

USER MANUAL



CP SYSTEM INTERFACE UNIT

REVISION B

**REVISIONS**

PUBLISHED	REVISION	NOTES
20.09.2023	A	Issued for release
03.07.2025	B	New profile and added technical protocol description



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1 INTRODUCTION

1.1 PURPOSE AND SCOPE

This document outlines and defines the configuration and operation of the CP System Interface Unit.

The manual is to be used by trained and competent personnel only.

1.2 ABBREVIATIONS

ABBREVIATION	DESCRIPTION
ESD	Electrostatic Discharge
IP	Internet Protocol
PCB	Printed Circuit Board
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
CP	Cathodic Protection
EEPROM	Electrically Erasable Programmable Read Only Memory

1.3 SUPPLIER CONTACT INFORMATION

Ixys AS

Langmyra 11

4344 Bryne

Norway

+47 51 42 22 22

post@ixys.no

<https://ixys.no>

1.4 DOCUMENT REFERENCES

DOCUMENT NUMBER	DESCRIPTION
101830-ICS-MC-DWG-0001	General Arrangement Drawing
101830-ICS-PD-DAS-001	Datasheet



2 HEALTH, SAFETY AND ENVIRONMENT

2.1 GENERAL

Safety Notes and General Precautions shall be presented to all personnel concerned prior to testing, operation, maintenance, and repair. The operations shall be performed by the responsible engineer/supervisor. The personnel using this equipment must have knowledge of this type of equipment and have familiarized themselves with the applicable procedures and manuals for this product.

2.2 SAFETY MESSAGE LEVELS

Safety message level		Indication
	DANGER:	A hazardous situation which, if not avoided, will result in death or serious injury
	WARNING:	A hazardous situation which, if not avoided, could result in death or serious injury
	CAUTION:	A hazardous situation which, if not avoided, could result in minor or moderate injury or damage to equipment
	Electrical Hazard:	The possibility of electrical risks if instructions are not followed in a proper manner
Note:		A potential situation which, if not avoided, could result in an undesirable result or state. A practice not related to personal injury



3 TECHNICAL INFORMATION AND DATA

3.1 TECHNICAL DESCRIPTION

The CP Interface Unit is designed to be used subsea down to 3000m. It reads the values from external CP probes and transmits it digitally by RS232 or RS485.

3.2 TECHNICAL DATA

Manufacturer	Ixys AS
Ixys part number	101830
Description	CP System Interface Unit
Weight in air	~1000 g
Weight in water	~900 g
Dimensions	194 x Ø40 mm
Supply voltage	22-26 V DC
Power consumption	~1 W
Depth rating	3000 m
Resolution	15 bit
Communication	RS232. RS485
Default baud rate	57600
Connector for communication	Glenair 5507-1508
Connector for CP probes	Subconn BCRI504F



