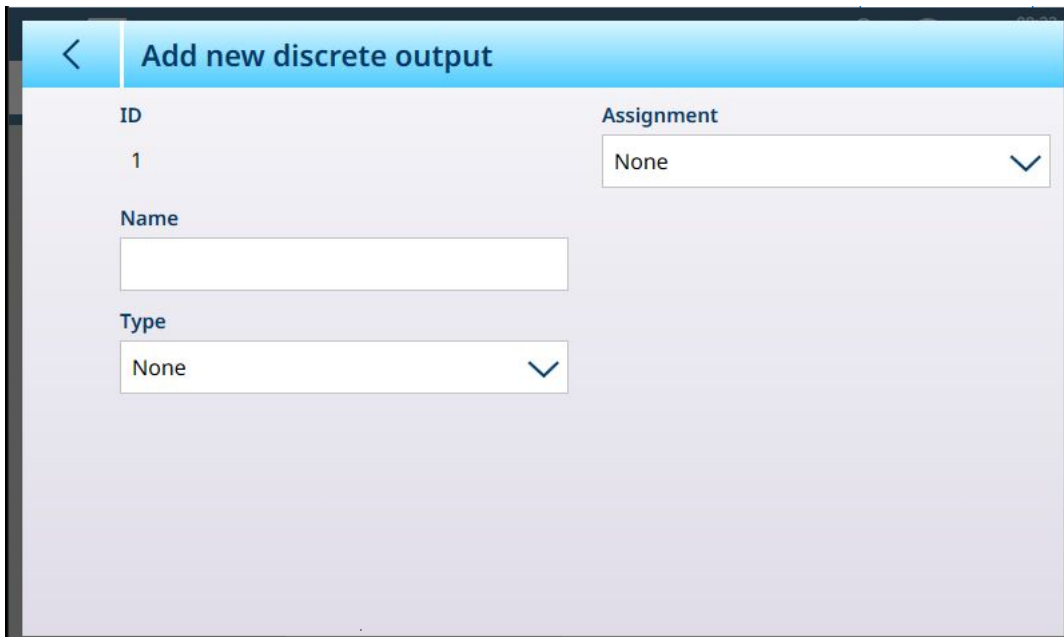


Figure 269: Discrete Outputs -- Add New

Once an **Assignment** and **Type** have been chosen, additional fields appear:

← Add new discrete output

ID	Assignment
2	Over Capacity
Name	Channel
	Active Scale
Type	
None	

Figure 270: Discrete Output Options, Assignment Selected

If the **Assignment** is **Comparators**, a **Comparators** field will display. Touch this screen to view the **Discrete Outputs** list. Here, the output can be associated with a comparator so that the output is triggered when the comparator's condition is satisfied. **Note:** Comparators are available in the IND700 only when the ProWorks Multi-Tools license is activated. Refer to the **ProWorks Multi-Tools User's Manual** for further details on Comparators.

← Edit

ID	Assignment
1	Comparators
Name	Comparators
Within target tolerance	1 / Within range
Type	
Main Board	
Position	
1	

✓

Figure 271: Discrete Output, Comparator Assignment

Touch the **Comparators** field to display a list of available comparators.

ID	Name	Data Source	Channel	Operator	Limit
01	Within range	Displayed Weight	Scale 1	>_<	2.
02	Process underway	Displayed Weight	Scale 1	>	.
03					
04					
05					
06					
07					
08					
09					
10					

Figure 272: Comparators List

Touch the required comparator and select the check mark from the context menu which appears:

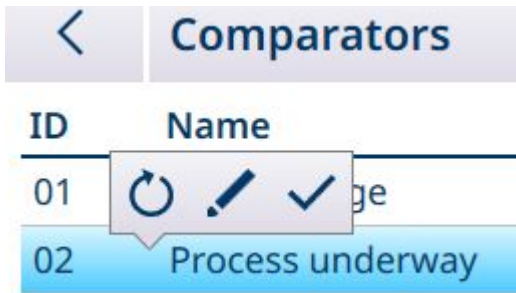


Figure 273: Comparator Selection Context Menu

The table below indicates the function of each of these options.

Parameter	Settings
ID	The Discrete Output ID is automatically set and cannot be changed, except by deleting existing outputs and re-creating them in the desired order.
Name	Touch the Name field to display an alphanumeric entry screen where a descriptive title for the output can be entered.

Parameter	Settings
Type	<p>Select from the Type list to determine the location of the output -- either on the main PCB or on a scale interface, or in an ARM100 Remote I/O module (if connected).</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Type</p> <p>Virtual ▼</p> <hr/> <p>None</p> <p>Scale Card</p> <p>Main Board</p> <p style="background-color: #e0f0ff;">Virtual</p> </div> <p>Options are:</p> <ul style="list-style-type: none"> • None • Scale Card • Main Board • Virtual • ARM100 (if connected)
Location	<p>Type = Scale Card: Scale 1, Scale 2</p> <p>Type = Main Board: 1, 2</p> <p>Type = Virtual: Virtual IO Device</p> <p>Type = ARM100: Up to 8 modules</p> <p>Note: The Virtual option is used for system diagnostics only; outputs triggered from the Maintenance > Run > Diagnostics > [DIO Test ▶ Page 262] do not affect attached devices.</p>
Position	<p>If Type is set to Virtual or ARM100, a Position field displays, from which the address of the output can be selected.</p>

Parameter	Settings
Assignment	<p>The output's Assignment can be selected from this dropdown list. The output will be triggered by the selected assignment:</p>  <p>Assignment options are:</p> <ul style="list-style-type: none"> • None • Center of Zero • Net • Motion • Over Capacity • Under Zero • Over Zone • Ok / Tolerance Zone • Under Zone • Classes 1 - 8 • Low Zone • High Zone • Comparators • System Error Alarm • System OK • Scale 1 - 4 selected • Sum Scale selected
Channel	<p>If Assignment is set to a scale-related parameter (Center of Zero, Net, Notion, Over Capacity, Under Zero), the Channel field appears. This drop-down lists offers the following options:</p> <ul style="list-style-type: none"> • Active Scale • Scale 1 - Scale 4

3.3 Terminal Setup

The Terminal branch includes the following menu options:

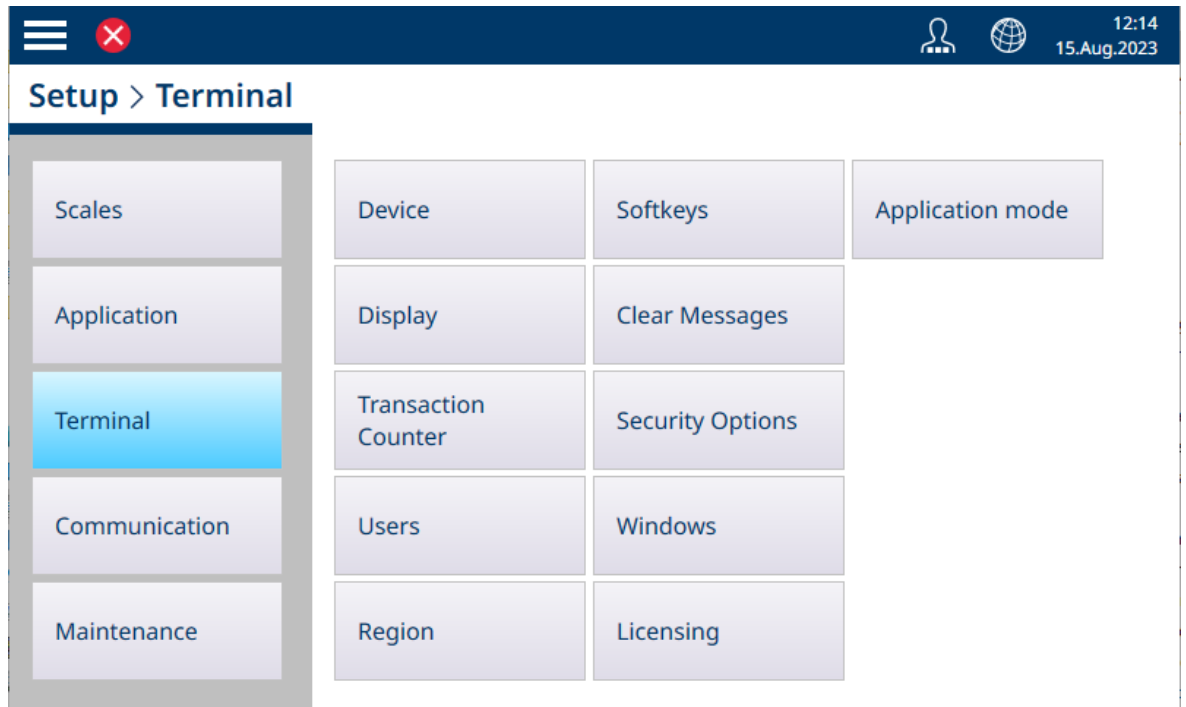


Figure 274: Terminal Menus

3.3.1 Device

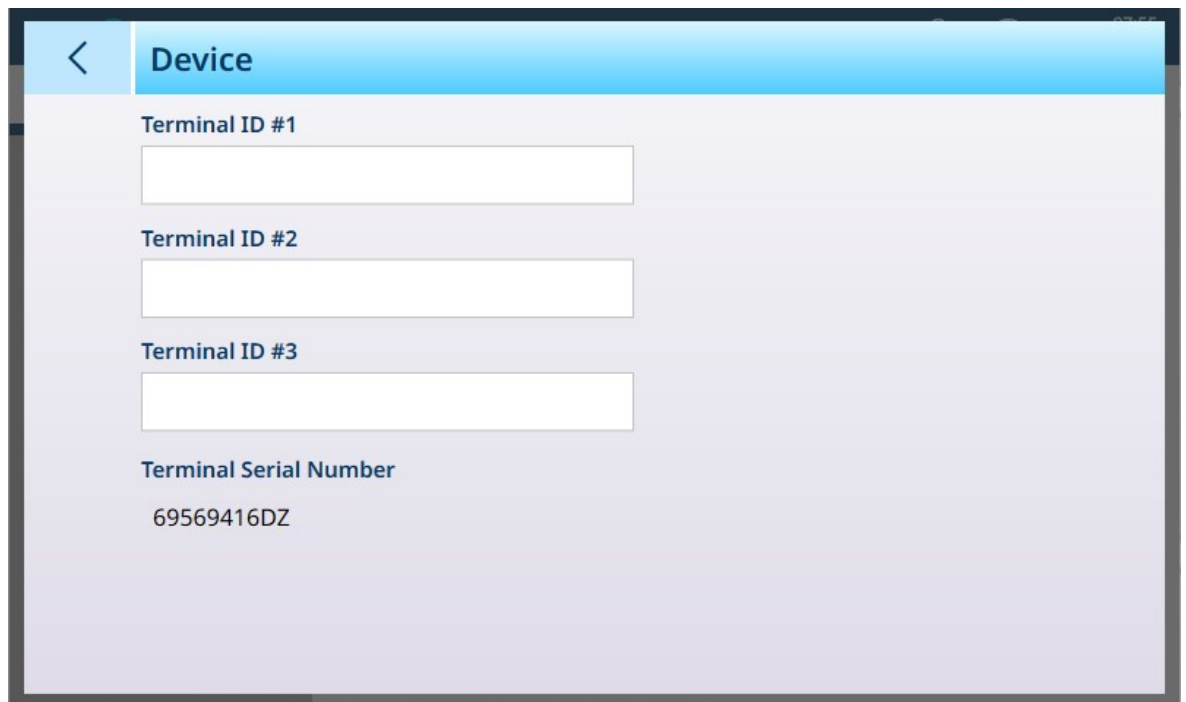


Figure 275: Terminal - Device

Parameter	Options	Function
Terminal ID #1, 2, 3	Displays an alphanumeric entry dialog.	Three optional strings used to identify the terminal. These could include location, function, etc.
Terminal Serial Number	Displays a value.	This serial number is fixed and cannot be modified.

Serial Number Mismatch

If the **Terminal Serial Number** field is editable and shows a "Serial Number Mismatch" warning in red, click on the field. If necessary, enter the correct serial number from the terminal's data plate, and then confirm the entry in the alphanumeric entry keypad. Finally, click the check mark which appears at lower right in the **Device** screen. The serial number mismatch will be cancelled, and the serial number will no longer be editable.

3.3.2 Display

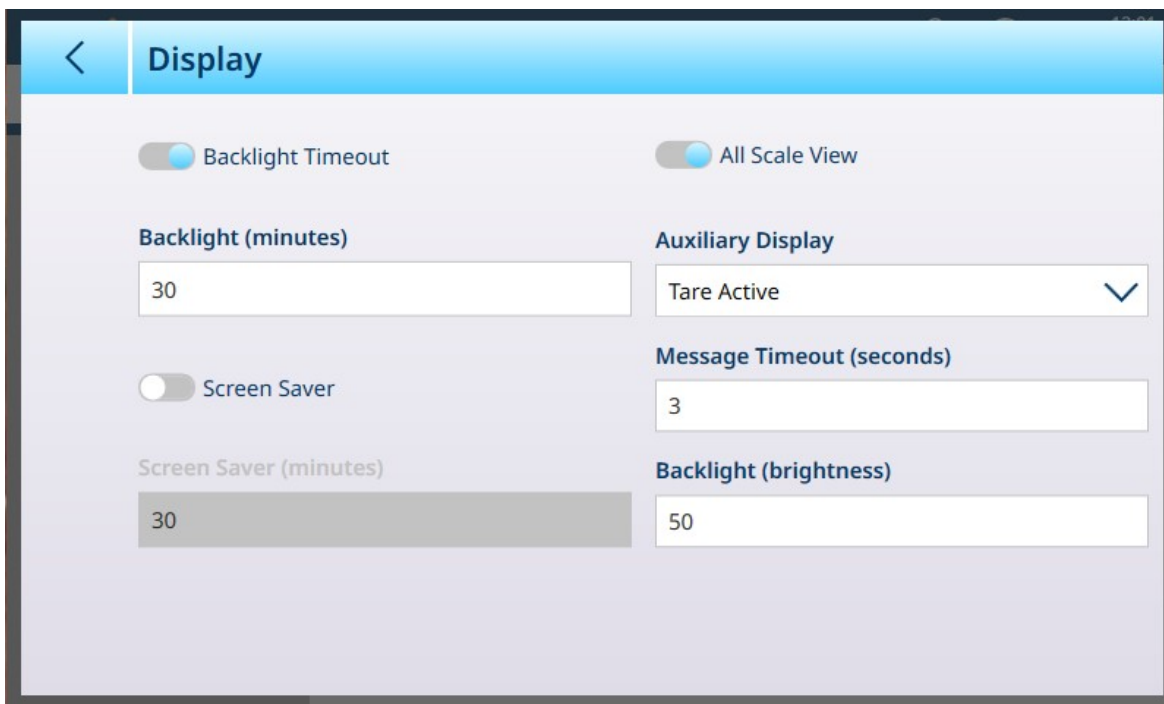


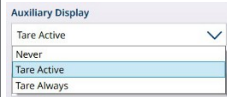
Figure 276: Terminal - Display



NOTICE

Backlight Timeout and Screen Saver

Either the Backlight Timeout or the Screen Saver can be enabled, but not both at the same time.

Parameter	Options	Function
Backlight Timeout	Enabled, Disabled	Determines whether the backlight timer is operative.
Backlight (minutes)	Displays numeric entry dialog. Default is 30 .	Determines how many minutes the terminal must be inactive before the backlight is turned off.
Screen Saver	Enabled, Disabled	Determines whether the screen saver is operative.
Screen Saver (minutes)	Displays numeric entry dialog. Default is 30 .	Determines how many minutes the terminal must be inactive before the screen saver is invoked.
All Scale View	Enabled, Disabled	Determines whether the main screen displays information for all scales at once, or one at a time (using Scale Switching to change between views).
Auxiliary Display	Tare Active, Tare Always.  Default is Tare Always .	Determines when the tare display appears at lower left of the weight display window. By default, this display appears only when a tare value is active and the terminal is in Net mode.

Message Timeout (seconds)	Default is 3 seconds .	Determines how long to display the popup which appears when a message arrives in the message area at top left of the screen. The maximum value is 30 seconds. A value of 0 prevents the message alert from displaying, but messages still accumulate in the message area.
Backlight (brightness)	Default is 50 .	The brightness of the backlight is configurable, so that the display can be adapted to its environment. In a darker space, a lower number will be adequate. The value is relative, where 0 represents no backlight, and 100 represents the backlight's highest possible value.

3.3.3 Transaction Counter

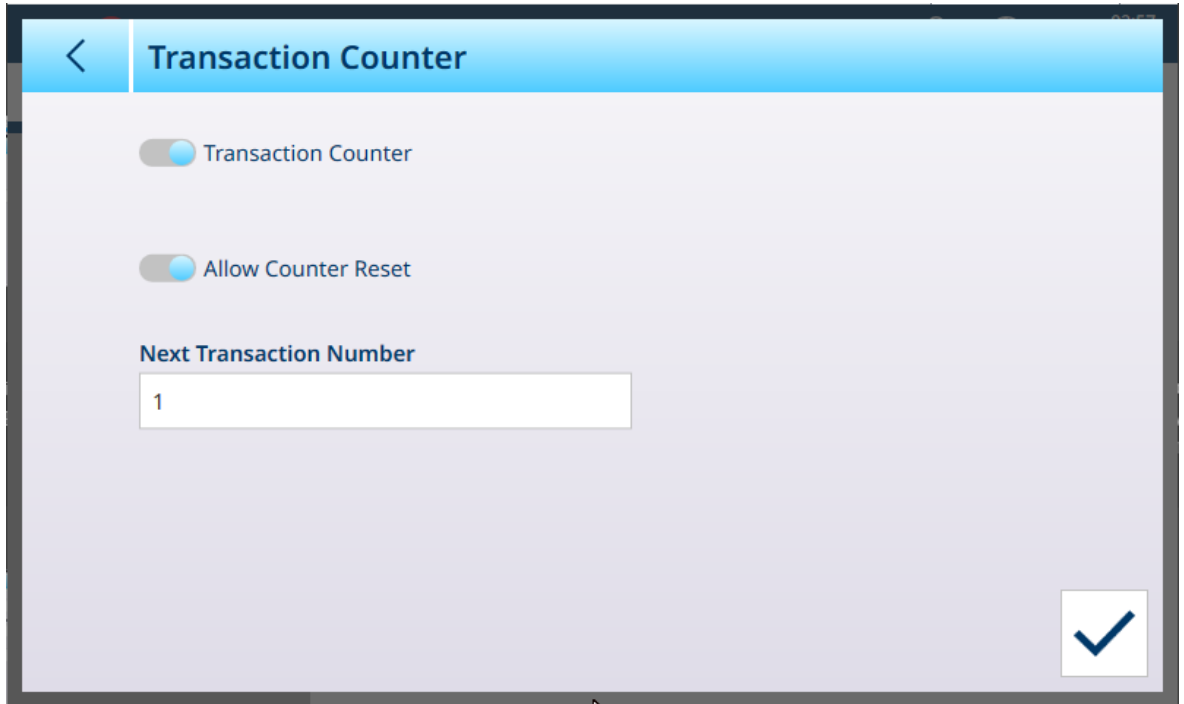
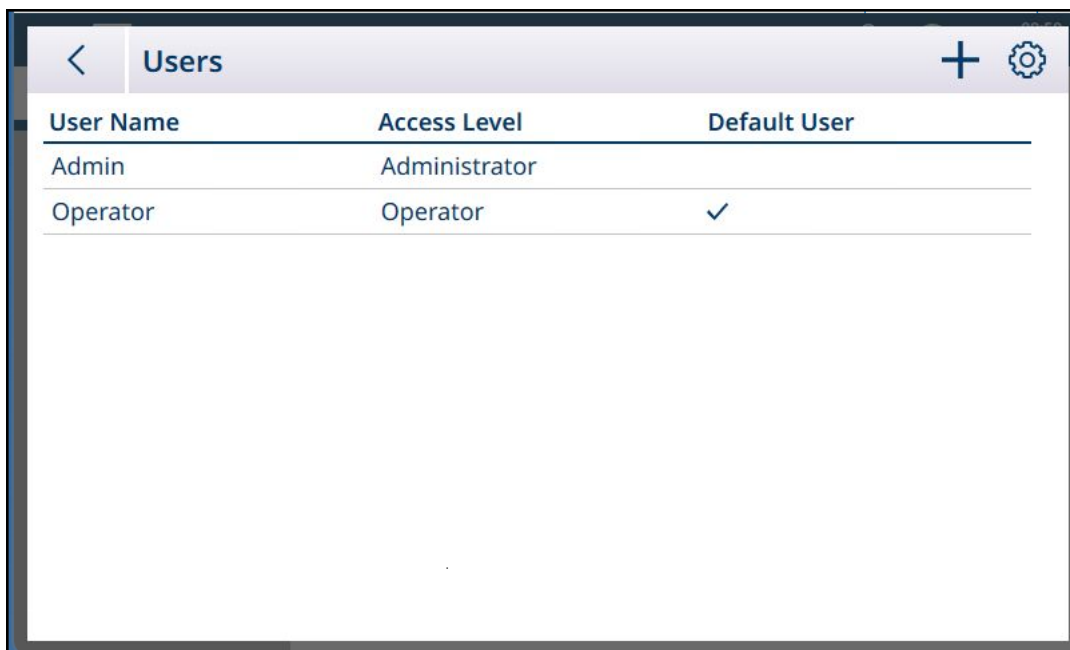


Figure 277: Transaction Counter

When the **Transaction Counter** is **Enabled** (the default is **Disabled**), an **Allow Counter Reset** option becomes available; when this is Enabled, a field displays which, when touched, opens a numeric entry dialog permitting a new transaction count start number to be defined.

3.3.4 Users



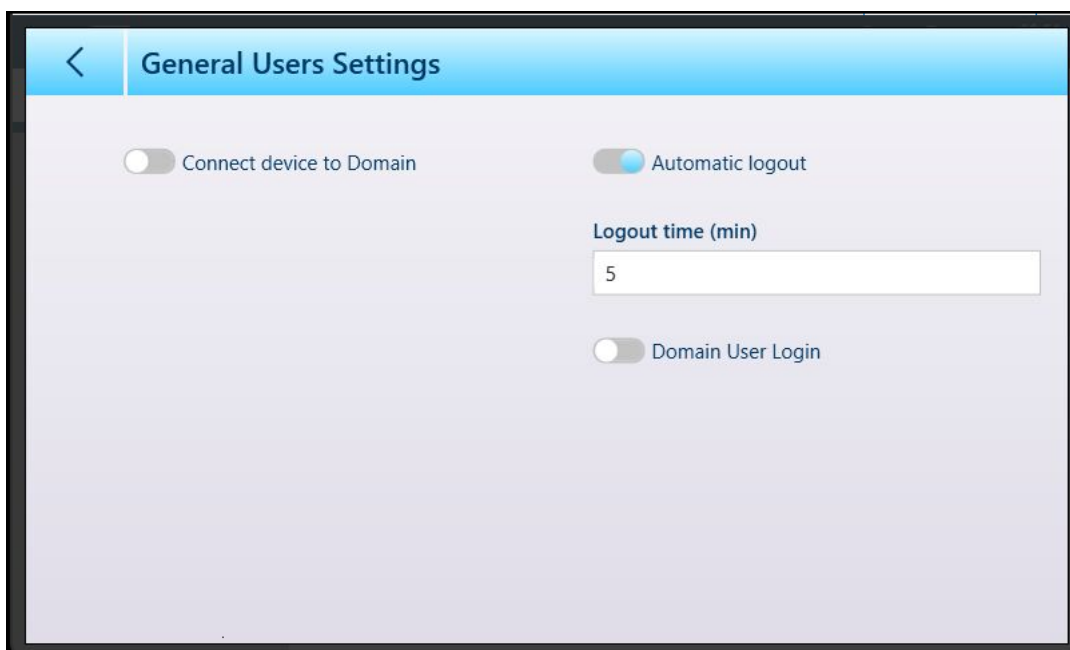
User Name	Access Level	Default User
Admin	Administrator	
Operator	Operator	✓

Figure 278: Users List

The **Users** list displays all currently configured users.

General Users Settings

Touch the Settings icon  to display the General Users Settings screen.



Connect device to Domain

Automatic logout

Logout time (min)

5

Domain User Login

Figure 279: General Users Settings Screen

Automatic Logout and its associated **Logout time (min)** parameter can be disabled only when **Connect device to Domain** and **Domain User Login** are disabled.

Before enabling the **Connect device to Domain** function, make sure that the Unified Write Filter (UWF) is disabled at [Security Options ▶ Page 200]. Otherwise, an attempt to make this setting will result in a warning:

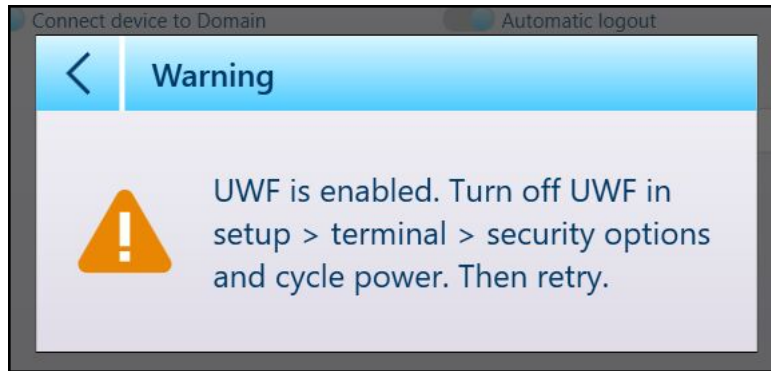


Figure 280: UWF Warning Dialog

Note that disabled the UWF in the **Security Options** screen requires a terminal re-boot. When UWF is disabled, touch the **Connect device to Domain** slider to display fields used for domain access.

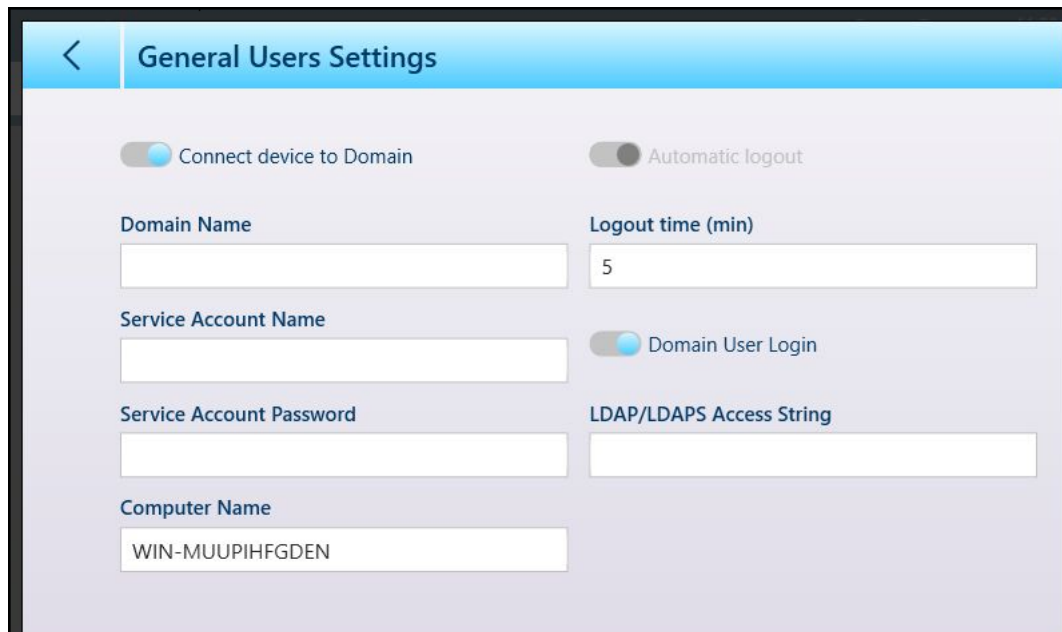


Figure 281: Device Access to Domain Parameters Displayed

When **Domain User Login** is enabled, a **LDAP/LDAPS Access String** field is displayed.



Figure 282: LDAP/LDAPS Access String Field

Touch this field to display an alphanumeric keypad for string entry.

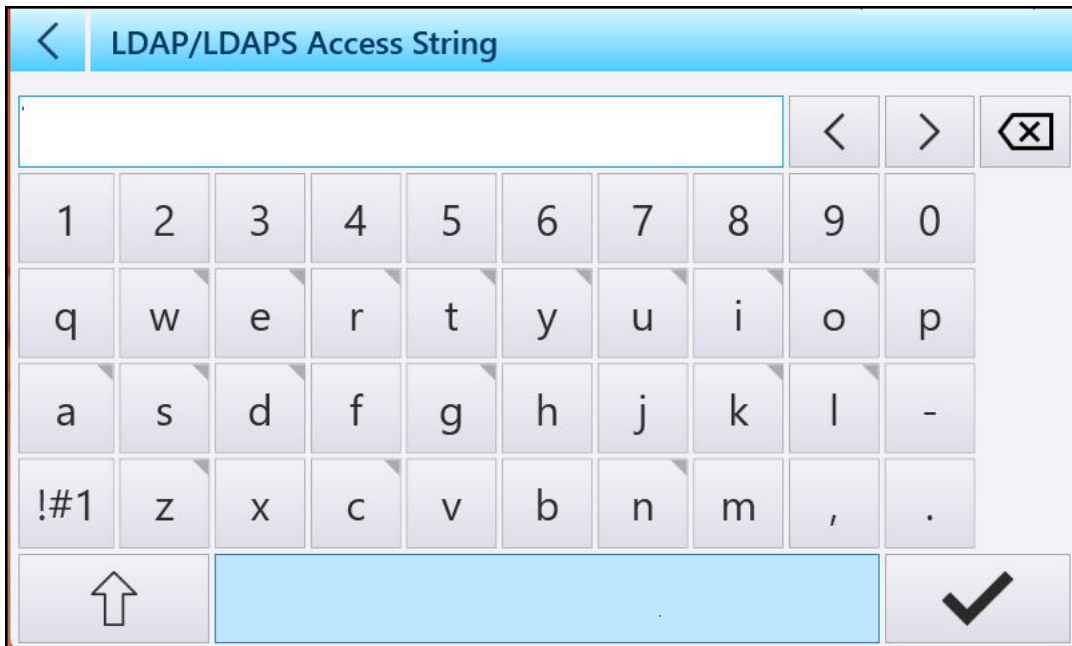


Figure 283: Access String Entry Dialog

Enter the required string and touch the check mark to connect to the domain.

Adding, Editing and Deleting Users

Touch a row to display the options for that row; neither of the default users can be deleted, but can be edited. Additional users of any access level can be created, edited and deleted.

To set a default user, click the **Default User** slider in the **Edit** screen. There can be only one default user. To delete a default user, first visit the user **Edit** screen and set the **Default User** slider to disabled. The user can then be deleted from the **Users** list.

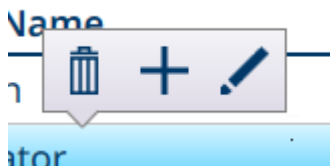


Figure 284: User Edit Options

The screenshot shows a mobile application interface for editing a user. At the top, there is a blue header bar with a back arrow on the left and the word "Edit" in white. Below the header, the form is set against a light purple background. It contains the following elements: a "User Name" label above a text input field containing "Admin"; a "Password" label above a text input field containing six dots; an "Access Level" label above a dropdown menu showing "Administrator" with a downward arrow; and a "Default User" label next to a blue toggle switch that is currently turned on.

Figure 285: Admin User Edit Options

The screenshot shows a mobile application interface for editing a user. At the top, there is a blue header bar with a back arrow on the left and the words "Edit User" in white. Below the header, the form is set against a light purple background. It contains the following elements: a "User Name" label above a text input field containing "Operator"; a "Password" label above a text input field containing six dots; an "Access Level" label above a dropdown menu showing "Operator" with a downward arrow; and a "Default User" label next to a grey toggle switch that is currently turned off.

Figure 286: Edit Standard User Options

3.3.5 Region

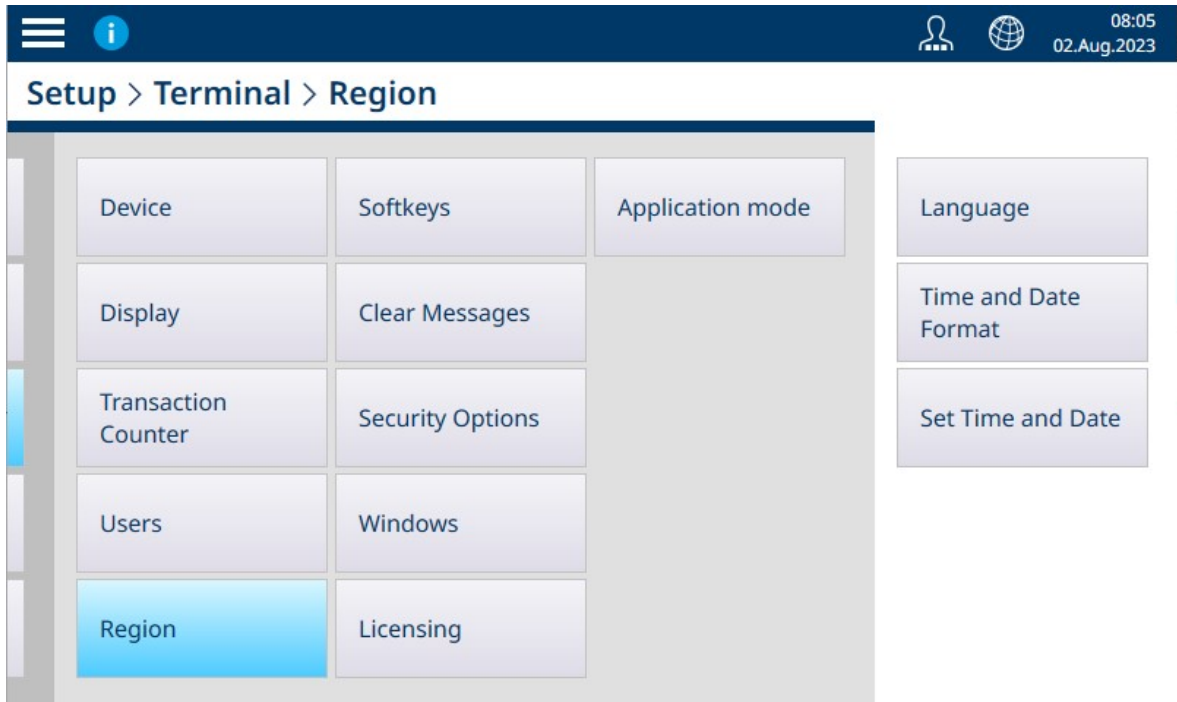


Figure 287: Region Menu

The **Region** menu offers the three options listed below.

3.3.5.1 Language

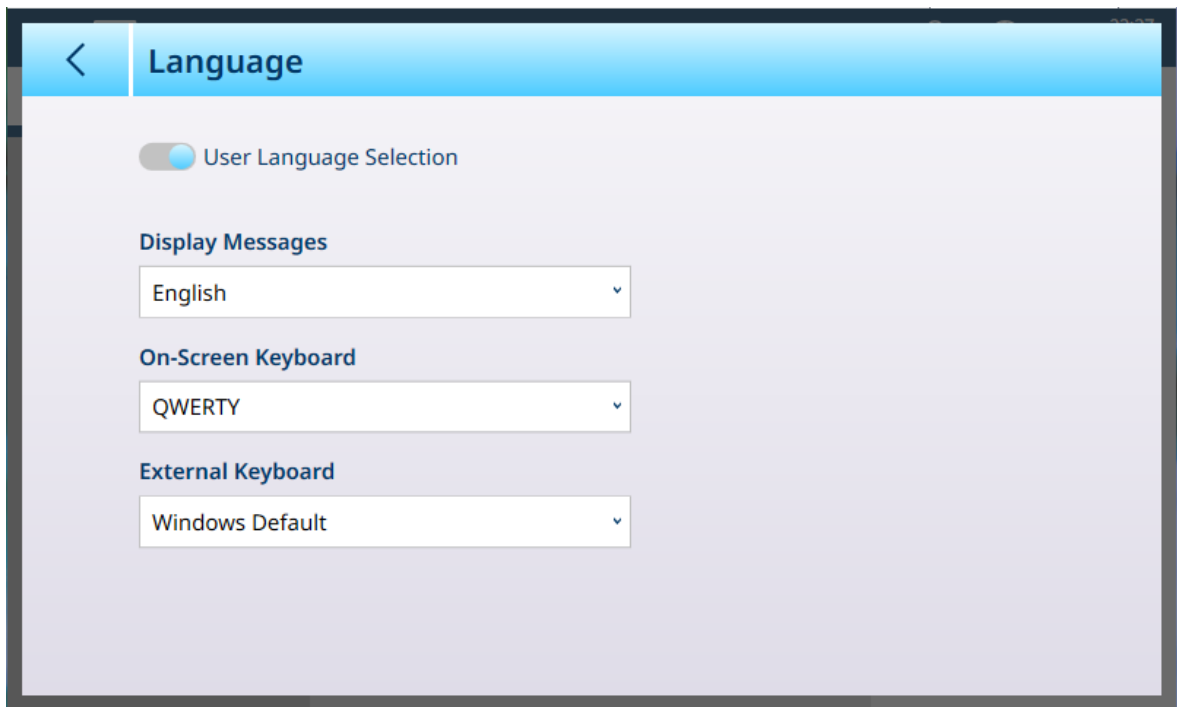



Figure 288: Region - Language

The **Language** page allows a language to be defined for the following items.

Parameter	Options	Function
User Language Selection	Enabled [default] , Disabled	When Enabled , the user can select a Display Messages language from the globe icon  on the home screen. When User Language Selection is Disabled , the globe icon is not displayed and the terminal's language is fixed to the selection made in Display Messages .

Display Messages	English [default] , Français, Deutsch, Italiano, Español	Determines the language in which displayed messages are shown.
On-Screen Keyboard	QWERTY [default] , QWERTZ, AZERTY	Determines the keyboard layout for alphanumeric input screens.
External Keyboard	Windows Keyboard [default] , English (United States)-US, German (Germany)-German, French (France)-French, Italian (Italy)-Italian, Dutch (Netherlands)-United States-International, Chinese (Simplified, China)-Chinese (Simplified) - US, Spanish (Spain, International Sort)-Spain	Determines the layout for an external (USB) keyboard.

3.3.5.2 Time and Date Format

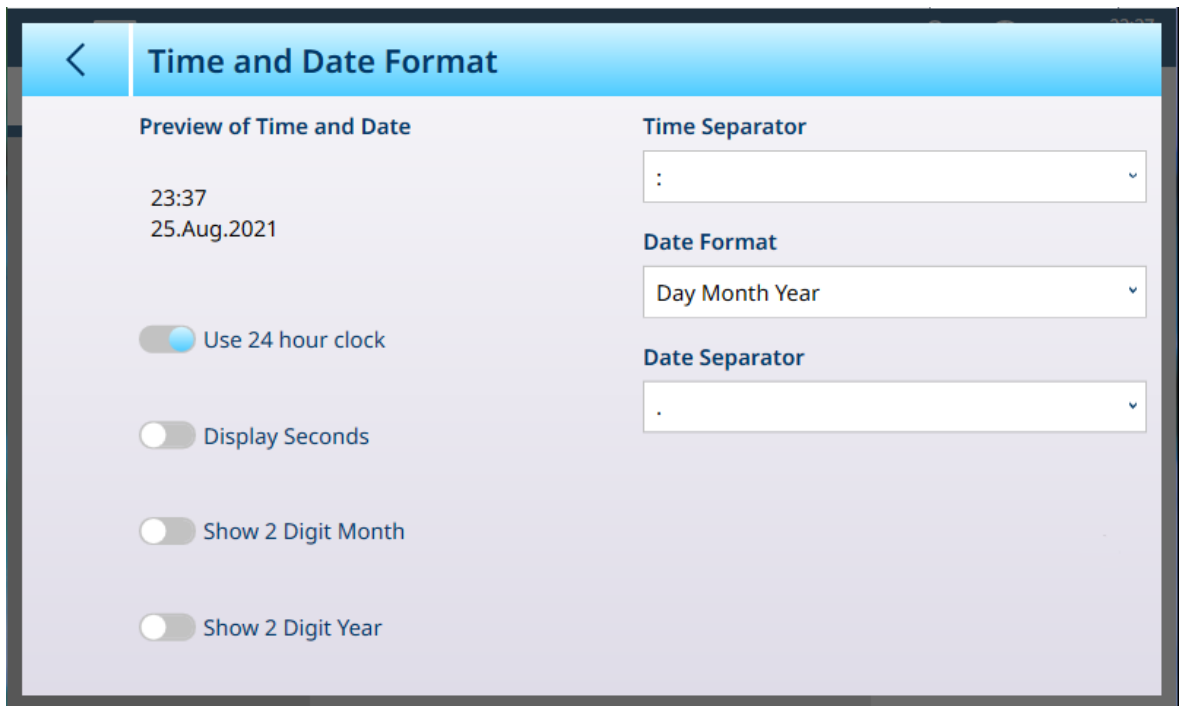


Figure 289: Time and Date Format Options

Parameter	Options	Function
Preview of Time and Date	Display only	Shows how time and date are currently formatted.
Use 24 hour clock	Enabled [default] , Disabled	Selects a 12 or 24 hour clock display. If 12 is selected AM or PM is appended to the time display, depending on the current 12 hour period.
Display Seconds	Enabled, Disabled [default]	Seconds can be displayed or hidden.
Show 2 Digit Month	Enabled, Disabled [default]	The month is either displayed in abbreviated alphabetical form (e.g. Aug) or as two digits (e.g. 08).
Show 2 Digit Year	Enabled, Disabled [default]	The year is either displayed as four digits (e.g. 2021) or two (e.g. 21).
Time Separator	. [default] , ,	Determines the character used to separate elements of time display.

Date Format	Day Month Year [default] , Month Day Year, Year Month Day	Determines the sequence of the date display.
Date Separator	None, (space), Dash, . [default] , /, :	Determines the character used to separate elements of the date display.

3.3.5.3 Set Time and Date

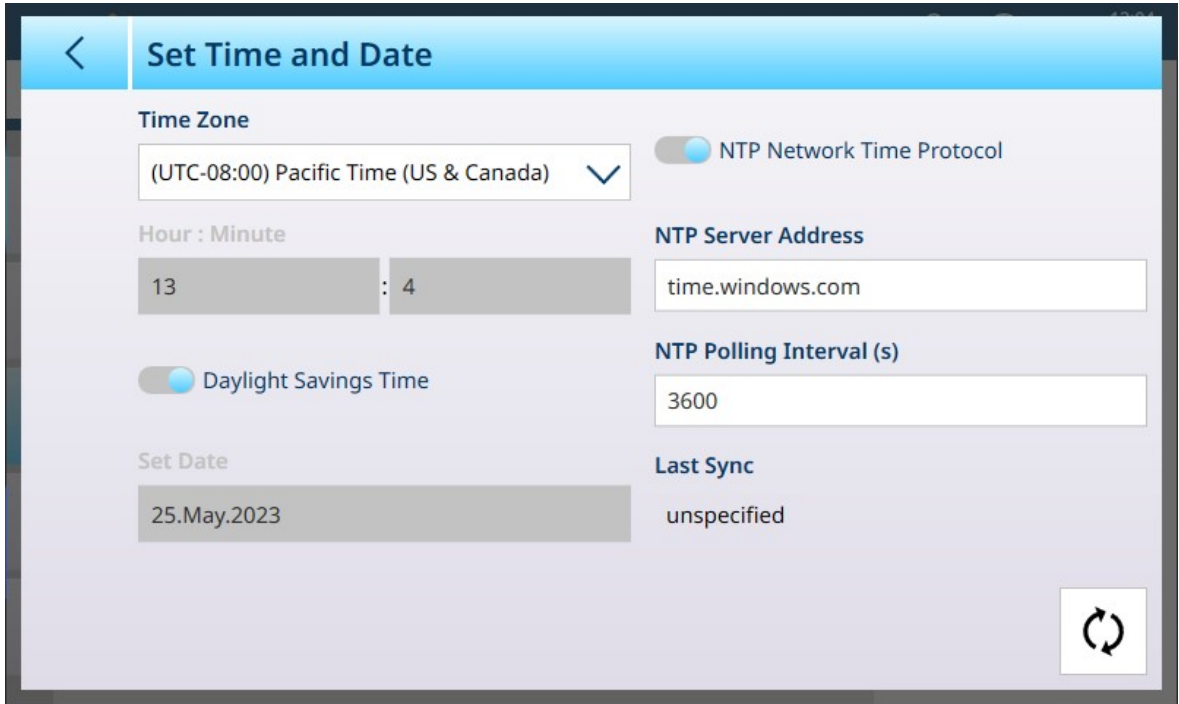
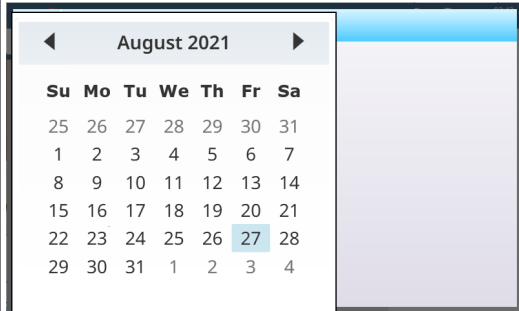



Figure 290: Set Time and Date

By default, when the terminal is connected to a network the **NTP Network Time Protocol** option is selected, and only the **Daylight Savings Time** slider remains active.

If the terminal is not connected to a network, the fields on this screen can be used to set the appropriate time and date.

Parameter	Options	Function
Time Zone	All time zones and regions from UTC-12 to UTC+14	Sets local time zone.
Hour : Minute	Each field opens a numeric entry dialog.	Sets the current time.
Daylight Savings Time	Enabled [default] , Disabled	Determines whether or not Daylight Savings Time is observed.
Set Date	Displays a calendar screen	Current date can be selected from the calendar screen.



NTP Network Time Protocol	Enables or disables NTP.	If the terminal is connected to a domain which provides its own rules, this toggle is greyed out and the data fields are populated with information from the Windows registry. Otherwise, enabling NTP allows the terminal to set its time and date automatically, by referring to the configured Server Address .
NTP Server Address	Default is time.windows.com .	
NTP Polling Interval (s)	Determines the frequency of NTP polling. The default value is 3600 seconds, or 1 hour.	By default, this value is read from the Windows registry.
Last Sync	Displays the time stamp of the last synchronization with the NTP. Default is Not specified , indicating that no synchronization has taken place.	In a terminal that is not connected to a network, polling cannot take place, and this value will remain unspecified.
	Synchronizes time and date with NTP server, then exits to Setup > Terminal > Region menu view.	

3.3.6 Softkeys

The softkeys displayed in the ribbon on the IND700 home screen are configurable, and can be used to access various functions and features directly. By default, the **Softkey Ribbon Editor** screen appears as shown here:




Figure 291 : Softkey Ribbon Editor: Softkeys Displayed with Labels -- Default

To display softkeys without labels, touch the **T** at upper right.



Figure 292: Softkeys Displayed Without Labels

Additional softkeys can be selected from the scrolling array at the bottom of the screen, and dragged to a position in the editor. The predefined softkeys cannot be moved or deleted.

Touch the reset icon  at the top right to reset the softkey ribbon to its default configuration. A confirmation dialog will display:

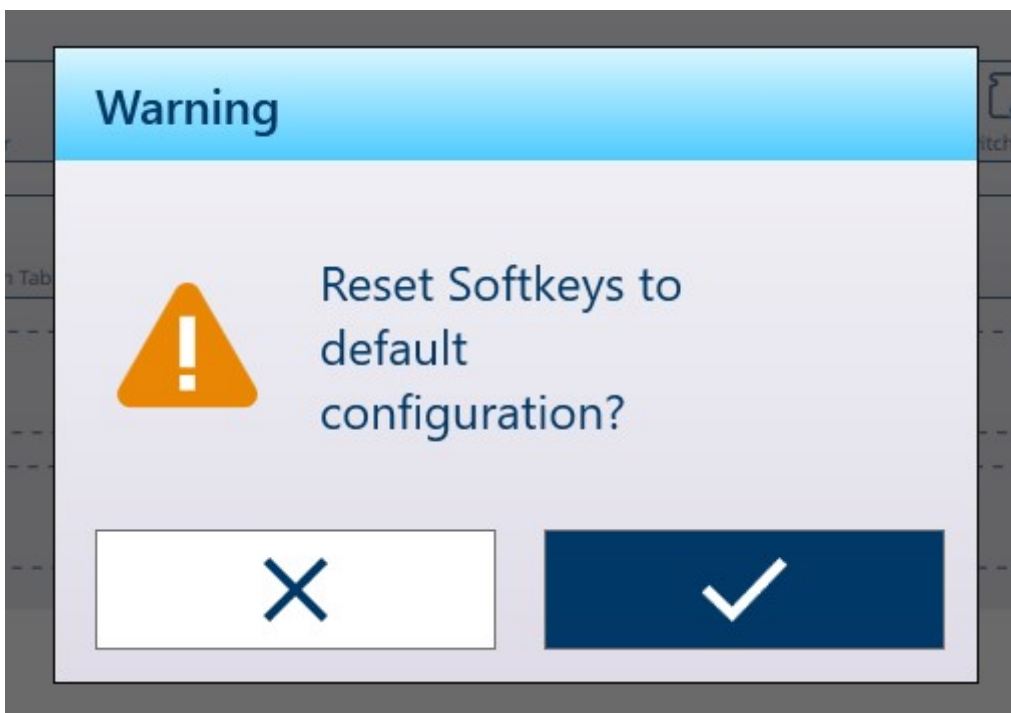


Figure 293: Reset Softkeys Confirmation Dialog

3.3.7 Clear Messages

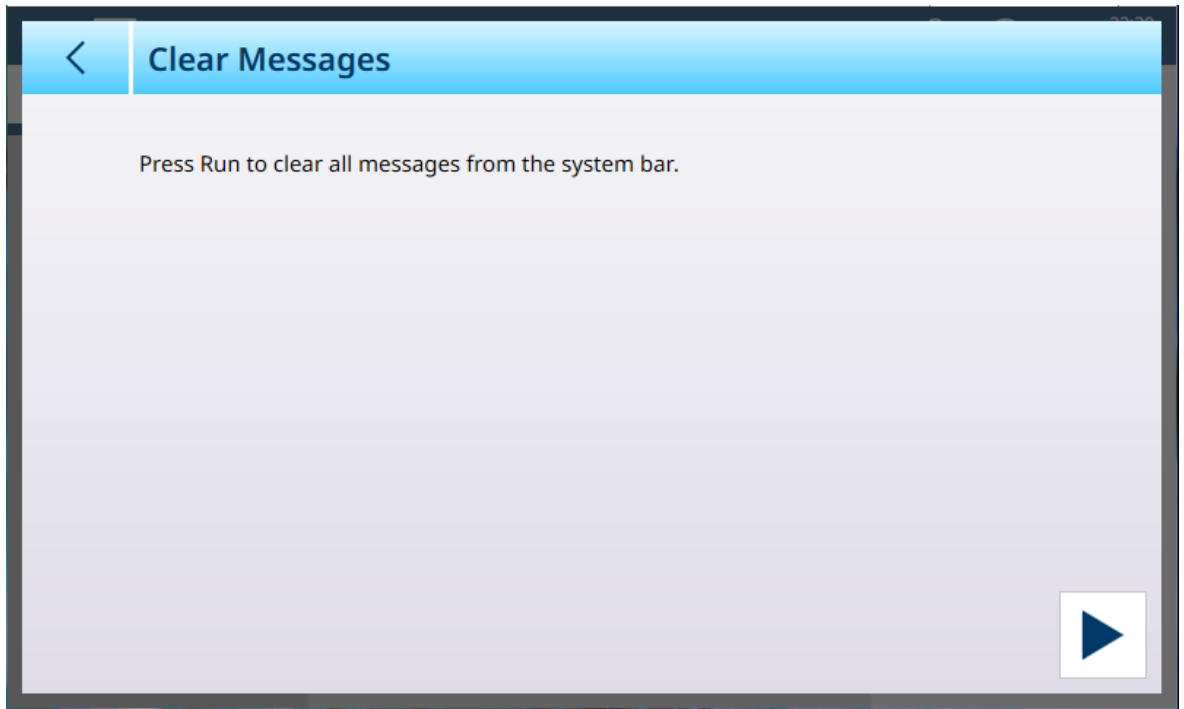


Figure 294: Clear Message

Touch the RUN arrow at lower right to clear all messages from the system bar on the home screen. A confirmation dialog will display:

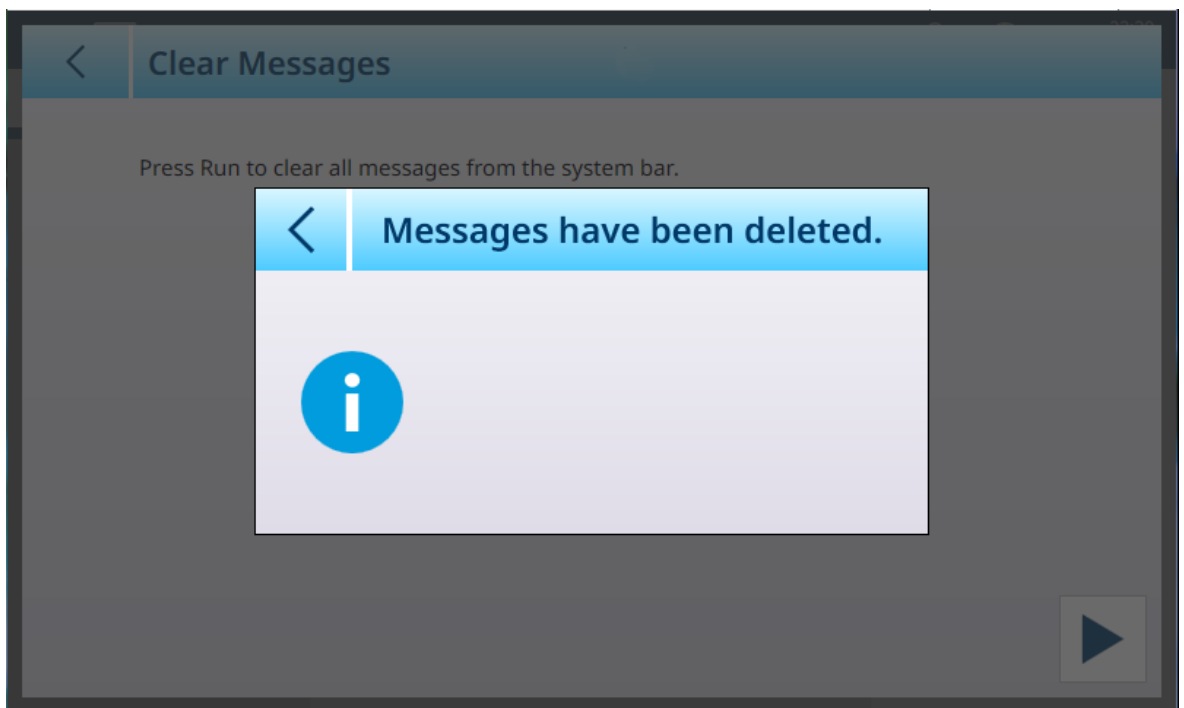


Figure 295: Clear Messages Confirmation Dialog

3.3.8 Security Options



Figure 296: Terminal Security Options

Parameter	Options	Function																					
Unified Write Filter	Enabled [default] , Disabled	The Unified Write Filter is a Windows feature that helps to protect drives by intercepting and redirecting any writes to the drive (app installations, settings changes, saved data) to a virtual overlay. This virtual overlay is a temporary location which is cleared during a reboot. For this reason, take care when performing an installation: If UWF is set to Enabled , the installation will be lost when the terminal is rebooted. When installing software outside folders excluded from UWF, first disable UWF. The following files, folders and registry keys are excluded -- their contents will be preserved during a reboot:																					
Keyboard Filter	Disabled [default] , Enabled	The Keyboard Filter suppresses undesirable key presses or key combinations -- for example, Ctrl+Alt+Delete, and the Windows key. Applying the Keyboard Filter can block any key combination or system keys which would allow the user to exit the application and access the Windows desktop. The following keys and key combinations are suppressed by this filter: <table border="1"> <tr> <td>Windows key</td> <td>Application key</td> <td>Function keys F1-F24</td> </tr> <tr> <td>Security Keys Ctrl+Alt+Del</td> <td>Security Keys Shft-Ctrl-Esc</td> <td>Accessibility Keys LShift+LAlt+PrntScr</td> </tr> <tr> <td>Accessibility Keys LShift+LAlt+NumLock</td> <td>Application Keys Alt+F4</td> <td>Application Keyes Ctrl+F4</td> </tr> <tr> <td>Alt+Space</td> <td>Ctrl+Esc</td> <td>Alt+Tab</td> </tr> <tr> <td>Ctrl+Tab</td> <td>LaunchMail</td> <td>LaunchMediaSelect</td> </tr> <tr> <td>LaunchApp1</td> <td>LaunchApp2</td> <td>Microsoft Surface Key F21</td> </tr> <tr> <td>VolumeMute</td> <td>VolumeDown</td> <td>VolumeUp</td> </tr> </table>	Windows key	Application key	Function keys F1-F24	Security Keys Ctrl+Alt+Del	Security Keys Shft-Ctrl-Esc	Accessibility Keys LShift+LAlt+PrntScr	Accessibility Keys LShift+LAlt+NumLock	Application Keys Alt+F4	Application Keyes Ctrl+F4	Alt+Space	Ctrl+Esc	Alt+Tab	Ctrl+Tab	LaunchMail	LaunchMediaSelect	LaunchApp1	LaunchApp2	Microsoft Surface Key F21	VolumeMute	VolumeDown	VolumeUp
Windows key	Application key	Function keys F1-F24																					
Security Keys Ctrl+Alt+Del	Security Keys Shft-Ctrl-Esc	Accessibility Keys LShift+LAlt+PrntScr																					
Accessibility Keys LShift+LAlt+NumLock	Application Keys Alt+F4	Application Keyes Ctrl+F4																					
Alt+Space	Ctrl+Esc	Alt+Tab																					
Ctrl+Tab	LaunchMail	LaunchMediaSelect																					
LaunchApp1	LaunchApp2	Microsoft Surface Key F21																					
VolumeMute	VolumeDown	VolumeUp																					
External Mass Storage Blocking	Disabled [default] , Enabled	Introducing an unknown USB storage device into the system can cause security issues. Removable storage media can be blocked from read/write access. If this feature is Enabled , an external USB storage device will not be detected and cannot be used. The USB storage device will be accessible only if this feature is Disabled .																					

Enable Windows Desktop	Enabled [default] , Disabled	To avoid changes in the Windows OS, access to the desktop can be limited. When this feature is Enabled , the Windows desktop will appear when the user exits the Application. If it is Disabled , a black screen will appear when the user exits the application. Remove and restore power to restart the terminal with the application running.
Firewall	Enabled [default] , Disabled	The Windows Firewall can be Enabled or Disabled ; by default, it is disabled.
Watchdog Timer (s)	30	The Watchdog Timer monitors the function of the terminal's CPU. If the CPU is prevented from performing scale functions because it is executing a Windows process, the watchdog will perform a system reset Note: Setting a value of 10 or less for the Watchdog Timer will cause the system to reboot continuously.
FTP Server (Port: 50001)	Disabled [default] , Enabled	If this feature is Enabled , files -- such as saved configuration files or log files -- can be read from and written to the terminal using an FTP utility.
sFTP Server (Port: 22)	Disabled [default] , Enabled	A Secure File Transfer Protocol (sFTP) can be enabled for devices accessed through a PC network. For access, the user name is ↵↵↵↵ and password ↵↵↵↵↵↵↵↵. These settings cannot be changed. The sFTP server connects to the root directory, C:\, on connection.
Remote Desktop Server	Disabled [default] , Enabled	When the Remote Desktop Server is Enabled , a remote connection can view the terminal's screen and control its function, including logging in and modifying configuration and calibration values.

3.3.9 Windows



Figure 297: Windows Menu

3.3.9.1 Activate Windows Through Internet

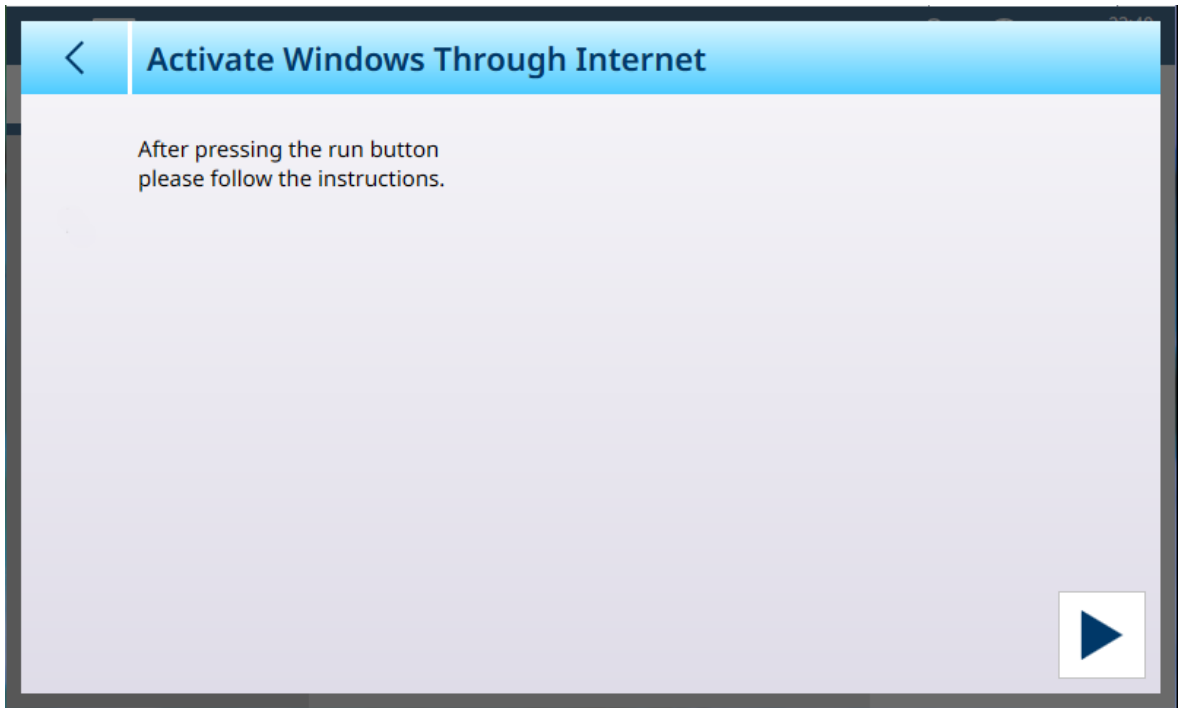


Figure 298: Windows Activatin by Internet

3.3.9.2 Activate Windows Through Phone

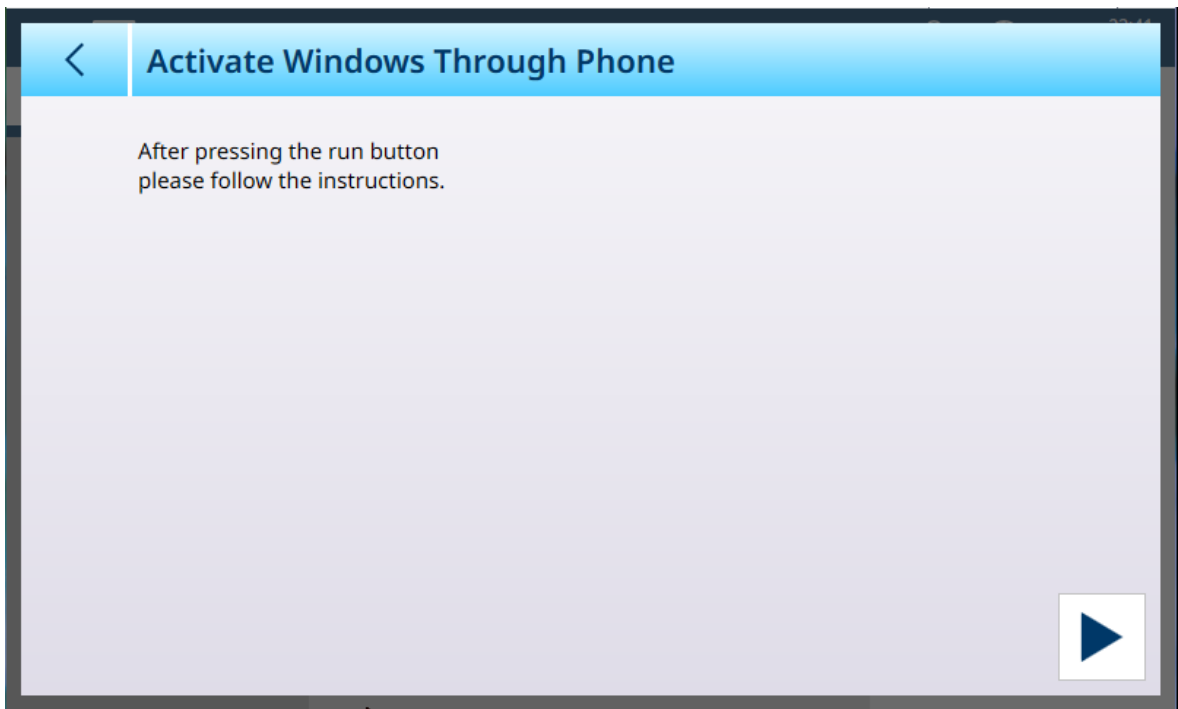


Figure 299: Windows Activation by Phone

3.3.9.3 License

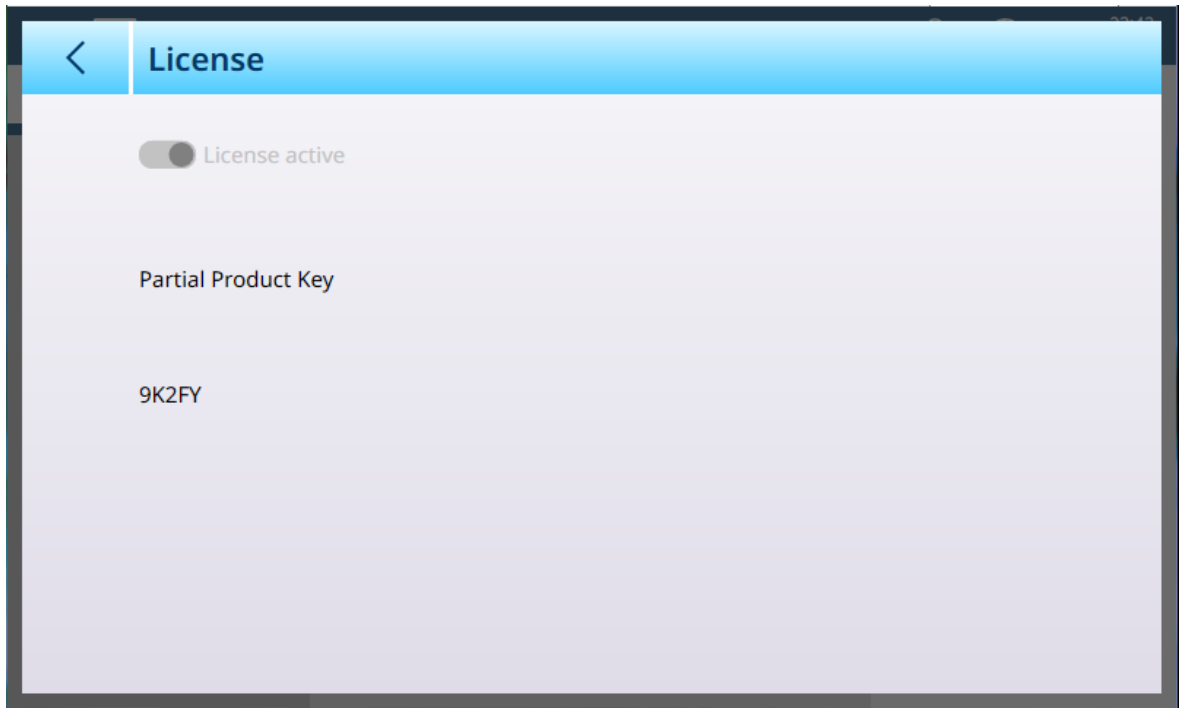


Figure 300: Windows License

3.3.9.4 Update Now

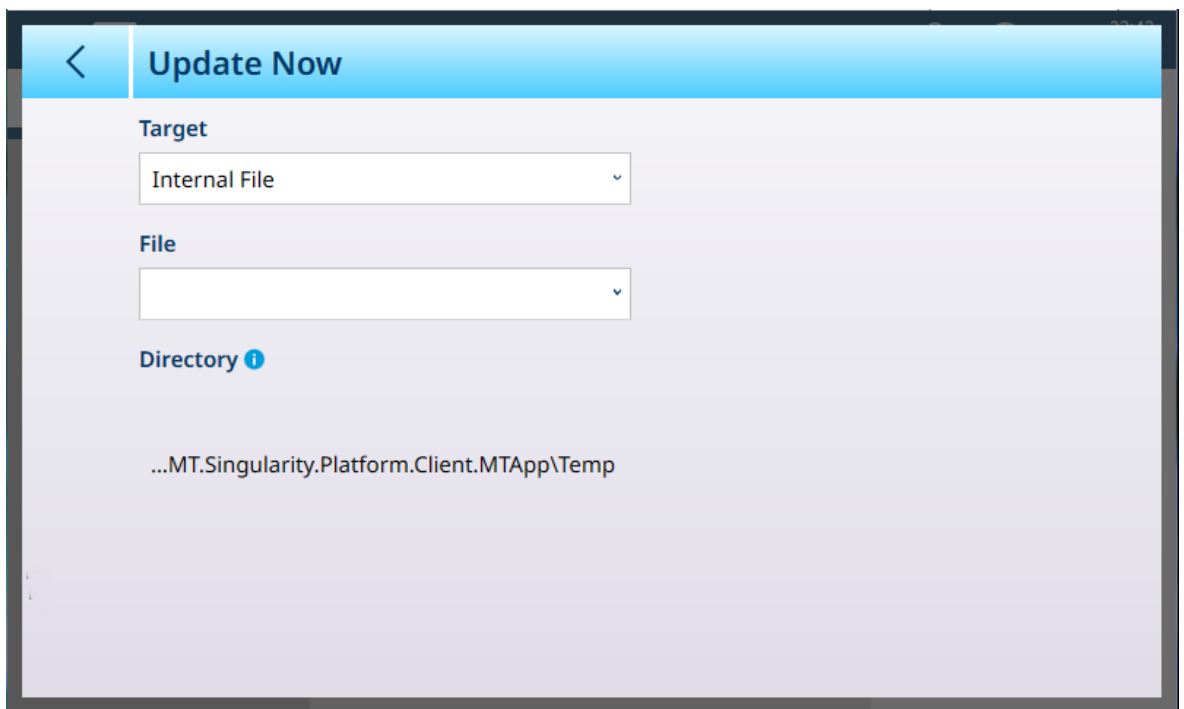


Figure 301: Windows Update

Parameter	Options	Function
Target	Internal File [default] , USB Memory	Determines where the terminal will look for the Windows update file.
File	Dropdown list of available update files.	If no files are found, this list is empty.
Directory	Display only	Directory location for update file.

