

Setup

Table of Contents

Introduction	2	Serial Port Setup	50
Qualified Persons	2	Routing Setup	51
Read this Instruction Sheet	2	Ethernet Setup	52
Retain this Instruction Sheet	2	Communication Tests Setup	55
Proper Application	2	DNP Diagnostics Setup	58
Special Warranty Provisions	3	DNP Status Points	59
Safety Information	4	DNP Analog Input Points	60
Understanding Safety-Alert Messages	4	DNP Control Points	62
Following Safety Instructions	4	DNP Analog Output Points	63
Replacement Instructions and Labels	4	DNP Counter Points	64
Safety Precautions	5	Team Addresses	66
IntelliTeam® SG Automatic Restoration System	6	Team Setup	68
Applicable Software	6	External Source Loading Setup	74
Planning the IntelliTeam SG System	7	Team Communication	77
IntelliLink® Setup Software	11	Distributed Generation	79
Starting IntelliLink Software	11	Restoration—External Device	81
Operation Screen	12	Log Management	89
IntelliLink Software Workspace	13	Security	92
IntelliNode Interface Module Setup	18	Password Management	92
IntelliNode Interface Module Configuration	18	Security Screen	98
Site-Related	18	Apply Configuration	100
Time	20	Factory Reset	102
Software Versions	23	Factory Reset Using IntelliShell	102
User Notes	23	Factory Reset Using IntelliLink	105
External Device Setup	24		
Automatic Operation	25		
External Device Status Points	31		
External Device Analog Input Points	35		
External Device Control Points	36		
External Device Communications	39		
Communication Setup	42		



Introduction

Qualified Persons

WARNING

Only qualified persons knowledgeable in the installation, operation, and maintenance of overhead and underground electric distribution equipment, along with all associated hazards, may install, operate, and maintain the equipment covered by this publication. A qualified person is someone trained and competent in:

- The skills and techniques necessary to distinguish exposed live parts from nonlive parts of electrical equipment
- The skills and techniques necessary to determine the proper approach distances corresponding to the voltages to which the qualified person will be exposed
- The proper use of special precautionary techniques, personal protective equipment, insulated and shielding materials, and insulated tools for working on or near exposed energized parts of electrical equipment

These instructions are intended only for such qualified persons. They are not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment.

Read this Instruction Sheet

NOTICE

Read this instruction sheet thoroughly and carefully before installing or operating the IntelliNode Interface Module. Become Familiar with the Safety Information on page 4 and Safety Precautions on page 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 the IntelliNode Interface Module. Designate a location where users can easily retrieve and refer to this publication.

Proper Application

WARNING

The equipment in this publication must be selected for a specific application. The application must be within the ratings furnished for the selected equipment. Refer to S&C Specification Bulletin 1043-31.

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 IntelliNode Interface Module, except 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 installation 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 IntelliNode Interface Module 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 IntelliNode Interface Module 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 of S&C manufacture, such as batteries and communication devices. However, S&C will assign to 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 attached to the IntelliNode Interface Module. Become familiar 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 any portion of this instruction sheet is not understood and assistance is required, 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 S&C Global Support and Monitoring Center at (888) 762-1100.

NOTICE	
Read this instruction sheet thoroughly and carefully before installing or operating an IntelliNode Interface Module.	

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 your nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

⚠ DANGER



IntelliNode Interface Modules operate devices at high voltage. Failure to observe the precautions below will result in serious personal injury or death.

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 an IntelliNode Interface Module 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. Always maintain proper clearance from energized components.
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.

Applicable Software

These instructions were prepared for use with IntelliNode Software installer versions ITNInstaller-7.6.x and later. References in this manual to the IntelliTeam SG Automatic Restoration System apply for IntelliTeam SG software revision 7.6.x, as indicated in Instruction Sheet 1044-570, “IntelliTeam® Designer: *User’s Guide*.”

The revision number is on the *Setup>General>Revisions* screen. For questions regarding the applicability of information in this chapter to previous software releases or future versions later than 7.6.x, contact S&C Electric Company.

WARNING

These instructions do NOT replace the need for utility operation standards. Any conflict between the information in this document and utility practices should be reviewed by appropriate utility personnel and a decision made as to the correct procedures to follow.

The IntelliNode Interface Module is connected to switchgear operating at primary voltage levels. High voltage may be present in the wiring to the switch control or the switch control itself during certain failures of the switchgear wiring or grounding system or because of a failure of the switch itself. For this reason, access to the switch control should be treated with the same safety precautions that would be applied when accessing other high-voltage lines and equipment. Follow all locally approved safety procedures when working on or around this switch control.

Before attempting to access an existing switch installation, check carefully for visible or audible signs of electrical or physical malfunction (do this before touching or operating the switch control or any other part of the installation). These warning signs include such things as smoke, fire, open fuses, crackling noises, loud buzzing, etc. If a malfunction is suspected, treat all components of the installation, including the switch control and associated mounting hardware, as though they were elevated to primary (high) voltage.

Whenever manually reconfiguring the circuit (for example, during repairs), follow your company’s operating procedures to disable automatic operation of the IntelliTeam SG Automatic Restoration System. This prevents any unexpected operation of a team member.

The IntelliTeam SG Automatic Restoration System can be disabled by selecting the **Prohibit Restoration** state for any member of a team.

Planning the IntelliTeam SG System

The IntelliTeam SG Automatic Restoration System lets teams of controls work together to isolate faults and restore service. Whether a team consists of a few switches on a single feeder or a complex configuration with multiple alternate sources, S&C recommends mapping out the team(s) and gathering all necessary information before installing hardware in the field. S&C also recommends keeping a copy of this information in the door of the switch control enclosure or low voltage cabinet.

During planning and setup of fault-detection settings, be sure to consider the fault conditions the IntelliTeam SG system may encounter from alternate sources. Follow these steps to implement the IntelliTeam SG system:

STEP 1. Create a layout of the source(s), IntelliRupter fault interrupters, switches, reclosers, and line segments that comprise teams in IntelliTeam Designer. See Instruction Sheet 1044-570: “IntelliTeam® Designer: *User’s Guide*.”

Use a system map or similar diagram showing source and switch locations.

STEP 2. Plan the communications system.

For more information, see the manufacturer’s documentation for the communications system, or contact your local S&C representative regarding available communications related services.

STEP 3. Identify and name the teams.

Form teams of line segments bounded by IntelliRupter fault interrupters, switches, and reclosers. Choose a team name up to 16 characters. IntelliTeam Designer will automatically assign team designations to each team in the **Team Number** field. If configuring the team members to operate in the **IntelliTeam II Compatibility Mode** setting, assigning team designations on the *Setup>Restoration>IntelliTeam SG>Team x* screen is required. The **Team 1** through **Team 8** tabs are analogous to Team 1 through Team 8 assigned by IntelliTeam Designer. If choosing to manually determine the team designations, teams that share a team member must have different designations.

STEP 4. Assign each team member a DNP/RTU address.

Each team member requires a unique DNP/RTU address. Enter this information on the **Device Attributes** tab found in IntelliTeam Designer or in the *Setup>Restoration>IntelliTeam SG>Team Summary* screen when configuring the IntelliNode module for the **IntelliTeam II Compatibility Mode** setting.

STEP 5. Determine the IntelliRupter fault interrupter, switch, or recloser position number for each team member.

Each team member is associated with a specific switch/position number (for example, Sw1 for a single overhead switch). Enter this information in the **Sw/Pos Number** setting on the *Setup>Restoration>IntelliTeam SG>Team x>Team Member Settings* screen.

STEP 6. Note the normally **Open/Closed** state for each team member.

If configuring the IntelliNode Interface Module for the **IntelliTeam II Compatibility Mode** setting, enter this information in the **Normal Open/Close** setting on the *Setup>Restoration>IntelliTeam SG>Team x>Team Member Settings* screen. Otherwise, set the normally open points in the IntelliTeam Designer diagram.

STEP 7. Determine the normal functionality for each team member.

IntelliTeam Designer automatically assigns the normal function for each device in the system diagram when the **Validate** command is used. If configuring the IntelliNode Interface Module to operate in the **IntelliTeam II Compatibility Mode** setting, determine the normal function and enter it in the **Normal Sw Func** setting on the *Setup>Restoration>IntelliTeam SG>Team x>Team Member Settings* screen. Each team member must be assigned one of the following normal functions:

Functionality	Description
Closed Switches	
Source/Sub	Use this value when the source switch is the first team member after the substation/source or it's an IntelliNode Interface Module on the source breaker relay.
Source	Use this value for one closed switch in the team through which the line segment receives power when the circuit is in its normal configuration.
Load/Tie	A team may have zero, one, or multiple closed switches through which loads on other line segments receive power. Use this value when the switch could be involved in restoring power to the line segment because line segments on the other side of the switch have alternate sources.
Load	A team may have zero, one, or multiple closed switches through which loads on other line segments receive power. Use this value when the switch could not be involved in restoring power to the line segment because line segments on the other side of the switch have no alternate sources. Every closed switch should have its sensors facing the normal source of the team.
Open Switches	
Tie/Sub	Use this value when the tie switch is the first team member after the substation/source. A Tie/Sub switch should have its voltage sensors facing the alternate source.
Tie	Use this value for zero, one, or multiple open switches in the team that restore power to the line segment directly from an alternate source when closed.

Enter this information on the *Setup>Restoration>IntelliTeam SG>Team x* screen. A team may have eight members. One Source or Source/Sub and from zero to seven in any combination of the other functional types.

STEP 8. Determine the **Return to Normal** mode for each team.

If desired, the team members can return the circuit to its normal configuration automatically when stable three-phase voltage has been restored to a faulted line segment.

For teams with one or more tie IntelliRupter fault interrupters, switches, or reclosers, select the **Open Transition** option, in which case the tie device(es) open before other team members return the circuit to its normal configuration. Or select the **Closed Transition** option, in which case team members close the normal source IntelliRupter fault interrupters, switches, and reclosers and then the tie device(es) open. The **Return to Normal** process starts at the line segment closest to the normal source and works outward.

Select this information with the **Rtn to Norm Mode** setting on the *Setup>Restoration>IntelliTeam SG>Team x>Team Member Settings* screen when configuring the IntelliNode Interface Module for the **IntelliTeam II Compatibility Mode** setting.

STEP 9. Determine the value for the **Return to Normal Time** setpoint.

Power must be restored to a faulted line segment for this amount of time (in minutes) before the **Return to Normal** process will start. Enter this information on the **Team Member Attributes** tab found in IntelliTeam Designer or on the *Setup>Restoration>IntelliTeam SG>Team x* screen.

STEP 10. Determine the Maximum Capacity for each team member.

This is the maximum load (in amperes) of the line section limited the most by conductor size, device rating, etc., when the team is served through that line section from either direction. Each team member continuously subtracts its present load from its **Maximum Capacity** setting to determine its **Local Capacity for Transfer** value. The smallest **Local Capacity for Transfer** value encountered in a particular restoration path determines the maximum load that the involved teams can transfer—the **Available Capacity to Transfer** value.

Enter this information in the **Maximum Capacity** setpoint on the **Team Member Attributes** tab found in IntelliTeam Designer or on the *Setup>Restoration>IntelliTeam SG>Team x>Team Member Settings* screen.

STEP 11. Determine the alternate source sequence for each team.

Using the **Normal Switch Function** setting discussed in Step 7 on page 8, set the sequence that team members will use to restore the line segment. If the team cannot use the source device to restore the line segment, it will use an alternate team member. Enter this information in the **Alternate Source Sequence** setpoints on the **Team Member Attributes** tab found in IntelliTeam Designer or on the *Setup>Restoration>IntelliTeam SG>Team x* screen.

STEP 12. Determine whether a contract is required to avoid overloading a line segment.

If there is concern a line segment may overload, set the **Contract Required** setpoint to “Yes” on the **Team Member Attributes** tab found in IntelliTeam Designer or on the *Setup>Restoration>IntelliTeam SG>Team x* screen.

If a circuit is bifurcated, multiple events can result in an overload if contracts are not used. To avoid overloading on bifurcated circuits, set this value to “Yes.” When team members encounter a line segment in a restoration path that requires a contract, they will communicate with all subsequent line segments in the direction of the alternate source to ensure that the alternate source will not be overloaded. This will slow down the reconfiguration process.

STEP 13. Determine whether the number of line segments restored by a team must be limited.

If the number of line segments a team picks up must be limited, enable the **Line Segment Limit** setpoint on the **Team Member Attributes** tab found in IntelliTeam Designer or on the *Setup>Restoration>IntelliTeam SG>Team x* screen. For example, the Add 1 selection inhibits additional line segments from being restored through a member after it restores its first line segment.

To allow the team to pick up as many line segments as capacity allows, set it to “N/A.”

STEP 14. Determine the appropriate **Prohibit Restoration** timer setting for each team.

The default setting is zero, which allows the IntelliTeam SG system to look for a restoration solution indefinitely. See the “IntelliTeam System Planning” section in S&C Instruction Sheet 1044-570: “IntelliTeam® Designer: *User’s Guide*,” for more information.

STEP 15. If Post Restoration Load Management is allowed, determine the **Load Priority** setting for each team.

See the “IntelliTeam System Planning” section in S&C Instruction Sheet 1044-570: “IntelliTeam® Designer: *User’s Guide*,” for more information.

Starting IntelliLink Software

The following steps explain how to start IntelliLink Setup Software when working with the setpoints or stored data in a switch control. To edit a snapshot (virtual memory file) or view the software without data, see the “Using Snapshots” section in S&C Instruction Sheet 1043-541, “IntelliNode Interface Module: *Operation*.”

NOTICE

Always use a grounded (three-wire) extension cord or battery power. When using an ungrounded (two-wire) extension cord to power either the computer or the switch control while they are connected, the serial port on the computer may be damaged.

- STEP 1.** Connect the computer to the switch control. Use the Local Communication Access port on the faceplate and a serial cable.
- STEP 2.** Double click on the **IntelliLink** icon in the S&C Electric folder, and the S&C Electric IntelliShell—Select Connection Mode dialog box opens.
- STEP 3.** Click on the **Local Connection (Serial or Wi-Fi)** button, and the S&C Electric IntelliShell—Product Selection dialog box opens.
- STEP 4.** Click on the **IntelliNode Interface Module** tab.
- STEP 5.** Click on the **Serial** button at the bottom of the dialog box and the S&C Electric IntelliShell—Local Communication Setup dialog box opens.
- STEP 6.** Click on the **IntelliLink** button in the upper right corner. The S&C IntelliLink software program will start and the S&C IntelliLink—Registered Log In dialog box opens.
- STEP 7.** Enter the username and password, and the IntelliLink Setup Software will open the *Operation* screen. See Figure 1 on page 17. Contact S&C Electric Company when the default username and password are needed.

NOTICE

With software later than version 7.3.100, the default passwords for all user accounts, including the Admin account, must be changed before the IntelliLink software can connect to and configure a control. See the “Security” section on page 92 for more information.

Operation Screen

The *Operation* screen shows the present status of various switch control settings, any existing fault, and error conditions. See Figure 1.

To display the *Operation* screen: Click on the “Operation” entry in the left-hand navigation tree.

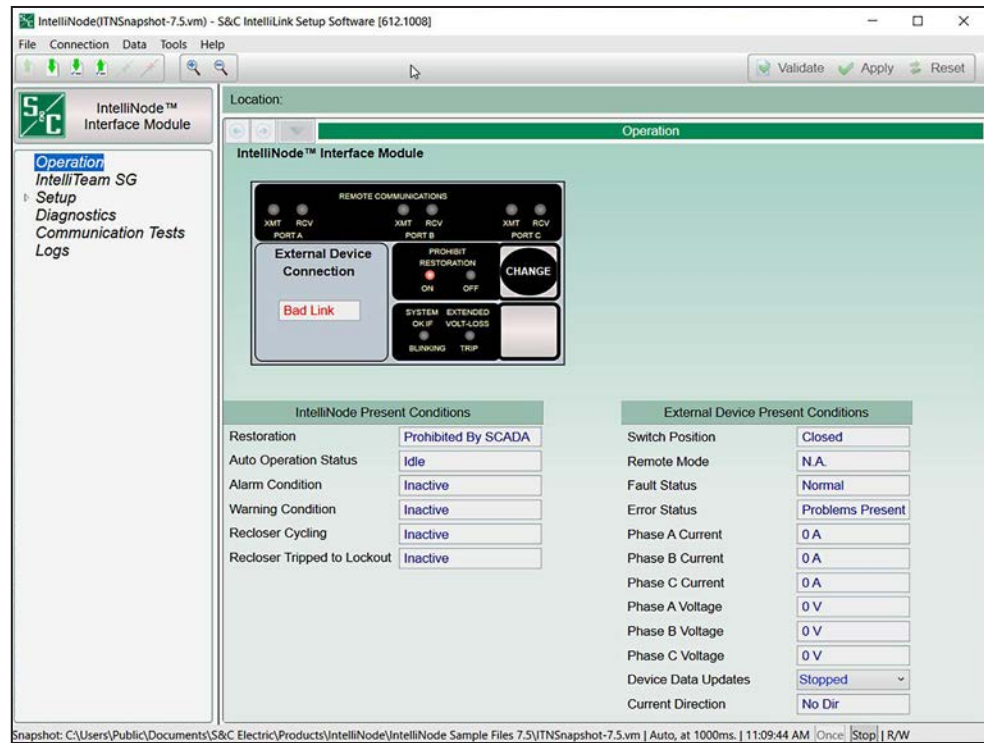


Figure 1. The *Operation* screen for the IntelliNode Interface Module.

Note: When IntelliLink software does not establish communication with a functioning IntelliNode Interface Module, it displays the message: “Could not set connection” in the dialog box. See Figure 2 on page 13.

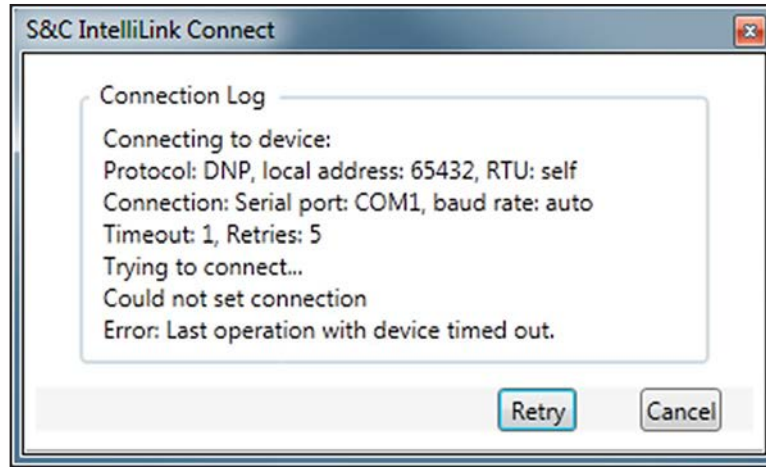


Figure 2. The IntelliLink Connect dialog box.

If this message appears or if the *Operation* screen opens but the software does not operate properly, see S&C Instruction Sheet 1043-551, “IntelliNode™ Interface Module: Troubleshooting.”

IntelliLink Software Workspace

The IntelliLink User Interface includes many standard features found in Windows-based products as well as some custom features designed to make navigating through the IntelliNode Interface Module settings easier. See Figure 3.

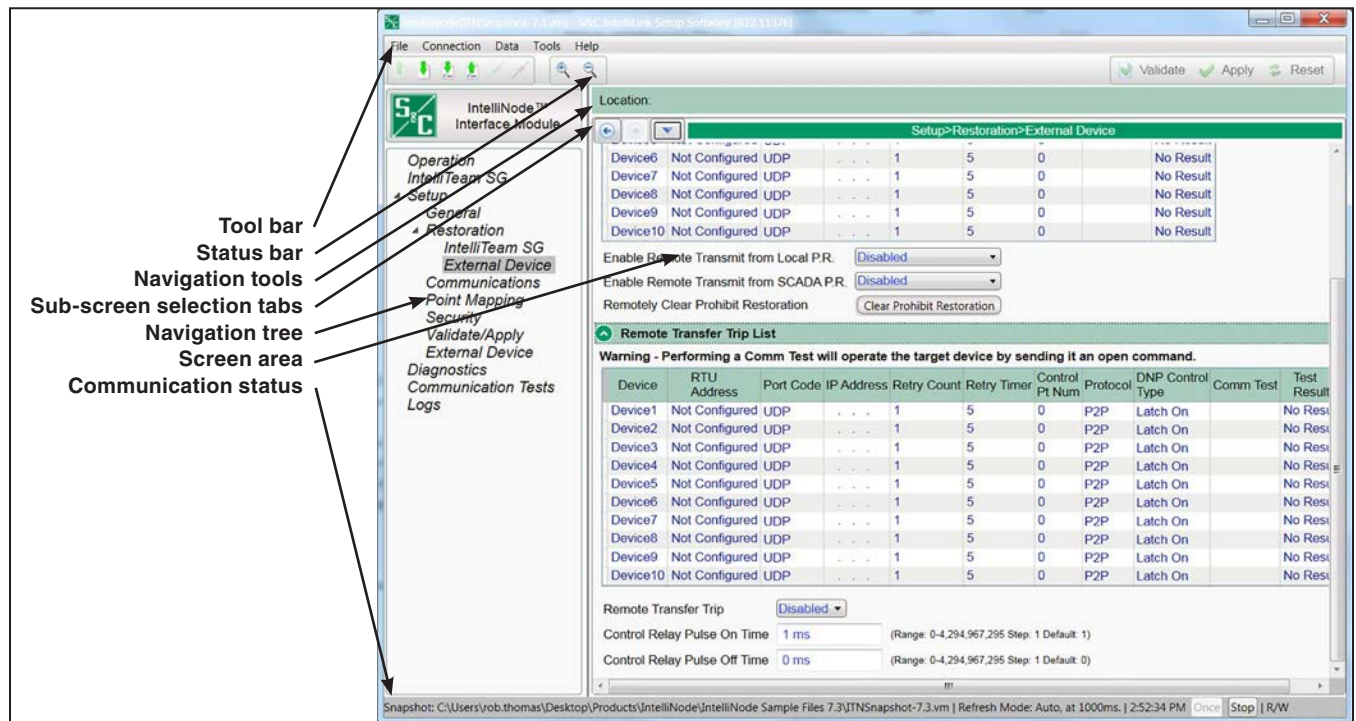











Figure 3. IntelliLink software features.

Tool Bar

	Open Snapshot	Same as <i>Main Menu>File>Open Snapshot</i> — Clicking this icon opens a file browser to allow the selection of a snap snapshot file.
	Save Data Snapshot	Same as <i>Main Menu>File>Save Data Snapshot</i> — Clicking this icon allows you save a snapshot of the control data. It provides a picture of the controls memory content in a programming format.
	Save Setpoints	Same as <i>Main Menu>File>Save Setpoints</i> — Clicking this icon opens the Save Setpoints dialog box.
	Load Setpoints •	Same as <i>Main Menu>File>Load Setpoints</i> — Clicking this icon opens the Load Setpoints dialog box.
	Zoom In	Clicking this icon increased the size of objects and text in the screen area.
	Zoom Out	Clicking this icon decreased the size of objects and text in the screen area.
	Validate	Same as the Validate button on the <i>Setup>Validate/Apply</i> screen. See Figure 46 on page 100. Checks the pending changes but does not apply them.
	Apply	Same as the Apply button on the <i>Setup>Validate/Apply</i> screen. See Figure 46 on page 100. Checks the pending changes and applies them if no errors are found.
	Reset	Same as the Reset Buffer button on the <i>Setup>Validate/Apply</i> screen. See Figure 46 on page 100. Removes pending changes and returns to settings in the memory.

• When setpoints from an earlier or later compatible version of IntelliLink software is loaded and the setpoints do not exist in this version, an error will occur because the software does not understand any setpoints not presently supported by the software. The unknown objects also will not be converted.

Status Bar

	Connected to:	This field shows the user-defined device name. The device name is entered on the <i>Setup>General>Site-Related</i> screen.
	Location:	This field shows the user-defined device location. The device location is entered on the <i>Setup>General>Site-Related</i> screen.
	Validate Status	This field shows the status of the Validate and Apply functions.

Navigation Tools

	Navigation History	Clicking this icon opens a list of the last 10 screens visited. Selecting a screen from the list will automatically transition from the present screen to the selected screen.
	Navigate Back	Clicking this icon selects the next screen down in the history list.
	Navigate Forward	Clicking this icon selects the next screen up in the history list.
	Breadcrumb Field	This field contains the path of the current screen.

Navigation Tree

	Expand Arrow	This arrow indicates item to the right is collapsed with additional items underneath. Clicking this icon expands the list to show the hidden sub-items.
	Collapse Arrow	This arrow indicates item to the right is expanded showing additional items underneath. Clicking this icon collapses the list to hide the displayed sub-items.

Sub-screen Selection Tabs

 Active Tab

Green indicates an active screen tab.

 Inactive Tab

Grey indicates an inactive tab. Clicking on an inactive tab changes from the active screen to the screen associated with the tab.

Screen Area and Data Entry

The screen area contains various data objects used for configuring the control as well as some features for displaying and accessing the data objects. The basic data objects contain text boxes for direct text entry and list boxes for data selection.

Profile:  Editable Text Boxes

Text boxes with white background and light blue text indicate editable content. The cursor will change when hovering over an editable field.

Direction:  Non-editable Text Boxes

Text boxes with a grey background and dark blue text indicate dynamic text that is populated by the control. This text cannot be changed.

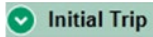
 List Boxes

List boxes as indicated by the down arrow supply a list of choices when selected. The current selection will either be shown on the list box or in an adjacent text box.

Phase
 High Current Lockout 

Check Boxes

Check boxes will be provided for enable/disable decisions. Data fields for disabled items will be automatically hidden or grey shaded. Data fields for disabled items cannot be changed.

 Initial Trip
 Initial Trip

Text Expanders

Expanders are provided to help manage the view. When the data below the expander are visible, the expander icon arrow points up. Clicking the icon collapses or hides the data from view. When the data are hidden, the expander arrow points down. Clicking the icon displays the hidden data.

Communication Status

The communication status bar at the bottom of the IntelliLink screen displays the connection addresses, the **Refresh** mode, and the last refresh. The time changing after “Refresh:” indicates the control is communicating. The refresh defaults to **Auto** mode but can be stopped by clicking on the **Stop** button and manually refreshed by clicking on the **Once** button that comes into context when the refresh is stopped. See Figure 4.

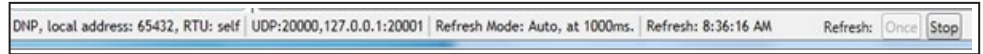


Figure 4. The communication status bar.

IntelliNode Interface Module Setup

IntelliNode Interface Module Configuration

When the IntelliNode Interface Module is set up for team and normal operation, carry out the series of steps outlined in the “Suggested Team Setup Procedure” flow charts at the end of S&C Instruction Sheet 1043-501, “IntelliNode™ Interface Module: *Product Description*.”

The values to be entered on each setup screen depend on the electrical distribution system and details specific to each individual switch.

⚠ WARNING

These instructions do not replace the need for utility operation standards. Any conflict between the information in this document and utility practices should be reviewed by appropriate utility personnel and a decision made as to the correct procedures to follow.

Establish communication with the IntelliNode Interface Module and start the IntelliLink software.

Site-Related

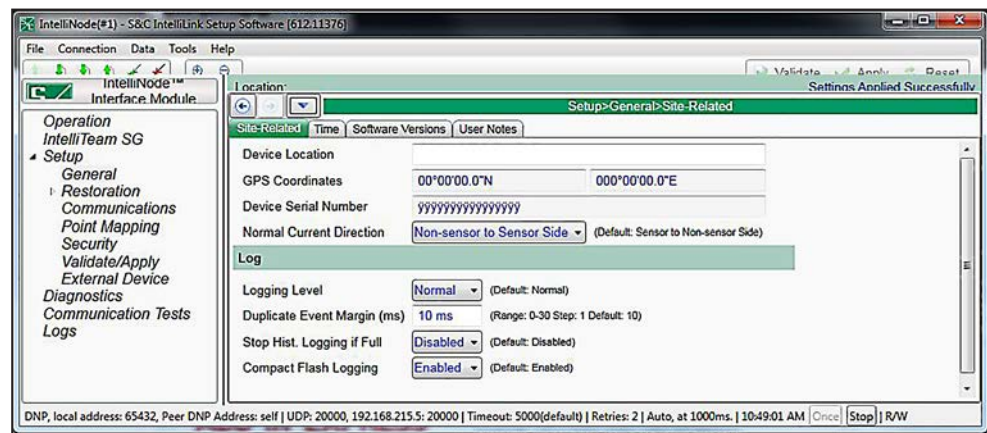


Figure 5. The Setup>General>Site-Related screen.

