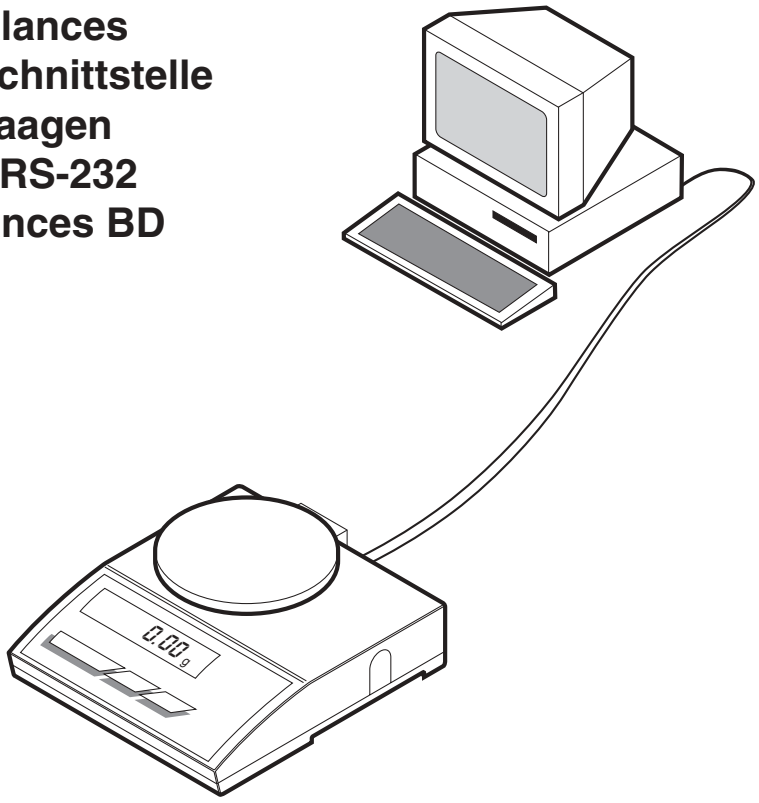
METTLER TOLEDO

Installation instructions
Montageanleitung
Notice de montage

Interface description

METTLER TOLEDO
RS-232 interface
for BD balances
RS-232-Schnittstelle
für BD-Waagen
Interface RS-232
pour balances BD



Installation 1

Preparation

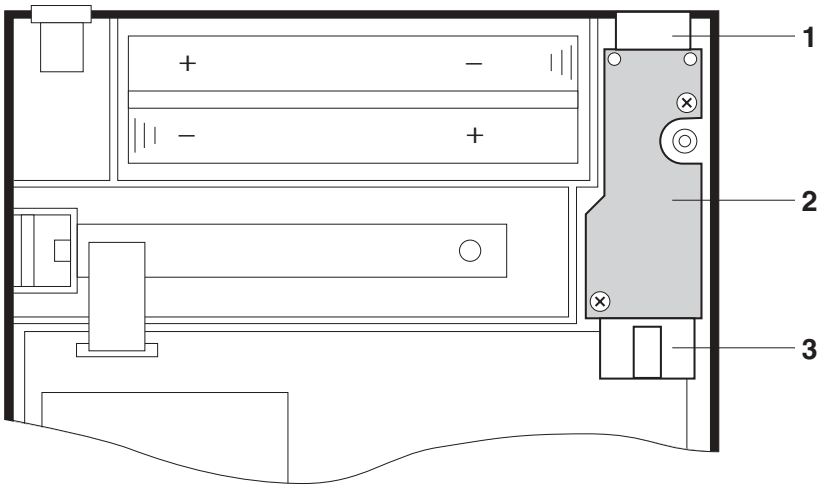
- Disconnect balance from power supply.
- Remove weighing pan, except in the BD6000 case.
- Turn balance over.
- Unscrew the four screws of the baseplate. Lift off baseplate.
- Remove cover for connector (1).

Mounting

- Prepare board (2) with the component side downward. Connector (1) must point to the rear of the balance, connector (3) (on ribbon cable) to the front of the balance.
- Connect connector (3) to main board.
- Install board so that connector (1) is positioned in the opening at the rear.
- Screw the self-tapping screws through the board into the body of the balance.