3.3.10 Licensing

+

For details on managing licenses, refer to [Application Software Activation ▶ Page 269].

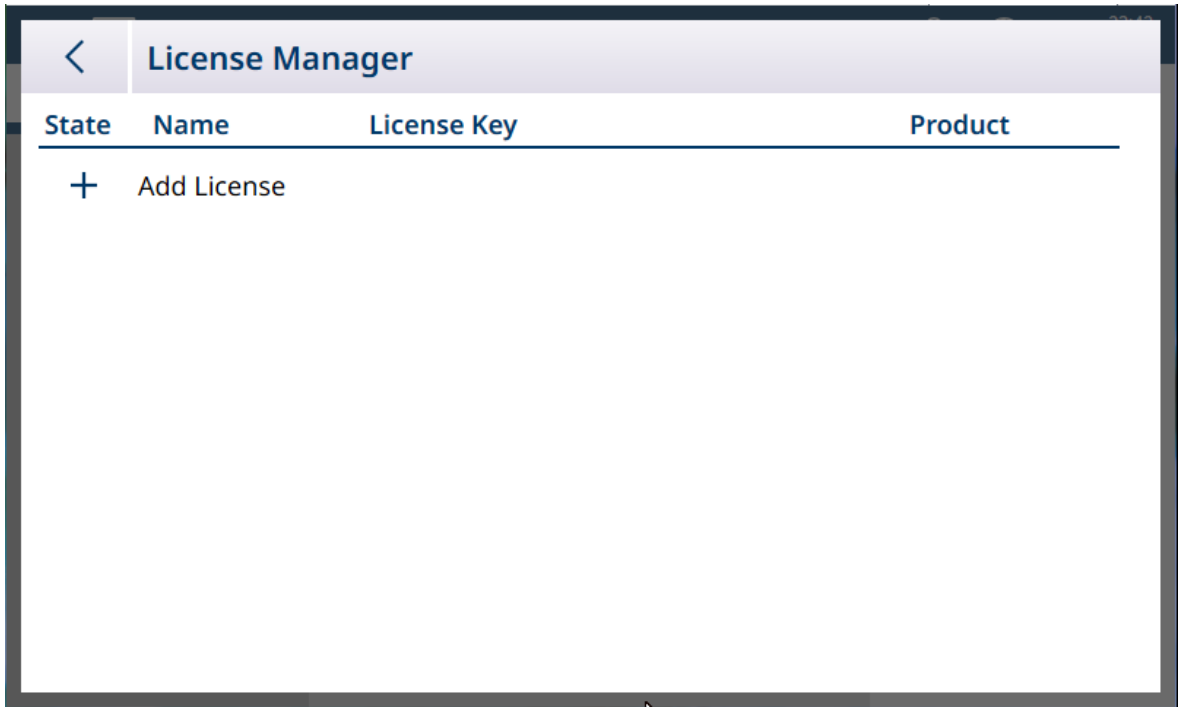


Figure 302: License Manager

The **License Manager** displays installed licenses, together with the key and the product to which they refer. In an IND700 licensed to run the ProWorks Multi-Tools applications, this screen will appear as shown here:

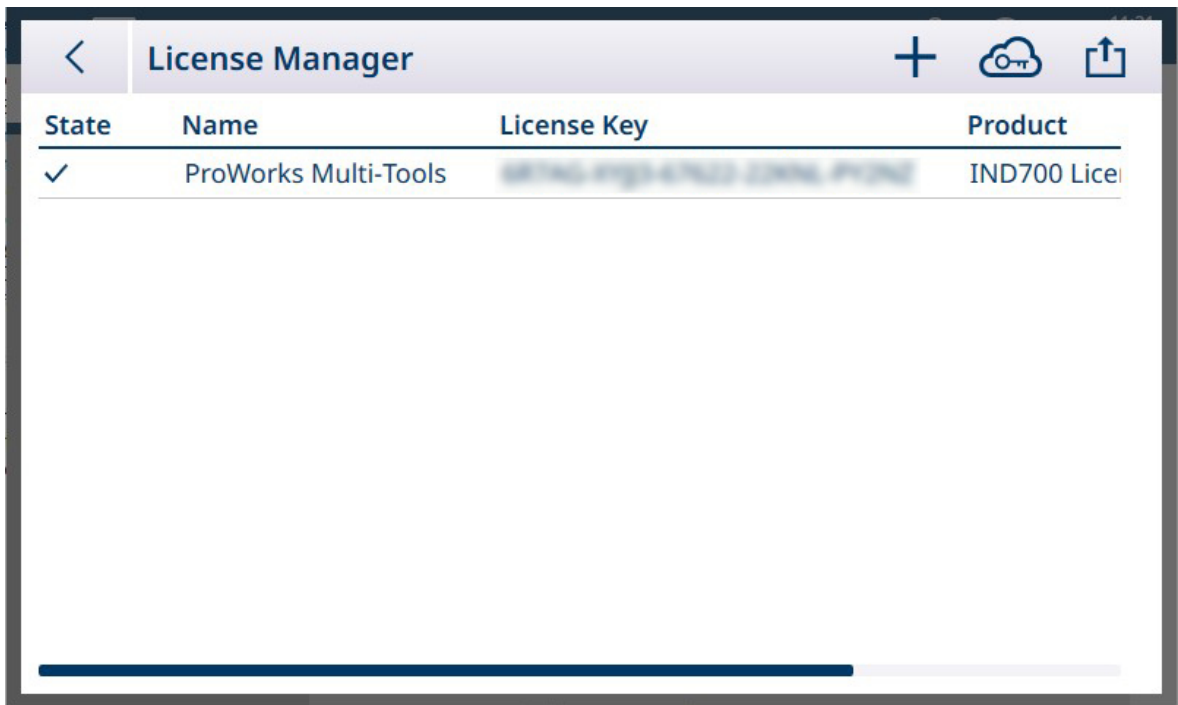


Figure 303: License Manager Screen Showing ProWorks Multi-Tools License

3.3.11 Application mode

The Application mode options determine how the IND700 will display its weight information. By default, the terminal is set to display weight information in Full Screen mode:

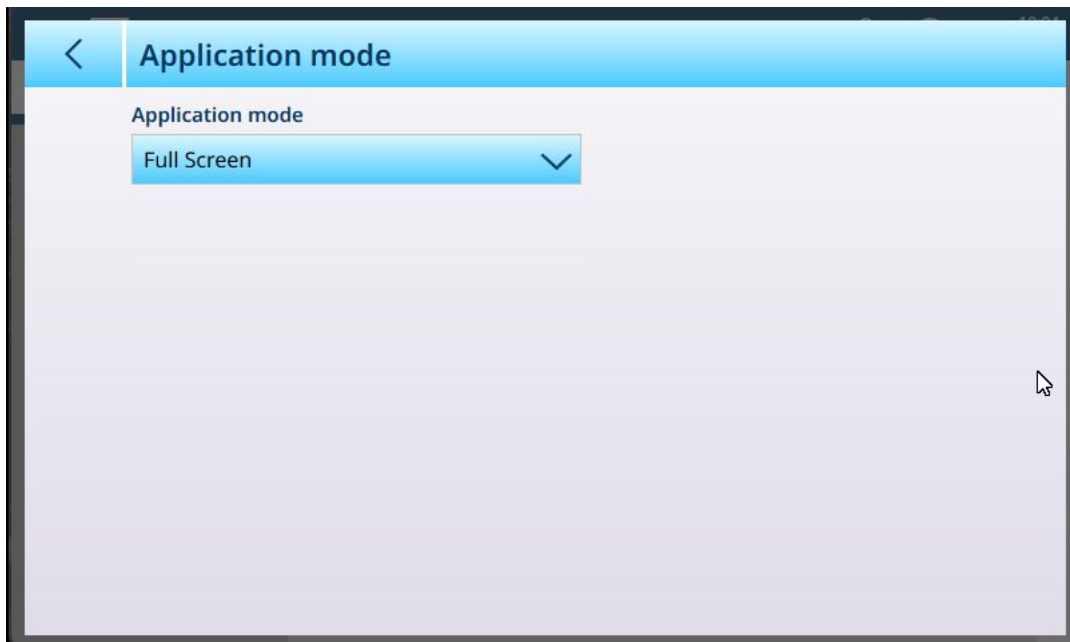


Figure 304: Application Mode, Default View

The **Application mode** dropdown list offers the following options:

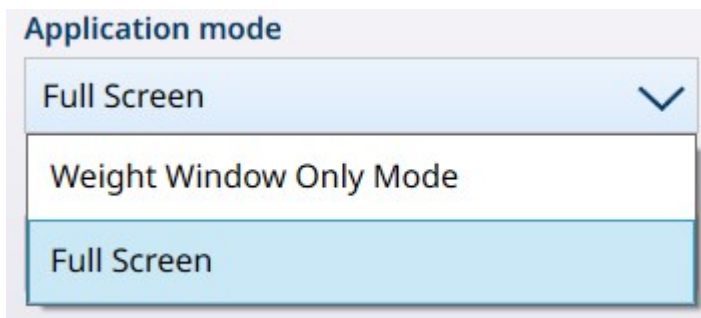


Figure 305: Application Mode Dropdown List Options



NOTICE

Weight Window Selection

The **Weight Window Only Mode** display shows weighing information for the scale currently selected (showing a blue highlight: **AL2**) when the configuration is made. To change the scale displayed, it is necessary to return to setup, select **Full Screen**, exit setup, select the desired scale, and then reapply the appropriate **Weight Window Only Mode** settings.

When **Weight Window Only Mode** is selected, additional options become available:

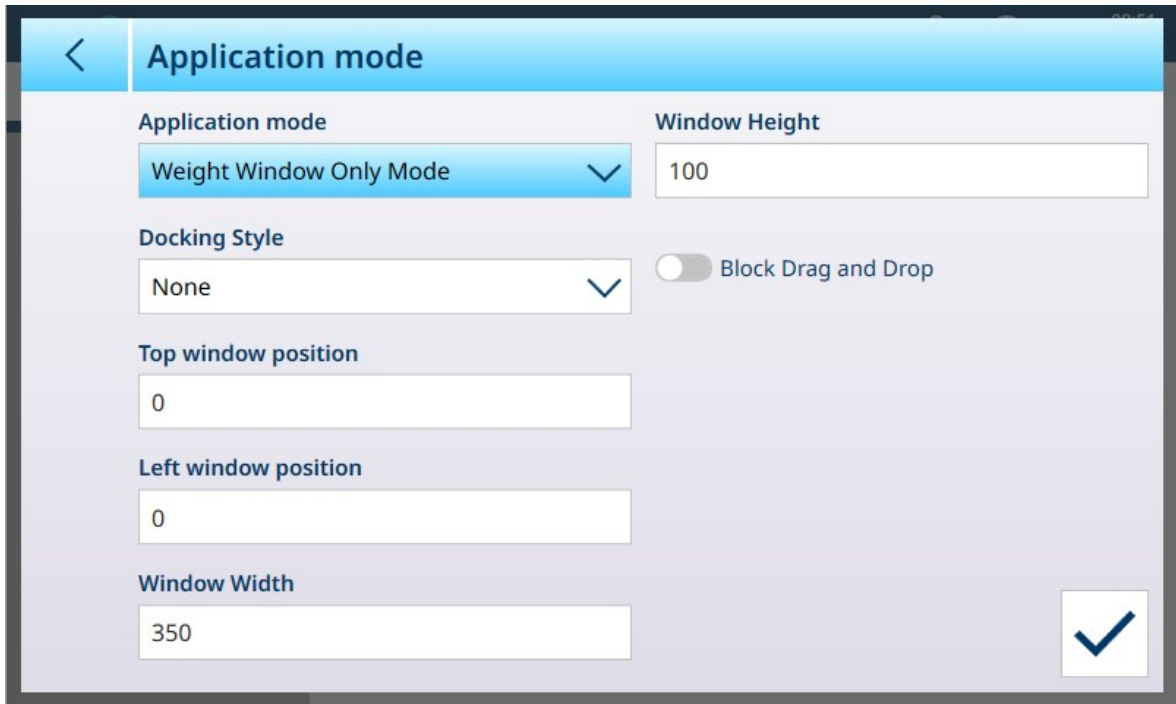
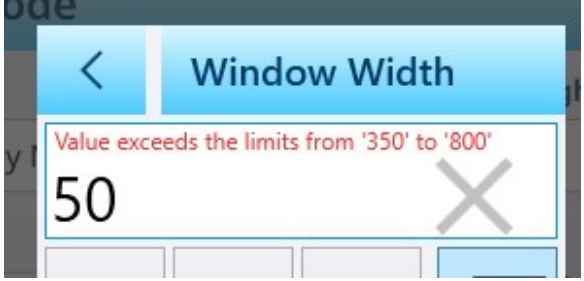


Figure 306: Application Mode Options, Weight Window Only Mode Selected

The options shown above are detailed in the table below.

Application Mode Parameters and Settings

Parameter	Settings
Application mode	The selection made here determines whether the other parameters are available. The default setting is Full Screen . When Weight Window Only Mode is selected, additional parameters determine the appearance and behavior of the weight window.
Docking Style	Options for Docking Style are None [default], Top , and Bottom . If Top or Bottom is selected, the weight display window will be attached to the respective edge of the screen, and the two position parameters will be unavailable.
Top window position	If Docking Style is None , the vertical window position can be set here, measured in pixels from the top of the IND700 display.
Left window position	If Docking Style is None , the horizontal window position can be set here, measured in pixels from the left of the IND700 display.

Parameter	Settings
Window Width Window Height	<p>Whichever Docking Style is selected, the window size -- width and height in pixels -- can be set here. Default values are 350 pixels wide by 100 pixels high.</p> <p>When either of these fields is touched, a numeric entry screen displays. If the entered value is outside the permitted range, a message will display -- "Value exceeds the limits from 'x' to 'y'", where x and y are the smallest and greatest permissible values:</p> 
Block Drag and Drop	<p>Whatever Docking Style is selected, the weight display screen floats and can be moved by touching the screen and dragging -- unless Block Drag and Drop is enabled, to fix the window's screen position.</p>

The figure below shows a **Weight Window Only Mode** display with the following parameters set:

- Docking Style: None
- Top window position: 250
- Left window position: 150
- Window Width: 500
- Window Height: 200

When **Block Drag and Drop** is not enabled, the window can be repositioned on screen by touching any part of it and dragging:

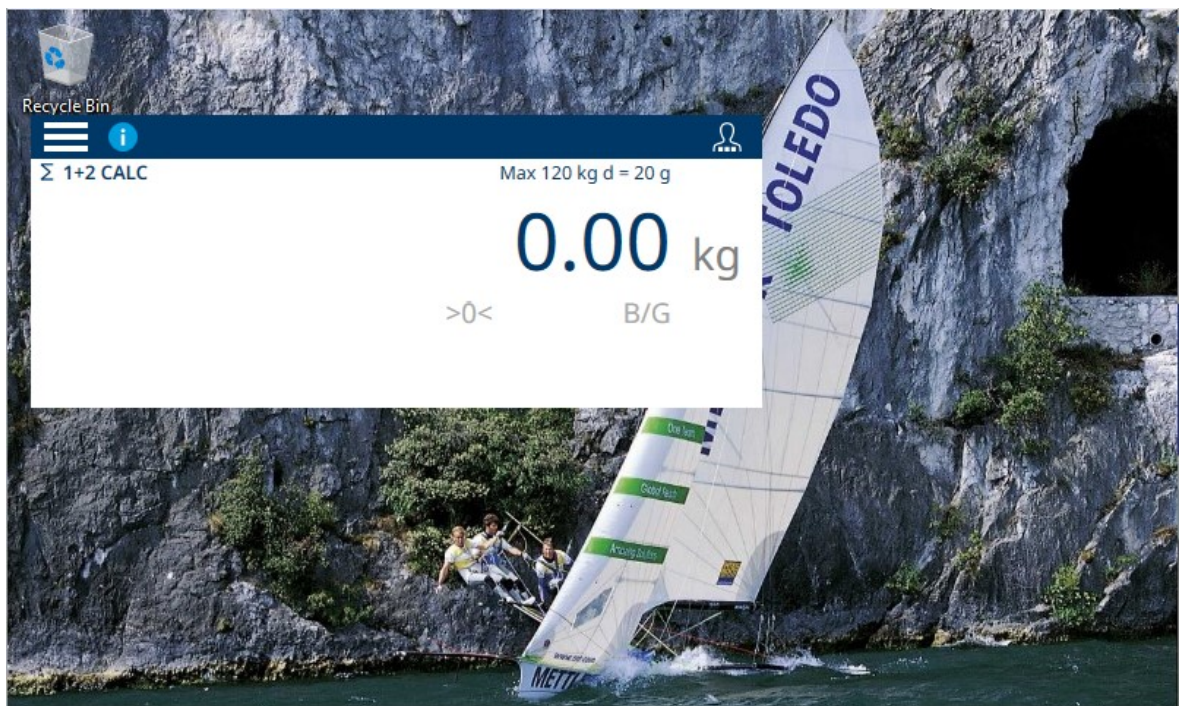


Figure 307: Weight Display Only Mode on Windows Desktop

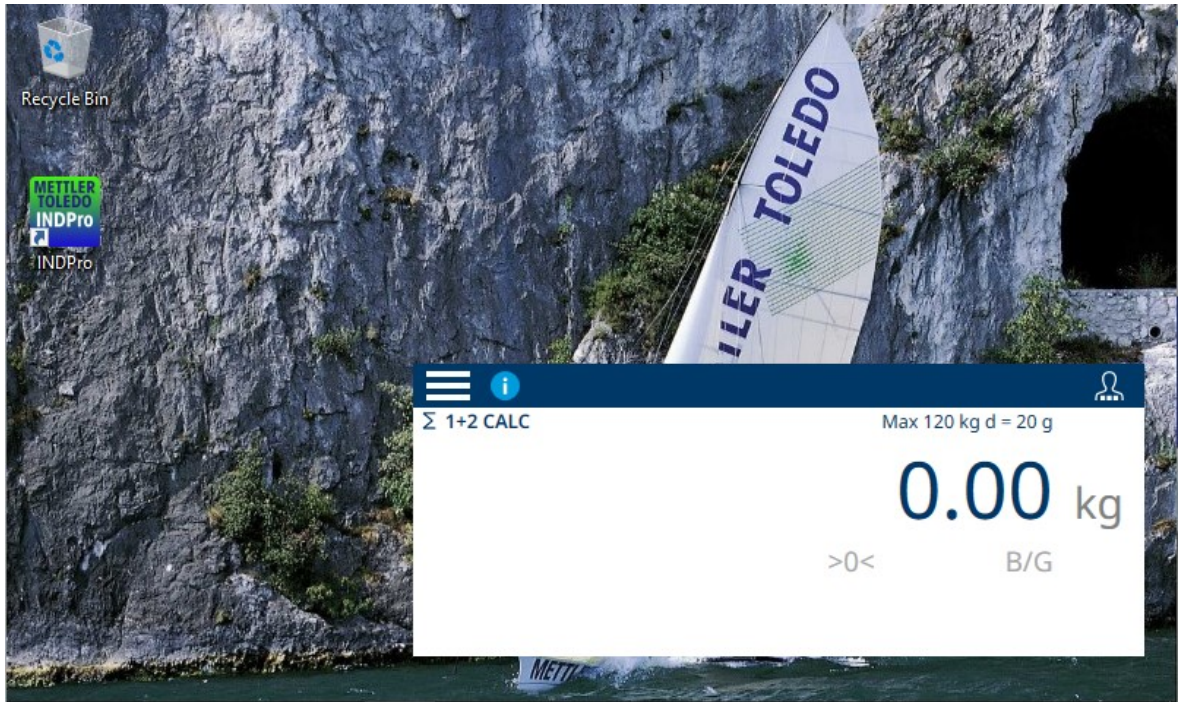


Figure 308: Weight Display Only Mode Dragged to a Different Location

Exit Weight Window Only Mode

To exit the **Weight Window Only Mode** of display, a user with Setup Menu access and configuration privileges must touch the Menu icon , access **Setup > Terminal > Application Mode**, and change **Application mode** to **Full Screen**. Note that the User login icon is available in the menu bar of the weight window.

3.4 Communication Setup

The **Communication** menu allows access to configuration options for the following items. Note that **Industrial Network** appears only if an Industrial Network option is installed.

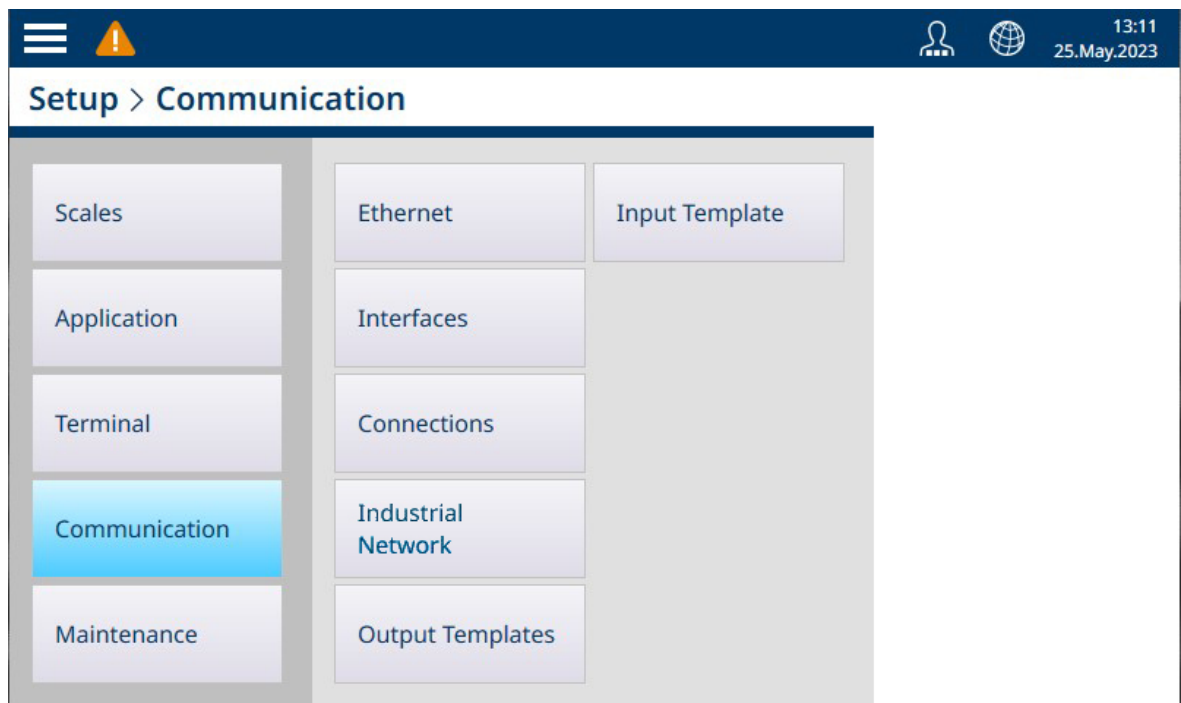


Figure 309: Communication Menu

3.4.1 Ethernet

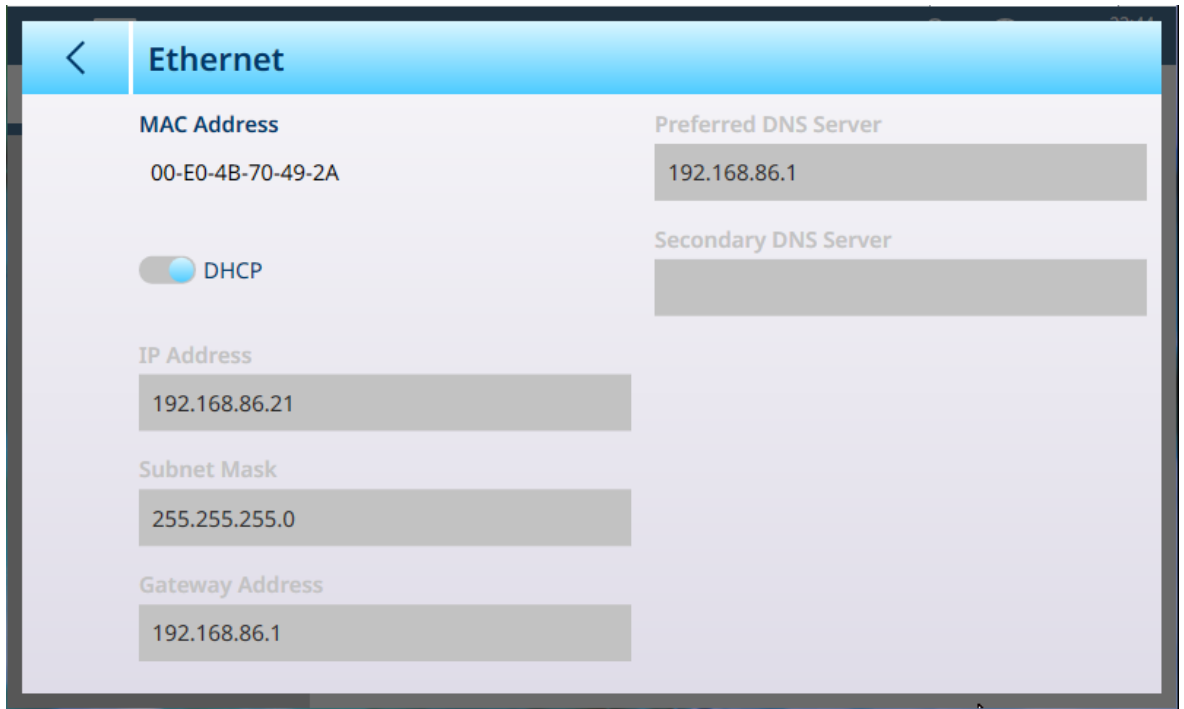


Figure 310: Ethernet Options, DHCP Enabled

When **DHCP** is disabled, the fields on the page become editable and fixed address parameters can be entered.

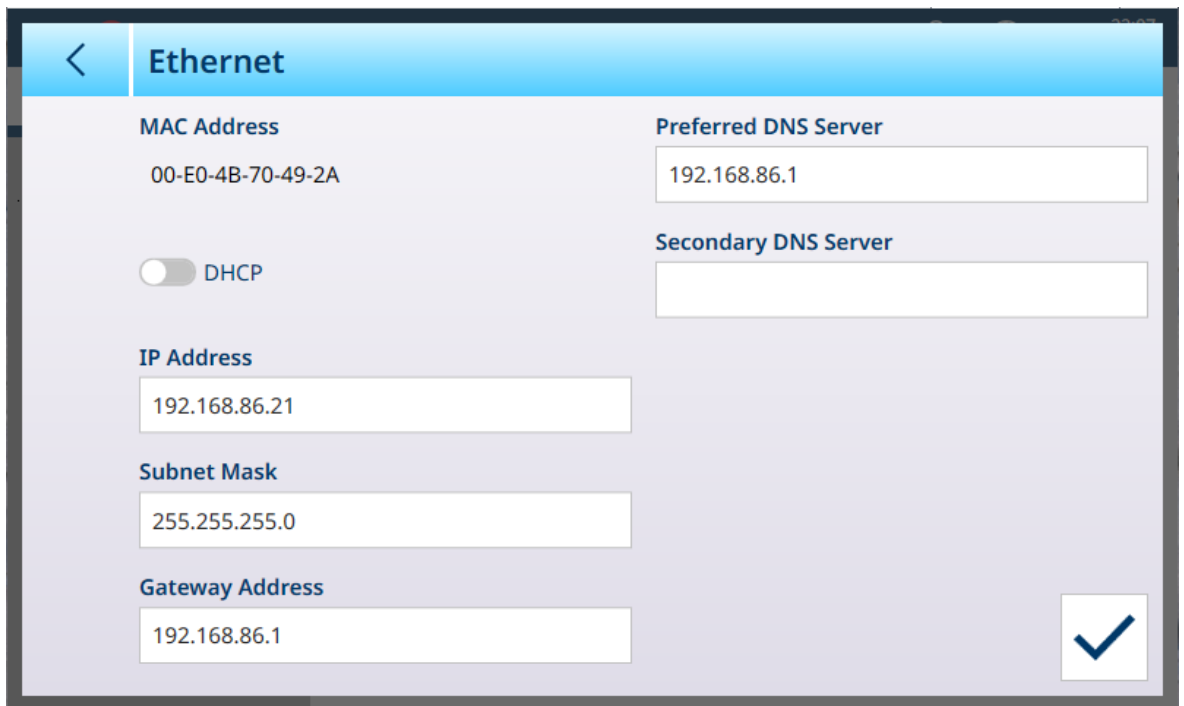
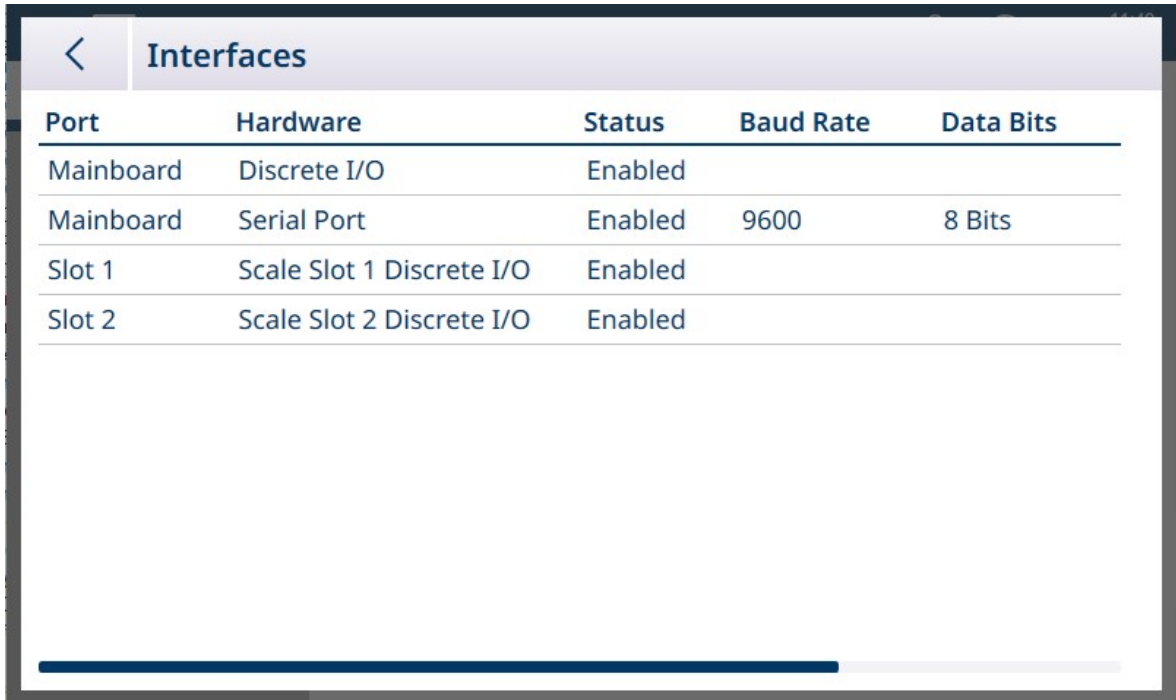


Figure 311: Ethernet Options, DHCP Disabled

3.4.2 Interfaces

The **Interfaces** screen shown below displays entries for an IND700 with two HSALC scale interfaces installed.

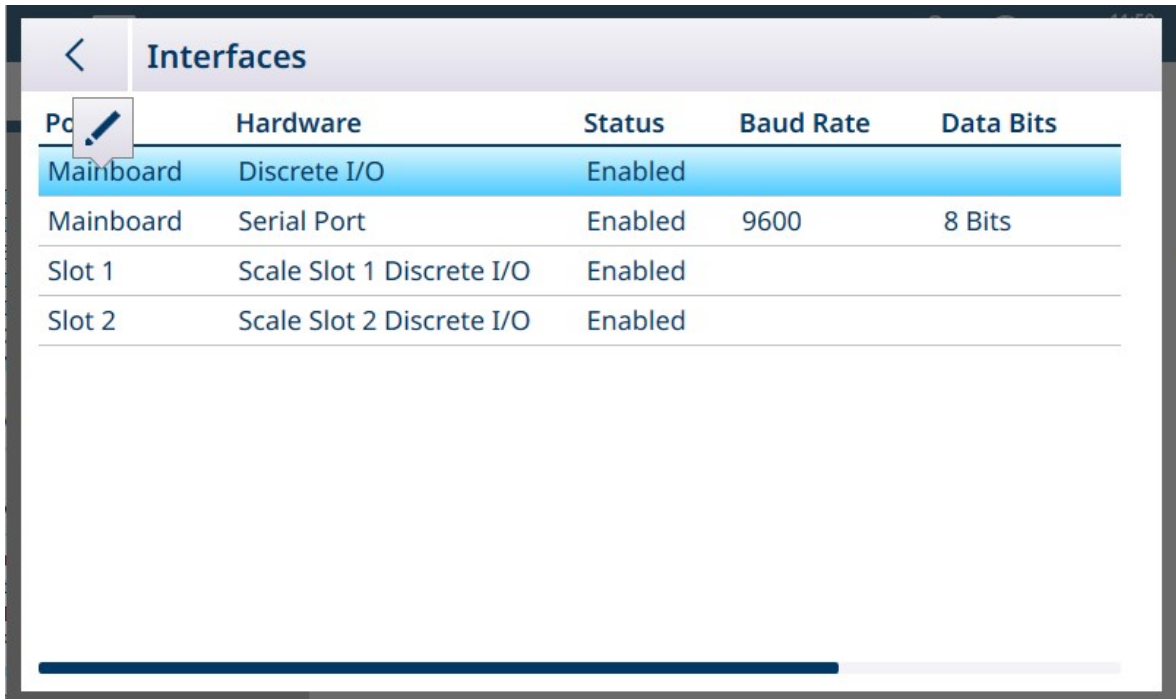


The screenshot shows the 'Interfaces' screen with a table listing the following data:

Port	Hardware	Status	Baud Rate	Data Bits
Mainboard	Discrete I/O	Enabled		
Mainboard	Serial Port	Enabled	9600	8 Bits
Slot 1	Scale Slot 1 Discrete I/O	Enabled		
Slot 2	Scale Slot 2 Discrete I/O	Enabled		

Figure 312: Interfaces

The **Interfaces** screen lists the terminal's configured interfaces. Touch a row to display the Edit icon.



The screenshot shows the 'Interfaces' screen with the first row highlighted in blue. An edit icon (a pencil) is overlaid on the 'Port' column of the first row.

Port	Hardware	Status	Baud Rate	Data Bits
Mainboard	Discrete I/O	Enabled		
Mainboard	Serial Port	Enabled	9600	8 Bits
Slot 1	Scale Slot 1 Discrete I/O	Enabled		
Slot 2	Scale Slot 2 Discrete I/O	Enabled		

Figure 313: Edit Icon

Touch the Edit icon to access the interface's parameters. The contents of this screen vary depending on the type of interface selected. In the screen shown below, the Mainboard DIO option can be enabled or disabled. When it is enabled, the inputs and outputs on the main board can be configured with assignments from the [Connections ▶ Page 215] screen.

Edit DIO Interface



Figure 314: Edit Interface - Discrete I/O

Parameter	Options	Function
Port Location	Display only	Indicates location of port. Not editable.
Hardware	Enabled, Disabled	Allows the interface to be turned on and off.

When a Serial Interface is selected for editing, a two-page configuration screen appears.

Edit Serial Interface

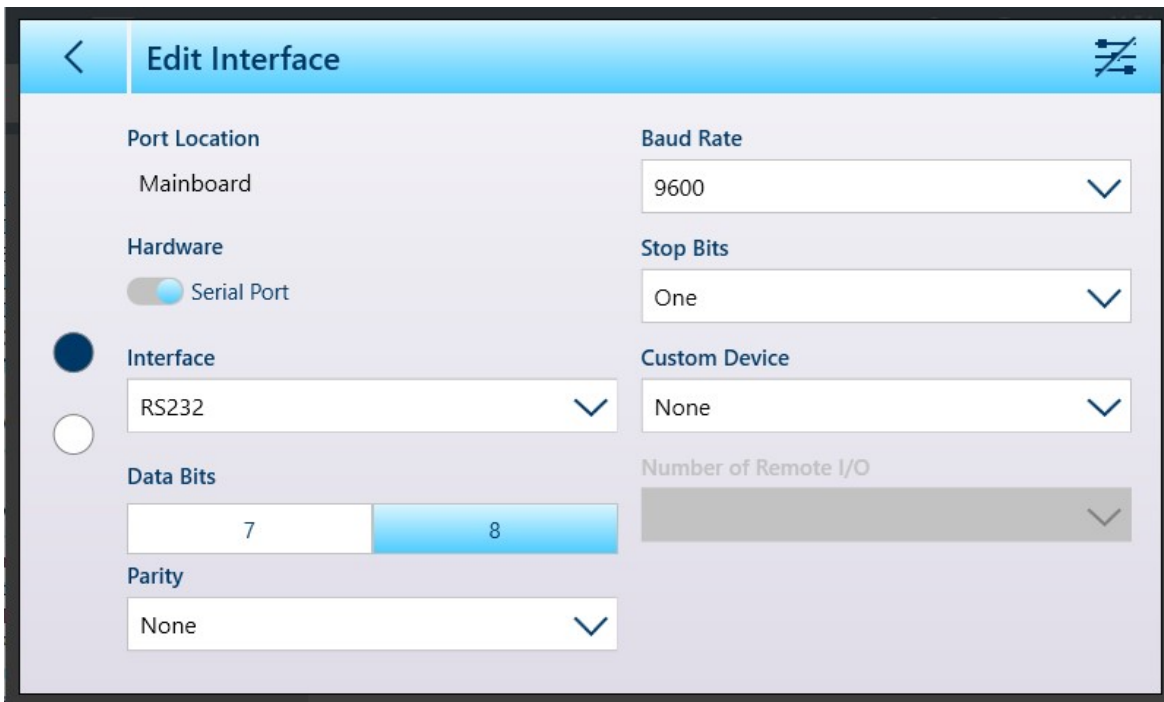


Figure 315: Edit Interface - Serial, Page 1


Note that in the following image, the character set change is disabled: 



Figure 316: Edit Interface - Serial, Page 2


When the character set change icon is touched to enable this function , the second page of the Edit Interface screens appears like this:



Figure 317: Edit Interface, Second Page with Character Set Option Enabled

Character Set options are as follows:



Parameter	Options	Function
Port Location	Display only	Indicates location of port. Not editable.
Hardware	Enabled , Disabled	Allows the interface to be turned on and off.
Interface	RS232 [default] , RS422, RS485	Selects the serial interface type.

Data Bits	7, 8 [default]	Sets the data bits for the serial interface.
Parity	None [default] , Even, Odd	Sets the parity selection for the serial interface.
Baud Rate	4800, 9600 [default] , 19200, 38400, 57600, 115200	Sets the baud rate at which the serial interface will operate.
Custom Device	Drop-down, listing all custom devices	Allows selection of a Custom Device such as an ARM100 Remote I/O module.
Number of Remote I/O	Not accessible [default]	This drop-down list becomes available when at least one ARM100 Remote I/O module is connected.
String Frame - CR	Enabled , Disabled	When enabled, adds a Carriage Return to the data string frame
String Frame - LF	Enabled , Disabled	When enabled, adds a Line Feed to the data string frame
<STX>...<ETC>	Enabled, Disabled	When enabled, the communication control characters STX and ETC are used to ensure synchronization between the IND700 and another communicating device
BCC	Enabled, Disabled	When enabled, a Block Check character calculation is performed
Flow Control	None , XON-XOFF	Toggles between no flow control and XON-XOFF flow control

3.4.2.1 ARM100 Interface Configuration

When a least one ARM100 remote I/O module is connected to the terminal, additional options appear in the **Edit Interface** screen. First, access the screen by touching a serial interface, either on the mainboard or on the Precision scale interface board:

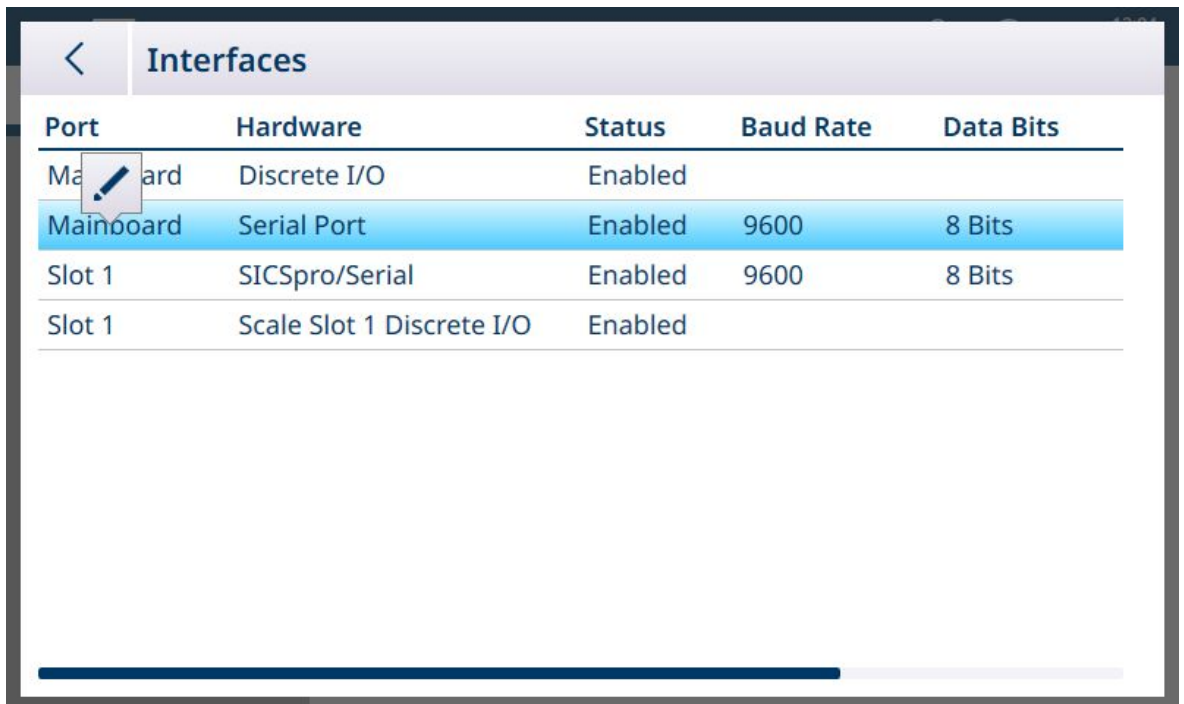


Figure 318: Accessing the Interface Edit Function

In addition to the standard serial port parameters, the **Edit Interface** screen will show an ARM100 option in the **Custom Device** drop-down list, and the **Number of Remote I/O** dropdown will be accessible. Note that with the ARM100 selected, 8 Data Bits are configured.

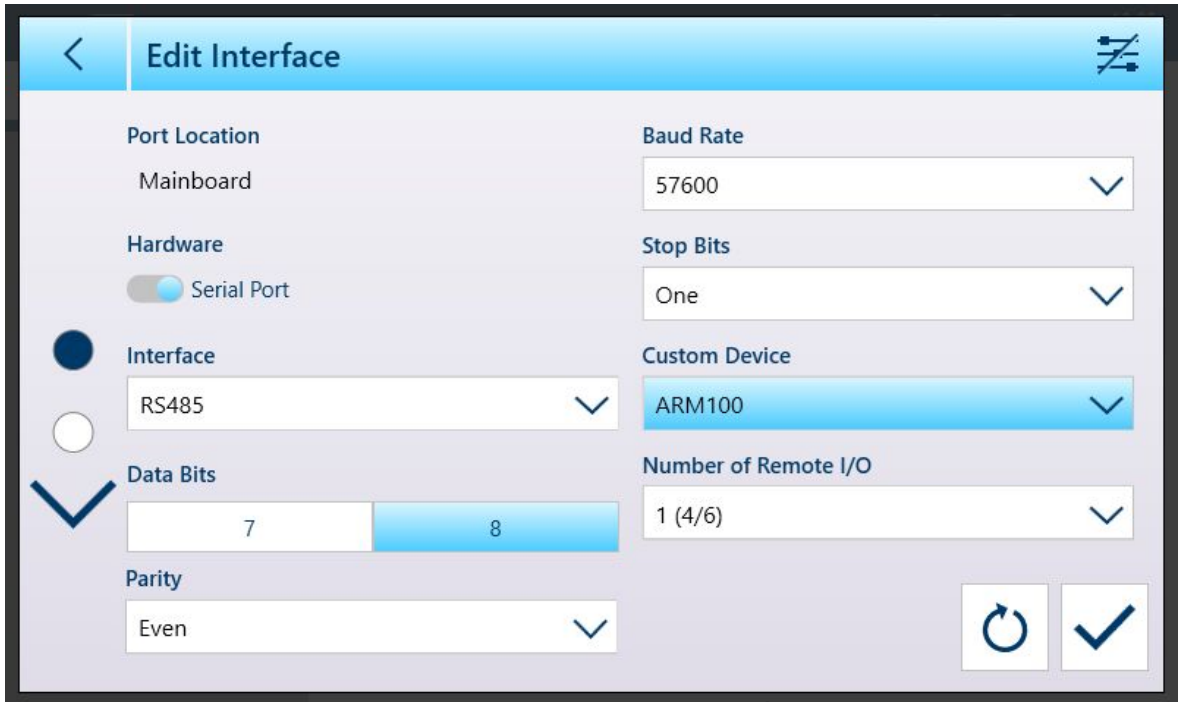


Figure 319: Edit Interface Screen

Standard parameters for the ARM100 I/O are:

- Baud Rate: 115200
- Data bits: 8
- Parity: Even
- Stop bits: 1
- Flow Control: None
- Interface: RS-485

Touch the **Number of Remote I/O** field to display all the available I/O options, including those in the ARM100 remote modules. Refer to the **Type**, **Location** and **Position** fields in setup at Application > [Discrete I/O ▶

Page 179] configuration screens to associate a discrete input or output with an address either in the terminal or in any of the attached ARM100 modules.

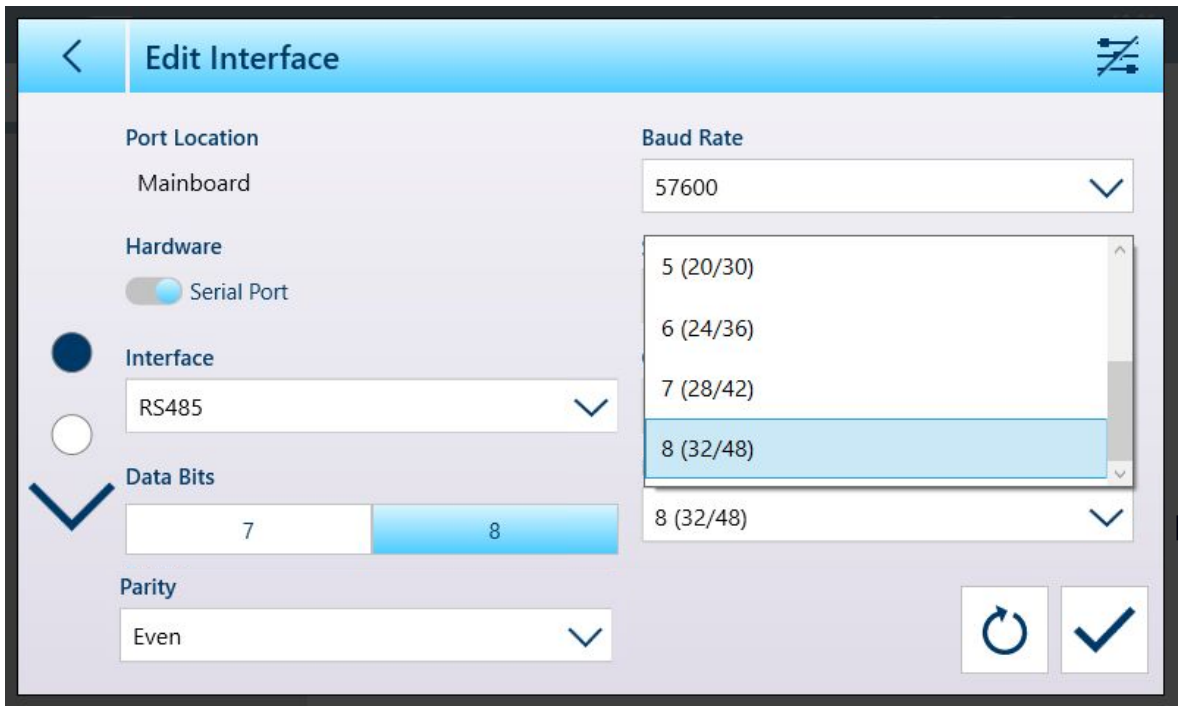


Figure 320: Edit Interface Screen, Remote I/O List expanded

3.4.3 Connections

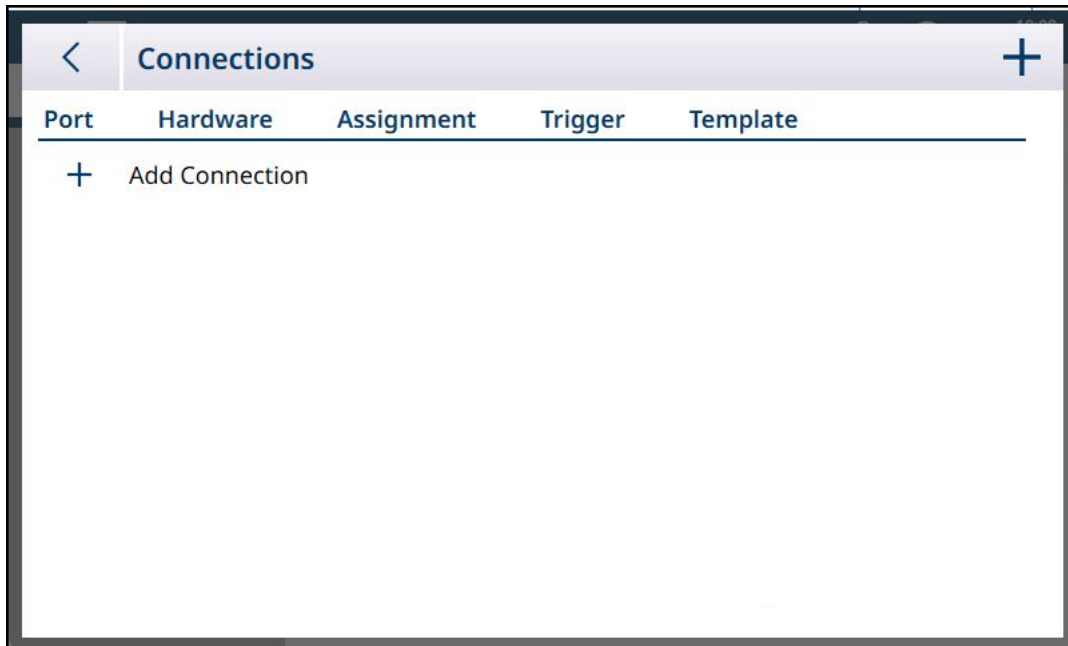


Figure 321: Connections List

When it is first displayed, the **Connections** list includes no items. Touch the + icon to add a new connection. Once a connection has been defined, touching it in this list will display three icons -- delete, add and edit:

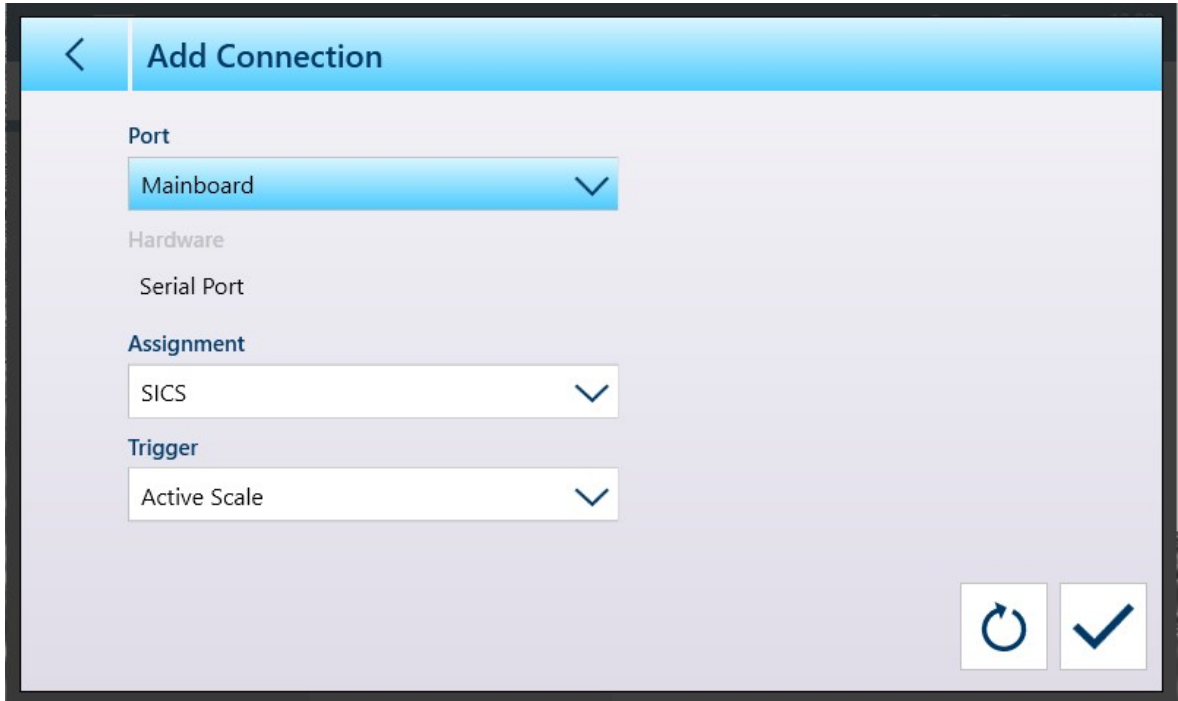


Figure 322: Delete, Add, Edit Icons



Figure 323: Add Connection Screen

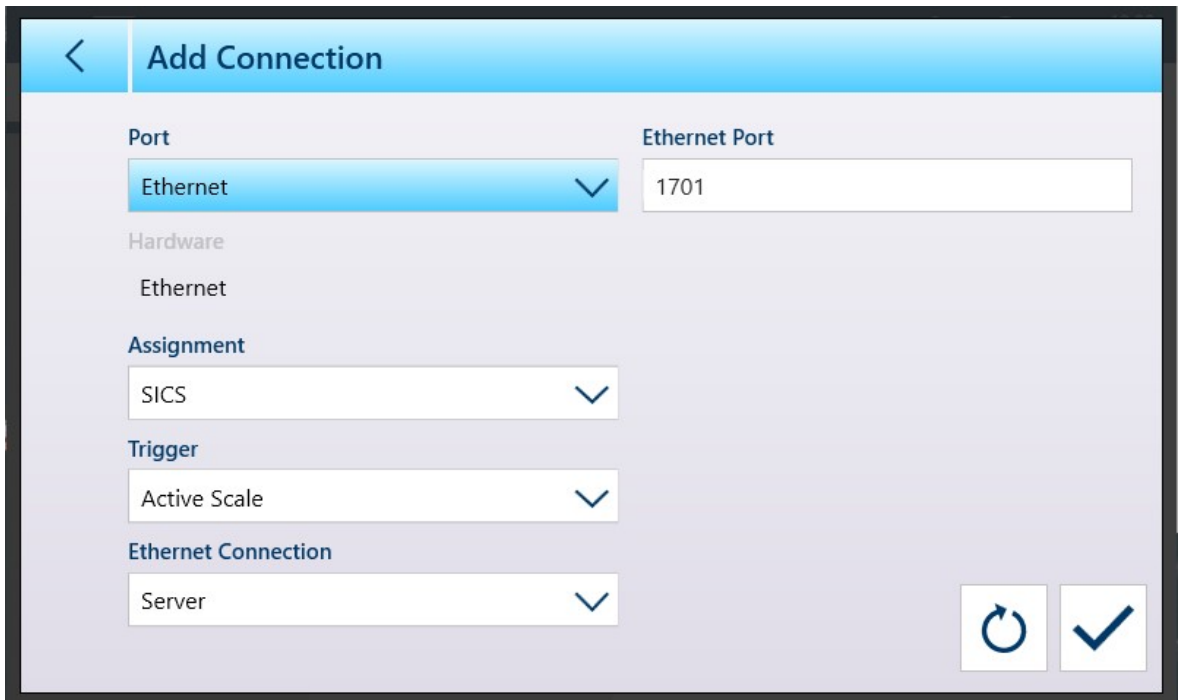
The contents of the **Add Connection** screen vary depending on the selections made in the available fields. In the image above, no **Port** assignment has been made. The image below shows options displayed when **Port** is set to **Mainboard**.



The screenshot shows the 'Add Connection' screen with a blue header bar containing a back arrow and the title 'Add Connection'. Below the header, the 'Port' dropdown menu is set to 'Mainboard'. Under the 'Hardware' section, 'Serial Port' is listed. The 'Assignment' dropdown is set to 'SICS', and the 'Trigger' dropdown is set to 'Active Scale'. At the bottom right, there are two buttons: a refresh button (circular arrow) and a confirmation button (checkmark).

Figure 324: Add Connection - Mainboard Port Selected

When **Port** is set to **Ethernet**, the screen appears as shown below.



The screenshot shows the 'Add Connection' screen with a blue header bar containing a back arrow and the title 'Add Connection'. Below the header, the 'Port' dropdown menu is set to 'Ethernet'. To the right of the 'Port' dropdown, there is an 'Ethernet Port' text input field containing the value '1701'. Under the 'Hardware' section, 'Ethernet' is listed. The 'Assignment' dropdown is set to 'SICS', and the 'Trigger' dropdown is set to 'Active Scale'. Below these, there is an 'Ethernet Connection' dropdown menu set to 'Server'. At the bottom right, there are two buttons: a refresh button (circular arrow) and a confirmation button (checkmark).

Figure 325: Add Connection - Ethernet Port Selected

When **Port** is set to **File**, the screen appears as shown below.

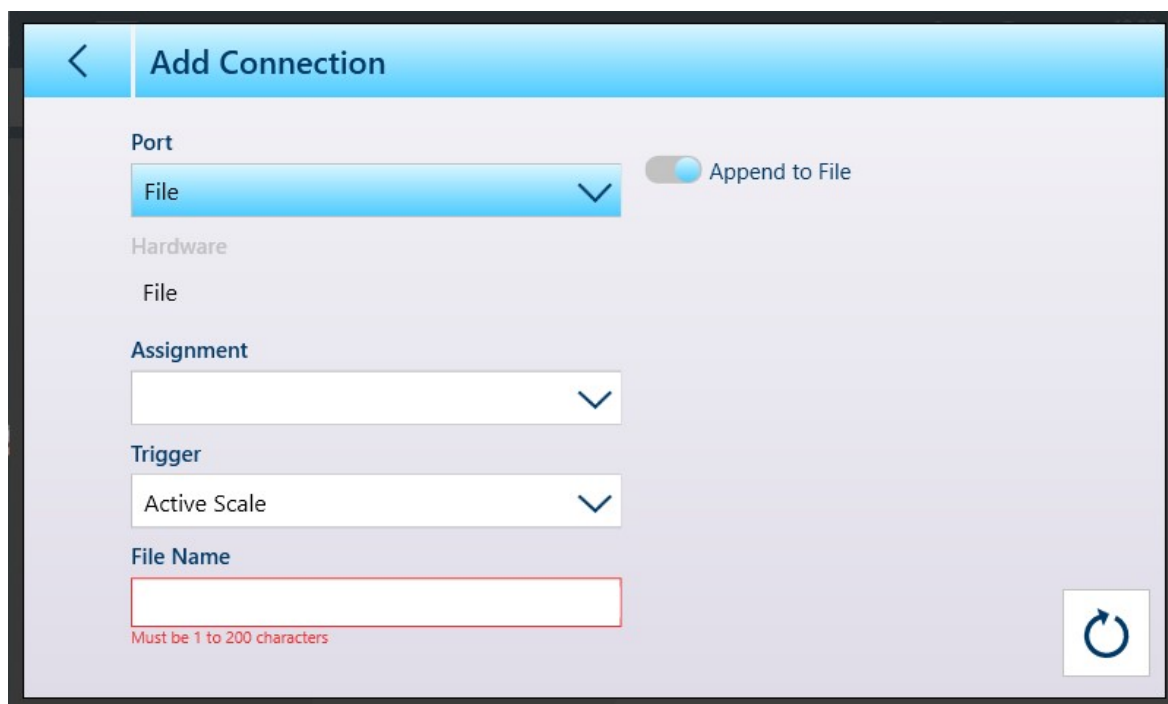


Figure 326: Add Connection - File Port Selected

Each of the Port types has different parameters associated with it, as shown in the following tables.

Key to Connection Options and Parameters Table

APP: Append to File	AS: Active Scale	ASG: Assignment	CO: Continuous Output	CS: With Checksum
CTPZ: CTPZ Input	ENC: Ethernet Connection	ENP: Ethernet Port	FN: Filename	HW: Hardware
IPT: Input Template	KB: Keyboard	MB: Main Board	SD: Shared Data	SK: Selectable by Softkey
SP: Serial Port	SS: SICS Scale	T: Template	TG: Trigger	TR: Transfer

Connection Options and Parameters

Port	HW	ASG	T	Scale #	IPT	T	ENC	ENP	FN	SK	CS	APP
None	HW	SICS	AS, 1-4									
		SD										
		None										
		TR	AS, 1-4		1-10							
		IPT			1-10						Yes	
		CO	AS, 1-4									Yes
		CTPZ	AS, 1-4									
MB	SP	SS		Scale 1-4								
		SICS	AS, 1-4									
		SD										
		None										
		Transfer	AS, 1-4		1-10							
		IPT			1-10						Yes	
		CO	AS, 1-4									Yes
CTPZ	AS, 1-4											
		SS		Scale 1-4								

Port	HW	ASG	T	Scale #	IPT	T	ENC	ENP	FN	SK	CS	APP
KB	HW	None										
		Input Template			1-10							
		CTPZ Input	AS, 1-4									
Slots 1 - 2	SICSpro /S	SICS	AS, 1-4									
		SD										
		None										
		TR	AS, 1-4			1-10						
		IPT				1-10					Yes	
		CO	AS, 1-4									Yes
		CTPZ	AS, 1-4									
		SS		Scale 1-4								
EN	EN	SICS	AS, 1-4				Server	1701				
		SD					Server	1701				
		None					Server	1701				
		TR	AS, 1-4			1-10	Server	1701				
		IPT				1-10	Server	1701				
		CO	AS, 1-4				Server	1701				
		CTPZ	AS, 1-4				Server	1701				
		SS		Scale 1-4			Server	1701				
File	HW	None							Free entry field			
		TR	AS, 1-4			1-10			Free entry field			Yes

Parameters and their Functions

Parameter	Function
Port	Sets the physical hardware associated with the connection.
Hardware	Display only; shows type of port installed
Port: None, Mainboard, Ethernet - Assignment	Assigns the selected port to a type of data.
Port: File - Assignment	Sets the assignment of the File port.
Port: None, Mainboard, Ethernet, File - Trigger	Sets a Trigger for the connection, which causes data to be transmitted.
Assignment: Transfer - Template	When the Assignment is set to Transfer , one of the IND700's ten templates can be specified as the destination for the transmitted data.
Assignment Transfer - File Name	When the Port type is File , and Assignment is Transfer , a name must be specified for the file which will receive the data. Touch this field to display an alphanumeric data entry dialog.
Assignment Transfer - Append To File	This parameter determines whether new data are added to a new file, or appended to an existing one. The name of the file is specified in the File Name field.
Port: Ethernet - Assignment: Input Template	
Remote Server IP	Sets the IP of the remote Client .
Remote Server Port	Sets the port for the remote Client .
Ethernet Connection: Server	

Ethernet Port	When an Ethernet port is specified, the Ethernet Port is selected here. The default port is 1701 , but touching this field displays a numeric entry dialog permitting the definition of a different port number.
----------------------	--

When changes are made to a connection, and the changes are saved, the terminal will restart the hardware affected by the modification.

When connections have been defined, the Connections list will display them.

Port	Hardware	Assignment	Trigger	Template
Slot1003	Serial Port	Print		Template 1
Slot1003	Serial Port	SICS	Active Scale	

Figure 327: Connections List Showing New Connections

When a **Connection** is defined with an Input Template **Assignment**, the **Selectable by Softkey** slider will display.

Figure 328: New Connection, Input Template Assignment




When at least one connection has been assigned to an input template, the Template softkey  can be seen in the softkey ribbon, if it has been added in setup at [Terminal > Softkeys ▶ Page 197]. When it appears on the home screen, this softkey displays Template 1 by default:  When multiple templates are configured and assigned to connections, touching the softkey will display a context menu, listing all available templates:



Figure 329: Templates Softkey with Context Menu

Touch the desired template to load it. The softkey will show the number of the currently selected template: 

See also

[Softkeys](#) ▶ Page 197

3.4.4 Industrial Network

If an Industrial Ethernet option installed, the **Communication > Industrial Network** menu will appear. It includes three sub-menus: **Mode**, a mode-specific format screen, and an interface-specific configuration screen.

Depending on the selection made in the **Mode** screen, the menus will include either an **SAI** or a **Custom** sub-menu. By default, the SAI menu item is shown.

Depending on which type of option board is installed, the third menu will show either **PROFINET** or **EtherNet/IP**.

