**6800 Series Automatic Switch Controls with IntelliTeam® SG Automatic Restoration System**

# Navigation Guide

## Table of Contents

# Introduction

**Qualified Persons**

**Read this Instruction Sheet**

| NOTICE |
|---|
| Thoroughly and carefully read this instruction sheet and all materials included in the product's instruction handbook before installing or operating the 6800 Series Automatic Switch Control. Familiarize yourself with the Safety Information and Safety Precautions on pages 4 and 5. The latest version of this publication is available online in PDF format at **sandc.com/en/support/product-literature/**. |

**Retain this Instruction Sheet**

This instruction sheet is a permanent part of your 6800 Series Automatic Switch Control. Designate a location where you can easily retrieve and refer to this publication.

**Special Warranty Provisions**

The standard warranty contained in S&C's standard conditions of sale, as set forth in Price Sheets 150 and 181, applies to the 6800 Series Automatic Switch Control, except that the first paragraph of the said warranty is replaced by the following:

**(1) General:** The seller warrants to the immediate purchaser or end user for a period of 10 years from the date of shipment that the equipment delivered will be of the kind and quality specified in the contract description and will be free of defects of workmanship and material. Should any failure to conform to this warranty appear under proper and normal use within 10 years after the date of shipment, the seller agrees, upon prompt notification thereof and confirmation that the equipment has been stored, installed, operated, inspected, and maintained in accordance with the recommendations of the seller and standard industry practice, to correct the nonconformity either by repairing any damaged or defective parts of the equipment or (at the seller's option) by shipment of necessary replacement parts. The seller's warranty does not apply to any equipment that has been disassembled, repaired, or altered by anyone other than the seller. This limited warranty is granted only to the immediate purchaser or, if the equipment is purchased by a third party for instal-lation in third-party equipment, the end user of the equipment. The seller's duty to perform under any warranty may be delayed, at the seller's sole option, until the seller has been paid in full for all goods purchased by the immediate purchaser. No such delay shall extend the warranty period.

Replacement parts provided by the seller or repairs performed by the seller under the warranty for the original equipment will be covered by the above special warranty provision for its duration. Replacement parts purchased separately will be covered by the above special warranty provision.

For equipment/services packages, the seller warrants for a period of one year after commissioning that the 6800 Series Automatic Switch Control will provide automatic fault isolation and system reconfiguration per agreed-upon service levels. The remedy shall be additional system analysis and reconfiguration of the IntelliTeam SG Automatic Restoration System until the desired result is achieved.

Warranty of the 6800 Series Automatic Switch Control is contingent upon the installation, configuration, and use of the control or software in accordance with S&C's applicable instruction sheets.

This warranty does not apply to major components not manufactured by S&C, such as batteries and communication devices. However, S&C will assign to the immediate purchaser or end user all manufacturer's warranties that apply to such major components.

Warranty of equipment/services packages is contingent upon receipt of adequate information on the user's distribution system, sufficiently detailed to prepare a technical analysis. The seller is not liable if an act of nature or parties beyond S&C's control negatively impact performance of equipment/services packages; for example, new construction that impedes radio communication, or changes to the distribution system that impact protection systems, available fault currents, or system-loading characteristics.

## Safety Information

**Understanding Safety-Alert Messages**

Several types of safety-alert messages may appear throughout this instruction sheet and on labels and tags attached to the 6800 Series Automatic Switch Control. Familiarize yourself with these types of messages and the importance of these various signal words:

---

### ⚠ DANGER

"DANGER" identifies the most serious and immediate hazards that will result in serious personal injury or death if instructions, including recommended precautions, are not followed.

---

### ⚠ WARNING

"WARNING" identifies hazards or unsafe practices that can result in serious personal injury or death if instructions, including recommended precautions, are not followed.

---

### ⚠ CAUTION

"CAUTION" identifies hazards or unsafe practices that can result in minor personal injury if instructions, including recommended precautions, are not followed.

---

### NOTICE

"NOTICE" identifies important procedures or requirements that can result in product or property damage if instructions are not followed.

---

**Following Safety Instructions**

If you do not understand any portion of this instruction sheet and need assistance, contact the nearest S&C Sales Office or S&C Authorized Distributor. Their telephone numbers are listed on S&C's website **sandc.com**, or call the S&C Global Support and Monitoring Center at 1-888-762-1100.

---

### NOTICE

Read this instruction sheet thoroughly and carefully before installing your 6800 Series Automatic Switch Control.

---

**Replacement Instructions and Labels**

If additional copies of this instruction sheet are needed, contact the nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

It is important that any missing, damaged, or faded labels on the equipment be replaced immediately. Replacement labels are available by contacting the nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

| ⚠ DANGER | |
|---|---|
|  © 1982 NEMA | **The 6800 Series Automatic Switch Control line voltage input range is 93 to 276 Vac. Failure to observe the precautions below will result in serious personal injury or death.**<br><br>Some of these precautions may differ from your company's operating procedures and rules. Where a discrepancy exists, follow your company's operating procedures and rules. |

1. **QUALIFIED PERSONS.** Access to the 6800 Series Automatic Switch Control must be restricted only to qualified persons. See the "Qualified Persons" section on page 2.

2. **SAFETY PROCEDURES.** Always follow safe operating procedures and rules.

3. **PERSONAL PROTECTIVE EQUIPMENT.** Always use suitable protective equipment, such as rubber gloves, rubber mats, hard hats, safety glasses, and flash clothing, in accordance with safe operating procedures and rules.

4. **SAFETY LABELS.** Do not remove or obscure any of the "DANGER," "WARNING," "CAUTION," or "NOTICE" labels.

5. **MAINTAINING PROPER CLEARANCE.** Always maintain proper clearance from energized components.

