Service Manual

METTLER TOLEDO
IND221 / IND226 weighing terminals

www.mt.com/support

ServiceXXL
Tailored Services

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, protecting your investment. Contact us about a ServiceXXL 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 product.

Contents

1 General

1.1 About this service manual

This service manual contains instructions for the repair and maintenance work to be performed by service engineers.
It is assumed that the reader is familiar with the operation of the device and can refer to the relevant operating instructions when necessary.

Working with the service manual
The exploded view drawings are provided as a guide for assembling and disassembling work and for identifying the order numbers for spare parts.
When ordering spare parts, please use the information given in the spare parts lists. The item numbers in the first column "Item" correspond to those on the corresponding exploded view drawing.

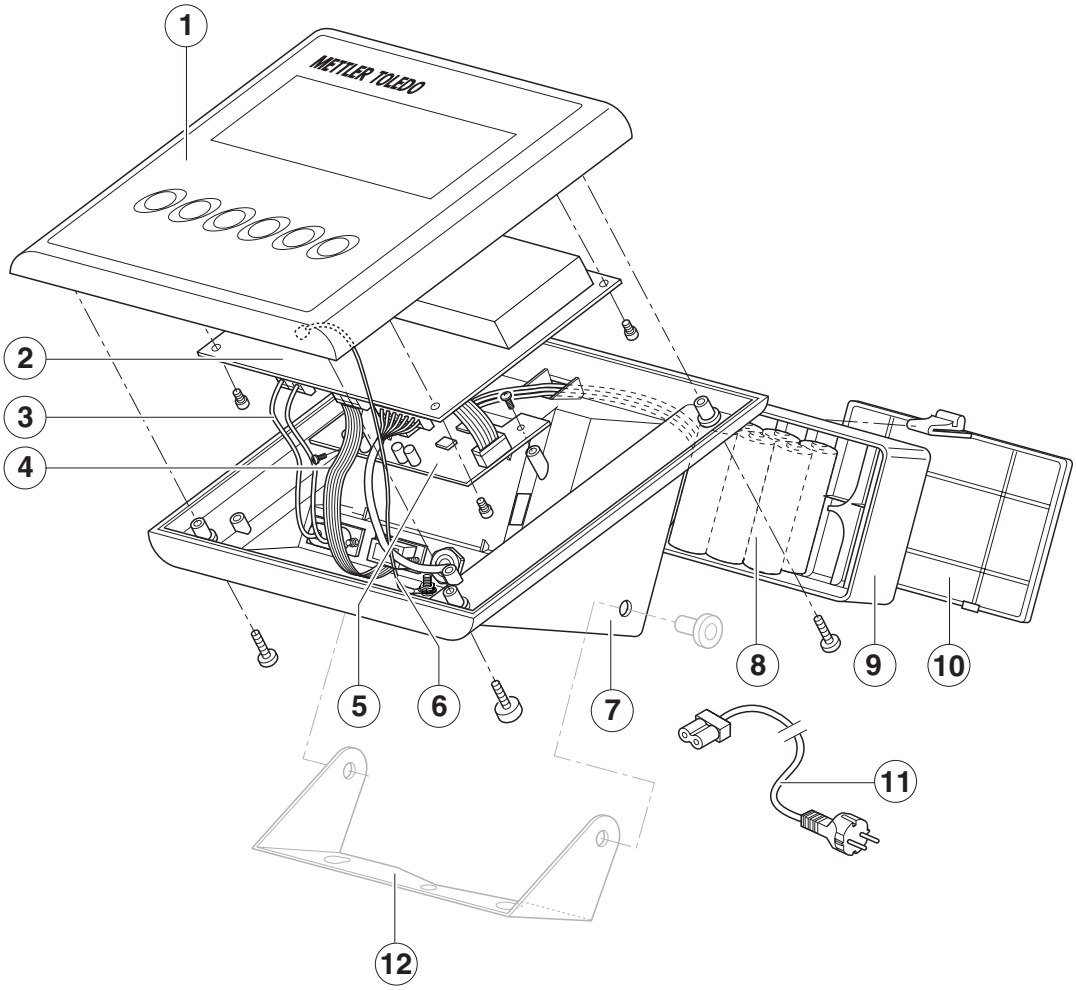
1.2 Safety precautions

Always observe the following basic safety precautions when performing service work on the IND221 / IND226 weighing terminals:

