

Application

Command format

Action

Response format

Remarks

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

For reading the inputs of the I/O port.

A **R** **107** | **C_{R1}** **L_{RF}**

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

A **B** | **6 input bits** | **C_{R1}** **L_{RF}**
 | **6** ← **1** |

- 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.

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

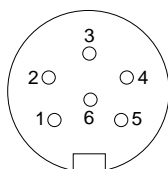
Connector

6-pin round connector, socket

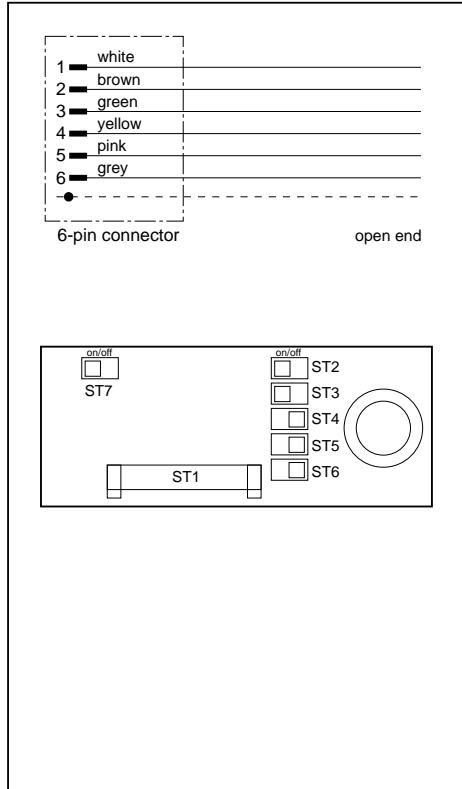
Appropriate male connector: order No. 204 866

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



Front view



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

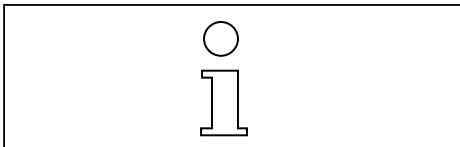
Standard setting in the factory: RS422 with terminating resistor.
Switching with jumper ST2 - ST7.

	ST2		ST3		ST4		ST5		ST6		ST7	
	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
RS422	X		Terminal resistor 150 Ω			X		X		X	X	
RS485		X	With resistor	With- out resistor	Pull-down- resistor for TXD - / RXD -		Terminal resistor 150 Ω		Pullup- resistor for TXD + / RXD +			X
					With resistor	With- out resistor	With resistor stand	With- out resistor	With resistor stand	With- out resistor		

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 $\boxed{W} \boxed{\text{status}} \boxed{C_{R1}} \boxed{L_F}$

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 $\boxed{W} \boxed{B} \boxed{C_{R1}} \boxed{L_F}$

Example With $\boxed{W} \boxed{1} \boxed{5} \boxed{C_{R1}} \boxed{L_F}$ digital outputs 1 and 3 are closed, digital output 2 open.

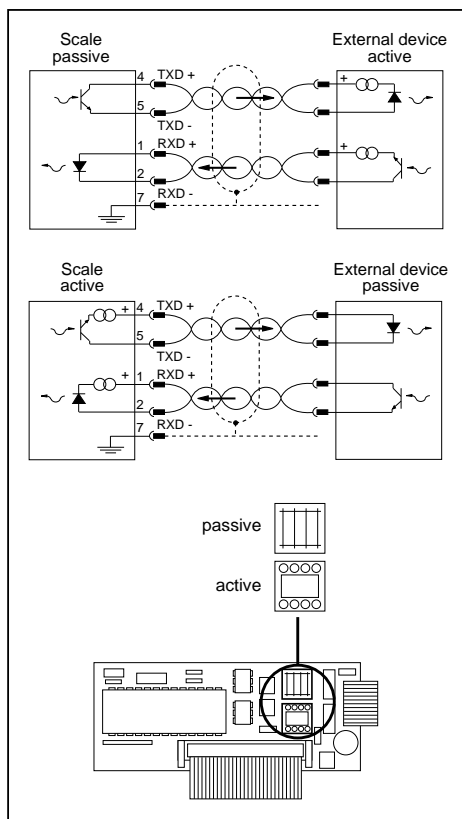
- Remarks
- Resetting all outputs with $\boxed{W} \boxed{C_{R1}} \boxed{L_F}$ or $\boxed{W} \boxed{-} \boxed{C_{R1}} \boxed{L_F}$.
 - A break at the interface has no effect on the outputs.
 - Error message $\boxed{E} \boxed{L}$ when status < 0 or status > 15 is entered.