# Overview

This Navigation Guide is intended to be used in conjunction with the more detailed 1045-range of instruction sheets for the 6800 Series Automatic Switch Controls. These instruction sheets can be downloaded as PDF files at **sandc.com/en/support/product-literature/**.

6800 series controls manage distribution switches and can automatically sectionalize a feeder based on factors such as overcurrent, loss of voltage, and phase unbalance. The switch controls can be controlled remotely using IntelliLink® Setup Software.

The Navigation Guide provides a general overview to switch control configuration with IntelliLink Setup Software. More information about control configuration with IntelliLink software can be found in Instruction Sheet 1045-530, "6800 Series Automatic Switch Controls with IntelliTeam® SG Automatic Restoration System: *Setup*."

6800 series controls come in three variants: 6801, 6802 and 6803 controls. The last numeral designates the number of switches that can be controlled by the 6800 control. A 6802 or 6803 controls can have different settings applied to each switch.

6800 controls can be used on a variety of switching devices including Scada-Mate® Switching Systems, Mini-Rupter® Switches in Remote Supervisory PME and PMH Pad-Mounted Gear, Remote Supervisory Vista® and Vista® SD Underground Distribution Switchgear, and a variety of switches from other manufacturers.

6800 controls can be operated in two states: **Local** and **Remote**. When set to the **Remote** state, SCADA commands are permitted. When set to the **Local** state, SCADA commands are blocked and the 6800 control can be operated by the faceplate or with a local connection using IntelliLink Setup Software. The **SCADA Control** mode can be set to the **Local** state from the front panel, a local connection (serial or Wi-Fi), and with a remote IntelliLink software command. When the **SCADA Control** mode is set to the **Local** state by a remote IntelliLink software command, the **Remote Operation** state can only be enabled by a local connection (serial or Wi-Fi) at the 6800 control site. See Figures 1 and 2 on page 7.

The 6800 control can also be used in S&C's IntelliTeam SG and IntelliTeam® II Automatic Restoration Systems for self-healing applications.

---

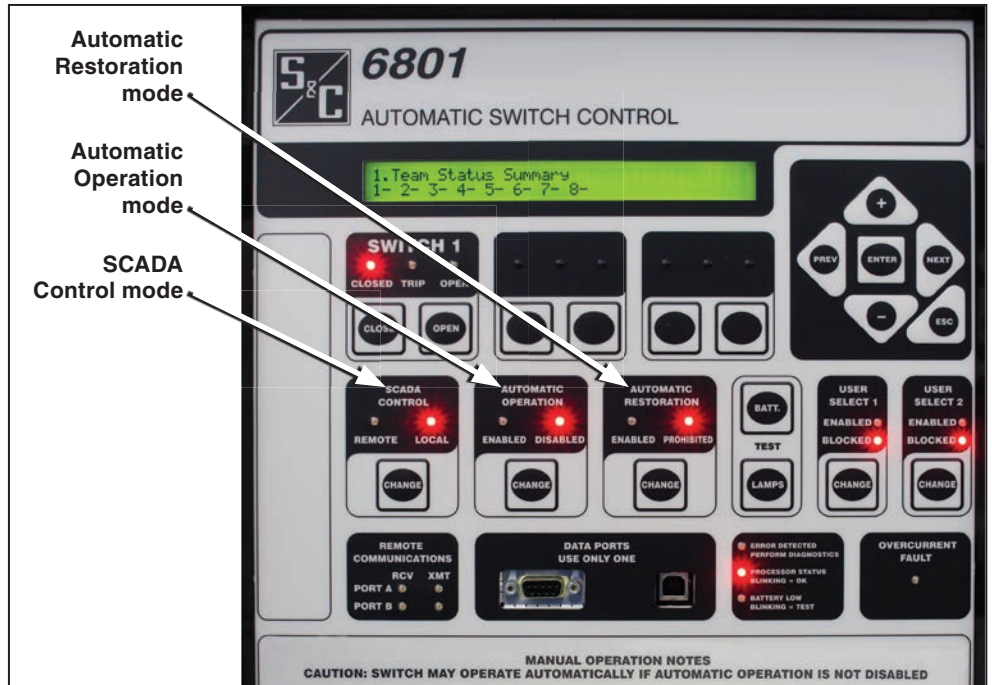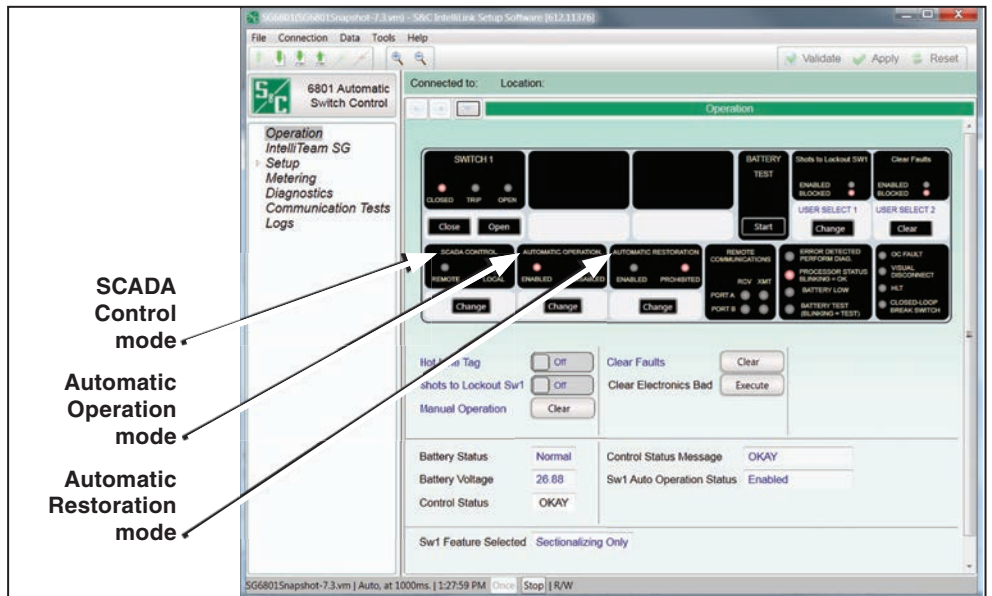| NOTICE |
|---|
| Setting **Local/Remote** mode to the **Local** state does not disable the **Automatic Sectionalizing** mode or IntelliTeam system **Automatic Restoration** mode. |
| To disable sectionalizing, the **Automatic Operation** mode must be set to the **Disabled** state. |
| To prevent automatic restoration operation, the **Automatic Restoration** mode must be set to the **Prohibited** state. |