4 HARDWARE DESCRIPTION

4.1 DRAWING

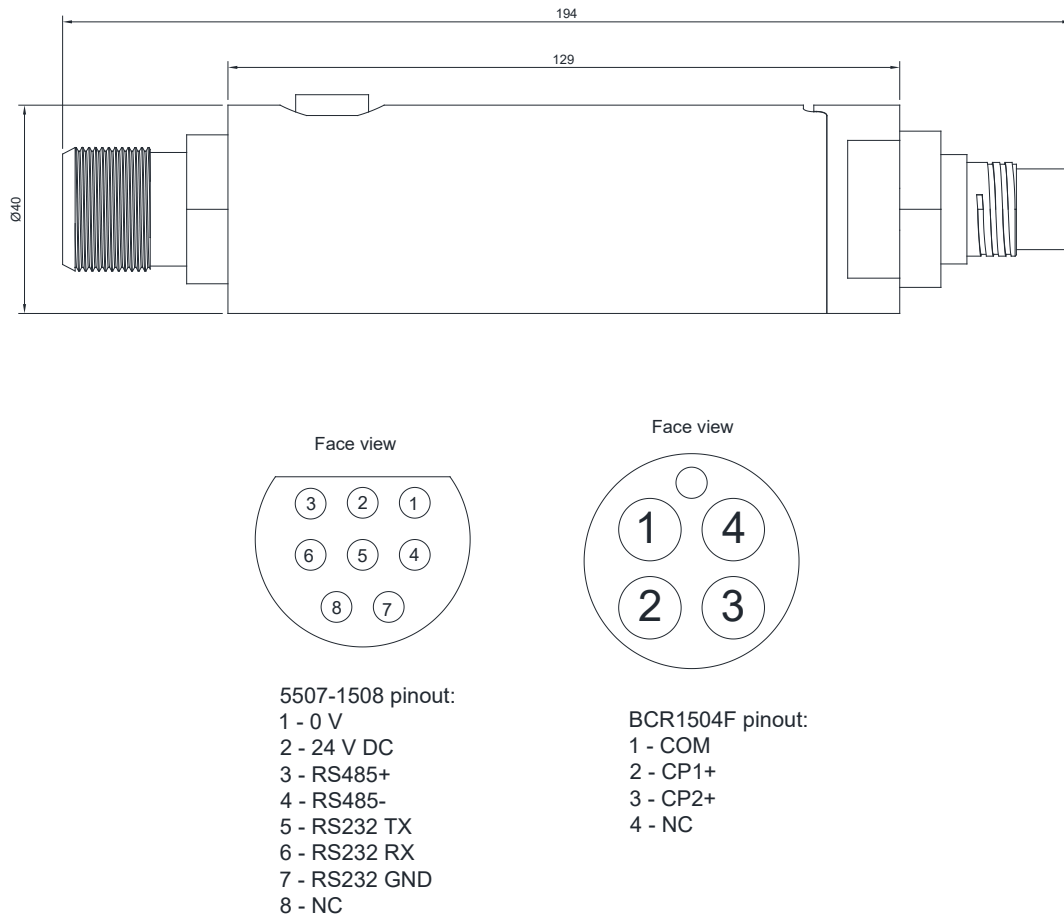


Figure 1 - Dimensions and pinout



5 FUNCTIONAL DESCRIPTION

5.1 COMMUNICATION

The communication is transmitted over RS232 and RS485 serial communication. Both communication interfaces can be used simultaneously.

Multiple ASCII based protocols can be selected or the industrial standard Modbus protocol can be used.

5.1.1 FEATURES

- Raw and Calibrated sensor readout
- High Resolution

5.1.2 PROTOCOL DESCRIPTION

The following is the technical description of the protocols available. See page 12 for a functional description.

1. Raw Value

String: \$S,[16 bit Raw Value #1],[16 bit Raw Value #2],[Checksum],E, CR LF

Checksum is the XOR value of "S, Value #1 and Value #2

Example String: \$S,12450,12550,503,E, CR LF

2. Calibrated

String: \$F,[Scaled and filtered Value with two decimals #1],[Scaled and filtered Value with two decimals #2],E, CR LF

No checksum on this protocol

Example String: \$F,102.23,E, CR LF

3. Calibrated Rounded

String: \$S,[Scaled and filtered rounded Value #1],[Scaled and filtered rounded Value #2],Checksum,E, CR LF

Checksum is the XOR value of "S, Value #1 and Value #2

Example String: \$S,123,456,480,E, CR LF

4. Modbus

Modbus RTU



5.2 CONFIGURATION

5.2.1 CONNECTING TO THE CP INTERFACE UNIT

The CP Interface Unit can be configured in many ways, and all parameters must be set correctly to establish communication. In case the parameters are unknown, there is a simple way to find the current configuration. When power is applied, a “welcome message” is transmitted where the most important settings are shown.

The welcome message is always sent at 9600bps.

Use any type of text based serial terminal application and listen for this welcome message when power is applied.