Device Location

Enter the location of the IntelliNode module, up to 64 characters. See Figure 5. The location is displayed on every screen at the bottom.

GPS Coordinates

Location data from the Integrated Global Positioning System are automatically displayed. This is only valid for a GPS-equipped IntelliNode module.

Device Serial Number

The serial number is automatically read from the control memory.

Log

Logging Level

The selected logging level determines the type of data-log messages captured in compact flash and displayed on the *Logs>Historic Log* screen. Every data-log message is assigned to one of these log levels:

Normal: User information

Extended: User information and internal status

All: User information, internal status, and internal trace/debugging information

Duplicate Event Margin (ms)

Storing duplicate events that occur rapidly can flood the internal memory, and duplicate events are not useful diagnostic information. Every element of the event records must match for events to be considered duplicate. This setpoint selects duplicate data that will be stored in the internal memory and displayed on the *Logs>Historic Log* screen. It determines the time between logging duplicate events. It has no effect on an alternating sequence of events.

For example, the setpoint can be set to 10 ms. For a sequence of events ABABAB (where A and B are different), assume the next event occurs 1 ms after the previous one. Even when identical events occur within 2 ms—well within the value of the set point—all events will be logged. (Minimum value: 0; maximum value: 30; increment: 1)

Stop Historic Logging if Full

When enabled, this option stops event logging when the historic event log is full; subsequent events are discarded without overwriting the existing log contents. Flash Memory logging, Status Point logging, and Special Event Counter logging are not affected by this setpoint. Only set it to the **Enabled** state when troubleshooting. When troubleshooting is complete, or new event data are desired, set this option to the **Disabled** state to return to Continuous Event logging.

Compact Flash Logging

When enabled, every historic event generated is written to flash memory. The **Logging Level** and **Duplicate Event Margin** setpoints do not prevent an event from being written to flash memory, so flash-memory logging preserves as much data as possible. Flash-memory data are retrieved through IntelliLink Setup Software. Open the **Tools** item on the menu bar and click on the **Compact Flash Access** entry. Select and save any files needed. It is strongly recommended that the **Compact Flash Logging** mode be enabled on the *Logs>Log Management* screen to simplify diagnostic and troubleshooting work.

Time

The clock synchronization source and daylight savings time are configured on the *Time* screen. See Figure 6.

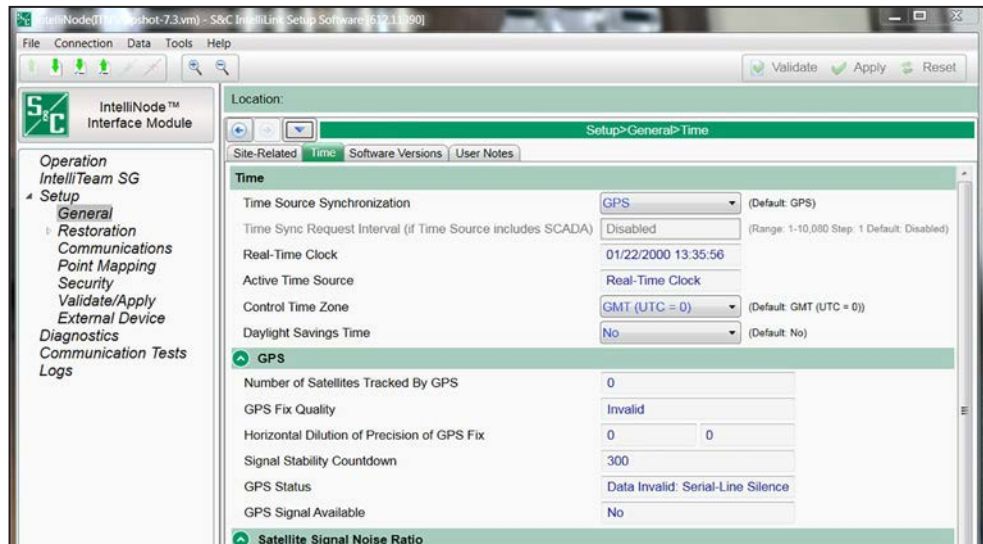


Figure 6. The Setup>General>Time screen.

Time Source Synchronization

Select from the drop-down list: **GPS** (default), **SCADA**, **GPS and SCADA**, or **User Set** mode. SCADA can only function for Master 1.

When **SCADA** mode is selected, the real-time clock will be synchronized to the time and date specified in the SCADA master's time synchronization request. Configuration of the **Time Sync Request Interval** setting is required.

When **GPS and SCADA** mode is selected, the GPS signal will be used when available. If the GPS signal is not available, the real-time clock will be synchronized to the time and date specified in the SCADA master's time synchronization request; otherwise the master's time synchronization request is ignored. Configuration of the **Time Sync Request Interval** setting is required.

When **User Set** mode is selected, the real-time clock will synchronize once to the time indicated on a user-furnished computer or the time entered by the user. Go to the **Tools** menu, select the "Device Maintenance" entry from the drop-down list, and click on either the **Set Control Time** button to enter the user-set time or the **Synchronize with PC** button.

Time Sync Request Interval (if Time Source=SCADA or Time Source=GPS and SCADA)

When this interval (in minutes) expires the control will assert IIN1.4 (Need Time) on every response until the master successfully writes absolute time and date using Object 50 variation 1. (Minimum: 1; Maximum: 10080; Step: 1, Default: Disabled)

Real-Time Clock

This is the date and 24-hour time display.

Active Time Source

This display indicates the time source as the real-time clock or as the GPS source.

Control Time Zone

Select from the drop-down list. GMT (UTC = 0) is the default.

All time-stamped files and the internal time are Universal Time, Coordinated (UTC), also known as Greenwich Mean Time (GMT). Local time also can be displayed by using the **Control Time Zone** and **Daylight Savings Time** settings.

Daylight Savings Time

Select from the drop-down list: **No** (default) or **Yes** mode.

Note: Select the **Start Day**, **End Day**, and **Offset** settings for the **Daylight Savings Time** feature.

GPS

Number of Satellites Tracked by GPS

This is the number of satellites used in the calculation of the position and time displays. Triangulation of three satellites at a minimum is required to determine position, but three satellites in a straight line cannot determine position. Only one satellite is required to determine time.

GPS Fix Quality

This statement indicates the GPS fix quality:

- Invalid
- GPS fix (SPS)
- DGPS fix
- PPS fix
- Real Time Kinematic
- Float RTK
- Estimated (dead reckoning)
- Manual input mode
- Simulation mode

Horizontal Dilution of Precision of GPS Fix

This statement indicates the relative estimate of GPS horizontal position fix accuracy:

<1 = Ideal—This is the highest confidence level.

1-2 = Excellent—The position measurements are accurate for most applications.

2-5 = Good—This is the minimum information appropriate for making business decisions.

5-10 = Moderate—This information could be used for calculation, but a more open sky view is recommended.

10-20 = Fair—This indicates a low confidence level, producing a very rough estimate of the present location.

>20 = Poor—This information can be inaccurate by as much as 300 meters with a 6-meter accurate device.

Signal Stability Countdown

This counter starts when a signal returns after it had been lost. It counts down from 300 seconds. If the timer reaches 0 (the signal has persisted for 300 seconds), the signal is considered stable.

GPS Status

This statement indicates the status of time, position, and reception conditions:

- Time and Position OK
- Time and Pos OK, Pending Stability
- Time and Pos OK, No Pulse Signal Time and Position Invalid
- Data Invalid: Serial-Line Anomaly
- Data Invalid: Serial-Line Error
- Data Invalid: Serial-Line Silence
- Disabled By User
- Not Initialized

GPS Signal Available

A “Yes” display indicates the GPS signal is adequate to permit GPS time synchronization.

Satellite Signal Noise Ratio

This displays the satellites in view by ID number and the signal-to-noise ratio in dB for each satellite. The number of satellites in the list can be higher than the number shown in the **Number of Satellites Tracked by GPS** field. 30 dB+ is a good signal, 20 dB to 30dB is an acceptable signal, 10 dB to 20 dB is a poor signal, and less than 10 dB is unreliable.

Software Versions

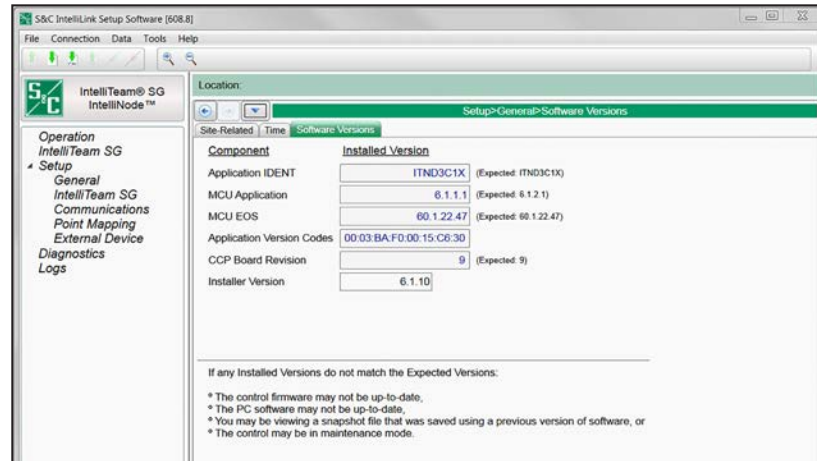


Figure 7. The Setup>General>Software Versions screen.

Data for the installed version update whenever a new software revision is installed. The expected value is stored in the IntelliLink software, and the installed version is loaded from the connected control. See Figure 7.

The latest control software revisions are available at the S&C Automation Customer Support Portal, which requires an assigned username and password. Register for portal access at this link: sandc.com/en/support/sc-customer-portal/.

User Notes

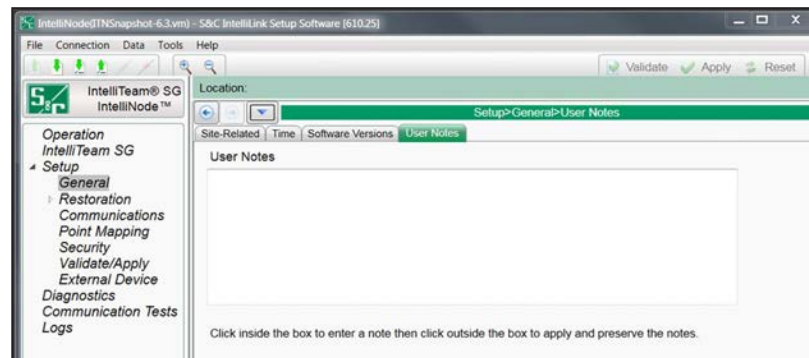


Figure 8. The Setup>General>User Notes screen.

Any character used in a standard text file can be entered. Field capacity is 1000 characters. See Figure 8.

External Device Setup

Device Data Updates

When set to the **Running** state, the IntelliNode Interface Module polls the external device for status points, analog input points, and counter points. A check is also made to verify any programmed automatic settings have associated status points, control points, and analog input points programmed. If not, the **Running** state will change to the **Stopped** state, and a **Protection Configuration Error** state will be active in the Status Point log. For example, when the **Extended Voltage Loss and Single Phase Voltage Loss** feature is enabled on the *Setup>External Device>Auto Operation* screen, status points for voltage present and analog input points for phase voltage must be entered. See Figure 9.

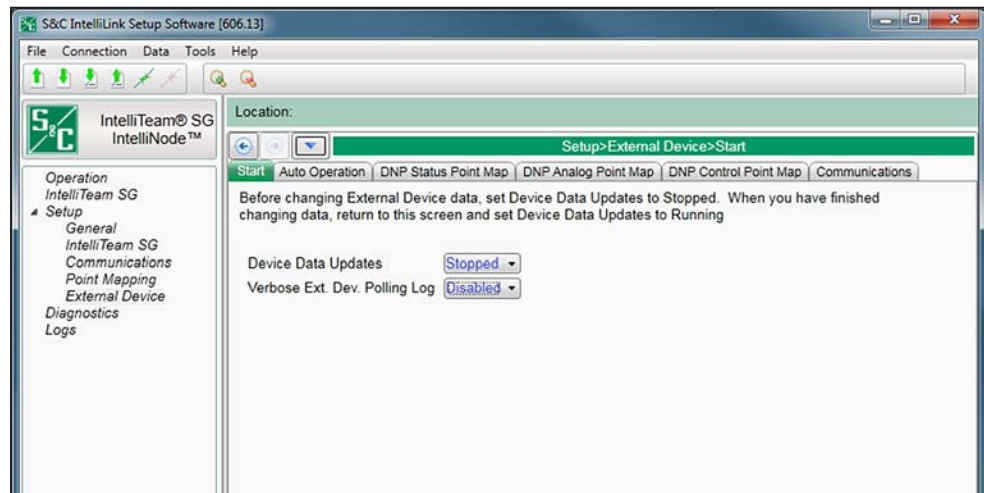


Figure 9. The *Setup>External Device>Start* screen.

As a configuration check, when the **Device Data Updates** mode is in the **Running** state, any change to automatic operation, status points, analog input points, or control points will set it to the **Stopped** state. This prevents any unintended operation while the external device configuration is being changed. The normal configuration sequence is to be in the **Stopped** state, complete all configuration changes, and then set the **Running** state.

NOTICE

Before making changes to any DNP settings on the *Setup>Communications* screens, set the **Device Data Updates** mode to the **Stopped** state to prevent data from being used incorrectly. When the changes are completed, set the **Device Data Updates** mode to the **Running** state to allow use of the retrieved data.

Verbose External Device Polling Log

When this is set to the **Enabled** state and the **Device Data Updates** mode is set to the **Running** state, the *Logs>Historic Log* screen will capture the transmission and response of the communication data to the external device (with time stamps). This is useful for fine-tuning the communications link to the device. However, the frequently logged messages will fill up the compact flash unnecessarily, so setting this to the **Disabled** state will stop the frequent messages from being logged.

Automatic Operation

Voltage Trip mode can be initiated by the external device or IntelliNode Interface Module. This is true for extended three-phase and single-phase voltage losses. If the IntelliNode module **Voltage Trip** mode is enabled, one or both features must be selected, and the time and threshold must be set. If the user chooses to initiate voltage tripping using the external device, the **Extended Voltage and Single Phase Loss Protection** mode is set to “None,” and the time and threshold settings become **N/A**. Then, the time and threshold must be specified in the external device. If the user chooses to configure the IntelliNode Interface Module to initiate voltage trips and also leave voltage tripping active in the external device, then the external device time threshold should be shorter than the IntelliNode module **Loss-of-Voltage Time Threshold** setting to give the external device logic priority.

When the external device initiates a single-phase or three-phase voltage trip, the IntelliNode Interface Module will see the action as an external operation. However, this action will be qualified as a valid transfer event when it is accompanied by a voltage loss event. The IntelliNode Interface Module will look at the **Voltage Present** status points to make this decision.

When the IntelliNode Interface Module initiates a single-phase or three-phase voltage loss event, the module will use the **Voltage** analog points to make a sectionalizing decision.

If the user selects **Single-Phase**, **Three-Phase**, or **Both Types** for the **Extended Loss Protection** setpoint, logic checks the analog inputs and binary status points to make sure voltage status and analog input voltage points have been programmed/mapped to support an extended voltage-loss operation. If they have not been mapped, alarm processing will prevent the team from going into the **Ready** state.

The *Setup>External Device>Auto Operation* screen permits enabling or disabling various automatic switch control operations and entering the setpoints for these operations. See Figure 10 on page 26.

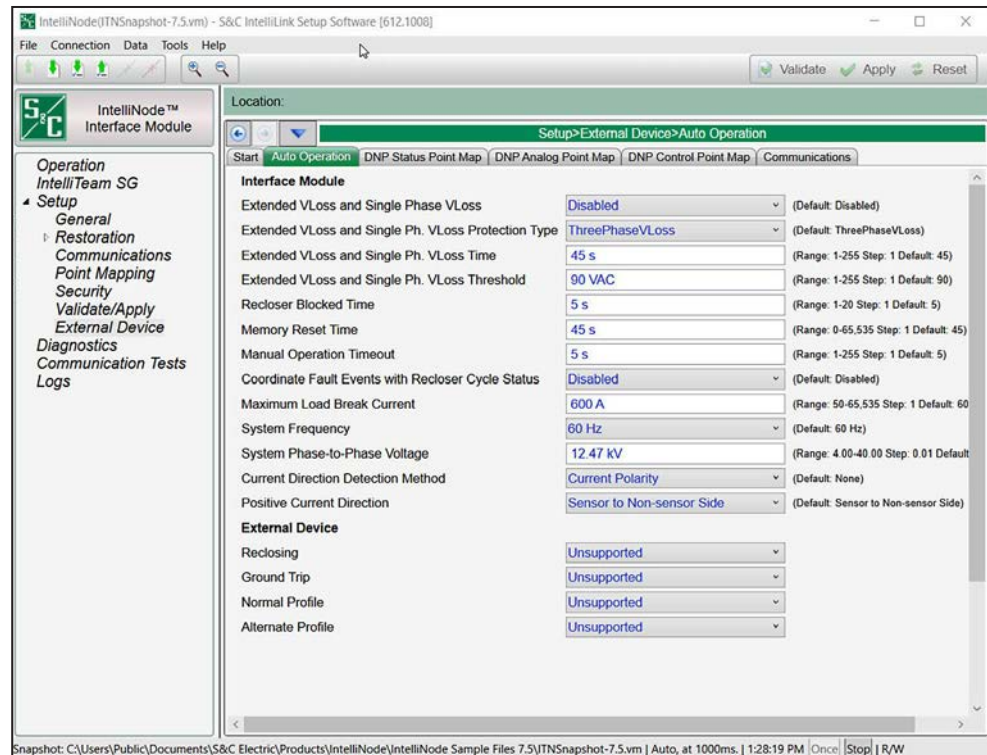


Figure 10. The Setup>External Device>Auto Operation screen.

Interface Module

Extended VLoss and Single Phase VLoss

Enable this setpoint to have the IntelliNode control initiate **Extended Single-Phase** or **Three-Phase Voltage Loss** conditions. Options are the **Enabled** or **Disabled** (default) settings.

Extended VLoss and Single Phase VLoss Protection Type

Enter the desired protection type. Setting options are **Three-Phase Voltage Loss** (default) and **Extended Single-Phase and Three-Phase Voltage Loss**.

Extended VLoss and Single Phase VLoss Time (sec)

Enter the amount of time in seconds to qualify a voltage or phase loss. (Minimum value: 1; maximum value: 255; default value: 45; increment: 1)

Extended VLoss and Single Phase VLoss Threshold

To qualify a voltage or phase loss, the reported analog values are converted to a 120-Vac base and then compared to this value. (Minimum value: 1 Vac; maximum value: 255 Vac; default value: 90 Vac; increment: 1 Vac)

Recloser Blocked Time (sec)

When a **Close** operation is executed, the IntelliTeam SG system does not register a successful close until the timer elapses. Only then is the reconfiguration process allowed to continue. (Minimum value: 1; maximum value: 20; default value: 5; increment: 1)

The **Control Point Operation Timeout** setting, located on the *Setup>External Device>DNP Control Point Map* screen, is an overall timer the IntelliTeam SG system uses to not wait indefinitely for control point operations to complete. To allow time for the external device to qualify a good close operation, make sure the **Recloser Blocked Time** setting is always less than the **Control Point Operation Timeout** setting.

Memory Reset Time (sec)

This is the number of seconds during which the IntelliTeam SG system remembers that a voltage loss or overcurrent event occurred and can use this information if the event leads to a lockout condition of this relay/recloser device or any source-side device. Generally, set this value to a time 5 seconds longer than the **Maximum Lockout Time** setpoint. (Minimum value: 0; maximum value: 65,535; default value: 45; increment: 1)

Manual Operation Timeout (sec)

Whenever the normally closed external device is reporting the **Open** state, this timer is started to wait for the cause of the change of state. A **Manual Operation Alarm** condition is not entered when:

- A **Frequency Trip** state is indicated, the IntelliNode module has initiated an **Extended Voltage Loss Trip** command, Fault Targets are active, and the **Cycling** state is not in the configuration (The **Cycling** state becomes active when fault targets are active and the **Tripped to Lockout** state is active.)
- The manual operation timeout occurs before any of the above indicators become active and a **Manual Operation Alarm** condition is entered
- On a normally open external device, if the IntelliTeam SG system isn't involved with a restoration **Close** command and a closed indication is reported (At this time, the **Manual Operation** timer is not used and an immediate **Manual Operation Alarm** state is entered.)
- The IntelliNode module senses the external device has tripped open with voltage-loss indicators (This is qualified as a **Manual Operation** state.) (Minimum value: 1; maximum value: 255; default value: 5; increment: 1)

Coordinate Fault Events with Recloser Cycle Status

To enhance the coordination with external recloser devices, this setpoint is used instead of the **Memory Reset Time** setpoint for how long the IntelliTeam system remembers an overcurrent event. The benefit is, while the **Reclose Cycle** status point is active, the IntelliTeam system will not attempt to clear voltage loss or overcurrent events. If the setpoint is disabled, the **Memory Reset Time** setpoint is used as before. Options are the **Enabled** or **Disabled** (default) settings.

Maximum Load Break Current

Before the IntelliTeam system issues the **Open** command for restoration activity, the real-time load current for each phase is compared with the **Max. Load Break** setpoint, and if the phase current on all phases is below the setpoint, the **Open** command can resume. If the current remains above the setpoint for 10 seconds, the IntelliTeam system will stop asking the switch to open. Restoration will still be attempted on other switches in the team. (Minimum value: 50 A; maximum value: 65,535 A; default value: 600 A; increment: 1 A)

System Frequency

Select the system frequency, either the **60 Hz** or **50 Hz** option. (Default: 60 Hz) This setting is required when using the IntelliTeam SG system across different voltage classes.

System Phase-to-Phase Voltage

Enter the value of the system phase-to-phase voltage in kV. (Range: 4.00-40.00; Step: 0.01 kV; Default: 12.47 kV) This setting is required when using the IntelliTeam SG system across different voltage classes.

Current Direction Detection Method

The IntelliTeam system uses this setting to accurately calculate loading for each team and capacity for each feeder.

When the **None** option is selected, the IntelliTeam system will not take directionality into consideration for this device when calculating loading. It assumes current is flowing in the Normal direction. The current direction status on the *Operation* screen displays “No Dir.” (Default: None)

When the **Status Points** option is selected, the device uses the status of the **Normal Current Flow** and/or **Reverse Current Flow** DNP status points to determine current direction. If both the **Normal** and **Reverse Current Flow** status points are configured and both points are either active or inactive at the same time, the IntelliTeam system assumes current is flowing in the normal direction. The current direction status on the *Operation* screen displays “No Dir.”

When the **Current Polarity** option is selected, the device uses the polarity of analog current values to determine current direction.

- If the polarity of the **Phase ABC Current** DNP analog points is positive, the device determines current is flowing in the normal direction.
- If the polarity of the **Phase ABC Current** DNP analog points is negative, the device determines current is flowing in the reverse direction.
- If the **Phase ABC Current** DNP analog points report mixed polarity values, the device will sum the phases together to determine current direction. When the sum of all phases is greater than or equal to 0, current is flowing in the normal direction. When the sum of all phases is less than 0, current is flowing in the reverse direction.

Positive Current Direction

When the **Current Polarity** setpoint is used for the current direction detection method, the **Positive Current Direction** setpoint is then used by the IntelliTeam system to determine the normal positive polarity current flow direction of the external device. Set this setpoint to the **Sensor-side to Non-sensor side** mode, which is the default, if normal current is flowing from the sensor side of the external device to the non-sensor side. Otherwise, set this setting to the **Non-sensor side to sensor-side** mode if normal current is flowing from the non-sensor side of the external device to the sensor side.

External Device Settings

These settings direct the IntelliNode module in its operation of the host relay/recloser device. Options are the **Supported** or **Unsupported** settings. When enabled, the **Supported** setting has **Enabled** and **Disabled** options.

Reclosing

When this parameter is set to **Supported** and **Enabled** settings, it indicates to the IntelliNode module the **Reclosing** feature of the host device is enabled in its normal state and the **Reclosing** feature is available for use by the IntelliTeam SG system during reconfiguration events. The sequence of commands sent to the host device when this parameter is supported and enabled are: 1), block reclosing, 2), send the **Close** command, and 3), re-enable reclosing.

When reclosing is unsupported, the IntelliTeam SG system will not issue the **Reclosing Block** and **Reclosing Enable** commands during reconfiguration. When reclosing is supported and enabled and the IntelliNode module detects the reclosing feature has been taken out of its normal state by an external means (faceplate or SCADA), the IntelliNode module considers this to be human intervention and will cause the associated team to be in a **Not-Ready** state. It will also prevent automatic operation of the relay/recloser device by the IntelliTeam SG system until the condition has been cleared. Options are the **Supported** or **Unsupported** (default) settings. The **Supported** setting has **Enabled** and **Disabled** options when it is enabled.

Ground Trip

No **Ground Trip** function for use with the IntelliNode Module/IntelliTeam SG system is supported at this time.

Normal Profile

Set this parameter to the settings profile the host relay/recloser device should use under normal circuit conditions. When the parameter is supported and enabled and the IntelliNode module detects the settings profile has been changed by an external means (faceplate or SCADA), the IntelliNode module considers this to be human intervention and will cause the associated team to be in a **Not-Ready** state. It will also prevent automatic operation of the relay/recloser device by the IntelliTeam SG system until the condition has been cleared. Options are the **Supported** or **Unsupported** (default) settings. When the **Supported** setting is chosen, it has the **Normal** (default), **Alt1**, **Alt2**, **Alt3**, **Alt4**, and **Alt5** setting options.

Alternate Profile

Set this parameter to the settings profile the host relay/recloser device should use under reconfigured circuit conditions. During a reconfiguration event the IntelliTeam SG system will change the active profile to this configured profile as part of the sequence of operating the relay/recloser device. When this parameter is supported and enabled and the IntelliNode module detects that the settings profile has been changed by an external means (faceplate or SCADA), the IntelliNode considers this to be human intervention and will cause the associated team to be in the **Not-Ready** state. It will also prevent automatic operation of the relay/recloser device by the IntelliTeam SG system until the condition has been cleared.

Note: If the profile is changed during circuit reconfiguration and the automatic **Return-to-Normal** function is enabled, the IntelliTeam SG system logic does not reset the profile back as part of the **Return-to-Normal** process. However, this can be accomplished remotely with a SCADA control point operation. Options are the **Supported** or **Unsupported** (default) settings. When the **Supported** setting is chosen, it has **Normal** (default), **Alt1**, **Alt2**, **Alt3**, **Alt4**, and **Alt5** setting options.

External Device Status Points

The screen shown in Figure 11 allows programming of the external device status points used by the IntelliTeam SG system. The required points are highlighted with an asterisk. Additional points should be mapped depending on the protection settings.

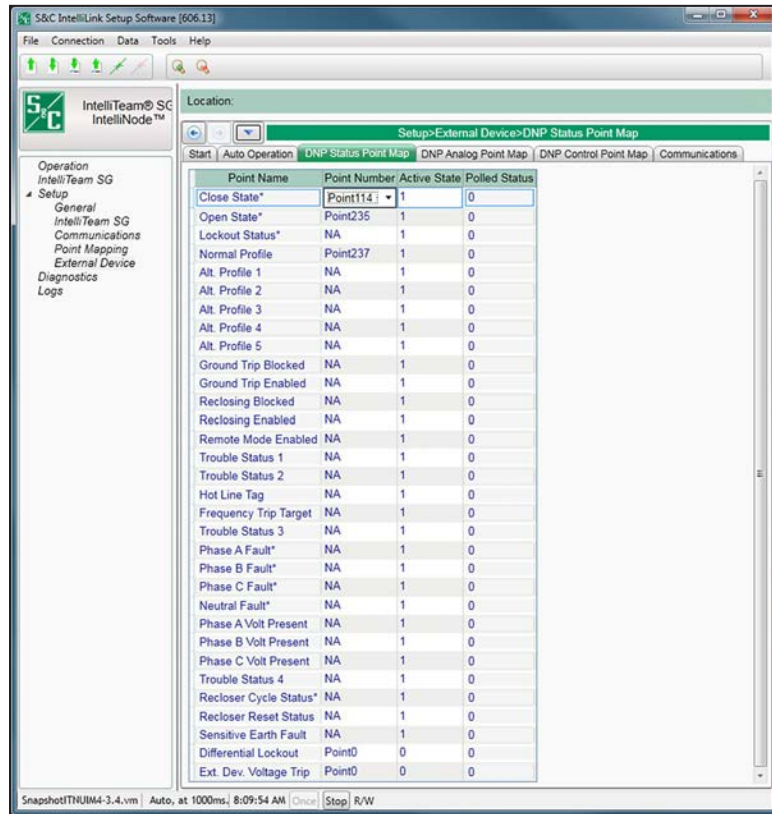


Figure 11. The Setup>External Device>DNP Status Point Map screen.

