Troubleshooting

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April 16, 2018

Instruction Sheet 1042-551

Introduction

Qualified Persons

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<tr><td>⚠ WARNING</td></tr>
</table>

The equipment covered by this publication must be installed, operated, and maintained by qualified persons who are knowledgeable in the installation, operation, and maintenance of overhead electric power distribution equipment along with the associated hazards. A qualified person is one who is 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 the special precautionary techniques, personal protective equipment, insulating 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

<table>
<tr><td>*NOTICE*</td></tr>
</table>

Read this instruction sheet thoroughly and carefully before installing or operating S&C 5800 Series Automatic Switch Controls. Familiarize yourself with the Safety Information page 4. The latest version of this publication is available online in PDF format at **sandc.com/en/support/product-literature/**.

Retain this Instruction Sheet

This instruction sheet is a permanent part of your 5800 Series Automatic Switch Control. Designate a location where you can easily retrieve and refer to this publication.

Proper Application

<table>
<tr><td>⚠ WARNING</td></tr>
</table>

The equipment in this publication must be selected for a specific application. The application must be within the ratings furnished for the selected equipment.

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 S&C 5800 Series Automatic Switch Control, except that the first paragraph of the said warranty is replaced by the following:

(1) General: The seller warrants to the immediate purchaser or end user for a period of 10 years from the date of shipment that the equipment delivered will be of the kind and quality specified in the contract description and will be free of defects of workmanship and material. Should any failure to conform to this warranty appear under proper and normal use within 10 years after the date of shipment, the seller agrees, upon prompt notification thereof and confirmation that the equipment has been stored, installed, operated, inspected, and maintained in accordance with the recommendations of the seller and standard industry practice, to correct the nonconformity either by repairing any damaged or defective parts of the equipment or (at the seller's option) by shipment of necessary replacement parts. The seller's warranty does not apply to any equipment that has been disassembled, repaired, or altered by anyone other than the seller. This limited warranty is granted only to the immediate purchaser or, if the equipment is purchased by a third party for 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 5800 Series Automatic Switch Control will provide automatic fault-isolation and system reconfiguration per agreed-upon service levels. The remedy shall be additional system analysis and reconfiguration of the IntelliTeam II Automatic Restoration System until the desired result is achieved.

Warranty of the S&C 5800 Series Automatic Switch Control is contingent upon the installation, configuration, and use of the control or software in accordance with S&C's applicable instruction sheets.

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

Warranty of equipment/services packages is contingent upon receipt of adequate information on the user's distribution system, sufficiently detailed to prepare a technical analysis. The seller is not liable if an act of nature or parties beyond S&C's control negatively affect 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.

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels attached to the 5800 Series Automatic Switch Control. Familiarize yourself with these types of messages and the importance of these various signal words:

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

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

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

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

Following Safety Instructions

If you do not understand any portion of this instruction sheet and need assistance, contact your 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 Headquarters at (773) 338-1000; in Canada, call S&C Electric Canada Ltd. at (416) 249-9171.

NOTICE	
Read this instruction sheet thoroughly and carefully before installing or operating your S&C 5800 Series Automatic Switch Control.	

Replacement Instructions and Labels

If you need additional copies of this instruction sheet, contact your 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.

This instruction sheet was prepared for use with the IntelliTeam II Automatic Restoration System and 5800 Series Control software: SNCD2B1X Rev. 2.45, SNCD2B6D Rev. 2.43, PADD2B1X Rev. 2.43, VISD2B1X Rev. 2.43, and USBD2B1X Rev. 2.43.

The software-revision number is on the *Troubleshooting>Control & Switch Information* screen. For questions regarding the applicability of information in this instruction sheet to future product releases, please 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.

Serious risk of personal injury or death may result from contact with electric distribution equipment when electrical isolation and grounding procedures are not followed. The equipment described in this document must be operated and maintained by qualified persons who are thoroughly trained and understand any hazards that may be involved. This document is written only for such qualified persons and is not a substitute for adequate training and experience in safety procedures for accessing high-voltage equipment.

S&C 5800 Series Controls are connected to switchgear operating at primary voltage levels. High voltage may be present in the wiring to the switch control or in the switch control itself during certain switchgear wiring or grounding system failures, or due to a problem with the switch control itself. For this reason, access to switch controls 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 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 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 if they were elevated to primary (high) voltage.

Whenever you manually reconfigure the circuit (for example, during repairs), follow your company's operating procedures to disable automatic operation of the switch control. This will prevent any unexpected operation.

The IntelliTeam II system operation can be disabled by pressing the Automatic Operation ENABLE/DISABLE faceplate button to the **Disable** state on the faceplate of any active 5800 Series team member of the team to be disabled.

NOTICE

All switch controls in the IntelliTeam II system must use the same software revision.

Revision 2.39 should be installed only in 5800 Series Switch Controls manufactured after January 1, 2005, or in older controls that have had the four-layer processor board (006-001053-01 or 006-001053-02) retrofitted. Using Revision 2.39 with the earlier two-layer boards may result in memory corruption. If assistance is required, or the-equipment requires the upgrade, please contact S&C Electric Company.

The following tools and switch control features are used to diagnose and correct problems.

LCD Screen

The LCD screen on the switch control faceplate provides information about the present state of the team and the control. For an explanation of the faceplate and the LCD screen, see "The Faceplate" section in Instruction Sheet 1042-541, "S&C 5800 Series Automatic Switch Control with IntelliTeam® II Automatic Restoration System: *Operation*."

LEDs

The LEDs on the switch control modules and the faceplate provide information about the present state of the control.

IntelliLink Setup Software

The *Operation* and *Troubleshooting* screens display information about the switch control, switch control operations, and switch sensor data. For an explanation of these screens, see the "Software Troubleshooting and Error Messages" section on page 11.

To view the screens, a computer, serial cable, and the IntelliLink software version for this 5800 Series switch control are required. See the "Hardware and Software Requirements" section on page 6 in Instruction Sheet 1042-531, "S&C 5800 Series Automatic Switch Control with IntelliTeam® II Automatic Restoration System: *Setup*."

Electrical Interconnect Diagrams

The electrical interconnect diagrams show the switch control wiring layout. See Instruction Sheet 1042-531, "S&C 5800 Series Automatic Switch Control with IntelliTeam® II Automatic Restoration System: *Setup*."

Test Points

Most of the wiring in the control enclosure is terminated in insulation displacement connectors. To test a pin, gently slide the black plastic cap sideways on the connector until the pin is exposed. Test the pin, and then replace the cap (to protect the wiring from dust and to prevent shorts). Avoid inserting the test probe into the connector receptacle as this may damage the connector.

Tools Required

To correct a problem, you may need one or more of the following tools:

- Multimeter and probes
- 4-inch long, #2 Phillips screwdriver
- 4-inch long, ¼-inch flat-blade screwdriver

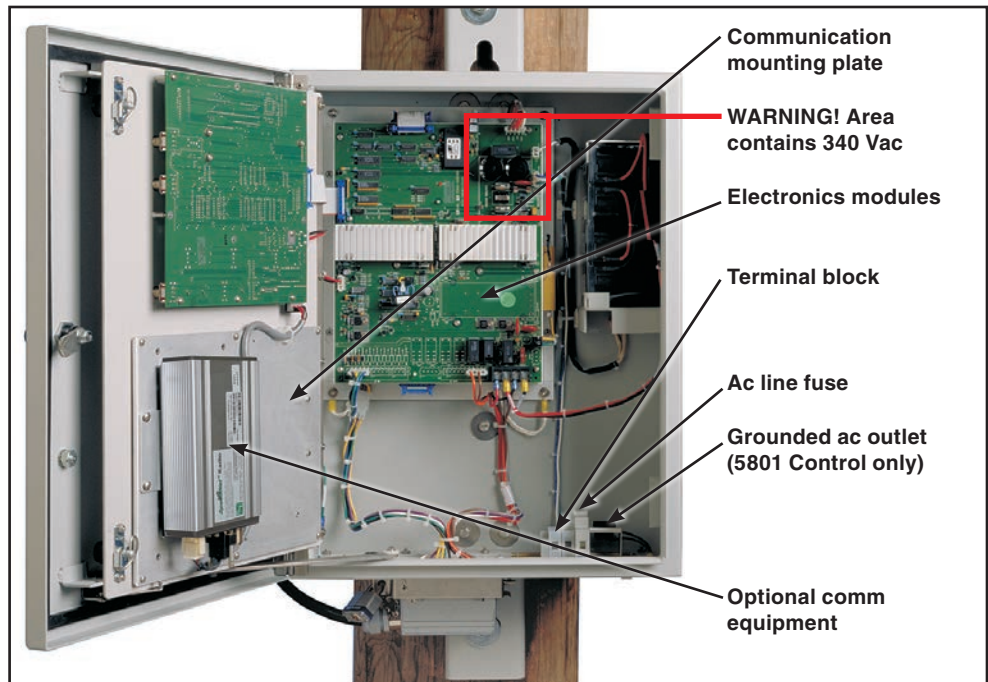| NOTICE |
|---|
| If the suggested troubleshooting steps do not resolve the problem, call S&C Electric Company at (888) 762-1100. |

Figure 1. Model 5801 Automatic Switch Control with the faceplate open.

Power Problems

Ac line fuse is blown

To replace the fuse, swing the fuse holder open, replace the fuse, and push the fuse holder back into place. See Figure 1.

Battery does not supply power when ac power is off

See the "BAT ON LED (on the PS/IO board) is Off" section on page 9.

Power supply/control I/O module is not providing power

See the "BAT ON LED (on the PS/IO board) is Off" section on page 9.

LCD Screen Problems

LCD screen is blank or data does not scroll

Follow these steps to check the condition:

STEP 1. Check the LEDs. If all the control LEDs (including those on the PS/IO board) are off, the control is not receiving power. See the "AC ON LED (on the PS/IO board) is off" section on page 8 and the "BAT ON LED (on the PS/IO board) is off" section on page 9.

STEP 2. Check the faceplate connections. Check connectors J4, J1, and DSC. If one of the connectors is loose, push it into place, and then cycle power to the switch control. To cycle power to the control, remove the ac line fuse and then disconnect the red and black battery leads. Reconnect the battery, and then reinsert the ac line fuse. If the LCD screen still does not work, the LCD module may need to be replaced.

Backlighting on the LCD screen does not light

Perform a lamp test. Hold the faceplate BATTERY TEST/LAMP TEST switch in the **Lamp Test** position. If the LCD screen backlight does not illuminate, but the LEDs blink, the toggle switch or the LCD module may need to be replaced. If none of the LEDs blink, see the "All LEDs on the faceplate are off" section on page 8.

Problems Displayed with LEDs

All LEDs on the faceplate are off

Follow these steps to check the condition:

STEP 1. Check the LCD screen for data. If the screen has information and can scroll through the data, the processor is powered and functioning. The problem is the tamper switch for the door. Make sure the magnet is present on the top inside of the enclosure door (S&C 5801 control) or on the compartment door (S&C 5802/5803 control). Make sure the wiring to the magnet is connected.

If the display is blank or data cannot be scrolled, open the faceplate and check the red CPU RESET LED. The LED is found behind the BATTERY TEST switch on the faceplate circuit board. If it is lit, the faceplate circuit board is bad; contact S&C Electric Company.

STEP 2. Check switch power (+12 Vdc). Check the AC ON and BAT ON LEDs. If neither is lit, the battery may be discharged. Press the BAT ON switch (on the left side of the PS/IO board, near the AC ON LED) to test this condition. Power will be restored for about one minute if the battery is low and ac power (or sensor power, if applicable) is off. If ac power (or sensor power, if applicable) is on, the battery will begin to recharge.

AC ON LED (on PS/IO board) is Off

Follow these steps to check the condition:

STEP 1. Check for ac power to the control. Check for ac voltage between the incoming-side test point of the ac line fuse holder and the ac neutral. See Figure 2.
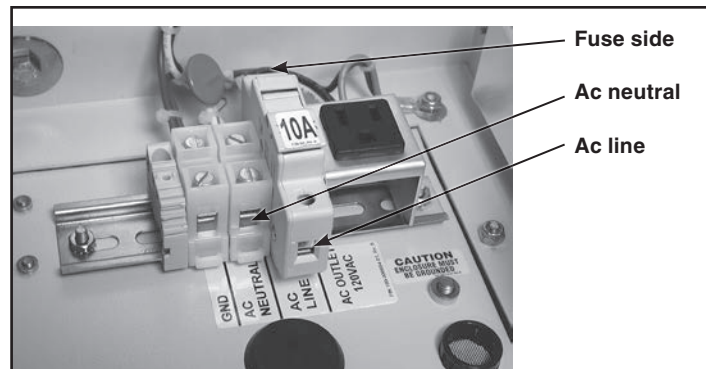

Figure 2. Test points for ac line and ac neutral measurements.

STEP 2. Following utility-approved work procedures and safety practices, verify there is 120 Vac in the line providing control power.

STEP 3. Check the ac line and ac neutral wiring connections. Make sure the ac line wire is securely connected to the bottom of the ac line fuse holder. See Figure 2. Make sure the neutral wire is securely connected to the ac neutral terminal.

