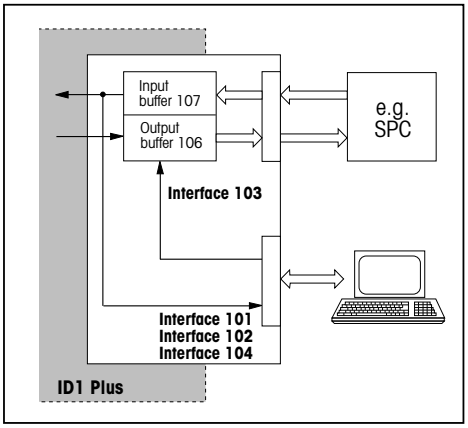


3.2 I/O port commands for interface 103 digital I/O

Input/output buffer of the I/O port

Reading of the inputs or setting of the outputs is effected via an input or output buffer. The input and output ports must be switched in the master mode to EXTERN for this.
Both buffers are separate application blocks.

Reading inputs

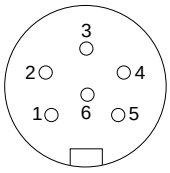
Application — For reading the inputs of the I/O port.

Command format — A | R | 107 | C_R | L_F

Action — After receipt of the "AR" command, the terminal sends the 6 input states of the I/O port.

Response format — A | B | 6 input bits | C_R | L_F
6 ← 1

Remarks
- Input states:
  Logic "0" = no current (contact open)
  Logic "1" = current flow (contact closed)
- With the ID1 Plus only inputs 1 and 2 are used.



Front view

2.3 Technical data Interface 104 RS422/RS485

Interface 104 is a retrofittable interface for the ID1 Plus weighing terminal which can be operated either as an RS422 (4-wire full duplex) or RS485 (2-wire half duplex). In both cases **one** peripheral device can be attached to the weighing terminal.
Factory setting: RS422

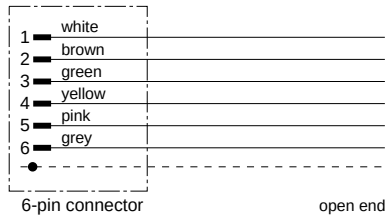
Interface mode	bidirectional differential voltage interface
Max. operating length	1200 m
Transmission rate	150 - 19200 baud
Galvanic separation	optocoupler

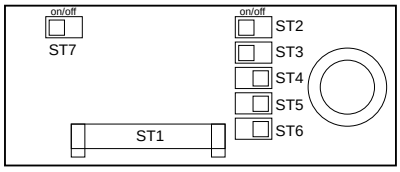
Connector

6-pin round connector, socket
Appropriate male connector: order No. 204 866

Pin assignment

	RS422	**RS485**
Pin 1	GND	GND
Pin 2	+5 V (max. 100 mA)	+5 V (max. 100 mA)
Pin 3	TXD +	TXD + / RXD +
Pin 4	TXD –	TXD – / RXD –
Pin 5	RXD –	not assigned
Pin 6	RXD +	not assigned





Cable

Cable with 6-pin connector and open end, length 3 m. Order No. 204933.
Cables prepared by the customer must be shielded and paired (twisted pair).

Switching between RS422 and RS485

Standard setting in the factory: RS422 with terminating resistor.
Switching with jumper ST2 - ST7.

	ST2		ST3		ST4		ST5		ST6		ST7	
	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
RS422	X		Terminal resistor 150 Ω: With resitor	Terminal resistor 150 Ω: Without resistor		X		X		X	X	
RS485		X		X	Pulldown-resistor for TXD – / RXD –: With resistor	Pulldown-resistor for TXD – / RXD –: Without resistor	Terminal resistor 150 Ω: With resistor stand	Terminal resistor 150 Ω: Without resistor	Pullup-resistor for TXD + / RXD +: With resistor stand	Pullup-resistor for TXD + / RXD +: Without resistor		X

Notes

- When a terminating resistor is used, ensure that the total load resistance is not less than 100 Ω.
- With RS485, the resistances which can be connected with ST4 - ST6 ensure that defined levels are applied at the receiver if no station drives the line.

3 Command set

The command set of interfaces 101, 102 and 104 is described in the interface description of the ID1 weighing terminal ME-703550.
Please note the following modifications:

- In writing into the display (see p. 36), the received text appears in the display **right** aligned.
- Other commands have been added and these are described in the following sections.

3.1 Setting the digital outputs

Application — Setting the digital outputs of interface 103.

Command format — W | status | C_R | L_F

Action — This command can be used to enable or disable the digital outputs of interface 103 individually. Each output is assigned a value:

Digital output 1	Value 1
Digital output 2	Value 2
Digital output 3	Value 4

The "status" is the sum of the values of those outputs which should be closed.

