



A Halma company

# **OPERATING BULLETIN**

## **EXTERNAL INPUT PRESSURE CONTROLLER**

Models PC-EXTSEN · PCD-EXTSEN

**Thank you for purchasing your pressure controller.**

# Contact Information

## Alicat Scientific

### World Headquarters

7641 N Business Park Dr., Tucson, AZ 85743 USA

[info@alicat.com](mailto:info@alicat.com) • [alicat.com](http://alicat.com) • +1 888-290-6060

#### India

[india@alicat.com](mailto:india@alicat.com)

M/s Halma India Pvt. Ltd.  
C/O Avire India Pvt. Ltd.  
Plot #A-147, Rd. #24  
Wagale Ind. Estate, Thane  
(West) 400604,  
Maharashtra, India  
+1 888-290-6060

#### China & SE Asia

[info-cn@alicat.com](mailto:info-cn@alicat.com)

[alicat.com.cn](http://alicat.com.cn)  
2nd Floor, Block 63, No.  
421, Hong Cao Rd,  
Shanghai, PRC 200233  
+86-21-60407398 ext. 801

#### Europe

[europa@alicat.com](mailto:europa@alicat.com)

Geograaf 24  
6921 EW Duiven  
The Netherlands  
+31 (0) 26 203.1651



This device comes with a NIST traceable calibration certificate.



This device conforms to the European Union's Restriction of Use of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive 2011/65/EU.

This device complies with the requirements of the Low Voltage Directive 2014/35/EU and the EMC Directive 2014/30/EU and carries the CE Marking accordingly.



This device complies with the requirements of the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC.

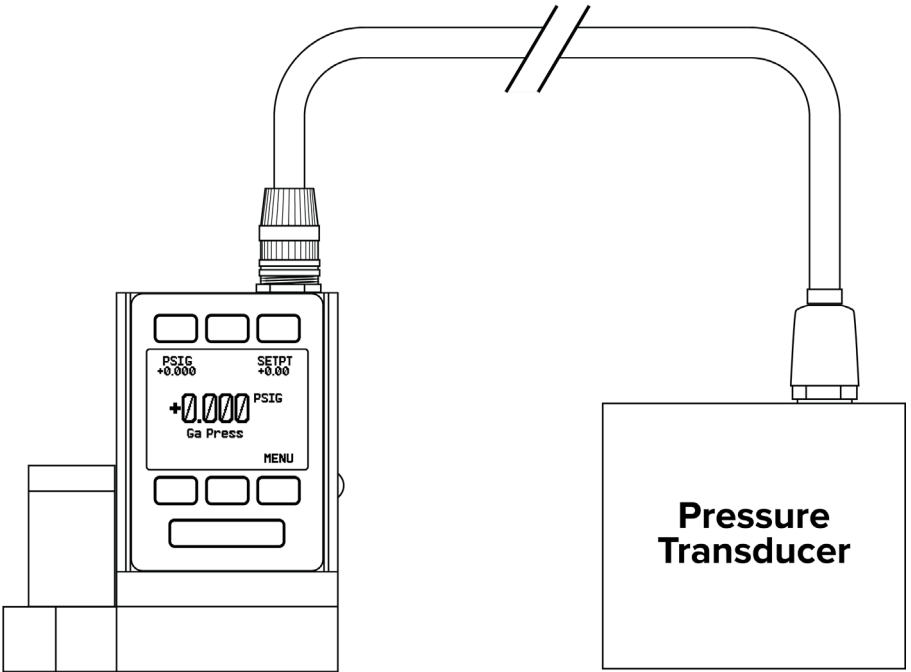
Rev. 2 • 2020-09-25 • DOC-MANUAL-EXTSEN

# Contents

<b>Introduction</b>	<b>4</b>
<b>Pinouts</b>	<b>5</b>
<b>Primary Connector Pinout</b>	<b>5</b>
Sensor Input Pin and Power	5
<b>Secondary Connector Pinout</b>	<b>6</b>
-ISC and -RI4 4-pin female industrial connectors	6
-RDB9 remote 9-pin D-SUB	6
-4M12 4-pin M12 male and -RM12 4-pin M12 female connector	7
<b>Setup Menu</b>	<b>8</b>
<b>LIVE CAL</b>	<b>9</b>
<b>TYPE/RANGE</b>	<b>10</b>
<b>CAL VALUES</b>	<b>10</b>
SIGNAL MENU	11
<b>INTRNL VALUES</b>	<b>11</b>

