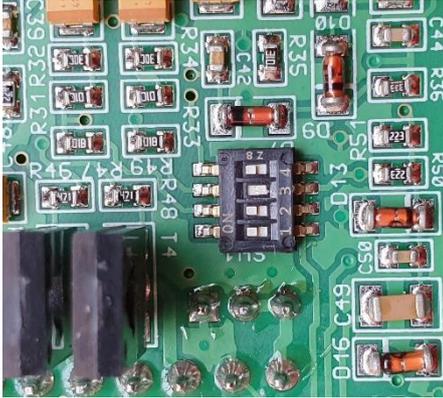


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EMS3 DIPSWITCHES EXPLAINED

The EMS3R unit has the added ability, over its predecessors, to use both resistance and voltage based sensors. In order to make use of this wider range of sensors, a small bank of on-off switches has been mounted on the input PC board inside the EMS3R housing to enable sensor compatibility selection.



Example:

In the image, switch 3 has been switched OFF to enable the use of a voltage based sensor on the Analogue 3 channel.

RESISTANCE BASED SENSORS

Identification:

These sensors contain a special resistor such that its resistance changes depending on the temperature. Most sensors of this design have only one terminal, the other side of the resistor is connected to the sensor body. Madman temperature sensors such as the VDO150 degree temp sensor or the older VDO5 and VDO10 bar pressure sensors are of this type.

Pros and Cons:

These sensors are very sensitive to installation resistance. Any increase in resistance due to the mounting threads, connections or the body that it is being mounted to results in an unreliable temperature value. Additionally, the earth path used for the sensor may be used by other electrical devices which further affects the true readings. These sensors usually give a non-linear output requiring additional internal calculations to provide accurate readings.

Settings:

For these sensors to work a 'pull-up' voltage is required (5 volts) which is provided by the sensing pin. The DIP switch for that channel must be set to ON, thus, if a DC voltage of 5V is measurable on an output pin with no sensor connected, the DIP switch is set ON and the pin is set as a pull-up.

VOLTAGE BASED SENSORS

Identification:

These sensors have at least 3 wires: SIGNAL, POSITIVE POWER and GROUND and they output a voltage linearly scaled to the input value.

The Madman MPS 2/5/7/10 range of pressure sensors are considered 0.5-4.5V sensors. They will output 0.5 VDC at zero input and 4.5 VDC at their maximum rated input.

Eg: A 5 bar sensor will output 4.5 VDC at 5 bar input (In some cases the rated pressure printed on the sensor is in Psi so that equivalent value can be used)

Pros and Cons:

The sensors output a linear voltage which is very easy to fault-find. They are less sensitive to resistance loss in the wiring and also do not use the sensor body or engine as an earth path, thus giving more accurate readings.

They have no moving parts and therefore retain accuracy and last longer.

Additional work is needed to connect up the additional power and ground wires.

Settings:

DIP switches must be set to OFF for channels using voltage sourcing sensors.