IQ Sensor Net MIQ/C6

IQ Sensor Net SIX-CHANNEL CURRENT OUTPUT MODULE

YSI

a **xylem** brand

For the most recent version of the manual, please visit www.ysi.com.

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MIQ/C6 - List of contents

1 Overview

1.1 How to use this component operating manual

Structure of the
**IQ SENSOR NET**
operating manual
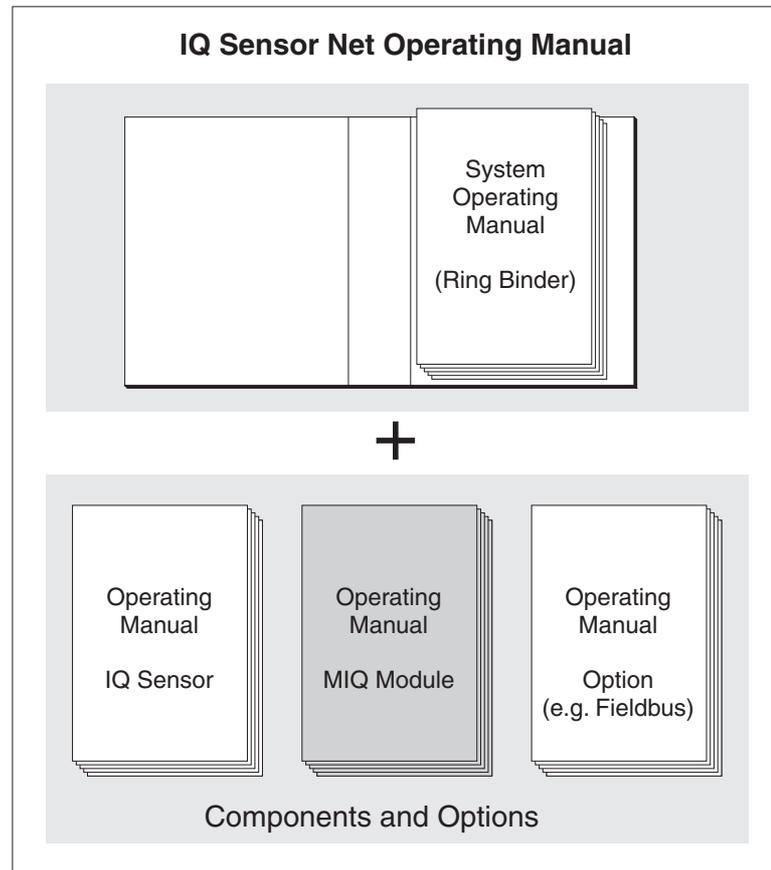
Fig. 1-1   Structure of the IQ SENSOR NET operating manual

The IQ SENSOR NET operating manual has a modular structure like the IQ SENSOR NET itself. It consists of a system operating manual and the operating manuals of all the components used.

Please file this component operating manual into the ring binder of the system operating manual.

1.2   Features of the MIQ/C6

General characteristics

The MIQ/C6 output module has six current outputs. They can be programmed as:

- Analog output (recorder)
- PID regulator

You can link current outputs to sensors. The linked current outputs can be used to monitor sensors or for control purposes.

With the standard MIQ module housing, the MIQ/C6 has the same characteristics as all MIQ modules regarding stability, leakproofness and weather resistance. It also provides the same wide variety of installation options (stacked mounting, canopy mounting, tophat rail mounting, etc.).

Terminal strip

The MIQ/C6 has the following electrical connections on the terminal strip inside the housing:

- 6 x current output
- 2 x SENSORNET connection

2 Safety instructions

2.1 Safety information

2.1.1 Safety information in the operating manual

This operating manual provides important information on the safe operation of the product. Read this operating manual thoroughly and make yourself familiar with the product before putting it into operation or working with it. The operating manual must be kept in the vicinity of the product so you can always find the information you need.

Important safety instructions are highlighted in this operating manual. They are indicated by the warning symbol (triangle) in the left column. The signal word (e.g. "CAUTION") indicates the level of danger:

	WARNING
⚠	**indicates a possibly dangerous situation that can lead to serious (irreversible) injury or death if the safety instruction is not followed.**

	CAUTION
⚠	**indicates a possibly dangerous situation that can lead to slight (reversible) injury if the safety instruction is not followed.**

NOTE
indicates a situation where goods might be damaged if the actions mentioned are not taken.

2.1.2 Safety signs on the product

Note all labels, information signs and safety symbols on the product. A warning symbol (triangle) without text refers to safety information in this operating manual.