STEP 4. Check the ac line fuse by doing one of the following:

(a) Swing the fuse holder open and check the fuse for continuity with a multimeter; replace a bad fuse, and close the fuse holder.

(b) If 120 Vac is present at the ac line test point, check for voltage at the fuse-side test point. See Figure 2.

STEP 5. With all power sources disconnected, tighten the screws behind the ac line fuse. Disconnect the ac power line and the battery. For sensor-powered controls, also disconnect the external signal cable(s). Remove the ac line fuse. Tighten the two screws that are normally hidden behind the fuse. Reinstall the fuse, and then reconnect all power sources.

STEP 6. Check that the ac power connector is plugged into the PS/IO board at the J17 connector.

STEP 7. For sensor-powered controls, check the voltage supplied by the switch sensors.

> ### ⚠ CAUTION
> This is a high-voltage area of the PS/IO board. When checking voltage, make sure the 10-A ac line fuse and the 10-A dc wetting fuse have been removed and the ac power line is de-energized. For switch controls powered by sensors, the switch interface cable(s) on the bottom of the enclosure must be disconnected.

Check the dc voltage across the PS/IO board J8 connector, pins 1 (positive) and pin 3 (negative). The voltage should measure between 280 and 340 Vdc.

Note: Do not unplug the PS/IO board J8 connector.

ANALOG PWR LED (on PS/IO board) is off or blinking

The PS/IO board is malfunctioning. Call S&C Electric Company.

BATTERY LOW LED is lit

See the "'Battery Low' on the *Troubleshooting>Event Status* screen" section on page 12.

BAT ON LED (on PS/IO board) is off

Follow these steps to check the condition:

STEP 1. Check the BATTERY LOW LED on the faceplate. When the BATTERY LOW LED is blinking, a battery test is in progress. The BAT ON LED normally turns off and on several times during a battery test.

STEP 2. Check the battery leads, and make sure they are connected.

STEP 3. Disconnect all power sources and check the wiring from the battery. Disconnect the battery leads and the ac power line. For sensor-powered controls, also disconnect the external signal cable(s).

STEP 4. On the PS/IO board, check that the cables are connected at the Bat A1+, Bat A2-, +24VOUT or +35VOUT, and BATCOM connectors. Tighten the screws that hold these wires.

STEP 5. Replace the battery.

CHG ON LED (on PS/IO board) is off

Follow these steps to check the condition:

STEP 1. Make sure the battery is present and connected to the control. The CHG ON LED is always off when the battery is disconnected.

STEP 2. Check the BATTERY LOW LED on the faceplate. If the BATTERY LOW LED is blinking, a battery test is in progress. The CHG ON LED is always off during battery tests.

STEP 3. Check for ac control power to the switch control. See the "AC ON LED (on PS/IO board) is off" section on page 8 for details. The CHG ON LED is always off when ac power is off. For sensor-powered controls, check the PS/IO board J8 connector. See Step 7 at the top of this page for voltage information.

STEP 4. Check the battery voltage. Disconnect the battery. With a voltmeter, see whether the voltage is greater than 23 volts (for a 24-Vdc battery) or 35 volts (for a 36-Vdc battery). If not, replace the battery.

STEP 5. Check the battery connections. Are the battery leads connected to the battery and the PS/IO board. Are the wires damaged?

STEP 6. The PS/IO board is probably bad. Call S&C Electric Company to discuss replacing the PS/IO board.

ERROR DETECTED LED (on the faceplate) is lit

Follow these steps to check the condition:

STEP 1. Determine which team switch control has a problem. The ERROR DETECTED LED is lit at each switch control when one or more team members have problems.

STEP 2. On the LCD screen, look for the switch symbol that is blinking. When the blinking symbol is for a different switch, go to that control site.

STEP 3. Connect the portable computer to the control and start the IntelliLink software. Check for active messages on Page 2 of the *Troubleshooting>Event Status* screen. To correct problems, follow the troubleshooting suggestions for those messages. When the only active message is "Stop Transfer," go directly to step 7.

STEP 4. Make sure the faceplate REMOTE/LOCAL switch is in the **Local** state. Toggle the Automatic Operation ENABLE/DISABLE switch to the **Disable** state.

STEP 5. Make sure the switch is in its **Normally Open/Closed** state, unless special system conditions require otherwise.

STEP 6. Toggle the Automatic Operation ENABLE/DISABLE switch back to the **Enable** state. Return the REMOTE/LOCAL switch to the normal state for this control.

STEP 7. For a **Stop Transfer** condition to clear, all line switches in the team must be in their **Normally Open/Closed** states. Other switch controls may have to be operated before the **Stop Transfer** condition will clear.

PROCESSOR STATUS LED (on faceplate) does not blink

Blinking is the normal state, and indicates the processor is operating. The control software commands this LED to be on or off. When blinking stops with the LED lit, the change command has stopped.

When the blinking stops with the LED off and other LEDs are illuminated, check for failure of the PROCESSOR STATUS LED. Do a lamp test. Hold the faceplate BATTERY TEST/LAMP TEST switch in the **Lamp Test** mode. If the PROCESSOR STATUS LED illuminates, a change command has not occurred.

IntelliLink software may display an error message when trying to establish communication with a switch control or a snapshot (VM file). If an error message appears, follow the corrective action given for that message.

IntelliLink software won't start

Follow these steps to correct the condition:

STEP 1. Close other software programs. Some software applications (such as HotSync® technology for Palm™ handhelds) may interfere with the IntelliLink software access to the computer serial port. Exit any program that might take control of a serial port while IntelliLink software is in use.

STEP 2. Reinstall IntelliLink software on the computer. There may be a problem with one of the files. See the "Starting IntelliLink Software" section on page 6 in Instruction Sheet 1042-531, "S&C 5800 Series Automatic Switch Controls With IntelliTeam® II Automatic Restoration System: *Setup*," for more information.

"Could not connect to control on COM1"

See the "Opening port COM1... Trying 38400 BAUD... Connection Failed" section below.

"Incompatible Ident"

IntelliLink Setup Software uses a different screenset (.WMN file) for each type of control and normally selects the screenset for the user. This message appears when a screenset is displayed and connection is attempted to a snapshot (.VM file) that requires a different screenset.

Follow these instructions to open the correct screenset:

STEP 1. To close an open screenset, click on the **File** menu and on the **Close Screenset** entry.

STEP 2. In the **Connection** menu, click on the **Connect to VM File** entry.

STEP 3. In the Open Controller Data File dialog box, select the snapshot (.VM file) to be viewed and click on the **OK** button to open both the snapshot and the correct screenset.

IntelliLink setup incorrect or incomplete

Reinstall IntelliLink Setup Software on the computer. There may be a problem with one of the files. See the "Starting IntelliLink Software" section on page 6 in Instruction Sheet 1042-531, "S&C 5800 Series Automatic Switch Controls With IntelliTeam® II Automatic Restoration System: *Setup*," for more information.

"Opening port COM1... Trying 38400 BAUD... Connection Failed"

These messages appear in the Connect dialog box when the IntelliLink software in the computer cannot establish communication with the software in the switch control.

Follow these steps to correct the condition:

STEP 1. Check the control power. If the LCD screen is blank or data does not scroll, the control may have no power and cannot communicate with the computer. See the "LCD screen is blank or data does not scroll" section on page 7.

STEP 2. Check the serial cable connection. Confirm the serial cable is plugged into the LOCAL port on the switch control faceplate. Confirm the cable goes to the correct port on the computer, usually the COM1 port.

STEP 3. Try another communication port. The COM1 port on the computer may be broken or assigned to a different device. Connect the cable to a different comm port. In the Connect dialog box, click the **Change Setup** button. From the pull-down list, select the name of the port where the cable is connected. Click on the **Connect** button.

STEP 4. Use a different serial cable. The old serial cable may have a broken wire or pin. The cable may be wired for use with a different type of computer, or it may be a null-modem cable.

STEP 5. Check the serial port on the computer. Test the serial port by trying to communicate with a modem or other serial device.

Note: If a two-wire, ungrounded extension cord was used to power the computer (or the switch control during lab testing), the serial port on the computer may have been damaged.

Program in the control: XXXX... not configured for this program

Reinstall IntelliLink Setup Software on the computer. Make sure the correct IntelliLink software is installed for the switch control software.

Software in control incompatible with open screenset... cannot be established

IntelliLink Setup Software uses a different screenset (.WMN file) for each type of control and automatically selects the screenset. This message appears when a screenset is displayed and connected switch control requires a different screenset.

Follow these instructions to open the correct screenset:

STEP 1. To close an open screenset, click on the **File** menu and on the **Close Screenset** entry.

STEP 2. In the **File** menu, click on the **Open Screenset** entry.

STEP 3. Select the correct screenset for the control.

STEP 4. When the screenset opens, in the **Connection** menu click on the **Connect to Device** entry.

Software in control is XXXX... not properly configured for this product

Reinstall IntelliLink software on the computer. There may be a problem with one of the files. See the "Starting IntelliLink Software" section on page 6 in Instruction Sheet 1042-531, "S&C 5800 Series Automatic Switch Controls With IntelliTeam® II Automatic Restoration System: *Setup*," for more information.

Times New Roman font is not on your system. The project requires it.

Click on the **OK** button to close the dialog box. When the program cannot find the desired font, it shows a warning and uses a different font.

"Cabinet Door" on the *Operation* screen shows wrong door status

Check the door magnet. Make sure the magnet is present on the top inside of the enclosure door (S&C 5801 control) or on the compartment door (S&C 5802/5803 control). Make sure the wiring to the magnet is connected.

"Battery Low" on the *Troubleshooting>Event Status* screen

Follow these instructions to correct the problem:

STEP 1. Test the battery. Briefly hold the BATTERY TEST/LAMP TEST switch in the BATTERY TEST position to start a battery test. If the BATTERY LOW LED remains lit after it stops blinking (when the battery test is finished), replace the battery. When the battery has been replaced, run the test again to update battery status.

STEP 2. Restart the switch control. If the "Battery Low" message is still active or the BATTERY LOW LED is still lit after replacing the battery, remove the ac line fuse and disconnect the battery cable. For sensor-powered controls, also disconnect the external signal cable(s). Reconnect the battery cable and replace the ac line fuse and signal cable(s) from the switch to the control.

"Battery Charger Bad" on *Troubleshooting>Event Status* screen

Call S&C Electric Company. The battery is being charged at an abnormally high voltage. The PS/IO board may need to be replaced.

"Open/Close Contacts Bad" on *Troubleshooting>Event Status* screen

Follow these instructions to correct the problem:

STEP 1. Check the cable from the control to the switch. The control must be connected to a switch to remove this active message. Check that the cable is securely connected to the switch interface connector(s) on the bottom of the switch control. Check that the line switch is correctly connected and cables are not damaged.

STEP 2. Check dc wetting voltage. Check the voltage between terminals #1 and #4 on J4 on the PS/IO board. The voltage should be the same as the battery voltage on terminals #2 and #3. If the voltage is 0 and the BAT ON LED is off, see the "BAT ON LED (on PS/IO board) is off" section on page 9.

STEP 3. Check the red 10-A dc wetting fuse (on the PS/IO board). With the fuse installed, check the dc wetting fuse using the test points and a voltmeter. Replace the fuse if it is bad.

Real-time data is all zero on the *Site-Related* or *Operation* screen

Follow these instructions to correct the problem:

STEP 1. Check the control to line switch cable. Make sure the cable is securely connected to the line switch and to the connector(s) on the bottom of the switch control. Make sure the cable is not damaged.

STEP 2. Check the sensor conditioning module connections. Carefully check that all connections to the module are secure. Make sure the three-pin dc power connector (at the top center of the sensor conditioning module) is securely connected.

STEP 3. For an externally powered control, check the control power line. Following utility-approved work procedures and safety practices, verify the distribution circuit is energized and load current is flowing through the switch. Verify ac power is connected to the control.

STEP 4. For sensor-powered controls, measure the voltage from the switch sensors.

⚠ CAUTION
This is a high-voltage area of the PS/IO board. When checking voltage, make sure the 10-A ac line fuse and the 10-A dc wetting fuse have been removed and the ac power line is de-energized. For switch controls powered by sensors, the switch interface cable(s) on the bottom of the enclosure must be disconnected.

Check the dc voltage across the PS/IO board J8 connector, pins 1 (positive) and pin 3 (negative). The voltage should measure between 280 and 340 Vdc.

Note: Do not unplug the PS/IO board J8 connector.

Real-time voltage or current or kvar values are wrong

Follow these instructions to correct the problem:

STEP 1. Reinitialize the switch control. At the *Setup>Site-Related* screen, click on the **Reinitialize Device** entry. Setup parameter values only take effect when the control is reinitialized.

STEP 2. If applicable, check the values on the *Setup>Sensor Configuration* screen. Confirm that the switch serial number(s) on the sensor-calibration data sheet(s) and on the installed switch(es) are identical. The sensor calibration data sheet is shipped with the switch and is usually stored in the door pocket of the switch control or low voltage cabinet. Then, confirm that the values on the *Setup>Sensor Configuration* screen exactly match the values on the data sheet. If any values are changed, reinitialize the control.

