HYDROTECHNIK

MultiControl 4070

Universal Portable Measuring System

Operating Instructions

Safety

Introduction

Description of the measuring instrument

Commissioning

Operation

Cleaning and maintenance

ENG

Safety

The following safety notices for **MultiControl 4070** are grouped by topic. Read the safety notices before commissioning the instrument.

General safety and warning information

- Never cut, damage or modify the connecting cables for the power pack.
- Do not place objects on top of the connecting cables for the power pack.
- Never touch the power pack with wet or moist hands.
- Only connect the power pack to power supplies for which it is suited.
  ⇨ **Technical data** on page 22
- Unplug the power cable from the outlet if the cable is damaged.
- Unplug the power cable from the outlet if you detect smoke or if there is an odor.
- Unplug the power cable from the outlet during a thunderstorm.
- Ensure sufficient grounding of your system. Inadequate grounding may cause incorrect measurements.

Handling information for the MultiControl 4070

- Never expose the instrument to excessive heat, cold, or humidity.
  ⇨ **Technical data** on page 22
- Do not store the instrument in a humid or dusty location.
- Never submerge the instrument into water or other liquids. Never let liquids come into the instrument.
- Never open the instrument.
- Do not use the instrument if it has been dropped or if the casing is damaged.
- Avoid strong magnetic fields. Keep the instrument away from electric motors or other instruments which generate electromagnetic fields. Strong magnetic fields may cause malfunctions and influence measurement values.
- Prevent the formation of condensation. If condensation has formed, let the instrument acclimate before you switch it on.

Information about the use of sensors and cables

- Protect the sensors from exceeding the allowed power range, mechanical overload and incorrect pin assignment.
- Make sure you enter the sensor parameters correctly in the HYDROlink6 software when using sensors without an ISDS (Intelligent Sensor Detection System).
- When extending standard measuring cables, use the extension cables provided for this purpose, otherwise the shielding will be interrupted.
- The data of ISDS sensors are read in when the measuring instrument is switched on. If ISDS sensors are reconnected, the measuring instrument must be switched off and on again for the sensor data to be adopted.
- Never connect an inductive load to the digital signal input.
  ⇨ **Digital signal input** on page 15

Information about handling batteries

- Always keep batteries away from heat sources and open fire.
- Never submerge batteries into water.
- Never disassemble, repair or modify the batteries.
- Never short-circuit the contacts of batteries.
- Use only batteries that are installed or delivered by HYDROTECHNIK.
- Only charge the battery while it is mounted in the instrument.
- Charge the battery for 3 hours before you commission the instrument. The battery will be charged as soon as the instrument is supplied by a HYDROTECHNIK power pack.
  ⇨ **Charge batteries** on page 24
- Dispose of used batteries as hazardous waste. Cover the contacts with insulation tape.

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*.

Introduction

Read the information in this chapter to avoid losing the right to make warranty and guarantee claims.

Scope

The manual on hand is valid for measuring instruments named **MultiControl 4070**. It is intended for operators of the instrument, i.e. persons who work with the instrument. This is not a technical manual. Please contact our customer service for questions that go beyond the contents of this manual.

Copyright

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The technical state by the time of delivery of instrument and manual is decisive, if no other information is given. We reserve the right to make technical changes without prior notice. Earlier manuals are no longer valid.

The general conditions of sale and delivery of HYDROTECHNIK GmbH are valid.

Limitation of liability

We guarantee the faultless functioning of our product in accordance with our advertising, the product information we publish and this manual. Further product features are not guaranteed. We assume no liability for the economy and faultless function if the product is not used as intended.

⇨ **Intended use** on page 8

Compensation claims are generally excluded, except if intention or culpable negligence by HYDROTECHNIK is proved, or if assured product features are not provided. If the product is used in environments for which it is not suited or that do not represent the technical standard, we shall not be responsible for the consequences.

⇨ **Technical data** on page 22

We assume no liability for damage to installations and systems in the surroundings of the product that is caused by a fault of the product or an error in this manual.

We are not responsible for the violation of patents and/or other rights of third persons outside the Federal Republic of Germany.

We are not liable for damage that results from improper operation and non-compliance with the instructions in this manual. We are not liable for lost profits and for consequential damages that arise from non-compliance with safety and warning information. We assume no liability for damage that results from the use of accessories and wearing parts that were not delivered and/or approved by HYDROTECHNIK.