  Caution

  Do not strip the screw threads.
- Fasten baseplate using the four screws.
- Turn balance over and replace weighing pan.



Einbau 2

Vorbereitung

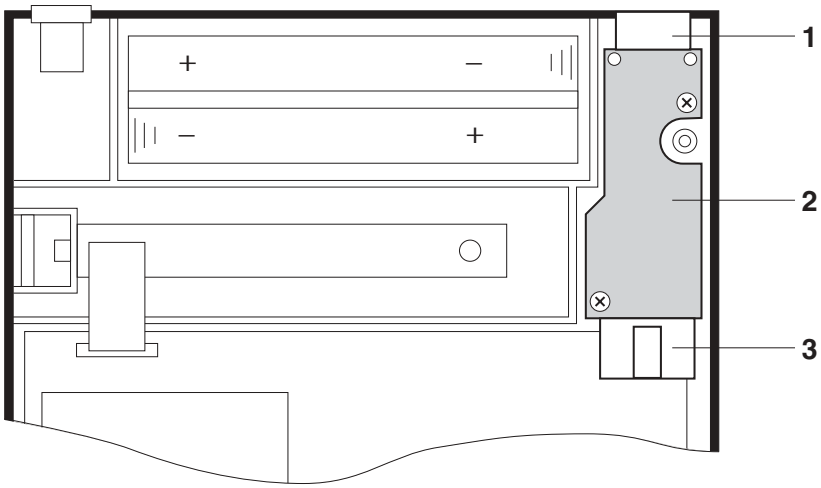
- Waage vom Netz trennen.
- Waagschale entfernen, ausser bei BD6000.
- Waage umdrehen.
- Die vier Schrauben der Bodenplatte herausdrehen. Bodenplatte abheben.
- Abdeckung für Stecker (1) entfernen.

Montage

- Die Platine (2) mit der bestückten Seite nach unten zurechtlegen. Stecker (1) muß zur Rückseite der Waage, Stecker (3) (am Flachbandkabel) zur Vorderseite der Waage zeigen.
- Stecker (3) mit der Hauptplatine verbinden.
- Platine so einbauen, daß sich Stecker (1) in der Öffnung an der Rückseite befindet.
- Die selbstschneidenden Schrauben durch die Platine in den Waagenkorpus einschrauben.

  Achtung

  Schrauben nicht überdrehen.
- Bodenplatte mit den vier Schrauben befestigen.
- Waage umdrehen und Waagschale aufsetzen.



Montage 3

Préparation

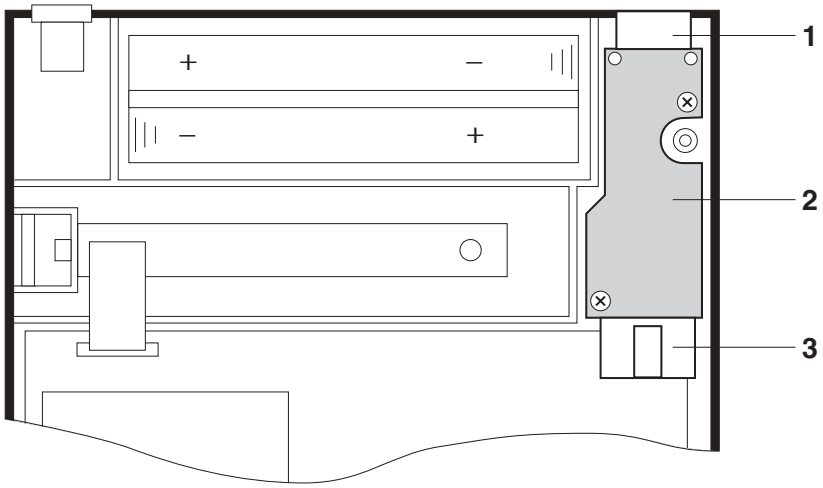
- Débrancher la balance du secteur.
- Retirer le plateau, sauf sur le modèle BD6000.
- Poser la balance à l'envers.
- Dévisser les 4 vis de la plaque de base. Retirer la plaque de base.
- Retirer le cache du connecteur (1).

