



# SMC-630 PRESSURE SENSOR USER GUIDE

# Notice

The information in this User Guide is subject to change without notice.

Not all the features described in this manual are available in all hardware and firmware versions. Please check with SMC for details of model specific features such as measurement parameters and Protocol support.

This document is property of SMC and shall not be reproduced in any form without written approval from SMC.

SMC Ship Motion Control is not responsible for any errors in this manual or their consequences.

All rights reserved.

SMC Ship Motion Control Ltd

Email: [info@shipmotion.eu](mailto:info@shipmotion.eu)

Web: [www.shipmotion.eu](http://www.shipmotion.eu)

Tel: +46 8 644 5010

# 1 TABLE OF CONTENTS

<b>2</b>	<b>INTRODUCTION.....</b>	<b>4</b>
2.1	RECEIVING THE SMC-630 PRESSURE SENSOR.....	4
2.2	SMC-630 DIMENSIONS.....	5
2.3	INSTALLATION.....	6
2.3.1	INSTALLATION LOCATION RECOMMENDATIONS.....	6
2.4	ELECTRICAL COMMUNICATION.....	7
2.4.1	DEFAULT SETTINGS AT THE FACTORY.....	7
2.5	SMC INSTRUMENTS CONFIGURATION SOFTWARE.....	8
2.5.1	GENERAL INFORMATION CONFIGURATION SOFTWARE.....	9
<b>3</b>	<b>SERIAL OUTPUT STRINGS.....</b>	<b>11</b>
3.1.1	WIXDR.....	11
3.1.2	PRESSURE OUTPUT.....	11
<b>4</b>	<b>CONFIGURATION COMMANDS.....</b>	<b>12</b>
4.1	REPLIES FROM THE SMC-630.....	12
<b>5</b>	<b>MAINTENANCE.....</b>	<b>13</b>
<b>6</b>	<b>SERVICE AND WARRANTY.....</b>	<b>13</b>
6.1.1	LIABILITY.....	14
6.1.2	RESTRICTION OF WARRANTY.....	14
6.2	TECHNICAL SUPPORT.....	15
<b>7</b>	<b>TECHNICAL SPECIFICATIONS SMC-630.....</b>	<b>16</b>
<b>8</b>	<b>FAQ AND SUPPORT.....</b>	<b>16</b>

## 2 INTRODUCTION

The SMC-630 Pressure sensor is an accurate, reliable and cost-effective way to measure the barometric air pressure for many indoor and outdoor applications.

The data transmitted from the SMC Pressure sensor is in a standard NMEA sentence format over RS232 and RS485 that can be used by many applications as well as SMCs Monitoring System applications for graphical presentation and data logging.

### 2.1 RECEIVING THE SMC-630 PRESSURE SENSOR

Unpack the equipment and remove all the packaging materials and shipping carton.

The SMC-630 sensor is delivered in a cardboard box to protect it from damage during transit.

When the sensor has been received, it must be inspected for damage during shipment. If damage has occurred during transit, all the shipping cartons and packaging materials should be stored for further investigation. If damage is visible, a claim for shipping damage must be filed immediately.

