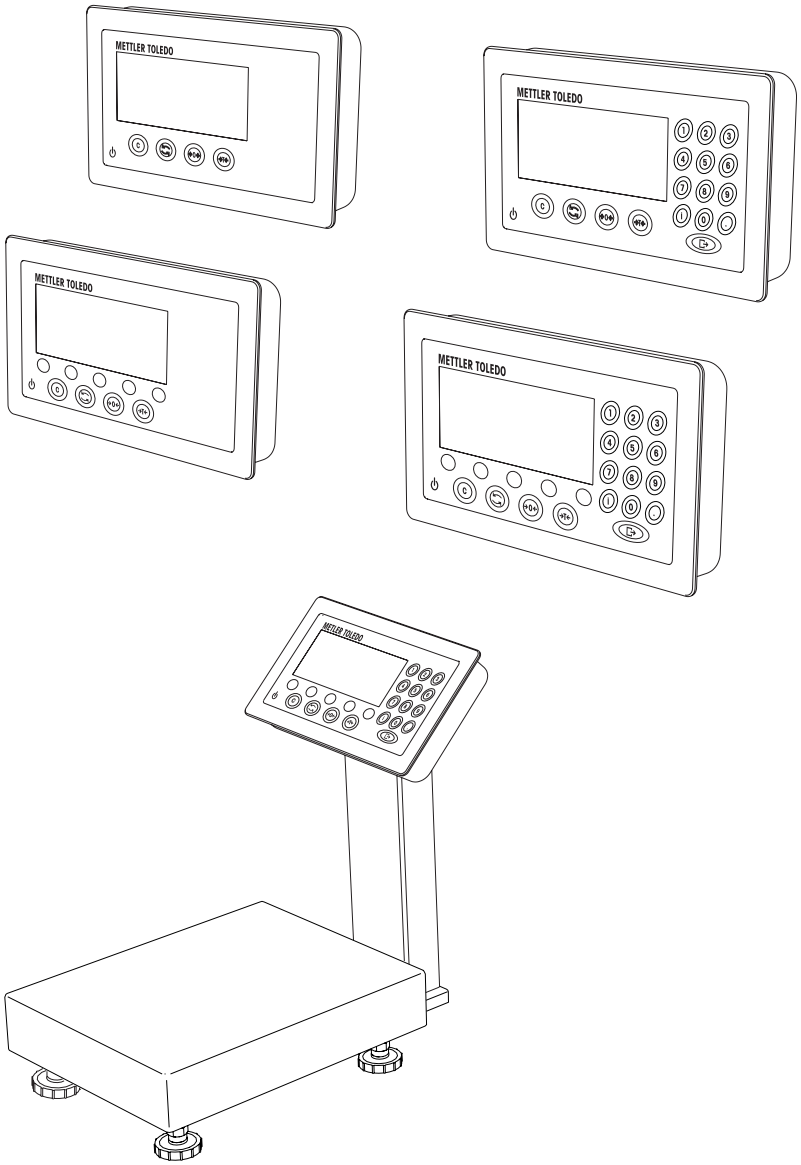
Service manual

ICS4_9

Weighing terminals



METTLER TOLEDO

METTLER TOLEDO Service

Congratulations on choosing the quality and precision of METTLER TOLEDO. Proper use according to these instructions and regular calibration and maintenance by our factory-trained service team ensure dependable and accurate operation to protect your investment. Contact us about a Service agreement tailored to your needs and budget.

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 METTLER TOLEDO product.

Contents

1 General information

1.1 Overview of the ICS4_9 series

The ICS4_9 series offers weighing terminals to connect a customer's weighing platform as well as complete terminal/platform combinations.

1.1.1 ICS4_9 weighing terminals

There are two versions of the ICS4_9 weighing terminals:

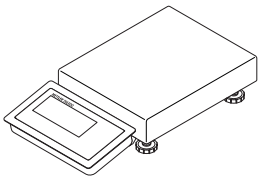
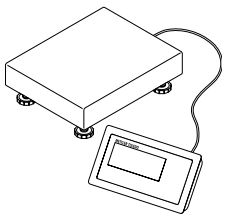
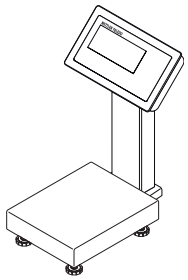
- ICS4_9**a** weighing terminal with analog scale interface
- ICS4_9**d** weighing terminal with IDNet scale interface

1.1.2 ICS4_9 terminal and platform combinations

The complete name of a terminal and platform combination also indicates the type, size and capacity of the connected analog weighing platform. E.g., ICS429a-QA6/c stands for:

ICS429a	type of weighing terminal and type of weighing interface
QA	design and size of the weighing platform
6	weighing platform capacity in kg
c	mechanical design

By default the weighing platforms are equipped with an aluminium load cell and a readability setting of 3000 or 5000 divisions, non-approved.

ICS4_9a-.../f	**ICS4_9a-.../t**	**ICS4_9a-.../c**
		
Weighing terminal fixed in front of the weighing platform	Fixed cable connection between weighing terminal and weighing platform	Weighing terminal and column seamlessly welded together

1.1.3 Options

Power supply Devices of the ICS4_9 series are available with built-in power supply unit or with built-in storage battery.

Scale connection Devices of the ICS4_9 series provide 1 scale connection, either analog or IDNet.

Data interfaces Devices of the ICS4_9 series provide an RS232 interface as standard (COM1).
As an option, a second data interface (COM2) is available.
Possible data interfaces for COM2 are:
RS232, RS422/RS485, Ethernet, USB Device, Digital I/O

1.2 Documentation

The device is supplied with a CD containing the complete documentation on the ICS4_9 series.
This service manual contains information about servicing and repairing the weighing terminals of the entire series.
For information about servicing and repairing the weighing platforms of the terminal/ platform combinations refer to the service manuals of the specific weighing platforms.

Service documentation for combination platforms
For a terminal and platform combination the following weighing platforms are used depending on the load cell option: The corresponding service manuals are in English.

Cell type	Platform type	Order no. service manual
Standard load cell	PBA226	72 230 076
Load cell "potted"	PBA426	72 230 074
Load cell "hermetically sealed"	PBA429	72 230 080