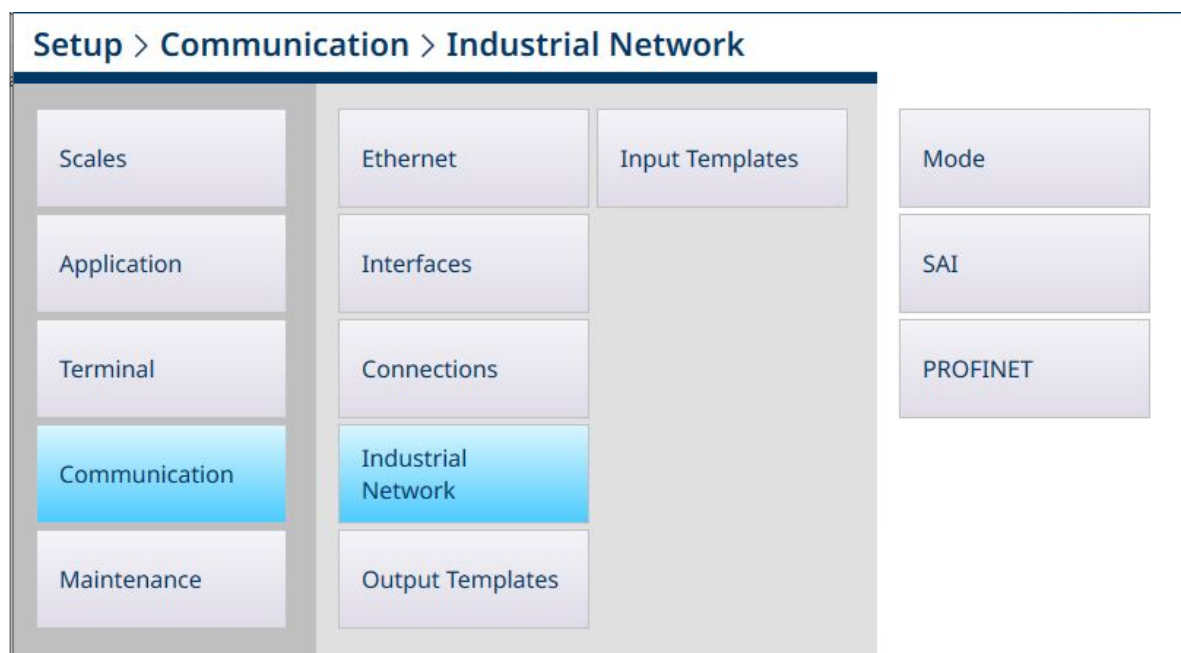


Figure 330: Industrial Ethernet Menus, PROFINET Option Installed

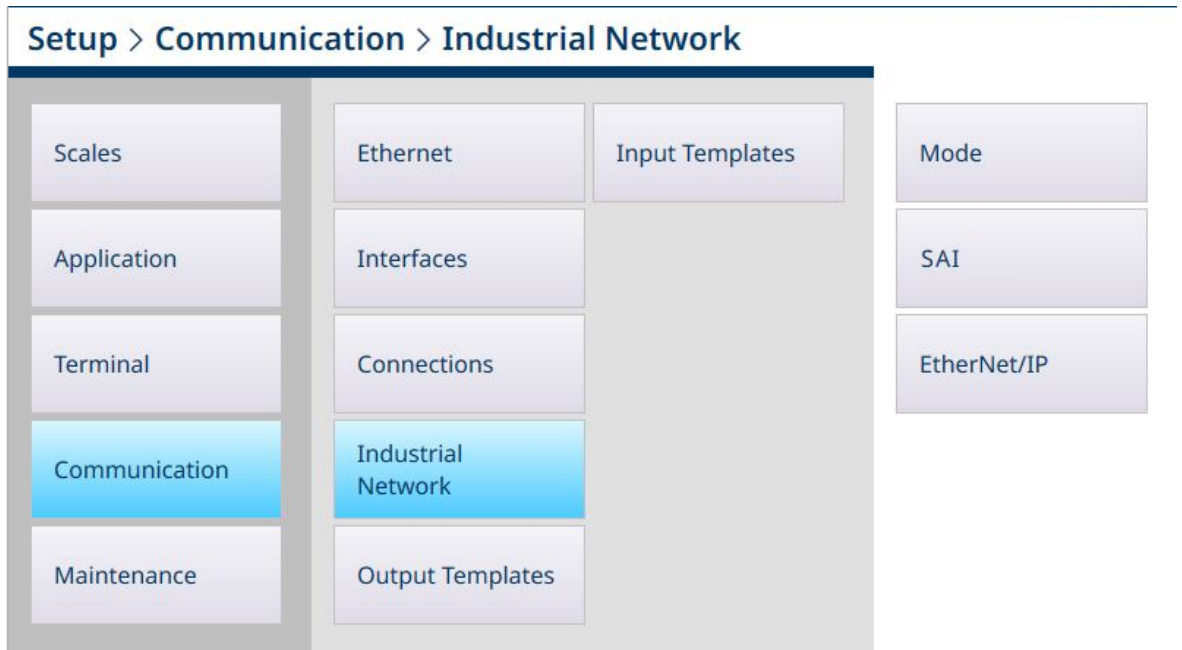


Figure 331: Industrial Ethernet Menus, EtherNet/IP Option Installed

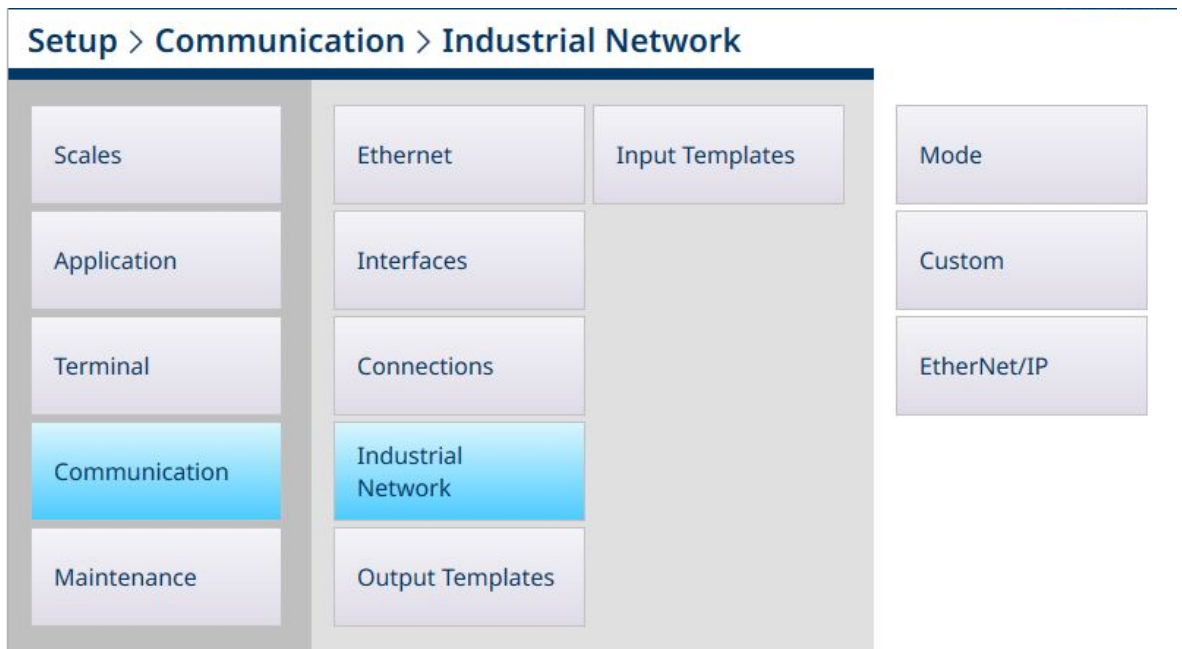


Figure 332: Industrial Ethernet Menus, Custom Mode Selected

3.4.4.1 Mode

The Mode screen determines the form taken by Industrial Ethernet communication. The options, shown in the the screen image below, are SAI and Custom. Depending on the selection made here, the second menu under Industrial Ethernet will be **SAI** or **Custom**.

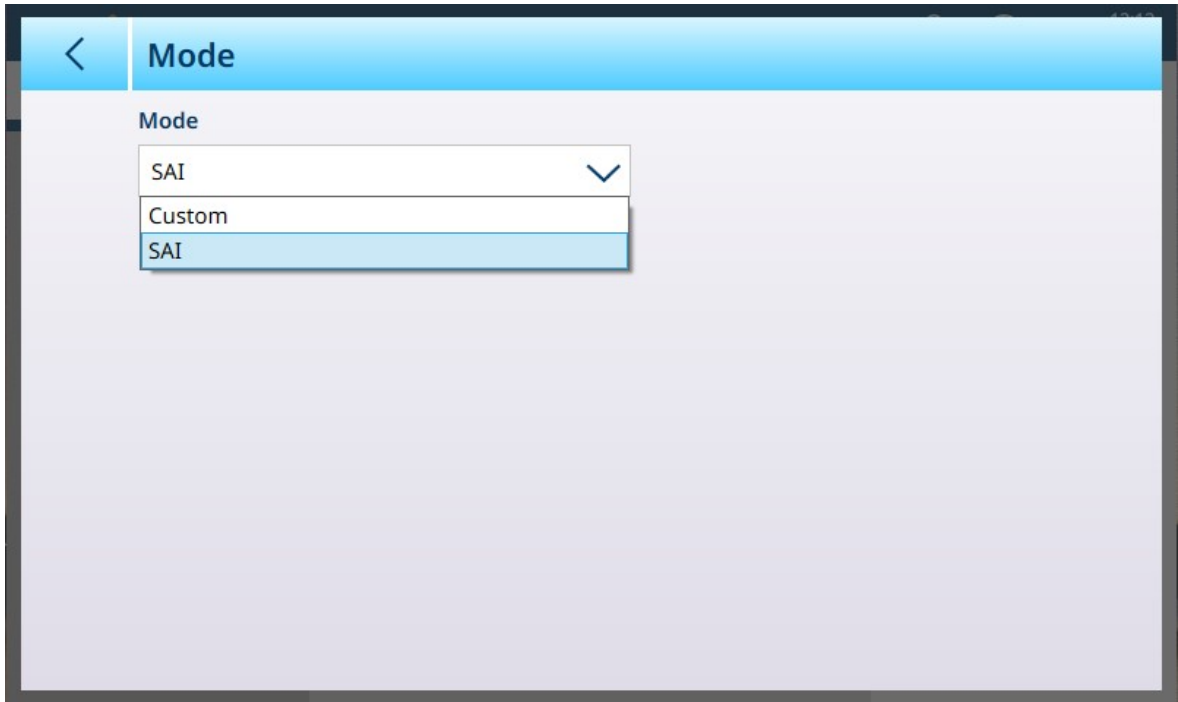


Figure 333: PLC - Mode

If **Mode** is set to **Custom**, the Mode screen changes to show a check mark.

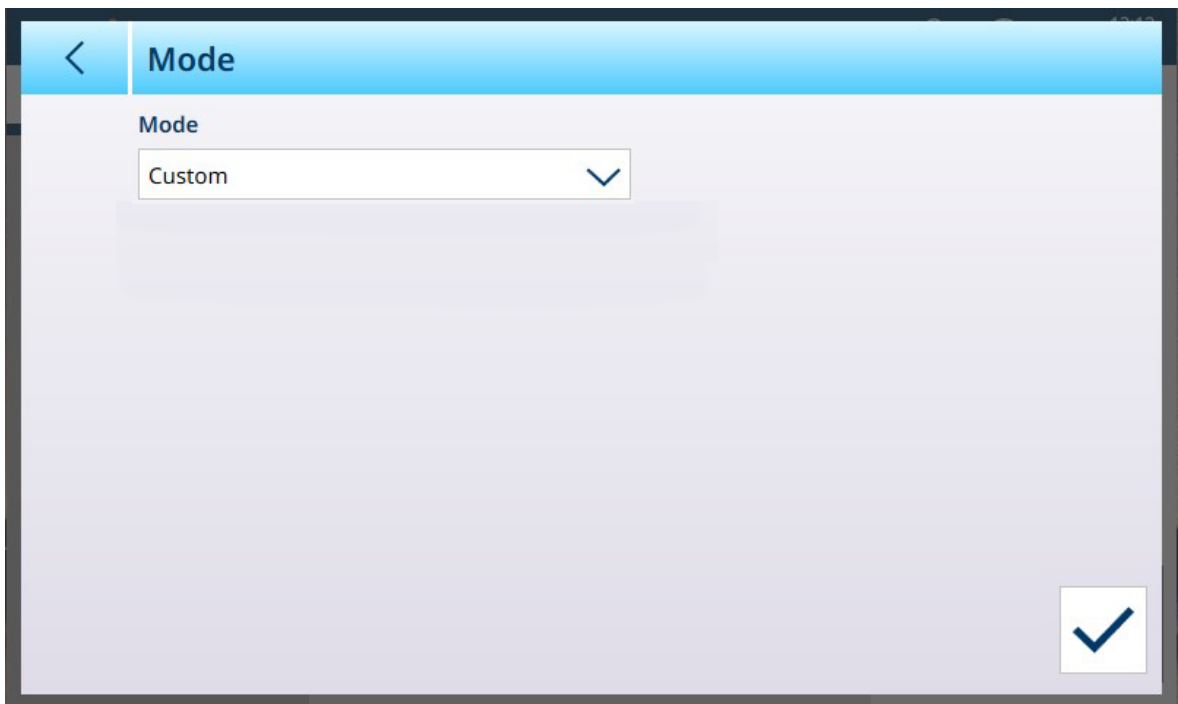


Figure 334: Industrial Ethernet Mode Screen, Custom Selected

Click the check mark to display the [Custom ▶ Page 224] configuration screen.

3.4.4.1.1 SAI

The METTLER TOLEDO Standard Application Interface (SAI) is the default mode for Industrial Network communication.

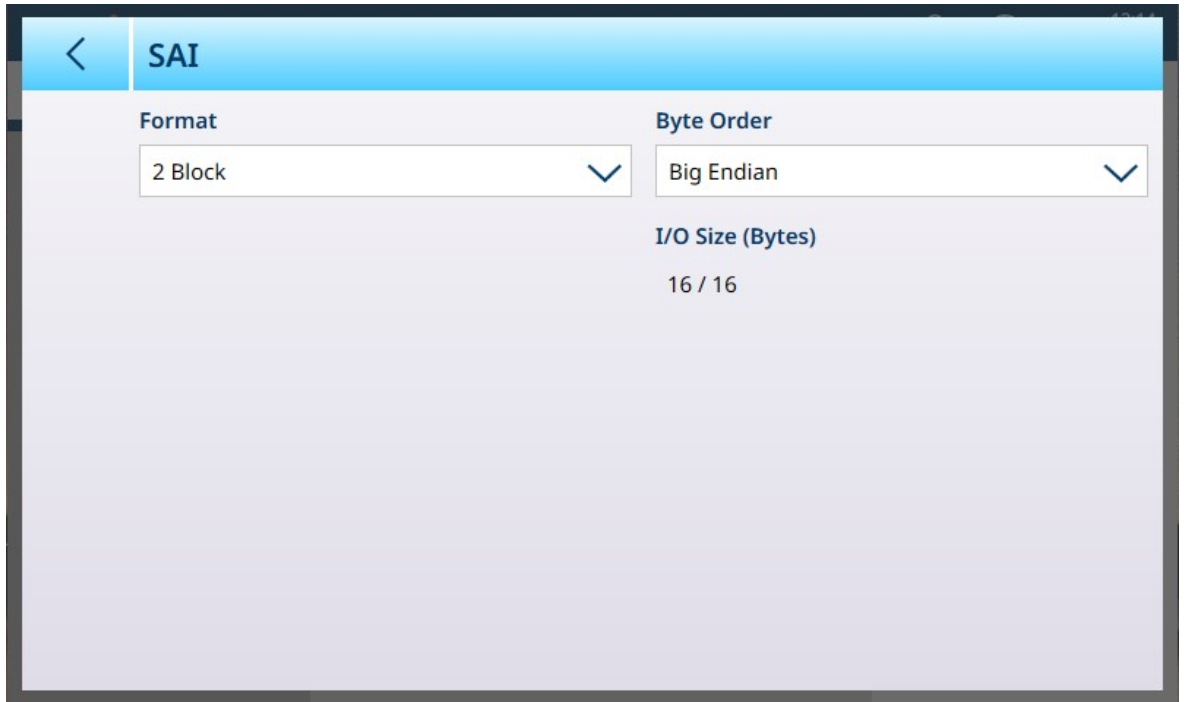


Figure 335: PLC Mode - SAI

SAI Mode Options

Parameter	Settings
Format	<p>The Format options are shown below:</p> <div style="border: 1px solid gray; padding: 5px;"> <p>Format</p> <p>2 Block ▼</p> <p>2 Block</p> <p>8 Block</p> <p>Custom</p> </div>
Byte Order	<p>The Byte Order options are shown below:</p> <div style="border: 1px solid gray; padding: 5px;"> <p>Byte Order</p> <p>Big Endian ▼</p> <p>Automatic</p> <p>Little Endian</p> <p>Byte Swap Only</p> <p>Word Swap Only</p> <p>Big Endian</p> </div>
I/O Size (Bytes)	<p>This value is calculated and displayed depending on the Format and Byte Order selections.</p>

See also

[Custom](#) ▶ Page 224

3.4.4.1.2 Custom

If PLC **Mode** is set to **Custom**, the following screen is available:

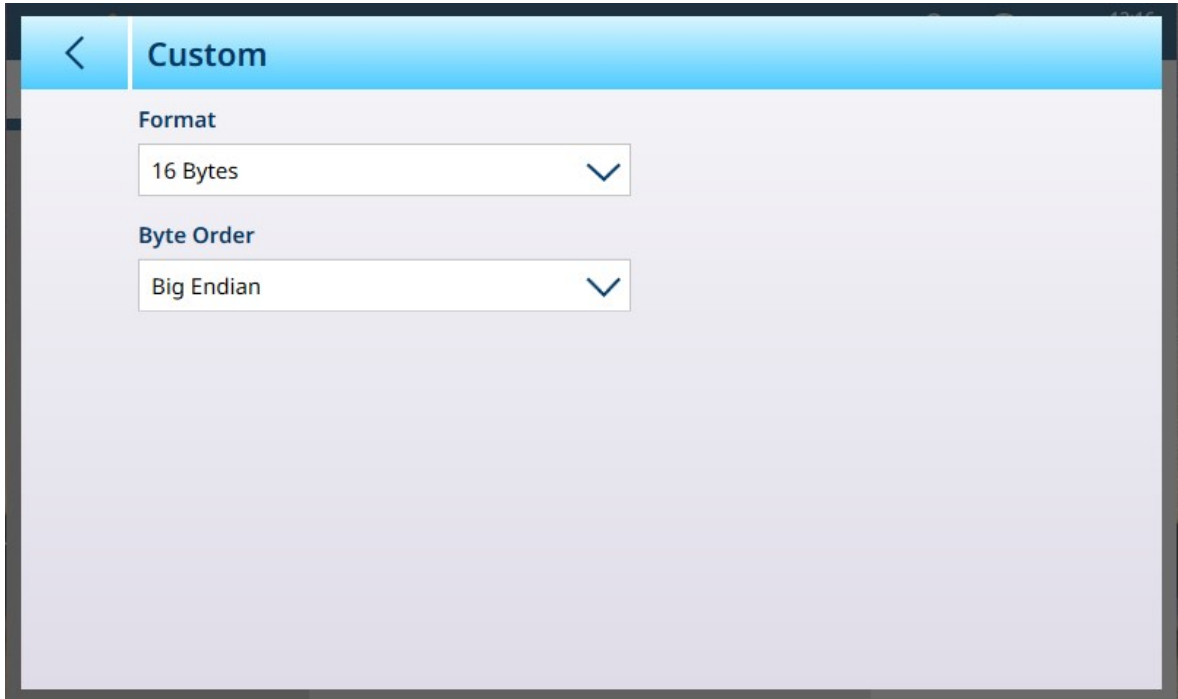


Figure 336: PLC - Custom Mode

PLC Custom Mode Options

Parameter	Settings
Format	<p>The following Format options are available for the Custom mode:</p> <div style="border: 1px solid #ccc; padding: 5px;"> <p>Format</p> <p>16 Bytes ▼</p> <hr/> <p>2 Bytes</p> <hr/> <p>4 Bytes</p> <hr/> <p>8 Bytes</p> <hr/> <p>16 Bytes</p> <hr/> <p>32 Bytes</p> <hr/> <p>64 Bytes</p> </div>
Byte Order	<p>The following Byte Order options are available for the Custom mode:</p> <div style="border: 1px solid #ccc; padding: 5px;"> <p>Byte Order</p> <p>Big Endian ▼</p> <hr/> <p>Little Endian</p> <hr/> <p>Big Endian</p> </div>

3.4.4.2 PROFINET

The PROFINET screen offers the following options:

Figure 337: PROFINET Industrial Ethernet Interface Configuration

PROFINET Configuration

Parameter	Settings
MAC Address	This value is display only, and cannot be modified.
Device name	Touch this field to open an alphanumeric entry screen. Enter a descriptive name for this IND700. This is the name the IND700 will display in the PROFINET network.
IP Address	Touch each of these fields to open a numeric entry screen, and enter the appropriate information
Subnet Mask	
Gateway Address	

3.4.4.3 EtherNet/IP

The **EtherNet/IP** screen offers the following options:

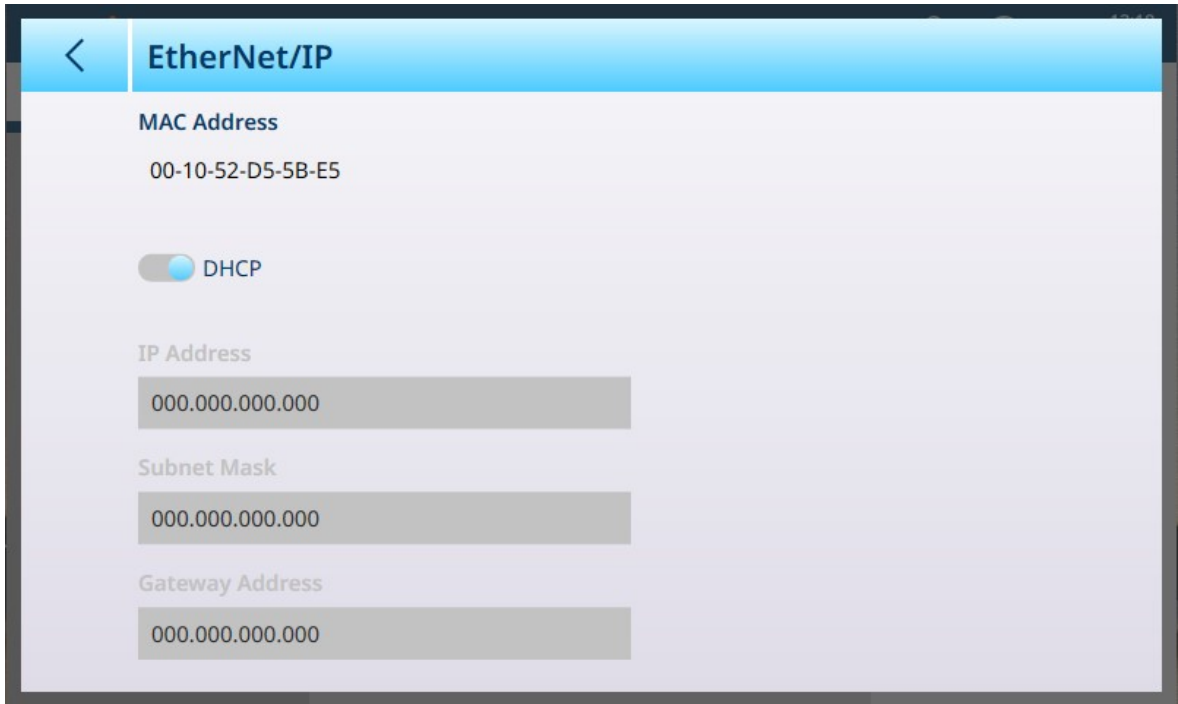



Figure 338: EtherNet/IP Industrial Ethernet Interface Configuration

EtherNet/IP Configuration

Parameter	Settings
MAC Address	This value is display only, and cannot be modified.
DHCP	By default, Dynamic Host Configuration Protocol (DHCP) is Enabled , and the terminal automatically acquires an IP address. This address can be viewed from the main screen by touching the Menu icon  and selecting Terminal . If DHCP is Disabled , the IP Address parameters must be set manually.
IP Address	With DHCP disabled , these fields can be edited. Touch a field to display a numeric data entry keypad, and enter the appropriate value.
Subnet Mask	
Gateway Address	

3.4.5 Output Templates

Output Templates are configured from the Output Templates menu, shown below.

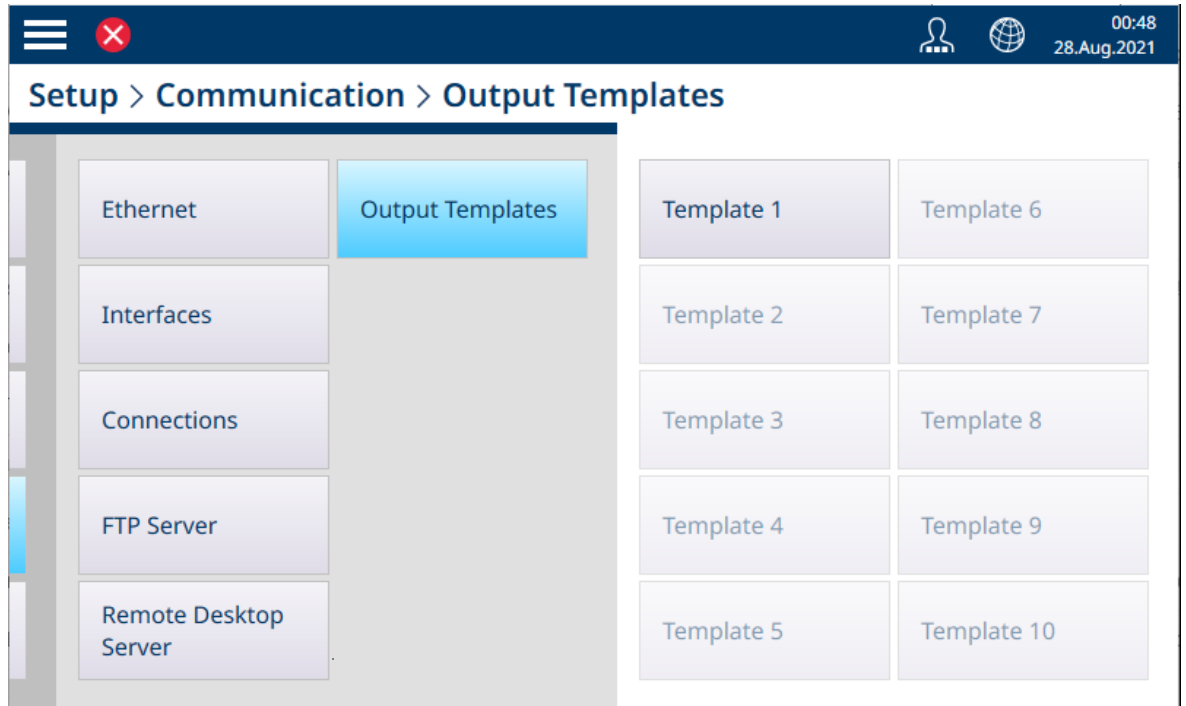


Figure 339: Output Templates Menu

Touch a Template name to open its configuration page.

The **Output Templates** menu allows each of the ten available templates to be viewed and edited. Only Template 1 is already configured.

Each element has a serial number, a **Type**, the **Data** it contains, an **Alignment**, a number of **Characters**, and a **Quantity** (e.g. for multiple CR/LF elements). Touch the headline row to sort the elements by any of these attributes.

Templates can be created in two ways: Manually, which involves looking up the SD codes and ensuring that all the necessary formatting is included; or by using the terminal's [Automatic Standard Template ▶ Page 321], which automates the process.

The content of a typical template is shown below in a series of images, followed by an image showing the template's output. It will be noted that the template includes 54 rows; this is why the Automatic Standard Template represents an extremely efficient, time-saving method of creating customized output templates.

Element	Type	Data	Alignment	# Chars	Quantity
1	String	Date:	Left	6	1
2	SD Var	xd0103	Exact	-	-
3	CR/LF	-	-	-	1
4	String	Time:	Left	6	1
5	SD Var	xd0104	Exact	-	-
6	CR/LF	-	-	-	1
7	String	User:	Left	6	1
8	SD Var	xd0171	Exact	-	-
9	CR/LF	-	-	-	1
10	String	Material Name:	Left	15	1

Figure 340: Output Template Content, Page 1

Element	Type	Data	Alignment	# Chars	Quantity
11	SD Var	ma0002	Exact	-	-
12	CR/LF	-	-	-	1
13	String	APW:	Left	5	1
14	SD Var	cd0104	Exact	-	-
15	String		Exact	1	1
16	SD Var	wt0003	Exact	-	-
17	CR/LF	-	-	-	1
18	String	Weight:	Left	8	1
19	SD Var	wt0002	Exact	-	-
20	String		Exact	1	1

Figure 341: Output Template Content, Page 2

Element	Type	Data	Alignment	# Chars	Quantity
21	SD Var	wt0003	Exact	-	-
22	CR/LF	-	-	-	1
23	SD Var	pr0131	Left	13	-
24	String	:	Exact	2	1
25	SD Var	pa0101	Exact	-	-
26	CR/LF	-	-	-	1
27	SD Var	pr0132	Left	13	-
28	String	:	Exact	2	1
29	SD Var	pa0102	Exact	-	-
30	CR/LF	-	-	-	1

Figure 342: Output Template Content, Page 3

Element	Type	Data	Alignment	# Chars	Quantity
31	SD Var	pr0133	Left	13	-
32	String	:	Exact	2	1
33	SD Var	pa0103	Exact	-	-
34	CR/LF	-	-	-	1
35	String	Scale:	Left	7	1
36	SD Var	xt0101	Exact	-	-
37	CR/LF	-	-	-	1
38	String	Gross:	Left	7	1
39	SD Var	wt0001	Exact	-	-
40	String		Exact	1	1

Figure 343: Output Template Content, Page 4

Element	Type	Data	Alignment	# Chars	Quantity
45	String		Exact	1	1
46	SD Var	wt0003	Exact	-	-
47	String		Exact	1	1
48	SD Var	ws0009	Exact	-	-
49	CR/LF	-	-	-	1
50	String	Net:	Left	5	1
51	SD Var	wt0002	Exact	-	-
52	String		Exact	1	1
53	SD Var	wt0003	Exact	-	-
54	CR/LF	-	-	-	1

Figure 344: Output Template Content, Page 5

```

Date: _27.Feb.2024
Time: _16:56
User: _Admin
Order_____:_OT-456
Batch_ID_____:_BT-700
Vendor_____:_Supplier_ABC
Scale: _1
Gross:_____2840_g
Tare: _0_g_T_
Net:_____2840_g

```

Figure 345: Output Template Output, as Configured Above



NOTICE

Template Fields

Columns available in the template configuration screen update as other changes are made to the terminal -- e.g. when an Application is enabled.

Automatic Standard Template

The IND700 features an AST (Automatic Standard Template) function which simplifies the preparation of templates customized for particular uses and applications. Shared Data variables representing all available information (which adds columns to the [Transaction Table ▶ Page 173]) are automatically added to Output Template 1.

To create multiple Output Templates with different automatically-generated content, make the necessary changes to the terminal configuration, then access **Setup > Communication > Output Templates > Template 1**. Here, all the currently configured Transaction Table fields are automatically represented as rows in the table (refer to the five-screen example shown above).

Select the Copy icon  at top left . From the **Copy Template** dialog, click the **To** dropdown list and select the desired template.

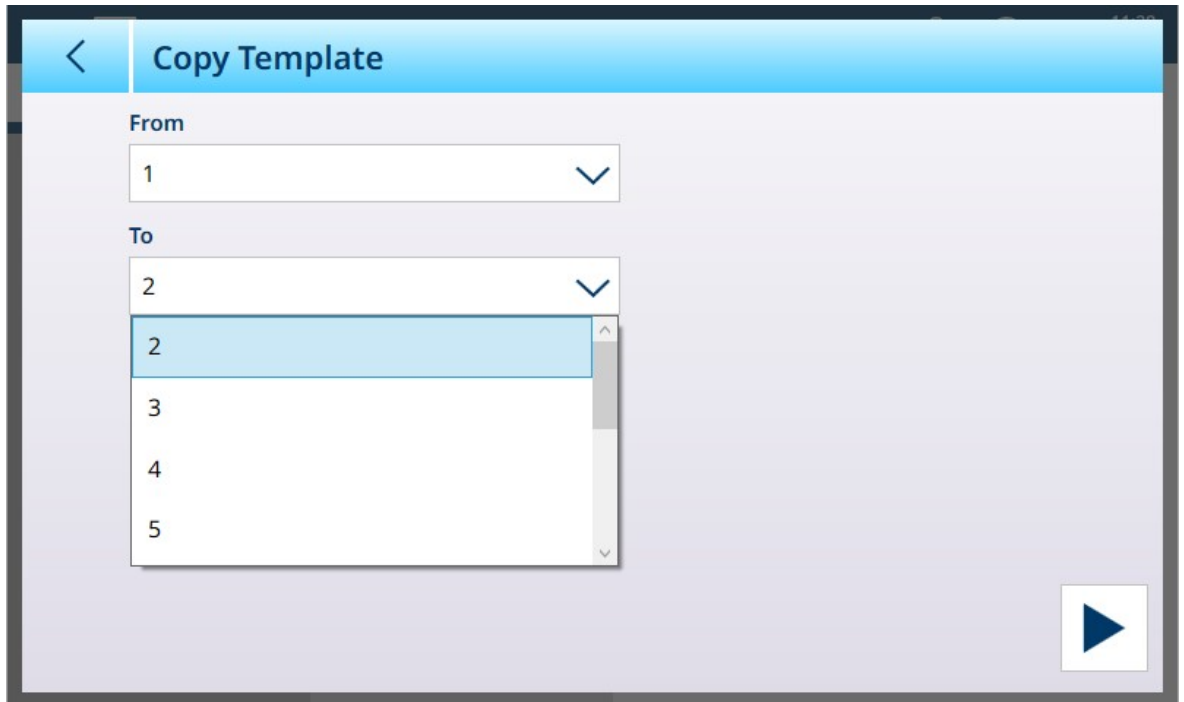



Figure 346: Copy Template Dialog

Click the **Run** icon  at lower right to execute the copy, then use the left arrow at top left twice to return to the **Output Templates** menu view. Template 2 is now shown as configured.

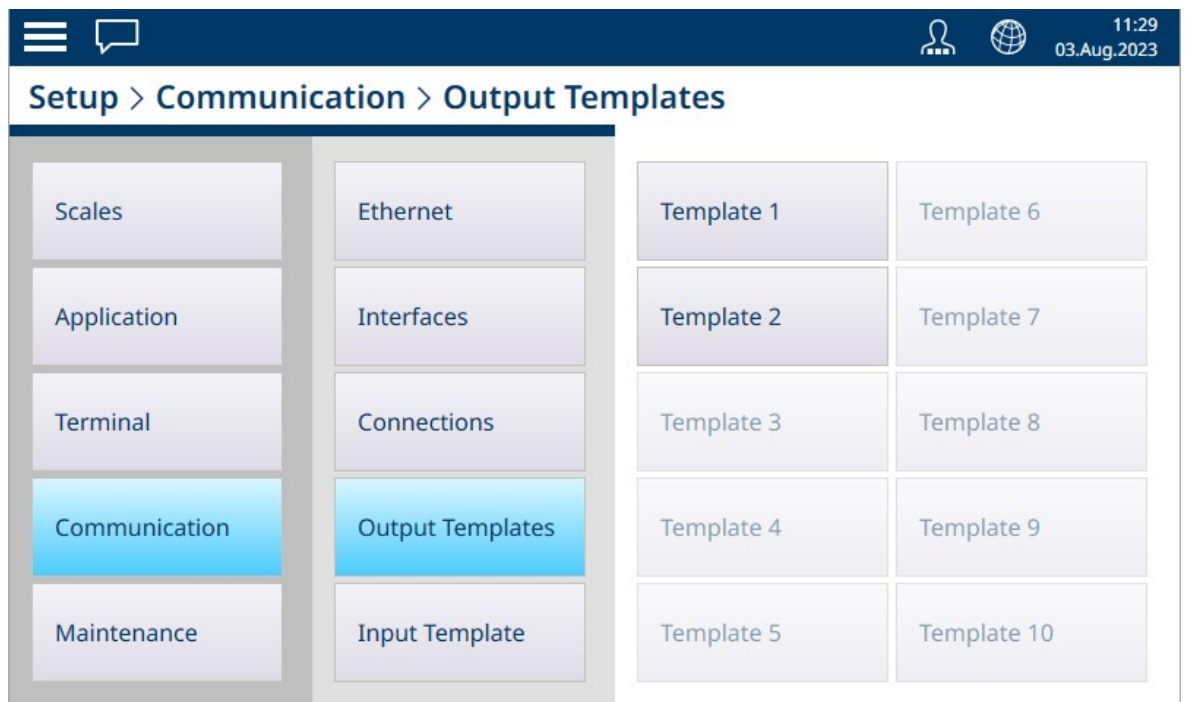


Figure 347: Output Templates Menu View, Template 2 Configured

This customized template -- in this case, Output Template 2 -- can now be used to determine the content and format of the output from a Connection. Multiple connections can be configured and use for different applications using other output templates.

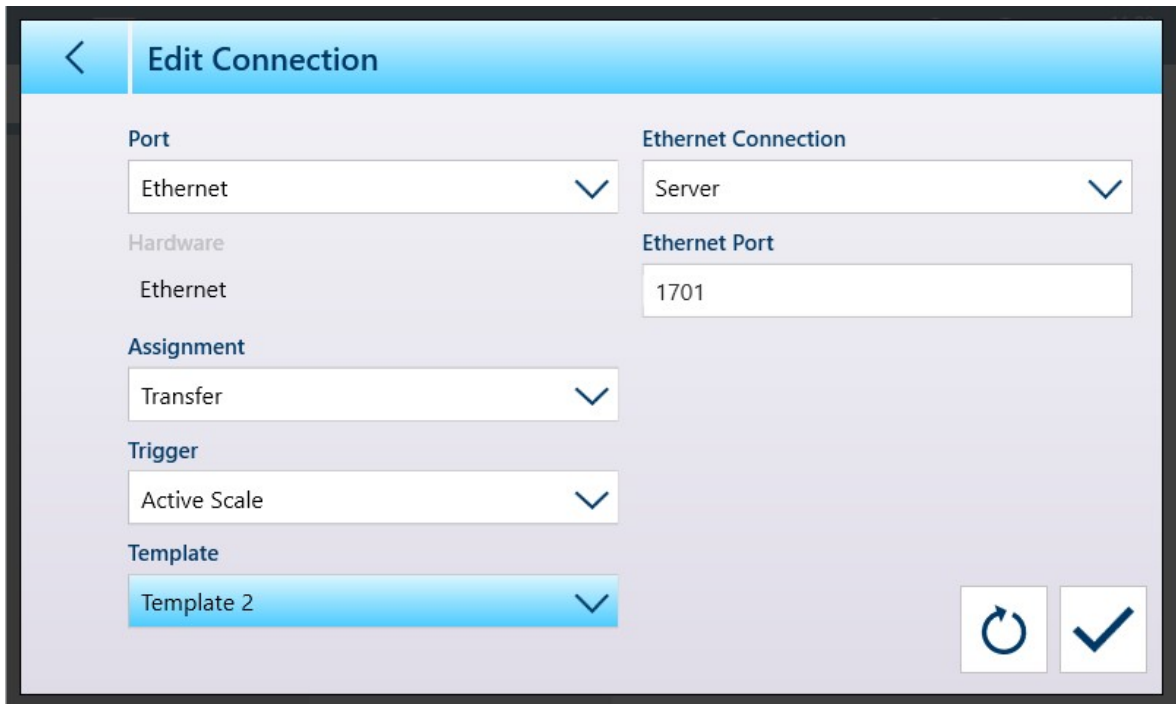



Figure 348: Connection Configuration Screen Showing Template 2 Selected

Template 1 will continue to reflect changes made to the configuration of the weight display. These can then be copied to another template.

Remember that templates can be **Exported**  and **Imported** , so that they can be kept safely outside the IND700, and restored to the same terminal or shared with other terminals. This option makes it very easy to standardize output data across multiple terminals.

To access these options in an Output template, click the ellipsis  in the menu bar.

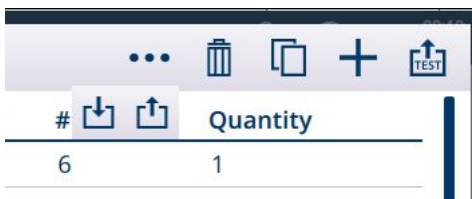


Figure 349: Output Templates Menu Bar, Import and Export Icons Displayed

Manual Template Editing

To configure a new template, or to modify an existing one, first touch the template's name in the **Templates** menu. If the template has not been configured, a blank template will display, with no elements defined and a + icon to add a new element. Otherwise, the existing template configuration will display. In either case adding, removing and editing template elements use the same method.

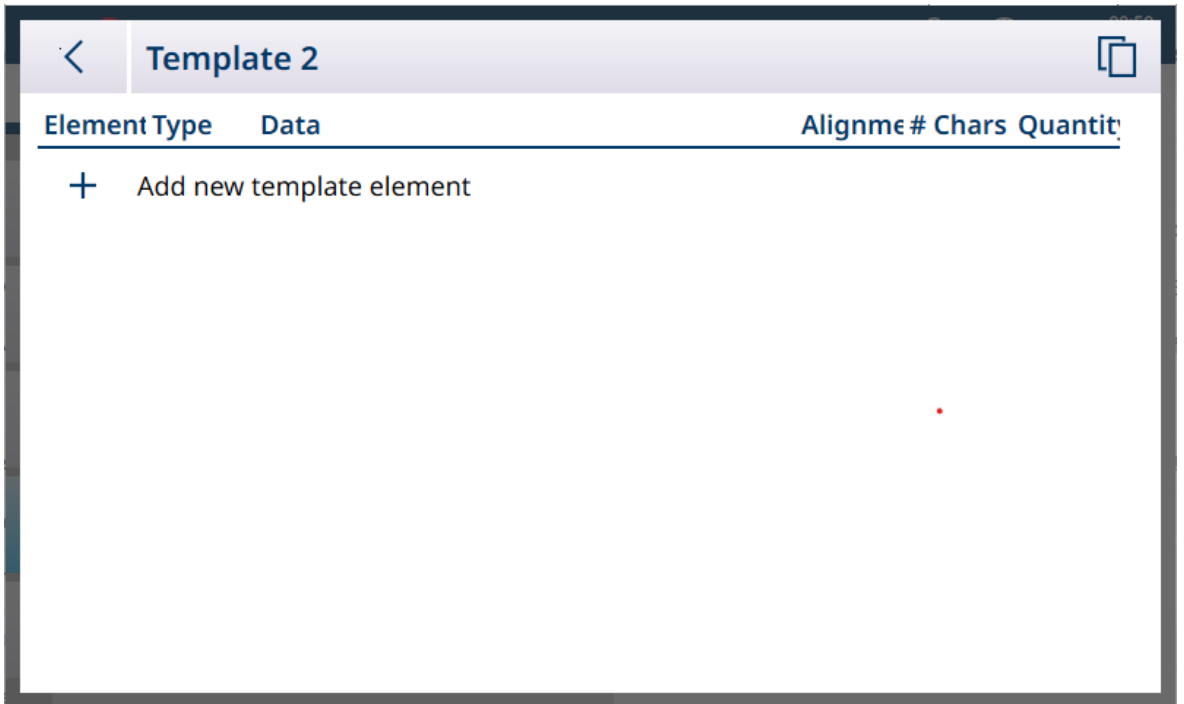


Figure 350: Undefined Template

When the + icon is touched, the template editor screen displays.

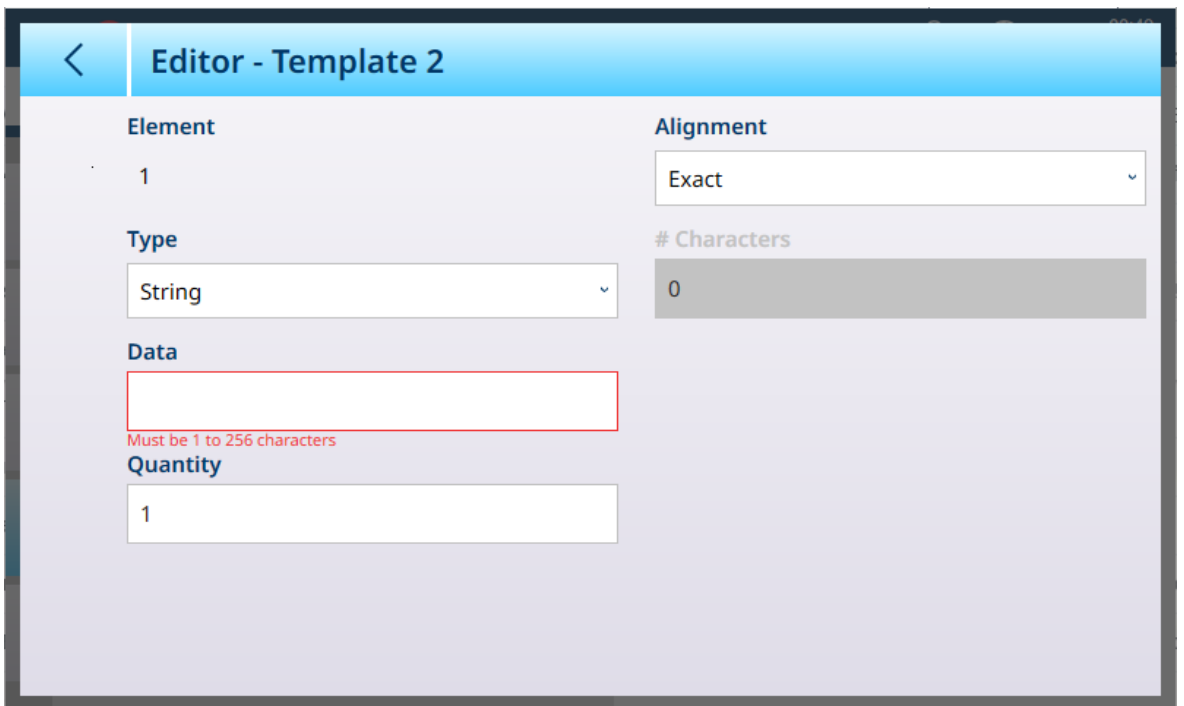


Figure 351: Template Editor

The fields available in the editor screen vary depending on the **Type** selected.

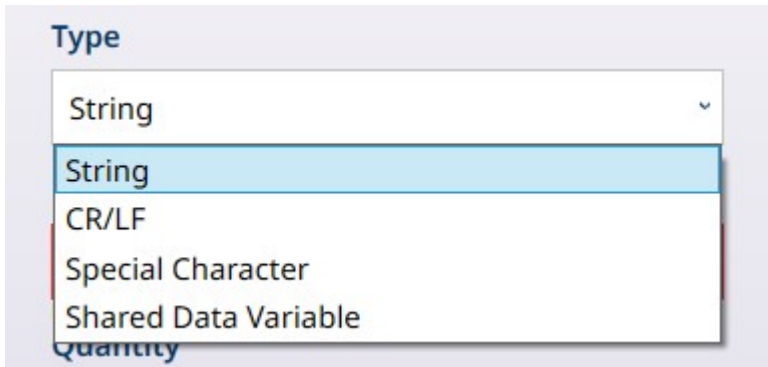


Figure 352: Template Editor - Type Options

CR/LF Options

For example, if CR/LF (carriage return/line feed) is chosen, the editor screen appears like this:

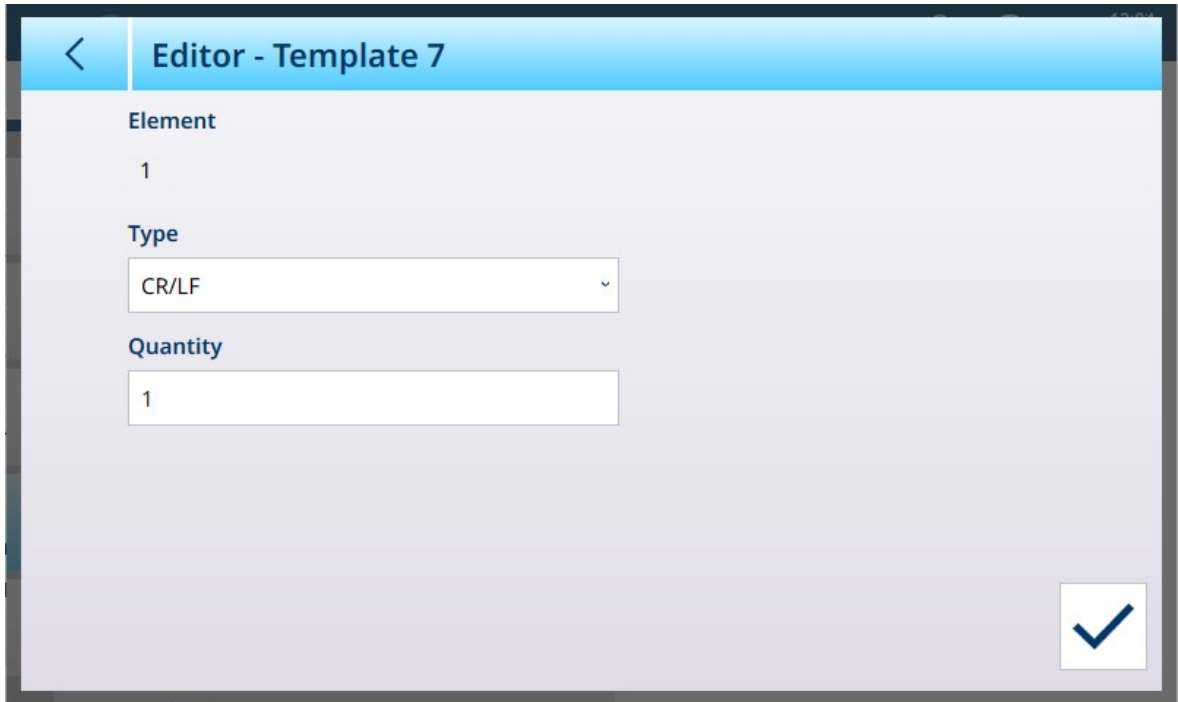


Figure 353: Template Editor, CR/LF Selected

Special Character Options

If **Special Character** is the selected **Type**, a drop-down lists the options.

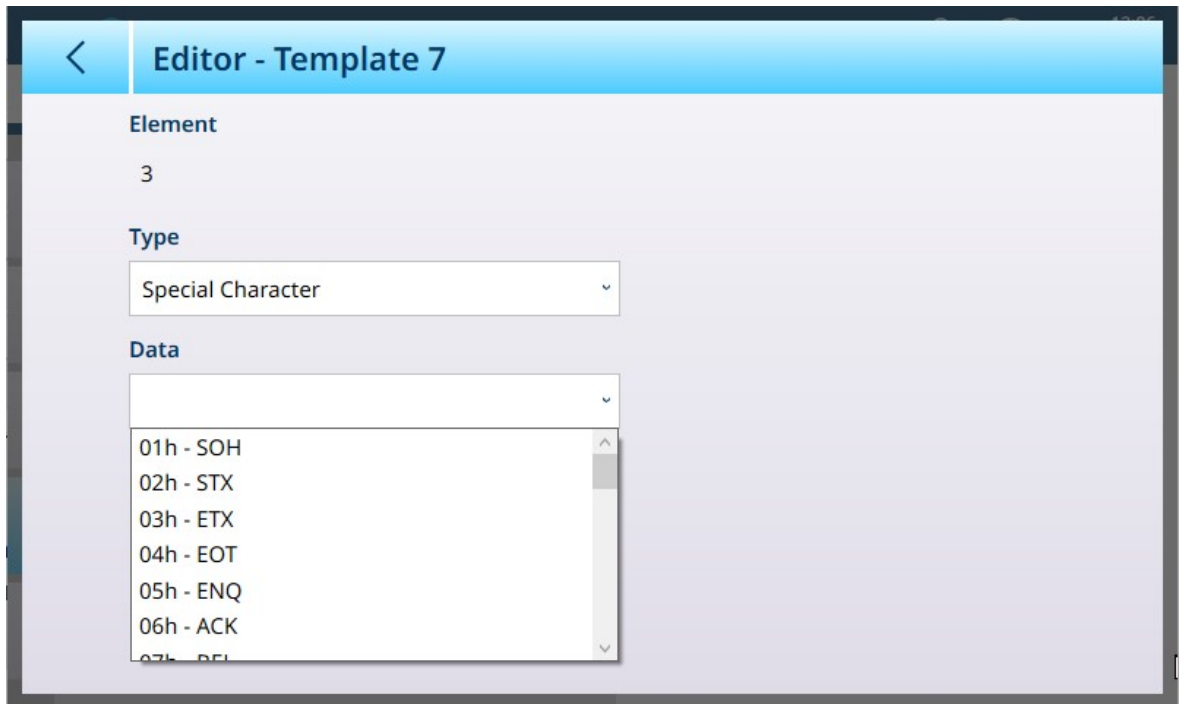


Figure 354: Template Editor - Special Character Selections

Refer to [Control Characters ▶ Page 356] for an explanation of these characters.

Shared Data Options



NOTICE

Commonly Used Shared Data Variables

A list of most commonly used Shared Data is included in the [Communication ▶ Page 343] section. For a complete account of available Shared Data in the IND700, refer to the **IND700 Shared Data Reference** (30753890).

For Shared Data variables, only the **Data** and **Alignment** fields are shown in addition to **Type**.

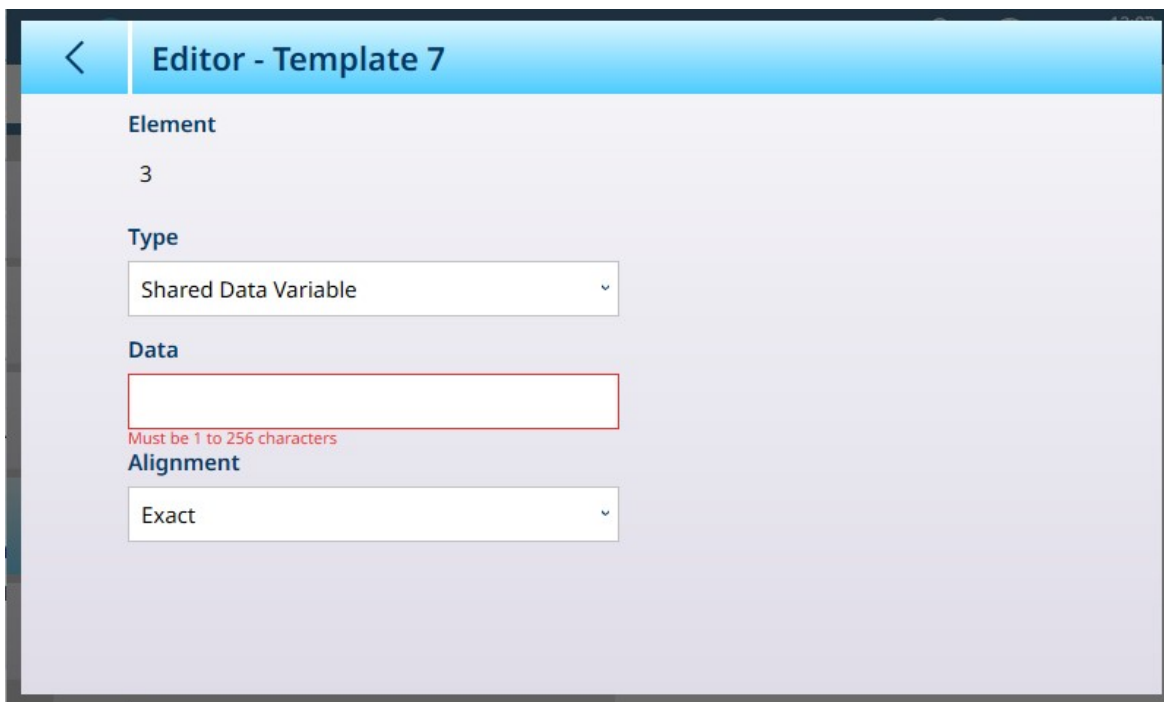


Figure 355: Template Editor - Shared Data Variable Selected

Available Shared Data Variables are listed and explained in the **IND700 Shared Data Reference**.

Alphanumeric Data Entry

For **String** and **Shared Data Variable** types, touching the **Data** field opens an alphanumeric data entry keypad.

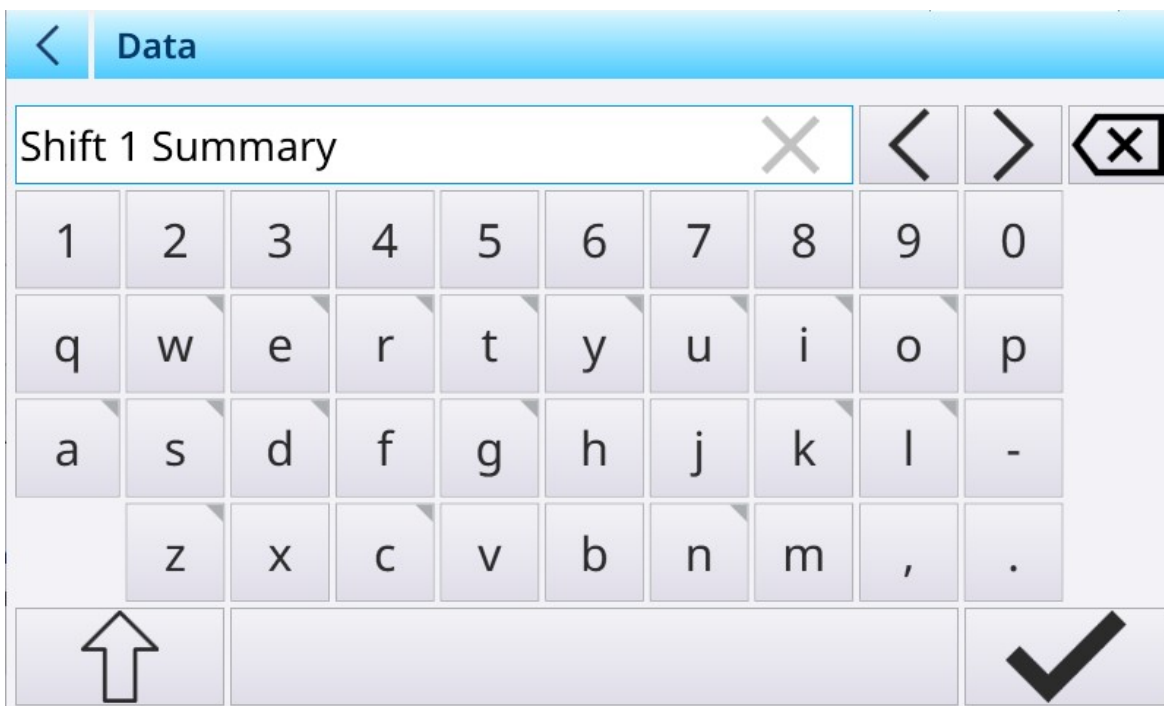


Figure 356: Template Editor - Alphanumeric Data Entry

Summary of Options

Element	Options	Function
---------	---------	----------

Element	Serial number of element; not editable	Once elements are defined, touching a row in the Template screen displays a set of delete/add/edit icons. If + (add) is selected, the new element is assigned the number of the element initially touched, and the element number of all subsequent existing elements increases by one.
Type	String [default] , CR/LF, Special Character, Shared Data Variable	The selection made here determines which other editing options are offered.
Data	Displays an alphanumeric entry screen	Displayed if Type is String or Shared Data Variable .
Data	None [default], 01 h -SOH, 02h - STX, 03h - ETX, 04h - EOT, 05h - ENQ, 06h - ACK, 07h - BEL, 08h - BS, 09h - HT, 0Ah - LF, 0Bh - VT, 0Ch - FF, 0Dh - CR, 0Eh - SO, 0Fh - SI, 10h - DLE, 11h - DC1, 12h - DC2, 13h - DC3, 14h - DC4, 15h - NAK, 16h - SYN, 17h - ETB, 18h - CAN, 19h - EM, 1Ah - SUB, 1Bh - ESC, 1Ch - FS, 1Dh - GS, 1Eh - RS, 1Fh - US	Displayed if Type is Special Character
Alignment	Exact [default] , Left, Center, Right	Determines how the element will be aligned in the template.
# Characters	Displays the count of characters in the Data field.	Displays if Type is String .

3.4.5.1 Format of Automatic Standard Output Template

The Automatic Standard Template includes a number of standard elements, together with elements derived from the application screen settings made in App Screen View page. Note that this page does not appear in the menu system unless a ProWorks Multi-Tools license is activated. Refer to the **ProWorks Multi-Tools User's Manual** for details on the display of application-specific data.

Automatic Standard Template Contents

Type	Data	Alignment	# Characters	Comment
String	"Date: "	Left	6	
SDVar	xd0103	Exact		Date
CR/LF				Carriage return, line feed
String	"Time: "	Left	6	
SDVar	xd0104	Exact		Time (format as configured)
CR/LF				
String	"User: "	Left	6	
SDVar	xc0171	Exact		Logged-in user
CR/LF				
CR/LF				
All items from the App Screen View are added here, between the header and the weight data. Below is an example for target information in a manual filling application.				
String	"Upper Tol.: "	Left	12	
SDVar	sp0011	Exact		Upper tolerance (deviation or absolute); sp0014 if tolerance type is percentage
String	"Lower Tol.: "	Left	7	
SDVar	sp0012			Lower tolerance (deviation or absolute); sp0015 if tolerance type is percentage

Type	Data	Alignme nt	# Cha ract ers	Comment
CR/LF				
CR/LF				
String	"Scale: "	Left	7	
SDVar	xt0101	Exact		Currently selected scale
CR/LF				
String	"Gross: "	Left	7	
SDVar	wt0001	Exact		Gross weight, selected scale
String	" "	Exact	1	Blank space
SDVar	wt0003	Exact		Unit, selected scale
CR/LF				
String	"Tare: "	Left	6	
SDVar	ws0002	Exact		Tare weight, selected scale
String	" "	Exact	1	Blank space
SDVar	wt0003			Unit, selected scale
String	" "	Exact	1	Blank space
SDVar	ws0009	Exact		Tare type (T or PT)
CR/LF				
String	"Net: "	Left	5	
SDVar	wt0002	Exact		Net weight, selected scale
String	" "	Exact	1	Blank space
SDVar	wt0003	Exact		Unit, selected scale
CR/LF				

3.4.6 Input Template

When the Input Template menu option is first visited, it displays its default contents.

Element	Preamble	Data	Postamble	Termination	Timeout
1	0	1	0	CR	ON

Figure 357: Input Template 1, Unconfigured

To add template elements, select the existing element (the CR Termination character) and click the + in the context menu which appears.



Figure 358: Input Template Context Menu

The following screen will appear. Note that the menu bar shows Element 2.

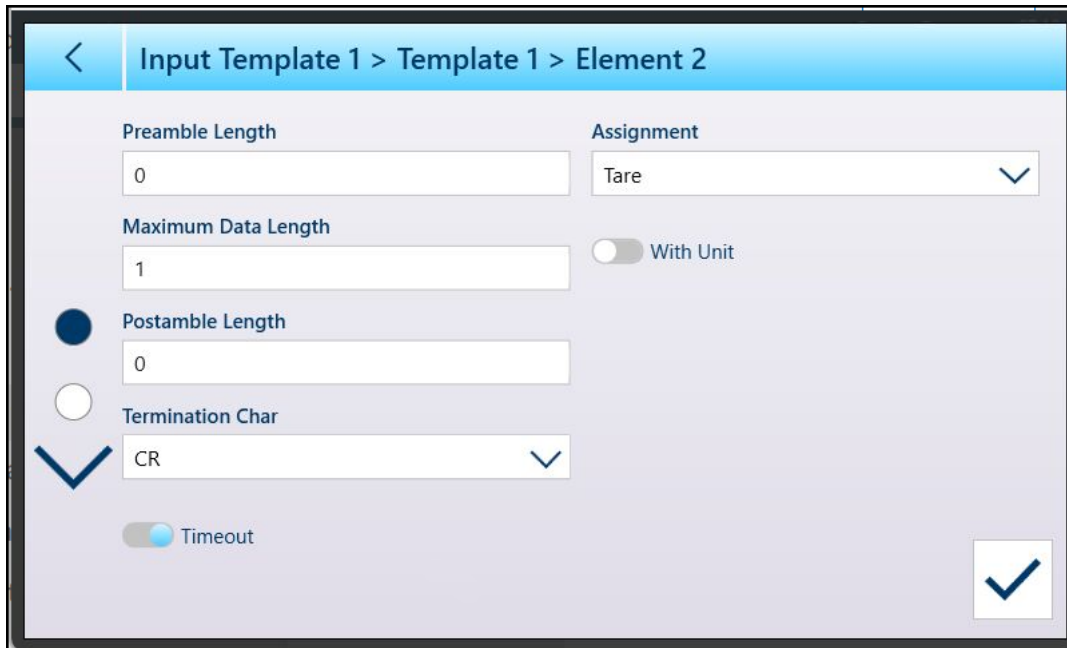



Figure 359: Input Template Element Edit Screen, Page 1



Figure 360: Input Template Element Edit Screen, Page 2

Existing elements can be edited in the same way, by selecting a row and clicking the edit icon  from the context menu.

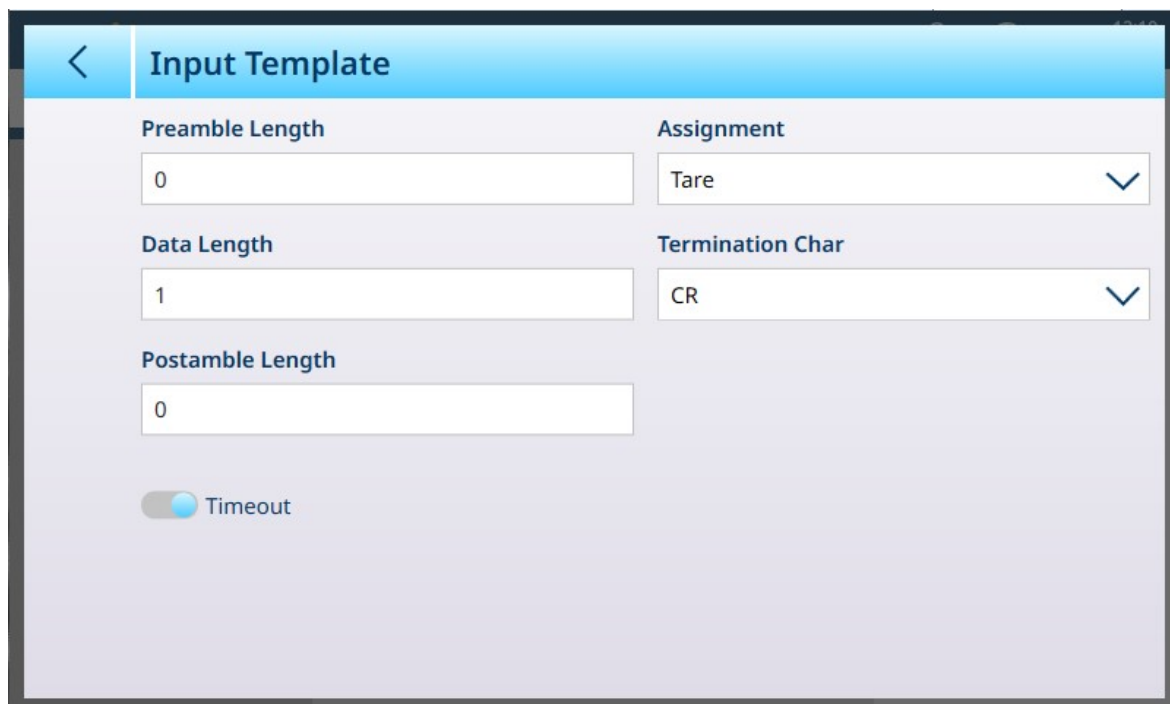
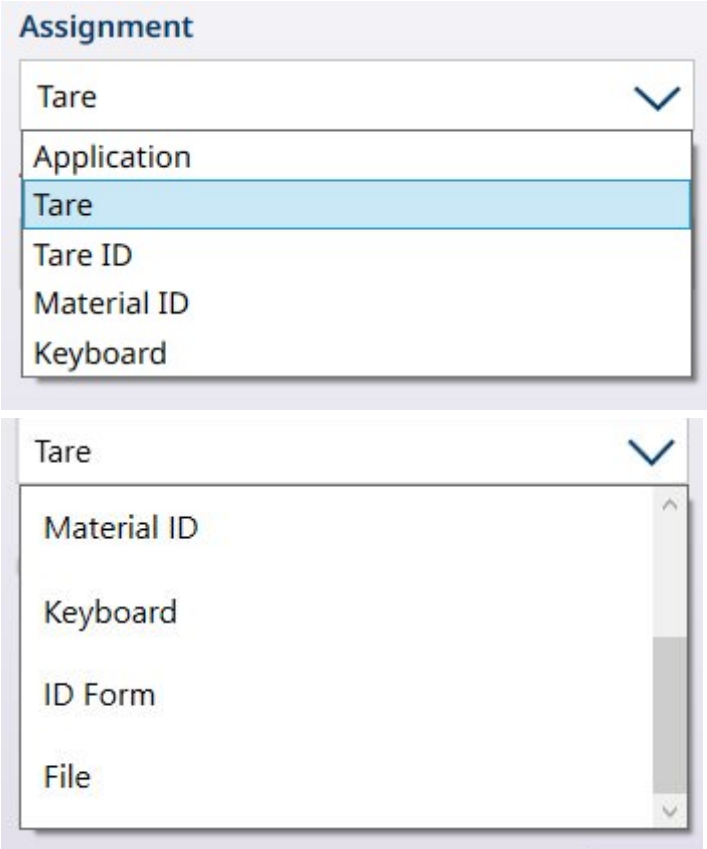


Figure 361: Input Template - Edit an Existing Element

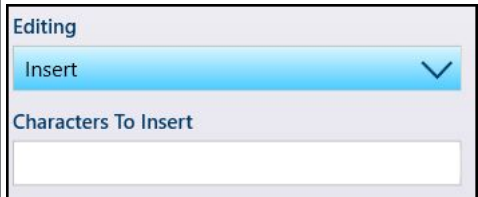
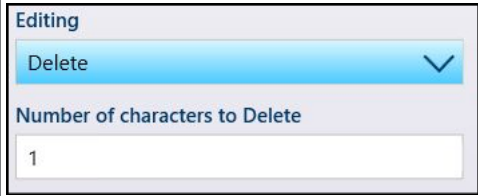
Input Template configuration

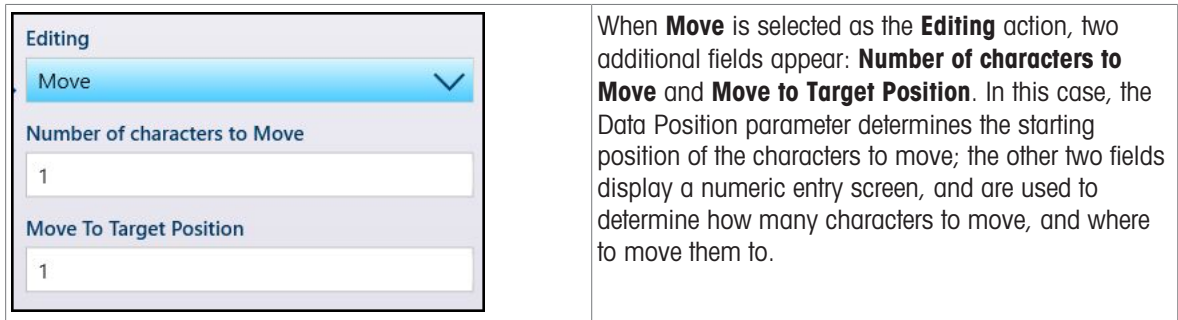
Parameter	Settings
Preamble Length	These parameters set the expected length, in characters, of the incoming data. The pre- and postamble lengths indicate the amount of data to be discarded from the start and end of an incoming data string. Similarly, the payload data string length is determined here. By default, the Pre- and Postamble length is 0 , and the Data Length is 1 . These values must conform to those for the incoming data, or an error will be generated.
Maximum Data Length	
Postamble Length	
Termination Char	This dropdown list permits the selection of the character which indicates the end of a data string. The default value is CR (carriage return). Possible values are: None, SOH, STX, ETX, EOT, ENQ, ACK, BEL, BS, HT, LF, VT, FF, CR, SO, SI, DLE, DC1, DC2, DC3 DC4, NAK, SYN, TB, CAN, EM, SUB, ESC, FS, GS, RS, US.
Timeout	When an input device – for example, a barcode scanner – is expected to send a specific number of fields of data, each of a specific length, and the received data does not correspond to those specifications, the input process times out and an alarm is generated. By default, this option is enabled.