# Introduction

The EXTSEN units connect a pressure controller (with no internal pressure sensor) to an end-user supplied external pressure transducer. The EXTSEN combines the sensing ability of an existing pressure transducer with an Alicat electronics package and an internal PID algorithm.



*Example setup*

The EXTSEN receives a linear analog signal from the external transducer. This analog signal corresponds to a full scale range that is specified by the user at the time of order, and corresponds to the scale of the external transducer. The EXTSEN device interprets this analog signal as its sensed pressure.

Please refer to the PC-Series or PCD-Series operating manual for complete information regarding use and tuning of your pressure controller.

# Pinouts

## Primary Connector Pinout

If ordered only with a standard Alicat 8-pin mini-DIN, M12, 9-pin D-SUB, or 15-pin D-SUB connector, the sensor input pin will replace the secondary analog output pin, unless otherwise specified in the part number or the device is ordered with a secondary sensor input connector.

## Sensor Input Pin and Power

	8-pin mini-DIN	M12 connector	9-pin D-SUB	15-pin D-SUB
<b>Sensor input pin</b>	Pin 2	Pin 6	Pin 2	Pin 11
<b>24 Vdc Power</b>	Pin 7	Pin 2	Pin 7	Pin 12
<b>Ground</b>	Pin 8	Pin 7	Pin 8	Pin 14



**Note:** Any EXTSEN device built for hazardous environments (CSA Class 1 Div 2 and ATEX Zone 2) cannot be configured with an 8-pin mini-DIN connector.

# Secondary Connector Pinout

EXTSEN pressure controllers may be ordered with a secondary connector specifically for communication and powering the external transducer. Any EXTSEN device that is configured with the industrial protocol board for EtherNet/IP, EtherCAT, MODBUS TCP/IP, etc., will need to use a secondary connector for the sensor input.



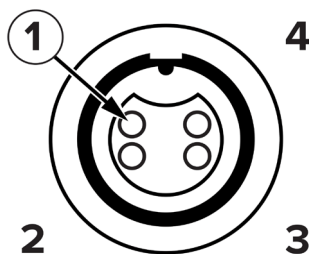
*Caution: When using a secondary connector as a dedicated connection to the transducer, do not wire any signal input into the primary connector of your device.*

## -ISC and -RI4 4-pin female industrial connectors



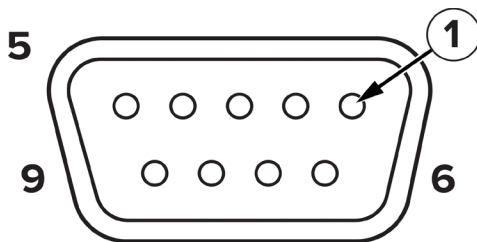
**Note:** -ISC is mounted to the top of the controller unit, and -RI4 is a side dongle.

Pin	Function
1	Power in
2	Inactive
3	External Sensor Signal Input
4	Ground



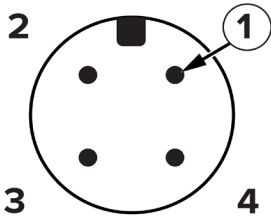
## -RDB9 remote 9-pin D-SUB

Pin	Function
1-5	Inactive
6	External Sensor Signal Input
7	Power in
8-9	Ground

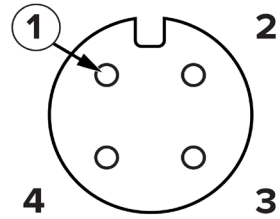


DB9 connector  
Female

**-4M12 4-pin M12 male and  
-RM12 4-pin M12 female connector**



4-pin M12 connector  
Male



4-pin M12 connector  
Female

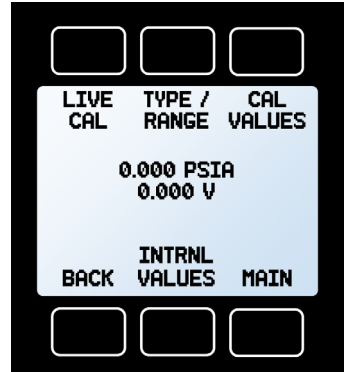
Pin	Function
1	Power in
2	Inactive
3	External Sensor Signal Input
4	Ground