STEP 3. Check the values on the *Setup>Site-Related* screen. Confirm that the **Line kV to 120 Vac Base Ratio**, **Voltage Transformer Wiring**, and **Voltage Sensors Present** setpoints are correct for this switch and distribution system. When any setting is changed, reinitialize the control. See Table 1.

Table 1. Delta or Wye Voltage Reporting

Distribution System	Line kV to 120 Vac Base Ratio	Voltage Transformer Wiring
Delta voltage reporting	Phase-to-Phase voltage / 120 volts*	Phase to Phase
Wye voltage reporting	Phase-to-Neutral voltage / 120 volts*	Phase to Neutral

* For example: 12000 volt distribution-line voltage / 120 volts = 100 / 1 ratio.

STEP 4. Check the sensor conditioning module jumper. Make sure the correct jumper (wye or delta) is installed for this distribution line. Make sure the side of the jumper with more wire loops (2 loops for wye, 3 loops for delta) is facing towards the bottom of the enclosure. See Table 2.

Table 2. Sensor Conditioning Moddule Jumpers

Wires & Grounding Type	Sensors	Use
Uni-grounded Wye 3-Wire System	3 Voltage Sensors 6 Voltage Sensors	Delta jumper Delta jumpers
Uni-grounded Wye (Primary Neutral) 4-Wire System	3 Voltage Sensors 6 Voltage Sensors	Delta jumper Delta jumpers
Multi-grounded Wye 4-Wire System	3 Voltage Sensors 6 Voltage Sensors	Wye jumper Wye jumpers
Delta System	Phase-to-ground connected sensors should not be used with ungrounded delta systems.	

Team does not communicate

Follow these steps to carry out the following general procedure at each member of the team, starting at the team member that is the most likely source of the problem.

STEP 1. Check the link between the control and the team communication device. Make sure all cables are firmly in place at both ends and the communications device has power.

STEP 2. Check all other communication ports in use. When the control is directly connected to another team member or has a radio or cable connection to a SCADA master station, check all the cable connections. Test communication between the control and the other device.

STEP 3. Check the *Setup>Team Configuration* screen settings. Make sure the **DNP/RTU Address** and **UtiliNet WAN Address** (if applicable) setpoints are correct for each team member (and master station, if applicable). Initiate a team configuration to ensure all team members have the same global setpoint values.

STEP 4. Check the *Setup>Communications* screen settings. Make sure the baud rates and duplex settings are correct for the installed communication hardware.

STEP 6. When this control uses a radio, check the radio antenna and that the antenna cable is attached at both ends.

Team does not reconfigure the circuit

Follow these instructions to correct the problem:

STEP 1. Check the **Team Logic** setpoint. Connect the computer to the control and start IntelliLink Setup Software. On the *Setup>Team* screen, confirm the **Team Logic** setpoint is enabled for this team.

STEP 2. Check the *Setup>Team Configuration* screen settings. Make sure the **DNP/RTU Address** is correct for each team member. Also, confirm the normal switch position is correct for each switch in the team, and the normal switch function is correct in the **Normal Sw Func** setpoint. Make sure that the **Maximum Capacity** setpoints are appropriate for circuit conditions.

STEP 3. Check values on the **Team Operation** screen. Make sure the **Ready Status** displays "READY." If not, check the **Operational Status**, **Line Status**, and **Configuration Status** fields for reasons the team may not be in the **Ready** state.

STEP 4. Check team communications. See the "Team does not communicate" section above.

STEP 5. Check the circuit configuration. Make sure the circuit has not been temporarily reconfigured because of construction or maintenance.

STEP 6. Check whether an event was logged. Check the *Overcurrent Fault>Fault Events* screen to see whether the switch control detected and took action for an event.

STEP 7. Check the sectionalizing parameters. Check the *Setup>Automatic Operation* screen and the *Setup>Fault Detection* screen, make sure the parameters necessary for proper sectionalizing to occur have been configured.

Team does not return the circuit to normal

Follow these instructions to correct the problem:

STEP 1. Check the **Return to Norm Mode** setpoints. Connect the computer to the control and start IntelliLink Software. On the *Setup>Team* screen, check that the **Rtn to Norm Mode** setpoint is set properly for this team, to **Open** or **Closed** mode.

STEP 2. Check the present operation mode for each team member. On the *Team Operation* screen, make sure that the **Ready Status** field shows "READY." If not, check the **Operational Status**, **Line Status**, and **Configuration Status** fields for reasons the team may not be ready.

STEP 3. Check team communication. See the "Team Does Not Communicate" section above.

STEP 4. Be sure **Automatic Operation** mode is enabled. If **Automatic Operation** mode was disabled at any team member while the circuit was being reconfigured, the **Return-to-Normal** process was canceled.

LCD shows "ALARM" or "FAULT"

Check the *Team Operation* screen. Check the **Operational Status**, **Line Status** and **Configuration Status** fields for reason(s) the team is not in the **Ready** state.

DNP communication between PC and team members is not working

Follow these instructions to correct the problem:

STEP 1. Check team communication. See the "Team Does Not Communicate" section on page 16.

STEP 2. Make sure the serial port on the computer is connected to the cable from the Comm Port (usually Port B) on the bottom of the faceplate circuit board. Confirm the 6-pin IDC connector is fully seated in the socket.

STEP 3. Check the protocol and the DNP address used by the control. Start IntelliLink software on the computer. Select Tools>Options>Communication Setup. Make sure DNP is the selected protocol. Also check the Peer Address matches the DNP/RTU Address of the communicating team member. Be sure the **Timeout** and **Baud Rate** setpoints are correctly configured.

STEP 4. Check for error messages on the *Troubleshooting>Communications* screen. To perform this check, connect directly to the faceplate communication port and select TTY in the IntelliLink Communications Setup dialog box.

OVERCURRENT FAULT LED failed to show a load-side fault

Follow these instructions to correct the problem:

STEP 1. Check the *Overcurrent Fault>Fault Events* screen to see whether the switch control detected and took action on the fault. Go to Step 2 if it logged the fault. If not, go to Step 3.

STEP 2. Check the *Overcurrent Fault>Fault Events* screen to see whether the fault was cleared. For a normally closed switch, the faceplate OVERCURRENT FAULT LED is off when all of the following are true:

- Three-phase line voltage is sensed, the switch is closed, and 45 minutes have elapsed

- The faceplate REMOTE/LOCAL switch is operated

- The REMOTE LOCAL switch is set to the **Remote** state and the OVERCURRENT FAULT LED is cleared via SCADA

Note: If the switch control was reinitialized by an IntelliLink software command, the LED goes off, regardless of whether the conditions above have been met.

STEP 3. Check the *Setup>Fault Detection* screen settings. If no fault was recorded, check the values for the **...Fault Detection Current Level** and the **...Fault Duration Time Threshold** setpoints on the *Setup>Fault Detection* screen.

SCADA commands are ignored by the switch control

Follow these instructions to correct the problem:

STEP 1. Check for switch control power. See the "AC ON LED (on PS/IO board) is off" section on page 8 for details.

STEP 2. Check the faceplate REMOTE/LOCAL switch. Toggle the faceplate REMOTE/LOCAL switch to the **Remote** state.

STEP 3. Check the RTU address. At the *Setup>Communications* screen, check the **Communications RTU Address** setting used by this control. Make sure the SCADA master station is sending commands for this control to the correct address.

STEP 4. Check the communications hardware.

Operation Screen

The *Operation*, *Team Operation*, and *Troubleshooting* screens can check the present status of:

- This switch control
- Other team members
- Team operations

In addition, these screens can locate the cause for various team and team member problems. For more information about events that cause problems, see the "Fault Events Log" section on page 28 in Instruction Sheet 1042-541, "S&C 5800 Series Automatic Switch Controls With IntelliTeam® II Automatic Restoration system: *Operation*."

The *Operation* screen shows the present status of various switch control settings, any existing fault and error conditions, the battery, and the power line. See Figure 3.

This screen opens when IntelliLink Setup Software starts. To access this screen from any other screen, click on the **Operation** button, and then click on the **Local Operation** button.
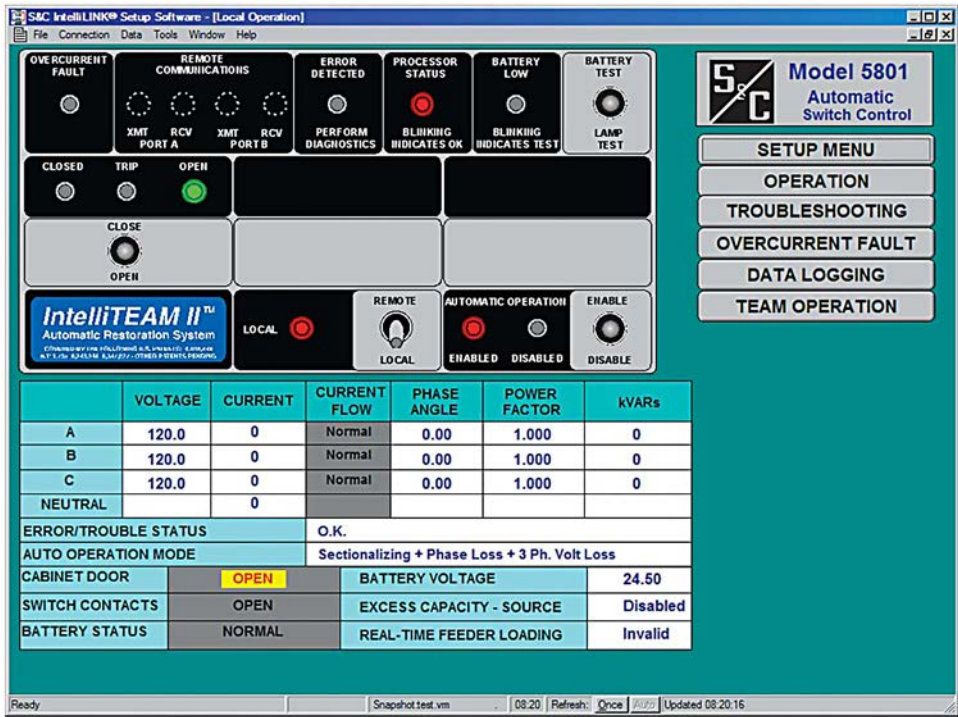

Figure 3. The *Operation* screen for a 5801 control.

The upper part of the screen shows the status of LEDs on the faceplate. For a full description of the LEDs and meanings, see Instruction Sheet 1042-541, "S&C 5800 Series Automatic Switch Controls With IntelliTeam® II Automatic Restoration system: *Operation*."

This screen also includes the following fields:

AC RMS Data:
Voltage, Current, Phase Ang., Rev. Current, Power Fac., kvars
These are the true RMS amplitude measurements for the three phases on each feeder. When applicable, only RMS current values are logged for Switch 3. The control takes a measurement every 0.2 seconds. Then, it averages eight measurements and displays the 1.6-second averaged value.

The control measures the phase angle between the voltage and current waveforms. The angle is reported as a value between 270 degrees and 90 degrees. A value between 270 and 356 indicates a leading power factor.

When the phase angle is outside the 270 to 90 degree range, the switch control displays a reverse current message and subtracts 180 degrees from the phase angle.

Error/Trouble Status

When the switch control detects an error or trouble condition, this field displays the message "Problems Present - See Troubleshooting Screen." When this message is present, see the "Event Status" section on page 28 for more information.

Auto Operation Mode [Switches 1 and 2, if applicable]

This field shows which stand-alone automatic-operation features are presently enabled (for example, **Sectionalizing + Phase Loss Protection** mode). These features are enabled and disabled on the *Setup>Automatic Operation* screen.

Cabinet Door

When the switch control enclosure door is open and the faceplate is receiving power, this field displays the message "Door Open." For switch control malfunctions that can also cause this message, see the "'Cabinet Door' on *Operation* screen shows wrong door status" section on page 12.

Switch Contacts

This is the present position of the switch contacts for each line switch:

"Open"	The switch is in a normal, fully open position.
"Closed"	The switch is in a normal, fully closed position.
"Bad"	The switch contacts are not mutually exclusive and the switch is not in motion.

Battery Status

This is the overall status of the battery system:

"Normal"	Enough charge is present to operate the line switch.
"Low"	The battery is in a marginal condition and line switch operation may or may not be possible.
"Bad"	The battery charge is too low to operate the line switch.

Battery Voltage

This is the battery voltage under normal operating loads, with the charger disconnected. When ac power is present, the control updates this voltage only during battery testing. When ac power is not present, this is the real-time measurement of battery voltage.

Excess Capacity - Source

This is calculated by subtracting the Real-Time Feeder Loading data (received through DNP) from the **Maximum Source Capacity** setpoint. The **Local Capacity** value will be calculated as it is presently. With Real-Time Feeder Loading data, Real Capacity at the configured source switch will then be computed as the lesser of either Local Capacity or Excess Capacity - Source. When the real-time data is invalid, Excess Capacity is then calculated as Maximum Source Capacity minus the Default Source Segment Load minus the Extended Load seen at the switch.

Real-Time Feeder Loading

This is the averaged three-phase total load of the feeder in amperes, received through DNP. This field displays "Invalid" if **Real-Time Feeder Loading** mode is not enabled, the information is old (not updated before the **Real-Time Feeder Loading Valid** timer expires), is received as zero amps, or the received data is less than the **Local Real-Time Load** value for the switch.

