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SLC4075TechNote205_ModifyingSetptWithExternalAnalogOrRelaySignal

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This document provides step-by-step instructions, using the Touchscreen Gateway (TSGW) to modify the set point using an external analog signal or discrete relay. Either PID1 or PID2 setpoint may be adjusted proportionally between the analog signal range using this method.

Set Point Modifier 1 (SPM1) is used to modify PID1, and Set Point Modifier 2 (SPM2) is used to modify PID2.
In a similar fashion as Outdoor Air Reset modifies the setpoint based on the outdoor air temperature, an analog signal may be used to proportionally modify the associated unmodified setpoint.

PID1 is used for temperature-based control, whereas PID2 is used for generic analog control.
Both PIDs *may* use the General Purpose Analog 2 (GPA2) input to modify the setpoint. This input may be configured and wired for the various types of compatible signals per the following table:

Command Signal Type	Connect (+)	Connect (-)	SW1-1 61.9 Resistor	SW1-2 Volt Network	SW1-3 61.9 Resistor	SW1-4 Volt Network	SW1-5 GPA1 Offset	SW1-6 GPA2 Offset
GPA2 0-10 V dc	TB7	TB8			OFF	ON		OFF
GPA2 2-10V dc	TB7	TB8			OFF	ON		ON
GPA2 0-20 ma	TB7	TB8			ON	OFF		OFF
GPA2 4-20 ma	TB7	TB8			**ON**	**OFF**		**ON**

PID1 - Temperature-based Control

1) Set Point Modifier 1 (SPM1) is used to modify the Unm (Unmodified) Set point.
   a. Determine the quantity of (+/-) degrees to modify at both the low (0%) and high (100%) extent of the analog signal range.
   b. For instance, if the unmodified set point is 140 degrees F and the customer wants to vary between 140 F and 180 F:
      i. In the Touchscreen (TSGW) page 4,
         1. **Set the SPM Src select to 3 to select GPA2 % span**
         2. *Leave Lo Mod Deg at default 0*
         3. **Change the "SPM1 Deg Chg @ Hi Pt" to 40**
         4. *Leave "SPM1 Lo Pt Deg/% Span" at default 0 (This is 0V for 0-10V range, or 4ma with 4-20ma configuration)*
         5. **Change the "SPM1 Hi Pt Deg/% Span" to 100, which means that the Unm Setpoint will be changed by Hi Mod Deg when GPA2 is at 100% Span, or full signal.**
            1. In this example, 10V or 20ma causes the Mod Setpoint to be 180 Deg.

  ii. On the SLC4060, PGW:
    1. Connect the signal to GPA2(+) at TB7 and GPA2(-) at TB8
    2. Set SW1 for the desired signal type. 4-20 ma is the default

PID2 – Generic Analog-based Control (Typically Pressure)

1) Set Point Modifier 2 (SPM2) is used to modify the Unm (Unmodified) Set point.
 a. PID2 Engineering Units is specified on TSGW Page 5, where '3' is for Percent Span and '4' is for PSI.
 b. Determine the quantity of (+/-) Span% or PSI to modify at both the low (0%) and high (100%) extent of the analog signal range.
 c. For instance, if PID2 is using PSI as the Engr Unit with the **unmodified set point at 100 PSI** and the customer wants to vary between 80 and 140 PSI:
  i. In the Touchscreen (TSGW) page 6,
    1. Set the SPM Src select to 4 to select GPA2 PSI
    2. Leave "SPM2 Lo Pt in EU/% Span" at default 0
    3. Change the "SPM2 Hi Pt in EU/% Span" to 100 (% span)
    4. Set the "SPM2 EUs Chg @ Lo Pt" to -20, which is 100 unmodified – 20 = desired 80 PSI
      1. So at 0V or 4 ma, the Mod Setpoint = 80.
    5. Set the "SPM2 EU Chg @ Hi Pt" to 40, which is 100 unmodified +40 = desired 140 PSI
      1. So at 10V or 20 ma, the Mod Setpoint = 140.
  ii. On the SLC4060, PGW:
    1. Connect the signal to GPA2(+) at TB7 and GPA2(-) at TB8
    2. Set SW1 for the desired signal type. (4-20 ma is the default)
  iii. If PID2 is using the generic Percent Span, then the Lo Mod and Hi Mod are specified in Percent Span.

Modified Setpoint

- Both the unmodified and modified setpoint are displayed on TSGW Page 1, as well as on the applicable PID and SPM pages.

Saving Configuration

1) The changes to the TSGW configuration are saved in non-volatile memory after a few minutes. Do not power off the TSGW during this period.
2) Cycle power to the unit, and verify that the desired changes have been saved. Repeat the process, if not successful
3) The settings may optionally be saved in the OnStartup Configuration file. Refer to document "TSGW_ Startup Configuration Modification Guide.pdf", available at http://selectronix.us/ in the Support section for SLC4075.

Configuration Complete

Two Setpoint Selection Using a Relay

A relay with a normally open and a normally closed contact may be used to select one of two setpoints.

1. Obtain an SLC4040-22.1K or a 22.1K ohm, 1%, 1/4Watt or greater resistor, referred to as R1
2. Configure GPA2 as a 0-10V input
3. Configure the applicable Setpoint Modifier (SPM) using the previous instructions.
4. Connect the relay and R1 per the schematic below
   a. The low setpoint is selected when the relay is open.
   b. The relay contacts may be interchanged if it is desired that the high setpoint is to be selected when the relay is open.

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                    ┌─────────────────────────┐
                    │       SLC4060           │
                    │                         │
         ┌──────────┤ TB17 +24 Aux            │
         │          │                         │
       ┌─┴─┐        │                         │
       │ R │        │                         │
       │ 1 │        │                         │
       └─┬─┘        │                         │
         │          │                         │
 ┌─────┐ ═╪═        │                         │
 │ Rly │  │         │                         │
 └─────┘  ├─────────┤ TB7 GPA2 (+)            │
          │         │                         │
         ╪╪         │                         │
        ╱ │         │                         │
          └─────────┤ TB8 GPA2 Common         │
                    │                         │
                    └─────────────────────────┘
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