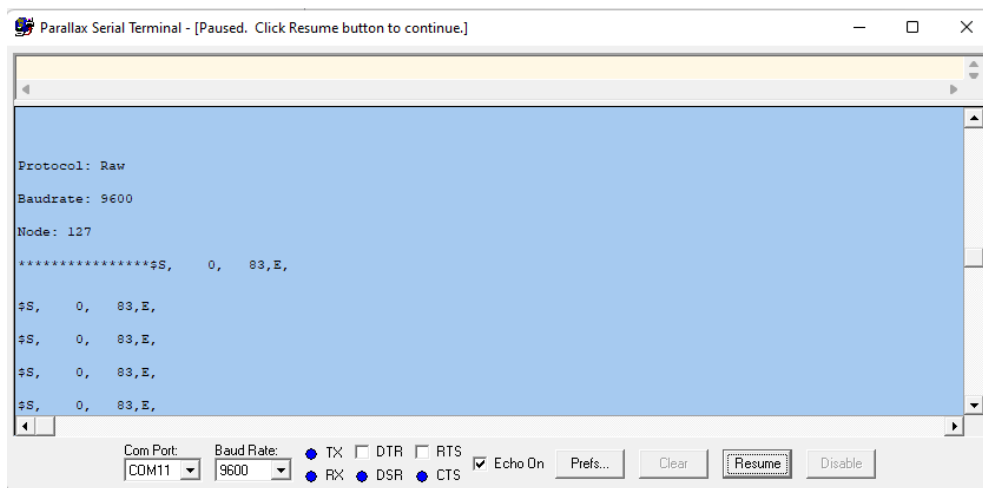


Figure 2 – Welcome message example and following communication string



5.2.2 CONFIGURE CP INTERFACE UNIT WITH ASCII PROTOCOL

All protocols except the Modbus can be configured from a terminal application. To enter the configuration menu, type “menu”. The menu shown below will then be sent back to the terminal. Navigate the menu by typing the numbers shown.

When changes are made, type 9 for saving to EEPROM and 0 to restart for effect.

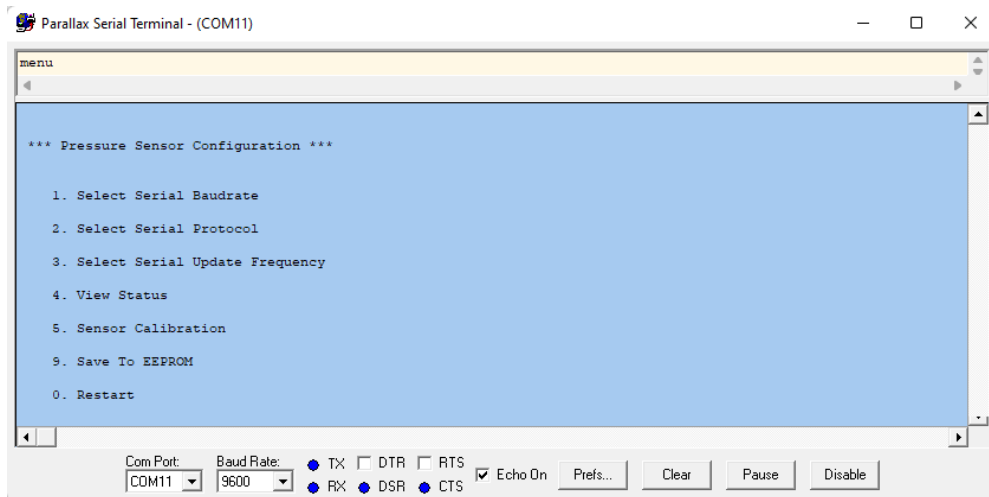


Figure 3 – Configuration menu

Serial number, firmware version, raw sensor and scaled values can be seen in the “View Status” submenu.

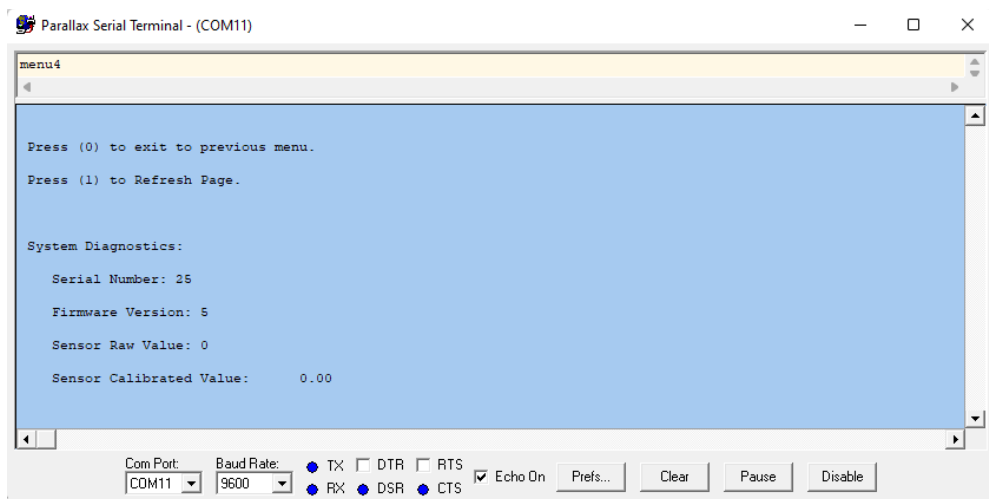


Figure 4 – View status



To calibrate the converter “scaled value”, enter the “Sensor Calibration” submenu and follow these steps:

