SELECTRONIX, INC.
WOODINVILLE, WA

SUPERSTEP SERIES 4000

SLC4075 Touch Screen GATEWAY

INSTALLATION & OPERATING

MANUAL

1.	**Models:**	**SLC4075-4 4" Screen**
2.	**Models:**	**SLC4075-7 7" Screen**

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GENERAL INFORMATION

Introduction

The **SELECTRONIX, INC. SLC4075-n, TouchScreen Gateway (TSGW) is a human-machine interface that is used with our SUPERSTEP SERIES 4000 controllers and optionally our SLC4060, Process Gateway (PGW). It provides an interface to building management systems that use the BACnet, Modbus protocols or many other supported protocols.**

The TSGW, SLC4075-4 is based on the Red Lion Kadet 2 Operator Interface, which has a 4.3" TFT, touch screen color display, while SLC4075-7 has a 7" screen. References to TSGW or SLC4075 apply equally to either unit.

The unit is configured using Red Lion's Crimson 3 software, which is a free download. This unit supports over 300 protocols which may be mapped to the internal data points.

The TSGW contains a pre-programmed database and BACnet/IP and Modbus addresses for the accessible parameters. The parameters are listed in Table 2, Building Management Interface Variable Assignment

The SLC4075-7, the 7" unit, has additional features in addition to the larger size. It has an SD card slot for upgrading the database in the field. This allows configuring the database at a main location, then upgrading on-site with operating personnel. It also has a System Menu mode that enables configuring the network parameters from the front panel, so initial commissioning may also be performed by the local network administrator, also eliminating the need for a PC configuration download to the unit. An internal battery maintains the realtime clock. **These features may reduce or completely eliminate the need for the on-site configuration using the Crimson 3 software.**

Communication interface is via a 10/100-base-T Ethernet port, or an asynchronous RS-232/422/485 port. Non-volatile memory is provided to store configuration and other vital information.

An optional NEMA 4/IP65 enclosure is available.

Power for the unit TSGW is 24V dc +/- 20%. The power for the SLC4075-4 is provided by an auxiliary 24V output of the SLC4060. **Power for SLC4075-7 must be provided by an external 24V dc power supply.**

Status LEDs on the front page of the touchscreen shows the individual elements that are activated, along with a numerical readout of the percent of step command and load limit, for both the Auxiliary and the BMS control. A large "AUX/BMS" 2-position switch, duplicated on every page, allows for convenient status and control of the equipment.
Additional pages provide for detailed information, status, and ability to change individual configuration and customization settings.

Classic Lead Lag is an optional feature that provides most of the traditional forms of Lead/Lag while providing additional control features.

SLC4080 provides the capability to add 8 additional isolated digital inputs, which uses 24 V dc excitation.

The standard SLC4000, using the dedicated input configuration, provides 8 additional relays outputs.

Warnings And Advisories

!!! WARNING !!!

This equipment should be installed, adjusted, and serviced by qualified electrical maintenance personnel familiar with the construction and operation of the equipment and the hazards involved.

FAILURE TO OBSERVE THIS PRECAUTION COULD RESULT IN BODILY INJURY!

This control is an operating device, not a limiting device. It is the responsibility of the user to install all limiting and safety devices to the end-item system. The system software controls many critical functions, such as maintaining set points, enabling and disabling multiple boilers.

For any critical safety-related limits, or enable/disable functions, the end-user shall install hardware limiting devices and cutout switches, as applicable.

The circuitry in this equipment contains static-sensitive electronic components. Observe proper handling precautions when handling the printed wiring boards. Avoid contacting components without first discharging your body to earth ground. Always disconnect power to any of the electronic assemblies before making electrical interconnect or input/output wiring. Failure to observe this precaution could result in damage to the circuitry.
The printed circuit assemblies contain sharp leads on the back side of the board, which may be avoided by handling the assemblies by the board edges.

!!! WARNING !!!

The Selectronix Building Management Interface allows remote write access to various data points via BACnet or Modbus. It is the end-user's responsibility to determine which data points are allowed to be changed, and which user may perform this action. Red Lion's Crimson software provides comprehensive security features to qualify user's access. Refer to the Crimson User's manual available at www.redlion.net.

This system contains software from 3rd party vendors which is configurable by the OEM, the integrator, and the end-item user over which Selectronix has no control. The delivered software is provided "As Is" without warranty of any kind. Selectronix disclaims all warranties, whether stated, implied or statutory, for merchantability or fitness for a particular purpose. Selectronix does not warrant that the functions contained in the supplied system will be error-free, or that all errors or defects are capable of being corrected. The end-user is solely responsible for verification of its design and suitability to the application.

This system is not designed or intended to be applied in a fail-safe system, such as life-support.

In no event shall Selectronix be liable for any loss of profits, loss of data, loss of configuration, or cost of procurement of substitute goods or services, or installation or labor charges.