The products of HYDROTECHNIK GmbH are designed for a long life. They represent the state of the art and their functions have been individually checked before delivery. The electrical and mechanical design corresponds to current standards and regulations. HYDROTECHNIK conducts ongoing product and market research for the further development and continuous improvement of its products.

In case of faults and/or technical trouble, please contact HYDROTECHNIK customer service. We can assure you that we will take immediate measures. The guarantee conditions of HYDROTECHNIK apply; if desired, we will gladly send you these.

Intended use

The **MultiControl 4070** instrument is a portable measuring system for the recording and storage of measurement data from sensors connected to the measuring instrument. The measurement data can then be read and evaluated using the HYDROcom6 software.

A variety of different sensors can be connected to the measuring instrument.

⇨ **Connections** on page 11

⇨ **Technical data** on page 22

Any other use of the measuring instrument is considered improper. If you have any question or want to use the measuring instrument for a different purpose, please do not hesitate to contact our service staff. We will be happy to assist you with any possibly necessary configurations.

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Warranty

In accordance with our warranty conditions, we guarantee the condition without defects for this measuring instrument for a duration of six months. Wearing parts and storage batteries are excluded from this warranty. The warranty becomes void if repair work or interventions are executed by unauthorized persons.

Within the warranty period we will repair damage or defects that are caused by a manufacturing fault. We only accept warranty claims if they are reported to us immediately, but no later than six months after delivery. The warranty benefit is by our choice through free repair of defective parts or replacement with sound parts.

Please send the instruments for which you have made a warranty claim postage-paid and with a copy of the invoice or the delivery slip to HYDROTECHNIK customer service. You can find the address at the end of this manual.

Customer obligations

Persons who operate this instrument must

- obey all regulations on occupational safety and accident prevention
- have read and understood the **MultiControl 4070** operating instructions in full, especially the safety instructions
  ⇨ **Safety** on page 3.
- have read and understood the HYDROlink6 software operating instructions in full
- have been instructed in the operation of this measuring instrument.

The operator of the measuring instrument must ensure that persons who operate the instrument meet the specified requirements.

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Authorized personnel

Persons are considered to be authorized if they have a professional education, technical experience, knowledge of the relevant standards and regulations and if they are able to estimate their duties and recognize possible danger early on.

Operators of the instrument

Persons are considered to be authorized if they have been instructed in the operation of the instrument and have read and understood these instructions as well as the HYDROlink6 software operating instructions in full.

Personnel for installation and maintenance

Persons are considered to be authorized if they have been trained in all aspects of the instrument and have read and understood these instructions as well as the HYDROlink6 software manual in full.

Description of the measuring instrument

This chapter provides information about the functionality of the measuring instrument, its connections, LED status indicators and technical data, as well as information about the software needed to operate the measuring instrument.

Properties of the MultiControl 4070

MultiControl 4070 is a practice-oriented, user-friendly, portable measuring system that supports the user in the daily measuring functions.

When using sensors with ISDS (intelligent sensor detection), **MultiControl 4070** automatically identifies the connected sensors when it is switched on and adopts all sensor parameters: measurement range, physical measurand, unit of measurement, signal output and characteristic curve (linearization).

You can also connect sensors without ISDS designation. In this case, enter the sensor parameters manually in the HYDROlink6 software. The software is included in the scope of delivery and is used to configure and control **MultiControl 4070**. The software operating instructions can be found in the download area of our website at *www.hydrotechnik.com*.

You can connect up to five sensors and store all measured values. Calculations from the measured values such as difference, sum and performance, as well as the 1st derivation (e.g. speed from path) are available as additional special channels for recording. The buffering of extreme minimum and maximum measurement values is always active and can be displayed in HYDROcom6.

The measurement data can be transferred via USB, RS232 or Ethernet to a PC/laptop or the local data network. HYDROcom6 software offers functions for evaluating, presenting, and printing measurement data. It can be downloaded free of charge from our website at *www.hydrotechnik.com*.