1. Set the “Max Process Value” to the full range value of the sensor connected to the sensor input (or highest available from test equipment).
2. Set the “Min Process Value” to zero.
3. Set the “Calibrate Min” Value to current raw value (while no signal is applied to the converter).
4. Apply signal to the converter equal to the value set in “Max Process Value”.
5. Set the “Calibrate Max” value to the current raw value (while the max signal is still applied).
6. Go back to main menu and save to EEPROM.

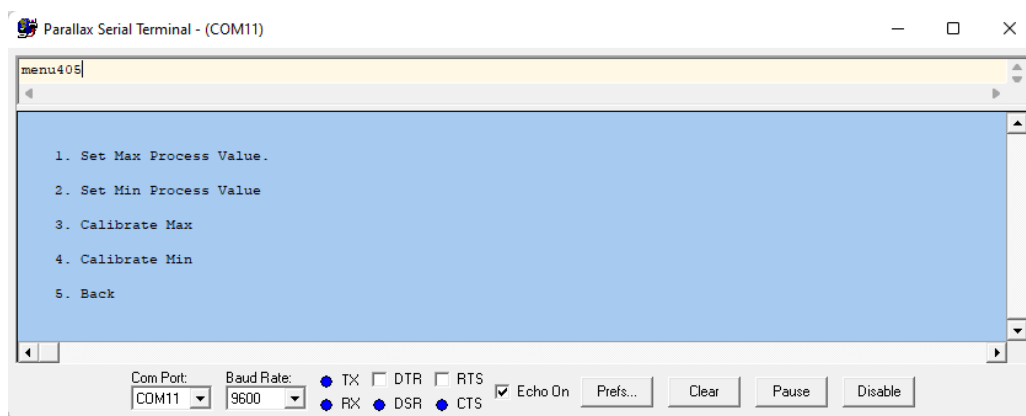


Figure 5 – Sensor calibration



These serial protocols are available to configure:

0. None

No data is sent.

1. Raw Value

The Raw value is sent at the configured interval.

2. Calibrated

The calibrated scaled value is sent at the configured interval.

3. Calibrated Rounded

The calibrated scaled value is sent at the configured interval. This protocol is used with the Ixys dedicated CP measurement application (baud rate at 57600 and interval at 10Hz).

4. Modbus

In this configuration, the sensor is not available from the terminal except for the welcome message. A Modbus application is needed to establish communication by request/respond method.