Response format — W | B | C_R | L_F

Example — With W | _ | 5 | C_R | L_F digital outputs 1 and 3 are closed, digital output 2 open.

Remarks
- Resetting all outputs with W | C_R | L_F or W | _ | C_R | L_F .
- A break at the interface has no effect on the outputs.
- Error message E | L when status < 0 or status > 15 is entered.

3.3 Target value entry for LED analog display

Application — For entering the target value in plus/minus weighing.

Command format — In weighing-in:

A	W	0	2	0	_	target value	_	unit	H_T	Tol. (+)	_	unit	H_T	Tol. (-)	_	unit	H_T	start point	_	unit	C_R	L_F

In checking:

A	W	0	2	0	_	target value	_	unit	H_T	Tol. (+)	_	unit	H_T	Tol. (-)	_	unit	C_R	L_F

In classifying:

A	W	0	2	0	_	limit 1	_	unit	H_T	limit 2	_	unit	C_R	L_F

Action — As for manual entry of the values using the keypad. See operating instructions of ID1 Plus.

Response format — | A | B | C_R | L_F |

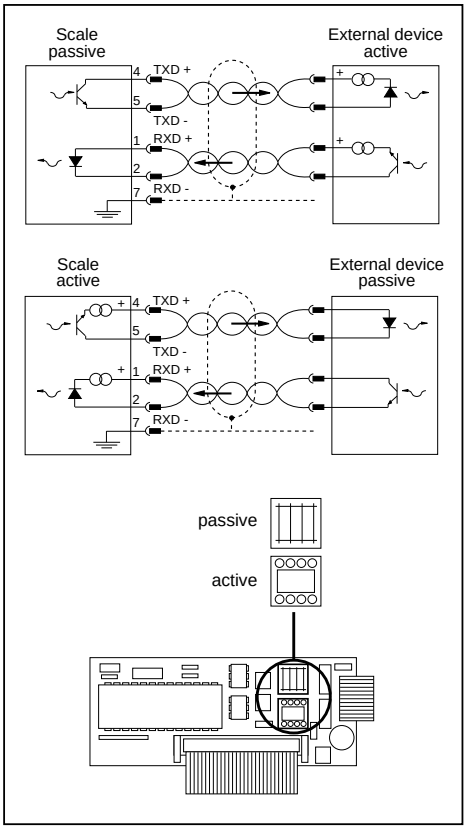
Example — Command | A | W | 0 | 2 | 0 | _ | 1 | 0 | . | 0 | 0 | 0 | _ | kg | H_T | 0 | . | 1 | 0 | 0 | _ | kg | H_T | 0 | . | 0 | 5 | 0 | _ | kg | C_R | L_F |

Response | A | B | C_R | L_F |

Remarks
- Note limit values for target value, tol.(+), tol.(-) and start point: see ID1 Plus operating instructions.
- Clear target value entry | A | W | 0 | 2 | 0 | _ | C_R | L_F | .
- In weighing in, entry of the start point is not mandatory.

H_T Horizontal tabulator hex 09

2 Technical data



2.1 Technical data of interface 101 CL 20 mA

Interface 101 is a retrofittable CL 20 mA interface for the ID1 Plus weighing terminal.

Interface 101 CL 20 mA

Interface type	20 mA current loop
Transmission loops	2
Operation	passive or active
Signal level "0"	20 mA (high level)
Signal level "1"	0 mA (low level)
Galvanic separation	optocoupler

Mode "passive" (default)

Transmitting and receiving loops must be supplied by an external power source.

Specifications of the external power source

I_{max}	30 mA
U_{max}	27 V
Voltage range	15 V (+10 % / -0 %)
Current level "high"	18 mA … 24 mA
Rate of change	2 … 20 mA/µs

Mode "active"

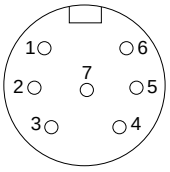
An internal power source supplies the transmitting and receiving loops.

Specifications of the internal power source

Voltage	12 VDC, nonstabilized
Current	stabilized to 20 mA ±2 mA, for transmitting and receiving loops

Switching between "passive" and "active"

- Remove plug-in connector from "passive" socket and plug into "active" socket.



Front view

Connector

7-pin circular connector, female

Pins 1 and 2	receiving loop (scale)
Pins 4 and 5	transmitting loop (scale)
Pin 7	protective ground

Cables

Cables prepared by the customer must be shielded and paired.

Cable resistance	≤125 Ω/km
Cable diameter	≥0.14 mm²
Cable capacitance	≤130 nF/km

The maximum cable length depends on the baud rate set.