# Switch Control Configuration

**Log In to the Control**

Follow these steps to log in to an installed switch control:

**STEP 1.** Before arriving at the site, download and install the 6800 Control Software (which includes IntelliLink Setup Software) on a computer. The software can by downloaded at this link: **sandc.com/en/support/sc-customer-portal/**. The video describing this process can be viewed at **sandc.com/videos**. Administrative privileges are required to install this software.

**STEP 2.** At the site, make sure the control has power by performing a lamp test. Press the TEST LAMPS button, and every LED on the faceplate should illuminate. See Figure 1 on page 7.

**STEP 3.** If the lights do not come on, make sure the battery is connected and push the BATTERY ON button on the control board inside the control. See Figure 3. Instruction Sheets 1045-510 and 1045-540 have more information about the battery.

**STEP 4.** When the control is powered, connect the computer to the control by a cable to one of the DATA PORTS on the faceplate. Use a USB A to B cable or a serial cable. Wi-Fi can be used to connect to a control that has the **Wi-Fi** option.

**STEP 5.** On the computer, double-click on the **IntelliLink** icon to launch the software.

**STEP 6.** Click on the **Local Connection** button to open the Product Selection dialog box. All installed S&C devices will be listed.

**STEP 7.** Click on the Series 6800 IntelliTeam II/SG entry. Then, click on the **serial** button.

**STEP 8.** Click on the **IntelliLink** button to launch IntelliLink Setup Software and log in. Contact S&C or your system administrator to get the default user name and password when a custom password has been assigned.
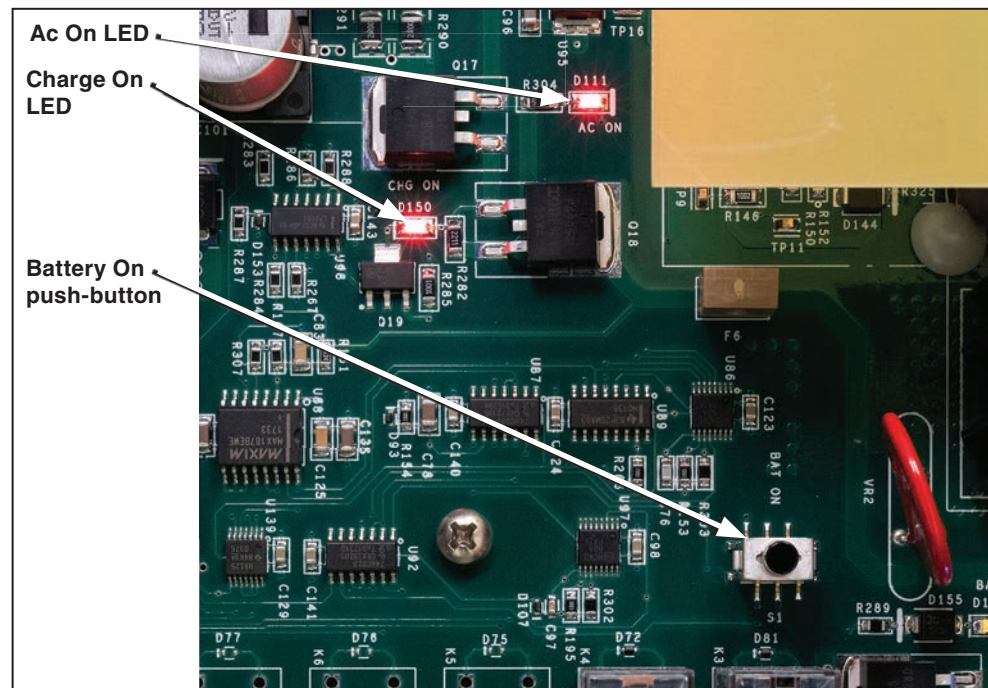