1. Red Lion G304 & G307 Kadet Detailed Information

Detailed TSGW information is contained in the Red Lion documentation, available on the Selectronix website at www.selectronix.us or at http://www.redlion.net

- **a. Communicating With the G304K2**
  - ***i. Use SLC4074-1, Adapter, DB9 (SLC4075) to RJ45 (SLCnet) and a SLC4020-x of suitable length.***
  - ***ii. Use SLC4073-1 Programming Cable***
- **b. Communicating With the G307K2**
  - ***i. Use SLC4074-2, Adapter, DB9 (SLC4075) to RJ45 (SLCnet) and a SLC4020-x of suitable length.***
  - ***ii. Use SLC4073-2 Programming Cable***
- ***c.* PC Connection**
  - ***i. Use "SLC4073-x" Programming Cable listed above***
- ***d.* Device Communication**
  - ***i. Use cable listed in 1a above, to communicate with SLC4000(S4K) master and SLC4060 (PGW)***
- ***e.* Setting the Switches**
  - ***i.*** The switches have been preset for the Normal mode. The unit is pre-loaded with a default database. ***The Clear Database position should not normally be required. Consult Selectronix Technical Support before using this option.***
- ***f.* Software/Unit Operation**
  - *i.* Crimson Software
  - *ii.* Front Panel LEDS
  - *iii.* Touchscreen
  - *iv.* Troubleshooting your SLC4075
    1. For SLC4075 Operation and Issues: Contact Selectronix Tech Support
       - *a.* Email: techsupport@selectronix.us
       - *b.* Web Site: www.selectronix.us
       - *c.* Phone: (425) 788-2979
    2. For G304K2-specific or G307K2-specific Operation and Issues:
       - *a.* Email: techsupport@redlion.net
       - *b.* Web Site: http://www.redlion.net

2. Unit Configuration

The SLC4075 is supplied with a default database that includes the basic SLC4075 functionality. The unit requires additional configuration if the following optional features are desired:

- Ethernet parameters
- User accounts and password
- Additional alarm notifications

a. Download the latest, free Crimson 3 software and manual from
b. http://www.redlion.net/Support/Downloads and find the Crimson3 software
c. Connect 24V dc to the SLC4075, but do not turn on until instructed.
d. If changes to the database are desired, determine the method to update the database.
   i. Method 1: The database download IP address is configured with a default address of **192.168.0.104** and the Link Options selection is TCP/IP. This method may be used to download updates to the database without using the programming cable. The TCP/IP parameters may be changed so that subsequent updates may use a corporate network address. Connect a laptop using an Ethernet switch or make a direct connection. Verify that the **wired adapter is enabled on the laptop**.
   ii. Method 2: Using Programming Cable Selectronix SLC4074-2 OR Red Lion Cable CBLPRO4K
      1. Determine the COM port on the host PC that will connect to the TSGW.
      2. Connect the Serial Programming Cable.
   iii. Method 3: For SLC4075-7 only, update the database using an SD card.
e. Power the unit
f. Open Crimson 3
   i. Open the delivered **SLC4075_TSGW…….cd3 database**
   ii. For Method 1 update:
      1. Select Link; Options; Set to the desired COM port on the host PC.
   iii. For Method 2 updates using the default TCP/IP address:
      1. Set the IP address ***on the PC running Crimson*** to **192.168.0.99 .**
      2. In the left window, Navigation Pane
         a. Select the **Communications** Tab
         b. select the **Network** item.
      3. In the right window, select the **Ethernet** tab and configure the applicable parameters
      4. From your network administrator, request a static IP and other required information OR set the initial Port Mode to "Configured via DHCP or APIPA". The unit will request an IP on power up. Note that after this IP is assigned, it is recommended that you request that the network administrator reserve that IP address for this specific unit. The Port Mode can then be changed to Manual Configuration with the assigned network information.
      5. If Ethernet is to be used for subsequent unit updates:
         a. Select Communications Tab; Network item; Download tab and change **IP Download** to Enabled and set the **Unit Addressing** to Manual and enter the desired Remote Address. Note that this IP address may be different from the IP address entered in the Ethernet tab. *Having separate IP addresses for unit addressing and for database downloads facilitates multiple unit upgrades without having to change the download IP address for each unit.*
         b. Select Link;Options, and set the desired link to TCP/IP.
   iv. For Method 3, go to section "Configuration using SD Card", on the next page.
   v. After all configuration and database options have been programmed
      1. **Select top menu, Link;Update**
   vi. See "Status"
      1. "Writing device firmware block nnnn", where nnnn is approximately
      2. "Do not power off the target device during this process."
   vii. TIP: A convenient way to set the time on the TSGW is to select **Link;Set Time.**

Configuration Complete.