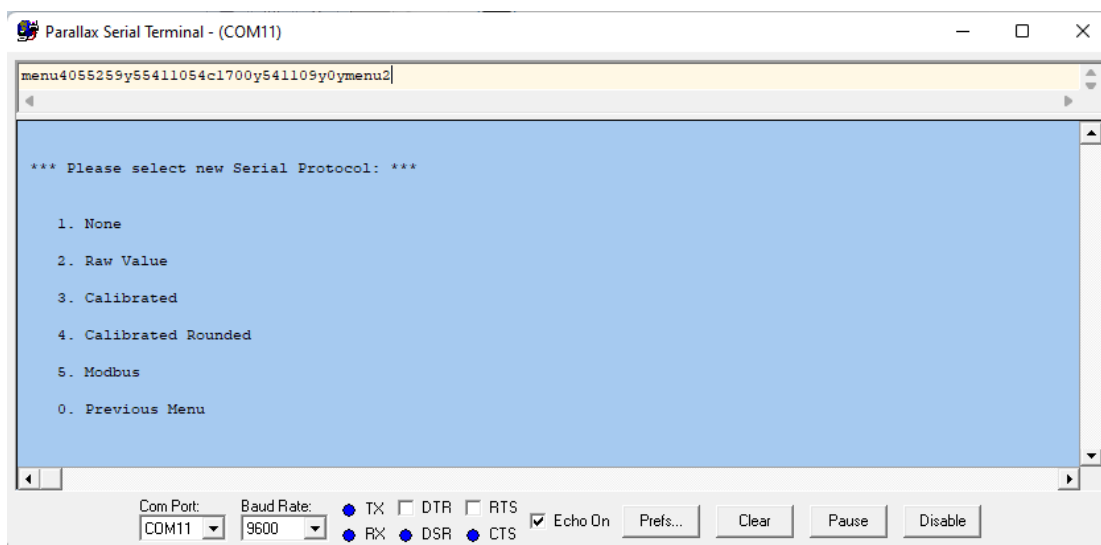


Figure 6 – Sensor calibration



5.2.3 CONFIGURE CP INTERFACE UNIT WITH MODBUS PROTOCOL

If the CP Interface Unit protocol is set to Modbus, then the unit will not respond to the menu command and a Modbus application must be used to establish communication. "Modbus Poll" is one flexible application for this purpose and is shown below.

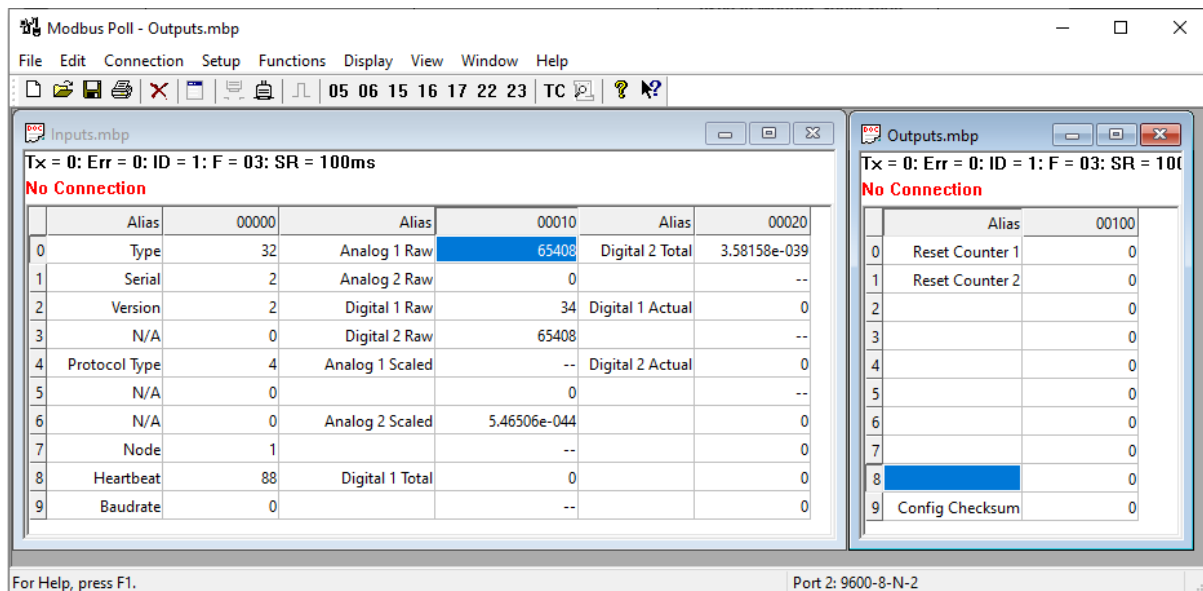


Figure 7 – Sensor calibration



5.3 CP SYSTEM SOFTWARE

The dedicated CP system software can be found on the [Ixys website](#).

To connect the CP software to the interface unit, click the “Connect” button. The software will then scan through all available com ports and look for the interface unit. If two probes are used, then click the “Dual Probes” checkbox to show an extra indicator.

Log entries can be entered into the textbox and will be stored to a log file when the “Log” button is clicked. A new log file is created every time the application is started.

A folder called “Ixys CP System” is created inside the Documents folder in Windows and the log file is stored there.