Note: Before making changes to any DNP settings here or from the Setup>Communications screens, set the **Device Data Updates** mode to the **Stopped** state to prevent data from being used incorrectly. When the changes are complete, set the **Device Data Updates** mode to the **Running** state to allow use of the retrieved data.

Point Name

A point name followed by an asterisk “*” indicates a required point.

Point Number

This sets the point’s location in the point map. Click in the **Point Number** field and select a point-mapping number from the pull-down list.

Active State

Select the active state that is returned from the external device for the associated status point number. For example, if **Close** and **Open** functions are reported by the same point number, and the external device reports the **Close** function as 1, the **Close** active state is 1 and the **Open** active state is 0. If **Close** and **Open** functions are reported as different point numbers, the active state is 1 for both.

When the **Device Data Updates** setting on the *Operation* screen is set to the **Running** mode, the returned status points will be displayed for the programmed points.

The points listed in Table 1 on page 33 are required for IntelliTeam SG system setup.

Table 1. Status Point requirements for IntelliTeam SG System

Status Point Name	Description
Close State●	True if the switch mechanism is in the Closed position
Open State●	True if the switch mechanism is in the Open position
Lockout Status●	True if the relay has tripped to lockout
Normal Profile■	True if the Normal profile is active
Alternate Profile 1■	True if Alternate profile 1 is active
Alternate Profile 2■	True if Alternate profile 2 is active
Alternate Profile 3■	True if Alternate profile 3 is active
Alternate Profile 4■	True if Alternate profile 4 is active
Alternate Profile 5■	True if Alternate profile 5 is active
Grd Trip Blocked	True if the relay is indicating trip on ground current is blocked
Grd Trip Enabled	True if the relay is indicating trip on ground current is enabled
Reclosing Blocked■	True if the relay is indicating reclosing is blocked
Reclosing Enabled■	True if the relay is indicating reclosing is enabled
Remote Mode Enabled▲	True if the relay is indicating remote mode is enabled
Trouble Status1	True if the relay is reporting trouble is active
Trouble Status2	True if the relay is reporting trouble is active
Hot Line Tag■	True if the relay has hot line tag active
Freq. Trip Target■	True if the relay has tripped due to frequency anomaly
Trouble Status3	True if the relay is reporting trouble is active
Direction 1 Phase A Fault●	True if the relay is indicating an A phase fault has been detected in the direction mapped to Direction1
Direction 1 Phase B Fault●	True if the relay is indicating a B phase fault has been detected in the direction mapped to Direction1
Direction 1 Phase C Fault●	True if the relay is indicating a C phase fault has been detected in the direction mapped to Direction1
Direction 1 Neutral Fault●	True if the relay is indicating a neutral or ground fault has been detected in the direction mapped to Direction1
Phase A Volt Present	True if the relay is indicating voltage is detected on phase A
Phase B Volt Present	True if the relay is indicating voltage is detected on phase B
Phase C Volt Present	True if the relay is indicating voltage is detected on phase C
Trouble Status 4	True if the relay is reporting that trouble is active

● Required DNP Point.

■ Required DNP Point if supported by the external device.

▲ The **Remote Mode Enabled** status point should be mapped. If not mapped or configured N/A it will always be displayed as active.

TABLE CONTINUED ►

Table 1. Status Point requirements for IntelliTeam SG System–continued

Status Point Name	Description
Recloser Cycle Status◆	True if the relay is fault cycling
Recloser Reset Status■	True if fault cycling has ended and the switch is closed
Direction 1 Sensitive Earth Fault■	SEF for the external device. When active, it is treated within the IntelliTeam SG System logic the same as an overcurrent fault
Differential Lockout■	Trip for the external device. When active, it is treated within the IntelliTeam SG System logic the same as an overcurrent fault with this directionality
Ext. Dev. Voltge Trip■	Trip for the external device. When active, it is treated within the IntelliTeam SG System logic the same as an overcurrent fault to prevent indication of manual operation of the external device as reported to the IntelliTeam system. This allows the IntelliTeam SG system to stay in the Ready state for events such as a transfer trip of a substation breaker
Bus One Shot Active	True if Bus One Shot is active
Bus One Shot Lockout	True if Bus One Shot has resulted in lockout
Direction 2 Phase A Fault	True if the relay is indicating an A phase fault has been detected in the direction mapped to Direction2
Direction 2 Phase B Fault	True if the relay is indicating an B phase fault has been detected in the direction mapped to Direction2
Direction 2 Phase C Fault	True if the relay is indicating an C phase fault has been detected in the direction mapped to Direction2
Direction 2 Neutral Fault	True if the relay is indicating a neutral or ground fault has been detected in the direction mapped to Direction2
Direction 2 Sensitive Earth Fault	SEF for the external device. When active, it is treated within the IntelliTeam SG System logic the same as an overcurrent fault with this directionality
Direction 1 Neg Seq Current Fault ■	Negative Sequence Fault for the external device. When active, it is treated within the IntelliTeam SG System logic the same as an overcurrent fault with this directionality
Direction 2 Neg Seq Current Fault	Negative Sequence Fault for the external device. When active, it is treated within the IntelliTeam SG System logic the same as an overcurrent fault with this directionality
Direction 1 Direction Current Flow	True if the external device is indicating load current flowing in the direction mapped to Direction1
Direction 2 Direction Current Flow	True if the external device is indicating load current flowing in the direction mapped to Direction2

- Required DNP Point.
- Required DNP Point if supported by the external device.
- ▲ The **Remote Mode Enabled** point should be mapped. If not mapped or configured N/A it will always be displayed as Active.
- ◆ The **Recloser Cycle Status** point should be mapped if supported by the external device.

NOTICE

If the switch **Open/Close** state is reported as being in both the **Open** and **Closed** state, a 10-second timer starts. If the status is still the same when the timer expires, the team enters the **Stop Transfer** state, and both a log event message and status change are reported.

External Device Analog Input Points

The screen shown in Figure 12 allows programming of the external device analog input points used by the IntelliTeam SG system. The required points are highlighted with an asterisk. Additional points should be mapped depending on the protection settings.

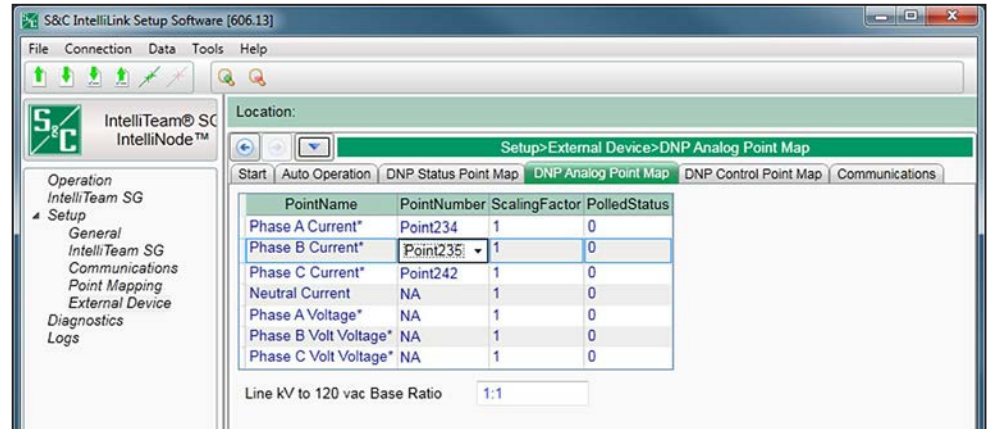


Figure 12. The Setup>External Device>DNP Analog Point Map screen.

Note: Before making changes to any DNP settings here or from the Setup>Communications screens, set the **Device Data Updates** mode to the **Stopped** state to prevent data from being used incorrectly. When completing the changes, set the **Device Data Updates** mode to the **Running** state to allow use of the retrieved data.

Point Number

This sets the point's location in the point map. Click in the **Point Number** field and select a point-mapping number from the pull-down list.

Scaling Factor

Phase current is expected to display in units of one amp per count. This sets the scaling factor to adjust the reported value. The **Scaling Factor** and the **Line kV to 120 Vac Base Ratio** settings are used to convert the external device's reported phase-voltage data to a 120-Vac base. The displayed value will be compared to the configured **Extended Voltage Loss and Single Phase Voltage Loss Threshold** setting on the Setup>External Device>Auto Operation screen.

Polled Status

This is the actual analog data reported by the external device for that programmed point number, with an “applied” scaling factor.

Line kV to 120 VAC Base Ratio

Enter a value to set a 120-Vac base for the displayed three-phase voltages.

Note: These scaling factors do not modify what the external device reports when a SCADA Master polls for analog-input data. There are separate scaling factors configured for SCADA DNP.

External Device Control Points

The screen shown in Figure 13 allows programming of the external device control points used by the IntelliTeam SG system. The required points are highlighted with an asterisk. Additional points should be mapped depending on the protection settings.

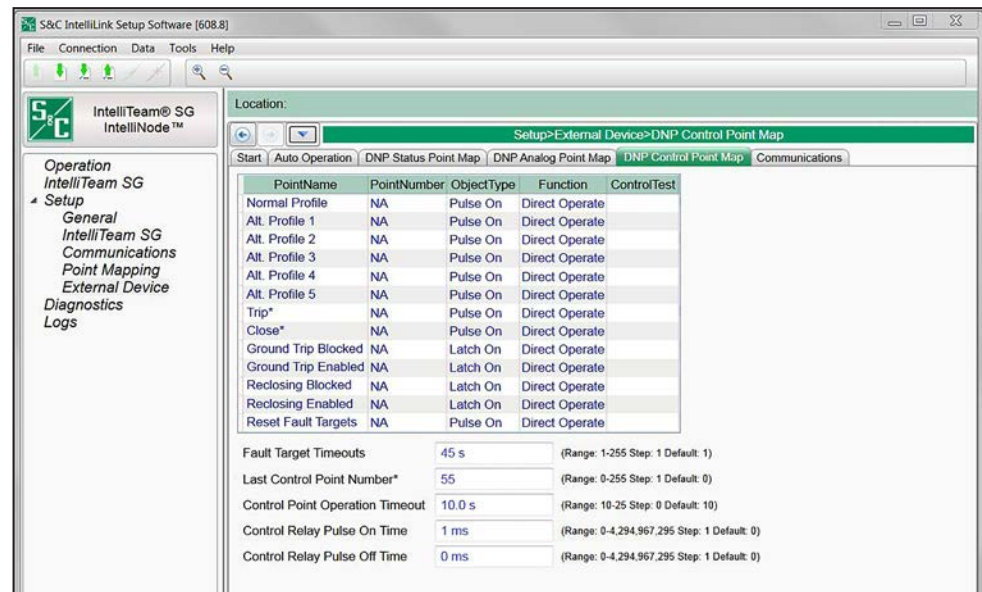


Figure 13. The Setup>External Device>DNP Control Point Map screen.

Note: Before making changes to any DNP settings here or from the Setup>Communications screens, set the **Device Data Updates** mode to “Stopped” to prevent data from being used incorrectly. When the changes are complete, set the **Device Data Updates** mode to “Running” to allow use of the retrieved data.

Point Name

A point name followed by an asterisk “*” indicates a required point.

Point Number

This sets the point's location in the point map. Click in the **Point Number** field and select a point-mapping number from the pull-down list.

Object Type

Select from the six object types that the external device supports for the associated control point.

Function

The **Direct Operate** function is the only function type supported for control points by the IntelliNode module or the IntelliTeam SG system.

Control Test

Click in the **Control Test** field and select the **Execute** option from the pull-down menu to send this control point to the external device. This facilitates quick verification of the **Control Point** operation and the reported status points.



Selecting the **Execute** option causes an operation of the external device. Be sure all standard safety precautions are followed before testing a point.

Fault Target Timeouts (secs)

The IntelliNode module waits the length of this timer before it sends the **Reset Fault Targets** control point to the external device. (Minimum: 1; maximum: 255; increment: 1; default: 45)

Last Control Point Number

The IntelliNode module doesn't poll for binary output status from the external device to get a count of how many control points the external device supports. So when programming the control points to be used by SCADA (on the *Setup>Point Mapping>Controls* screen), configure this setpoint to the number of control points the external device supports. (Minimum: 0; maximum: 255; increment: 1; default: 55)

Control Point Operation Timeout

This value is used by the IntelliTeam SG system as the upper limit for how long a control point operation will run. Successful operation time is based on the polling rate and the returned status point associated with that control point. (Minimum: 10 s; maximum: 25 s; increment: 0.1 s; default: 10.0)

Control Relay Pulse On/Off Time (ms)

The on and off times in the control relay output block are programmable. (Range: 0-4,294,967,295 ms; increment: 1; On time default: 1; Off time default: 0)

The points listed in Table 2 are required for IntelliTeam SG system setup.

Table 2. Control Point requirements for the IntelliTeam SG System

Control Point Name	Description
Normal Profile●	Command to enable the normal settings profile of the host control device
Alternate Profile 1●	Command to enable the alternate settings profile 1 of the host control device
Alternate Profile 2●	Command to enable the alternate settings profile 2 of the host control device
Alternate Profile 3●	Command to enable the alternate settings profile 3 of the host control device
Alternate Profile 4●	Command to enable the alternate settings profile 4 of the host control device
Alternate Profile 5●	Command to enable the alternate settings profile 5 of the host control device
Trip■	Command to open the contacts of the breaker or recloser
Close■	Command to close the contacts of the breaker or recloser
Ground Trip Blocked	Ground trip for use by the IntelliNode module and IntelliTeam SG system is not supported at this time
Ground Trip Enabled	Ground trip for use by the IntelliNode module and IntelliTeam SG system is not supported at this time
Reclosing Blocked●	Command to block the reclosing feature of the host control device
Reclosing Enabled●	Command to unblock the reclosing feature of the host control device
Reset Fault Targets▲	Command to clear the fault targets in the host control device

- Required DNP Point.
- Required DNP Point if supported by the external device.
- ▲ Not required if host device automatically clears fault status when it closes.

External Device Communications

These setpoints are specifically for communication with the external device. See Figure 14.

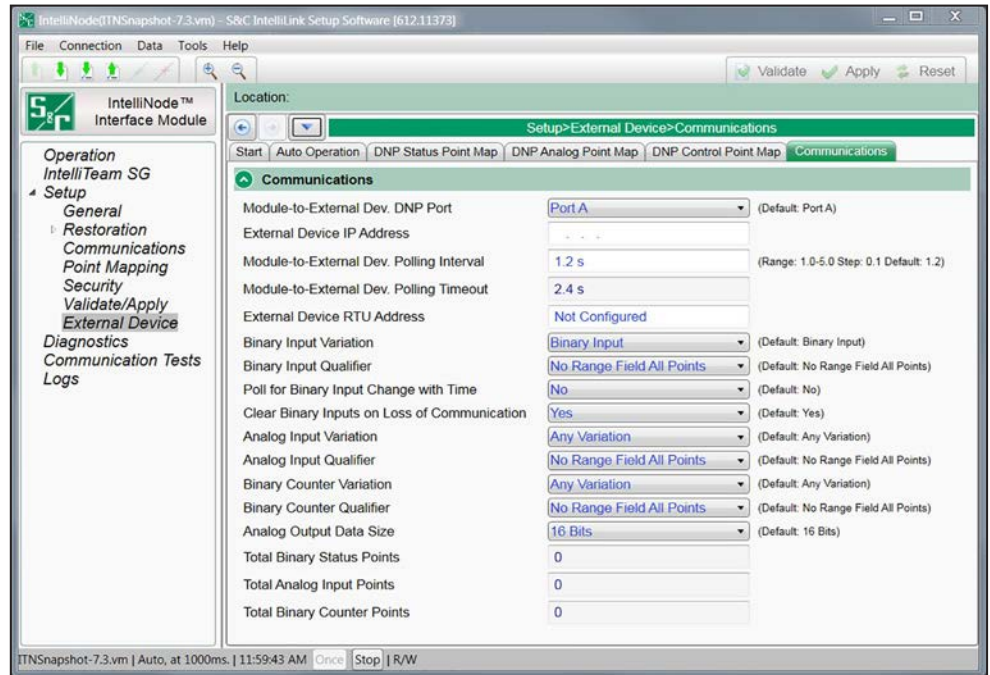


Figure 14. The Setup>External Device>Communications screen.

Note: Before making changes to any DNP settings here or from the *Setup>Communications* screens, set the **Device Data Updates** mode to “Stopped” to prevent data from being used incorrectly. When the changes are complete, set the **Device Data Updates** mode to “Running” to allow use of the retrieved data.

Module-to-External Dev. DNP Port

Enter the serial port connected to the external device: UDP port A, B, C, or D.

External Device IP Address

Enter the IP address of the external device when Ethernet is used for the connection.

Module-to-External Dev. Polling Interval

The IntelliNode module polls the external relay/switch device for data and stores that data in an internal database. This parameter defines the interval (in seconds) that this polling will be repeated. (Minimum: 1; maximum: 5; increment: 0.1; default: 1.2)

Module-to-External Dev. Polling Timeout

This is the amount of time (automatically calculated) the IntelliNode module waits before logging a communication timeout. For the normal data polls, when a timeout occurs, the pending message is deleted off the transmit list and another poll is sent. Enter the **Polling Interval** setting, go to the *Setup>External Device>Start* screen, and set the **Verbose Ext. Dev. Polling Log** setpoint to “Enabled.” Set the **Device Data Updates** setpoint to “Running.” Go to the *Logs>Historic Log* screen and verify the Data Poll Sent to Ext.

Device and Data Received from Device events are logged without a timeout being logged. When this is completed, go to the *Setup>External Device>Start* screen and set the **Verbose Ext. Dev. Polling Log** setpoint to “Disabled” so the compact flash doesn’t fill up with these messages.

External Device RTU Address

This is the DNP RTU address configured in the external relay/switch device directly connected to this IntelliNode module. This RTU address must be unique within the communications system.

NOTICE

IntelliLink Software Users: Changing the RTU address or other communication parameters can stop this device from communicating remotely with IntelliLink Setup Software and its other team members. The IntelliTeam SG system stops working when it can’t reach a team member. If communication with a control is lost, the operator must go to the site, connect directly to the control, and reset the RTU address, or other changed communication parameter.

Binary Input Variation

This is the DNP object variation used in the IntelliNode module’s poll to the external device for binary input data. Using the **Any Variation** setting allows the external device to select the variation of the binary input data it will respond with.

Selecting the **Binary Input with Status** setting causes the IntelliNode module to look at the offline status of every binary input returned by the external device. When an offline status is found, an alarm condition is entered and any IntelliTeam SG system activity will be stopped. Choices are: **Any Variation** (default), **Binary Input**, and **Binary Input with Status** settings.

Binary Input Qualifier

This is the DNP qualifier code used in the IntelliNode module poll to the external device for binary input data. The no range field all points qualifier requests that all available binary input data points be returned in the external-device response.

Note: The IntelliNode module only supports 216 binary status points.

Poll for Binary Input Change with Time

When the external device is set for fast fault cycling and a slow polling interval is configured, valuable information occurring between the polling intervals may be missed. When set to “Yes,” the IntelliNode module polls for binary change events and any active fault current or voltage loss event will be reported to the IntelliTeam SG system.

Note: If there are too many events stored in the external device (events haven’t been polled for a long time), the time it takes to receive all of them might exceed the **Poll Timeout** value, resulting in a **Reset Link** command being sent to the external device instead of a confirmation acknowledgement. The events will not be purged from the external device and the process repeats. First purge old events from the external device and then enable this setpoint. The TRANSMIT and RECEIVE LEDs for the port connected to the external device should show one **Transmit** indication followed by one **Receive** indication.

Clear Binary Inputs on Loss of Communication

When set to the **Yes** setting, it causes clearing of all binary status data that have been returned by the external device when communication is lost. Clearing the binary input points also applies to points from the external device that are mapped to SCADA points.

Analog Input Variation

This is the requested DNP object variation of analog input data. The **Any Variation** setting allows the external device to select the analog input data variation it will respond with. Choices are: **Any Variation** (default), **16 Bit without Flag**, and **16 Bit** settings.

Note: The IntelliNode module supports only 16-bit analog values. If the **Any Variation** setting is used, be sure the external device is configured to return 16-bit analog values.

Analog Input Qualifier

This is the requested DNP qualifier code for analog input data. The **No Range Field All Points** setting requests that all available analog input points are returned in the external device response. This is the only option.

Note: The IntelliNode module only supports 126 analog input points.

Binary Counter Variation

This is the requested DNP object variation of binary counter data. For the **Any Variation** setting is used, the external device selects the variation of binary counter data it will respond with. This is the only option.

Note: The IntelliNode module supports up to 32-bit counters.

Binary Counter Qualifier

This is the requested DNP qualifier code for binary counter data. For the **No Range Field All Objects** setting is used, all available binary counter data objects are returned in the external device response. This is the only option.

Note: The IntelliNode module only supports 16 binary counters.

Analog Output Data Size

This setpoint matches the data size supported when DNP receives a request to set one of the 16 mapped analog output points that will be sent to the external device. Options are **16 Bits** (default) or **32 Bits** settings.

Total Binary Status Points, Total Analog Input Points, and Total Binary Counter Points

To help verify the IntelliNode module is receiving data from the external device, these real-time counts are the totals received. If 38 binary status points are displayed with a zero reference, the device is returning 0-37.

Note: The IntelliNode module sends three DNP objects to the external device: **Status Points**, **Analog Input Points**, and **Counter Points**. For correct operation, the external device can respond to all three, or it can return data for just status points and analog input points.

Communication Setup

DNP communication settings for the IntelliTeam SG Automatic Restoration System, SCADA, and IntelliLink Setup Software are configured on the screen shown in Figure 15

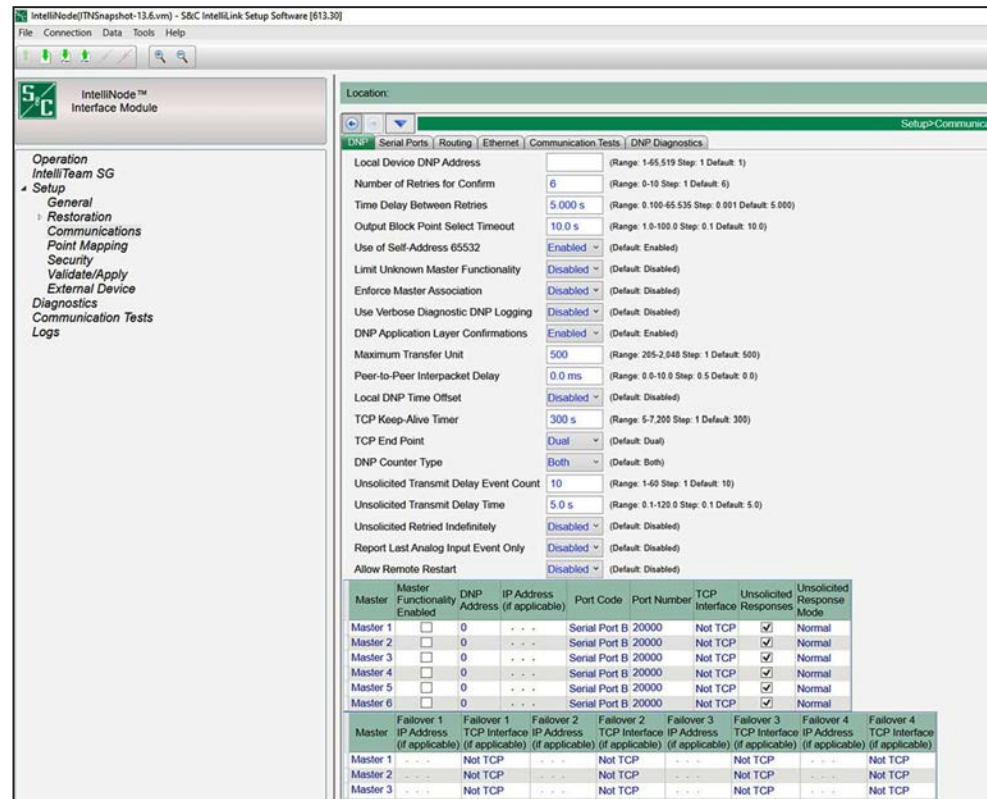


Figure 15. The Setup>Communications>DNP screen.

Local Device DNP Address

Enter the network address for this control. It must be the same as the DNP/RTU address on the *Setup>Restoration>IntelliTeam SG>Team Summary* screen. Be sure to enter an address even if this control will not be accessed via SCADA or a remote IntelliLink software connection. The DNP address must be greater than 0; 1 is the default, and the maximum value is 65519.

NOTICE

Changing the DNP address or other communication parameter can prevent the control from communicating with other team members in an IntelliTeam SG system and via SCADA or a remote IntelliLink software connection. If communication is lost with a control, go to the site, connect through IntelliLink software, and reset the communication parameter that had been changed.

NOTICE

Make sure to enter the new DNP address when relocating a configured control to a new site. If failing to do so, the control may respond to commands intended for a different location.

Number of Retries for Confirm

This is the number of times the control will resend a data-filled unsolicited message to the master station if a confirmation message is not received within the **Time Delay Between Retries** setting. The control will save the event data after this number of retries until it receives a confirmation. If there is no confirmation after the number of retries is exceeded and a new event occurs, the control will resend the saved event data along with any new event data. Setting this parameter at 0 will prevent retries. This setting applies to all masters. (Range: 0-10; Step: 1; Default: 6)

Time Delay Between Retries

This is the time delay between retries for initial unsolicited null and data-filled unsolicited responses. The initial unsolicited null is transmitted indefinitely until the master confirms it. Data-filled unsolicited responses are transmitted until the number of retries specified in the **Number of Retries for Confirm** setting has been reached. Transmission retries stop when an application confirmation is received from the master during this period.

For master event requests, this is the application confirmation timeout period. When the control receives a confirmation after this timer has expired the confirmation will be ignored and the events will remain in the event buffers. This setting applies to all masters. (Range 0.100-65.535 seconds; Step: 0.001; Default: 5.000)

NOTICE

When the master will set or read an Application Layer Confirmation Retry Time longer than 32.767 seconds: to set it, use Group 41 variation 1 (32-bit) to read it use Group 40 variation 1 (32-bit with flag). Otherwise, a SCADA poll may report a negative value because the default configuration is 16-bit. Review S&C Instruction Sheet 1043-561 "S&C IntelliNode™ Interface Module: *Configurable DNP Points and Implementation*," for more information.

Output Block Point Select Timeout

This is the timeout duration of the **Select** function on control points. See the appropriate S&C Instruction Sheet 766-560, 1043-561, 1045M-560A, 1045M-560B, 1045-560, 1045-560B, 1045-560C, 1045-560D, 1045-560E, or 1045-560F: “*DNP Points List and Implementation.*” If the timeout duration between **Select** and **Operate** functions during a **Select-Before-Operate** sequence exceeds this timeout value, the control will disable the point and return a timeout status code in the subsequent **Operate** request. This setting applies to all masters. (Range: 1.0-100.0; Step: 0.1; Default: 10.0)

Use of Self-Address 65532

NOTICE

Disabling the **Use of Self-Address** setting can prevent the IntelliNode module from communicating with IntelliLink software. If communication with the IntelliNode module is lost, the user must know the **Local Device DNP Address** setting, connect through a remote IntelliLink software connection, and re-enable the **Use of Self-Address** setting to connect locally.

Wi-Fi will not work if the **Use of Self-Address** setting is disabled. If the local DNP address is not known and the **Use of Self-Address** setting is disabled, the IntelliNode module will require reprogramming at the factory to re-establish access to the control.