Configuration using SD Card (7" Screen only)

The 7" TSGW may upload a new image by using an SD card (SLC4030)) inserted into unit.
Obtain an SD card with the desired image from Selectronix or

- On a PC using the Crimson software, loaded with the desired database
  - Save the image on the SD card using File; Save Image; **image.ci3 (must be this name)**
  - **Tip: Save a copy of the source database on the SD card for later identification of the database image contents.**
- On the TSGW, power off and open the DIP switch access cover on the back of the unit.
  - Set switches 1 and 2 to On (Up)
  - Power up the unit and see the System Menu screen
  - Press and hold the <button> until it changes color
  - <Database Utilities>
  - <Database Image Menu>
  - <Load Image from Memory Card
  - Load Database Image from Memory Card…
  - Are you sure you want to continue?
  - <Yes>
  - See the unit reboot
  - <Continue>
  - Reset DIP switches to continue
  - Power off the unit and set the DIP switches back to normal SW1 and SW2 off(down)
  - See the new database load and run
- Configuration Complete

3. Terminology

Acronym	Definition
ADC	Analog-to-Digital Converter
AUX	Auxiliary SLC4000 direct connection to the Step command or Load Limit inputs.
BMI	Building Management Interface
BMS	Building Management System
DIP	Dual Inline package
DeciPct	Percent in tenths – 10% is represented as 100
GPAx	General Purpose Analog Channel x
GWnet	Gateway net may be BACnet or Modbus on Ethernet or serial
MAC	Media Access Control
PGW	Process Gateway SLC4060
RTDx	Resistance Temperature Device x
Rx	Receive
S4K	SLC4000
SLCnet	Selectronix communications via RS485
TSGW	TouchScreen Gateway SLC4075-x
Tx	Transmit

4. TSGW Pages

Front Page

a. Clock is programmed via the touch panel or, if connected to Crimson using Link, Send Time..
b. Master and Expansion LEDs show the state of the relays on each unit. The LEDs are only displayed if there is an active unit that is responding.
c. Setpt is the SLC4060 remote set point.
d. RTD1 and degrees is displayed in the selected units. RTD1 Open Ckt is displayed if no RTD is installed or if the resistance is greater than that at the maximum temperature range. Add a jumper across RTD1 terminals if a sensor is not installed.
e. Aux Step Cmd % is the command in % to the SLC4000 terminals.
f. Aux Load Limit % is the load limit input in % to the SLC4000 terminals
g. BMS Step Cmd % is the command in % to the SLC4000 terminals.
h. BMS Load Limit % is the load limit input in % to the SLC4000 terminals
i. AUX/BMS switch (available on all pages)
    i. AUX enables the local connection to the SLC4000
    ii. BMS enables the Building Management Interface and local changes via the TSGW front panel.
j. SLCnet Tx, Selectronix, transmit
k. SLCnet Rx, Selectronix, receive
l. GWnet Tx, BMI communication link transmit
m. GWnet Rx, BMI communication link receive

Alarms

a. There may be various pre-configured alarms which the equipment manufacturer defined for safety limit inputs.
    a. Examples of alarms are for Low Water, High Limit, or a generic Boiler Lockout condition.
    b. These alarms have been pre-configured to be level-triggered alarms.
        i. When the alarm occurs, the TSGW panel background illumination flashes along with the audible alarm.
        ii. To mute the audible alarm, go to Page 2 and press **<Mute>**.
        iii. Once the limit has been resolved and to remove the alarm display, press **<Prev>** or **<Next>** to highlight the alarm of interest. Press **<Accept>** to remove the alarm line item.
        iv. If the alarm is still active, and since it is a level-triggered alarm, the alarm line remains displayed unit it is no longer active.
        v. When all alarms are accepted, see “No Active Alarms” displayed.
b. For additional options for User-programmed alarms, see the Red Lion Crimson 3 documentation.

SLC4060 PID 1

a. Mode Select
    a. 1 = Heat Mode BMS
    b. 2= Cool Mode BMS
    c. 3 = Heat Mode AUX available for monitoring or optional Voltage Driver
    d. 4 = Cool Mode AUX available for monitoring or optional Voltage Driver
b. Process Var: Displays the process variable sensor
c. Setpt: Displays the set point
d. Units:
    a. 0 = Deg F
    b. 1 = Deg C
e. Process Variable: Displays in the selected units
f. SPM Select selects the Setpt Modifier Mode
    a. 0 = Disabled
    b. 1 = RTD2 Deg F
    c. 2 = RTD2 Deg C
    d. 3 = GPA2 % Span
    e. 4 = GPA2 PSI
g. Setpt Cnts: Set point in internal ADC counts
h. Preset:
    a. 0 = Slow
    b. 1 = Medium
    c. 2 = Fast
i. Proportion: PID Proportion
j. Integral: PID Integral
k. Derivative: PID Derivative

SLC4060 Setpoint Modifier 1 (SPM1) – Outdoor Air Reset

a. SPM Select:
    a. 0 = Disabled
    b. 1 = RTD2 Deg F
    c. 2 = RTD2 Deg C
    d. 3 = GPA2 % Span
    e. 4 = GPA2 PSI
b. Setpt: Setpoint after SPM1 applied
c. Preset:
    a. 0 = TBD
    b. 1 = TBD
    c. 2 = TBD
d. Lo Mod Deg is the amount to modify the setpoint at the X axis Lo point
e. X Axis Lo is the low temperature corresponding to the Lo Mod Deg
f. High Mod Deg is the amount to modify the setpoint at the X axis Hi point
g. X Axis Hi is the high temperature corresponding to the Hi Mod Deg