Team Operation Screens

The *Team Operation* screens show the present status of various team-related parameters for all members of the team.

To display the *Team Operation Menu* screen, click on the **Operation** button at any IntelliLink screen, and then click on the **Team Operation** button. See Figure 4.
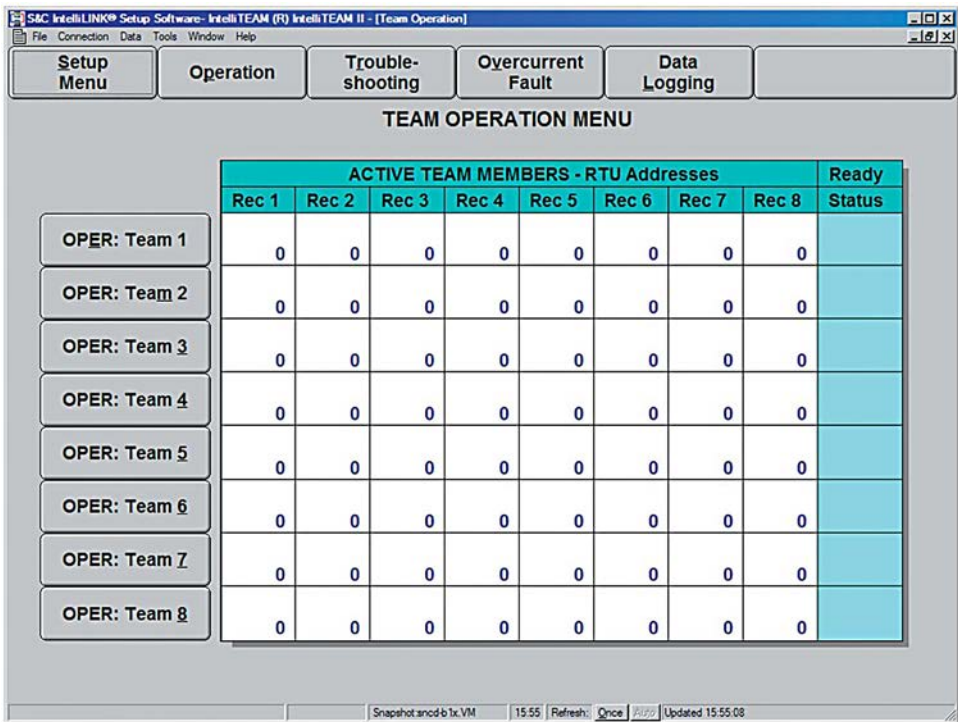

Figure 4. The *Team Operation Menu* screen.

The *Team Operation Menu* screen shows a summary of the DNP/RTU addresses for the teams where this switch control is a member and each team **Ready** status.

To display one of the *Team Operation* screens: At the *Team Operation Menu* screen, click the **OPER: Team X** button for the team to be accessed. Page 1 of the corresponding *Team Operation* screen opens. See Figure 5 on page 21.

Figure 5. Page 1 of the *Team Operation* screen.

The *Team Operation* screen Page 1 shows the present status of various team-related parameters and information for each team member.

Team ID
This is the name entered in the **Team ID** setpoint on the *Setup>Team* screen.

Ready Status
If the **Operational Status**, **Line Segment Status**, and **Configuration Status** fields all indicate no errors are present, "READY" is displayed in this field. If errors are present, "ALARM" is shown. FAULT will be displayed when the team is isolating a faulted line segment.

Operational Status

This is the operational status of the system. When the team members can perform team operations, this field displays "Good." Other possible values are:

"Coordination"	The team coach is not travelling among the team members, causing lack of team coordination.
"Remote Config"	The configuration of an adjacent team member is not consistent with the local team member's configuration.
"Local Config"	There has been a change to the local team configuration on the *Setup>Team* screen that has not yet been accepted.
"Remote Error"	An adjacent team member is indicating an error condition.
"Local Error"	The local switch is disabled—because of a **Bad Battery** or other condition, because **Automatic Operation** has been disabled, or because the switch has changed state from a faceplate or SCADA command.
"Logic Disabled"	Team Logic has been disabled on the *Setup>Team* screen.
"Not In Use"	This field is not used.
"No 2nd Contin."	This team is in a transferred state, but if an additional event occurs, no further transfer is allowed.

Configuration Status

This is the status of the user configuration parameters essential for team operation. Possible values are:

"NoRTU Addr"	No RTU address was specified on the *Setup>Communications* screen.
"Stop + Data Chg"	The **Team Setup** setpoint is in the **Stopped** state following a change made to the team parameters on the *Setup>Team* screen.
"Stopped"	The **Team Setup** setpoint is in the **Disabled** state on the *Setup>Team* screen.
"Data Change"	An unexpected change has been made to the team parameters on the *Setup>Team* screen.
"Record Count"	The count of team member records on the *Setup>Team* screen is incorrect. The team database must have at least one record to be valid.
"Not 1 Source"	An incorrect number of source switches was configured on the *Setup>Team* screen. A team may have one and only one source switch.
"No Local Rec"	No local record was found in the team database. One of the team records must contain an RTU address that matches the **DNP/RTU Address** entered on the *Setup>Communications* screen.

Line Segment Status

This is the fault and voltage-loss status of the line segment protected by this team of controls. If no fault or voltage loss is detected, this field displays "Good." The field can include a combination of possible values:

"Segment Dead (Dd)"	The line segment is deenergized.
"Segment Open (Op)"	All team switches are in the open position in preparation for a circuit reconfiguration.
"Overcurrent (OC)"	An overcurrent fault has been detected on the line segment protected by this team of controls.
"Voltage Loss (VL)"	A voltage loss event has been detected on this line segment within the Sectionalizer Reset Time or before this transfer event occurred.
"Team Error (Er)"	An error has been detected within the team, affecting the accuracy of the **Line Segment** status.
"Alt Source (AS)"	The line segment is being fed by an alternate source, either directly from an adjacent line segment or indirectly from another location.

Local Real-Time Load

This is the 2-minute average measured three-phase load, in amps, on the line segment protected by this team. This averaged load does not include the load measured beyond any of the switches serving load outside of the local line segment.

Real Capacity

This is the loading capacity available on the line segment protected by this team. This value takes into account the real capacity of any source-side teams, the maximum capacity of the team's present source switch, and any load that has already been transferred during team circuit reconfiguration.

Transfer State

This is the present state of any transfer operations. When no **Transfer** or **Return-to- Normal** process is in effect, this field displays "Idle." Possible values are:

"Idle"	The team configuration is normal, and no **Transfer** or **Return-to-Normal** operation is taking place.
"Init"	The first step of a transfer event, where information is quickly collected from all team members, is taking place.
"Rqst"	The stage of the transfer event when the line segment is requesting service restoration from an adjacent line segment is taking place.
"Grant"	The stage of the transfer event when the line segment has been asked to grant service restoration to an adjacent line segment is taking place.
"Wait"	The team is not in a normal configuration and is waiting for additional circuit **Reconfiguration** or **Return-to-Normal** events.
"RTN"	The team is actively returning to a normal configuration.
"Stop"	An error has been indicated either locally or remotely, causing a **Stop Transfer** condition.
"Fault"	This is a special **Transfer** state used by the team presently isolating a fault.
"Hold"	This **Transfer** state will be active when the team has begun a transfer event but the line segment is not yet fully de-energized, requiring that further transfer activity be delayed.

Individual Team Member Status

These fields apply to the individual team members in this team.

DNP/RTU Addr

This column shows the DNP/RTU address for each team member. This information was entered on the *Setup>Team* screen for this team.

Sw/Pos Num

This column shows the switch/position number associated with the team member (for example, "Sw1" for a single overhead switch). This information was entered on the *Setup>Team* screen for this team.

Normal State

This column shows the state of each line switch when the circuit is configured normally. This information was entered on the *Setup>Team* screen for this team.

Present State

This is the present position of each switch in the team:

"Open"	The switch is open.
"Closed"	The switch is closed.
"----"	The switch state is unknown or the record is not in use. This is the initial state of all switches and is considered an error condition during normal operation.

Auto Mode

This field shows the automatic features enabled for each team member. This information was entered for each team member on the *Setup>Automatic Operation* and *Setup>Team* screens. It also indicates whether the switch control has been temporarily placed in **Manual Operation** mode. The field can include a combination of possible values:

"M"	The switch control has been temporarily placed in **Manual** mode by a faceplate or SCADA command.
"A"	**Automatic Sectionalizing** mode has been enabled with the features configured on the *Setup>Automatic Operation* screen.
"V"	**Sectionalizing on Loss of Voltage** mode only is enabled.
"T"	**Automatic Transfer** mode has been enabled on the *Setup>Team* screen.
"Ro"	**Return-to-Normal** mode using an **Open** transition has been enabled on the *Setup>Team* screen.
"Rc"	**Return-to-Normal** mode using a **Closed** transition has been enabled on the *Setup>Team* screen.

Internal Error

This field displays "None" when no internal errors are present in a team member. Possible error values are:

"Trouble"	The switch is disabled because of a **Bad Battery** or other condition.
"NotAuto"	The switch has been placed into a **Non-Automatic** condition.
"ManOR"	The switch **Open/Close** state has been manually overridden by either a faceplate or SCADA command.
"No OP"	This switch detected an error in operation following a transfer event. A **Close** or **Open** operation was requested, but either the team member was unable to perform the operation or the switch tripped back open based on **Shots-to-Lockout** logic (**Close** request only). To clear this error condition, toggle the Automatic Operation ENABLE/DISABLE switch on the faceplate or via SCADA command.
"ProRes"	The switch received a **Prohibit Restoration** command.

Event Status

This is the present status of events related to this team member. The field can include a combination of possible values:

"O"	Latched overcurrent event
"V"	Latched voltage loss, any or all phases
"P"	Latched phase loss sectionalizing event
"Vr"	Real-time voltage loss, any phase
"3Vr"	Three-phase real-time voltage loss

Avg Load

This is the **2-minute averaged Three-Phase Load** value reported by each individual team member. This value is used when determining the **Local Real-Time Load** value. Following a circuit event, this value is frozen at the last value reported before the event began; this ensures the team uses pre-event values during the transfer. The value is not updated until after transfer completion.

Rev Current

This field displays "Active" when a team member senses reverse current.

Team Operation

To display the *Detailed Team Operation* screen, click on the **PgDn** button on the *Team Operation Menu* screen. See Figure 6.

Figure 6. The *Detailed Team Operation* screen.

The *Detailed Team Operation* screen provides a detailed view of the switch control's internal team database. See Figure 6.

The upper part of this screen displays information that is the same for all members of the team.

Coach ID

This field identifies the presently active coach. When a coach is lost, the next coach generated uses an identification sequence greater than the present number.

Coach Present

This field shows the automatic features enabled for each team member. This information was entered for each team member on the *Setup>Automatic Operation* and *Setup>Team* screens. It also indicates whether the switch control has been temporarily placed in **Manual** operation mode.

The field can include a combination of possible values:

"Reborn"   The coach is newly generated.

"SeekingBC"   The new coach is looking for the most recent copy of team data.

"Mature"   The coach contains the valid team data and is able to facilitate normal team functions.

Coach Counter

This is the ongoing count of times the present coach arrived at team members. The Coach Counter is used with the Coach ID to validate the coach when it is received by a team member.

Coach Flags

This indication, used by various functions within the team member, records a completed coach visit to this team member. It indicates team data in this team member have been refreshed.

Coach Sw Rec

This field shows the switch record of the switch position where the coach is present.

Team Visit Time

This field indicates how frequently a coach must arrive at this switch control.

Crumb Trail

This field holds a team database record as a marker that allows team functions to span multiple teams and have a path back to the originating team.

RTN Activity

This field shows the team database record where the **Return-to-Normal** process originated.

Present Source

This field indicates the switch through which the line segment is presently receiving power.

Segment Limit

This field shows the **Line Segment Limit** value entered on the *Setup>Team* screen or the **Segment Limit** value propagated from a source-side team, whichever is less.

Extended Load

This is the extended loading of the team, which includes the loading of the line segment and all downstream load.

Local RT Load

This field displays the local real-time load on the line segment protected by this team. It is the same as the **Local Real-Time Load** value on Page 1 of the *Team Operation* screen.

Local Capacity

This is the loading capacity of the local team. This value is compared with the remote capacity of the adjacent source-side team to determine the real capacity of the team.

Real Capacity

This field shows the loading capacity available on the line segment protected by this team. It is the same as **Real Capacity** value on Page 1 of the *Team Operation* screen.

Segments Added

This field shows the number of segments presently added. The team compares this value to the **Line Segment Limit** value on the *Setup>Team* screen when a transfer event occurs.

The center part of the screen contains a table of the team tasks presently being executed. This information is used for diagnostic purposes by S&C support engineers.

TaskID

This is the identification for the task to be executed.

TaskOwn

This is the team member where this task is to be executed. The task may also require global execution at all team members.

TaskSeq

This is the sequence number of the executing task.

TaskTTR

This is the Time-to-Run of the executing task.

Visit Timer

This is the countdown timer for the next time a specific team member should receive a visit from the coach. Every team member is listed.

Event Sequence

This is the sequence number of the last event received from this team member. Every team member is listed.