This setting is present to comply with the DNP standard. Care must be used when deciding to change the default. Options are “Disabled,” which blocks the use of DNP Address 65532, and “Enabled,” which allows the use of DNP Address 65532. Default is enabled.

Limit Unknown Master Functionality

NOTICE

Enabling this feature prevents unknown master stations from making any configuration changes. When the **Limit Unknown Master Functionality** setting is enabled, at least one master other than the SCADA master must be enabled.

When this feature is enabled, the only way to connect with the control (to make any changes or disable this feature) is with IntelliLink software and a computer set to the configured DNP address of the enabled master that is not the SCADA master. The control must be returned to the factory and reset to the factory default when the DNP address of the master is unknown.

The default is the **Disabled** setting to allow master station addresses to be entered into the configuration. After those addresses have been entered, this parameter may be enabled and a configured master station address used to complete the configuration process.

When enabled, a master/peer station not included in the configuration of this control is prevented from writing to or controlling it. Master/peer stations configured in this control include any of the six master station DNP addresses and team members configured on the *Setup>Restoration>IntelliTeam SG>Team Summary* screen. The default is the **Disabled** setting.

Enforce Master Association

The primary identification for a master station is its DNP address. When a master sends DNP requests to a control and this setting is enabled, the Master's port code (i.e. TCP, UDP, or serial), IP address (when the port code is TCP or UDP), and DNP address must match the data configured for that master station in the control. DNP requests are ignored when this setting is enabled and the IP address and port code do not match the configured data.

When this setting is disabled the IP address and port code are ignored, and only the DNP address is checked and validated with the control configuration. Note that configuring the **Failover IP Address** setting is optional; when the **Enforce Master Association** feature is enabled, the master station IP address must match either the configured **IP Address** or the **Failover IP Address** setting. For this feature to work, the **Limit Unknown Master Functionality** feature must be enabled. The allowable port values are 20,000 - 20,999 and 49,152 - 65,535.

Use Verbose Diagnostic DNP Logging

When the **Enabled** setting is selected (for diagnosing a communication issue), a message is logged for every source and destination frame. Enabling this function for an extended period will cause Historic logs to fill quickly and reduce the number of saved historical events. The **Disabled** setting is the default.

DNP Application Layer Confirmations

When the **Enabled** setting is selected, an application layer confirmation will be requested with every solicited response that includes event data. Event buffers will not be cleared until an application layer confirmation is received from the master station. When disabled, the event buffers are cleared when events are reported. The **Enabled** setting is the default. This setting applies to all masters.

Maximum Transfer Unit (all product software except ST6801MSS)

This setting allows the IntelliTeam SG system to make the most efficient use of communication system bandwidth. For SpeedNet™ Radios, set it to 500. For an Ethernet connection, set it to 1500. For other communication devices, set it to the maximum packet size of the device. The Maximum Transfer Unit is only used for IntelliTeam SG system communications and can be set to the default setting for any control not using the IntelliTeam SG system. (Range: 205-2,048; Step: 1; Default: 500)

Note: When pushing Netlists using IntelliTeam Designer, an MTU of 500 or higher is required.

Peer-to-Peer Interpacket Delay

Set this to zero unless the IntelliTeam SG system is enabled. Interpacket delay improves communication reliability between team members by adjusting the delay between successive frames of a multi-frame P2P fragment. The **Maximum Transmission Unit** setting defined for that control determines frame size.

When data traffic is heavy, a peer's receive buffer may overflow, and messages could be lost. This problem is usually noticed in a direct P2P/UDP system. The **Interpacket Delay** setting increases the time a peer will have to process received data. It is advisable to increase the receive buffers instead of increasing the **Interpacket Delay** setting, which will create artificial delays in the communication system. (Range: 0.0-10.0; Step: 0.5; Default: 0.0)

Local DNP Time Offset

When the **Disabled** setting is selected, UTC time is applied to the DNP timestamps. When a local time offset ranging from +14 hr. to -14 hr. in 15-minute increments has been selected, the offset is applied to the UTC time to allow the DNP time stamp to be adjusted to local time. The **Disabled** setting is the default.

TCP Keep-Alive Timer

This specifies the time between keep-alive messages as defined in the DNP specification. This setting applies to all masters. (Range: 5-7200; Step: 1; Default: 300)

TCP End Point

A listening end point can be configured to report unsolicited events but it cannot initiate a connection, it must wait for the master to connect and then report unsolicited events. A dual end point can initiate a connection if there is not an active connection already present.

DNP Counter Type (not applicable for IntelliRutper® fault interrupters)

This selects the counter that will be reported in static data for a Class 0 Poll requested by the master station. Counter selections are **Frozen**, **Running**, and **Both Counters** (default) settings.

Unsolicited Transmit Delay Event Count

This is the number of new events that will cause an unsolicited message to be transmitted, provided the **Unsolicited Transmit Delay Time** setting has not been reached. Setting this parameter to 1 results in an unsolicited message generated for every new event. This setting applies to all masters. (Range: 1-60; Step: 1; Default: 10)

Unsolicited Transmit Delay Time

This is the maximum time (in seconds) that may elapse after a new event before an unsolicited message is sent. During this delay other new events may be added to the message. If the number of events reaches the **Unsolicited Transmit Delay Event Count** setting before the delay time elapses, the unsolicited message will be sent immediately. This setting applies to all masters. (Range: 0.1-120.0; Step: 0.1; Default: 5.0)

Unsolicited Retried Indefinitely

Enabling this setting allows unsolicited message retries to be performed until a confirmation is received, and the **Number of Retries for Confirm** setting will be ignored. Disabled is recommended for normal operation. This setting applies to all masters.

Report Last Analog Input Event Only

When the **Report Last Analog Event Only** setting is set to “Enabled,” only the latest DNP analog input events will be reported for a DNP analog input point (both solicited and unsolicited messages); otherwise, all analog input point changes will be reported when this setting is “Disabled,” which is the default.

Allow Remote Restart

When the **Allow Remote Restart** setting is set to “Enabled,” the control performs a restart on receipt of a request to perform a cold restart or a warm restart from a master station.

Master Stations 1 through 6

Master Station Functionality

When Enable Master Functionality is checked, several features are provided to the master:

- Event data are saved until the master confirms receipt of the data (or just polls the data if the **DNP Application Layer Confirmations** setting is disabled). Each of the masters has its own event data, so if one of the masters has retrieved and confirmed receipt of the data, the other masters can still retrieve the data they have not yet received. (Unknown/unregistered masters may still receive event data through polling, but they will only receive the data that have not yet been confirmed/received by Master 1.)
- The **Unsolicited Reporting by Exception** feature for event data is available.
- The **Limit Unknown Master Functionality** setting (if enabled) does not apply to these masters.

No master can have the same DNP address as the local device. All masters must have unique DNP addresses. In order to properly clear event buffers the port code must match the connection type and the proper IP address must be associated with the DNP address.

DNP Address

This is the DNP address to which the control sends all unsolicited responses. This is also used to verify whether a master is one of the registered masters. (Range: 0-65,519; Step: 1; Default: 0)

IP Address (if applicable)

This is the IP address to which the control sends all unsolicited responses (if enabled). It is also used to verify whether a master is one of the registered masters (both DNP and IP addresses must match). An IP address of 0.0.0.0 is represented as blank on the IntelliLink software screen. When using serial communications specify the DNP master address and the serial port to be used. All other IP related parameters are ignored. The listening port for incoming TCP connections and UDP packets is hard coded at 20,000.

Entering an IP Address

IP address entry has been simplified, follow these steps:

- STEP 1.** Click and highlight the character in the first cell.
- STEP 2.** Type one to three characters as needed.
- STEP 3.** Hit the space bar to advance to the next field. Advancing in this fashion automatically highlights the characters in the next field.
- STEP 4.** Repeat typing, followed by the space bar until entry is complete.

To revert to the IP address value presently configured in the control memory, press the <Esc> key or click the **Reset** button in the tool bar.

IP Address FAILOVER (if applicable)

The local control sends unsolicited messages (if enabled) to any registered master it

has received a message from (provided that master has sent an **Enable Unsolicited Messages** command, if the **Unsolicited Response Mode** function is set to the **Normal** setting). The local control will respond to either the Primary master or the Failover master, whichever sent the last message. The IP address in use will be highlighted. If there is no **Failover** setting configured for this master, leave this entry blank or enter 0.0.0.0.

Port Code

This is the port through which unsolicited report-by-exception DNP frames to the master station are sent. Port A (serial) is the default. Select the **TCP** option if the SCADA master is configured for a TCP/IP connection, and select the **UDP** option if the SCADA master is configured for UDP/IP.

The port code also is used to check that an incoming message is from a registered master. In addition to the DNP address and IP address (if TCP or UDP is used), the port code must also match.

Port Number

This setting is ignored unless the **TCP** or **UDP** option has been selected for the master station port code. This port is the outgoing port for unsolicited TCP or UDP messages that occur when there isn't an active session with the master. (Range: 1,024-65,535; Step: 1; Default: 20,000)

Note: The **UDP** option uses the fixed port 20,000 as the source port for all UDP messages.

Note: When the **Enforce Master Association** and **Limit Unknown Master** options are enabled, the valid UDP port number must be in the following range: 20,000-20,999; 49,152-65,535.

TCP Interface

When configuring the IP address (if applicable), set this to the Ethernet port associated with that IP address. This setting is ignored unless the **TCP** option has been selected for the master station port. Select the **Add-On** or **Native** setting. The **Not TCP** option is a placeholder and is not applicable. Select the **Add-On** setting for IntelliRupter fault interrupters because they do not have a native Ethernet port.

Unsolicited Responses

When enabled (the default), the control sends a message to the master station when new event data are available based on the **Unsolicited Transmit Delay Event Count** setting and the **Unsolicited Transmit Delay Time** setting. A master station DNP address and master station port code or master station IP address must be entered. Enabling this feature may add significant traffic to the communication network.

Unsolicited Response Mode

Select the **Normal** (default) or **5800 V2 Mode** setting. The **Normal** mode requires the

Master Station to acknowledge an initial empty (null) unsolicited message at control restart. The SCADA master must send a command to enable unsolicited reporting.

If acknowledgment of the initial empty unsolicited message is not received, the control continues to resend these messages at the configured retry interval until an acknowledgment is received. The **5800 V2 Mode** setting is a non-standard mode that bypasses the initial empty unsolicited messages and the requirement for the master station to enable unsolicited reporting with a SCADA command. It simply starts sending unsolicited responses as events occur, provided that the unsolicited responses parameter is enabled.

The **5800 V2 Mode** setting may require that the control be restarted unless the control is presently sending unsolicited responses in the **Normal** mode or a remote command to enable unsolicited responses can be sent to the control. To restart the control after all configuration changes have been successfully applied, select **Tools>Device Maintenance...** option on the menu bar, and select the **Reset Control** option and click on the **Yes** option in the dialog box. Afterward, log in when the IntelliLink dialog box opens.

Failover IP Address (if applicable)

Each of the six master stations can have up to four Failover IP addresses registered. The local control sends unsolicited messages (if enabled) to any registered master it has received a message from (provided that master has sent an **Enable Unsolicited Messages** command, if the **Unsolicited Response Mode** setting is set to the **Normal** state). The local control will respond to either the primary master or the failover master, whichever sent the last message. The IP address in use will be highlighted. If there is no **Failover** setting configured for this master, leave this entry blank or enter 0.0.0.0.

Failover TCP Interface (if applicable)

Each of the six master stations can have up to four Failover TCP Interfaces configured. Select the **Add-On** setting for IntelliRupter fault interrupters.

Serial Port Setup

The screen shown in Figure 16 contains communication settings related to the IntelliTeam SG Automatic Restoration System, SCADA, and IntelliLink Setup Software. S&C automation products have different serial-ports configurations:

IntelliNode Interface Modules have four configurable serial ports.

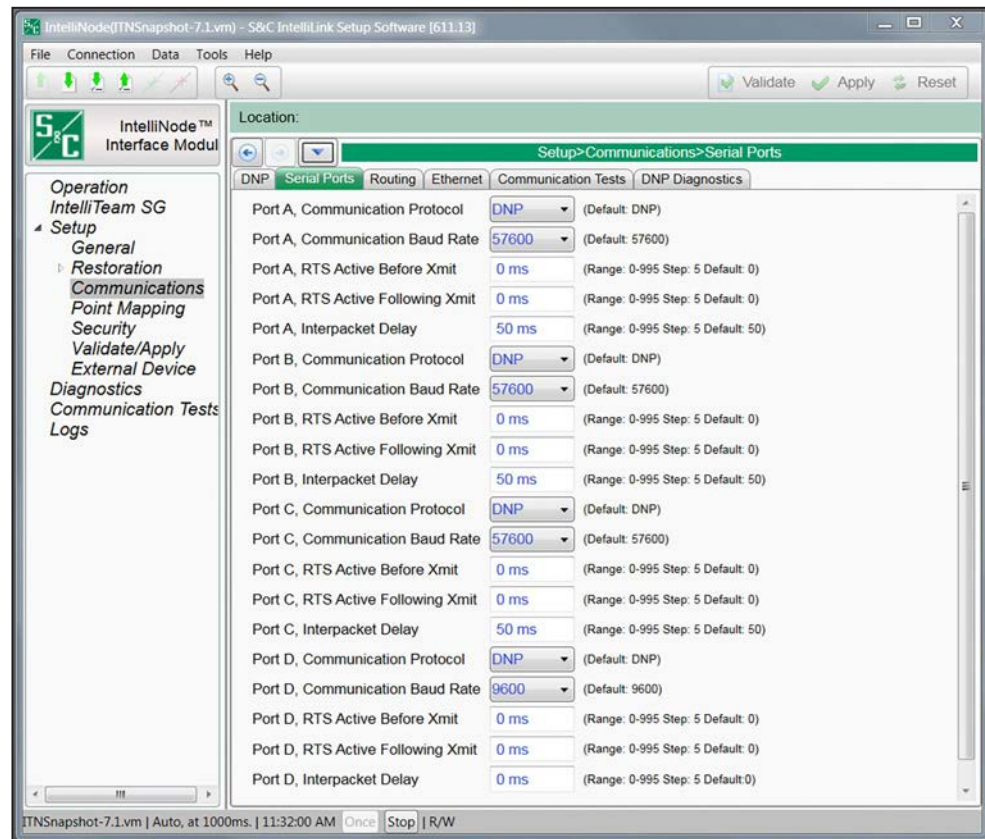


Figure 16. The Setup>Communications>Serial Ports screen.

Ports A, B, C, and D

Communication Protocol

DNP is permanently configured because S&C controls only use the Distributed Network Protocol. (Default: DNP)

Communication Baud Rate

This is the baud rate from the S&C control to the radio, and it must be identical to the baud rate of the radio. (1 200, 2 400, 4 800, 9 600, 19 200, 38 400, 57 600 (default), 115 200, and 230 400 baud)

RTS Active Before/Following Xmit

This is the time in milliseconds the request to send (RTS) is active for this port before and after a transmission takes place. The default value is usually suitable. (Range: 0-995; Step: 5; Default: 0)

Interpacket Delay

This is the time in milliseconds between individual message frames of a data stream. Set this parameter appropriately for the radio. (Range: 0-995; Step: 5; Default: 50)

Routing Setup

The screen shown in Figure 17 can display routing information for up to 32 destination devices. If a message frame is received with a destination address other than the local address, this information is used to redirect the message out an adjacent port. The frame will be dropped if the destination address is not included in the routing table and a default pass-through route has not been configured.

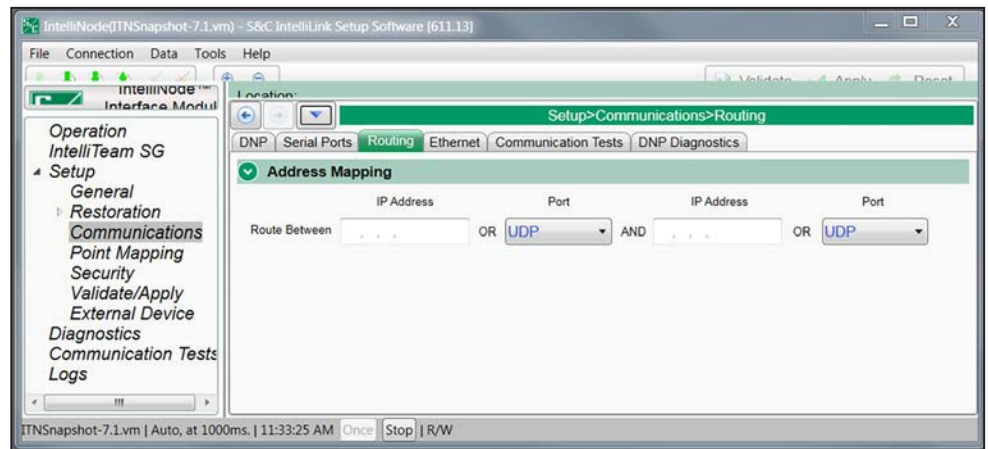


Figure 17. The Setup > Communications > Routing screen.

Address Mapping**RTU Address**

When an incoming message frame is received that is not destined for the local device, these addresses are searched to find an active route.

IP Address

This parameter should be configured if the destination device is on an IP network. The received frame will be transmitted out the local UDP port.

Port

This parameter should be configured if the destination device may be found through a serial communications port. The received frame will be transmitted out the local serial port.

Local Device DNP Address

Contains entries that define default routing for messages that are addressed to devices that were not found in the configured routing table and are not the local device. This default routing performs a simple pass-through functionality between the two interface points. If not wanting unknown traffic to be routed through this device, leave these entries unconfigured.

IP Addresses

This parameter should be configured if the intended destination device may be found on the IP network. This will cause the received frame to be transmitted out the local UDP port.

Port

This parameter should be configured if the intended destination device may be found through a serial communications port. This will cause the received frame to be transmitted out the configured local serial port.

Ethernet Setup

IntelliNode Interface Modules have both Native and AddOn ports. See Figure 18.

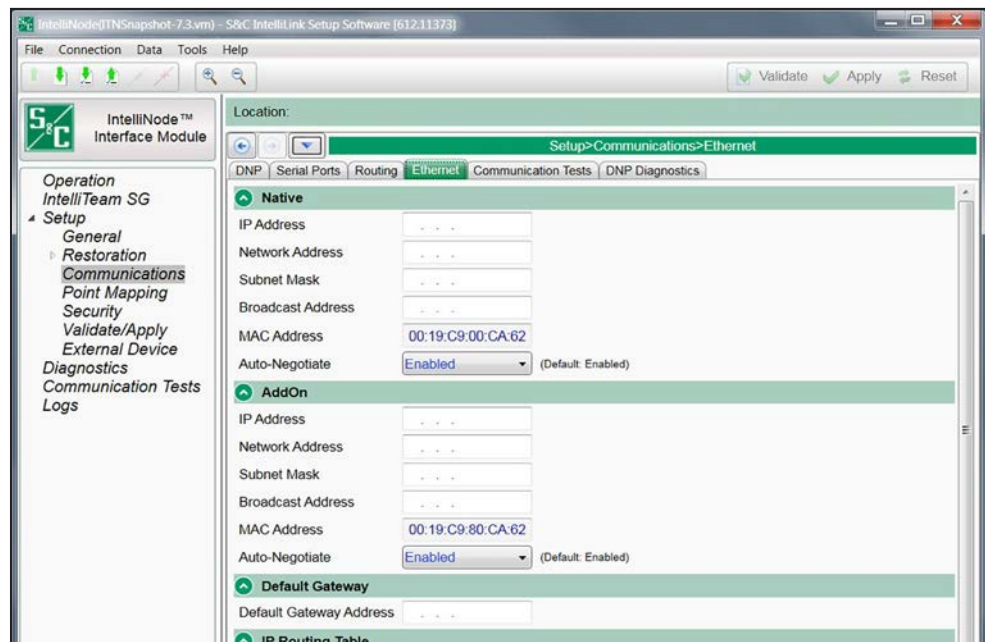


Figure 18. The Setup>Communications>Ethernet screen.

IP Address

The IP address of the control.

Network Address

The IP address of the network. The IP address entered must be an address within the network. The relationship between the IP Address entry and the Network Address entry is defined by the Subnet Mask entry.

Subnet Mask

This is a 32-bit mask that divides an IP address into subnets and specifies the available hosts. Two bits are always automatically assigned. For example, in 255.255.255.0, “0” is the assigned network address; and in 255.255.255.255, “255” is the assigned broadcast address. The “0” and “255” are always assigned and cannot be used.

Broadcast Address

This is the address used to distribute a signal across a network. It is commonly used to declare that a new device has been connected and to provide information about the device to existing devices on the network. The broadcast address commonly ends with “255.”

MAC Address

This is the MAC address assigned to the control’s Ethernet port.

Auto-Negotiate

The **Auto-Negotiation** setting can be enabled for the Ethernet port. When disabled, the **Duplex Mode** selection and **Data Rate** setting must be configured.

NOTICE

The native port of units shipped before April 17, 2014, does not support **Auto-Negotiate** functionality. The recommended solution is to connect the communication device to the AddOn port. If it is necessary to use both ports, turn off the **Auto-Negotiate** function and explicitly set the port speed to 100 MBS. Looking at the bottom of the front panel with the faceplate at the top, the left port is the Native port and the right port is the AddOn port.

Duplex Mode

The **Full Duplex** setting permits simultaneous communication in both directions. The **Half Duplex** (default) setting permits communication in one direction at a time.

Data Rate

This can be set to 10 Mbit or 100 Mbit. (Default: 10 Mbit)

Default Gateway Address

A gateway is a node (a router) on a computer network that serves as an access point to another network. A default gateway is the node on the computer network that is chosen when the IP address does not belong to any other entities in the routing table.

The default gateway address is the Ethernet IP address of the radio in the control.

IP Routing Table

This table is used to route data to specific network destinations. All controls (except IntelliRupter fault interrupters) have two Ethernet ports: Native and AddOn. When both ports have different IP addresses but identical network addresses and subnet masks, issues may exist because packets may mistakenly be sent out of the wrong interface. If both ports are configured with different network addresses and/or subnet masks, then filling out this table is not required.

The table can accommodate 16 entries for 16 possible rules. Variables are entered in IPv4 dot-decimal notation (xxxx.xxxx.xxxx.xxxx) and the network-destination priority is from first to last. When the source IP matches a rule, the corresponding destination is automatically selected and further routing is abandoned. The IP Routing Table has higher priority than the regular port routing (based on Ethernet settings). When the IP Routing Table is parsed and no rule is found to match, the regular routing function will be used.

All controls (except IntelliRupter fault interrupters with the SDA-4540R2 control module) have two Ethernet ports: Native and AddOn. When both ports have different IP addresses but identical network addresses and Subnet Masks, issues may exist because packets could mistakenly be sent out of the wrong interface. When both ports are configured with different network addresses and/or subnet masks, then filling out this table is not required.

Network Destination

This is typically the IP address of the client machine that wants to connect to a specific interface address.

Subnet Mask

This is typically 255.255.255.255, which means only one specific address is directed to the specified interface. However, by carefully selecting the netmask values and defining the priority rules, it is possible to create a range of addresses directed to specific interfaces.

Gateway

This is typically the IP address of the Ethernet port (Native or AddOn) on the control.

Communication Tests Setup

Scheduled Test

Diagnostic tests determine that nodes are responding to communication and how quickly they respond. Statistics are recorded, such as response time, failure, and retry. Tests are scheduled periodically and typically run for one hour. Any network node can send tests to other network nodes. One or more test message types (Data types, such as a coach or runner) can be configured but do not contain real data. See Figure 19.

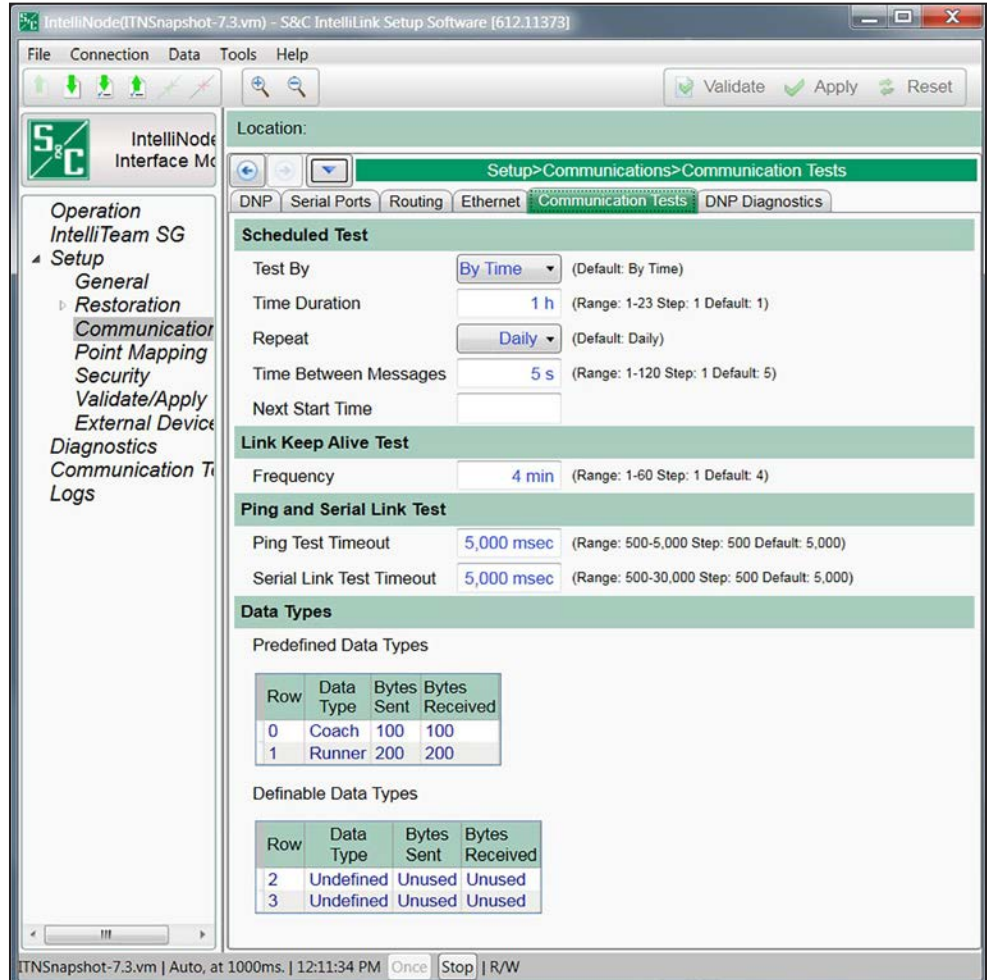


Figure 19. The Setup > Communications > Communication Tests screen.

NOTICE

Running scheduled tests across a slower-speed communication network may cause poor performance. S&C recommends keeping all settings at their default or lower values when running these tests on slower communication networks.

Note: The tested nodes are determined automatically based on the nodes entered on IntelliTeam system configuration screens.

Test By

Test duration option can be selected: **By Time**—the amount of time it will run, or **By Message**—the total number of messages it will send. (Default: By Time)

Time Duration

When the **Test By Time** option is selected, the **Time Duration** field sets the number of hours the test will be run. (Range: 1-23; Step: 1; Default: 1)

Message Duration

When the **Test by Message** option is selected, the **Message Duration** field will set the number of messages that will be sent. (Range: 100-1,000; Step: 100; Default: 100)

Repeat

This is the retest schedule interval setting: **None**, **Daily**, **Weekly**, or **Monthly**. (Default: Daily)

Time Between Messages

This is the number of seconds between each message transmission. The first test message is sent to each node sequentially, then the second test message is sent to each node sequentially, etc. (Range: 1-120; Step: 1; Default: 5)

Next Start Time

This field is blank until the first start time is entered. After the next test, the field updates automatically to show the next time a test will start. The **Next Start Time** function is determined by the previous start time (entered manually or updated automatically from the last test) and the configured repeat interval.

Note: Users are not allowed to set a date or time in the past.

Link Keep Alive Test

When a TCP or UDP connection remains idle it may shut down. A link keep alive event is not a test, but to keep all links active it periodically sends a single message to every node. If more than one message is configured for the scheduled test, the link keep alive event only sends the first configured message. It also records statistics for the message transmissions.

