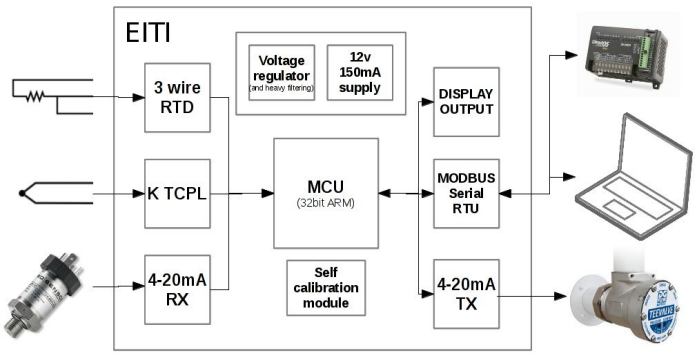
Applications

- Industrial temperature measurement
- Oven control
- PC temperature acquisition
- 4-20mA current loop transmitter/receiver
- Relay controller

Features

- MODBUS serial RTU server
- PC software examples available (python)
- 3 wire PT100 RTD α 3850 input
- Type K thermocouple input
- Reads a 4-20 current loop signal via 315 ohm loop resistance sensor impedance.
- Transmits a 4-20 signal via loop resistance that can be as low as 200 ohm loop.
- On board power supply possible via jumper option, allowing 12Vdc up to 150mA

Functional Block Diagram

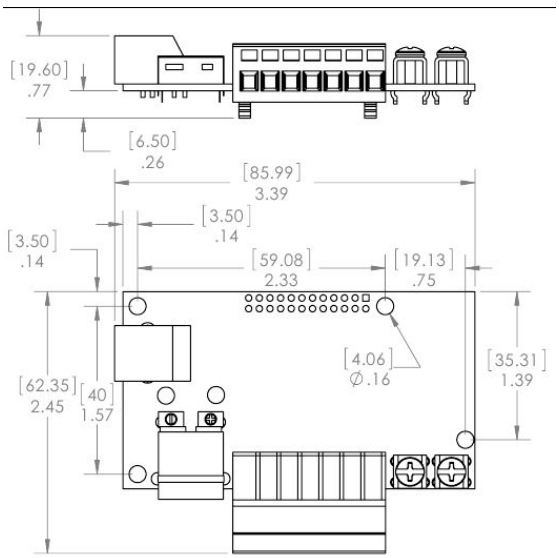


Product Description

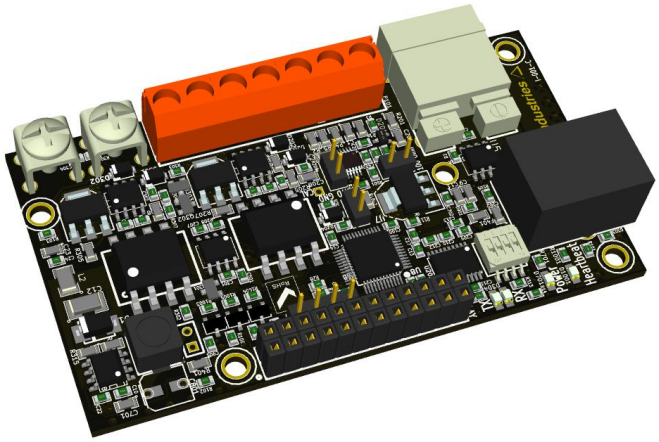
EITI is a powerful addition to a PLC/MODBUS based design. The Electronic Industrial Temperature Interface (EITI) will measure temperature sensor signals, communicate via a RX or TX current loop signals and communicate with other devices over MODBUS. This allows a PLC or PC to interface with many common analog signals.

When connected to a KOYO D05/D06 PLC, with DV-1000CBL cable, the EITI is powered by the PLC power supply. When the PLC is powered, EITI will automatically start sending sensor readings to the PLC's memory. The PLC can immediately start operating off the sensor data.