Montage

- Mettre la carte en place, côté composants vers le bas. Le connecteur (1) doit être orienté vers la face arrière de la balance et le connecteur (3) (du câble en nappe) vers la face avant.
- Relier le connecteur (3) avec la carte principale.
- Monter la carte de telle sorte que le connecteur (1) soit engagé dans l'ouverture prévue sur la face arrière.
- Visser les vis autotaraudeuses à travers la carte dans le corps de la balance.

  Attention

  Ne pas forcer le pas de vis.
- Fixer la plaque de base à l'aide des quatre vis.
- Remettre la balance sur ses pieds et poser le plateau.



Technical data 4

RS-232C interface

Interface type	voltage-controlled interface following EIA RS-232C/DIN 66020 (CCITT V.24/V.28)
Mode	full duplex
Transmission mode	bit-serial, asynchronous (1 start bit)
Transmission code	7-bit code, ASCII-ISO 464 + parity bit
Baud rate	300, 1200, 2400, 4800, 9600
Parity	even, odd, none, space
Stop bit	1 (receiving), 2 (transmitting)

Connection

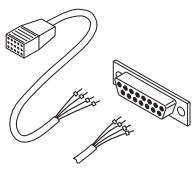
Cables

Prepared connection cables are available for the following devices:

	Order number
Printer Epson P-40	33688
Computer Epson PX-4	33982
Computer Epson HX-20	33955
Computer Apple Macintosh	210495

When using these cables, only the interface parameters have to be configured in the menu (see page 6).

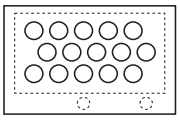
Additional cables and connectors:



	Order number
Cable set, 25-pin male, for printer	210492
Cable set, 25-pin female, for IBM XT/PS2 etc.	210491
Cable set, 9-pin female, for IBM AT/laptops etc.	210493
Extension cable DATA I/O, 5 m	216152
MiniMettler connector, solderable	33930

Connection 5

Pin assignment



The balance has the following connector pin assignment:

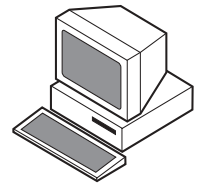
2	green	Commands for balance	RXD
12	brown	Data from balance	TXD
13	white	Signal ground	GND
3	yellow	Handshake to balance	DTR
4	grey	Handshake from balance	CTS

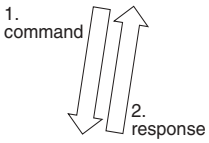
Handshake

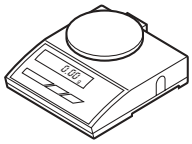
In operation of the RS-232 interface, the data transmission can be controlled by a mutual exchange of ready messages (handshake).

In an uncontrolled data transmission (free mode), data losses can appear.

Handshake modes







- **Software handshake**
  The control signals (Xon/Xoff) are transmitted like data using the transmitting and receiving line.
- **Hardware handshake**
  The control signals are transmitted along additional control lines.

Note

The commands "S" and "SI" (single inquiry) also control the data transmission. This informs the computer that it must again request a result.

Configuration in the menu 6

The interface parameters of the balance must be matched to these of the peripheral instruments.
This section describes the menu settings that concern the interface. Operation in the menu is described in the operating instructions of the BD balances.

Transmission mode

S.Stb	**Send stable**	send next stable weighing result, triggering by ⇨ key (factory setting)
S.ALL	Send All	send current value (stable or not), triggering by ⇨ key
S.Auto	Send Auto	send stable values after every change (> 5 d)
S.Cont	Send continuous	send all values continuously; maximum rate is the clock pulse of the display (every 0.2 seconds). If the selected baud rate is too low, values can be lost.

Transmission rate (baud rate)

b 300	300 baud
b 1200	1200 baud
b 2400	**2400 baud** (factory setting)
b 4800	4800 baud
b 9600	9600 baud

Parity

P -E-	**even** (factory setting)
P -O-	odd
P -n-	none
P -S-	space

Command set 7

Entry of commands

No distinction is made between upper- and lowercase letters.
Each command must be closed with $C_R L_F$.

