HYDROTECHNIK

ENG

MultiPanel 2025

Operating Instructions

Version 1.0 ENG
Firmware-Version 1.2
TKZ L3160-00-80.00EN

OPERATING INSTRUCTIONS

BASICS

This instruction manual is part of the MultiPanel 2025 instrument. It contains the information necessary for safe use. Read this manual before starting up the instrument.

Note

General Safety Information and Warnings are not given in this instruction manual.

- Observe the sheet on the General Safety Information and Warnings enclosed in the measuring instrument case.

Manufacturer

Hydrotechnik GmbH
Holzheimer Straße 94
D-65549 Limburg an der Lahn

Record of change

Document Version 1.0:
May 2017, new creation
Firmware version: 1.2

Symbols

The following icons and warning texts are used for certain dangerous situations:

Note

Indicates a dangerous situation which could lead to system damage if the safety information is not observed.

Disposal of the measuring instrument

Disposal information
Do not dispose of this product with your household waste.
You can find more detailed information on disposal on our website at: www.hydrotechnik.com.

ENG

Intended use

The measuring instrument MultiPanel 2025 is a built-in unit for measuring, displaying and recording operating states. The measurement data is recorded by sensors connected to the measuring instrument. A number of sensors can be connected to the measuring instrument for different measurements.
Any other use of the measuring instrument is considered improper.
⇨ See also Technical data, page 24.

DESCRIPTION OF THE MEASURING INSTRUMENT

This section describes the connections, keys and the display of the measuring instrument.

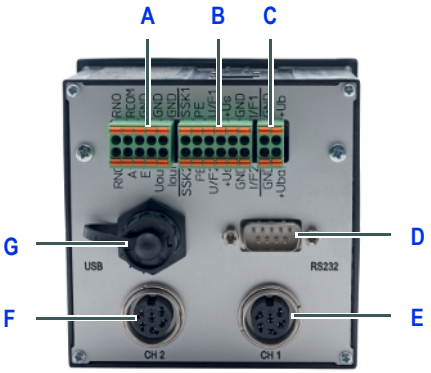
Measuring instrument

A Display
B Function keys
C Menu key
D On/off button (F4)

The MultiPanel 2025 is a measuring instrument which provides the user with all functions needed for professional and challenging metrology.
When using sensors with ISDS (intelligent sensor detection), the measuring instrument automatically identifies the connected sensors during switch-on and adopts all parameters: Measurement series, physical measurement variables, unit of measurement, output signal and characteristic curve (linearisation).
This prevents sensors from getting mixed up. Manual entry of a variety of data is unnecessary.
When using sensors without ISDS, sensor parameters must be entered manually.
The measuring instrument is operated via 4 function keys and a menu key.

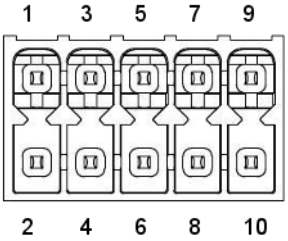
Up to two sensors can be connected simultaneously on one measuring instrument. Moreover, a special channel provides the option of making calculations. In addition, there are a trigger input, a trigger output, a relay output and two analog outputs.
The instrument is equipped with an internal memory. Up to 5 measurement series with up to 60,000 measurement points each can be saved in the measuring instrument.
You can connect the measuring instrument to a PC using the USB interface. We recommend the HYDROlink6 software for downloading the measurement data. Alternatively, you can use the HYDROcom6 software.

Rear side



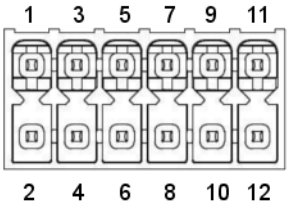
A Plug connector 1
B Plug connector 2
C Power supply
D RS232
E Signal input 1
F Signal input 2
G USB interface

Plug connector 1



#	Label	Function
1	RNO	Break contact
2	RNC	Make contact
3	RCOM	Relay switcher
4	A1	Trigger output
5	GND	Ground
6	E1	Trigger input
7	GND	Ground
8	Uout1	Analog voltage output
9	GND	Ground
10	Iout	Analog power output

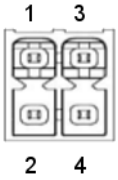
Plug connector 2



#	Label	Function
1	SSK1	Sensor detection (ISDS) for channel 1
2	SSK2	Sensor detection (ISDS) for channel 2
3	PE	Ground potential connection
4	PE	Ground potential connection

#	Label	Function
5	U/F1	Analog signal input 10V Direction detection f-signal from channel 1
6	U/F2	Analog signal input 10V Direction detection f-signal from channel 2
7	+Ub	Power supply sensor 1 (+Ub or 14VDC)
8	+Ub	Power supply sensor 2 (+Ub or 14VDC)
9	GND	Ground
10	GND	Ground
11	I/F1	Analog signal input 20mA Frequency input from channel 1
12	I/F2	Analog signal input 20mA Frequency input from channel 2

Power supply



#	Label	Function
1	GND	Ground
2	GND	Ground
3	$+U_b$	Power supply instrument 7 to 32VDC
4	$+U_{bat}$	Power supply via external batteries 2.4V (NIMH) $U_{max} \leq 3.6$VDC

Operating keys

The measuring instrument has five keys:

- Function keys **[F1]** to **[F4]**:
  The function of the key is shown in the display as an icon above the key.
- **[MENU]** key:
  Switches to the main menu or confirms the selection.