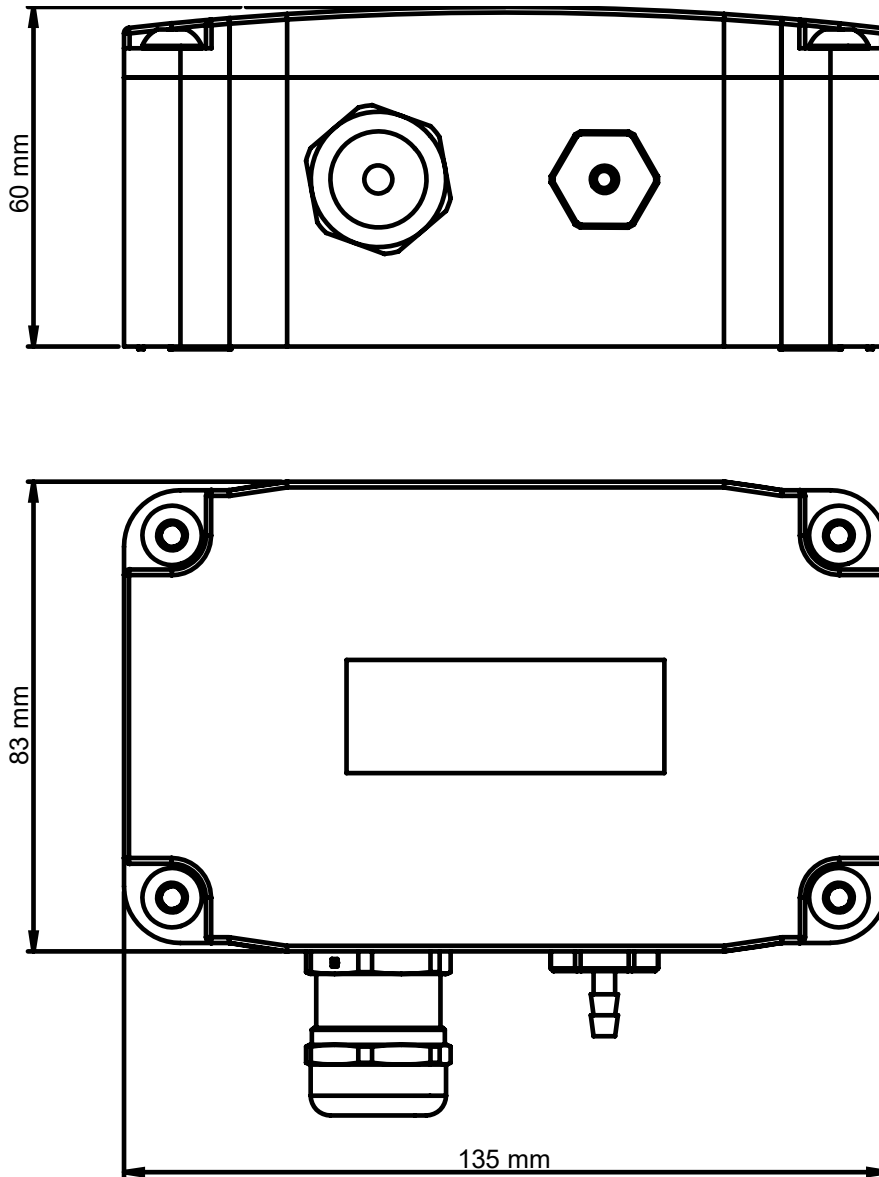
#### Standard Delivered Items

- Pressure Sensor
- Calibration Certificate
- SMC Instruments Configuration software and User Guide