Board Dimensions



Introduction



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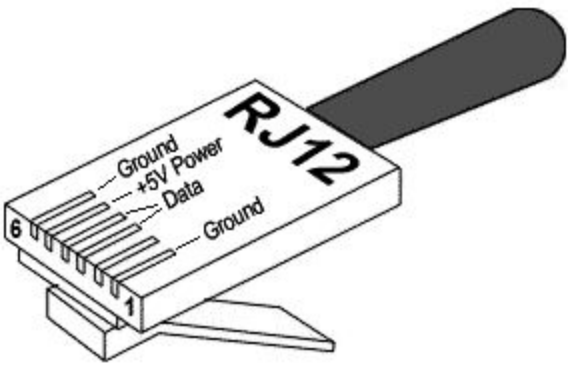
Getting started

Power up

EITI is supplied directly from the communication cable, so you can use it with just one cable, with the following pinout:



Pin	Signal
1	GND
2	NC
3	RX
4	TX
5	5v
6	GND

The suggested cable is a DV-1000CBL, and up to 12v of supply voltage is normally allowed.

During powerup the board will perform a self check. If the check is OK, the HEARTBEAT led will be turned off. If a problem is detected, the LED will stay on until the internal error flag is cleared by the OS.

Also, EITI will send modbus packets every 500 msec until a connection is made, the green TX LED will blink on every packet sent.

Using a PLC

This is the easiest way to use EITI. Connect the board to a MODBUS PLC, and the data will be stored in the following registers of the PLC:

SENSOR	HOLDING REGISTER	PLC MEMORY	
RTD	1344	V2500	Signed integer -200.0C TO 200.0C
TCPL	1345	V2501	Signed integer -270.0C TO 1372.0C
4-20 READ	1346	V2502	Signed integer 4.00 TO 20.00 mA
4-20 TRANSMIT	1347	V2503	Signed integer 4.00 TO 20.00 mA
STATUS	1348	V2504	See below bit chart
BOARD TEMP	1349	V2505	Signed integer -40.0C TO 125.0C
CONFIG	1350	V2506	See below bit chart

STATUS REGISTER

BIT	15 - 0
FEATURE	VERSION NUMBER

BIT	7	6	5	4	3	2	1	0
FEATURE	RTD OPEN	RTD SHORT	TCPL OPEN	TCPL SHORT	4-20mA TX LOW	4-20mA TX HIGH	4-20mA RX LOW	4-20mA RX LOW

CONFIGURATION REGISTER

BIT	15 - 0
FEATURE	N/A

BIT	7	6	5	4	3	2 - 1	0
FEATURE	DISPLAY ENABLE (TBI)	TX CLP ENABLE	RX CLP ENABLE	RTD ENABLE	TCPL ENABLE	Packets per second	12V ENABLE

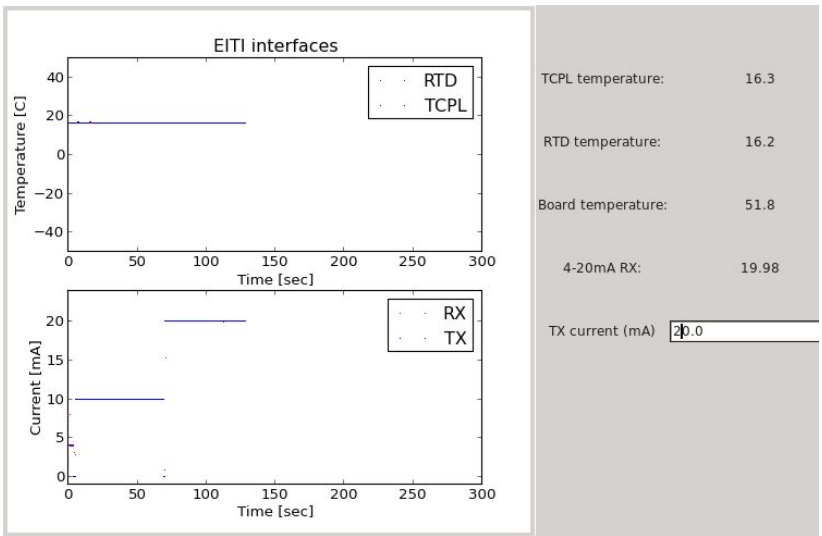
Packets per second bits:

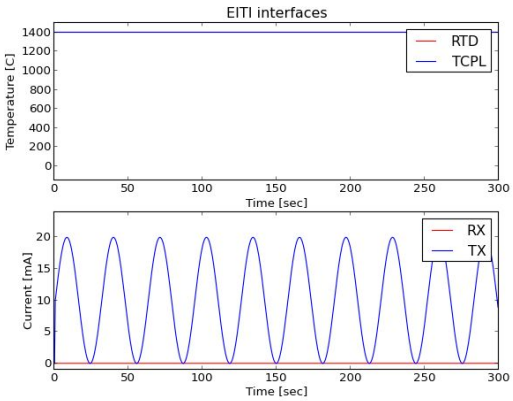
00: Maximum frequency (~30Hz)
01: Transmit only new data
10: 2 Hertz
11: 1 Hertz

Using a PC

In this case, a USB<->RS232 cable is needed. This is the suggested off-the-shelf one, but you can use your own pin-compatible cable as well.