The measuring instrument shows the current measurement values by default. **[F1]** / ⇋ switches to the min./max. measurement values.

If **[F4]** shows the lamp icon, the display illumination is switched on or off. Holding down the key switches off the instrument.

Keys, icons and functions

F4	**Switches instrument on.**
MENU	Opens main menu. Selects marked entry.
	Switches display illumination on/off. **Switches instrument off (press for 2 seconds).**
	Changes view: - Current measurement values - Min./max. Measurement values
	Sets zero point for all displayed channels.
	Deletes all current min./max. measurement values.
	Starts the recording of a measurement series.
	Stops the recording of a measurement sere.
	Displays the memory status during recording of measurements.
	Scrolls down.
	Scrolls up.
	Selects the next entry.
	Confirms the entry.
	Interrupts the current process.
	Exits the menu. Interrupts the current process.
	Opens the menu for deleting measurement sere.
	Switches the view of the selected measurement or special channel on or off.
	Displays USB status: • Instrument connected with USB. • Instrument is communicating via USB.
	Displays battery status: Full, half-full, empty.

START-UP

Basic settings

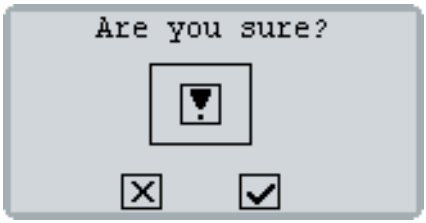
When you switch on the measuring instrument for the first time, you are asked to define the basic settings.

How to define the basic settings

1 Press **[F4]** to switch on the measuring instrument.

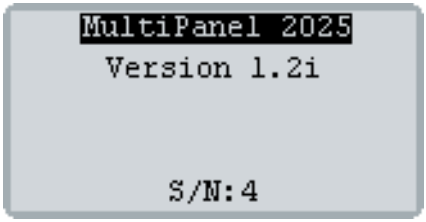
2 Use **[F1]** or **[F2]** to select the desired menu language.
Save your entry by pressing **[F4]**.

3 Confirm your selection with **[F3]**.

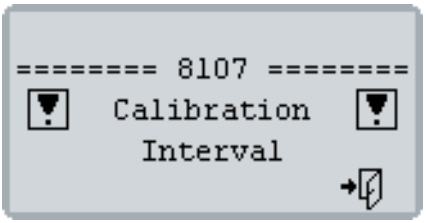


4 Use **[F1]** to select your desired units of measurement.
Save your entry by pressing **[F4]**.

The display shows the firmware version number and serial number of the measuring instrument. The display then shows the calibration notice.



5 Use **[F4]** to exit the calibration notice.
The calibration notice is only displayed if no calibration interval is defined.
⇨ Calibration interval, page 9



The measuring instrument is ready.

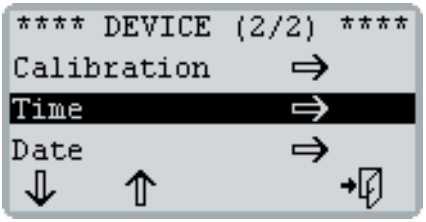
ENG

Time and date

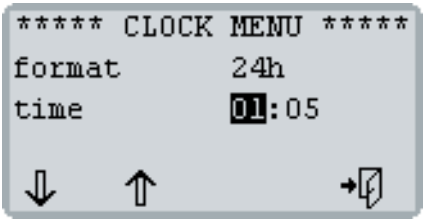
How to set the time and date

1 Press **[MENU]** and use **[F1]** to select the **Device** entry.
Use **[MENU]** to open the **DEVICE** menu.

2 Keep pressing **[F1]** until the **Time** entry is selected.
Use **[MENU]** to open the **CLOCK MENU**..



3 Set the time format and time:
- Use **[F1]** to select **format** or **time** and press **[MENU]**.
- Press **[F1]** or **[F2]** to change the selected value.
- Press **[MENU]** to save your entry.



4 Press **[F4]** to return to the **DEVICE** menu.

5 Press **[F1]** to select **Date**.
Use **[MENU]** to open the **DATE MENU**.

6 Set the date format and date:
- Use **[F1]** to select **format** or **date** and press **[MENU]**.
- Press **[F1]** or **[F2]** to change the selected value.
- Use **[MENU]** to save your entry.

7 Press **[F4]** until the display shows the measurement values again.

CALIBRATION INTERVAL

The measuring instrument was calibrated before it was shipped by the manufacturer. The calibration interval is the period of time after which the measuring instrument is to be re-calibrated by the manufacturer. You can only define the calibration interval once. After that, it can no longer be changed.
The measuring instrument is also ready for use if no calibration interval is set.
12, 18, 24, 30 or 36 months can be set as the calibration interval.
If a calibration interval is set, the measuring instrument displays the following information after switch-on:

- A month before expiration of the calibration interval:
  === 8106 ===
  ! Calibration!
  Date (end of calibration interval)
- After calibration interval has been exceeded:
  === 8108 ===
  ! Calibration!
  Date (of last calibration)

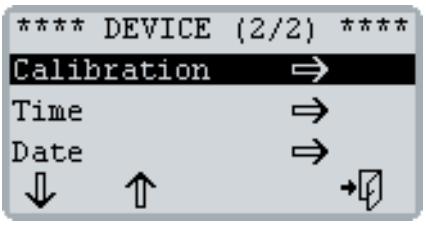
⇨ See also Calibration, page 21.

