

849 Level Control



Manual
8.849.8001EN



Metrohm AG
CH-9100 Herisau
Switzerland
+41 71 353 85 85
info@metrohm.com
www.metrohm.com

849 Level Control

Manual

Technical Communication
Metrohm AG
CH-9100 Herisau

This documentation is protected by copyright. All rights reserved.

This documentation has been prepared with great care. However, errors can never be entirely ruled out. Please send comments regarding possible errors to the address above.

Disclaimer

Deficiencies arising from circumstances that are not the responsibility of Metrohm, such as improper storage or improper use, etc., are expressly excluded from the warranty. Unauthorized modifications to the product (e.g. conversions or attachments) exclude any liability on the part of the manufacturer for resulting damage and its consequences. Instructions and notes in the Metrohm product documentation must be strictly followed. Otherwise, Metrohm's liability is excluded.

Table of contents

1	Introduction	1
1.1	Instrument description	1
1.2	Model versions	1
1.3	Intended use	2
1.4	About the documentation	2
1.4.1	Symbols and conventions	2
1.5	Safety instructions	3
1.5.1	General notes on safety	3
1.5.2	Electrical safety	3
1.5.3	Flammable solvents and chemicals	4
1.5.4	Recycling and disposal	4
2	Overview of the instrument	5
3	Installation	6
3.1	Configuration	6
3.2	Connecting the sensor	8
3.3	Connecting the remote cable	9
4	Operation and maintenance	11
4.1	Sensor monitoring via remote interface	11
4.2	Maintenance	12
5	Technical specifications	13
5.1	Measuring inputs	13
5.2	Remote socket	13
5.3	Supply	14
5.4	Ambient temperature	14
5.5	Dimensions and material	14
6	Accessories	15
	Index	16



Table of figures

Figure 1	849 Level Control Front	5
Figure 2	849 Level Control Rear	5
Figure 3	Printed circuit board	6
Figure 4	DIP switch strip	6
Figure 5	Wiring the sensor	8
Figure 6	Bottle adapter	8
Figure 7	Remote connection 849 Level Control - Sample Processor with remote interface	9
Figure 8	Remote connection 849 Level Control - Metrohm instrument with Remote Box	10

1 Introduction

1.1 Instrument description

The 849 Level Control is used for monitoring liquid levels in canisters and bottles. It can detect both high liquid levels (e.g. warning of overflow of a waste container) as well as low liquid levels (e.g. a supply container running empty). Thanks to conductivity measurement, the level sensors can be used in various media.

The sensor signal is detected by the 849 Level Control and is forwarded as signal level to a remote connection of a Metrohm automation system. Therefore, the 849 Level Control can be used with all Metrohm systems in which the scanning of remote lines is possible (SCAN command).

1.2 Model versions

The 849 Level Control is available in the following model versions:

2.849.0010	With 6.1113.000 sensor made of stainless steel (AISI 304).	For aqueous media. Sensor only partially resistant to strong acids.
2.849.0020	With metal-free sensor 6.1113.100.	Use in solutions with very low conductivity (ultrapure water, nonaqueous media).
2.849.0030	With metal-free sensor. Sensor rods for empty function of a 2L bottle (6.1608.070) are included in the scope of delivery. Depending on the application, alternative sensors are optionally available.	Use in solutions with very low conductivity (ultrapure water, nonaqueous media, suitable for ion chromatography).

1.3 Intended use

The 849 Level Control is designed for usage in an automation system in analytical laboratories. It is **not** suitable for usage in biochemical, biological or medical environments in its basic equipment version.

The instrument described here can be used in chemicals and flammable solvents. Therefore, the use of the 849 Level Control requires the user to have basic knowledge and experience in handling toxic and caustic substances. Knowledge with respect to the application of the fire prevention measures prescribed for laboratories or production plants is also mandatory.

1.4 About the documentation



CAUTION

Please read through this documentation carefully before putting the instrument into operation. The documentation contains information and warnings which the user must follow in order to ensure safe operation of the instrument.