System requirements for your PC/laptop:

• Windows 8 or later

Connections
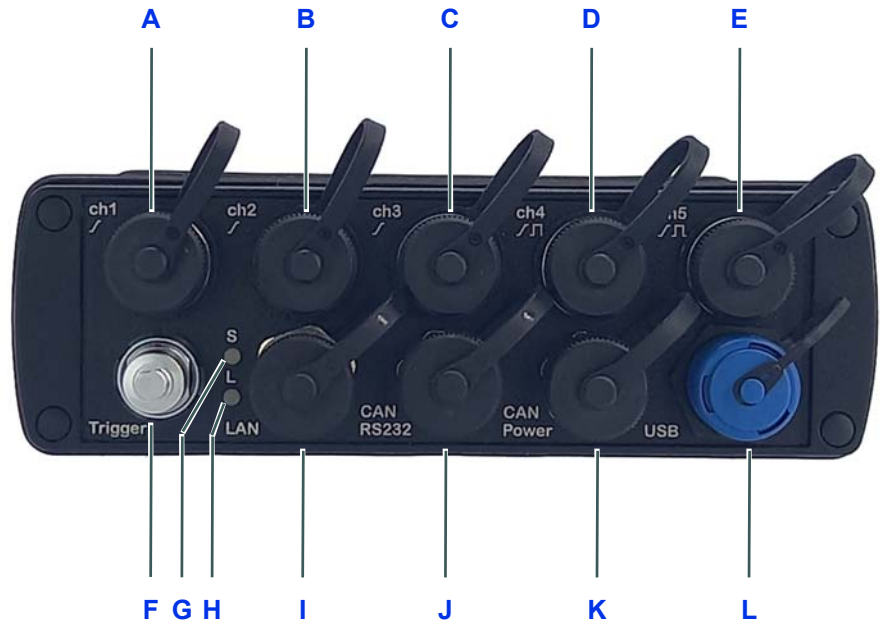
A	Analog input ch1	G	LED (S) for instrument status
B	Analog input ch2	H	LED (L) for Ethernet connection status
C	Analog input ch3	I	Ethernet connection
D	Frequency/analog input ch4	J	Combi jack CAN / RS232
E	Frequency/analog input ch5	K	Combi jack CAN / Power
F	Digital input/output trigger signal	L	USB-C interface

Picture 5-1:   Back of **MultiControl 4070**

Analog inputs
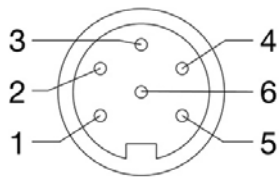
| Number	3 (ch1, ch2, ch3)
Signal input	Switchable 0/4 … 20 mA; 0/2 … 10 V; ±10 V; 0.5 … 4.5 V; 1 … 5 V
Resolution	13-bit analogue/digital converter (12-bit + sign)
Measuring rate	1.0 ms = 1 kHz
Filter function	Input filter 50 kHz (dynamic mode)
IIR filter	Connectable: 5 kHz (standard mode) / 50 Hz (damped mode)
Connector	6 pin device plug
Protection type	IP40

Pin	Function	R_i	C_i	Limitation	Protection type
1	Signal I [mA]	113 Ω	35 nF	5 V (DC)	Transil diode
2	Ground				
3	Ub[a]			100 mA	Current limiting
4	Signal U [V]	88 kΩ	4.7 nF	±15 V (DC)	Transil diode
5	Shield				
6	ISDS				

Table: Pin assignment for analog inputs

[a] Power supply during mains operation 15 V

Frequency/analog inputs
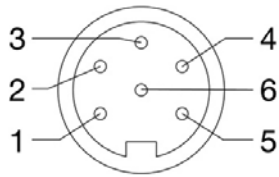
Number	2 (ch4, ch5) frequency/counter inputs with switchable direction detection or analog inputs
Signal input (Frequency mode)	5-30 V (DC) 0.25 Hz – 20 kHz
Signal input (Analog mode)	Switchable 0/4 … 20 mA; 0/2 … 10 V; ±10 V; 0.5 … 4.5 V; 1 … 5 V
Resolution (Analog mode)	13-bit analogue/digital converter (12-bit + sign)
Measuring rate (Analog mode)	max. 10 000 measurement values/sec.
Filter function (Frequency mode)	Adjustable period measurement for averaging
Filter function (Analog mode)	Input filter 50 kHz (dynamic mode)
IIR filter (Analog mode)	Connectable: 5 kHz (standard mode) / 50 Hz (damped mode)
Connector	6 pin device plug
Protection type	IP40

Pin	Function	R_i	C_i	Limitation	Protection type
1	Signal (f)	110 kΩ	33 nF	15 V (DC)	VDR Transile diode
2	Ground				
3	Ub[a]			100 mA	PTC
4	Signal direction	100 kΩ	33 nF	15 V (DC)	VDR Transile diode
5	Shield				
6	ISDS				