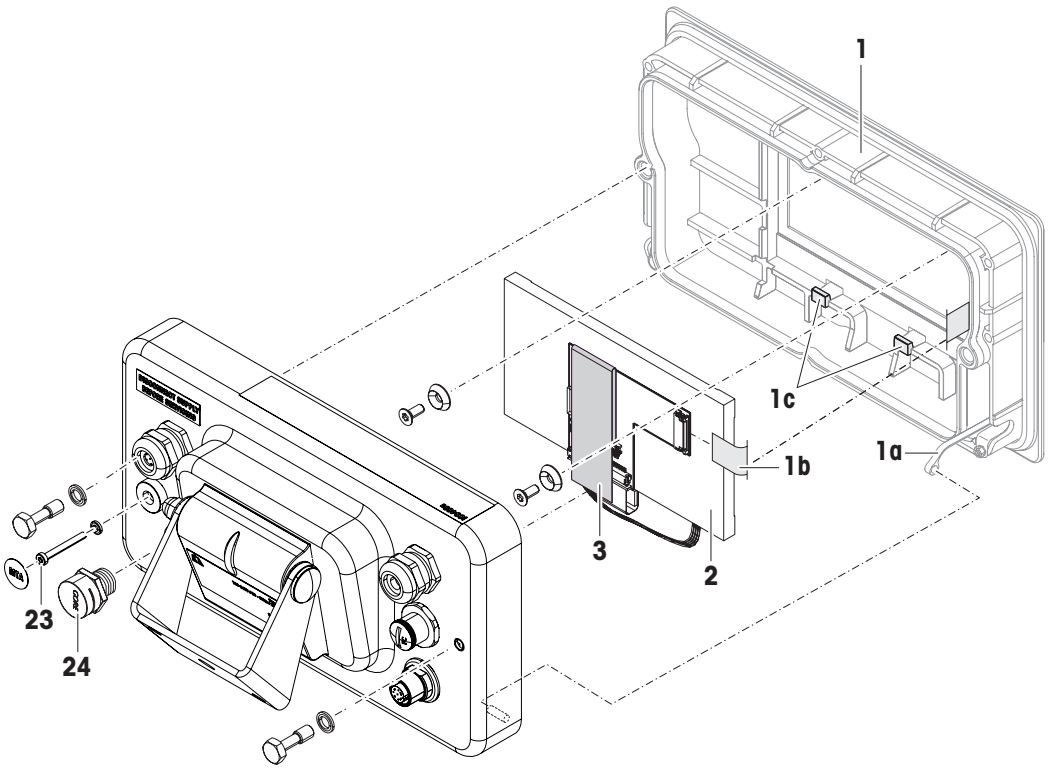
1.3 Safety instructions

- ▲ Do not use the device in a hazardous environment!
  Special devices are available in our range of products for hazardous environments.
- ▲ Ensure that the power socket outlet for the device is earthed and easily accessible, so that it can be de-energized rapidly in emergencies.
- ▲ Ensure that the supply voltage at the installation site lies within the range of 100 V to 240 V.
- ▲ The safety of the device cannot be ensured if it is not operated in accordance with the operating instructions and if it is not serviced in accordance with this service manual.
- ▲ Only authorised personnel may open the device.
- ▲ Check the power cable regularly for damage. If it is damaged, disconnect the device immediately from the power supply.
- ▲ Ensure that there is a space of at least 3 cm (1.25") at the rear in order to prevent the power cable from being bent too strongly.