1.4.1 Symbols and conventions

The following symbols and formatting may appear in this documentation:

(5-12)

Cross-reference to figure legend

The first number refers to the figure number, the second to the instrument part in the figure.

1

Instruction step

Perform the steps one after the other.

Method

Dialog text, parameter in the software

File ► New

Menu or menu item

[Continue]

Button or **key**



WARNING

This symbol draws attention to a possible life-threatening hazard or risk of injury.

**WARNING**

This symbol draws attention to a possible hazard due to electrical current.

**WARNING**

This symbol draws attention to a possible hazard due to heat or hot instrument parts.

**WARNING**

This symbol draws attention to a possible biological hazard.

**WARNING**

Warning of optical radiation

**CAUTION**

This symbol draws attention to possible damage to instruments or instrument parts.

**NOTICE**

This symbol highlights additional information and tips.

1.5 Safety instructions

1.5.1 General notes on safety

**WARNING**

Operate this instrument only according to the information contained in this documentation.

This instrument left the factory in a flawless state in terms of technical safety. To maintain this state and ensure non-hazardous operation of the instrument, the following instructions must be observed carefully.

1.5.2 Electrical safety

The electrical safety when working with the instrument is ensured as part of the international standard IEC 61010.

**WARNING**

Only personnel qualified by Metrohm are authorized to carry out service work on electronic components.

Protection against electrostatic charges



WARNING

Electronic components are sensitive to electrostatic charges and can be destroyed by discharges.

Do not fail to pull the power cord out of the power socket before you set up or disconnect electrical plug connections at the rear of the instrument.

1.5.3 Flammable solvents and chemicals

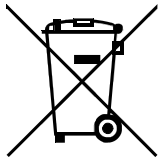


WARNING

All relevant safety measures are to be observed when working with flammable solvents and chemicals.

- Set up the instrument in a well-ventilated location.
- Keep all sources of flame far from the workplace.
- Clean up spilled liquids and solids immediately.
- Follow the safety instructions of the chemical manufacturer.

1.5.4 Recycling and disposal



This product is covered by European Directive 2012/19/EU, WEEE – Waste Electrical and Electronic Equipment.

The correct disposal of your old instrument will help to prevent negative effects on the environment and public health.

More details about the disposal of your old instrument can be obtained from your local authorities, from waste disposal companies or from your local dealer.

2 Overview of the instrument

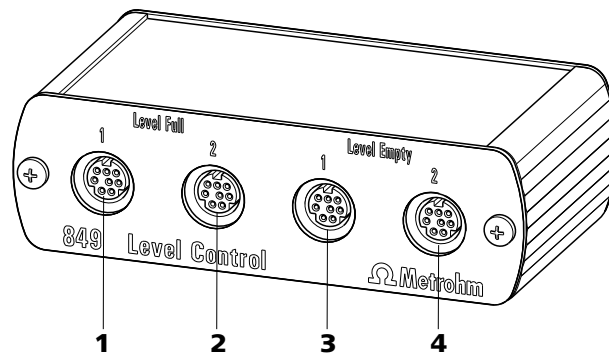


Figure 1 849 Level Control Front

- | | |
|---|---|
| <p>1 Sensor connector 1 for overflow monitoring (Level Full)
Signal at contact.</p> | <p>2 Sensor connector 2 for overflow monitoring (Level Full)
Signal at contact.</p> |
| <p>3 Sensor connector 1 for empty level monitoring (Level Empty)
Signal at contact loss.</p> | <p>4 Sensor connector 2 for empty level monitoring (Level Empty)
Signal at contact loss.</p> |

The connectors for the sensor cables (6.2151.060) are located on the front of the 849 Level Control.

