

ENGLISH

Operating manual



DMP41

Digital precision measuring instrument

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Subject to modifications.
All product descriptions are for general information
only. They are not to be understood as a guarantee of
quality or durability.

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1 SAFETY INSTRUCTIONS

Intended use

The DMP41 precision measuring instrument (referred to as the DMP41 in the following document) is to be used exclusively for measurement tasks and directly related control tasks. Use for any purpose other than the above is deemed to be non-designated use.

In the interests of safety, the DMP41 should only be operated as described in the operating manual. It is also essential to comply with the legal and safety requirements for the relevant application during use. The same applies to the use of accessories.

General dangers of failing to follow the safety instructions

The DMP41 is state of the art and failsafe. The DMP41 may give rise to residual dangers if it is inappropriately installed and operated by untrained personnel.

Any person instructed to carry out installation, startup, maintenance or repair of the DMP41 must have read and understood the operating manual and in particular the technical safety instructions.

Conditions at the place of installation

- Protect the DMP41 from direct contact with water.
- Protect the DMP41 from moisture or weather conditions such as rain, snow, etc. The protection class under the IP standard DIN EN 60 529, is IP20.
- Do not expose the DMP41 to direct sunlight.
- Keep all ventilation slots open to ensure unhindered air flow.
- For installation in 19" electrical enclosures, due to poorer heat dissipation, measures must be taken to ensure that the maximum permitted ambient temperature (+50°C) is not exceeded. We recommend forced venting in any case and in especially critical cases, intermediate spaces between the upper and lower rack frames.
- Please comply with the maximum permitted ambient temperatures (→ see *Technical Data sheet*). Do not operate the DMP41 when the ambient temperature is below +5°C or over +50°C.
- The permissible relative humidity at 31°C is 80% (non condensing); linear reduction up to 50% at 40°C.

- The DMP41 is classified in overvoltage category II, degree of pollution 2.
- Install the DMP41 so that it can be disconnected from the mains at any time without difficulty.
- It is safe to operate the DMP41 up to a height of 2000 m.

Residual dangers

The scope of supply and performance of the DMP41 covers only a small area of measurement technology. In addition, equipment planners, installers and operators should plan, implement and respond to the safety engineering considerations of measurement technology in such a way as to minimize residual dangers. On-site regulations must be complied with at all times.

After making settings and carrying out activities that are password-protected, you must make sure that any controls that may be connected remain in a safe condition until the switching performance of the DMP41 has been tested.

Maintenance and cleaning

The DMP41 is maintenance free.

- Before cleaning, disconnect the module from all connections.
- Clean the housing with a soft, slightly damp (not wet!) cloth. You should *never* use solvent, since this could damage the labeling on the front panel and destroy the display.
- When cleaning, ensure that no liquid gets into the DMP41 or on the connections.

Product liability

In the following cases, the protection provided for the DMP41 may be adversely affected. Liability for equipment functionality then passes to the operator:

- The DMP41 is not used in accordance with the operating manual.
- The DMP41 is used outside the field of application described in this chapter.
- The operator makes unauthorized changes to the DMP41.

Working safely

Before starting up, ensure that the circuit used is sufficiently protected.

The mains plug must only be inserted into a socket with a protection switch (protection class I).

The DMP41 must be switched off and the mains plug disconnected from the socket before opening the DMP41.

Never pull the mains plug out of its socket by the supply lead.

Do not operate the DMP41 if the mains lead is damaged. If you need to replace the mains cable, order a new one with ordering number 1-KAB274-... (→ also see Chapter 3.3 "Scope of supply", Page 18), or ensure that you use an equivalent cable.

If the DMP41 is used as a built-in instrument, it must only be operated in the enclosure provided.

The DMP41 meets the safety requirements of DIN EN 61010 Part 1 (VDE 0411 Part 1) (overvoltage category II) and DIN EN 61010-2-030.

To ensure adequate immunity from interference, use only the *Greenline* shielding concept (see separate HBM publication: "Greenline shielding design", downloadable from the Internet at <http://www.hbm.com/Greenline>).

Safety precautions must be taken both in terms of hardware and software, so that a line break or other interruptions to signal transmission, such as via the bus interfaces, do not cause undefined states or loss of data in the automation device.

Error messages should only be acknowledged once the cause of the error is removed and there is no further danger.

Only carry the DMP41 using the carrying handles.

Electromagnetic compatibility

The DMP41 has been tested based on EMC product standard EN 61326-1:2013. This standard includes definitions of limit values and test levels for various electromagnetic environments.

Regarding emission (EME), requirements are included for class A (industrial environments) and class B (residential, business and commercial environments as well as small businesses). Laboratory applications also usually require class B.

The product standard here references to EN 55011:2009+A1:2010.

Regarding immunity to interference, the product standard includes requirements for controlled electromagnetic environments (lowest requirements), general environments and industrial environments (highest requirement).

The DMP41 satisfies the following requirements:

- Emission (EME): Class B (see Note)
- Immunity to interference: Industrial environment

Note on emission (EME): The DMP41 is supplied ex works i.a. with a mains cable and an adapter cable (USB to RS232). These cables are fitted with ferrites to minimize emission (EME) and must not be removed. The requirements of Class B are only satisfied when the ferrites are fitted.

Should the ferrites have been inadvertently removed, they must be attached to the cables as close as possible to the DMP41.

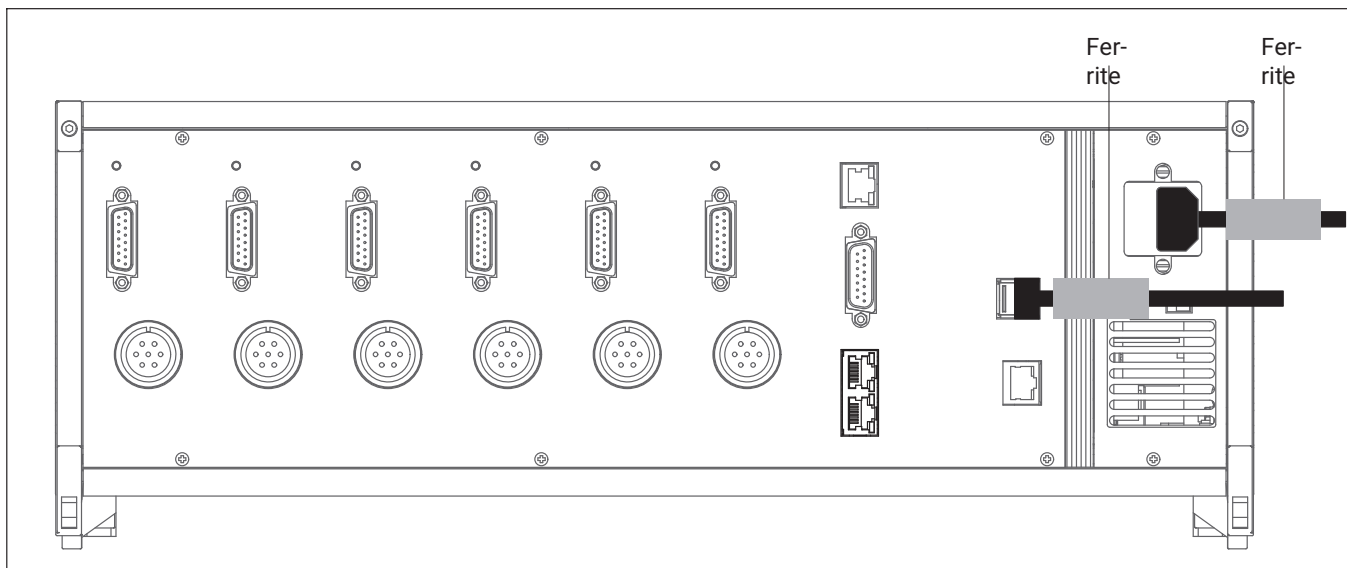


Fig. 1.1 Position of the ferrites

Important

The distance between ferrite and plug must not exceed 2 cm

The DMP41 thus essentially satisfies the highest requirements and is therefore suitable for use in all environments described in the product standard.

Conversions and modifications

The DMP41 must not be modified in terms of design or safety engineering except with our express agreement. Any modification shall exclude all liability on our part for any resultant damage.

In particular, any repair or soldering work on motherboards is prohibited. When exchanging complete modules, use only original parts from HBK. The DMP41 is delivered from the factory with a fixed hardware and software configuration. Changes can only be made within the possibilities documented in the manuals.

Ensure that the electrical safety of the DMP41 has been confirmed after a conversion or repair.

Measuring circuits and interfaces

The measuring circuits and all other DMP41 interface ports must be securely isolated from circuits connected to supply networks. These circuits must be free of transient overvoltages.

The measuring circuits of the DMP41 are not assigned to any measurement category as per DIN EN 61010-2-030.

Qualified personnel

The DMP41 is only to be installed and used by qualified personnel strictly in accordance with the specifications and with the safety rules and regulations which follow.

Qualified personnel means persons entrusted with siting, mounting, starting up and operating the product who possess the appropriate qualifications for their function.

This includes people who meet at least one of the three following requirements:

- Knowledge of the safety concepts of automation technology is essential and as project personnel, they must be familiar with these concepts.
- The personnel, as automation plant operating personnel, have been instructed how to handle the machinery. They are familiar with the operation of the equipment and technologies described in this document.
- As system startup engineers or service engineers, they have successfully completed the training to qualify them to repair the automation systems. They are also authorized to operate, ground and label circuits and equipment in accordance with safety engineering standards.

It is also essential to comply with the legal and safety requirements for the relevant application during use. The same applies to the use of accessories.

Maintenance and repair work on an open DMP41 with the power on may only be carried out by trained personnel who are aware of the dangers involved.

2 SYMBOLS ON THE INSTRUMENT



Attention

It is essential to take account of the instructions in the operating manual.



CE mark

The CE mark enables the manufacturer to guarantee that the product complies with the requirements of the relevant EC directives (the Declaration of Conformity can be found on the HBK website (www.hbkworld.com) under DMP41).



Statutory waste disposal mark

The electrical and electronic devices that bear this symbol are subject to the European waste electrical and electronic equipment directive 2012/19/EU.

The symbol indicates that the DMP41 must not be disposed of as household garbage. In accordance with national and local environmental protection and material recovery and recycling regulations, old equipment that can no longer be used must be disposed of separately and not with normal household garbage.

All electrical and electronic products must be disposed of as hazardous waste. The correct disposal of old equipment prevents ecological damage and health hazards.

If you need more information about disposal, please contact your local authorities or the dealer from whom you purchased the product.

As waste disposal regulations within the EU may differ from country to country, we ask that you contact your supplier as necessary.



Environmental protection

The product will comply with general hazardous substances limits for at least 20 years, and will be ecologically safe to use during this period, as well as recyclable.

Statutory mark of compliance with emission limits in electronic equipment supplied to China.

3 INTRODUCTION

3.1 Document information



Important

We can assume no liability for any damage arising from non-compliance with this operating manual.

Notice

Damage to property caused by incorrect operation

If you use an outdated version of this document or an outdated version of any of the documentation it mentions, this may result in the product being operated incorrectly.

- ▶ Make sure that all the documents you possess and use are always the current version. The current documentation version for DMP41 can be found at www.hbkworld.com on the DMP41 product website.

Full documentation for the DMP41 comprises the following documents:

- The *operating manual*, explaining manual operation of, and measurement with the DMP41.
- The document *interface description and command set*, explaining programming and measurement with PC or terminal.

This manual contains all the information required to operate the DMP41.

Several guides are available to you:

- To help you quickly find the information you require, there is a full list of contents at the front of the operating manual.
- You can use the alphabetical index at the end of the manual to find individual keywords.
- The header shows you which chapter you are currently reading.
- The marginal column is used for images or symbols that are explained in the body text.
- Chapter 6 *Operation* gives you an overview of the selection and setting windows of the DMP41.

Introduction

Document information






Read the operating manual thoroughly and in full before operating the DMP41 for the first time.

Look upon this operating manual as part of the product and keep it so that it is accessible to all users, all of the time.

If you pass the DMP41 on to a third party, always pass it on together with the requisite documentation.

3.2 The markings used in this document

Important instructions for your safety are specifically identified. It is essential to follow these instructions in order to prevent accidents and damage to property.

Symbol	Meaning
 WARNING	The “WARNING” marking warns of a potentially dangerous situation in which failure to comply with safety requirements could result in death or serious physical injury.
Notice	This marking draws your attention to a situation in which failure to comply with safety requirements <i>could result in</i> damage to property.
 Important	This marking draws your attention to <i>important</i> information about the product or about handling the product.
 Tip	This marking indicates tips for use or other information that is useful to you.
 Information	This marking draws your attention to information about the product or about handling the product.
→ See ...	The arrow (and the italics that follow) identify references to chapters, images or external documents and files.
<i>Emphasis</i>	Italics identify emphasis in the text.
<i>Input</i>	Bold italics identify keyboard input.
Menu/dialog/file name	The names of menus, dialogs, or files appear in bold in the body text.
	The black triangle at the start of a paragraph marks the start of an instruction to be followed.
A, B, C, 1, 2, 3	Blue letters and numbers are used for labeling in keys to the images.

3.3 Scope of supply

Ordering number	
1-KAB239-2	1 pc networking cable (Ethernet cable Cat 6A)
1-KAB274-...	1 pc power cable IEC 320 C13 Please enter the country in which the cable is to be used in the order (different versions: DE/CH/GB/IT/USA)
1-KAB287-3	1 pc synchronization cable (standard networking cable) for synchronization between two DMP41s (can be used for both DMP41-T2 and DMP41-T6)
	2 x operating instructions: Digital precision measuring instrument DMP41-T2, DMP41-T6 Digital precision measuring instrument DMP41 interface description and command set
1-KAB297	USB-RS232 adapter (from the new USB interface of the DMP41 to the RS232 interface previously present on the DMP40)
1-KAB2114-3	RS232 cable (null modem cable)

Accessories (not included in the scope of supply)

Ordering number	
available from www.wiregate.de	Temperature sensor (1-Wire® ¹⁾); with open ends; 1 sensor per temperature channel
1-RJ45-EMV	RJ45 connector for tool-free fitting

¹⁾ Proprietary name and registered trademark of Dallas-Maxim

3.4 Device overview

The DMP41 is available in the following two enclosure versions (each with 2 or 6 amplifiers):

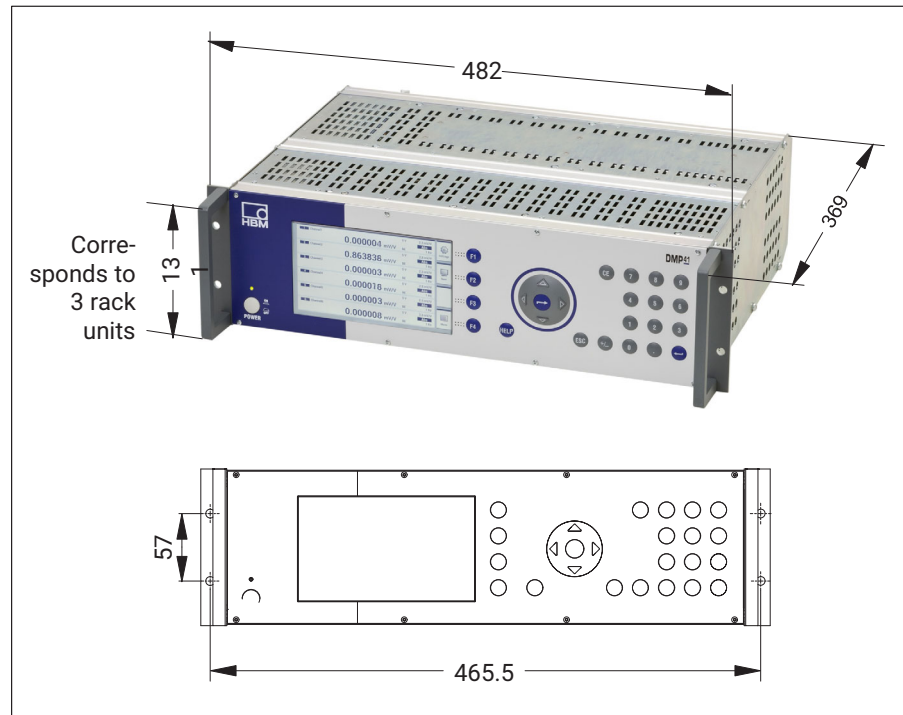
- Desktop housing
- 19" rack-mount case

Desktop housing



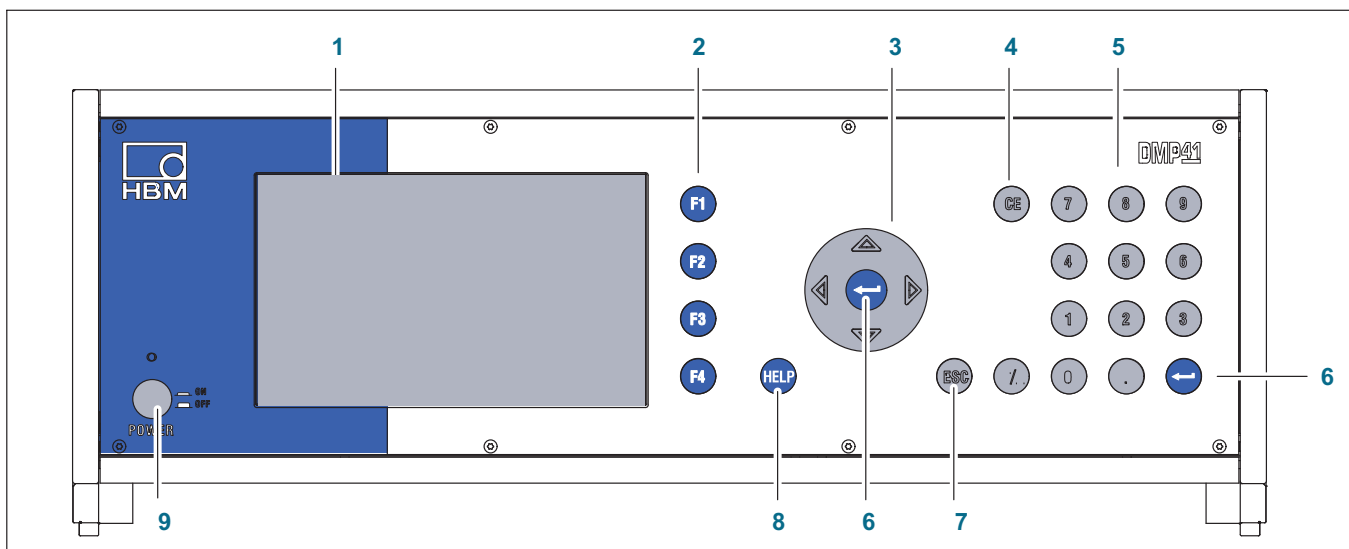
Device version	Number of amplifiers	Temperature channels	Power supply
DMP41-T2	2	4	230 V/115 V ~
DMP41-T6	6	4	230 V/115 V ~

19" rack-mount case



Device version	Number of amplifiers	Temperature channels	Power supply
DMP41-E2	2	4	230 V/115 V ~
DMP41-E6	6	4	230 V/115 V ~

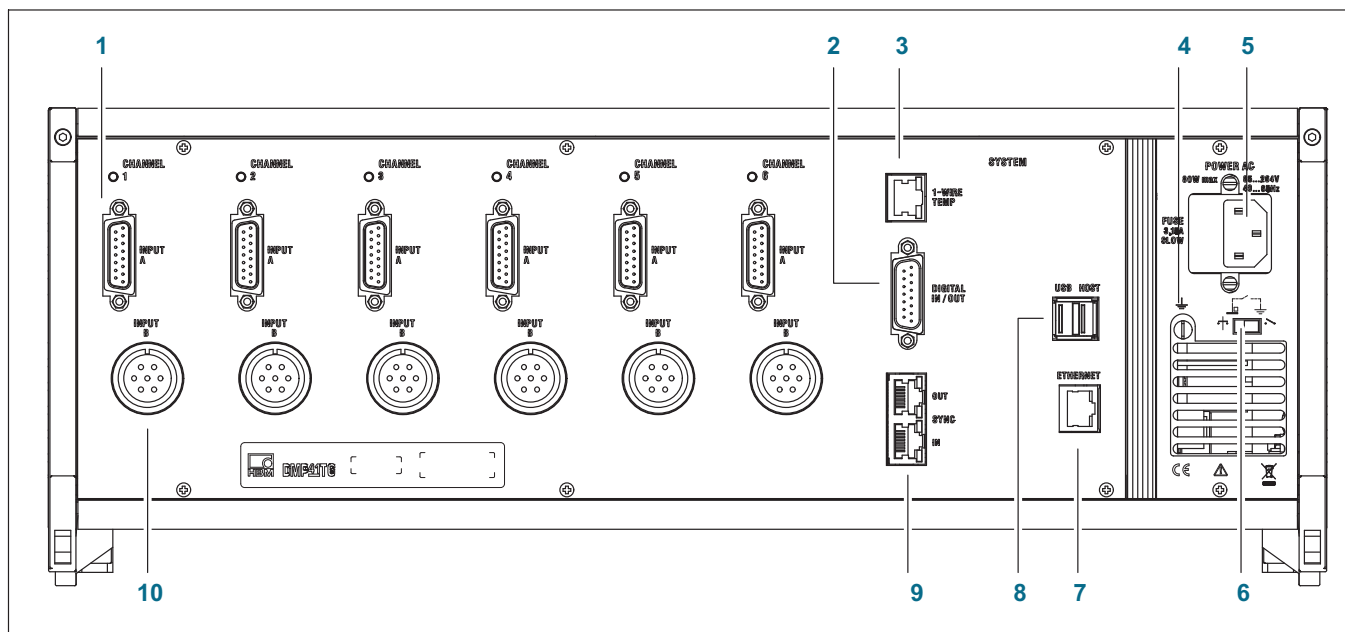
3.4.1 Front of device



- 1 Display/TouchScreen
- 2 Function keys **F1** to **F4**
Active in measuring and setting mode
- 3 Cursor keys and Enter key
◇ ◇ Navigation in measuring and setting mode
- 4 Delete key
Deletes the character currently in the cursor position
- 5 Alphanumeric keypad
For entering numbers in the edit fields of the display
- 6 Enter key
Activates the settings that have been made
- 7 Escape key
Resets the last entry in menus or selection fields (excluding text fields) and closes the online help
- 8 Help key
Activates the online help for the functions currently activated
- 9 On/Off switch