Parameter	Settings
Assignment	<p>The Assignment parameter determines which function should be executed when the template receives data. The default value is Tare.</p>  <p>Possible values are Application, Tare, Tare ID, Material ID, Keyboard, ID Form, File.</p>
With Unit	When enabled, this switch automatically appends the appropriate unit to any weight-based element.
Data Position 1 and 2 / Editing 1 and 2	The options on the second page of the template element editing screens are used to Insert , Delete , or Move character strings within the element. Two such functions can be performed at the same time, each affecting a different Data Position . Refer to Modifying a Template Element , below. The two actions are performed in sequence -- position 1 then position 2.

Modifying a Template Element

The options on the second page of the template element editing screens are used to **Insert**, **Delete**, or **Move** character strings within the selected template element. Two such functions can be performed at the same time, each affecting a different **Data Position** in the selected element.

	<p>When Insert is selected as the Editing action, a Characters to Insert field is displayed. Touch the field to display an alphanumeric entry screen. Characters entered here are inserted at the Data Position specified for this editing action.</p>
	<p>When Delete is selected as the Editing action, a Number of characters to Delete field is displayed. Touch the field to display a numeric entry screen. The number of characters entered here are deleted starting at the Data Position specified for this editing action.</p>



Once all the required settings are made, touch the OK button at bottom left.

General Template Settings

Touch the Setup softkey to display the **General Template Settings** screen.

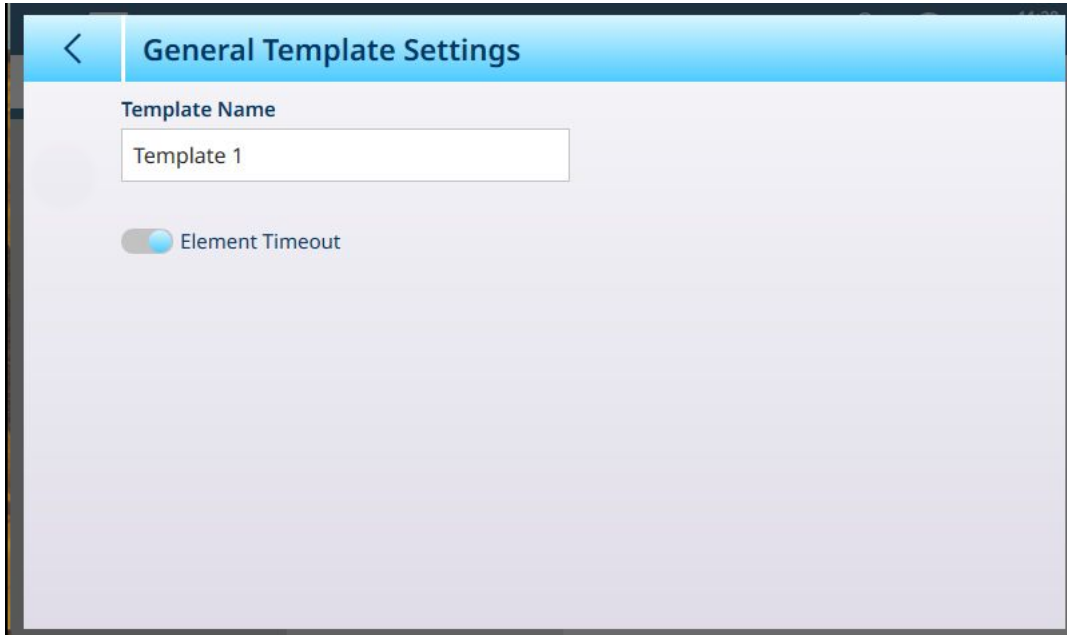


Figure 362: Input Reset Confirmation Dialog

When enabled, the **Element Timeout** option permits the template to continue to the next element if an element generates an error.

Resetting an Input Template to Default

To restore a template's default configuration, touch the ellipses in the menu bar and select the delete icon from the context menu.



Figure 363: Input Template Reset Option

A confirmation dialog will appear. Touch the check mark to confirm the operation.

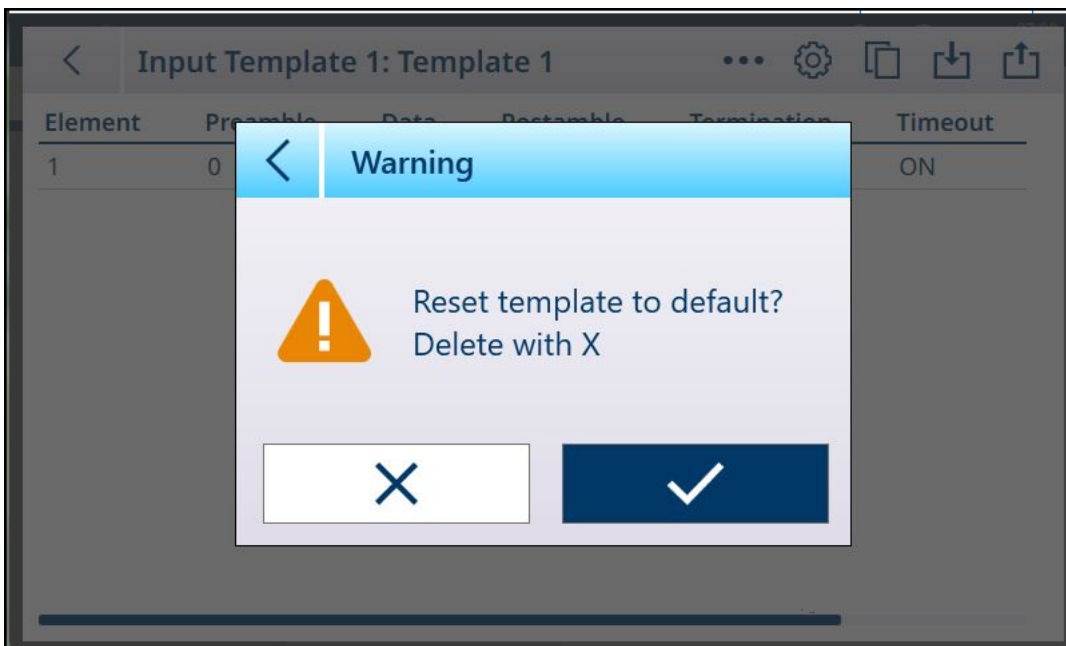


Figure 364: Input Template Reset Confirmation

3.5 Maintenance Setup

The **Maintenance** menu provides access to the following items:

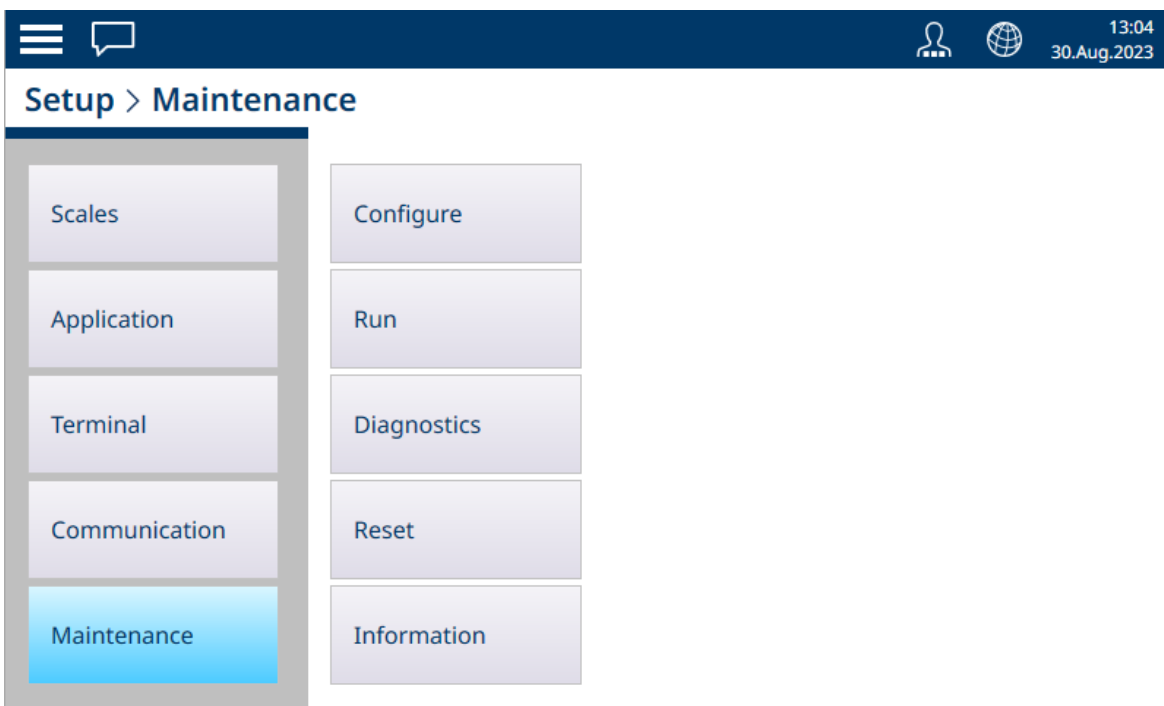


Figure 365: Maintenance Menus

3.5.1 Configure

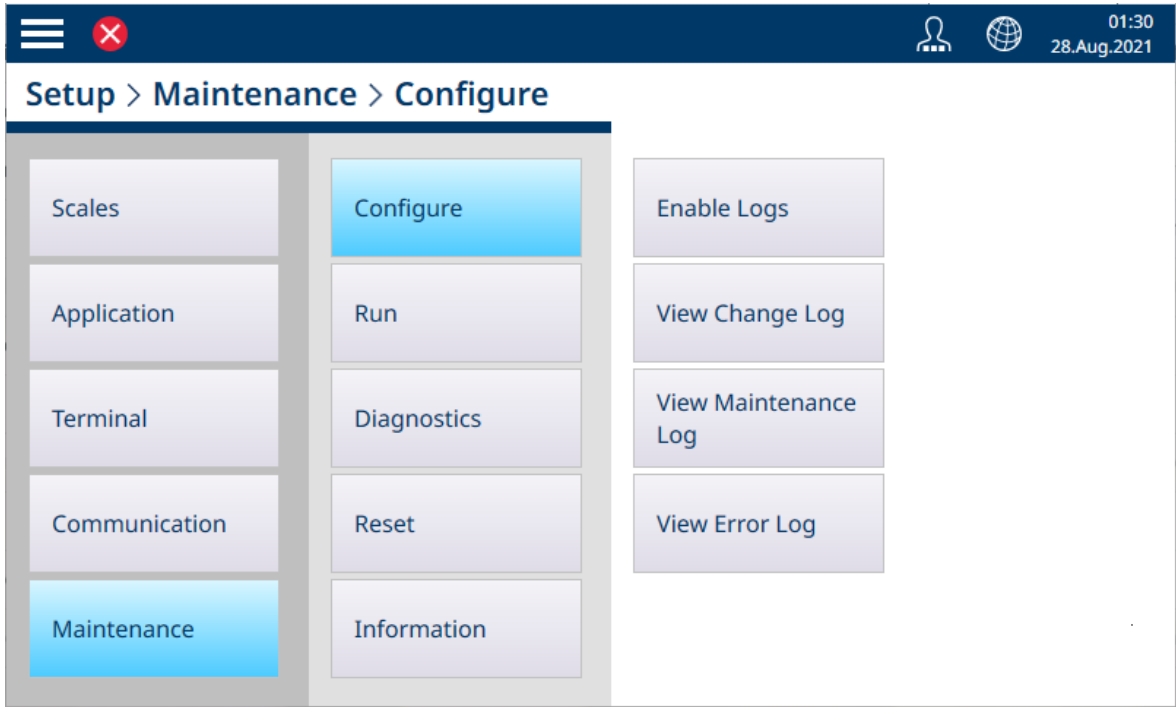


Figure 366: Maintenance - Configure Menus

The **Configure** screens are used to determine the behavior of the Terminal's logs, and to view their contents.

3.5.1.1 Enable Logs

The following logs can be enabled in the IND700. Note that the POWERCELL log appears only in terminals with at least one POWERCELL scale interface installed.

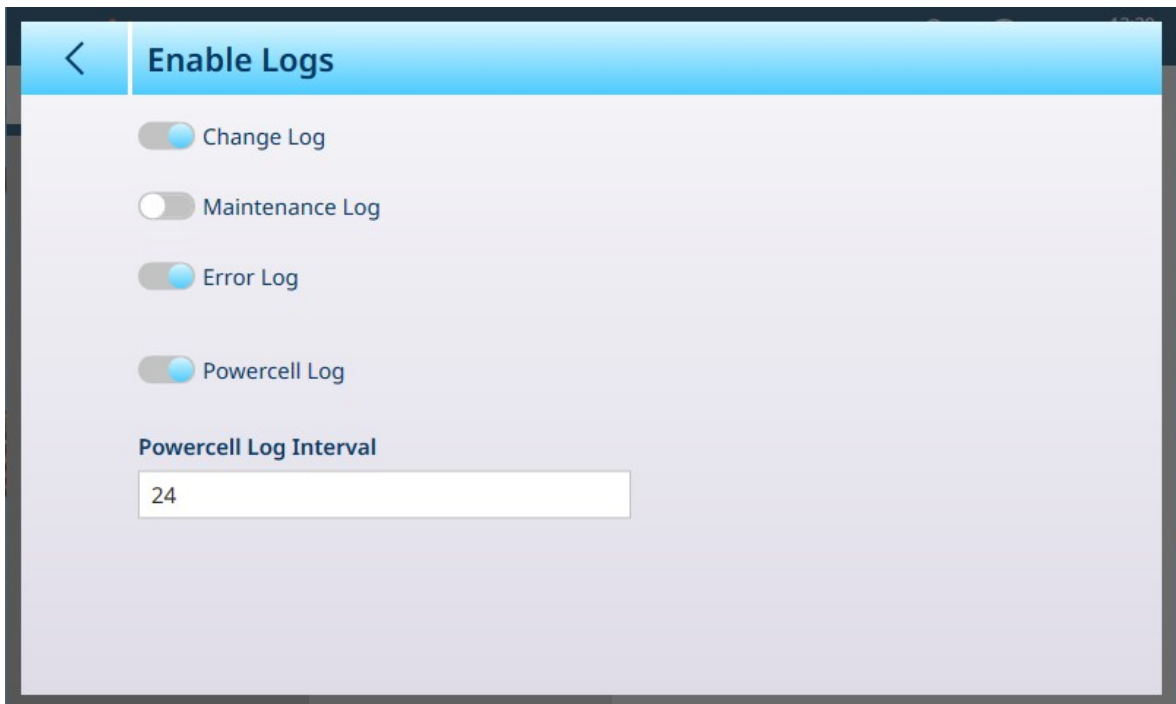


Figure 367: Enable Logs Screen

Each of the logs -- **Change**, **Maintenance**, **Error** and **POWERCELL** -- can be **Enabled** or **Disabled**. By default, both the **Change Log** and **Error Log** are enabled. Only enabled logs appear in the **Configure** menu.

When the **POWERCELL Log** is enabled, a polling interval must be set. This is expressed in hours, and determines the frequency with which the log collects POWERCELL data. The default value is 24 hours.

When one or more enabled logs is disabled from this screen, its contents will be cleared. When a change in log configuration is made, a blue confirmation check mark appears at bottom right.

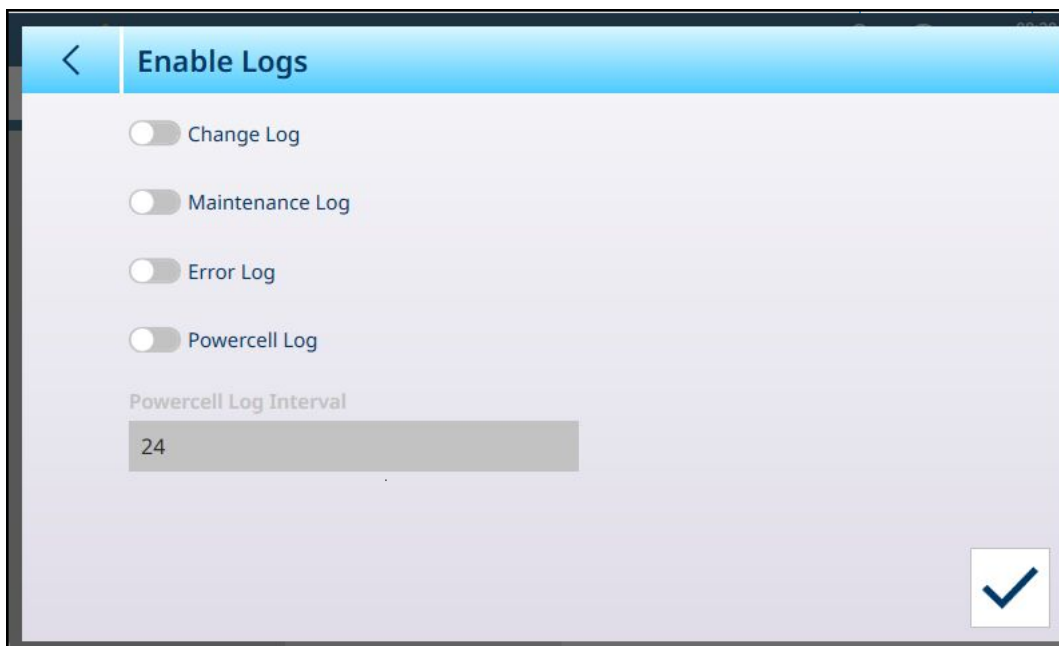


Figure 368: Logs Disabled, Confirmation Check Mark Displayed

Touching this check mark to confirm the changes will display one or more warning dialogs, one for each newly-disabled log, requesting confirmation for clearing the contents of the log. These dialogs will display one after the other, and each must be acknowledged to exit the screen.

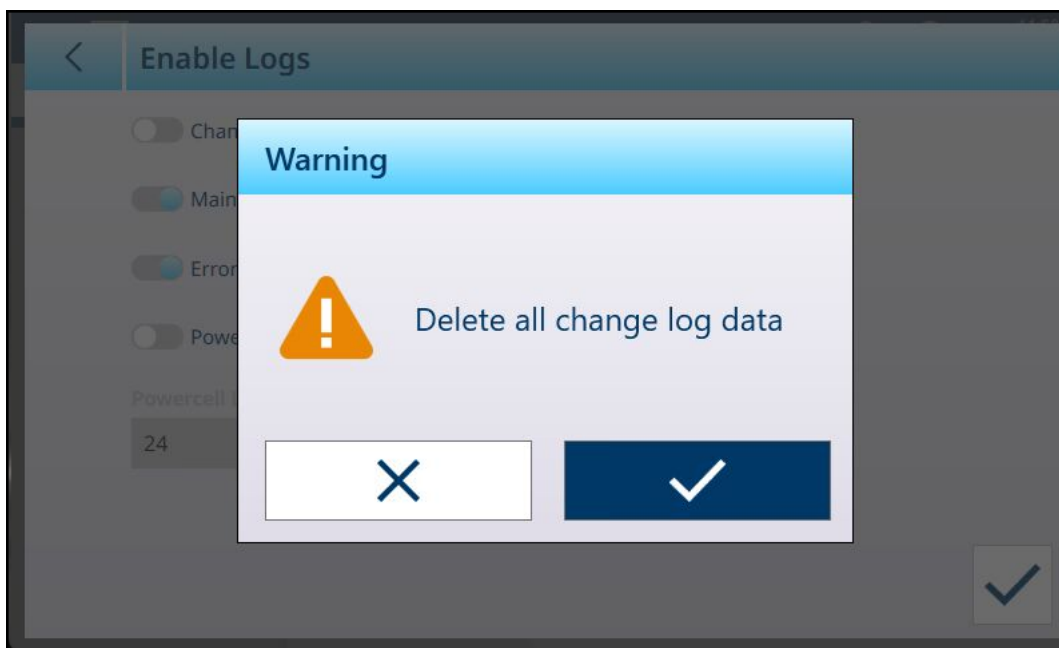
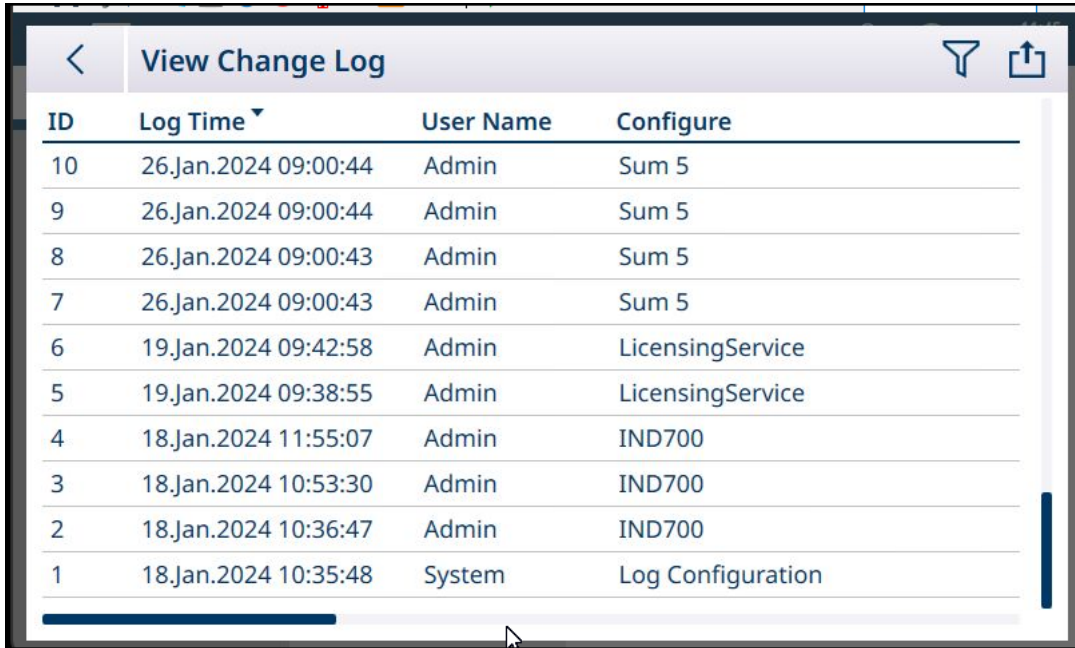


Figure 369: Clear Log Content Confirmation Dialog

3.5.1.2 View Change Log



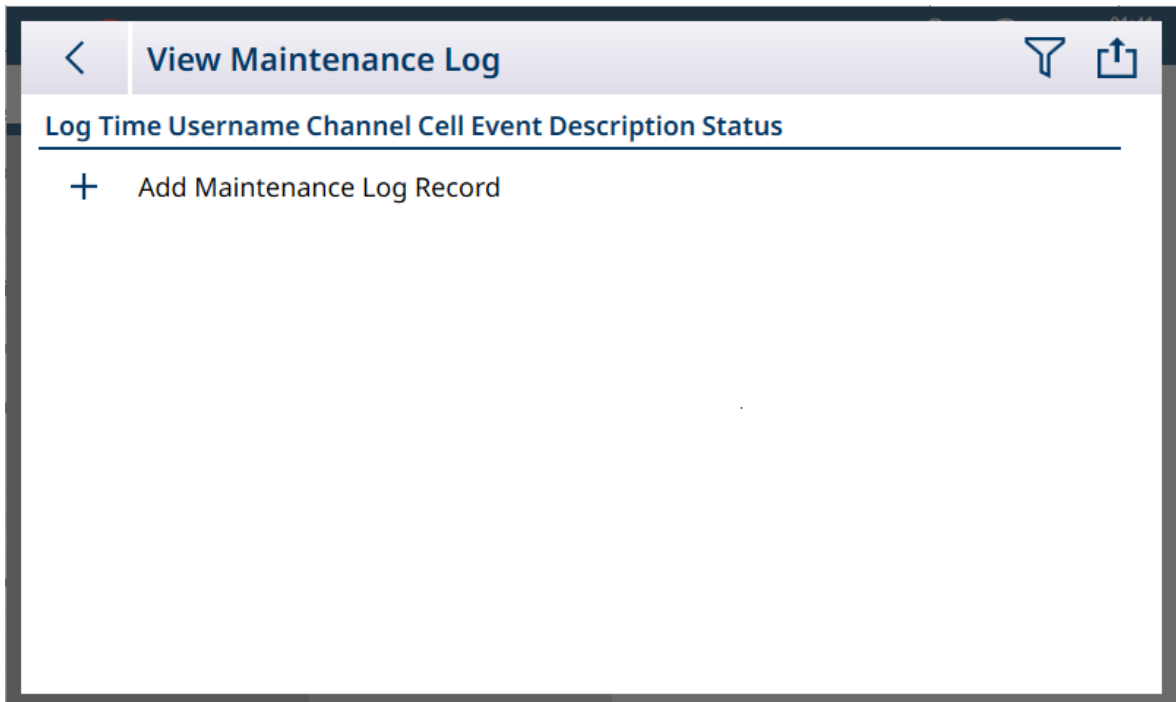
ID	Log Time	User Name	Configure
10	26.Jan.2024 09:00:44	Admin	Sum 5
9	26.Jan.2024 09:00:44	Admin	Sum 5
8	26.Jan.2024 09:00:43	Admin	Sum 5
7	26.Jan.2024 09:00:43	Admin	Sum 5
6	19.Jan.2024 09:42:58	Admin	LicensingService
5	19.Jan.2024 09:38:55	Admin	LicensingService
4	18.Jan.2024 11:55:07	Admin	IND700
3	18.Jan.2024 10:53:30	Admin	IND700
2	18.Jan.2024 10:36:47	Admin	IND700
1	18.Jan.2024 10:35:48	System	Log Configuration

Figure 370: Change Log

When the log is enabled, entries are added automatically.

The Change Log can be filtered, searched, and exported. Refer to [Table Functions: Filter, Export, Import, Clear ▶ Page 307].

3.5.1.3 View Maintenance Log



Log Time	Username	Channel	Cell	Event	Description	Status
+ Add Maintenance Log Record						

Figure 371: Maintenance Log

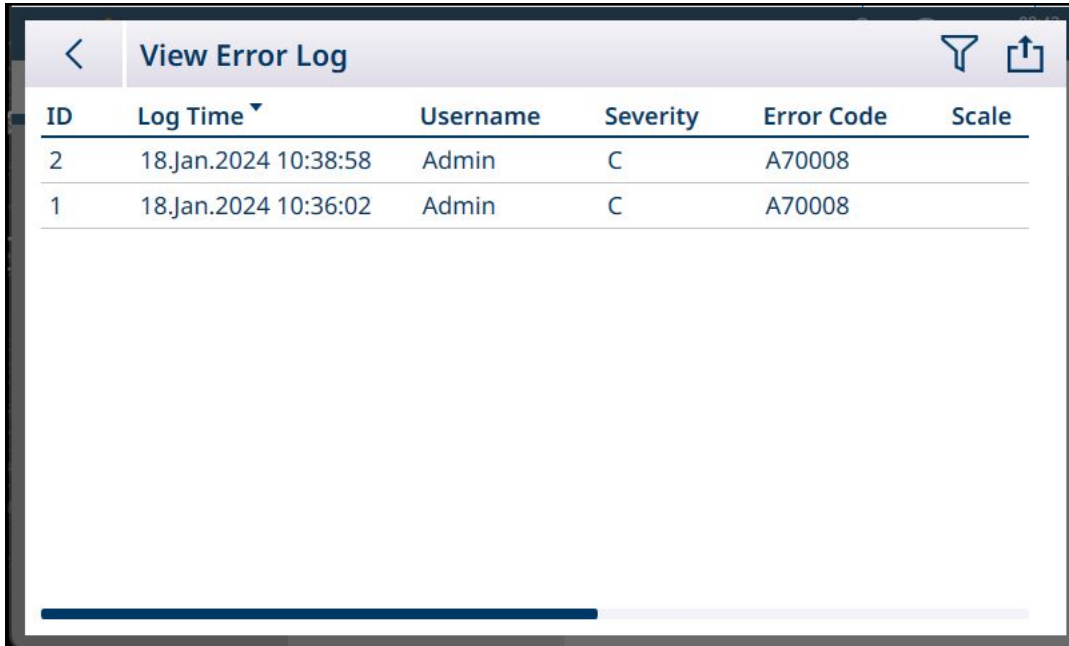
Entries to the **Maintenance Log** are made manually, by touching the + sign to open the **Add Maintenance Log Record** screen.

Figure 372: Maintenance Log Record

Item	Options	Function
Channel	Terminal [default], Scale 1, Scale 2, Scale 3, Scale 4	Defines the affected component of the terminal, or the terminal itself.
Event	MAINT. OPTION COMPONENT ADDED [default] , MAINT. OPTION COMPONENT REMOVED, MAINT. OPTION COMPONENT REPLACED	Defines the type of maintenance action taken.
Status	Displays an alphanumeric entry dialog	Text description of action taken, and any maintenance notes.

The Maintenance Log can be filtered and searched, and exported. Refer to [Table Functions: Filter, Export, Import, Clear ▶ Page 307].

3.5.1.4 View Error Log




ID	Log Time	Username	Severity	Error Code	Scale
2	18.Jan.2024 10:38:58	Admin	C	A70008	
1	18.Jan.2024 10:36:02	Admin	C	A70008	

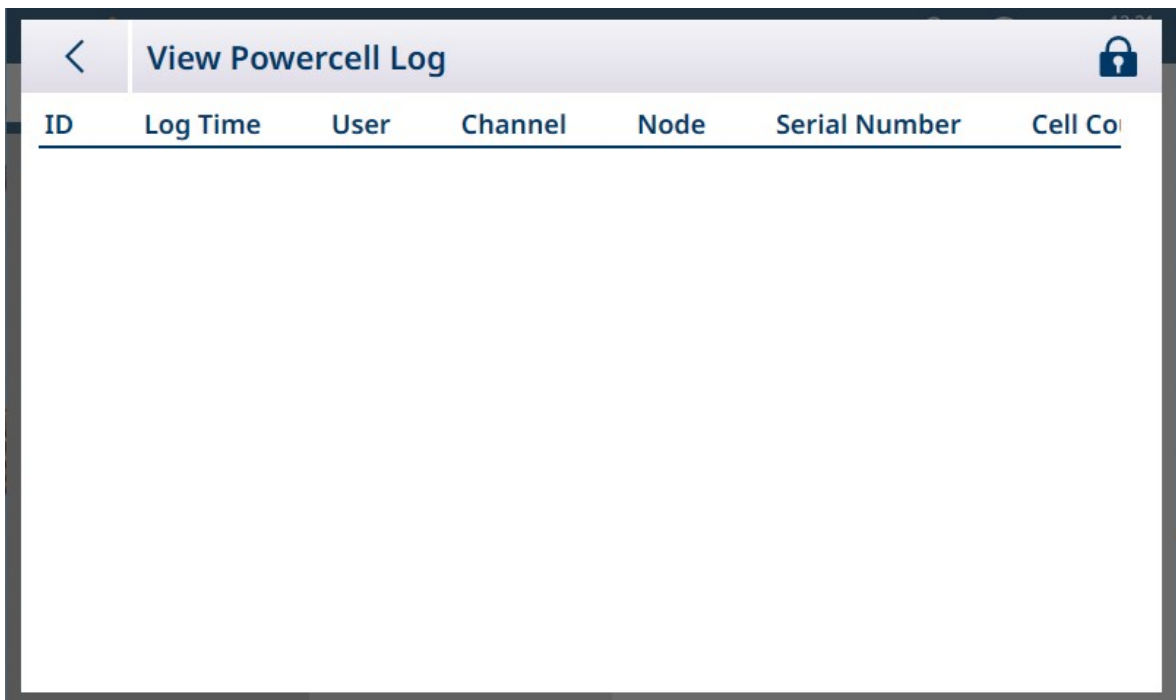
Figure 373: Error Log

Error Log entries are created automatically by the terminal. Errors are described in more detail in [Troubleshooting ▶ Page 284].

The Error Log can be filtered, searched, and exported. Refer to [Table Functions: Filter, Export, Import, Clear ▶ Page 307].

3.5.1.5 View POWERCELL Log

In IND700 terminals with at least one POWERCELL scale interface installed, the **POWERCELL Log** displays a selection of read-only data, including a time stamp and node number to assist in diagnosing POWERCELL problems. In its default state, the log is shown with the lock icon closed .








ID	Log Time	User	Channel	Node	Serial Number	Cell Co
----	----------	------	---------	------	---------------	---------


Figure 374: POWERCELL Log View

Touch the lock icon to unlock the log. Additional options now appear.

ID	Log Time	User	Channel	Node	Serial Number
24	29.Jan.2024 11:33:51	Admin	Scale 1	4	
23	29.Jan.2024 11:33:51	Admin	Scale 1	3	
22	29.Jan.2024 11:33:51	Admin	Scale 1	2	
21	29.Jan.2024 11:33:51	Admin	Scale 1	1	
20	28.Jan.2024 11:33:52	Admin	Scale 1	4	
19	28.Jan.2024 11:33:52	Admin	Scale 1	3	
18	28.Jan.2024 11:33:52	Admin	Scale 1	2	
17	28.Jan.2024 11:33:52	Admin	Scale 1	1	
16	27.Jan.2024 11:33:51	Admin	Scale 1	4	
15	27.Jan.2024 11:33:51	Admin	Scale 1	3	


Figure 375: POWERCELL Log Unlocked

In addition to the **Filter**  and **Export**  icons, touching the ellipsis  displays a **Delete**  and an **Add**  icon.

Touch the , either in the menu bar or from the record list, to display the **Add POWERCELL Log Record** screen.

Channel
Scale 1

Figure 376: Add POWERELL Log Record

Choose the scale for which a log record should be added, and touch the blue check mark to confirm .

Note that one new record is added for each of the scale's nodes.

ID	Log Time	User	Channel	Node	Serial Number
4	02.Feb.2024 09:24:30	Admin	Scale 1	4	
3	02.Feb.2024 09:24:30	Admin	Scale 1	3	
2	02.Feb.2024 09:24:30	Admin	Scale 1	2	
1	02.Feb.2024 09:24:30	Admin	Scale 1	1	

Figure 377: POWERCELL Log Records Added

3.5.2 Run

The current configuration of an IND700 can be backed up and saved, either within the terminal or on an external USB device. The configuration backup file can then be stored safely in another location. Keeping a current backup of the parameters configured in Setup ensures that the terminal's function can be restored if necessary, without the user having to remember and enter settings.

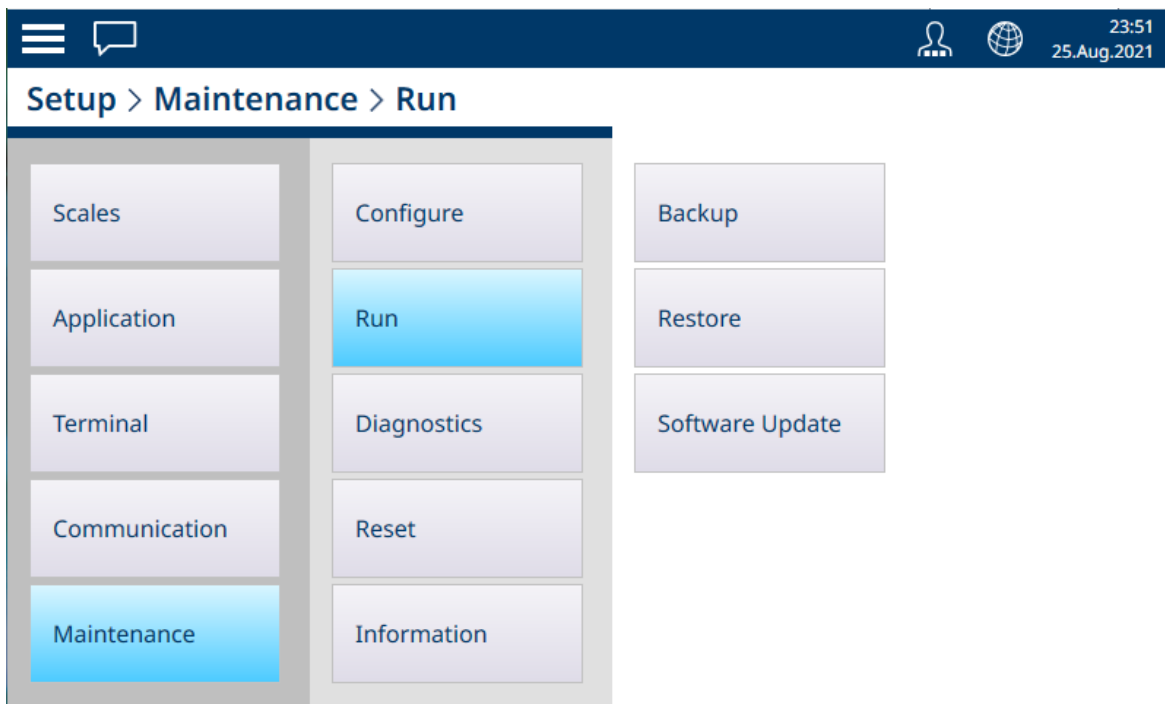


Figure 378: Maintenance - Run Menus

The **Run** menu provides access to the following items:

3.5.2.1 Backup

The terminal's backup function requires only a **Target** specification (**Internal File [default]** or USB Memory) and a target filename. The export directory is determined by the chosen target.

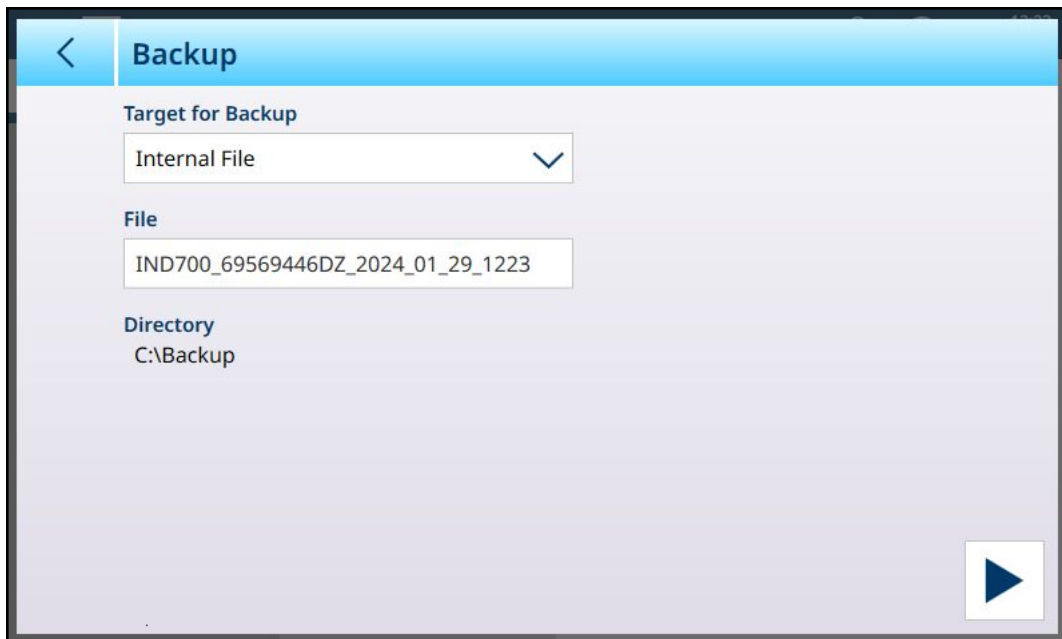


Figure 379: Run - Backup Configuration, Internal File Target

If a USB device is connected to the terminal, it will appear as an option in the Target for Backup dropdown list.

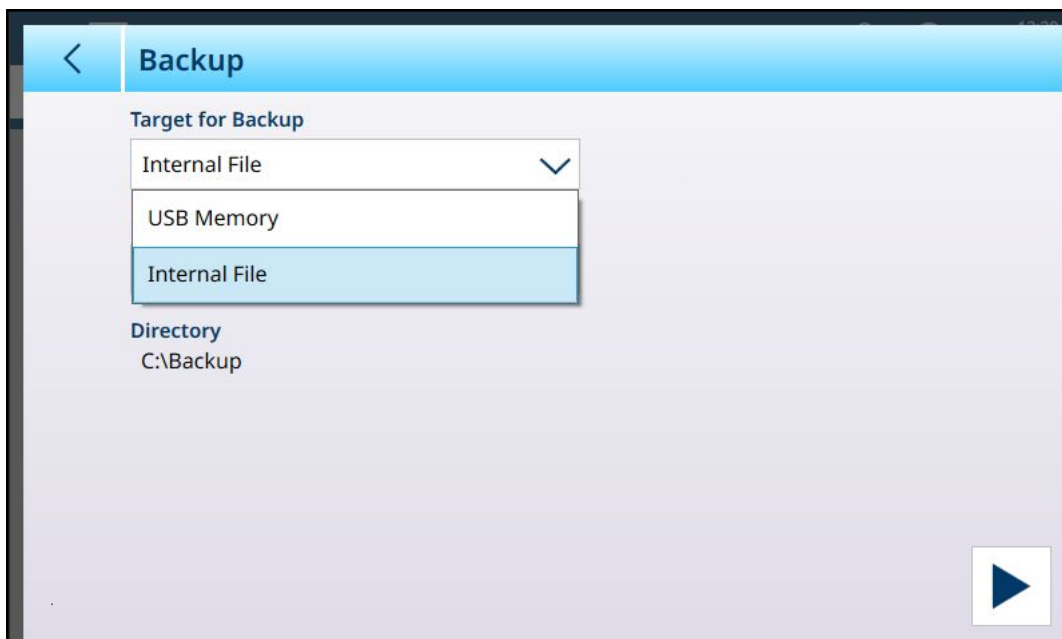


Figure 380: Run - Backup Configuration, USB Memory Target

The backup function saves the terminal's configuration in an **.mtbak** file. A confirmation dialog indicates that the process completed successfully.

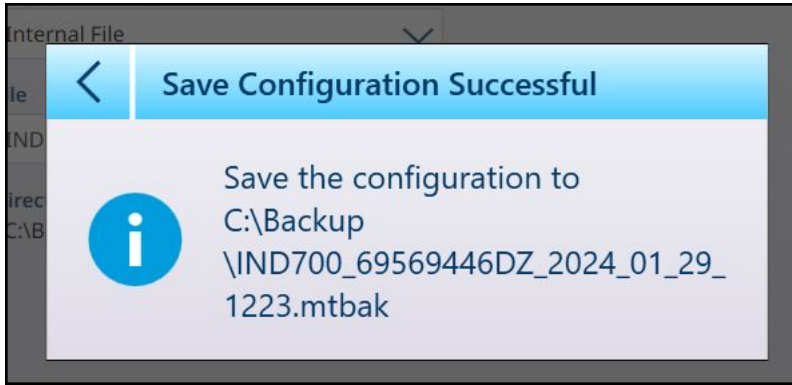


Figure 381: Backup Success Confirmation

3.5.2.2 Restore

When a configuration backup file is saved to the IND700 **C:\Backup** directory, the terminal automatically detects it and asks the user to confirm the restoration of settings.

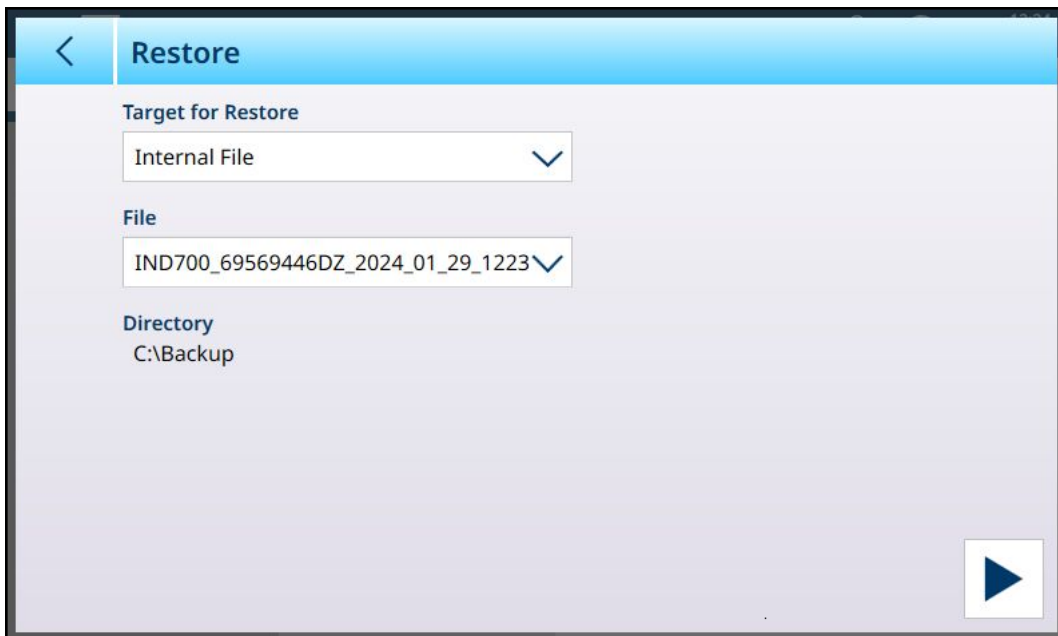


Figure 382: Run - Restore Configuration from File Stored in the Terminal

If the backup file is stored on an external USB device, or being transferred from an external storage location using a USB device, the device must be connected to the terminal when the restore process is begun. In this case, the **Target for Restore** dropdown list will include the external device.

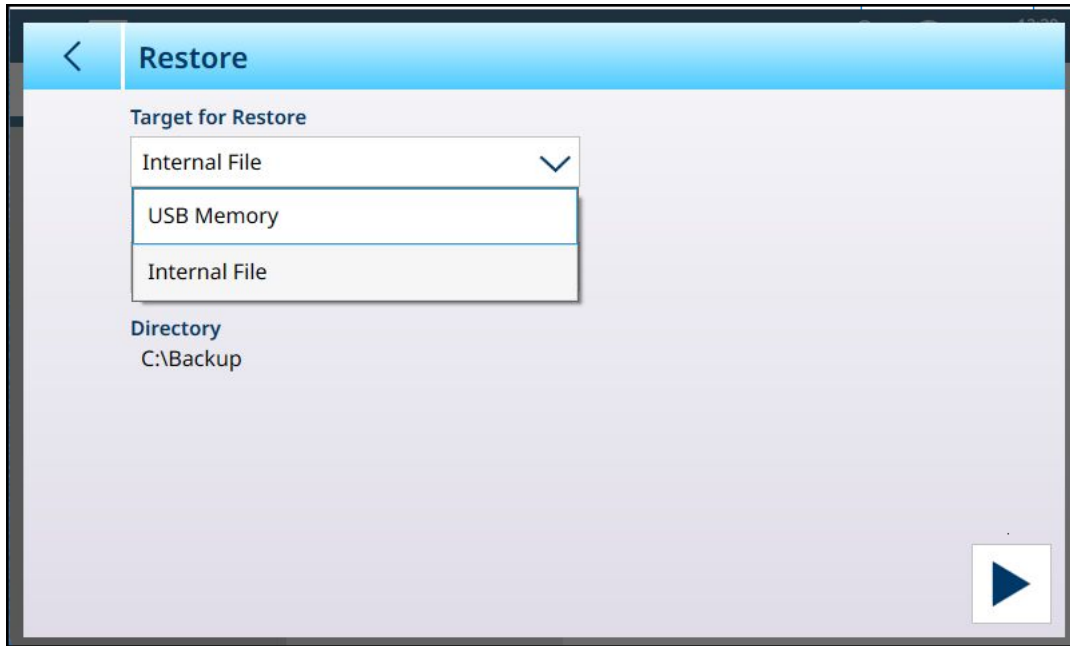


Figure 383: Run - Restore Configuration from External Device

Once the **Target for Restore** is defined (the file from which the restore will take place, either from an **Internal File [default]** or from USB Memory), the File dropdown list will include all saved **.mtbk** configuration files in that location. Select a file and touch the RUN button at lower right. A warning dialog will display, allowing the user either to continue or stop the restore procedure.

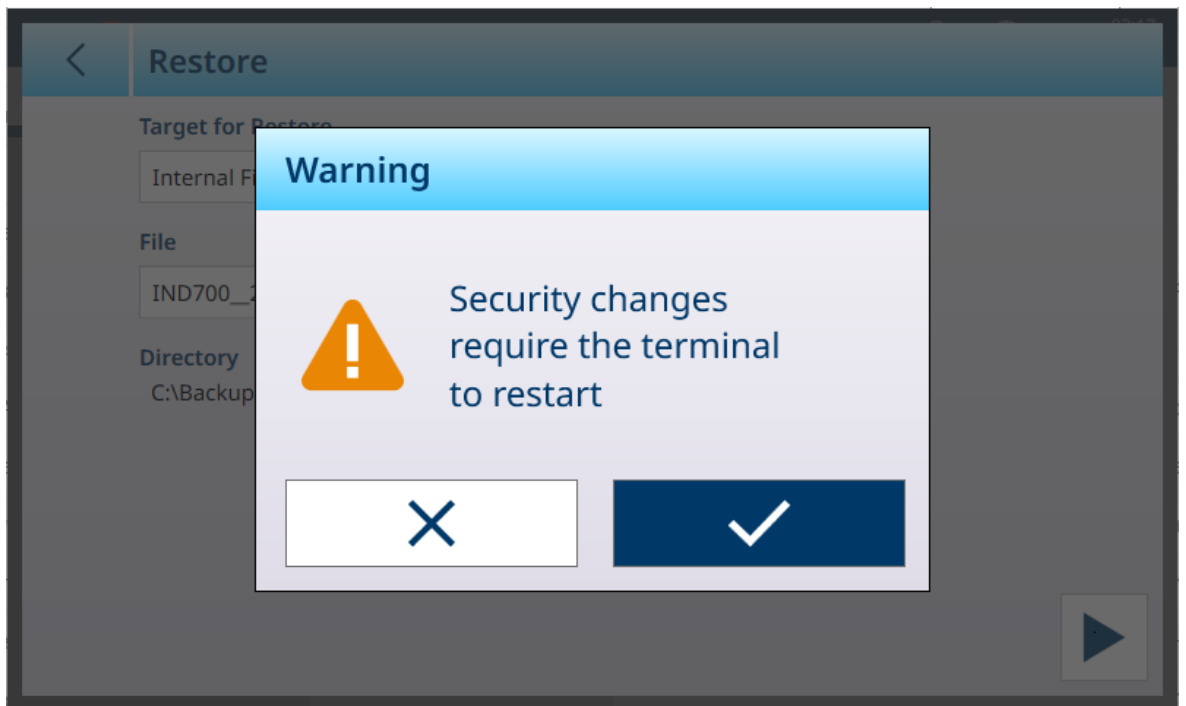


Figure 384: Restore Caution Dialog

3.5.2.3 Software Update

The **Software Update** menu includes three sub-menus -- **Windows Servicing & Deployment**, **Scale Interface** and **Load Cell**.

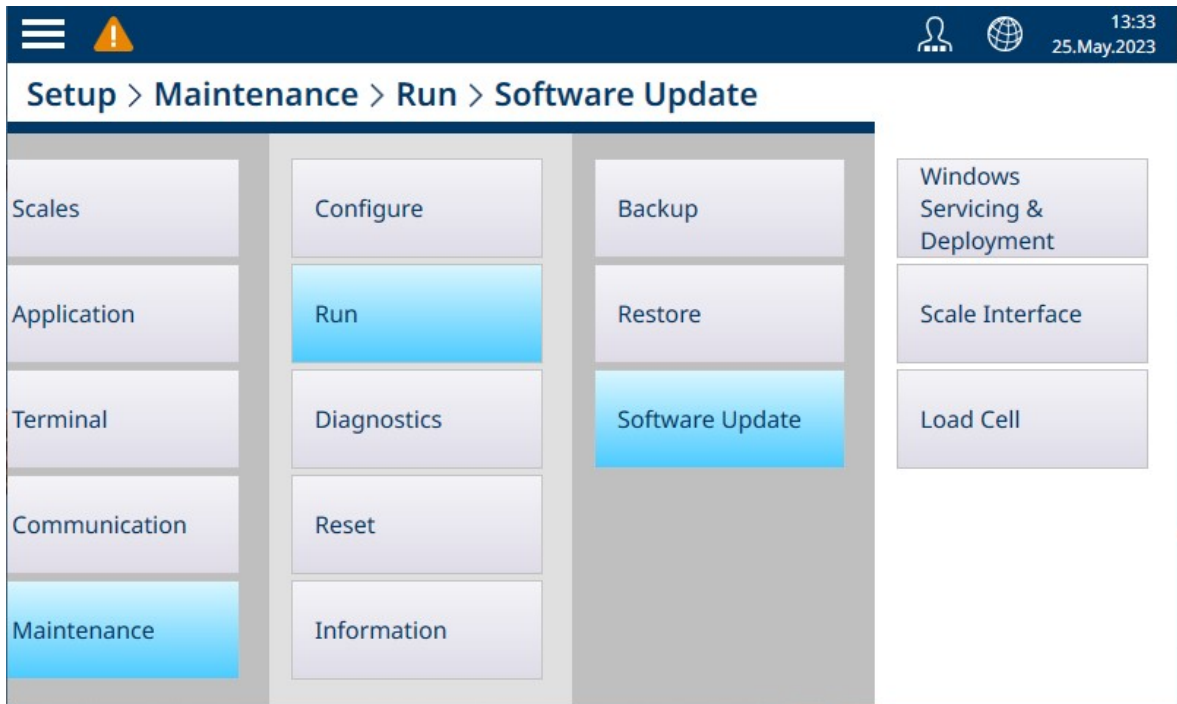



Figure 385: Software Update

To run a **Software Update**, the update file must be saved in the terminal's **C:\ToUpdate** folder. Use an FTP client or some other utility to copy the necessary file/s into this location. This does not apply to **Windows Servicing & Deployment**, for which other sources are used.

Once the **Source** is selected, the **File** dropdown list will show all available update files at that location. Select a file and touch the **RUN** button  which will appear at lower right on the screen.

3.5.2.3.1 Windows Servicing & Deployment

The options provided on this page are shown below:

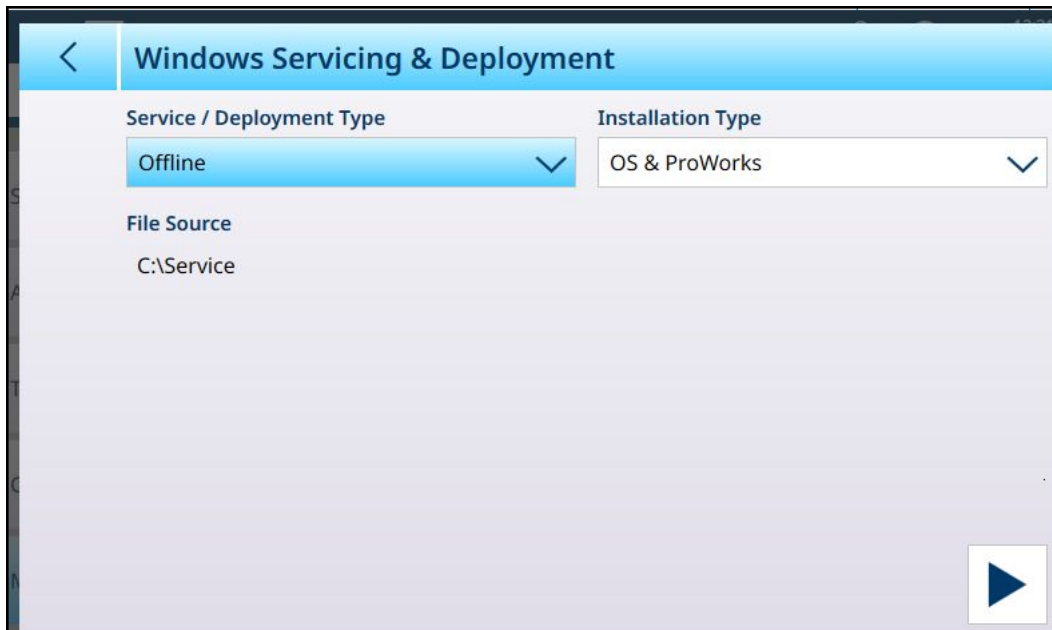


Figure 386: Software Update - Windows Servicing & Deployment

Select the **Service / Deployment Type**, then click the RUN button ► at lower right. A message will appear:

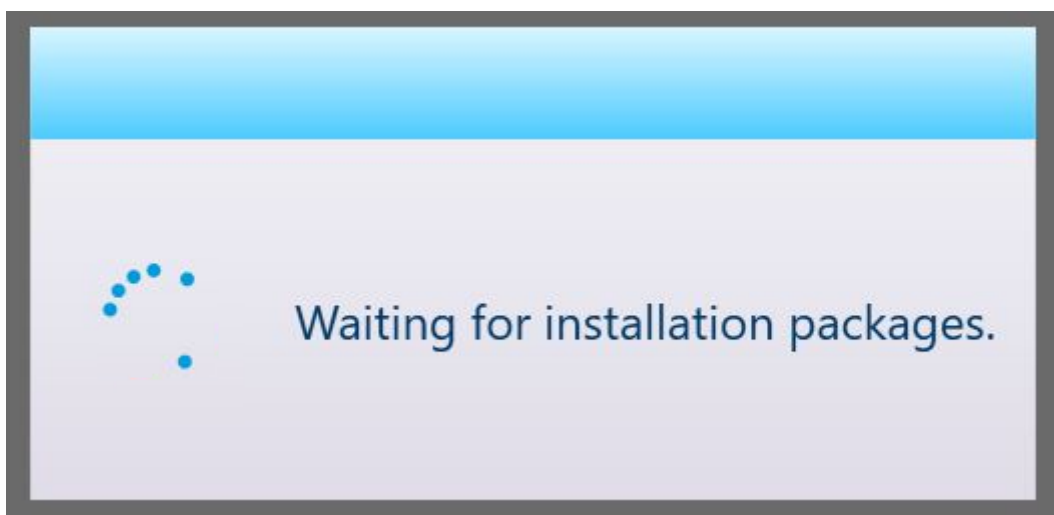


Figure 387: Message: Waiting for Installation Packages

Then a list of available Update Files will display.

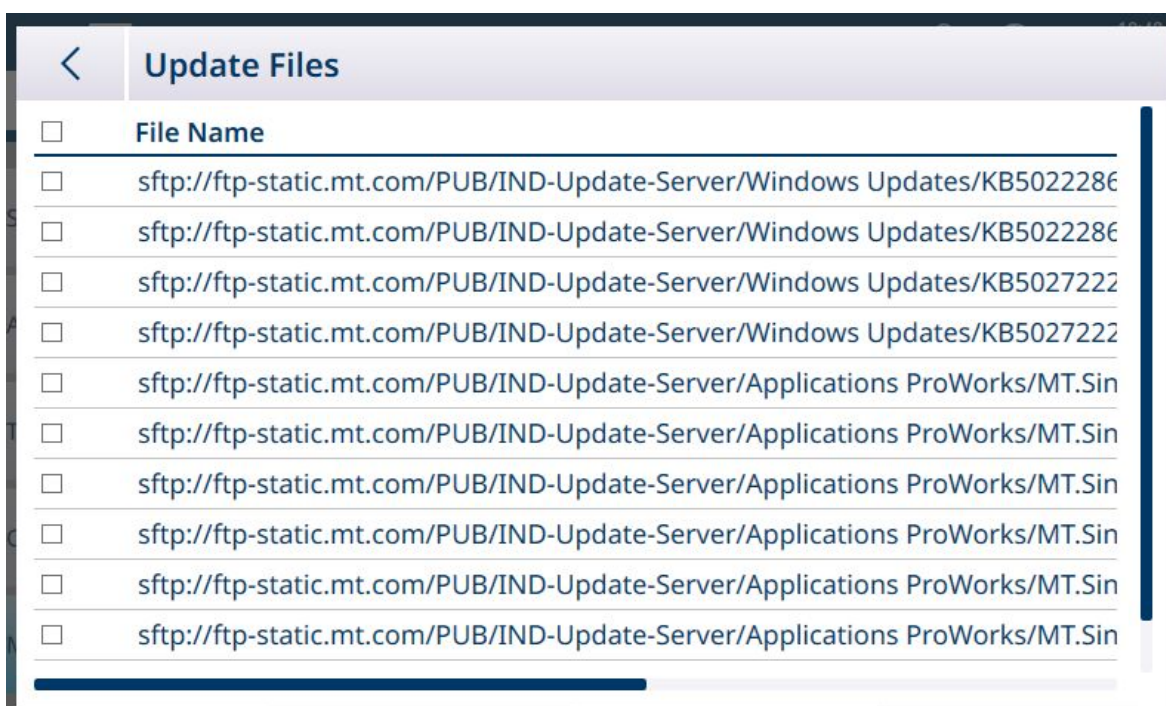


Figure 388: List of Update Files

To see which type of file is in each row, scroll the screen to the right.

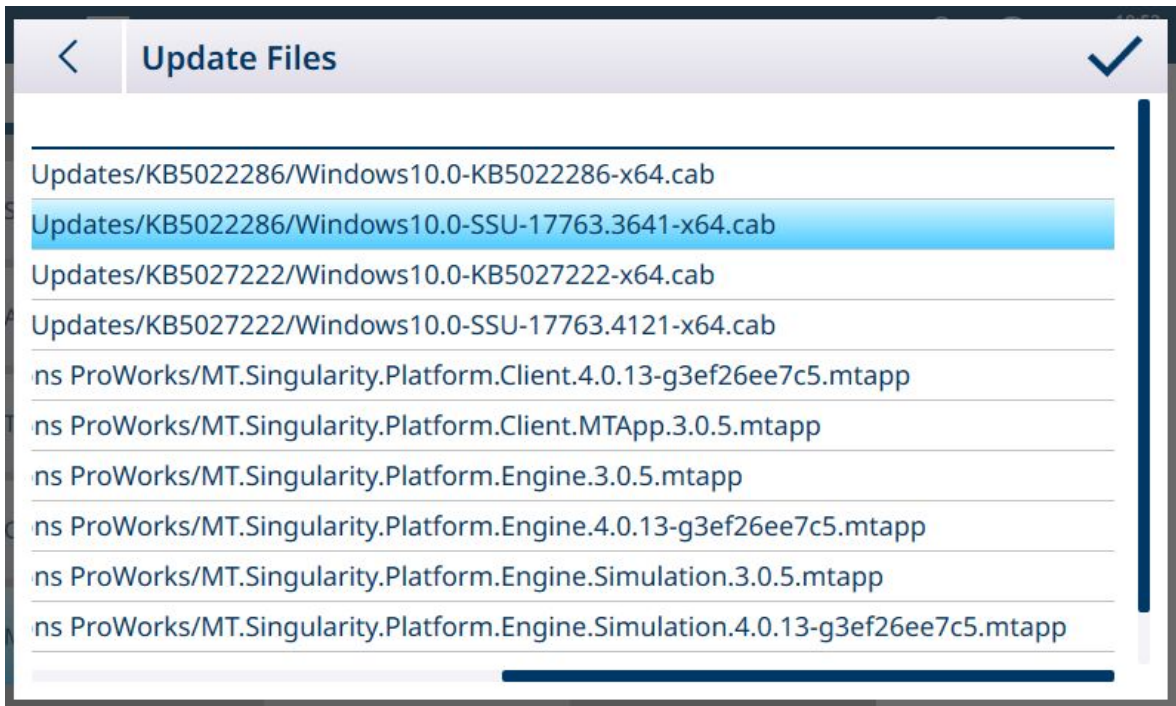


Figure 389: List of Update Files, Scrolled

Touch one or more check boxes to select the desired file/s.

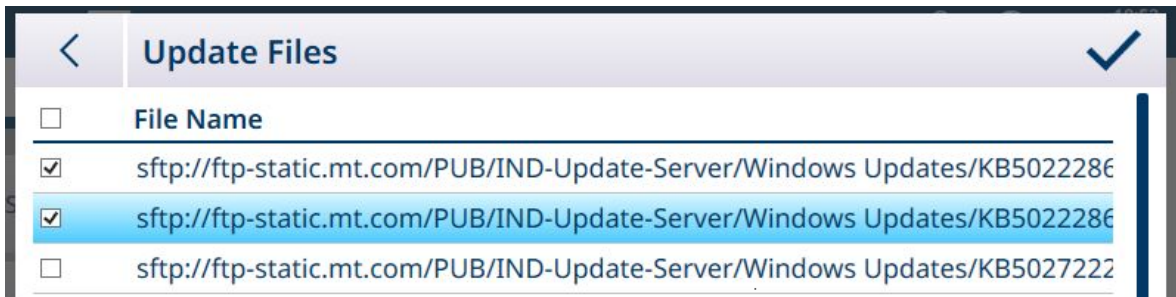


Figure 390: Update Files selected

Once at least one file is checked, a check mark appears at the right of the menu bar. Touch this check mark to initiate the update. A confirmation message will appear:

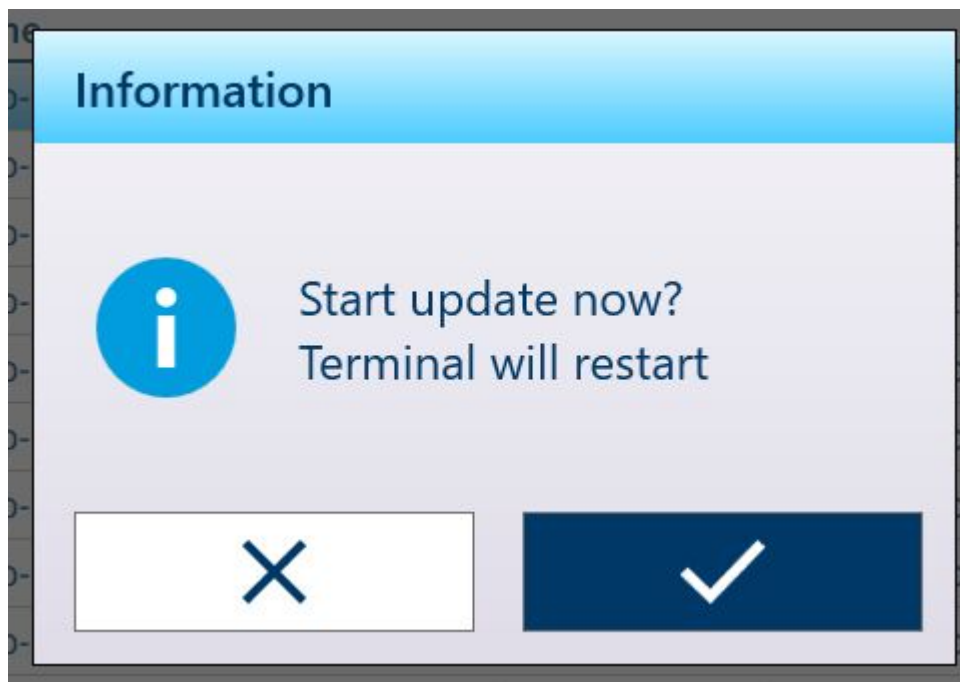
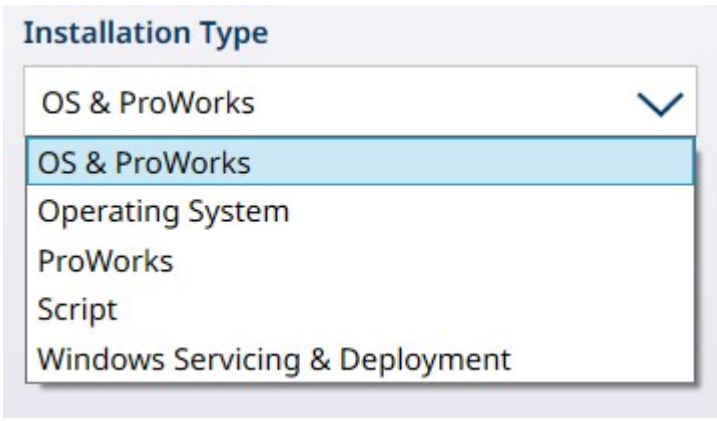


Figure 391: Update Confirmation Message

The terminal will reboot, with the update installed.

Windows Servicing & Deployment Options

Parameter	Options
Service\Deployment Type	<p>The type options are:</p> <div style="border: 1px solid gray; padding: 5px;"> <p>Service / Deployment Type</p> <div style="border: 1px solid gray; padding: 2px;"> <p>Offline ▼</p> <p style="background-color: #e0f0ff;">Offline</p> <p>Local</p> <p>Online</p> <p>All</p> </div> </div> <p>In each case, if the necessary parameters are set, touching the RUN button ► will display a list of update files.</p> <p>Offline: A deployment file has been copied into the terminal's C:\Service folder. If a valid file is found, touching RUN will perform the update.</p> <p>Local: A deployment file is available on the customer's local network. The login information (FTP File Source, Anonymous Login, User Name and Password) are visible, but cannot be changed. The customer's IT department must code these values in the Windows registry.</p> <p>Online: A deployment file is available on an FTP server provided by METTLER TOLEDO. This static IP is fixed -- sftp://anonymous@ft-static.mt.com/PUB/IND-Update-Server.</p> <p>All: This option displays a list of files from all available deployment options.</p>

Parameter	Options
Installation Type	<p>Installation type options are:</p>  <p>The Script item refers to scripts used to update and/or customize specific functions such as the Universal Writer Filter (UWF), Keyboard Filter, NTP - for example, to exclude a specific folder from the UWF protection. Only signed MT scripts will be updated:</p> <ul style="list-style-type: none"> • UWF • Keyboard filter • NTP • Production scripts • Reset to factory default • Join domain • Change OS language <p>A script update is not a software update, but a list of parameters or attributes used to change the behavior of particular functions.</p> <p>Select the type of installation required, then touch the RUN button. A list will appear, containing only files of the selected type.</p>
File Source	The default value is C:\Service . If a USB drive is attached to the terminal, it may be selected as a local location.