- ▲ Before opening the terminal, disconnect the power supply.
- ▲ Only replace parts or assemblies listed in the spare parts list.
- ▲ Do not conduct repairs on assemblies.
- ▲ The terminals contain precision electronic components that are sensitive to **electrostatic discharge**. We recommend that you wear a grounding wrist strap when doing any work in the interior of the terminal, in order to prevent any electrostatic charge build-up. Grounding wrist straps are commercially available from electronic component suppliers.

2 Spare parts

2.1 IND221

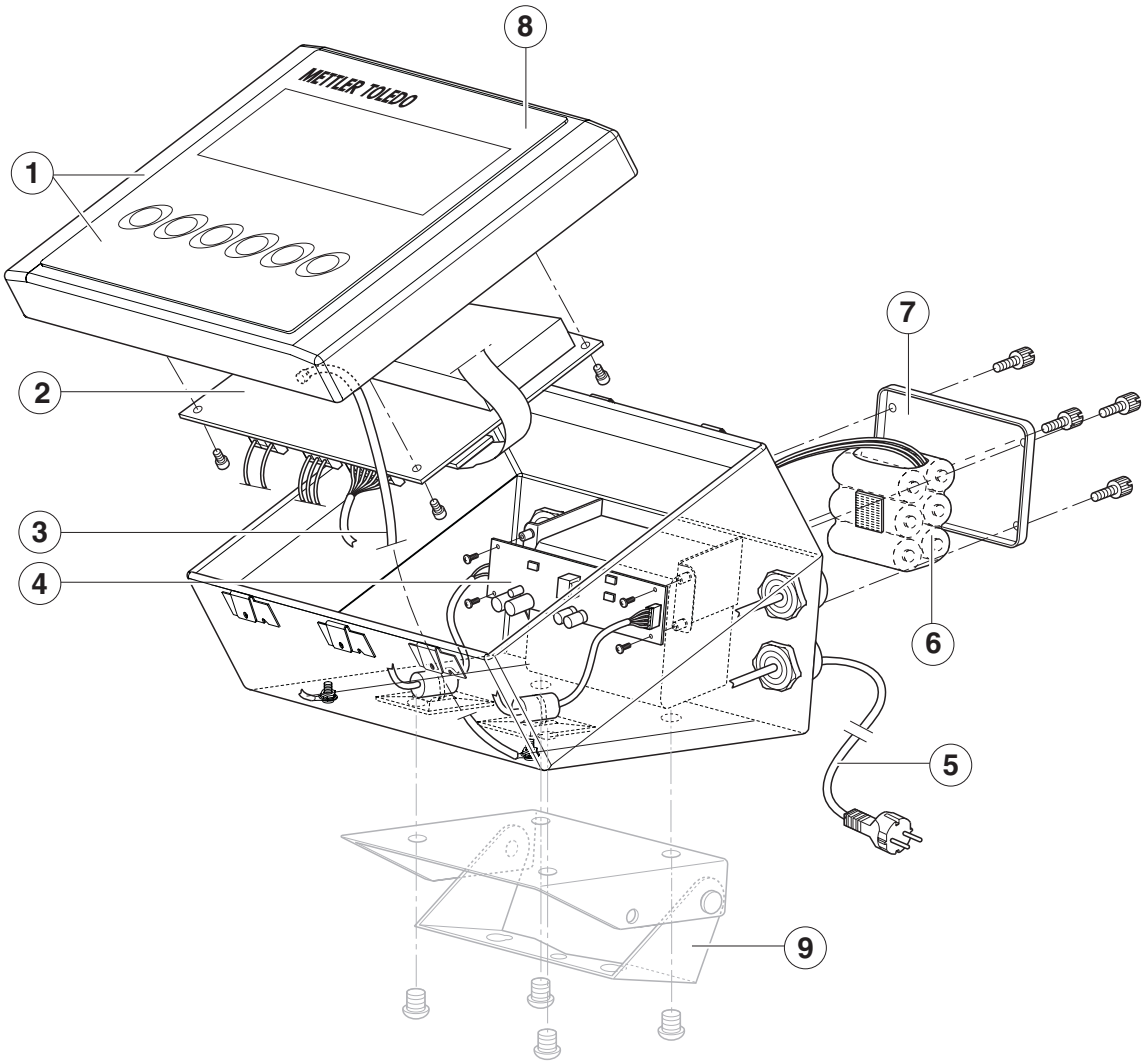


Item	Designation	Order number
1	Cover with keypad	72 190 111
2	Main board	72 181 553
3	Power wire	72 183 117
4	RS232 flat cable	72 183 006
5	Rechargeable battery board with connecting cables and mounting material	72 189 973
6	Ground wire	72 186 171
7	Housing, back part	72 182 604
8	Rechargeable battery	72 189 972
9	Battery case	72 189 974
10	Battery cover	72 182 606
11	Power cord EU GB AUS US	 71 209 965 71 210 223 71 209 966 71 209 968