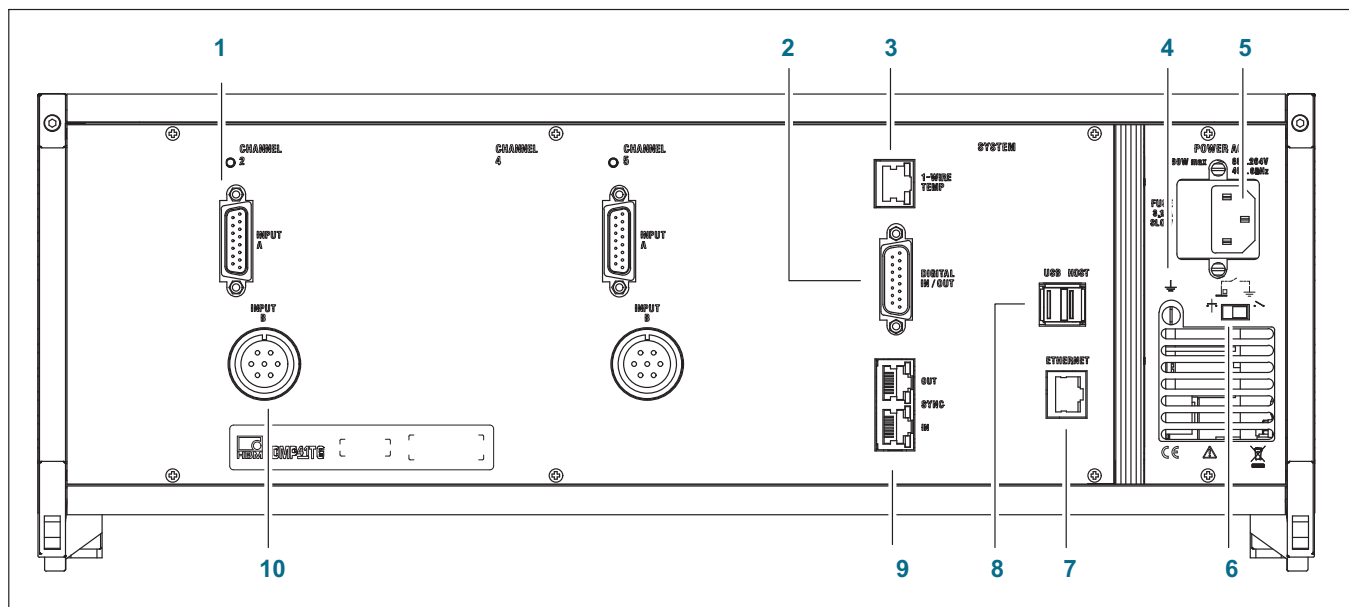
3.4.2 Back of device

DMP41-T6/E6



- 1 Full bridge strain gage transducer; D-sub, 15-pin, DA-15P
- 2 Digital inputs/outputs
- 3 RJ45 1-Wire® temperature sensors
- 4 Housing ground
- 5 Mains connection
- 6 Grounding switch
- 7 Ethernet network
- 8 USB host (RS232 adapter, keyboard, USB flash drive, etc.)
- 9 Synchronization of several DMP41s
- 10 Full bridge strain gage transducer; MS cable connector, 7-pin, MS3106A 16S-P

DMP41-T2/E2



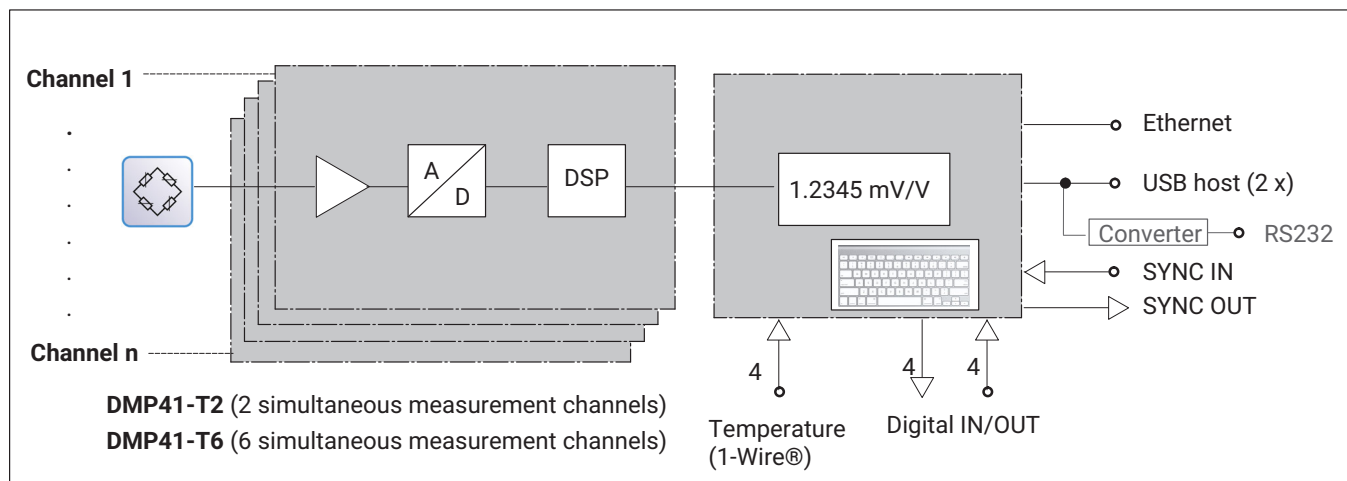
- 1 Full bridge strain gage transducer; D-sub, 15-pin, DA-15P
- 2 Digital inputs/outputs
- 3 RJ45 1-Wire® temperature sensors
- 4 Housing ground
- 5 Mains connection
- 6 Grounding switch
- 7 Ethernet network
- 8 USB host (RS232 adapter, keyboard, USB flash drive, etc.)
- 9 Synchronization of several DMP41s
- 10 Full bridge strain gage transducer; MS cable connector, 7-pin, MS3106A 16S-P

3.5 Principle of operation

This section explains the basic working method of the DMP41.

Up to six measuring points can be connected to the DMP41.

Auxiliary variables such as the measuring point temperature or an external voltage can be displayed in parallel with the strain gage signal.



3.6 Preparation and connection

- ▶ Unpack the DMP41.
- ▶ Check the DMP41 for damage.
- ▶ Check that your delivery is complete.
- ▶ Comply with the accompanying safety instructions.
- ▶ Connect the DMP41 in accordance with → *Chapter 4* "Electrical connections", starting on *Page 25*.

4 ELECTRICAL CONNECTIONS

4.1 Mains connection

The NT040 power supply is designed for a 115/230 V connection.

The power supply fan is temperature-controlled and is automatically switched on only when necessary. The DMP41 must be connected to a socket with a grounding protective conductor using the supplied mains cable.

The power supply is protected internally with a 4 A/T fine-wire fuse.



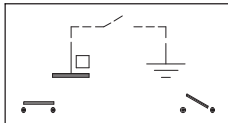
Important

The mains fuse may only be replaced by HBK service personnel!

Mains cable

If you need to replace the mains cable, order a new one with ordering number 1-KAB274-... (→ also see Chapter 3.3 “Scope of supply”, Page 18), or make sure that you use an equivalent cable.

Grounding switch



In the factory settings, the grounding switch connects supply voltage zero with the protective conductor. If external devices (transducer, computer) have already set up this connection resulting in ground loops (hum-pick-ups), the grounding switch must be opened.



Important

A back-up battery (type: CR2032 lithium) is integrated into the DMP41. This battery may only be replaced by HBK service personnel!

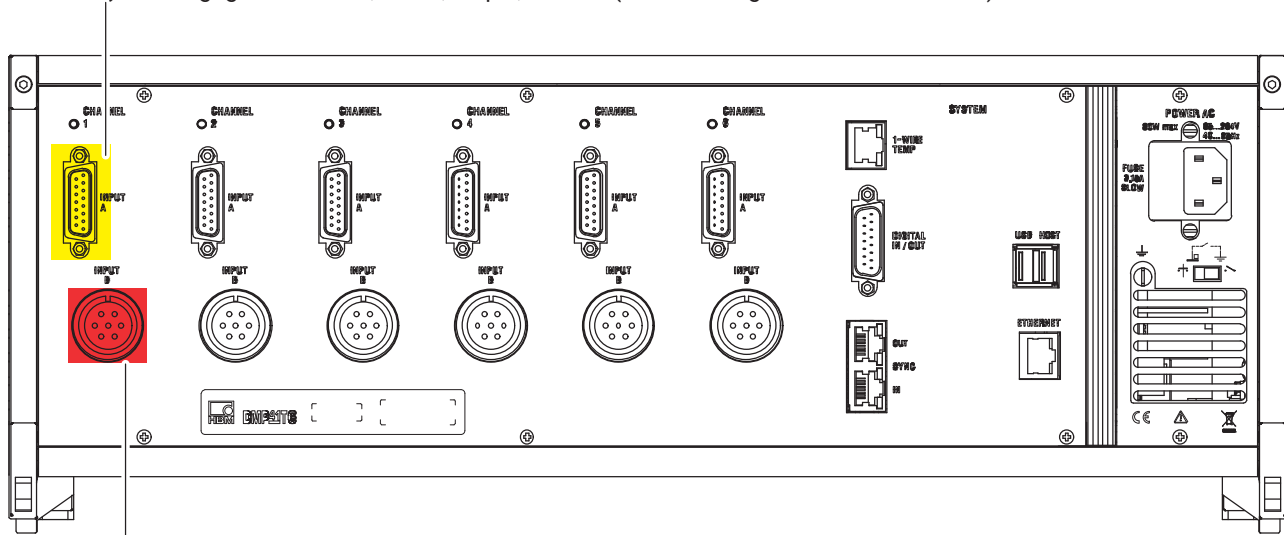
4.2 Transducer connection



Important



*Connect transducers **either** to the upper 15-pin socket **or** to the lower Amphenol socket. Simultaneous connection of transducers in both sockets will result in incorrect measurement results.*

Full bridge strain gage transducer; D-sub, 15-pin, DA-15P (HBK ordering number 3-3312.0182)



Full bridge stain gage transducer; MS cable connector, 7-pin, MS3106A 16S-P (HBK ordering number 1-MS3106 PEMV)

4.2.1 Connection options

Measured quantity	
	Full bridge strain gage
	Temperature measurement (1-Wire® sensor)
	TID

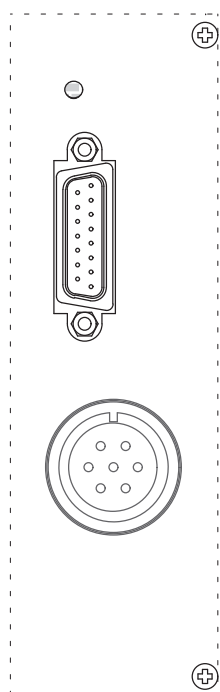
 **Important**

Only connect strain gage transducers in a 6-wire configuration.

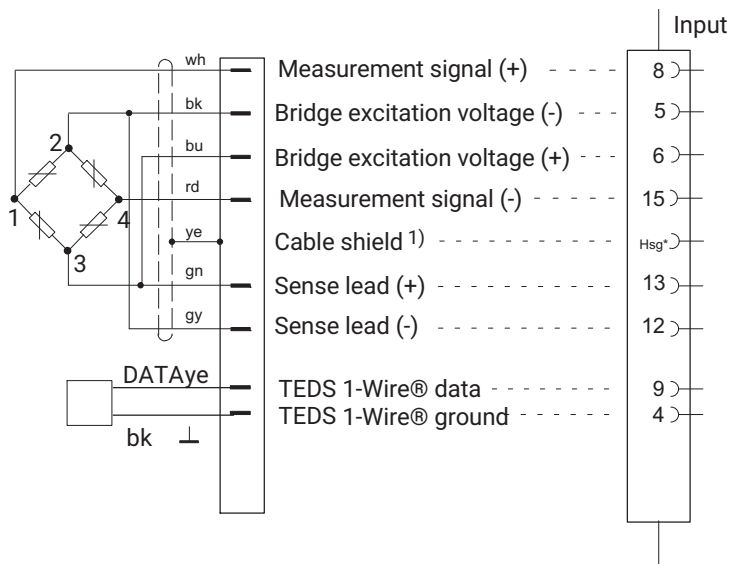
4.2.2 Full bridge strain gages



Connection point

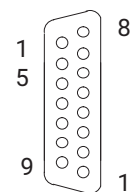


Connection diagram



* Hsg. = Housing

Pin assignment



Cable color code: wh= white; bk= black; bu= blue; rd= red; ye= yellow; gn= green; gy= gray

The LEDs above the connection sockets indicate the operating status of the measuring point:

LED green = Measuring point active

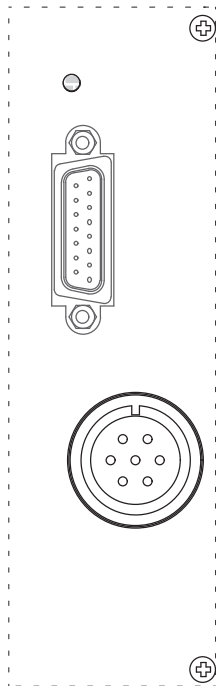
LED off = Measuring point passive

LED red = Error

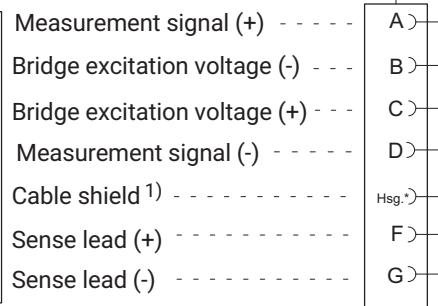
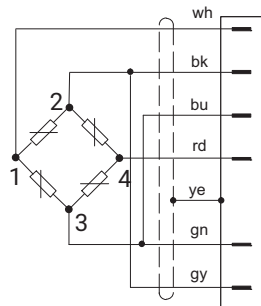
LED orange = Transducer identification



Connection point

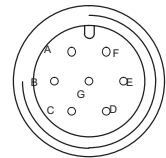


Connection diagram



* Hsg. = Housing

Pin assignment



Cable color code: wh= white; bk= black; bu= blue; rd= red; ye= yellow; gn= green; gy= gray

The LEDs above the connection sockets indicate the operating status of the measuring point:

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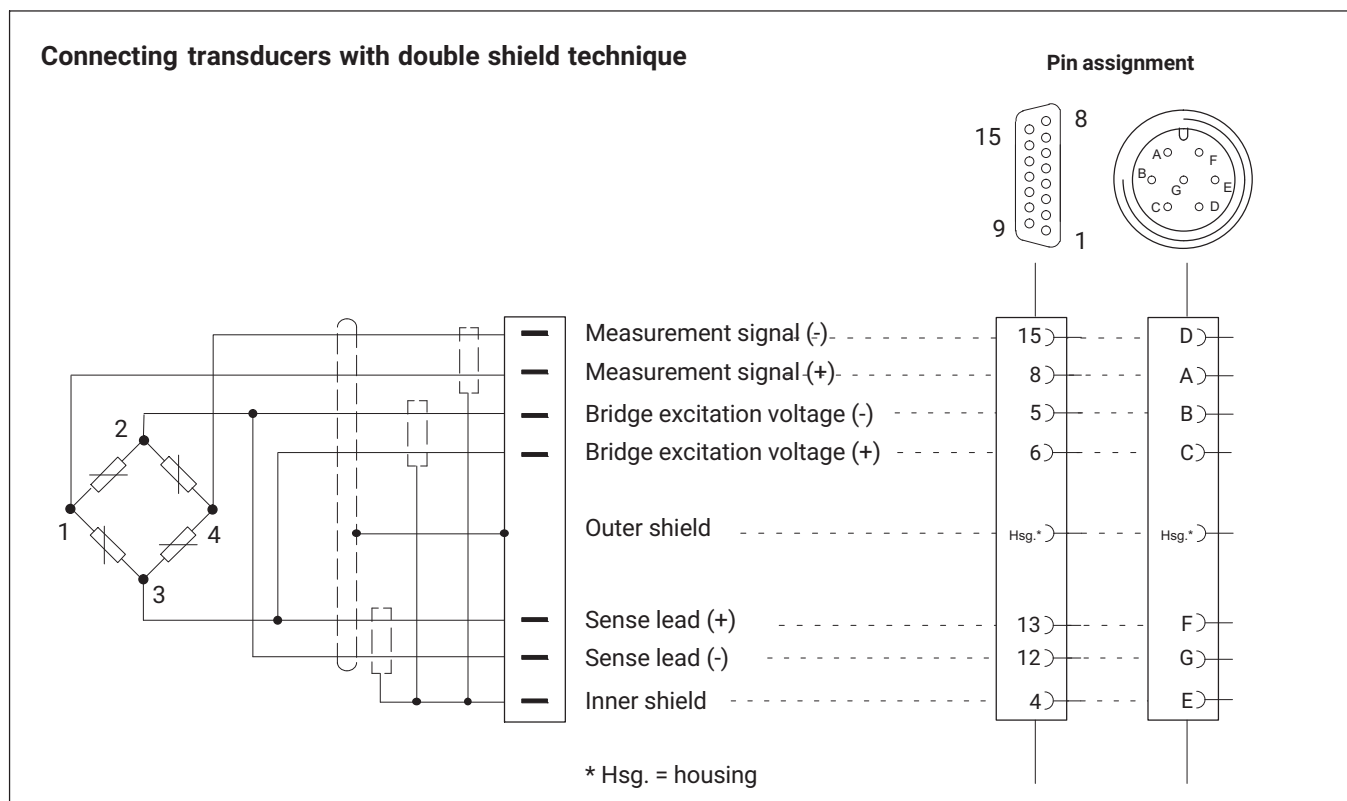
LED off = Measuring point passive

LED red = Error

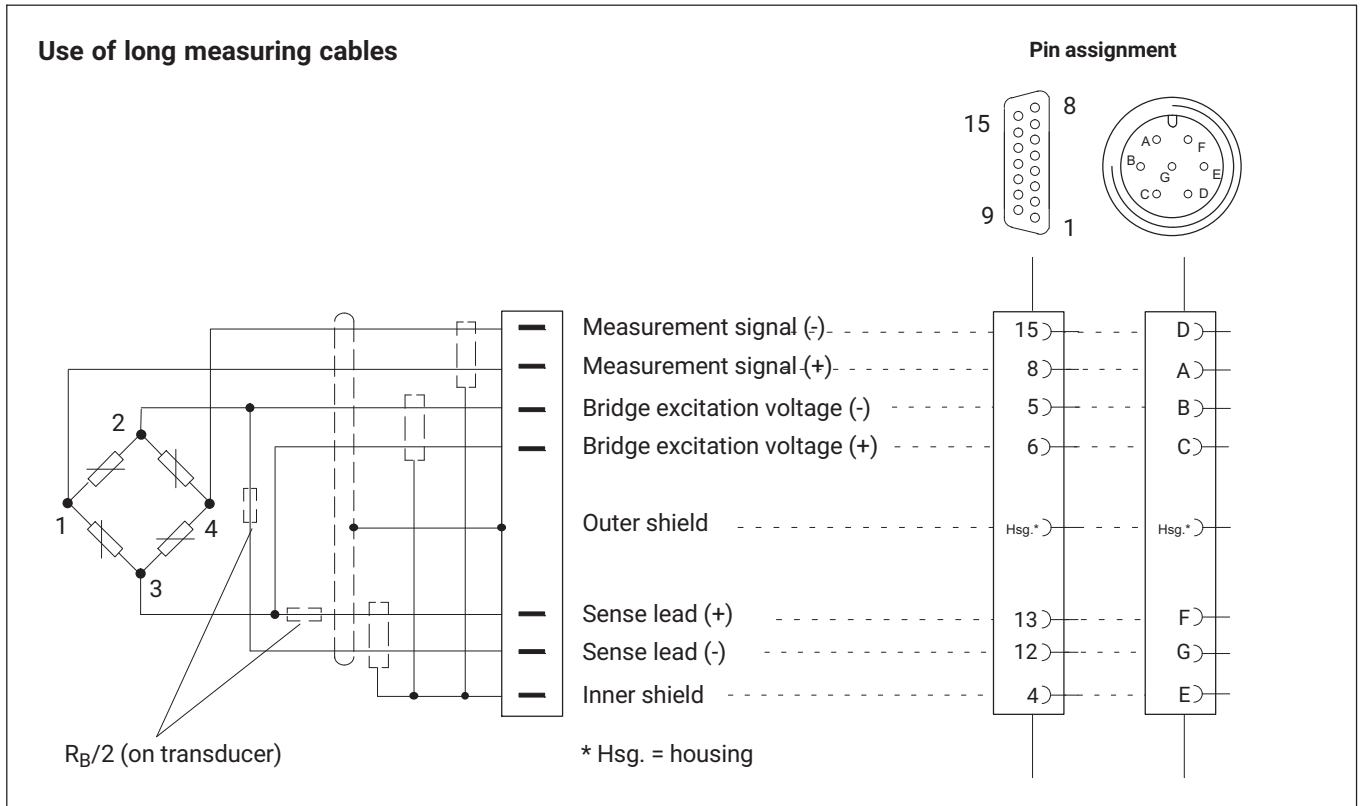
LED orange = Transducer identification

TEDS transducer identification omitted in this connector version.