3.5.2.3.2 Scale Interface



NOTICE

Scale Firmware Update Note

When more than one scale interface is installed in a terminal, each scale must be updated separately.

To update the firmware on a scale interface board, the **.mot** update file must be saved to the terminal's **C:\Service\ToUpgrade** folder. If the correct file type is found, the update screen will appear as below, with the most recent file already selected in the **File** field.

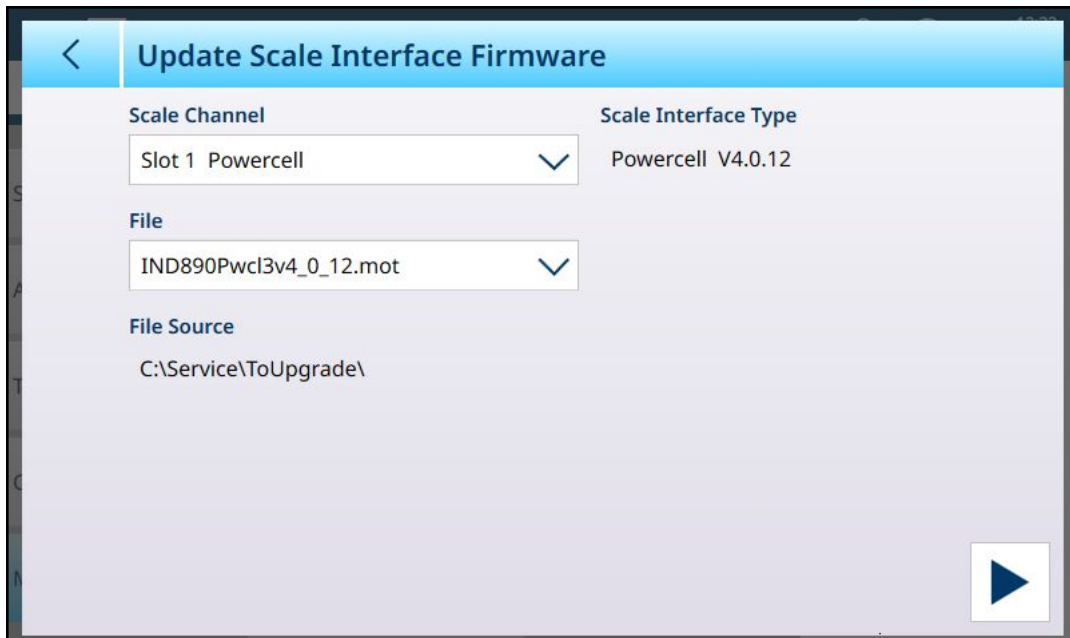


Figure 392: Software Update - Scale Interface

To perform the upgrade, click the RUN button ► at lower right. The terminal will reboot to the home screen without further action from the user. When the reboot is complete, the firmware update is complete. The updated scale interface will retain its settings from before the update.

The update file will remain in the **C:\Service\ToUpgrade** folder, ready for use in updating a second scale interface if one is installed.

See also

🔗 [Software Update](#) ▶ Page 281

3.5.2.3.3 Load Cell

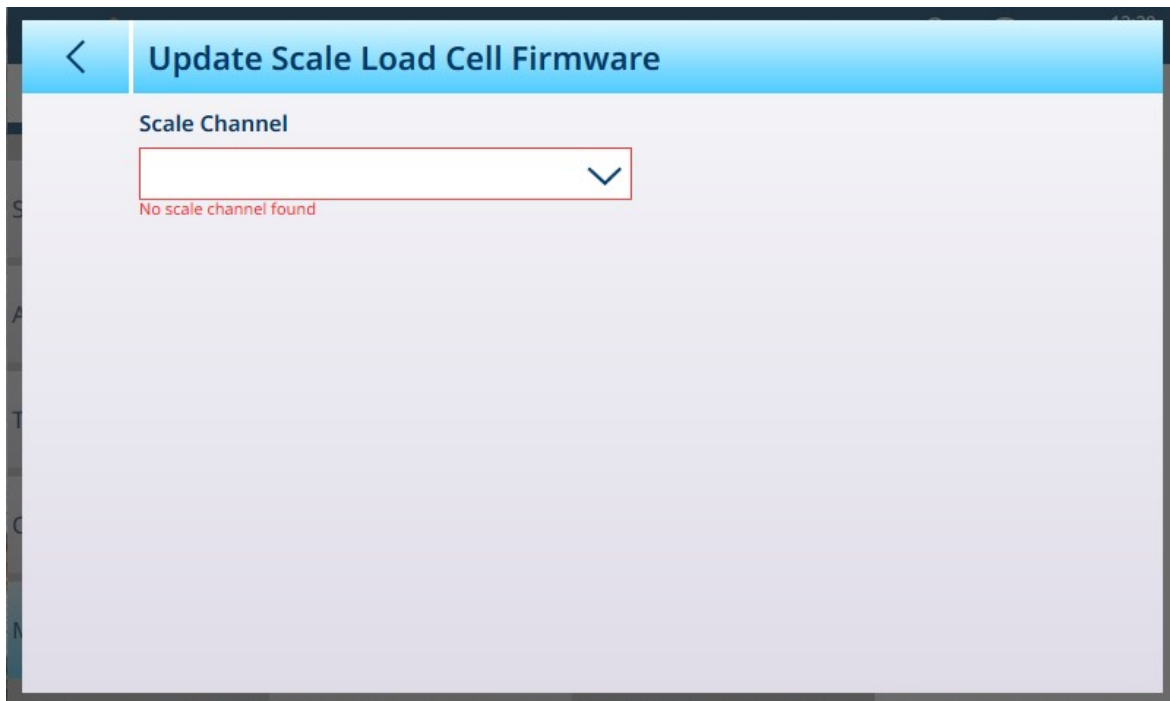


Figure 393: Software Update - Load Cell

3.5.3 Diagnostics

The **Diagnostics** menu provides access to the following items:

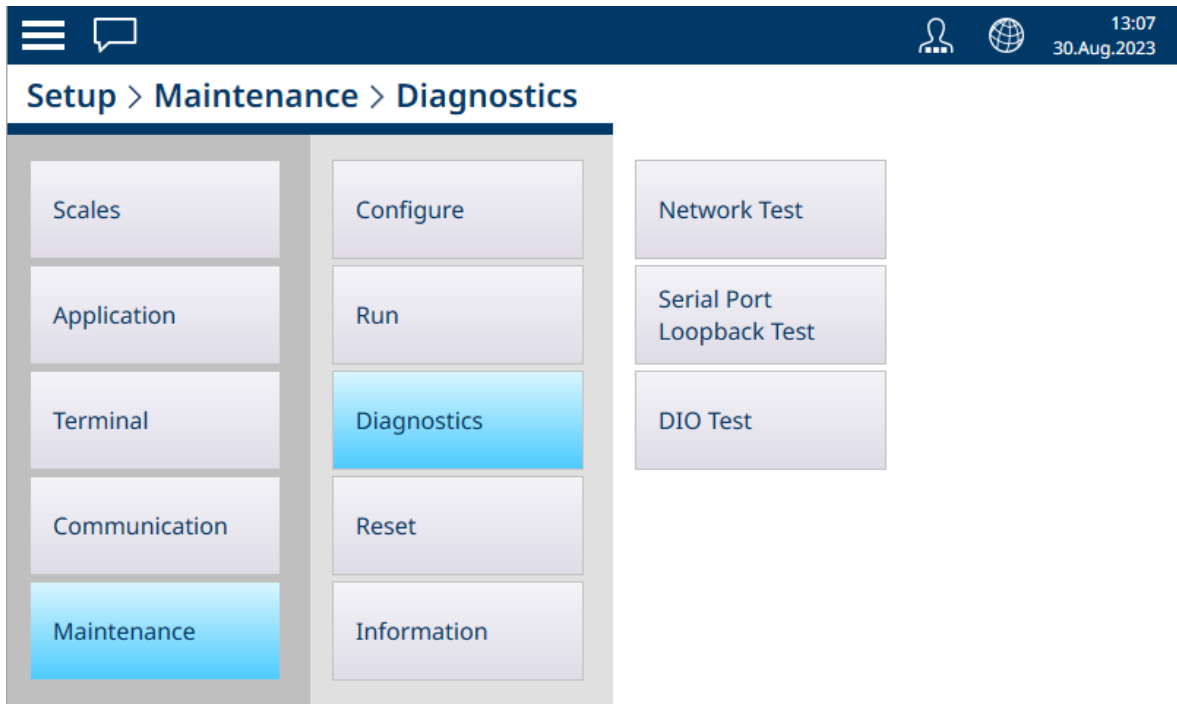


Figure 394: Maintenance - Diagnostics Menu

3.5.3.1 Network Test

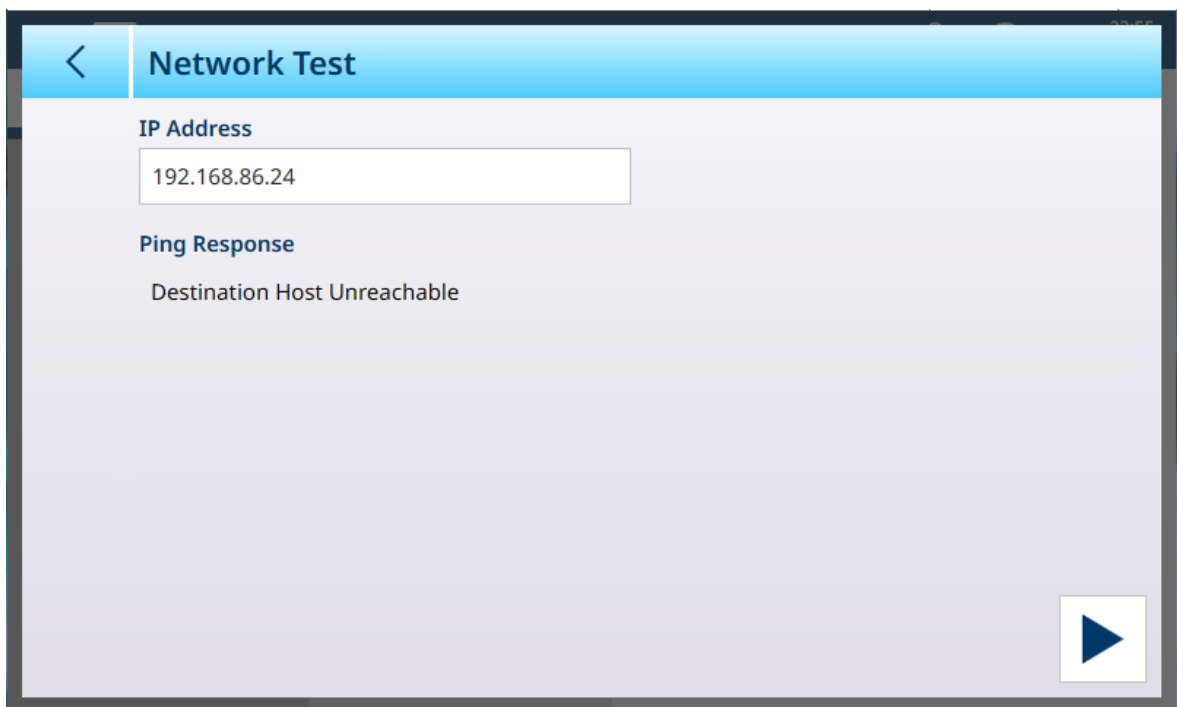


Figure 395: Network Test

Touch the **IP Address** field to display an IP entry dialog and define the IP address.

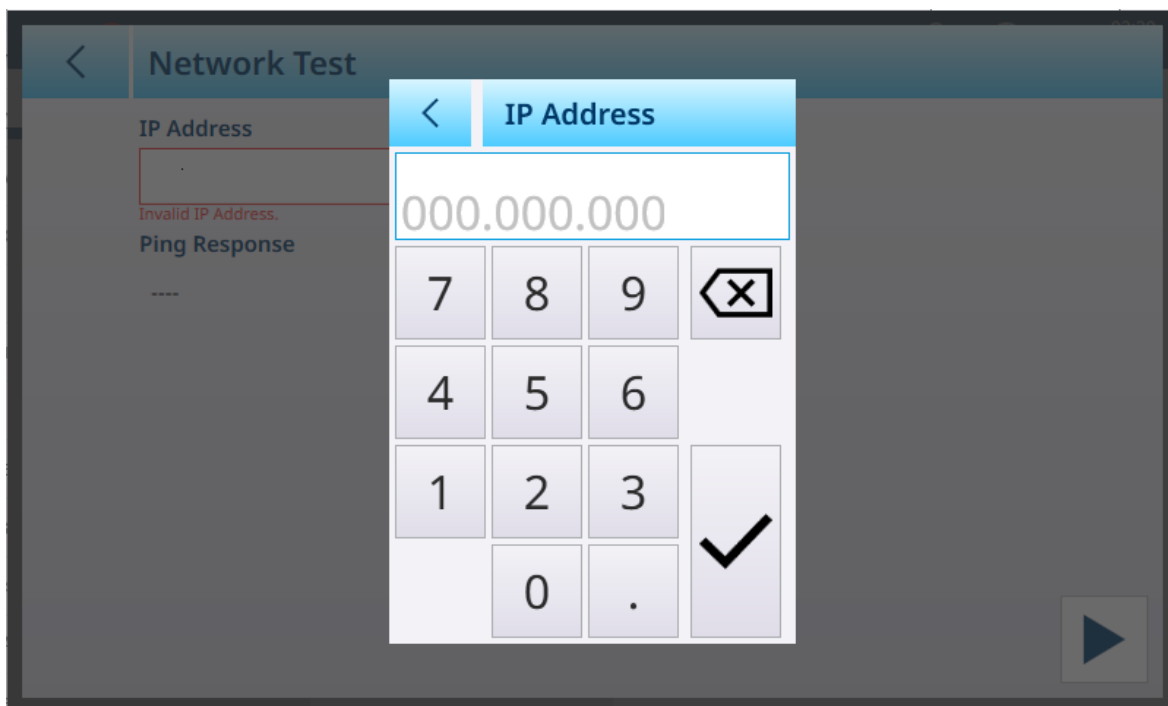


Figure 396: IP Address Entry Dialog

Once the IP address is defined, touch the ✓ button in the dialog, then the RUN button at lower right. The Terminal will ping that address and, if the test is successful, display the response time.

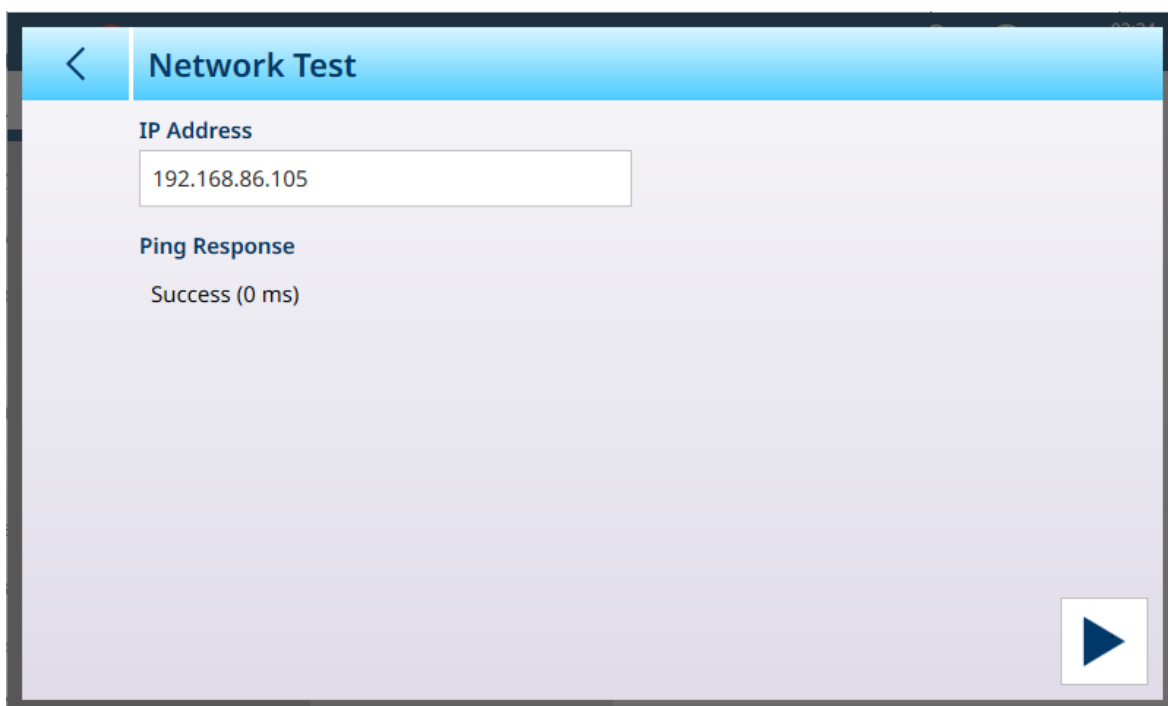


Figure 397: Network Test - Success

3.5.3.2 Serial Port Loopback Test

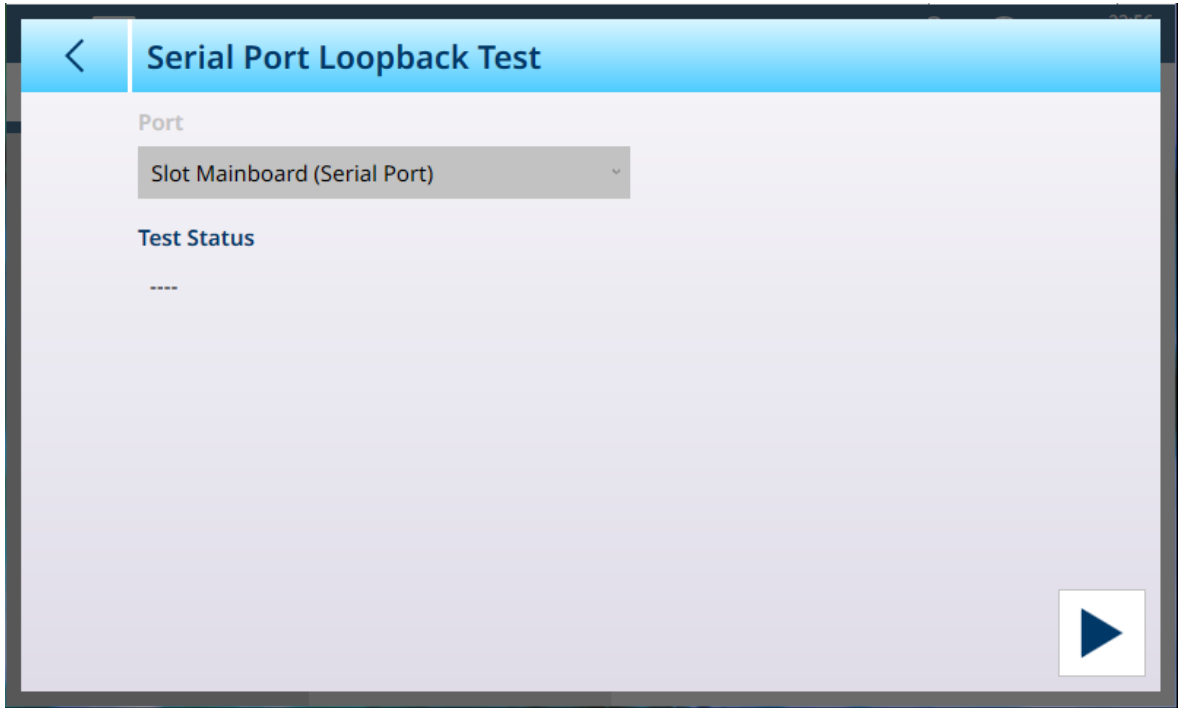


Figure 398: Serial Port Loopback Test

This test requires the installation of a loopback device on the terminal's serial port.

3.5.3.3 DIO Test

To facilitate testing and diagnostics, the **DIO Test** screen displays the status of the IND700 digital inputs and outputs.



WARNING

DIO Test and Device Control Power

Before running the DIO test, ensure that power is removed from all devices controlled by outputs. Injury or equipment damage can result from a failure to observe this precaution. This precaution does not apply if **Virtual IO Device** is selected under **Port**.

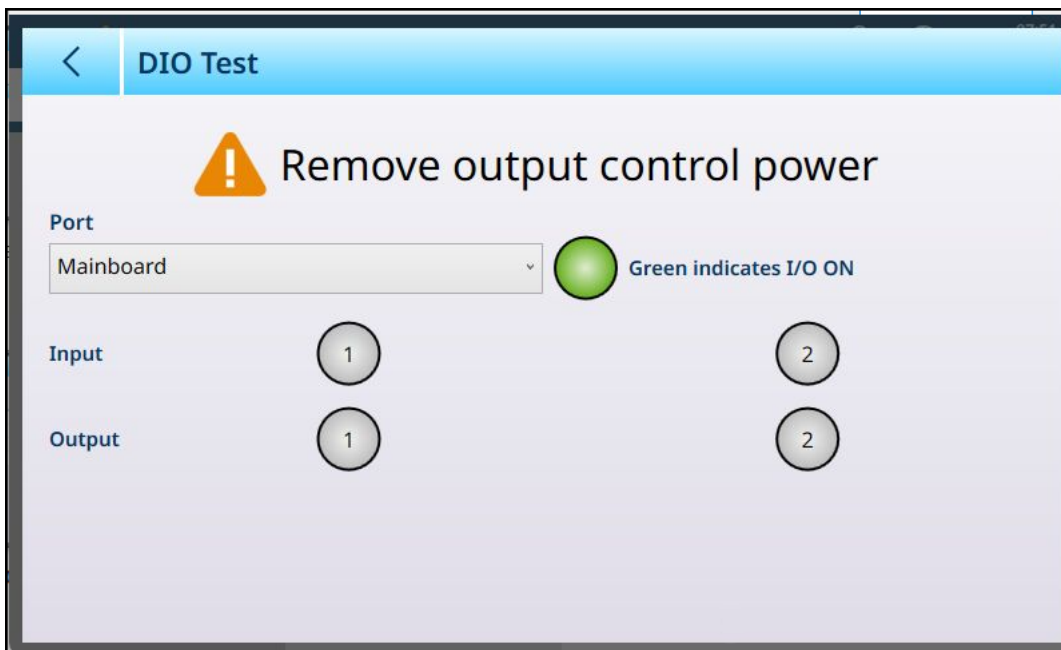


Figure 399: DIO Test

Select the inputs and outputs to test by making a **Port** selection. The list shows all installed DIO devices.

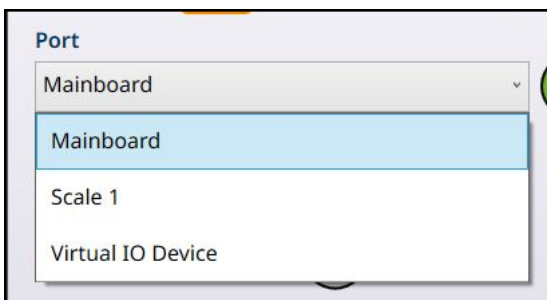


Figure 400: DIO Test Port Options

This screen allows each installed input and output to be tested, by touching the Output indicators. When an **Output** indicator is touched, it will turn green to indicate that that output is active. In the example shown below, mainboard DIO inputs and outputs are represented.

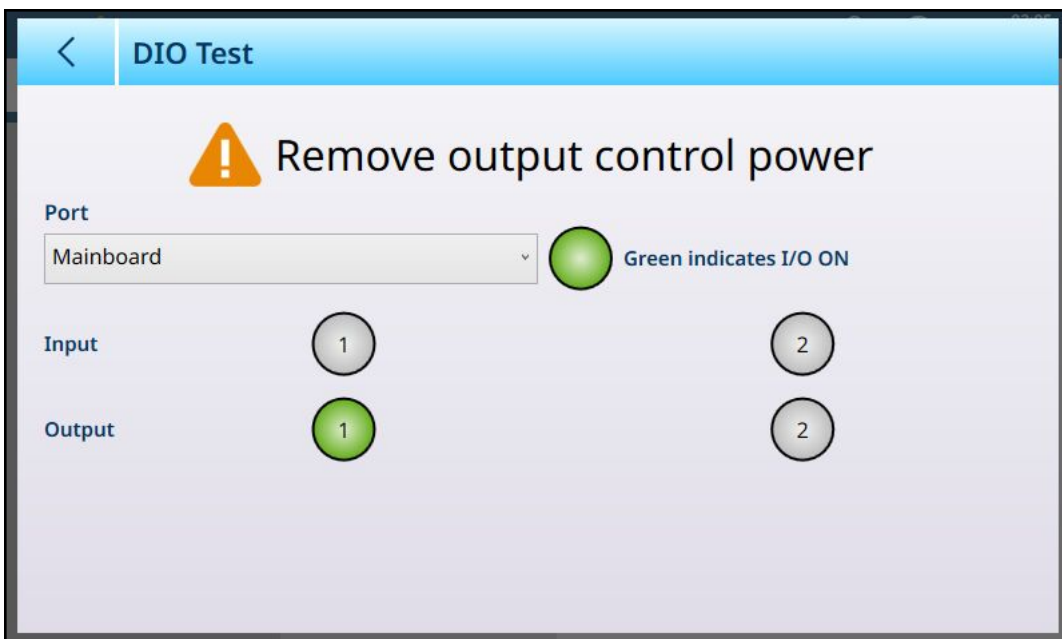


Figure 401: DIO Test, Output Active

The **Virtual IO Device** option is a diagnostic tool which represents a consolidated view of all available inputs and outputs. This display is not connected to external hardware, and the state of its output bits does not affect any external device.

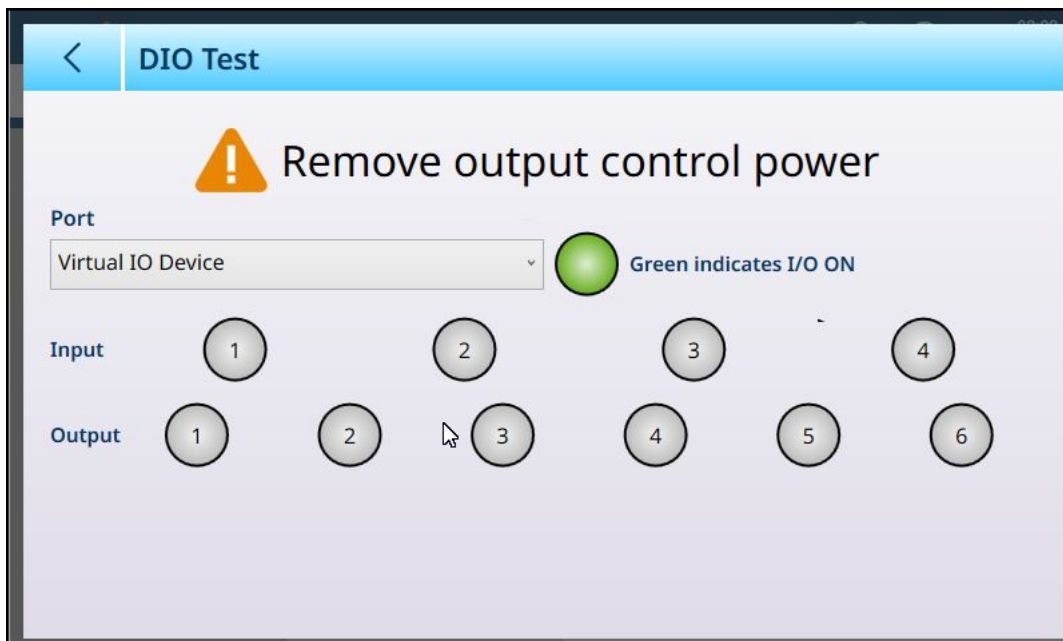


Figure 402: DIO Test Screen, Virtual IO Device Selected

3.5.4 Reset

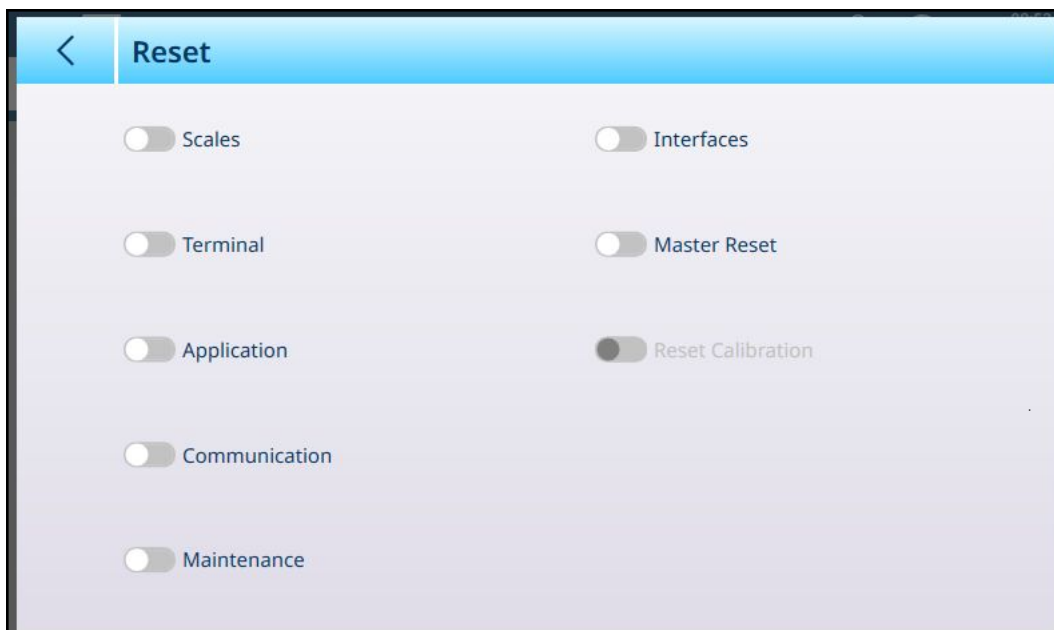


Figure 403: Maintenance - Reset Options

The **Reset** screen allows any combination of menu branches and types of configuration data to be reset. Once at least one item is selected, a RUN button appears at lower right.

If a **Master Reset** is selected, only the **Reset Calibration** slider remains active. A **Master Reset** can include or exclude the terminal's calibration data.



NOTICE

Main PCB Switch Settings and Master Reset

When the terminal is in Approved mode, SW1-1 must be ON and SW1-2 OFF. In this condition, metrological data are protected and cannot be reset. Refer to PCB DIP Switch Settings.

Touch the RUN button ► to carry out the selected reset. Depending on which kind of reset is carried out, different warning dialogs appear, allowing the user to continue or abandon the reset.

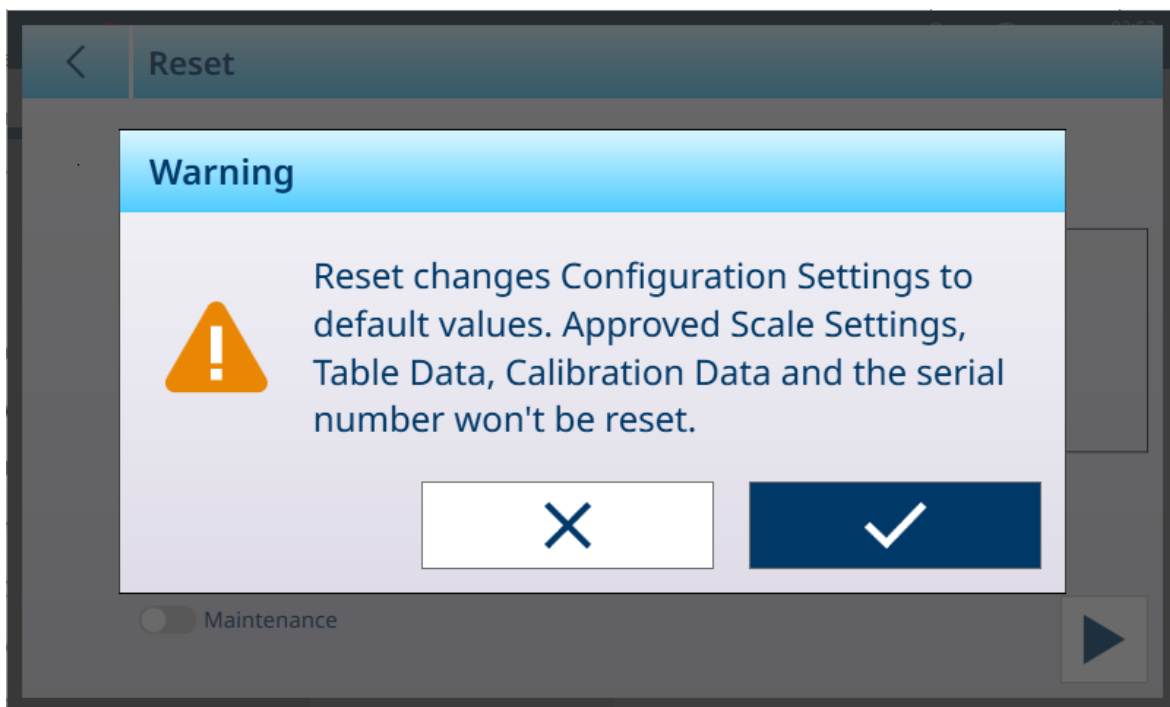


Figure 404: Reset Scale Menu Warning Dialog

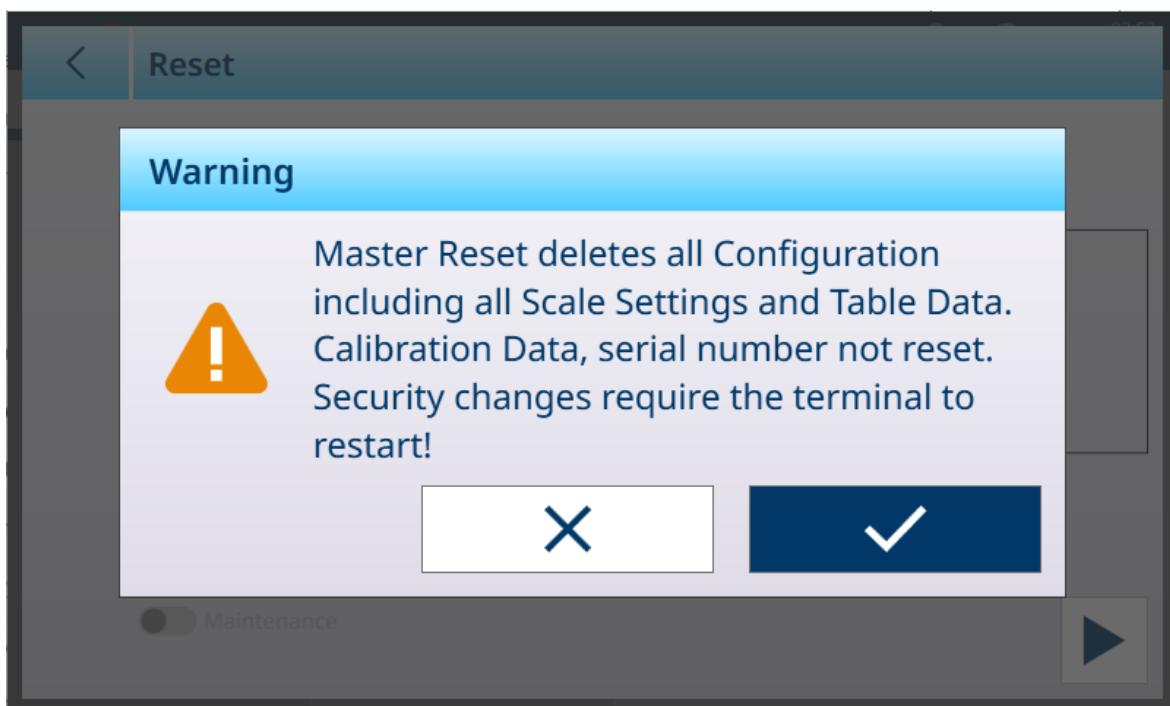


Figure 405: Master Reset without Calibration Warning Dialog

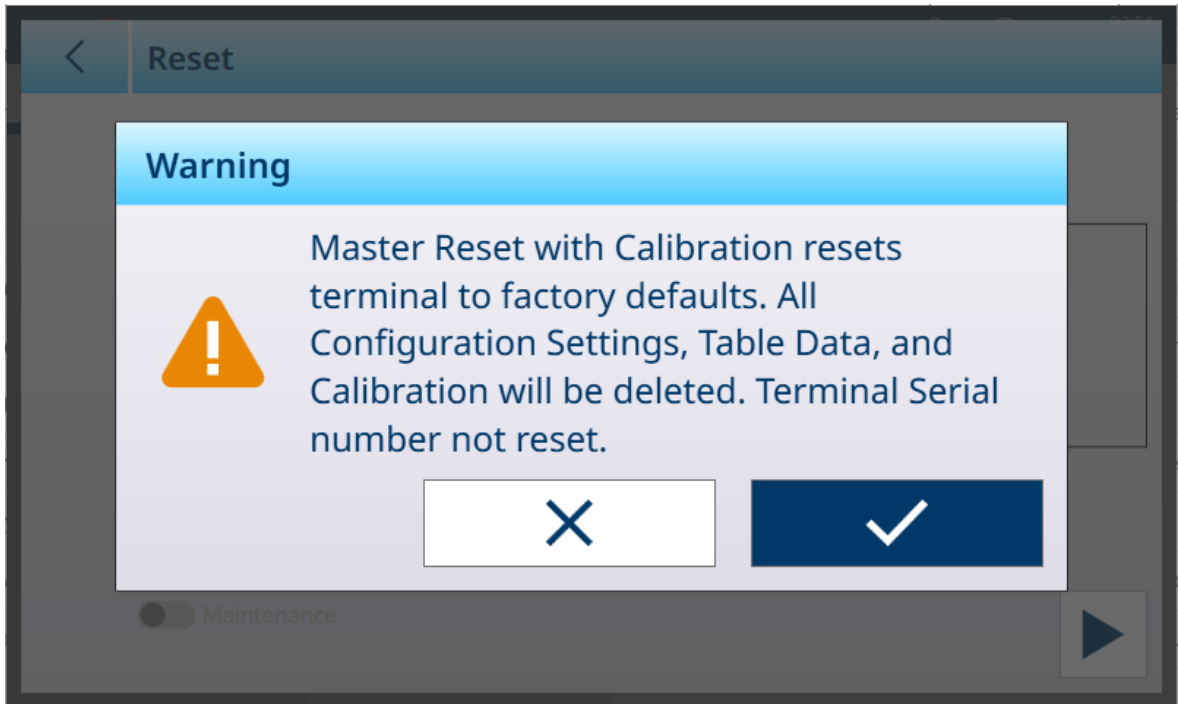


Figure 406: Master Reset with Calibration Warning Dialog

3.5.5 Information

The **Information** screen provides information about many terminal configurations and parameters.

The **Category** selections are :

- CountingService, CurrentMaterialService, CurrentTareService, IDDataService, FillingService, OverUnder-Service, Classification, TotalizationService, EngineModules, ClientModules, ScaleUpdateRate, OptionBoard-Information, HardwareInformation, AllConfigured

An example of an Information screen is shown below. **Category** selections may or may not display any information, depending on terminal configuration.

Some examples of these screens are shown below.

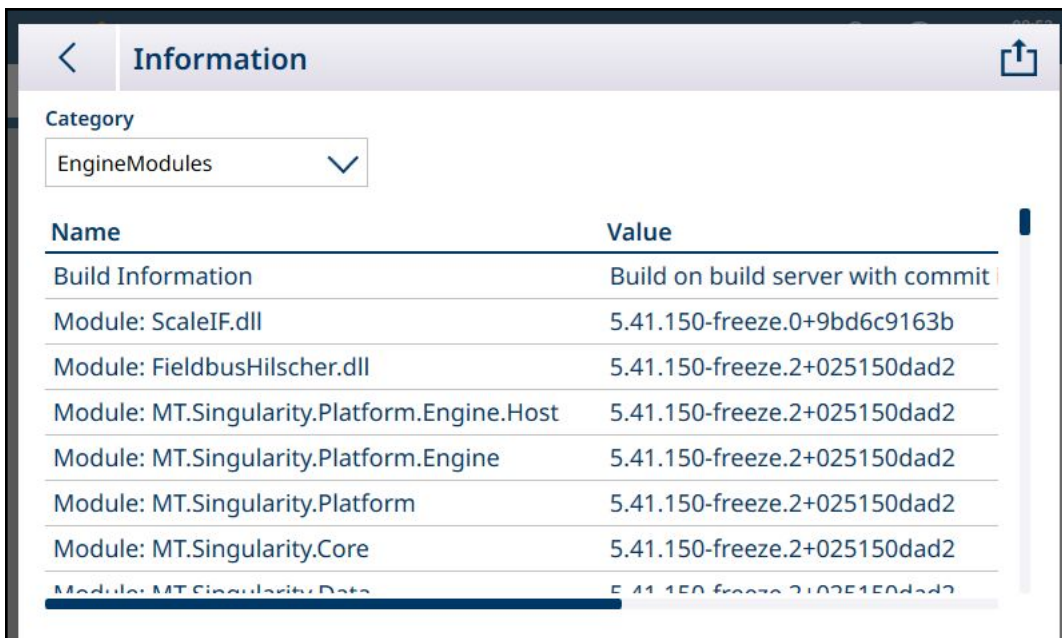


Figure 407: Maintenance - Information Screen: Engine Modules

Information

Category: ClientModules

Name	Value
Build Information	Build on build server with commit
Module: ScaleIF.dll	5.41.150-freeze.0+9bd6c9163b
Module: MT.Singularity.Platform.Client.MTApp	5.41.150-freeze.2+025150dad2
Module: MT.Singularity.Platform.UI.Shell.WPF	5.41.150-freeze.2+025150dad2
Module: MT.Singularity.Core	5.41.150-freeze.2+025150dad2
Module: MT.Singularity.Platform.Client	5.41.150-freeze.2+025150dad2
Module: MT.Singularity.Platform	5.41.150-freeze.2+025150dad2
Module: MT.Singularity.Translation	5.41.150-freeze.2+025150dad2

Figure 408: Maintenance - Information: Client Modules

Information

Category: ScaleUpdateRate

Name	Value
Scale 1	111

Figure 409: Maintenance - Information: ScaleUpdateRate

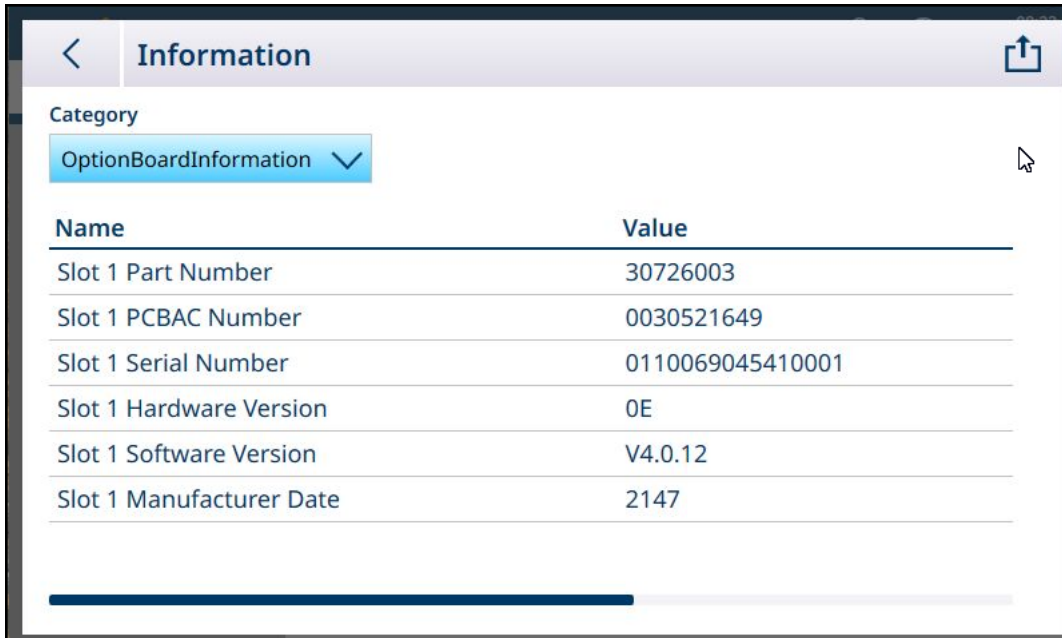


Figure 410: Maintenance - Information: OptionBoardInformation

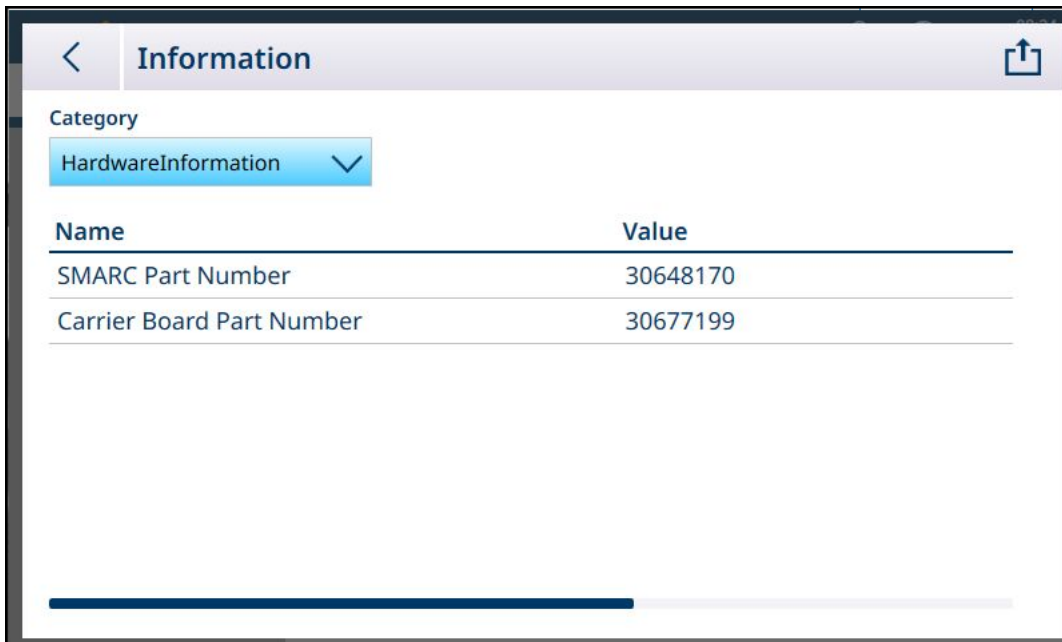


Figure 411: Maintenance - Information: HardwareInformation

Information for each category can be exported to an internal file, saved to the **C:\Export** folder, or to an external USB device. Refer to [Export ▶ Page 310].

4 Service and Maintenance

The terminal is designed to provide years of dependable operation. However, METTLER TOLEDO recommends that – as with any industrial measurement equipment – the terminal and the connected scale system be serviced periodically. Timely, factory-specified maintenance and calibration by a METTLER TOLEDO service technician will ensure and document accurate and dependable performance to specifications.

4.1 Application Software Activation

Application software such as ProWorks Multi-Tools can be registered and activated in two ways:

- From within the METTLER TOLEDO intranet
- From outside the METTLER TOLEDO intranet -- e.g., at a customer's site

Terminal Serial Number

Before attempting to activate application software, ensure that the terminal's serial number (in setup at [Terminal > Device ▶ Page 187]) does not show a mismatch. A mismatch may appear when the terminal's firmware has been updated, for example.

1. Check that the displayed serial number corresponds to the number on the terminal's data plate:



Figure 412: Terminal Data Plate Showing Serial Number



Figure 413: Terminal > Device Screen Showing Serial Number

2. If the **Terminal Serial Number** field is editable, and shows a "Serial Number Mismatch" warning in red, click on the field. If necessary, enter the correct serial number in the entry screen which displays.
3. Click on the check mark at lower right.
4. Finally, click the check mark at lower right of the **Device** screen. The serial number will now appear as a displayed item which cannot be edited.

Software License key

When a software license is purchased, a license key envelope is provided.

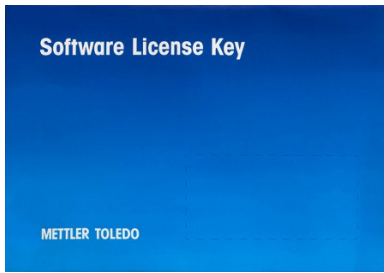


Figure 414: License Key Envelope

This envelope contains a card showing the license key, in five groups of characters separated by dashes.



Figure 415: License Key Card

Save this card in a secure place. The Key will be required if the software needs to be re-activated, or moved to another terminal (for example, when the original terminal is no longer functional.)

For additional information on moving files to and from the terminal, refer to [File Transfer ▶ Page 348].

4.1.1 Activation from Within the METTLER TOLEDO Intranet

If the terminal is connected to the network inside the METTLER TOLEDO intranet, an automatic activation procedure can be used:

1. Make sure that the IND700 is connected to the network via an Ethernet connection.
2. Enter setup and access **Terminal > Licensing**. The **License Manager** page will appear.



Figure 416: Licensing Manager

3. Click the **+** either in the menu bar, or in the license list pane. The **Add License** screen will appear.





Figure 417: Add License Screen

4. Enter a name to associate with this license -- e.g. ProWorks Multi-Tools, or a terminal identifier -- and the **License Key** from the card.



Figure 418: License Key Entered

5. Click the check mark at lower right.
6. Click the Cloud/Key icon  in the menu bar. The **Online License Activation** screen will display. Enter the **User Name** and **Password** associated with the activation account, then click the check mark .
7. A **License Activation Successful** message will display, The software is now activated.

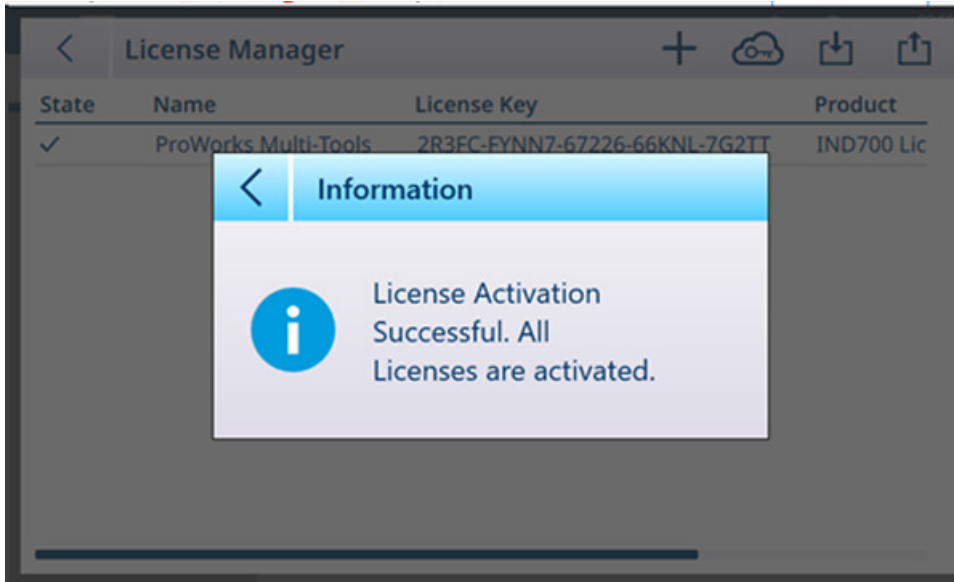


Figure 419: License Activation Confirmation Screen

8. The License Manager screen will now display the activated license.

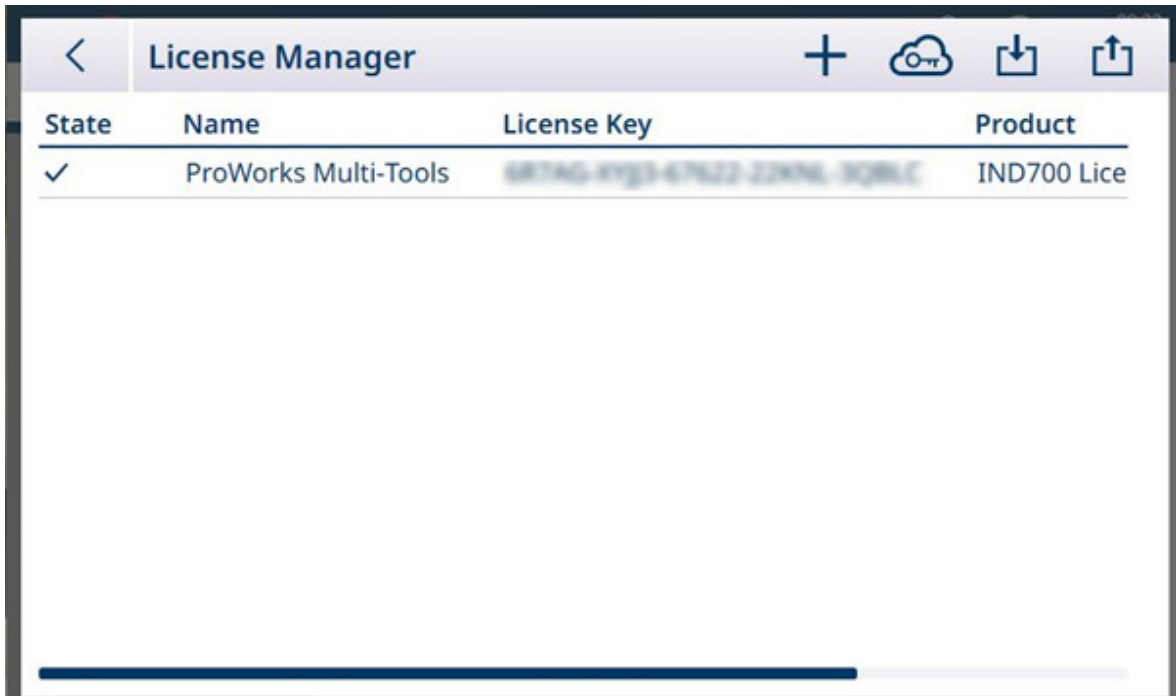


Figure 420: License Manager Showing Activated License

4.1.2 Activation from Outside the METTLER TOLEDO Intranet

If the IND700 is connected to a network outside the METTLER TOLEDO intranet, the activation procedure can be carried out manually.

Before beginning the procedure, confirm that the correct server (depending on transfer tool used) is active at [Terminal > Security Options ▶ Page 200] -- FTP, sFTP or Remote Desktop.

1. Make sure the IND700 is connected to the network via an Ethernet connection.
2. In setup, access **Terminal > Licensing**. The **License Manager** screen will display.

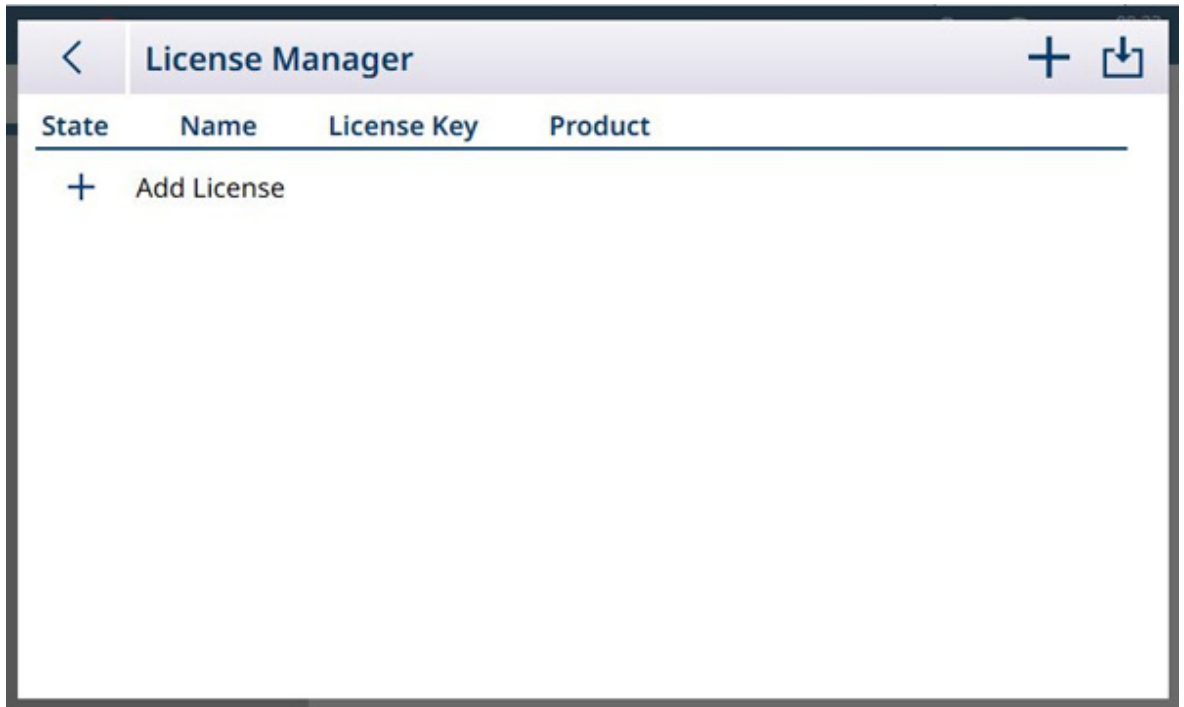



Figure 421: License Manager Screen

3. Click the **+**, either in the menu bar or in the license list pane. The **Add License** screen will display.



Figure 422: Add License Screen

4. Confirm the entry to return to the **License Manager** screen.
5. Click the EXPORT icon  in the menu bar. A **.lic** (license) file will be exported to the terminal's hard drive at **C:\Export**.
6. Access the terminal from a PC via the Ethernet connection, and use a tool such as UltraVNC to access the **Export** folder.

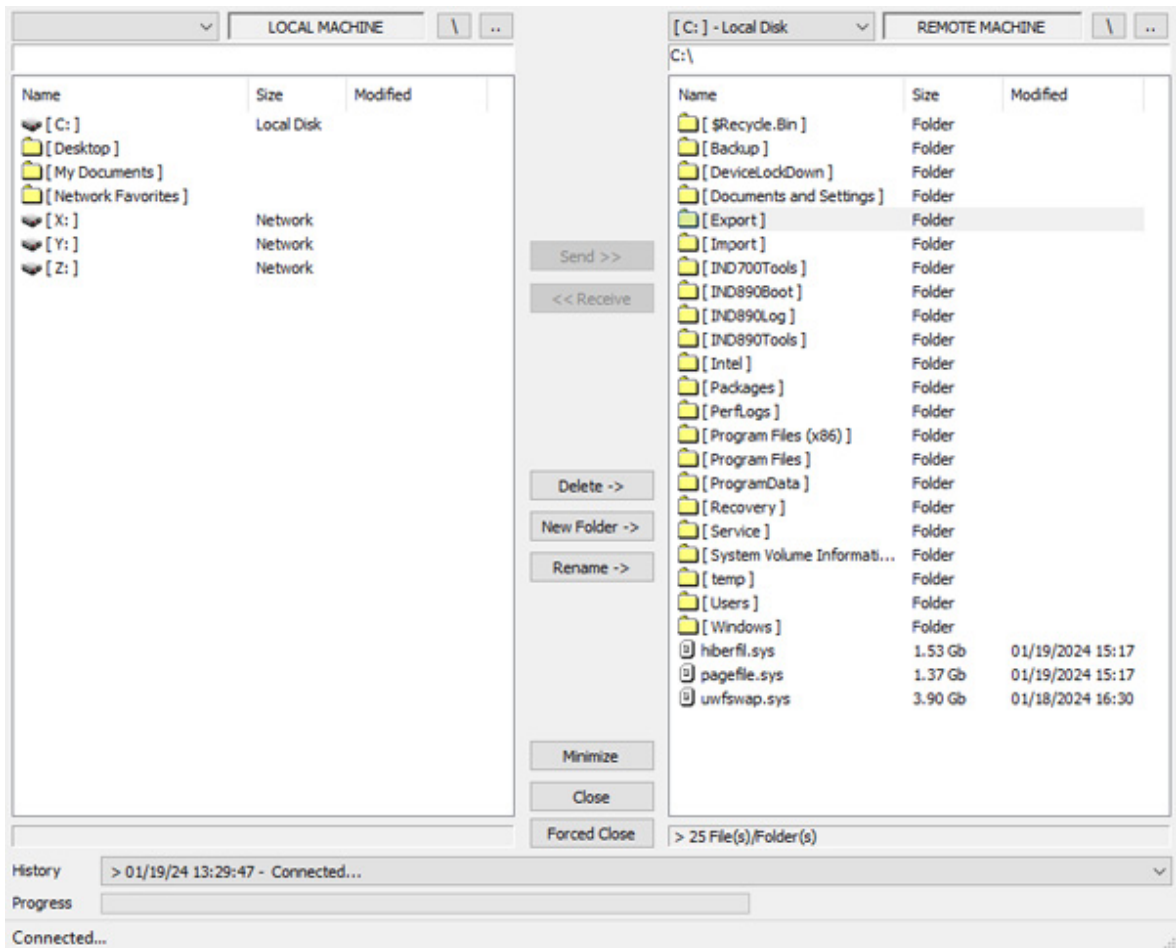


Figure 423: IND700 Export Folder

7. Copy the **.lic** file from the **Export** folder to the PC.
8. From a web browser on the PC, access the **Activation Portal**.

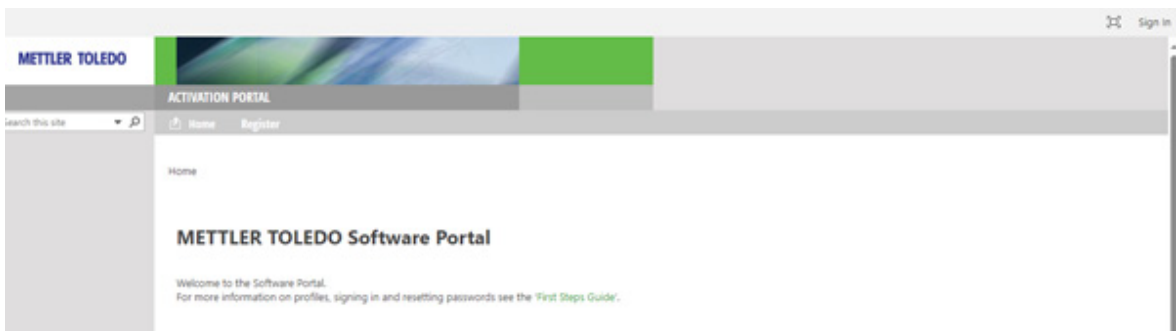


Figure 424: Activation Portal

9. Enter the required user name and password.



Figure 425: Activation Portal Login

10. Click on the **Activation** item in the site's menu bar.

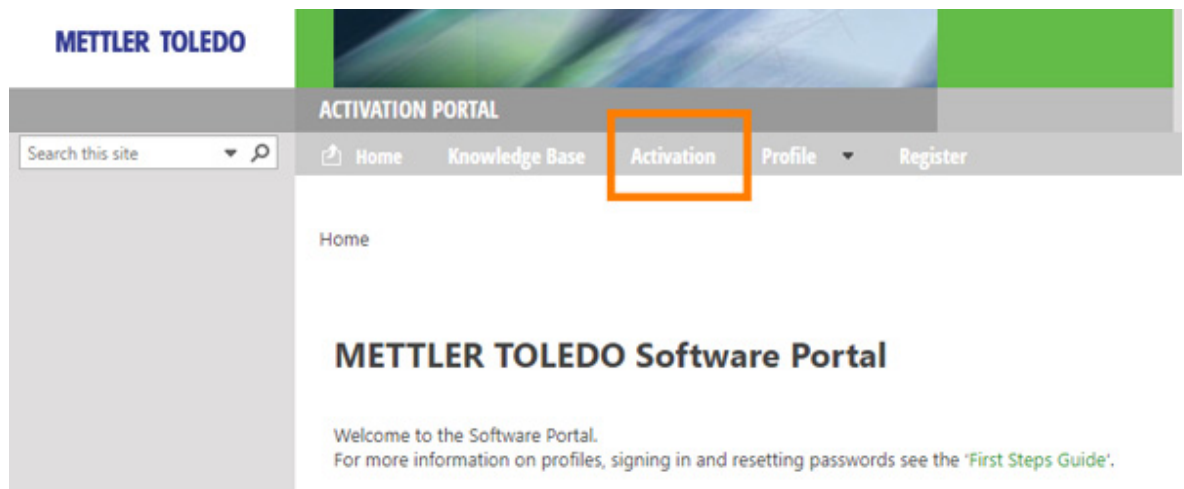


Figure 426: Activation Link in Menu Bar

11. The **Activation / Reactivation / System Transfer** screen appears. Here, software can be activated or reactivated, or transferred between systems.

Activation / Reactivation / System Transfer

In order to activate your product, first export the license key file using the "License manager" in your product. The license key file contains the hardware ID of your PC (Server) and all the license keys of your installation. On this page, browse for the path to the exported license key file (.lic) and click on "Submit" to upload.

License key file: No file chosen

Add license key + License Registration Information (LRI)
Add a single license key of a simple software product plus the LRI of the installed software.

License key: LRI:

Add Transfer Key
Add a transfer key to receive an activated system from another user account.

Transfer Key:

Activated products | Non-Activated products

Please select to change, update or view details of a system.

This user hasn't any activated products yet.

Figure 427: Activation Screen

- Click the **Choose File** button, navigate to the folder containing the .lic file, select the file and confirm the selection.
- The server will generate an activation file with a **.key** suffix, and display a download link. Click the link to download the file.
- Using the terminal access tool used in step 6, browse to the terminal's **C:\Import** folder, and copy the **.key** file from the PC into the folder. Close the tool.

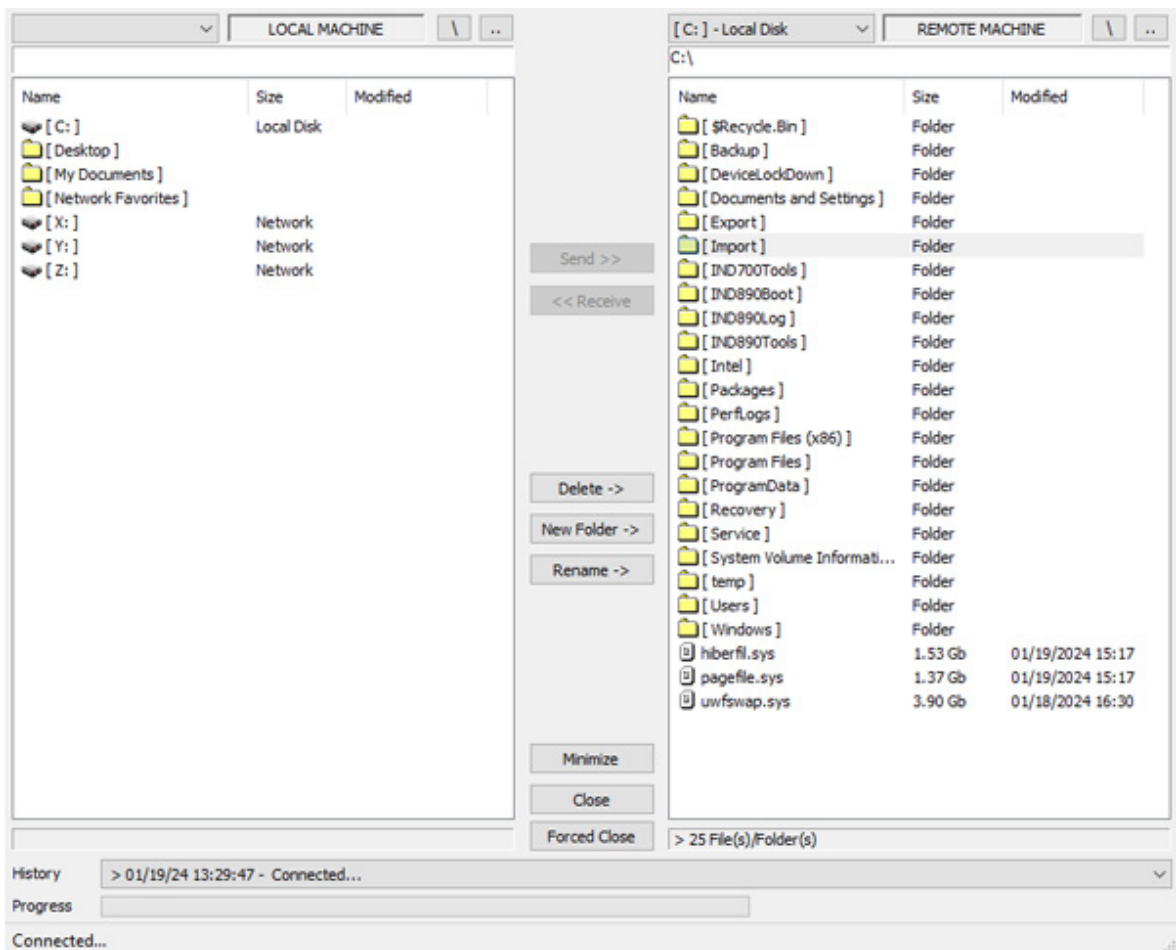


Figure 428: IND700 Import Folder

- In the **License Manager** screen, click the Import icon
- The terminal will read the **.lic** file and display a confirmation that software activation has been successful.