Event Status

The *Troubleshooting>Event Status* screens show the present status (active or inactive) of several troubleshooting-related events. The fields on these screens are grouped into five categories: Normal Events, Trouble Conditions, Switch Not Ready Conditions, Team Events, and Team-Related Conditions.

The *Troubleshooting>Special Event Counters* screen shows the count of special troubleshooting events.

To display Page 1 of the *Troubleshooting>Event Status* screen, click on the **Troubleshooting** button on any IntelliLink screen, and then click on the **Event Status** button. See Figure 7.
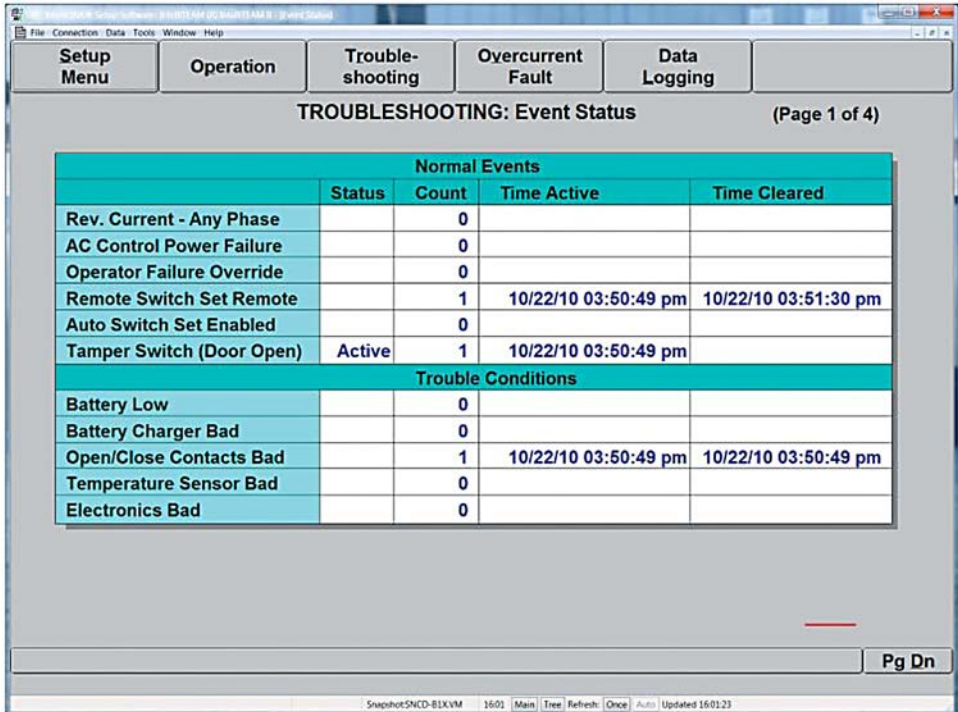

Figure 7. Page 1 of the *Troubleshooting>Event Status* screen (5801 control shown).

This screen contains five columns:

(no title)	This the name of the event.
Status	If the status of an event is "Active", it means that the condition presently exists. If there is no entry, the condition does not exist.
Count	This is the number of times this event or condition has occurred since the last time the switch control was reset. If the control software is reloaded (not updated), the counts are reset to zero.
Time Active	This is the most recent time the event status became "Active."
Time Cleared	This is the most recent time the event status became "Inactive."

Normal Events

The events named in the first column are conditions that may occur routinely during normal operations but may also indicate a problem.

Rev. Current - Any Phase

This field displays an "Active" message when reverse current flow is detected on any single phase.

Ac Control Power Failure

This field displays an "Active" message when ac power is not present at the power supply/control I/O board. For corrective actions, see the "All LEDs on the Faceplate are Off" section on page 8.

Operator Failure Override

This field displays an "Active" message when the SCADA operator sends a **Failure Override** command to the switch control. This command enables the line switch to be opened and closed by the operator even when the **Battery Low** state is active.

Remote Switch Set Remote

This field displays an "Active" message when the faceplate REMOTE/LOCAL switch is in the **Remote** state.

Auto Switch Set Enabled

This field displays an "Active" message when the faceplate Automatic Operation ENABLE/DISABLE switch is in the **Enabled** state. A **Stop Transfer** condition exists when **Automatic Operation** mode is in the **Disabled** state.

Tamper Switch (Door Open)

This field displays an "Active" message when the switch control enclosure door (S&C 5801 control) or the low voltage cabinet door (S&C 5802/5803 control) is open.

Trouble Conditions

These are conditions which clearly indicate a problem, but may not prevent line switch operation.

Battery Low

This field displays an "Active" message when the predicted battery voltage under load is below the **Battery Low** setpoint.

Battery Charger Bad

This field displays an "Active" message when the battery is being charged at an abnormally high voltage.

Open/Close Contacts Bad – Switches 1, 2, and 3

This field displays an "Active" message when the open and close contacts on the line switch are not mutually exclusive, and the switch is not in motion.

Temperature Sensor Bad

This field displays an "Active" message when the switch control temperature sensor reports outside its valid range.

Electronics Bad

This field displays an "Active" message when the switch control self-diagnostic software confirms a hardware problem. **Automatic Operation** mode is latched in the **Disabled** state, and the latch can only be cleared through local intervention with an IntelliLink software command (or remotely with a WinMon® Graphical User Interface or IntelliLink® Remote Setup Software command). Use the CLEAR dialog box on this screen to clear this message. See Figure 7 on page 28.

Switch Not Ready Conditions

To display Page 2 of the *Troubleshooting>Event Status* screen, click on the **Troubleshooting** button on any IntelliLink screen, and then click on the **PgDn** button on Page 1.
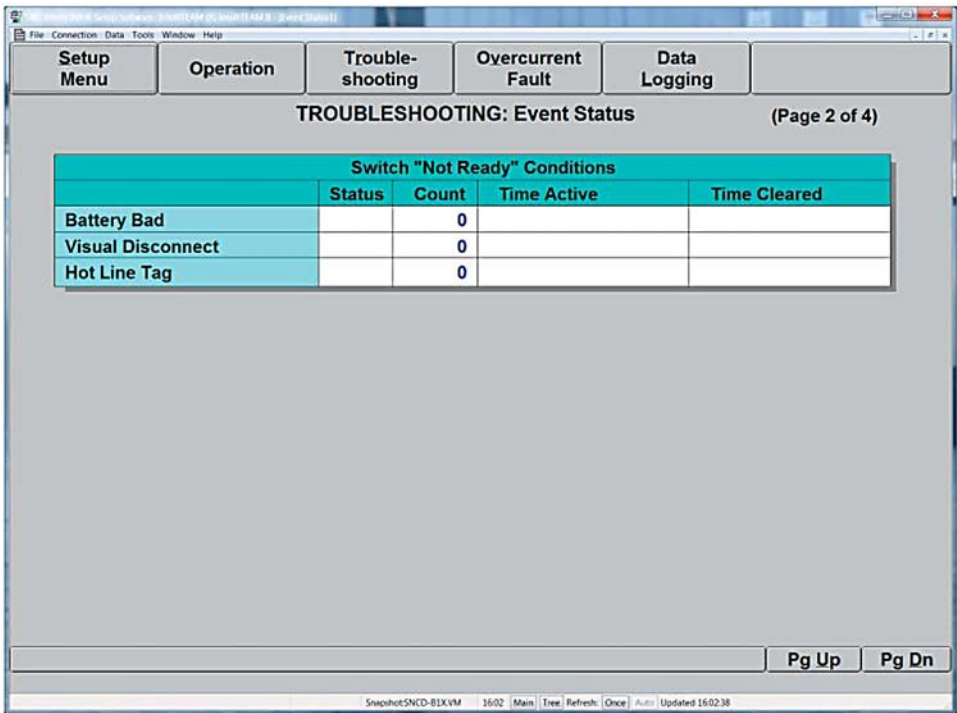

Figure 8. Page 2 of the *Troubleshooting>Event Status* screen, 5801 Control shown.

For an explanation of the five columns on this screen, see Figure 7 on page. Page 1 of the *Troubleshooting>Event Status Screen* on page 28.

These are conditions that prevent operation of the line switch. For S&C 5802/5803 controls, the **Switch Not Ready** conditions are reported on Page 3 of the *Troubleshooting>Event Status* screen. Click on the **PgDn** button on page 2 to display this screen. See Figure 8.

Battery Bad

This field displays an "Active" message when the predicted battery voltage under load drops below the **Battery Bad** setpoint.

Visual Disconnect (S&C 5801)

This field displays an "Active" message when visual disconnect contacts (if applicable) are open on the line switch. The condition clears when the contacts are closed.

Hot Line Tag

The **Hot Line Tag** feature modifies both automatic and manual operation of the switch control and prevents the control from closing the switch.

Hot Line Tag mode can be set and cleared with DNP 3.0 SCADA commands. **Latch On** sets **Hot Line Tag** mode, and **Latch Off** clears it. A DNP binary status point communicates the **Hot Line Tag** state, 1 indicates active and 0 indicates inactive.

Hot Line Tag mode may only be set if the following conditions are true:

• The switch must be open.

• The switch contacts must be consistent.

• No switch operation may be pending.

If any of these three conditions are not met, the control will return a **Hardware Error** DNP response to the **Set Hot Line Tag** command, and **Hot Line Tag** mode will remain cleared.

When **Hot Line Tag** mode is set or active—switch closing is inhibited by these means:

- Locally with the front-panel toggle switch
- Locally with directly connected IntelliLink software
- Remotely with IntelliLink Remote Setup Software
- Remotely with a DNP SCADA command
- Automatically by an IntelliTeam II operation

The sole exception to inhibiting a **Close** command is the manual operating mechanism on the switch (hot-stick operation). A 5801 switch control cannot block hot-stick operation of the switch. A hot-stick operation does not clear an active 5801 **Hot Line Tag** state, and any 5801 control **Close** command is still inhibited.

Setting **Hot Line Tag** mode on an open switch in an IntelliTeam II system will take the switch, and the teams where that switch is a member, out of the **Ready** state. When the **Hot Line Tag** mode is cleared and the switch and its teams will be restored to the **Ready** state, if the switch was in a **Normally Open** state before the **Hot Line Tag** mode was set. If the switch was in a **Normally Closed** state and it was opened to set the **Hot Line Tag** mode; to return the team(s) to the **Ready** state, clear the **Hot Line Tag** mode, close the switch, and clear the **Manual Operation** state.

Hot Line Tag status is displayed in the Maintenance category on the LCD screen. When **Hot Line Tag** mode is set, the LCD screen displays the message "Caution: Hot Line Tag Applied." While **Hot Line Tag** mode is active, LCD data scrolling is disabled and only this message is displayed. When the **Hot Line Tag** mode is cleared, confirmation of this status is provided by scrolling the LCD data to "Hot Line Tag Status" in the Maintenance category, and the message displayed is "Hot Line Tag Cleared."

These conditions can be reported by S&C 5802/5803 controls:

Low Pressure (Vista® Underground Distribution Switchgear)

If applicable, this field displays an "Active" message when the switch control detects low SF_6 pressure inside a switch equipped with low-pressure sensing.

Switch in Local Mode – Switch 1, 2, or 3

This field displays an "Active" message when the external REMOTE/LOCAL switch, located in the PM Operator compartment, is set to **Local** state.

Vista Switchgear in Local Mode

This field displays an "Active" message when the external REMOTE/LOCAL switch on Vista switchgear is set to **Local** state.

Position 1 or 2 Grounded – Vista Switchgear

This field displays an "Active" message when the switch has been opened and set to the ground position.

Switch Voltages Disagree – Vista Switchgear

This field displays an "Active" message when Switches 1 and 2 are closed and their voltages disagree by greater than 10 volts; this indicates at least one voltage sensor is generating bad voltage. When "Active" is displayed, the switch control will disable all automatic operation. "Active" is latched at the first occurrence of mismatched voltage. The latched "Active" display is reset when the control doesn't generate any more mis-readings within a user-configurable time period, or if reset by a **Disable Automatic Operation** command from the faceplate or through SCADA.

To display Page 3 of the *Troubleshooting>Event Status* screen, click on the **Troubleshooting** button on any IntelliLink screen, and then click on the **PgDn** button until Page 3 opens. See Figure 9.

Figure 9. Page 3 of the *Troubleshooting>Event Status* screen (5801 control shown).

For an explanation of the five columns on this screen, see the "Event Status" section page 28.

These are team-related conditions which may occur routinely during normal operation, but which may also indicate a problem.

Switch not xfer rdy

This field displays an "Active" message when the switch operation is not consistent with the expected team operation (i.e. incomplete or manual switch operation). This field is also active if the switch control is disabled, **Automatic Operation** mode is disabled, or **Switch Position** indication is inconsistent.

Not all teams xfer rdy

This field displays an "Active" message if any teams in which the switch control participates are not fully operational. This may be due to error conditions at individual team members (see the "Switch not xfer rdy" section above), or team-wide conditions such as isolation of a fault, team-configuration errors, team-coordination errors, **Automatic Restoration Prohibited** mode, and **Team** logic is disabled on the *Team>Setup* screen. If the "Switch not xfer rdy" message is active in one switch control of a team, this will cause the indication to be set in the other team members.