Table: *Pin assignment for frequency/analog inputs in frequency mode*

[a] Power supply during mains operation 15 V

Pin	Function	R_i	C_i	Limitation	Protection type
1	Signal I [mA]	113 Ω	100 nF	5 V (DC)	Transil diode
2	Ground				
3	Ub[a]			100 mA	Current limiting
4	Signal U [V]	8.8 kΩ	100 nF	±15 V (DC)	Transil diode
5	Shield				
6	ISDS				

Table: Pin assignment for frequency/analog inputs in analog mode

[a] Power supply during mains operation 15 V

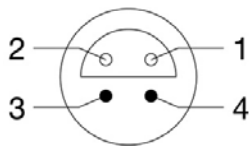## Digital signal input

Note
Instrument damage due to connection of inductive loads
If an inductive load, e.g. the coil of a magnetic valve, is connected to the digital signal input, the measuring instrument may be damaged.
• Never connect an inductive load to the digital signal input.

The digital signal input is connected to the pins (3 and 4) of the digital input/output (trigger).
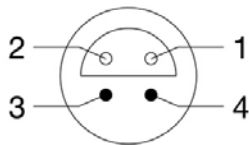
The digital signal input is isolated.

Pin	Function	Limitation	Protection type
3	Signal[a]	30 V (DC)	VDR Transile diode
4	Ground		

Table: Pin assignment for digital signal input

[a] 1 mA constant current

Digital signal output

The digital signal output is connected to the jacks (pins 1 and 2) of the digital input/output (trigger).
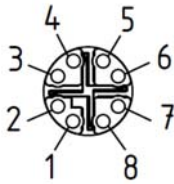
Pin	Function	Limitation	Protection type
1	Ground		
2	Signal	Ub/10 mA	VDR Transile diode

Table: Pin assignment for digital signal output

Ethernet connection

Pin	Function	Explanation
1	TX+	Transfer of data+ or bidirectional
2	TX-	Transfer of data- or bidirectional
3	RX+	Reception of data+ or bidirectional
4	DC+	No connection
5	DC+	No connection
6	RX-	Reception of data- or bidirectional
7	DC-	No connection
8	DC-	No connection

Table: *Pin assignment for Ethernet connection (LAN)*

Combi jack CAN / RS 232
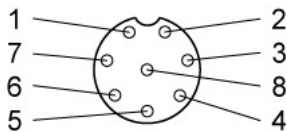
Pin	Function	Explanation
1	CAN GND	Ground
2	CAN +Ub	Power supply for CAN devices[a]
3	DTR	RS232 signal DTR
4	CAN H	CAN High
5	TXD	RS232 signal TXD
6	RTS	Reserved for bootloader
7	CAN L	CAN Low
8	RXD	RS232 signal RXD

Table: *Pin assignment for combi jack CAN / RS 232*

[a] ~14.6 to 15 V, max. 800 mA (power supply) / ~13 V (DC), 180 mA (battery)

Combi jack CAN / Power
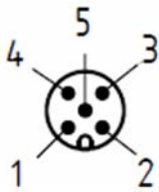
Pin	Function	Explanation
1	CAN SHLD	Shield
2	PWR+	Power supply for measuring instrument
3	PWR- / CAN GND	Ground
4	CAN H	CAN High
5	CAN L	CAN Low

Table: Pin assignment for combi jack CAN / Power

USB-C interface

The USB-C interface facilitates communication with a PC/laptop. HYDROTECHNIK recommends this connection for commissioning and configuring the sensors with the HYDROlink6 software.

LED status indicators

ON/OFF button status indicator

A

A   ON/OFF button

Picture 5-2:   Front of **MultiControl 4070**

The illuminated ON/OFF button on the front of **MultiControl 4070** displays the following instrument statuses:

LED code	Status	Description
LED is off and flashes every 3.5 seconds	Operation	The instrument is ready for operation.
LED is on and extinguishes every 3.5 seconds	Online	Instrument is communicating with PC/laptop.
LED flashes 5 times/second	Power off	The ON/OFF button is pressed. The power off mode is activated after 4 seconds if the button is pressed for that long.