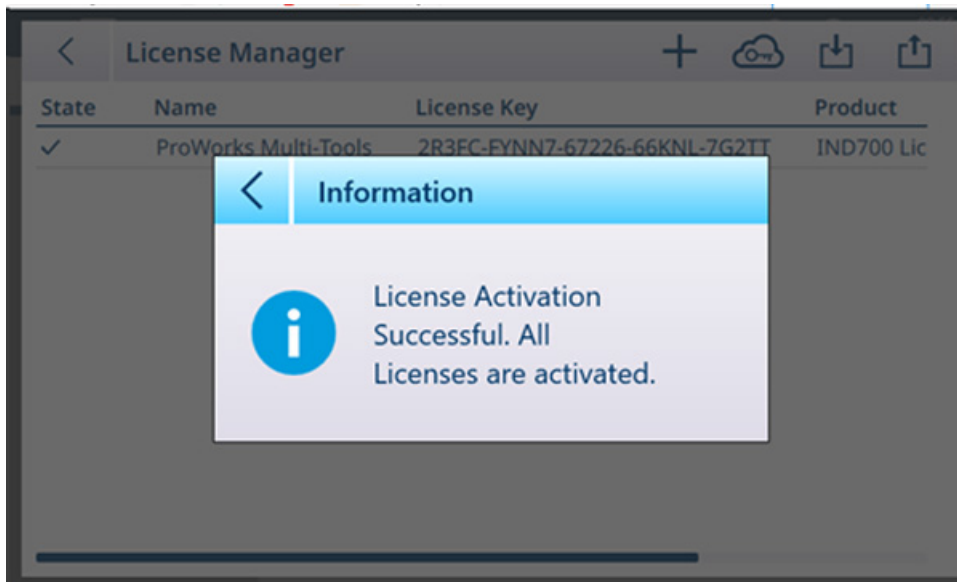


Figure 429: Activation Confirmation

17. The License Manage screen will now display the activated license.

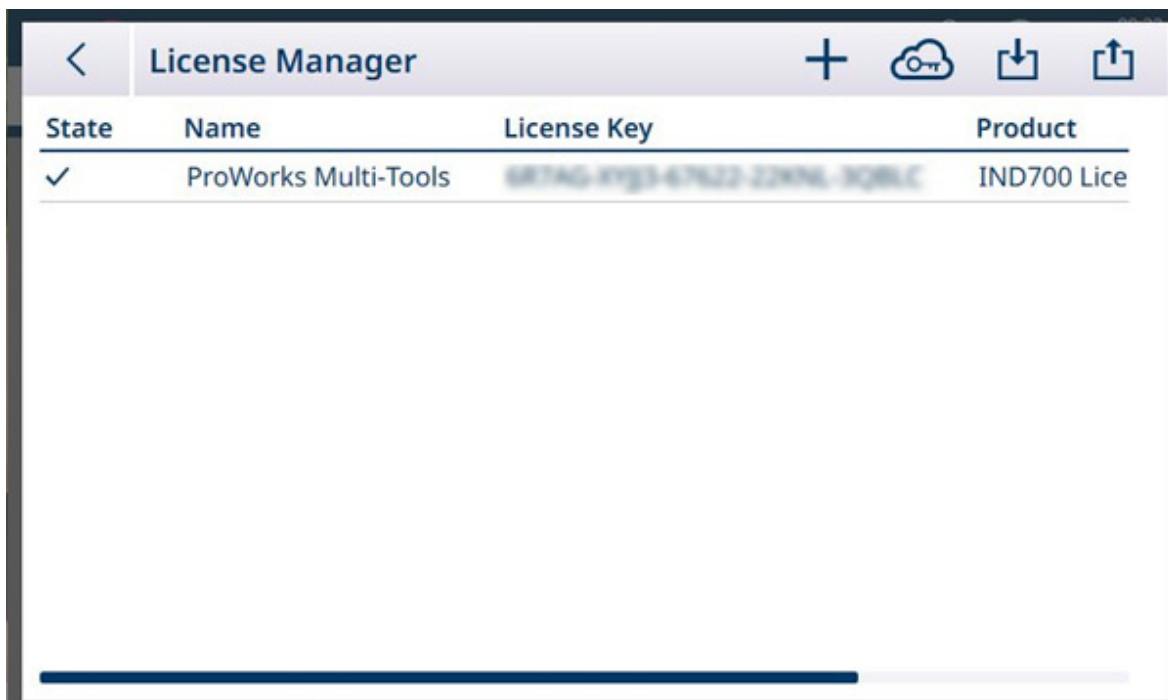


Figure 430: License Manager Showing Activated License

4.2 Precautions

- READ this manual BEFORE operating or servicing this equipment and FOLLOW these instructions carefully.
- SAVE this manual for future reference.



WARNING

Before service, disconnect power from this device.



⚠ WARNING

The protective ground connection must be checked after service work is performed. Perform the check between the protective ground contact on the power plug and the housing. This test must be documented in the service report.



⚠ WARNING

Only permit qualified personnel to service the equipment. Exercise care when making checks, tests and adjustments that must be made with power on. Failure to observe this precaution could result in bodily harm and/ or property damage.



⚠ WARNING

When this equipment is included as a component part of a system, the resulting design must be reviewed by qualified personnel who are familiar with the construction and operation of all components in the system and the potential hazards involved. Failure to observe this precaution could result in bodily harm and/ or property damage.



⚠ WARNING

Before connecting/disconnecting any internal electronic components or inter-connecting wiring between electronic equipment always remove power and wait at least thirty (30) seconds before any connections or disconnections are made. Failure to observe these precautions could result in damage to or destruction of the equipment and/or bodily harm.



⚠ WARNING

Observe precautions for handling electrostatic sensitive devices.

4.3 List of Tools Required

The following tools are required to perform these procedures:

- Soft cloth and mild glass cleaning solution
- Voltmeter
- Anti-static mat and wrist strap
- Philips head screwdrivers
- Flat blade screwdriver
- Wrench kit
- Nut driver with 7 and 8 mm sockets

4.4 Cleaning and Maintenance

- Clean the terminal's keypad and cover with a clean, soft cloth that has been dampened with a mild glass cleaner.
- Do not use any type of industrial solvent such as toluene or isopropanol (IPA) that could damage the terminal's finish.
- Do not spray cleaner directly on the terminal.
- Regular maintenance inspections and calibration by a qualified service technician are recommended.

- The terminal is a rugged stainless steel enclosed instrument; however, the front panel is a polyester covering over sensitive electronic switches and a lighted display. Care should be taken to avoid any punctures to this surface or any vibrations or shocks to the instrument. Should the front panel become punctured, ensure that steps are taken to prevent dust and moisture from entering the unit until the terminal can be repaired

4.4.1 Enclosure Gasket

In order to preserve the enclosure's IP rating, inspect the sealing gasket to ensure that it makes a good seal, and does not have permanent indentations. Gasket lifetime is shortened by exposure to high temperatures. The enclosure gasket should be inspected during any maintenance activity, and replaced if it becomes damaged or brittle. Refer to Spare and Replacement Parts.



Figure 431: Replacement Gasket

4.5 Maintenance

4.5.1 Run

Touch Run in the Maintenance options to open the Maintenance Run screen.



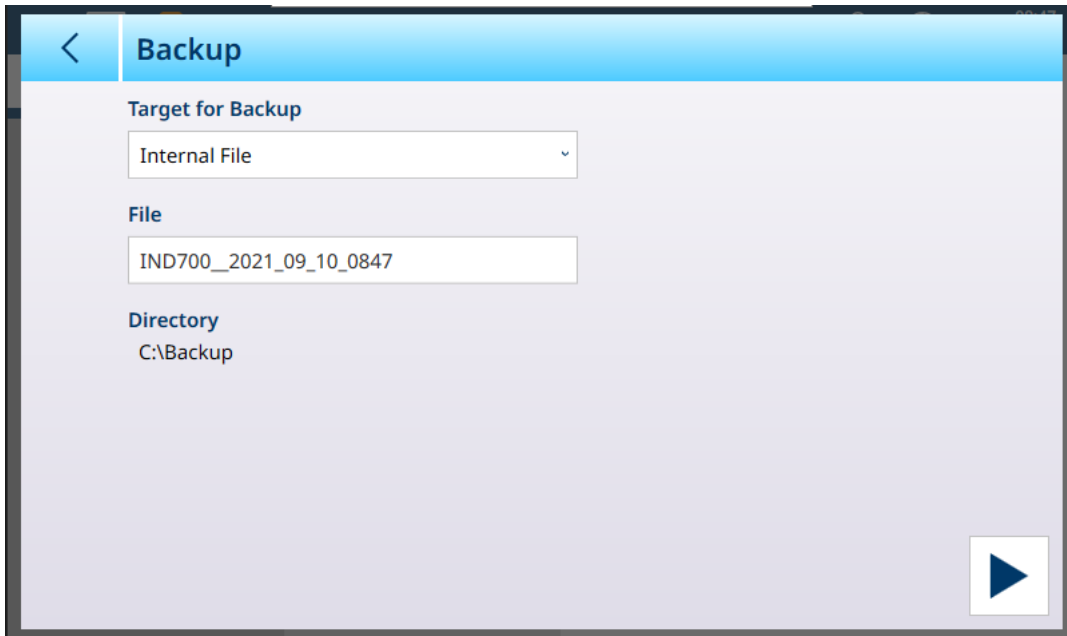
Figure 432: Maintenance Run Screen

4.5.1.1 Backup

The system's configuration can be backed up to a file stored either on the terminal's hard drive, or on an attached USB device. This means that:

- If a master reset is performed, system configuration (except for metrological and calibration settings) can be restored.
- A default setup can be shared to other IND700 terminals, eliminating the necessity to configure each terminal individually.

Touch **Backup**. The follow screen will appear.



From this screen, choose the **Target** for the backup (**USB Memory** or **Internal File**) and the File to create.

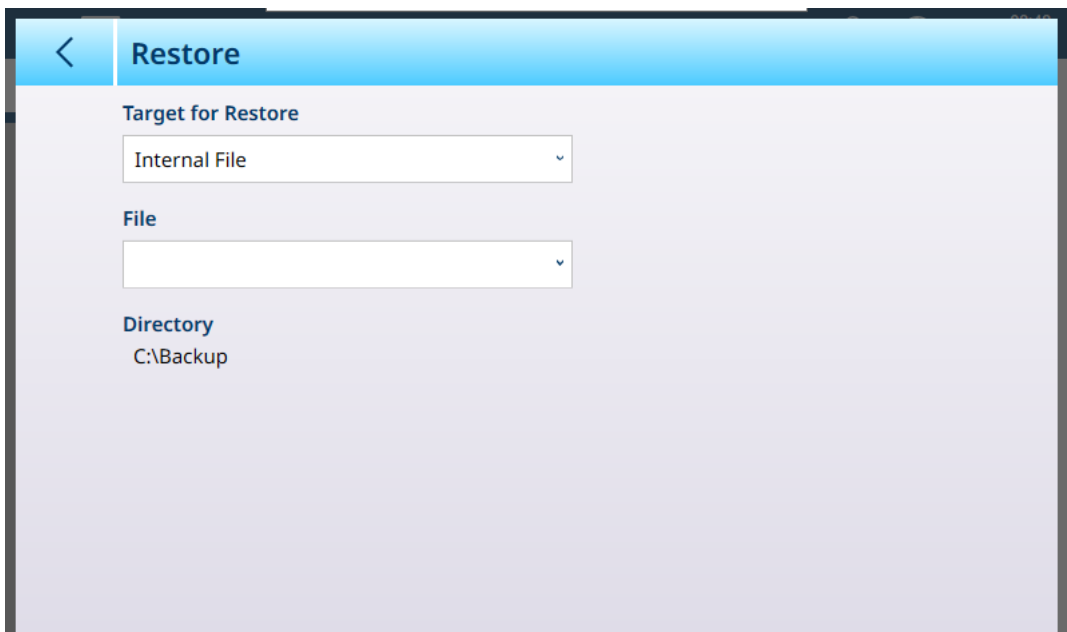
The default filename takes the form IND700__YYYY_MM_DD_TTTT – i.e., with date and time appended. This name can be modified by touching the field and using the alphanumeric keyboard to enter a new name.

The **Directory** area displays the target location; this cannot be modified, but once the file is stored on a USB device it can be saved elsewhere and, if necessary, renamed.

Once the parameters are set, touch ► to begin the backup process. Note that if **USB Memory** is selected, but no USB device is attached, the **Run** button will not work and the Directory line will show “**No USB Memory connected!**”

4.5.1.2 Restore

Touch **Restore**. The following screen will appear.

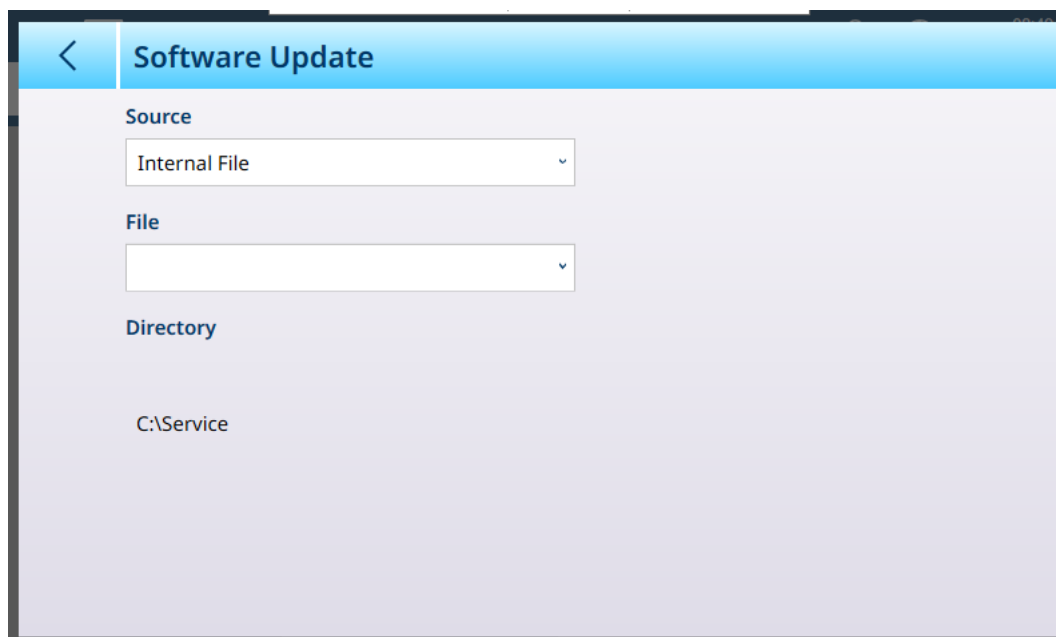


From this screen, choose the **Target** (Internal File, USB Memory) of the file from which a configuration is to be restored, and then touch the File field to view a drop-down list of all configurations available in the selected location. **Directory** displays the location from which the restore file will be selected.

Note that if **USB Memory** is selected, but no USB device is attached, the **Run** button will not work and the Directory line will show “**No USB Memory connected!**”

4.5.1.3 Software Update

The **Software Update** screen includes **Source**, **File** and **Directory** areas. If **Internal File** is selected as the **Source**, the Directory line will display the location where the system will look for the update file –a folder, **Hard Disk\Update**.



To update the software of the terminal, an upgrade package file with an **.IPK** extension is required.

Note: Install only package files that you have received directly from METTLER TOLEDO by download. Package files of unknown source or package files sent by e-mail may be corrupted!

The terminal performs a check on all components received in a package file, and terminates the installation process with an error message (such as checksum validation failed) in the event of inconsistencies.


4.5.2 Battery Replacement

When the main PCB battery runs low, the message center on the main screen will display a warning:



Figure 433: Replace Battery Warning Message

NOTICE



Battery Replacement

When the IND700 main PCB battery is replaced, a back up of configuration and calibration values is recommended, but not required.

To replace the battery:

- 1 Remove power from the terminal and open its enclosure.

- 2 Locate the battery on the main PCB. The following images indicate its location in the Wedge and Harsh environment versions of the terminal.

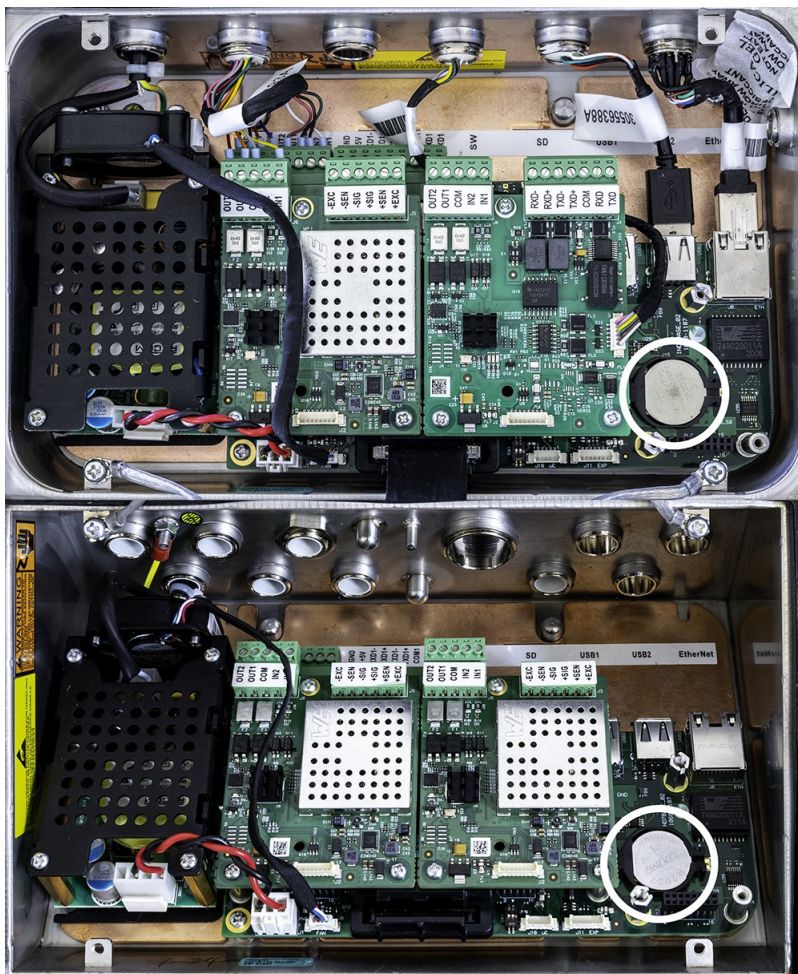


Figure 434: Battery Location, Wedge (top) and Harsh Environment (bottom) Enclosures

- 3 Use a small flat blade screwdriver or other instrument to press the battery to the right, as indicated by the arrow in the image below.



Figure 435: Battery Removal

- 4 Install the replacement battery by placing it, positive side upward, in the battery holder, then pressing it to the left and into the slot until it is properly seated.
- 5 Close the terminal's enclosure.
- 6 Restore power to the terminal.
- 7 Enter setup to check that configuration and calibration settings have been retained.
- 8 If the terminal has an active Ethernet connection, time and date will be set automatically. Otherwise, set the terminal's date and time at [Setup > Terminal > Region > Set Time and Date ▶ Page 196].

4.5.3 Leveling Guidance

The **Leveling Guidance** feature is available to PowerDeck scale systems. To assure maximum weighing accuracy and reliable calibration, it is important that floor scales are installed such that an approximately equal dead load is placed on each load cell.

During factory calibration of a PowerDeck floor scale, the zero counts of each load cell (at a no-load condition) are stored in the load cell along with other initial factory data. When a PowerDeck floor scale is first installed, its accuracy is enhanced by ensuring that it is levelled so that the current cell counts match the stored, factory calibration values as closely as possible.

- The Leveling Guidance feature in IND700 terminals provides a graphical comparison of the current counts vs. the factory calibration counts stored in each load cell of a PowerDeck platform. This feature is provided as a tool for the service technician during installation, and can be accessed in setup at Scale ↔ > Leveling Guidance. Level Guidance is available if the **Application** is set to **Floor** in setup at **Scale n > ASM > Load Cell > System**.
- The installation guidance is valid only for platforms which include only the original, factory-installed load cells. It should not be used for platforms in which one or more load cells have been replaced.
- Before accessing the **Leveling Guidance** feature, a bubble level should be used for initial leveling.

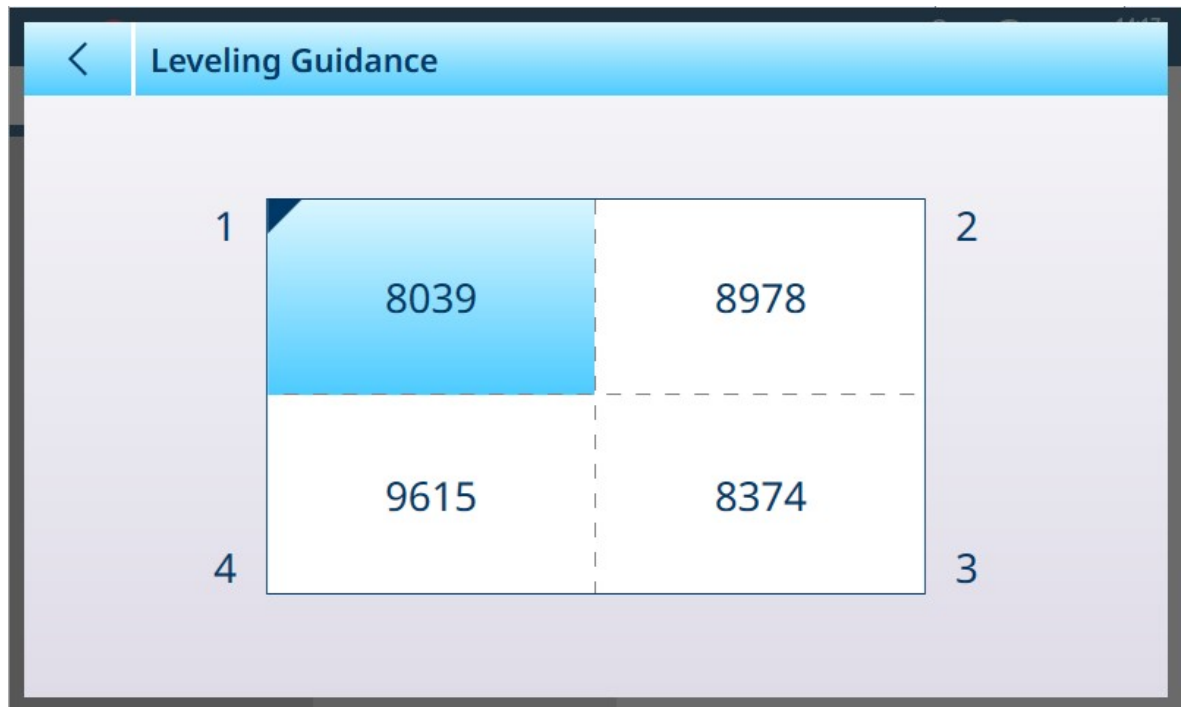


Figure 436: Leveling Guidance, 4 Load Cell Scale

The Leveling Guidance graphic display represents a PowerDeck floor scale and assumes that the load cells are addressed as node 1 through 4 starting with the corner where the home-run cable exits and moving in a clockwise direction.

The counts displayed in the center of the graphic indicate how many counts the current reading is above or below the stored factory value. The load cell with the largest negative count variance from the stored factory value is highlighted – cell 1 in the example above. This indicates that this load cell should be shimmed first.

Acceptable count values depend on the resolution of the scale. For example, for a scale displaying 1,000 divisions, cell counts should be <5,000. For higher resolution scales, values such as <2,500 are required.

The display updates automatically once a second (1 Hz) as the count variances of each load cell change, so shims can be added or subtracted in an attempt to achieve an acceptable count variance. Due to the high resolution of the raw count readout, it will not be possible to achieve exact equality between the raw count values. An acceptable count variance is determined by the platform size, capacity and the number of increments as defined in the platform installation manual.

4.5.4 Master Reset

4.5.5 Troubleshooting and Error Codes

4.6 Filter and Search Tables and Logs

Maintenance and troubleshooting procedures often require information found in the terminal's tables and logs. For information on filters and searches, refer to [Table Functions: Filter, Export, Import, Clear ▶ Page 307].

4.7 Disposal

In conformance with the European Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in domestic waste. This also applies to countries outside the EU, per their specific requirements.

Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment. If you have any questions, please contact the responsible authority or the distributor from which you purchased this device. Should this device be passed on to other parties, the content of this regulation must also be related.



4.8 Troubleshooting

4.8.1 Internal Diagnostic Testing

The IND700 provides several internal diagnostic tests that are accessible in setup mode.

- 1 From the home screen, open the main menu and select Enter Setup.

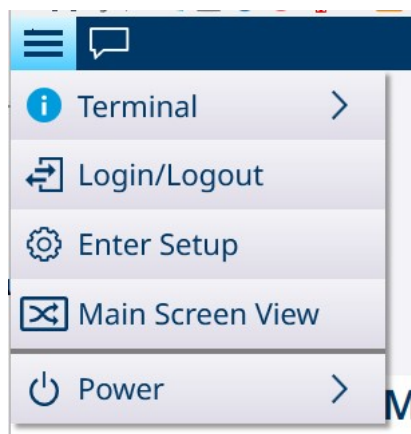


Figure 437: Main Menu

- 2 Touch Maintenance.
- 3 Select **Maintenance > Diagnostics**.
- 4 Refer to [Diagnostics ▶ Page 260] for details on the diagnostic options.

4.8.2 Alarm Codes and Messages

Alarms and alerts in the IND700 are indicated in two ways:

- In the [home screen message box ▶ Page 14]
- In the IND700 [Error Log ▶ Page 317]

The Error Log records all alert and action messages generated by the terminal. This log is helpful in diagnosing and correcting problems and failures in the terminal. These alarms can help predict failure and trigger maintenance action before the problem becomes severe enough to make the terminal unusable.

Users with **Admin** and **Supervisor** credentials can view the Error Log.

4.8.2.1 Reading Alarm Codes

When an alarm is triggered, a message will display on-screen for the number of seconds defined in setup at [Terminal > Display > Message Timeout ▶ Page 188]. The message pop-up will disappear after the set timeout period, but all errors can be reviewed if the Error Log is enabled in setup at [Maintenance > Configure > Enable Logs ▶ Page 244]. To view the error log, go to [Maintenance > Configure > View Error Log ▶ Page 248]. A typical error log display is shown below:

ID	Log Time	Username	Severity	Error Code	Scale
10	26.Jan.2024 11:20:22	Admin	E	200	1
9	26.Jan.2024 11:20:22	Admin	E	200	1
8	26.Jan.2024 11:20:22	Admin	E	200	1
7	26.Jan.2024 11:20:21	Admin	E	200	1
6	26.Jan.2024 10:14:25	Admin	C	A10015	
5	18.Jan.2024 11:19:57	Operator	C	108	1
4	18.Jan.2024 11:19:57	Operator	C	108	1
3	18.Jan.2024 11:19:57	Operator	C	108	1
2	18.Jan.2024 11:19:57	Operator	C	108	2
1	18.Jan.2024 11:19:57	Operator	C	108	1

Figure 438: Example Error Log View



NOTICE

Logging Errors

For errors to appear in the Error Log, that log must be enabled in setup at Maintenance > Configure > Enable Logs.

Error records consist of the following:

- The **ID** of the Error Log record. This is a sequential number provided the Error Log database
- The **Log Time** at which the alarm occurred, or when it was read by the user
- The **Username** of the user logged in at the time the alarm occurred
- A **Category**, indicating the type of alarm on a scale of 1 to 5
- An **Alarm Code** ([Alerts and Alarms ▶ Page 286]) which can be used for troubleshooting, and by MT Service
- If more than one scale is configured in the terminal, the affected **Scale** will also be indicated
- An alarm/alert **Message**, in the currently configured language, displayed to the user in the home screen message area
- The same **Message** in English, to facilitate alarm reporting
- A **Detail**, which contains additional information about the record -- for instance, whether the Log Time represents the time when the alarm was triggered or when the user read it

Examples of Alarm Codes

Example Alarm Codes

ID	Log Time	User Name	Category	Alarm Code	Scale	Message	Message (English)	Detail
4	23.Jan.2024 11:18	Admin	4	3333	1	Smart5 Cat4 no.3 action message	Smart5 Cat4 no.3 action message	read
3	23.Jan.2024 11:02	Admin	3	1234	2	Kontaktieren Sie den Support!	Contact support!	read

ID	Log Time	User Name	Category	Alarm Code	Scale	Message	Message (English)	Detail
2	23.Jan.2024 10:50	Admin	3	3333	3	Die verherige Anwen- dungsversion kann nicht entfernt werden.	Cannot remove previous appli- cation version	detect ed
1	23.Jan.2024 10:39	Admin	4	1234	1	Smart5 Cat4 no3 alert message	Smart5 Cat4 no3 alert message	detect ed

4.8.2.2 Alerts and Alarms






This section provides a description of the alarm/alert [Categories ▶ Page 286], and a comprehensive [list of all alarms and alerts ▶ Page 286] a user may encounter when operating the IND700.

4.8.2.2.1 Key to the Alarm and Alert List

In the alarms and alerts list, six attributes are provided for each record:

- A numeric **Alarm Code**, as displayed in the Error Log
- A **Category**:

Alarm and Alert Categories

Icon	Cat ego ry	Type	Description	Result
	5	Catastrophic failure	Wrong weight / equipment failure	Alarm stops operating -- clearing the alarm will not reset the condition. The device must be repaired to eliminate the alarm.
	4	Imminent failure	Wrong weight / equipment failure expected based on predictive algorithms and sensors, such as temperature and humidity	Alarm indicates that failure is imminent, within one week. The alarm can be reset but will recur each day until the cause is eliminated.
	3	Out of specification	Wrong operator actions or device / application is operating out of specification	Alarm and log the event. Alarms are only generated / transmitted at the request of the customer.
	2	Predictive alarm	Routine test, calibration or preventative maintenance must be undertaken	Alarm and log the event. Alarms are only generated / transmitted at the request of the customer.
	1	Normal condition	Unit is operating correctly	No action is required. In practice, the Category 1 alert is not displayed.

- An indication of whether this error will be stored in the Error **Log**, and whether the error can be read and transmitted by **SAI** (the Standard Application Interface)
- A **message text**, representing what a viewer sees on-screen when the alarm is triggered
- A suggested **response**, representing actions the user should take in response to the alarm

The response "Call MT Service" is included for alarms which occur rarely and are severe enough to require service intervention.

4.8.2.2.2 Alerts and Alarms

Items shown in brackets {} are variables, such as a load cell identifier. Their value is supplied dynamically by the terminal.

Error Codes, Messages and Responses

Alarm Code	Category	Log?	SAI?	Error Message	Suggested Response
0002	4	y	y	The voltage of the ADC is too low	Call MT Service
0003	2	y	y	Below Process Tolerance	Add [0] pieces or close warning to abort
0025	3	y	y	Comparator [0] data source lost	Check scale communication
0042	3	y	y	Implementation of interface [0] no registered	Cycle power, or call MT Service
0058	3	y	y	Loading Alert	Move load to platform center
0060	3	y	y	Maint: calibration expired	Call MT Service
0064	3	y	y	Maint: metrology seal broken	Call MT Service
0067	4	y	y	Maint: zero failures	Call MT Service
0068	4	y	y	Maint: zero commands	Call MT Service
0069	5	y	y	Memory error	Call MT Service
0098	3	y	y	Scale Reset Failed	Re-try reset, or call MT Service
0105	4	y	y	Scale settings validation error	Call MT Service
0112	3	y	y	Symmetry errors	Call MT Service
0131*	2	y	y	Validation Error	Call MT Service
0146	4	y	y	Zero Drift Errors	Call MT Service
1001	5	y	y	Interface not registered: DIO and Scale interfaces	Call MT Service for replacement
1001	4	y	y	Interface not registered: all except DIO and Scale interfaces	Call MT Service for replacement
1004	4	y	y	Low battery	Call MT Service for replacement
2011	5	y	n	Industrial Network not communicating	Check network connection or configuration
2012	5	y	y	Scale error / Scale [0] not responding	Check scale connection and settings
2013*	5	y	y	Scale [0]: Invalid mixture of load cell types, or invalid load cell serial number	Check load cell types or check load cell serial number
4043	3	n	n	Zero component scale failed	Unload scales and retry
4043	3	n	n	Zero Failed	Check scale or call MT Service
4053	3	n	n	Init zero could not be performed	Make sure scale is empty on power up
4054	3	y	n	Tare failed	Retry tare, or call MT Service
4063*	5	y	y	Under Zero condition	Check scale and touch Zero key
4064	3	y	y	Maint: scale overload	Call MT Service
4075	2	y	y	Maint: calibration expired	Call MT Service
5083	5	y	n	Pairing failed	Check pairing or call MT Service
5084	3	y	n	Scale [0] Automatic Internal Calibration (FACT) Failed	Please inspect the connected weigh module or call MT Service
6515	3	Y	y	Symmetry error (low deviation)	Call MT Service
6515	5	y	Y	Symmetry error (high deviation)	Call MT Service

* These alarm codes are subject to change.

5 Appendices

5.1 Default Settings

The following tables indicate the default value for each configurable parameter in the IND700.

5.1.1 Scale - HSALC

HSALC Scale Settings

Parameter	Default Value
Metrology	
Approval	Not approved
GEO value	20
Lower temperature limit (°C)	-10
Upper temperature limit (°C)	40
Identification	
Serial number	[blank: alphanumeric entry field]
Scale model	[blank: alphanumeric entry field]
Scale location	[blank: alphanumeric entry field]
Scale identification	[blank: alphanumeric entry field]
Capacity & Increments	
# ranges	Single range
Primary unit	kg
Capacity 1	60
Resolution 1	0.02
Capacity 2 [if # ranges or intervals is 2]	[blank: numeric entry field]
Resolution 2 [if # ranges or intervals is 2]	[blank: numeric entry field]
Capacity 3 [if # ranges or intervals is 3]	[blank: numeric entry field]
Resolution 3 [if # ranges or intervals is 3]	[blank: numeric entry field]
Blank over capacity (d)	5
Linearization and Calibration	
Calibration	
Calibration unit	kg
Linearity adjustment	Disabled
Test load 1	60
Test load 2 [if Linearity adjustment = 3]	[blank: numeric entry field]
Test load 3 [if Linearity adjustment = 4]	[blank: numeric entry field]
Test load 4 [if Linearity adjustment = 5]	[blank: numeric entry field]
Gain jumper	2 mV/V
Span Adjustment	
Test weight (kg)	0
Displayed weight (kg)	0
Step Calibration	
Test load (kg)	60
CalFree	
Cell capacity	0
Cell unit	kg
Rated cell output mV/V	3
Use zero	Calibrated
Estimated preload [If Use zero = Estimated]	0

Parameter	Default Value
Preload unit [If Use zero = Estimated]	kg
Control Mode	[Display only]
Units	
Secondary unit	kg
Host / auxiliary unit	kg
Startup unit	Primary unit
Zero	
Startup zero	Use last
Power up zero -range (%) [if Startup zero = Capture new]	0
Power up zero +range (%) [if Startup zero = Capture new]	0
Auto zero tracking	On
Auto zero range (d) [if Auto zero tracking = On]	0.5
Blank under zero (d)	20
Push button zero	On
Push button zero -range (%) [if Push button zero = On]	2
Push button zero +range (%) [if Push button zero = On]	2
Tare	
Startup tare	Use last
Auto tare mode	Off
Auto tare threshold (kg) [If Auto tare mode = On]	0
Auto tare reset threshold (kg) [If Auto tare mode = On]	0
Chain tare mode	Off
Auto clear tare	Off
Auto clear tare threshold (kg) [If Auto clear tare = On]	0
Push button tare	On
Keyboard tare	On
Clear with zero	On
Filter	
Low pass filter	Medium
Stability filter	Off
Stability	
Motion range (d)	0.5
No motion interval (seconds)	0.3
Timeout (seconds)	3
MinWeigh	
MinWeigh mode	Off
MinWeigh value (kg) [If MinWeigh mode = on]	0
Reset	[No configurable parameters]
Maintenance	
Cell counts	

Parameter	Default Value
Node n	[Display only]
Calibration values	
Zero	0
Load 1 (kg)	60
Counts 1	6000000

5.1.2 Scale - POWERCELL

POWERCELL Scale Settings

Parameter	Default Value
Metrology	
Approval	Not approved
GEO value	20
Lower temperature limit (°C)	-10
Upper temperature limit (°C)	40
Identification	
Serial number	[blank: alphanumeric entry field]
Scale model	[blank: alphanumeric entry field]
Scale location	[blank: alphanumeric entry field]
Scale identification	[blank: alphanumeric entry field]
Capacity & Increments	
# ranges	Single range
Primary unit	kg
Capacity 1	60
Resolution 1	0.02
Capacity 2 [if # ranges or intervals is 2]	[blank: numeric entry field]
Resolution 2 [if # ranges or intervals is 2]	[blank: numeric entry field]
Capacity 3 [if # ranges or intervals is 3]	[blank: numeric entry field]
Resolution 3 [if # ranges or intervals is 3]	[blank: numeric entry field]
Blank over capacity (d)	5
Linearization and Calibration	
Calibration	
Calibration unit	kg
Linearity adjustment	Disabled
Test load 1	60
Test load 2 [if Linearity adjustment = 3]	[blank: numeric entry field]
Test load 3 [if Linearity adjustment = 4]	[blank: numeric entry field]
Test load 4 [if Linearity adjustment = 5]	[blank: numeric entry field]
Gain jumper	2 mV/V
Span Adjustment	
Test weight (kg)	0
Displayed weight (kg)	0
Step Calibration	
Test load (kg)	60
CalFree	
Cell capacity	0
Cell unit	kg
Rated cell output mV/V	3

Parameter	Default Value
Use zero	Calibrated
Estimated preload [If Use zero = Estimated]	0
Preload unit [If Use zero = Estimated]	kg
Control Mode	[Display only]
Units	
Secondary unit	kg
Host / auxiliary unit	kg
Startup unit	Primary unit
Zero	
Startup zero	Use last
Power up zero -range (%) [if Startup zero = Capture new]	0
Power up zero +range (%) [if Startup zero = Capture new]	0
Auto zero tracking	On
Auto zero range (d) [if Auto zero tracking = On]	0.5
Blank under zero (d)	20
Push button zero	On
Push button zero -range (%) [if Push button zero = On]	2
Push button zero +range (%) [if Push button zero = On]	2
Tare	
Startup tare	Use last
Auto tare mode	Off
Auto tare threshold (kg) [If Auto tare mode = On]	0
Auto tare reset threshold (kg) [If Auto tare mode = On]	0
Chain tare mode	Off
Auto clear tare	Off
Auto clear tare threshold (kg) [If Auto clear tare = On]	0
Push button tare	On
Keyboard tare	On
Clear with zero	On
Filter	
Low pass filter	Medium
Stability filter	Off
Stability	
Motion range (d)	0.5
No motion interval (seconds)	0.3
Timeout (seconds)	3
MinWeigh	
MinWeigh mode	Off
MinWeigh value (kg) [If MinWeigh mode = on]	0
Reset	[No configurable parameters]

Parameter	Default Value
Maintenance	
Cell counts	
Node n	[Display only]
Calibration values	
Zero	0
Load 1 (kg)	60
Counts 1	6000000

5.1.3 Scale - Precision

Precision Scale Settings

Parameter	Default Value
Metrology	
Approval	Not approved
GEO value	19
Lower temperature limit (°C)	-10
Upper temperature limit (°C)	40
Ramp	[Display only]
Identification	
Serial number	[blank: alphanumeric entry field]
Scale model	[blank: alphanumeric entry field]
Scale location	[blank: alphanumeric entry field]
Scale identification	[blank: alphanumeric entry field]
Capacity & Increments	
# ranges	Single range
Primary unit	kg
Capacity 1	12
Resolution 1	0.002
Capacity 2 [if # ranges or intervals is 2]	[blank: numeric entry field]
Resolution 2 [if # ranges or intervals is 2]	[blank: numeric entry field]
Capacity 3 [if # ranges or intervals is 3]	[blank: numeric entry field]
Resolution 3 [if # ranges or intervals is 3]	[blank: numeric entry field]
Blank over capacity (d)	9
Linearization and Calibration	
Autoprint calibration	
Autoprint calibration	On
External calibration	[No configurable parameters]
3-point lin&cal	[No configurable parameters]
5-point lin&cal	[No configurable parameters]
Span adjustment	
Weight for span adjustment	12
Displayed weight for span adjustment	12
Control mode	[Display only]
Control mode	[Display only]
Units	
Secondary unit [If Legacy mode = off]	None
Host / auxiliary unit [If Legacy mode = off]	None
Startup unit [If Legacy mode = off]	Primary

Parameter	Default Value
Legacy mode	Version 2
Zero	
Startup zero	Capture new
Power up zero -range (%)	2
Power up zero +range (%)	18
Center of zero	Off
Auto zero tracking	On
Auto zero range (d) [if Auto zero tracking = On]	0.5
Blank under zero (d)	20
Push button zero	On
Push button zero -range (%) [if Push button zero = On]	2
Push button zero +range (%) [if Push button zero = On]	2
Tare	
Startup tare	Clear
Auto tare mode	On
Auto clear tare	Off
Push button tare	On
Keyboard tare	On
Filter	
Vibration filter	Standard
Process filter	Universal
Stability	
Stability detection	Standard
MinWeigh	
MinWeigh mode	Off
MinWeigh value (kg) [If MinWeigh mode = on]	0
Reset	[No configurable parameters]
Diagnostics	
Channels and parameters	[Display only]
Diagnostics block	
Load cycle monitor	[Display only]
Overload cycle monitor	[Display only]
Shock load cycle monitor	[Display only]
Analog load cell fault detection	[Display only]
Zero deviation monitor	[Display only]
Temperature 1 monitor	[Display only]
Temperature gradient monitor	[Display only]

5.1.4 Application

Application Settings

Parameter	Default Setting
Memory	
Alibi Enable	
Alibi Memory table	Enabled

Parameter	Default Setting
Alibi Table	
Alibi Table	[Table view]
Material table	
Material Table	[Table view; editable]
Tare Table	
Tare Table	[Table view; editable]
Transaction Table	
Transaction Table	[Table view]
ID Form	
ID Form	[List view; editable]
Select Application	
[List of available applications]	Disabled
Auto Start Application	[Display only]

5.1.5 Terminal

Terminal Settings

Parameter	Default Setting
Device	
Terminal ID #1	[Blank field]
Terminal ID #2	[Blank field]
Terminal ID #3	[Blank field]
Terminal Serial Number	[Display only]
Display	
Backlight Timeout	Enabled
Backlight (minutes)	30
Screen Saver	Enabled
Screen Saver (minutes)	30
All Scale View	Enabled
Auxiliary Display	Tare Active
Transaction Counter	
Transaction Counter	Disabled
Allow Counter Reset [If Transaction Counter = Enabled]	Disabled
Next Transaction Number [If Allow Counter Reset = Enabled]	1
Users	
Admin	Table view; editable
Access Level	Administrator
Default User	Disabled
Operator	
Access Level	Operator
Default User	Enabled
Region	
Language	
User Language Selection	Enabled
Display Messages	English
On-Screen Keyboard	QWERTY

Parameter	Default Setting
External Keyboard	Windows Default
Time and Date Format	
Preview of Time and Date	[Display only]
Use 24-hour clock	Enabled
Display Seconds	Disabled
Show 2 Digit Month	Disabled
Show 2 Digit year	Disabled
Time Separator	:
Date Format	Day Month Year
Date Separator	.
Set Time and Date	
Time Zone	(UTC -05:00)
Hour : Minute	[Numeric entry fields]
Set Date	[Alphanumeric entry field]
Softkeys	
Softkey Ribbon Editor	[Softkey array and Softkey row view; editable]
T	No text
Clear Messages	
	[No configurable parameters]
Security Options	
Unified Write Filter	Enabled
Keyboard Filter	Enabled
External Mass Storage Blocking	Enabled
Enable Windows Desktop	Disabled
Firewall	Enabled
Windows	
Activate Windows Through Internet	[No configurable parameters]
Activate Windows Through Phone	[No configurable parameters]
License	
License active	[Display only]
Partial product key	[Display only]
Update Now	
Target	Internal File
File	[Dropdown list]
Directory	[Display only]
Licensing	
License Manager	[List view]

5.1.6 Communication

Communication Settings

Parameter	Default Setting
Ethernet	
MAC Address	[Display only]
DHCP	Enabled
IP Address [If DHCP = Disabled]	[Numeric entry field]
Subnet Mask [If DHCP = Disabled]	[Numeric entry field]

Parameter	Default Setting
Gateway Address [If DHCP = Disabled]	[Numeric entry field]
Preferred DNS Server [If DHCP = Disabled]	[Numeric entry field]
Secondary DNS Server [If DHCP = Disabled]	[Numeric entry field]
Interfaces	
Interfaces	[List view; editable]
Connections	
Connections	[Blank list view; editable]
FTP Server	
FTP Server	Disabled
FTP Port	[Display only]
sFTP Server	
sFTP Server	Disabled
Port	[Display only]
Remote Desktop Server	
Remote Desktop Server	Disabled
Output Templates	
Template 1	[Default Template 1 configuration; editable]
Templates 2-10	[No configuration; editable]
Input Template	
Preamble Length	0
Data Length	1
Postamble Length	0
Timeout	Enabled
Assignment	Tare
Termination Char	CR

5.1.7 Maintenance

Maintenance Settings

Parameter	Default Setting
Configure	
Enable Logs	
Change Log	Enabled
Maintenance Log	Disabled
Error Log	Enabled
View Change Log	[Log view]
View Error Log	[Log view]
Run	
Backup	
Target for Backup	Internal File
File	[Alphanumeric entry field; default filename = product_serial number_year_month_day_hour_minute]
Director	[Display only] C:\Backup
Restore	
Target for Restore	Internal File

Parameter	Default Setting
File	[Dropdown list showing all available backup files]
Director	[Display only] C:\Backup
Software Update	
Source	Internal File
File	[Dropdown list showing all available update files]
Director	[Display only] C:\Service
Diagnostics	
Network Test	
IP Address	[Numeric entry keypad]
Ping Response	[Display only]
Touch Calibration	[Description of test with RUN button]
Serial Port Loopback Test	
Port	Mainboard (Serial Port)
Test Status	[Display only]
DIO Test	
Port	Mainboard Discrete I/O
DIO Status indicators	[Display only]
Reset	
Scales	Disabled
Terminal	Disabled
Application	Disabled
Communication	Disabled
Maintenance	Disabled
Interfaces	Disabled
Master Reset	Disabled
Reset Calibration	[Available if Master Reset = Enabled] Disabled
Information	
Category	[Dropdown list] CountingService
List view	[Display only]

5.2 Table and Log File Structure

The IND700 terminal includes the following tables:

- Alibi Table
- Material Table
- Tare Table
- Transaction Table

This chapter details the structure of each of these.

5.2.1 Memory Tables

5.2.1.1 Alibi Memory

Alibi memory stores transaction information in a preset format that is not changeable. Alibi memory can be enabled or disabled in setup at **Application > Memory > Alibi Enable**.

The Alibi memory stores up to 500,000 Alibi records in a battery-backed file as they occur. When this file is full, new alibi data overwrites the oldest records in the table.

The columns displayed in the Alibi Table vary depending on terminal configuration. Different columns will appear depending on which application is in use.

Log ID	Log Time	Transaction Counter	Scale #	Gross Weight	Net Weight	Tare Weight
7	06.Feb.2024 09:39:08		1	2.139	1.989	0
6	06.Feb.2024 09:38:51		1	2.140	1.990	0
5	06.Feb.2024 09:38:46		1	2.140	1.990	0
4	06.Feb.2024 09:37:09		1	2.140	1.990	0
3	06.Feb.2024 09:36:52		1	2.139	1.989	0
2	06.Feb.2024 09:36:11		1	2.212	2.062	0
1	01.Feb.2024 20:12:45		1	0.000	0.000	0

Figure 439: Alibi Record Columns 1

Scale	Gross Weight	Net Weight	Tare Weight	Calculated	Tare Type	Unit	User Data
1	2.139	1.989	0.150		PT	kg	
1	2.140	1.990	0.150		PT	kg	
1	2.140	1.990	0.150		PT	kg	
1	2.140	1.990	0.150		PT	kg	
1	2.139	1.989	0.150		PT	kg	
1	2.212	2.062	0.150		PT	kg	
1	0.000	0.000	0.000			kg	

Figure 440: Alibi Record Columns 2

Not all columns are populated for each record. The data captured by the Alibi table depends on the type of operation being performed.

For details on Alibi Table searches, refer to [Table Functions: Filter, Export, Import, Clear ▶ Page 307]. For the export of Alibi Table data, refer to [Alibi Table ▶ Page 172].

5.2.1.2 Material Table

Correct configuration of the Material Table facilitates the use of the Applications. Depending on the currently enabled application, different options will exist for a Record, and the record will appear in the Material Table with its associated application listed.

The IND700 can store up to 100,000 material records.

Access the Material Table

The Material Table can be accessed in two ways:

- Access **Setup > Application > memory > Material Table**.

- Touch the Material Table softkey  from the Application Screen View.

Add New Material, No Application Selected

1. Open the Material Table
2. Touch the + icon in the header row.
3. The **Add New Material** screen will appear. This page includes four fields: **ID**, **Name**, **Description** and **Tare ID**. When Valid entries have been made, touch the confirmation check button at lower right of the screen to return to the Application View screen.



Figure 441: Add New Material Screen

Add New Material Fields

ID	ID is a number which simply indicates the record's position (1, 2,...n) in the table.
Name	An alphanumeric identification of the material (article or raw material)! This identification is particularly useful when recalling Material records using a barcode scanner.
Description	A descriptive name which will appear on the Application Screen View when the Material Table record is loaded (if configured to display at Setup > Application > App Screen View).
Tare ID	[Optional] The numerical ID of a Tare Record associated with this item. If a valid Tare ID is entered here, the name of Tare name will appear at the bottom of the screen. Tare can also be taken manually while in the Application Screen View.

Add New Material, Application Selected

When an application has been selected (in the Select Application screen), additional fields appear in the **Add New Material** screen, and dots appear at the left of the screen to indicate that additional parameters are available on two or three pages. Touch a dot to display the second or third page.

Add New Material

ID
2

Name
[Empty Field]

Description
[Empty Field]

Tare ID
[Empty Field]

Tare Name

[Checkmark]

Figure 442: Add New Material, Application Selected

The additional pages show the selected application in the screen's header:

Add New Material (Classification)

Classification Active
Invalid Data

Unit
g

Lower Limit 1
[Empty Field]

Lower Limit 2
[Empty Field]

Lower Limit 3
[Empty Field]

Lower Limit 4
[Empty Field]

Lower Limit 5
[Empty Field]

Lower Limit 6
[Empty Field]

Lower Limit 7
[Empty Field]

Figure 443: Add New Material Header Showing Selected Application

By default, the additional pages show only a slider used to activate the application for this material. Touch the slider to activate the application, and further fields appear. In the case of an 8-category Classification configuration, one more additional page appears.

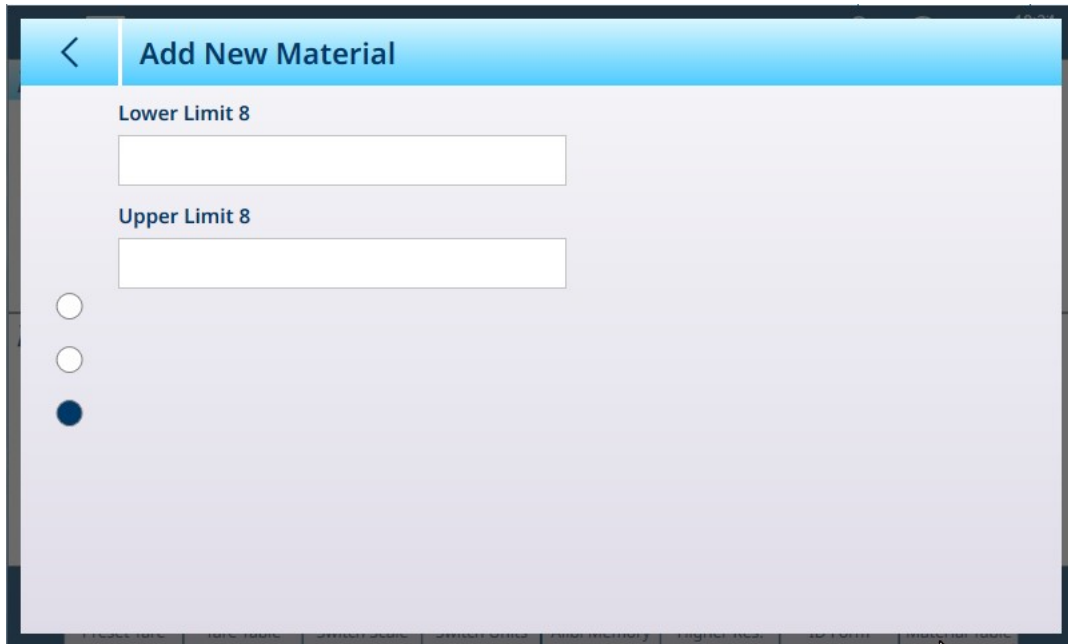


Figure 444: Add New Material - Classification, Second Page





NOTICE

Material Table Record Units Field

The Unit field configured in a Material Table record is used in the application's calculations (e.g. for Average Piece Weight in Counting). This unit is not affected by the Primary Unit set for the scale in ASM at **Capacity & Increments** (refer to chapter 2, **Configuration**, in the IND700 **Technical Manual** or **User's Manual**). This permits the Application to display a result appropriate for the size of the item or material – for example, grams for small items, kilograms for large ones – using the same scale.

Add New Material Fields by Application

Totalization	APW	The average piece weight of reference pieces can be included in the Material Table record. Note: APW can also be calculated from the Application Screen View using the FIX 10  and VAR 10  soffkeys.
	Unit	The weight unit for the APW.
Counting	APW	The weight, in the units defined, of a measured reference piece.
	Unit	The weight unit for the APW.
	Fix 10 Soffkey	Captures live scale weight to use as reference weight for 10 items.
Classification	Unit	The weight unit to be used for the classification operation.
	Lower Limits 1-7	The number of fields depends on how many classes are specified at Setup > Application > Classification.
	Upper Limit	The upper limit of the last defined class.
Manual Filling	Target Value	Target weight for Filling operation.
	Unit	Weight unit for Filling target.
	-Tolerance	The type of value used here depends on the configuration of the Filling application -- Absolute, Deviation or Percentage.
	+Tolerance	
Over/Under	Target Value	Target weight for Over/Under operation.
	Unit	Weight unit for Over/Under target.

If 3 zones selected:	-Tolerance (Under)	The type of value used here depends on the configuration of the Filling application -- Absolute, Deviation or Percentage.
	+Tolerance (Over)	
	-Tolerance (Under)	
If 5 zones selected:	-Tolerance (Low)	
	+Tolerance (High)	
	+Tolerance (Over)	

When the record is correctly configured, access the first **Add New Material** screen and touch the confirmation check mark.

The Material Table will display, with the new record listed and its associated application/s indicated in the **Application** column. Note that the application is indicated **only** for active applications. Records which show no Application may be associated with other applications. In the example below, the **Counting** application is active.

ID ^	Name	Tare ID	Description	Application
1	Cookies	5	Packet	
4	Sand	1	Bags of sand	Counting
6	Sugar	6	Granulated sugar	
7	BB1		Ball bearings, 5mm	Counting

Figure 445: Material Table View

Editing or Deleting a Material Table Record

Edit a Material Table Record

Access the Material Table. With the table displayed, touch the affected record and select the Edit icon from the pop-up.

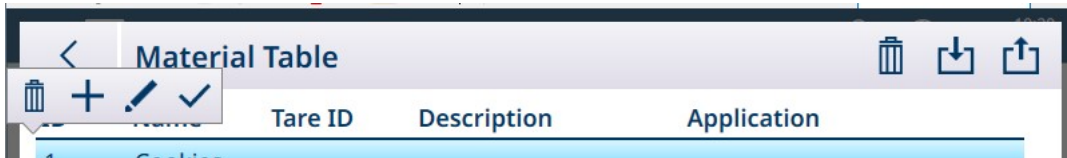


Figure 446: Material Table Options Popup

Configure the record as described above. All fields, including the ID number field, can be modified.

To save the changes, touch the check mark at lower right; the Material Table will display.

Managing Material Table Records

Refer to [Table Functions: Filter, Export, Import, Clear ▶ Page 48] for details on filtering, exporting, importing and deleting Material Table records.

5.2.1.3 Tare Table

The Tare table in the IND700 terminal can store 1,000 records. These records can be recalled for use during weighing operations, instead of manually entering a tare value for each transaction. This recall function is especially useful when certain tare values are used repeatedly. When totalization is enabled for the tare table, each time a transaction is completed using an activated tare ID, the selected weight value (gross or net weight) is added to the total and the counter increments by one.


For details on configuring a tare record and managing the tare table, refer to [Tare Table ▶ Page 172].


5.2.1.3.1 Quick Access to a Tare Record



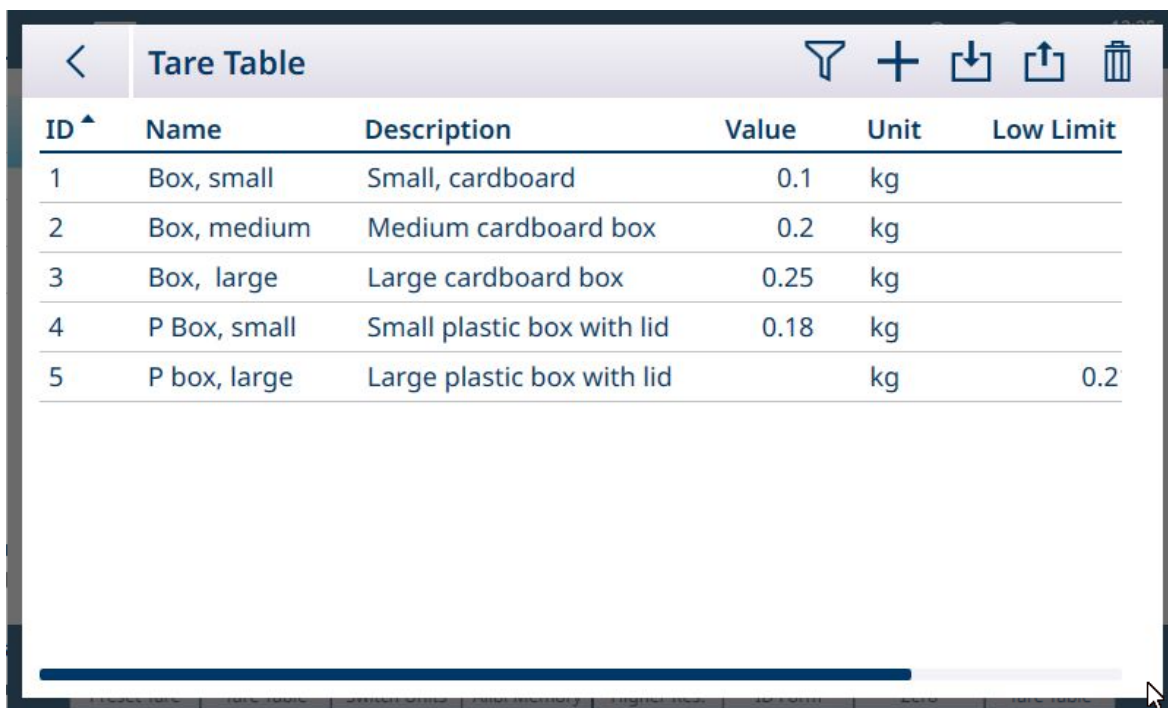
NOTICE

Tare Records Quick Access

The Tare Table softkey  must be assigned to the homescreen in configuration at [Terminal > Softkeys ▶ Page 197].

A Tare record can be quickly recalled for use by a user with **Admin** login, by entering Setup and accessing **Application > Memory > Tare Table**. However, a quick access method available to **Operator** logins is to touch the the Tare Table  softkey.

The Tare Table will display; use the up and down arrows to scroll through the table, or perform a table search (XREF) to find the desired tare record.



ID ^	Name	Description	Value	Unit	Low Limit
1	Box, small	Small, cardboard	0.1	kg	
2	Box, medium	Medium cardboard box	0.2	kg	
3	Box, large	Large cardboard box	0.25	kg	
4	P Box, small	Small plastic box with lid	0.18	kg	
5	P box, large	Large plastic box with lid		kg	0.2

Figure 447: Tare Table View

Touch the desired record to display its context menu.

ID ^	Name	Description	Value	Unit	Low Limit
1	Box, small	Small, cardboard	0.1	kg	
2	Box, m	cardboard box	0.2	kg	
3	Box, large	Large cardboard box	0.25	kg	
4	P Box, small	Small plastic box with lid	0.18	kg	
5	P box, large	Large plastic box with lid		kg	0.2

Figure 448: Tare Record Context Menu

With the record selected, touch the OK icon.

The home screen will appear, with the weight in NET mode and the tare value displayed.



Figure 449: Home Screen, Tare Loaded

5.2.1.4 Transaction Table

The Transaction Table is accessed in Setup at **Application > Memory**. It can be exported to an internal file location as a .csv or .xml file, and then copied to a network location for storage or analysis. Refer to [Table Functions: Filter, Export, Import, Clear ▶ Page 307] for details on filtering and exporting the contents of the Transaction Table.

This table logs a number of parameters for each weighing transaction performed on the terminal. A transaction occurs when the scale TRANSFER function is executed directly from the front panel or any of the available remote means (discrete input, Industrial Network, SICS command, etc.). The Transaction Table can be accessed from the home screen if the TRANSACTION TABLE softkey is assigned in setup at [Terminal > Softkeys ▶ Page 197]. The REPEAT TRANSACTION function does not affect the Transaction Counter.

Columns in the Transaction Table reflect various configuration settings in the terminal -- the contents of the [Material ▶ Page 298] and [Tare ▶ Page 302] Tables, the configuration and use of [ID Forms ▶ Page 69], and the settings applied to the [Transaction Counter ▶ Page 189]. A typical transaction record might include:

- Transaction Counter serial number (if enabled)
- Log Time, including date and time of day
- Scale # for which the transaction was recorded
- Gross, Net and Tare Weights
- Tare type (T or PT)
- User Name associated with the transaction
- Material ID, if any
- Material Name, if any (if ProWorks Multi-Tools is licensed)
- Identifiers such as Lot, Batch number, Shift, etc., depending on how the ID Form is configured in setup at **Application > ID Form**. Each enabled field is included as a column, with the name assigned in configuration
- APW, pcs, Status, and other parameters associated with a running application (if ProWorks Multi-Tools is licensed)

The following images show the complete contents of a Transaction table, scrolled to the right to reveal additional columns.

Log Time	Transaction Counter	Scale #	Gross Weight	Net Weight	Tare Weight
06.Feb.2024 09:39:08		1	2.139	1.989	0.150
06.Feb.2024 09:38:51		1	2.140	1.990	0.150
06.Feb.2024 09:38:46		1	2.140	1.990	0.150
06.Feb.2024 09:37:09		1	2.140	1.990	0.150
06.Feb.2024 09:36:52		1	2.139	1.989	0.150
06.Feb.2024 09:36:11		1	2.212	2.062	0.150
01.Feb.2024 20:12:45		1	0.000	0.000	0.000

Figure 450: Transaction Table 1

Transaction Table						
Tare Weight	Preset Tare	Unit	User Name	Material ID	Material Name	Product
0.150	PT	kg	Admin	1	Aluminum scrap	22
0.150	PT	kg	Admin	1	Aluminum scrap	22
0.150	PT	kg	Admin	1	Aluminum scrap	22
0.150	PT	kg	Admin	1	Aluminum scrap	
0.150	PT	kg	Admin	1	Aluminum scrap	
0.150	PT	kg	Admin	1	Aluminum scrap	
0.000		kg	Admin			

Figure 451: Transaction Table 2

Transaction Table								
Product	Batch	Lot Number	Shift	Operator ID	pcs	APW	Unit	Target Cont
22	43	2	1	104				Filling
22	43	2	1	104				Filling
22	43	2	1	104				Filling
								Filling
								Filling
								Filling

Figure 452: Transaction Table 3

rator	pcs	APW	Unit	Target	Control Application	Target	Unit	Status
				Filling		2.0	kg	OK
				Filling		2.0	kg	OK
				Filling		2.0	kg	OK
				Filling		2.0	kg	OK
				Filling		2.0	kg	OK
				Filling		2.0	kg	OK

Figure 453: Transaction Table 4

5.2.1.5 Table Functions: Filter, Export, Import, Clear

Enabled tables include a number of functions, accessed by touching an icon in the table's header row.

The **Alibi Table** is read-only, and its contents can be filtered and exported. Alibi data cannot be imported , records cannot be deleted, and the table cannot be cleared . Once the Alibi Table has reached its maximum capacity, the terminal begins to overwrite the oldest data. To avoid loss of Alibi Table data, it is recommended that an export schedule be implemented.

The contents of the **Material Table** and **Tare Table** can be filtered, exported to a file, imported from a file, and cleared. The import function permits table contents to be configured outside the terminal, or shared between terminals performing the same function.

The contents of the **Transaction Table** can be filtered, exported and cleared.

Exported table contents are stored on the terminal in the **C:\Export** folder. Data to be imported must be placed in the **C:\Import** folder. For details on file transfers in and out of the terminal, refer to [File Transfer ▶ Page 348].

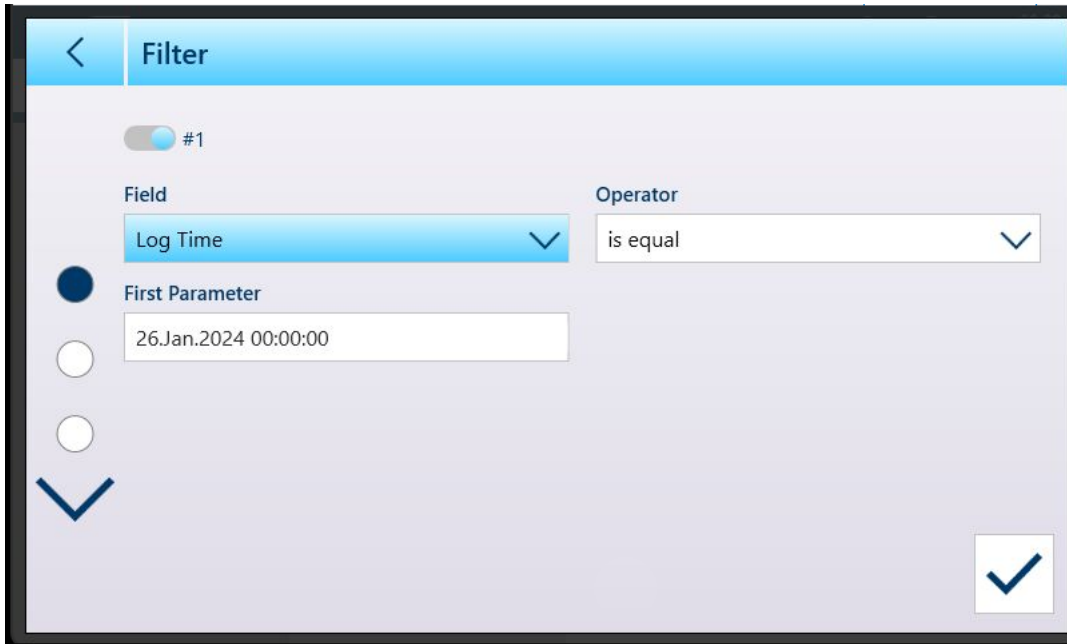
5.2.1.5.1 Filter

For an account of the filter entry methods, refer to [Data Entry ▶ Page 43].

Because it accumulates many records, the Alibi Table has a **Filter** function which filters the visible records depending on up to three conditions.

Search Condition

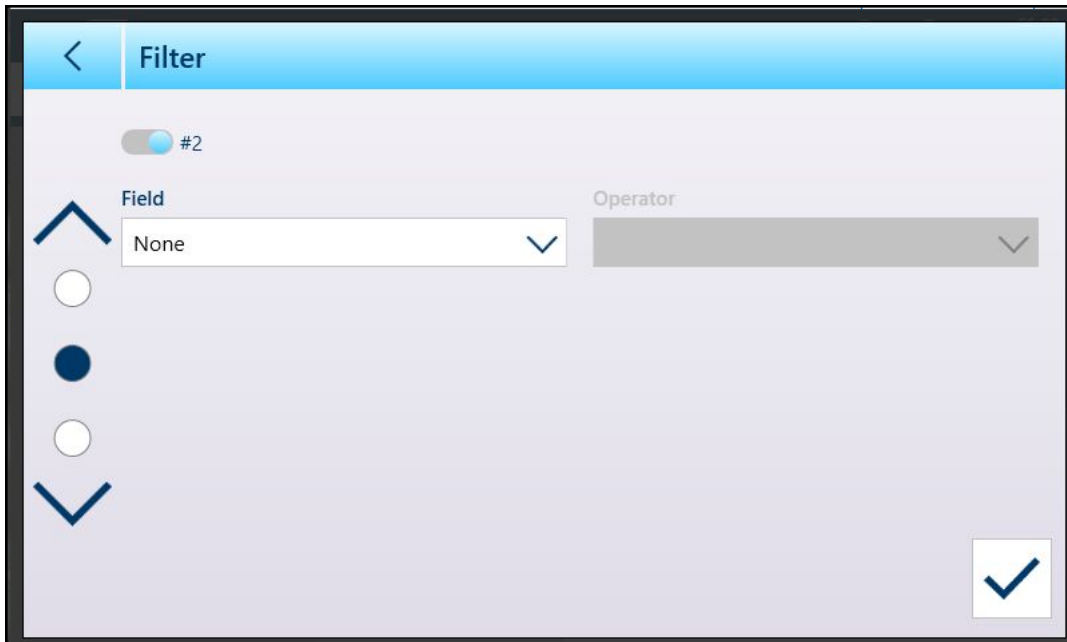
The Search Condition fields permit the definition of three search criteria. The three filters screens are shown below. Note the screen indicator dots and up/down arrows at left.