2.1.3 Further documents providing safety information

The following documents provide additional information, which you should observe for your safety when working with the measuring system:

● Operating manuals of other components of the IQ SENSOR NET system (power supply modules, controller, accessories)

● Safety datasheets of calibration and maintenance equipment (e.g. cleaning solutions).

2.2 Safe operation

2.2.1 Authorized use

The authorized use of the MIQ/C6 consists of providing current outputs in the IQ SENSOR NET. Only the operation according to the instructions and technical specifications given in this operating manual is authorized (see chapter 6 TECH-NICAL DATA). Any other use is considered unauthorized.

2.2.2 Requirements for safe operation

Note the following points for safe operation:

● The product may only be operated according to the authorized use specified above.

● The product may only be operated under the environmental conditions mentioned in this operating manual.

● The product may only be supplied with power by the energy sources mentioned in this operating manual.

● The product may only be opened if this is explicitly described in this operating manual (example: connecting electrical lines to the terminal strip).

2.2.3 Unauthorized use

The product must not be put into operation if:

● it is visibly damaged (e.g. after being transported)

● it was stored under adverse conditions for a lengthy period of time (storing conditions, see chapter 6 TECHNICAL DATA).

2.3 User qualification

Target group   The IQ SENSOR NET system was developed for online analysis. Some mainte-nance activities, e.g. changing the membrane caps in D.O. sensors, require the safe handling of chemicals. Thus, we assume that the maintenance personnel is familiar with the necessary precautions to take when dealing with chemicals as a result of their professional training and experience.

Special user qualifications   The following installation activities may only be performed by a qualified electri-cian:

● Connection of the MIQ/C6 to the power supply.

● Connection of external, line voltage-carrying circuits to relay contacts (see module manual of the relay output module).

3 Installation

3.1 Scope of delivery

- MIQ module
- Accessory set, including:
  - 4 x cable glands (clamping range 4.5-10 mm) with seals and blind plugs
  - 4 x ISO blind nuts M4 with suitable cheese-head screws and plain washers
  - 2 x countersunk screws M3x6 to close the module lid
    (+ 2 replacement screws)
  - 1 x contact base with fixing screws
- Accessory kit, including
  - 1 x extension M16x1.5 to M20x1.5 with O-ring
  - 1 x cable gland
- Operating manual.

3.2 Installation in the IQ SENSOR NET

The IQ SENSOR NET provides a number of options for integrating the MIQ/C6 mechanically and electrically in the system (stacked mounting, distributed mounting, etc.). The various types of installation are described in detail in the INSTALLATION chapter of the system operating manual.

3.3 Electrical connections: General instructions

Cable glands All electric cables are fed from below via prepared openings in the enclosure of the MIQ/C6. Cable glands with different clamping ranges are included with the MIQ/C6 to provide sealing between the cable and enclosure as well as for strain relief. Select the matching cable gland for the respective cable diameter:

- **Small**, clamping range 4.5 to 10 mm. This cable gland is suitable for all IQ SENSOR NET sensor cables.

sealing ring 20 x 15 x 1 mm

cable gland M16

blind plug
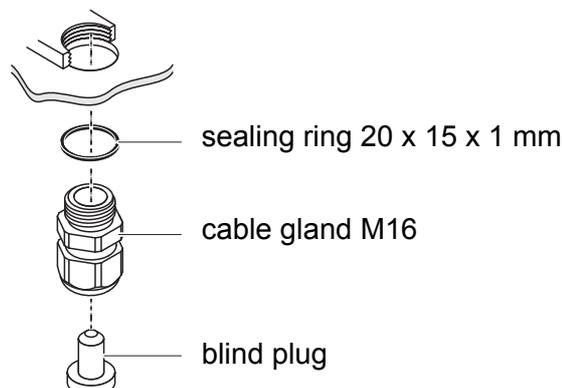
● **Large**, clamping range 7 to 13 mm. This cable gland is required for cable sheaths with an outside diameter of more than 10 mm and is screwed into the enclosure via an extension piece.

sealing ring 20 x 15 x 1 mm

extension piece M16/M20

sealing ring 24 x 19 x 2 mm
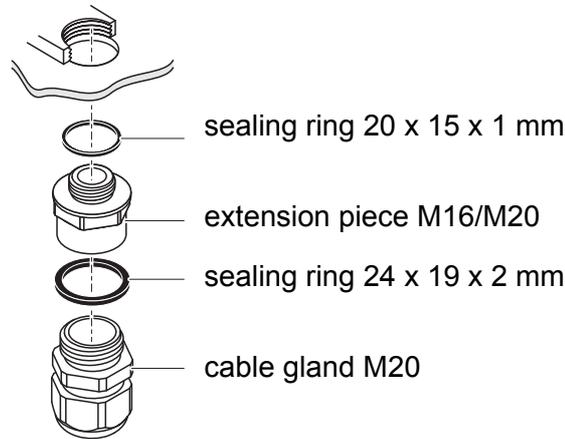
cable gland M20

If necessary, you can order more large cable glands in a set of 4 pieces (Model EW/1, Order No. 480 051).