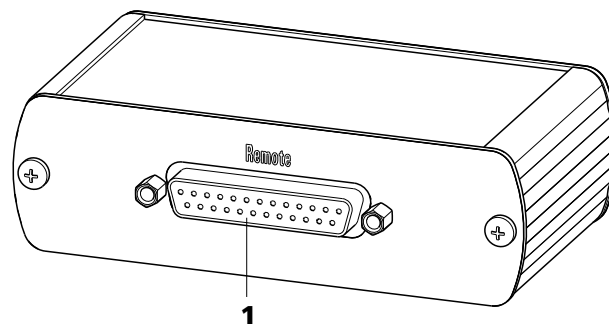


Figure 2 849 Level Control Rear

- | |
|--|
| <p>1 Remote connector
For the 6.2125.090 cable.</p> |
|--|

The 6.2125.090 connection cable providing power supply for the conductivity measurement is connected on the rear. It is connected to the remote socket of a suitable Metrohm instrument in order to transfer the activating signals of the sensors.



3 Installation

3.1 Configuration

The logic of the 849 Level Control must be configured before it is used for the first time. The operating mode can be set with DIP switches.

Basic setting

Remove the two fastening screws on the rear side of the housing and then carefully pull the electronic print located there out of the housing to the rear..

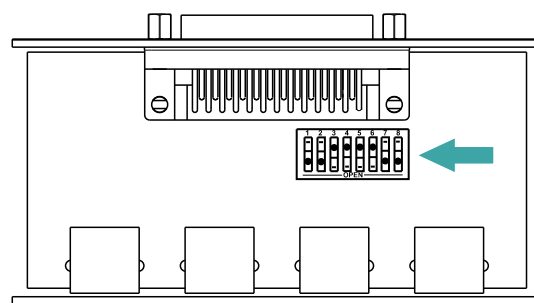


Figure 3 Printed circuit board

You will see a DIP switch strip on the electronic print. The switch settings can be changed with the sharp end of a pencil.

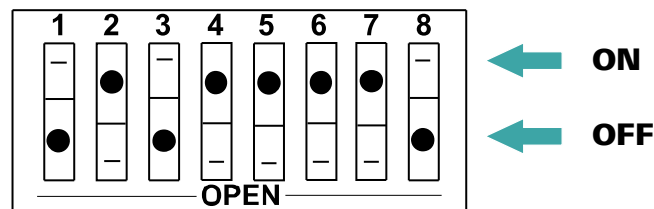


Figure 4 DIP switch strip

DIP switches 2 and 4 to 7 are used to define the remote lines which can be activated according to the sensor signals.

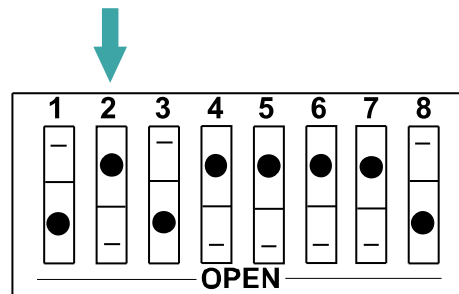
Default setting for monitoring all sensors:

DIP switch	Sensor connection
2	Overall status
4	Level Full 1
5	Level Full 2
6	Level Empty 1

7 Level Empty 2

Overall status

Should general monitoring of all sensor signals via a single remote line ("OR-gate") be desired, remote line 2 can be switched on for monitoring the overall status. Switch on **DIP switch 2** for this purpose. This causes remote line 2 to be activated as soon as a **Level Full or Level Empty status** is reached.



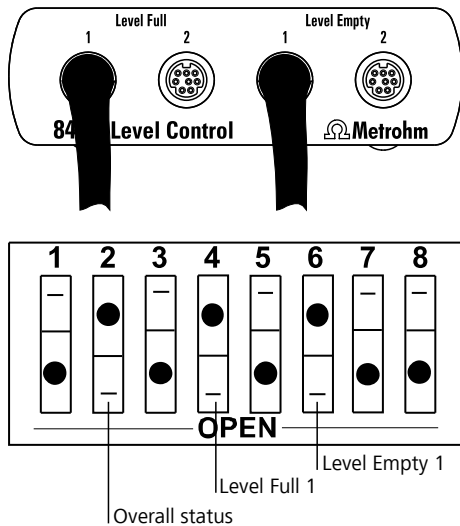
Remote line 2 is activated whenever a random sensor signal reacts to overflow or empty running.

Selective operating mode

The individual remote lines can be switched off selectively if they are not required for monitoring purposes, i.e. when not all sensor connections are assigned.

