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USER MANUAL

CP INTERFACE UNIT

PUBLISHED	REVISION	REVISION NOTE
20.09.2023	A	Released

PREPARED	CHECKED	APPROVED
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CONTENTS

1. INTRODUCTION

1.1.1. PURPOSE AND SCOPE

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

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

1.1.2. ABBREVIATIONS

Abbreviation	Description
EEPROM	Electrically Erasable Programmable Read Only Memory

1.1.3. SUPPLIER CONTACT INFORMATION

Ixys AS
Langmyra 11
N-4344 Bryne
Norway

+47 51 42 22 22
post@ixys.no
www.ixys.no

1.1.4. DOCUMENT REFERENCES

DOC No.	Description
101830-ICS-MC-DWG-0001	GA Drawing

2. HEALTH, SAFETY AND ENVIRONMENT

2.1.1. 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 performing this job shall have knowledge of this type of equipment and have familiarized themselves with the applicable procedures and manuals for this product.

2.1.2. USER HEALTH AND SAFETY

This product is made to operate under many circumstances and specific cases for health and safety will not be described here but must be considered by the equipment manufacturer or owner.

CAUTION:

- By remote operating equipment, there is always a risk of people accessing the equipment without notice to the operator and it is therefore important to establish safety procedures for the specific equipment involved.

2.1.3. QUALIFICATIONS AND TRAINING

It is essential that operating personnel have been given training and education how to operate and maintain the software and equipment described in this manual. It is also essential that operating personnel have general operational experience.

The personnel responsible for the operation of this system must be appropriately qualified. The operating company must do the following tasks:

- Define the responsibilities and competency of all personnel handling this system.
- Provide instruction and training.
- Ensure that the contents of the operating instructions have been fully understood by the personnel.

2.1.4. NON-COMPLIANCE RISKS

Failure to comply with all safety precautions can result in the following conditions:

- Death or serious injury due to electrical and mechanical influences
- Product damage
- Property damage
- Loss of all claims for damages

2.1.5. UNACCEPTABLE MODES OF OPERATIONS

The operational reliability of this product is only guaranteed when it is used as designated. The operating limits given in this manual shall not be exceeded under any circumstances.

3. TECHNICAL INFORMATION AND DATA

3.1.1. TECHNICAL DESCRIPTION

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

3.1.2. TECHNICAL DATA

Manufacturer	Ixys AS
Ixys Part Number	101830
Description	CP Interface Unit
Weight in air	~1000g
Weight in water	~900g
Dimensions	194 x Ø40mm
Supply Voltage	22-26VDC
Power Consumption	~1W
Depth Rating	3000m
Resolution	15bit (0-32767)
Communication	RS232, RS485
Default Baudrate	57600
Connector for communication	5507-1508 (pigtail PN: 5501-1508)
Connector for CP probes	Subconn BCR1504F (pigtail PN: MCIL4M)

3.1.3. COMMUNICATION

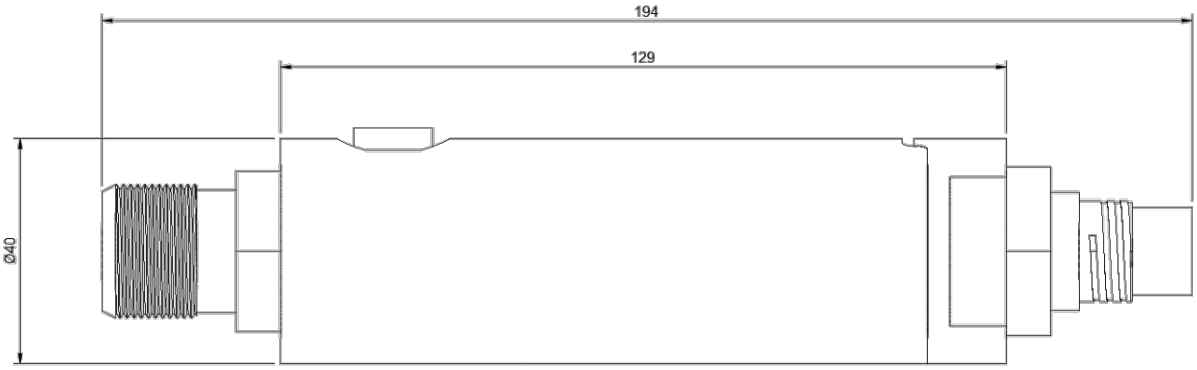
The communication is based on RS232 and RS485 Serial communication. Both communication interfaces can be used simultaneously.