SLC4060 PID 2

l. Mode Select
   a. 1 = Heat Mode BMS
   b. 2 = Cool Mode BMS
   c. 3 = Heat Mode AUX available for monitoring or optional Voltage Driver
   d. 4 = Cool Mode AUX available for monitoring or optional Voltage Driver
m. Process Var: Displays the process variable sensor
n. Unm Setpt EU: Displays the unmodified set point in engineering units
o. Engr Unit:
   a. 0 = None
   b. 1 = Deg F
   c. 2 = Deg C
   d. 3 = % Span
   e. 4 = PSI
p. Process Variable: Displays in the selected units
q. SPM Src Select is the choice of the Setpt Modifier sensor and engineering unit
   a. 0 = Disabled
   b. 1 = RTD2 Deg F
   c. 2 = RTD2 Deg C
   d. 3 = GPA2 % Span
   e. 4 = GPA2 PSI
r. Mod Setpt EU: Setpoint in engineering units after SPM1 applied
s. Preset:
   a. 0 = Slow
   b. 1 = Medium
   c. 2 = Fast
t. Proportion: PID Proportion
u. Integral: PID Integral
v. Derivative: PID Derivative

SLC4060 Setpoint Modifier 2 (SPM2) – Outdoor Air Reset

a. SPM Src Select is the choice of the Setpt Modifier sensor and engineering unit
   a. 0 = Disabled
   b. 1 = RTD2 Deg F
   c. 2 = RTD2 Deg C
   d. 3 = GPA2 % Span
   e. 4 = GPA2 PSI
b. Mod Setpt EU: Setpoint in engineering units after SPM2 applied
c. Preset:
   a. 0 = TBD
   b. 1 = TBD
   c. 2 = TBD
h. Lo Mod in EU is the amount to modify the setpoint at the X axis Lo point, in engineering units
i. X Axis Lo is the low point corresponding to the Lo Mod in engineering units
j. High Mod in EU is the amount to modify the setpoint at the X axis Hi point in engineering units
k. X Axis Hi is the high point corresponding to the Hi Mod in engineering units

SLC4060 RTD Sensors

a. RTD1 and RTD 2
b. Deg F
c. Deg C
d. ADC Cnts
e. RTD Bias Cnts is used to adjust the displayed RTD displayed temperature to compensate for wiring resistance or to calibrate the unit to the actual temperature.

SLC4060 Aux Sensors

a. GPA1
b. GPA1 in engineering units
c. GPA1 Span%
d. GPA1 Bias% is used to calibrate GPA1
e. Input Cfg: either Full Span or 20% offset as set by the DIP switches on the PGW
f. GPA2
g. GPA2 in engineering units
h. GPA2 Span%
i. GPA1 Bias% is used to calibrate GPA2
j. Input Cfg: either Full Span or 20% offset as set by the DIP switches on the PGW

SLC4060 General Purpose Digital Inputs (GPDI)

a. Displays the state of the General purpose digital inputs
b. Invert illuminates when the GPDI Invert Mask is set to '1' in the applicable position
c. Alm En illuminates if this GPDI is designated as an alarm
d. Active illuminates when the GPDI is in the logical active state.
e. GPDI Invert Mask is used to invert the logical input sense of the individual inputs. The data is set as either a '1' or '0' with the far right bit being GPDI1.
f. GP Digital is a composite byte representing the GPDI inputs.
g. PwrOn Inh Secs is the startup period in seconds that the alarms are inhibited during system configuration.

SLC4060 Expansion Digital Inputs (XDI)

a. Displays the state of the Expansion digital inputs
b. Invert illuminates when the Expansion Invert Mask is set to '1' in the applicable position
c. Alm En illuminates if this XDI is designated as an alarm
d. Active illuminates when the XDI is in the logical active state.
e. XDI Invert Mask is used to invert the logical input sense of the individual inputs. The data is set as either a '1' or '0' with the far right bit being XDI1.
f. PwrOn Inh Secs is the startup period in seconds that the alarms are inhibited during system configuration.

SLC4060 Relays

a. Source Selector defines the signal which activates the relay
    a. 0 = Disabled
    b. 1 = GPDIx, the corresponding GPDIx operates the relay.
    c. 2 = GPDIx and GPDI4 the corresponding GPDIx And'ed with GPDI4 operates the relay.
    d. 3 = GPDIx and GPDI4 the corresponding GPDIx Or'ed with GPDI4 operates the relay.
    e. 4 = BMS, Building Management System operates
    f. 5 = SLC4000 Fault
    g. 6 = PGW & Cmd=0 Fault
    h. 7 = TSGW Fault
    i. 8 = Combines #2 and #6 above
    j. 9 = Combines #3 and #6 above
b. Relay Invert Mask is used to invert the logical source signal to operate the relay.
    a. Note that an inverted relay reverts to normally open on AC power loss.