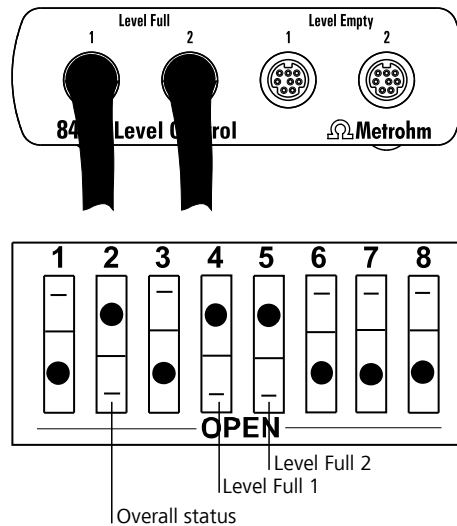
Example:

Monitoring overflow and empty level (incl. overall status)



Example:

Monitoring overflow in two containers (incl. overall status)





3.2 Connecting the sensor

The sensor is comprised of three rods in one screw cap adapter which can be mounted on a plastic canister or on a glass bottle. Connections for one to two sensor cables are located in the screw cap adapter.

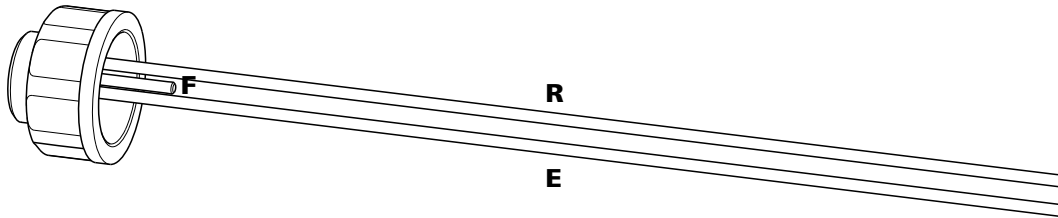
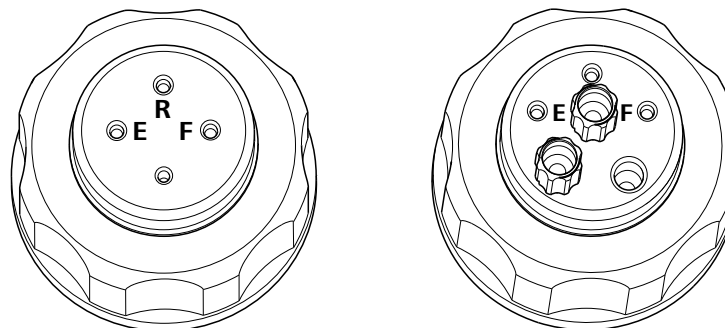


Figure 5 Wiring the sensor

<p>R Reference Sensor rod for the reference potential.</p>	<p>E Empty level Sensor rod for detecting the minimum fill level.</p>
<p>F Full level Sensor rod for detecting the maximum fill level.</p>	

One sensor cable has two lines and two narrow test plugs at one end. Always connect the **red plug** to the connector **R** (= Reference, see below). The reference connection is always linked with a long sensor rod.



6.1113.000

6.1113.100

Figure 6 Bottle adapter

<p>R "Reference" connector Connector for the reference line (for the red plug).</p>	<p>E "Empty level" connector Connector for detecting the minimum fill level (for the black plug).</p>
<p>F "Full level" connector Connector for detecting the maximum fill level (for the black plug).</p>	

**NOTICE**

The extra opening in the bottle adapter is used for ventilating the container. This opening may not be sealed. The pressure equilibrium in the container must always be ensured.

A **6.1619.000 adsorber tube** can be attached with the bottle adapter for the 6.1113.100 and 6.1113.110 sensors. This adsorber tube (with M6 thread) can be filled with a suitable material which protects the contents of the container, e.g. against CO₂ or humidity.

Overflow monitoring

In the case of overflow monitoring, connect the **black plug** of the sensor cable to the connector **F** (Level Full). The "Full level" connector must be linked with a short sensor rod (activation upon contact).