General installation instructions

Observe the following points when attaching connecting wires to the terminal strip

● Shorten all wires to be used to the length required for the installation

● Always fit all the ends of the wires with wire end sleeves before connecting them to the terminal strip

● Any wires that are not used and project into the enclosure must be cut off as closely as possible to the cable gland.

● Screw a small cable gland with sealing ring into each remaining free opening and close it with a blind plug.

3.4   Connections to the current outputs

Materials required

● Wire end sleeves, suitable for the connecting wires, with suitable crimping tool

● 4 x cable gland with sealing ring (scope of delivery MIQ/C6)

Tools

● Cable stripping knife

● Wire stripper

● Phillips screw driver

● Small screw driver

Connecting lines to the terminal strip

1   Open the module.

2   Open the dummy screw fitting under the required connection. Keep the dummy screw fitting for possible later modifications.
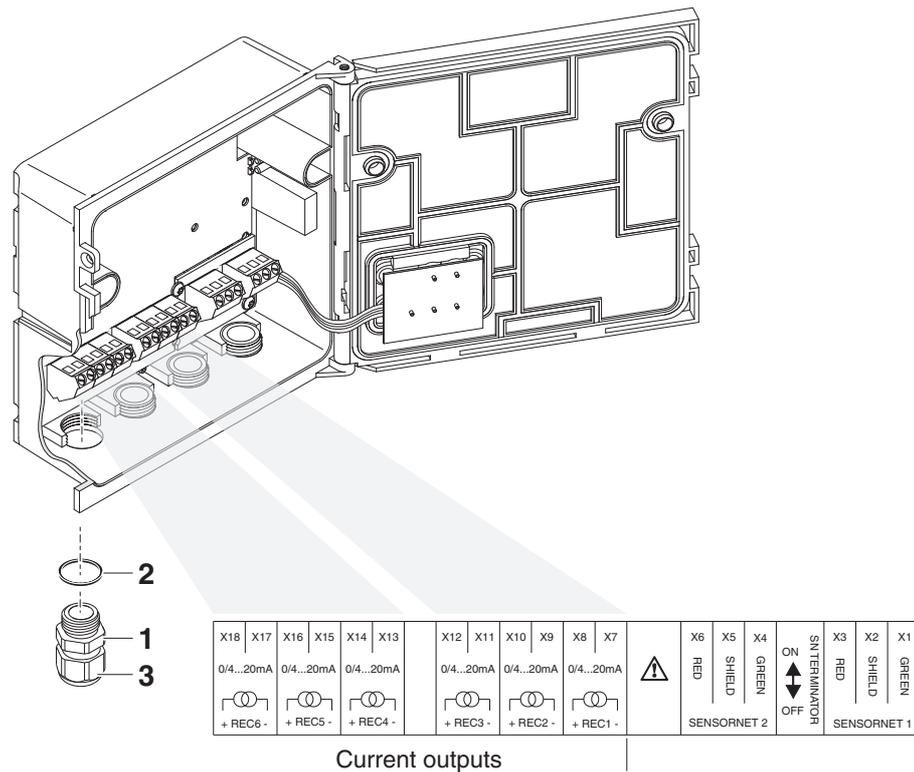
Fig. 3-1   Terminal strip with the current connections

3   Screw the cable gland (pos. 1 in Fig. 3-1) with the sealing ring (pos. 2) into the module housing.

4   Loosen the coupling ring (pos. 3 in Fig. 3-1).

5   Feed the line through the cable gland in the module housing.

6   Connect the wires to the terminal strip. While doing so, pay attention to the specifications on the label located under the terminal strip.

7   Tighten the coupling ring (pos. 3 in Fig. 3-1).

8   Close the module.

4   Settings

The MIQ/C6 module has six current outputs that supply a current that depends on the measured value.

On the IQ SENSOR NET terminal, you can

● assign names to the outputs.