Table: ON/OFF button status indicator

Status indicator on the back of instrument – LED (S)

The top LED (S) on the back of the instrument indicates further instrument statuses. The following operational and error displays are possible:

LED code	Status	Description
LED illuminates uninterrupted	Power on	The instrument is started.
LED is off and flashes 2 times every 2 seconds	Save	Recording is running: trigger event triggered the recording.
LED is off and flashes 3 times every 2 seconds	Save	Recording is running: pretrigger is filled, waiting for trigger event.
LED is off and flashes 4 times every 2 seconds	Save	Recording is running: pretrigger is filled.
LED is off and flashes 2 times every 1.5 seconds	Error code 2	ISDS sensor not detected; check connection and switch on again. Plug in each sensor if necessary. It is possible that the ISDS sensor with frequency output is plugged into the analog input.
LED is off and flashes 3 times every 1.5 seconds	Error code 3	SD card is full or not formatted; download the measurement series and delete them from the instrument or format the SD card.
LED is off and flashes 4 times every 1.5 seconds	Error code 4	Ethernet error; check the cable connection and network installation.
LED is off and flashes 5 times every 1.5 seconds	Error code 5	Battery is low; connect power pack.
LED is off and flashes 8 times every 1.5 seconds	Error code 8	SD card not detected; contact customer service.
LED is off and flashes 10 times every 1.5 seconds	Error code 10	Factory calibration not performed; have the instrument calibrated.
LED is off and flashes 11 times every 1.5 seconds	Error code 11	No battery detected.

Table: *Status indicator on the back of instrument – LED (S)*

Status indicator on the back of instrument – LED (L)

The bottom LED (L) on the back of **MultiControl 4070** indicates the status of the Ethernet connection. The following statuses are possible.

LED code	Description
LED flashes orange	Ethernet connection detected.
LED illuminates orange	Operating speed is 100 Mbps.
LED is extinguished	No Ethernet connection, operating speed is 10 Mbps or the cable is disconnected.

Table: Status indicator on the back of instrument – LED (L)

Software

HYDROlink6 Advanced

This software allows you to configure and operate the measuring instrument from a PC/laptop.

For more information about installing and operating the HYDROlink6 software, visit the download area of our website at *www.hydrotechnik.com*.

HYDROcom6

After you have transferred the measurement data from the measuring instrument to a PC/laptop, you can use this software to evaluate, process, and graphically display the measurement data.

For more information about installing and using HYDROcom6, visit the download area of our website at *www.hydrotechnik.com*.

Firmware

The firmware is preinstalled on the measuring instrument and acts as the intermediary between the measuring instrument's hardware and the HYDROlink6 and HYDROcom6 software.

The HYDROTECHNIK customer center is in the download area of our website at *www.hydrotechnik.com*. It informs you automatically of firmware updates and requests that you install these updates.

Technical data

Casing	Aluminum casing / die casting cover
Weight	1220 g
Protection type	IP65
CE conformity mark	Complies with Directive 2014/30/EU (Electromagnetic Compatibility) Complies with Directive 2014/68/EU (Pressure Equipment Directive) Complies with Directive 2011/65/EU (Restriction of Hazardous Substances)
Internal power supply	Lithium ions, 7.2 V / 6.2 Ah
External Power supply	24 V (DC) / 2 A
Dimensions	~ 180 mm x 165 mm x 54 mm (L x W x H)
Interfaces	USB, RS232, CAN, Ethernet
Ambient temperature	-10 °C – 50 °C
Relative humidity	0 – 80% (not condensing)
Storage temperature	-20 °C – 50 °C
Trigger	4 channels as start/stop, with operators AND or OR, time trigger
Scanning rate	Selectable between 1 μsec and 999 min
Measuring rate	Analog inputs 1 ms (1 kHz) Frequency inputs 0.25 Hz … 20 kHz
Measured value memory	4 GB SD card, max. 100 measurement series, max. 8 MB per measurement series (2 million values)
Tolerances	Analog ±0.1% of final value Digital ±0.02% from measurement value (resolution: 20 ns)

Commissioning

Before you take measurements with the instrument, you must check that all parts have been delivered in their entirety and are intact. You must charge the batteries and read these operating instructions.

Connecting and configuring the sensors is described in the following sections:
⇨ **Connect sensors** on page 28
⇨ **Configure and operate the instrument** on page 29

Check delivery

The measuring instrument is delivered by HYDROTECHNIK and transported by suited shipping companies. At the time of delivery, you should check:

•   Does the number of delivered items corresponds with the HYDROTECHNIK delivery note?
•   Is the packing free of visible damage?
•   Are measuring instrument and accessories free of visible damage?
•   Are there any indications of rough treatment during transportation (e.g. burn marks, scratches, color)?