Expansion Relays

a. 8 additional relays may be added by using a standard SLC4000 with the "Dedicated Test" position selected, (SW2-1 Off). This sets an SLCnet pre-determined address and "Expansion Relay mode" operation. The dedicated test functions for 'Test Up' and 'Test Dn' remain, as does the Status indication.
b. Source Selector defines the signal which activates the relay according to the following table:

SrcSel	XRly1	XRly 2	XRly 3	XRly 4	XRly 5	XRly 6	XRly 7	XRly 8
0	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
1	XDIx	XDIx	XDIx	XDIx	XDIx	XDIx	XDIx	XDIx
2	XDIx	XDIx	XDIx	XDIx	PGW Flt	TSGW Flt	S4K Flt	Rsv Flt
3	XDIx	XDIx	XDIx	XDIx	BMS	BMS	BMS	BMS
4	BMS	BMS	BMS	BMS	BMS	BMS	BMS	BMS

SLC4060 Voltage Driver

a. Source Select defines the signal that is sent to the voltage driver
    a. 0 = Disabled
    b. 1 = RTD1
    c. 2 = RTD2
    d. 3 = GPA1
    e. 4 = GPA2
    f. 5 = PID1 0-10 V dc
    g. 6 = PID1 2-10 V dc
    h. 7 = PID2 0-10 V dc
    i. 8 = PID2 2-10 V dc
    j. 9 = BMS

SLC4060 Information

a. PGW Firmware Version:
b. Remote Enable Code:
    a. 90 is the default enable code
    b. 0 is the default disable code
c. PGW Step Cmd % is the step command originating from either PID1, PID2, or a PGW BMI.
d. PGW Ld Lmt % originating from a PGW BMI.
e. PGW On Dly Sec originating from a PGW BMI I
f. PGW Fault
g. MSTP Addr is the setting of the MSTP address by DIP switch SW2.

Classic Lead Lag

Classic Lead Lag (CLL) is an optional feature that provides several different sequencing profiles to match specific control objectives, in addition to providing the ability to define a custom profile.

- The TSGW controls a special CLLversion of our SLC4000 step controller.
- Up to 3 expansion units may be cascaded from the master, allowing direct control for up to 4 boilers with up to 8 relays or 4 fuel-based boilers when SLC4000-1 units are used, which have an analog output.
- The Lead boiler may be changed by a pre-set interval from 1 to 1000 hours (41+ days).
- Each of the 4 primary S4Ks are software enabled and disabled, and provide automatic recognition and re-configuration when a unit's online status has changed, either due to the lead unit being changed, a limit string event, or an operator action.
- Auxiliary pilot relays may be activated when an individual S4K has any active output, suitable for signaling contactors to operate fans or pumps. The auxiliary relays may be on the Process Gateway (PGW) or on another SLC4000 configured as an XRly unit. On and Off delays may be individually specified for each of the 4 corresponding relays.
- For more details, see "SLC4000Addendum_ClassicLeadLagFeaturesAndControls.pdf" available at www.selectronix.us in the Support Section.

MSTP Inst ID Device Instance (Future Use)

This box is for future use to allow for changing the Instance ID from the default 4060.

MS/TP support is provided by an optional BACnet I/P to MS/TP converter, SLC4082. See "SLC4000Addendum_BACnetMSTPConverterWiring.pdf" , available at www.selectronix.us in the Support Section.

TSGW Information

a. TSGW Firmware Version
b. BMS Values Enabled/Disabled annunciation
    a. If BMS values are enabled, the originating source is displayed, either Not Set, PGW, or TSGW
c. BMS Ld Lmt Status and originating source, either Not Set, PGW, or TSGW
d. BMS On Dly Status and originating source, either Not Set, PGW, or TSGW
e. TSGW Fault
f. IP Addr: is the configured IP address stored in the TSGW
g. Net Mask is the configured Subnet Mask stored in the TSGW
h. Gateway IP is the configured default network gateway in the TSGW
i. MAC Addr: is the MAC address of the TSGW

SLC4000 Information

a. Qty Sys Rlys is the quantity of relays on all SLC4000 units.
b. Ld Lmt Rlys is the quantity of relays that can be energized after the load limit has been applied.
c. Aux Step Cmd % is the local command percent connected to the master SLC4000.
d. Aux Ld Lmt % is the local load limit percent connected to the master SLC4000.
e. AUX OnDly Secs is the setting of the On Delay on the master SLC4000 unit.
f. AUX Vnr Out % is the percent of the 0-10 V dc vernier output.
g. Command Status Table

S4K Src	PGW Src	TSGW Src
BMS Dis or blank	BMS En or blank	BMS En or blank
Rlys On shows system relays on	Cmd if originates Step Cmd or blank	Cmd if originates Step Cmd or blank
blank	LdLmt if originates Ld Lmt or blank	LdLmt if originates Ld Lmt or blank

h. S4K Fault: displays the SLC4000 fault code
i. S4K Ver: displays the firmware version of the SLC4000 master

HMI Information

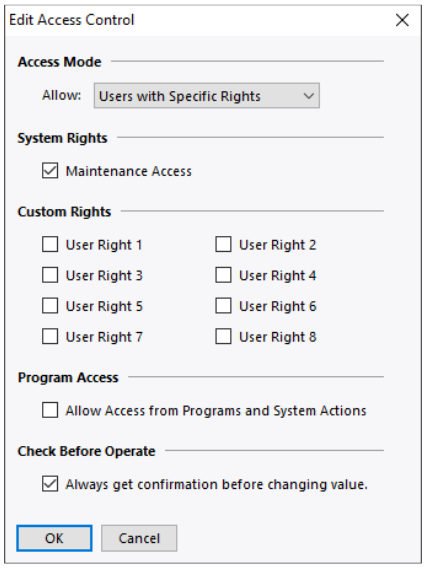
a. HMI Model: Model of the TSGW HMI
b. HMI Runtime Ver: Runtime version of the HMI
c. HMI Config Ver: Configuration version of the HMI
d. HMI Bootloader Ver: Bootloader version of the HMI

User Manager

The Selectronix Building Management Interface allows remote write access to various data points via BACnet or Modbus. It is the end-user's responsibility to determine which data points are allowed to be changed, and which user may perform this action. Red Lion's Crimson software provides comprehensive security features to qualify user's access. Refer to the Crimson User's manual available at www.redlion.net.