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

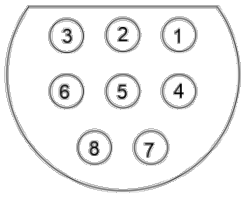
3.1.4. FEATURES

- Raw and Calibrated sensor readout
- High Resolution

4. DRAWING

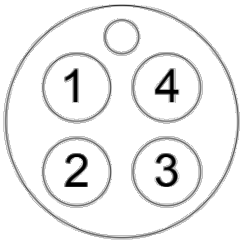


Face view



5507-1508 pinout:
1 - 0V
2 - 24VDC
3 - RS485+
4 - RS485-
5 - RS232 TX
6 - RS232 RX
7 - RS232 COM
8 - NC

Face view



BCR1504F pinout:
1 - COM
2 - CP1+
3 - CP2+
4 - NC

5. CONFIGURATION

5.1.1. CONNECTING TO CP INTERFACE UNIT

The CP Interface Unit can be configured in many ways, and all parameters must be set correct 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.

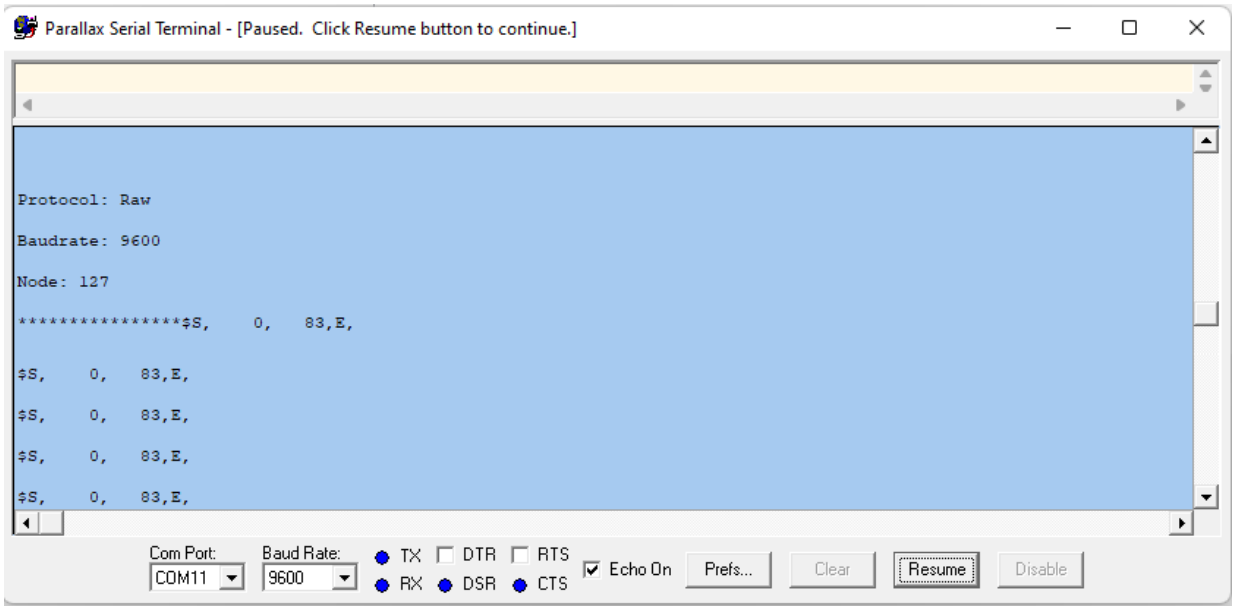


Figure 1 – Example of “Welcome message” and following communication string

5.1.2. 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.