#### Optional Items

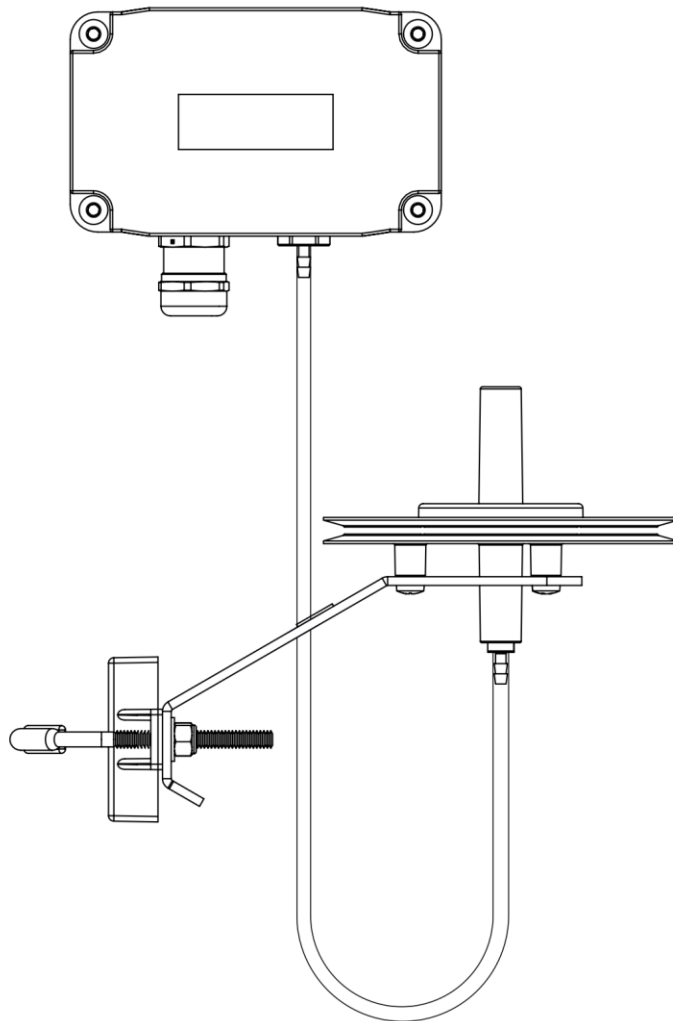
- SMC-660 Pressure port

## 2.2 SMC-630 DIMENSIONS



## 2.3 INSTALLATION

SMC recommend that the SMC-630 Pressure sensor is mounted vertically with the pressure hose facing down achieve to avoid condensation water getting into the pressure sensor. SMC strongly recommend the use of a pressure port as the SMC-660 to improve the readings in windy conditions. The pressure port does also act as a weather protection in outdoor installations.



### 2.3.1 INSTALLATION LOCATION RECOMMENDATIONS

Install the SMC-630 Pressure sensor in an area with free air flow. Avoid positioning the sensor in a position that would not be representative of the area to be measured. Where possible the sensor should be mounted away from heat sources, either direct such as exhausts or reflected such as building walls. Placing the sensor too close to the ground may lead to inaccurate measurements.

## 2.4 ELECTRICAL COMMUNICATION

The electrical connection to the SMC-630 pressure sensor is done by removing the lid to access the terminal list on the printer circuit board. The 8 position terminal list is detachable for easier access. The accepted terminal list wire dimension is up to 2.5mm<sup>2</sup> and the casing cable gland is valid for cables between 7 and 13mm in outer diameter.

Pin	Sensor function	Details
+	VDC+	Power input 12...30 VDC
-	VDC -	
Rx	RS232 Receive	default 38400 8N1
Tx	RS232 Transmit	
GND	Signal Ground	
GND	Signal Ground	
D+	RS485 Data+	default 38400 8N1
D-	RS485 Data-	

**Note:** Please pay special attention to the SMC-630 connections, as applying voltage to the data wires may damage the sensor.

### 2.4.1 DEFAULT SETTINGS AT THE FACTORY

The sensor is delivered from SMC with a set of default parameters which can be changed from the SMC Configuration Software.

The factory default communication settings are as follows.

Baud Rate 38400

8 Databits

No parity

1 stop bits

The SMC-630 is not a polled device and will automatically output the strings in the selected data format in the selected output rate.

## 2.5 SMC INSTRUMENTS CONFIGURATION SOFTWARE

The SMC configuration software is a Windows PC application. After the sensor serial communication has been connected the SMC Configuration Software can be used to set the sensor configuration and communication parameters according to requirements.

The settings entered in the SMC Configuration software are written to the sensor. The settings are stored in flash memory inside the sensor and are not dependent on power supply or battery power.

SMC Instruments Configuration

Menu Help

Set PC Communication Detect Device Read Settings

Instrument type:  Pressure  Temperature

Pressure sensor

Device information

Model:

Serial number:

Hardware number:

Firmware version:

Calibration date:

Current reading

Pressure:

Measurement unit

Protocols

Active protocol:

Device XDR name

Communication

Baudrate:

Parity:

Output interval

Pressure transducer offsets

Transducer 1:

Transducer 2:

Average calculation time

Pressure output

Pressure verification

Mode:  On  Off

Range:

Command: Send Terminal Clear

Version: 1.0.0.10



## 2.5.1 GENERAL INFORMATION CONFIGURATION SOFTWARE

### Menu

Select to choose from the options: Detect Sensor, COM Port settings, Read settings, Firmware update or to exit the software.