Spare parts for sales region Americas only

Item	Designation	Order number
12	Mounting bracket	72 204 996

2.2 IND226

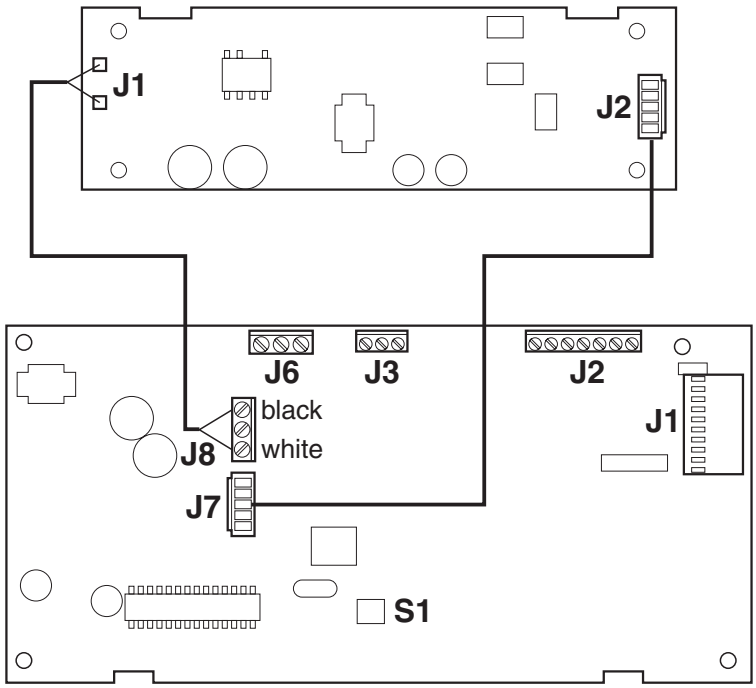


Item	Designation	Order number
1	Cover with keypad	72 189 969
2	Main board	72 181 553
3	Ground wire	72 188 108
4	Rechargeable battery board with connecting cables and mounting material	72 189 971
5	Power cord DK CH GB EU AUS US	 71 209 954 71 209 955 71 209 956 71 209 957 71 209 958 71 209 963
6	Rechargeable battery	72 189 972
7	Battery cover	72 200 772
8	Keypad overlay	72 180 247

Spare parts for sales region Americas only

Item	Designation	Order number
9	Mounting bracket	72 204 997

2.3 Cabling



Cable connections

J1 (Charging board) – J8 (Main board)
J2 (Charging board) – J7 (Main board)

Sockets on the main board

J1	Keyboard (foil cable)
J2	Load cell
J3	RS232 serial interface
J6	Power supply
J7	Control charging board
J8	Supply charging board

3 Repair

CAUTION

➜ Before opening the terminal, switch the terminal off and disconnect the power supply.