Commands that can not be executed immediately are overwritten by those that follow, i.e. they are lost.

If the balance can not execute or evaluate a command, it sends an appropriate error message.

Send next stable weighing result

Command: S (Send value)
Format: S | C_R | L_F

Note: On stability, the current weighing result is sent immediately.

Example:

Computer:

S | C_R | L_F

Balance:

Stability

S | _ | _ | _ | _ | _ | _ | 9 | 5 | . | 3 | 7 | _ | g | C_R | L_F

Send current weighing result

Command: SI (Send Immediate value)
Format: S | I | C_R | L_F

Note: The balance sends the current weighing result immediately. Unstable weighing results are marked with "D" (dynamic).

Example:

Computer:

S | I | C_R | L_F

Balance:

S | D | _ | _ | _ | _ | _ | 9 | 5 | . | 3 | 7 | _ | g | C_R | L_F

or on stability

S | _ | _ | _ | _ | _ | 1 | 0 | 0 | . | 3 | 0 | _ | g | C_R | L_F

Send current weighing result repeatedly

Command: SIR (Send Immediate value and Repeat)
Format: S I R C_R L_F

Note: The balance sends the current weighing result and then all others; maximum rate is the clock pulse of the display (every 0.2 seconds). If the baud rate has not been matched to this maximum rate, values can be lost.

Example:

Computer:	**Balance:**
S I R C_R L_F	S D _ _ _ _ _ 9 5 . 3 7 _ g C_R L_F
	S D _ _ _ _ _ 9 5 . 4 2 _ g C_R L_F
	S D _ _ _ _ _ 9 5 . 4 1 _ g C_R L_F
	S _ _ _ _ _ _ 9 5 . 4 0 _ g C_R L_F

Taring balance

Command: T (Tare)
Format: T C_R L_F

Notes: With this command, taring can be accomplished via the interface. If no stability is found within 10 seconds, an error message "EL" is outputted.
If taring can not be performed owing to overload or underload, "EL" is outputted immediately.
If an "SI" or "SIR" command follows a "T" command and the balance is waiting for stability, it sends the error message "SI".

Example:

Computer:	**Balance:**
T C_R L_F	There is no acknowledgement via the interface.

Command set 9

Calling up balance identification

Command: ID (Identify)
Format: I D C_R L_F

Note: The balance sends its identification in the following format:

Example:

Computer: I D C_R L_F

Balance: B D 2 0 2 _ _ 1 _ 1 2 3 4 5 6 7 C_R L_F

Model Version Identification

Data output format

Every valid weighing result is outputted in a uniform format. It can be divided into three blocks and is always closed by the string delimiter carriage return and line feed (C_RL_F).

Identification of the value 2 characters	_ (hex 20)	Weighing result 9 characters right-aligned	_ (hex 20)	Unit 1 - 3 characters left-aligned	C_RL_F

Identification	Meaning
_ _	Triggering via balance key ⇨, stable value
_ D	Triggering via balance key ⇨, dynamic value (only with "S.All" configuration)
S _	Triggering via interface or transmission mode "S.Cont", stable value
S D	Triggering via interface or transmission mode "S.Cont", dynamic value

Example: S D _ _ _ _ - 2 4 . 3 7 _ g C_R L_F

Dynamic weight value inquiry via the interface

Data output format 10

Status messages of the balance

If the balance can not transmit a valid weighing result, it sends a status message.

Message	Meaning
	Triggering by ⇨ key
_ I C_R L_F	invalid measurement result
_ I + C_R L_F	overload
_ I − C_R L_F	underload
	Triggering by command or transmission mode "S.Cont"
S I C_R L_F	invalid measurement result
S I + C_R L_F	overload
S I − C_R L_F	underload

Error messages

E S C_R L_F	**S**yntax **E**rror A command is wrong.
E L C_R L_F	**L**ogical **E**rror A received command can not be executed.

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Thank you.

Subject to technical changes and to the availability of the accessories supplied with the instruments.

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