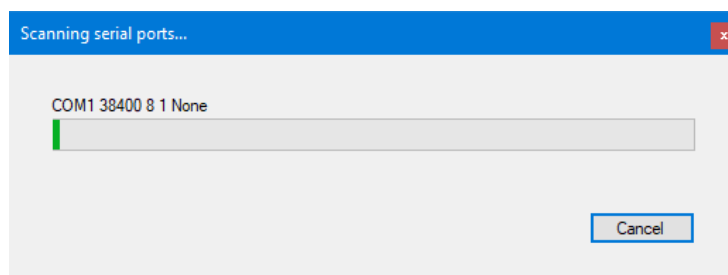
### Help > About

Displays the SMC Instruments Configuration software version and contact details for SMC.

### Menu button selections:

#### Detect Sensor

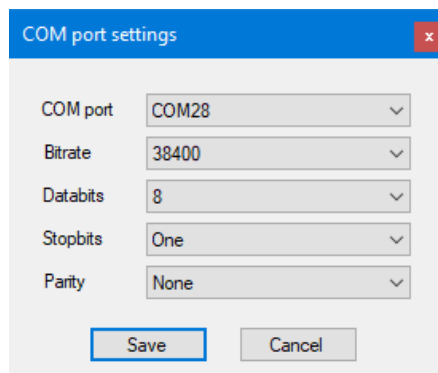
The software will search all the COM ports of the PC to find output data from a sensor, useful for a PC with multiple COM ports from multiport serial cards.



#### COM Port settings

The COM port to which the sensor is connected to.

If the COM port the sensor is connected to is known, this option allows a quicker connection setup to the sensor.



#### Read settings

The software will read or re-read the sensor settings.

#### Firmware update

The sensor firmware can be updated from the configuration software. The update is done over RS232 serial communication and should only be updated with guidance from SMC. The serial update is not possible to do over the RS485 serial port.

## **Main window sections:**

### **Device Information**

Shows the sensor Type, Serial Number, Hardware version, Firmware version and Calibration date.

### **Current reading**

Displays the current Pressure values.

### **Measurement Units**

Use the drop down to select a unit for the Pressure of Hectopascal, Bar or Millibar.

### **Protocols**

Choose the Active protocol from a drop-down selection. Available protocols are found in the next chapter.

### **Device XDR Name**

Sets the device name of the transducer in the \$WIXDR string

### **Bitrate**

Select from a drop down the bitrate of the data output. The same baudrate applies for both serial ports. Available baudrates: 4800, 9600, 19200, 38400 or 57600 bps.

### **Parity**

Sets the parity on the serial output string on both serial outputs to Odd, Even or None

### **Output Interval**

The automatic string output rate can be set between 0.25 and 600 seconds

### **Pressure Transducer Offsets**

Add an offset to the Pressure to adjust the output. Note that offsets should not be used in place of a full recalibration.

### **Average calculation time**

Sets the Pressure calculation average between 0 and 600 seconds. 0 means no average set for the output.

### **Pressure Output**

Sets the Pressure output to output data from pressure transducer 1 respectively pressure transducer 2 or an average out of both. The SMC-631 is a single transducer device and SMC-632 is dual transducer version.

### **Pressure Verification**

When a dual head device SMC-632 is being used it is advised to use the pressure verification feature to verify that the reading difference between the two transducers is less than the specified difference. In case this feature is being used the SMC-632 will output \* instead of the value.

### **Command**

Manual Terminal Commands can be sent to the sensor via this input window.

### **Terminal**

Use the check box to enable or disable the display of incoming data in the terminal window. Click on clear to clear the data in the terminal window.

## 3 SERIAL OUTPUT STRINGS

### 3.1.1 WIXDR

Example

```
$WIXDR,P,1010.70,H,BARO1*4E
```

Description	Form
Start Characters	\$WIXDR
Transducer type (P)	P for pressure
Pressure (1010.70)	Pressure value
Unit (H)	Unit for pressure, H=Hectopascal
Name of transducer (BARO1)	Default BARO1, user configurable
Checksum (*4E)	XOR checksum
Termination Characters	<CR><LF>

### 3.1.2 PRESSURE OUTPUT

Example

```
1010.70
```

Description	Form
Pressure (1010.70)	Pressure value

## 4 CONFIGURATION COMMANDS

If the SMC configuration software is preferred not to be used the following commands can be used to setup the instrument instead using the serial command prompt over both RS232 and RS485.