How to define the calibration interval

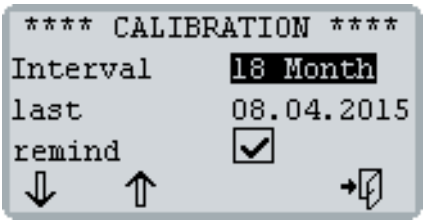
The calibration interval cannot be changed.
Do not set a calibration interval if you are unsure which interval is right for you.

1 Press **[MENU]** and use **[F1]** to select the **Device** entry.
Use **[MENU]** to open the **DEVICE** menu.

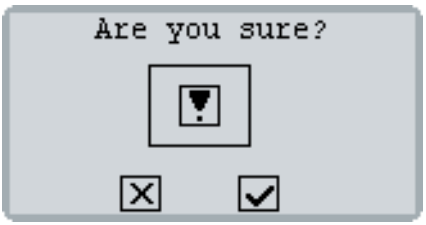
2 Press **[F1]** to select the **Calibration** entry and use **[MENU]** to open the **CALIBRATION** menu.



3 Set the calibration interval:
- Press **[MENU]**.
- Press **[F1]** or **[F2]** to select the calibration interval.
  You can select between **12**, **18, 24, 30** and **36 Months**.
  Press **[F4]** to cancel the process without saving.
- Use **[MENU]** to save your entry.



4 Press **[F3]** to confirm the entry and irreversibly define the calibration interval.



5 Press **[F4]** until the display shows the measurement values again.

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HYDROCENTER

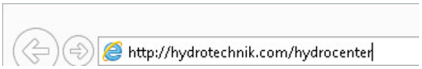
HYDROcenter is a program for Windows. HYDROcenter is your centre for all instruments and software from HYDROTECHNIK.
Install HYDROcenter to receive updates for your measuring instrument as well as other software (e.g. HYDROlink6).

Pre-requisites

You need a PC or notebook with Internet connection and an operating system of Windows 7 or higher.

How to install HYDROcenter

1 Enter the following text into the address bar of your Internet browser (e.g. Internet Explorer):
http://hydrotechnik.com/hydrocenter



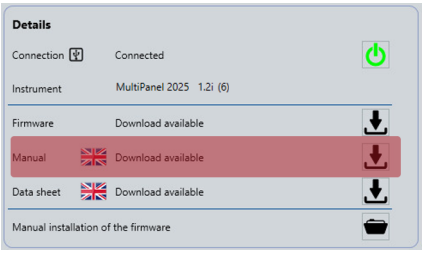
2 Follow the instructions displayed there.
The installation file is downloaded.
3 Run the installation file.
Confirm the confirmation prompts, if applicable.
4 Follow the installation instructions.
The installation is complete when the link is displayed on the desktop.

How to connect your measuring instrument to HYDROcenter

1 Connect the USB cable to the USB interface of the measuring instrument.
2 Connect the other end of the USB cable to your PC or notebook.
3 Switch the measuring instrument on by pressing **[F4]**.
4 Start the HYDROcenter program.
HYDROcenter detects the connected measuring instrument and offers suitable downloads.

How to open the Operating Instructions

1 Click on the download icon next to the **Manual** entry.



When the Operating Instructions are done downloading, it changes to the icon.
2 Click on the open icon .
The Operating Instructions are opened in your PDF viewer.
You can save the Operating Instructions on your PC or notebook.

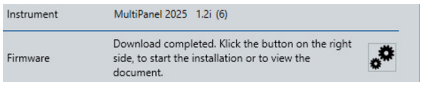
Firmware update

If there is new firmware for your measuring instrument, HYDROcenter offers you an update.
Save all stored measurement series (e.g. with HYDROlink6) before running an update.

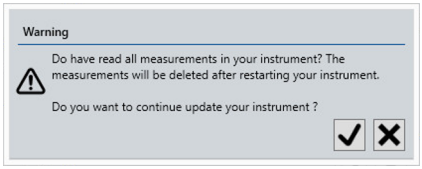
How to execute a firmware update

1 Connect your measuring instrument with HYDROcenter.
⇨ See How to connect your measuring instrument to HYDROcenter.
If there is new firmware for your measuring instrument, HYDROcenter shows the download as available.

2 Click on the download icon next to the **Firmware** entry.
HYDROcenter shows when the download is complete.



3 Click on the process icon to start with the update.
Read and confirm the information.



Note

Instrument damage during firmware update
Errors during the firmware updates can damage the measuring instrument.
- Do not interrupt the USB connection.
- Do not switch off the measuring instrument.
- Wait until the update is complete.

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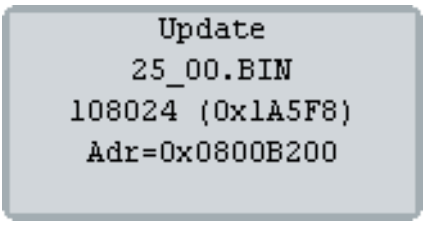


4 Wait until the update is complete and the measuring instrument has been restarted.

MEASUREMENT

You can begin measurement immediately after starting up the measuring instrument.

Measurement with ISDS sensors

How to perform measurements

1 Find the MINIMESS testing point on your hydraulic system.
Remove the protective caps from the MINIMESS testing points you want to use to make measurements.

2 Connect the ISDS sensors to the measuring instrument (*Signal input 1* or *Signal input 2*) an.

3 Connect the ISDS sensors with the MINIMESS direct connections.
If necessary, remove the protective plastic covering from the MINIMESS direct connections.
Only tighten the thread manually. Do not use a tool.