3.1 Opening the terminal

Opening IND221

➜ Unscrew 4 screws and lift off the cover.

Opening IND226

The cover of the IND226 is locked by 4 spring clips.

1. Insert the tip of a flat-blade screwdriver into one of the two slots located on the bottom of the cover and gently push in toward the enclosure until a "pop" sound is heard.
2. Lift off cover.

3.2 Changing the main board

1. Undo all cable connections: keyboard cable (foil cable), load cell cables, serial data interface cable, power cables, 2 cables from the charging board.
2. Remove the mainboard by unscrewing 4 screws.
3. Mount the new mainboard and rewire all cable connections.

Note

After replacing the main board all menu settings must be reset by a general reset.

3.3 Changing the charging board

1. Undo the 2 charging cables on the main board.
2. Cut the binder attaching the cables to the bottom housing.
3. Remove the charging board by unscrewing 2 screws.
4. Mount the charging board and connect the 2 cables to the main board, see section 2.3.
5. Attach the cables to the bottom housing with binders.

3.4 Changing the cover

1. Unmount the main board by unscrewing 4 screws.
2. Undo the cables connecting cover and bottom housing.
3. Mount the mainboard in the new cover.
4. Fix the cable connection of cover and bottom housing.

3.5 Changing the keypad overlay (IND226 only)

1. Unplug the keypad cable (foil cable) from the main board.
2. Lift up the defective keypad overlay. If necessary carefully pry it up with a knife and gently peel it off the cover.
3. Carefully clean cover. Remove all traces of adhesive.
4. Pass the cable of the new keypad overlay through the opening and plug in the cable on the mainboard.
5. Peel off the protective film from the new keypad overlay and carefully affix the keypad overlay to the cover.
6. Press the keypad overlay down uniformly.

3.6 Closing the terminal

Closing IND221

➜ Mount the cover and tighten the 4 screws.

Closing IND226

➜ Mount the cover and press on the bottom housing until the spring clips engage.

4 Menu

The menu is divided in the operator menu with application settings and the supervisor menu with scale settings.
The menu is described in detail in the User manual.

4.1 Overview

O = Operator menu
S = Supervisor menu

S	**F1**	**Scale menu**
	F1.1	Approval
	F1.2.1	Weight units
	F1.2.2	Weighing ranges
	F1.2.3	Capacity of the first weighing range
	F1.2.4	Resolution of the first weighing range
	F1.2.5	Capacity of the 2nd weighing range
	F1.2.6	Resolution of the 2nd (fine) weighing range
	F1.3.1	Geo value
	F1.3.2	Linearization during adjustment
	F1.3.3	Adjustment
	F1.4.1	Automatic zero setting
	F1.4.2	Power up zero
	F1.4.3	Pushbutton zero
	F1.5.1	Automatic taring
	F1.5.2	Clear tare automatically
	F1.5.3	Tare Interlock
	F1.5.4	Auto tare threshold
	F1.5.5	Auto clear tare threshold
	F1.6.1	Digital filter
	F1.7.1	Motion detection
	F1.10	Resetting parameters 1.x(.x)
O	**F2**	**Application menu**
	F2.1	F key settings
	F2.2	Plus/Minus weighing
	F2.2.1	Operating mode
	F2.2.2	Setting the target weight
	F2.2.3	Upper tolerance
	F2.2.4	Lower tolerance
	F2.3	Reference optimization
	F2.10	Reset F key settings