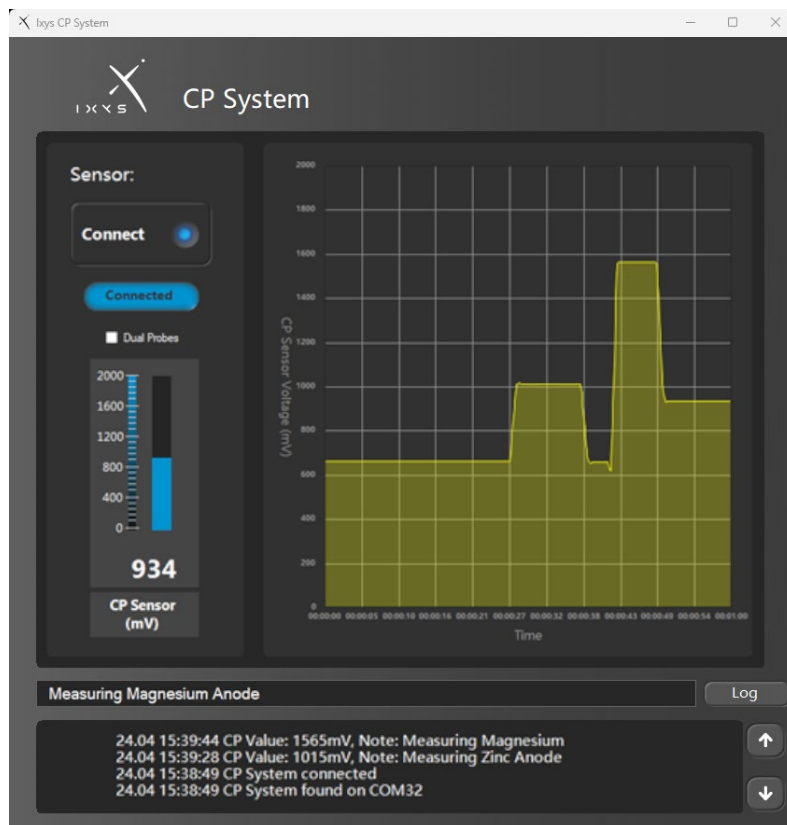


Figure 8 – CP System software

5.3.1 DDE LINK

The CP reading can be read from third party software applications running on the same computer using DDE-Link (i.e. the Options Vigra Overlay software). The DDE-Link parameters are: Server=“Ixys”, Topic=“CP”, Item=“CP” and Item=“CP2”.



6 REGISTERS

The following sections describe all registers that can be read or written either over Modbus.

6.1 DATATYPES

The following table describes the data types used. For 32-bit values two Modbus registers are used, where the first is the most significant.

Name	Size	Value Range
INT16	2 bytes	-32,768 to 32,767
UINT16	2 bytes	0 to 65,535
INT32	4 bytes	-2,147,483,648 to 2,147,483,647
UINT32	4 bytes	0 to 4,294,967,295
REAL32	4 bytes	1.2E-38 to 3.4E+38



6.2 HEADER REGISTERS

Protocol type, Slave address and Baud rate are automatically stored to EEPROM on change.

Address	Description	Default	Note	Data Type
0	PCB Type	46	CP Interface Unit Type = 46	UINT16
1	Serial Number	N/A	Last part of the serial number	UINT16
2	Firmware Version	N/A	Numeric part of firmware version	UINT16
3	Reserved	N/A		UINT16
4	Protocol type	1	0 = None 1 = Raw Value 2 = Calibrated 3 = Calibrated Rounded 4 = Modbus	UINT16
5	Reserved	N/A		UINT16
6	Reserved	N/A		UINT16
7	Slave Address	1	Modbus Slave Address	UINT16
8	Heartbeat	N/A	1 Hz counter. Rolls over to zero after 65535	UINT16
9	Baud rate	4	0 = 9600 1 = 19200 2 = 28800 3 = 38400 4 = 57600 5 = 115200 6 = 230400	UINT16



6.3 INPUT REGISTERS

Input registers are not writable.

Address	Description	Note	Data Type
10	Analog 1 Raw	0-32767 = 0 – 20 mA	UINT16
11	Analog 2 Raw		UINT16
12	Reserved		UINT16
13	Reserved		UINT16
14	Analog 1 Scaled MSB	Scaled analog inputs. To adjust settings, swap to protocol type 0 and use terminal menu to access scaling parameters.	REAL32
15	Analog 1 Scaled LSB		
16	Analog 2 Scaled MSB		REAL32
17	Analog 2 Scaled LSB		



7 TROUBLESHOOTING / FAULTFINDING

Symptom	Possible cause	Remedy
No welcome message presented	Not powered	• Verify power connections are according to specifications in section 3.2 and connected as in section 4.3
	Faulty PCB	• Contact Ixys support
No Modbus communication	Wrong Modbus slave address used	• Check "Node" in welcome message and verify correct used in Modbus application
Wrong values displayed in software	Converter not calibrated	• Calibrate converter
	Raw value used in software and wrong calibration used in software	• Check if raw value is used in software and perform calibration of sensor in software