4 Connect the MINIMESS direct connections of the ISDS sensors to the selected MINIMESS testing points.

5 Switch the measuring instrument on by pressing **[F4]**.
If applicable, use **[F4]** to confirm the calibration notice.
The ISDS sensors are detected by the measuring instrument. The display shows the current measurement values.

p1 displays the measurement value of the sensor from channel 1 (**CH1**). Measurement unit **[bar]** follows.
p2 stands for channel 2 (**CH2**).
dp (special channel) shows the difference between **p1** and **p2**.

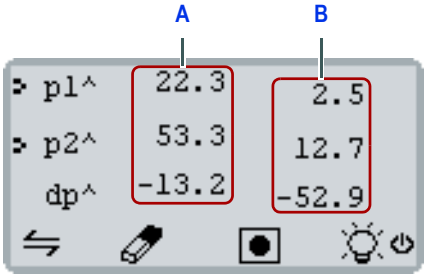
Zero adjustment

Press **[F2]** to execute a zero adjustment. The current measurement values are set to zero.
Observe the following rules:

- Zero adjustment is applied to all displayed channels.
- Zero adjustment cannot be undone.
- Zero adjustment is only deactivated when you switch off the measuring instrument.
- For safety reasons, a zero adjustment can only be executed up to values of 2% of the maximum measurement series.
  With larger values, the display shows code **8110** and the maximum permissible values.
- A zero adjustment cannot be executed for channels showing a frequency.
- No zero adjustment can be done for the following channels: C4, C5, C6, C7, C8.
- Measurement values are set to zero for channels configured as counters.

Min./max. Display

Pressing **[F1]** switches to min./max. display or back to the current measurement values.



A Maximum values **B** Minimum values

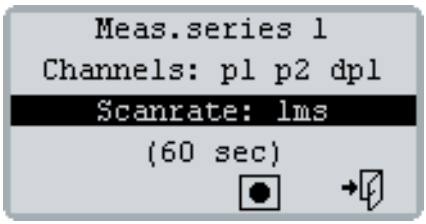
Pressing **[F2]** deletes the min./max. memory. The display immediately shows the current min./max. measurement values.

Saving and deleting measurement series

You can save up to five measurement series. You can assess and save measurement series with the HYDROlink6 software.
If you have already saved five measurement values in the measuring instrument, you must delete measurement series before you can save new measurement series.

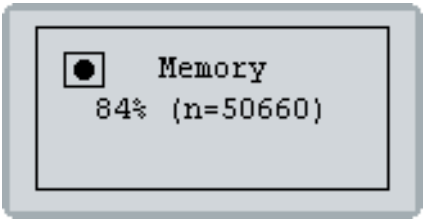
How to save a measurement series

1 Press **[F3]**.
2 If necessary, change the **Scanrate** using **[MENU]**.
The value in brackets shows the maximum length of the measurement series for the selected scanrate.



3 Start the measurement series by pressing **[F3]**.
The display shows a progress bar on the right side.

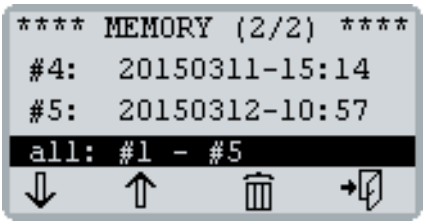
4 Press **[F2]** to display the current memory status.



The display automatically switches back after 5 seconds. The measurement series automatically end after 60,000 measurement points.
5 Press **[F3]** to manually end the measurement series.

How to delete a measurement series

1 Press **[MENU]** to open the **MAIN MENU**.
2 Press **[F1]** to select the **Memory** entry and use **[MENU]** to open the **MEMORY** menu.
3 Press **[F1]** or **[F2]** to select a measurement series of **all: #1 - #5**.



4 Press **[F3]** and confirm with **[F4]**.
The selected measurement series are deleted.
5 Press **[F4]** until the display shows the measurement values again.

CHANNELS

The measuring instrument has eight channels:

- **C1** and **C2** for sensors at connections CH1 and CH2.
- **C3** as a special channel for calculations from measurement values **C1** and **C2**.
- **C4** as trigger input.
- **C5** and **C6** as trigger and relay outputs
- **C7** and **C8** analog outputs (current and voltage)

Displaying/hiding channels

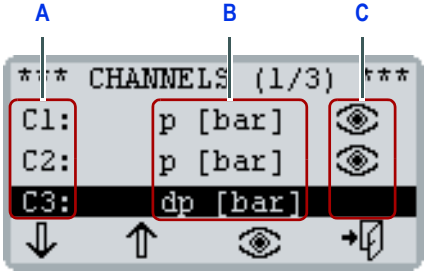
You can switch the display for every channel on or off. You must display at least one and a maximum of 3 channels. If you select no channel or more channels for display, an error is displayed.