O	**F3**	**Terminal menu**
	F3.1.1	Timeout
	F3.1.2	Brightness
	F3.2	Auto power off
	F3.3	Battery type
	F3.10	Reset terminal settings
O	**F4**	**Communication menu**
	F4.1	Connections
	F4.2.1	Line format
	F4.2.2	Print format
	F4.2.3	Print language
	F4.2.4	Add line feed
	F4.2.5	Auto print threshold
	F4.2.6	Auto print reset threshold
	F4.3.1	Baudrate
	F4.3.2	Data bits / parity
	F4.3.3	Xon/Xoff
	F4.3.4	Checksum
	F4.10	Reset communication settings
S	**F5**	**Maintenance**
	F5.1	Calibration values
	F5.1.1	Show zero-counts
	F5.1.2	Show half load weight value
	F5.1.3	Show half load counts
	F5.1.4	Show full load weight value
	F5.1.5	Show full load weight counts
	F5.2	Keypad test
	F5.3	Display test
	F5.4	Display internal resolution
	F5.5	COM1 test
	F5.6	Print setup
	F5.10	General reset
	F6	**Ending menu**

5 Software download

IND221 / IND226 can download software in the field.

1. Switch the terminal off, open it and connect it to a PC.
2. Open the Hyperterminal program on the PC and establish a new serial connection with the following parameters:
   - 19200 baud
   - 8 Bits
   - no parity
   - no flow control
3. Select "Xmodem" in the "Transfer -> Send file" menu and click "Send".
4. Press the S1 button on the main board and switch on the weighing terminal. FLASH is displayed and the download starts (see page 10 for position of S1).

6 Interface data

6.1 Load cell connection

➜ Connect the weighing platform cable to the 7-pin terminal strip J2 according to the following table.

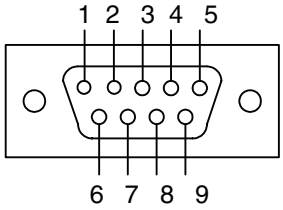
Terminal	1	2	3	4	5	6	7
Assignment	+EXC	+SEN	+SIG	Shield	–SIG	–SEN	–EXC

Note
With 4-wire load cells make bridges with: +EXC and +SEN, –EXC and –SEN.

6.2 Serial interface connection

6.2.1 IND221

With IND221 the serial interface connection is carried out as a 9-pin D-sub socket.



Pin assignment
Pin 2 RXD
Pin 3 TXD
Pin 5 GND

6.2.2 IND226

With IND226 the serial interface must be connected inside the weighing terminal to the 3-pin terminal strip J3.