**Figure 3. The Battery On (BAT ON) button on the top circuit board inside the control.**

## Software Screen Features

IntelliLink software screens have a tool bar across the top, a navigation tree on the left and status screens in the center. The communication status is displayed along the bottom. There are many tabs and data fields on specific screens. This guide introduces a small amount of the functionality needed to configure the control. See Figure 4. Instruction Sheet 1045-530 has comprehensive information about every software screen.
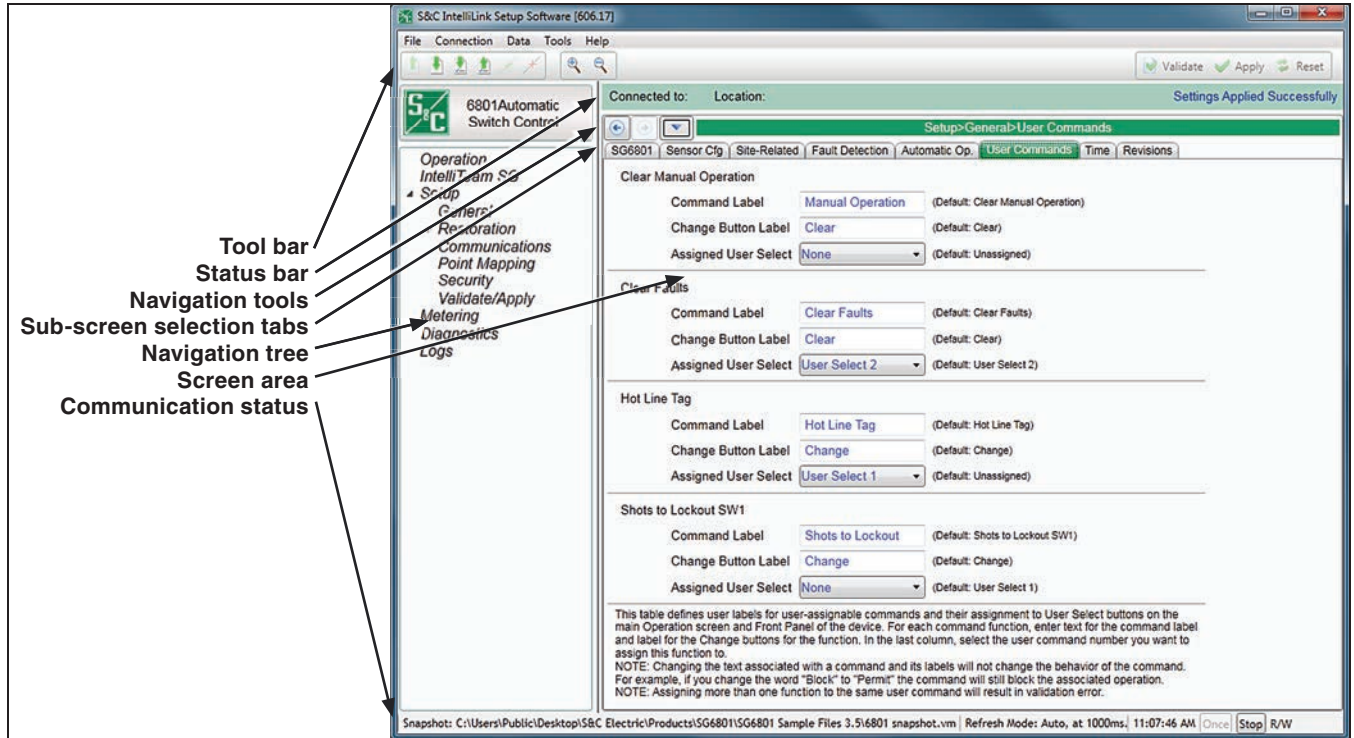


**Figure 4. IntelliLink software navigation features.**

## Validate/Apply Screen

The *Validate/Apply* screen is where configuration changes are validated and applied. See Figure 5 on page 10.

The **Validate** button evaluates settings in the buffer memory without applying them. When changes are pending, click on the **Validate** button to initiate a logical check of the pending changes for errors. If the procedure detects an error or inconsistency, it will be displayed in the **Validation Result** field.

The **Apply** button evaluates settings in the buffer memory and applies them. When changes are pending, click on the **Apply** button to initiate a logical check of the pending changes for errors and commit the changes to control memory if no errors are detected. A successful check will be indicated in the **Validation Result** field.

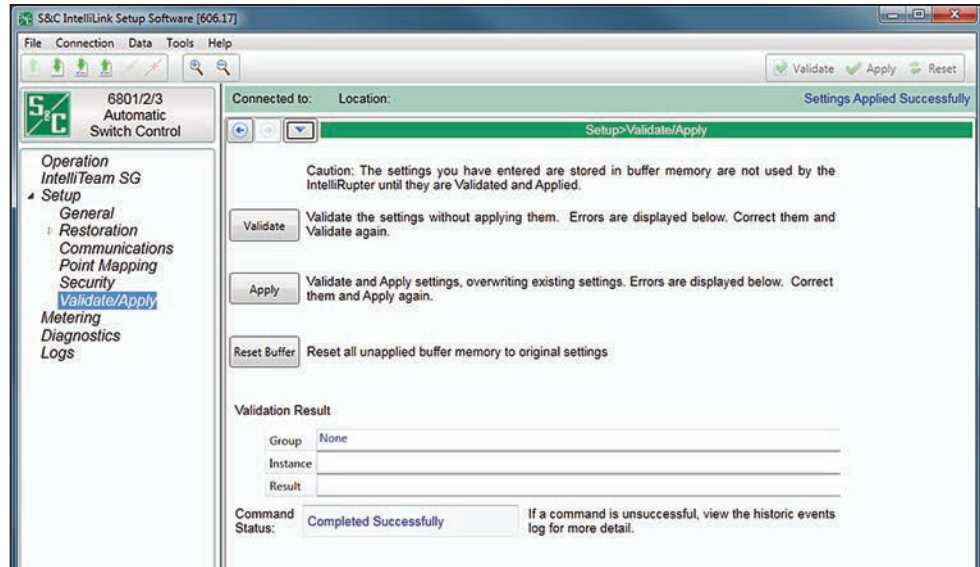| *NOTICE* |
|---|
| The **Reset Buffer** button does not undo a previously applied command. Instead, the button resets the settings in buffer memory to the presently active values in the control. |

