

### 1 Requirement

In many applications there is a requirement to have the ‘setpoint’ of a process controller to be remotely set by external applications. For example, a DaisyLab application operating on a Windows PC may be used to provide remote monitoring and control over a number of installed Platinum controllers using several different communication channels.

The Platinum controller provides three communication options: serial (RS232 and RS485), Ethernet or USB. The USB interface is standard on all devices and the serial and Ethernet are provided as options. These communication channels support a proprietary Omega protocol as well as industry standard Modbus RTU and ASCII.

#### 1.1 SETPOINT Control

The Platinum controller has several ‘setpoint’ control registers and operating modes. Setpoint 1 (SP1) is used to drive the PID and ON/OFF control functions and may be selected by the ALARM functions. Setpoint 2 (SP2) is used by the ALARM functions. The following table provides the Modbus index register and the associated use. Refer to the Platinum Modbus Interface manual for further details on the Modbus interface.

**Table 1. Setpoint Control.**

Index	Mnemonic	Type	Description	
<b>Setpoint Values</b>				
532	0x0214	REMOTE_SETPOINT_VALUE	F	Value read by auxiliary analog input (remote setpoint)
548	0x0224	CONTROL_SETPOINT	F	Setpoint used in PID calculations
<b>Setpoint Control</b>				
736	0x02e0	SETPOINT_1_MODE*	R	Enumerated Setpoint mode
738	0x02e2	SETPOINT_1*	F	Setpoint 1 value
740	0x02e8	SETPOINT_2_MODE*	R	Enumerated Setpoint mode
742	0x02ea	ABSOLUTE_SETPOINT_2*	F	Setpoint 2 value (absolute mode)
744	0x02ec	DEVIATION_SETPOINT_2*	F	Setpoint 2 value (derivative mode)

\* These values are retained in FLASH.



**NOTE:** Values that are retained in FLASH memory will persist thru power cycles. Since flash memory variables take significant time to write and flash memory has a limited number of write cycles (~ 50,000).

**Table 2. Enumerated Setpoint Modes.**

<b>Enumerated Setpoint Modes</b>			
<b>Value</b>	<b>Mnemonic</b>	<b>Applies to</b>	<b>Description</b>
0	SETPOINT_ABSOLUTE	SP1 and SP2	Setpoint value = Setpoint_x value (fixed constant). Applies to Setpoint_1 or Setpoint_2
1	SETPOINT_DEVIATION	SP2	Setpoint_2 value = Setpoint_1 value + Deviation_Setpoint_2 value
2	SETPOINT_REMOTE	SP1	Setpoint_1 value = Auxiliary Analog Input (remote setpoint) Value
3	SETPOINT_EXTERNAL	SP1 and SP2	Setpoint value set externally
4	SETPOINT_RAMP_SOAK	SP1	Setpoint_1 value set by Ramp & Soak process

### **1.2 Implementation:**

A Platinum series PID controller, with 1 relay output, 1 DC Pulse output and one Analog output provides the necessary control functions (CN8PT-145-EI). Ethernet capability has been included to address future system integration needs.

The Process Temperature is measured using an external Thermocouple.

The DC Pulse output will directly drive the PWM controlled external TRIAC.

The Analog output, set to operate at 0-5 Vdc will directly drive the DC motor driven bellows.

The SPST relay provided by the Platinum controller must be augmented with an external SPDT control relay.

### 1.3 Configuration

TYPE	Configured as...Set at	NOTE	
<b>Input type</b>	set to the appropriate thermocouple type (INIT/INPT = T.C., INIT/INPT/T.C. = <thermocouple type>)		
<b>RST.1 output (Relay, SPST)</b>	To be driven by the ALARM 1 (PROG/STR1/MODE = ALM.1)		
<b>ALARM 1</b>	As an ABOVE ALARM (ABOV)	Setpoint set as a derivative of the Control Setpoint (AB.DV = D.SP1)	
	<b>Over Temperature (ALR.H)</b>	5 degrees	
	<b>Output</b>	Normally closed (CTCL = N.C.)	Ensures that if the Platinum controller loses power the relay will active the external control relay
	<b>On Delay</b>	Set at 1 second (DE.ON = 1)	
<b>DC.1 output (DC Pulse)</b>	To be driven by the PID control function (PROG/DC.1/MODE = PID)	The PWM output cycle time is set to 0.1 seconds (PROG/DC.1/CYCL = 0.1)	
<b>ANG.1 output (Analog Output)</b>	To be driven by the PID control function (PROG/ANG.1/MODE = PID)	The Analog output range is set to 5 volts (PROG/ANG.1/RNGE = 0-5).	
<b>PID</b>	To operate in the reverse mode	Causing the control output signal to be active if the process temperature is below the setpoint temperature (PROG/PID.S/ACTN/RVRS).	