Empty level monitoring

In the case of empty level monitoring, connect the **black plug** of the sensor cable to the connector **E** (Level Empty). The "Empty level" connector must be linked with a long sensor rod (activation when contact is lost).

A second sensor cable will be required in the event that Level full and Level empty monitoring are to be performed simultaneously. It is sufficient to plug the black plug of the second cable into the corresponding connector **E** or **F**. No second reference connection is required.

3.3 Connecting the remote cable

849 — Sample Processor with remote interface

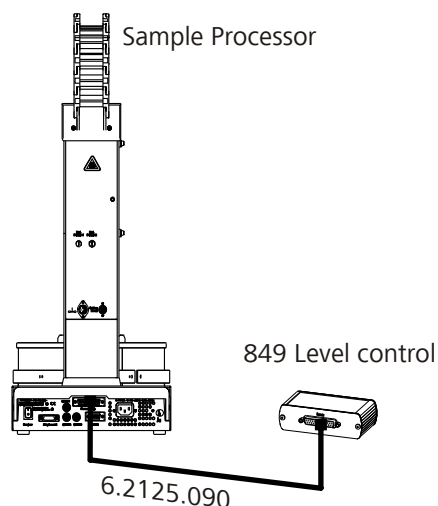


Figure 7 Remote connection 849 Level Control - Sample Processor with remote interface



If the remote lines are to continue to be available for the purpose of controlling a different device, then a 6.2125.000 stackable plug and an additional 6.2125.090 connecting cable are to be used..

849 — Metrohm instrument with 6.2148.010 Remote Box

Metrohm instruments that are controlled via a USB connection (e.g. Professional ICs, Titrandos, USB Sample Processors) can be supplemented with a 6.2148.010 Remote Box. This adapter box connects to an MSB connector on the instrument and provides a full 25-pin remote interface.

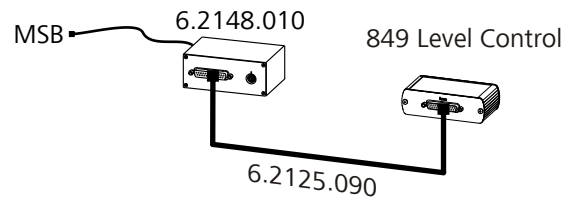


Figure 8 Remote connection 849 Level Control - Metrohm instrument with Remote Box

The 6.2148.010 remote box is also equipped with a fully functioning MSB connector, which means that the complete array of MSB connectors continues to be available for use.

4 Operation and maintenance

4.1 Sensor monitoring via remote interface

The 849 Level Control is connected to the remote interface of a suitable Metrohm device. Metrohm Sample Processors, ProflC and Titrando systems can scan the input lines of the remote interface in one method run and thus check the status of one Level Control sensor.

A total of 8 lines (Inputs 0 to 7) are available. The 849 Level Control uses the remote lines Input 4, 5, 6, and 7. Input 2 can, depending on the configuration of the Level Control, be used as a bus.

Input lines

The 8 input lines of the remote socket can be scanned in a method run with the **SCAN** command. The method run will thereby be stopped until the prescribed bit pattern matches the actual status of the input lines. An 8-digit bit pattern must be set for this purpose in which each bit is assigned to one input line. In the event of a match, the method run will be resumed with the next command.

Input	7 6 5 4 3 2 1 0
Bit	7 6 5 4 3 2 1 0

(The bits are always numbered from right to left)

Example:

*******0**** expects an inactive input line 2 (0=not activated). This line is set by the 849 Level Control, in the event that a sensor signal has been set.

Input lines that are of no interest or for which no defined condition can be predicted should also be masked with an asterisk (*).