How to switch the display for a channel on or off

1 Press **[MENU]** to open the **MAIN MENU**.

2 Use **[MENU]** to open the **CHANNELS** menu.

3 Use **[F1]** to select the desired channel.

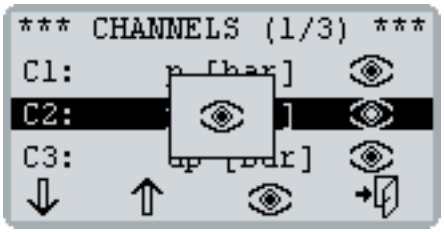


A Channel
B Measurement variables and unit of measurement
C Icon for display

4 Press **[F3]** to switch the display on or off.
The eye icon is shown when the display is switched on for a channel.

5 Press **[F4]** until the display shows the measurement values again.

If you have switched on the display view for no channel or several channels, the following error is displayed:



Configuring measurement channels C1 and C2

If you are using a sensor without ISDS, you have to configure a channel. You need a corresponding parameter for the sensor. They are on the sensor or in the sensor data sheet.
The measuring instrument only detects ISDS sensors when the measuring instrument is being switched on. You can configure an ISDS sensor manually if you do not connect it until the measuring instrument is switched on.
You must define the following parameters during the configuration:

- **C1/2**: Measurement variables and unit of measurement
- **Signal**: Signal type and range, if applicable
- **Range**: Measurement series or calibration value

Measurement variables and units of measurement

You can configure sensors for the following measurement variables and units of measurement.

Measurement variable (measurand)		Unit of measurement
Pressure	p	[mbar]
	p	[bar]
	p	[psi]
	p	[Pa]
Temperature	T	[°C]
	T	[°F]
Rate of flow	Q	[l/min]
	Q	[GPM]
Rotation	n	[rpm]
	n	[rpm]
Frequency	f	[Hz]
Current	U	[mV]
	U	[V]
Current strength	I	[mA]
	I	[A]
Force	F	[kN]
Torque	M	[Nm]
Course	s	[mm]
Speed	v	[mm/s]
Angular speed	v	[°/s]
Ground	m	[to]
	m	[kg]
Volume	V	[l]
	V	[ccm]

Signal type, signal range and Range

You can configure sensors for various signal types and signal ranges. Make sure that the signal type matches the selected measurement variable.
The range can have the following meaning depending on the signal type:

- Measuring range
- Calibration value

The following table shows signal types and the corresponding meaning of the range:

Signal type	Display	Range
Current	0 ... 20mA 4 ... 20mA	Measuring range
Current	0 ... 10V 2 ... 10V	Measuring range
Frequency	FRQ ±FRQ	Calibration value
Counter	CNT ±CNT	Calibration value

Measuring range

The measurement series is specified for the signal range. You must enter the upper and lower limit.
Every limit value is a number and is entered as five characters. The first character can be a minus sign. Digits or periods (correspond to commas) are also characters.
Examples for limit values:

- **-9999**
- **-2.50**
- **60.00**
- **99999**

Calibration value

The calibration value is a number and is entered as five characters. The first character can be a minus sign. Digits or periods (correspond to commas) are also characters.

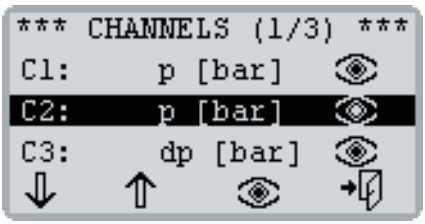
Examples for calibration values:

- Gear wheel volumetric flow sensor
  Quantity per spaces between cogs
- Turbine volumetric flow sensor
  Flow rate at 1000 Hz
- RPM sensor
  Number of pulses per revolution (reflective marks)

How to configure a measurement channel

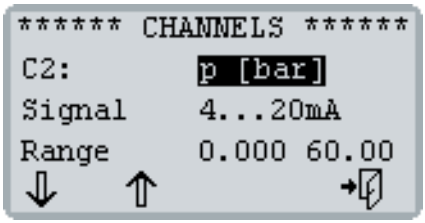
1 Press **[MENU]** to open the **MAIN MENU**.

2 Use **[MENU]** to open the **CHANNELS** menu.



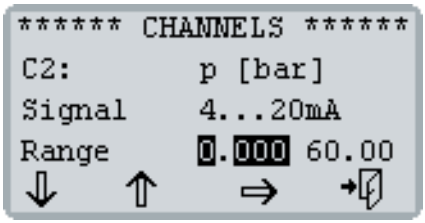
3 Use **[F1]** to select the desired channel.
Use **[MENU]** to open the **CHANNELS** menu.

4 Configure the measurement variables:
- Press **[MENU]**.
- Press **[F1]** or **[F2]** to change the measurement variable and unit of measurement.
- Use **[MENU]** to save your entry.



5 Configure the signal type:
- Press **[F1]** to select **Signal**.
- Press **[MENU]**.
- Press **[F1]** or **[F2]** to change the signal type.
- Use **[MENU]** to save your entry.

6 Configure the measurement series or C value:
- Press **[F1]** to select **Range**.
- Press **[MENU]**.
- Press **[F1]** or **[F2]** to change the first digit.
- Press **[F3]** to select the next digit.
- Repeat the last two steps until you have entered the lower measurement area or the K value.
- Press **[MENU]** to save your entry.



7 When you configure the measurement area, you can enter the upper measurement series.
To do so, repeat Step **6**.

8 Press **[F4]** until the display shows the measurement values again.

Configuring special channel C3

The measuring instrument offers a pseudo or calculation channel **C3** as the third channel.