**Figure 5. The *Setup>Validate/Apply* screen.**

**Security**

Security is extremely important for the electric grid. Log-in and password information should never be left set to default entries. To change them, navigate to the *Setup>Security* screen. See Figure 6. Configure the User Groups, create passwords for each group, and select the access for each group with these checkboxes. Only users logged in as an Admin can make changes to this screen. The User Group name can be changed for all groups except Admin and Viewer. All passwords can be changed. Passwords have no restrictions on characters, and the max character limit is 12. A dialog box will open when the value to change is clicked on. Changes do not take effect until the **Apply** button is clicked on in the *Setup>Validate/Apply* screen.
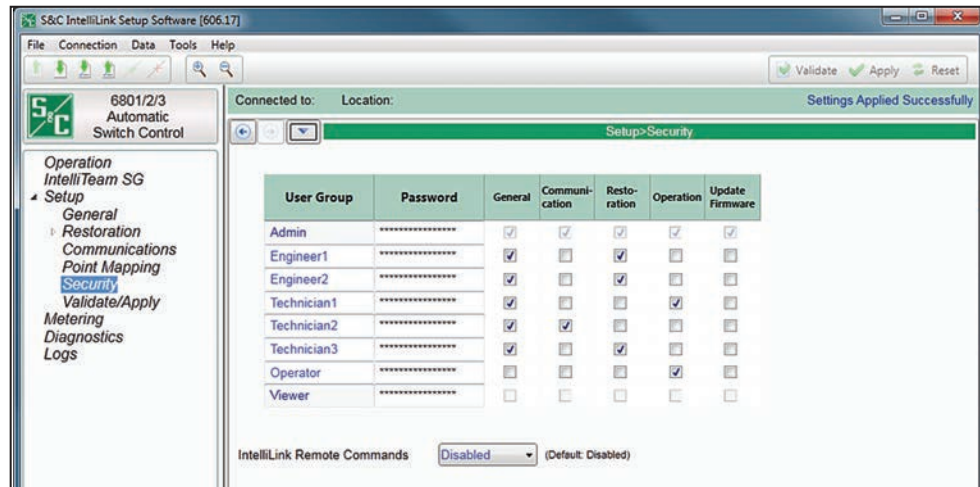


**Figure 6. The *Setup>Security* screen.**

| NOTICE |
| --- |
| Lost Admin passwords cannot be recovered in the field. The control must be returned to the factory for the default passwords to be reset. |

**General Setup**

In the left menu, select the Setup and General entries to configure settings specific to the control on the *Setup>General* screen. See Figure 7. The **SG6800** tab configures name and location information for the switch control. Name this control in the **Device Name** field and enter the location in the **Device Location** field. These fields display to identify this control when you log in.
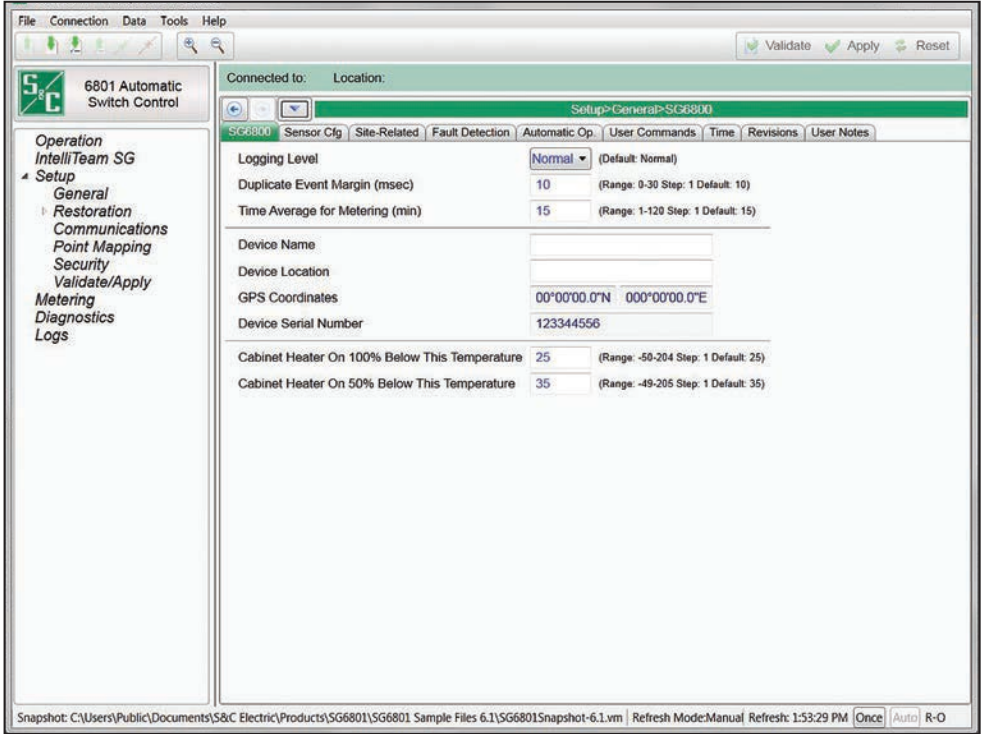


**Figure 7. The *Setup>General>SG6800* screen.**

**Sensor Configuration**   Click on the **Sensor Config** tab. See Figure 8. This screen configures sensor calibration data for Scada-Mate Switching Systems, and PME, PMH, or Vista Underground Distribution Switchgear sensors. The switch control uses this data to calibrate sensor input to the voltage and current amplitude accuracy specified for S&C Sensors. The 6802 and 6803 controls are supplied with a yellow sheet showing the current and voltage ratio information (also stamped on each sensor). Enter the information on this screen.