The screenshot shows a mobile application interface for configuring a filter. At the top, there is a blue header with a back arrow and the word "Filter". Below the header, a toggle switch labeled "#1" is turned on. The "Field" dropdown menu is set to "Log Time". The "Operator" dropdown menu is set to "is equal". The "First Parameter" text input field contains the date and time "26.Jan.2024 00:00:00". On the left side, there are three radio buttons; the top one is selected. Below the radio buttons are two large blue arrows pointing up and down. In the bottom right corner, there is a white square button with a blue checkmark.

Figure 454: First Table Filter Screen

The second and third Filter screens are shown with no Field selected. **Filter #2** is shown enabled but not configured. **Filter #3** is shown disabled. The other filter options -- **Operator** and **Parameter** -- are not accessible until a Filter Field is selected.



The screenshot shows the second filter screen. The header is the same as in Figure 454. The toggle switch labeled "#2" is turned on. The "Field" dropdown menu is set to "None". The "Operator" dropdown menu is disabled and has a grey background. On the left side, there are three radio buttons; the middle one is selected. Below the radio buttons are two large blue arrows pointing up and down. In the bottom right corner, there is a white square button with a blue checkmark.

Figure 455: Second Table Filter Screen

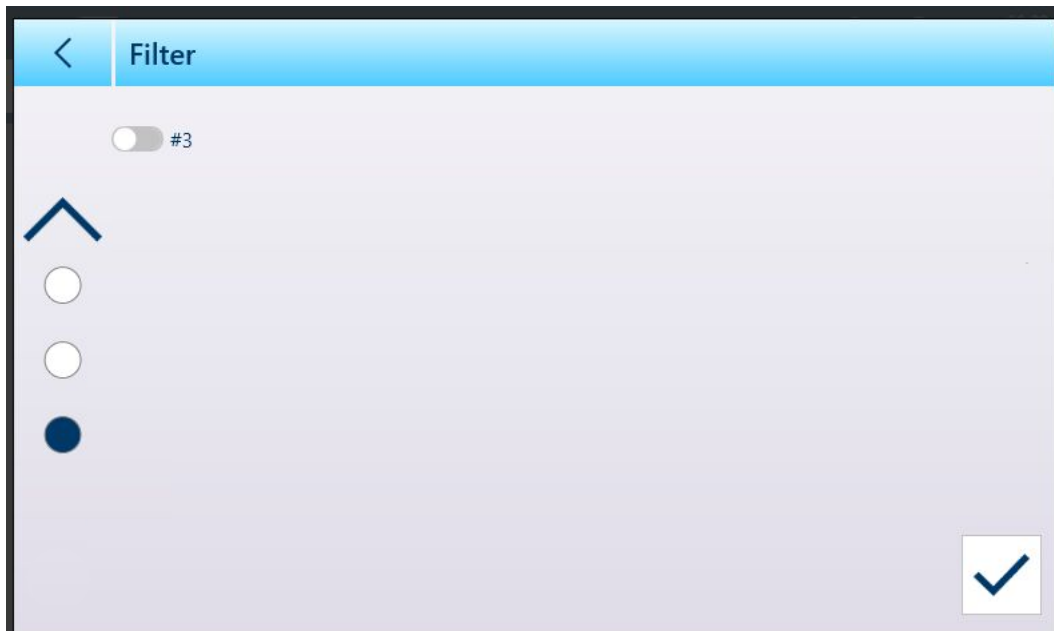


Figure 456: Third Table Filter Screen

Field options are:

- None (filter not operational)
- ID
- Log Time
- Transaction Counter
- Scale #
- Tare Type
- Unit

The options provided by the **Parameter** value depend on the **Field** type selected. For example, if **Scale #** is chosen, the **Parameter** field is a drop-down list of all available scales plus Sum Scale.

When a filter **Field** has been selected, the **Operator** field and a **Parameter** field becomes available -- two **Parameter** fields, if **in the range** is selected as the **Operator**. Touch the **Parameter** field to display its associated entry method. ([Data Entry ▶ Page 43]). The Parameter entry dialog shown below is for a numeric parameter, in this case **ID**.

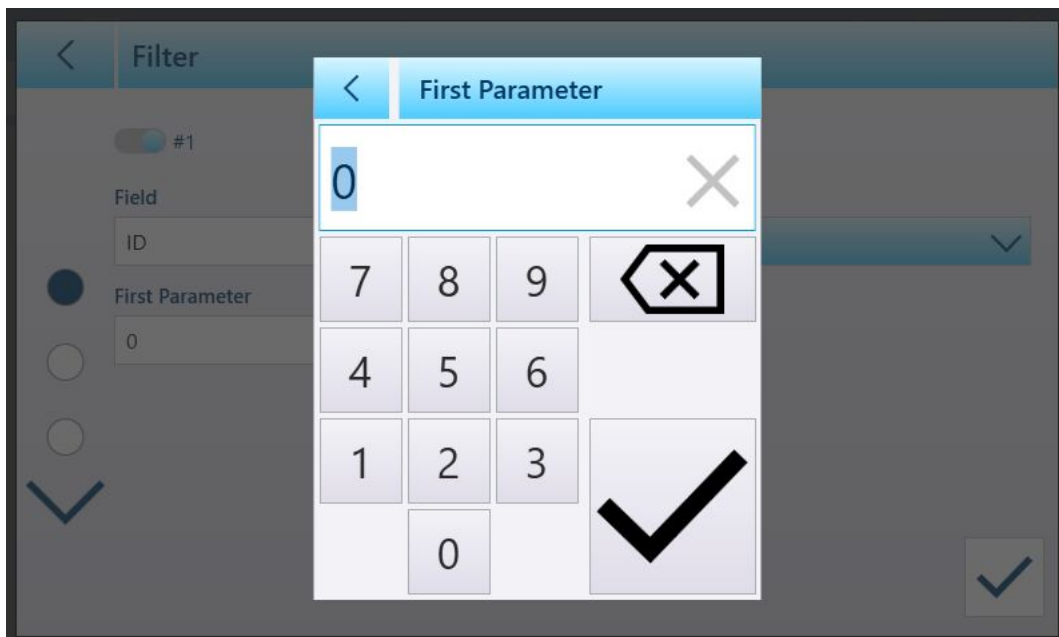


Figure 457: Example Filter Parameter Entry

Other Field types are associated with other entry types. For example, if **Log Time** is selected under **Field**, the Parameter field will display a calendar and Hour : Minute input dialog.

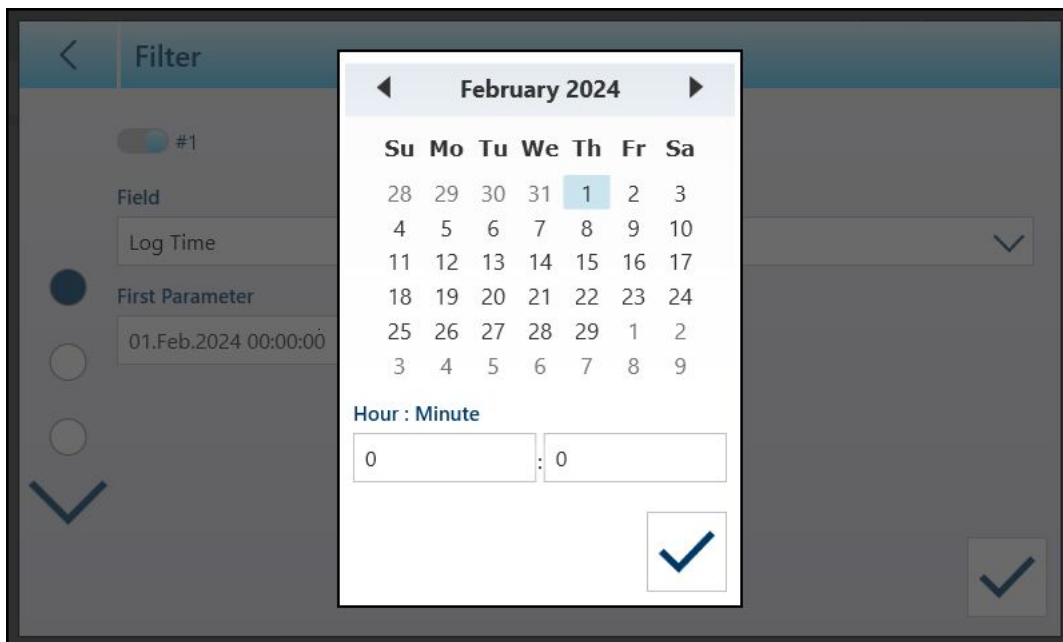


Figure 458: Calendar Dialog for Log Time Field Parameter

Parameter options are:

- is equal
- freater
- greater or equal
- less than
- in the range

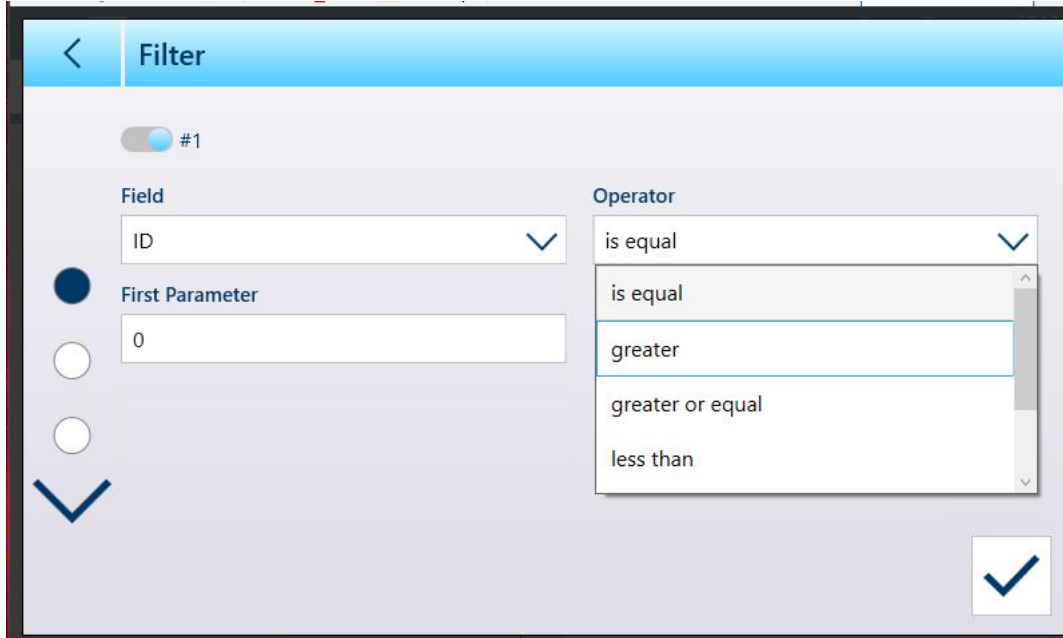


Figure 459: Filter Condition Operators

5.2.1.5.2 Export

All tables permit the export [📄](#) of data. The export screen requires the selection of a File Type, and the choice of a File Name. The default form of the filename has the form [terminal]_[Year_Month_Day]_[time]_[Table name], but this can be modified by touching the File Name field to display an alphanumeric entry screen ([Data Entry ▶ Page 43]).

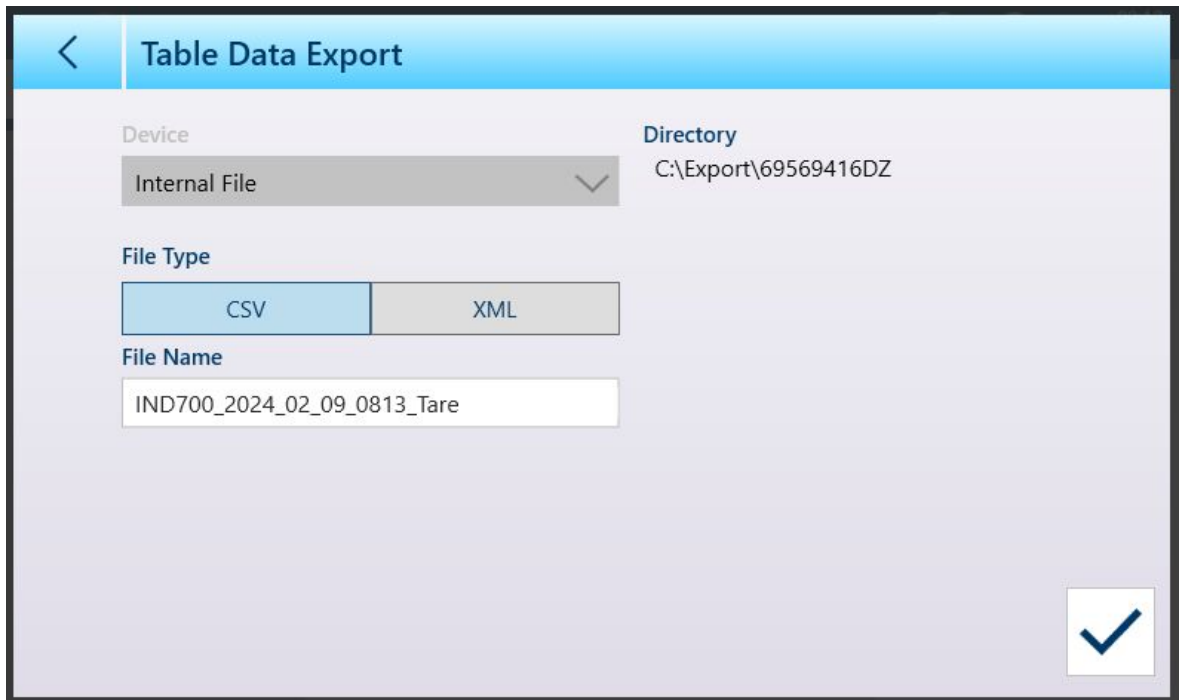



Figure 460: Table Data Export Screen

Touch the blue check mark to confirm the export and return to the Table view screen.

5.2.1.5.3 Import

The Material and Tare tables both permit data to be imported. Data for import to a table must be contained in a file of the appropriate format, either .csv or .xml. Touch the Import icon  to display the Table Data Import screen.

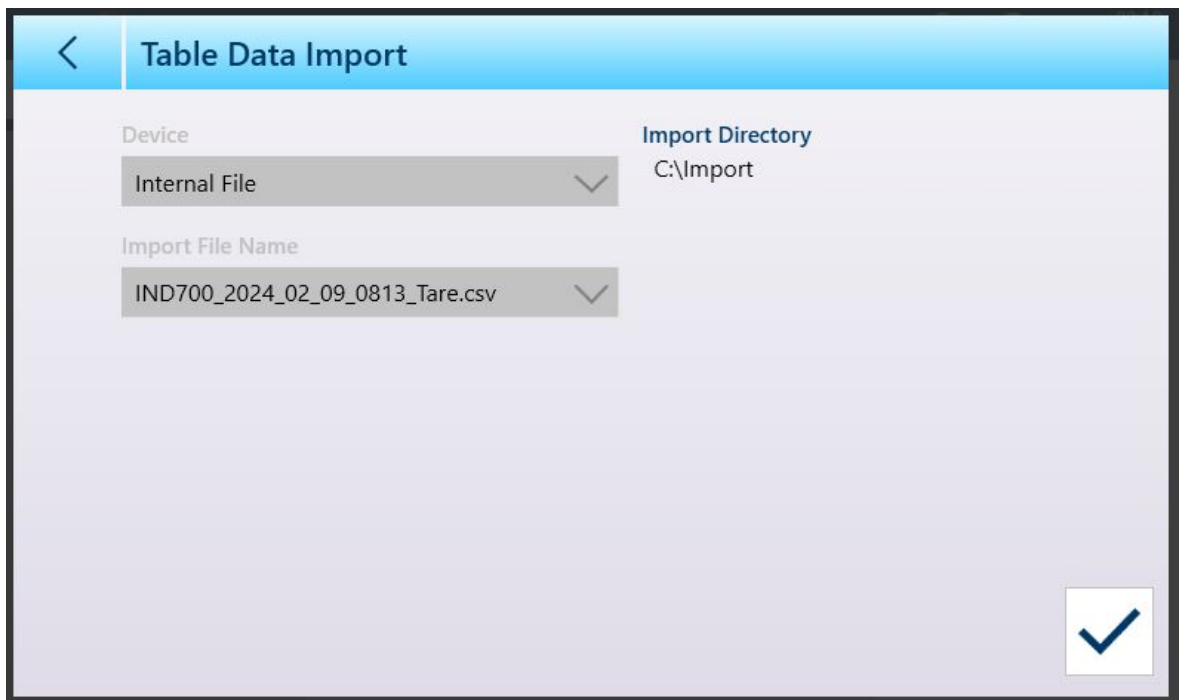


Figure 461: Table Data Import Screen

Touch the blue check mark to confirm the import. The Table view screen will appear, with the new data displayed.

5.2.1.5.4 Clear

To manage space in the terminal's memory, it may be necessary to clear a table. Before clearing a table, it is recommended that a table export be performed. The data can be stored outside the terminal. This will prevent unwanted data loss.

When the clear icon  is touched, a warning displays indicating that the entire table will be cleared.

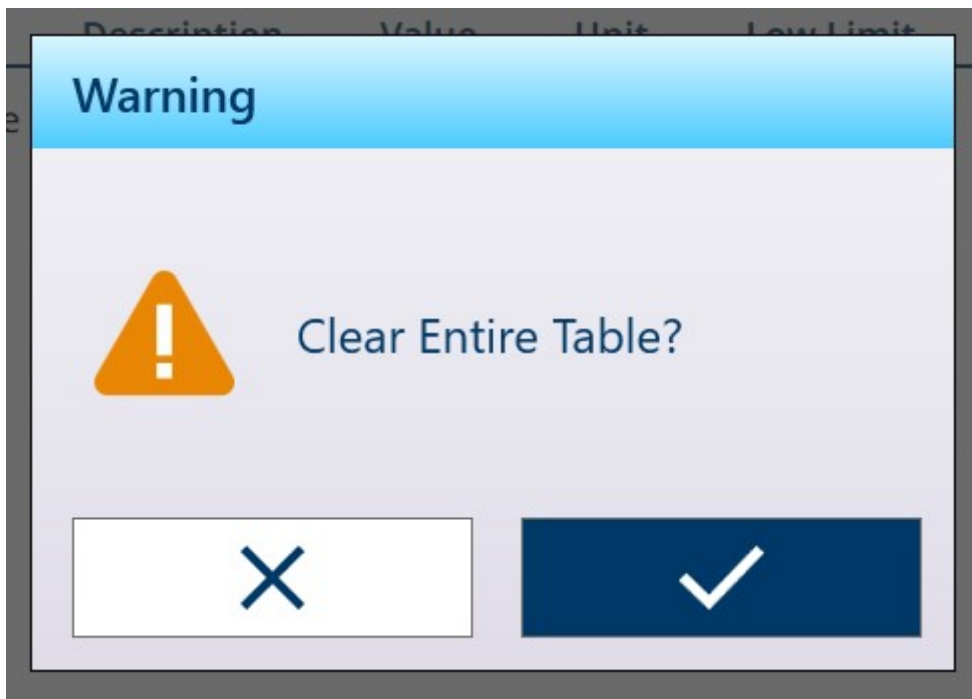


Figure 462: Table Clear Warning

Touch the check mark to confirm the deletion, or the X to return to the table view.

5.2.2 Log Files

5.2.2.1 Scale Log Table

The Scale Log Table is accessed from the main menu under **Terminal > Metrology**. For the contents of this table, refer to [Metrology ▶ Page 46].

See also

[Accessing Terminal Information ▶ Page 45](#)

5.2.2.2 Pairing History File

The Pairing History File is accessed from the main menu, under **Terminal > Metrology**. For the contents of this file, refer to [Metrology ▶ Page 46].

See also

[Accessing Terminal Information ▶ Page 45](#)

5.2.2.3 Change Log

The **Change Log** in the IND700 terminal file tracks all changes to shared data. The Change Log can be enabled or disabled in setup at **Maintenance > Configure/View > Change Log**.

The Change Log file is a linear-type file that eventually becomes full if not reset. It will hold an estimated 30,000 records. When the file becomes 75% full, a warning message displays to indicate the status. Another message displays when the file is 90% full. If the file is not reset, it will continue to store records until it is 100% full and a final 100% full message displays. Additional changes to shared data will not be recorded until the file is reset.

An example of Change Log view is shown below. The second image shows the same view scrolled to the right to display more columns of information, which include current and prior values for the modified item.

ID	Log Time	User Name	Configure	Property Name
48	12.Feb.2024 07:40:56	Admin	Sum 5	PushButtonZer
47	12.Feb.2024 07:40:50	Admin	Sum 5	PushButtonZer
46	12.Feb.2024 07:40:48	Admin	Sum 5	PushButtonZer
45	12.Feb.2024 07:40:41	Admin	Sum 5	PushButtonZer
44	12.Feb.2024 07:40:22	Admin	Sum 5	PushButtonZer
43	12.Feb.2024 07:40:15	Admin	Sum 5	PushButtonZer
42	12.Feb.2024 07:40:13	Admin	Sum 5	PushButtonZer
41	12.Feb.2024 07:40:03	Admin	Sum 5	PushButtonZer
40	12.Feb.2024 07:22:17	Admin	InputTemplates	InputTemplate
39	12.Feb.2024 07:22:02	Admin	Connections	Connection Ad


Figure 463: View Change Log, 1

Property Name	Old Value	New Value
oMode	False	True
oMode	True	False
oMode	False	True
oMode	True	False
oMode	False	True
oMode	True	False
Updated	MT.Singularity.Platform.InputTemplate.InputTemplateConfiguration	
ded		
ded		
ded		

Figure 464: View Change Log, 2

	New Value
	True
	False
	True
	False
	True
	False
Configuration	MT.Singularity.Platform.InputTemplate.InputTemplateConfiguration
	MT.Singularity.Platform.Communication.ConnectionConfiguration
	MT.Singularity.Platform.Communication.ConnectionConfiguration
	MT.Singularity.Platform.Communication.ConnectionConfiguration

Figure 465: View Change Log, 3

- The Maintenance Log export file, generated by the **Table Data Export** option , is named Terminal_YEAR_MO_HR_MIN_LogName. Example: **IND700_2024_03_12_1113_ErrorLog**. The log file is exported to the terminal's **C:\Export\Terminal Serial Number** folder.
- The log file is exported to the terminal's **C:\Export\Terminal Serial Number** folder. Using the terminal's serial number as the sub-folder name ensures that the listed log items are associated with the specific terminal.
- The file can be exported in either .csv or .xml format. Refer to [Table Functions: Filter, Export, Import, Clear ▶ Page 48] for details on table and log file exports, and [File Transfer ▶ Page 348] for external transfers of files.

See also

 Table Functions: Filter, Export, Import, Clear ▶ Page 48

5.2.2.4 Maintenance Log

The **Maintenance Log** tracks service operations performed on the equipment. MT Service and Validation Agencies or those who audit for them will use this log. This log can contain up to 32,000 records.

A typical log view is shown below, with a second screen showing the view scrolled to the right to display additional information.

ID	Log Time	Username	Channel	Cell	Event	Description
2	12.Feb.2024 06:46:04	Admin	Scale2		23	Maint. Calibration Test Passed
1	12.Feb.2024 06:44:18	Admin	Scale1		23	Maint. Calibration Test Passed

Figure 466: View Maintenance Log, 1

Channel	Cell	Event	Description	Status
cale2		23	MAINT. CALIBRATION TEST PASSED	Successful
cale1		23	MAINT. CALIBRATION TEST PASSED	Successful

Figure 467: View Maintenance Log, 2

Overview

The maintenance log file is a ring-type file that overwrites the oldest record when it becomes full. The maintenance log file can hold a maximum of 2500 records. The maintenance log is recorded in File-system and won't be lost after system power-off. The used size will be checked while new log is recorded. If the used size is more than 75%, 90% or full, hint information will be thrown to System Line of Home Screen to inform user to do backup and clear maintenance log.

Maintenance Log Record

The maintenance log format shows as below.


Field	Data Type	Length (bytes)	Description
Date and Time	U32	7	Year/Month/Day/Hour/Minute/Second
Username	String	13	User String Name
Event Code	U8	1	Event code
Status	String	8	Log String status

Operation

When Event identified by Event Code happens, a record is added into Maintenance Log. The Maintenance Event Code, Event and related possible status are illustrated in the following table.

Event Code	Event Description	Status (String)
1	Calibration test failed.	1-n=failed at step n
2	Zero calibration performed.	FAILURE, SUCCESS, Motion
3	Span calibration performed.	FAILURE, SUCCESS, Motion
4	CalFree calibration performed.	FAILURE, SUCCESS
8	Log file exported via FTP.	MAINT, CHANGE, TACT (Action), ALIBI
9	Setup file exported - .dmt files exported via FTP.	SUCCESS
10	Metrology switch / electronic seal broken.	SUCCESS
11	Calibration Expired.	"1"=days
15	Added option component	Manual text entry
16	Removed option component	Manual text entry
17	Replaced component	Manual text entry
18	Maintenance Log initialized. When Maintenance Log is Enabled, Maintenance Log is Reset in Menu, this event will be added. Note: If Master Reset or Factory Reset is detected while terminal is powered up, system try to add this event, but default maintenance Log xr0103 is disabled, this event is not added successfully.	SUCCESS
19	Calibration values manually edited.	SUCCESS
21	Set date or time.	SUCCESS
22	Table exported.	tare, target, cont, caltw1, caltest1
23	Calibration test passed.	SUCCESS
28	Successful zero command	SUCCESS
55	Step calibration performed.	SUCCESS, FAILURE
56	1-Point Test failed.	1-n = failed at step n
57	1-Point Test expired.	"1"= Days
58	1-Point Test passed.	SUCCESS
59	Walk Test failed.	1-n = failed at step n
60	Walk Test expired.	"1" = Days
61	Walk Test passed.	SUCCESS
62	Custom Named Event Test failed.	1-n = failed at step n
63	Custom Named Event Test expired.	"1" = Days
64	Custom Named Event Test passed.	SUCCESS

Event ID 15, 16, 17 are added manually. Other Events are added automatically when the Events are triggered by Operation described in Event Description.

- The Maintenance Log export file, generated by the **Table Data Export** option , is named Terminal_YEAR_MO_HR_MIN_LogName. Example: **IND700_2024_03_12_1113_ErrorLog**. The log file is exported to the terminal's **C:\Export\Terminal Serial Number** folder.
- The log file is exported to the terminal's **C:\Export\Terminal Serial Number** folder. Using the terminal's serial number as the sub-folder name ensures that the listed log items are associated with the specific terminal.
- The file can be exported in either .csv or .xml format. Refer to [Table Functions: Filter, Export, Import, Clear ▶ Page 48] for details on table and log file exports, and [File Transfer ▶ Page 348] for external transfers of files.

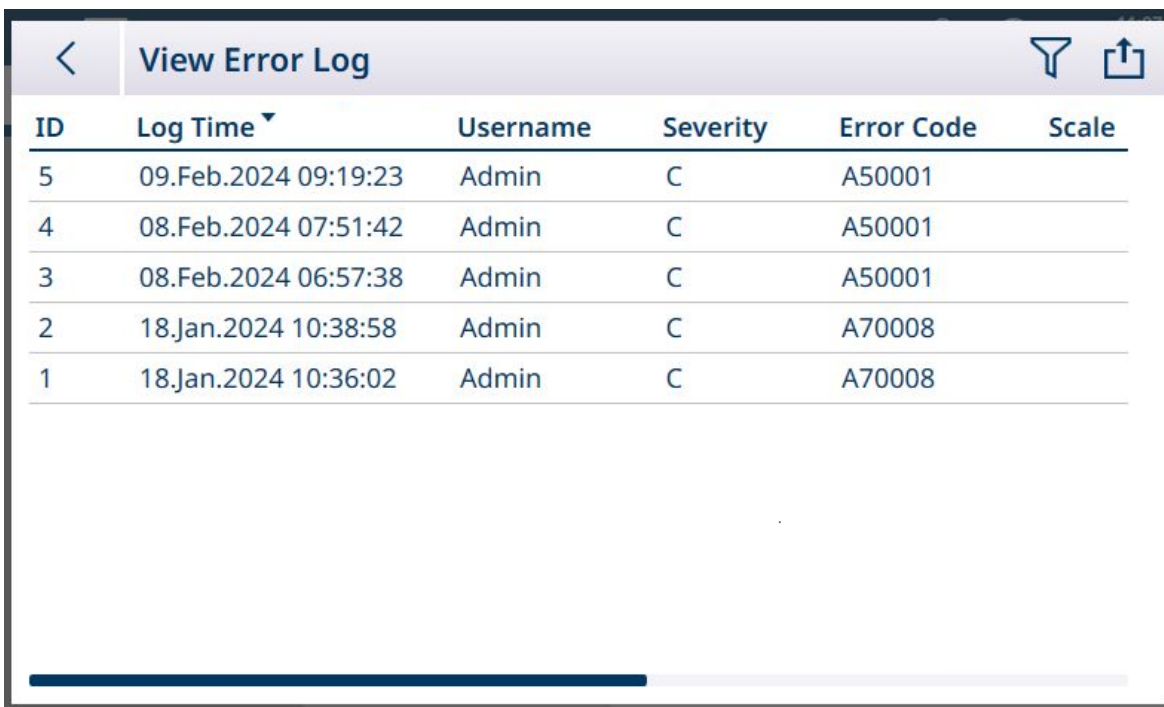
See also

-  Table Functions: Filter, Export, Import, Clear ▶ Page 48
-  File Transfer ▶ Page 348

5.2.2.5 Error Log

The **Error Log** contains a list of all events and alarms that the terminal has generated. Customers or technicians can use this log to trace operations, events and alarms to aid troubleshooting. This log can contain up to 32,000 records.

A typical Error Log view is shown below. For further information about significant events which might be recorded here, refer to [Alarm Codes and Messages ▶ Page 284].




ID	Log Time	Username	Severity	Error Code	Scale
5	09.Feb.2024 09:19:23	Admin	C	A50001	
4	08.Feb.2024 07:51:42	Admin	C	A50001	
3	08.Feb.2024 06:57:38	Admin	C	A50001	
2	18.Jan.2024 10:38:58	Admin	C	A70008	
1	18.Jan.2024 10:36:02	Admin	C	A70008	

Figure 468: Error Log View 1

View Error Log				
r Code	Scale	Message	Message (English)	Detail
I001		No error occurred	-	
I001		No error occurred	-	
I001		No error occurred	-	
I008		Scale 7 not responding.	-	
I008		Scale 7 not responding.	-	

Figure 469: Error Log View 2

- The Maintenance Log export file, generated by the **Table Data Export** option , is named Terminal_YEAR_MO_HR_MIN_LogName. Example: **IND700_2024_03_12_1113_ErrorLog**. The log file is exported to the terminal's **C:\Export\Terminal Serial Number** folder.
- The log file is exported to the terminal's **C:\Export\Terminal Serial Number** folder. Using the terminal's serial number as the sub-folder name ensures that the listed log items are associated with the specific terminal.
- The file can be exported in either .csv or .xml format. Refer to [Table Functions: Filter, Export, Import, Clear ▶ Page 48] for details on table and log file exports, and [File Transfer ▶ Page 348] for external transfers of files.

See also

 Table Functions: Filter, Export, Import, Clear ▶ Page 48

5.3 Communications

This section is intended as a reference concerning only the structure and setup of communication protocols supported by the IND700 terminal.



NOTICE

Incorrect wiring of the communication circuits

The IND700 terminal or interface board can be damaged.

- Wire the communication circuits exactly as shown in Installation.

Serial Interface Parameters

The IND700 main PCB includes one standard 9-pin serial port connector, COM1. This standard port supports RS232, RS422 and RS485 communications, and includes a +5V output and an isolated ground.

An additional serial port is available if a Precision scale interface is installed in the terminal. This 7-pin port is labeled COMx. It supports RS232, RS422 and RS485 communications, but does not include the +5V output and ground pins.

For installation information concerning the optional COMx port, refer to the **IND700 Accessories Installation Guide**, 30753892.

Character framing is programmable in the setup mode -- refer to [Configuration > Communication Setup > Interfaces ▶ Page 210] for details on selecting these parameters. Framing can be:

- 1 start bit
- 7 or 8 ASCII data bits (selectable)
- 0 or 1 parity bit (none, even, or odd)
- 1 stop bit

The baud rate can be configured from 4800 to 115.2K baud.

The IND700 terminal uses software handshaking to control data flow commonly referred to as XON/XOFF handshaking. When a receiving device is getting information from an IND700 terminal and cannot receive any more in its buffer, it sends an ASCII XOFF (13h) telling the IND700 terminal to temporarily stop sending data until its buffer clears.

When the device can receive more data, it sends an ASCII XON (11h) telling the terminal to begin sending data again. This process can occur as often as required by a receiving device.

The XON/XOFF method is the only type of handshaking supported by the IND700.

The terminal supports demand and continuous output modes.



See also

[Configuration ▶ Page 72](#)

[Communication Setup ▶ Page 208](#)

5.3.1 Demand Output Mode

The demand output mode transmits data only when the IND700 terminal receives a print request. Print requests are sent to the terminal when:

- The operator presses the TRANSFER  button or the REPEAT TRANSACTION softkey .
- A discrete input selected as print is triggered.
- An ASCII "P" is sent through a command input port.
- An Industrial Network command to print is received.
- The "Print" command shared data is triggered.

When triggered, data is transmitted in a string programmed in the template editing portion of setup.

Demand mode is used typically when sending data to a printer or PC on a transactional basis.

5.3.2 Output Templates

The IND700 provides ten fully customizable templates to define a custom string of data to be transmitted. A template is used with a demand mode connection. In the setup of the terminal, a template is tied to an output connection so that when that connection is triggered, the selected template and its current contents will be transmitted.

Template 1 is the Automatic Standard Template. Details about its operation can be found in the Operation section ([Automatic Standard (Output) Template ▶ Page 54]) and in this section, below ([Automatic Standard Template ▶ Page 321]).

Each template can store up to 1,000 bytes of data. There is no warning if a template overflows this limit until the template is saved. At this time, any information over the 1,000-byte limit will be lost. The InSite program does track the size of the template as it is being built and provides an appropriate warning if the limit is exceeded.

The table that follows defines how the 1,000 bytes are calculated.

Print Field	Space Used
IND700 Data Field	8 characters
Special Character	4 characters + code (2 or 3 characters depending on the character)
String Field	String length + quantity (1 or 2)
Justify a Field	2 characters + justify letter (L, R, C) + space limit (1, 2, or 3 characters)
Zero Fill a Field	2 characters + Z + space limit (1, 2 or 3 characters)
Repeat Character	5 characters + number (1, 2 or 3 digits for number of times repeated)
Line end <CR><LF>	7 characters

The default Output Template 1 appears as shown below:

Element	Type	Data	Alignment	# Chars	Quantity
1	String	Date:	Left	6	1
2	SD Var	xd0103	Exact	-	-
3	CR/LF	-	-	-	1
4	String	Time:	Left	6	1
5	SD Var	xd0104	Exact	-	-
6	CR/LF	-	-	-	1
7	String	User:	Left	6	1
8	SD Var	xd0171	Exact	-	-
9	CR/LF	-	-	-	1
10	String	Material ID:	Left	13	1

Figure 470: Output Template 1, Default Configuration

Rows in a template can be dragged and dropped using a finger on the screen, to re-order the display of data. In the image below, Row 8 is being dragged.

Element	Type	Data	Alignment	# Chars	Quantity
1	String	Date:	Left	6	1
2	SD Var	xd0103	Exact	-	-
3	CR/LF	-	-	-	1
4	String	Time:	Left	6	1
5	SD Var	xd0104	Exact	-	-
6	CR/LF	-	-	-	1
7	String	User:	Left	6	1
8	SD Var	xd0171	Exact	-	-
9	CR/LF	-	-	-	1
10	String	Scale:	Left	7	1

Figure 471: Template 1, Re-Ordering Rows

As a general rule, the most efficient and least time-consuming way to create templates is to take advantage of the [Automatic Default Template ▶ Page 321] feature. This method does not require access to a list of Shared Data Variables, as the system provides the correct values.

For additional information on configuring templates, refer to [Output Templates ▶ Page 227].

5.3.2.1 Automatic Standard Template

The IND700 features an AST (Automatic Standard Template) function which simplifies the preparation of templates customized for particular uses and applications. Shared Data variables representing all available information (which adds columns to the [Transaction Table ▶ Page 173]) are automatically added to Output Template 1.

To create multiple Output Templates with different automatically-generated content, make the necessary changes to the terminal configuration, then access **Setup > Communication > Output Templates > Template 1**. Here, all the currently configured Transaction Table fields are automatically represented as rows in the table (refer to the five-screen example shown above).

Select the Copy icon  at top left. From the **Copy Template** dialog, click the **To** dropdown list and select the desired template.

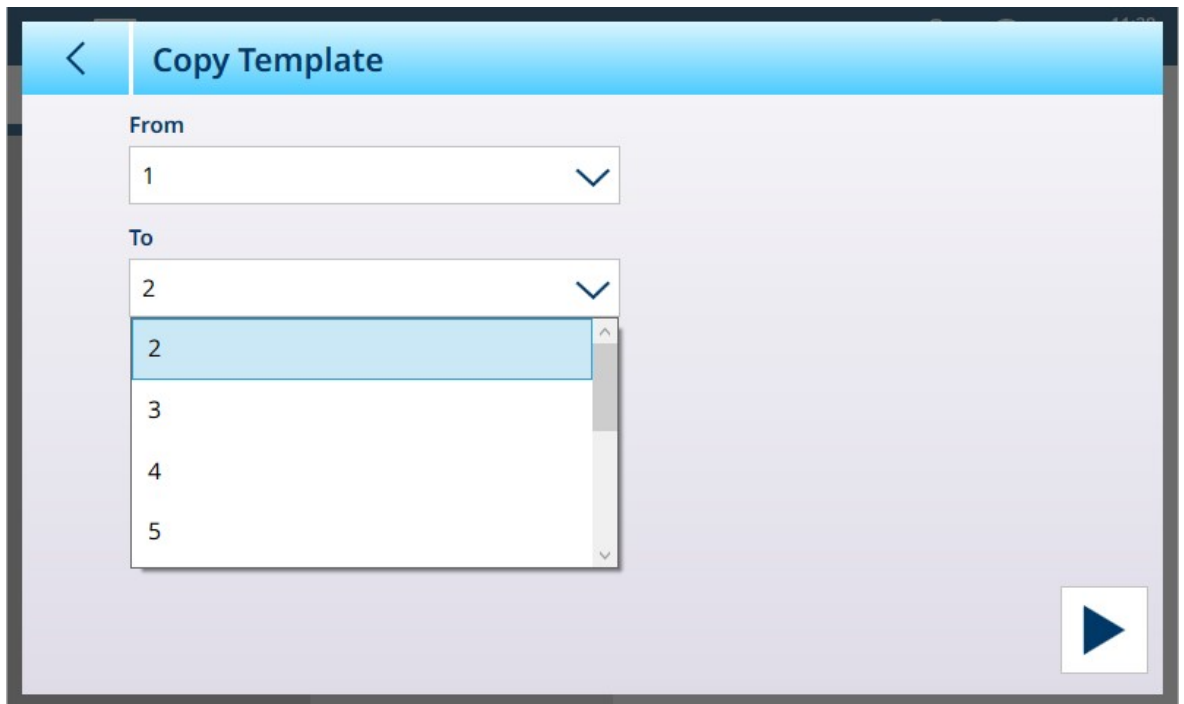


Figure 472: Copy Template Dialog

Click the **Run** icon ► at lower left to execute the copy, then use the left arrow at top left twice to return to the **Output Templates** menu view. Template 2 is now shown as configured.

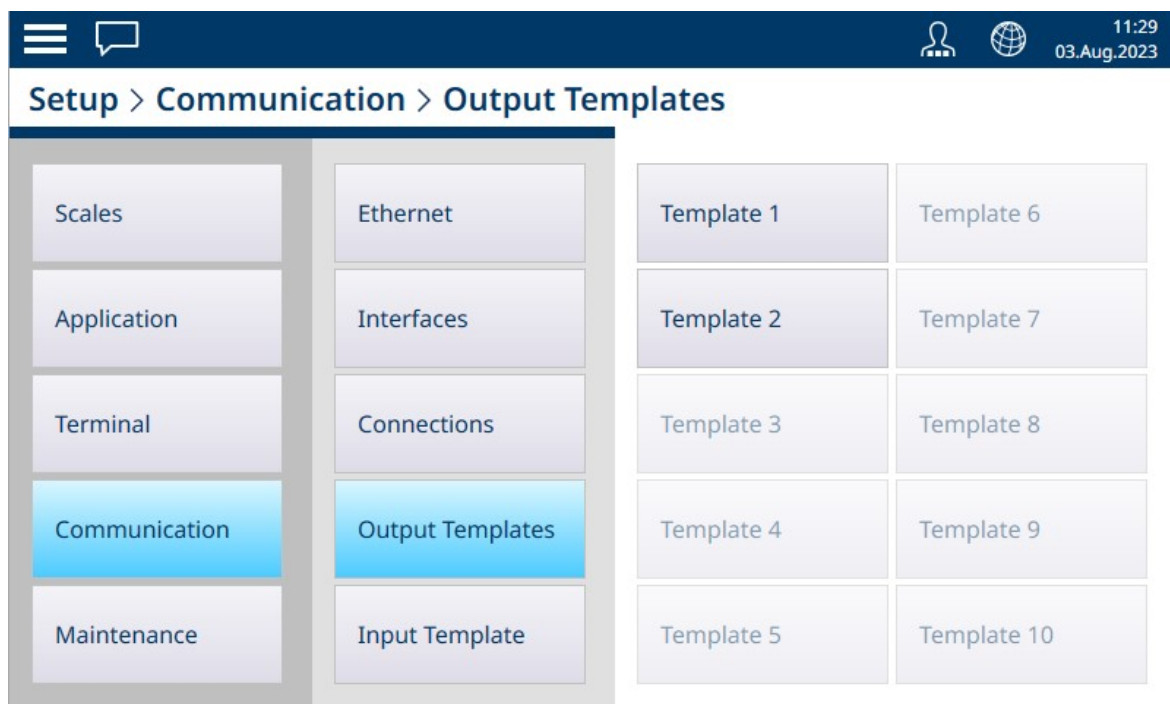


Figure 473: Output Templates Menu View, Template 2 Configured

This customized template -- in this case, Output Template 2 -- can now be used to determine the content and format of the output from a Connection. Multiple connections can be configured and use for different applications using other output templates.

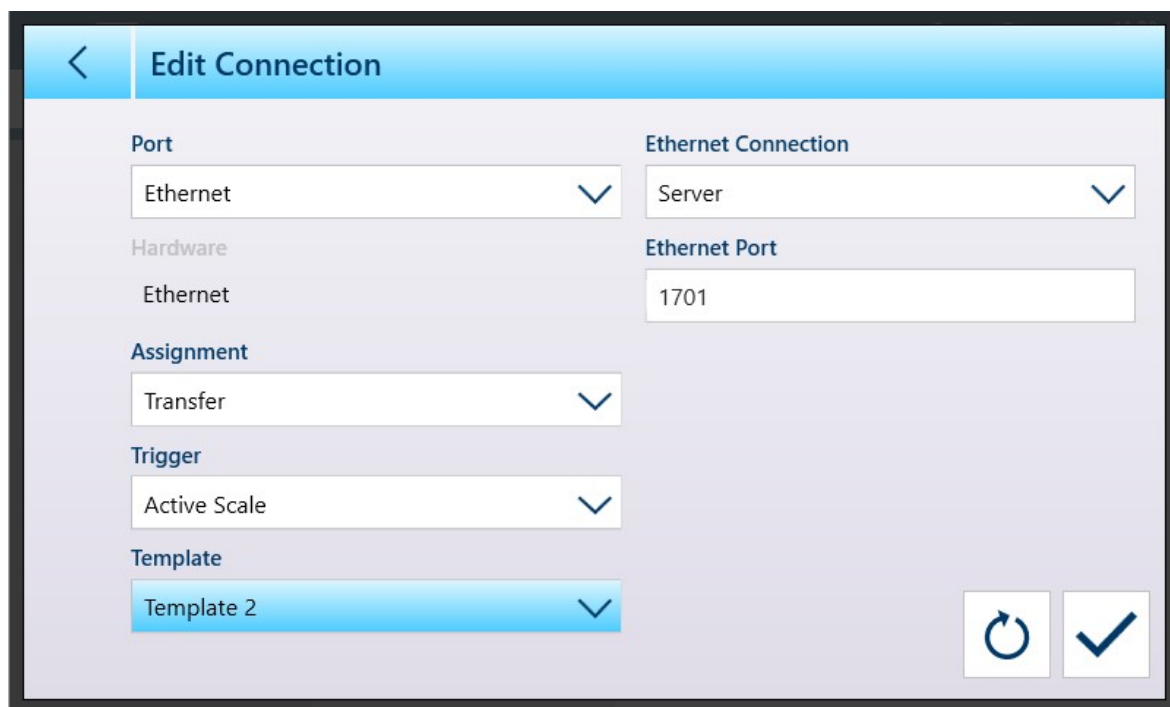


Figure 474: Connection Configuration Screen Showing Template 2 Selected

Template 1 will continue to reflect changes made to the configuration of the weight display. These can then be copied to another template.

Remember that templates can be **Exported** and **Imported**, so that they can be kept safely outside the IND700, and restored to the same terminal or shared with other terminals. This option makes it very easy to standardize output data across multiple terminals.

To access these options in an Output template, click the ellipsis **...** in the menu bar.



Figure 475: Output Templates Menu Bar, Import and Export Icons Displayed

See also

[Transaction Table](#) ▶ Page 173

5.3.3 Continuous Output Mode

The continuous output mode of the IND700 can be used to continuously send weight data and scale status information to a remote device such as a PC or a remote display.

5.3.3.1 Standard Continuous Output

Continuous mode can be assigned to COM1, COM2, COM3, COM4, COM5, COM6 or Eprint. Checksum can be enabled or disabled on any of these ports with continuous output. A data string will be output approximately 20 times per second for baud rates above 4800 baud. A specific output rate can be set through a Shared Data write to field cs0121 (refer to the **IND700 Shared Data Reference**).

The format is fixed, except for baud rate, parity, data flow (XON/XOFF), and interface type. The data consists of 17 or 18 bytes.

Non-significant weight data and tare data digits are transmitted as spaces. The continuous output mode provides compatibility with METTLER TOLEDO products that require real-time weight data.

The table that follows shows continuous format output.

	Status2				Indicated Weight3						Tare Weight4							
Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Data	STX 1	SWA	SWB	SWC	MSD	-	-	-	-	LSD	MS D	-	-	-	-	LSD	CR 5	CH K6

Notes on Continuous Output Format

- ASCII Start of Text character (02 hex), always transmitted.
- Status words.

Status Word A Bit Definitions			
Bits 2, 1, and 0			
2	1	0	Decimal Point Location
0	0	0	XXXXX00
0	0	1	XXXXX0
0	1	0	XXXXXX
0	1	1	XXXXX.X
1	0	0	XXXX.XX
1	0	1	XXX.XXX
1	1	0	XX.XXXX
1	1	1	X.XXXXX
Bits 4 and 3			
4	3		Build Code
0	1		X1
1	0		X2
1	1		X5
Bit 5			Always = 1
Bit 6			Always = 0

Status Word B Bit Definitions	
Status Bits	Function
Bit 0	Gross = 0, Net = 1
Bit 1	Sign, Positive = 0, Negative = 1
Bit 2	Out of Range = 1 (Over capacity or Under Zero)
Bit 3	Motion = 1, Stable = 0
Bit 4	lb = 0, kg = 1 (see also Status Byte 3, bits 0-2)
Bit 5	Always = 1
Bit 6	Zero Not Captured = 1

Status Word C Bit Definitions			
Bits 2, 1, and 0			Weight Description
2	1	0	-
0	0	0	lb or kg, selected by Status Byte B, bit 4
0	0	1	grams (g)
0	1	0	metric tons (t)
0	1	1	ounces (oz)
1	0	0	troy ounces (ozt)
1	0	1	penny weight (dwt)
1	1	1	tons (ton)
1	1	1	custom units
Bit 3			Print Request = 1
Bit 4			Expand Data x 10 = 1, Normal = 0
Bit 5			Always = 1
Bit 6			Always = 0

5.3.3.2 Continuous Template Output

If continuous template is selected as the assignment for a connection, a custom string of data can be configured using one of the five available templates. When a continuous template output is selected, the output rate depends on the size of the template and the baud rate selected. The rate varies from approximately once per second up to approximately 20 times per second.

The table that follows shows the estimated output rates of a 160-byte template.

Continuous Template Output Rate			
Baud Rate	Outputs / Second	Baud Rate	Outputs / Second
4800	8	38400	14
9600	10	57600	16
19200	12	115200	18

The template can include any combination of elements (IND700 Field Codes, ASCII characters, or print strings). Note that the output rate may be adversely affected by transmitting a large template or selecting a slow baud rate.

The template is configured as explained at [Configuration > Communication Setup > Output Templates ▶ Page 227], and this template has the same size restrictions as described above in the Output Templates section of Demand Output Mode.

5.3.4 CTPZ

The CTPZ input mode provides a method for a remote serial device to trigger several basic functions when a control character is sent to the IND700. Remote ASCII control characters and the terminal responses include:

- C – Clears the scale to gross mode
- T – Tares the scale (causes a pushbutton tare)
- P – Initiates a print command
- Z – Zeros the scale

All other characters are ignored. ASCII control characters can be sent in upper- or lower-case.

Example: Initiate A Pushbutton Tare

- 1 Program the terminal for CTPZ input for a specific port.
 - 2 Program the serial port parameters to match the other device.
 - 3 Send the ASCII character "T".
- ➔ A pushbutton tare is initiated.

5.3.5 Standard Interface Command Set (SICS) Protocol

The IND700 terminal supports the METTLER TOLEDO Standard Interface Command Set (MT-SICS), which is divided into four levels (0, 1, 2, 3), depending on the functionality of the device. The IND700 terminal supports parts of levels 0 and 1:

- MT-SICS level 0 – Command set for the simplest device
- MT-SICS level 1 – Extension of the command set for standard devices

A feature of this concept is that the commands combined in MT-SICS level 0 and 1 are identical for all devices. Both the simplest weighing device and a fully expanded weighing workstation recognize the commands of MT-SICS levels 0 and 1.

SICS communication is enabled by configuring the **Assignment** of a [connection ▶ Page 215] as **SICS**.

5.3.5.1 Data Interface Configuration

Interface settings such as baud rate, number of data bits, parity, handshake protocols and connector pin assignments are described in [Configuration > Communication Setup > Interfaces ▶ Page 210].

5.3.5.2 Version Number of the MT-SICS

Each level of the MT-SICS has its own version number, which can be requested with the command I1 from level 0. The IND700 supports:

- MT-SICS level 0, version 2.2x (except the ZI command)
- MT-SICS level 1, version 2.2x (except the D, DW and K commands)

5.3.5.3 Command Formats

Each command received by the scale via the data interface is acknowledged by a response of the device to the transmitter. Commands and responses are data strings with a fixed format.

Commands sent to the IND700 terminal comprise one or more characters of the ASCII character set. Commands are entered only in uppercase.

- The parameters of the command must be separated from one another and from the command name by a space (ASCII 32 dec., in the examples shown in this section, a space is represented as _).
- Each command must be terminated by CR LF (ASCII 13 dec., 10 dec.).

The characters CR and LF, which can be inputted using the ENTER or RETURN key of most entry keypads, are not listed in this description. However, they are essential to be included for communication with the terminal.

Example

Command to tare the terminal: "TA_20.00_lb" (The command terminator CR LF is not shown.)

5.3.5.4 Response Formats

All responses sent by the IND700 terminal to the transmitter to acknowledge the received commands have one of the following formats:

- Response with weight value

- Response without weight value
- Error message

Format of the Response with Weight Value



Figure 476: Format of response with weight value

- ID – Response identification
- _ _ – Space (ASCII 32 dec.)
- Status – Status of the IND700 terminal. See description of the commands and responses.
- Weight Value – Weighing result, which is shown as a number with 10 digits, including sign directly in front of the first digit. The weight value appears right justified. Preceding zeroes are suppressed with the exception of the zero to the left of the decimal point.
- Unit – Weight unit displayed.
- C_R – Carriage Return (ASCII 13 dec.)
- L_F – Line Feed (ASCII 10 dec.)

Example

Response with a stable weight value of 0.256 kg: S _ S _ _ _ _ _ 0.256 _ kg

Format of the Response without Weight Value

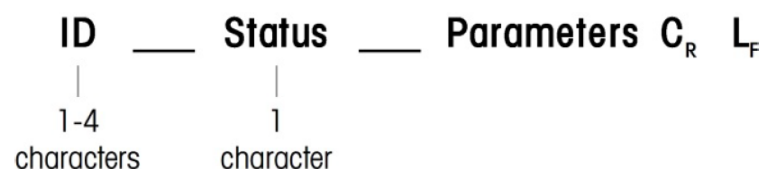


Figure 477: Format of response without weight value

- ID – Response identification
- _ _ _ _ – Space (ASCII 32 dec.)
- Status – Status of the IND700 terminal. See description of the commands and responses.
- Parameters – Command-dependent response code
- C_R – Carriage Return (ASCII 13 dec.)
- L_F – Line Feed (ASCII 10 dec.)

Format of Error Messages

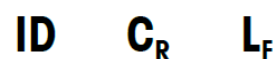


Figure 478: Format of error message

- ID – Error Identification
There are four different error messages. The identification always comprises two characters.
 - ES – Syntax error
The terminal has not recognized the received command.
 - ET – Transmission error
The scale has received a “faulty” command, such as a parity error.
 - EL – Logical error
The command is understood, the parameter is wrong.
 - Internal Error
The command is understood but cannot be executed at this time.
- C_R – Carriage return (ASCII 13 dec.)
- L_F – Line Feed (ASCII 10 dec.)

5.3.5.5 Tips for the Programmer

This section contains tips for using the SICS protocol in the IND700 terminal.

Command and Response

The dependability of application software can be improved by having the program evaluate the response of the terminal to a command. The response is the acknowledgment that the terminal has received the command.

Reset

When establishing communication between the IND700 terminal and system, a reset command can be sent to the terminal to enable a start from a determined state. When the terminal or system is switched on or off, faulty characters can be received or sent.

Quotation Marks (“ ”)

Quotation marks included in the command responses are used to designate fields and will always be sent.

5.3.5.6 Commands & Responses MT-SICS Level 0

The IND700 terminal receives a command from the system computer and acknowledges the command with an appropriate response. This section contains a detailed description of the command set in alphabetical order with the associated responses. Commands and responses are closed with CR and LF. These termination characters are not shown in the following description, but they must always be entered with commands or sent with responses.

The commands of MT-SICS level 0 are available with even the simplest devices, which support the METTLER TOLEDO Standard Interface Command Set. The commands are listed as follows:

- IO Inquiry of all implemented MT-SICS commands
- I1 Inquiry of MT-SICS level and MT-SICS versions
- I2 Inquiry of balance data
- I3 Inquiry of balance SW version and type definition number
- I4 Inquiry of serial number
- S Send stable weight value
- SI Send weight value immediately
- SIR Send weight value immediately and repeat
- Z Zero
- ZI Zero immediately
- @ Reset (clear out serial buffer)

IO – INQUIRY OF ALL IMPLEMENTED MT-SICS COMMANDS

Command: IO – Inquiry of all implemented MT-SICS commands

		Response	
IO B 0 "IO"	Level 0 "IO" command implemented	IO B 0 "I1"	Level 0 "I1" command implemented
IO B 0 "I2"	Level 0 "I2" command implemented	IO B 0 "I3"	Level 0 "I3" command implemented
IO B 0 "I4"	Level 0 "I4" command implemented	IO B 0 "S"	Level 0 "S" command implemented
IO B 0 "SI"	Level 0 "SI" command implemented	IO B 0 "SIR"	Level 0 "SIR" command implemented
IO B 0 "Z"	Level 0 "Z" command implemented	IO B 0 "@"	Level 0 "@" command implemented
IO B 1 "SR"	Level 1 "SR" command implemented	IO B 1 "T"	Level 1 "T" command implemented
IO B 1 "TA"	Level 1 "TA" command implemented	IO B 1 "TAC"	Level 1 "TAC" command implemented
IO B 1 "TI"	Level 1 "TI" command implemented		

Error Response IO I - Cannot execute command at this time.

I1 – INQUIRY OF MT-SICS LEVEL AND MT-SICS VERSIONS

Command: I1 – Inquiry of MT-SICS level and MT-SICS versions

Response: I 1 _ A _ "" _ "2.2x" _ "2.2x" _ " " _ ""	
""	No Levels fully implemented
2.2x	Level 0, version V
2.2x	Level 1, version V2.2x
""	No MT-SICS 2 commands
""	No MT-SICS 3 commands
Error Response I1 _ I – Command understood, not executable at present.	

Comments

- In the case of the MT-SICS level, only fully implemented levels are listed. In this case, neither level 0 nor level 1 were fully implemented so the level is not specified.
- In the case of the MT-SICS version, all levels are specified even those only partially implemented.

I2 – INQUIRY OF DATA

Command: I2 – Inquiry of data.

Response: I 2 _ A _ "IND700 _ Standard _50.00 kg"

Response: I 2 _ A _ "IND700 _ 700Fill _50.00 kg"

- IND700 - Model number of terminal
- Standard - Basic model with no special application software
- 700Fill - Sent when an IND700-Fill is queried
- 50.00 kg - Capacity and primary unit of the base connected to the IND700
- Error Response I2 _ I – Command understood, not executable at present.

Comments

The number of characters of "text" depends on the application software and scale capacity.

I3 – INQUIRY OF SW VERSION AND TYPE DEFINITION NUMBER

Command I3: Inquiry of SW version number(s) and type definition number.

Response: I3 _ A _ "200.11"

- 2.00.11 – Firmware version of the IND700
- Error Response I3 _ I – Command understood, not executable at present.

Comment

The number of characters of "text" depends on the revision and device type.

I4 – INQUIRY OF SERIAL NUMBER

Command: I4 – Inquiry of serial number.

Response: I4 _ A _ "text"

- Serial number as "text" (content of shared data xs0105 in IND700 terminal)
- Error Response I4 _ I – Command understood, not executable at present.

Example

Command: I 4 – Inquiry of serial number

Response: I 4 _ A _ "123456-6GG"

Comments

The serial number response is the content of the terminal serial number as entered in the setup.

S – SEND STABLE WEIGHT VALUE

Command: S – Send the current stable net weight.

Response:

- S _ S _ WeightValue _ Unit – Current stable weight value.
- S _ I – Weight value is in the current displayed units.
- S _ + – IND700 in overload range.
- S _ - – IND700 in underload range.

Example

Command: S – Send a stable weight value.

Response: S _ S _ _ _ _ _ 100.00 _ kg. – The current, stable weight value is 100.00 kg.

Comments

The terminal will wait for up to 3 seconds after receiving an “S” command for no-motion. If motion does not settle within this time, the command is aborted.

SI – SEND WEIGHT VALUE IMMEDIATELY

Command: SI – Send the current net weight value regardless of scale stability.

Response:

- S _ S _ WeightValue _ Unit – Stable weight value.
- S _ D _ WeightValue _ Unit – Non-stable (dynamic) weight value.
- S _ I – The command is understood, cannot execute the received command at this time (scale currently executing another command, such as tare).
- S _ + – IND700 in overload range.
- S _ - – IND700 in underload range.

Example

Command: SI – Send current weight value.

Response: S _ D _ _ _ _ _ 129.07 _ kg – The current weight value is unstable (dynamic) and is 129.07kg.

Comments

- The response to the command SI is the last internal weight value (stable or dynamic) before receipt of the command SI.
- Weight value is in the current displayed units.

SIR – SEND WEIGHT VALUE IMMEDIATELY AND REPEAT

Command: SIR – Send the net weight values repeatedly, regardless of scale stability.

Response:

- S _ S _ WeightValue _ Unit – Stable weight value.
- S _ D _ WeightValue _ Unit – Non-stable (dynamic) weight value.
- S _ I – The command is understood, cannot execute the received command at this time (IND700 terminal is executing another command, such as tare).
- S _ + – IND700 in overload range.
- S _ - – IND700 in underload range.

Example

Command: SIR – Send current weight values at intervals.

Response:

- S _ D _ _ _ _ _ 129.07 _ kg
- S _ D _ _ _ _ _ 129.08 _ kg
- S _ D _ _ _ _ _ 129.09 _ kg
- S _ D _ _ _ _ _ 129.09 _ kg
- S _ D _ _ _ _ _ 114.87 _ kg
- . . . – The scale sends stable or non-stable weight values at intervals.

Comments

- SIR is overwritten and cancelled by the commands S, SI, SR, and @.
- The number of weight values per second depends on the scale type and will vary from approximately 6 (older IDNet bases) to approximately 50 (SICSpro bases).
- Weight value is in the current displayed units.

Z – ZERO

Command: Z – Zero the scale.

Response:

- Z _ A – The following then holds:
Scale is in gross mode
Zero setting performed, (stability criterion and zero setting range complied with).

- Z_ I – The command is understood, cannot execute the received command at this time (IND700 terminal is currently executing another command, such as tare, or timeout as stability was not reached.)
- Z_ + – Upper limit of zero setting range exceeded.
- Z_ - – Lower limit of zero setting range exceeded.

Example

Command: Z – Zero.

Response: Z_ A – Zero setting performed.

Comments

- If enabled in setup a tare value will be cleared during zero setting.
- The zero point determined during switching on is not influenced by this command (the measurement ranges remain unchanged).
- The duration of the timeout is approximately one second.

ZI - ZERO IMMEDIATELY

Command:

ZI - Zero the scale irrespective of stability

Response:

- ZI_D Zero setting performed under dynamic conditions
- ZI_S Zero setting performed under stable conditions
- Z_I Command understood but not executable
- Z_+ Upper limit of zero setting range exceeded
- Z_- Lower limit of zero setting range exceeded

Example

Command: ZI Zero immediately

Response: ZI_S Zero setting performed, scale was stable

Comments

- Tare memory is cleared during zero setting
- The zero point determined during switching on is not influenced by this command. i.e. the measurement ranges remain unchanged

@ – RESET

Command: @ – Reset the scale to the condition found after switching on, but without a zero setting being performed.

Response: I 4 _ A _ "text" – Serial number of the scale, the scale is ready for operation.

Example

Command: @

Response: I4 _ A _ "123456-6GG" – The IND700 terminal is reset and sends the serial number.

Comments

- All commands awaiting responses are canceled.
- The "reset" command is always executed.
- A reset command received by the IND700 terminal during the calibration and test procedure cannot be processed.

5.3.5.7 Commands & Responses MT-SICS Level 1

The following commands of MT-SICS level 1 are available:

- D - Write to Terminal Display
- DW - Display Standard Weight Display
- K – Keyboard Monitoring
- SR – Send weight value on weight change (Send and Repeat)
- TA – Set tare value
- TAC – Clear tare value
- TI – Tare Immediately

D - WRITE TO TERMINAL DISPLAY

Command:

D D_ "text" (" " are required for proper command execution)

D " " (clears previously transmitted text from the Data line)

Responses:

- D_A – Text appears unabridged, left-aligned in Data line just above the softkeys
- D_R – The end of the text appears in Data line. The start of the text is cut off and marked by the symbol "*".
- D_I – Command is understood but cannot be executed at this time. (the IND700 terminal is currently executing another command, such as tare, or timeout as stability was not reached.)
- D_L – Command understood, parameter wrong.

Example

Command: D_ "HELLO"

Response: D_A – "HELLO" appears in the Data line.

Note: The maximum number of characters of "text" visible in the Data line is 30. Above 30 characters, beginning characters in the string will be dropped represented with a "*".

DW - DISPLAY STANDARD WEIGHT DISPLAY

Command: DW – Returns display to previous settings/status.

Responses:

- DW_A – Display showing previous settings/status.
- DW_I – Command understood, parameter wrong.

K - KEYBOARD MONITORING

Commands

- K_1 When a key is pressed, **execute** the corresponding function but **do not send** the corresponding key code
- K_2 When a key is pressed, **do not execute** the corresponding function and **do not send** the corresponding key code
- K_3 When a key is pressed, **do not execute** the corresponding function but **send** the corresponding key code
- K_4 When a key is pressed, **execute** the corresponding function and **send** the corresponding function code.
If the corresponding function cannot be executed immediately, the function code K_B_y for the start of the function and K_A_y or K_I_y for the end of the function are sent
This behavior applies to taring, zeroing, calibrating, testing, transferring, etc.
If a function cannot be executed, the function code K_I_y is sent

Responses

- K_A Command executed successfully
- K_I Command understood but not executable
- K_L Command understood but not executable, wrong or missing parameter

Example for K_3 mode

Command K_3: Disable keyboard

K_A: K_3 mode enabled

K_C_2: Zero key pressed

K_C_4: Transfer key pressed

SR – SEND WEIGHT VALUE ON WEIGHT CHANGE (SEND AND REPEAT)

Command: SR

- S R _ PresetValue _ Unit – Send the current stable weight value and then continuously after every weight change greater or equal to the preset value a non-stable (dynamic) value followed by the next stable value, range = 1d to maximum load.
- SR – If no preset value is entered, the weight change must be at least 12.5% of the last stable weight value, minimum = 30d.

Response:

- S _ S _ WeightValue _ Unit – Current, stable weight value. Weight change.
- S _ D _ WeightValue _ Unit – Non-stable weight value.
- S _ S _ WeightValue _ Unit – Next stable weight value.
- S _ I – The command is understood, the received command cannot be executed at this time (the IND700 terminal is currently executing another command, such as tare, or timeout as stability was not reached.)
- S _ L – Command understood, parameter wrong.
- S _ + – IND700 in overload range.
- S _ - – IND700 in underload range.

Example

Command: S R _ 0.50 _ kg – Send the current stable weight value followed by every load change > 0.50 kg.

Response:

- S _ S _ _ _ _ _ 100.00 _ kg – Scale stable.
- S _ D _ _ _ _ _ 115.23 _ kg – More than 0.50 kg loaded.
- S _ S _ _ _ _ _ 200.00 _ kg – Scale again stable.

Comments

- SR is overwritten and cancelled by the commands S, SI, SIR, @ and hardware break.
- If, following a non-stable (dynamic) weight value, stability has not been reached within the timeout interval, the response “S _ I ” is sent and then a non-stable weight value. Timeout then starts again from the beginning.
- The preset value must be entered in the first unit that is the weight unit displayed after the IND700 terminal is switched on.

T – TARE

Command: T – Tare a stable weight value

Response:

- T_S_WeightValue_Unit – Taring performed. Stability criterion and taring range comply with settings.

Current Tare weight value in current units is returned.

- T _ I – Taring not performed (scale is executing another command, zero setting, or stability timeout reached.)
- T_+ – Upper limit of taring range exceeded.
- T_- – Lower limit of taring range exceeded.

Example

Command: T

Response: T_S_ _ _ _ _ 100.00_kg – The IND700 accepts a tare value of 100.00 kg.

Comments

- The new tare weight value overwrites tare memory.
- The duration of the timeout depends on the scale type and its settings. If motion does not settle within this time, the command is aborted.
- Clearing tare value: See command TAC

TA – INQUIRE/ENTER TARE VALUE

Command:

- TA – Inquiry of tare weight value
- TA _ Tare Preset Value _ Unit – Entry of a tare value.

Response:

- T A _ A _ TareWeightValue _ Unit – Current Tare weight value.
- T A _ I – The command is understood, the received command cannot be executed at this time (the IND700 terminal is currently executing another command, such as zero setting).
- T A _ L – Command understood, parameter wrong.

Example

Command: T A _ 10.00 _ kg – Load a preset tare of 10 kg.

Response: T A _ A _ _ _ _ _ 10.00_k g – The IND700 accepts the 10.00 kg tare value.

Comments

- The existing tare will be overwritten by the preset tare weight value.
- The IND700 terminal will automatically round the inputted tare value to the current readability.
- The preset value must be entered in the current units.

TAC – CLEAR TARE VALUE

Command: TAC – Clear tare value.

Response:

- TAC _ A – Tare value cleared.
- TAC _ I – The command is understood, the received command cannot be executed at this time (the IND700 terminal is currently executing another command, such as zero setting, or timeout as stability was not reached).

TI – TARE IMMEDIATELY

Command: TI – Tare immediately, (store the current weight value, which can be stable or nonstable (dynamic), as tare weight value).

Response:

- T I _ S _ WeightValue _ Unit – Taring performed, stable tare value.
- T I _ D _ WeightValue _ Unit – Taring performed, non-stable (dynamic) tare value.
- T I _ I – The command is understood, the received command cannot be executed at this time (the IND700 terminal is currently executing another command, such as zero setting.)
- T I _ L – The command is understood, the parameter is wrong.
- T I _ + – Upper limit of taring range exceeded.
- T I _ - – Lower limit of taring range exceeded.

Example

Command: TI – Tare.

Response: T I _ D _ _ _ _ _ 117.57 _ kg – The tare memory holds a non-stable (dynamic) weight value.

Comments

- Any previous tare value will be overwritten by the new tare weight value.
- Even during a non-stable (dynamic) condition, a tare weight value can be determined. However, the tare value determined in this manner may not be accurate.
- The stored tare weight value is sent in the current units.