Xfer in Progress

This field displays an "Active" message while the team is in the process of reconfiguring the circuit and transferring load to an alternate source.

RTN in Progress

This field displays an "Active" message while the team is returning the circuit to its normal configuration.

SCADA Prohibit Rest

This field displays an "Active" message when a SCADA command prohibits restoration. The SCADA command affects all teams associated with this switch control.

Timer Prohibit Rest

This field displays an "Active" message when the **Prohibit Restoration** timer for that team runs out. The timer command only affects the team on which it has expired. When enabled, the timer countdown will be initiated at the same time a **Transfer** process begins at the team, usually at the time a **Sectionalizing** event occurs. Although it will often be the case that timers in adjacent teams start simultaneously, there is no requirement for this to occur. Each team will decrement its timer independently from other teams, so teams may potentially enter the **Prohibit Restoration** state asynchronously.

⚠ WARNING
Because teams may asynchronously enter the **Prohibit Restoration** state, one or more disconnected teams throughout a circuit, or a system, may be prohibited from further automatic restoration activity, while others may continue as necessary for subsequent events. For this reason it is extremely important that standard safety practices are adhered to when working on a circuit that has been involved in automatic transfer and restoration. Disabling **Automatic Operation** mode and tagging devices are strongly recommended before performing any manual switching or repair work.

Prohibit Restoration status can be changed on the *Prohibit Restoration* screen. See Instruction Sheet 1042-541, "S&C 5800 Series Automatic Switch Controls With IntelliTeam® II Automatic Restoration System: *Operation.*"

Team Trouble Conditions

These are team-related conditions which clearly indicate a problem and will prevent team operation.

Setup Data Revision

This field displays an "Active" message when the configuration data for an enabled team has been modified. It remains active until the field is disabled and then re-enabled. This error can be cleared in two ways:

- Set the **Team Setup** setpoint on the *Setup>Team* screen to the **Stopped** state. Then, set it to the **Running** state.
- Reload the team configuration data using IntelliLink software. Select File>Load Setpoints. This process automatically stops and restarts the **Team Setup** setpoint.

Err get local switch data

This field is not presently used.

To display the *Troubleshooting>Special Event Counters* screen, click on the **PgDn** button on Page 3 of the *Troubleshooting>Event Status* screen. See Figure 10.
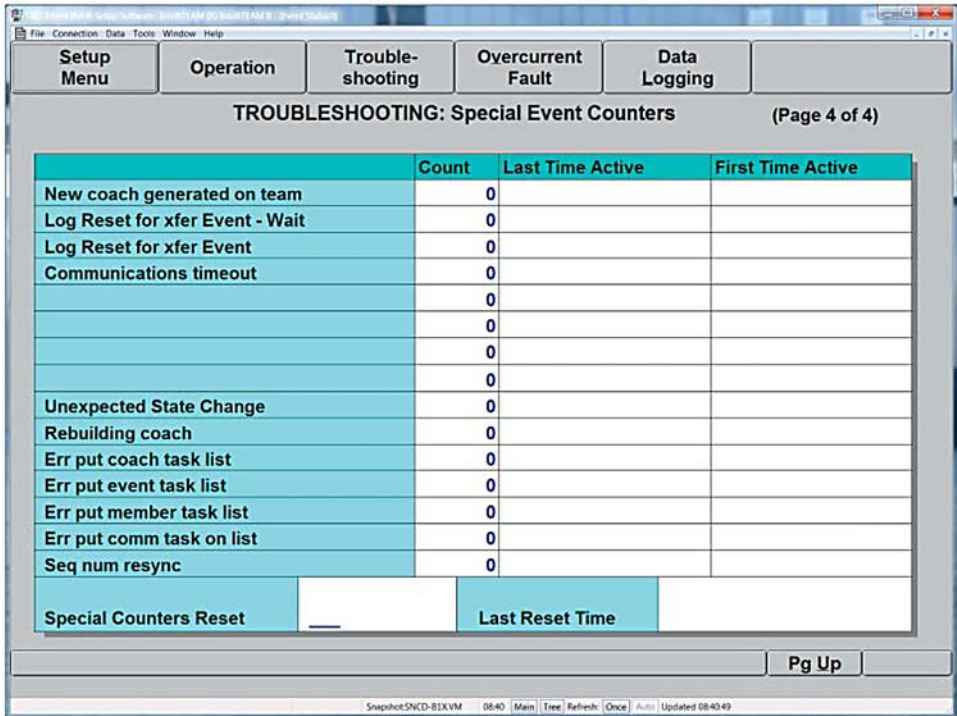

Figure 10. The *Troubleshooting>Special Event Counters* screen (5801 control shown).

This screen has four columns:

(no title)	The name of the event.
Count	The number of times this event has occurred since the last time the switch control was reset. If control software is reloaded, not updated, the counts are reset to zero.
Last Time Active	The most recent time the event occurred.
First Time Active	The first time the event occurred after the switch control was reset or the team events log was cleared.

New coach generated on team
This event occurs when the coach does not arrive within a predetermined time. This causes the team member to generate a new coach and attempt to restore team synchronization.

Log Reset for Xfer Event - Wait
This event occurs when the **Logging Options** setpoint on the *Troubleshooting>Team Events Log* screen is set to **Logging Active, Clear on Next Xfer** mode and a transfer event takes place. The switch control also records a message at the start of the log.

Log Reset for xfer Event
This event occurs when the **Logging Options** setpoint on the *Troubleshooting>Team Events Log* screen is set to **Logging Active, Clear on Each Xfer** mode and a transfer event takes place. The switch control also records a message at the start of the log.

Communications timeout
This event occurs when any team message is not successfully transmitted via DNP.

Unexpected State Change

This event occurs when the coach requests an action from IntelliTeam II logic that is out of the normal sequence of actions. When this occurs, the coach is forced to reevaluate the course of action before continuing implementation of that logic.

Rebuilding coach

When the team member's **Coach Visit** timer expires before the coach returns, that member generates and transmits a new coach. The new coach travels among the team members. When it arrives at the team member with the most recent team information, it recognizes it has accessed the latest information and becomes a mature coach. The **Rebuilding Coach** counter is incremented whenever the team member is visited by a new coach that has not yet become mature.

Err put coach task list

This event occurs when a list of pending tasks the coach carries between team members is full. No more tasks can be put on this list until one or more of the existing tasks have been completed.

Err put event task list

This event occurs when a list of pending team-related tasks is full. No more tasks can be put on this list until one or more of the existing tasks have been completed.

Err put member task list

This event occurs when a list of pending member-process tasks is full. No more tasks can be put on this list until one or more of the existing tasks have been completed.

Err put comm task on list

This event occurs when the coach or the team member needs to send a new message to another team member and the DNP communications buffer is full. Existing transactions must be completed before more are put in the communications buffer.

Seq num resync

This event occurs when the sequence numbers of events have become un-synchronized.

Special Counters Reset

When this field is set to **Reset** mode and the **OK** button is clicked, the counters and timestamps on this screen are cleared.

Last Reset Time

This field shows the time and date when the counters on this screen were last cleared.

Chronological Log

The *Troubleshooting>Chronological Log* screen shows a chronological list of events related to troubleshooting. Each time an "Active" message is added or removed on page 1 of the *Troubleshooting>Event Status* screen, the switch control reports the event on this log.

To display the *Troubleshooting>Chronological Log* screen, click on the **Troubleshooting** button on any screen, and then click the **Chronological Log** button.
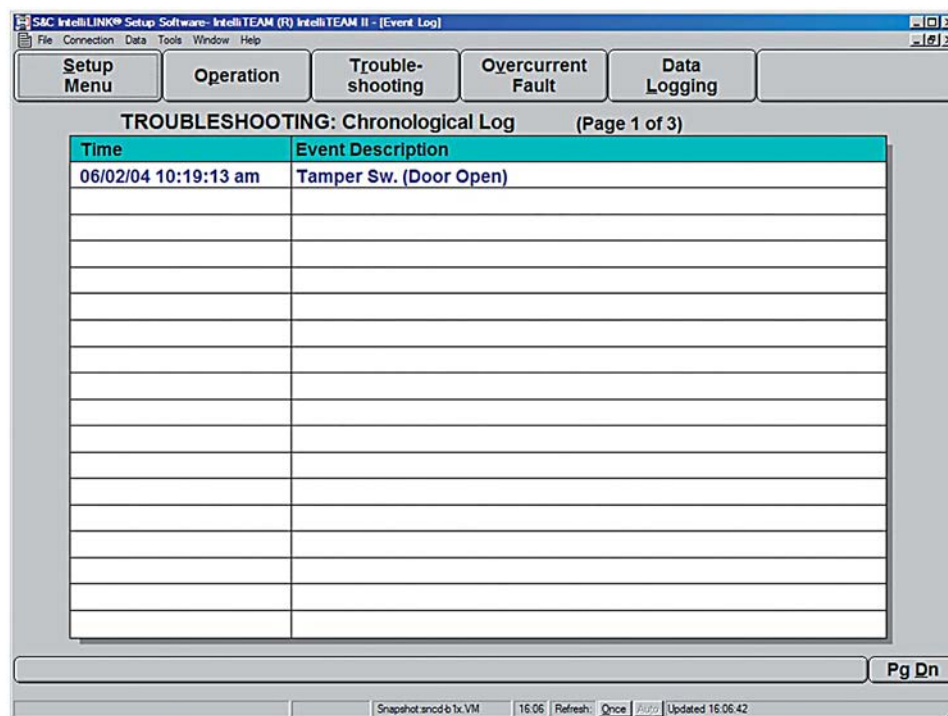

Figure 11. The *Troubleshooting>Chronological Log* screen.

The log can hold three pages of information. When the log is full, each new event overwrites the oldest event in the log. To find the most recent event, look for the message with a timestamp older than the time for the message above it. See Figure 11.

For an explanation of each event, see the "Event Status" section on page 28.

Team Event Log

The *Troubleshooting>Team Event Log* screens show a chronological list of team-related events. Each time an "Active" message is added or removed on the *Troubleshooting>Event Status* screen or on the *Troubleshooting>Special Event Counters* screen, the switch control reports the event on this log.

To display the *Troubleshooting>Team Event Log* screen, click on the **Troubleshooting** button on any screen, and then click the **Team Event Log** button.

Figure 12. The *Troubleshooting>Team Event Log* screen.

The log can hold eight pages of information.

Event Description

The event message, along with the values for **Data x** and **Data y**, describes the event and action(s) taken. There are three categories of messages—Normal, Extended, and Trace All—based on the filter choosen. See the "Filter" section on page 47.

If an event message refers only to Data x, then any value in the Data y column is diagnostic information used by the S&C engineering staff.

The following messages are logged for all values of the **Filter** setpoint:

3ph VL sect. enabled by team member

Three-Phase Voltage Loss Sectionalizing mode has been enabled at this team member because the team is in the **Ready-to-Transfer** state.

3ph VL sect. disabled by team member

Three-Phase Voltage Loss Sectionalizing mode has been disabled at this team member because of a problem within the team, either at this team member or at one of the adjacent team members. Provided **Automatic Operation** mode has not been disabled at this team member, while in this state this team member will sectionalize using standard standalone sectionalizing logic. This requires the detection of overcurrent prior to a three-phase voltage loss in order to arm the **Sectionalizer** mode.

3ph VL sect. disabled by timer

Three-Phase Voltage Loss Sectionalizing mode has been disabled at this team member because of expiration of a timer associated with team activity. When this timer is not updated during normal team operation, it is assumed the team is not operational, possibly due to a change in team configuration and this team member should fall back to **Standard Standalone Sectionalizing** mode.

Adjust line segment count, team x

The switch control has increased or decreased the line segment count associated with its line segment.

All teams are transfer ready

All teams are fully operational, and may close switches as necessary to transfer load and reconfigure the circuit.

Not all configured teams xfer ready

At least one of the active teams where the local control is a member is not fully operational.

Close switch ok, team x, sw y

The switch and position indicated was successfully closed by the specified team.

Close switch fail, team x, sw y

The switch and position indicated failed to close or remain closed after a request by the specified team. **Automatic Operation** mode may have been disabled at this team member, or the switch may have reopened during the **Shots-to-Lockout Time** period.

Config. update, operation suspended

The team configuration of any of the active local teams is being changed on the *Setup>Team* screen. While this change is in progress, **Team** operation mode is suspended.

Config. update, operation resumed

The **Team** configuration mode of any of the active local teams has been re-enabled on the *Setup>Team* screen. **Team** operation mode is resumed.

Contract approved switch close, team x

The specified team requested a contract, which then traveled to the granting agent, was approved, and came back. The switch has closed to energize the line segment.

Contract declined, team x

The contract request made by the specified team was declined.

Contract dissolved by member, team x

The local team member has started the process to dissolve an active contract on behalf of the specified team.

Contract reactivated, agent x

The contract is missing somewhere along its routing path, so the requesting agent reactivated the contract. The number for the specified agent is associated with the RTU address at the originating team member.

Contract requested by member, team x

The local team member has requested that the contract agent negotiate a contract on behalf of the specified team.

