Question

How do I set up the 2080sc-NTC from Spectrum Controls for a standard thermistor?

Environment

2080SC-NTC

Answer

As an example, a 2080sc-NTC plug-in module is using thermistors with specifications:

- NTC 10 kΩ ±1% at 25℃
- Beta = 3435

An example configuration for channel 0 might look like this:

```
S1_CFG_CH_0_Params[0] = 130 decimal (0000 0000 1000 0010b). This equates to a
BETA linearization equation, EUX1, 4Hz filter, and channel enabled.
S1_CFG_CH_0_Params[1] = 20000 (Maximum Range 200.00C)
S1_CFG_CH_0_Params[2] = 0 (Minimum Range 0.00C)
S1_CFG_CH_0_string[0] = 3435 (The BETA value)
S1_CFG_CH_0_string[1] = 10000 (The resistance at 25C)
S1_CFG_CH_0_string[2] = (Ignored for BETA Equation)
```

Micro800™ 4 Ch Universal Thermistor Input Module 7

Configuration Tags

This table shows the tags in the sample ladder program for configuration.

Details are described in the sub-sections that follow.

Register	Data Type	Comments
S1_CFG_Trigger	INT	Transition from 0 to non-zero to trigger new config.
S1_CFG_CH_n_Params[0]	INT	**Configuration Bits**
S1_CFG_CH_n_Params[1]	INT	**Maximum Range (default 19016)** Degrees C x100 or ohms div 10 Default: 19016
S1_CFG_CH_n_Params[2]	INT	**Minimum Range** Degrees C x100 or ohms div 10 Default: 0
S1_CFG_CH_n_String[0]	STRING	-COEFF-A for Steinhart-Hart Equation -BETA for BETA Equation
S1_CFG_CH_n_String[1]	STRING	-COEFF-B for Steinhart-Hart Equation -Resistance @25C for BETA Equation
S1_CFG_CH_n_String[2]	STRING	-COEFF-C for Steinhart-Hart Equation Ignored for BETA Equation

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For a module in slot 2, set up the Offline Initial Values for channel 0 like this:

Micro850-VAR | NTC_Slot2-POU

Name	Initial Value	Data Type	Dimension
S1_CFG_CH_0_Parms	...	INT	[0..2]
S1_CFG_CH_0_Parms[0]	130	INT	
S1_CFG_CH_0_Parms[1]	20000	INT	
S1_CFG_CH_0_Parms[2]	0	INT	
S1_CFG_CH_0_string	...	STRING	[0..2]
S1_CFG_CH_0_string[0]	'3435'	STRING	
S1_CFG_CH_0_string[1]	'10000'	STRING	
S1_CFG_CH_0_string[2]		STRING	
S1_CFG_CH_1_Parms	...	INT	[0..2]
S1_CFG_CH_1_string	...	STRING	[0..2]
S1_CFG_CH_2_Parms	...	INT	[0..2]
S1_CFG_CH_2_string	...	STRING	[0..2]
S1_CFG_CH_3_Parms	...	INT	[0..2]
S1_CFG_CH_3_string	...	STRING	[0..2]
S1_CFG_Trigger	1	UINT	
S1_Input_CH_0		INT	
S1_Input_CH_1		INT	
S1_Input_CH_2		INT	
S1_Input_CH_3		INT	
S1_STS_CHAN_OC		USINT	
S1_STS_CHAN_OU		USINT	
S1_STS_LED		USINT	
S1_STS_REV_FPGA_0_MAJOR		USINT	
S1_STS_REV_FPGA_1_MINOR		USINT	
S1_STS_REV_MOD_0_MAJOR		USINT	
S1_STS_REV_MOD_1_MINOR		USINT	
S1_STS_REV_MOD_2_BUILD		USINT	
S1_STS_WD_DISABLE		USINT	
Slot_ID	2	UINT	

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Your Online Values will look something like this:

Micro850-VAR | NTC_Slot2-POU

Name	Logical Value	Initial Value	Data Type	Dimension
S1_CFG_CH_0_Parms	...	...	INT	[0..2]
S1_CFG_CH_0_Parms[0]	130	130	INT	
S1_CFG_CH_0_Parms[1]	20000	20000	INT	
S1_CFG_CH_0_Parms[2]	0	0	INT	
S1_CFG_CH_0_string	...	...	STRING	[0..2]
S1_CFG_CH_0_string[0]	3435	'3435'	STRING	
S1_CFG_CH_0_string[1]	10000	'10000'	STRING	
S1_CFG_CH_0_string[2]			STRING	
S1_CFG_CH_1_Parms	...	...	INT	[0..2]
S1_CFG_CH_1_string	...	...	STRING	[0..2]
S1_CFG_CH_2_Parms	...	...	INT	[0..2]
S1_CFG_CH_2_string	...	...	STRING	[0..2]
S1_CFG_CH_3_Parms	...	...	INT	[0..2]
S1_CFG_CH_3_string	...	...	STRING	[0..2]
S1_CFG_Trigger	0	1	UINT	
S1_Input_CH_0	2727		INT	
S1_Input_CH_1	3002		INT	
S1_Input_CH_2	2985		INT	
S1_Input_CH_3	3118		INT	
S1_STS_CHAN_OC	0		USINT	
S1_STS_CHAN_OU	0		USINT	
S1_STS_LED	0		USINT	
S1_STS_REV_FPGA_0_MAJOR	1		USINT	
S1_STS_REV_FPGA_1_MINOR	3		USINT	
S1_STS_REV_MOD_0_MAJOR	1		USINT	
S1_STS_REV_MOD_1_MINOR	1		USINT	
S1_STS_REV_MOD_2_BUILD	7		USINT	
S1_STS_WD_DISABLE	0		USINT	
Slot_ID	2	2	UINT	
Temp_Ambient	29.85		REAL	
Temp_Ambient_Raw	2985		INT	
Temp_Chiller	27.27		REAL	
Temp_Chiller_Raw	2727		INT	
Temp_Floor	31.18		REAL	
Temp_Floor_Raw	3118		INT	
Temp_SP	65.0		REAL	
Temp_Tower	30.02		REAL	
Temp_Tower_Raw	3002		INT	

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The 4 temperatures are running in the 27℃ to 31℃ range (near ambient).
The last 4 groups of lines in the ST code POU for this example look like this

```
147  (*******************************************)
148  (* Temperature Data                        *)
149  (*******************************************)
150
151  Temp_Chiller_Raw := (S1_Input_CH_0);
152  Temp_Chiller := ANY_TO_REAL(Temp_Chiller_Raw);
153  Temp_Chiller := (Temp_Chiller/100.0);
154
155  Temp_Tower_Raw := (S1_Input_CH_1);
156  Temp_Tower := ANY_TO_REAL(Temp_Tower_Raw);
157  Temp_Tower := (Temp_Tower/100.0);
158
159  Temp_Ambient_Raw := (S1_Input_CH_2);
160  Temp_Ambient := ANY_TO_REAL(Temp_Ambient_Raw);
161  Temp_Ambient := (Temp_Ambient/100.0);
162
163  Temp_Floor_Raw := (S1_Input_CH_3);
164  Temp_Floor := ANY_TO_REAL(Temp_Floor_Raw);
165  Temp_Floor := (Temp_Floor/100.0);
166
```