3.3 Target value entry for LED analog display

Application	For entering the target value in plus/minus weighing.
Command format	In weighing-in: $\boxed{A} \boxed{W} \boxed{0} \boxed{2} \boxed{0} \boxed{-} \boxed{-} \text{target value} \boxed{-} \boxed{-} \text{unit} \boxed{H_T} \text{ Tol. (+)} \boxed{-} \boxed{-} \text{unit} \boxed{H_T} \text{ Tol. (-)} \boxed{-} \boxed{-} \text{unit} \boxed{H_T} \text{ start point} \boxed{-} \boxed{-} \text{unit} \boxed{C_{R1}} \boxed{L_F}$ In checking: $\boxed{A} \boxed{W} \boxed{0} \boxed{2} \boxed{0} \boxed{-} \boxed{-} \text{target value} \boxed{-} \boxed{-} \text{unit} \boxed{H_T} \text{ Tol. (+)} \boxed{-} \boxed{-} \text{unit} \boxed{H_T} \text{ Tol. (-)} \boxed{-} \boxed{-} \text{unit} \boxed{C_{R1}} \boxed{L_F}$ In classifying: $\boxed{A} \boxed{W} \boxed{0} \boxed{2} \boxed{0} \boxed{-} \boxed{-} \text{limit 1} \boxed{-} \boxed{-} \text{unit} \boxed{H_T} \text{ limit 2} \boxed{-} \boxed{-} \text{unit} \boxed{C_{R1}} \boxed{L_F}$
Action	As for manual entry of the values using the keypad. See operating instructions of ID1 Plus.
Response format	$\boxed{A} \boxed{B} \boxed{C_{R1}} \boxed{L_F}$
Example	Command $\boxed{A} \boxed{W} \boxed{0} \boxed{2} \boxed{0} \boxed{-} \boxed{-} \boxed{1} \boxed{0} \boxed{.} \boxed{0} \boxed{0} \boxed{0} \boxed{-} \boxed{-} \text{kg} \boxed{H_T} \boxed{0} \boxed{.} \boxed{1} \boxed{0} \boxed{0} \boxed{-} \boxed{-} \text{kg} \boxed{H_T} \boxed{0} \boxed{.} \boxed{0} \boxed{5} \boxed{0} \boxed{-} \boxed{-} \text{kg} \boxed{C_{R1}} \boxed{L_F}$ Response $\boxed{A} \boxed{B} \boxed{C_{R1}} \boxed{L_F}$
Remarks	<ul style="list-style-type: none"> • Note limit values for target value, tol.(+), tol.(-) and start point: see ID1 Plus operating instructions. • Clear target value entry $\boxed{A} \boxed{W} \boxed{0} \boxed{2} \boxed{0} \boxed{-} \boxed{-} \boxed{C_{R1}} \boxed{L_F}$. • 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"

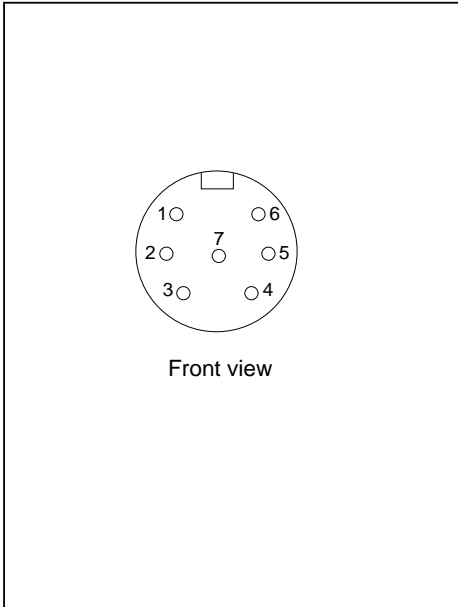
An internal power source supplies the transmitting and receiving loops.

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.



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.