The 6801 controls do not have this card, but the information is part of the data package provided with the Scada-Mate switch. Because the controls and switches are typically shipped separately it is important to make sure the information stays with the switch until it is pared with a control.
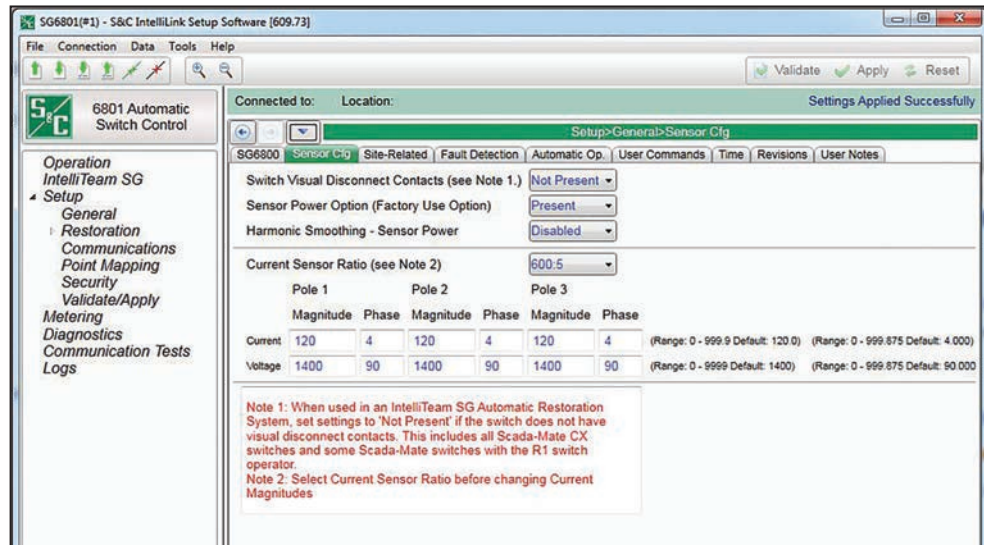


**Figure 8. The *Setup>General>Sensor Configuration* screen (6801 switch control shown).**

| NOTICE |
|---|
| Ratios must be entered for phase B when phases A, B, and C are measured. The phase B ratios are used to adjust all voltage scales for 15-, 25-, or 35-kV systems. |

**Site-Related Settings**

The **Site-Related** tab configures settings for the specific control site. See Figure 9.

Make sure the **Line kV to 120 Vac Base Ratio** setpoint is correct. This is the voltage step-down ratio of all customer-load transformers on the feeder. The control records, displays, and manipulates voltages normalized on a 120-Volt or 240-Volt base. This setting is the conversion ratio from line voltage to base voltage. The **Voltage Transformer Wiring** setting configures the switch control for customer voltage reporting. The control uses this information when calculating kvars. Set as either **Phase-to-Neutral** or **Phase-to-Phase** mode.

At the bottom of the screen are the **Installation Voltage-Current Phase Angle Offset** settings. The setpoints (one for each voltage-current phase) allow installation-dependent phase-angle corrections. The angle offsets are used to determine the Normal Current and Reverse Current flow direction.
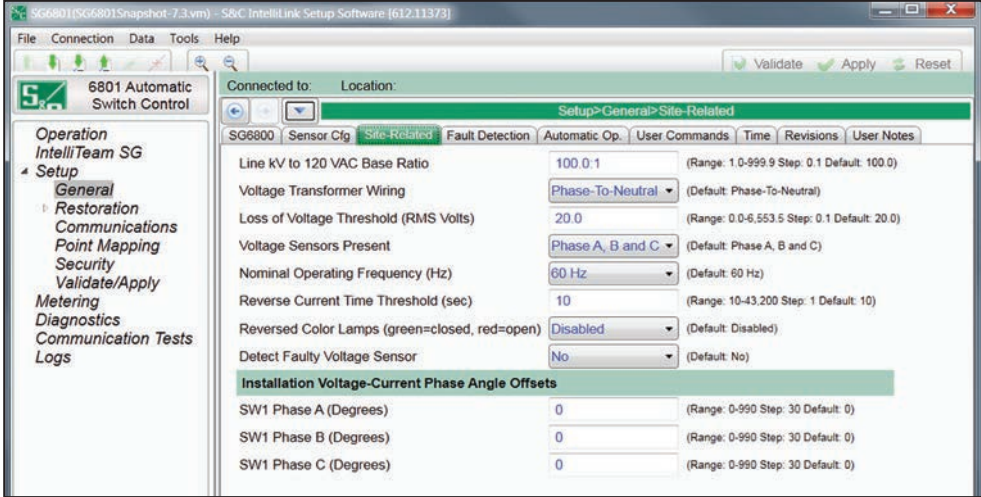


**Figure 9. The *Setup>General>Site-Related* screen.**

**Metering**

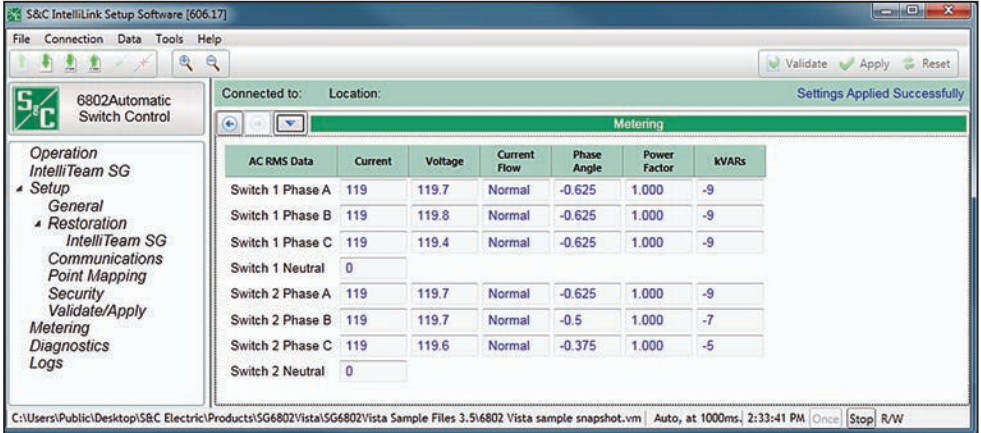The *Metering* screen reports the current and voltage passing through each phase. This is real-time data. See Figure 10.