5.3.5.8 Commands & Responses MT-SICS Level 2

The following commands of MT-SICS level 2 are available:

- PRN – Initiate a printout/transfer
- R - Switch keyboard on or off
- SIH – Send net weight value in high resolution immediately
- SIRU – Send weight value with currently-displayed unit immediately, and repeat
- SIS – Inquiry of the current net information with the currently-displayed unit and with status information
- SIU – Send weight value with currently-displayed weight immediately
- SRU – Send weight value with currently-displayed unit on weight channel (send and repeat)
- ST – Send stable weight value after pressing transfer key
- SU – Send stable weight value with currently-displayed unit
- SV – Send stable net weight value
- SVI – Send net weight value immediately
- SVIR – Send net weight value immediately and repeat
- SWU – Switch display unit
- SX - Send stable weight data
- SXI - Send weight data immediately
- U - Switch units

PRN - INITIATE A PRINTOUT/TRANSFER

Command: PRN

Responses:


- PRN_A: Command executed successfully
- PRN_I: Command understood but not executable

Example

Command: PRN: Initiate printout/transfer

Response: PRN_A: Command executed successfully

Comments

- A printer must be correctly connected to an interface, or a transfer destination defined in setup
- The printout can be configured in the Communication menu
- The PRN command has the same effect as the TRANSFER key 

R - SWITCH KEYPAD ON OR OFF

Command: R

- R0 – Switch on IND700 keypad.
- R1 – Switch off IND700 keypad.

Responses:

- R0 _ A – Keypad enabled
- R1 _ A – Keypad disabled

Example

Command: R1 – Disable terminal keypad and keyboard.

Response: R1 _ A – Keypad and keyboard disabled.

Comments

- By default and after power-up the keypad is always enabled
- When the keypad is disabled, the terminal cannot be manually operated

SIH – SEND NET WEIGHT VALUE IN HIGH RESOLUTION IMMEDIATELY

Command: SIH

Responses:

- H_S_Weight value_unit: Stable net weight in high-resolution and in the unit currently set as Unit 1
- H_D_Weight value_unit: Dynamic net weight in high-resolution and in the unit currently set as Unit 1
- H_I: Command understood but not executable
- H_+: Scale in overload range
- H_-: Scale in underload range

Example

Command: SIH

Respond: H_S_____1.99982_kg -- current net weight in high resolution is 1.99982 kg and stable

Comments

- Like SI command
- High resolution data i.e. highest possible resolution of the connected scale

SIRU – SEND WEIGHT VALUE WITH CURRENTLY-DISPLAYED UNIT IMMEDIATELY, AND REPEAT

Command: SIRU - like the [SIR command ▶ Page 327], but send the weight value immediately with the currently displayed unit, and repeat

Responses:

- S_S_Weight value_Unit: Current stable weight in currently-displayed unit
- S_D_Weight value_Unit: Dynamic (unstable) weight in currently-displayed unit
- S_I: Command understood but not executable
- S_+: Scale in overload range
- S_-: Scale in underload range

SIS – INQUIRY OF THE CURRENT NET INFORMATION WITH THE CURRENTLY-DISPLAYED UNIT AND WITH STATUS INFORMATION

Command: SIS

Responses:

- SIS_A_Status_ "Value" _Unit _Dec _Step _App _Info
 Status - refer to table below
 Value - net weight value
 Unit - refer to table below
 Dec - number of decimal places
 Step - Display step
 App - refer to table below
 Info - refer to table below
- S_I: Command understood but not executable

Status Information

0	=	Stable weight value
1	=	Dynamic weight value
2	=	Stable value below MinWeigh
3	=	Dynamic value below MinWeigh
4	=	Overload
5	=	Underload
6	=	Error, invalid

Unit Information

0	=	g
1	=	kg
2	=	t
7	=	lb
8	=	oz
9	=	lb-oz

Approval State Information

0	=	Not approved
1	=	Approved, e=d
2	=	Approved, e=10d

Weight Information

0	=	Without tare
1	=	Net with weighed tare
2	=	Net with preset tare

Example

Command: SIS

Response: SIS_A_0_"0.007"_1_3_1_0_0 -- Stable weight value 0.007 kg, 3 decimal places, display step 1, not approved, without tare

SIU – SEND WEIGHT VALUE WITH CURRENTLY-DISPLAYED WEIGHT IMMEDIATELY

Command: SIU

Responses:

- S_S_Weight value_Unit: Current stable weight value in the currently-displayed unit
- S_D_Weight value_Unit: Dynamic (unstable) weight value in the currently-displayed unit
- S_I: Command understood but not executable
- S_+: Scale in overload range

- S₋: Scale in underload range

Example

Command: SIU

Response: S_D_____129.07_lb or S_S_____129.11_lb-- The scale sends stable or unstable weight continuously in the currently-displayed unit

SRU – SEND WEIGHT VALUE WITH CURRENTLY-DISPLAYED UNIT ON WEIGHT CHANNEL (SEND AND REPEAT)

Inquiry Command: SRU_Preset value_Unit

Responses:

- S_S_Weight value_Unit: Current stable weight in the unit currently set as Unit 1
-- weight change --
- S_D_Weight value_Unit: Dynamic (unstable) weight in the unit currently set as Unit 1
-- stable --
- S_S_Weight value_Unit: Next stable weight in the unit currently set for Unit 1
- S_I: Command understood but not executable
- S_L: Command understood but not executable, wrong or missing parameter
- S₊: Scale in overload range
- S₋: Scale in underload range

ST – SEND STABLE WEIGHT VALUE AFTER PRESSING TRANSFER KEY

Inquiry Command: ST

Responses:

- ST_A_x:

x = 0	Function inactive; do not send weight value when transfer key is pressed
x = 1	Function active until restart of the scale or the restart command is sent; weight will be sent when transfer key is pressed
x = 2	Function permanently active, even after device is restarted; weight will be sent when transfer key is pressed

- ST_I: Command understood but not executable

Setting Command: ST_x, where x is as for response above

Response: ST_A -- Command executed successfully

Example

Command: ST₁ -- Activate ST function

Response:

- ST_A -- ST function activated
-- Transfer key pressed --
- S_S_____123.456_g -- current net weight is 123.456 g

Comments

- ST₀ is the default setting (function inactive)
- The duration of the timeout depends on the scale type

SU – SEND STABLE WEIGHT VALUE WITH CURRENTLY-DISPLAYED UNIT

Command: SU -- like the [S command ▶ Page 327], but send the current stable weight value with the currently-displayed unit

Responses:

- S_S_Weight value_Unit: Current stable weight value in currently-displayed unit
- S_I: Command understood but not executable
- S₊: Scale in overload range
- S₋: Scale in underload range

Example

Command: SU

Response: S_S_____100.00_g -- the current stable weight value is 100.00 g

Comment

- The duration of the timeout depends on the scale type

SV – SEND STABLE NET WEIGHT VALUE

Command: SV

Responses:

- SV_Weight value_Unit____HR value, where **Weight value** = net weight value, **HR value** = High resolution net weight value
- SV_I: Command understood but not executable
- SV_+: Scale in overload range
- SV_-: Scale in underload range

Example

Command: SV

Response: SV_____1.995_kg_____1.9972 -- stable net weight is 1.995 kg, stable high resolution weight is 1.9972 kgh

SVI – SEND NET WEIGHT VALUE IMMEDIATELY

Command: SVI

Responses:

- SV_Weight value_Unit____HR Value -- stable weight
- SVD_Weight value_Unit_D_HR value -- dynamic (unstable) weight
D: D if weight value dynamic, blank if stable
Weight value: Net weight value
HR value: High resolution net weight value
- SV_I: Command understood but not executable
- SV_+: Scale in overload range
- SV_-: Scale in underload range

SVIR – SEND NET WEIGHT VALUE IMMEDIATELY AND REPEAT

Command: SVIR

Responses:

- SV__Weight value_Unit____HR Value
- SVD_Weight value_Unit_D_HR Value
D: D if dynamic weight, blank if stable
Weight value: Net weight value
HR value: High resolution net weight value
- SV_I: Command understood but not executable
- SV_+: Scale in overload range
- SV_-: Scale in underload range

Example

Command: SVIR

Response: SVD_____0.826_kg____D_____0.8263

Response: SV_____0.876_kg_____0.8764

Comment

- SVIR is overwritten, and hence cancelled, by all send commands and hardware breaks

SWU – SWITCH DISPLAY UNIT

Command: SWU -- switch to next display unit

Responses:

- SWU_A: Command executed successfully
- SWU_I: Command understood but not executable

Comments

The available units depend on

- The setting of unit 1, Unit 2 and Unit roll (On/Off)
- The approval status of the scale

SX - SEND STABLE WEIGHT DATA

Command: SX – Send the current stable weighing data.

Responses:

- SX _ S _ x1 _ y _ x2 _ y _ x3 _ y – Stable weight data where x1 = G _ GrossWeight, x2 = N _ NetWeight, x3 = T _ TareWeight, y = WeightUnits.
- SX _ I – Command not performed (scale is executing another command, zero setting, or stability timeout reached).
- SX _ + – Scale in overload range. SX _ - – Scale in underload range.

Example

Command: SX – Send stable weight data.

Response: SX _ S _ G _ _ _ _ _ 15620 _ kg _ _ _ N _ _ _ _ _ 15305 _ kg _ _ _ T _ _ _ _ _ 315 _ kg _ – The current, stable gross, net and tare weight data is sent.

Comments

- The duration of the timeout depends on the scale type and its settings. If motion does not settle within this time, the command is aborted.
- The weight values are in the current displayed units.

SXI - SEND WEIGHT DATA IMMEDIATELY

Command: SXI – Send the current weighing data immediately regardless of scale stability.

Responses:

- SX _ S _ x1 _ y _ x2 _ y _ x3 _ y – Current stable weight data where x1 = G _ GrossWeight, x2 = N _ NetWeight, x3 = T _ TareWeight, y = WeightUnits.
- SX _ D _ x1 _ y _ x2 _ y _ x3 _ y – Current unstable weight data where x1 = G _ GrossWeight, x2 = N _ NetWeight, x3 = T _ TareWeight, y = WeightUnits.
- SX _ I – Command not performed (scale is executing another command).
- SX _ + – Scale in overload range.
- SX _ - – Scale in underload range.

Example

Command: SXI – Send the current weighing data immediately.

Responses:

- SX _ S _ G _ _ _ _ _ 22220 _ kg _ _ _ N _ _ _ _ _ 22220 _ kg _ _ _ T _ _ _ _ _ 0 _ kg _ – The current, stable gross, net and tare weight data is sent.
- SX _ D _ G _ _ _ _ _ 2.520 _ ton _ _ N _ _ _ _ _ 2.520 _ ton _ _ T _ _ _ _ _ 0.000 _ ton – The current, unstable dynamic gross, net and tare weight data is sent.

Comments

- The response to the command SXI is the last internal weight value (stable or dynamic) before receipt of the command SXI.
- Weight value is in the current displayed units.

U - SWITCH UNITS

Command:

- U Switch to main primary units
- U_Unit Switch to specified units

Responses:

- U _ A – Units switched
- U _ I – Command not performed (incorrect units specified)

Comments

- Units switching is limited to the current settings for the primary and secondary units

5.3.5.9 Commands & Responses MT-SICS Level 3

The following commands of MT-SICS level 3 are available:

- AMR - Readout Alibi data
- AR - Read Shared Data file
- AW - Write Shared Data file
- DY - Specify SmarTrac target value
- I11 - Inquiry of model designation
- I14 - Inquiry/setting of ID3
- SNS – Inquiry/setting of the active scale
- STA – Preset tare weight value in the defined unit
- UPD - Update rate of host interface

AMR - READOUT OF ALIBIT MEMORY DATA

Command: AMR_OPT

OPT definitions:

All	Send all Alibi data
First	Send the first (oldest) Alibi record
Last	Send the last (newest) Alibi record
ID_x	Send Alibi record number x
ID_x_y	Send Alibi records numbers x to y
DT_DD/MM/YYYY	Send alibi records from date DD/MM/YYYY
SEP_x	Define data separator (factory setting: ";")

Responses:

- AMR_A Command executed successfully
- AMR_I: Command understood but not executable

AR – READ SHARED DATA FIELD

Command: AR _ SDName – Read a specific shared data field.

Responses:

- AR _ A _ SDValue – Shared data field value returned (Content format is dependent on the shared data field type)
- AR _ I – Command not performed (invalid shared data field)

Example

Command: AR _ wf0101 – Read displayed gross weight for scale 1.

Response: AR _ A _ " _ _ _ _ _ 12.180" – The displayed gross weight value is returned.

Command: AR _ wx0131 – Read scale 1 motion status.

Response: AR _ A _ 0 – Scale 1 motion status returned.

Comments

- SDName is the shared data field name with a length of six A/N characters.
- String type SDValue fields returned are surrounded by quote marks
- Array type SDValue fields are returned as a series of values separated by spaces
- Composite variables of the entire shared data block are not supported.

AW - WRITE SHARED DATA FIELD

Command: AW_SDName_SDValue - write to a specific shared data field

Responses:

- AW _ A – Written successfully to shared data field.
- AW _ I – Invalid shared data field.
- AW _ L – Shared data field cannot be written.

Example

Command: AW _ wc0101 _ 1 – Pushbutton tare for scale 1.

Response: AW _ A – Scale 1 pushbutton tared.

Command: AW _ aw0101 _ "HELLO" – Write the text HELLO to message table ID 1.

Response: AW _ A – HELLO is written into the message table ID 1.

Comments

- SDName is the shared data field name with a length of six A/N characters.
- String type SDValue fields have to be surrounded by quote marks.
- Array type SDValue fields have to be formatted as a series of values separated by spaces.
- Composite variables of the entire shared data block are not supported.
- Only operator and supervisor level access SDName fields can be written to.

DY - SPECIFY SMARTRAC TARGET VALUE

- DY _ TargetWeight _ Unit _ LowTol _ Unit _ HighTol _ Unit – Specify the active target and tolerance values in weight units.
- DY _ TargetWeight _ Unit _ Tol _ % – Specify the active target and percentage tolerance values.
- DY – Clear the active target and tolerance values to zero.

Responses:

- DY _ A – Target and tolerance values are set.
- DY _ I – Command not performed (specified units are not valid).

Example

Command: DY _ 150 _ lb _ 12 _ lb _ 10 _ lb – Set target = 150 lb, low tolerance = 12 lb and high tolerance = 10 lb.

Response: DY _ A – Target and tolerance values are set for the scale.

Command: DY _ 100 _ kg _ 10 _ % – Set target = 100 kg and low / high tolerance = 10 % of target.

Response: DY _ A – Target and tolerance values are set for the scale.

Comments:

- Weight units can only be specified in the primary or secondary units for the scale. Tolerance weight units must match the target weight units.
- % tolerance can be entered provided it is enabled in SETUP as the appropriate target tolerance type.
- Target and tolerance entries must match displayed increment sizes.

I11 - INQUIRY MODEL DESIGNATION

Command: I11 Inquiry of model designation of the weighing terminal

Responses:

- I11_A_ "text" Text represents the model designation
- I11_I The model designation cannot be transferred at present as another operation is taking place.

Example

Command: I11

Response: I10_A_ "IND700"

Comments

- The scale can display the device name
- The device name has a max. length of 40 characters
- The device name cannot be changed

I14 - INQUIRY/SETTING OF IDENTIFICATION ID3

Command: I14 Inquiry of Identification 3

Response: I14_A_ "text" Text specified Identification 3

Setting

Command: I14_ "text" Set the text for ID3

Responses:

- I14_A: Identification 3 has been set
- Identification 3 cannot be set at present
- Identification 3 is too long, or wrong parameter

Comments

- The scale can display, transfer and print the identifications.
- Up to 40 characters can be entered

SNS - INQUIRY/SETTING OF THE ACTIVE SCALE

Inquiry Command: SNS

Inquiry Responses:

- SNS_x: x = active scale
- SNS_I: Command understood but not executable

Setting Command: SNS_x

- SNS_x: Sets x as the active scale

Setting Responses

- SNS_A: Command executed successfully
- SNS_I: Command understood but not executable
- SNS_L: Command understood but not executable - wrong or missing parameter

STA - PRESET TARE WEIGHT VALUE IN THE DEFINED UNIT

Command

- STA_Weigh value_Unit: Presets a tare value in the defined unit

Responses:

- STA-A_Weigh_value_Unit: Current tare weight value in the unit currently set under Unit 1
- STA_L: Command understood but not executable; reemote scale active or average weighing inactive
- STA_I: Command understood but not executable

Example

Command: STA_100.00_g -- sets a tare value of 100.00 grams

Response: STA_A_____100.00_g -- the scale has 100.00g in the tare memory

Comments

- The tare memory will be overwritten by the preset tare weight
- The input tare value will be automatically rounded by the scale to its current readability
- If no unit is entered, the currently displayed unit will be used
- The taring range is specific to the scale type

UPD - UPDATE RATE OF HOST INTERFACE

Command: UPD Query the host interface update rate

UPDD_<rate> Set the update rate

- UPD_A_<rate> Current host update rate
- UPD_I Command understood but not currently executable (balance is currently executing another command)
- UPD_L Command understood but not executable (incorrect parameter, etc.)

5.3.6 Remote Discrete I/O (ARM100)

The IND700 provides the ability to expand its discrete input and output control options to include up to eight ARM100 devices. This ability is required when more inputs and outputs are needed than are natively supported by the IND700 mainboard and option boards. Depending on the application, it may be beneficial to have all the I/O external to the terminal.

The communication link from the IND700 terminal to an ARM100 remote discrete I/O module is an RTU-based RS-485 communication protocol. During power-up, if remote discrete I/O has been enabled communication will be established between the IND700 and the remote modules. Any communication errors will be indicated in the message box on the IND700 home screen.

This communication uses both the input and output portions of the port, so it cannot be shared with any other connections. When "Remote Discrete I/O" is selected as the assignment for COM1 or COMx, the communication parameters are set automatically by the terminal and cannot be changed from the front panel - they can only be viewed.

The parameters include:

- Baud Rate: 115200

- Data bits: 8
- Parity: Even
- Stop bits: 1
- Flow Control: None
- Interface: RS-485

After the ARM100 modules are wired per the details in the **ARM100 Installation Guide** and the assignment is programmed at **Communication > Connections**, the remote modules will be operational. When assigning functions to the remote discrete I/O locations, the remote modules are addressed by 1.0.x for module #1, 2.0.x for module #2, and so on. Each module provides four inputs and six dry-contact relay outputs.

For details on ARM100 configuration in the IND700, refer to [ARM100 Interface Configuration ▶ Page 213].

Example

Tare assigned to discrete I/O input addresses 1.0.1.

This indicates that when input #1 is turned on in the remote module #1, a tare will be taken.

5.3.7 ASCII Input

A bar code scanner or other ASCII device can be connected to a port in the IND700, and used as an input device to enter ASCII data, using an ASCII Input connection type. When this input type is selected, the assignment for the data received must also be specified at Communication > Templates > Input. Available assignments include:

- ID1
- Keypad
- Tare
- Tare ID
- Target ID
- Filling Material ID for Filling & Drum Filling
- Active Target.

As part of the programming for using the ASCII input, an input template must be configured. The template feature permits removal of a preamble (preceeding characters) and a postamble (trailing characters) that are not part of the desired data. Using these parameters in the setup of the input template, the number of characters to be ignored before and after the data are programmed. These must be the same for each data input string that the IND700 receives.

An input will be terminated after the receipt of the programmable "Termination Character" or a 1 second timeout of no new characters received. At this time, any input data that has been collected will be applied to the assignment that has been selected. This could be an actual value such as a preset tare value or a response for IDs, or it could initiate a look-up into the tare or target table by selecting Tare ID or Target ID.

The following notes apply to how the ASCII input is handled through the input template:

- The Preamble Length selects how many characters should be skipped at the beginning of an input string before the desired data.
- Data Length defines the maximum length of a string. All characters beginning after the Preamble through the Length selection will be used as the input.
- The Postamble length is the number of characters (before the Termination Character) that will be stripped off the data string. All other data from the Preamble Length to the Termination Character minus the Postamble Length will be used as the input string. When using an input that is always the same fixed length, this field would remain blank.
- The Termination Character is used to signal the end of the string input. It can be any ASCII control character. If "None" is selected, the timeout feature will terminate the entry.
- There is also a 1 second timeout feature that tracks the amount of time between characters. If this 1 second time is exceeded, the string will also be considered terminated.

Example

Preamble of 2, Data length of 5, Postamble of 0, Termination Character of <CR>, Input assignment of Tare.

Data received is: <STX>P001.5 kg<CR>

The preamble of 2 removes the <STX> and P characters. The next 5 characters of 001.5 are the actual data.

The postamble is set to 0 because the data field has already been filled so no characters have to be removed.

The <CR> terminates the input.

This string would input 1.5 as a preset tare to the IND700.

This same data could be obtained by programming a Preamble of 2, Data length of 8, Postamble of 3, Termination Character of <CR>. The Postamble length of 3 would remove the <space>kg from the data field since they are the last 3 characters received in front of the <CR>.

5.3.8 Shared Data Access

All setup parameters, triggers and statuses in the IND700 are stored and routed through Shared Data variables. This is a system of memory mapping that permits remote clients to send commands and receive data from the terminal. In order to access the shared data variables in the IND700, a remote client must login to the Shared Data Server. Access is provided through either the COM1 serial port or through the Ethernet port. Regardless of the method used, the same access is provided and the login procedure is very similar. Up to 25 Shared Data Server logins are supported by the IND700 -- a single connection using a serial interface, and multiple connections using a TCP/IP Ethernet interface .

Note that the Shared Data server does not support serial RS485 or USB connectivity.

Server connections are configured in setup at [Communication Setup > Connections ▶ Page 215], by selecting **SharedData** as the connection's **Assignment**.

Shared Data Name Structure

Each SD variable includes a class, an instance and an attribute, and uses the following structure:

- Class: Example -- **wt** (dynamic scale weight)
- Instance: Example -- **01** (scale #1)
- Attribute: Example -- **02** (Displayed Net Weight)

Multiple instances are indicated by dashes in place of the instance number -- for example, **wt--02**.

Shared Data Types

SD variables may take any of the following forms (where **nn** indicates the length of an array):

Shared Data Types

Label	Data Type	Description
BI	Boolean	Boolean fields are one-byte integers, but can only have values of 0 or 1
By	Byte	One-byte integer
US	Unsigned Short	Two-byte unsigned integer (double)
UL	Unsigned Long	Four-byte unsigned integer (word)
F	Float	Single-precision floating point
D	Double	Double-precision floating point
ABy nn1	Array of Bytes	Array of one-byte integers
ABI nn1	Array of Booleans	Array of one-byte integers used as Boolean
S mm2	String	A Unicode String, NULL terminated. Array of two-byte unsigned integers (doubles)
AL nn1	Array of Longs	Array of four-byte unsigned integers (words)
Struct	Structure	Composite structure of the entire block (multiple data types together)

For further detail on Shared Data variables and structures, refer to the **IND700 Shared Data Reference**, 30753890.

5.3.8.1 Commonly Used Shared Data Variables

This section lists Shared Data Variables most commonly used with the IND700 in its base configuration. For a list of additional, application-specific variables, refer to the **IND700 ProWorks Multi-Tools User's Manual** (30753893).

Share Data Variables in On-Screen Display

The Tare Table image below and the following table illustrate the relationship between data in the terminal and the corresponding Shared Data Variables.

ID ^	Name	Description	Value	Unit	Low Limit
1	Small blue	Sugar container	0.175	kg	
2	Hopper 2	Flour container	0.075	kg	
3	Water vessel 3		0.65	kg	
4	Within range tare			kg	0.0
5	CB001	Small cardboard box		kg	0.0

Figure 479: Data in Tare Table

Example of Tare Table Elements Represented by Shared Data

	Shared Data Name	Shared Data Variable
1	Tare ID	ws0027
2	Tare name	ws0028
3	Tare description	ws0029

Terminal Identification Shared Data

Terminal Identification Shared Data

xs0105	Terminal Serial Number
xs0106	Terminal ID1
xs0107	Terminal ID2
xs0108	Terminal ID3
xd0103	Current Date
xd0104	Time of Day
xs0103	Software ID
xp0101	Transaction counter

Scales Shared Data

wf0101	Gross weight, Scale 1
wf0102	Net weight, Scale 1
wf0103	Display Unit, Scale 1
ws0102	Tare value, Scale 1
wf0201	Gross weight, Scale 2
wf0202	Net weight, Scale 2
wf0203	Display Unit, Scale 2

ws0202	Tare value, Scale 2
wt0501	Gross weight, Sum Scale
wt0502	Net weight, Sum Scale
wt0503	Display Unit, sum Scale

ID Form Shared Data

When ID Form fields are configured, Shared Data variables are available both for the configuration of fields, and for information added to the fields.

ID	Name	Status	Numeric Only	Preserve Prev. Value
01	Lot	Enabled	Disabled	Enabled
02	Vendor	Enabled	Enabled	Enabled
03	Order	Enabled	Disabled	Enabled
04	Ident D	Disabled	Disabled	Disabled
05	Ident E	Disabled	Disabled	Disabled
06	Ident F	Disabled	Disabled	Disabled
07	Ident G	Disabled	Disabled	Disabled
08	Ident H	Disabled	Disabled	Disabled
09	Ident I	Disabled	Disabled	Disabled
10	Ident J	Disabled	Disabled	Disabled

Figure 480: ID Form Configured with Three Data Fields

Each ID Form prompt has a Shared Data Variable associated with it:

pr0131	Lot
pr0132	Vendor
pr0133	Order
pr0134	ID Form 04 prompt
pr0135	ID Form 05 prompt
pr0136	ID Form 06 prompt
pr0137	ID Form 07 prompt
pr0138	ID Form 08 prompt
pr0139	ID Form 09 prompt
pr014-	ID Form 10 prompt

When the ID Form is configured as shown above, touching the ID from softkey  will display all enabled fields.

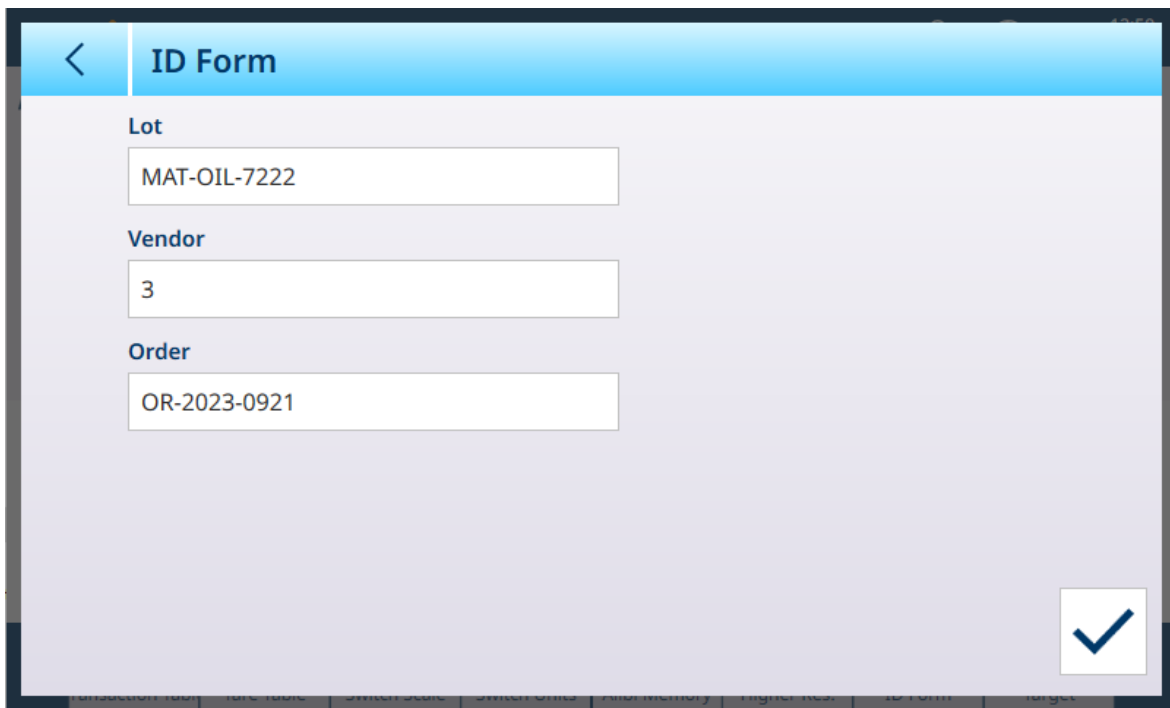


Figure 481: ID Form, Three Fields Enabled

Information entered into the ID Form

Each field of information has a Shared Data Variable associated with it:

pa0101	MAT-OIL-7222
pa0101	3
pa0103	OR-2023-0921
pa0102	ID Form 04 response
pa0105	ID Form 05 response
pa0106	ID Form 06 response
pa0107	ID Form 07 response
pa0108	ID Form 08 response
pa0109	ID Form 09 response
pa0110	ID Form 10 response

DIO Shared Data

I/O Pins	Mainboard	Scale 1	Scale 2
Input 1	di0001	di0101	di0201
Input 2	di0002	di0102	di0202
Output 1	di0005	di0105	di0205
Output 2	di0006	di0106	di0206

5.3.9 Ethernet

The IND700 Ethernet port provides a 1000 Base-T connection for connection to an Ethernet network. The Ethernet port can be used for the following functions:

- Shared data access (described previously)
- Demand output
- Continuous output
- FTP
- Sending calibration alert emails
- Web Server access

Ethernet communication is configured in setup at [Communication > Ethernet ▶ Page 209].

5.3.9.1 Ethernet Connection to A PC

The IND700 Ethernet port provides a way to interface a PC to the IND700 to download and upload files and configuration information. To use the Ethernet port to transfer templates or Shared Data, a properly configured [Connection ▶ Page 215] is necessary.

5.3.9.2 Ethernet Demand Output

If a demand output connection to Ethernet is made in the connections section of setup, a remote device may “register” to receive the data through the Ethernet port. In order to do this, the remote device must login to the shared data server and send the command to register for the data. The login can be any valid username and password for the terminal.

When a user logs into the shared data server, he or she acquires the level of access for the username and password used. All levels of users can receive a demand string.

If a demand output connection to EPrint is made in the Connections section of setup, a remote device is not required to “register” with the Shared Data Server to receive the data through the Ethernet port. The data string simply contains the assigned template’s information. The EPrint connection is made via the secondary TCP/IP port at the user-defined port number (set up at Communication>Network>Port).

Register for the Demand Output

The “printout” command allows the client to define a Demand Print Stream as a callback field. The Demand Print Streams include demand print (triggered by the scale) and custom triggers (triggers 1, 2, and 3). The console print server sends a message to the client at each print output. Since print messages can span multiple message blocks (depending upon size), the start of the print message has a <dprint> tag and the end of the message has a </dprint > tag. After registering for the demand output, the client will receive the appropriate data stream. The “ctimer” command specifies the minimum time between repeated callback messages. The “xprintout” command removes the registration from the terminal and the communication will stop.

The “xgroup all” command will also terminate any demand output registrations.

Sequence Example 1

- 1 Enter the menu tree of setup.
- 2 In the Connections sub-branch of the Communications branch of setup, create a connection for Demand Output assignment to the Ethernet port triggered by Scale using Template 2.
- 3 Ensure that the IP and Gateway addresses are programmed properly.
- 4 Login to the shared data server from the client, (see “user” command in the Shared Data Server section).
- 5 Register to receive the demand data by entering the “printout 1” command.
 - ➔ The IND700 will acknowledge the registration with a message [00Gxxx~number PRINTOUT streams=1]. Now, whenever a demand print is generated, the Template 2 data will be sent to the client.

```
00P004 <dprint>Scale 1
01:33:10
06/Sep/2005
17.08 lb
17.08 lb T
0.00 lb N
</dprint>
```

The “xprintout” command allows the client to remove the print output callback registration thus stopping the demand output.

Sequence Example 2

- 1 Enter the menu tree of setup.
- 2 In the Connections sub-branch of the Communications branch of setup, create a connection for Demand Output assignment to the Ethernet port triggered by Trigger 1 using Template 1.
- 3 Ensure that the IP and Gateway addresses are programmed properly.
- 4 Login to the shared data server from the client, (see “user” command in the Shared Data Server section).
- 5 Register to receive the demand data by entering the “printout 1” command.

- ➔ The IND700 will acknowledge the registration with a message [00Gxxx~number PRINTOUT streams=1]. Now, whenever the custom trigger is initiated (by a programmed discrete input or Industrial Network command), the Template 1 data will be sent to the client.


```
OOP004 <dprint> 17.08 lb
17.08 lb T
0.00 lb N
</dprint>
```

The "xprintout" command allows the client to remove the print output callback registration thus stopping the demand output.

5.3.9.3 Ethernet Continuous Output

If a continuous output type of connection to Eprint is made in the connections section of setup, a remote device is not required "register" with the Shared Data server, to receive data through the Ethernet port. The data string simply contains the assigned continuous output or template information. The Eprint connection is made via the secondary TCP/IP port at the user-defined secondary port number (configured in setup at Communication > Network > Port).

If a continuous output or continuous template output connection to Ethernet is made in the connections section of setup, a remote device may "register" to receive the data through the Ethernet port. In order to do this, the remote device must login to the shared data server and send the command to "register" for the data. The login can be any valid username and password for the terminal.

When a user logs onto the shared data server, they acquire the level of access for the username and password used. All levels of users can receive a continuous string.

Register for the Continuous Output

The "contout" command allows the client to define the continuous output string as a callback field. The Console Print Server sends a message to the client at each continuous output. The continuous output message is either in the Standard METTLER TOLEDO Continuous Output format or in a continuous template format. The "ctimer" command specifies the minimum time between repeated callback messages. The "xcontout" command removes the registration from the terminal and the communication will stop.

The "xgroup all" command will also terminate any continuous output registrations.

Sequence Example

- 1 Enter the menu tree of setup.
- 2 In the Connections sub-branch of the Communications branch of setup, create a connection for Continuous Output assignment to the Ethernet port triggered by Scale.
- 3 Ensure that the IP and Gateway addresses are programmed properly.
- 4 Login to the shared data server from the client, (see "user" command in the Shared Data Server section).
- 5 Register to receive the continuous data by entering the "contout" command.

- ➔ The IND700 will acknowledge the registration with a message [00Gxxx~number CONTOUT streams=1]. Now, whenever a continuous output string is generated by the IND700, the data will be sent to the client.


```
OOC148 14! 354 236
>
OOC149 14! 354 236
>
OOC150 14! 354 236
>
OOC151 14! 354 236
```

The "xcontout" command allows the client to remove the continuous output callback registration thus stopping the continuous output.

The output rate of a Continuous type output over Ethernet is 20Hz by default. This rate cannot be modified through the terminal setup menu. However, the output rate can be modified by a Shared Data write to a field in the "cs" block of Shared Data. Please refer to the IND700 Shared Data Reference for specifics.

5.3.10 File Transfer

The IND700 can transfer files using a PC tool such as VNC, or an FTP (file transfer protocol) client. The VNC method simplifies the process, because the VNC's File Transfer function permits the user to browse to the appropriate folder on the IND700 and select the required file/s from a list.

FTP Method

To access files in the IND700 via ftp, the client must login to the FTP server. Valid usernames and passwords are entered as configured in setup at [Terminal > Users ▶ Page 190], and each username is assigned an access level. All access levels can read files but only maintenance and administrator levels can write new files to the terminal. Refer to [Terminal > Security Options ▶ Page 200] to enable the FTP or sFTP server ports.

- `fgget` (Shared Data server) or `get` (FTP) – All files can be read using this command.
- `fput` (Shared Data server) or `put` (FTP) – Only certain files can be downloaded back to the IND700 terminal.

VNC Method

VNC or an equivalent tool must be installed on a PC accessible to the IND700, and **Remote Desktop Server** enabled in the terminal in setup at [Terminal > Security Options ▶ Page 200].

With the terminal connected, click the file transfer icon in the VNC tool menu bar, indicated in the image below:

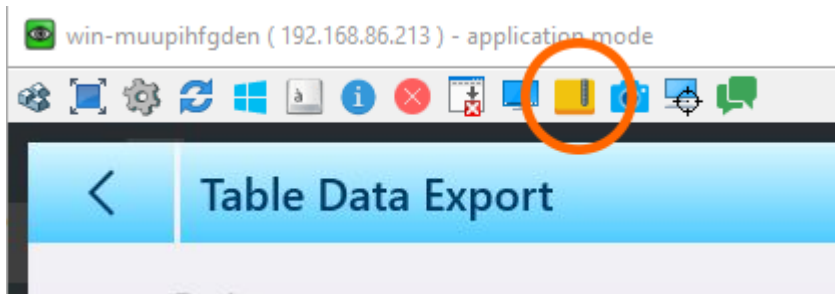


Figure 482: VNC File Transfer Icon

When the file transfer icon is clicked, the transfer screen will display, with the local PC's contents displayed on the left, the terminal's on the right. In the image below, the folder containing the exported files has been accessed, but the PC contents appear in their default state.

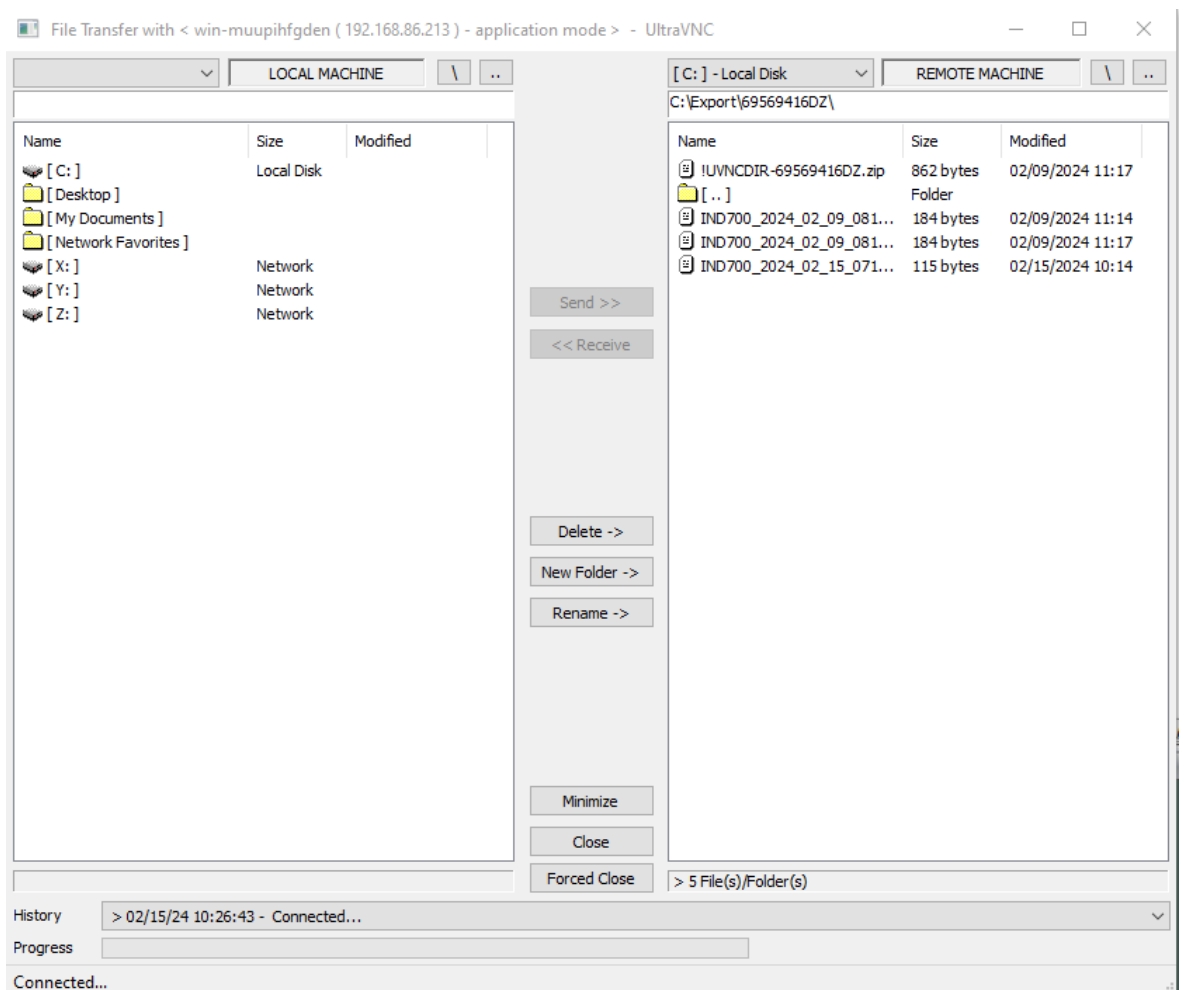


Figure 483: VNC File Transfer Screen

Browse to an appropriate location on the host PC, and click the **<<Receive** button at center.

Exported File Names and Paths

The following list indicates the path for exportable files.

- File Names: All table file names have the form IND700_YYYY_MM_DD_HHMM. The content type is added at the end of this standard name.
- The contents of each exported file may include the entire set of table records, or a [filtered ▶ Page 48] subset.
- Exported files can be formatted either as comma-separated values (.csv) or XML (.xml)

File Name	File Path	File Content
_Alibi.csv or xml	C:\Export\[Terminal Serial Number]	Records from [Alibi Table ▶ Page 172]
_Material.csv or xml		Records from Material Table (refer to the ProWorks Multi-Tools User's Manual for details)
_Tare.csv or xml		Records from the [Tare Table ▶ Page 172]
_Transaction.csv or xml		Records from the [Transaction Table ▶ Page 173]
_ChangeLog		Records from the [Change Log ▶ Page 246]
_ErrorLog		Records from the [Error Log ▶ Page 248]
IND700_[Terminal Serial Number]_YYY_MM_DD-HHMM.mtbak	C:\Backup	A [backup ▶ Page 251] of the terminal's configuration, current at the date and time indicated in the filename.

File imports can be performed in the same way, for the following files types and at the listed IND700 C:\ locations:

File suffix	File Path	File Types
.mot	C:\ToUpdate	An update file for the scale interface's firmware
(Various)	C:\Service	Updates for Windows OS files; ProWorks licensing; script file
.csv or .xml	C:\Import	Table and log files kept on a host PC
.mtbak	C:\Backup	Saved terminal configuration

5.3.10.1 FTP Example

The example describes how to upload the tare table to a PC running Microsoft Windows, modify the file, and then download it again to the terminal.

The following procedures assume that the user has:

- A valid username and password for the IND700 terminal.
- The IP address of the IND700.
- A valid network connection established between the client and the terminal. Refer to Ethernet Connection to A PC.

Making the Connection

1. Open the command prompt window in the client PC and type **ftp**.
2. Press enter. The command line will show **ftp>**.
3. To open the FTP connection, type open **xxx.xxx.xxx.xxx nnnn**, where the **xxx.xxx.xxx.xxx** represents the IP address of the IND700 terminal and **nnnn** represents the port number.
4. Press ENTER. The display will indicate that the service is ready and prompts for the user name.
5. Enter a valid user name for the IND700. If the name is valid, the display will prompt for the password associated with that user.
6. Enter the password and press ENTER.
7. If the password is valid, the prompt line will display **ftp>**.

Copying files Via FTP

Use the following procedure to transfer files to and from the IND700 using ftp. Not that by default files will be copied to the folder location shown in the ftp prompt line.

To **download** a file from the IND700:

1. Enter the command **get filename.nnn**, using the desired file name with its correct extension.
2. Press ENTER.
3. The file will be copied from the IND700 and the system will indicate that the command was executed successfully.

To **upload** a file to the IND700:

1. Enter the command **put filename.nnn**, using the desired file name with its correct extension.
2. Press ENTER.
3. The file will be copied to the IND700 and the system will indicate that the command was executed successfully.

5.3.10.2 File Transfer Using Other Software

Files can also be transferred via Ethernet between a host PC and an IND700 using a utility such as VNCViewer. The file transfer feature will display an intuitive browser application, in which file locations can be found, and one or more files selected and copied to or from the IND700.

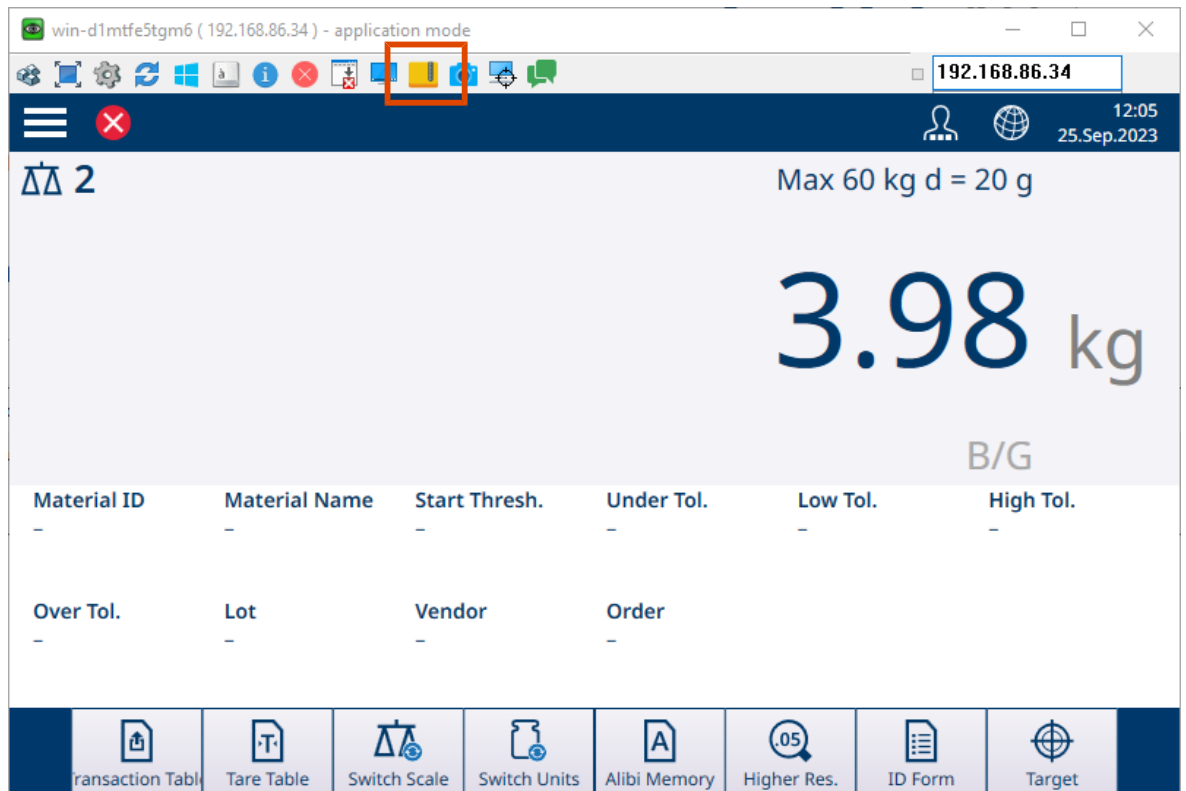


Figure 484: File Transfer Utility in VNCViewer

When the file icon is clicked, a transfer window will display on the PC.

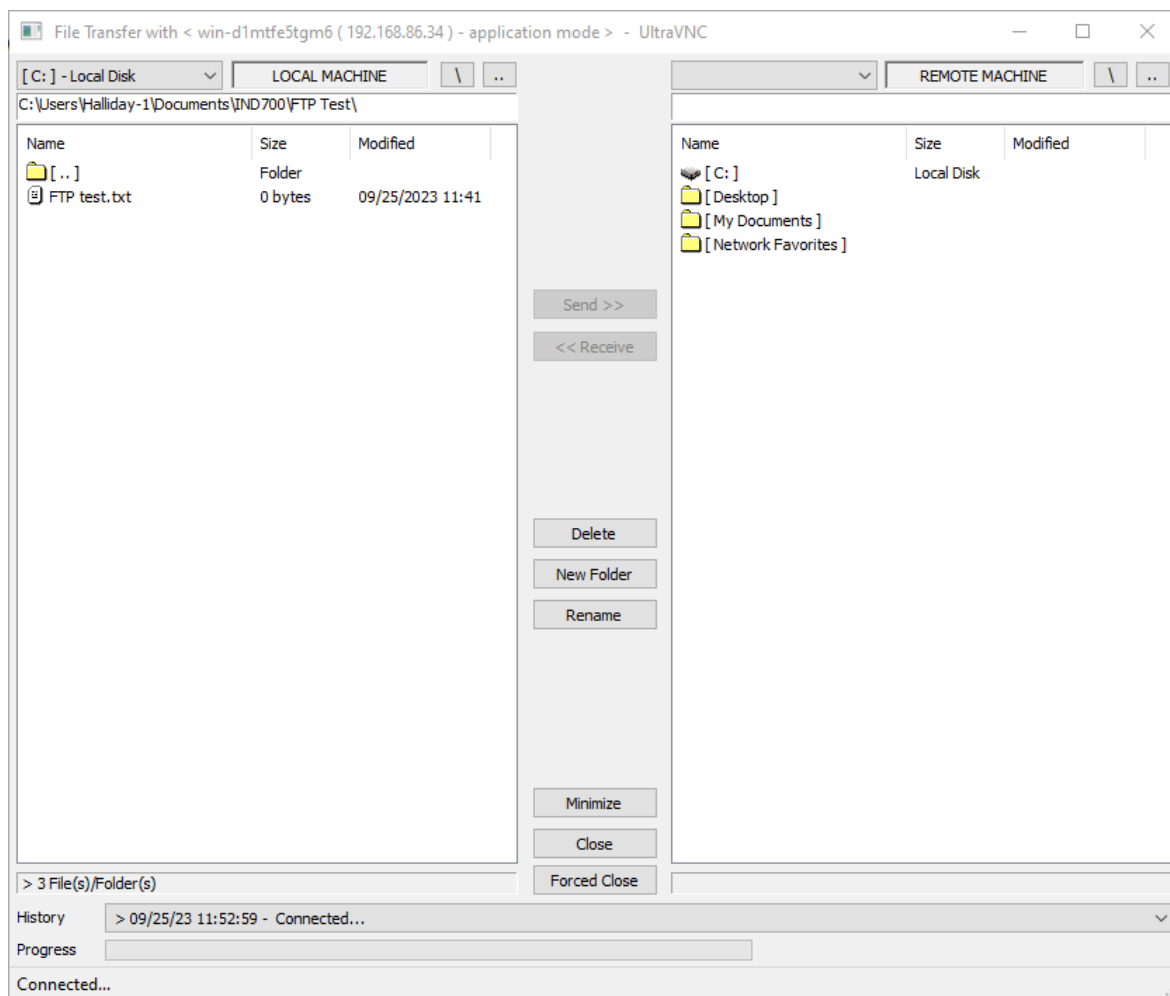


Figure 485: VNC File Transfer Window

In this window, files can be selected by clicking on them (CTRL-click to select multiple files). Once the desired files are selected and the correct destination folder displayed, click **Send>>** or **<<Receive** to copy the files either to or from the IND700.

Note that, for such an application to work with the IND700, the **Terminal > Security Options** must be correctly configured in [setup ▶ Page 200]. **Remote Desktop Server** must be enabled.

5.4 GEO, ASCII and Control Codes

These sections contain codes for geographical setup of the terminal, and for characters used in terminal communication.

5.4.1 GEO Codes

The Geo code feature provided in the weighing terminal permits adjustment by a METTLER TOLEDO service technician due to changes in elevation or latitude without reapplying test weights. This assumes that a previously accurate adjustment was done with the Geo code set properly for that original location and that the Geo code for the new location can be accurately determined.

When a weighing terminal is to be reinstalled at a different geographic location, gravitational and altitude changes can be accounted for by the following steps.

Note that this procedure is not necessary if an on-site adjustment is performed.

Determining the Geo code value

There are two methods to determine the Geo code value for your location.

Method A

- 1 Go to www.welmec.org and find the **Gravity Information** page to obtain the g value (e.g. 9.770390 m/s²) for your specific geographic location.

- 2 Check the METTLER TOLEDO Geo code Table A to select the Geo code according to your g value, e.g. Geo code 20 should be applied if your g value is 9.810304.

Method B

- Use the METTLER TOLEDO Geo code Table B to determine the Geo code for the new altitude and location where the scale will be used.
The latitude and height above sea level can be found using this link www.mapcoordinates.net/en.

Checking the Geo code value in the instrument

Comparing Geo codes

- 1 Compare the determined Geo code with the current Geo code setting of the weighing terminal.
- 2 If the two Geo code values do not match, call the METTLER TOLEDO service technician.
When the system is certified, a re-verification will be necessary.

Note

Using the Geo code value for calibration adjustment is not as accurate as re-applying certified test weights and re-calibrating the scale in a new location.

Table A: Definition of METTLER TOLEDO Geo codes with g value

Geo code	g value (m/s ²)	Geo code	g value (m/s ²)	Geo code	g value (m/s ²)	Geo code	g value (m/s ²)
0	9.770390	8	9.786316	16	9.802295	24	9.818326
1	9.772378	9	9.788311	17	9.804296	25	9.820333
2	9.774367	10	9.790306	18	9.806298	26	9.822341
3	9.776356	11	9.792302	19	9.808300	27	9.824351
4	9.778347	12	9.794299	20	9.810304	28	9.826361
5	9.780338	13	9.796297	21	9.812308	29	9.828371
6	0.782330	14	9.798295	22	9.814313	30	9.830383
7	9.784323	15	9.800295	23	9.816319	31	9.832396

Table B: Definition of METTLER TOLEDO Geo codes with geographic latitude and height

Geographical latitude, North or South	Height above sea level											
	[m]	0 - 325	325 - 650	650 - 975	975 - 1300	1300 - 1625	1625 - 1950	1950 - 2275	2275 - 2600	2600 - 2925	2925 - 3250	3250 - 3575
	[ft]	0 - 1060	1060 - 2130	2130 - 3200	3200 - 4260	4260 - 5330	5330 - 6400	6400 - 7460	7460 - 8530	8530 - 9600	9600 - 10660	10660 - 11730
0° 0' - 5° 46' (0.0° - 5.77°)		5	4	4	3	3	2	2	1	1	0	0
5° 46' - 9° 52' (5.77° - 12.87°)		5	5	4	4	3	3	2	2	1	1	0
9° 52' - 12° 44' (12.87° - 12.73°)		6	5	5	4	4	3	3	2	2	1	1
12° 44' - 15° 6' (12.73° - 15.1°)		6	6	5	5	4	4	3	3	2	2	1
15° 6' - 17° 10' (15.1° - 17.17°)		7	6	6	5	5	4	4	3	3	2	2
17° 10' - 19° 2' (17.17° - 19.03°)		7	7	6	6	5	5	4	4	3	3	2
19° 2' - 20° 45' (19.03° - 20.75°)		8	7	7	6	6	5	5	4	4	3	3
20° 45' - 22° 22' (20.75° - 22.37°)		8	8	7	7	6	6	5	5	4	4	3
22° 22' - 23° 54' (22.37° - 23.9°)		9	8	8	7	7	6	6	5	5	4	4
23° 54' - 25° 21' (23.9° - 25.35°)		9	9	8	8	7	7	6	6	5	5	4
25° 21' - 26° 45' (23.35° - 26.75°)		10	9	9	8	8	7	7	6	6	5	5
26° 45' - 28° 6' (26.75° - 28.1°)		10	10	9	9	8	8	7	7	6	6	5
28° 6' - 29° 25' (28.1° - 29.42°)		11	10	10	9	9	8	8	7	7	6	6

Geographical latitude, North or South	Height above sea level											
	[m]	0 - 325	325 - 650	650 - 975	975 - 1300	1300 - 1625	1625 - 1950	1950 - 2275	2275 - 2600	2600 - 2925	2925 - 3250	3250 - 3575
	[ft]	0 - 1060	1060 - 2130	2130 - 3200	3200 - 4260	4260 - 5330	5330 - 6400	6400 - 7460	7460 - 8530	8530 - 9600	9600 - 10660	10660 - 11730
29° 25' - 30° 41' (29.42° - 30.68°)		11	11	10	10	9	9	8	8	7	7	6
30° 41' - 31° 56' (30.68° - 31.93°)		12	11	11	10	10	9	9	8	8	7	7
31° 56' - 33° 9' (31.93° - 33.15°)		12	12	11	11	10	10	9	9	8	8	7
33° 9' - 34° 21' (33.15° - 34.35°)		13	12	12	11	11	10	10	9	9	8	8
34° 21' - 35° 31' (34.35° - 35.52°)		13	13	12	12	11	11	10	10	9	9	8
35° 31' - 36° 41' (35.52° - 36.68°)		14	13	13	12	12	11	11	10	10	9	9
36° 41' - 37° 50' (36.68° - 37.83°)		14	14	13	13	12	12	11	11	10	10	9
37° 50' - 38° 58' (37.83° - 38.97°)		15	14	14	13	13	12	12	11	11	10	10
38° 58' - 40° 5' (38.97° - 40.08°)		15	15	14	14	13	13	12	12	11	11	10
40° 5' - 41° 12' (40.08° - 41.2°)		16	15	15	14	14	13	13	12	12	11	11
41° 12' - 42° 19' (41.2° - 42.32°)		16	16	15	15	14	14	13	13	12	12	11
42° 19' - 43° 26' (42.32° - 43.43°)		17	16	16	15	15	14	14	13	13	12	12
43° 26' - 44° 32' (43.43° - 44.53°)		17	17	16	16	15	15	14	14	13	13	12
44° 32' - 45° 38' (44.53° - 45.63°)		18	17	17	16	16	15	15	14	14	13	13
45° 38' - 46° 45' (45.63° - 46.75°)		18	18	17	17	16	16	15	15	14	14	13
46° 45' - 47° 51' (46.75° - 47.85°)		19	18	18	17	17	16	16	15	15	14	14
47° 51' - 48° 58' (47.85° - 48.97°)		19	19	18	18	17	17	16	16	15	15	14
48° 58' - 50° 6' (48.97° - 50.1°)		20	19	19	18	18	17	17	16	16	15	15
50° 6' - 51° 13' (50.1° - 51.22°)		20	20	19	19	18	18	17	17	16	16	15
51° 13' - 52° 22' (51.22° - 52.37°)		21	20	20	19	19	18	18	17	17	16	16
52° 22' - 53° 31' (52.37° - 53.52°)		21	21	20	20	19	19	18	18	17	17	16
53° 31' - 54° 41' (53.52° - 54.68°)		22	21	21	20	20	19	19	18	18	17	17
54° 41' - 55° 52' (54.68° - 55.87°)		22	22	21	21	20	20	19	19	18	18	17
55° 52' - 57° 4' (55.87° - 57.07°)		23	22	22	21	21	20	20	19	19	18	18
57° 4' - 56° 17' (57.07° - 56.28°)		23	23	22	22	21	21	20	20	19	19	18
56° 17' - 59° 32' (56.28° - 59.53°)		24	23	23	22	22	21	21	20	20	19	19
59° 32' - 60° 49' (59.53° - 60.82°)		24	24	23	23	22	22	21	21	20	20	19
60° 49' - 62° 9' (60.82° - 62.15°)		25	24	24	23	23	22	22	21	21	20	20
62° 9' - 63° 30' (62.15° - 63.5°)		25	25	24	24	23	23	22	22	21	21	20
63° 30' - 64° 55' (63.5° - 64.92°)		26	25	25	24	24	23	23	22	22	21	21

Geographical latitude, North or South	Height above sea level											
	[m]	0 - 325	325 - 650	650 - 975	975 - 1300	1300 - 1625	1625 - 1950	1950 - 2275	2275 - 2600	2600 - 2925	2925 - 3250	3250 - 3575
	[ft]	0 - 1060	1060 - 2130	2130 - 3200	3200 - 4260	4260 - 5330	5330 - 6400	6400 - 7460	7460 - 8530	8530 - 9600	9600 - 10660	10660 - 11730
64° 55' - 66° 24' (64.92° - 66.4°)		26	26	25	25	24	24	23	23	22	22	21
66° 24' - 67° 57' (66.4° - 67.95°)		27	26	26	25	25	24	24	23	23	22	22
67° 57' - 69° 35' (67.95° - 69.58°)		27	27	26	26	25	25	24	24	23	23	22
69° 35' - 71° 21' (69.58° - 71.35°)		28	27	27	26	26	25	25	24	24	23	23
71° 21' - 73° 16' (71.35° - 73.27°)		28	28	27	27	26	26	25	25	24	24	23
73° 16' - 75° 24' (73.27° - 75.4°)		29	28	28	27	27	26	26	25	25	24	24
75° 24' - 77° 52' (75.4° - 77.87°)		29	29	28	28	27	27	26	26	25	25	24
77° 52' - 80° 56' (77.87° - 80.93°)		30	29	29	28	28	27	27	26	26	25	25
80° 56' - 85° 45' (80.93° - 85.75°)		30	30	29	29	28	28	27	27	26	26	25
85° 45' - 90° 0' (85.75° - 90.0°)		31	30	30	29	29	28	28	27	27	26	26

5.4.2 ASCII Standard and Control Codes

DEC	HEX	Symbol	DEC	HEX	Symbol	DEC	HEX	Symbol	DEC	HEX	Symbol
0	00	NUL	64	40	@	128	80	€	192	C0	À
1	01	SOH	65	41	A	129	81		193	C1	Á
2	02	STX	66	42	B	130	82	,	194	C2	Â
3	03	ETX	67	43	C	131	83	f	195	C3	Ã
4	04	EOT	68	44	D	132	84	„	196	C4	Ä
5	05	ENQ	69	45	E	133	85	...	197	C5	Å
6	06	ACK	70	46	F	134	86	†	198	C6	Æ
7	07	BEL	71	47	G	135	87	‡	199	C7	Ç
8	08	BS	72	48	H	136	88	^	200	C8	È
9	09	HT	73	49	I	137	89	‰	201	C9	É
10	0A	LF	74	4A	J	138	8A	Š	202	CA	Ê
11	0B	VT	75	4B	K	139	8B	‹	203	CB	Ë
12	0C	FF	76	4C	L	140	8C	œ	204	CC	Ì
13	0D	CR	77	4D	M	141	8D		205	CD	Í
14	0E	SO	78	4E	N	142	8E	Ž	206	CE	Î
15	0F	SI	79	4F	O	143	8F		207	CF	Ï
16	10	DLE	80	50	P	144	90		208	D0	Ð
17	11	DC1	81	51	Q	145	91	'	209	D1	Ñ
18	12	DC2	82	52	R	146	92	'	210	D2	Ò
19	13	DC3	83	53	S	147	93	“	211	D3	Ó
20	14	DC4	84	54	T	148	94	”	212	D4	Ô
21	15	NAK	85	55	U	149	95	•	213	D5	Õ
22	16	SYN	86	56	V	150	96	–	214	D6	Ö
23	17	ETB	87	57	W	151	97	—	215	D7	×
24	18	CAN	88	58	X	152	98	~	216	D8	Ø
25	19	EM	89	59	Y	153	99	™	217	D9	Ù
26	1A	SUB	90	5A	Z	154	9A	š	218	DA	Ú

DEC	HEX	Symbol	DEC	HEX	Symbol	DEC	HEX	Symbol	DEC	HEX	Symbol
27	1B	ESC	91	5B	[	155	9B	›	219	DB	Û
28	1C	FS	92	5C	\	156	9C	œ	220	DC	Ü
29	1D	GS	93	5D	]	157	9D		221	DD	Ý
30	1E	RS	94	5E	^	158	9E	ž	222	DE	Þ
31	1F	US	95	5F	_	159	9F	ÿ	223	DF	ß
32	20		96	60	`	160	A0		224	E0	à
33	21	!	97	61	a	161	A1	ı	225	E1	á
34	22	"	98	62	b	162	A2	ç	226	E2	â
35	23	#	99	63	c	163	A3	£	227	E3	ã
36	24	\$	100	64	d	164	A4	¤	228	E4	ä
37	25	%	101	65	e	165	A5	¥	229	E5	å
38	26	&	102	66	f	166	A6	ı	230	E6	æ
39	27	'	103	67	g	167	A7	§	231	E7	ç
40	28	(	104	68	h	168	A8	¨	232	E8	è
41	29	)	105	69	i	169	A9	©	233	E9	é
42	2A	*	106	6A	j	170	AA	ª	234	EA	ê
43	2B	+	107	6B	k	171	AB	«	235	EB	ë
44	2C	,	108	6C	l	172	AC	¬	236	EC	ì
45	2D	-	109	6D	m	173	AD		237	ED	í
46	2E	.	110	6E	n	174	AE	®	238	EE	î
47	2F	/	111	6F	o	175	AF	¯	239	EF	ï
48	30	0	112	70	p	176	B0	°	240	F0	ð
49	31	1	113	71	q	177	B1	±	241	F1	ñ
50	32	2	114	72	r	178	B2	²	242	F2	ò
51	33	3	115	73	s	179	B3	³	243	F3	ó
52	34	4	116	74	t	180	B4	´	244	F4	ô
53	35	5	117	75	u	181	B5	µ	245	F5	õ
54	36	6	118	76	v	182	B6	¶	246	F6	ö
55	37	7	119	77	w	183	B7	·	247	F7	÷
56	38	8	120	78	x	184	B8	¸	248	F8	ø
57	39	9	121	79	y	185	B9	ı	249	F9	ù
58	3A	:	122	7A	z	186	BA	º	250	FA	ú
59	3B	;	123	7B	{	187	BB	»	251	FB	û
60	3C	<	124	7C	|	188	BC	¼	252	FC	ü
61	3D	=	125	7D	}	189	BD	½	253	FD	ý
62	3E	>	126	7E	~	190	BE	¾	254	FE	þ
63	3F	?	127	7F		191	BF	¿	255	FF	ÿ

5.4.2.1 Control Characters

Symbol	Definition	Function
SOH	Start of Heading	A transmission control character used as the first character of a heading of an information message.
STX	Start of Text	A transmission control character that precedes a text and that is used to terminate a heading.
ETX	End of Text	A transmission control character that terminates a text.
EOT	End of Transmission	A transmission control character used to indicate the conclusion of the transmission of one or more texts.

Symbol	Definition	Function
ENQ	Enquiry	A transmission control character used as a request for a response from a remote station; the response may include station identification and/or station status. When a "Who are you" function is required on the general switched transmission network, the first use of ENQ after the connection is established will have the meaning "Who are you" (station identification). Subsequent use of ENQ may, or may not, include the function "Who are you", as determined by agreement.
ACK	Acknowledgment	A transmission control character transmitted by a receiver as an affirmative response to the sender.
BEL	Bell	A control character that is used when there is a need to call for attention; it may control alarm or attention devices.
BS	Back Space	A format effector that moves the active position one character position backwards on the same line.
HT	Horizontal Tab	A format effector that advances the active position to the next pre-determined character position on the same line.
LF	Line Feed	A format effector that advances the active position to the same character position of the next line.
VT	Vertical Tab	A format effector that advances the active position to the same character position on the next pre-determined line.
FF	Form Feed	A format effector that advances the active position to the same character position on a pre-determined line of the next form or page.
CR	Carriage Return	A format effector that moves the active position to the first character position on the same line.
SO	Shift Out / X-On	A control character that is used in conjunction with SHIFT IN and ESCAPE to extend the graphic character set of the code.
SI	Shift In / X-Off	A control character that is used in conjunction with SHIFT OUT and ESCAPE to extend the graphic character set of the code.
DLE	Data Line Escape	A transmission control character that will change the meaning of a limited number of contiguously following characters. It is used exclusively to provide supplementary data transmission control functions. Only graphic characters and transmission control characters can be used in DLE sequences.
DC1	Device Control 1 (off. XON)	A device control character that is primarily intended for turning on or starting an ancillary device. If it is not required for this purpose, it may be used to restore a device to the basic mode of operation (see also DC2 and DC3), or for any other device control function not provided by other DCs.
DC2	Device Control 2	A device control character that is primarily intended for turning on or starting an ancillary device. If it is not required for this purpose, it may be used to set a device to a special mode of operation (in which case DC1 is used to restore normal operation), or for any other device control function not provided by other DCs.
DC3	Device Control 3 (off. XOFF)	A device control character that is primarily intended for turning off or stopping an ancillary device. This function may be a secondary level stop, for example, wait, pause, stand-by or halt (in which case DC1 is used to restore normal operation). If it is not required for this purpose, it may be used for any other device control function not provided by other DCs.
DC4	Device Control 4	A device control character that is primarily intended for turning off, stopping, or interrupting an ancillary device. If it is not required for this purpose, it may be used for any other device control function not provided by other DCs.
NAK	Negative Acknowledgement	A transmission control character transmitted by a receiver as a negative response to the sender.

Symbol	Definition	Function
SYN	Synchronous Idle	A transmission control character used by a synchronous transmission system in the absence of any other character (idle condition) to provide a signal from which synchronism may be achieved or retained between data terminal equipment.
ETB	End of Transmit Block	A transmission control character used to indicate the end of a transmission block of data where data is divided into such blocks for transmission purposes.
CAN	Cancel	A character, or the first character of a sequence, indicating that the data preceding it is in error. As a result, this data is to be ignored. The specific meaning of this character must be defined for each application and/or between sender and recipient.
EM	End of Medium	A control character that may be used to identify the physical end of a medium, or the end of the used portion of a medium, or the end of the wanted portion of data recorded on a medium. The position of this character does not necessarily correspond to the physical end of the medium.
SUB	Substitute	A control character used in the place of a character that has been found to be invalid or in error. SUB is intended to be introduced by automatic means.
ESC	Escape	A control character that is used to provide additional control functions. It alters the meaning of a limited number of contiguously following bit combinations.
FS	File Separator	A control character used to separate and qualify data logically; its specific meaning has to be specified for each application. If this character is used in hierarchical order, it delimits a data item called a file.
GS	Group Separator	A control character used to separate and qualify data logically; its specific meaning has to be specified for each application. If this character is used in hierarchical order, it delimits a data item called a group.
RS	Record Separator	A control character used to separate and qualify data logically; its specific meaning has to be specified for each application. If this character is used in hierarchical order, it delimits a data item called a record.
US	Unit Separator	A control character used to separate and qualify data logically; its specific meaning has to be specified for each application. If this character is used in hierarchical order, it delimits a data item called a unit.

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China, 213125
www.mt.com/contacts

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