Frequency

This sets how often a link keep alive event is run. (Range: 1-60 minutes; Step: 1 minute; Default: 4 minutes)

Ping and Serial Link Test

A ping test is a manually sent Ethernet ping to a specific IP address. A serial link test is a manually sent ping over a serial port to a specific DNP address.

Ping Test Timeout

If a ping test return takes longer than this configured value, the ping test event will timeout and stop waiting for a response. Set this value in milliseconds. (Range: 500-5,000; Step: 500; Default: 5,000)

Serial Link Test Timeout

If a serial link test return takes longer than this configured value, the serial link test event will timeout and stop waiting for a response. Set this value in milliseconds. (Range: 500-30,000; Step: 500; Default: 5,000)

Data Types

This configures each message sent in a scheduled test. The predefined data types messages sent are not actual coach or runner messages, but they're configured to represent the approximate size of an actual average coach or runner message. The definable data types allow users to define their own messages by setting the byte size of the sent and received messages.

Predefined Data Types

The Connection ID in Row 0 is always configured "Coach" and Row 1 is always configured "Runner." The **Bytes Sent** and **Bytes Received** fields are not configurable.

Data Types

The Connection IDs in Row 2 and 3 are always configured "Undefined" whereas the **Bytes Sent** and **Bytes Received** fields are user defined. If one "Unused" entry is changed, a numerical entry must also be entered for the other field in that row.

Row

This identifies the row: 0 is the first message type sent, 1 is the second message type sent, etc.

Data Type

This is the name of the configured test message, such as Coach or Runner. The message sent is not an actual coach or runner message, but it should be configured to represent the approximate size of the average coach or runner message by setting the appropriate number of sent and received bytes.

Bytes Sent

This field configures the length of the message being sent for this type. (Range: 1-2048 and Unused; Step: 1; Default: Unused)

Bytes Received

This field configures the length of the response message automatically generated when the remote node receives the sent message. (Range: 1-2048 and Unused; Step: 1; Default: Unused)

DNP Diagnostics Setup

Peer Communications Statistics Configuration

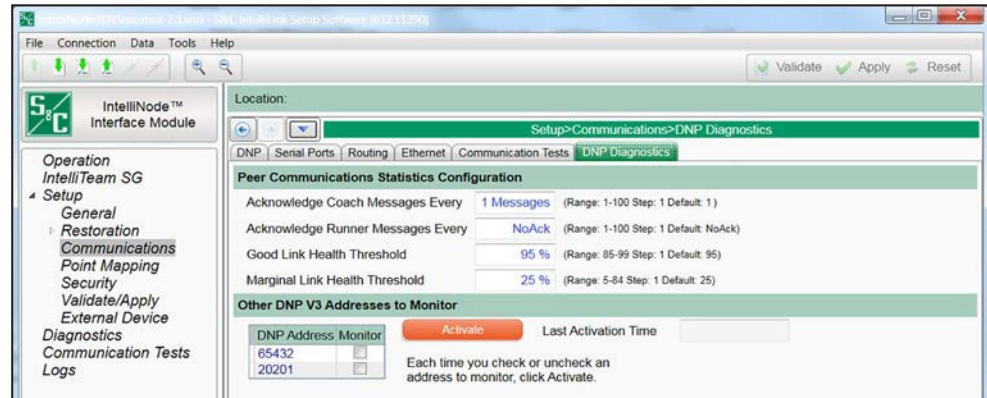


Figure 20. The Setup>Communications>DNP Diagnostics screen.

Acknowledge Coach Messages Every “N” Messages

This configures the number of messages required before an acknowledgement is sent, where “N” is the number of messages. When 10 is entered, every 10th coach message will be acknowledged. (Range: 1-100 and NoAck; Step: 1; Default: 1) See Figure 20.

Acknowledge Runner Messages Every “N” Messages

This configures the number of messages required before an acknowledgement is sent, where “N” is the number of messages. When 10 is entered, every 10th runner message will be acknowledged. (Range: 1-100 and NoAck; Step: 1; Default: NoAck)

Good Link Health Threshold

This configures the percentage of successful message transmissions that will define good link health. (Range: 85-99; Step: 1; Default: 95)

Marginal Link Health Threshold

This configures the percentage of successful message transmissions that will define marginal link health. (Range: 5-84; Step: 1; Default: 25)

Other DNP V3 Addresses to Monitor

Selected DNP Addresses

These DNP addresses can be monitored, check the box to select an address to monitor. (Default: Unchecked)

Activate button

Every time a DNP address is checked or unchecked for monitoring, click on the **Activate** button.

Last Activation Time

This timestamp indicates the last time the **Activate** button was clicked.

DNP Status Points

The screen shown in Figure 21 contains configuration parameters for DNP status points. Map these points to make them available in the SCADA system.

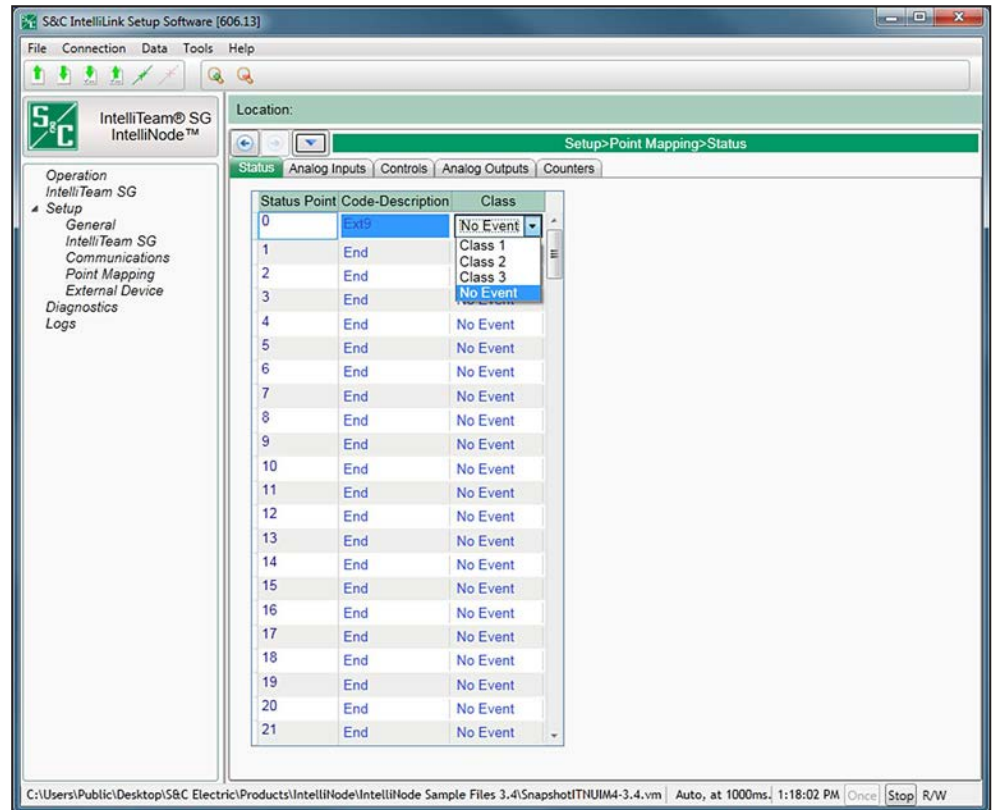


Figure 21. The Setup>Point Mapping>Status screen.

Status Point

This is the point number the SCADA system will see in response to a static or event data request or an unsolicited event response.

Code-Description

These are the point codes representing specific status points that may be assigned to individual SCADA point numbers. Setting a code-description to the end descriptor defines the end of the configured points list and the maximum number of status points that can be returned.

Status points received from the external device may be mapped to individual SCADA points. Enter the external device status point number (the range is 0 to 255) in this column. See the external device manufacturer's documentation for definitions of its status points.

Class

This is the DNP event class in which this point can be placed. Choose **Class 1**, **Class 2**, or **Class 3**, or the **No Event** option (if event data reporting is turned off for this point).

DNP Analog Input Points

The screen show in Figure 22 contains configuration parameters for analog input points. Map these points to make them available in the SCADA system.

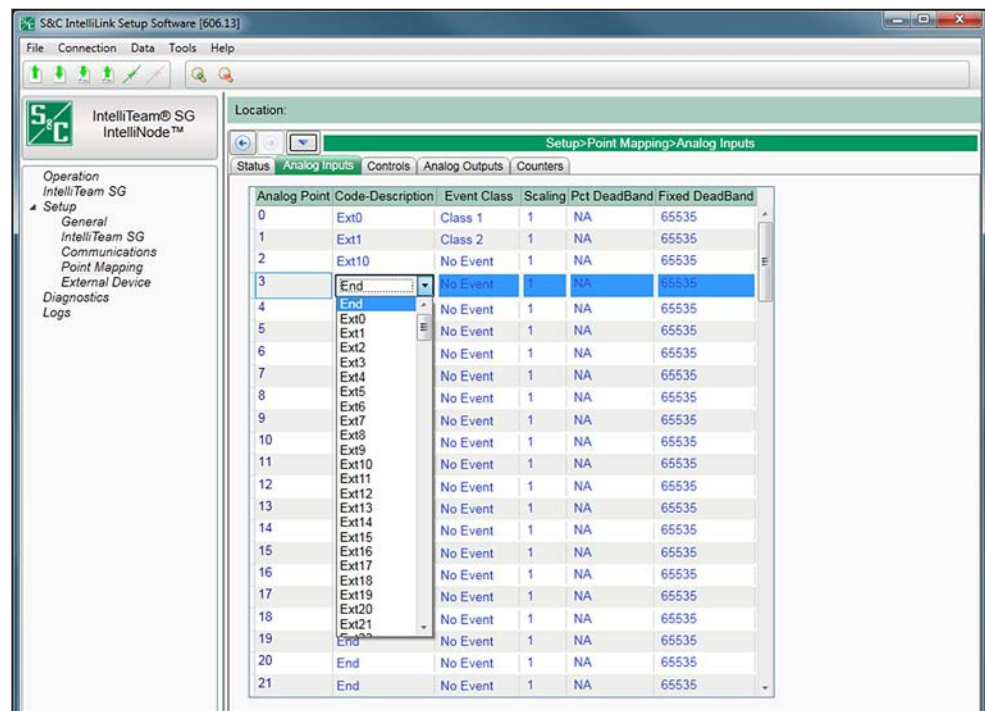


Figure 22. The Setup>Point Mapping>Analog Inputs screen.

Analog Point

This is the point number seen by the SCADA system in response to a static request, event data request, or an unsolicited event response.

Code-Description

These are the point codes that represent specific analog inputs that may be assigned to individual SCADA point numbers. Setting a code-description to the end descriptor defines the end of the configured points list and the maximum number of analog inputs that can be returned.

Analog input points received from the external device may be mapped to individual SCADA points. Enter the external device analog input point number (the range is 0 to 255) in this column. See the external device documentation for definitions of its analog input points.

Event Class

This is the DNP event class assigned to this point. Specify Class 1, Class 2, or Class 3, or choose the **No Event** option to turn off event data reporting for this point.

Scaling

This is the scaling factor for the analog input data, to match the analog input requirements of the SCADA system.

Pct DeadBand

This is the deadband range expressed as a percentage of the previously reported analog input data. If the analog input data associated with this point exceed the range in either a positive or negative direction, the information will be included in the next event report. Specify the **N/A** option to turn off deadband reporting as a percentage of the previously reported analog input data.

Fixed DeadBand

This is the deadband range expressed as a fixed value relative to the previously reported analog input data. If the analog input data associated with this point exceed the range in either a positive or negative direction, the information will be included in the next event report. Specify the **N/A** option to turn off deadband reporting as a fixed value relative to the previously reported analog input data.

DNP Control Points

The screen shown in Figure 23 contains configuration parameters for control point mapping. Map these points to make them available in the SCADA system.

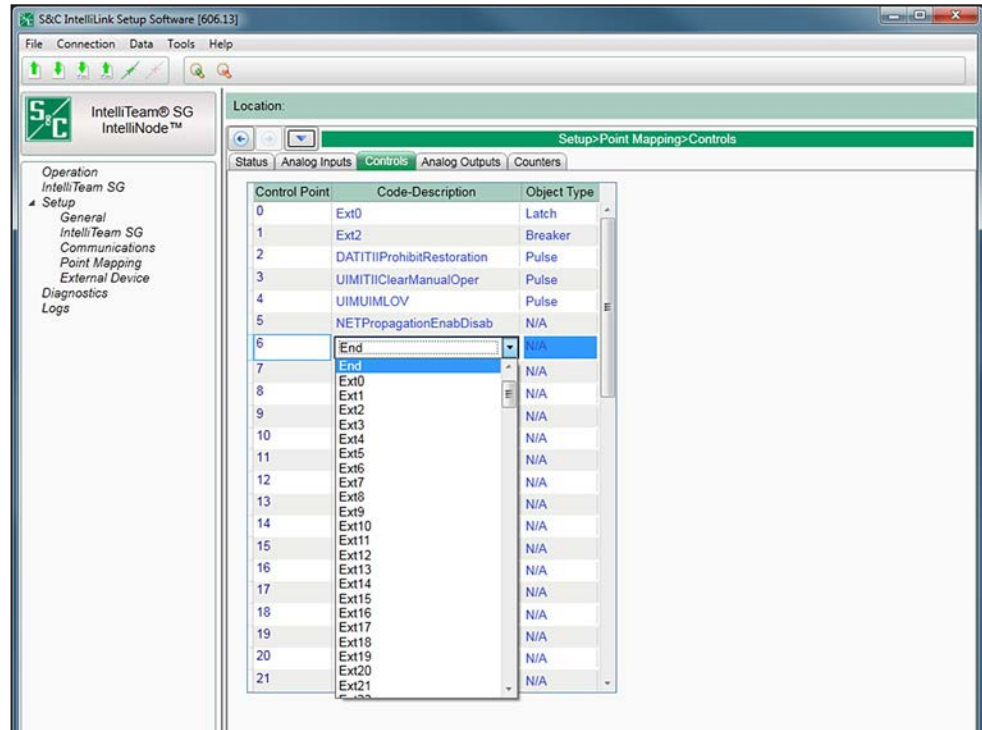


Figure 23. The Setup>Point Mapping>Controls screen.

Control Point

This is the point number the SCADA system will use when operating the control point.

Code-Description

These are the point codes representing specific control points that may be assigned to individual SCADA point numbers. Setting a code-description to the end descriptor defines the end of the configured points list and the maximum number of control points that can be returned.

Object Type

This specifies the type of control code the SCADA master will use in the control relay output block request. Specify “Breaker” for a **Trip/Close** operation, “Latch” for a **Latched On/Off** operation, “Pulse” for a momentary control output, or “N/A” if the control point will not be used.

The object type must be valid for the selected object. For more information see S&C Instruction Sheet 1043-561, “IntelliNode® Interface Module: *DNP Points List and Implementation.*” The control operation will be rejected if the object type received is “Pulse” and the mapped object type is either “Breaker” or “Latch,” or if the mapped object type is “Pulse” and the received object type is either “Breaker” or “Latch.”

Every control point configured for “Breaker” accepts **Latch** operations and every control point configured for “Latch” accepts **Breaker** operations.

Function Codes

Control requests may be issued using **Select/Operate** sequence, **Direct Operate**, and **Direct Operate No Ack** function codes.

DNP Analog Output Points

The screen shown in Figure 24 contains configuration parameters for analog output points. Map these points to make them available in the SCADA system.

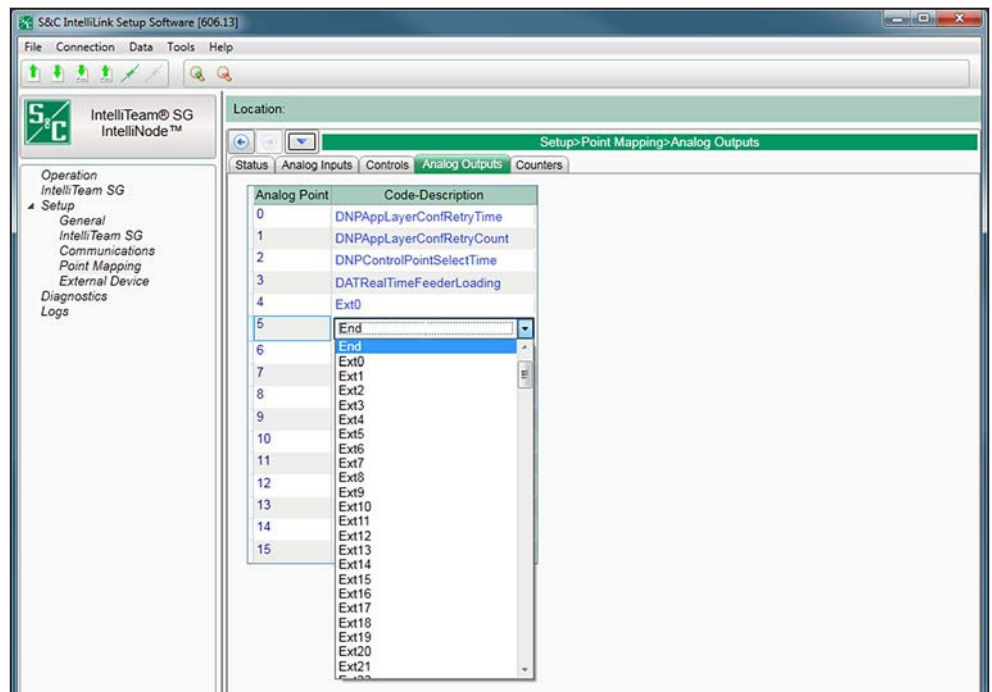


Figure 24. The Setup>Point Mapping>Analog Outputs screen.

Analog Point

This is the point number the SCADA system will use when operating analog output.

Code Description

These are the point codes representing specific analog outputs that may be assigned to individual SCADA point numbers. Setting a code-description to the end descriptor defines the end of the configured points list and the maximum number of analog outputs that can be returned.

DNP Counter Points

The screen shown in Figure 25 contains configuration parameters for counter points. Map these points to make them available in the SCADA system.

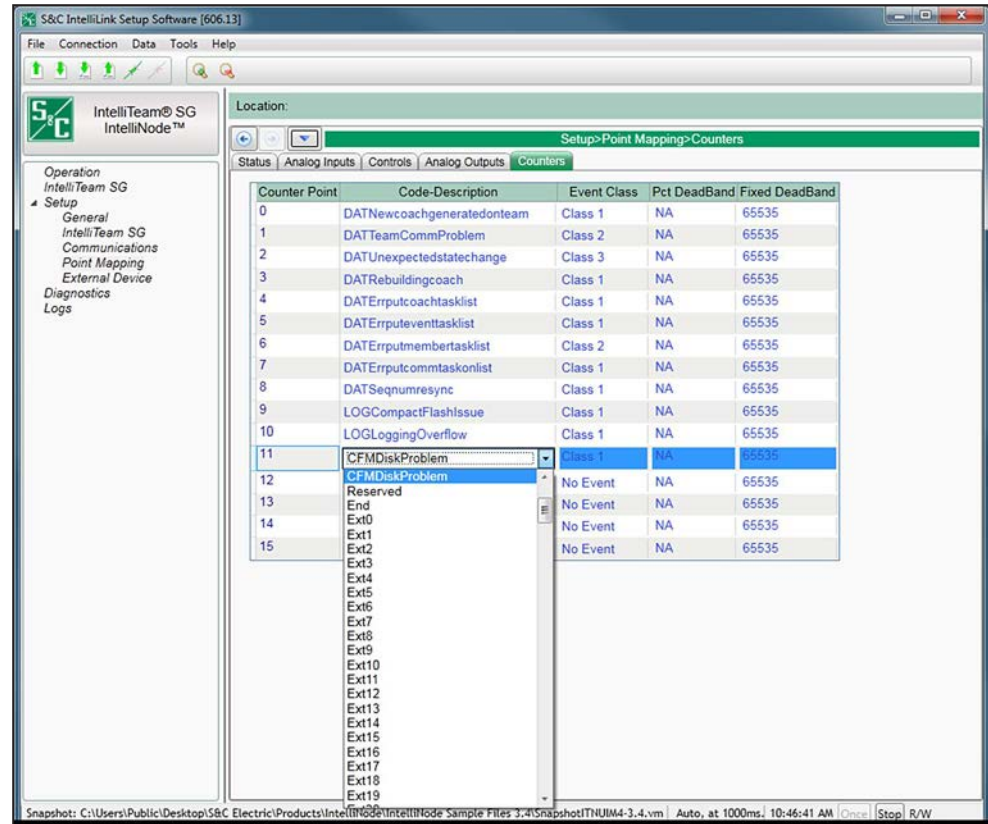


Figure 25. The Setup>Point Mapping>Counters screen.

Counter Point

This is the point number the SCADA system will use in response to a static or event data request or an unsolicited event response.

Code-Description

This is the point codes representing specific counter points that may be assigned to individual SCADA point numbers. Setting a code-description to the end descriptor defines the end of the configured points list and the maximum number of counter points that can be returned. All counter points that can be mapped to individual SCADA points are also displayed on the *Logs/Special Events* screen.

Evt Class

This is the DNP event class in which this point can be placed. Specify **Class 1**, **Class 2**, or **Class 3**, or choose the **No Event** option to turn off event data reporting for this point.

Pct DeadBand

This is the deadband range expressed as a percentage of the previously reported counter point data. If the counter point data associated with this point exceed the range in either a positive or negative direction, the information will be included in the next event report. Choose the **N/A** option to turn off deadband reporting as a percentage of the previously reported counter point data.

Fixed Deadband

This is the deadband range expressed as a fixed value relative to the previously reported counter point data. If the counter point data associated with this point exceed the range in either a positive or negative direction, the information will be included in the next event report. Choose the **N/A** option to turn off deadband reporting as a fixed value relative to the previously reported counter point data.

Team Addresses

The screen shown in Figure 26 shows the DNP/RTU address of the teams in which this control is a member and shows ready status for each team.

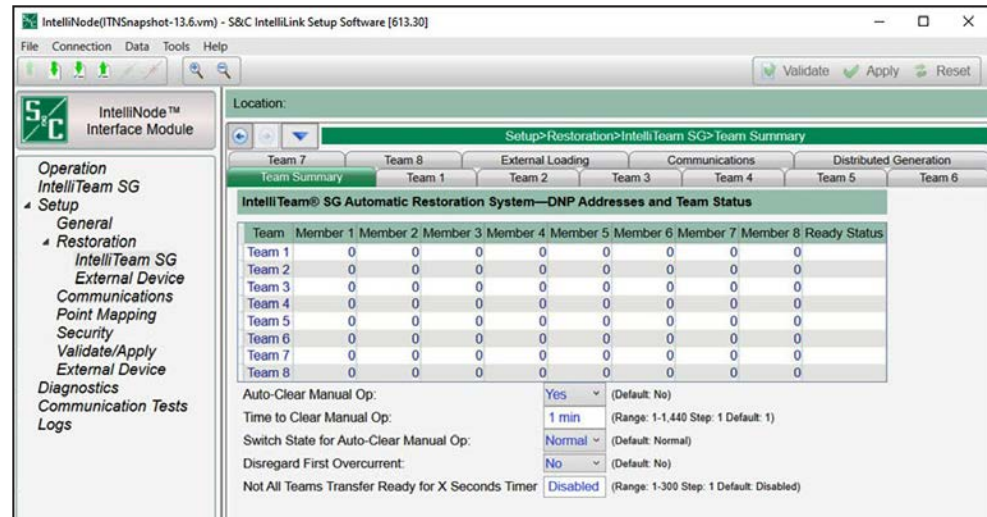


Figure 26. The Setup>Restoration>IntelliTeam SG>Team Summary screen.

DNP Addresses and Team Status

Team Selection

The tabs for Team 1 through Team 8 can be used to navigate to screens where general team parameters and information for individual team members are entered for **IntelliTeam® II Compatibility Mode** setting configuration. For the IntelliTeam SG system, the parameters in these screens are automatically entered by the netlist the IntelliTeam Designer software generated.

Auto-Clear Manual Operation

Select the **Yes** option to automatically clear the **Manual Operation** condition when all other **Ready** conditions are met for this team member. When “No” is selected, **Manual Operation** conditions must be cleared by an IntelliLink software or SCADA command before teams will return to the **Ready** state. The **No** setting is the default.

Time to Clear Manual Operation

When the **Auto Clear Manual Operation** setting is set to “Yes,” enter the time delay before the IntelliTeam SG system will clear the **Manual Operation** condition. (Range: 1-1440 minutes; Step: 1 minute; Default: 1 minute)

Switch State for Auto-Clear Manual Op

Select the switch state the switch must be in to automatically clear a **Manual Operation** condition when the **Auto-Clear Manual Operation** setting is enabled and the **Time to Clear Manual Operation** setting has been met. The three options are:

Normal—(Default) Auto-clear manual operations only on devices in their normal switch state.

Abnormal—Auto-clear manual operations only on devices in their abnormal switch state.

Both—Auto-clear manual operations on devices in their normal or abnormal switch state.

 **WARNING**

Selecting the **Abnormal** or **Both** setting will clear manual operation on a switch when it is in an **Abnormal** state. To ensure any associated team is not reenergized during maintenance activities, disable the **Auto Clear Manual Operation** function on the device and/or put the device in a **Prohibit Restoration** state.

Disregard First Overcurrent

When the **Yes** option is selected, the IntelliTeam application disregards the fault flag generated after the first overcurrent event is detected on the circuit and does not count it as a fault. Instead, it waits until after the first reclose/PulseClosing[®] Technology sequence to allow the distributed generation (DG) to be taken offline before counting the fault event. This will produce more accurate fault location information and lead to better load restoration decisions when there is distributed generation feeding fault current into the circuit.

Note: Enabling this setting has no effect on the sectionalizing logic of the device (i.e. the **Recloser Counts to Sectionalizer Trip** setting is not impacted). This setting only impacts how the IntelliTeam system logic determines fault location.

When the **No** option is selected, the IntelliTeam system functions normally. The application will qualify a fault condition and determine fault location based on the external device DNP status point information.

Not All Teams Transfer Ready for X Seconds Timer

This is the amount of time the device can go without seeing a coach from its adjacent team members before the **Not all Teams Transfer Ready** status point becomes active. The timer resets and the status point becomes inactive when a new valid coach arrives. (Range: 1-300 seconds; Default: Disabled)

Team Setup

The *Setup>Restoration>IntelliTeam SG>Team x* screens help set the IntelliTeam II Automatic Restoration System parameters for each team in which this control is a member. Only use these screens when configuring this control to operate in the **IntelliTeam II Compatibility Mode** setting.

If this control is configured to operate in an IntelliTeam SG system, use IntelliTeam® Designer software. See S&C Instruction Sheet 1044-570, “IntelliTeam® Designer: *User’s Guide*.”

The **Set Team** setpoint is used with both IntelliTeam II and IntelliTeam SG software when it is necessary to restart the IntelliTeam system logic for troubleshooting purposes. See Figure 27.

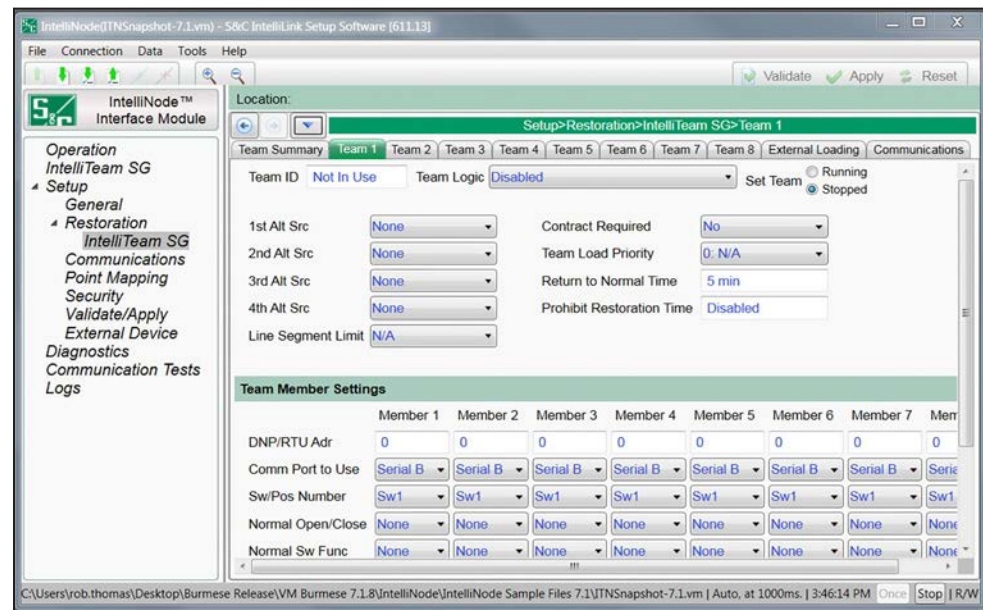


Figure 27. The *Setup>Restoration>IntelliTeam SG>Team 1 through Team 8* screen.