● link outputs with sensors

● delete links of outputs with sensors

● adjust outputs

● check the condition of the outputs

Functions of current outputs

Current output

● *Recorder*

● *PID controller*

● *Fixed current value*

The following informations are given in the system operating manual for your IQ SENSOR NET system:

● general operating principles

● settings for the outputs

5   Maintenance and cleaning

5.1   Maintenance

The MIQ/C6 requires no special maintenance. The general maintenance of IQ SENSOR NET components is described in the IQ SENSOR NET system operating manual.

5.2   Cleaning

The cleaning of IQ SENSOR NET components is described in the IQ SENSOR NET system operating manual.

6   Technical data

6.1   General data

Dimensions

Front view:

Rear view:

Side view:

144.0

144,0

115.0

70.0

45.0

72.0

52.2

11.0

16.5

Stack mounting:

100

148
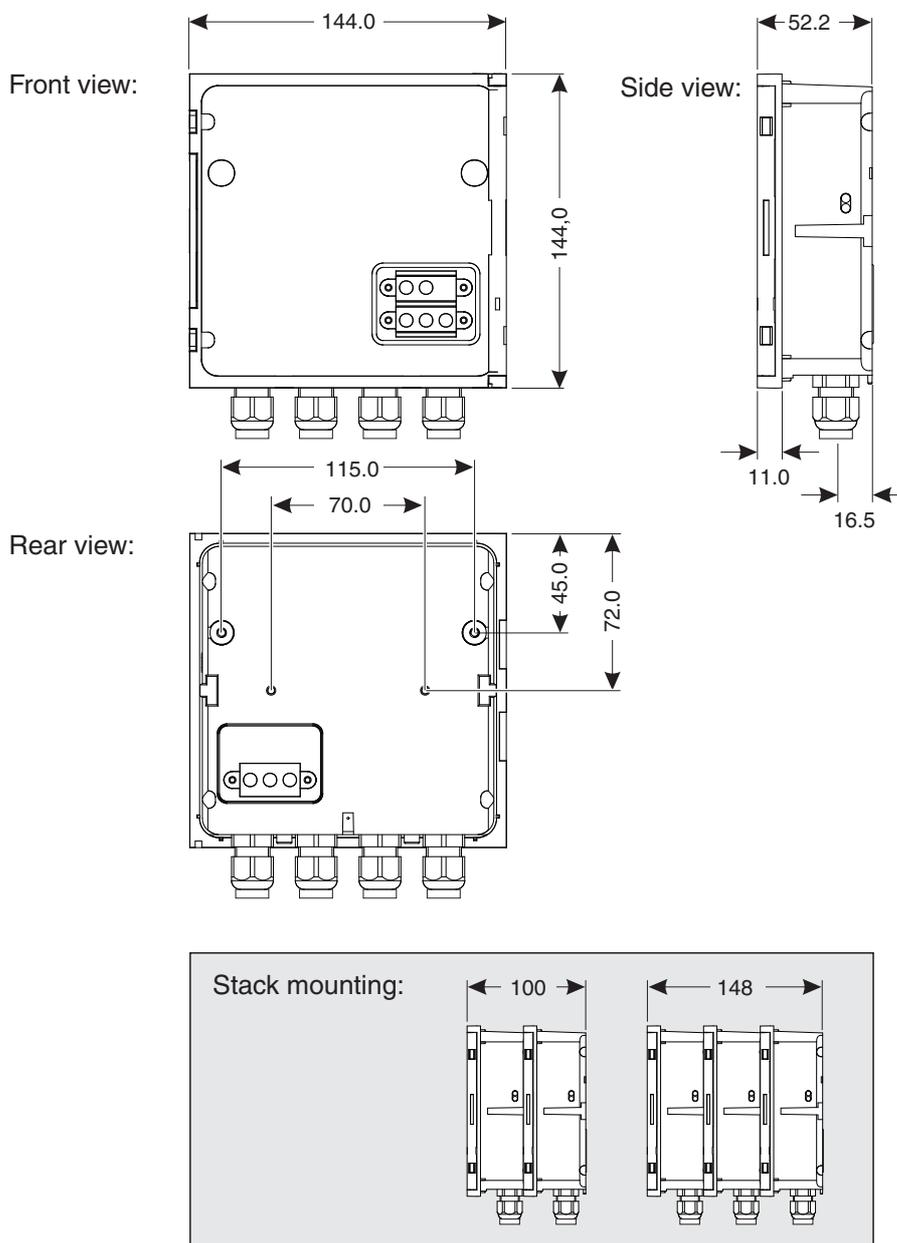
Fig. 6-1   Dimension drawing of MIQ module (dimensions in mm)