4.2.3 Special precautions on transducer connection



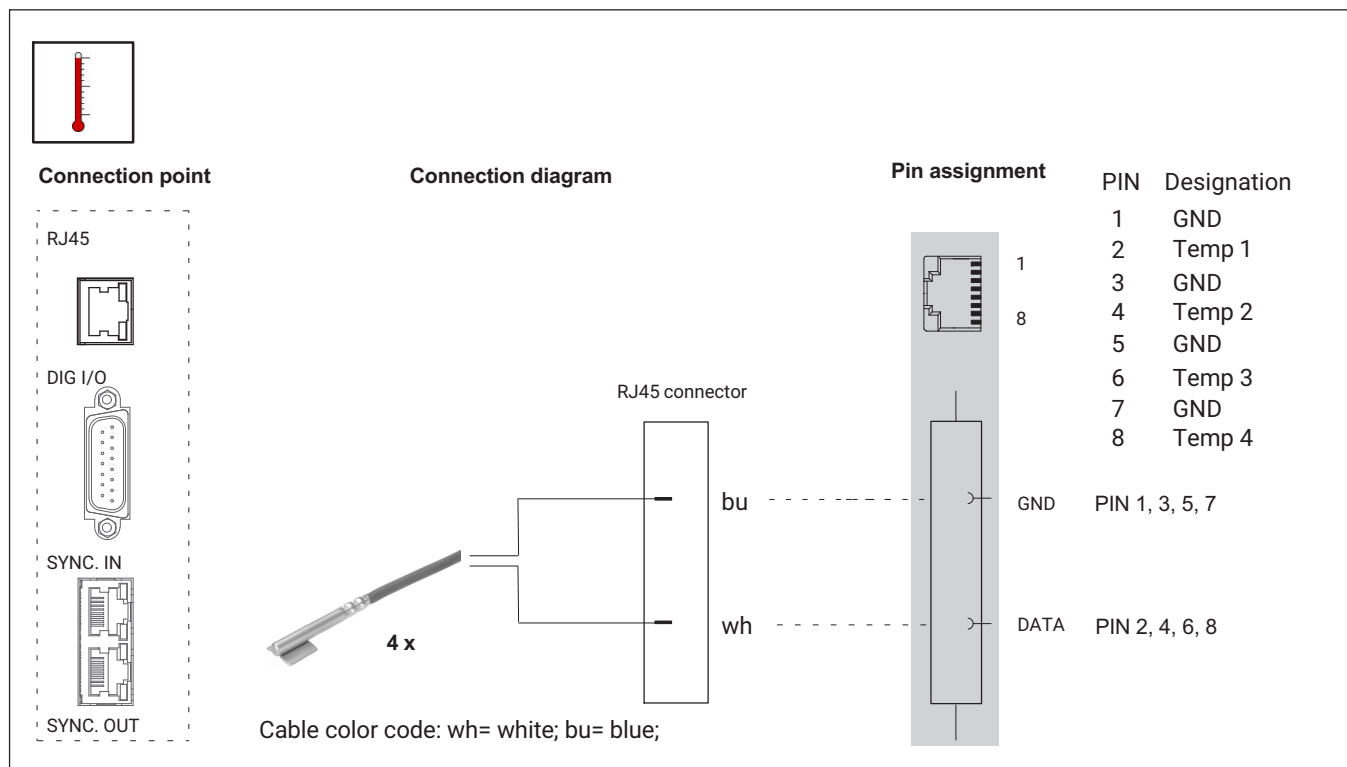
With very small measuring ranges, in environments with major interference and when using long cables, HBK recommends double-shielded measuring cables. The inner shield should be open on the transducer side.



When using long cables and with a high transducer resistance, HBK additionally recommends soldering resistors in the sense leads. The resistors should be placed as close as possible to the transducer. The value of the resistances must be half that of the bridge resistance ($R_B/2$).

4.2.4 Temperature sensors

Cable wire assignment when using an RJ45 connector:



 **WARNING**

An electric shock can be fatal or cause serious injury

- Make sure that all the metallic surfaces to which the temperature sensor is attached (glued, clamped) are voltage-free.

4.2.5 TID (Transducer Identification)

TID displays the (worldwide) unique ID of a TEDS module (Transducer ID).

The IEEE standard 1451.4 defines a generally acknowledged process with which sensors can be identified. The sensor is identified via its data sheet, which is stored in electronic format in the sensor, cable or plug on a 1-Wire® EEPROM (TEDS - Transducer Electronic Data Sheet). The amplifier communicates with this EEPROM via the serial 1-Wire® interface, reads out the data sheet and makes the corresponding amplifier settings.

The TEDS information is not evaluated, only the unique ID is read out.

If a transducer with TID is connected, the ID number and information about whether 1-Wire® or zero-wire is used is displayed (→ see also Chapter 7.2.9 “TID (Transducer Identification)”, Page 78).

The screenshot shows a software interface titled "TID Information". Below the title, it says "TID information for each channel." There are six channels listed, each with a text input field showing the detected TID status:

- Channel1: No TID detected
- Channel2: No TID detected
- Channel3: No TID detected
- Channel4: 23322F93000000D5 (Zero-Wire)
- Channel5: No TID detected
- Channel6: 239C2E9300000057 (Zero-Wire)

On the right side of the screen, there is a "Measure" button at the top and a "Back" button at the bottom.

This is also shown in the channel status overview (→ see Chapter 8 “Error messages/remedial action”, Page 101):



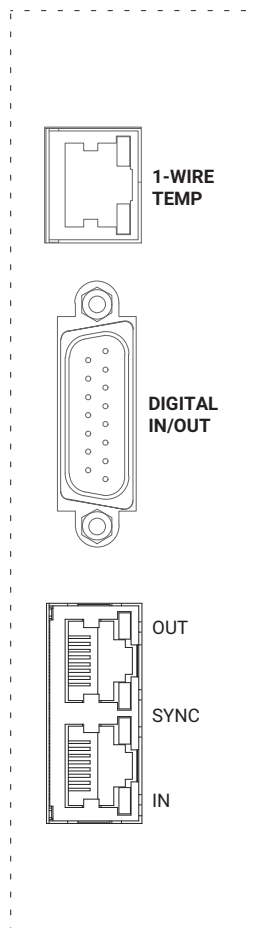
TID connected



No TID connected

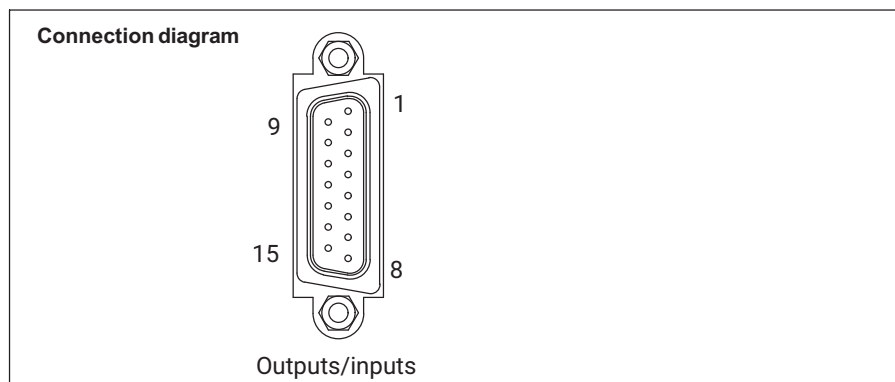
A special circuit makes it possible to use the existing wires for transferring TEDS data. This allows the same cables to be used as for transducers without TEDS.

The switch is made between a measuring mode (the lead transfers the analog measurement signal) and a data mode (the lead transfers the digital TEDS data).



4.3 Inputs and outputs, remote controls

Four digital inputs and four digital outputs are available. The control inputs and outputs are electrically isolated via optocouplers.



PIN	Designation
1	Not in use
2	GND/IN
3	IN 3
4	IN 1
5	GND OUT
6	OUT 3
7	OUT 1
8	+24 V external
9	GND/IN
10	IN 4
11	IN 2
12	GND OUT
13	OUT 4
14	OUT 2
15	+24 V external

⚠ WARNING

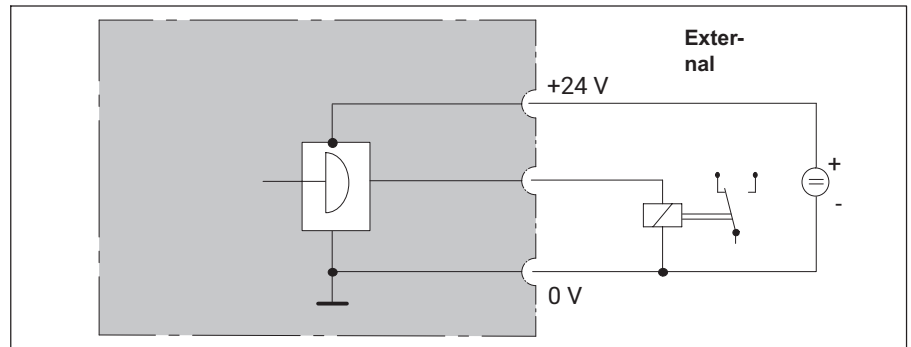
Electric voltage can be fatal or cause serious injury

- ▶ Disconnect all connected control inputs from mains circuits.

! Important

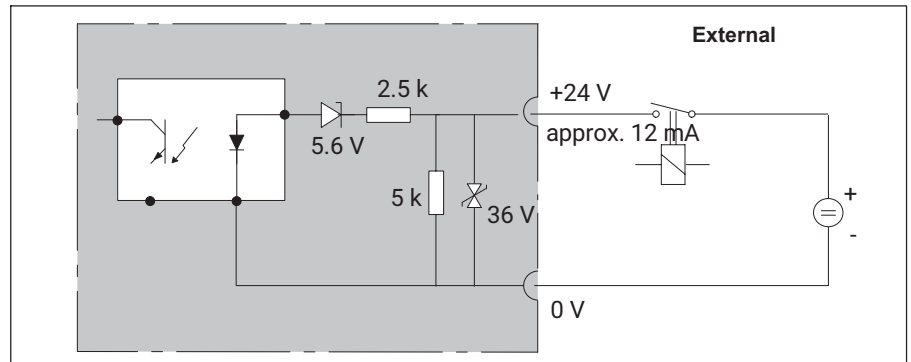
All externally connected voltages must conform to SELV circuits, in accordance with the requirements of IEC/EN/DIN EN60950-1.

Circuit for control outputs: digital outputs 1 ... 4



The voltage at the output is approx. 0.5...1 V lower than the externally connected supply voltage. The maximum current depends on the strength of the external supply voltage, but must not exceed 0.5 A.

Circuit for control inputs: control inputs 1 ... 4

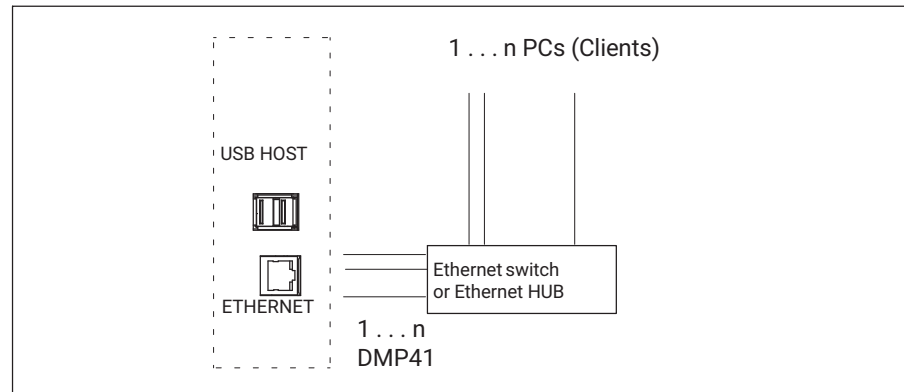


4.4 PC connection

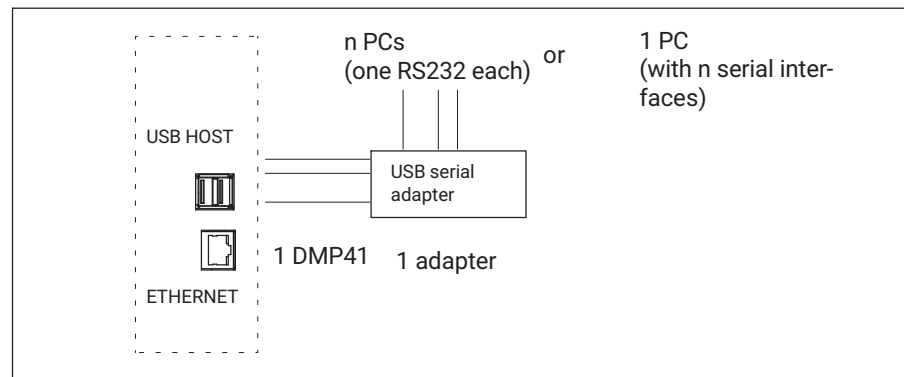
Connection variants

- PC connection via Ethernet (recommended variant)
- PC connection via RS232 (with USB serial adapter)

PC connection via Ethernet /Ethernet switch

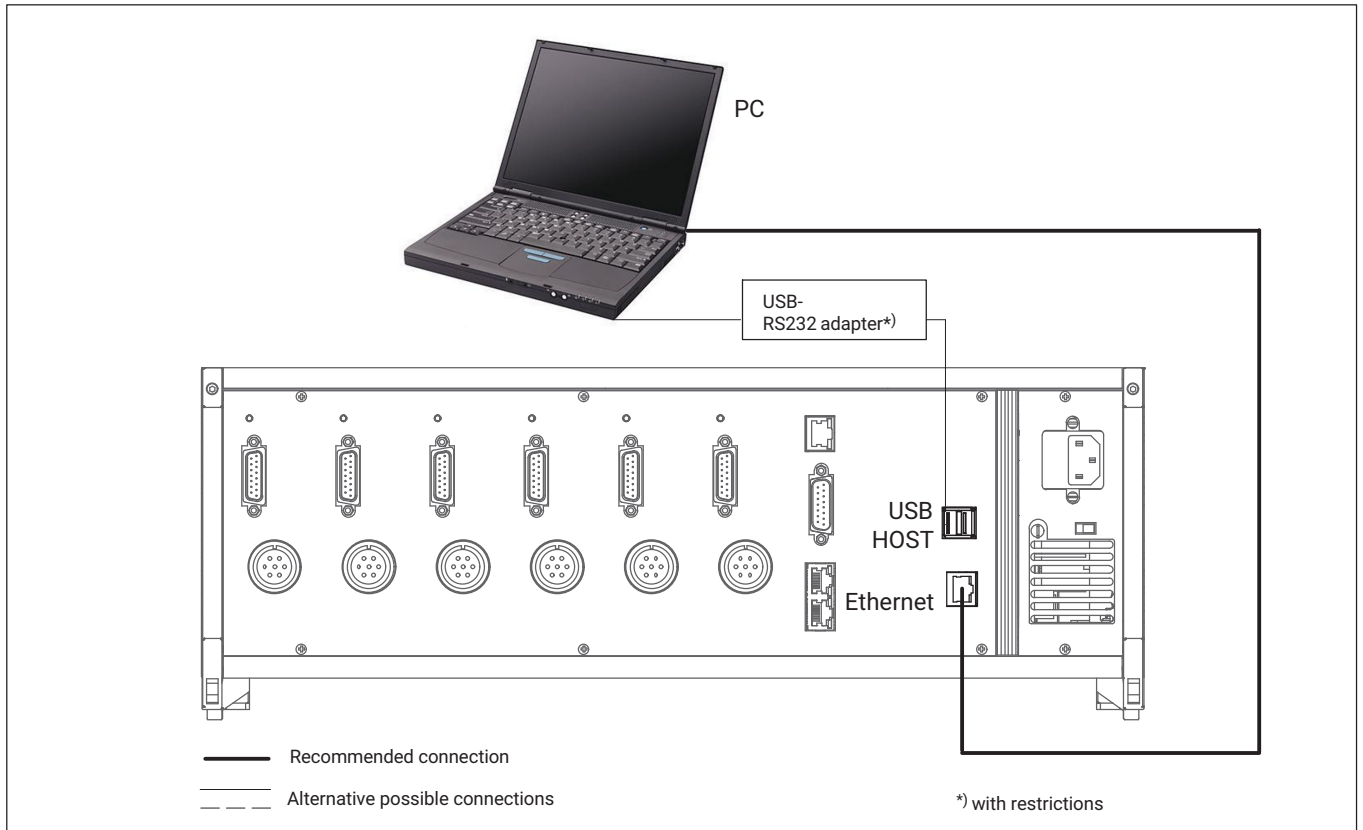


PC connection via USB serial adapter

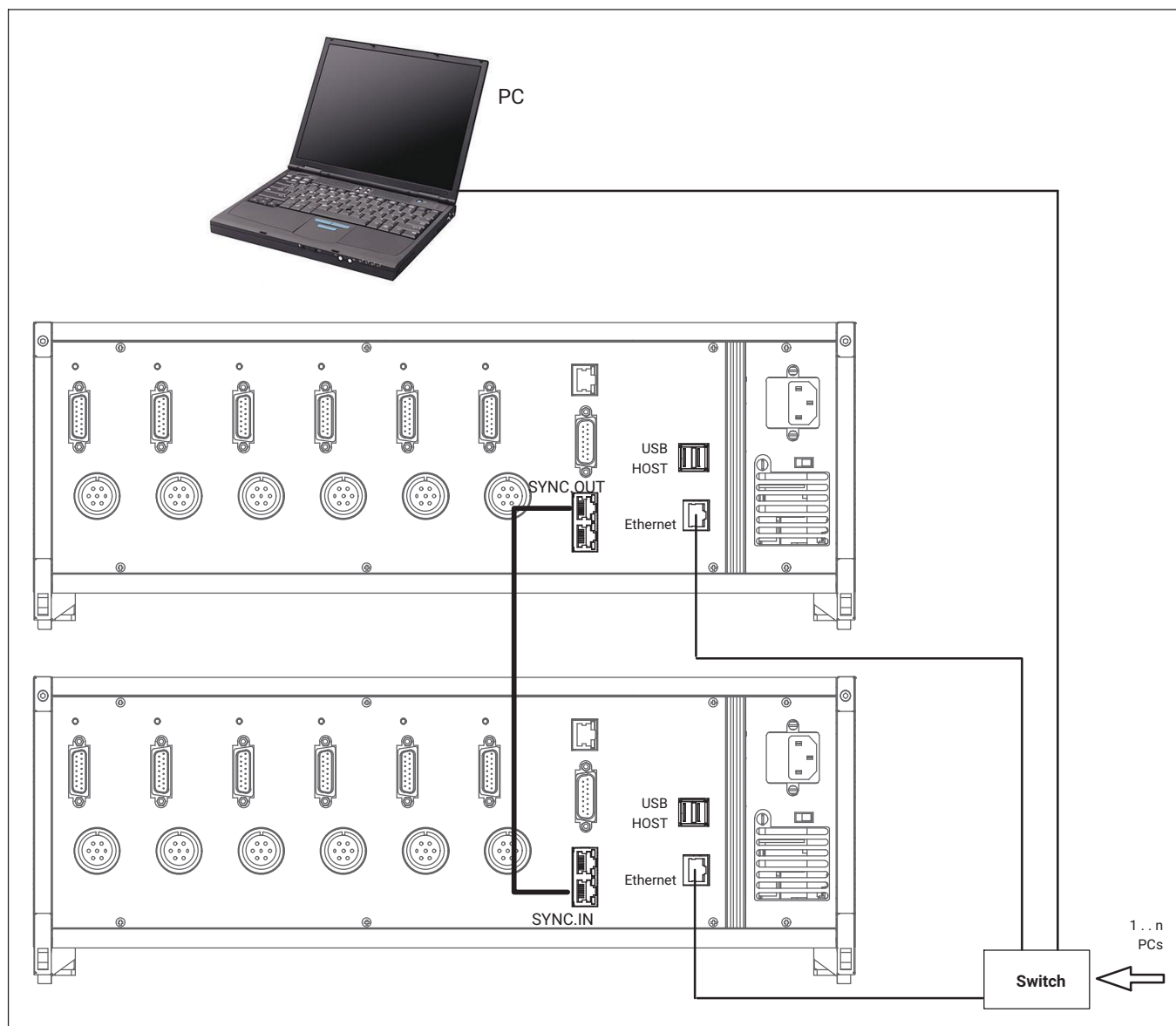


Connection examples

Connecting one DMP41.



Connecting several DMP41s (with recommended Ethernet connection)



4.5 Synchronization

During active synchronization, the carrier frequency generators of participating DMP41s are synchronized. This is necessary so that the generators are not mutually disruptive as the carrier frequencies of the various DMP41s are never exactly identical. This would otherwise lead to a crosstalk of the carrier frequency from one DMP41 to the measurement signal of another DMP41.

All amplifiers are basically synchronized within a DMP41.

We recommend synchronization of the DMP41s when:

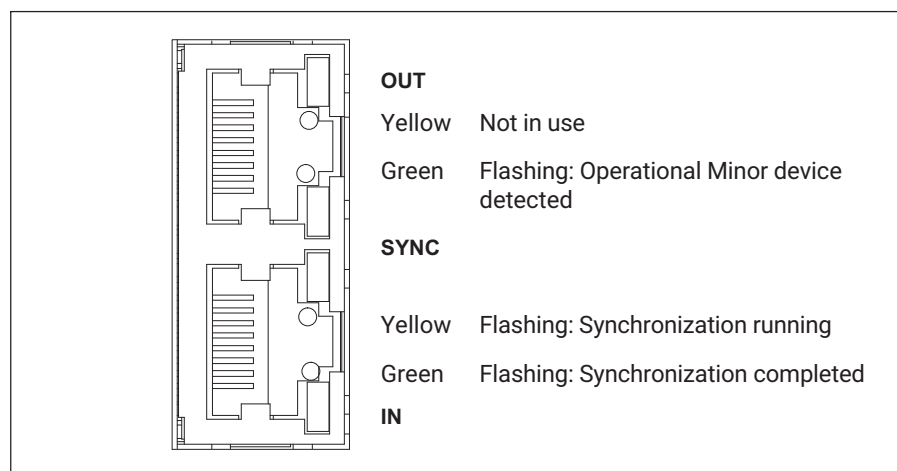
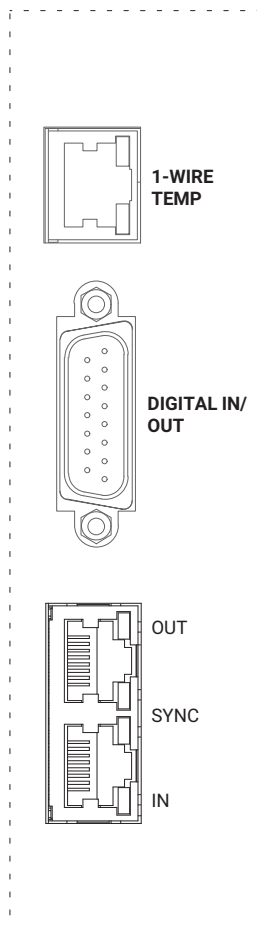
- the transducer cables of several DMP41s run side by side,
- the measuring points are unshielded and are close together.