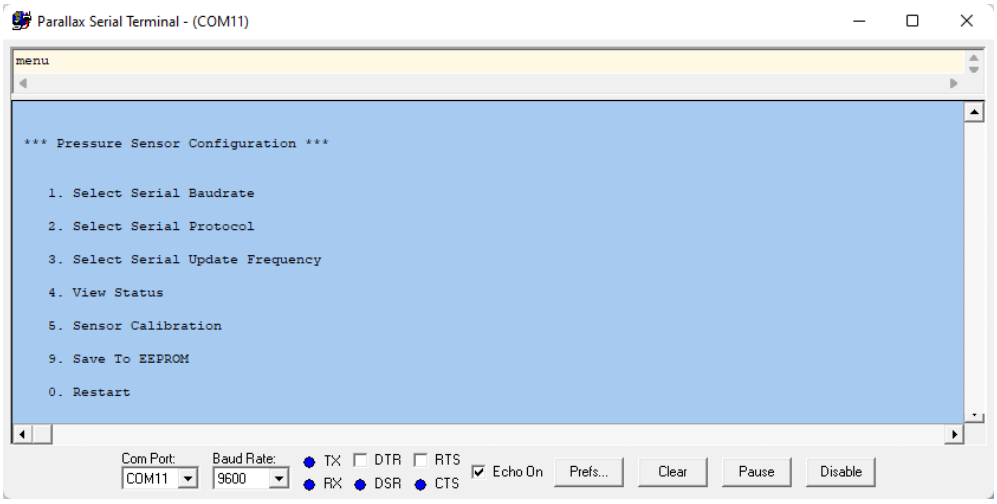


Figure 2 – Configuration menu

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

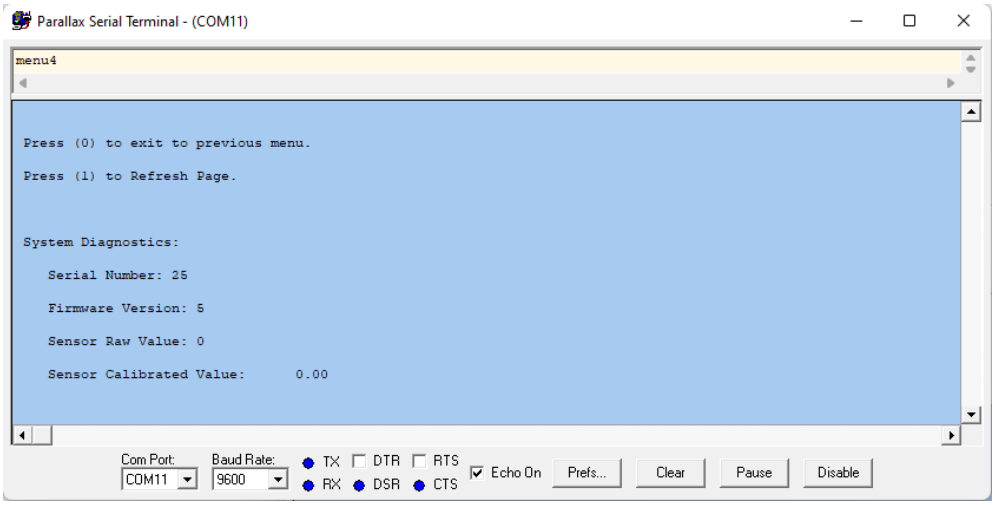


Figure 3 – View Status

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.**

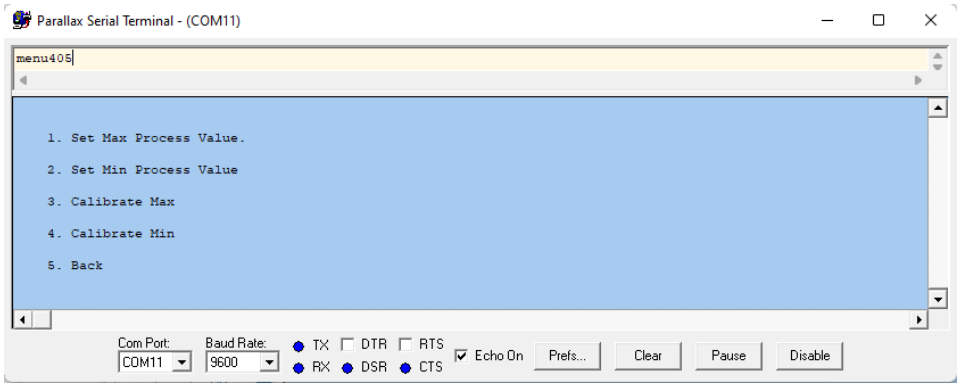


Figure 4 – Sensor Calibration

These serial protocols are available to configure:

1. **None**
   No Data is sent
2. **Raw Value**
   The Raw value is sent at the configured interval
3. **Calibrated**
   The calibrated scaled value is sent at the configured interval
4. **Calibrated Rounded**
   The calibrated scaled value is sent at the configured interval. This protocol is used with the Ixys dedicated CP measurement application (baudrate at 57600 and interval at 10Hz).
5. **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.