**Figure 10. The *Metering* screen for a 6802 switch control.**

**Saving a Memory Snapshot**

Good practice is to save a memory snapshot when making a change or troubleshooting the control. Saving a memory snapshot creates a file with all the present control settings and the historic log of previous events. This will help S&C engineers troubleshoot the control.

Follow these steps to save a memory snapshot:

**STEP 1.** On any screen in the **File** drop-down menu, click on the **Save Memory Snapshot** option.

**STEP 2.** In the displayed dialog box, specify a file name and location to save this snapshot.

**STEP 3.** Click on the **Save** button.

**Communications**

Remote communication can be configured for the IntelliTeam SG Automatic Restoration System, SCADA communications, and IntelliLink Setup Software. See Figure 11.

Information supplied by the department that supports your field-area network is entered on this screen. All the settings are defined in Instruction Sheet 1045-530, "6800 Series Automatic Switch Controls with IntelliTeam® SG Automatic Restoration System: *Setup*." Wi-Fi configuration is also covered in this instruction sheet.
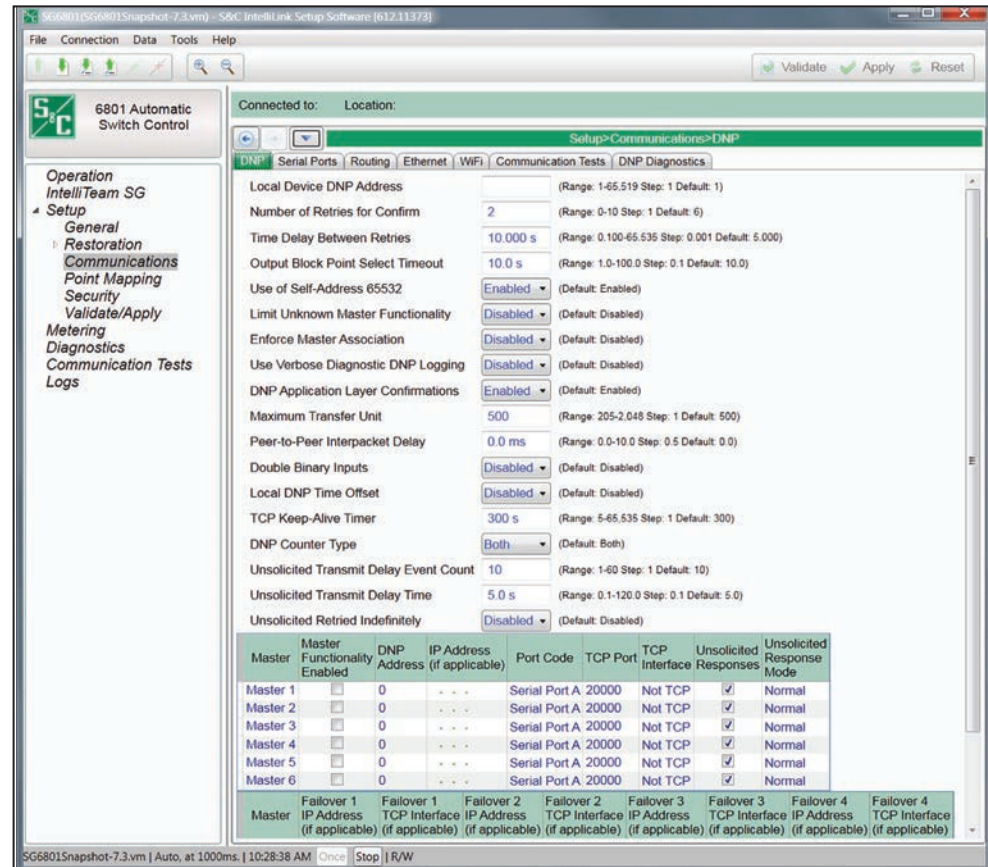


**Figure 11. The *Setup>Communications>DNP* screen.**

---

| NOTICE |
|---|
| This section provides a summary of basic programming requirements. Programming should not be started until site and system requirements have been established and S&C Instruction Sheet 1045-530, "6800 Series Automatic Switch Controls with IntelliTeam® SG Automatic Restoration System: *Setup*" has been thoroughly reviewed. |

When you have a screen question, press the <F1> key to open the help section for the screen being viewed. This is a very handy IntelliLink software resource.

## Setpoint Files

Many settings will be the same for most controls in a system. Making a setting template with the common settings saves time and reduces setting errors. Because of this, most users configure a control in the office, save a setpoint file with the unique site values, and simply load that file into the control in the field.

*After configuring the control:* follow these steps to save a setpoint file:

**STEP 1.** Click on the **File** drop-down menu and click on the Save Setpoints entry.

**STEP 2.** Enter the file name and location in the **Save as** field.

**STEP 3.** In the Save Setpoint Profile dialog box, choose the setpoint values to be saved.

    (a) To save the stand-alone setpoint values, make sure the General and Communication check boxes are checked and the Restoration check box is unchecked. Then, click on the **Save** button.

    (b) To save the team setpoint values, click on the **Profile: Team x Setpoints** option for the desired team. Then, click the **OK** button.

    (c) To save all setpoint values, including values for teams that may not have been configured, click on the **Select All** option. Then, click on the **OK** button.

*At the site:* follow these steps to load a setpoint file into the control:

**STEP 1.** Click on the **File** drop-down menu and click on the Load Setpoints entry.

**STEP 2.** Select the CFG file to be loaded and click on the **Open** button.

**STEP 3.** Specific setpoint changes required for this control can now be entered. For stand-alone setpoints, enter the correct value for the **Physical Location** setting, the **Local Device DNP Address** setting, and the sensor configuration data, if applicable.