19200 baud	max. 300 m
9600 baud	max. 600 m
- 4800 baud	max. 1000 m

Accessories

Data cable CL, 3 m	ME-503749
Data cable general purpose, 3 m	ME-503743
Data cable general purpose, 7 m	ME-503746
Adapter 7-pin	ME-503745

2.2 Technical data of interface 102 RS232

Interface 102 is a retrofittable RS232 interface for the ID1 Plus weighing terminal.
The technical data are described in the interface description of the ID1 weighing terminal ME-703550.

Setting outputs

Application — For setting or resetting the outputs of the I/O port.

Command format — `A | W | 106 | _ | 8 output bits | CR | LF`

`8 ← 1`

Action — After receipt of the "AW" command, the 8 outputs are set or reset according to the output bits.

Response format — `A | B | CR | LF`

Command not executable:

`E | S | CR | LF` Wrong application block No.

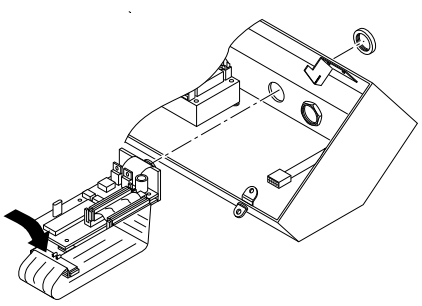
Remarks
- Output states:
  Logic "0" = no current
  Logic "1" = current flow
- With the ID1 Plus only outputs 1 … 3 are used.

4.2 Response formats in reading

Number	Response format	
002	A B _ I T 1 + - 0 - 0 X X X C_R L_F	xxx = current version number
003	A B _ STX C_R L_F	
004	A B _ ETX C_R L_F	
006	A B _ C_R L_F C_R L_F	
007 - 009	A B _ value _ unit C_R L_F	
010	A B _ 1 C_R L_F	
011 - 019	see 007	
020	A B _ value _ unit _ _ value _ unit _ _ value _ unit _ _ value _ unit C_R L_F Target value Tol. (+) Tol. (-) Start point	in weighing-in
	A B _ value _ unit _ _ value _ unit _ _ value _ unit C_R L_F Target value Tol. (+) Tol. (-)	in checking
	A B _ value _ unit _ _ value _ unit C_R L_F Limit 1 Limit 2	in classifying
021 - 023	see 007	
024	A B _ _ _ _ _ _ _ _ _ _ _ number _ C_R L_F	
025	see 007	
026 - 050	see 020	
107	A B _ 0 0 0 0 X X C_R L_F	x = o: no current, x = 1: current flow
310	see 007	

unit	Unit, 3 characters, left-aligned
value	Value, 10 digits with sign and decimal point, right-aligned
number	Number, 3 digits, right-aligned

1 Installation instructions



Interface 101, 102 and 104 are retrofittable serial interfaces for the ID1 Plus weighing terminal.

Installation instructions

Caution

Before opening the terminal, disconnect power plug!

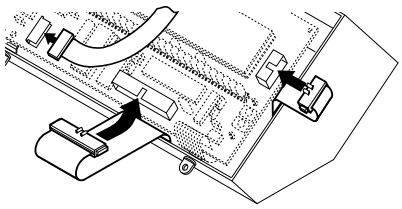
- Unscrew 2 screws on underside of cover at front and lift off cover.
- Disconnect keypad cable and weighing platform cable from main board on the right next to the display.
- Unscrew heavy gauge screw fitting and push in power cable approx. 5 cm.
- Unscrew 2 screws on main board, lift main board from guide and place to left side.
- At the rear of the housing, remove the right dummy stopper.

- Break off socket board from interface board.
- Undo ring nut at interface socket.
- Ensure correct seating of rubber ring seal.
- Lead interface socket outward through the opening, screw on ring nut from outside and tighten.
- Align spacer on the underside of the interface board parallel to the edges.

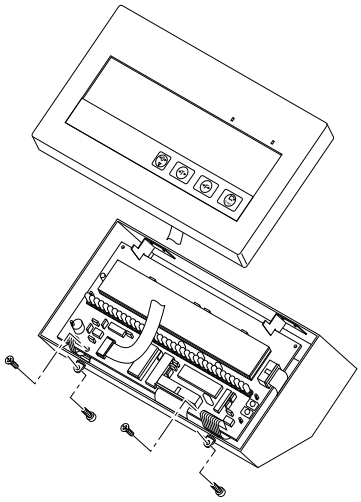
  Caution

  Degrease the bonding surfaces before installation!
- Remove protective film from bonding surfaces, push interface board directly onto socket board and press down firmly on housing base.

- Bend ribbon cable downward by 90° before installation.
- Plug outer connector of ribbon cable into interface board and secure.