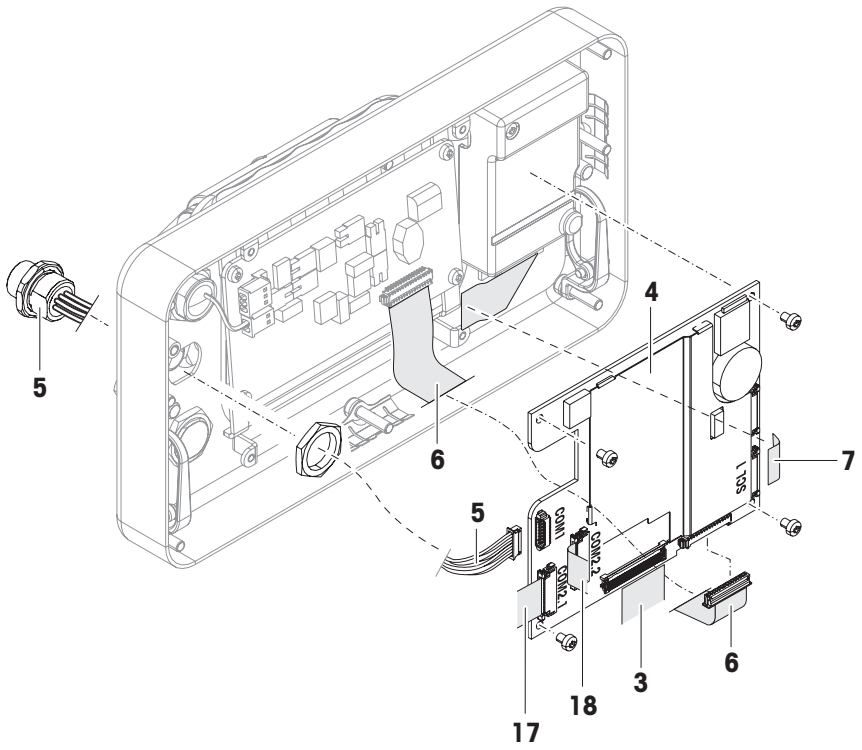
2 Spare parts

2.1 Exploded drawings

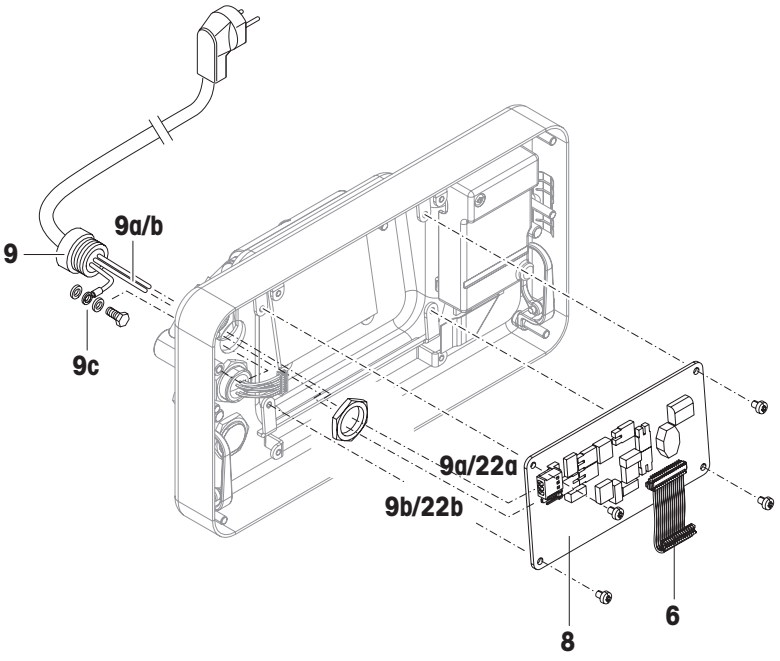
2.1.1 Cover and display



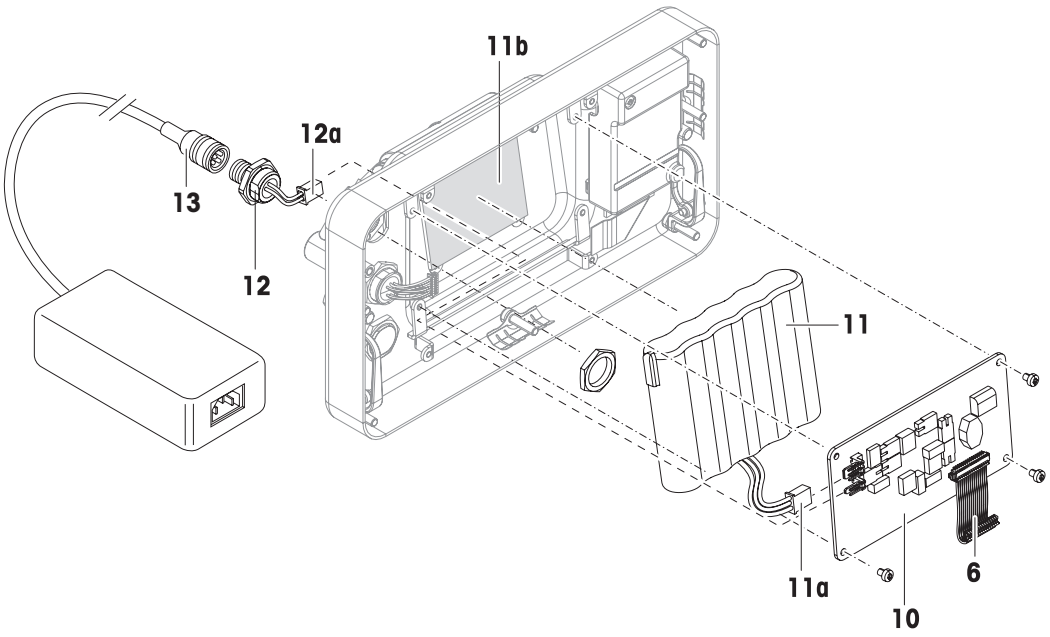
2.1.2 Main PCB and COM1



2.1.3 Built-in power supply unit

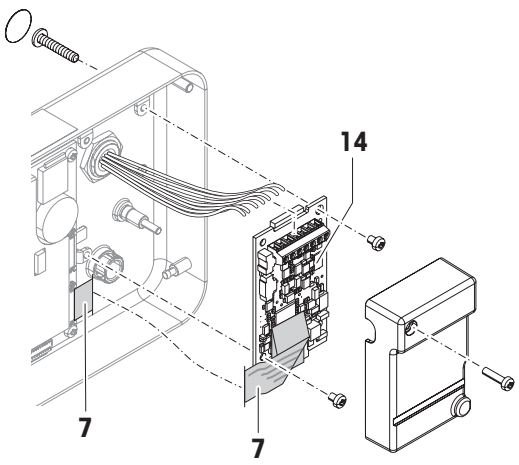


2.1.4 Built-in storage battery

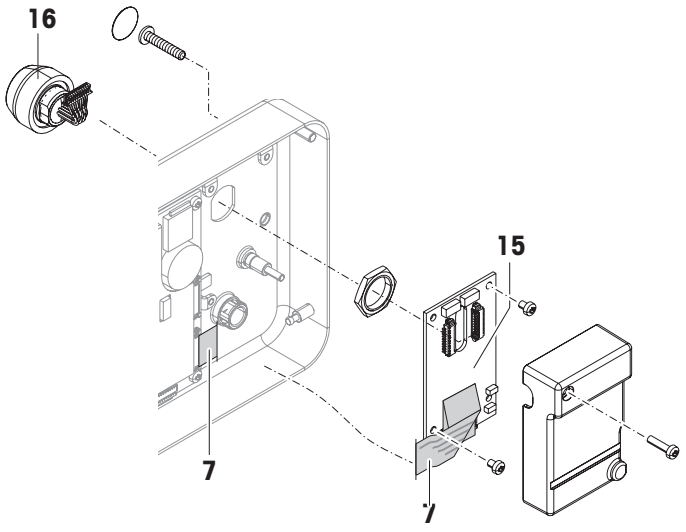


2.1.5 Scale connection

Digicell

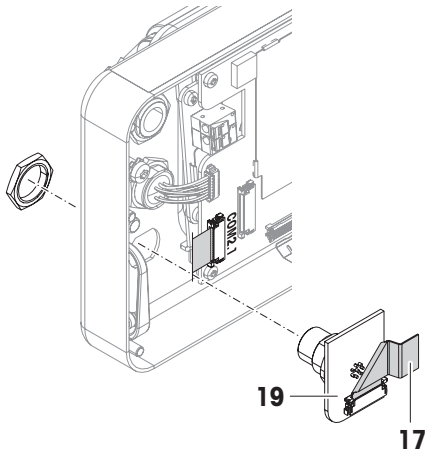


IDNet

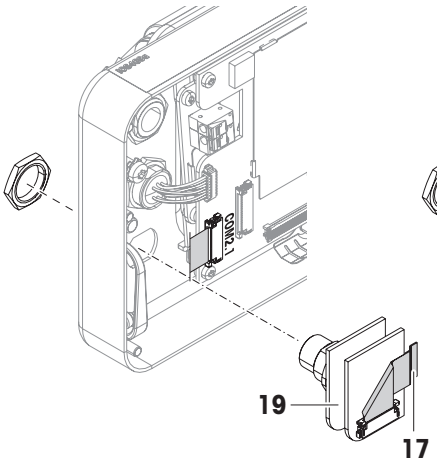


2.1.6 Optional interface

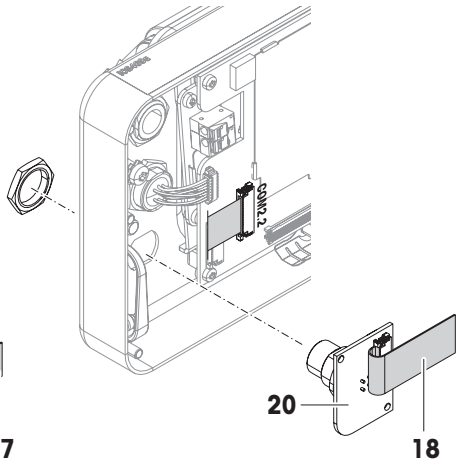
RS232, RS422/RS485



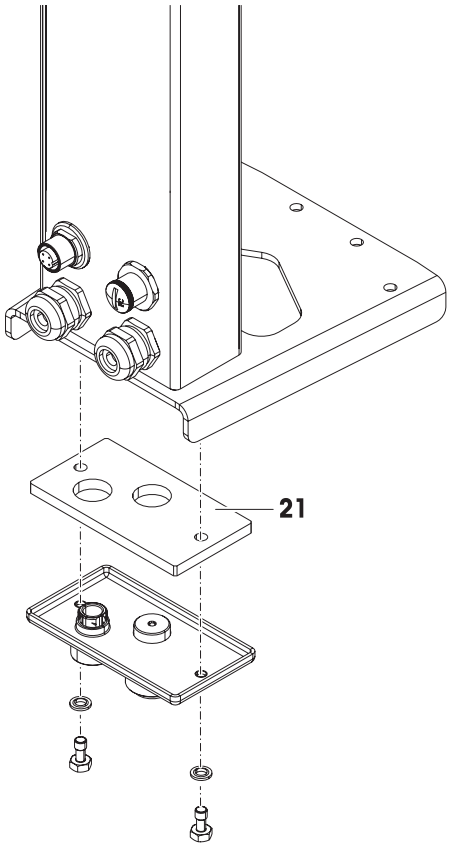
Digital I/O, USB Device



Ethernet

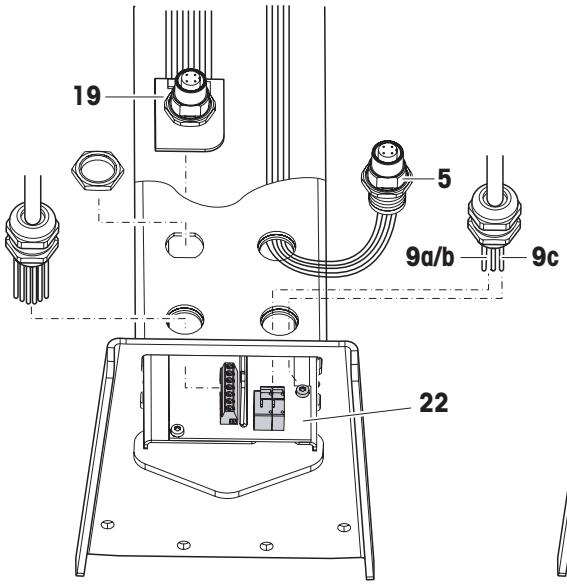


2.1.7 Column version – assembly

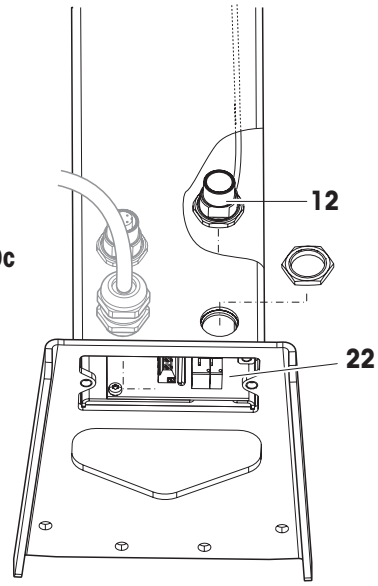


2.1.8 Column version – connectors

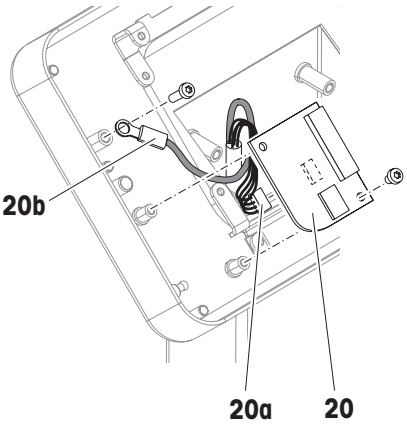
COM1, COM2 (except Ethernet)
Analog Scale, power supply