Control feature ok, team x, point y

Indicates the requested control feature executed normally. Possible point values are:

Code	Meaning
1	Point to operate switch
2	Point to block reclosing
3	Point to block ground trip
4	Point to block voltage trip
5	Point to block frequency trip
6	Point to change profile

Control feature fail, team x, point y

As above, but indicates the requested control feature did not succeed.

Error get local switch data, team x

An error was detected when the IntelliTeam II software retrieved data for the local switch in the specified team. This may occur if the switch/position number configured on the *Setup>Team* screen is incorrect.

Find alt src result, team x, rec y

During a transfer event, the team must find an alternate source, based on the alternate source sequence and the normal function of the switches within the team, both entered on the *Setup>Team* screen. This message indicates the resulting switch record to be used for the team indicated.

Line segment faulted, team x

The line segment protected by the specified team is the location of the overcurrent fault on the circuit. The team will not attempt to restore service to this line segment.

Log reset for xfer event

A transfer event occurred with the **Logging Options** mode set to the **Logging Active, Clear on Each Xfer** state. The team member cleared the log and will save the data until the next transfer event or until another logging option is selected. See the "Logging Options" section on page 48 for more details.

Log reset for xfer event, wait user

A transfer event occurred with the **Logging Options** mode set to the **Logging Active, Clear on Next Xfer** state. The team member cleared the log and went into **Logging Active, Hold When Full** mode. The team member will save the data until another logging option is selected. See the "Logging Options" section on page 48 for more details.

Max count for event above reached

The number of times the previous log message has been displayed has reached the maximum number of entries for this message. See the **Message Dup. Limit** setpoint on page 47.

New coach generated on team x

A new coach has been generated at the local team member for the specified team. This could be caused by a power up state, by the existing coach being lost due to communication failure, or by the existing coach data being inconsistent.

Register event disabled, team x

The registering of events for distribution within the specified team has been disabled at the local team member. This was probably caused by a change in the team's configuration on the *Setup>Team* screen.

RTN continue ok, team x, code y

The internal **Return-to-Normal** process for the specified team indicated the **Return-to-Normal** process may continue to the next step. The process result code is also shown.

RTN return failed, team x, code y

The internal **Return-to-Normal** process for the specified team indicated the **Return-to-Normal** process cannot continue. This may be caused by a team member that has **Return-to-Normal** mode disabled (code 7) or by the adjacent source team not yet being in its normal state (code 6).

RTN disabled at switch, team x

The **Return-to-Normal** process will not be carried out on the specified team because **Return-to-Normal** mode is disabled on the *Setup>Team* screen.

RTN in progress on any team

A team is presently returning the circuit to its normal configuration.

RTN not active on any team

No teams are presently returning the circuit to its normal configuration.

RTN start event request, team x

The **Return-to-Normal** timer has expired, allowing the **Return-to-Normal** process to start on the specified team. This message indicates that the specified team generated the event.

RTN start event received, team x

The local team member of the specified team received a request to start the **Return-to-Normal** process. This follows the end of the **Return-to-Normal** timer and the subsequent event request.

RTN timer started, team x

The **Return-to-Normal** timer was started by the local team member of the specified team.

SCADA Prohibit Restoration Active

A SCADA command was received to prevent the restoration of any load by this team member, and the switch may not close automatically. However, **Automatic Sectionalizing** mode is not affected. If applicable, this message will also be displayed on power up.

SCADA Prohibit Restoration Cleared

A SCADA command was received to re-enable the restoration of load by this team member, and the switch may be closed automatically. If applicable, this message will also be displayed on power up.

Software mismatch on arriving coach

There is a software revision incompatibility within the team. The data fields show revision and version information for the team member from which the coach just arrived.

Switch not xfer ready, team x, sw y

The local switch on the specified team is not ready for transfer operations. This may be caused by an internal switch error (for example, a **Bad Battery** state), the Automatic Operation ENABLE/DISABLE switch is in the **Disable** state, or the switch has been manually operated from the faceplate or a SCADA command.

Switch is xfer ready, team x, sw y

The local switch on the specified team is ready for transfer operations.

Switch open fail, team x, sw y

The specified team was unable to open the switch/position indicated.

Switch open ok, team x, switch y

The specified team successfully opened the switch/position indicated.

Switch open to break extended parallel

During a closed transition **Return-to-Normal** event, the team member at a tie switch automatically opened the switch after a prescribed time. This ensured a circuit parallel was not left in place indefinitely. This condition is not normal and may have resulted in load being dropped.

Sw opened for xfer, team x, sw y

During a **Transfer** event, the coach of the specified team opened the switch indicated to allow the **Transfer** operation to continue. This may occur when one or more switches within the team are not coordinated to open at the same time as the other switches.

Timer Prohibit Restoration Active

The **Prohibit Restoration** timer expired, preventing restoration of load by the team for which the timer expired, however, **Automatic Sectionalizing** mode is not affected. If applicable, this message will also be displayed on power-up.

Timer Prohibit Restoration Cleared

A SCADA command was received to re-enable the restoration of load by this team member, and the switch may be closed automatically. If applicable, this message will also be displayed on power-up.

Transfer approved, team x, code y

The **Transfer** operation requested by the specified team, using the alternate source switch previously determined, was approved by the adjacent teams. The approval code is also shown. Contact S&C for information about the code definitions.

Transfer declined, team x, code y

The **Transfer** operation requested by the specified team has been declined by the adjacent teams. The requesting team must look for another alternate source or retry the operation on this alternate source if no other exists. Possible codes are:

Code	Meaning
2	Fault isolated
3	Excessive load
4	Open team not prepared for the transfer
5	Closed team not prepared for the transfer
6	Line segment limit exceeded
7	Problem detected on one of the teams
8	Phase loss isolated
9	Source breaker isolated

Transfer in progress on any team

A team is in the process of reconfiguring the circuit and transferring load to an alternate source.

Transfer not Active on any team

No teams are presently reconfiguring the circuit or transferring load.

Extended Messages

The following messages are also logged when the **Filter** setpoint is set to **Extended** or **Trace All** mode:

Error getting all switch data

An error was detected when the IntelliTeam II software collected data related to the internal switch function.

Error clrd - getting all switch data

The error collecting data related to the internal switch function was cleared.

Error get comm task from list

An error was detected when removing a message from the DNP communications buffer.

Error put coach task list, team x

The list of pending tasks that the coach carries between team members is full in the specified team. No more tasks can be put on this list until one or more of the existing tasks have been completed.

Error put comm task on list

The coach or the team member needs to send a new message to another team member and the DNP communications buffer is full. Existing transactions must be completed before more are put on the communications list.

Error put event task list, team x

The list of pending team-related tasks is full in the specified team. No more tasks can be put on this list until one or more of the existing tasks have been completed.

Error put member task list, team x

The list of pending member-process tasks is full in the specified team. No more tasks can be put on this list until one or more of the existing tasks have been completed.

Message timeout, team x, code y

A message on the comm list for the specified team has timed out, based on a timer in either the IntelliTeam II software code 1 or in DNP code 2.

Rebuilding coach, team x, code y

The coach for the specified team is being regenerated. This may be caused by a power up event, a configuration change in the team, or a lost coach due to communication failure. A diagnostic code is also shown. Contact S&C for details about the code.

Seq num resync, team x

The sequence numbers of events for the specified team have fallen out of synchronization. The local team member will now re-synchronize the number. This involves the coach going to each team member to clear out old events, and then re-initializing the event handling logic.

Trace All Messages

The following messages are only logged when the **Filter** setpoint is set to **Trace All** mode:

Action path complete, team x

This message is displayed when the action path for operating the switch has completed all possible steps in either the forward or reverse direction.

Alt source flag cleared, team x

The line segment associated with the specified team is no longer being fed from an alternate source. This message usually follows a **Return-to-Normal** operation.

Bad received mesg type, team x, type y

An IntelliTeam message was received but contains a message type that is not recognized. The team the message was intended for, and the message type received, are included in the data.

Coach arrived for team x

This message logs the arrival of the coach, along with all the updated data, at the local team member for the specified team.

Coach arrived on request, team x

This message logs the arrival of the coach at the local team member of the specified team after the local team member requested the coach.

Coach collect data, team x, goto y

This message logs the collection of new data by the coach in the specified team. This data-collection process occurs during the start of a transfer event. The team record where the coach is going is also shown.

Coach is held by member, team x

The coach for the specified team is being held by the local team member. This occurs when a process is taking place at the local team member that requires the presence of coaches from both adjacent teams.

Coach hold override, team x, goto y

When the team member of the specified team holds the coach for an extended period of time, an override occurs that allows the coach to briefly visit other team members. This prevents the coach from becoming old and regenerated by an adjacent team member. The team record where the coach is going is also shown.

Coach left, team x, goto record y

This message logs the departure of the coach from the local team member for the specified team and indicates where the coach is going next.

Coach Old, dup or CRC bad, team x

The coach received by the specified team is not the current coach (Old, code 1), it is a duplicate of the current coach (dup, code 2), or it contains data inconsistent with the presently expected data (CRC bad, code 3). The coach is rejected.

Contract added to list, team x, team y

A new contract was added to the list of contracts being maintained. This message shows both the requesting and granting teams associated with the transfer process. The requesting team (team x) identifies the origin of the contracts.

Contract cannot travel, agent x

The requesting contract agent does not know where the present source is, so it could not forward the contract request. The contract failed. The number for the specified agent is associated with the RTU address at the team member.

Contract comm received, team x, team y

The contract agent has received a message. Team x refers to the contract's originating segment, and team y refers to the temporary segment (usually the segment through which the message just passed).

Contract dup rcvd, agent x, state y

The specified requesting agent received an old or duplicate contract message, which refers to the indicated contract state. The number for the agent is associated with the RTU address at the team member.

Contract failed list add, agent x

A contract agent tried to add a new contract to its list but could not, so the contract was declined. The number for the specified agent is associated with the RTU address at the originating team member.

Contract general error, agent x

The specified contract agent detected a contract error. The number for the agent is associated with the RTU address at the team member.

Contract is being dissolved, agent x

An active contract is no longer needed and is in the process of being dissolved. The number for the specified agent is associated with the RTU address at the originating team member.

Contract maintained, agent x

Scheduled maintenance of a contract was performed by the specified requesting agent to confirm the continued need for the contract. The number for the agent is associated with the RTU address at the team member.

Contract not found, agent x

A contract agent received a message about a contract that is not in its list. This may result in the contract being dissolved and, if necessary, reactivated. The number for the specified agent is associated with the RTU address at the originating team member.

Contract pending fail, team x, team y

The requesting contract agent was waiting for a response when the timer ran out, so it failed the contract. The coach may restart the contract request if it cannot find another alternate source. This message shows the two teams involved with the transfer process at this team member location, where team x is the requesting team.

Contract receiver busy, agent x/y

A contract agent's receiver buffer was full, so a contract message was dropped. The numbers for the specified agent are associated with the RTU address at the originating team member.

Contract request travel team x, sw y

A contract request is travelling between teams. Team x is the segment through which the request just came, and sw y is the team member in the direction where the request is headed.

Contract request was accepted, agent x

The granting agent accepted the contract. The number for the specified agent is associated with the RTU address at the originating team member.

Contract request was declined, agent x

The granting agent declined the contract request. The number for the specified agent is associated with the RTU address at the originating team member. This message can appear at any agent with the contract on its list.

Contract requires member wait, team x

The specified team is waiting for a contract to be requested, granted, or declined.

Contract resource limitation, code x

A contract agent found resources were not available for load transfer because of either segment limitations (code 2) or capacity limitations (code 3). The contract agent did not forward the contract any further.

Contract started by member, team x

A member of the specified team has determined it can close based on information from the coach, but it must first request a contract.

Contract transmit busy, agent x

A contract agent's transmit buffer was full. The message is held until the transmit buffer has space and is then sent. The number for the specified agent is associated with the RTU address at the originating team member.

DNP feeder loading data rcvd, data X

Feeder loading data have been received from the source substation or breaker and may be used in determining the capacity of the circuit during transfer operations. Data x indicates the circuit loading received in increments of 10 amps per count.

Event register ok, team x, task y

The task indicated has enabled event registering for the specified team. The registering of an event is the process of making all team members aware an event has occurred.

Internal test point, data x, data y

This is a general internal message to display data that may be helpful during diagnostics. For details about the code, contact S&C Electric Company.

Loading data reset, team x, code y

When a transfer with a known load value occurs, the IntelliTeam II software resets the loading data to reflect the new value. This updates the information more quickly than the 2-minute load averaging. The code relates to the state of the reset process.

Member cleared task lock attributes

The team member logic cleared the execution lock on tasks present on the task list. These tasks may now be executed by the team member.

Member requested, team x, task y

The specified team has requested that the local team member execute the task indicated.

Monitor line segment, team x

The specified team has an indication to start a transfer event, but the line segment is still energized. The team monitors the segment until it is de-energized.

Next action, action x, direction y

The operation of the switch gear is progressing to the next action within the action path. Data x indicates the action to be taken and can be one of the following codes.

Code	Meaning
0	Action path done
30	Close for xfer
76	Contract request
83	Contract terminate
84	Block recloser
85	Unblock recloser
87	Block ground trip
88	Unblock ground trip
90	Alternate settings
91	Normal settings

Data y is the direction the action path is going, either forward (1) or reverse (2).