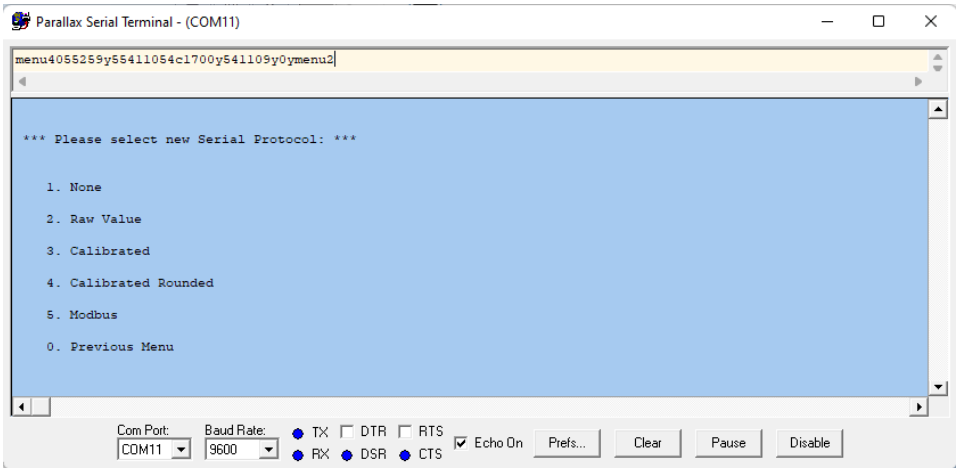


Figure 5 – Select Serial Protocol

5.1.3. 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.

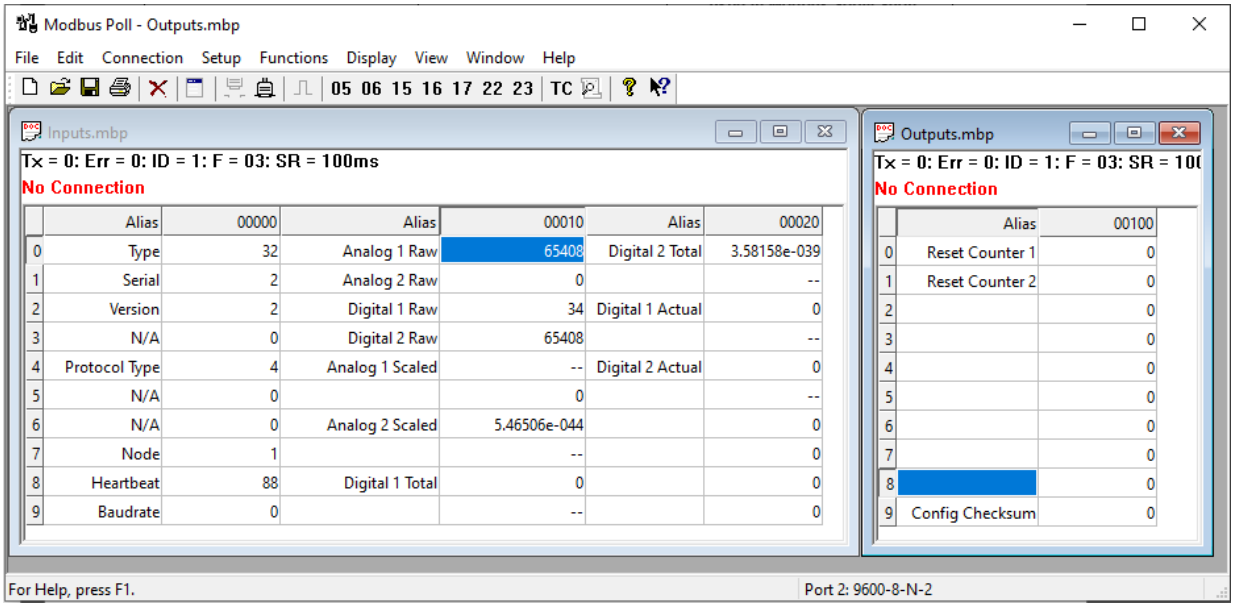


Figure 6 – Modbus Poll

DATA TYPES

The following table describes the data types used on iCsys boards. For 32bit values two Modbus registers is used where the first is the most significant.