- Plug interface connector into main board and secure.
- Plug weighing platform connector into main board.
- Pull out power cable and tighten heavy gauge screw fitting.



- Insert main board in the guide and secure with 2 screws.
- Plug keypad cable into main board.
- Mount cover and tighten firmly with the 2 screws on underside of cover at the front.

4 Application blocks

4.1 Contents of the application blocks

Number	Contents	Remarks
002	Program number	
003	STX	
004	ETX	
006	C_R L_F	
007	Gross 2nd unit	only in work with 2 weight units
008	Net 2nd unit	only in work with 2 weight units
009	Tare 2nd unit	only in work with 2 weight units
010	Scale number	
011	Gross	
012	Net	
013 w	Tare	
014	Display contents	
016 w	Dynamic result	only in dynamic weighing
017	Piece number	only in piece counting
018	Difference	only in +/- weighing
019	Percent	only in +/- weighing
020 w	Target value, tolerance (+), tolerance (-), start point (current)	only in +/- weighing
021 w	Zero limit	only in +/- weighing
022	Components/items	only in formula weighing and totalization
023	Total	only in formula weighing and totalization
024	Item counter	only in formula weighing and totalization
025	Container tare	only in formula weighing and totalization
026 w	Target value 1, tolerance 1 (+), tolerance 1 (-), start point 1	only in +/- weighing
...	...	
050 w	Target value 25, tolerance 25 (+), tolerance 25 (-), start point 25	only in +/- weighing
106 w	Output buffer of I/O port	
107	Input buffer of I/O port	
310	Piece number	only in counting

w = writable application block

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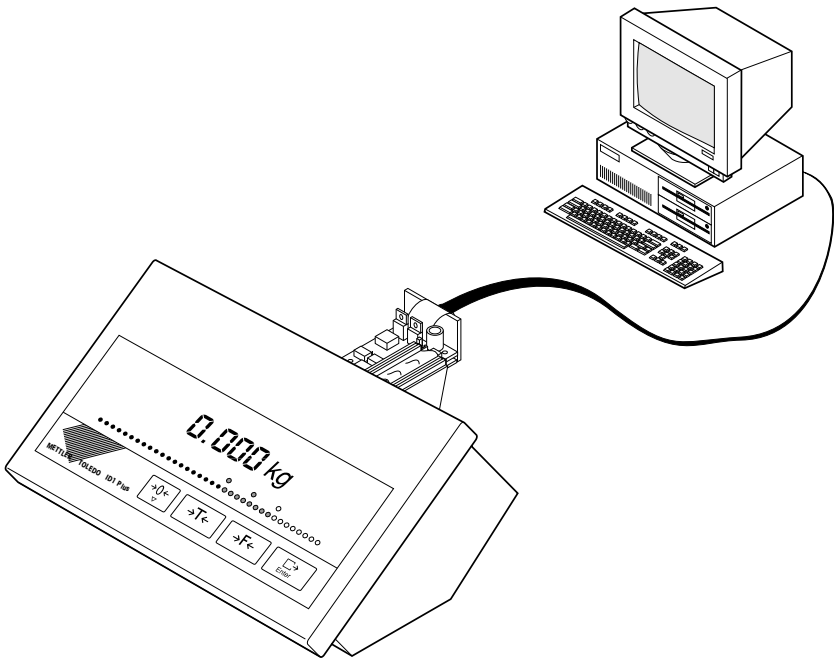
Installation instructions
Interface description

METTLER TOLEDO MultiRange
Interface 101 CL 20 mA
Interface 102 RS232
Interface 104 RS422/RS485



METTLER TOLEDO

Contents

4.3 Command formats in writing

Number	Command format	
013	A W 0 1 3 _ value _ unit C_R L_F	
016	A W 0 1 6 _ number C_R L_F	Start of a weighing cycle such as dynamic weighing with F key (only if F key appropriately configured in master mode).
020	A W 0 2 0 _ value _ unit H_T value _ unit H_T value _ unit H_T value _ unit C_R L_F Target value Tol. (+) Tol. (-) Start point	in weighing-in
	A W 0 2 0 _ value _ unit H_T value _ unit H_T value _ unit C_R L_F Target value Tol. (+) Tol. (-)	in checking
	A W 0 2 0 _ value _ unit H_T value _ unit C_R L_F Limit 1 Limit 2	in classifying
026 - 050	see 020	
106	A W 1 0 6 _ 0 0 0 0 0 X X X C_R L_F	x = 0: no current, x = 1: current flow

unit	Unit, 3 characters, left-aligned
value	Value, 10 digits with sign and decimal point, right-aligned
number	Number, 3 digits, right-aligned
H_T	Horizontal tabulator hex 09