4 CHANNEL THERMOCOUPLE TEMPERATURE SCANNER

Summary

- 4 Thermocouple measurement -100^{0}C to 1200^{0}C
- Rugged lightweight carbon fibre construction
- Accuracy 2.0^{0}C over compensated range.
- Resolution 0.2^{0}C
- Designed for autosport and wind tunnel applications.
- CAN bus communication protocol @1Mbit/s <1% bus loading.
- 0^{0}C to 115^{0}C operation

Revision:	Date:	Summary of Changes:	Author:
1.0	22/08/2014	First Issue	SB

Table 1. Mechanical Data

Mechanical	
Weight	30 grams
Dimensions	32x16.5x48mm
Temperature Connector	Miniature K-Type Thermocouple
Case	Carbon Fibre
Electrical Connector*	AS

*Others available on request

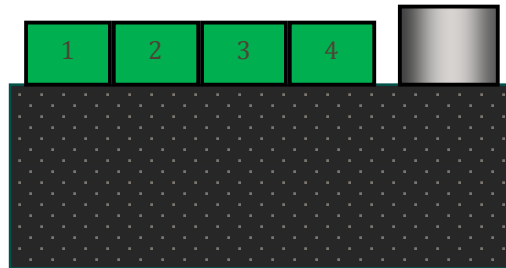Figure 1. Temperature Channel Identification

Table 2. Electrical Specifications

Electrical	
Supply Voltage	8-16V DC
Current Consumption	<30mA
Sampling Rate	10Hz
CAN ID	Programmable
CAN bus loading	0.3% maximum

Table 3. Environmental Specifications

Environmental	
Supply Voltage	8-16V DC
Current Consumption	<30mA
Vibration	9g 100-1000Hz 24hrs
Media	Resistant to most motorsport fluids
Compensated Range	25^0C to 100^0C

Table 4. Electrical Harness Identification

Connector Identification	
1	CANH
2	CANL
3	SUPPLY
4	GND

5	No internal connection

CAN Message Data

Table 5. MUX ID

Identifier	N/A		
Rate	20Hz		
BYTE	**DESCRIPTION**	**SCALING**	**Length**
0	MUX	1	8

Table 6a. Sensor Data

Identifier	MUX=0x00					
Rate	10Hz					
BIT	**DESCRIPTION**	**Format**	**SCALING**	**Offset**	**Length [bits]**	**Units**
8-23	Temperature1	S16	1/5	0	16	^{0}C
24-39	Temperature2	S16	1/5	0	16	^{0}C
40-55	Temperature3	S16	1/5	0	16	^{0}C
56-63	BLANK	U8	1	0	8	N/A

Table 6b. Sensor Data

Identifier	MUX=0x01					
Rate	10Hz					
BIT	**DESCRIPTION**	**Format**	**SCALING**	**Offset**	**Length [bits]**	**Units**
8-23	Temperature4	S16	1/5	0	16	^{0}C
24-39	Unit Temperature	S16	1/10	0	16	^{0}C
40-55	Serial No	U16	1	0	16	N/A
56-63	BLANK	U8	1	0	8	N/A

Configuration

The temperature scanner can be configured to set the CAN ID. This is applied immediately and is stored in non-volatile memory. (CAN ID=0x215).

Allow approximately 100mS between sending configuration messages to the node.

On power cycle settings including the system zero are stored in non-volatile memory.

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                           ┌─────────────┐
                           │    START    │
                           └─────────────┘
                                  │
                                  ▼
┌──────────────────────────────────────────────────────────────┐
│ HOST->SENSOR TRANSMIT                                          │
│ CAN TX ID = 0x7F1                                              │
│ MESSAGE = [0x64,0x01,0x00,0x00,0x00,0x00,0x00,0x00]           │
└──────────────────────────────────────────────────────────────┘
                                  │
                                  ▼
┌──────────────────────────────────────────────────────────────┐
│ SENSOR->HOST TRANSMIT                                          │
│ CAN TX ID = 0x7F3                                              │
│ MESSAGE = [0x64,0x01,0xF1,0x00,0x00,0x00,0x00,0x00]           │
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┌──────────────────────────────────────────────────────────────┐
│ HOST->SENSOR TRANSMIT                                          │
│ CAN TX ID = 0x7F1                                              │
│ MESSAGE = [0x64,0x01,0xF1,0x00,0x00,0x00,0x00,0x00]           │
└──────────────────────────────────────────────────────────────┘
                                  │
                                  ▼
┌──────────────────────────────────────────────────────────────┐
│ HOST->SENSOR TRANSMIT                                          │
│ CAN TX ID = 0x7F1                                              │
│ MESSAGE = [0x64,0x01,0x00,0x01,0x02,0x15,0x00,0x00]           │
└──────────────────────────────────────────────────────────────┘
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