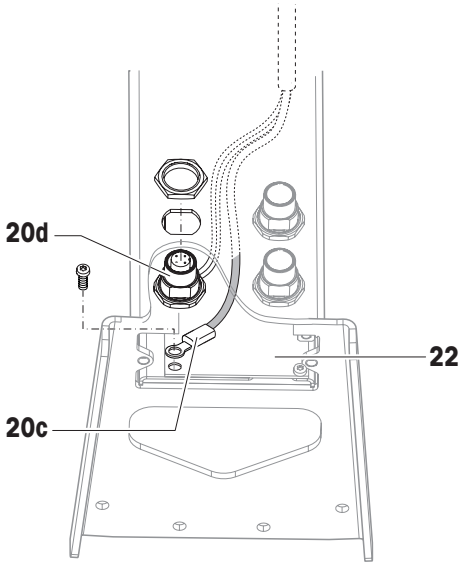


Battery

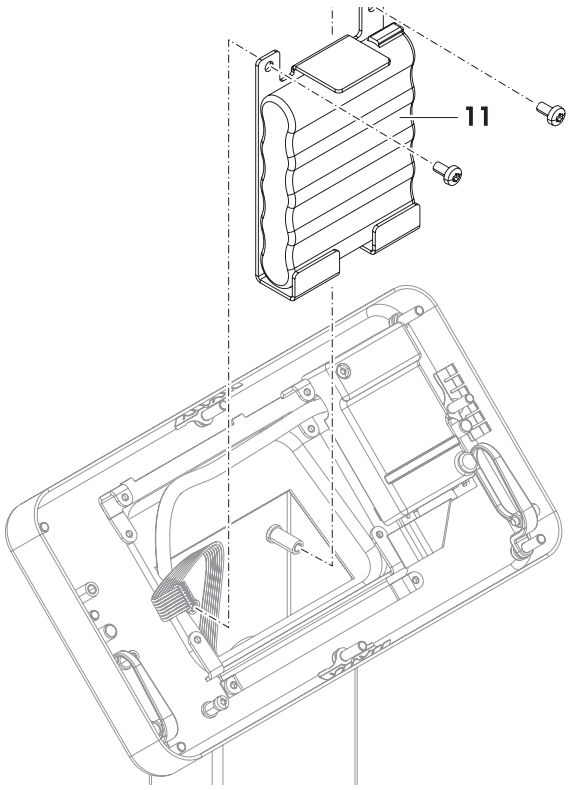


COM2 – Ethernet

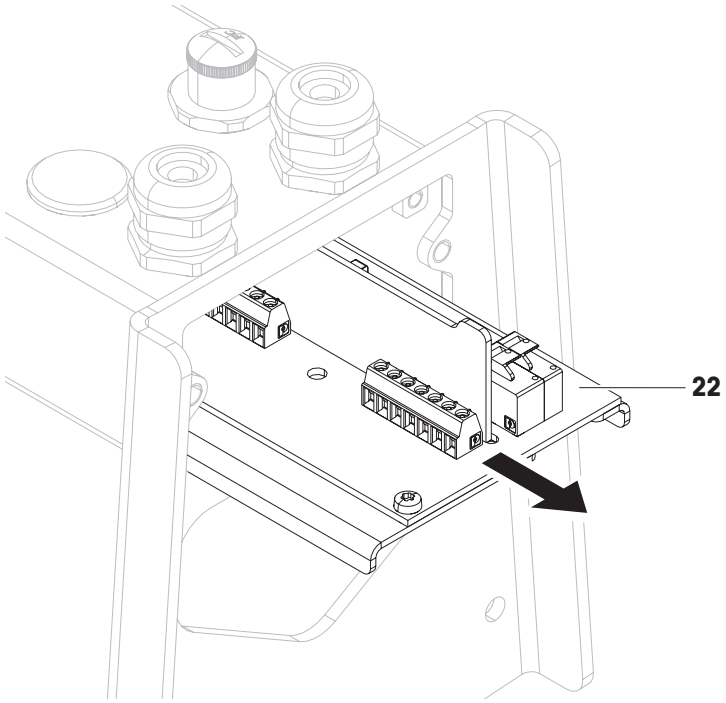




2.1.9 Column version – battery



2.1.10 Column version – connection PCB



2.2 Spare parts list

Item	Designation	Order number
1	Front cover complete, including keypad overlay for ICS429 for ICS439 for ICS449 for ICS469	 22 020 863 22 020 864 22 020 865 22 020 866
2	Display for ICS429, ICS439 for ICS449, ICS469	 22 020 867 22 020 868
3	Junction cable (display – main PCB)	72 243 329
4	Main PCB	72 225 202
5	RS232 socket (COM1) terminal version column version	 72 243 331 72 243 332
6	Power cable (power/charging PCB – main PCB)	72 229 935
7	Scale connection cable (Digicell/IDNet PCB – main PCB)	72 243 325
8	Power PCB	72 222 564
9	Power cord with plug Euro CH UK US JP AUS DK SA	 72 243 737 72 243 738 72 243 739 72 243 740 72 243 832 72 243 741 72 243 742 72 243 743
10	Charging PCB	72 223 842
11	Battery, with adhesive strips	22 020 882
12	Charging socket terminal version column version	 72 244 819 72 244 820
13	Battery charger	72 251 594
14	Digicell PCB (analog/digital converter)	42 110 200
15	IDNet PCB	72 243 351
16	IDNet socket, terminal version only	72 240 457

Item	Designation	Order number
17	COM2 optional interface cable (RS232, RS422/RS485, Digital I/O, USB Device) terminal version column version	 72 243 325 72 243 328
18	COM2 optional interface cable (Ethernet)	72 243 326
19	COM2 optional interfaces, PCB with socket RS232 RS422/RS485 Digital I/O USB Device	 72 228 919 72 237 964 72 228 921 72 237 968
20	COM2 optional Ethernet interface terminal version: PCB with socket column version: PCB without socket column version: socket with cable	 72 232 861 72 246 337 72 244 821
21	Column sealing	72 229 011
22	Connection PCB column version	72 245 205
23	Sealing screws, set of 5 pcs for ICS4_9, 5 pcs for ICS6_9 incl. washers and installation information	30 025 060
24	Pressure compensation valve, set of 10 pcs	72 228 076
	Power cord battery charger Euro CH UK US JP AUS DK SA	 72 243 744 72 243 745 72 243 746 72 243 747 72 243 833 72 243 748 72 243 749 72 243 750

2.3 Hardware set

Pieces	Designation	Order number
1	Hardware set, consisting of • Neck screw M5x10, 25 pcs • Sealing washer M5, 25 pcs • Neck screw M6x20, 25 pcs • Sealing washer M6, 25 pcs • Tooth lock washer M4, 50 pcs • Pan head screw M4x8, 25 pcs • Pan head screw M3x4, 50 pcs • Nut M16x1.5, 25 pcs • Blind plug M16x1.5, 10 pcs • Dust cover M12 – female (for interfaces), 25 pcs • Sealing washer M3, 25 pcs • Pan head screw M3x25, 25 pcs • Pan head screw M3x12, 25 pcs • Dust cover M12 – male (for battery), 25 pcs • Desiccant bag (set of 10), 2 pcs • Bumper column, 25 pcs • Carriage Bolt M6x80, 2 pcs • Washer 8, 2 pcs • Disc spring 18, 2 pcs • Hex domed nut M6, 2 pcs • Countersunk screw M3x20, 25 pcs	22 020 884

2.4 Pressure gauge kit

Pieces	Designation	Order number
1	Pressure gauge kit, consisting of • Manometer • Socket wrench 18 mm • Service manual Pressure test ICS__9	22 020 885

3 Replacing parts

3.1 Important information

- Before repair work, save the current configuration data using the InSite configuration tool, see section 6.2.
- In case of repair work, observe the exploded drawings and spare parts list in Chapter 2.
- When the terminal has been opened and closed, carry out a pressure test, see section 5.3.
- After components have been replaced, carry out a function check of the terminal, see section 5.1.

3.1.1 Safety and environment

▲ Disconnect the device from the power supply before beginning with repair work!

▲ The device contains electronic components that can be damaged through electrostatic discharges. Therefore always wear an earthing wrist strap during all repair work. Such wrist straps are available in specialist electronic shops.

▲ Observe the specifications in the User manual when disposing of defective components.