Below is a selection of commands to be used for terminal communication.

All commands lines should be followed by a [CR] [LF]

Commands format	Description
\$upiset,1	Sensor output rate in seconds where "1" is 0.25s to 600s
\$btrset,9600	The bitrate of the output. Accepted output rates are 4800, 9600, 19200, 38400, 57600 bps
\$parset,n	Sets the parity of the serial output where n = none o = odd e = even
\$avgset,0	Sets the average time of the Pressure output. Can be set to 0 to 600s as integer values
\$prtset,2	Output string format where 2 = WIXDR string format 3 = Pressure Output format
\$un1set,1	Sets the unit for the Pressure output 1 = Hectopascal 2 = Bar 3 = Millibar
\$cldget	To receive the sensor factory calibration date
\$op1set,1.00	Sets the offset of pressure transducer 1
\$op2set,1.00	Sets the offset of pressure transducer 2
\$xdrset,SMC	Sets the name of the transducer in the WIXDR string

### 4.1 REPLIES FROM THE SMC-630

The device will reply with a confirmation when the command is accepted in the format as **\$upians,1** where the three first letters are identical to the command and the three last letters in the identifier are replaced with "ans".

In case the command is not accepted the sensor will reply with **\$ans cmd error**. In case of a problem to store the information to the built-in flash memory of the sensor the device will reply with **\$ans mem err**. If a parameter is set outside the available range the sensor will return the message **\$ans range err**.

## 5 MAINTENANCE

### Pressure Hose

The pressure hose to the pressure port should be checked to be without damages. In a regular interval verify that there is no water or dirt inside the hose blocking the free air pressure inside the hose between the pressure port and the pressure sensor.

### Calibration

SMC recommends recalibrating the pressure sensor once a year. The sensor must be sent to SMC for recalibration. Contact [support@shipmotion.eu](mailto:support@shipmotion.eu) for return details, quoting the serial number of the sensor.

### General

Check the cable, connector and the installation for potential damage in a regular interval.

## 6 SERVICE AND WARRANTY

All products are inspected prior to shipment and SMC manufactured products are guaranteed against defective material or workmanship for a period of two (2) calendar years after delivery date of purchase.

SMC liabilities are limited to repair, replacement, or refund of the factory quoted price (SMC's option). SMC must be notified and provided with sufficient time to remedy any product deficiencies that require factory attention. This time period may include but is not limited to standard production lead times, travel time and raw material lead times. SMC will not be responsible for any charges related to repair, installation, removal, re-installation, or any actual, incidental, liquidated, or consequential damages. All claims by the buyer must be made in writing. All orders returned to SMC must have an issued RMA number supplied by the SMC prior to shipment. Only SMC shall have the authority to issue RMA numbers.

Any products manufactured by others supplied with and/or installed with SMC's products are covered by the original manufacturers' warranty and are excluded from SMC's warranty

SMC manufactured product must be sent to SMC for repair or replacement.

Please read the SMC Ship Motion Control terms and conditions for complete information.

---

### 6.1.1 LIABILITY

SMC shall have no liability under the warranties in respect of any defect in the Products arising from: specifications or materials supplied by the Buyer; fair wear and tear; wilful damage or negligence of the Buyer or its employees or agents; abnormal working conditions at the Buyer's premises; failure to follow SMC's instructions (whether oral or in writing); misuse or alteration or repair of the Products without SMC's approval; or if the total price for the Products has not been paid.

SMC shall in no event be liable for any indirect or consequential, or punitive damages or cost of any kind from any cause arising out of the sale, use or inability to use any product, including without limitation, loss of profits, goodwill or business interruption. In case of failure in the product the company is not liable to compensate the buyer with anything exceeding the cost of the product sold by SMC.

The exclusion of liability in these Terms & Conditions shall not apply in respect of death or personal injury caused by SMC's negligence.

SMC shall not be bound by any representations or statements on the part of its employees or agents, whether oral or in writing, including errors made in catalogues and other promotional materials.

