



SSC

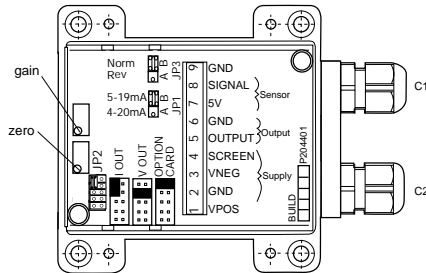
Installation and set-up guide

Model **SSC** is a Sensor Signal Conditioning unit housed in an IP68 protected metal enclosure. It is suitable for use with any sensor that produces a dc output signal voltage in the range 0-5V. The **SSC** also provides a 5Vdc source that may be used as a supply for many types of sensor, including potentiometers, contactless position transducers, tilt sensors, pressure transducers and load cells. The SSC converts the sensor output voltage signal to a 4-20mA (or optional 5-19mA) current output, or by using additional module cards, into a variety of different voltage formats or a digital PWM output. Model SSC normally operates from an unregulated 10V to 30Vdc supply. Where lowest noise performance is required with the optional voltage module card, a negative supply in the range -10 to -30Vdc may also be employed.

Important Note: It is essential that Steps 1 to 8 are completed before connecting a power supply to the SSC. Incorrect connections may destroy the SSC on power up.

Step 1 Remove the four retaining screws to release the cover from the enclosure base. Note the position of the gasket in the cover.

Fig. 1



Step 2 Unscrew the cable glands **C1** & **C2**. (Fig.1). See note [1] regarding cable diameter.

Pass power supply/output signal cable through gland **C2** into '**SUPPLY**' zone on SSC board. Connect the power supply and output connections to the terminals on the SSC board, as indicated below and shown in Fig.1.

Note on Dual supply operation:

The SSC, with or without option cards fitted, only requires a single supply voltage connected between **GND** and **VPOS**.

When the **VM** (Voltage Module) option card is used, an internal negative rail generator enables zero and negative output voltages to be achieved.

If you have a dual supply available, you can connect -10V to -30Vdc to **VNEG**, in which case the internal negative supply generator on the **VM** option card will be disabled and current will be drawn from the external supply.

To obtain outputs of -10Vdc or -7.5Vdc, the external negative supply must be at least -13.5Vdc.

Terminal 1 - Power supply lead carrying the most POSITIVE potential (e.g. +24Vdc) [**VPOS**]

Terminal 2 - Power supply lead carrying 0V [**GND**]

Terminal 3 - Power supply lead carrying the most NEGATIVE potential (e.g. -15Vdc)

[**VNEG**] ONLY IF DUAL SUPPLY AVAILABLE

Terminal 5 - Output signal [**OUTPUT**]

Terminal 6 - Output 0V (ground) [**GND**]

A power supply cable screen can be connected to Terminal 4 [**SCREEN**]. This is recommended but optional. Consult your systems engineer if other options required. Firmly tighten cable gland lock nut **C2**.

Step 3 Pass the sensor cable through gland **C1** into '**SENSOR**' zone on SSC board. Connect the sensor to the terminals on the SSC board, as indicated below and shown in Fig.1.

Terminal 7 - Sensor supply [**5V**] (See note [4] for alternative supply voltages)

Terminal 8 - Sensor output [**SIGNAL**]

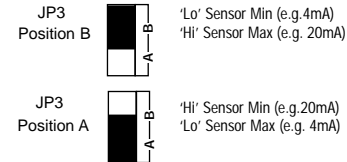
Terminal 9 - 0 Vdc [**GND**]

Firmly tighten cable gland lock nut **C1**.

Selecting the output slope

Step 4 Locate **JP3** on SSC board (Fig.1). This determines the 'sense' of the voltage/current output with respect to the sensor output range. Locate the 'jumper' in the required position - Norm or Rev (Fig.2). The SSC is factory set with **JP3** in position B (Norm).

Fig. 2



Selecting the output type

Step 5 Locate **JP2** on SSC board (Fig.1).

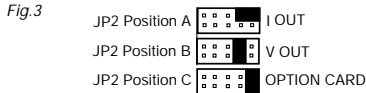
For **CURRENT** output range of 4-20 mA or 5-19 mA, fit 'jumper' into position A (Fig.3).

For **NOMINAL VOLTAGE** output range of 0.5-4.5 Vdc, fit 'jumper' into position B (Fig.3).

If required **VOLTAGE** signal output is anything other than 0.5-4.5Vdc (An additional Voltage Module (**VM**) output option card is required) then fit 'jumper' **JP2** into position C (Fig.3) and proceed to step 7.

For **DIGITAL PWM** output, fit 'jumper' into position B and follow steps 8 - 10 to adjust zero and gain to 0.5-4.5Vdc, then move jumper to position C and follow step 11.

