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USER MANUAL

SUBSEA PRESSURE SENSOR RS232/CAN

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1. INTRODUCTION

1.1. PURPOSE AND SCOPE

This document outlines and defines the configuration and operation of the Subsea Pressure Sensor RS232/CAN.

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

1.2. ABBREVIATIONS

Abbreviation	Description
EEPROM	Electrically Erasable Programmable Read Only Memory

1.3. SUPPLIER CONTACT INFORMATION

iCsys AS
Postvegen 610
N-4351 Kleppe
Norway

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

1.4. DOCUMENT REFERENCES

DOC No.	Description
100812-ICS-EL-SCH-0001	Wiring Schematic

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

2.2. 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.

2.3. 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.

2.4. 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

2.5. 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. TECHNICAL DESCRIPTION

The Subsea Pressure Sensor RS232/CAN is designed to be used subsea down to 3000m. It reads pressure and transmit it digitally by multiple RS232 protocols and CAN-Bus.

3.2. TECHNICAL DATA

General	
Manufacturer	iCsys AS
iCsys Part Number	*Multiple Pressure Ranges Available
Description	Subsea Pressure Sensor RS232
Weight in air	TBD
Weight in water	TBD
Dimensions	164 x Ø40mm
Supply Voltage	20-28VDC
Power Consumption	~2W
Depth Rating	3000m
Resolution	15bit (0-32767)
Communication	RS232, CAN-Bus
Default RS232 Baudrate	9600
CAN-Bus bitrate	250 Kbps
Pressure port	¼” BSP or optional Medium Pressure

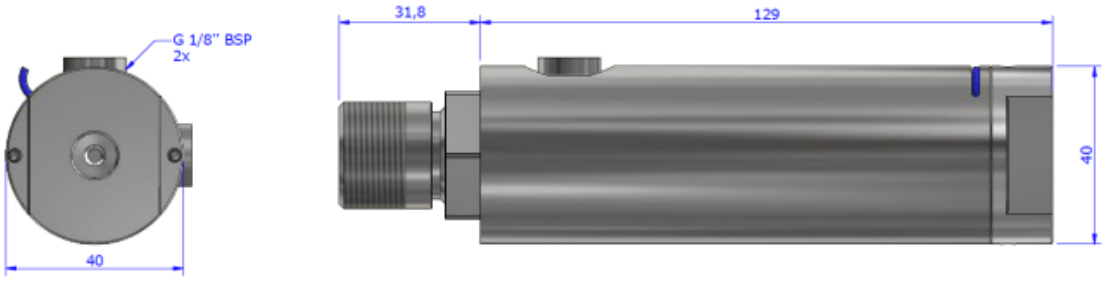
3.3. COMMUNICATION

The communication is based on RS232 Serial communication and CAN-Bus. Both communication interfaces can be used simultaneously.

3.4. FEATURES

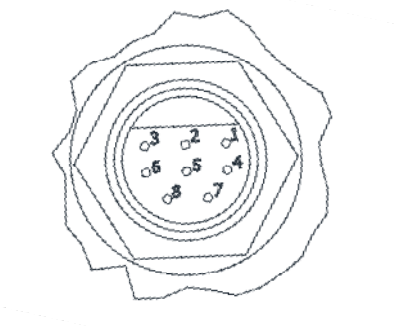
- Raw and Calibrated sensor readout
- High Resolution
- Compensation port for relative/differential pressure reading

4. DRAWING



GLENAIR 5507-1508

1: 0V
2: 24VDC
3: CAN-H
4: CAN-L
5: RS232 Tx
6: RS232 Rx
7: RS232 Com
8: NC



5. CONFIGURATION

5.1. CONNECTING TO SENSOR

The Subsea Pressure Sensor can be configured in many ways, and all parameters must be set correct to establish communication. In case the parameters are unknow, 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.