Synchronization of several DMP41s

You can synchronize any number of DMP41s via the synchronization sockets (SYNC.IN and SYNC.OUT). The connected DMP41s are automatically detected and synchronized when the SYNCH sockets are occupied.

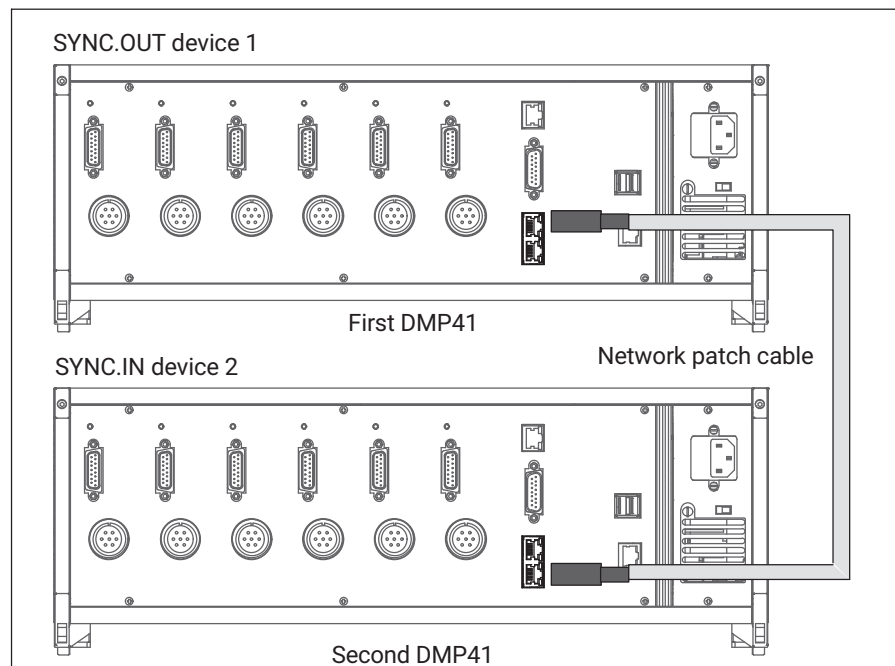
The first DMP41 (Master) must be connected via the output socket (SYNC.OUT) to the input socket (SYNC.IN) of the subsequent DMP41 (Minor). Additional DMP41s can be interconnected as required, always via the output and input sockets.

The Master/Minor status is shown via the LEDs.

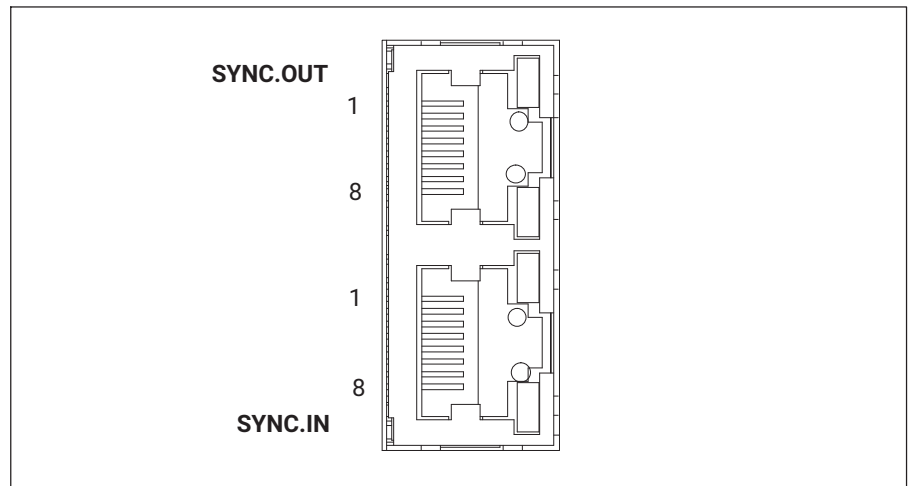


To synchronize several DMP41s, you need a synchronization cable with HBK ordering number 1-KAB287-3. Synchronization means that all the supply voltages are phase-identical and phase-locked in all the DMP41s. The status of the synchronization connection is displayed.

The total length of the synchronization chain (total cable length between SYNC.OUT of the first DMP41 and SYNC.IN of the last DMP41) must be less than 100 m.



PIN assignments of the synchronization sockets



PIN	Pin assignment	
	SYNC.OUT	SYNC.IN
	Designation	Designation
1	Start-A	Start-A
2	Start-B	Start-B
3	Ready-A	Ready-A
4	Master-A	Minor-A
5	Master-B	Minor-B
6	Ready-B	Ready-B
7	Master ID	Master ID
8	Ground	Ground

5 STARTING UP

This Chapter shows you the steps that need to be taken to operate your measurement chain (DMP41 and transducer).

After connecting the transducer (*Chapter 4 “Electrical connections”*) and the initial start-up described below, you will be able to discover the further functions and options of the DMP41.

5.1 Switching on

Important

→ Please comply with Chapter 1 “Safety instructions”, Page 7!

- ▶ Connect your transducer to the relevant socket on the back of the DMP41.

If you are using a cable pre-assembled in-house, please note the pin assignments for your transducer in → Chapter 4.2, “Transducer connection”, Page 25.

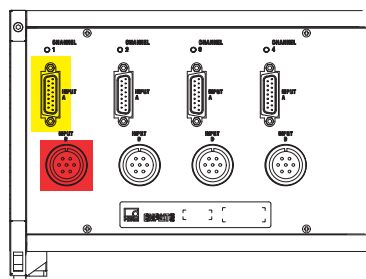
- ▶ Connect the DMP41 to the mains with the mains cable provided.
- ▶ Switch the DMP41 on using the POWER button on the front of the device (the launch display appears immediately).

The DMP41 is initialized and detects the existing components. This procedure takes approx. 45 seconds (the LED above the switch-on button flashes during this booting process).

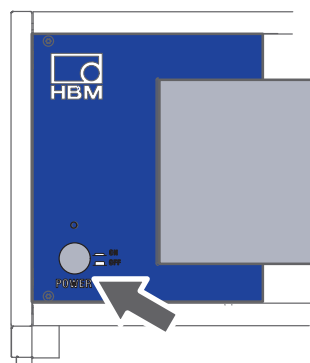
If there is no transducer connected, **No Transducer** is displayed!

Important

Please wait until the DMP41 indicates it is ready for measurement on the device start screen.

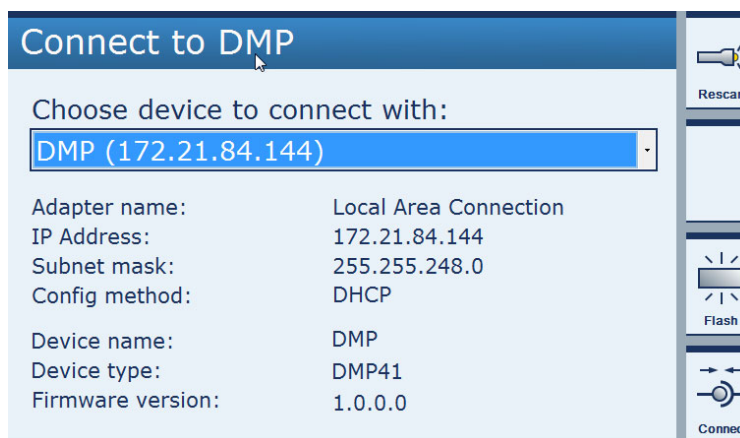


Back of device



Front of device

Start screen on the PC



Connect to DMP

Choose device to connect with:
DMP (172.21.84.144)

Adapter name: Local Area Connection
IP Address: 172.21.84.144
Subnet mask: 255.255.248.0
Config method: DHCP

Device name: DMP
Device type: DMP41
Firmware version: 1.0.0.0

Rescan
Flash
Connect

Start screen on the DMP41



Channel	Value	Units	Mode	Additional Info
1 Channel1	2.000112	mV/V	Abs	Min: 0.993654, Max: 2.006506
1 Channel1	1.000032	mV/V	Gross	T1: -- °C
1 Channel1	-0.000002	mV/V	Net	
1 Channel1	800044	ppm	Abs	Peak-to-Peak: 405141

Settings
Next
Dis-connect
Menu

Information

For more information on the start screens, → see Chapter 6.4.1
“The first display”, Page 55.

5.2 Installing the operating software:

- ▶ Download the system CD from www.hbkworld.com/en/services-support/downloads.
- ▶ Double-click on the **setup** file.
- ▶ Select **Install DMP41 Client Software** in the following dialog.



The DMP41 is connected to your computer.



5.3 Important information before measurement

If you are using several DMP41s, they must be synchronized before measurement (even cables lying next to one another could otherwise cause measurement errors). We recommend synchronizing the DMP41s when:

- the transducer cables of several DMP41s run side by side,
- the measuring points are unshielded and are close together.

If synchronizing *several* DMP41s, use a standard networking cable (synchronization cable 1-KAB287-3) for connecting the SYNC sockets on the back of the DMP41 (→ also see Chapter 4.5 “Synchronization”, starting on Page 39).

6 OPERATION

The DMP41 can be operated in three ways:

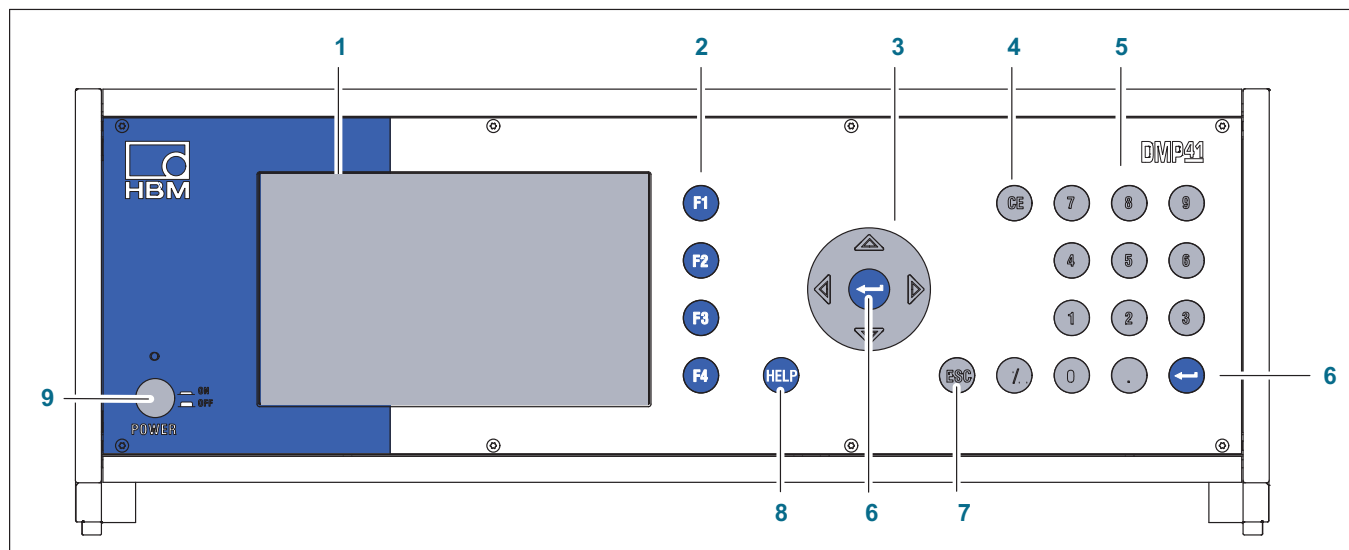
- Via the keyboard
- Via the screen of the DMP41 (TouchScreen)
- Via the PC (mouse, keyboard)

All three variants are equivalent and can be operated in parallel.

Examples

- DMP41 without connected PC:
Operate using the keys on the front panel
- DMP41 with connected keyboard (via the USB port):
Operate by means of this keyboard and/or the front panel keys
- DMP41 with connected PC *and* keyboard *and* mouse:
Operate by means of the PC keyboard and/or touchscreen and/or mouse

6.1 Control elements

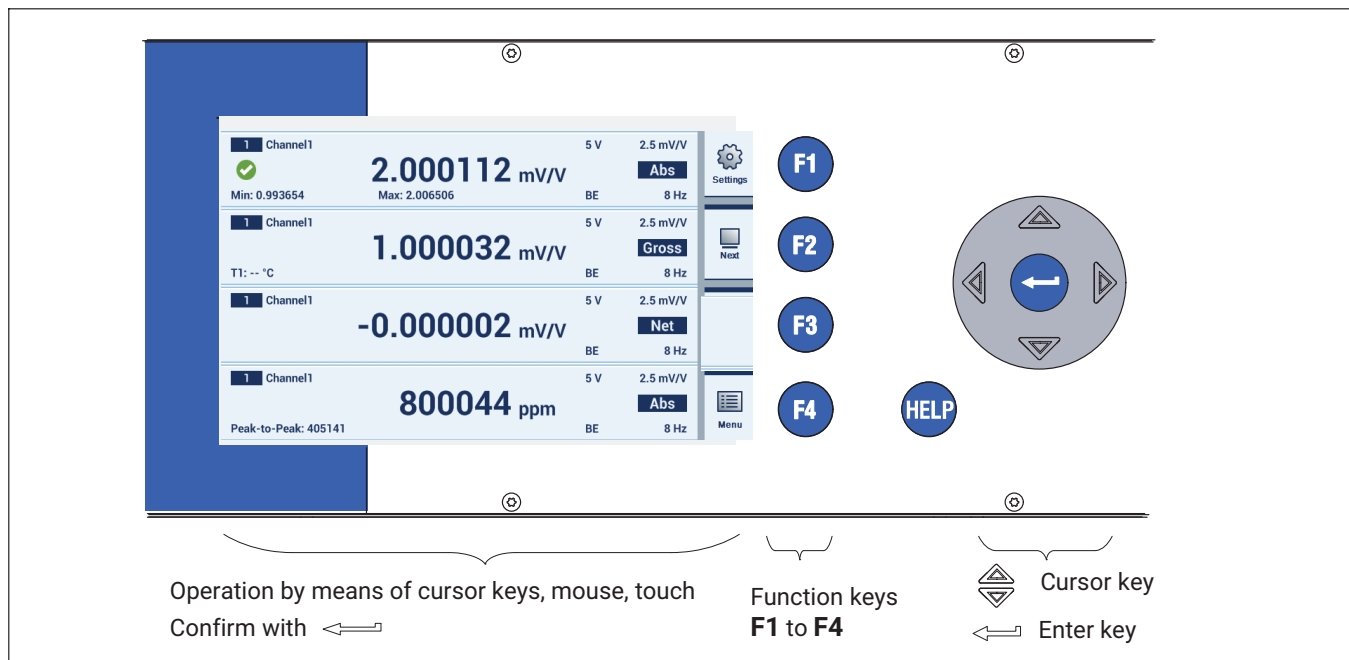


- 1 Display/TouchScreen
- 2 Function keys **F1** to **F4**
Active in measuring and setting mode
- 3 Cursor keys and Enter key
◊ ◊◊ Navigation in measuring and setting mode
- 4 Delete key
Deletes the character currently in the cursor position
- 5 Alphanumeric keypad
For entering numbers in the edit fields of the display
- 6 Enter key
Activates the settings that have been made
- 7 Escape key
Resets the last entry in menus or selection fields (excluding text fields) and closes the online help
- 8 Help key
Activates the online help for the functions currently activated
- 9 On/Off switch

! Important

The cursor keys on the front panel correspond to the arrow keys of the PC keyboard, while the function keys of the front panel are equivalent to keys **F1** to **F4** on the keyboard.

Navigation information



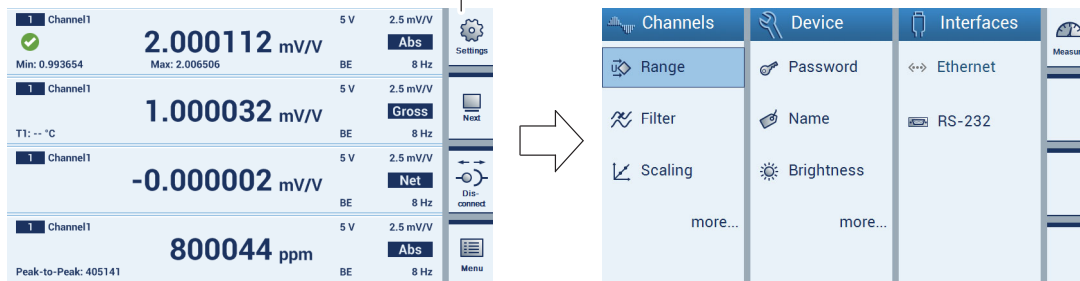
Operation via the front panel keyboard

You can make all the settings for your DMP41 by means of the control keys on the front panel. There are two operating modes available, *measuring mode* (Measure) and *setting mode* (Settings).

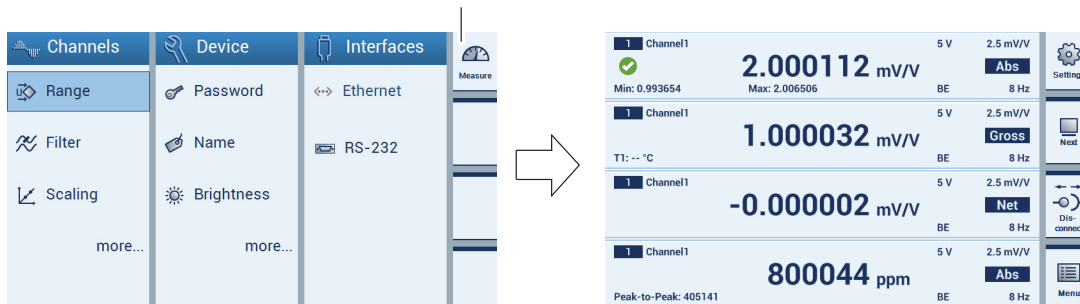
! Important

Key **F1** has a special status. Pressing this function (shift) key switches the user to the other operating mode, i.e. from measuring mode (Measure) to setting mode (Settings), and vice versa.

Switching from *measuring mode (Measure)* to *setting mode (Settings)*

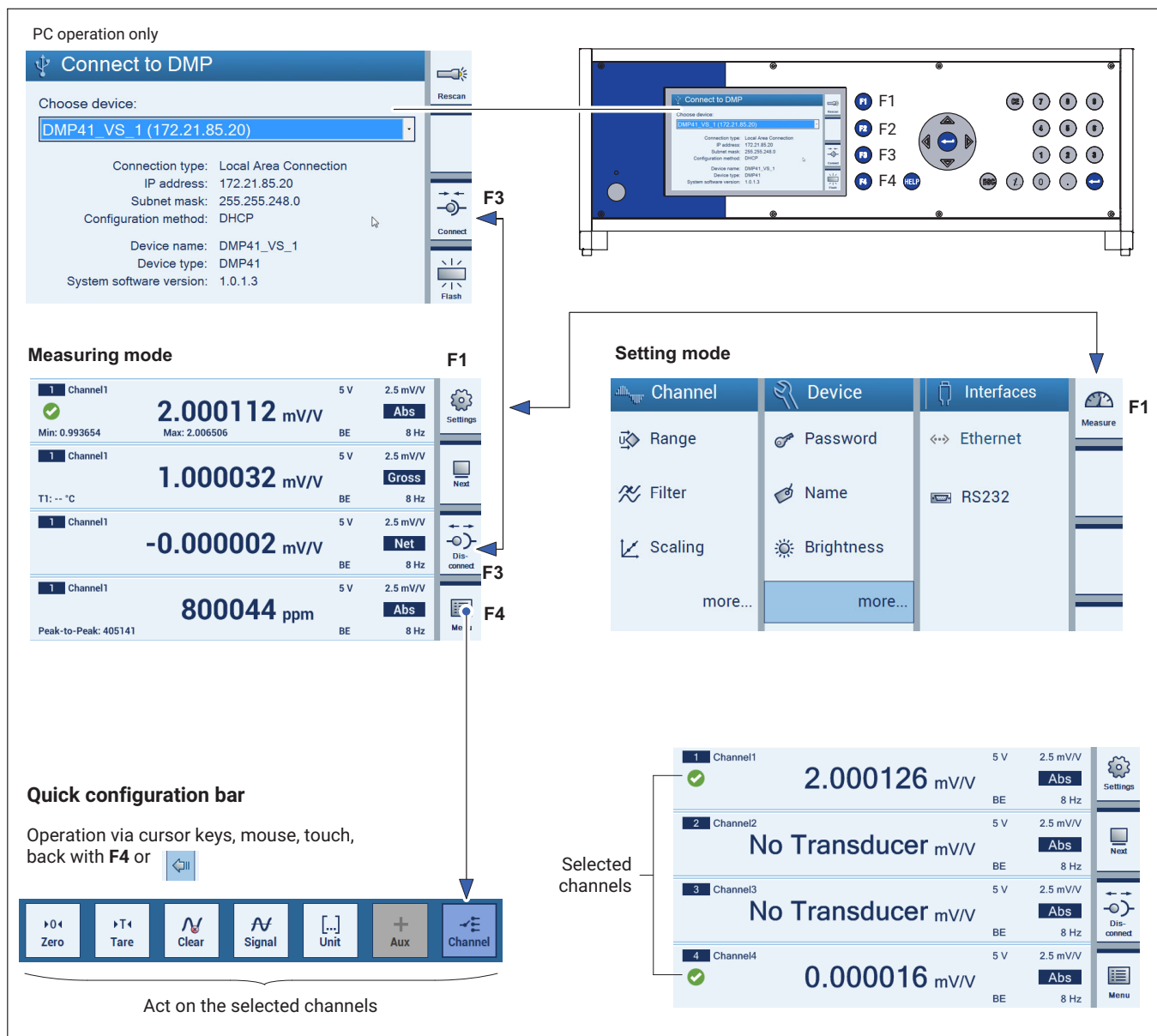


Switching from *setting mode (Settings)* to *measuring mode (Measure)*



- Configuring **Channels**: measuring range, filter, scaling, channel name, display accuracy, zeroing, peak values, copy, save, load
- Configuring **Device**: password, terminal, display brightness, information, logging, factory settings, device name, date/time, update
- Configuring **Interfaces**: Ethernet, RS232

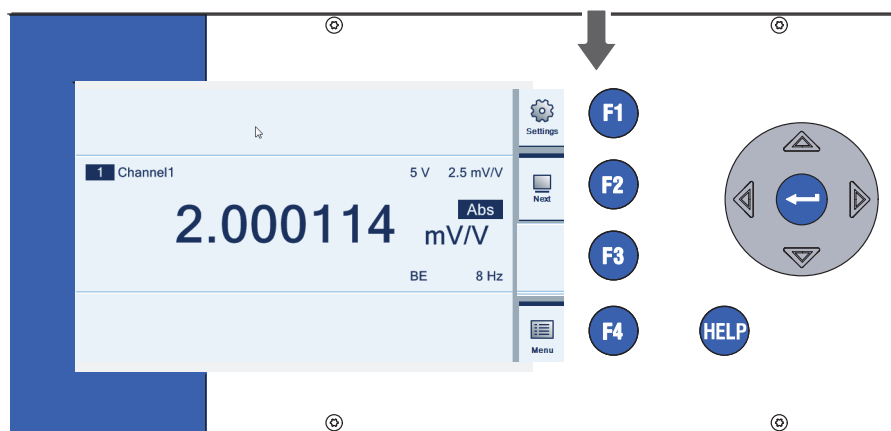
Overview of the touchscreen user interface



Operation

Function keys in measuring mode (Measure)

6.2 Function keys in measuring mode (Measure)



Measure



Settings

F1

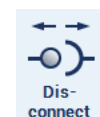
Shift key for measuring mode (Measure) setting mode (Settings)



Next

F2

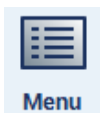
Shift key for the number of displayed measurement channels (1, 2, 4, 6)



Dis-
connect

F3

Connection/disconnection of the DMP41 (PC operation only)



Menu

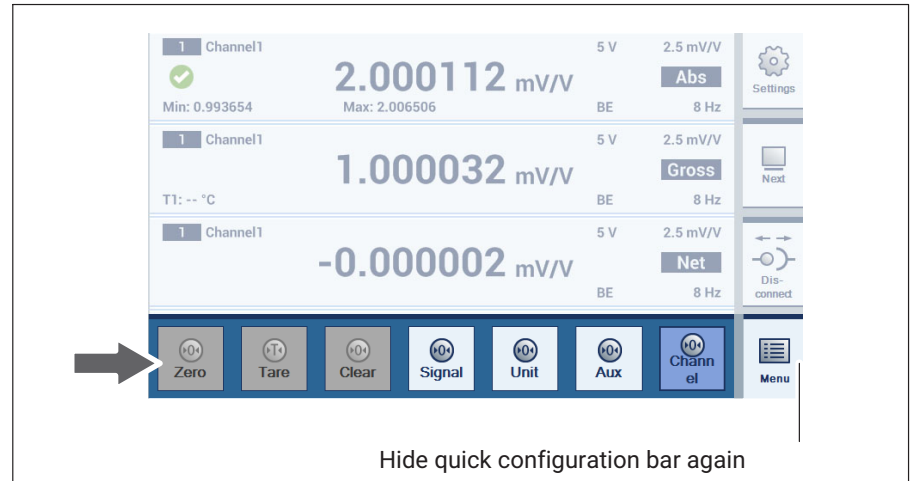
F4

Quick configuration bar and back (hide quick configuration bar again)

Function keys **F1** to **F4** are effective in both measuring mode and setting mode, but have different functions.