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

HEADER REGISTERS

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

Address	Description	Note	Data Type
0	PCB Type	CP Interface Unit = 46	UINT16
1	Serial Number		UINT16
2	Firmware Version		UINT16
3	Reserved		UINT16
4	Protocol Type	0 = None 1 = Raw Value 2 = Calibrated 3 = Calibrated Rounded 4 = Modbus	UINT16
5	Reserved		UINT16
6	Reserved		UINT16
7	Slave Address	Modbus Slave Address (default = 1)	UINT16
8	Heartbeat	1Hz counter. Rolls over to zero after 65535	UINT16
9	Baudrate	0 = 9600 1 = 19200 2 = 28800 3 = 38400 4 = 57600 5 = 115200 6 = 230400	UINT16

INPUT REGISTERS

Address	Description	Note	Data Type
10	Analog 1 Raw	0-32767 = 0-20mA	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		

6. TROUBLESHOOTING / FAULTFINDING

The below list is meant to provide some hints for troubleshooting but does not guarantee that the issue is covered by the list. Operational feedback will be used to extend the list in future revisions.

Trouble shooting		
Symptom	**Possible Causes**	**Remedy**
No "Welcome message" presented	• **Wrong wiring**	• **Check pin configuration according to drawing (remember crossing Tx-Rx)**
	• **Lack of power**	• **Measure voltage applied to sensor and verify correct voltage according to specification**
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 in software**	• **Check if raw value is used in software and perform calibration of sensor in software**

7. SOFTWARE

Contact Ixys to get the installation files for the dedicated CP software application.

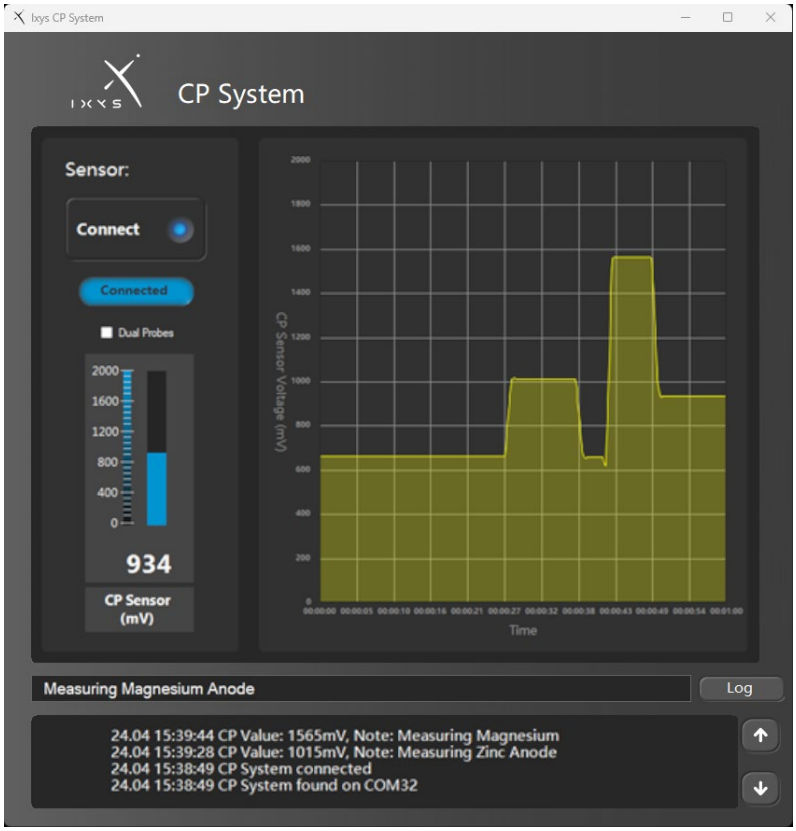
To connect the CP software to the interface unit, click the “Connect” button. The software will then scan through all available comports and look for the interface unit.

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.

The log file is later found under the document folder in windows and a folder named “Ixys CP System”.

A new log file is created every time the application is started.



DDE Link

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