- You cannot configure special channel **C3**.
- You can switch the display for special channel **C3** on or off.
  ⇨ Displaying/hiding channels, page 14

Difference (delta) C1-C2

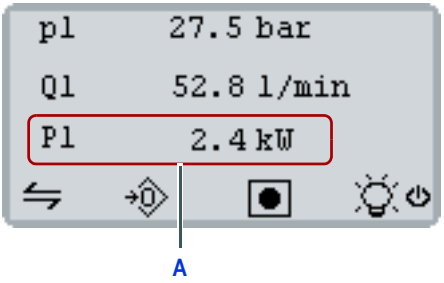
If the **C1** and **C2** channels display the same measurement variables in the same unit of measurement, special channel **C3** always offers the difference of **C1** minus **C2**.

A Special channel **C3:**
dp = **2.0** - **53.2** = **-51.2** [bar]

Hydraulic performance [KW]

Special channel **C3** can display the hydraulic performance in kilowatts. To do so, one channel must display the pressure in [bar] and one channel the rate of flow in [l/min].
The hydraulic performance is calculated as follows:

$$P[kW] = \frac{p1[bar] \times Q1\left[\frac{l}{min}\right]}{600}$$



A Special channel **C3:**
P1 = **27.5** x **52.8** / **600** = **2.4** [kW]

Configuring trigger input C4

Trigger input **C4** cannot be configured. The following values can be shown on the display:

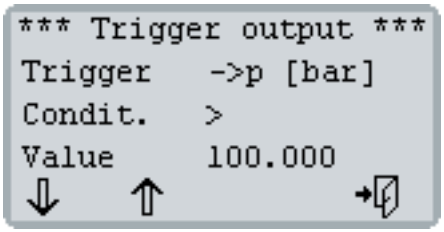
Display		Meaning of trigger input
E1	**0**	OFF
E1	**1**	ON

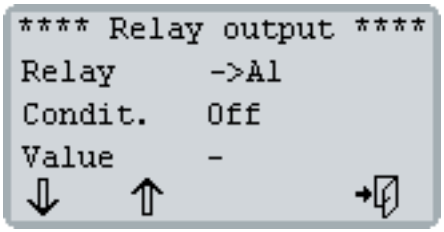
Inverse logic of the trigger input

The trigger input of the MultiPanel 2025 is not, as for other measuring instruments from Hydrotechnik GmbH; instead, it has an inverse logic.
The trigger input is switched on (**ON**) if nothing is connected to the input.
The trigger input is switched off (**OFF**) if the input is pulled to GND.

Configuring trigger and relay outputs C5 and C6

The operation of the menus for trigger output (**C5**) and relay output (**C6**) is identical.





The following values can be shown on the display:

Display		Meaning of trigger output
A1	**0**	OFF
A1	**1**	ON

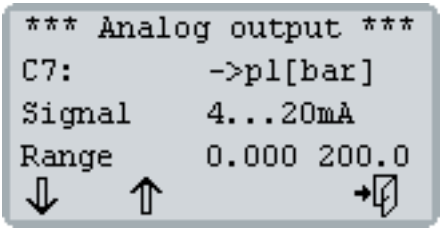
Display		Meaning of relay output
A2	**0**	OFF
A2	**1**	ON

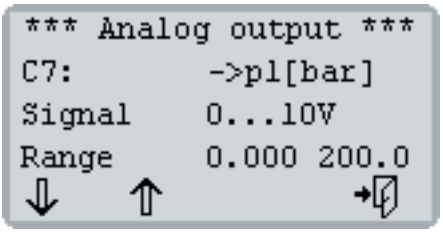
How to configure the trigger or relay output

1. Press **[MENU]** to open the **MAIN MENU**.
2. Use **[MENU]** to open the **CHANNELS** menu.
3. Use **[F1]** to select the desired channel.
   Use **[MENU]** to open the **CHANNELS** menu.
4. Configure the reference channel:
   - Press **[MENU]**.
   - Press **[F1]** or **[F2]** to change the reference channel.
   - Use **[MENU]** to save your entry.
5. Configure the condition:
   - Press **[F1]** to select **Cond.**.
   - Press **[MENU]**.
   - Press **[F1]** or **[F2]** to change the condition.
   - Use **[MENU]** to save your entry.
6. Configure the value:
   - Press **[F1]** to select **Value**.
   - Press **[MENU]**.
   - Press **[F1]** or **[F2]** to change the first digit.
   - Press **[F3]** to select the next digit.
   - Repeat the last two steps until you have entered the value.
   - Press **[MENU]** to save your entry.
7. Press **[F4]** until the display shows the measurement values again.

Configuring analog outputs C7 and C8

The operation of the menus for trigger output (**C7**) and relay output (**C8**) is identical.





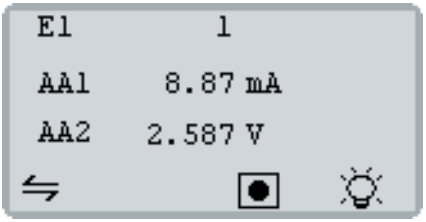
How to configure an analog output

1 Press **[MENU]** to open the **MAIN MENU**.
2 Use **[MENU]** to open the **CHANNELS** menu.
3 Use **[F1]** to select the desired channel.
Use **[MENU]** to open the **CHANNELS** menu.
4 Configure the reference channel:
- Press **[MENU]**.
- Press **[F1]** or **[F2]** to change the reference channel.
- Use **[MENU]** to save your entry.

5 Configure the signal type:
- Press **[F1]** to select **Signal**.
- Press **[MENU]**.
- Press **[F1]** or **[F2]** to change the signal type.
- Use **[MENU]** to save your entry.