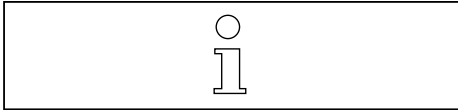
Cable resistance	$\leq 125 \Omega/\text{km}$
Cable diameter	$\geq 0.14 \text{ mm}^2$
Cable capacitance	$\leq 130 \text{ nF/km}$

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

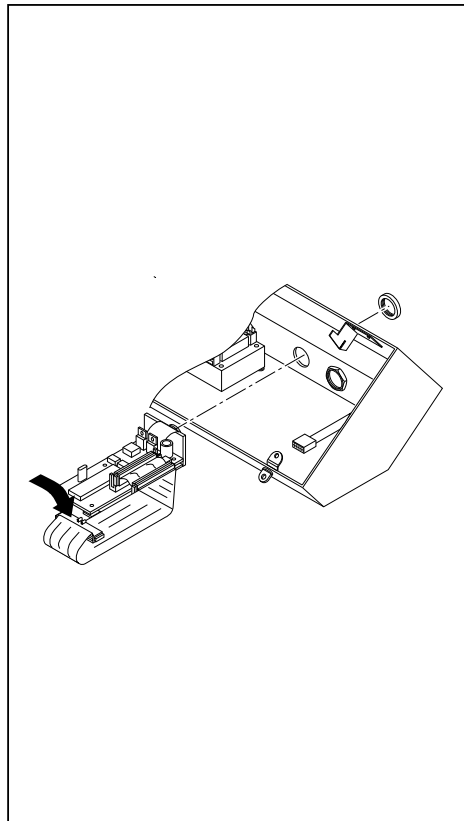
Application	For setting or resetting the outputs of the I/O port.														
Command format	<table border="1"> <tr> <td>A</td> <td>W</td> <td>106</td> <td>-</td> <td>8 output bits</td> <td>C_R</td> <td>L_P</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>8 ← 1</td> <td></td> <td></td> </tr> </table>	A	W	106	-	8 output bits	C _R	L _P					8 ← 1		
A	W	106	-	8 output bits	C _R	L _P									
				8 ← 1											
Action	After receipt of the "AW" command, the 8 outputs are set or reset according to the output bits.														
Response format	<table border="1"> <tr> <td>A</td> <td>B</td> <td>C_R</td> <td>L_P</td> </tr> </table> <p>Command not executable:</p> <table border="1"> <tr> <td>E</td> <td>S</td> <td>C_R</td> <td>L_P</td> </tr> </table> <p>Wrong application block No.</p>	A	B	C _R	L _P	E	S	C _R	L _P						
A	B	C _R	L _P												
E	S	C _R	L _P												
Remarks	<ul style="list-style-type: none"> 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 _{R1} L _F	xxx = current version number
003	A B _ STX C _{R1} L _F	
004	A B _ ETX C _{R1} L _F	
006	A B _ C _{R1} L _F C _{R1} L _F	
007 - 009	A B _ value _ unit C _{R1} L _F	
010	A B _ 1 C _{R1} L _F	
011 - 019	see 007	
020	A B _ value _ unit _ _ value _ unit _ _ value _ unit _ _ value _ unit C _{R1} L _F	in weighing-in
	Target value Tol. (+) Tol. (-) Start point	
	A B _ value _ unit _ _ value _ unit _ _ value _ unit C _{R1} L _F	in checking
	Target value Tol. (+) Tol. (-)	
	A B _ value _ unit _ _ value _ unit C _{R1} L _F	in classifying
	Limit 1 Limit 2	
021 - 023	see 007	
024	A B _ _ _ _ _ _ _ _ _ _ number _ C _{R1} L _F	
025	see 007	
026 - 050	see 020	
107	A B _ 0 0 0 0 X X C _{R1} L _F x = 0: no current, x = 1: current flow	
310	see 007	

Unit, 3 characters, left-aligned
 Value, 10 digits with sign and decimal point, right-aligned
 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!