**STEP 4.** If the CFG file contains security settings and the Security check box is selected, the authentication/login credentials will be reset to those in the CFG file. Have a clear understandinf of what those are before loading them.

| NOTICE |
|---|
| Controls with lost passwords must be returned to the factory to be reset to the default values. |

**IntelliTeam System Configuration**

The IntelliTeam Automatic Restoration System is a self healing or Fault Location, Isolation, and Service Restoration (FLISR) application. There are two types of IntelliTeam system restoration that can be implemented with the 6800 controls. The IntelliTeam SG Automatic Restoration System, the latest version, is configured with the S&C IntelliTeam® Designer software.

After the settings have been configured with IntelliTeam Designer they are automatically pushed to the controls. See S&C Instruction Sheet 1044-570 for more details.

The IntelliTeam® II Automatic Restoration System, the previous version, is configured through the IntelliTeam screens in the IntelliLink software. See S&C Instruction Sheet 1045-530, "6800 Series Automatic Switch Controls with IntelliTeam® SG Automatic Restoration System: *Setup*" for more information.

**Stand-Alone Programming**

In some cases, the 6800 control will be used to sectionalize by detecting phase and ground faults. The setpoint values are on the *Setup>General>Fault Detection* screen. These settings define the fault. Currents on all three phases are monitored and compared with these setpoints.

**Automatic Operation**

The **Automatic Operation** tab configures various automatic switch control operations. See Figure 12. For the 6802 and 6803 Automatic Switch Controls, configure most setpoints as separate values for Switch 1 and Switch 2. The switch control implements automatic operations based on the **Sectionalizing Only**, **Phase Loss Protection Only**, or **Sectionalizing plus Phase Loss Protection** mode.

The **Sectionalizing** feature is based on the number of operations of an upstream or source-side breaker or recloser configured in the **Recloser Counts to Sectionalize Trip, Fault Detected** setpoint, while the **3-Phase Volt Loss Sectionalizing** feature is based on time. The **Phase Loss Protection** feature can be set to automatically operate the switch when the control detects loss of voltage on one or two phases.
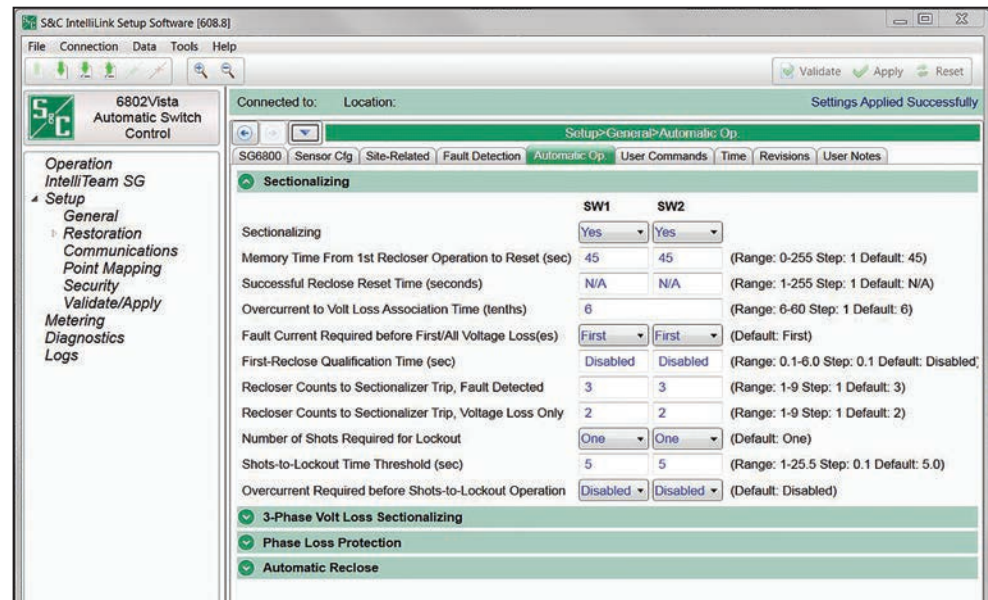


Figure 12. The *Setup>General>Automatic Operation>Sectionalizing* screen. The 6802 control is shown.

**SCADA Point Mapping**

Point mapping assigns point commands and status points in the order required for a specific SCADA system. See Figure 13.

In the point list, the left column sets the index position of the selected point defining the order in which the points are returned to SCADA. For a detailed description of the DNP point in your control, refer to the appropriate S&C instruction sheet on **sandc.com**. The DNP Points List instruction sheets have the prefix 1045-560.
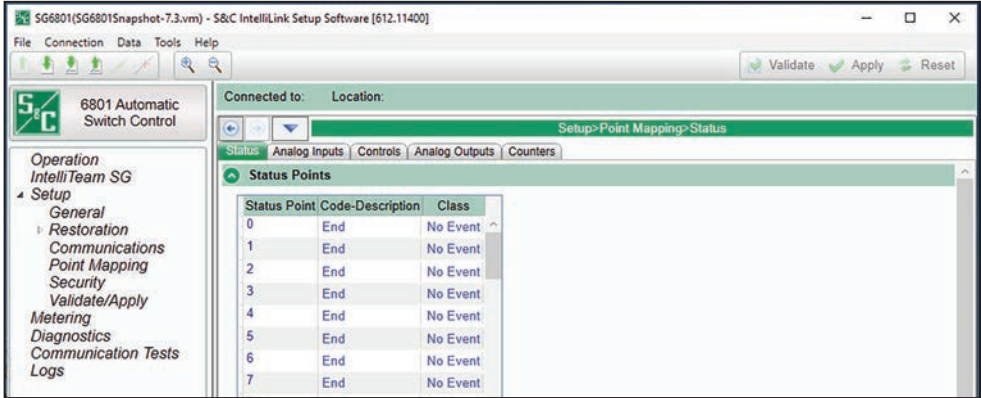


**Figure 13. The** *Setup>Point Mapping>Status* **screen.**