Terminal assignment J3
Terminal 1 TXD
Terminal 2 RXD
Terminal 3 GND

7 Table of geo values (valid up to 7500 e)

Northern or southern latitude in degrees and minutes	Height above sea level in meters										
	0 325	325 650	650 975	975 1300	1300 1625	1625 1950	1950 2275	2275 2600	2600 2925	2925 3250	3250 3575
	Height above sea level in feet										
	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′	5	4	4	3	3	2	2	1	1	0	0
5° 46′ – 9° 52′	5	5	4	4	3	3	2	2	1	1	0
9° 52′ – 12° 44′	6	5	5	4	4	3	3	2	2	1	1
12° 44′ – 15° 6′	6	6	5	5	4	4	3	3	2	2	1
15° 6′ – 17° 10′	7	6	6	5	5	4	4	3	3	2	2
17° 10′ – 19° 2′	7	7	6	6	5	5	4	4	3	3	2
19° 2′ – 20° 45′	8	7	7	6	6	5	5	4	4	3	3
20° 45′ – 22° 22′	8	8	7	7	6	6	5	5	4	4	3
22° 22′ – 23° 54′	9	8	8	7	7	6	6	5	5	4	4
23° 54′ – 25° 21′	9	9	8	8	7	7	6	6	5	5	4
25° 21′ – 26° 45′	10	9	9	8	8	7	7	6	6	5	5
26° 45′ – 28° 6′	10	10	9	9	8	8	7	7	6	6	5
28° 6′ – 29° 25′	11	10	10	9	9	8	8	7	7	6	6
29° 25′ – 30° 41′	11	11	10	10	9	9	8	8	7	7	6
30° 41′ – 31° 56′	12	11	11	10	10	9	9	8	8	7	7
31° 56′ – 33° 9′	12	12	11	11	10	10	9	9	8	8	7
33° 9′ – 34° 21′	13	12	12	11	11	10	10	9	9	8	8
34° 21′ – 35° 31′	13	13	12	12	11	11	10	10	9	9	8
35° 31′ – 36° 41′	14	13	13	12	12	11	11	10	10	9	9
36° 41′ – 37° 50′	14	14	13	13	12	12	11	11	10	10	9
37° 50′ – 38° 58′	15	14	14	13	13	12	12	11	11	10	10
38° 58′ – 40° 5′	15	15	14	14	13	13	12	12	11	11	10
40° 5′ – 41° 12′	16	15	15	14	14	13	13	12	12	11	11
41° 12′ – 42° 19′	16	16	15	15	14	14	13	13	12	12	11
42° 19′ – 43° 26′	17	16	16	15	15	14	14	13	13	12	12
43° 26′ – 44° 32′	17	17	16	16	15	15	14	14	13	13	12
44° 32′ – 45° 38′	18	17	17	16	16	15	15	14	14	13	13
45° 38′ – 46° 45′	18	18	17	17	16	16	15	15	14	14	13
46° 45′ – 47° 51′	19	18	18	17	17	16	16	15	15	14	14
47° 51′ – 48° 58′	19	19	18	18	17	17	16	16	15	15	14
48° 58′ – 50° 6′	20	19	19	18	18	17	17	16	16	15	15
50° 6′ – 51° 13′	20	20	19	19	18	18	17	17	16	16	15
51° 13′ – 52° 22′	21	20	20	19	19	18	18	17	17	16	16
52° 22′ – 53° 31′	21	21	20	20	19	19	18	18	17	17	16
53° 31′ – 54° 41′	22	21	21	20	20	19	19	18	18	17	17
54° 41′ – 55° 52′	22	22	21	21	20	20	19	19	18	18	17
55° 52′ – 57° 4′	23	22	22	21	21	20	20	19	19	18	18
57° 4′ – 58° 17′	23	23	22	22	21	21	20	20	19	19	18
58° 17′ – 59° 32′	24	23	23	22	22	21	21	20	20	19	19
59° 32′ – 60° 49′	24	24	23	23	22	22	21	21	20	20	19
60° 49′ – 62° 9′	25	24	24	23	23	22	22	21	21	20	20
62° 9′ – 63° 30′	25	25	24	24	23	23	22	22	21	21	20
63° 30′ – 64° 55′	26	25	25	24	24	23	23	22	22	21	21
64° 55′ – 66° 24′	26	26	25	25	24	24	23	23	22	22	21
66° 24′ – 67° 57′	27	26	26	25	25	24	24	23	23	22	22
67° 57′ – 69° 35′	27	27	26	26	25	25	24	24	23	23	22
69° 35′ – 71° 21′	28	27	27	26	26	25	25	24	24	23	23
71° 21′ – 73° 16′	28	28	27	27	26	26	25	25	24	24	23
73° 16′ – 75° 24′	29	28	28	27	27	26	26	25	25	24	24
75° 24′ – 77° 52′	29	29	28	28	27	27	26	26	25	25	24
77° 52′ – 80° 56′	30	29	29	28	28	27	27	26	26	25	25
80° 56′ – 85° 45′	30	30	29	29	28	28	27	27	26	26	25
85° 45′ – 90° 00′	31	30	30	29	29	28	28	27	27	26	26

72182837A

Mettler-Toledo AG
Im Langacher
CH-8606 Greifensee, Switzerland
Tel. ++41-44-944 22 11
Fax ++41-44-944 45 10

www.mt.com