3.1.2 Tools and utilities

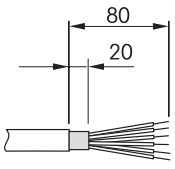
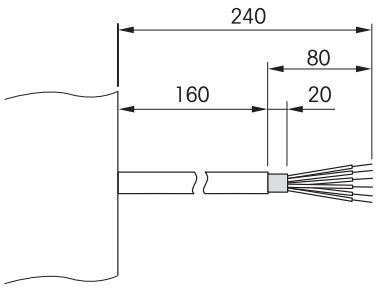
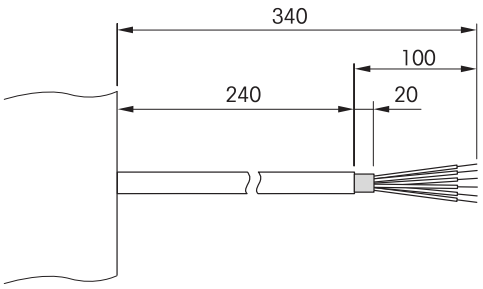
- Screwdriver Torx T10, T15 and T20
- Screwdriver blade 2.5 mm
- Spanners 8, 10, 18, 19 and 20 mm
- Earthing wrist strap (protection against electrostatic discharge)
- Service kit
- InSite software tool

3.1.3 Connecting weighing platforms

For connecting weighing platforms, refer to the ICS4_9 Installation information.

Note

Make sure to prepare the load cell cable according to the terminal and platform combination.

Terminal, .../t version	.../f version	.../c version
		

3.1.4 Tightening torques

▲ For safe operation make sure that all screws and nuts are tightened with the correct tightening torque.

M3	M4	M5	M6	M12x1.5	M16x1.5 (nut)	M16x1.5 (screw)
0.55 Nm	1.5 Nm	2.5 Nm	5.5 Nm	0.7 Nm	2.5 Nm	3.75 Nm
4.9 Lb-In	13.3 Lb-In	22.1 Lb-In	48.7 Lb-In	6.2 Lb-In	22.1 Lb-In	33.2 Lb-In

3.2 Opening and closing

3.2.1 Terminal

Exploded drawing Refer to the exploded drawing "Cover and display" on page 6.

Opening

1. Turn over the terminal and loosen the 2 screws. Do not remove the screws.
2. Return the terminal to its normal position and lift off the cover.
3. Put down the cover (1) in front or leave it hanging down with the plastic hinges (1a).

Closing

➜ Closing the terminal is carried out in reverse order. Do not tilt the cover when fitting it.

3.2.2 Column

Exploded drawing Refer to the exploded drawing "Column version – assembly" on page 9.

1. Unscrew 2 screws on the bottom of the column and remove the cover.
2. When closing the column make sure the sealing (21) is in place.

3.3 Replacing the cover

When replacing the cover, the display has to be transferred from the old cover to the new one.

Exploded drawing Refer to the exploded drawing "Cover and display" on page 6.

Disassembly

1. Unplug the junction cable (3) on the main PCB. To do so, swing open the locking bar of the connector.
2. Unhinge the plastic hinges (1a) from the housing.
3. Unplug the keypad cable (1b) on the display. To do so, open the locking bar of the connector.
4. Remove the two display fixation screws with plastic washers.
5. Remove the display (2) by carefully raising it at the recessed grip.

Assembly

1. Mount the display (2) in the new cover:
   - Carefully insert the display under the two notches (1c) and press it down. Make sure not to clamp the keypad cable (1b).
   - Screw in the two display fixation screws with plastic washers.
2. Plug in the keypad cable (1b) of the new cover and fix it with the locking bar.
3. Mount the plastic hinges (1a) at the housing.
4. Plug in the junction cable (3) on the main PCB and close the locking bar of the connector.

3.4 Replacing the display

Exploded drawing Refer to the exploded drawing "Cover and display" on page 6.

Disassembly

1. Unplug the junction cable (3) on the display (2). To do so, open the locking bar of the connector.
2. Unplug the keypad cable (1b) on the display. To do so, open the locking bar of the connector.
3. Remove the two display fixation screws with plastic washers.
4. Remove the display (2) by carefully raising it at the recessed grip.

Assembly

1. Mount the new display in the cover:
   - Carefully insert the display (2) under the two notches (c) and press it down. Make sure not to clamp the keypad cable (1b).
   - Screw in the two display fixation screws with plastic washers.
2. Plug in the keypad cable (1b) of the new cover and fix it with the locking bar.
3. Plug in the junction cable (3) and close the locking bar of the connector.

3.5 Replacing the main PCB

Exploded drawing Refer to the exploded drawing "Main PCB and COM1" on page 7.

Disassembly

1. Unplug the following cables on the main PCB (4):
   - COM1 cable (5) (connector COM1)
   - COM2 cable (17, connector COM2.1) or (18, connector COM2.2), if present. To do so, open the locking bar of the connector.
   - Junction cable (3). To do so, swing open the locking bar.
   - Power cable (6)
   - Scale connection cable (7) (connector SCL 1). To do so, open the locking bar of the connector.
2. Unscrew the 4 main PCB fixation screws and remove the main PCB.

Assembly

1. Plug in the power cable (6) on the main PCB.
2. Mount the new main PCB (4) with 4 screws.
3. Plug in the following cables on the main PCB:
   - COM1 cable (5) to connector COM1
   - If present: COM2 cable (17) to connector COM2.1 (RS232, RS422/485, USB Device, Digital I/O) or COM2 cable (18) to connector COM2.2 (Ethernet).
     To do so, insert the cable into the connector with the contact side facing upwards and secure with the locking bar.
   - Junction cable (3). To do so, insert the cable into the connector and close the locking bar.
   - Scale connection cable (7) to connector SCL 1. To do so, insert the cable into the connector with the contact side facing upwards and secure with the locking bar.

3.6 Replacing the power PCB

Exploded drawing Refer to the exploded drawing "Built-in power supply unit" on page 7.

1. Remove the main PCB, see section 3.5.
2. Disconnect the brown and blue power supply cables (9a,b / 22a,b). To do so, move the orange switches to the right to open the terminals.
3. Unscrew 4 screws and remove the power PCB (8).
4. Mount the new power PCB in reverse order.

3.7 Replacing the power cord

3.7.1 Terminal version

Exploded drawing Refer to the exploded drawing "Built-in power supply unit" on page 7.

Disassembly

1. Disconnect the brown and blue power supply cables (9a,b) on the power PCB (8). To do so, move the orange switches to the right to open the terminals.
2. Disconnect the grounding cable (9c).
3. Open the screwed cable gland and remove the power cord (9).

Assembly

1. Feed in the new power cord (9) and secure it with a cable clip at the end of the insulating of all three wires.
2. Connect the brown wire (9a) to the upper terminal on the power PCB (8), connect the blue wire (9b) to the lower terminal on the power PCB.
3. Connect the yellow-green wire (9c) to the earthing bolt.
4. Fasten the screwed cable gland.

3.7.2 Column version

For the power connection of the column version an additional part is needed: the connection PCB (22).

Exploded drawing Refer to the exploded drawings "Built-in power supply unit" on page 7 and "Column version – connectors" on page 10.

Replacing power cord

1. Open the screwed cable gland.
2. Disconnect the power cord (9) from the conncection PCB (22).
3. Insert the new power cord and connect the wires to the conncection PCB. Make sure not to confuse the colours.
4. Fasten the screwed cable gland.

3.8 Replacing the charging PCB and/or the battery

Exploded drawing Refer to the exploded drawing "Built-in storage battery" on page 8.

Column version For the column version also refer to the exploded drawing "Column version – battery" on page 11.

Removing charging PCB

1. Remove the main PCB (4), see section 3.5.
2. Disconnect the battery cable (11a) on the charging PCB (10) (upper connector).
3. Disconnect the charging cable (12a) on the charging PCB (lower connector).
4. Unscrew 4 hex bolts and remove the charging PCB.

Removing battery

Terminal version

1. Remove battery (11) and adhesive strip (11b) from the housing.
2. Clean the housing from residues of the adhesive strip.

Column version

➜ Unscrew the 2 screws of the battery holder and remove the battery (11).

Mounting

➜ Mount the new charging PCB and/or battery in reverse order.