To maintain all claims against the shipping company you should document all possible transportation damage (e.g. by taking photos and signing a written protocol), before you unpack the measuring instrument.

HYDROTECHNIK is not responsible for transportation damage and will assume no liability.

Check the scope of delivery

Carefully remove the transportation packing. Observe all rules and regulations for the disposal of packing materials. After unpacking you should find the following parts:

- **MultiControl 4070** measuring instrument
- Portable power supply, 264 VAC / 24 VDC
- USB-C data transmission cable
- Ethernet connection cable
- Serial number key for HYDROlink6 Advanced software

Check the scope of delivery against the delivery note and the order documents. Please report any discrepancies immediately to HYDROTECHNIK. Subsequent claims about incomplete delivery cannot be accepted.

Charge batteries

Note
Damage to batteries due to excessive discharge The lithium-ion battery installed in the instrument is only slightly precharged ex works. If the battery is not fully charged before start-up, there is a risk of excessive discharge, which would severely impair the performance of the battery. • Charge the battery for 3 hours before you commission the instrument. • The battery will be charged as soon as the instrument is supplied by a HYDROTECHNIK power pack.

Information about handling instrument batteries

The life cycle of lithium ion cells depends greatly on the conditions of use.

- Avoid a complete discharge, continuous charging and immediate re-charging after every use.
- The LED (S) on the back of the instrument will display error code 5 when the battery is low. In this case you should maintain a 3 hour charging time.

    ⇨ **Status indicator on the back of instrument – LED (S)** on page 19

- In case of longer periods without use you should discharge and charge the batteries monthly.

Display operating instructions

The operating instructions are available in PDF format in the download area of our website at *www.hydrotechnik.com* and on the measuring instrument.

➜   **Displaying the operating instructions on the measuring instrument**

   1   Switch on the measuring instrument and PC/laptop.

   2   Connect the measuring instrument and PC/laptop with a USB-C cable.

      ⇨ **Connections** on page 11.

   3   Wait until the measuring instrument is detected.

      The measuring instrument is recognized as a removable storage device.

   4   Open the operating instructions in the **DOCU-VOL** partition of the measuring instrument.

      ⇨ **Internal data memory** on page 32.

   ∎

Operation

This chapter describes how to operate the measuring instrument.

- **Switch the instrument on and off**
- **Connect sensors**
- **Configure and operate the instrument**
- **Coupling of several instruments**
- **Connect MultiXtend**
- **Read and evaluate the data**
- **Reset device**

The HYDROlink6 and HYDROcom6 software, which are needed for some of these operations, are not described here. For more information, consult the separate software documentation in the download area of our website at *www.hydrotechnik.com*.

Switch the instrument on and off

*Picture 7-1:   Front of **MultiControl 4070** – illuminated ON/OFF button*

If you are using ISDS sensors, the sensor parameters will be read in automatically. If you use other sensors, you must first enter the sensor parameters in the HYDROlink6 software before you switch on the instrument.

⇨ **Configure and operate the instrument** on page 29

➔ **Switching the instrument on and off**

1 Make sure that the desired sensors are connected before switching on the instrument.

2 Switch on: ON/OFF button > press and hold for 2 seconds until the light illuminates.

3 Wait for the self-test until the light starts to flash.

During the self-test, observe whether the top LED (S) on the back of the instrument indicates an error status.

⇨ **Status indicator on the back of instrument – LED (S)** on page 19

4 Use instrument.

5 Switch off: ON/OFF button > press and hold for 4 seconds until the light extinguishes. The light flashes during this time.

⇨ **ON/OFF button status indicator** on page 18

The instrument saves all data and settings before the instrument software is shut down.

■

Connect sensors

➜ **Connecting sensors**

1 Switch the instrument off.

2 Connect the desired sensors to the appropriate inputs.

⇨ **Connections** on page 11

3 Switch the instrument on.

■

Configure and operate the instrument

HYDROTECHNIK recommends that a USB connection is used to commission the instrument initially. To do this, use the USB (Type C) data transmission cable included in the scope of delivery.

The instrument is configured and operated with the HYDROlink6 Advanced software. The software is included in the scope of delivery. For more information, consult the documentation in the download area of our website at *www.hydrotechnik.com*.