6 Configure the output range:
- Press **[F1]** to select **Range**.
- Press **[MENU]**.
- Press **[F1]** or **[F2]** to change the first digit.
- Press **[F3]** to select the next digit.
- Repeat the last two steps until you have entered the lower output range.
- Press **[MENU]** to save your entry.

7 Now enter the upper output range.
To do so, repeat Step **6**.
8 Press **[F4]** until the display shows the measurement values again.



ENG

INSTRUMENT CONFIGURATION

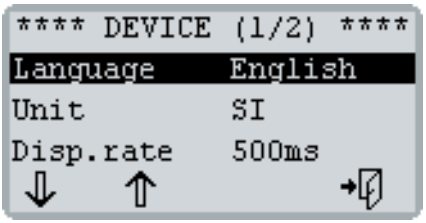
You can make basic instrument settings in the **DEVICE** menu. The instrument menu offers the following entries:

- **DEVICE (1/2)**
  - Language, page 20
  - Units, page 21
  - Display rate, page 21
- **DEVICE (2/2)**
  - Calibration, page 21
  - Time, page 22
  - Date, page 22

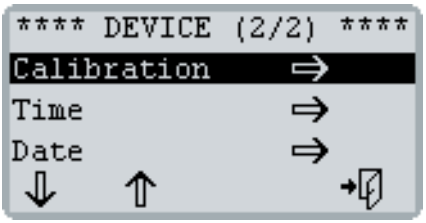
How to open the **DEVICE** menu

1 Press **[MENU]** and use **[F1]** to select the **Device** entry.

2 Use **[MENU]** to open the **DEVICE** menu.



3 Press **[F1]** three times to display the second page of the **DEVICE** menu.



Press **[F4]** to leave the **DEVICE** menu.

Language

Use the **Language** setting to change the menu language of the measuring instrument.
The menu language was set during start-up. You can change the menu language at any time, however.

Incorrect menu language

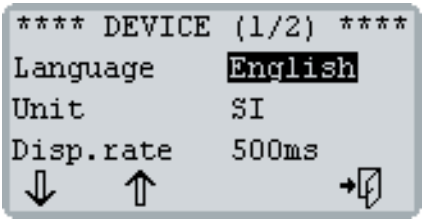
If the measuring instrument is set to the incorrect language, you may not be able to operate it.

- You can reset the menu language without understanding the menu entries.
- See Resetting menu language, page 23.

How to change the menu language

1 Open the **DEVICE** menu and use **[F1]** to select the **Language** entry.
⇨ How to open the DEVICE menu, page 20

2 Press **[MENU]**.



3 Use **[F1]** or **[F2]** to select the desired menu language.
4 Press **[MENU]** to save your entry.
5 Press **[F4]** to leave the **DEVICE** menu.

Units

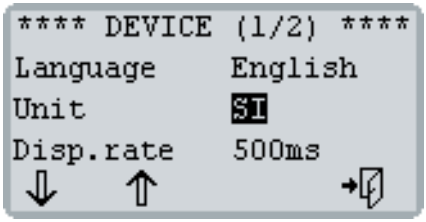
Use the **Unit** setting to change the unit system of the measuring instrument. You can choose between the following unit systems:

- **SI**: International standardised units
- **US**: US American units

The setting of the unit system only has an effect on the connected ISDS sensors.
The unit system was determined during start-up. You can change the unit system at any time, however.

How to change the unit system

1 Open the **DEVICE** menu and use **[F1]** to select the **Unit** entry.
⇨ How to open the DEVICE menu, page 20
2 Press **[MENU]**.



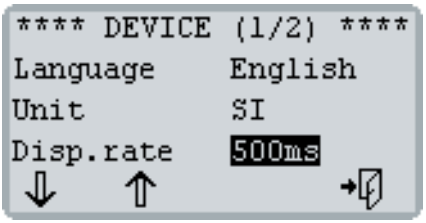
3 Use **[F1]** or **[F2]** to select the desired unit system.
4 Press **[MENU]** to save your entry.
5 Press **[F4]** to leave the **DEVICE** menu.

Display rate

You can use the **Disp.rate** setting to change the display rate. The display rate determines at which intervals the measurement values are updated on the display. You can choose between 1 second and 500 milliseconds.
The shorter the display rate, the more unstable the measurement values appear in the display.
Do not confuse the display rate with the measurement rate at the signal input and the scanrate of a measurement series.

How to change the display rate

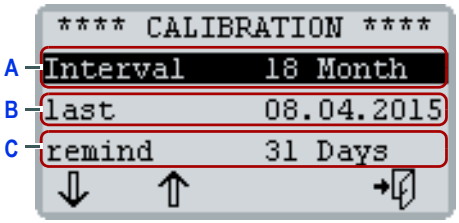
1 Open the **DEVICE** menu and use **[F1]** to select the **Disp.rate** entry.
⇨ How to open the DEVICE menu, page 20
2 Press **[MENU]**.



3 Use **[F1]** or **[F2]** to select the desired display rate.
4 Press **[MENU]** to save your entry.
5 Press **[F4]** to leave the **DEVICE** menu.

Calibration

You can use the **Calibration** setting to open the **CALIBRATION** menu.



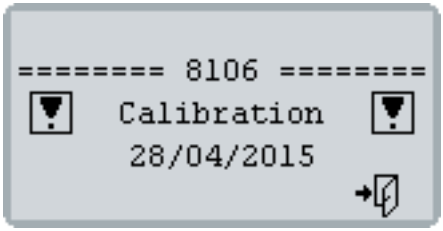
A Displays the set calibration interval.
B Displays the date of the last calibration.
C Displays when the measuring instrument displays a reminder of the next calibration.