3.9 Replacing the charging socket

Exploded drawing Refer to the exploded drawing "Built-in storage battery" on page 8.

Column version For the column version also refer to the exploded drawing "Column version – connectors" on page 10.

1. Disconnect the charging cable (12a) from the charging PCB (10) (lower connector).
2. Unscrew the hex nut of the charging socket from the inside and remove the socket.
3. Mount the new charging socket from the outside. Make sure the sealing is in place.
4. Screw on the hex nut.
5. Connect the charging cable to the lower connector on the charging PCB.

3.10 Replacing the DigicellI PCB

Exploded drawing Refer to the exploded drawing "Scale connection" on page 8.

1. Remove the verification screw on the back of the housing.
2. Remove the verification cover by unscrewing the screw.
3. Unplug the scale connection cable (7) on the DigicellI PCB.
4. Remove the DigicellI PCB by unscrewing 2 screws.
5. Note the colour coding of the analog scale connection and disconnect the analog scale wires.
6. Mount the new DigicellI PCB in reverse order. Plug in connection cable (7) with the contact side facing upwards.

3.11 Replacing the IDNet PCB and the IDNet socket

Exploded drawing Refer to the exploded drawing "Scale connection" on page 8.

Disassembly

PCB

1. Remove the verification screw on the back of the housing.
2. Remove the verification cover by unscrewing the screw.
3. Unplug the scale connection cable (7) and the IDNet cable (16a) on the IDNet PCB (15).
4. Remove the IDNet PCB by unscrewing 2 screws.

Socket

➜ Remove IDNet socket (16) by unscrewing the hex nut.

Assembly

➜ Mount the new IDNet socket and/or PCB in reverse order. Plug in connection cable (7) with the contact side facing upwards.

3.12 Replacing the COM1 RS232 socket

Exploded drawing Refer to the exploded drawing "Main PCB and COM1" on page 7.

Column version For the column version also refer to the exploded drawing section "Column version – connectors" on page 10.

1. Unplug the COM1 cable (5) on the main PCB (4).
2. Unscrew the hex nut of the socket (from the inside) and remove the socket.
3. Feed in the cable and mount the new socket from the outside. Make sure the sealing is in place.
4. Screw on the hex nut form the inside.
5. Plug in the COM1 cable on the main PCB.

3.13 Replacing optional interfaces (COM2)

3.13.1 RS232, RS422/RS485, Digital I/O, USB Device, Ethernet (terminal version only)

Exploded drawing Refer to the exploded drawing "Optional interface" on page 9.

Column version For the column version also refer to the exploded drawing section "Column version – connectors" on page 10.

1. Unplug the interface cable (17 or 18 (Ethernet)) from the interface PCB (19 or 20 (Ethernet)).
2. Unscrew the hex nut of the socket (from the outside) and remove PCB with socket.
3. Mount the new interface PCB with socket from the inside. Make sure the sealing is in place.
4. Screw on the hex nut from the outside.
5. Plug in the interface cable on the interface PCB with the contact side facing upwards.

3.13.2 Ethernet (column version)

Exploded drawing For the column version refer to the exploded drawing section "Column version – connectors" on page 10.

Disassembly

1. Unplug the interface cable (18) from the interface PCB (20).
2. Remove the interface PCB by unscrewing 2 screws.
3. Unplug connector (20a) from the interface PCB.
4. Unscrew grounding cable (20b).
5. Unscrew grounding cable (20c) from the connection PCB (22).
6. Unscrew the hex nut of the socket (20d) from the outside and remove PCB with socket and cable.

Disassembly

1. Insert the socket from the top through the column.
2. Connect grounding cable (20c) to the connection PCB.
3. Screw on the hex nut from the outside. Make sure the sealing is in place.
4. Connect grounding cable (20b) to the terminal housing.
5. Connect connector (20a) to the interface PCB.
6. Mount the interface PCB with 2 screws.
7. Plug in the interface cable on the interface PCB.

3.14 Replacing the connection PCB of the column version

When replacing the connection PCB, the "extension" cables from the connection PCB to the mainboard must be transferred from the old one to the new one.

Exploded drawing Refer to the exploded drawing section "Column version – connection PCB" on page 11.

1. Disconnect power connection (22a) from the mainboard.
2. Unscrew the sealing screw of the digicell PCB and disconnect scale connection.
3. Disconnect power and scale from the connection PCB (22).
4. If present, unscrew Ethernet grounding cable (20c) and Ethernet socket (20d) from the connection PCB.
5. Pull out the connection PCB and disconnect power and analog scale connection on the upper end of the connection PCB.
6. Mount the new connection PCB in reverse order.

4 Scale configuration

Scale configuration takes place in the SCALE menu block of the technician menu.

4.1 Calling up the technician menu

1. Switch on the terminal.
2. Enter the menu with password →0← ⊏→ →0← ⊏→.
   The technician menu is displayed.
   On verified scales only settings or functions are available which are not relevant for verification, e.g., enabling/disabling the tare key, calling up the smart weighing counter, saving configuration settings.

Modification of verification-relevant settings

1. Switch on the terminal.
2. Remove the sealing sticker and loosen the sealing screw.
   The technician menu is displayed. Verification is no longer valid.

After configuration has been completed, the device has to be verified by an authorised company and a new verification seal (sticker) has to be attached before the device may be used again as a verified scale.

4.2 Technician menu operation

Operation in the technician menu is the same as in the user and supervisor menu, see the corresponding User manual.

4.3 SCALE menu block

After the technician menu has been called up, the entire menu is available, also the user and supervisor menu. The following overview shows the SCALE menu block, the remaining menu is described in the User manual.
The SCALE menu block depends on the connected weighing platform – analog or IDNet.

4.3.1 Overview of the analog SCALE menu block

Factory settings are printed in **bold** in the following overview.

Level 1	Level 2	Level 3	See ...
Metrology	Approval	**Not Approved**, OIML, NTEP	page 28
	Class	Class I, Class II, **Class III**, Class IIII	
	Ver. interval	e = d, e = 10d (Class II only)	
	Display	Off, **On**	
Ramp value			page 28
Serial number			page 28
Scale build	Ranges	Single range, 2 Multi int., 2 Multi range, 3 Multi int., 3 Multi range	page 29
	Calibrated unit	g, kg, oz, lb, t	
	Capacity 1		
	Resolution 1		
	Capacity 2		
	Resolution 2		
	Capacity 3		
	Resolution 3		
GEO value			page 29
Linearisation	Perform 3p		page 30
Calibration	Perform calibration?		page 30
Control			page 30
Display/Units	Unit 1	g, kg, oz, lb, lb-oz, t	User manual
	Unit 2	g, kg, oz, lb, lb-oz, t	
	Resolution	0.005 kg ... 0.01 kg	
	Unit roll	**Off**, On	

Level 1	Level 2	Level 3	See ...
Zero	Zero capture	-2 to +2%, **-2 to +18%**	page 31
	Set zero		
	AZM	Off, **0.5d**, 1d, 2d, 5d, 10d	User manual
	Zero key	Off, **On**	page 31
	Center of Zero	**Off**, On	
	Zero blanking	9d, 9d with zero	
Tare	Auto tare	**Off**, On	User manual
	Chain tare	Off, **On**	
	A-Clear tare	**Off**, On, 9d	
	Tare key	Off, **On**	page 31
Restart	**Off**, on		User manual
Filter	Vibration	Low, **Medium**, High	User manual
	Process	**Universal**, Dosing	
	Stability	Fast, **Standard**, Precise	
MinWeigh	Function	**Off**, On	User manual
	Value		page 31
Reset	Perform reset ?		User manual

4.3.2 Overview of the IDNet SCALE menu block

Factory settings are printed in **bold** in the following overview.