# Setup Menu

The **EXTSEN SETUP** Menu provides additional configuration and calibration of the EXTSEN pressure controller. The EXTSEN device can adapt to multiple transducers and ranges in the field.

The EXTSEN will be configured for a specific full scale pressure range, input signal, and signal type out of the box. Here are some reasons why you would want to use the **EXTSEN SETUP** Menu:

1. Pairing an external transducer with a different full scale pressure range than the preconfigured range for the EXTSEN device.
2. Changing the pressure controller's settings to match an external transducer's signal calibration. The transducer could have previously been configured for a 4–20 mA current signal, or a 0.5–4.5 V signal, while the controller was calibrated for a 0–5 V transducer.
3. Modifying the slope for a paired transducer after the pressure/volt has been characterized.



## **MENU → ADV SETUP → SENSOR SETUP → EXTSEN SETUP**

This is the base menu for configuration and calibration. This is how you adjust the range and calibrate the input for your EXTSEN device.

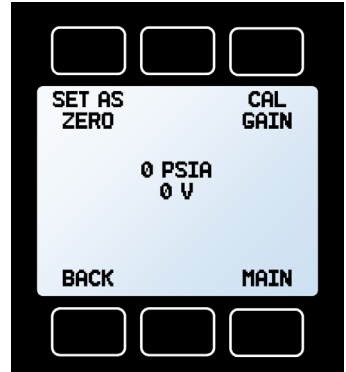
The values in the middle of the screen are your pressure readings and your input signal read by the Alicat in volts (V) or current (mA).

- **LIVE CAL** calibrate an attached pressure transducer
- **TYPE/RANGE** set the type and range of the attached transducer
- **CAL VALUES** enter in previously collected calibration data
- **BACK** go back to the Advanced Setup Menu
- **INTRNL VALUES** contain the internal offset and gain calculated from either **LIVE CAL** or **CAL VALUES**
- **MAIN** go back to Main Display



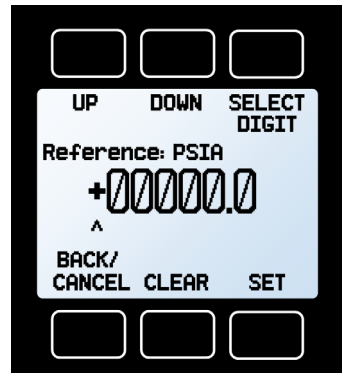
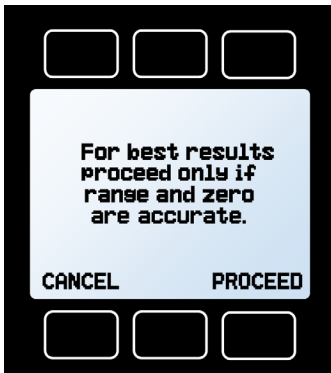
# LIVE CAL

This menu allows you to perform a live calibration when a pressure transducer or process calibrator is connected the EXTSEN device. Press **SET AS ZERO** to set the zero point, the pressure reading should go to zero regardless of the transducer input. Then use **CAL GAIN** to ensure the device reads the desired pressure value at another signal level. The device will calculate a new gain value for the transducer input.



- **SET AS ZERO** set the current signal level as zero pressure
- **CAL GAIN** ensure the device pressure reading matches the reference transducer value
- **BACK** go back to EXTSEN Setup Menu
- **MAIN** go back Main Display

There will be a warning when **CAL GAIN** is pressed to ensure everything is configured properly before setting your reference pressure.