SCAN command

Sensor	Bit pattern	Function	Canister
Overall status ok	*****0**	No sensor signal active	
Overall status "active"	*****1**	At least one sensor signal active	
Full level 1 ok	***0****	Overflow monitoring 1: everything ok	
Full level 1 "active"	***1****	Overflow warning at sensor 1	full



Sensor	Bit pattern	Function	Canister
	***1*1**	Overflow warning at sensor 1	full
Full level 2 ok	**0*****	Overflow monitoring 2: everything ok	
Full level 2 "active"	**1*****	Overflow warning at sensor 2	full
	11**	Overflow warning at sensor 2	full
Empty level 1 ok	*0*****	Empty level monitoring 1: everything ok	
Empty level 1 "active"	*1*****	Empty level warning at sensor 1	empty
	*1***1**	Empty level warning at sensor 1	empty
Empty level 2 ok	0*****	Empty level monitoring 2: everything ok	
Empty level 2 "active"	1*****	Empty level warning at sensor 2	empty
	1***1**	Empty level warning at sensor 2	empty

4.2 Maintenance

The 849 Level Control is maintenance-free to a large extent.

If one of the stainless steel sensors exhibits traces of corrosion, then the sensor rod can be rubbed clean with a cloth and a conventional cleaning agent..

5 Technical specifications

5.1 Measuring inputs

4 sensor connectors 8-pin Mini DIN sockets

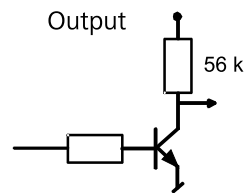
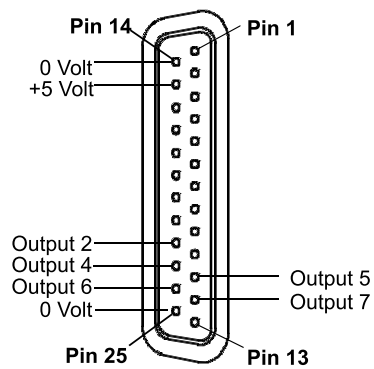
Switching threshold 1 μ S

Measurement frequency ca. 1.7 kHz

5.2 Remote socket

Max. switching current 20 mA

Max. collector voltage 40 V





5.3 Supply

<i>Voltage</i>	5.0 V
<i>Power consumption</i>	< 15 mA

5.4 Ambient temperature

<i>Nominal function range</i>	+5...+45 °C
<i>Storage</i>	-20 ...+60 °C
<i>Transport</i>	-40 ...+60 °C

5.5 Dimensions and material

<i>Height</i>	32 mm
<i>Width</i>	106 mm
<i>Depth</i>	61 mm
<i>Weight</i>	148 g (without accessories)
<i>Materials</i>	
<i>Housing</i>	Aluminum coated (Al Mg 1½ h)

6 Accessories

Up-to-date information on the scope of delivery and optional accessories for your product can be found on the Internet. You can download this information using the article number as follows:

Downloading the accessories list

- 1 Enter <https://www.metrohm.com/> into your Internet browser.
- 2 Enter the article number (e.g. **Variable Produktnummer**) into the search field.
The search result is displayed.
- 3 Click on the product.
Detailed information regarding the product is shown on various tabs.
- 4 On the **Included parts** tab, click on **Download the PDF**.
The PDF file with the accessories data is created.



NOTICE

Once you have received your new product, we recommend downloading the accessories list from the Internet, printing it out and keeping it together with the manual for reference purposes.



Index

A

Aqueous media 1

B

Basic setting 6

Bit pattern 11

C

Configuration 6

Corrosion 12

D

DIP switches 6

E

Electronic print 6

Electrostatic charge 4

Empty level 8

Empty level monitoring 9

F

Fill level 8

Full level 8

I

Input line 11

M

Measuring inputs 13

Model versions 1

Monitoring 6

MSB connector 10

N

Nonaqueous media) 1

O

Overall status 7

Overflow 7

Overflow monitoring 9

P

Professional IC 10

R

Reference 8

Remote Box 10

Remote cable 9

Remote connector 5

Remote interface 11

Remote socket 13

S

Safety instructions 3

Sample Processor 9, 10

SCAN command 11

Screw cap adapter 8

Selective operating mode 7

Sensor 1

Sensor connection 6

Sensor connector 5

Sensor rod 8

Service 3

Stackable plug 10

Stainless steel 1

Supply 14

T

Test plugs 8

Titrande 10

U

Ultrapure water 1