Level 1	Level 2	Level 3	See ...
Metrology	Approval	**Not Approved**, OIML, NTEP	page 28
	Class	Class I, Class II, **Class III**, Class IIII	
	Ver. interval [1]	e = d, e = 10d (Class II only)	
	Display	Off, **On**	
Service mode	See Service manual of the connected weighing platform.		
Serial number [2]			page 28
Display/Units	Unit 2	g, kg, oz, lb, lb-oz, t	User manual
	Unit roll	**Off**, On	
Zero	AZM	Off, **0.5d**, 1d, 2d, 5d, 10d	User manual
	Zero key	Off, **On**	page 31
	Center of Zero	**Off**, On	
	Zero blanking	9d, 9d with zero	
Tare	Auto tare	**Off**, On	User manual
	Chain tare	Off, **On**	
	A-Clear tare	**Off**, On, 9d	
	Tare key	Off, **On**	page 31
Restart	**Off**, on		User manual
Filter	Vibration	Stable, **Normal**, Unstable	User manual
	Process	**Universal**, Absolute, Finefil	
	Stability	ASD = 0, 1, **2**, 3, 4, 5	
Update	6, 10, 15, 20 UPS		User manual
MinWeigh	Function	**Off**, On	User manual
	MinWeigh value		page 31
Reset	Perform reset ?		User manual

[1] read only

[2] read only when the serial number is stored in the load cell

4.3.3 Description of the SCALE menu block

METROLOGY – admissibility for verification

Approval	Setting the admissibility for verfication
Not approved	Scale not verifiable
OIML	Verify scale to OIML
NTEP	Verify scale to NTEP, valid for USA
Class	Setting the verification class, displayed only if approved
Class I ... Class IIII	Select the verification class
Ver. interval	Setting the verification interval, for Class II only
e = d	Verification interval = display resolution
e = 10d	Verification interval = 10 x display resolution
Display	
Off	No metrological data in the display
On	Metrology data line enabled
Notes	• If a scale is verified, various scale settings are no longer available or are only available to a limited extent. Direct access to the menu for service personnel is, furthermore, blocked subsequently for some menu items. • With verification interval e = 10 d the last (not approved) digit is displayed smaller.

RAMP VALUE – querying the value of the A/D converter (analog scales only)

Ramp value	
Ramp 20	Display of the percentage deflection of the analog/digital converter (ramp) Possible values: 0 ... 100 The empty scale has a lower ramp value than the scale with load.
Note	This value can be used to determine whether the weighing cell operates correctly. Scales with identical weighing cells that function correctly have more or less the same ramp values. The value is dynamic and changes when the load changes.

SERIAL NUMBER – querying the serial number of the scale

Serial number	Display or modification of the serial number of the scale
Note	The serial number should not be changed except, e.g., after a new main PCB has been installed.

SCALE BUILD – entering configuration data (analog scales only)

Ranges	Defining the scale type
Single range	Single range scale
2 Multi int.	Scale with rough range and 1 shiftable fine range. Automatic switching between the ranges in both directions.
2 Multi range	Scale with rough range and 1 fixed fine range. Automatic switching to the rough range. Return to the fine range at zero pass.
3 Multi int.	Scale with rough range and 2 shiftable fine ranges. Automatic switching between the ranges in both directions.
3 Multi range	Scale with rough range and 2 fixed fine ranges. Automatic switching to the rough range. Return to the fine range at zero pass.
Calibrated unit	Select the basic unit for entering in the service menu Possible units are: g, kg, oz, lb, t
Capacity 1/2/3	Enter capacity of the first/second/third range in the calibrated unit
Resolution 1/2/3	Select resolution of the first/second/third range in the calibrated unit
Note	• Capacity 2/3 and Resolution 2/3 are only displayed if they are supported by the scale. • Capacity and resolution are displayed in the following order: Capacity 1, Resolution 1, Capacity 2, Resolution 2, Capacity 3, Resolution 3 • The units g, kg and t are permissible in accordance with verifiable operation to OIML. The units kg and lb are permissible in accordance with verifiable operation to NTEP.

GEO VALUE – setting the GEO value (analog scales only)

0 ... 31	The Geo value is used to adapt the weighing system to the local gravity conditions. Setting range: 0 ... 31, see table in the Appendix.

LINEARISATION – linearisation with simultaneous calibration (anlaog scales only)

A basic calibration must have been carried out at least once for linearisation with simultaneous calibration.

`Perform 3p`	Performing 3-point linearisation (by default at 0 %, 50 % and 100 % of the full load)
Procedure	1. If existent, apply the preload. 2. Confirm the type of linearisation. The display begins to flash, the scale determines the zero point automatically. The scale next requires the first weight. 3. If appropriate, change the displayed weight value. 4. Place the displayed weight on the scale and confirm with ⮆. 5. Repeat steps 3 and 4 for each additional weight. After all the weights have been applied, `done` is displayed.
Note	Linearisation/calibration can be cancelled at any time with ⏻.

CALIBRATION – basic calibration (analog scales only)

Procedure	1. When `Preload` is displayed, load the desired preload and confirm with ⮆. The scale next requests the calibration weight corresponding to the full load. 2. If appropriate, change the displayed weight value. 3. Place the displayed weight on the scale and confirm with ⮆. After calibration has been carried out, `done` is displayed.
Note	• Calibration can be cancelled at any time with ⏻. • In order to achieve particularly high precision, carry out calibration under full load.

CONTROL – activating the control mode (analog scales only)

Note	• With control mode enabled, the current weighing result is displayed with high resolution and without weight unit. This allows the scale to be checked, e.g., after calibration and/or linearisation. • To leave the control mode press ⏻.

ZERO – Settings for the zero point

Zero capture	Select the zero capturing range. Possible zero capturing ranges: –2 % to +2 % or –2 % to +18 %
Set zero	Move the calibration zero point. This is necessary if an auxiliary preload is used or if the preload (e.g. roller conveyor) cannot be used for calibration or if they are outside the zero capturing range. 1. Apply the preload and confirm with ⇨. The query Sure ? is displayed. 2. Confirm moving of the zero point with ⇨ or cancel with →T←. 3. If underload or overload is displayed after the menu has been exited, switch the device off and on again.
AZM	Setting for the automatic zero compensation mode, refer to the User manual.
Zero key	Enabling/disabling manual zeroing using the →0← key.
Center of Zero	Switching on/off indication of **>0<** when zero setting is within the zero capturing range.
Zero blanking 9d 9d with zero	Setting for the underload condition • When there is an underload condition and the weight comes back to a value of –9d or bigger, the display will automatically show the weight again without pressing a key. • When there is an underload condition, the only way back to a regular weight indication is to press the →0← key.
Note	• The zero capturing range limits the nominal capacity of the scale. If the capacity of a weighing cell is to be used to its complete extent, the zero capturing range can be limited to –2 % to +2 %. • The new zero point is not activated until the scale is restarted. • No changes to Zero capture and Set zero should be carried out when the restart function is activated.

TARE – Settings for the tare function

Auto Tare	Supervisor menu, refer to the User manual
Chain Tare	
A-Clear Tare	
Tare key	Enabling/disabling manual taring using the →T← key.

MIN WEIGH – specifying the minimum weighing-in quantity

Function	Supervisor menu, refer to the User manual
Value	Entry of the minimum weighing-in quantity in the selected base unit. When the minimum weighing-in quantity is activated, < is displayed if the weight on the scale drops below the stored minimum weight.

5 Diagnostics and tests

5.1 General tests

1. With the closed terminal, check the following:
   - Smart weighing counter, see section 5.2
   - Damages, changes and lost parts
   - Pressure tightness, see section 5.3
   - Screw tightening
   - Water ingress (check display area)
2. Open the terminal and check the following:
   - Water ingress
   - Corrosion
   - Sealing
   - Desiccant bag
3. After servicing close the terminal:
   - Reset smart weighing counter
   - Perform a pressure test, see section 5.3
   - Perform a function test
4. If all tests are passed, fix the sealing sticker.

5.2 Smart weighing counter

ICS4_9 weighing terminals feature several control functions to monitor the condition of the device. This helps the user and the service technician to detemine how the device is treated and what measures are needed to keep it in a good shape.
If the control functions have put out an alert, the spanner icon  is displayed.
The smart weighing counter is accessible in the technician menu.

5.2.1 Calling up smart weighing counter

1. Call up the technician menu of the weighing terminal, see section 4.1 on page 24.
2. Select MAINTENANCE –> SERVICE.
   The smart weighing counter can be displayed and edited.