Functions of the quick configuration bar

F4: Opens the quick configuration bar



The functions act on all the selected channels (maximum 6).

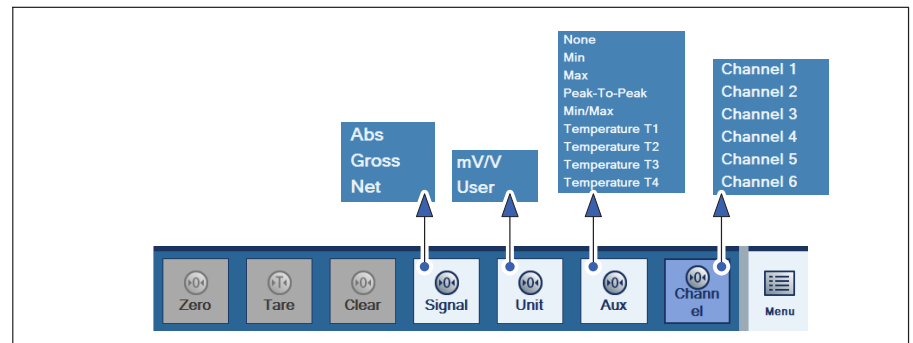
The channel parameters can be selected from a pop-up menu in the functions **Signal**, **Unit**, **Aux** and **Channel**.

Aux: Temperature T1

All selected channels display the temperature T1

Channel: Channel 4

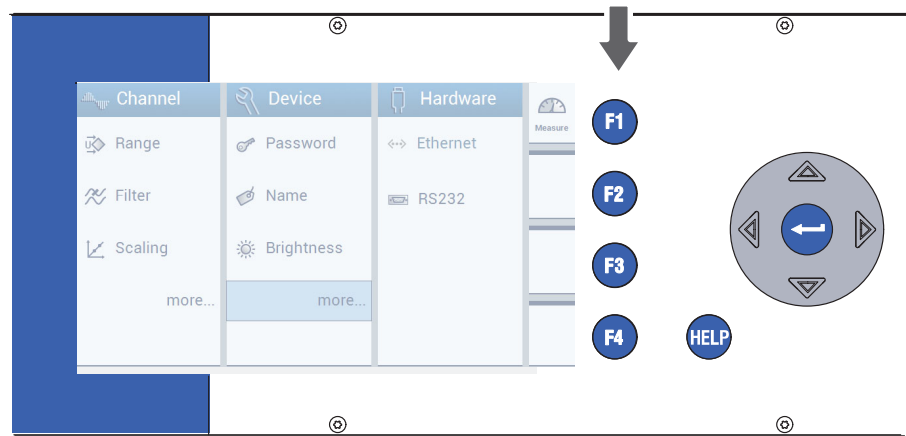
All the selected channels show **Channel 4** in the set properties (e.g. unit, gross, net).



Operation

Function keys in measuring mode (Measure)

6.3 Function keys in setting mode (Settings)





Settings



Measure



F1 Shift key for setting mode (Settings)  / measuring mode (Measure) 

F2 Enters numbers or letters in the display

F3 Saves edited settings



Save

F4 Back to previous level



Back

F2 to F4: Display and function depend on the level

Operation via the screen of the DMP41 (TouchScreen)

Operation via TouchScreen is equivalent to the functions of DMP41 keyboard operation. To make a selection, tap on a menu item, a drop-down heading or a link.



Information

*Exception: the online help can only be called up via the **HELP** key on the DMP41 or by using key **F5** on the keyboard during PC operation.*

Operation via PC (with mouse and keyboard)

You have connected the DMP41 to a PC. Operation via PC is equivalent in all functions to keyboard operation. Use the mouse pointer to click on menu items, drop-down texts or links.

Both the function keys (**F1** to **F4**) and the alphanumeric keypad on the keyboard correspond to the comparable keys on the front of the DMP41 enclosure.

If there are several PCs connected, only one PC has the right to make settings (→ see *Chapter 4.4 "PC connection", Page 36*).

The screens shown on the monitor and the DMP41 display may differ (no direct screen correlation).

Online help



Important

*In PC operation, the online help function is called up using key **F5** on the keyboard. This applies both to measuring mode and setting mode.*

*During DMP41 operation, you reach the online help via the **HELP** key. Help texts relating to the currently activated function are displayed.*

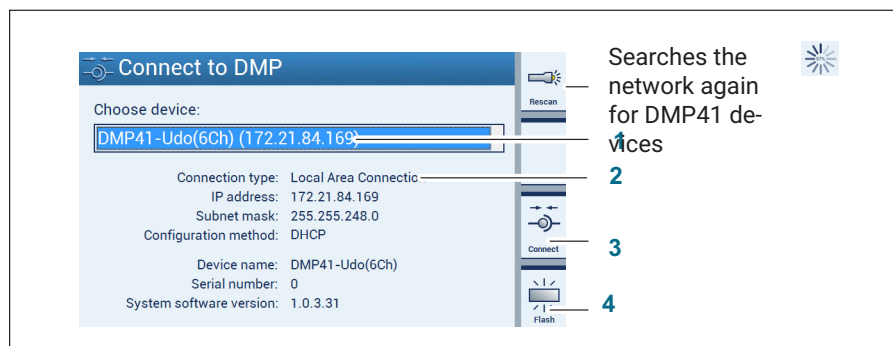
6.4 Display/TouchScreen

6.4.1 The first display

After the mains voltage is switched on, the DMP41 is initialized and detects the components that are present. This procedure takes approx. 45 seconds.

Start screen on the PC

The PC start screen shows the selectable, connected DMP41s. General information about the selected DMP41 will also be displayed.



- 1 Chooses a DMP41 in the network
- 2 Information about the selected DMP41
- 3 Connects the selected DMP41 to the PC
- 4 The display of the selected DMP41 flashes

► Choose a DMP41 (1).

Information about the selected DMP41 is shown underneath (DHCP, device address, etc.) (2).

► Confirm this with **Connect** (3).

You are taken to measuring mode (→ see Chapter "Display in measuring mode (Measure)", Page 57)

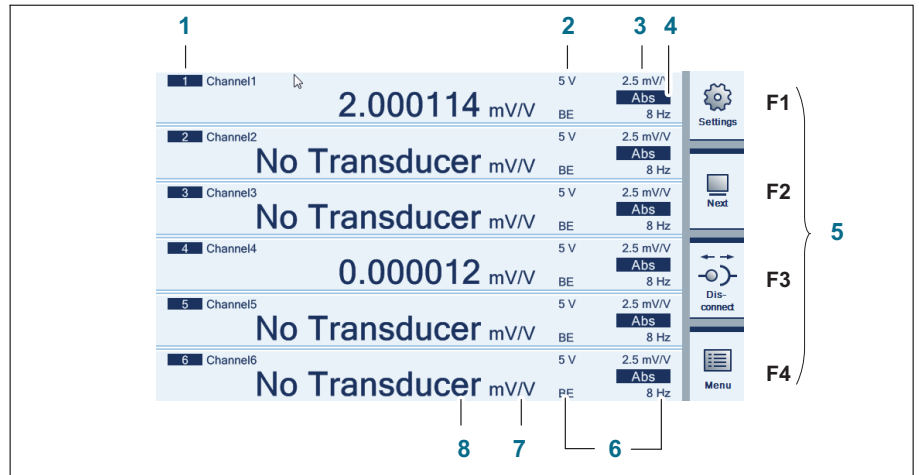
If several DMP41s are connected, you can use the **Flash** (4) function to identify a DMP41. The display on the front panel of the DMP41 becomes alternately brighter or darker.

6.4.2 Display in measuring mode (Measure)

Start screen on the DMP41(measuring mode)

The measured values for all the selected channels are displayed in measuring mode.

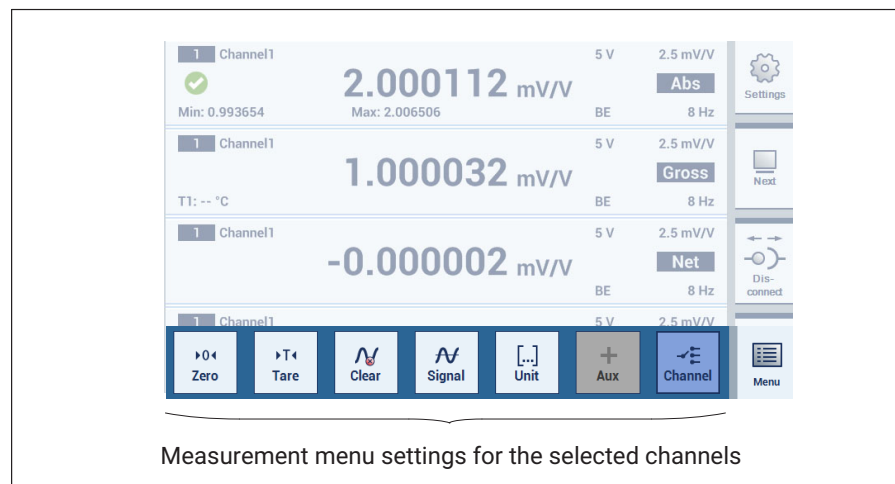
Press the shift key **F1** to be taken from measuring mode to setting mode and vice versa (→ see Chapter 6.4.3 “Display in setting mode (Settings)”, Page 60).



- 1 Channel number
- 2 Excitation voltage
- 3 Measuring range
- 4 Output signal (absolute, gross, net (→ see Page 59))
- 5 Function keys (→ see Page 48)
- 6 Filter
- 7 Unit
- 8 Measured value
- F1 Shift key for measuring mode/setting mode
- F2 Shift key for the number of displayed measurement channels (1, 2, 4, 6)
- F3 Connection/disconnection of the DMP41 (PC operation only)
- F4 To the quick configuration bar (and back)

The quick configuration bar display

► Press key **F4** or click on **Menu**.



! Important

All settings/changes implemented via this quick configuration bar only affect the actually selected channels.

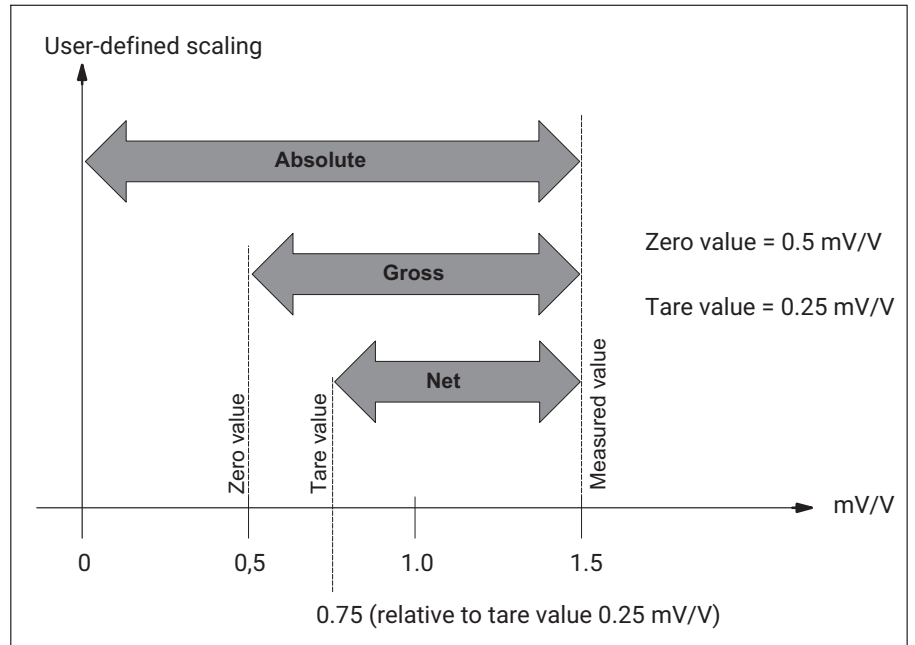


The channel parameters can be selected from a pop-up menu in the functions **Signal**, **Unit**, **Options** and **Channel**.

→ Also see Chapter 6.2 "Function keys in measuring mode (Measure)", starting on Page 52.

Signal type in the display

You can display the absolute, gross and net signals in sequence for each measuring point.

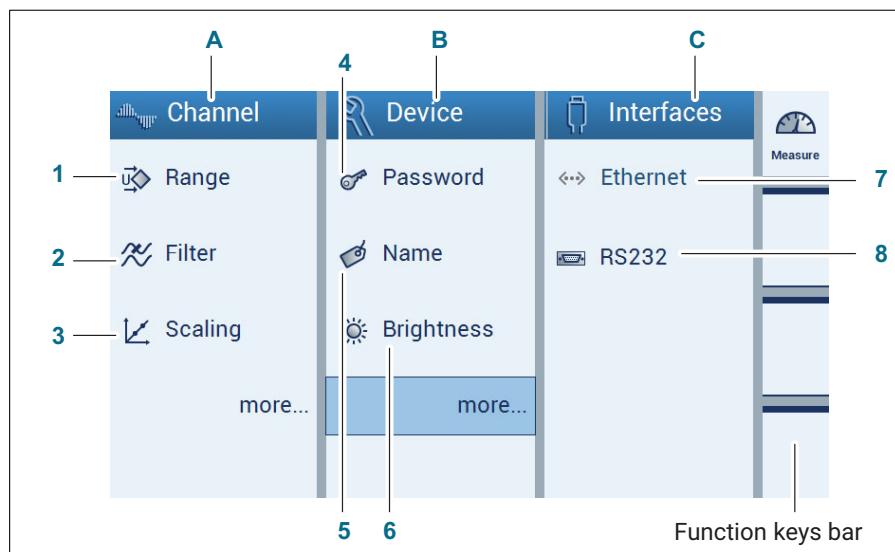


The following values appear in the display for this example:

Absolute	1.5 mV/V
Gross	1.0 mV/V
Net	0.75 mV/V

6.4.3 Display in setting mode (Settings)

The screens shown on the PC and the DMP41 may differ (no direct screen correlation).



A Measurement channel settings (Channel)

- 1 Bridge excitation voltage and measuring range
- 2 Filter
- 3 Scaling

B Device settings (Device)

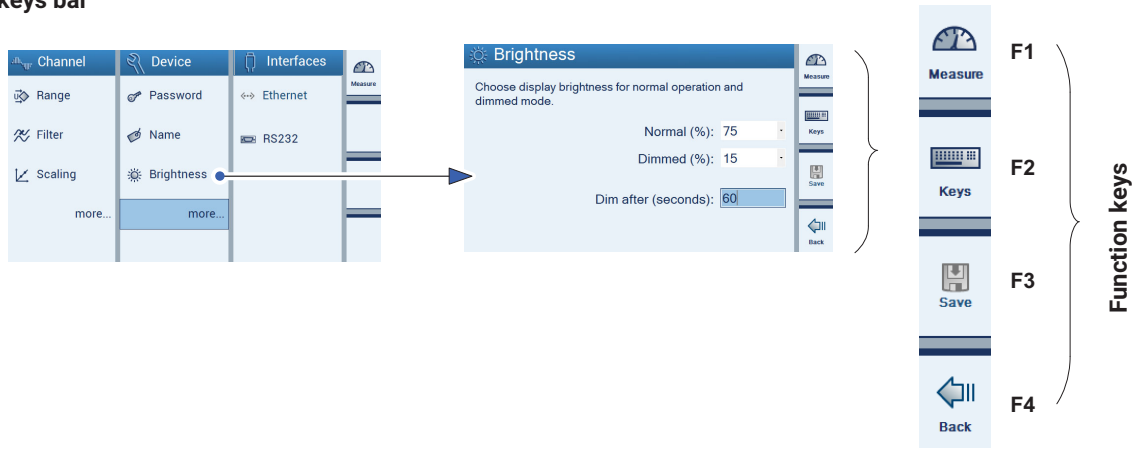
- 4 Password
- 5 Device name
- 6 Display brightness

C Interface settings (Interfaces)

- 7 Ethernet interface
- 8 RS232 interface

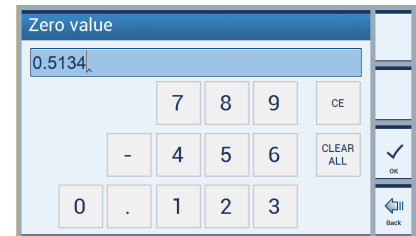
Function keys bar

Example:



- F1** Settings Shift key for measuring mode (Measure) -> setting mode (Settings)
- F2** Keys Key input via display¹⁾
- F3** Save Saves edited settings
- F4** Back Back to previous level

¹⁾ Entering letters or numbers. Deleting characters with the CE key.



7 CONFIGURATION

This chapter looks at the functions and configuration options of the DMP41. The menu structures shown below will help you find the required setting menus more rapidly. We also show you at the same time the actual key sequences to follow to make the settings.

7.1 Basic configuration options

Essential settings

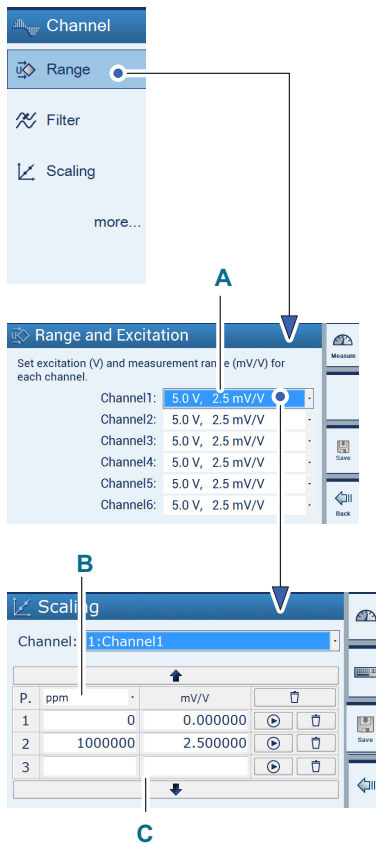
The following essential settings can be made in setting mode:

A Bridge excitation voltage and measuring range

B Unit

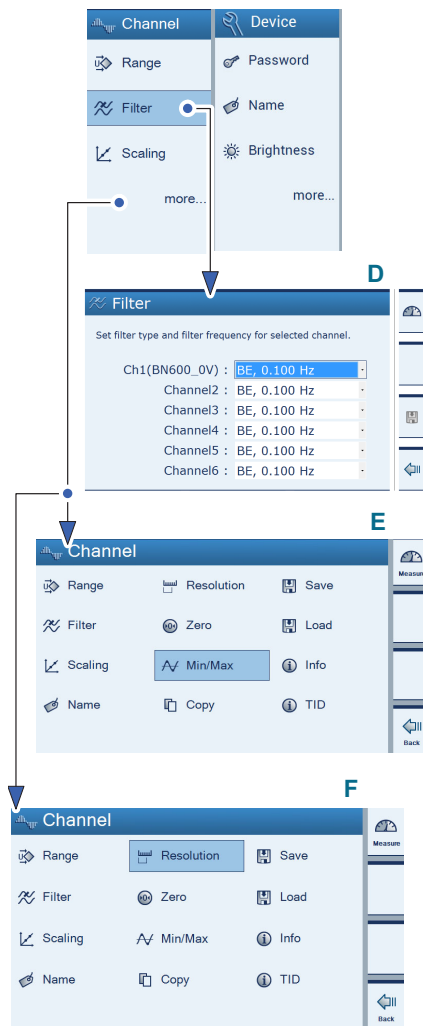
C Linearization table corresponding to the transducer data

Simple measurements are now possible in measuring mode. You can continue setting additional functions, as required.