Mechanical structure	Maximum number of MIQ modules in a module stack	3
	Enclosure material	Polycarbonate with 20 % glass fiber

	Weight	Approx. 0.5 kg
	Type of protection	IP 66 (not suitable for direct conduit connection).
Cable glands	Suitable for cable sheath diameter	4.5 - 10 mm or 9.0 - 13 mm

Ambient conditions	Temperature	
	Mounting/installation/maintenance	+ 5 °C ... + 40 °C (+ 41 ... +104 °F)
	Operation	- 20 °C ... + 55 °C (- 4 ... + 131 °F)
	Storage	- 25 °C ... + 65 °C (- 13 ... + 149 °F)

	Relative humidity	
	Mounting/installation/maintenance	≤ 80 %
	Yearly average	≤ 90 %
	Dew formation	Possible

	Site altitude	Max. 2000 m above sea level

Meter safety	Applicable norms	– EN 61010-1 – UL 61010-1 – CAN/CSA C22.2#61010-1

EMC product and system character- istics	EN 61326	EMC requirements for electrical resources for control technology and laboratory use – Resources for industrial areas, intended for indispensable operation – Interference emission limits for resources of class A
	System lightning protection	Noticeably extended qualitative and quantitative protective characteristics as opposed to EN 61326
	FCC, class A	

6.2   MIQ/C6

Electrical data	Nominal voltage	Max. 24 VDC via the IQ SENSOR NET (for details, see the TECHNICAL DATA chapter of the IQ SENSOR NET system operating manual)
	Power consumption	3 W
	Protective class	II
	Overvoltage category	II

Terminal connections	IQ SENSOR NET connections	2 Additional connectable SENSORNET terminator (terminating resistor)
	Number of current outputs	6
	Terminal type	Screw-type terminal strip, accessible by opening the lid
	Terminal ranges	Solid wires: 0.2 ... 4.0 mm^2 AWG 24 ... 12 Flexible wires: 0.2 ... 2.5 mm^2
	Line cross-section of cables carrying mains voltage	Europe: 1.5 ... 4.0 mm^2 USA: AWG 14 ... 12
	Cable feeds	4 cable glands M16 x 1.5 on the underside of the module

Current outputs	Output	Physically separated from the IQ SENSOR NET
	Output current	Can be switched between 0 - 20 mA and 4 - 20 mA In the case of errors, can be set to: 0 ... 21 mA
	Max. initial output voltage	15 V, in the case of missing or incorrect burden
	Max. load	500 Ω
	Accuracy	0.3 % ± 50 μA

Functions	Programmable as:
	– Analog output (recorder)
	– PID regulator
	– Output with fixed current value (for test purposes)

7 Lists

7.1 Explanation of the messages

In this chapter you will find a list with all the message codes and corresponding message texts that may occur in the log book of the IQ SENSOR NET system for the MIQ/C6 output module.

Information about

● Contents and structure of the log book and

● Structure of the message code

can be found in the LOG BOOK chapter of the IQ SENSOR NET system operating manual.

All message codes of the MIQ/C6 output module end with the number, "421".

7.1.1 Error messages

Message code	Message text
EA4421	*Current output range undercut* ** Check process* ** Check settings and, if necessary, change them*
EA5421	*Current output range exceeded* ** Check process* ** Check settings and, if necessary, change them*
EI3421	*Burden resistor too large (> 500 Ohm)* *or current loop interrupted* ** Check burden, terminal connections and connection lines*

7.1.2 Informative messages

The MIQ/C6 output module does not send informative messages.

8   Contact Information

8.1   Ordering & Technical Support

Telephone: (800) 897-4151
                      (937) 767-7241
                      Monday through Friday, 8:00 AM to 5:00 PM ET

Fax: (937) 767-1058

Email: info@ysi.com

Mail: YSI Incorporated
                      1725 Brannum Lane
                      Yellow Springs, OH 45387
                      USA

Internet: www.ysi.com

When placing an order please have the following information available:

YSI account number (if available)	Name and Phone Number
Model number or brief description	Billing and shipping address
Quantity	Purchase Order or Credit Card

8.2   Service Information

YSI has authorized service centers throughout the United States and Internationally. For the nearest service center information, please visit www.ysi.com and click 'Support' or contact YSI Technical Support directly at 800-897-4151.

When returning a product for service, include the Product Return form with cleaning certification. The form must be completely filled out for an YSI Service Center to accept the instrument for service. The Product Return form may be downloaded at www.ysi.com and clicking on the 'Support' tab.

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1) The tissue in plants that brings water upward from the roots;
2) a leading global water technology company.

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