Provides for the authenticated access to the pre-defined protected pages or data points.

a. Configured using the Crimson 3 software. See section "Using The Security System"
b. Of particular importance is the Edit Access Control Dialog,



If the Program Access box is checked, remote access to write to the data points is enabled without any additional security checks. Unchecked write-protects the values.

Communication Assurance

This page displays the internal information for assuring communication integrity.

a. FailSafe Cnt – Master: is incremented on messages received from the SLC4000 master
b. FailSafe Cnt – Addr1 through Addr3: is incremented on messages received from the SLC4000expansion units.
c. FailSafe Cnt – PGW: is from the SLC4060
d. PGW Exits Off/On is a binary reporting whether a PGW is communicating.
e. TSGW Polled is a binary reporting whether the TSGW has been polled.
f. SLCnet Dev Addr: is the current addr of the received SLCnet message.
g. Message Nbr is an internal message count.
h. Device Status is a binary number representing the devices online, where each bit represents the corresponding address of an SLCnet device. Address 0 corresponds with bit 0 of the byte.

The reference documents may be found in the Support section on our website www.selectronix.us.

Table 1 SLC4075 Error Indications

Display	Page(s)	Description
No Comm with SLC4000!	All	Communication has been lost with SLC4000
RTDn Open Circuit	SLC4060 RTD Sensors	RTD1 or RTD2 has a resistance that exceeds the high temperature resistance.
PGW Exists OFF	Communication Assurance	Communication with SLC4060 (PGW) has been lost.
TSGW Polled Off	Communication Assurance	The SLC4075 (TSGW) has not been polled by an SLC4000 master.

BACnet IP and Modbus Parameters

- **When the BMS uses BACnet IP or Modbus to update the variables, the TSGW front panel data entry and the BMS have the same priority when changing the data, as the last written value is used.**

Table 2 Building Management Interface –Most Commonly Used BACnet And Modbus Addresses

Description	Units	BACnet Analog Input Present Vaule Read Only	BACnet Analog Value Present Value Read/ Write	Modbus Analog Input Reg Read Only	Modbus Holding Reg Read/ Write	Min Val	Max Val	TSGW Page
BMS, Aux/BMS Switch			AV0001		400001	0	90	All
BMS, Ld Lmt	Pct		AV0003		400005t	0	99	TSGW
PGW PID1,Unmodified Set point	Deg F		AV0017		400033	-60	260	PID1
PGW RTD1 Temperature	Deg F	AI0031		300061		-60	260	RTD Sensors
PGW SPM1, Modified Setpt	Deg F	AI0024		300047		-60	260	SPM1
PGW RTD2 Temperature	Deg F	AI0033		300061		-60	260	RTD Sensors
PGW PID2, Unmodified Set pt	Pct		AV0033		400065	0	100	PID2
PGW, GPA1	Span Pct	AI0036		300071		-25	100	Aux Sensors
PGW SPM2, Modified Setpt		AI0025		300049		0	100	SPM2
PGW, GPA2	Span Pct	AI0037		300073		-25	100	Aux Sensors
PGW, GPDI *1	Packed byte	AI0038		300075		0	15	GPDI
PGW, GPA2 Value in Engr Units		AI0040		300079				GPA2