Note: For any one team the values must be identical in all team members except for the **Comm Port to Use** setting.

Each team screen includes the following fields:

Team ID

Enter the name of this team, 16 characters maximum. This name will help identify the team to the SCADA operator. It appears on all reports generated from the team members. When saving a team configuration, this name is saved along with the other information. It also appears on the front panel display, if applicable.

Team Logic

This setpoint enables or disables IntelliTeam II software or sets various IntelliTeam SG system feature options for this team.

Set Team

This setpoint changes the operation status of the team defined on this screen. When team logic detects any parameter changes on this screen, the setpoint automatically changes to **Stopped** mode.

Note: When this value is set to the **Stopped** mode and then back to the **Running** mode, IntelliLink software uses the setpoint values on this screen as the presently valid team parameters. Until all team members have identical values on this screen, the team will not be in the **Ready** state.

Alternate Source Sequence

The way team members restore a line segment can be prioritized. If the team cannot use the source device (see the “Normal Sw Func” section on page 72) to restore the line segment, the team will try the members listed here, in the order configured.

The alternate source sequence is optional and does not need to be configured for automatic load restoration to occur. If this information was not entered or if the selected team members cannot be used to restore the line segment, the team will try to restore the line segment with the tie device(es). If this is not successful, the team will try to restore the line segment using the load/tie device(es).

General Team Parameters

These set points apply to the entire team.

Line Segment Limit

Configure this to the maximum number of line segments the team can pick up. For example, the **Add 1** setting inhibits additional line segments from being restored through a member after the team restores one line segment. To allow the team to pick up as many line segments as capacity allows, set this value to “N/A.”

Contracts will be used if the **Line Segment Limit** threshold is set. Configuring this setpoint to a value other than “N/A” automatically changes the **Contract Required** setpoint to “Yes.”

Contract Required

If there is concern that a line segment may overload, set this value to a **Yes** setting. As team members encounter such line segments in a restoration path, they will communicate with all the other line segments in the direction of the alternate source to ensure the alternate source will not be overloaded.

Team Load Priority

This is user configurable and the default is the **NoXfer** setting. The choices are:

- **Priority1_NoXfer**—Load shedding or transferring is not allowed.
- **Priority2_CloseXfer**— <FUTURE> Load shedding is not allowed. Load transfer is allowed through closed transition only.

- **Priority3_OpenXfer**—Load shedding is not allowed. Load transfer allowed through an open transition only.
- **Priority4_XferShed**—Load shedding is allowed. Only shed after transfers to other circuits have been considered.

Note: Priority 4 is the highest priority of this category.

- **Priority5_XferShed**—Load shedding is allowed. Only shed after transfers to other circuits have been considered.
- **Priority6_XferShed**—Load shedding is allowed. Only shed after transfers to other circuits have been considered.
- **Priority7_XferShed**—Load shedding is allowed. Only shed after transfers to other circuits have been considered.

Note: Priority 7 is the lowest priority of this category and will be transferred or shed before Priority 6, 5, 4, etc.

- **Priority8_Shed**—Load shedding is allowed. Shed these loads before considering load transfers to other circuits.

Note: Priority 8 is the highest priority of this category.

- **Priority9-19_Shed**—Load shedding is allowed. Shed these loads before considering load transfers to other circuits.
- **Priority20_ShedNoXfer**—Load shedding is allowed. Shed load will not be restored from an alternate circuit. Priority 20 is the highest priority of this category.
- **Priority21_ShedNoXfer**—Load shedding is allowed. Shed load will not be restored from an alternate circuit.
- **Priority22_ShedNoXfer**—Load shedding is allowed. Shed load will not be restored from an alternate circuit.
- **Priority23_ShedNoXfer**—Load shedding is allowed. Shed load will not be restored from an alternate circuit.
- **Priority24_ShedNoXfer**—Load shedding is allowed. Shed load will not be restored from an alternate circuit.
- **Priority25_ShedNoXfer**—Load shedding is allowed. Shed load will not be restored from an alternate circuit. Priority 25 is the lowest priority of this category and will be shed before any others.

Note: Any load configured with a priority of 20-25 will be shed and will not be restored until the circuit returns to normal. These will only be used when there is a self-tie in the circuit and will only be used on loads that are in the self-tie area. See Figure 28 on page 71.

Note: Using a load priority of 20-25 in a non-self-tie circuit will result in those teams not getting restored. To correct a misconfiguration, the load priorities must be configured with a different load priority (1-19) and the circuit must be re-pushed to the devices.

Note: If loads that were shed using Post Restoration Load Management (PRLM) are brought back online manually and the circuit has not been returned to normal, then the loads may be restored in subsequent events and will not be shed again. This is a known limitation of the **PRLM** logic. To shed these loads again, they must be shed manually.

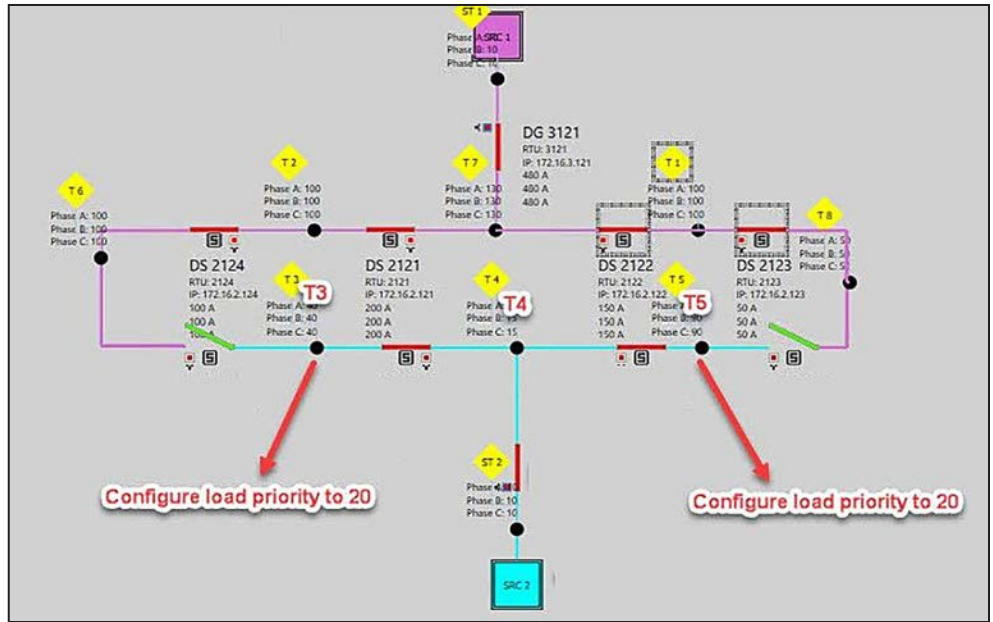


Figure 28. Self-tie example diagram.

Return to Normal Time

This setting is the amount of time, in minutes, power must be restored to the faulted line segment before the **Return to Normal** process will start. (Range: 1 to 254 minutes; Default: 5)

Prohibit Restoration Time

Set this value for the amount of time (in minutes) the team is allowed to restore service after an event begins. If the team cannot restore service within this period, it will enter the **Prohibit Restoration** state, preventing any further restoration activity. It will remain in this state until cleared through the appropriate SCADA command or clicking on the **IntelliTeam SG Restoration Enabled** button on the *IntelliTeam SG>Team Summary* screen. For 6800 Series Controls and 6801M Switch Operators, the **Automatic Restoration Enabled** command on the faceplate or *Operation* screen can also be used.

Note: The **Prohibit Restoration** state must be cleared from a device being removed from an IntelliTeam system before pushing a new Netlist to avoid issues.

Team Member Settings

These setpoints apply to individual team members in this team.

DNP/RTU Address

Enter the DNP/RTU address for each team member. One of these addresses must be the DNP/RTU address entered on the *Setup>Communications>DNP* screen.

Comm Port to Use

This column shows the port through which this team member is found for the purpose of peer-to-peer communications, either serial or Ethernet. If a single radio is used for peer-to-peer communications, set this parameter to the port to which the radio is connected. Because the radio communication port may be different for each team member, this is the only parameter on this screen that can be different for each member of the same team.

When the **Discover** option is selected, the control will scan all ports, and the port that receives a response from a destination peer will be selected for subsequent communications.

Note: This parameter is not saved in a team setpoint profile and must be modified separately if the default value (Port B) is not correct.

Sw/Pos Number

Position number associated with the team member, for example set Sw1 for a single overhead switch.

Normal Open/Close

The **Normal Open** or **Normal Closed** state of each device when the circuit is configured normally. The team uses this information during transfer operations.

Normal Sw Func

The IntelliTeam SG system dynamically assigns the switch functions for a team operating in the **Closed Loop Operation** mode. This is a team that has only two substation sources capable of supplying fault current, the same operation as the original IntelliTeam system.

If the listed control is part of a closed loop team, the field will have an asterisk "*" in the upper right corner. The IntelliTeam Designer software assigns a switch function at the time of configuration, but the IntelliTeam SG system may override that assignment. The assigned switch function is displayed when the screen updates.

Select the normal switch function of each team member from the following settings. See Table 3.

Table 3. Normal Switch Function of Each Team Member

<i>For normally closed IntelliRupter fault interrupters, 6800 controls, switches, breakers, and reclosers:</i>	
Function	Characteristics
Source/Sub	Assigned to the source device when it is the first team out of the substation or it is an IntelliNode Interface Module on a substation breaker
Source	Assigned to the normally closed device that provides power to the line segment when the team is in its normal configuration
Load/Tie	A team may have from zero to seven closed switches through which loads on other line segments receive power. This value is assigned when the switch could be involved in restoring power to the line segment because line segments on the other side of the switch have alternate sources.
Load	A team may have from zero to seven closed switches through which loads on other line segments receive power. This value is assigned when the switch could not be involved in restoring power to the line segment because line segments on the other side of the switch have no alternate sources.
<i>For normally open IntelliRupter fault interrupters, 6800 controls, switches, breakers, and reclosers:</i>	
Function	Characteristics
Tie/Sub	This is assigned when the tie switch is the first team member after the substation source. A tie/sub switch or recloser should have its voltage sensors facing the alternate source.
Tie	This is assigned to open switches in the team that restores power to the line segment directly from an alternate source when closed. A team may have from zero to seven open switches.
Note: Every closed switch or recloser should have its sensors facing the normal source of the team. A tie/sub switch or recloser should have its voltage sensors facing the alternate source.	
<i>For IntelliNode Interface Modules directly associated with distributed generation sources:</i>	
Function	Characteristics
Info Only	<p>This value is assigned when the IntelliNode Interface Module is directly associated to a distributed generation device to gather distributed generation real-time contribution data and status from the device and to send a Transfer Trip command to the distributed generation when necessary.</p> <p>An info-only team member takes part in all normal team activity but cannot initiate a team transfer event, nor can it be selected as a switch to open or close during normal restoration and reconfiguration.</p> <p>If DG Reconnect mode is enabled, and after the DG Reconnect Delay Timer Time setpoint expires, this IntelliNode module will also issue a Close command to the associated device to bring the distributed generation back online.</p>

Rtn to Norm Mode

Team members can return the circuit to its normal configuration automatically when stable three-phase voltage has been restored to a faulted line segment or on command.

For teams with one or more tie switches, select the **Open** transition setting, and the tie device(es) open before other team members return the circuit to its normal configuration. Select the **Closed** transition setting, and team members close the normal source switches and then the tie device(es) open. The **Return to Normal** process starts at the line segments closest to the normal source and works outward.

Maximum Capacity

Maximum load (in amperes) this team member can carry because of limitations such as conductor size and device rating, when carrying current in any direction.

External Source Loading Setup

The screen shown in Figure 29 is used with feeder loading monitored at the substation breaker to calculate the real-time excess capacity available when a transfer occurs. Both **Maximum Source Capacity** and **Default Source Segment Loading** settings must only be set for SRC/Sub or Tie/Sub.

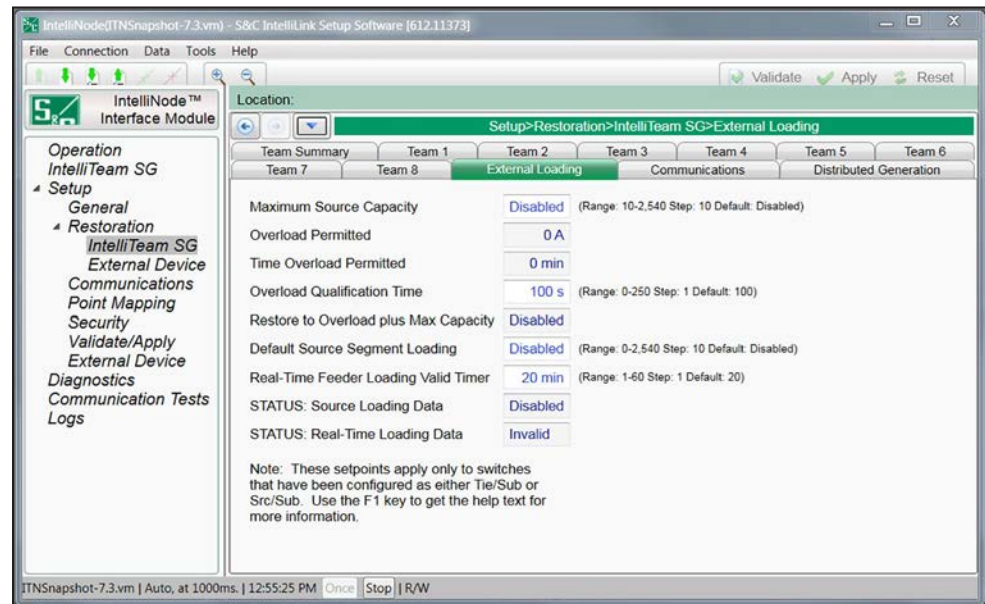


Figure 29. The Setup>Restoration>IntelliTeam SG>External Loading screen.

Maximum Source Capacity

This is the maximum feeder capacity (in amperes) as viewed from the substation end of the feeder. This value represents the maximum three-phase average load the feeder can carry at any time. (Range: 10-2,540 amps, Step: 10, Default: Disabled)

Overload Permitted

This value is added to the **Maximum Source Capacity** threshold and becomes the new maximum load threshold that when exceeded requires immediate load shedding using the **Post Restoration Load Management** feature. This setting is only applicable when the IntelliTeam system **Post Restoration Load Management** options are enabled. Overloads above this level trigger a load-shedding event with no intentional delay to get the load under the **Overload Permitted** threshold, and the **Time Overload Permitted** timer will continue to count if it has not expired at this point.

The load will be shed based on the **Team Load Priority** setting configured for the affected team. Otherwise, when load is above the **Maximum Source Capacity** value but lower than the **Overload Permitted** threshold, it will be allowed to remain until the **Time Overload Permitted** timer expires, which triggers an immediate load-shedding event to get the load below the **Maximum Source Capacity** value.

At this point, the PRLM will identify the lowest priority team and shed its load. If shedding that team's load does not eliminate the overload condition, the PRLM will find the next lowest priority team and shed its load. It will continue that process until the load falls below the **Maximum Source Capacity** value, removing the overload condition.

No other overload conditions will be allowed until the system returns to its **Normal** state. (Range: 0-2,550 amps, Step: 1, Default: 0) This setting is configured in the IntelliTeam Designer software and cannot be changed on this screen. See S&C Instruction Sheet 1044-570, "IntelliTeam® Designer: *User's Guide*."

For example: If the **Maximum Source Capacity** value is set to 150 amps and the **Overload Permitted** value is set to 150 amps, the PRLM will allow up to 300 amps of load on that source before shedding load.

Time Overload Permitted

The total time load can be above the **Maximum Source Capacity** setting before load shedding is triggered. This setting is only applicable when the IntelliTeam system **Post Restoration Load Management** options are enabled. This setting is used along with the **Overload Permitted** setting to allow temporary overloads on a specific source. (Range: 0-7,200 minutes, Step: 1, Default: 0) This setting is configured in the IntelliTeam Designer software and cannot be changed on this screen. See S&C Instruction Sheet 1044-570, "IntelliTeam® Designer: *User's Guide*."

Overload Qualification Time

This is the time the measured load must be above the **Maximum Source Capacity** setting to qualify as an overload condition. When an overload is qualified, the **Time Overload Permitted** timer begins timing. This setting is only applicable when the IntelliTeam system **Post Restoration Load Management** options are enabled. (Range: 0-250 seconds, Step: 1, Default: 100)

For example: The **Maximum Source Capacity** setting = 400 amps, the **Overload Permitted** setting = 100 amps, the **Time Overload Permitted** setting = 5 minutes, and the **Overload Qualification Time** setting = 50 seconds. If the load goes above 400 amps for 50 seconds, the **Time Overload Permitted** timer begins timing. If the load stays between 400 and 500 amps for 5 minutes, a load-shedding event is initiated based on the configured load priorities, and load will be shed to below the **Maximum Source Capacity** value.

Restore to Overload plus Max Capacity

When enabled, this setting allows IntelliTeam system to restore load up to the **Maximum Source Capacity + Overload Permitted** values during an IntelliTeam restoration event. This setting is only applicable when the IntelliTeam system **Post Restoration Load Management Options** function is enabled. (Default: Disabled)

This setting is configured in the IntelliTeam Designer software and cannot be changed on this screen. See S&C Instruction Sheet 1044-570, “IntelliTeam® Designer: *User’s Guide*.”

For example: The **Maximum Source Capacity** setting = 400 amps, the **Overload Permitted** setting = 100 amps, and the **Restore to Overload plus Max Capacity** setting = Enabled. When there is a restoration event, the IntelliTeam system will restore up to 500 amps of load (the **Max Source Capacity + Overload Permitted** settings) for the configured source.

Default Source Segment Loading

The estimated peak three-phase average load (in amperes) of the source-side segment between the substation-feeder breaker and first IntelliRupter fault interrupter, 6800 Switch Control, switch, or recloser. This value is used to estimate the maximum load in the event that real-time feeder loading data are not available or valid. (Range: 0-2,540 amps, Step: 10.0, Default: Disabled)

Real-Time Feeder Loading Valid Timer

When real-time feeder loading data are received through SCADA, this configurable timer starts counting. If the loading data are not updated within the configured interval (in minutes), loading calculations will default to using the **Default Source Segment Loading** value. (Range: 1-60, Step: 1, Default: 20)

STATUS: Source Loading Data

If either the **Maximum Source Capacity** or the **Default Source Segment Loading** setpoint is not configured, the real-time loading feature is not active. This field will show “Disabled,” even if the team member receives feeder-loading data. In this case, the present calculations using the **Maximum Source Capacity** value are used. Both setpoints must be configured for this field to show “Enabled.”

STATUS: Real-Time Loading Data

This field will show “Invalid” if:

1. Either the **Maximum Source Capacity** or the **Default Source Segment Loading** setting is configured as Disabled.
2. Or the received real-time feeder loading data:
 - Is zero
 - Are less than the 3-phase average load of the IntelliRupter fault interrupter, 6800 series switch control, switch, or recloser team member
 - Are equal or greater than the **Maximum Source Capacity** setpoint
 - Has not been updated within the **Real-Time Feeder Loading Valid Timer** setting

When this field shows “Invalid” the **Default Source Segment Loading** value will be used instead if it is configured.

Note: Real-time feeder loading data are only available at a sub switch.

Team Communication

Peer-to-Peer Message Retry Time (sec)

The control waits this amount of time (in seconds) to receive a response from another team member. If it does not receive the response within this time period, it resends the message to that team member. It continues sending the message until it receives a response or reaches the **Peer-to-Peer Message Retry Count** value. (Range: 0.000-65.535, Step: 0.001, Default: 6.000) See Figure 30.

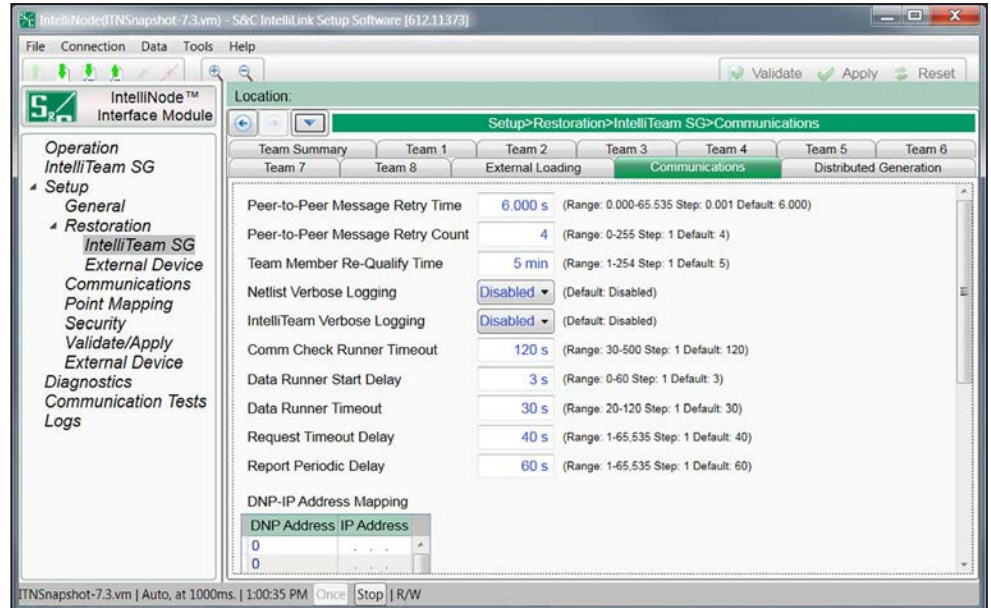


Figure 30. The Setup>Restoration>IntelliTeam SG>Communications screen.

Peer-to-Peer Message Retry Count

This is the number of times the control resends a message to a team member that does not respond within the **Peer-to-Peer Message Retry Time** period.

Note: Decreasing the **Peer-to-Peer Message Retry Time** value or increasing the **Peer-to-Peer Message Retry Count** setting may have a negative effect on some communications systems because of increased traffic. Be sure to take this into account when changing these setpoints. (Range: 0-255, Step: 1, Default: 4)

Team Member Re-Qualify Time (minutes)

This is the number of minutes a team member will remain disqualified as a potential alternate source after that team member attempted but was unable to restore full service. This inability to restore full service is likely the result of a second contingency event, such as a loss of phase between the alternate source and the team member attempting to restore service. In this case, the team member would close, find that three-phase voltage is present, and reopen. (Range: 1-254, Step: 1, Default: 5)

Netlist Verbose Logging

When enabled, all netlist-related event messages will be logged. The default is the **Disabled** setting because netlist logging quickly fills log memory and should only be used for troubleshooting a specific situation.

IntelliTeam Verbose Logging

When enabled, all IntelliTeam restoration system event messages (excluding Netlist-related events) will be logged. The default is the **Disabled** setting because IntelliTeam system logging quickly fills log memory and should only be used for troubleshooting a specific situation.

Comm Check Runner Timeout

When this timer expires before the communications check runner cycle is complete, the Netlist push is incomplete. (Range: 30-500 seconds, Step: 1, Default: 120)

Data Runner Start Delay

This sets the interval between the completion of one data runner cycle (to collect and distribute real-time data) and the start of the next data runner cycle. (Range: 0-60, Step: 1, Default: 3)

Data Runner Timeout

When this timer expires before the data runner cycle is complete, a new data runner cycle is started. (Range: 20-120 seconds, Step: 1, Default: 30)

Request Timeout Delay

This sets the time interval between firmware upload completion and the subsequent request for a new Netlist. This delay also applies when a new control is deployed, it will wait this time interval before requesting a new Netlist. (Range: 1-65,535 seconds, Step: 1, Default: 40)

Report Periodic Delay

This sets the time interval between each Netlist transmission. (Range: 1-65,535 seconds, Step: 1, Default: 60)

DNP-IP Address Mapping

IP addresses can be mapped to DNP/RTU addresses for team members that are accessible only over an Ethernet port. An entry must be included in this table for any team member where Ethernet is the configured **Comm Port to Use** setting. The **DNP Address** value is the DNP/RTU address for the IP-based team members. The **IP Address** value is the IP address associated with the destination team members.

Distributed Generation

Distributed generation (DG) settings are used for IntelliTeam systems with distributed generation resources (e.g. solar, wind, etc.) on the circuit. See Figure 31.

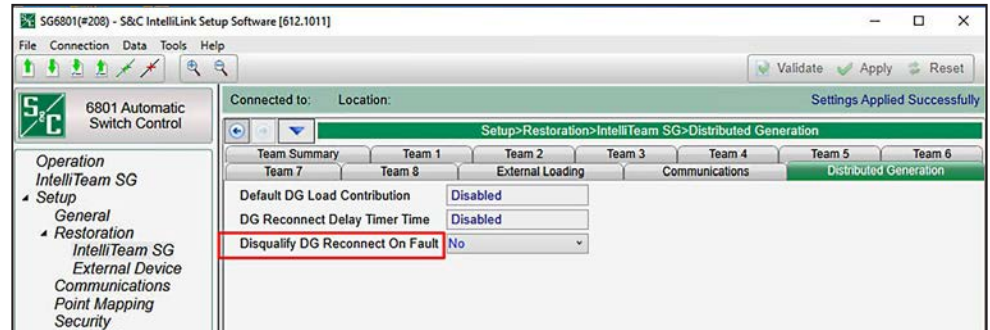


Figure 31. The *Setup>Restoration>IntelliTeam SG>Distributed Generation* screen.

Default DG Load Contribution

This setting should only be used when no real-time loading data are available from a distributed generation (DG) device. (Range: 0–1000 A; Default: 0, meaning this is disabled and not used by the IntelliTeam system.)

When set to a **Non-Zero** value, the IntelliTeam system uses this as the amount of current flowing from the (DG) device into the distribution grid. When set to “Zero” (the default) and the DG device is teamed with an IntelliNode/Info-Only module, the IntelliTeam system uses loading polled by the IntelliNode/Info-Only module from the DG device as the current it’s contributing to the distribution grid.

However, if a normal IntelliTeam system device is teamed with the DG device, it will assume there are zero amps flowing into the distribution grid from the DG device when this value is set to “Zero.” The IntelliTeam system will then calculate the DG load contribution by using the direction and magnitude of current flow into or out of the IntelliTeam device.

Note: If this value is set to a **Non-Zero** value and the DG device is teamed with a normal IntelliTeam system device (i.e., not an IntelliNode/Info-Only module), the IntelliTeam system uses this value as the DG load contribution if the device teamed with the DG device measures less current than configured for the **DG Load Contribution** value.

For example, if the device measures 20 amps but the **DG Load Contribution** setting is 80 amps, the IntelliTeam system will use 80 amps as the DG load contribution. Otherwise, if the device measures more current than configured for the **DG Load Contribution** setting, the IntelliTeam system will use the measured current from the device as the DG load contribution.

Note: The configured **DG Load Contribution** value will only appear on the device teamed with the distributed generation device in the *Setup>Restoration>IntelliTeam SG>Distributed Generation* screen. All other devices on the circuit will display “Disabled.”

DG Reconnect Delay Timer Time

If set to a **Zero** value, then the **DG Reconnect** feature is disabled on all devices receiving a Transfer Trip message. Upon return of the normal source, users must manually close the device that opened due to the **Transfer Trip** command to bring the distributed generation back online.

Setting this to a **Non-Zero** value enables the **DG Reconnect** feature. After the normal source returns (either during restoration or the **Return to Normal** process) to the device that opened due to the **Transfer Trip** command, then the IntelliTeam logic will count down the timer. After the timer expires, the IntelliTeam system logic removes the **Transfer Trip Prohibit Restoration** (TTPR) mode on the device and will then close the device to bring the distributed generation device back online. (Range: 0-900 seconds; Default = 0 seconds, meaning the **Reconnect DG on Return to Normal** mode is disabled.)

Note 1: The configured value will only appear on the device teamed with the distributed generation. All other devices on the circuit will display “Disabled.”