Configuration

Basic configuration options



Additional settings (if necessary)

D Filter

E View/delete peak values (Min/Max)

F Set display formats (Resolution and Step)


Settings such as password, name and brightness can be made under **Device** (device settings).


Selecting and marking channels

The cursor, the mouse (with a PC) or touch can be used to assign the measured value displays.

A channel to which a measured value is assigned is identified by a green checkmark. Click again to remove the marking.


Measuring mode

Channel selection marking 




The screenshot shows a measuring mode interface with four channels. Channel 1 is selected and marked with a green checkmark. The measured values are: 2.000112 mV/V (Abs), 1.000032 mV/V (Gross), -0.000002 mV/V (Net), and 800044 ppm (Abs). The interface also shows a 'Quick configuration bar' with buttons for Zero, Tare, Clear, Signal, Unit, Aux, Channel, and Menu.

Quick configuration bar



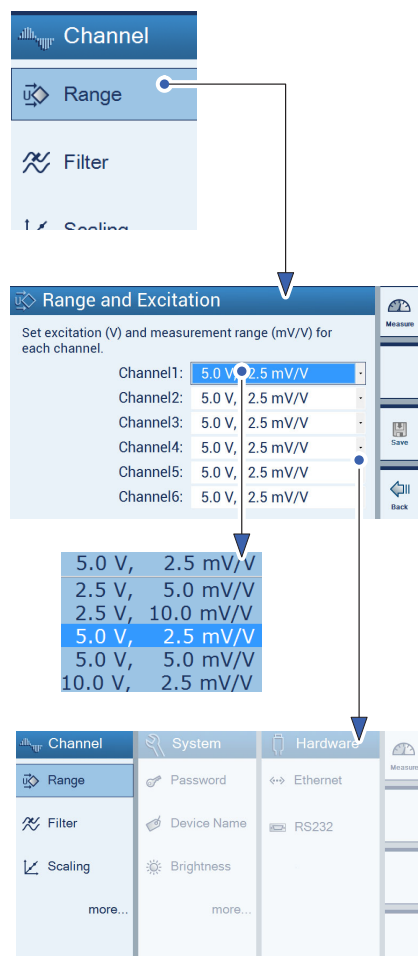
Inputs via this menu only act on the selected channels (→ also see Chapter 6.1 “Control elements”, starting on Page 48).

Information

The inputs in setting mode  do not depend on the channels marked here.

Configuration

Configuring measurement channels in setting mode



7.2 Configuring measurement channels in setting mode

! Important

The measurement channels are set via the menus under **Channel**.

If the device is in measuring mode:

- ▶ Press shift key **F1** to switch to setting mode (Settings).

7.2.1 Measuring range (Range) and bridge excitation voltage (Excitation)

The measuring range selection is dependent on the choice of bridge excitation voltage.

Bridge excitation voltage (V)	Selectable measuring range (mV/V)
2.5	5 10
5 (factory setting)	2.5 5
10	2.5 (factory setting)

- ▶ Press **Range**.
- ▶ In the **Range and Excitation** menu, choose the required bridge excitation voltage/measuring range combination.
- ▶ Press **Save**.

! Important


The maximum accuracy as stated in the specifications is only achieved with settings of 10 V for the excitation voltage and 2.5 mV/V for the measuring range.

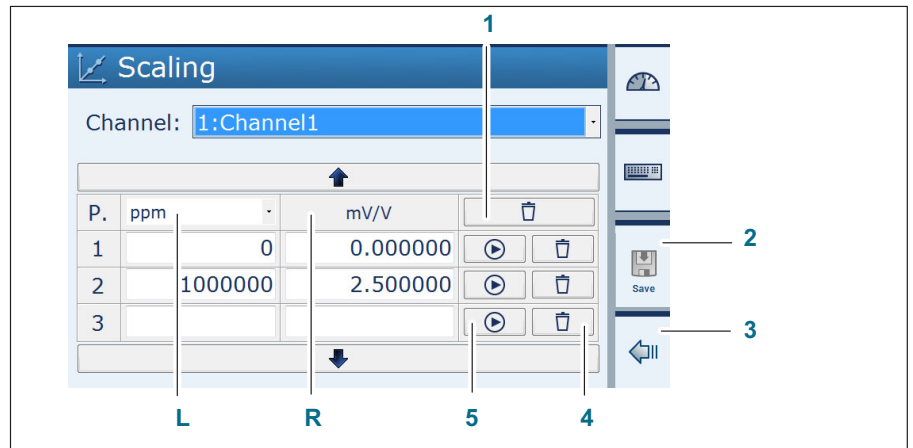
The bridge excitation voltage selection can restrict the choice of measuring range.

7.2.2 Scaling and linearization (Scaling)

Every function in this settings window can be assigned two values (with the exception of the unit).

The left-hand value (**L**) relates to the user-defined scaling, the right-hand value (**R**) to the scaling in mV/V.

The  buttons only apply the current measured values in mV/V (right-hand edit field).



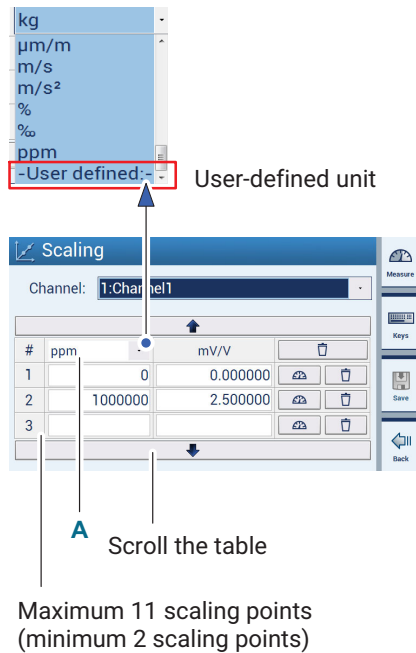
- 1 Deletes all the scaling
- 2 Saves all changes
- 3 Resets changes and applies the values of the last characteristic curve
- 4 Deletes line P3
- 5 Applies the currently measured value (in mV/V) to the (mV/V) edit field.

Linearization compensates for the non-linearities of the transducer.

In the scaling dialog, values with up to 7 decimal places are shown accurately, with the 7th digit rounded off (example: 200 kg remain exactly 200 kg in the linearization table, not 199.999)

Configuration

Configuring measurement channels in setting mode



The screenshot shows a unit selection menu with options: kg, $\mu\text{m}/\text{m}$, m/s , m/s^2 , %, ω , ppm, and -User defined:-. The -User defined:- option is highlighted with a red box and labeled "User-defined unit". Below this is the "Scaling" screen for "Channel: 1:Channel1". It features a table with columns for "#", "ppm", and "mV/V". The table contains three rows of data. A blue arrow labeled "A" points to the table with the text "Scroll the table". Below the table, it states "Maximum 11 scaling points (minimum 2 scaling points)".

#	ppm	mV/V
1	0	0.000000
2	1000000	2.500000
3		

Choosing the unit

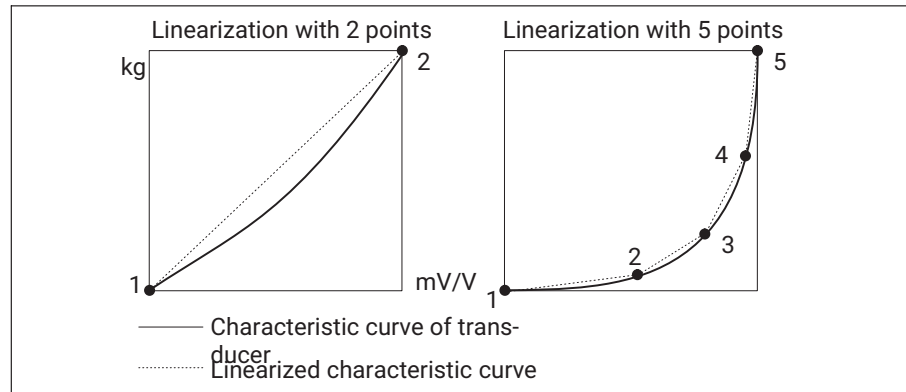
Required unit in the display (e.g. ppm) can be selected from the menu or be user defined.

Setting scaling points

Edit fields **1** to **11** are used to linearize a transducer characteristic curve.

Display errors caused by non-linear characteristics can therefore be compensated.

Basically, more scaling points are required in strongly curved characteristic curves in order to obtain smaller straight line segments.



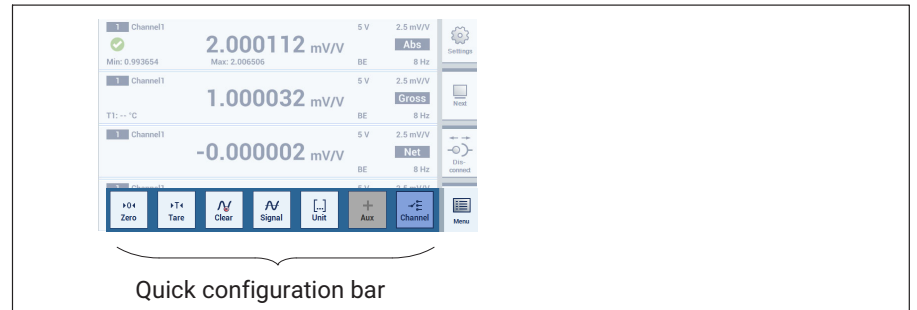
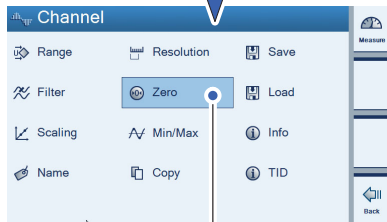
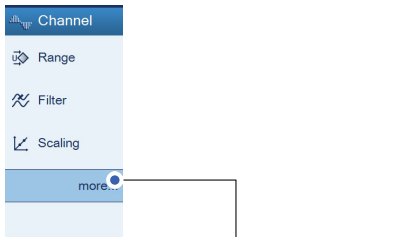
If values lie outside the stated scaling points, the gradient of the last two scaling points is used and extrapolated accordingly.

- ▶ Press **Scaling**.
- ▶ Choose a unit (**A**).
- ▶ Choose the values for unit and mV/V for each scaling point.
- ▶ Press **Save**.

7.2.3 Zeroing and taring (Zero/Tare)

Zeroing and taring using the quick configuration bar in measuring mode

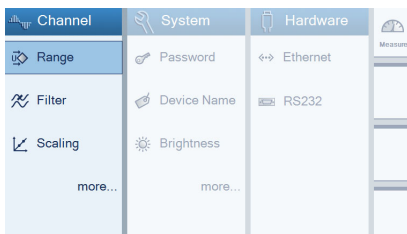
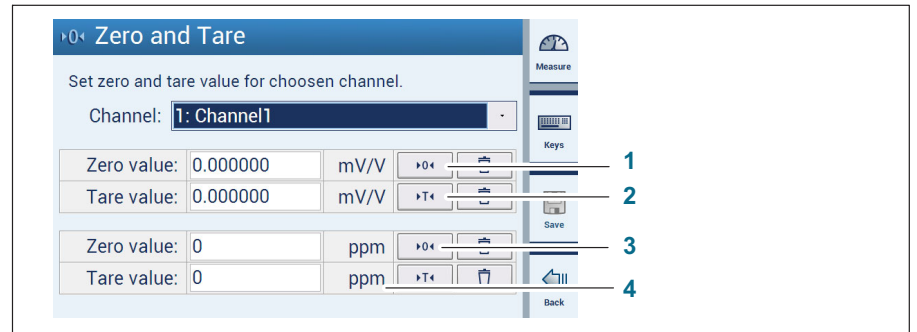
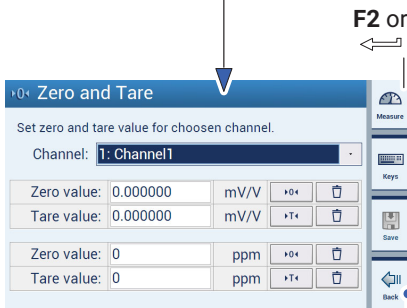
Selected channels are set to zero or tared with **Zero** or **Tare**, i.e. the currently measured zero value or tare value is applied (in mV/V).



Zeroing and taring using an edit field in setting mode

Edit fields for the zero value and the tare value:

- Zero value
- Tare value



- 1 Applies the adjacent electrical value as the zero value
 - 2 Applies the adjacent electrical value as the tare value
 - 3 Applies the adjacent (scaled) physical value as the zero value
 - 4 Any unit (set in Scaling)
- The input of the unit and the mV/V value are synchronized.

Configuration

Configuring measurement channels in setting mode

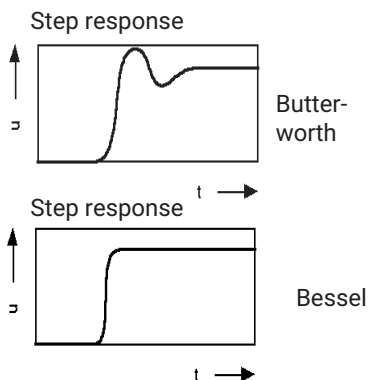
- ▶ Press **more....**
- ▶ Press **Zero**.
- ▶ Enter a value for Zero value (via keypad or **F2**).
- ▶ Enter a value for Tare value (via keypad or **F2**)
- ▶ Press **Save**.
- ▶ Press **Back**.



Important

When zeroing the mV/V value, the user-defined unit is set in accordance with the characteristic curve (non-zero).

When zeroing the user-defined unit, the mV/V is set in accordance with the characteristic curve (non-zero).



7.2.4 Filter type and filter frequency

Low-pass filters are used to suppress unwanted higher frequency interference that lies above a specific cut-off frequency.

The amplitude response, runtime and step response are dependent on the filter characteristics. You can choose between Butterworth characteristics and Bessel characteristics.

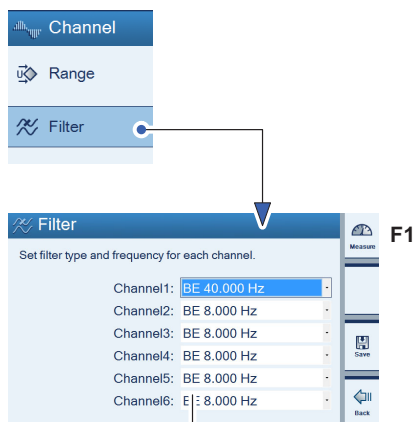
Butterworth characteristics show a linear amplitude response with a steep drop above the cut-off frequency. There is an overshoot of approx. 10%.

Bessel characteristics show a step response with very little (<1%) or no overshooting. The amplitude response drops less sharply.

Nominal (rated) values are amplitude damped for -3dB.

The settings are explained with the following example:

Masses are to be determined with a scale. The scale stands on a foundation that tends to oscillate around 12 Hz. Interference frequencies over 12 Hz must be filtered out.



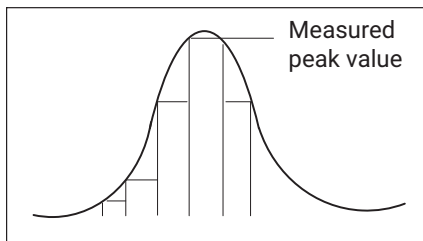
scroll

- BE 40.00 Hz
- BE 20.00 Hz
- BE 10.00 Hz
- BE 8.00 Hz
- BE 4.00 Hz
- BE 2.00 Hz
- BE 1.00 Hz
- BE 0.80 Hz
- BE 0.40 Hz
- BE 0.20 Hz

- ▶ Press shift key **F1** to switch to setting mode (Settings).
- ▶ Press **Filter**.
- ▶ Select **BE, 1 Hz** for the individual channels (corresponds to damping of > 90 dB at 12 Hz).
- ▶ Press **Save**.
- ▶ Press shift key **F1** to return to measuring mode (Measure).

Configuration

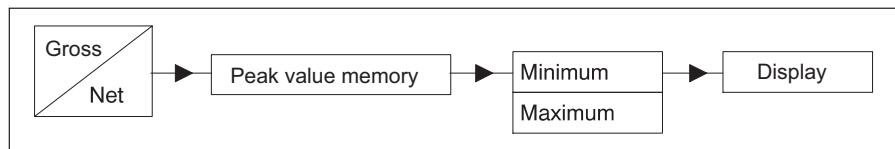
Configuring measurement channels in setting mode



7.2.5 Peak-value memory (Min/Max)

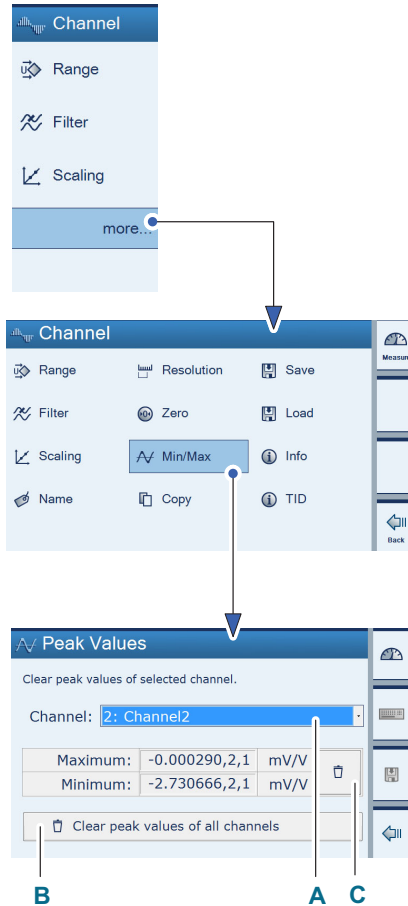
The peak values function (Min/Max) can be used to record and save isolated signal peaks and minimum/maximum signal amplitudes. All peak values are stored continuously.

You can display min/max and peak-to-peak as gross, net, or absolute values, either in mV/V or scaled as defined by the user, or query them using the MSV command.



With fast dynamic signals, you must take into account that the peak values are determined from the filtered signal.

If, in the above example, the peaks of the the foundation oscillations are to be measured, the filter must be set to more than 12 Hz.




Clearing the peak value memory per channel (Min/Max Peak Values)

There are three ways to clear the peak value memory:

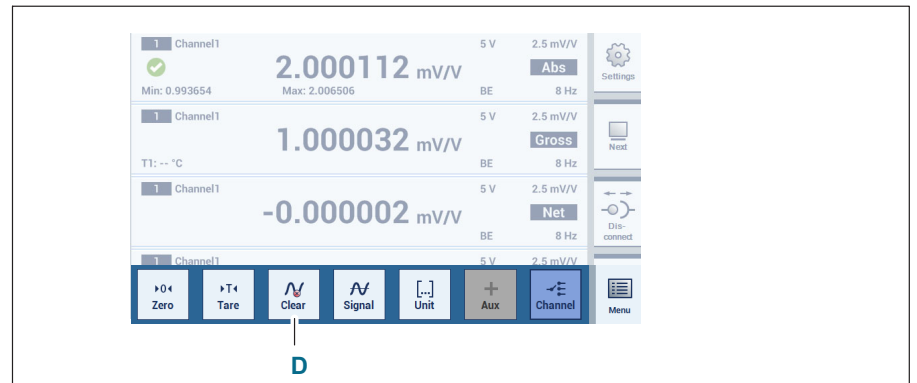
- Via the **Min/Max** menu (of the selected channel (A) or of all the channels (B)).
- ▶ Press **more...**
- ▶ Press **Min/Max** (Peak Values).
- ▶ Choose the channel from which you want to delete the peak values (A).
- ▶ Press (C).

The peak values are deleted.

- Via a computer using the command **CPV**

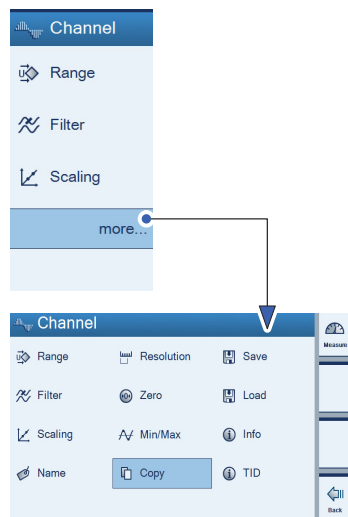
- Directly via  (quick configuration bar)

- ▶ Press shift key **F1** to switch to measuring mode (Measure).
- ▶ Press **Clear** (D).



Configuration

Configuring measurement channels in setting mode



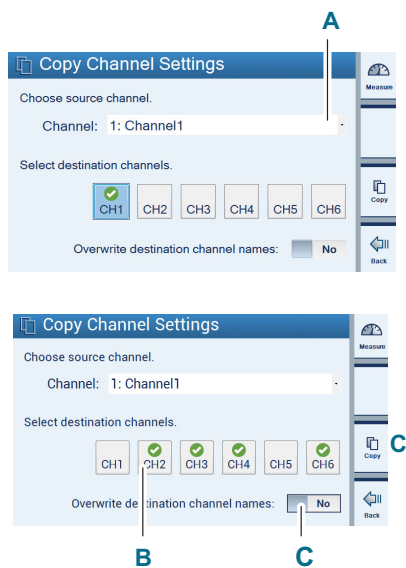
7.2.6 Copying (Copy)

You can use the “Copy” function to transfer the settings of one channel to other channels. This obviates the need for time-consuming setting work.

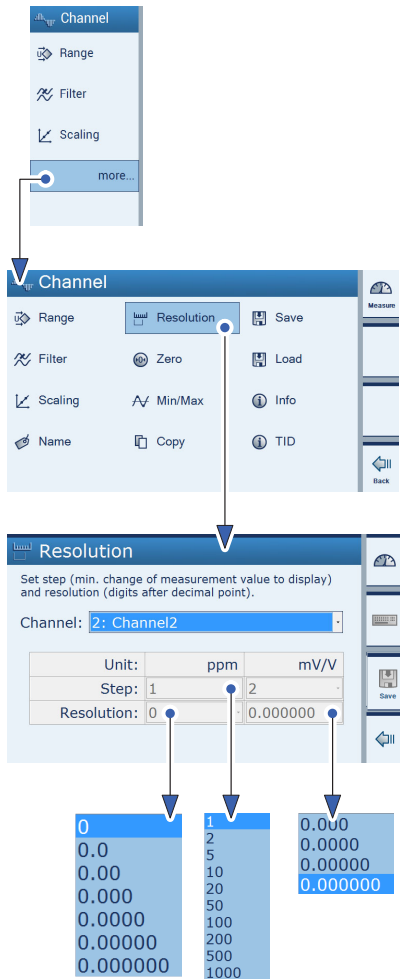
- ▶ Press **more....**
- ▶ Press **Copy**.
- ▶ Select the channel whose settings are to act as the source channel (Master channel) (here: **Channel1**) (A).
- ▶ Select the channels whose settings should be overwritten with those of the Master channel (B).
- ▶ Confirm with **Copy** (C).