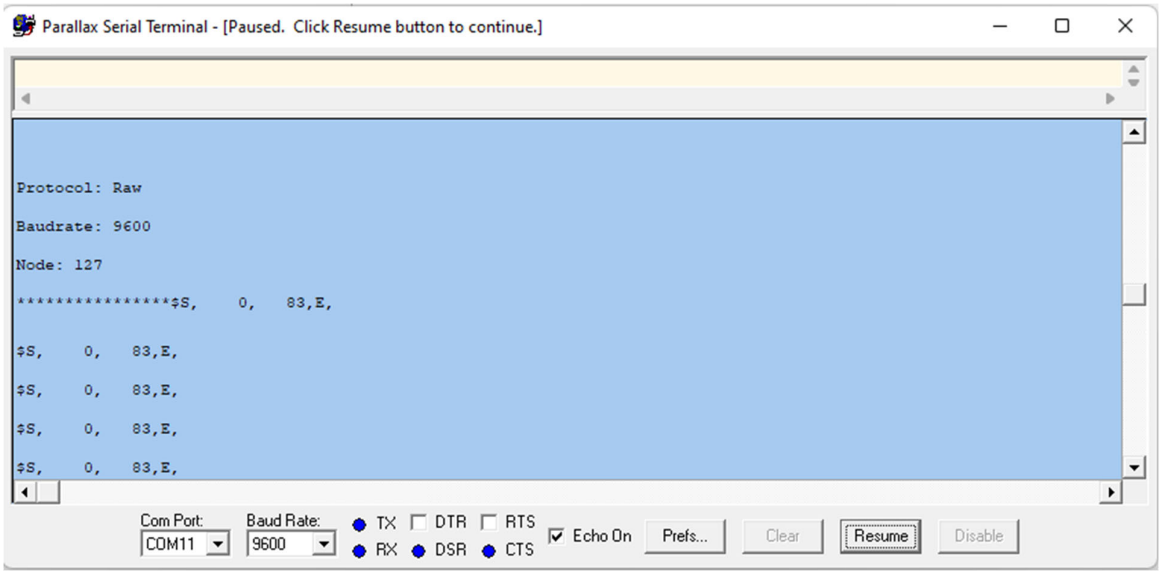


Figure 1 – Example of “Welcome message” and following communication string

5.2. CONFIGURE SENSOR 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.

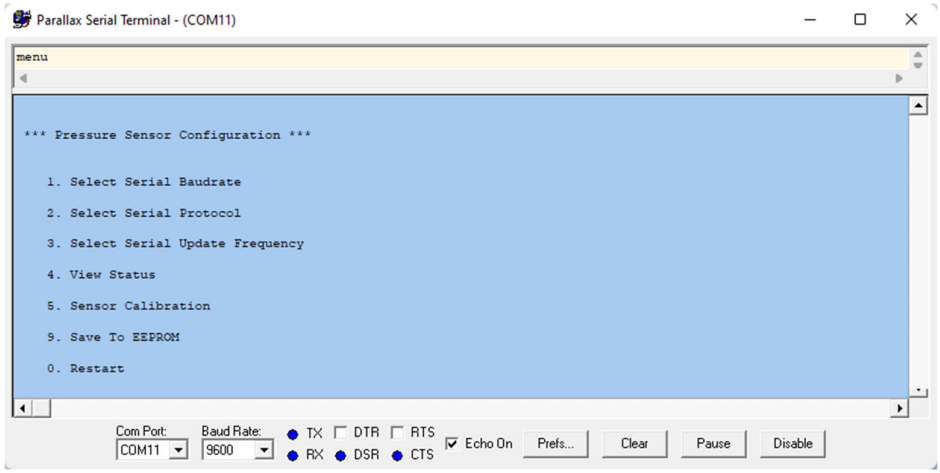


Figure 2 – Configuration menu

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

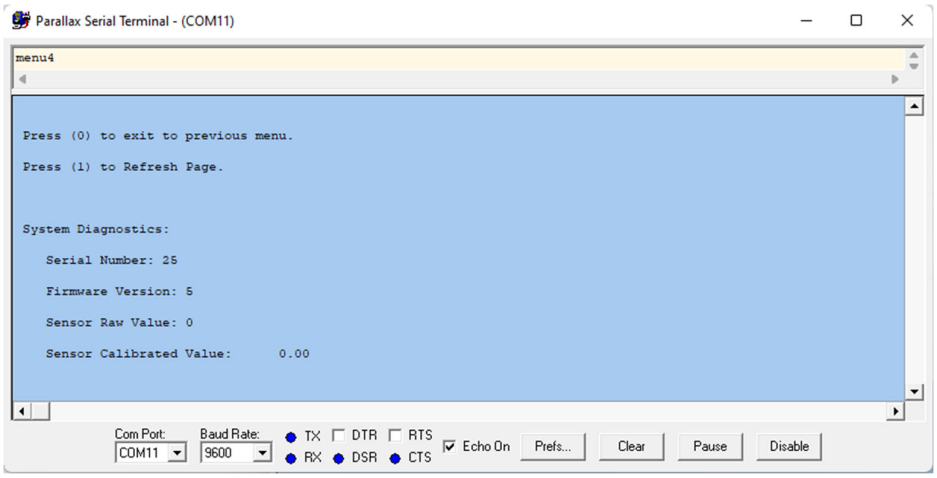


Figure 3 – View Status

To calibrate the sensor “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 (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 pressure is applied to the sensor).**
4. **Apply pressure to the sensor equal to the value set in “Max Process Value”.**
5. **Set the “Calibrate Max” value to the current raw value (while the max pressure is still applied).**
6. **Go back to main menu and save to EEPROM.**