Support software is also needed. You can download it from http://mrkindustries.com.ar/es/download.html. Unzip and run PyEITI.exe

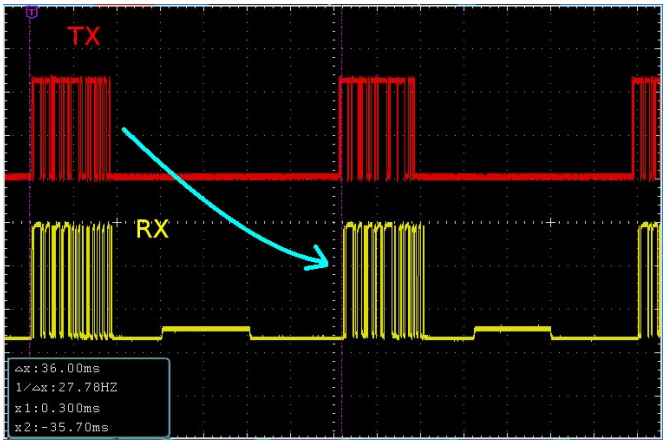




In case you need total control over the board, or you have to integrate it into a bigger system, you can modify the open source code of PyEITI, hosted here. Its around 200 lines of code.
For example, EITI can drive a relay through the current loop transmitter, and the PC can do a PID loop using the temperature data.

Communications

If the board has been connected to a MODBUS enabled device, the RS232 interface will transmit continuously at 9600 baud, and both TX and RX will be always on.

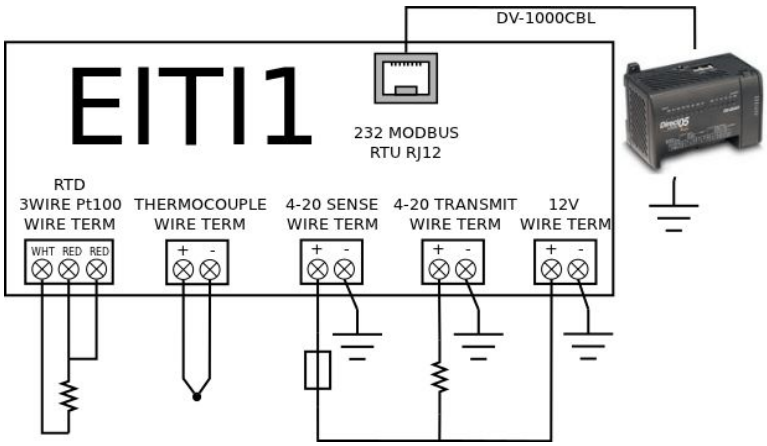


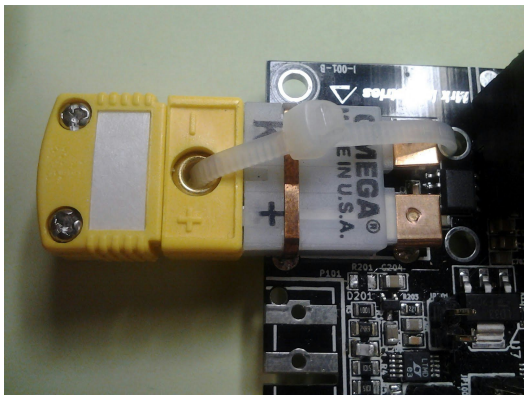
Parameter	Value
Baudrate	9600
Stop bits	0
Parity	ODD
Handshake	No
Time between packets	36 msec

Temperature acquisition

Sensor connections

The connections are straightforward. EITI has terminal blocks to connect to the RTD and current loop interfaces, and an special thermocouple connector for commercial TCPL sensors. Note that the TCPL connector is prepared to be locked in place with a zip tie.





Mechanical dimensions