The channel names can also be overwritten with the name of the Master channel (C).

Example: Channels 2, 3, 4 and 6 are renamed as **Channel1**.



Copies all the settings from channel 1 to channels 2, 3, 4 and 6.



7.2.7 Configuring the measured value display (Resolution/Step)

The settings in the **Resolution** menu influence what is shown in the display.

Setting the display accuracy (Resolution)

You can use the display accuracy to specify the number of digits after the decimal point.

Example: Full scale value of display 20 g

Resolution 0.0 (20.0 kg)

Resolution 0.000 (20.000 kg)

Setting the increment (Step)

You can specify the display increments with the step value. The step value refers to the last digit.

Example: Full scale value of display 20 g

Decimal places (Resolution) 1 (20.0 kg)

Step 1 means display increments of 100 g

Step 5 means display increments of 500 g

Step 100 means display increments of 10,000 g

Decimal places (Resolution) 3 (20.000 kg)

Step 1 means display increments of 1 g

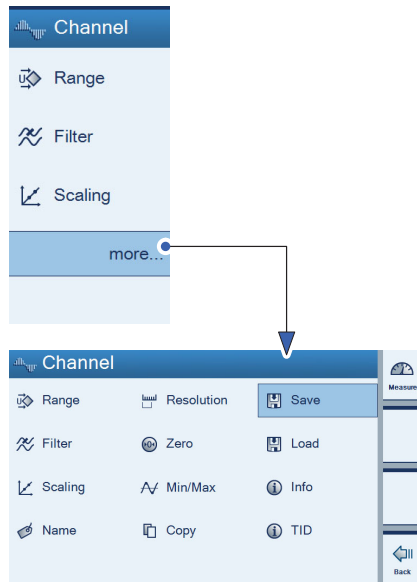
Step 5 means display increments of 5 g

Step 100 means display increments of 100 g

- ▶ Press **more...**
- ▶ Press **Resolution**.
- ▶ Select the channel to be set.
- ▶ Enter the increment (Step) for the user-defined unit.
- ▶ Enter the resolution for the user-defined unit.
- ▶ Enter the increment (Step) for mV/V.
- ▶ Enter the resolution for mV/V.

Configuration

Configuring measurement channels in setting mode



7.2.8 Saving/loading (Save/Load)

Use the **Save** and **Load** functions to permanently save the current channel settings or load saved settings. All the channel settings of all 6 channels are saved each time. You can assign 1 to 100 parameter sets.

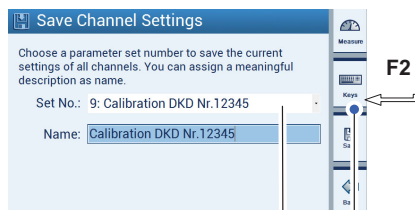
Save

- ▶ Press **more....**
- ▶ Press **Save**.
- ▶ Select parameter set number.

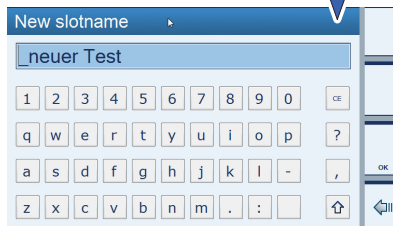
Here:

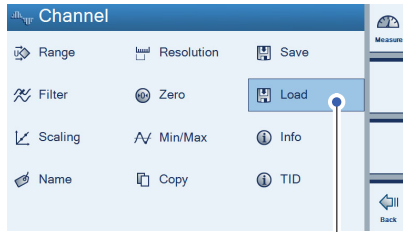
All the channel settings of all six channels are stored under parameter set number 9.

- ▶ Press **F2** and assign a name to the selected parameter set (delete letters and characters with the CE key).
- ▶ Press **OK**.
- ▶ Press **Save**.



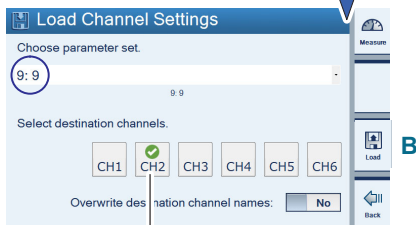
Here: saves all the parameter sets of all 6 channels under the number 9.





Loading (Load)

- ▶ Press **more....**
- ▶ Press **Load**.
- ▶ Select the parameter set number (here: **9**).
- ▶ Choose the channels to be overwritten with the settings of the selected parameter set.
Here:
The channel settings stored in parameter set **9** are written over to channel 3 (**A**).
- ▶ Confirm with **Load (B)**.

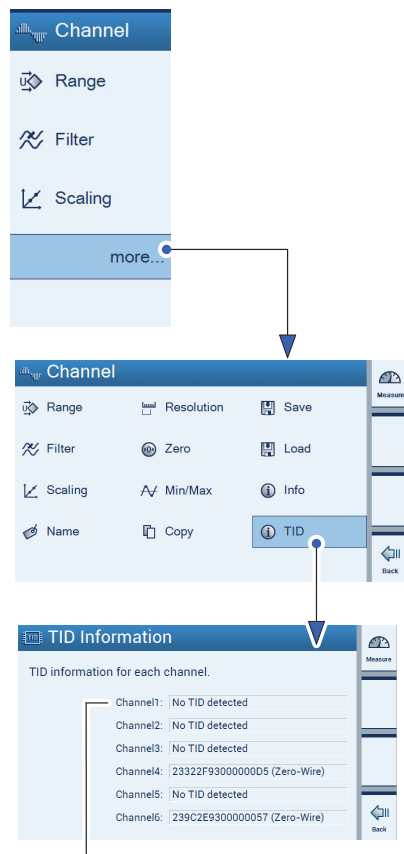


A

The channel settings saved in parameter set number 9 are written over to channel 2 only.

Configuration

Configuring measurement channels in setting mode



Detects whether an identification module (T-ID) for strain gages is connected.

7.2.9 TID (Transducer Identification)

TID displays the (worldwide) unique ID of a TEDS module (Transducer ID).

- ▶ Press **more....**
- ▶ Press **TID**.

If there is no TID connected:

No TID detected

If a TID is connected:

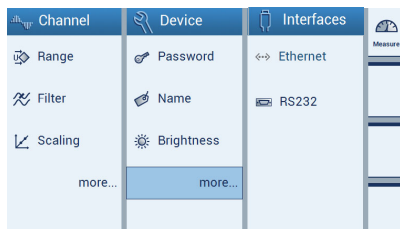
The TID number is displayed

7.3 Device configuration in setting mode



Important

The device is set up via the menus under **Device**.



If the device is in measuring mode:

- ▶ Press shift key **F1** to switch to setting mode (Settings).

7.3.1 Password

You can password-protect all the settings of your DMP41.

This password protection (for working directly on the DMP41) is switched off in the factory setting.

If the DMP41 is operated via a PC, it is *always* necessary to enter a password.

As soon as password protection is activated, the password must be entered whenever the DMP41 is restarted. Only then can the settings be edited.

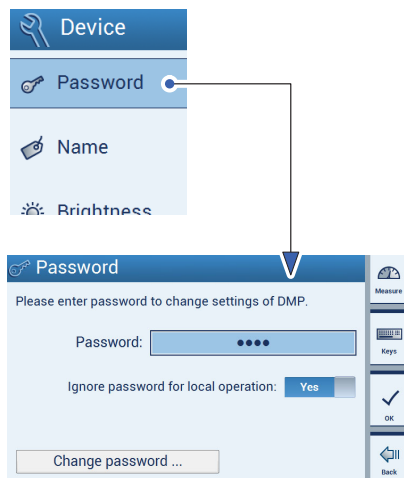
The password only needs to be entered for the zeroing, taring and min/max functions in measuring mode.

Administrator rights apply to:

- the person who entered the password
- the person working *directly* on the DMP41 (default)

Configuration

Device configuration in setting mode



7.3.1.1 Password protection activation

Operation via DMP41 or PC:

Password protection ON:

- ▶ Press **Password**.
- ▶ Enter the password.
- ▶ Under **Ignore password**, select: **No**.
- ▶ Press **OK**.



Important

Password protection only takes effect after the next restart.

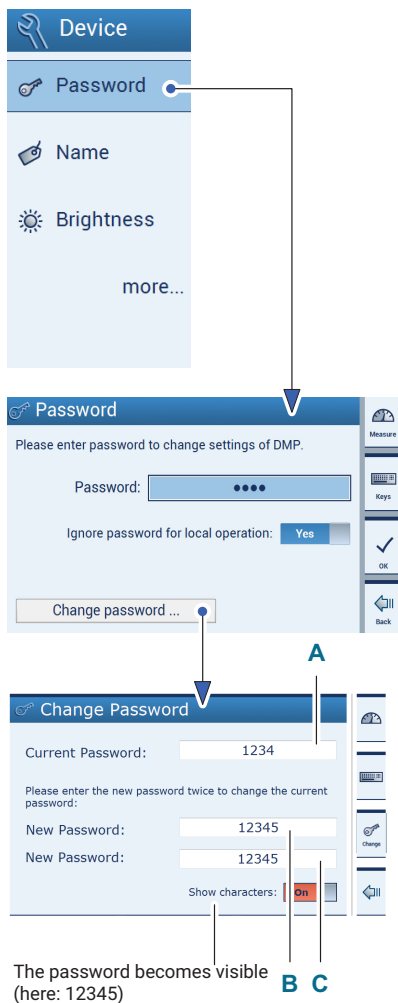
Password protection OFF:

- ▶ Press **Password**.
- ▶ Enter the password.
- ▶ Under **Ignore password**, select: **Yes**.



Important

The password can be ignored when working on the DMP41. The password must never be ignored when working with a PC!

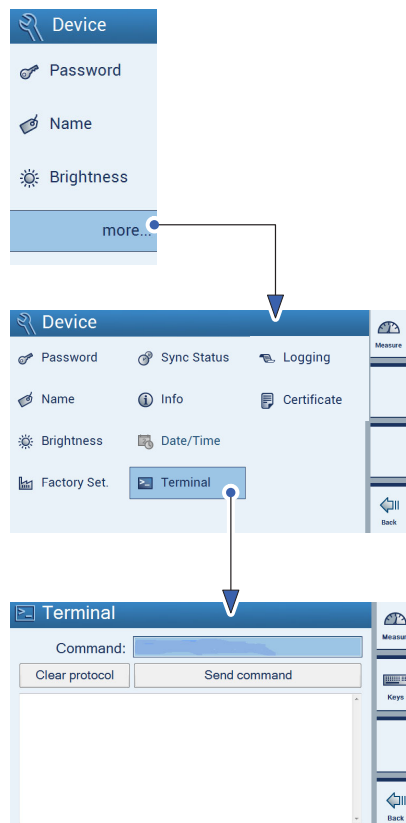


7.3.1.2 Change password

- ▶ Press **Password**.
- ▶ Press **Change password**.
- ▶ Enter the current password (**A**).
- ▶ Enter a new password (**B**).
- ▶ To confirm the new password, enter it for a second time (**C**).
- ▶ Confirm and save with **Change**.

Configuration

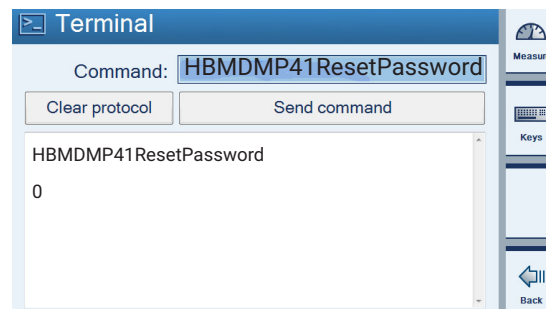
Device configuration in setting mode



7.3.1.3 Lost password

If the password is lost, you can reactivate it. Proceed as follows:

- ▶ Press **more....**
- ▶ Press **Terminal**.
- ▶ Under **Command**, enter the following command:
HBMDMP41ResetPassword.



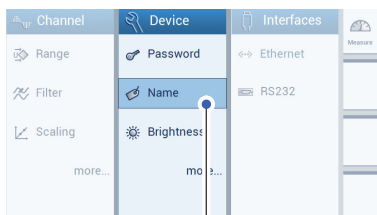
The password is then reset to the default password "1234".

If you want to set a different password, proceed as described in → [Chapter 7.3.1.2 "Change password", Page 81](#).



Important

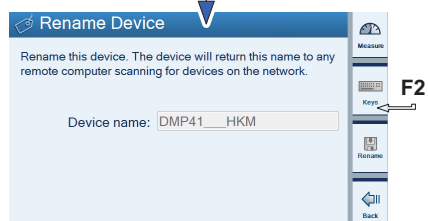
The password can only be reactivated on the the DMP41 (not via PC).



7.3.2 Device name

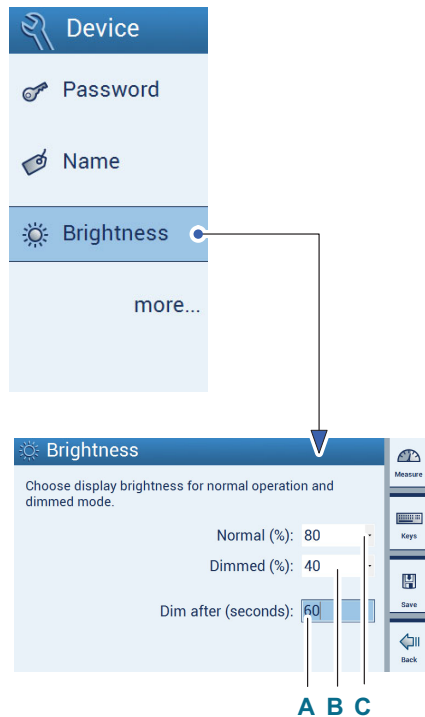
You can allocate a name to each DMP41 in your device network.

- ▶ Press **Name**.
- ▶ Press **F2** and assign a name.
- ▶ Press **Save**.



Configuration

Device configuration in setting mode



A: 1 ... 3800 seconds

B: 0 ... 100% scrollable

C: 1 ... 100% scrollable

7.3.3 Display brightness (Brightness)

The display brightness can be set between 1 and 100% of the normal brightness and between 0 and 100% of the dimmed brightness.

Setting the waiting time before the display brightness is dimmed (Dim after (seconds)):

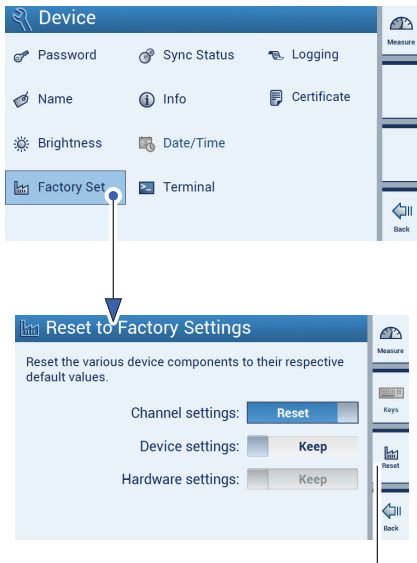
If no input occurs on the DMP41 (by keyboard or touch operation) for some time, the display brightness is reduced to the set dimmed brightness after the set waiting time has elapsed (1 to 3600 seconds).



Tip

Setting the dimmed brightness to < 100% will help increase the service life of the display.

- ▶ Press **Brightness**.
- ▶ Choose a %-value for **Normal**.
- ▶ Choose a %-value for **Dimmed**.
- ▶ Choose a %-value for **Dim after (seconds)**.
- ▶ Press **Save**.



Confirmation of reset

7.3.4 Factory settings (Factory Set)

Overview of the DMP41 factory settings and explanation of their selective resetting

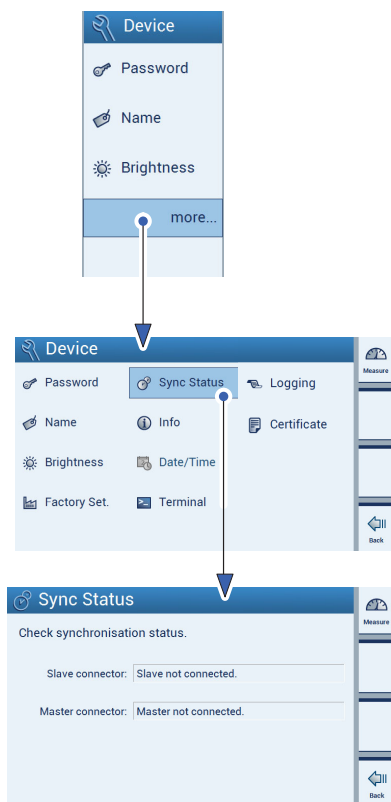
The channel, device and interface settings can be returned to their respective factory settings.

Below is a detailed list of the settings that can be reset:

- Channel settings:
 - Measuring range
 - Filter
 - Scaling
 - Channel name
 - Decimal places and step
 - Zeroing
- Device settings:
 - Password
 - Device name
 - Brightness
 - Logging
- Interface settings:
 - Ethernet
 - RS232

Factory settings can be applied (Keep) or changed (Reset) at a channel, device or interface level.

- ▶ Press **more....**
- ▶ Press **Factory Set**.
- ▶ Choose **Keep** or **Reset** for each of the three setting ranges
- ▶ Press **Reset (F3)** to run.



7.3.5 Synchronization status (Sync Status)

You can query the synchronization status for each DMP41 in your device network.

- ▶ Press **more....**
- ▶ Press **Sync Status.**

The following messages may appear:

Minor connected

Synchronizing

xx %

Master connected and synchronized

Minor not connected

Master not connected

Synchronization complete

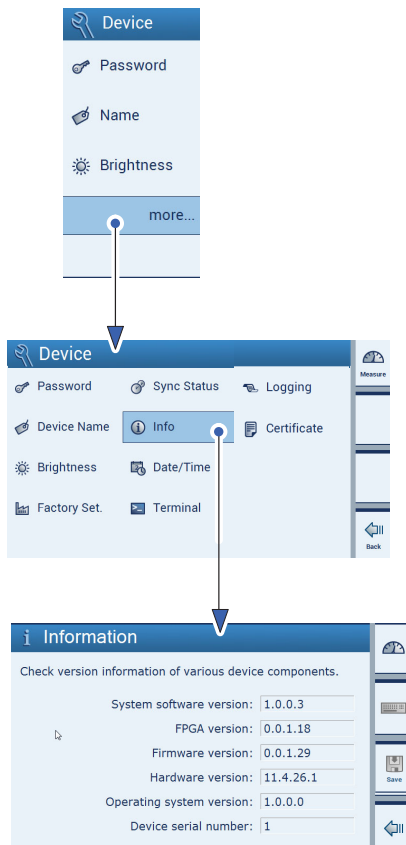
Synchronization ongoing

Steps towards synchronization

Synchronization complete

No synchronization cable connected

No synchronization cable connected



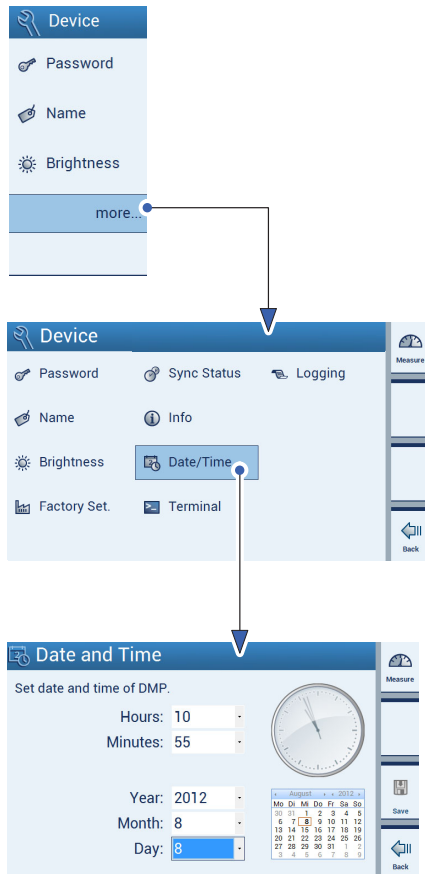
7.3.6 Device component information (Info)

This menu gives you information about the various components of the DMP41.

- ▶ Press **more...**
- ▶ Press **Info**.

- System software version
- FPGA version
- Firmware version
- Hardware version
- Operating system version
- Device serial number
- Number of connected clients (other DMP41s connected to a PC)

This information serves to identify the DMP41 and in the event of a fault, is sent to HBK together with the log file.



7.3.7 Date/Time

This function is required to specify when the log file was written.



Important

The "Date/Time" function is only available for device operation, but not for operation via PC.

Setting the date and time

The clock stops initially, when the time is being set. The seconds hand moves to the 12.

The hour, minute, year, month and day data can be entered manually, using the selection lists in the menu.

The network time is not taken over, even if connected to a PC.

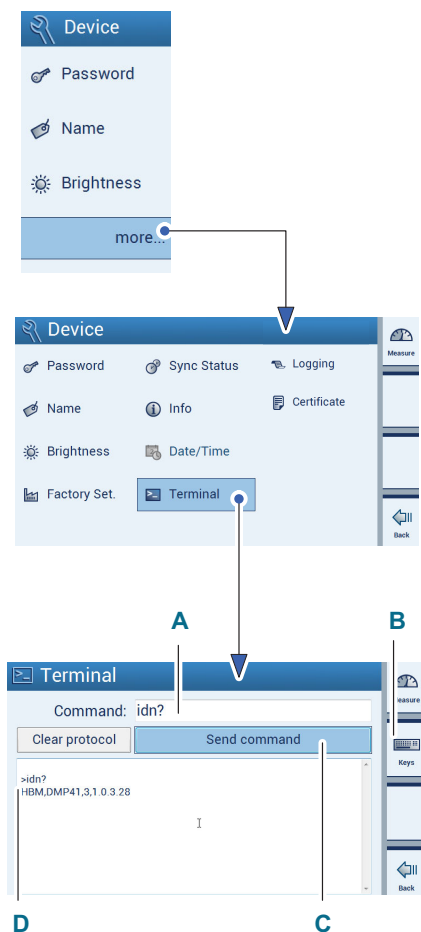
The clock starts working once the time has been entered and saved.