The SSC is factory set with **JP2** in position A for current output.



Configuring the current output

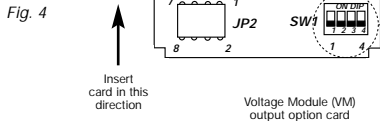
- Step 6** Locate **JP1** on SSC board (Fig.1).
 For 4-20 mA output, fit 'jumper' into position A.
 For 5-19 mA output, fit 'jumper' into position B.

Configuring the Voltage Module output card (optional)

- Step 7** When the Voltage Module (**VM**) output option card is selected, locate the DIP switch on **VM** card. (Fig.4) Select the required sensor output voltage, using the Switch Position Matrix Guide (Fig.5), and set the DIP switch positions accordingly. Insert connector of Voltage Module (**VM**) output option card onto the vacant pins at position **JP2**. See note [2] for permissible supply voltage range.

Fig. 5 Switch position matrix guide

	ON	OUTPUT
	OFF	-5V to 0V
	ON	-2.5V to +2.5V
	OFF	0V to +5V
	ON	-10V to 0V
	OFF	-5V to +5V
	ON	0V to +10V
	OFF	-7.5V to +7.5V
	ON	-10V to +10V
	OFF	



Zero and Gain adjustment

- Step 8** Connect a DMM to :-
 Terminal 5 (**OUTPUT**) +V or I Output
 Terminal 6 (**GND**) (0V) Ground
 Set DMM range to measure DC voltage or DC current, depending on the position of the jumper **JP2**.
- Step 9** Adjust the sensor to the minimum output position (See Step 4 and Fig.2) and power up the SSC. Adjust 'ZERO' trim pot until the required output voltage or current is achieved on the DMM display.
- Step 10** Adjust the sensor to the maximum output position and adjust 'GAIN' trim pot until required output voltage or current is achieved.
 Note: If the sensor output is moving in the opposite direction to that required, simply change the jumper position on **JP3**. Slight readjustment of the 'ZERO' and 'GAIN' pots may be required.

Configuring the PWM output card (optional)

- Step 11** If Pulse Width Modulated (**PWM**) output option card is selected, ensure steps 5, 8, 9 & 10 have been completed. Switch off power supply to SSC. Locate the DIP switch on PWM card. Select the required output frequency using the matrix table printed on the PWM card and set the DIP switch positions accordingly.

Ensure 'jumper' **JP2** is located in position C. Insert connector of PWM output option card onto the vacant pins at position **JP2**. Monitor the PWM output (Terminal 5) with respect to GND (Terminal 6) using an oscilloscope. Power up the SSC. Check that output is 10-90% of duty cycle over the movement of the sensor output range. (Equivalent to 0.5 to 4.5Vdc output).

If adjustment is required:-

Adjust the sensor to the minimum output position (See Step 4 and Fig. 2). Adjust 'ZERO' trim pot until the required output (10% duty cycle) is achieved.
 Adjust the sensor to the maximum output position and adjust 'GAIN' trim pot until required output (90% duty cycle) is achieved.

- Step 12** Switch off power to SSC. Remove DMM from Terminal 5 & 6. Replace cover using screws removed, ensuring all gaskets are present and in the correct place.
- Step 13** Optional, but recommended. Use an indelible pen to mark the configuration settings you have selected, in the appropriate label area shown on the SSC housing cover.
- Step 14** The sensor and SSC are now ready for use. Refer to SSC technical data sheet for full specification, mounting options and dimensions.

Notes

- Cable diameters must be between 3.0 and 8.0 mm diameter to maintain IP68 rating of the SSC housing. Make off cable elements to the connector.
- When using the **VM** voltage option card, for selected output signals of 0-10, ±10 and ±7.5Vdc the supply voltage [**VPOS**] to the SSC must be at least +13.5Vdc.
- Adjustment range**
 Zero pot approximately 20 turns. Adjustment range = -10% to +60% of nominal sensor range. Gain pot approximately 20 turns. Adjustment range = +40% to +110% of nominal sensor range. Minimum sensor range is 50% of nominal sensor range.
- Alternative sensor supply voltage**
 If the sensor requires a supply voltage greater than 5Vdc, it is permissible to connect the sensor supply to Terminal 1 and sensor ground (0Vdc) to Terminal 2 (i.e. the power supply voltage range 8-30Vdc). The sensor signal must be connected to Terminal 8. Continue with set-up from step 4.
- ESD protection note**
 Static electricity can damage electronic devices. Steps 7 and 11 require handling and fitting of extended range option cards. To avoid damage, keep static-sensitive devices in their static protective bags until you are ready to install them. Normal precautions for handling static sensitive circuits should be observed when setting DIP switches and inserting into the main SSC board.

For technical assistance contact your local distributor or Penny + Giles at

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