Note 2: If for any reason the **DG Reconnect Delay Timer Time** timer is aborted, the timer will not restart automatically and the distributed generation device must be manually put online.

Note 3: When an IntelliNode/Info-Only module is not directly associated with the distributed generation device, it is up to the distributed generation device’s own protection/control device (e.g. breaker, inverter, etc.) to reconnect the distributed generation device because the IntelliTeam system has no control over the device or the reconnection process. However, it should be put online when good voltage, current, and frequency are seen by the distributed generation protection/control device.

When the IntelliTeam system control is an IntelliNode/Info-Only module directly associated with the distributed generation device, if it was sent the initial **Transfer Trip** command it will control the reconnection process and issue a **Close** command to the distributed generation device’s protection/control device when the **DG Reconnect Delay Timer Time** timer expires.

Disqualify DG Reconnect On Fault

If set to “Yes,” and the **DG Reconnect Delay** timer time is set to a non-zero value, the **DG Reconnect** feature will be disqualified if a fault was detected by the device that received the **Transfer Trip** command, but that device is not providing fault direction. If the **DG Reconnect** feature is disqualified, when the normal source returns, users must manually close the device that opened because of the **Transfer Trip** command to bring the distributed generation back online.

If set to “No,” and the **DG Reconnect Delay** timer is set to a **Non-Zero** value, the **DG Reconnect** feature will automatically close the device that opened because of the **Transfer Trip** command, bringing the distributed generation back online, even when that device detected a fault but does not provide fault direction.

Restoration—External Device

Remote Prohibit Restoration List Table (when using firmware version 7.3)

The screen shown in Figure 32 contains setpoints specifically related to sending the **Prohibit Restoration** SCADA command to remote devices. The non-zero RTU address in this list must be configured to receive a **Latch On, Direct Operate** SCADA control point when any of the following events are active in the control:

- **Hot Line Tag** mode is active
- A **Frequency Trip** state occurs
- The IntelliTeam SG system determines a **Manual Operation** event has occurred
- A SCADA **Prohibit Restoration** command was received from a configured master address and the **Enable Remote Transmit from SCADA P. R.** setpoint is enabled.

Prohibit Restoration is also sent when **Prohibit Restoration** mode is active in the local control, set from the front panel or with an IntelliLink screen command and the **Enable Remote Transmit from Local P. R.** setpoint is enabled.

Note: The **Prohibit Restoration** mode is applied to the device if a **Frequency Trip** event is active. Therefore, the **Prohibit Restoration** mode must be removed from the device to put it and the teams associated to it back into the **Ready** state.

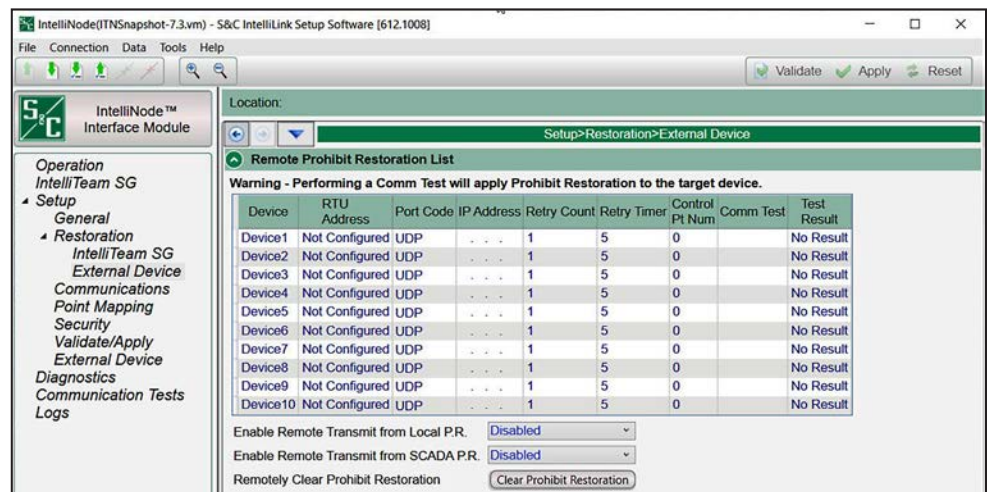


Figure 32. The Setup>Restoration>External Device screen.

Device

This is the Device ID for the remote device. This field is not configurable.

RTU Address

Enter the address of the remote device. (Range: 1-65519; Step: 1; Default: Not Configured)

Port Code

Select the port to use for transmitting to the remote device. (Default: UDP)

IP Address

When the port code is set to “UDP,” enter the IP address of the remote device here.

Retry Count

Enter the number of retries to perform on any timeout event. (Range: 0-255; Step: 1; Default: 1)

Retry Timer

Enter the amount of time in seconds to wait before a retry is attempted. (Range: 0-255; Step: 1; Default: 5)

Control Point Number

Enter the DNP control point number that activates the **Prohibit Restoration** mode in the remote device. (Range: 0-255; Step: 1; Default: 0)

Commission Test

Selecting the **Execute** option from the drop-down menu sends a **Prohibit Restoration** command to the target device(s) to perform the operation in the exact same manner that will occur when the command is sent during normal operation.

NOTICE

Performing a Commission Test will apply the **Prohibit Restoration** state to the target device. The **Prohibit Restoration** state must be removed to put the device in the **Ready** state.

Test Result

This indicates “Pass,” “Pending,” “Bad Response,” or “No Result” for the sent **Prohibit Restoration** command. “Pass” means that the local device received an acknowledgement from the remote device before the **Retry Timer** expired. “Pending” means that the local device sent out the test command but is still awaiting a response. “Bad Response” means that either the remote device rejected the command or the **Retry Timer** expired before the local device received an acknowledgement. “No Result” means that no tests have been performed yet.

Note: If DNP association of the peer device cannot be completed due to an incorrect RTU address, IP address, or Port Code, the **Test Result** field may show a **Pending** status indefinitely until the test is rerun again and the association can be made.

Enable Remote Transmit from Local P.R.

Enabling this option sends a **Prohibit Restoration** command to all devices in the list when the **Prohibit Restoration** state is activated locally via the front panel or IntelliLink screen.

Enable Remote Transmit from SCADA P.R.

Enabling this option will send a **Prohibit Restoration** command to all devices in the list if any the following events are active: **Hot Line Tag** mode, **Frequency Trip** state, **Manual Operation** state, or **Prohibit Restoration** state is activated from a SCADA command from a configured master station address.

Remotely Clear Prohibit Restoration

Clicking on this button sends a **Clear Prohibit Restoration** command to the local device and all devices in the list and will clear the local **Prohibit Restoration** state. If an event is still active (**Hot Line Tag** mode, **Frequency Trip** state, **Manual Operation** state) the **Clear Prohibit Restoration** command will not be sent.

Remote Transfer Trip List Table (when using firmware version 7.3.x)

Transfer Trip commands are sent from the device to distributed generation (DG) resources within the distribution system immediately upon detection of a circuit anomaly so the DG does not interfere with IntelliTeam system restoration activities. This action is both for safety reasons and for the protection of load. See Figure 31 on page 79.

If the local device trips open due to a Protection or Automatic Sectionalizing event, and the **Transfer Trip** feature is enabled, Then, it sends **Transfer Trip** (TT) commands to all devices, whether S&C controls or third party controls, listed on its Remote Transfer Trip list. The TT commands are sent, no matter what state the DG/DER is in at the time, to ensure it is disconnected from the system. When the trip is due to a protection event the TT commands will initiate following the initial trip. **Lockout** state is not necessary.

Device

This is the Device ID for the remote device. This field is not configurable.

RTU Address

Enter the address of the remote device. (Range: 0-65519; Step: 1; Default: Not Configured)

Port Code

Select the port to use for transmitting to the remote device. (Default: UDP)

IP Address

When the port code is set to “UDP,” enter the IP address of the remote device here.

Retry Count

Enter the number of retries to perform on any timeout event. (Range: 0-255; Step: 1; Default: 1)

Retry Timer

Enter the amount of time in seconds to wait before a retry is attempted. (Range: 0-255; Step: 1; Default: 5)

Control Point Number

Enter the DNP control point number that activates the **Transfer Trip** mode in the remote device. (Range: 0-255; Step: 1; Default: 0)

Protocol

When the remote device is an S&C device select the peer-to-peer (P2P) protocol. The P2P protocol allows the remote S&C device to report the actual opening of the remote device to the sending device, to allow the IntelliTeam system to proceed with transfer events. When the remote device is not an S&C device, select DNP3 for the protocol.

DNP Control Type

Enter the appropriate control type for the configured **Control PT Number** setpoint: **Pulse On**, **Latch On** or **Breaker Close**. When received, the remote control will issue an **Open** command to the distributed generation switch.

Commission Test

Selecting “Execute” from the drop-down menu sends a **Transfer Trip** command to the target device(s) in the exact same manner that will occur when the command is sent during normal operation.

NOTICE

Performing a commission test will operate the target device by sending it an **Open** command. A **Close** command must be sent to the device and any alarms cleared to put the device in the **Ready** state.

Test Result

This indicates “Pass,” “Pending,” “Bad Response,” or “No Result” for the sent **Prohibit Restoration** command. “Pass” means that the local device received an acknowledgement from the remote device before the **Retry Timer** expired. “Pending” means that the local device sent out the test command but is still awaiting a response. “Bad Response” means that either the remote device rejected the command or the **Retry Timer** expired before the local device received an acknowledgement. “No Result” means no tests have been performed yet.

Remote Transfer Trip

Selecting the **Enabled** state allows commands from this device to be sent to all non-zero RTU addresses listed on the Remote Transfer Trip list. Selecting the **Disabled** state blocks the commands. When there are no distributed generation resources listed on the Remote Transfer Trip list, set this to “Disabled.”

Control Relay Pulse On Time

This sets the control relay output block on time for the distributed generation devices that receive DNP3 transfer trip control requests. Each count is 1 ms. (Range: 0-4,294,967,295; Step: 1; Default:1)

Control Relay Pulse Off Time

This sets the control relay output block off time for the distributed generation devices that receive DNP3 transfer trip control requests. Each count is 1 ms. (Range: 0-4,294,967,295; Step: 1; Default: 0)

Remote Transmit List Table

With firmware versions 7.5.x and later, the **Remote Prohibit Restoration List** and **Remote Transfer Trip List** functionality has been combined into a single table called, “Remote Transmit List.” This table is on the *Setup>Restoration>External Device* screen and includes the same functionality for sending a **Remote Prohibit Restoration** or **Remote Transfer Trip** command to remote devices as was available in the 7.3.x firmware release. See Figure 33.

SG6801MSX(#100) - S&C IntelliLink Setup Software [612.1013]

File Connection Data Tools Help

6801M Automatic Switch Operator

Connected to: Location: Settings Applied Successfully

Setup>Restoration>External Device

Remote Transmit List

Warnings - Performing a Comm Test will operate the target device by sending it an open command or by applying Prohibit Restoration on it.

Device	Function	RTU Address	Port Code	IP Address	Retry Count	Retry Timer	Control Pt Num	DNP Type	Comm Test	Test Result
1	None	Not Configured	UDP	...	1	5	0	N/A		No Result
2	None	Not Configured	UDP	...	1	5	0	N/A		No Result
3	None	Not Configured	UDP	...	1	5	0	N/A		No Result
4	None	Not Configured	UDP	...	1	5	0	N/A		No Result
5	None	Not Configured	UDP	...	1	5	0	N/A		No Result
6	None	Not Configured	UDP	...	1	5	0	N/A		No Result
7	None	Not Configured	UDP	...	1	5	0	N/A		No Result
8	None	Not Configured	UDP	...	1	5	0	N/A		No Result
9	None	Not Configured	UDP	...	1	5	0	N/A		No Result
10	None	Not Configured	UDP	...	1	5	0	N/A		No Result
11	None	Not Configured	UDP	...	1	5	0	N/A		No Result
12	None	Not Configured	UDP	...	1	5	0	N/A		No Result
13	None	Not Configured	UDP	...	1	5	0	N/A		No Result
14	None	Not Configured	UDP	...	1	5	0	N/A		No Result
15	None	Not Configured	UDP	...	1	5	0	N/A		No Result
16	None	Not Configured	UDP	...	1	5	0	N/A		No Result
17	None	Not Configured	UDP	...	1	5	0	N/A		No Result
18	None	Not Configured	UDP	...	1	5	0	N/A		No Result
19	None	Not Configured	UDP	...	1	5	0	N/A		No Result
20	None	Not Configured	UDP	...	1	5	0	N/A		No Result

Control Relay Pulse On Time: 1 ms (Range: 0-4,294,967,295 Step: 1 Default: 1)

Control Relay Pulse Off Time: 0 ms (Range: 0-4,294,967,295 Step: 1 Default: 0)

Transfer Trip

Remote Transfer Trip: Disabled

DNP, local address: 65432, Peer DNP Address: self | UDP: 20000, 10.64.243.100: 20000 | Timeout: 5000(default) | Retries: 10 | Refresh Mode: Auto, at 1000ms. | 3:54:35 PM [Once] [Stop] [R/W]

Figure 33. The *Setup>Restoration>External Device* screen Remote Transmit List.

DEVICE

This is the Device ID of the remote device and is not configurable.

Function

Select “Xfer Trip” to send a **Transfer Trip** command to a remote device. Select “Proh. Rest.” to send a **Prohibit Restoration** command to a remote device. Default is “None,” which means no function is selected for the device.

When “Proh. Rest.” is selected as the function, the device will send the **Prohibit Restoration** SCADA command to remote devices. The non-zero RTU address in this list must be configured to receive a Latch On, Direct Operate SCADA control point when any of the following events are active in the control:

- **Hot Line Tag** mode is active
- A Frequency **Trip** state occurs
- The IntelliTeam SG system determines that a Manual Operation event has occurred or a SCADA **Prohibit Restoration** command was received from a configured master address
- The **Enable Remote Transmit from SCADA P. R.** setpoint is enabled

Prohibit Restoration is also sent when **Prohibit Restoration** mode is active in the local control, set from the front panel or with an IntelliLink screen command and the **Enable Remote Transmit from Local P. R.** setpoint is enabled.

When “Xfer Trip” is selected as the function, **Transfer Trip** commands are sent from the device to distributed generation (DG) resources within the distribution system immediately upon detection of a circuit anomaly so the DG does not interfere with IntelliTeam restoration activities. This action is both for safety reasons and for the protection of load.

If the local device trips open because of a Protection or Automatic Sectionalizing event, and the **Transfer Trip** mode is enabled, then, it sends **Transfer Trip** (TT) commands to all devices, whether S&C controls or third party controls, listed on its Remote Transmit List that have “Xfer Trip” configured for their function. The **TT** commands are sent, no matter what state the DG/DER is in at the time, to ensure it is disconnected from the system. When the trip is because of a Protection event the **TT** commands will initiate following the initial trip. The **Lockout** state is not necessary.

RTU Address

Enter the DNP RTU address of the remote device. (Range: 0-65519; Step: 1; Default: Not Configured)

Port Code

Select the port to use for transmitting to the remote device. (Default: UDP)

IP Address

When the **Port Code** setting is “UDP,” enter the IP address of the remote device here.

Retry Count

Enter the number of retries to perform on any timeout event. (Range: 0-255; Step: 1; Default: 1)

Retry Timer

Enter the amount of time in seconds to wait before a retry is attempted. (Range: 0-255; Step: 1; Default: 5)

Control Point Number

Enter the DNP control point number that activates the **Prohibit Restoration** mode in the remote device. (Range: 0-255; Step: 1; Default: 0)

DNP Control Type

Enter the appropriate **DNP Control Type** value for the configured **Control Point Number** setpoint: **Pulse On**, **Latch On** or **Breaker Close**. When received, the remote control will issue an **Open** command to the distributed generation switch.

Commission Test

Selecting the **Execute** command from the drop-down menu sends a **Prohibit Restoration** command to the target device(s) to perform the operation in the exact same manner the command is sent during a normal operation.

NOTICE

A **Commission Test** command will apply the **Prohibit Restoration** state to the target device. The **Prohibit Restoration** state must be removed to put the device in the **Ready** state.

Test Result

This indicates “Pass,” “Pending,” “Bad Response,” or “No Result” for the sent **Commission Test** command. “Pass” means the local device received an acknowledgement from the remote device before the **Retry** timer expired. “Pending” means that the local device sent the **Commission Test** command but is still waiting for a response. “Bad Response” means either the remote device rejected the message or the **Retry** timer expired before the local device received an acknowledgement. “No Result” means no tests have been performed yet.

Note: If DNP association of the peer device cannot be completed because of an incorrect RTU address, IP address, or Port Code, the **Test Result** field may show “Pending” indefinitely until the test is rerun again and the association can be made.

Enable Remote Transmit from Local P.R.

Enabling this option sends a **Prohibit Restoration** command to all devices in the list when the **Prohibit Restoration** state is activated locally via the front panel or IntelliLink software screen.

Enable Remote Transmit from SCADA P.R.

Enabling this option will send a **Prohibit Restoration** command to all devices in the list if any the following events are active: **Hot Line Tag** mode, **Frequency Trip** state, **Manual Operation** state, or **Prohibit Restoration** state is activated from a SCADA command from a configured master station address.

Clear Prohibit Restoration on Hot Line Tag Removal

When both the **Clear P.R. on Hot-Line-Tag Removal** and the **Enable Remote Transmit from SCADA PR** settings are enabled, the **Prohibit Restoration** state will be cleared on a device when the **Hot Line Tag** state is removed from the device, provided a **Frequency Trip** state is not active. At that point, the device will also send a **Clear PR SCADA** command to all devices listed in its Remote Transmit List table that have the **Prohibit Restoration** function configured. A device receiving this **Clear PR** command will then clear its **Prohibit Restoration** states, other than those **Prohibit Restoration** states that were caused by a Transfer Trip event or a PRLM Do-Not-Restore Load Shed event.

Note: Receiving a propagated **Prohibit Restoration Clear** command will clear the **Prohibit Restoration** state even if any of the local critical conditions are still present, including **Hot Line Tag**, **Frequency Trip**, and **Manual Operation**. If these critical conditions are present, they will remain active on the local device, and the local device and its associated team members will remain in the **Out of Ready** state, until the critical conditions are cleared themselves.

Note: The **Clear P.R. on Hot-Line-Tag Removal** setting is hidden until the **Enable Remote Transmit from SCADA PR** setting is set to “Enabled.”

Remotely Clear Prohibit Restoration

Clicking on this button sends a **Clear Prohibit Restoration** command to the local device and all devices in the list and will clear the local **Prohibit Restoration** state. If an event is still active (**Hot Line Tag** mode, **Frequency Trip** state, **Manual Operation** state) the **Clear Prohibit Restoration** command will not be sent.

Log Management

The screen shown in Figure 34 configures the filter settings for viewing log screens. The administrative login is required to execute any of the log-control functions.

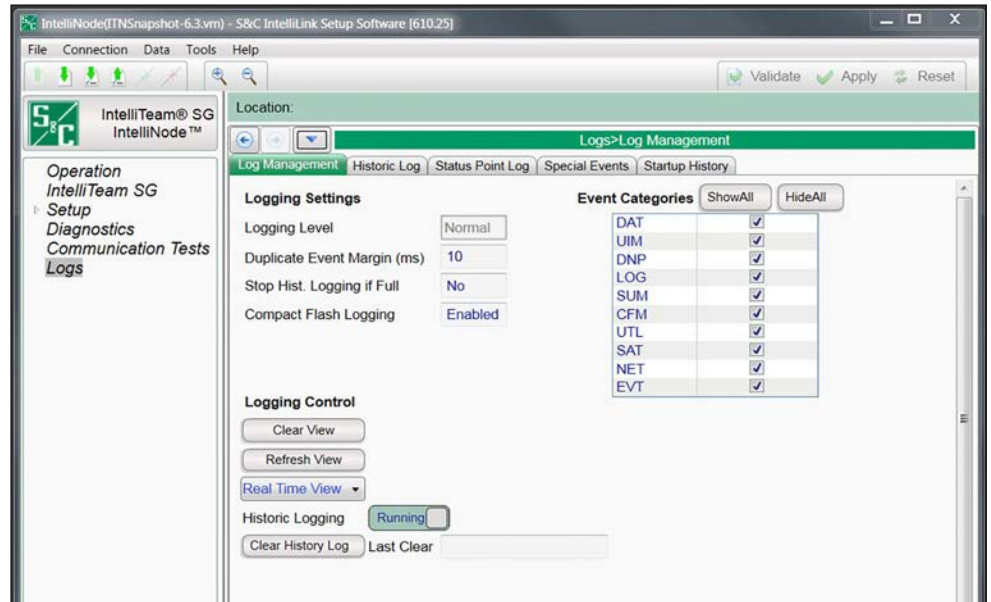


Figure 34. The Logs>Log Management screen.

Logging Settings

Logging Level

The logging level selected determines the type of data-log messages captured in the base memory module (for an IntelliRupter fault interrupter) and is displayed on the *Logs>Historic Log* screen. Every data-log message is assigned a specific log level:

Normal—User information

Extended—User information and internal status

All—User information, internal status, and internal trace/debugging information

Duplicate Event Margin (milliseconds)

Storing identical events in a short time period can flood internal memory and does not provide useful diagnostic information. By configuring the time between duplicate-event log entries, this set point determines which data will be stored in the internal memory and be displayed on the *Logs>Historic Log* screen. It has no effect on an alternating sequence of events.

Two events are considered duplicates when every element of their event records match. For example, when the **Duplicate Event Margin** setting is 10 ms. and the sequence of events ABABAB (where A and B are different) has every event occur 1 ms after the previous one. The identical events occur within 2 ms, well within the value of the set point, but all events will be logged because events are alternating. (Range = 0-30, increment = 1.)

Stop Historic Logging if Full

When enabled, this setting stops logging events when the Historic log is full and subsequent events are discarded without overwriting contents of the log. Flash memory logging, the Status Point log, and **Special Events** counter logging are not affected by this set point. Do not set this to “Yes” unless doing troubleshooting. When troubleshooting is completed or new event data are desired, set this to “No” to ensure continued event logging.

Compact Flash Logging

When enabled, every historic event generated is written to flash memory. **Logging Level** and **Duplicate Event Margin** setpoints do not prevent an event from being written to flash memory. Flash memory logging preserves as much data as possible. Flash memory data can be retrieved with IntelliLink software. Open the **Tools** option on the menu bar and click on the **Compact Flash Access** option. Select and save any files needed. S&C strongly recommends enabling the **Compact Flash Logging** setting to simplify diagnostic and troubleshooting work.

Event Categories

Select the categories that will be displayed on the *Logs>Historic Log* screen. To display only the most important operation information, select the EVT category and click the **Refresh View** button. Utility operation data will be displayed and log information for software troubleshooting and debugging will be omitted.

Logging Control

Complete data are stored in the Historic Event log in flash memory. Flash memory files can be downloaded by opening the **File** option on the menu bar and clicking on the **Flash Memory Files** option. The complete Historic Event log (up to a million events) cannot be viewed through IntelliLink software, but a small subset of the Historic Event log (160 events) is displayed on the *Logs>Historic Log* screen. Event filters can be applied to the *Logs>Historic Log* screen, but these filters do not affect entry of events in the Historic Event Log.

Clear View

This button clears all data on the *Logs>Historic Log* screen. In **Real-Time View** mode, the next qualifying event will be placed at the top of the *Logs>Historic Log* screen. In **Static View** mode, the *Logs>Historic Log* screen will remain empty until it is completely refilled.

Refresh View

This button clears the present contents of the *Logs>Historic Log* screen and loads up 160 events from the Historic Event log in ascending chronological order. Only events satisfying the checked **Event Categories** options are displayed on the *Logs>Historic Log* screen.

Real Time View or Static View

Use this drop-down menu to select the view mode. **Real Time View** mode loads the latest data on the screen, and **Static View** mode freezes data on the *Logs>Historic Log* screen.

Historic Logging

Running—Starts the Historic log but does not affect flash memory logging, Status Point log entries, or Special Events logging.

Stopped—Stops the Historic log but does not affect flash memory logging, Status Point log entries, or Special Events logging. Subsequent events will not be put into the Historic log, preventing newer events from overwriting older events. Be sure to return the **Historic Logging** mode to “Running” so future events will be logged.

Clear History Log

This button clears all data in the Historic log. It does not affect flash memory logging, Status Point log entries, or Special Events logging. The date and time of the last **Clear History Log** command are displayed. Clearing the Historic log permanently deletes all event data. If wanting to preserve event data, generate an HTML report of logged data before clearing the log.

Chronological Browsing (static – no refill)

Chronological browsing is only available in the **Static View** mode. It is not available in the **Real Time View** mode. Because the size of the *Logs>Historic Log* screen is only a fraction of that of the Historic Event log, the Historic Event log must be navigated chronologically, either by **Browse By Time** mode or **Browse By Page** mode.

Browse By Time

This loads up to 160 events that occurred at or after the specific time entered. Only events that satisfy the event categories criterion are placed in the *Logs>Historic Log* screen. If all events in the Historic Event log occurred before the specified time, the oldest-available events are placed in the *Logs>Historic Log* screen. The *Logs>Historic Log* screen is refilled as soon as the specific time is entered; the specified time is cleared when the refill is complete.

Browse By Page

Historic log pages can be browsed four ways:

Oldest 8 Pages—Loads up to 160 of the oldest-qualifying events from the Historic Event log.

Newest 8 Pages—Loads up to 160 of the newest-qualifying events from the Historic Event log.

Previous 8 Pages—Loads up to 160 previous events relative to the events currently in the *Logs>Historic Log* screen.

Next 8 Pages—Loads up to 160 next events relative to the events currently in the *Logs>Historic Log* screen.

When the selection is entered, the *Logs>Historic Log* screen is refilled immediately. Because the Historic Event log is circular, selecting the **Previous 8 Pages** option may cause the newest events to be displayed (if the *Logs>Historic Log* screen presently holds the oldest). Similarly, selecting the **Next 8 Pages** option may cause the oldest events to be displayed (if the *Logs>Historic Log* screen presently holds the newest).

Password Management

Admin User Default Password Change

With software later than version 7.3.100, a user is required to change the default user passwords in the IntelliLink Setup Software before it will allow the user to access the control and read or modify settings on the control using IntelliLink software. This is required for all user accounts, including the Admin account, which must be changed first before any user can access a control. See Figure 35.



Figure 35. The Password Change Required dialog box requesting the user change the password to a non-default password.

Non-Admin User Default Password Change

When users attempt to log in with one of the non-admin accounts before the default password is changed, they will be notified via the following message that the Admin user must change the default user account password before being allowed to connect to a control. See Figure 36.



Figure 36. The Password Change Required dialog box requesting the user update the password to the proper complexity.

Password Complexity Rules

When changing a user password using IntelliLink software, complexity rules are enforced for the new password. See Table 4.

Table 4. Password Complexity Rules

Rule	Description
Password Length	Must be between 8-12 characters long
Alpha Characters	Must have at least one uppercase and one lowercase character
Special Characters	May contain special characters with the exception of the "Space," "Tab," and "&," characters, which are not allowed
Numbers	May contain numbers

When the password entered does not meet the complexity requirements, the error message shown in Figure 36 on page 92 will open and the Admin user will be required to enter a password that meets the complexity requirements before being allowed to proceed.

Change Admin User Password

With software later than version 7.3.100, the Admin user account default password must be changed before IntelliLink software can connect to a control.

Follow these steps to change the Admin user password:

- STEP 1.** After IntelliLink Setup Software is launched and the default Admin password is used to connect to a control, the prompt shown in Figure 37 opens to instruct the user to change the Admin user account password.



Figure 37. The Password Change Required dialog box.

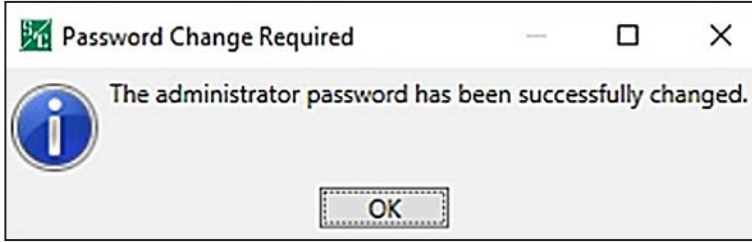
STEP 2. Enter a new non-default password that meets the complexity requirements into the **Enter Password** and **Confirm Password** fields. Then, click on the **OK** button. See Figure 38.