Information

*The **Date/Time** is only available for operation via the DMP41 (not for operation via PC).*

- ▶ Press **more....**
- ▶ Press **Date/Time**.
- ▶ Select (scrollable) values for :
 - Hours
 - Minutes
 - Year
 - Month
 - Day (also appears on the calendar)



7.3.8 Command input via the keyboard (Terminal)

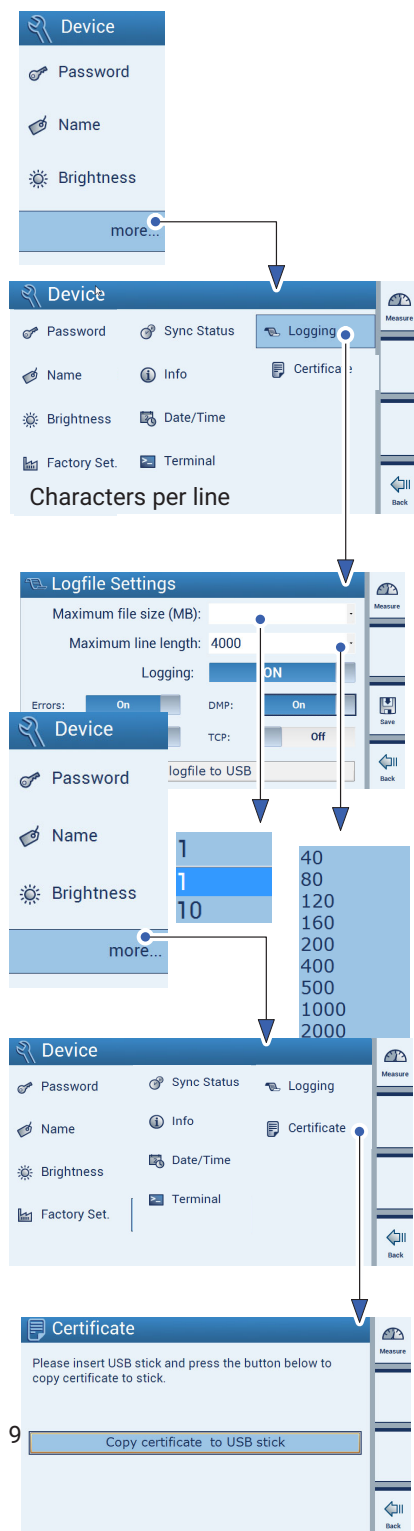
It is always possible with the DMP41 to also use command shortforms when making settings and carrying out measurements. This dialog is firstly intended for service purposes and secondly for programmers who want to test the commands to be sent by a software in interactive operation.

The possible commands, their significance and syntax are explained in the document *Interface description and command set*.

- ▶ Press **more....**
- ▶ Press **Terminal**.
- ▶ Enter the command shortform (e.g. IDN?) (**A**) via the PC keyboard or on the DMP41 (**B**).
- ▶ Press **Send command** to send the command (**C**).

Device identification example:

>idn?	The sent command (A)
HBM,DMP41,1230321,1.0.10.0	Response from the DMP41 (D)
(manufacturer, device, serial number, software version)	



7.3.9 Logging

The properties of the log file can be defined for troubleshooting (e.g. communication errors between the DMP41 and the PC).

The log file is only of interest when the DMP41 is not working as expected. You can then specify which events should be recorded in the log and you can transfer the log file to a USB flash drive.

The file can then provide HBK Support with indications about the cause of the problem. Ask Support which options should be activated in your case.

HBK Support

Telephone support is available on all working days from 09:00 to 12:00 and from 13:00 to 16:00 (CET):

06151 803-0 (within Germany)

+49 6151 803-0 (international)

In addition, you can contact HBK Support by e-mail: info@hbkworld.com

Information

The "Logging" function is only available for operation via the DMP41 (not for operation via PC).

- ▶ Press **more....**
- ▶ Press **Logging**.

You can specify the log file properties and choose which errors are written to the log file:

Maximum file size :	Size of the log file
Maximum line length :	Line length in the log file
Errors :	Error logging ON/OFF
Control :	Setup dialog logging
DMP:	Logging internal DMP41 communication
TCP :	Logging communication with PC operating software (DMP41 Client)
Copy logfile to USB :	Saves the log file to a USB flash drive

7.3.10 Certificate

The German Calibration Service certificate (PDF format) can be copied onto a USB flash drive.

- ▶ Press **more....**

- ▶ Press **Certificate**.
- ▶ Insert a USB flash drive into the USB HOST socket on the back of the DMP41 device.
- ▶ Press **Copy certificate to USB stick**.

The certificate is copied to the USB flash drive.

Configuration

Configuring interfaces in setting mode

7.4 Configuring interfaces in setting mode



Important

Interfaces are set via the menus under **Interfaces**.

If the device is in measuring mode:

- ▶ Press shift key **F1** to switch to setting mode (Settings).

7.4.1 Ethernet interface (Ethernet)



Information

The Ethernet settings can only be implemented on the DMP41 (not via PC).

Choose here whether you want to use DHCP, or assign a permanent IP address.

Permanent IP address

Enter an IP address and subnet mask suitable for your network. The gateway address is only used if your PC is connected via a gateway to the DMP41(s), e.g., in order to create a connection via a different network type. If there is any doubt, enter the same IP address as under "IP address".

DHCP

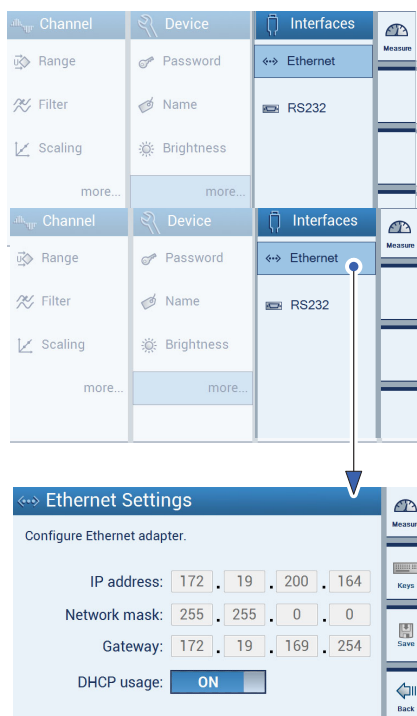
DHCP (Dynamic Host Configuration Protocol) enables automatic assignment of an IP address in the network in conjunction with a server. As soon as this automatic address link is set up, you no longer need to do anything, an address is requested from the server and set up as soon as the DMP41 is switched on. Additional parameters (subnet mask, gateway address) can also be specified by the network administrator and these will then also be set.



Information

The **Ethernet** function is only available for operation via the DMP41 (not for operation via PC).

- ▶ Press **Ethernet**.
- ▶ Select DHCP **OFF** or **ON**.



OFF :

You can enter values for “IP address, Network mask and Gateway”

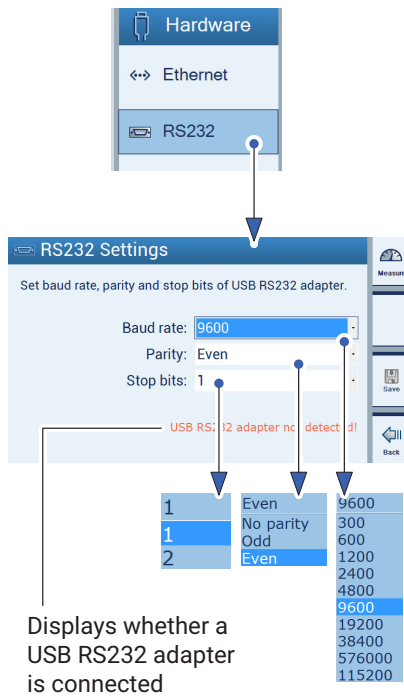
ON :

The values for “IP address”, “Network mask” and “Gateway” are assigned to the DMP41 by a DHCP server.

The values for “IP address”, “Network mask” and “Gateway” are network-dependent.

Configuration

Configuring interfaces in setting mode

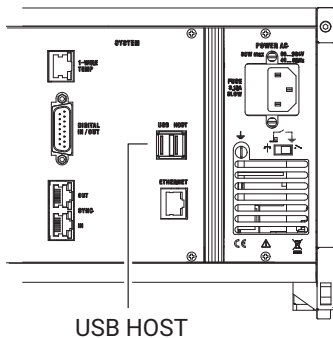


7.4.2 RS232 Interface

i Information

The **RS232** function is available for operation via the DMP41 and for operation via a PC.

- ▶ Press **RS232**.
- ▶ Enter the values for **Baud rate, Parity and Stop bits**.
- ▶ Press **Save**.



7.5 Updating the firmware

Installing a new firmware version:

- ▶ Download the firmware from www.hbkworld.com/en/services-support/downloads.
- ▶ Insert a USB flash drive into the PC.
- ▶ Unzip the file and run the setup file on the Windows computer. The update file will be copied to the USB flash drive.
- ▶ With the DMP41 switched off, insert the USB flash drive into the **USB HOST** socket on the back of the DMP41.
- ▶ Switch on the DMP41 (percentage display of the setup process).

The following DMP41 displays appear:

```
DMP41 Updater                                     Hottinger Baldwin Messtechnik GmbH
-----
Do you want to update the hard drive of the DMP41?
Press any key to continue . . .
```

- ▶ Press any key.

```
DMP41 Updater                                     Hottinger Baldwin Messtechnik GmbH
-----
Update started...
```

Progress points with percentage display in 10% steps

```
DMP41 Updater                                     Hottinger Baldwin Messtechnik GmbH
-----
The hard drive has been successfully updated. Please remove the USB stick!
Press any key to continue . . .
```

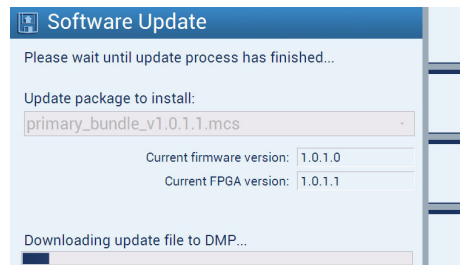
- ▶ Remove the USB flash drive.

After the restart, outdated firmware may be detected and your attention will be drawn to the fact that the firmware will now be updated:



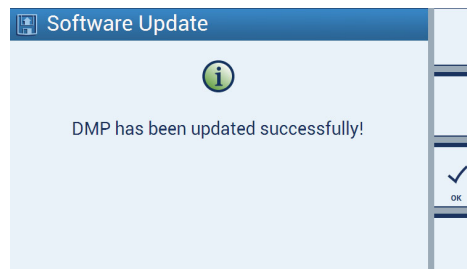
► Confirm with **OK**.

The actual update process then starts, and can last for approx. 4 minutes.



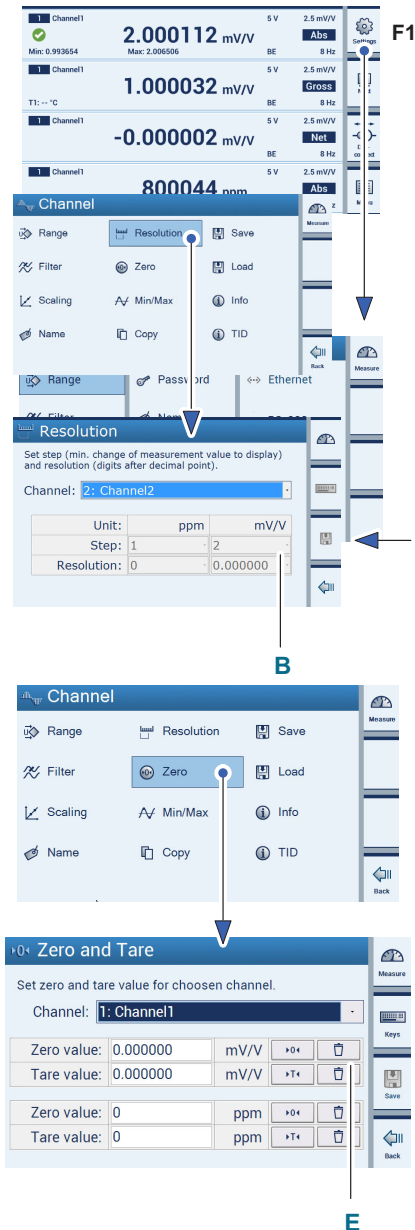
The bar indicates the progress of the process.

Once the update process is successfully completed, the following message appears:



The following have been re-installed:

- Interface
- Operating system
- FPGA
- Firmware



7.6 Typical configuration example

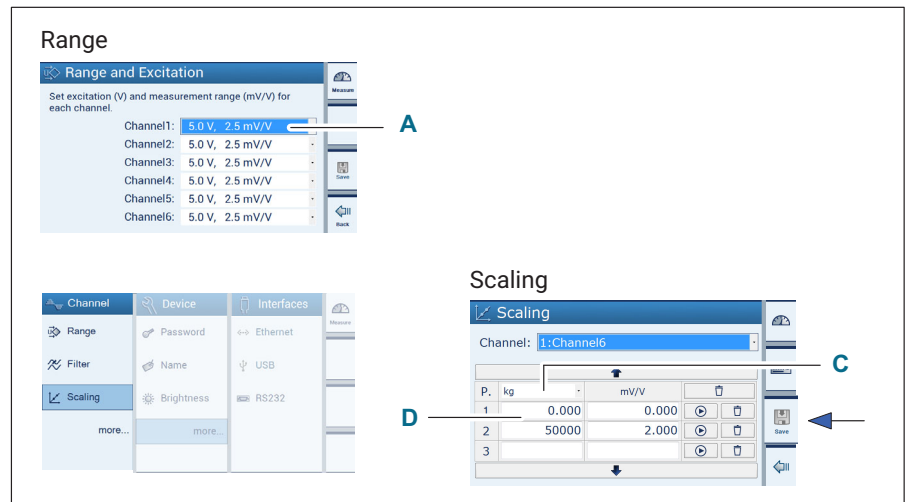
The transducer is a load cell with the following nominal (rated) data:
maximum capacity: 50 kg, sensitivity: 2.5 mV/V

The weight of a small amount of bulk material in a container is to be determined.

- ▶ Connect the load cell to the "INPUT B" socket → see *Chapter 3.4.2 "Back of device", Page 22.*

Channel configuration

- ▶ Use shift key **F1** to select setting mode.
- ▶ Under **Range** (bridge excitation voltage), choose the selection fields **5 V** and **2.5 mV/V (A)**.
- ▶ Press **Save**(diskette symbol).
- ▶ Press **more...**
- ▶ Press **Scaling** and select the unit **kg (C)**.
- ▶ Use the keypad to make entries in the edit fields (**D**):
Point 1: **0.000** kg and **0.000** mV/V
Point 2: **50.000** kg and **2.500** mV/V
- ▶ Press **Save** (diskette symbol).

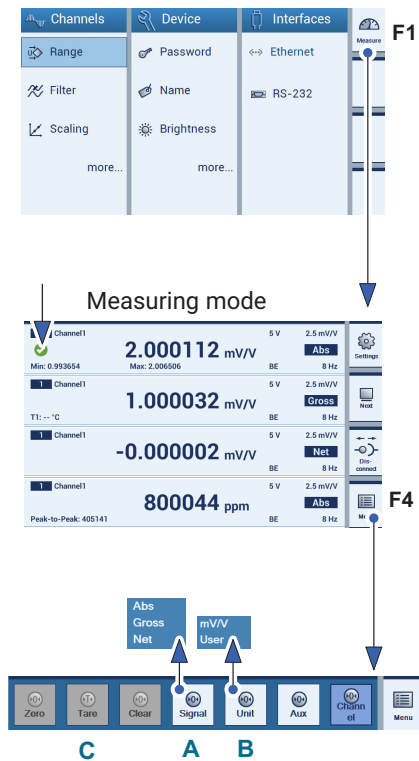


- ▶ Press **Resolution** and set the display formats (e.g. Resolution 0.000; Step 1) (**B**).

Configuration

Typical configuration example

- ▶ Press **Save** (diskette symbol).
- ▶ Press **Zero**.
- ▶ Delete **Zero value** and **Tare value (E)**.
- ▶ Use shift key **F1** to switch to measuring mode.



Display configuration

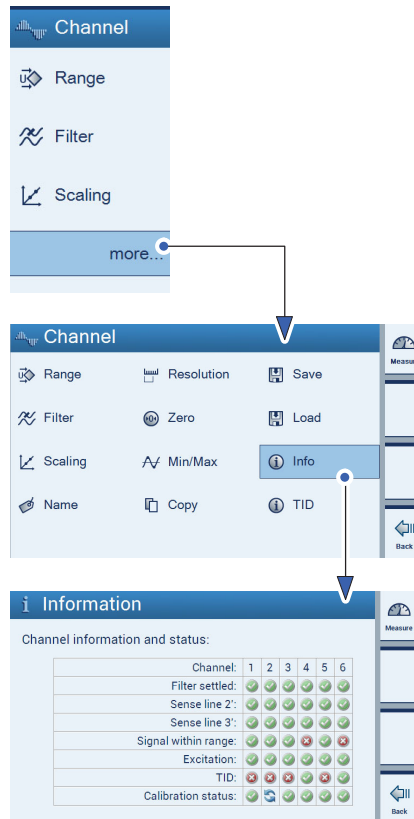
- ▶ Use shift key **F1** to select measuring mode.
 - ▶ Select the measured value display to be edited (set checkmark).
 - ▶ Press **Menu(F4)**.
 - ▶ Press **Signal** and select the signal type **Net (A)**.
 - ▶ Press **Unit** and select the required unit (here: User = kg in the display) (**B**)
 - ▶ Place the container on the scale.
 - ▶ Press **Tare** to zero (**C**).
 - ▶ Pour the bulk material into the container.
- The weight of the bulk material is displayed.

Configuration

Typical configuration example

8 ERROR MESSAGES/REMEDIAL ACTION

Errors in the channel status are displayed via the INFO menu.



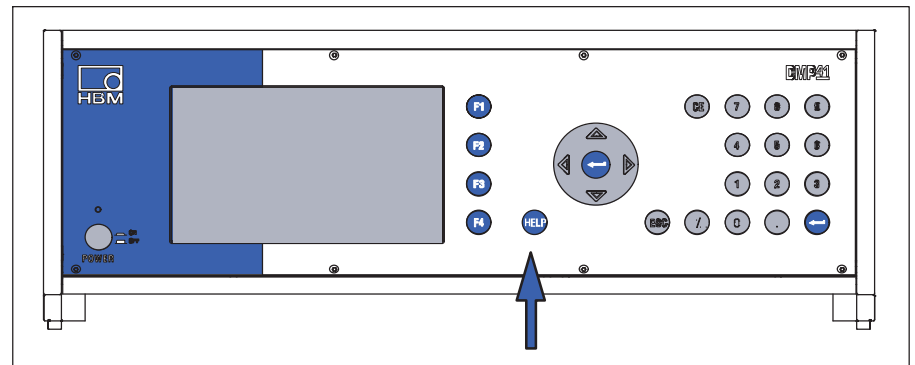
Channel information (Info)

The (Channel) **Info** menu allows the status of all channels to be queried.

Status information is available for:

- Filter selected (Filter settled)
- Sense line 2' (sense line 2 detected)
- Sense line 3' (sense line 3 detected)
- Signal within range (Signal in the measuring range (no overflow detected))
- Excitation (excitation voltage)
- TID (TID detected)
- Calibration status

Press the **HELP** key on the front of the device to call up the meanings of the channel status (error messages).



Filter settled



The channel low-pass filter is settled, it deviates less than 1 ppm from the full scale value. Actions such as zeroing or taring are only possible in a settled state.



The settling process is still ongoing.

Sense line 2/3 detected (Sense line 2/3)



The sense line is present and properly connected, no errors are present.



The sense line connection has not been detected. Either no transducer is connected or the sense line connection is missing.

Signal in the measuring range (Signal within range)



The measurement signal is within the measuring range, there is no overloading.



The amplifier is overloaded, the measured value is invalid. Overflow is displayed in the channel display.

Excitation



The excitation voltage is within the required range, no errors are present.



The excitation voltage has been switched off, e.g. because the transducer resistance is too low or a short-circuit is present.

TID



A TEDS module has been detected, the module ID has been read out. The TEDS information is not evaluated.



No TEDS module has been detected.

Calibration status

The calibration status is OK, there are no errors present.



(Auto)calibration could not be implemented, the permissible error limit is exceeded and the measured values are invalid.



((Auto)calibration is currently underway.



(Auto)calibration should really be implemented.

But this cannot be implemented, as the calibration or zero signal is already in use.

This happens when when you display the internal zero signal (Zero) or calibration signal (Cal) for a channel.

The error limit can lie outside the device tolerance.

In the DMP41 specifications, all channels can be used to measure while an Autocal process is being run. Measurement is not interrupted or affected. The information table shows which channel is in a calibration cycle.

The adjustment required after the warm-up phase of the DMP41 is minimal and imperceptible.

During autocalibration (actually auto-adjustment), an internal reference signal is cyclically switched to the amplifier and the amplifier drift compensated in order to maintain the 5 ppm error limit. This process does not affect measurement, the measuring process can proceed normally.

It is possible to switch the internal reference signal (Zero and Cal) to the amplifier input as a control signal (this is only possible on one channel at a time).

In this case, the control signal (Zero or Cal) is displayed and is no longer the measured value of the transducer.

Autocalibration is prevented on all channels for as long as the control signal is switched to a channel.

DMP41 calibration is implemented in the factory on a traceable BN100.

9 TECHNICAL SUPPORT

Should you have any questions when working with the DMP41, you can contact HBK's technical support in the following ways:

E-mail support

info@hbkworld.com

HBK on the Internet

www.hbkworld.com

Downloading software updates from HBK

www.hbkworld.com/en/services-support/downloads

Headquarters world-wide

Europe

Hottinger Brüel & Kjaer GmbH
Im Tiefen See 45
D-64293 Darmstadt, Germany
Tel. +49 6151 803-0, Fax +49 6151 803-9100
info@hbkworld.com
www.hbkworld.com

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19 Bartlett Street,
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