Please read the SMC Ship Motion Control terms and conditions for complete information.

---

### 6.1.2 RESTRICTION OF WARRANTY

The warranty does not cover malfunction of the sensor generated from

- If the sensor case has been opened by the customer in an attempt to carry out repair work
- If the sensor has been fed with an over voltage in the power supply wires or the signal wires

The sensor electronics are shielded in a case of UV protected ABS plastic with O ring seals to prevent damage from moisture.

The sensor should not be opened as this could affect the warranty on the unit. All operations inside the sensor must be carried out by SMC personnel.

## 6.2 TECHNICAL SUPPORT

If you experience any problem, or you have a question regarding your sensor please contact your local agents or SMC directly.

Refer to the SMC website at <https://www.shipmotion.eu/>

Please have the following information available

- Equipment Model Number
- Equipment Serial Number
- Fault Description

Worldwide Service contact

Telephone: +46 8 644 50 10 (CET 8am – 5pm)

E-mail: [support@shipmotion.eu](mailto:support@shipmotion.eu)

### Return Procedure

If this is not possible to solve the problem a Ship Motion Control technician will issue a Return Material Authorization Number (RMA#). Please be ready to provide the following information.

- Name
- Address
- Telephone, E-mail
- Equipment Model Number
- Equipment Serial Number
- Installation Date

If the Sensor is under warranty, repairs are free.

Pack the sensor in its original packaging, or suitable heavy packaging.

Mark the RMA# on the outside of the package

Return the Sensor, prepaid carrier to SMC

## 7 TECHNICAL SPECIFICATIONS SMC-630

<b>Performance</b>	Total Accuracy 0.3 hPa Pressure 800-1100 hPa Long Term stability 0.1 hPa per Year
<b>Communication</b>	Com1: RS232 Com2: RS485  SMC Configuration software included User selectable Output Protocols
<b>Physical</b>	Housing Material Hard Anodized Aluminium Dimensions (W x D x H) 135 x 60 x 83mm excl. connector Weight 1 kg  Pressure fitting: Barbed fitting for 4mm ID hose Cable connection 7-13mm cable diameter Electrical connection: Terminal block
<b>Environmental</b>	Operating Temperature -40° to +60° Celsius MTBF (computed) 50 000 hours IP66
<b>Versions</b>	SMC-631 Single pressure head version SMC-632 Dual pressure head version
<b>Electrical</b>	Power requirements 12 - 30 VDC, 0.7 W Complies with the IEC 60945
<b>Warranty &amp; Support</b>	2 Years Hardware & Software Warranty Free Technical & Hardware support

## 8 FAQ AND SUPPORT

If no communication is seen or bad data is displayed, please refer to the FAQs below which cover the most common configuration problems.



## Configuration

### Is the unit sending data with RS485 or RS232?

The sensor is *always on* and sends data over an RS485 serial channel. Check the wiring as per the Electrical configuration guide to see which output is being used.

### Data is being received but is either seen as bad data or wrong data.

Check which serial mode your sensor has been wired for, RS232 or RS485. The receiving comport would have to match the sending data.

Verify that there is a signal ground connected for RS232, if not the data would not be readable.

### Parameters changed in the configuration software are not being set in the sensor.

If after pressing the *Set* button the parameters set in the sensor are not changing, check if the sensor Serial number, Hardware number, Firmware version and Calibration date are displayed in the configuration software.

If not, press the *Read Settings* button. If the data is still not showing this is typically due to the lack of two-way communication to the sensor. The Receive data lines are connected but not the Transmit data lines. Check the wiring through to the sensor.

Are the cables connected correctly?

### No communication with the sensor

Check the cable connection and disconnect and reconnect is necessary. Is the sensor powered up? Voltage should be 12 to 30 VDC

Check what Baud Rate and Output Rate should be used or has been set up. Use the *Detect sensor* button to scan all available ports.

The default baud rate set when the sensor is shipped from SMC is 38400 and the standard output rate is set to 1Hz.

If there is a chance that the baud rate has been changed and the *Detect sensor* button does not find the sensor, systematically check each baud rate option in the SMC sensor Configuration Software until the correct rate is found.