The image shows a dialog box titled "Change Password" with a close button (X) in the top right corner. It contains two text input fields: "Enter Password" and "Confirm Password". Below these fields is a checkbox labeled "Show Password" which is currently unchecked. At the bottom of the dialog, there are two buttons: "OK" and "Cancel". A message at the bottom of the dialog reads: "The password must be between 8 and 12 characters long with one upper case and one lower case character at a minimum."

Figure 38. The Change Password dialog box.

STEP 3. When the password is changed successfully, the Successfully Changed dialog box opens. See Figure 39. Click on the **OK** button to finish the change-password process. If the password was not changed successfully, go to Step 4.



The image shows a dialog box titled "Password Change Required" with standard window controls (minimize, maximize, close) in the top right corner. On the left side, there is a blue information icon (a lowercase 'i' inside a circle). To the right of the icon, the text reads: "The administrator password has been successfully changed." At the bottom center of the dialog, there is an "OK" button.

Figure 39. The Password Change Required dialog box displaying a successful password change message.

STEP 4. When the password was not successfully changed, the Password Change Required dialog box opens. See Figure 40. Click on the **Yes** button to change the password again and go back to Step 2 on page 94.

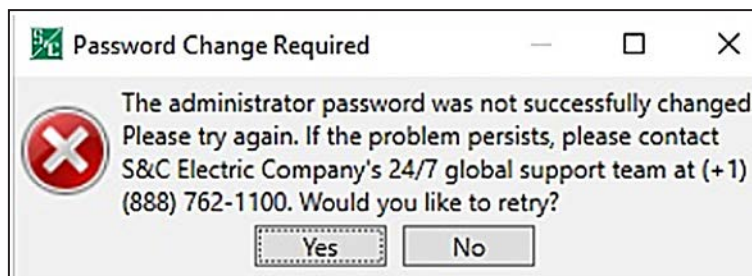


Figure 40. The Password Change Required dialog box.

Change Non-Admin User Password

With software later than version 7.3.100, the Non-Admin user accounts (i.e. Engineer1/2, Technician1/2/3, Operator, and Viewer) must have the passwords changed by an Admin user before a control can be connected using IntelliLink software.

Note: The Admin password must have been changed to a non-default password before a Non-Admin user can access a control. If this has not been done, go to the “Admin User Default Password Change” section on page 92 for instructions on how to change the Admin password before proceeding with the next instructions.

Follow these steps to change a Non-Admin user password:

STEP 1. Launch the IntelliLink Setup Software and log in using the Admin account and the non-default Admin password.

STEP 2. Go to the *Setup>Security* screen in IntelliLink Setup Software. See Figure 41.

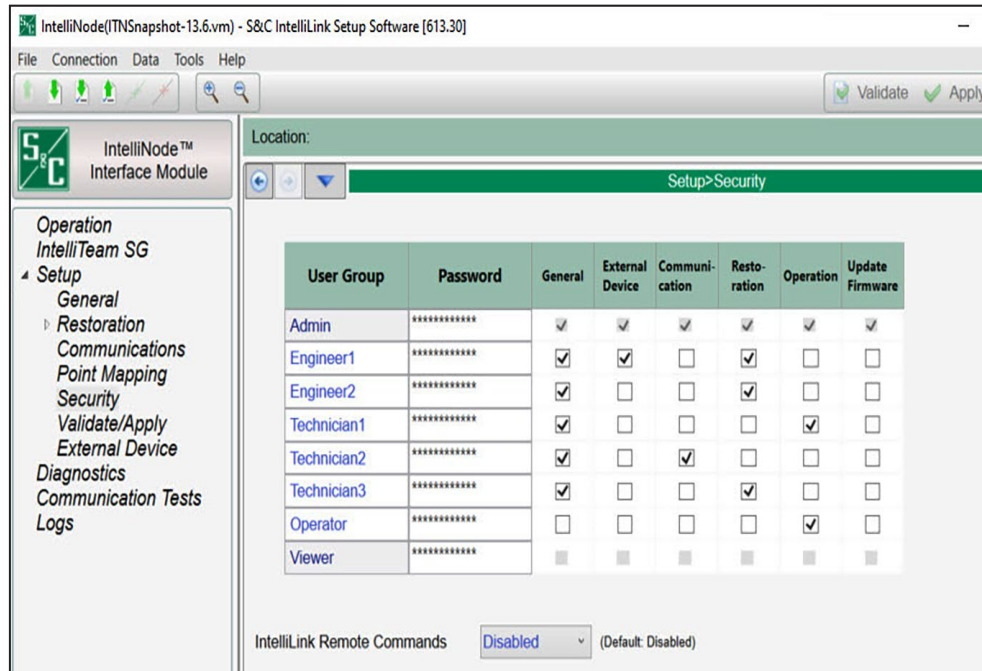


Figure 41. The *Setup>Security* screen.

STEP 3. Click on the **Password** field for a given user and enter a new non-default password that meets the complexity requirements into the **Enter Password** and **Confirm Password** fields. Then, click the **OK** button. See Figure 42.

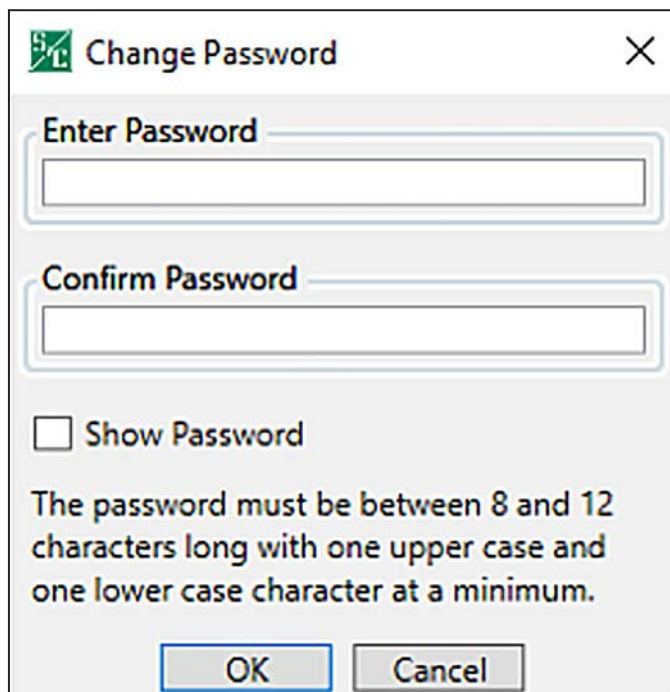
A screenshot of a 'Change Password' dialog box. The dialog has a title bar with a green icon and a close button (X). It contains two text input fields: 'Enter Password' and 'Confirm Password'. Below the fields is a checkbox labeled 'Show Password' which is currently unchecked. A message below the checkbox states: 'The password must be between 8 and 12 characters long with one upper case and one lower case character at a minimum.' At the bottom of the dialog are two buttons: 'OK' and 'Cancel'.

Figure 42. The Change Password dialog box.

STEP 4. When the password has been entered, click on the **Validate** button in the top right corner of the *IntelliLink* screen. See Figure 43.

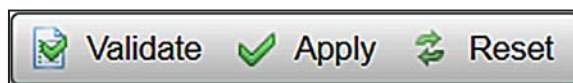


Figure 43. The Validate button.

STEP 5. If the password change validates successfully, click on the **Apply** button to finish the password-change process and configure the new password on the control. See Figure 43. Go to Step 6 if the password change was not validated successfully.

STEP 6. If the password was not successfully validated, the Validation Error dialog box will open. See Figure 44 on page 98. Click on the **OK** button to attempt to change the password again. Go to Step 3.

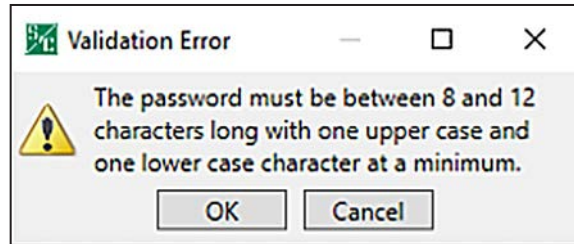


Figure 44. The Validation Error dialog box.

Security Screen

Only a user logged in as Admin (administrator) can make changes to this screen. See Figure 45. The user group name can be changed for all groups except Admin and Viewer. All passwords can be changed, and all default passwords must be changed by the Admin at initial login.

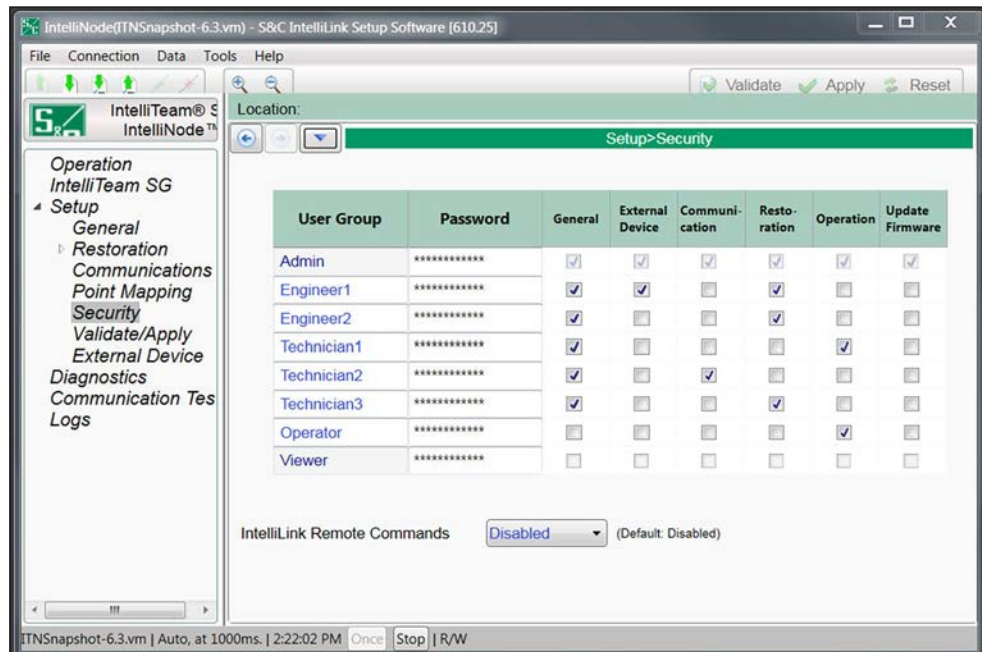


Figure 45. The Setup>Security screen.

The following security controls are available for selection by the Admin for the various user groups:

- **General**—When checked, it allows the user group to configure all configurable settings found on the *Setup>General* screen.
- **Protection**—When checked, it allows the user group to configure all configurable settings found on the *Setup>Protection* screen.

- **Communication**—When checked, it allows the user group to configure all configurable settings found on the *Setup>Communication* screen.
- **Restoration**—When checked, it allows the user group to configure all configurable settings found on the *Setup>Restoration* screen.
- **Operation**—When checked, it allows the user group to configure all configurable settings found on the *Operation* screen.
- **Update Firmware**—When checked, it allows the user group to perform a firmware upgrade on the control using the **Tools>Firmware Update** option on the **Tools** menu.

Note: When the **Update Firmware** option is checked, all other settings groups (Protection, Communication etc.) become enabled for the user that has been allowed to update firmware by the Admin. If the Admin disables access to any settings group after the **Update Firmware** option is checked and settings are validated, the disabled setting is automatically re-enabled. As long as **Update Firmware** option is enabled, all settings groups will be enabled automatically when the settings **Apply** command is initiated.

Changes will not take effect until the **Apply** command is selected on the *Setup>Validate/Apply* screen..

IntelliLink Remote Commands

When set to **Enabled** mode, IntelliLink Setup Software can be used to access the device operation commands. The **Disabled** setting is the default.

For all device types, these commands are not available when this setting is set to **Disabled** mode:

- **IntelliTeam SG Restoration**—on the *IntelliTeam SG>Team Summary* screen
- **Clear Manual Operation**—on the *IntelliTeam SG>Team Summary* screen

For IntelliNode Interface Modules, these commands are not available when this setting is set to **Disabled** mode:

- **Device Data Updates**—on the *Setup>External Device>Start* screen
- **Control Test**—on the *Setup>External Device>DNP Control Point Map* screen

Settings are stored in the buffer memory of the control and are not active until they have been applied. The screen shown in Figure 46 provides commands for managing settings between the buffer memory and the active settings area of the control.

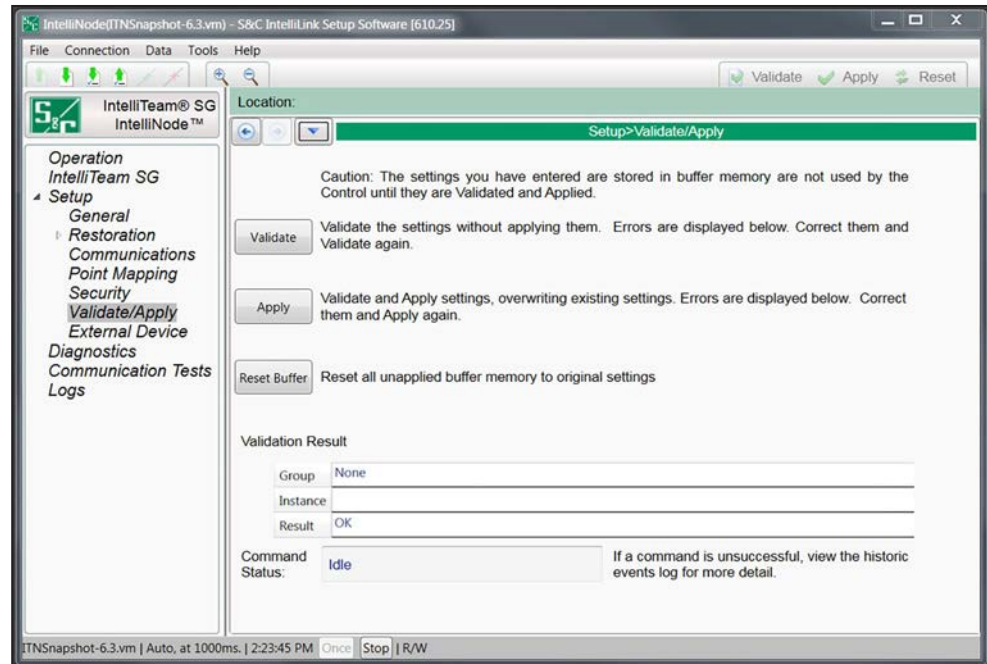


Figure 46. The Setup>Validate/Apply screen.

Validate

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 validation procedure detects an error or inconsistency, it will be displayed in the Validation Result box.

Apply

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 box.

Reset Buffer

The **Reset Buffer** button resets settings in the buffer memory to the presently active values. It will not undo an **Apply** command. When changes are pending, click on the **Reset** button to remove pending changes and return to the setting presently located in the control memory. The **Validate**, **Apply**, and **Reset** icons will fade to indicate no changes are pending.

Validation Results

If a **Validation** or **Apply** command is unsuccessful, the **Validation Result** field will provide information related to the violated validation rules.

Command Status

Shows the result of the last **Validation** or **Apply** request.

Factory Reset

Factory Reset Using IntelliShell

NOTICE

Factory Reset functionality requires installing the default setpoints/setting file on the system for the firmware version the control is running at the time the factory reset is used. Therefore, to proceed with the factory reset, make sure the default setpoint/settings file is properly installed. If the default setpoints/settings file is not installed, the factory reset procedure will not be executed.

STEP 1. Click on the **IntelliShell** button and click on the **Local Connection (Serial/Wi-Fi)** button. See Figure 47.

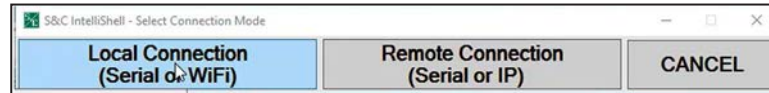


Figure 47. The IntelliShell Local Connection button.

STEP 2. Select the product on which to perform the factory reset and click on the **Serial** button. See Figure 48.

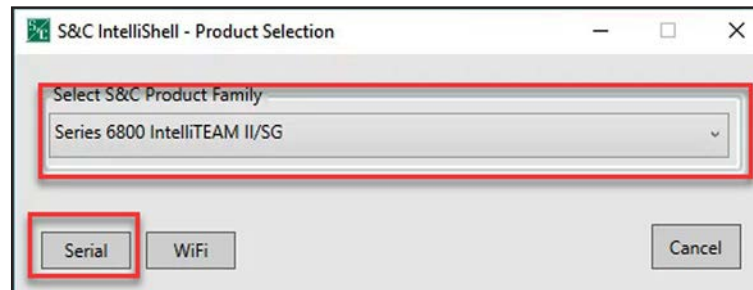


Figure 48. The Product Selection and Serial connection option.

STEP 3. Click on the **Factory Reset** option to launch the **Factory Reset** procedure. See Figure 49.

After clicking on the **Factory Reset** option, the IntelliLink software will launch and the user must login using the admin account.

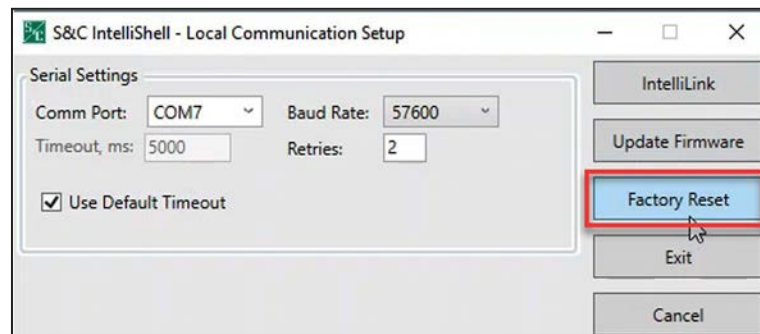


Figure 49. The Factory Reset button.

STEP 4. When prompted, enter “admin” for the username and enter the admin password in the password field. See Figure 50.

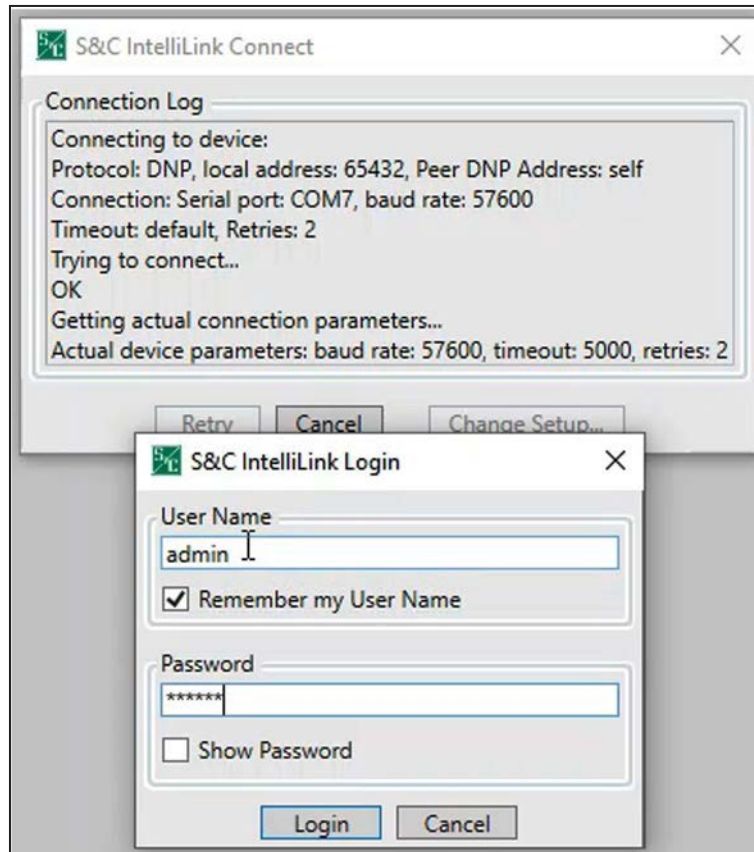


Figure 50. The IntelliLink Login dialog box.

STEP 5. Click on the **Proceed to Factory Reset** button when prompted. See Figure 51.

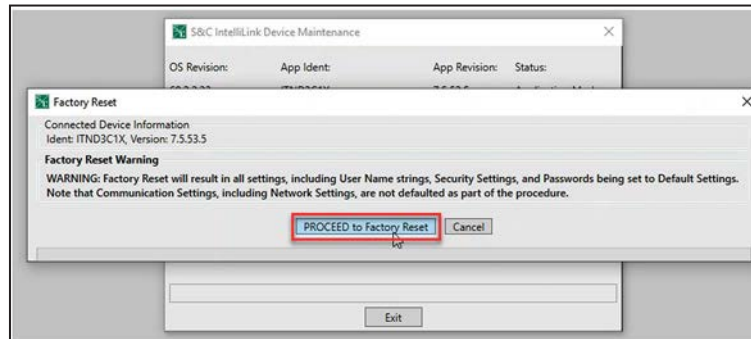


Figure 51. The Proceed to Factory Reset button.

NOTICE

Performing a **Factory Reset** procedure on software versions 7.5 and earlier results in usernames, passwords, and other security settings being reset to default-setting values. The communication settings are not set to default values as part of this procedure to allow the IntelliLink software to reconnect to the control when the factory reset is completed.

Performing a **Factory Reset** procedure on software versions 7.6 and later results in all settings (including usernames, passwords, security, and network settings) being reset to default-setting values. Because the network settings are reset to factory defaults, default network settings must be used to reconnect to the control when the factory reset is completed.

STEP 6. When the **Factory Reset** procedure is completed, click on the **Cancel** button to complete the procedure. See Figure 52.

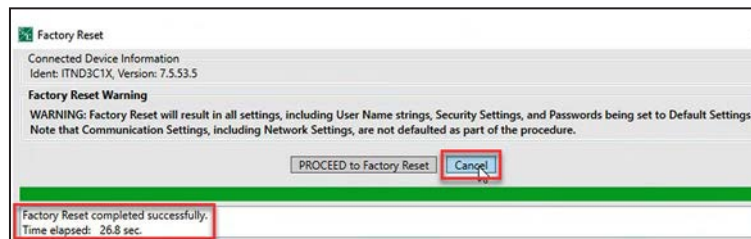


Figure 52. The Factory Reset completed successfully message.

NOTICE

When the factory reset is completed, the admin password will revert to the default password. At the initial login, the admin user will be required to change the password to a non-default password that meets the complexity requirements.

Factory Reset Using IntelliLink

- STEP 1.** Login to the IntelliLink software application using the admin username and password.
- STEP 2.** Click on the **Tools>Device Maintenance** button. See Figure 53.

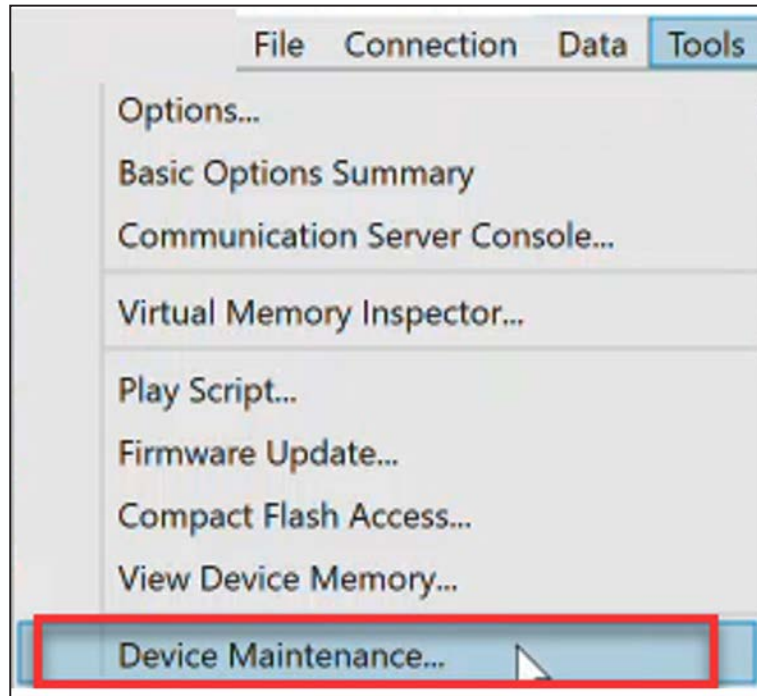


Figure 53. The Tools>Device Maintenance button.

STEP 3. When the Device Maintenance window opens, click on the **Factory Reset** button to launch the **Factory Reset** procedure. See Figure 54.

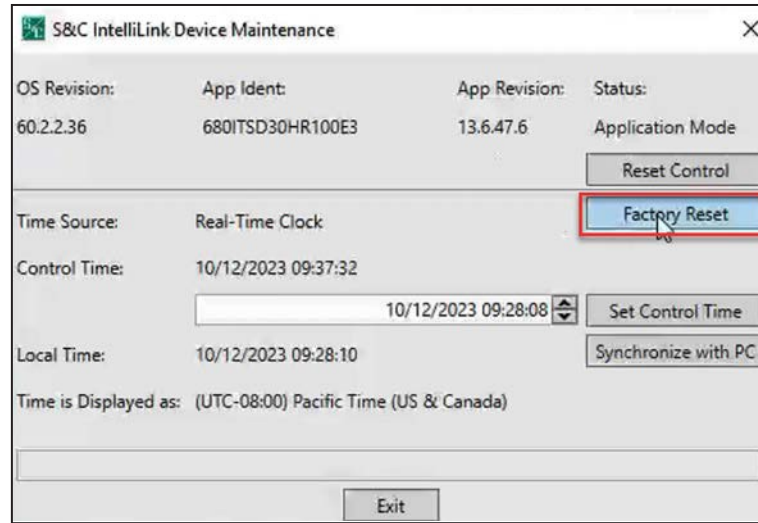


Figure 54. The **Factory Reset** button.

STEP 4. Click on the **Proceed to Factory Reset** button when prompted. See Figure 55.

NOTICE

Performing a **Factory Reset** procedure on software versions 7.5 and earlier results in usernames, passwords, and other security settings being reset to default-setting values. The communication settings are not set to default values as part of this procedure to allow the IntelliLink software to reconnect to the control when the factory reset is completed.

Performing a **Factory Reset** procedure on software versions 7.6 and later results in all settings (including usernames, passwords, security, and network settings) being reset to default-setting values. Because the network settings are reset to factory defaults, default network settings must be used to reconnect to the control when the factory reset is completed.

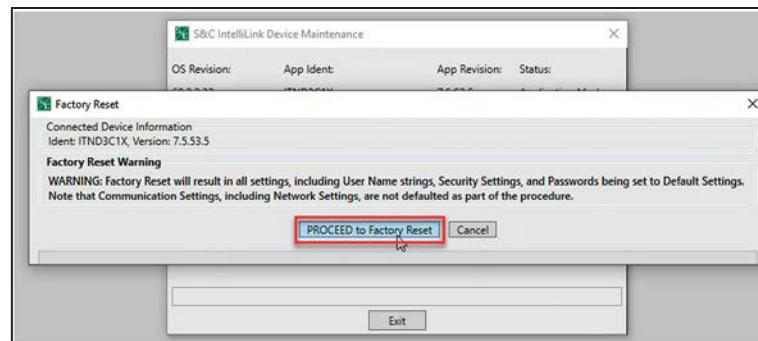


Figure 55. The **Proceed to Factory Reset** button.

STEP 5. When the **Factory Reset** procedure is completed, click on the **Cancel** button to complete the procedure. See Figure 56.

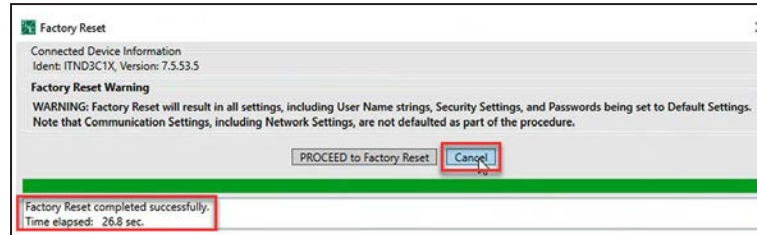


Figure 56. The Factory Reset completed successfully message.

NOTICE

When the **Factory Reset** procedure is completed, the admin password will revert to the default password. At the initial login, the admin user will be required to change the password to a non-default password that meets the complexity requirements.