Serial Protocol Definition for GMT SEL2001 5-RTD Thermal Scanner Version 1.0

Straight Engineering LLC
860 S Craycroft Rd.
Tucson, AZ 85711-7104
Phone: (520) 343-5744
Email: info@straightengineering.com
URL: straightengineering.com

Background

The SEL2001 5-channel RTD scanner is equipped with an FTDI USB to UART chip to allow the implementation of virtual COM ports in the host computer. Drivers are available for all major operating systems at ftdichip.com.

Virtual COM port (VCP) drivers cause the USB device to appear as an additional COM port available to the PC. Application software can access the USB device in the same fashion as a standard RS232 device.

Serial Interface Parameters

- Serial Interface: RS-422
- Baud Rate: 921,600 b/s
- Bits: 8
- Stop Bits: 1
- Parity: None
- Flow Control: None
- Data type: 8-bit ASCII (ISO/IEC 8859-1:1998)

Protocol Description

Straight Engineering LLC (SEL) scanners are multi-channel measurement instruments; the number of channels and sensor type vary by model. These instruments feature a read-only protocol called Direct Serial Output (DSO™).

In general, all the channels of a particular scanner are configured for the same type of sensor and unit, but this is not mandatory. The generic communications frame is composed of comma separated groups, where each group corresponds to each input channel following a very simple rule:

°CMM=NNNN.NNNN,

- °C indicates the result is in degrees Celsius;
- MM is the channel number from 01 to 05;
- NNNN.NNNN is the numerical result where N = 0 to 9 and the period is the decimal separator;
- negative numbers are represented as -NNN.NNNN;
- a comma is transmitted immediately after the result of each channel except at the end of each output line, where the characters carriage return and line feed are used as line terminator.
- there is approximately a 250 ms delay after transmitting the result of each channel
- the output line repetition rate is 333 ms nominal.

Example output line for a 5-channel scanner:

°C01=NNNN.NNNN,°C02=NNNN.NNNN,°C03=NNNN.NNNN,
°C04=NNNN.NNNN,°C05=NNNN.NNNN<CR><LF><~250ms>

Valid temperature readings for an RTD are between -203.15 °C and 850 °C; higher temperatures and open channels are signaled as 0850.0000, and lower temperatures and shorted channels are signaled as -203.1499.

Recommended Integrity Checks

There is no checksum nor other form of integrity data supplied by the instrument in each output line; the USB link already contains such provisions.

Tests performed on the data should be performed based on output line length and expected format of the data, and timeout may be used to determine if the instrument is connected/disconnected.

- timeout should occur if a line terminator is not received within the timeout period;
- channel data is continuously output at a rate of 333 milliseconds per 5-channel scan.

Split output line by comma delimiter and test for correct number of channels.

Test fixed preamble for each channel number.

Test channel temperature value format and that they are convertible to float data type.

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