Analog Extension

User's manual

doc_370_c_en.odt

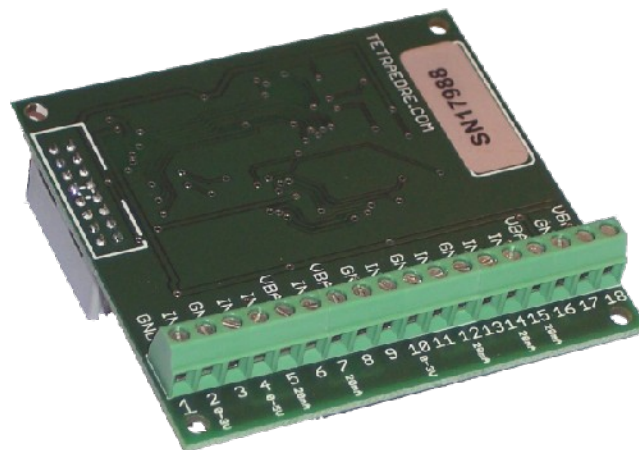# Presentation

The analog extension board is a small electronic module that can be mounted inside some TRMC, adding analog measurement channels.

The boards has

- ❑ 2 analog 0-3V inputs
- ❑ 1 analog 0-5V input
- ❑ 3 analog 4-20mA inputs measuring current going to GND
- ❑ 2 analog 4-20mA inputs measuring current coming from power supply

Hardware installation

Switch off the TRMC before any modification of the hardware !

The module is mounted in the predefined location of the TRMC and it has two screws.

Analog terminal block

The analog terminal block is a row of 18 terminals.

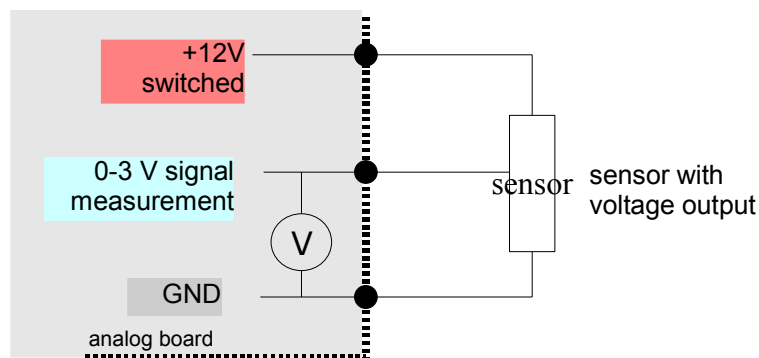| 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
GND	input #0 0-3V	GND	input #1 0-5V	current measurement #2 (GND)	+12V switched	current measurement #3 (GND)	+12Vswitched	GND	iinput #4 0-3V	GND	Current measurement #5 (VBAT)	GND	Current measurement #6 (VBAT)	Current measurement #7 (GND)	+12Vswitched	GND	+12Vswicthed

Note : the terminal "+12 switched" is the battery powered switched. Usually this output is switched on only during measurement (software configurable)

Voltage measurement

To measure a voltage, the signal must be connected to the terminals #2, #4 or #10 of the terminal block

- ❑ Terminal #2 is input #0 and can be used in a range 0 to +3V
- ❑ Terminal #4 is input #1 and can be used in a range 0 to +5V
- ❑ Terminal #10 is input #4 and can be used in a range 0 to +3V

One can easily connect all kind of sensor to this interface as indicated with the following drawings.
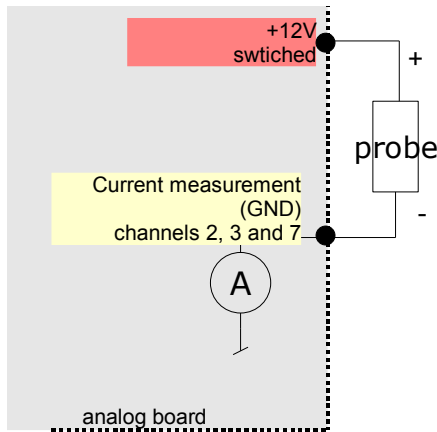

Illustration 1: Voltage output sensor connection

Current measurement

The analog measurement board can measure current in two different ways:

- ❑ Measurement of the current leaving the probe, with a resistor between the probe and GND
- ❑ Measurement of the current entering the probe, with a resistor between power supply and the probe
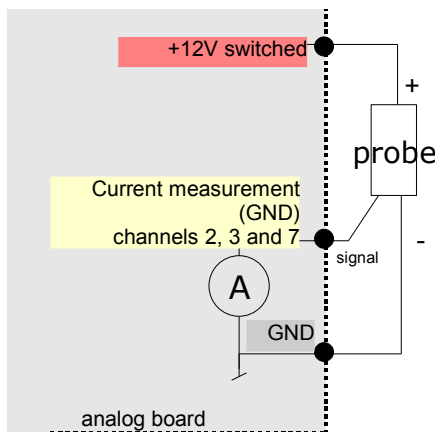
current leaving probe measurement

Advantage : more accurate measurement

Drawback : The GND of the probe is not the GND of the system
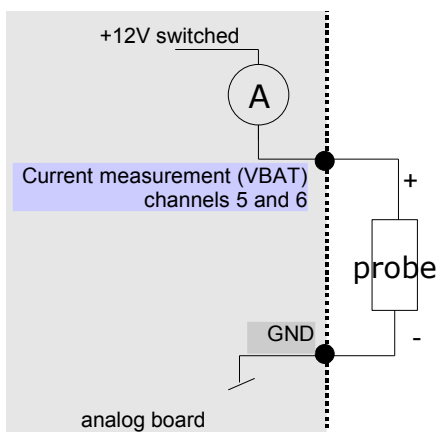
Illustration 2: Current leaving probe measurement, 2-wires

current leaving probe measurement

Advantage : more accurate measurement,
The probe's GND is the system GND

Illustration 3: Current leaving probe measurement, 3-wires

current entering probe measurement

Advantage : The probe's GND is the system GND

Drawback : less accurate measurement

Illustration 4: Current entering the probe measurement, 2-wires

Software configuration of the TRMC

For the TRMC, the analog extension board, adds new channels available during the acquisition sequence.

The extension board is powered by the TRMC. To switch it on and off, we must act with the PROBES_POWER command (see TRMC's firmware documentation).

In the acquisition sequence, it is necessary to specify a **port**. On a TRMC-5 the port number is **7**.

The list of available channels is given hereafter.

Channel	Header	Description	Unit	Threshold
0	169	input #0, voltage measurement 0-3V	Volts	Volts
1	176	input #1, voltage measurement 0-5V	Volts	Volts
2	178	input #2, 4-20mA to GND	mA	mA
3	161	input #3, 4-20mA to GND	mA	mA
4	170	input #4, voltage measurement 0-3V	Volts	Volts
5	180	input #5, 4-20mA from VBAT	mA	mA
6	179	input #6, 4-20mA from VBAT	mA	mA
7	162	input #7, 4-20mA to GND	mA	mA

Example:

```
<!-- +++++++++++++++ REMOTE SEQUENCE (HEALTH) ++++++++++ -->
        <ACQUISITION_SEQUENCE  value="2">
            <PROBES_POWER state="8"/>
            <ACQ     header="178" port="7" channel="2"   timeout="7"/>
            <ACQ     header="161" port="7" channel="3"   timeout="7"/>
            <PROBES_POWER state="0"/>
        </ACQUISITION_SEQUENCE>
```

Contact information

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