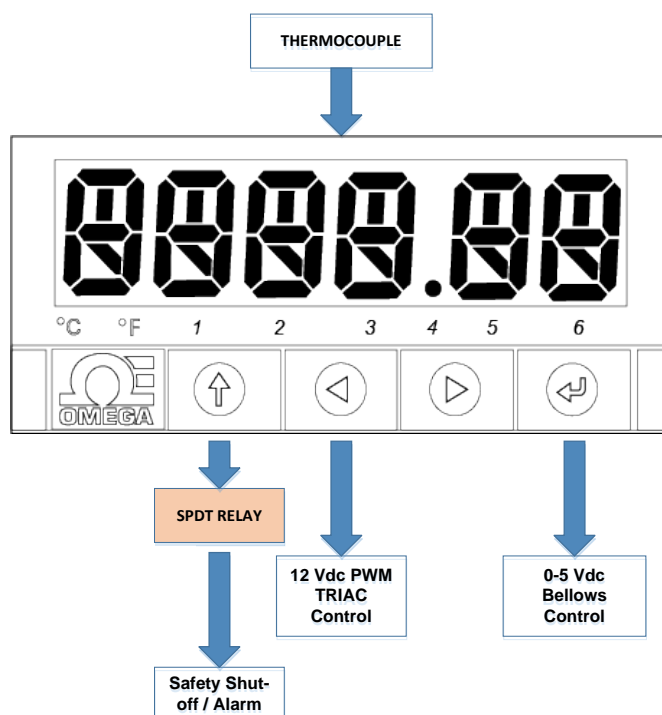


Figure 1. Input Type Configuration.

### 1.4 Wiring

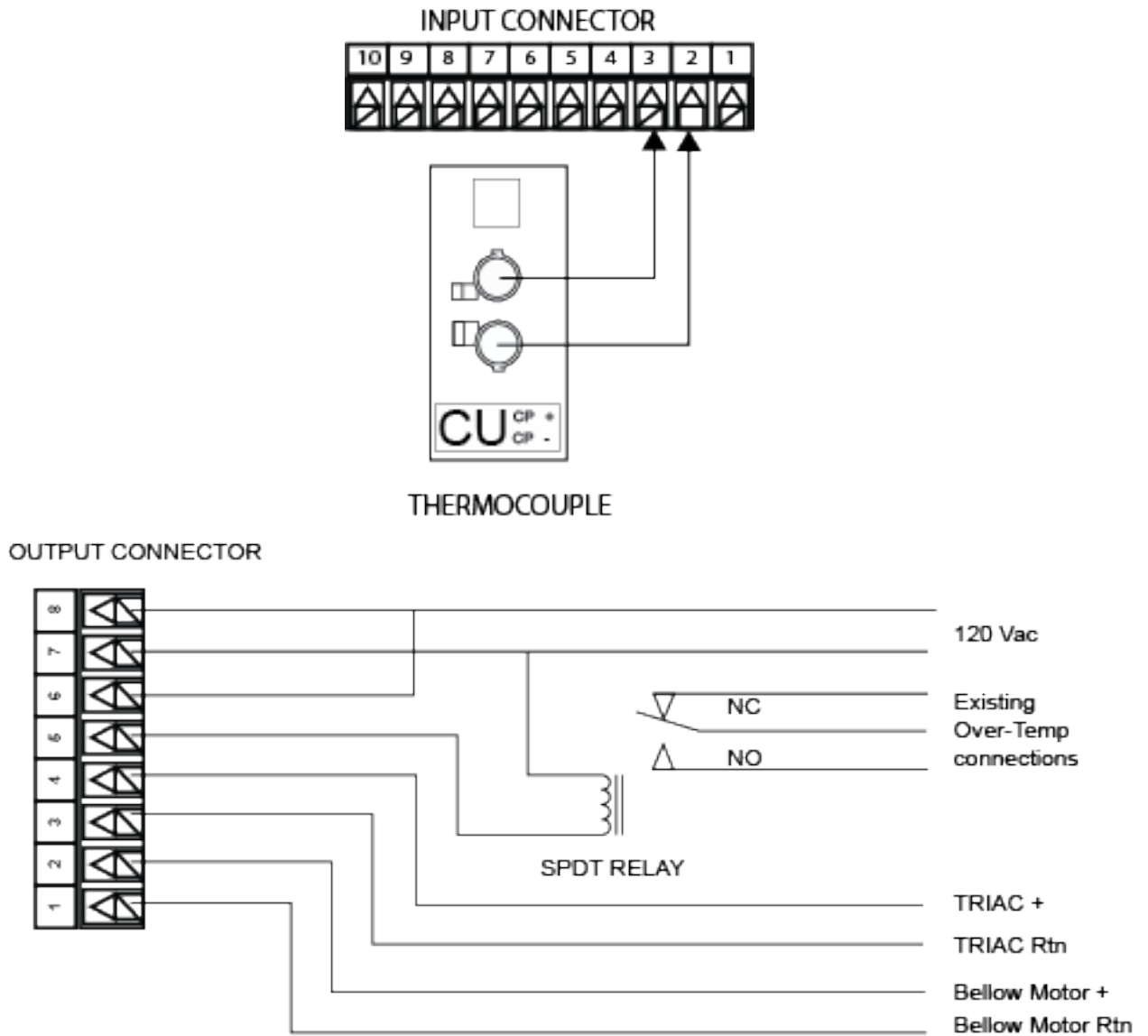


Figure 2. Wiring Output/Inputs Connections.

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