➔ **Configuring the measuring instrument**

1 Install the HYDROlink6 Advanced software on a PC/laptop.

2 Switch on the measuring instrument and PC/laptop.

3 Connect the measuring instrument and PC/laptop with a USB-C cable.

⇨ **Connections** on page 11

4 Wait until the measuring instrument is detected.

5 Configure **MultiControl 4070** from the PC/laptop.

⇨ **Configuration tasks in HYDROlink6** on page 29

■

Configuration tasks in HYDROlink6

Before you can begin measuring with **MultiControl 4070**, you must configure the instrument with the HYDROlink6 software.

Depending on the measuring task, it may be necessary to carry out other configuration tasks, for example:

• Set sensor parameters (not necessary for ISDS sensors)

• Define recording parameters

• Define display parameters

• Define CAN channels (if used)

The HYDROlink6 software operating instructions can be found in the download area of our website at *www.hydrotechnik.com*.

Coupling of several instruments

You can couple several **MultiControl 4070** measuring instruments and increase the number of available input channels with almost no limitations. Note, however, that the following parameters must be programmed identically for all participating measuring instruments.

- Scanning rate
- Recording time
- Pretrigger

The measuring instruments are interconnected electrically as follows:

Coupling of two instruments

Use the connection cable TKZ 8824-F2-00.50 and connect the trigger jacks.

Coupling of several instruments

Use the connection cable for external trigger TKZ 8824-D8-05.00 and couple the instruments serial or parallel:

Use of the MultiXtend Trigger

For the coupling of more than two instruments we recommend the use of the MultiXtend Trigger (TKZ 316A-00-00.50). This simplifies the coupling and allows the use of the standard connection cables (TKZ 8824-F2-00.50).

For more information about coupling several measuring instruments, see the HYDROlink6 software operating instructions, chapter "Coupling of several instruments".

Connect MultiXtend

The channel expansion modules of the MultiXtend product line can be used to connect additional analog or frequency input channels to **MultiControl 4070**. Thermocouples or Bluetooth items can also be connected. The signals are digitized in MultiXtend, transmitted to the measuring instrument via the CAN bus, and stored on the measuring instrument.

To use MultiXtend with **MultiControl 4070**, you must first make the following settings with the HYDROlink6 software:

- Activate CAN bus
- Program CAN channels
- Activate the MultiXtend power supply

  MultiXtend can either be supplied with power by its own power pack or by **MultiControl 4070** (combi jack CAN / Power). If the instrument shall supply the required power, this function must be activated:

- Start MultiXtend

  After connecting the power supply, MultiXtend must be started. Otherwise it doesn't send signals. MultiXtend must be started again each time there is a loss of supply power or the measuring instrument has been switched off.

Read and evaluate the data

The HYDROcom6 software is used to read the measurement data from the internal memory of the measuring instrument and to evaluate them. The software is included in the scope of delivery. For more information, consult the separate software documentation in the download area of our website at *www.hydrotechnik.com*.

➔ **Reading and evaluating the data**

1 Install the HYDROcom6 software on a PC/laptop.

2 Switch on the measuring instrument and PC/laptop.

3 Connect the measuring instrument and PC/laptop with a USB-C cable, RS232 cable, or Ethernet cable.

⇨ **Connections** on page 11

4 Wait until the measuring instrument is detected.

When a USB connection is established, the measuring instrument is recognized as a removable storage device.

5 Transfer the measurement data from the measuring instrument to the PC/laptop.

6 Evaluate the measurement data with HYDROcom6.

■

Internal data memory

The measuring instrument's internal memory (SD card) has two partitions:

• **DATA-VOL**

General data memory, e.g. for sensor databases, measurement series and test sequence files.

• **DOCU-VOL**

This is where you will find the operating instructions and data sheets for the instrument.

DATA-VOL partition directories
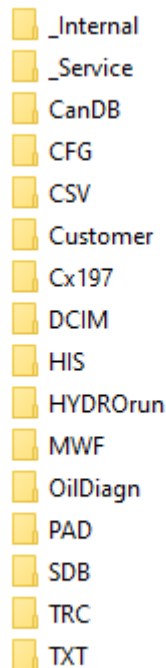
The **DATA-VOL** partition has a directory structure. The files are saved to different folders, depending on their file type.

You may not find all of the folders listed here on the instrument. The folders displayed depend on the instrument version.