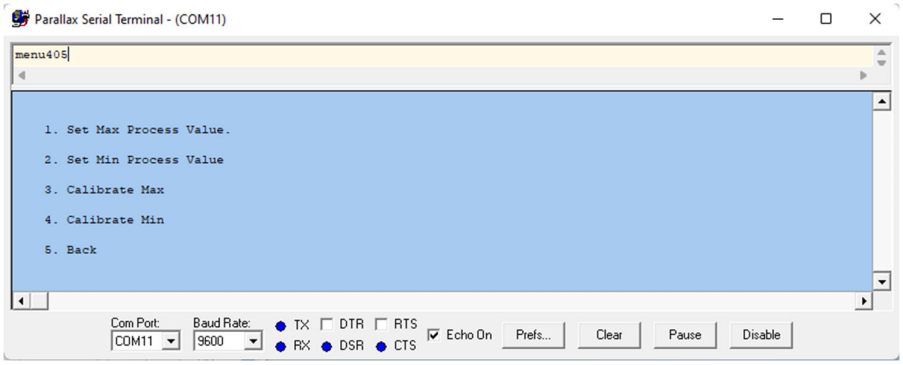


Figure 4 – Sensor Calibration

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
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.

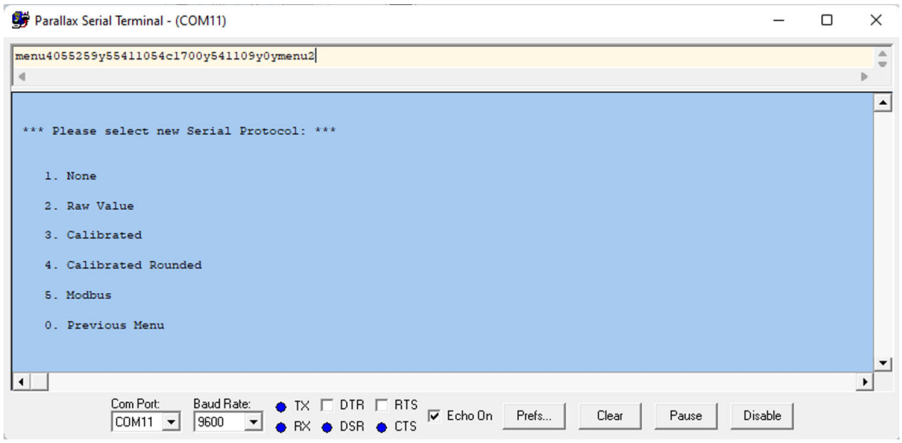


Figure 5 – Select Serial Protocol

5.3. CONFIGURE SENSOR WITH MODBUS PROTOCOL

If the sensor protocol is set to Modbus, then the sensor 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.

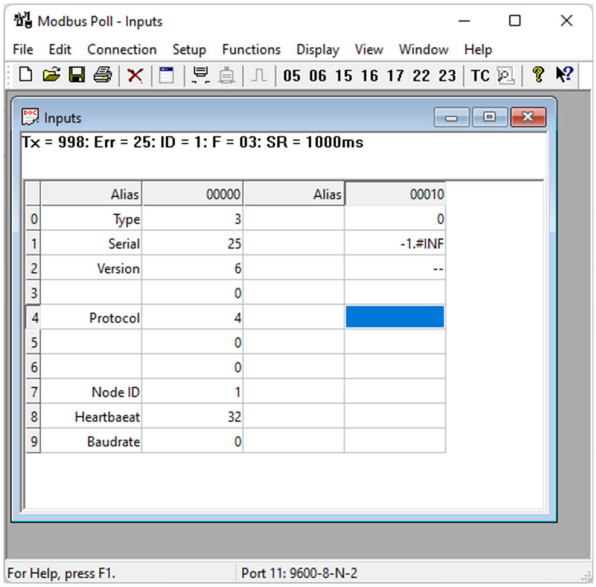


Figure 6 – Modbus Poll

Three different parameters can be changed by writing to the registers and the change is saved to EEPROM automatically on change.

Register #4: This register holds the communication protocol with these values being used:

0: None
1: Raw Value
2: Calibrated
3: Calibrated Rounded
4: Modbus

Register #7: This register holds the Modbus Slave Address and is default to 127.

Register #8: This register counts up one step every second and rolls over to zero at 65535

Register #9: This register holds the baudrate selection according to this table:

0: 9600
1: 19200
2: 28800
3: 38400
4: 57600
5: 115200
6: 230400

Register #10 hold the current raw value of the sensor.

Register #11-12 holds the scaled sensor value as a 32bit floating-point number where #11 is the LSB and #12 is the MSB.

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 Pressure Displayed in software	• Sensor not calibrated	• Calibrate sensor
	• 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