Table 3 Building Management Interface –BACnet And Modbus Configuration Addresses

Description	Units	BACnet Analog Input Present Vaule (Read Only)	BACnet Analog Value Present Value (Read /Write)	Modbus Analog Input Reg Read Only	Modbus Holding Reg Read/ Write	Min Val	Max Val	TSGW Page
BMS , Step Cmd	Pct		AV0002		400003	0	100	TSGW
BMS, On Delay Secs	Secs		AV0004		400007	0	480	TSGW
S4K, Relays, Qty In-Srvc - Master	Each	AI0001		300001		1	8	Front
S4K,Relays, Qty In-Srvc - Exp #1	Each	AI0002		300003		1	8	Front
S4K,Relays, Qty In-Srvc - Exp #2	Each	AI0003		300005		1	8	Front
S4K,Relays, Qty In-Srvc - Exp #3	Each	AI0004		300007		1	8	Front
S4K,Relays, Qty In-Srvc Total	Each	AI0005		300009		1	32	Front
S4K,Relays, Binary Image of Active on Master		AI0006		300011		0	255	Front
S4K,Relays, Binary Image of Active on Exp #1		AI0007		300013		0	255	Front
S4K,Relays, Binary Image of Active on Exp #2		AI0008		300015		0	255	Front
S4K, Relays, Binary Image of Active on Exp #3		AI0009		300017		0	255	Front
S4K, Input Cfg - Master		AI0010		300019		0	32	
S4K, Aux Step Cmd Input	Pct	AI0011		300021		0	100	SLC4000
S4K, Aux Ld Lmt	Pct	AI0012		300023		0	100	SLC4000
S4K, Lcl OnDly Secs	Secs	AI0013		300025		0	3600	SLC4000
S4K, Fault		AI0016		300031		0		SLC4000
S4K Version		AI0017		300033		0	480	SLC4000
PGW, GPA1/GPA2 Cfg *1	Packed Byte	AI0035				0	3	Aux Sensors
PGW, Fault code		AI0045		300089		0		SLC4060 Info
PGW, Version		AI0046		300091		4.03		SLC4060 Info
TSGW, Fault code		AI0050		300099		0		TSGW Info
TSGW, Version		AI0051		300101		1.16		TSGW Info
PGW PID1, Mode select			AV0015		400029	0	4	PID1
PGW SPM1, Set Src Sel			AV0016		400031	0	4	SPM1
PGW PID1, Set Engr Units			AV0018		400035	1	2	PID1
PGW PID1, Proportional Term			AV0020		400039	0	10000	PID1
PGW PID1, Integral Term			AV0021		400041	0	10000	PID1
PGW PID1, Derivative Term			AV0022		400043	0	10000	PID1
PGW PID1, Min out	Pct		AV0023		400045	0	50	PID1
PGW SPM1, X Axis, Lo Temp	Deg F		AV0026		400051	-60	260	SPM1
PGW SPM1, Mod Degrees At Lo Temp	Deg F		AV0027		400053	-100	100	SPM1
PGW SPM1, X Axis, Hi Temp	Deg F		AV0028		400055	-60	260	SPM1
PGW SPM1, Mod Degrees at Hi Temp	Deg F		AV0029		400057	-100	100	SPM1
PGW PID2, Mode Sel			AV0031		400061	0	4	PID2

PGW PID2, Source Select			AV0032		400063	0	3	SPM2
PGW PID2, Unmod Setpt in Engr Units			AV0033		400065	-260	10000	PID2
PGW PID2, Engr Units			AV0034		400067	3	4	PID2
PGW PID2, Proportional Term			AV0036		400071	0	10000	PID2
PGW PID2, Integral Term			AV0037		400073	0	10000	PID2
PGW PID2, Derivative Term			AV0038		400075	0	10000	PID2
PGW PID2, Min out			AV0039		400077	0	50	PID2
PGW SPM2, X Axis, Lo	Pct		AV0041		400081	0	100	SPM2
PGW SPM2, Mod Degrees, Pct or Engr Unit at LoX	Deg F or Pct		AV0042		400083	-60 -100	260 100	SPM2
PGW SPM2, X Axis, Hi Temp	Deg F or Pct		AV0043		400085	0	100	SPM2
PGW SPM2, Mod Degrees, Pct or Engr at HiX	Deg F or Pct		AV0044		400087	-60 -100	260 100	SPM2
PGW RTD1, Bias Cnts	Cnts		AV0046		400091	-100	500	RTD
PGW RTD2, Bias Cnts	Cnts		AV0047		400093	-100	500	RTD
PGW GPA1 Bias Pct	Pct		AV0048		400095	-50	50	AUX
PGW GPA2 Bias Pct	Pct		AV0049		400097	-50	50	AUX
PGW GPDI Invert Mask *1	Packed Byte		AV0050		400099	0	7	GPDI
PGW Relay 1, Src Select			AV0051		400101	0	9	Rlys
PGW Relay 2, Src Select			AV0052		400103	0	9	Rlys
PGW Relay 3, Src Select			AV0053		400105	0	9	Rlys
Description	**Units**	**BACnet Analog Input Present Vaule (Read Only)**	**BACnet Analog Value Present Value (Read /Write)**	**Modbus Analog Input Reg Read Only**	**Modbus Holding Reg Read/ Write**	**Min Val**	**Max Val**	**TSGW Page**
PGW Relays, Set image	Binary		AV0054		400107	0	7	Rlys
PGW Relays, Invert Mask	Binary		AV0055		400109	0	7	Rlys
PGW Voltage Driver, Src Select			AV0056		400111	0	9	Voltage Driver
PGW Voltage Driver Output	Pct		AV0057		400113	0	100	Voltage Driver
XDI Logical Input		AI0018		300035		0	255	Expansion Digital Inputs
XDI Invert Mask			AV0008		400015			Expansion Digital Inputs
XDI Alarm Mask			AV0009		400017			Expansion Digital Inputs
XRLYS Set Relays			AV0010		400019			Expansion Relays
XRLYS Src Select			AV0011		400021			Expansion Relays

Table 4 Packed byte assignments

Parameter	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	Remarks
GPA1/GPA2 Cfg							GPA2 Cfg	GPA1 Cfg	1=offset 4-20ma 0 No offset
GPDI					GPDI 4	GPDI 3	GPDI 2	GPDI 1	
GPDI Invert Mask					GPDI 4	GPDI 3	GPDI 2	GPDI 1	Set bit to invert sense