_Internal   Internal system files for oil condition analysis, e.g. oil database, measuring point database and database for sensor assignment

_Service   Files for diagnostics and service

CanDB   Configuration files for CAN databases (***.CDB**)

CFG   Stored instrument configurations (***.CFG**)

CSV   Converted spreadsheet or database files in CSV format (***.CSV**)

Customer   Customer-specific files

Cx197   HySense CX197 diagnostic files

DCIM   Image files of screenshots in bitmap format (***.BMP**)

HIS   History files read from oil condition sensors:
- History file of a Patrick sensor (***.PHIS**)
- History file of a viscosity sensor (***.VHIS**)
- History file of a moisture sensor (***.HHIS**)
- History file of a filling level sensor (***.LHIS**)

HYDROrun   Databases created with HYDROrun, e.g. measurement results of test sequences (*.DBF)

MWF   MWF files for measurement series (*.MWF)

OilDiagn   Measurement results from oil condition sensors:
- Oil condition diagnosis file from Patrick sensor (*.OCDP)
- Oil condition diagnosis file from CV100 viscosity sensor (*.OCDV)
- Oil condition diagnosis file from CM100 moisture sensor (*.OCDM)
- Oil condition diagnosis file from CL1xx filling level sensor (*.OCDL)
- Oil condition diagnosis file from CW100 contamination sensor (*.OCDW)

PAD   Test sequence files and test sequences (*.PAD)

SDB   Stored sensor settings (*.SDB)

TRC   Stored TRACE files (CAN traces) (*.TRC)

TXT   Stored text files (*.TXT)

Reset device

All user-defined parameters and settings (channels, memory, etc.) will be deleted by resetting the instrument. All data on the SD card remain unaffected (measurement series, sensor and CAN databases, projects, test sequences, databases from test sequences, etc.).

ENG

➜ **Reset instrument**

1 Switch on the instrument with the ON/OFF button and keep the button pressed.

The green LED starts to flash.

After another 4 seconds, the green LED extinguishes and the red LED starts flashing.

2 Release the button and then press the button 5 times.

Each time the button is pressed, the green LED flashes to confirm the action.

The instrument is then reset.

∎

Cleaning and maintenance

In this chapter you will learn how to clean the instrument, where it can be calibrated, and what information the customer service department needs if it needs to be repaired.

ENG

Cleaning

Note
Instrument damage due to a short circuit or chemicals
If liquid enters the interior of the instrument, a short circuit can cause considerable damage to it. Chemicals can damage the casing of the instrument.
• Before cleaning the measuring instrument, switch off the instrument and disconnect it from the power supply.
• Do no use any aggressive cleaning materials, solvents, cleaning solvents or similar chemicals when cleaning the casing.

•   If the casing becomes dirty, wipe it with a soft, slightly damp cloth.

•   Any stubborn dirt can be removed with a mild household cleaning product.

Shipping the measuring instrument

The instrument is equipped with internal lithium ion batteries.

The battery was tested according to the test requirements of the UN manual *Tests and criteria, Part 3, Subsection 38.3*. The battery is categorized in class 9 of hazardous materials, however eased transport according to Special Regulation 188 (ADR, RID, ADN, IMDG) and Packaging Instruction 965/968, Part 2 and Part 1B (IATA) apply.

When shipping the measuring instrument, observe the respective hazardous goods transport regulations applicable for your country. You can also send the measuring instrument without the battery.

Maintenance

The instrument is maintenance-free. However, it is still essential to have the instrument recalibrated regularly. In case of frequent use, we recommend calibration every two years by our calibration laboratory:

HYDROTECHNIK GmbH

Holzheimer Strasse 94-96
65549 Limburg, Germany

Tel.: +49 6431 4004 555

E-mail: *service@hydrotechnik.com*
Website: *www.hydrotechnik.com*

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Repair

If repair is needed, please contact our customer service department.

Have the following information ready when you contact us. If you are returning the instrument, please also attach this information.

- Company, department, contact person
- Address, telephone and fax number, email address
- Faulty part (instrument, sensor, cable, power pack)
- PC/laptop used (CPU, operating system, RAM, HDD)
- Software version used (HYDROcom6 or HYDROlink6)
- Description of fault
  – Leave the settings on the measuring instrument as they were at the time the fault occurred.
  – Briefly describe the measuring task.
  – List the sensors used.
  – Describe the instrument settings, e.g. the recording parameters, triggers, measuring rate, etc.

Customer service

Please contact the HYDROTECHNIK customer service department:

HYDROTECHNIK GmbH

Holzheimer Strasse 94-96
65549 Limburg, Germany

Tel.: +49 6431 4004 555

E-mail: *service@hydrotechnik.com*
Website: *www.hydrotechnik.com*