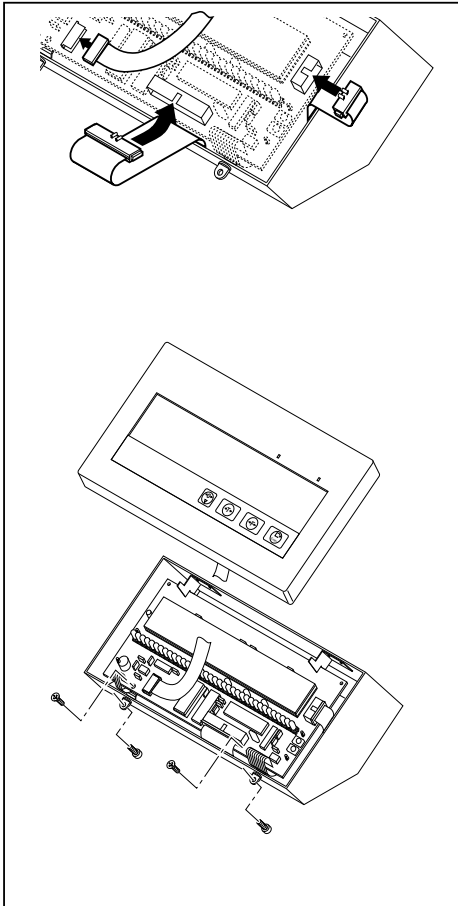
- Unscrew 2 screws on underside of cover at front and lift off cover.
- Disconnect keypad cable and weighing platform cable from main board on the right next to the display.
- Unscrew heavy gauge screw fitting and push in power cable approx. 5 cm.
- Unscrew 2 screws on main board, lift main board from 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

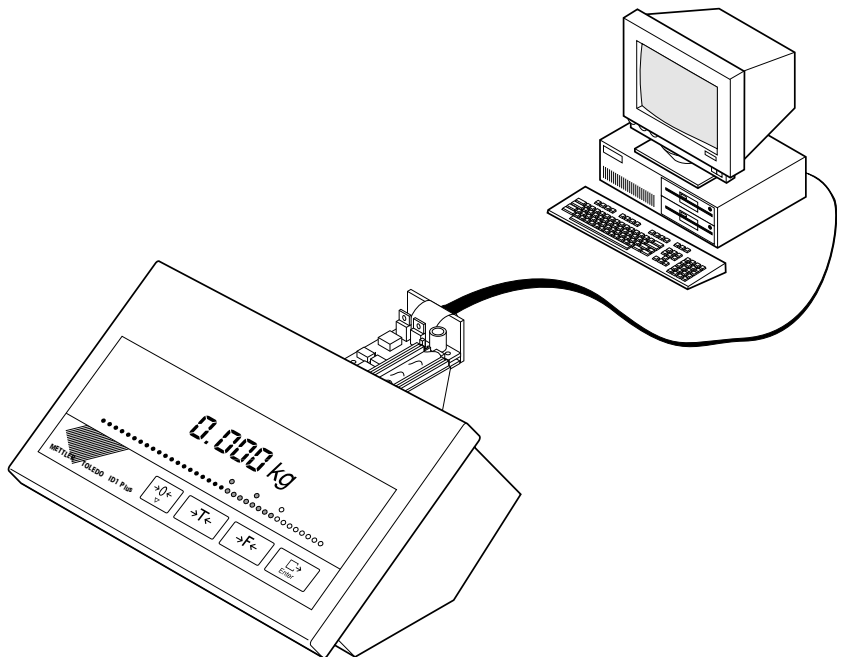
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Installation instructions Interface description

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



METTLER TOLEDO

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4.3 Command formats in writing

Number	Command format	
013	<code>A W 0 1 3 _ value _ unit C_{R1} L_F</code>	
016	<code>A W 0 1 6 _ number C_{R1} L_F</code>	Start of a weighing cycle such as dynamic weighing with F key (only if F key appropriately configured in master mode).
020	<code>A W 0 2 0 _ value _ unit H_T value _ unit H_T value _ unit H_T value _ unit C_{R1} L_F</code>	in weighing-in
	Target value Tol. (+) Tol. (-) Start point	
	<code>A W 0 2 0 _ value _ unit H_T value _ unit H_T value _ unit C_{R1} L_F</code>	in checking
	Target value Tol. (+) Tol. (-)	
	<code>A W 0 2 0 _ value _ unit H_T value _ unit C_{R1} L_F</code>	in classifying
	Limit 1 Limit 2	
026 - 050	see 020	
106	<code>A W 1 0 6 _ 0 0 0 0 0 0 X X X C_{R1} L_F</code>	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