For Alarm monitoring by the BMS:

- Determine which alarms are assigned to each of the General Purpose Digital Inputs
- AI0038 is a packed byte with a weighted value for each bit position

GPDI Number	AI0038 Bit	Bit value	Example boiler assignment
GPDI 1	0	1	Low Water
GPDI 2	1	2	High Limit
GPDI 3	2	4	Low Flow
GPDI 4	3	8	Not used

Example AI0038 values:

- AI0038 = 1 for a Low Water alarm
- AI0038 = 4 for a Low Flow alarm
- AI0038 = 1 + 4 =5 for a Low Water AND a Low Flow alarm
- AI0038 = 2 + 4 = 6 for a High Limit AND a Low Flow alarm

5. Field Wiring

Shielding

Shielded twisted pair wire is recommended for wire runs which are in close proximity to power wiring or other sources of electromagnetic interference (EMI).
When using shielded wiring, the shield should only be terminated at one end to prevent ground loop currents. Preferably terminate the shield at the source end's signal common. 2nd choice is to terminate the source end to earth ground. 3rd choice is to leave both ends of the shield un-terminated. EMI may originate from conducted, induced, or capacitive sources.

Grounding

The low voltage circuit common on the Selectronix Superstep SLC4000 controller is TB3, and TB6. It is isolated from the line control voltage and relay connections.
Connecting the low voltage circuit common to earth ground is optional, however extreme care must be taken not to introduce ground loops. Verify that all field wiring is in accordance with local electrical codes

Limit Control Wiring

The recommended wiring for a limit event is:

1. Provide continuous power to the master SLC4000, as it coordinates communication between the TSGW and the PGW (SLC4060).
2. On all SLC4000 units, disconnect power to the RLYCOM terminal, TB109. This de-energizes all contactor control power.
3. **On a limit condition which has been configured as a PGW fault, the TSGW automatically switches the AUX/BMS switch to the AUX position and sets the BMS command to 0.**
    a. **On the master SLC4000 during a limit event, verify that the auxiliary command input is set to zero. This ensures a re-start with no load when the limit is resolved**.
        i. This may be accomplished by disconnecting the control power to an electronic controller.
        ii. An alternate method of providing for a zero command is to use an external relay to connect SLC4000 TB4, load limit excitation to TB5, load limit input, during the limit event.
    b. If there is no connections to the SLC4000 command inputs, verify that the input configuration switches are set to anything other than ohmic.
    c. If the PGW Voltage Driver has been connected to the SLC4000 command input, the output is held at 0 during the limit event, provided the limit has been configured as a PGW fault.

4. Configuration Customization

Several items may be customized to suit a specific installation or to utilize the advanced features and settings of the TSGW.

a. Default Variable Values

Variables that define the desired configuration of the TSGW or of the PGW may be set so that they cannot be changed by the operator or the BMS. Using the Crimson software,

i. Select the "Display Pages" tab in the lower portion of the Navigation Pane.
ii. Select "Pages" in the upper portion of the Navigation Pane.
iii. Select <Edit> to the right side of the "On Startup Complex Code:"
iv. Enable or disable any of the available selections by adding or removing "//" at the beginning of the line.
v. Contact Selectronix technical support (email techsupport@selectronix.us) for instructions to change specific parameters, not included in the delivered list.
vi. There is a section for entering default values that can be changed by the user or the BMS and be retained after a power cycle, and another section to enter values that will never be changed by the operator. See the comments to find the applicable section.
    1. Examples of changeable default values would be the initial settings for the PID or SPM values, label selections, or any other available tag value.
    2. Examples of non-changeable default values for a specific-installation would be GPDI and relay configuration,
        a. Note that once a desired configuration has been established, the values may be entered in the non-changeable section so that the values will not be inadvertently changed in the field.

b. TCP/IP values

Network parameters are set using the Crimson software. Select "Communications" in the lower portion of the Navigation Pane. Select "Network" in the upper portion of the Navigation Pane. In the main window, select the "Ethernet" tab and enter the desired parameters.

- **TIP**: Select the "Download" tab to configure and enable downloads via TCPIP. Downloads via this link reduces the download time to a few seconds, compared with the serial port method.

c. Alarm Characteristics

Alarms may be set for various conditions or values that are monitored by the TSGW. There are a number of characteristics that may be defined for each alarm. See the Crimson User Manual for detailed descriptions on the alarm characteristics. Select "Data Tags" in the lower portion of the Navigation Pane, and select the desired tag to apply the alarm.

d. Multi-state Labels

There are pre-defined multi-state labels that may be used to select the desired label. An example is the tag that labels GPDI inputs. PGW.GPSI.g_iGPDI1_MultiLbl has selections for "GPDI unused", "Low Water", "High Limit", etc. Assign the format state value to the tag to select the desired label.

5. Restoring SLC4075 to Default Configuration

The TSGW may be restored to either a version-specific or to the latest default database by requesting a copy by emailing techsupport@selectronix.us .