5.2.2 Smart weighing counter items

The following items can be displayed and/or edited:

Information	Show overview of the smart weighing counter
Last service	
Date	Show date of the last service
Next service	
Date	Show date of the next service
Alarm	Switch service alarm on/off With the alarm switched on, when reaching a trigger value a message is displayed
Weighings	
Actual value	Show number of weighings since the last reset
Reset	Reset the weighing counter to 0, **Sure ?** is displayed as a confirmation prompt
Overloads	
Actual value	Show number of overloads since the last reset
Trigger value	Enter a trigger value for overloads
Reset	Reset the overload counter to 0, **Sure ?** is displayed as a confirmation prompt
Peak weight	
Actual value	Show the highest weight value since the last reset
Reset	Reset the peak weight, **Sure ?** is displayed as a confirmation prompt
Zero commands	
Actual value	Show the number of zero commands since the last reset
Reset	Reset the counter, **Sure ?** is displayed as a confirmation prompt
Zero failures	
Actual value	Show the number of zero failures since the last reset
Trigger value	Enter a trigger value for zero failures
Reset	Reset the counter, **Sure ?** is displayed as a confirmation prompt
Battery	
Actual value	Show the number of charging cycles since the last reset
Trigger value	Enter a trigger value for charging cycles
Reset	Reset the charging counter, **Sure ?** is displayed as a confirmation prompt
On Time	
Actual value	Show the operating hours since the last reset
Reset	Reset the operating hours, **Sure ?** is displayed as a confirmation prompt
Custom message	The custom message is displayed together with the message **Service required**. To edit the custom message, use the InSite tool.

5.3 Pressure test

Tools Service kit 22 020 885

1. Unscrew the pressure compensation valve on the rear side using the socket wrench delivered with the service kit.
2. Connect the manometer to the pressure compensation thread.
3. Pump up to 30 mm Hg (approx. 40 mbar).
4. Wait for 15 seconds and read the pressure.
   The pressure must not drop below 20 mm Hg (approx. 26 mbar).
5. Log the test results.

Note

- If the pressure test has failed, check all screw connections and sealings and repeat the test.
- Consult the pressure test manual.

6 Software

6.1 Software labeling

The ICS4_9 software labeling consists of the following parts:

- product level (LN)
- cell connection (CC)
- software version (aa.bb.cc[D])
- application type (AT)
- application level (AL)

The complete label looks as follows:
LN-CC-aa.bb.cc[D]-AT-AL

Product level The ICS4_9 product level is S4.

Cell connection With ICS4_9 the following cell connections are possible:

DC Digicell
ID IDNet

Software version The software version is indicated by 6 digits: aa.bb.cc

aa for approval relevant revisions
bb for functional upgrades
cc for small changes or bug fixes

Example for ICS4_9: 01.04.12

If the software is not an official release version there has to be an extra character after the last digit. This character is always a capital letter.

Example for a non-release version: 01.04.12C

Note
A non-release version must not be used for a verified weighing system.

Application type The application type defines the weighing applicatione:

SW Straight Weighing
OU Over/Under Checkweighing

Application level With ICS4_9 the following application levels are possible:

2 Straight weighing without numeric keypad
3 Straight weighing with numeric keypad
4 Application level without numeric keypad
6 Application level with numeric keypad

Examples

S4	–	DC	–	01.01.14	–	SW	–	2
ICS4_9		Digicell		SW release version		Straight weighing application		Straight weighing without keypad

S4	–	DC	–	01.01.14	–	OU	–	4
ICS4_9		Digicell		SW release version		Over/Under Checkweighing application		Over/Under Checkweighing without keypad

S4	–	ID	–	01.01.15A	–	SW	–	3
ICS4_9		IDNet		SW test version		Straight weighing application		Straight weighing with keypad

6.2 Configuring with the InSite configuration tool

For basic information on the InSite configuration tool please refer to the InSite User Guide.

6.2.1 Menu configuration, saving/loading menu settings to/from a PC

Using the InSite configuration tool you can comfortably configure the weighing terminal on the PC.
Interface options identify themselves and can be configured immediately without prior activation.

Preparation

1. Connect the COM ports of weighing terminal and PC.
2. Switch on weighing terminal and PC.

Weighing terminal side

1. Call up the technician menu of the weighing terminal, see section 4.1 on page 24.
2. Select the connected COM port under **`Maintenance -> ShareData srvr`**. The message "Communication to InSite active" shows up and the communication parameters are displayed in the bottom line.

PC side

1. Start the InSite configuration tool and select the terminal to be configured.
2. Press the "Settings" button and set the communication parameters as displayed on the weighing terminal.
3. Press the "Connect" button to connect the PC to the weighing terminal.

Menu configuration

4. Make the requested menu settings in the menu tree.
   The settings are transferred to the weighing terminal immediately.
5. To finish, press the "Disconnect" button.

Saving the menu configuration to a file on the PC

4. Press the "Read" button.
   The configuration information is transferred from the weighing terminal to InSite.
5. Press the "Save" button.
6. Enter file name (extension: .bcf) and select location.
7. To finish, press the "Disconnect" button.

Loading the menu configuration from a file on the PC

4. Press the "Write" button.
   A selection window opens.
5. Select the desired file name (extension: .bcf).
6. Press the "Open" button.
   The configuration information is transferred from InSite to the weighing terminal.
   When transferring is finished, InSite will automatically disconnect the connection to the weighing terminal.

Finishing

➜ On the weighing terminal, press ⏻ as indicated on the Shared data server screen.
The weighing terminal automatically switches off and on again.
The new settings are active.

6.2.2 Software download

Software updates of the application software or the DigicelI PCB software are described below.

Note

To load a new DigicelI PCB software the verification screw must be loosened. The W&M approval will become invalid.

Preparation

1. Connect the COM ports of weighing terminal and PC.
2. Switch on the PC.
3. Make sure that the weighing terminal is switched off.

PC side

1. Start the InSite configuration tool and select the terminal to be configured.
2. Press the "Flash Download" button and select the programme file (.mot) to be downloaded to the weighing terminal.
3. Press the "Start" button.
   When downloading the Digicell PCB software, a message is displayed: Cell communication.

Weighing terminal side

➜ Switch on the weighing terminal.
The software is downloaded to the weighing terminal.
After finishing the download, the weighing terminal automatically switches off and on again.

6.3 Configuring the mainboard

After replacing the mainboard, default country and device name must be set:

6.3.1 Preparation: Enabling production configuration commands

Setting the default country and entering device name are not part of the "normal" SICS commands but of the production test commands.

1. Send command "PSS" to the device.
2. The device will return "PSS OK" if the command was successfully executed.

6.3.2 SDC – Set default country and language

Inquiry		
Command	SDC	Inquiry of default country and language
Response	SDC␣A␣XXXX	XXXX represents the country code, see table below
Setting		
Command	SDC␣XXXX	Set the country, see table below
Response	SDC␣A	Country has been set, country specific settings have been set, too
	SDC␣I	Country cannot be set at present
	SDC␣L	Parameter wrong
Example		
Command	SDC	Inquiry of the country
Response	SDC␣A␣2090	The country is 2090 (Germany)

Country codes

Code	Language	Unit 1	Unit 2	Date format	Comment
9999	English	kg	g	EU	
1020	US-English	lb	oz	US	
1280	English	kg	g	EU	W&M Argentina
2090	German	kg	g	EU	
2140	French	kg	g	EU	
2200	Italian	kg	g	EU	
2240	Spanish	kg	g	EU	
5020	Chinese	kg	g	EU	

6.3.3 SDN – Inquiry/Setting of the device name

Inquiry		
Command	SDN	Inquiry of default country and language
Response	SDN␣A␣"text"	"text" represents the device name
Setting		
Command	SDN␣"text"	Set the device name
Response	SDN␣A	Device name has been set
	SDN␣I	Device name cannot be set at present
	SDN␣L	"text" is too long
Example		
Command	SDN	Inquiry of the device name
Response	SDN␣A␣"ICS469check-BB30/f"	The device name is "ICS469check-BB30/f"
Comment	Set the device name as printed on the data label of the device	

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