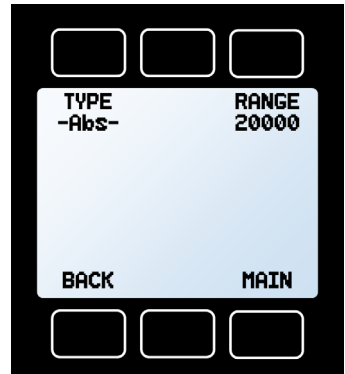


**Note:** Ensure the transducer type (absolute, gauge, or differential), transducer range, and signal type and range are configured before performing a live calibration.

# TYPE/RANGE

This menu configures the type and range of the connected pressure transducer.

- **TYPE** configure the EXTSEN with the type of pressure (absolute, gauge, or differential)
- **RANGE** configure the full scale range of the pressure transducer
- **BACK** return to the EXTSEN Setup Menu
- **MAIN** go back Main Display



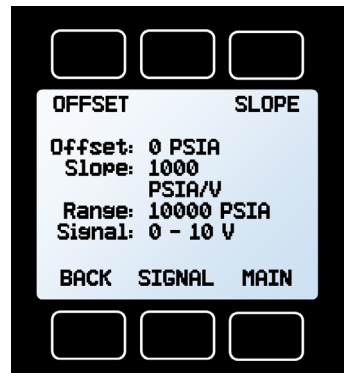
**Note:** Pressure engineering units are set in BASIC CONFIG under DEVICE UNITS.

**MENU → BASIC CONFIG → DEVICE UNITS → PRESSURE**

# CAL VALUES

This menu allows you to input known information about an external pressure transducer. The EXTSEN device will calculate new gain and offset values for the input values in these menus.

- **OFFSET** set the reading of the pressure transducer when at minimum signal
- **SLOPE** set the slope of the transducer in terms of pressure / (V or mA) of the pressure transducer
- **BACK** return to the EXTSEN Setup Menu
- **SIGNAL** enter in the nominal signal range of the pressure transducer
- **MAIN** go back Main Display



# SIGNAL MENU

This is where the nominal signal range is entered. Common values for signal range are 0–5V, 0–10V, 0.5–4.5V, and 4–20 mA.

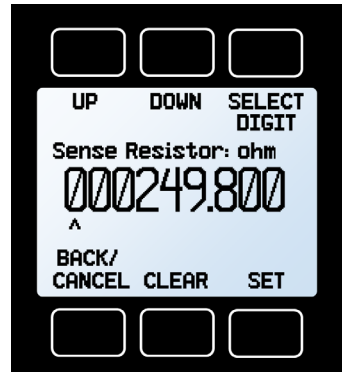
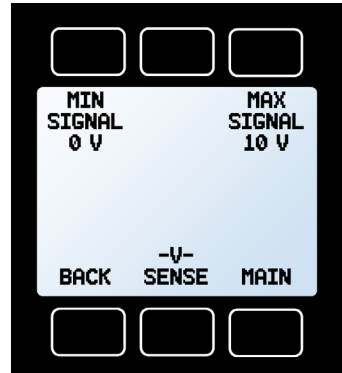
If the EXTSEN device is calibrated in volts and current is chosen in the **SENSE** Menu, a sub-menu is shown to specify the sense resistor being used. The sense resistor would be integrated into the pressure transducer or the cabling used; it is not internal to the Alicat device.

- **MIN SIGNAL** minimum signal value
- **MAX SIGNAL** maximum signal value
- **BACK** return to the EXTSEN Setup Menu
- **SENSE** enter in either volts or current;



*Note: EXTSEN devices calibrated for current cannot use voltage transducers*

- **MAIN** go back Main Display



*Sense Resistor Sub-Menu*

# INTRNL VALUES

This menu will automatically update when using either the **LIVE CAL** or **CAL VALUES** Menu.

- **OFFSET** internal transducer offset calibration value
- **GAIN** internal transducer offset calibration value
- **BACK** return to the EXTSEN Setup Menu
- **MAIN** go back Main Display