For information on the calibration interval, please read the following section:
⇨ Calibration interval, page 9

Reminder of the next calibration

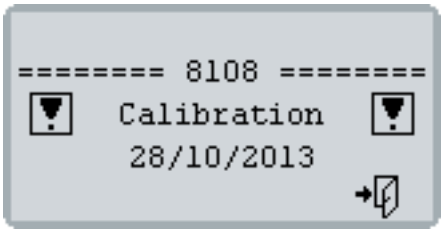
You can determine when the measuring instrument displays a reminder. When switching on, the measuring instrument checks when the measuring instrument was calibrated and which calibration interval is set.

If the time to the next calibration is less than the set reminder period, the measuring instrument displays the following information after the next switch-on:



Error code
Information text
Date of the next calibration

If the date of the next calibration has been exceeded, the measuring instrument displays the following information after the next switch-on:



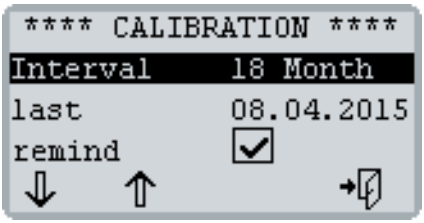
Error code
Information text
Date of last calibration

You must confirm the information with **[F4]** in order to use the measuring instrument.

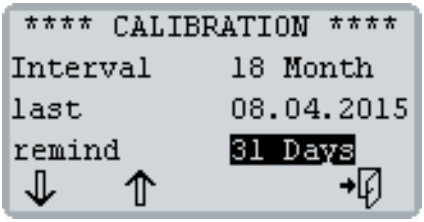
How to change the reminder period

1 Open the **DEVICE** menu and use **[F1]** to select the **Calibration** entry.
⇨ How to open the DEVICE menu, page 20

2 Press **[MENU]**.



3 Set the reminder period:
- Use **[F1]** to select the **remind** entry and press **[MENU]**.
- Press **[F1]** or **[F2]** to change the value.
- Use **[MENU]** to save your entry.



4 Press **[F4]** to exit the **CALIBRATION** menu.

Time

Read the following section for information on the **CLOCK MENU:**:
⇨ Time and date, page 8

Date

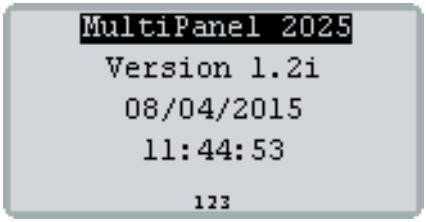
Read the following section for information on the **DATE MENU**:
⇨ Time and date, page 8

RESETTING MENU LANGUAGE

If the measuring instrument is set to the incorrect language, you may not be able to operate it.
You can reset the menu language without understanding the menu entries.

How to reset the menu language

1 Press **[F4]** until the instrument switches off.
2 Press **[F4]** to switch the measuring instrument on.
3 Press **[F1]**, **[F2]** and **[F3]** in succession while the measuring instrument switches on.



4 Set the menu language.

⇨ How to define the basic settings, page 7

RESETTING MEASURING INSTRUMENT

You can reset the measuring instrument. Resetting has the following effects:

- All settings in the **CHANNELS** menu are reset.
- All measurement series in the **MEMORY** menu are deleted.
- The settings in the **DEVICE (1/2)** menu are reset:
  - **Language**
  - **Unit**
  - **Disp.rate**

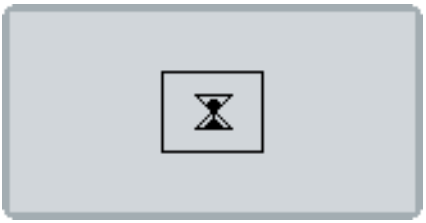
The settings in the **CALIBRATION**, **TIME** and **DATE** menus remain unchanged.
When you switch the instrument on, you must make the basic settings.

⇨ See Basic settings, page 7

How to reset the measuring instrument

1 If possible, save all stored measurement series (e.g. with HYDROlink6).
2 Press **[F4]** for 2 seconds to switch off the measuring instrument.
3 Press **[F1]**, **[F2]** and **[F3]** in succession while the measuring instrument switches off.

The measuring instrument is reset and switches off.



ENG

ERROR CODES

Code	Description
8100	Error in flash memory during read and write test
8101	Flash memory could not be deleted
8102	General error with flash memory (e.g. flash memory not detected)
8106	Calibration interval: Reminder of the next calibration ⇨ Reminder of the next calibration, page 22
8107	Calibration interval: Calibration interval is not set ⇨ Calibration interval, page 9
8108	Calibration interval: Calibration interval has been exceeded ⇨ Calibration, page 21
8114	Range: Upper and lower limit values are inverted.
8110	Zero adjustment not possible Current measurement value > 1% max. measurement series ⇨ Zero adjustment, page 12

TECHNICAL DATA

Property	Value
Dimensions (H x W x D)	96 x 96 x 60mm
Weight	298 g
Temperature range	-20...+50 °C
Relative humidity	0...80%
Protection class	IP 40

Measurement channels	
Analogue input signal	0/4...20 mA 0/2...10 V
Tolerances	±0.2% FS
Frequency input signal	1 Hz...5 kHz
Tolerances	±0.1% MW

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HYDROTECHNIK