Not Rdy, discard task, team x, task y

The indicated task has been discarded because the specified team was not ready to transfer. This is typically the result of a local or team error condition.

Old or dup task discarded, team x

The task taken from the event list on the specified team is either old or is a duplicate of an existing task. This occurs normally in the operation of the team as events are distributed throughout the team.

Op sw func return, team x, code y

This message displays the internal code returned during the operation of the local switch in the specified team. Possible codes are:

Code	Meaning
0	Operate switch function completed normally
1	Bad switch number
2	Close operation verified good
3	Close operation verify failed
4	Close operation verify failed with tripped switch
5	Close requested but already closed
6	Switch not in automatic
7	Open operation verified good
8	Open operation verify failed
9	Open requested but already open
10	Open/close argument not recognized
11	Open requested but excessive load

Pending comm message cleared, team x

The coach has determined a pending message is no longer valid and should be removed from the communications transmit list.

Prohibit restoration timer expired

The timer for the **Prohibit Restoration** feature has expired and will cause **Prohibit Restoration** mode to become active. Data x indicates the team number to which this event applies.

RTN process stopped, team x, code y

The **Return-to-Normal** process completed at the local team member with the indicated completion code. For details about the code, contact S&C Electric Company.

Task travel from team x to team y

During a **Return-to-Normal** process, tasks associated with the process travel among multiple teams between the normal source and the normal tie point of the circuit. This message traces the path of the tasks.

Unexpected state change, team x

The **Transfer** state went through an unexpected transition at the specified team. This error might stop an ongoing **Transfer** process.

Unknown event/task request, team x

An event or task for which the local team member is not programmed was requested within the specified team.

Volt/fault idle xfer state, sw x

This message is output when all teams this switch control is a member of have their transfer states back to idle, signaling a reset of the total three-phase average load.

Volt/fault OC Cleared, team x, rec y

This message is output when an overcurrent fault was previously detected, the field now is not faulted, and three-phase voltage has returned, causing the coach to clear the latched overcurrent condition. For details about rec y, contact S&C Electric Company.

Volt/fault PL cleared, team x, rec y

This message is output when a phase loss was previously detected, the switch control is now in its **Normal Open** or **Close** state, real time three-phase voltage is present, causing the coach to clear the **Latched Phase-Loss** condition. For details about rec y, contact S&C Electric Company.

Volt/fault reset occurred, sw x

The voltage loss and overcurrent indications maintained by the IntelliTeam II software have been reset after either the **Sectionalizer Reset Time** or, if a **Transfer** event has occurred, after team reconfiguration is complete.

Volt/fault VL Cleared, team x, rec y

The coach clears a three-phase voltage loss when: three-phase voltage loss was previously detected and real time three-phase voltage is now present and either the switch control is in its **Normal** state or the switch control's normal job is a source sub. For details about rec y, contact S&C Electric Company.

For additional team events, see the "Special Events" section on page 28.

Timestamp...MSec

This is the date and time (to the nearest 6.25 milliseconds) when the event occurred.

Data x...Data y

The values in these columns replace the "x" and "y" in the event messages.

   Note: When an event message refers only to "x," then any value in the "y" column is diagnostic information used by S&C engineers.

   For Example: Data x is "1" and Data y is "6" for the **Switch open ok, team x, switch y** event. This means that team 1 successfully opened switch 6.

Message Dup. Limit

This is the maximum number of messages of a given event code the switch control logs until the **Team Event** Log is cleared. While the event log is filling, the switch control monitors the number of occurrences of each individual message code. If the number exceeds the limit, the control suppresses further messages of the affected code. If the value is set to 255, no message limits are imposed.

   To check whether an event occurred that would otherwise generate a message, check the **Overcurrent Fault>Fault Events** log.

Message Dups.

When this field is set to **Reset** mode and the **OK** button is clicked, the switch control clears all of the message duplicate counters.

Filter

This setpoint chooses the categories of messages the switch control will log:

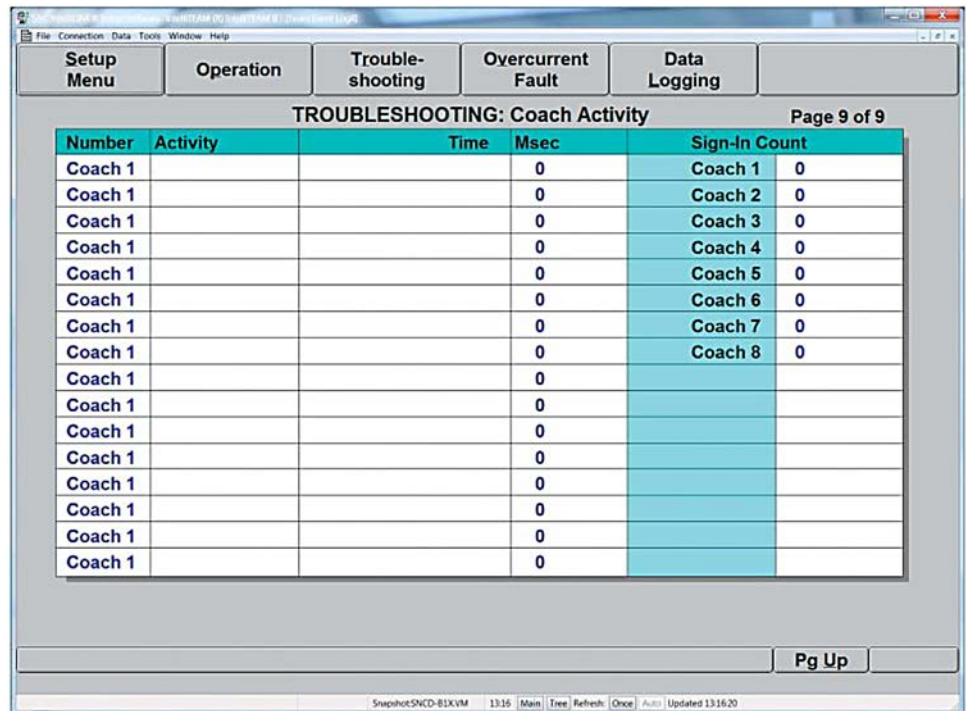|	
Normal	Logs only typical user-oriented information
Extended	Logs both user-oriented information and internal errors
Trace All	Logs user-oriented information, internal errors, and internal trace/ debugging information

Logging Options

This field gives you several options for how the *Troubleshooting>Team Event Log* screen functions:

Normal	This is the normal (default) event logging mode. When the log is full, each new event overwrites the oldest event in the log. To find the most recent event, look for the message with a timestamp older than the time for the message above it.
Clear Log	This command erases all messages in the log. The next message will appear as the first message in the log. When the log is cleared, the switch control will be in **Normal** mode.
Pause Logging	This command suspends logging until another logging option is selected. If messages are generated while **Pause Logging** mode is active, they are ignored and lost.
Clear Log and Fill	This command clears the log file and puts the switch control in **Logging Active, Hold When Full** mode. When the log is full, the control does not record any more messages until another logging option is selected.
Logging Active, Hold When Full	This mode allows the switch control to add messages to the buffer but suspends logging when the last message space in the buffer has been filled or overwritten.
Logging Active, Clear on Next Xfer	In this mode, when the switch control transitions from a state where all teams are in their **Normal**, **Idle**, **Team-enabled** mode to a state that initiates a transfer, the control clears the log and goes into **Logging Active, Hold When Full** mode. This captures and saves the next transfer event until another logging option is selected.
Logging Active, Clear on Each Xfer	In this mode, if the switch control transitions from a state where all teams are in their **Normal**, **Idle**, **Team-enabled** mode to a state that initiates a transfer, the control clears the log and captures the transfer event messages. The switch control saves the messages until the next transfer event or until another logging option is selected.

Coach Activity

The *Troubleshooting>Coach Activity* screen shows timestamps for basic coach activities as well as counters for each team's coach. To display the screen, click on the **Troubleshooting** button on any IntelliLink screen, and then click on the **Team Event Log** button. Then, click the **PgDn** button to go to page 9. See Figure 13.

Figure 13. The *Troubleshooting>Coach Activity* screen.

This screen includes the following fields:

Number
This field shows the coach/team number.

Activity
This field shows the coach activity: signing in or going to the specified team member (Rec 1, Rec 2, etc.).

Time...Msec
This is the date and time, to the nearest 6.25 milliseconds, when the activity occurred.

Sign-In Count
These fields show the ongoing counts for each team's coach.

Control and Switch Information

The *Troubleshooting>Control & Switch Information* screen shows miscellaneous hardware and software information, the present operations count, and the power-failure log. To display the screen, click on the **Troubleshooting** button on any IntelliLink screen, and then click on the **Control & Switch Information** button. See Figure 14.
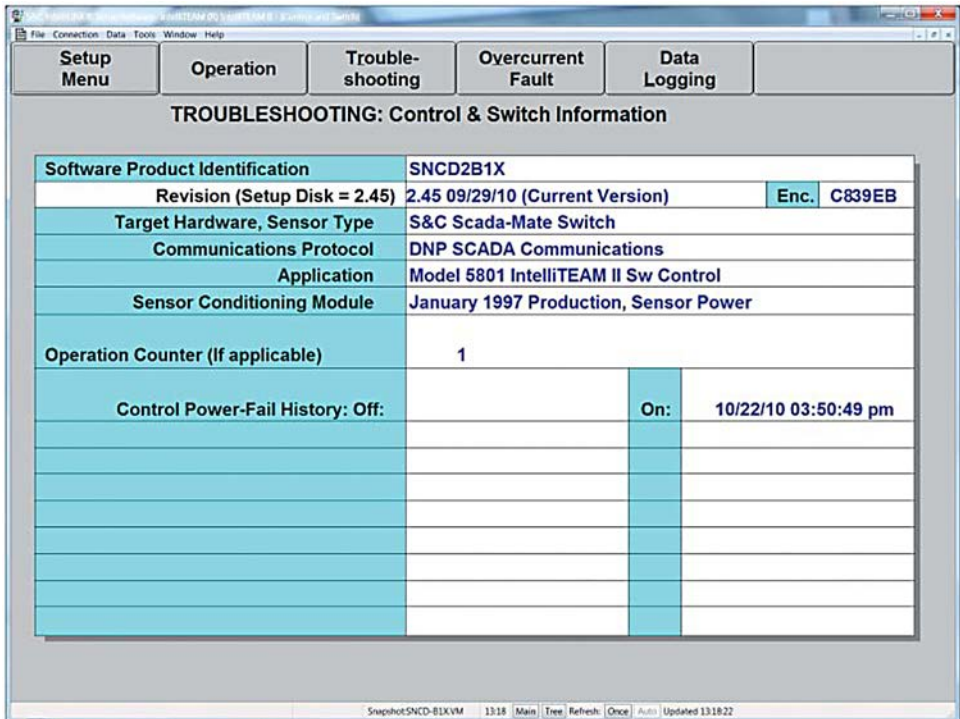

Figure 14. The *Troubleshooting>Control & Switch Information* screen.

This screen includes the following fields:

Software Product Identification

This is a two-line field:

- The first line is the S&C name for the control software version present in this switch control (for example, SNCD2B1X).
- The left side of the second line is the revision number for the IntelliLink version presently loaded in memory on the computer.
- The right side of the second line is the revision number and date of the control software in the switch control.

When the IntelliLink version is older than the control software, this field shows the message "Unrecognized/superseded." When the IntelliLink version is newer than the control software, this field shows the message "Not Current Release."

When starting IntelliLink software for a different S&C product (for example, an S&C 2801 Automatic Switch Control) while the computer is connected to a 5800 Series Switch Control, the IntelliLink software terminates during startup and displays an error message.

Enc.

This is a six-digit hexadecimal encoding of the name/version information for the software in the switch control. This code is used by S&C staff during software troubleshooting. Please have this code available when calling S&C about a problem.

Target Hardware, Sensor Type

This is the type of switch hardware and sensors for which this switch control was designed.

Communications Protocol

When the switch control is connected to a SCADA communication system, this is the communications protocol that is loaded in the control. If no communications protocol is present, this field displays the message "None."

Application

If the switch control is programmed for any active control functions or application-specific features, such as event-driven data logging or custom features, these features are listed in this field.

Sensor Conditioning Module

This is the version of the sensor-conditioning module presently installed in the switch control. This information helps S&C engineers troubleshoot switch control problems.

Operation Counter (If applicable)

This is the number of completed close operations performed on the line switch. The switch control only counts operations that begin with a SCADA or faceplate **Close** command, while the switch is in a valid open position and end with a closed signal from the switch status circuits. The switch control filters out excess control signals or intermittent digital input state changes.

Control Power-Fail History: …Off: …On:

This is a chronological listing of switch control power failures, when both ac and battery power are lost. The log can hold information about nine power losses, and nine power returns. When the log is full, each new event overwrites the oldest event in the log. To find the most recent power-on or power-off event, look for the message with a timestamp older than the time for the message above it.

Switch Operations

The *Troubleshooting>Switch Operations* screen shows a chronological listing of switch actions. Each time the switch control opens or closes the line switch, a message is posted to this log. To display the screen, click on the **Troubleshooting** button on any IntelliLink screen, and then click on the **Switch Operations** button. See Figure 15.
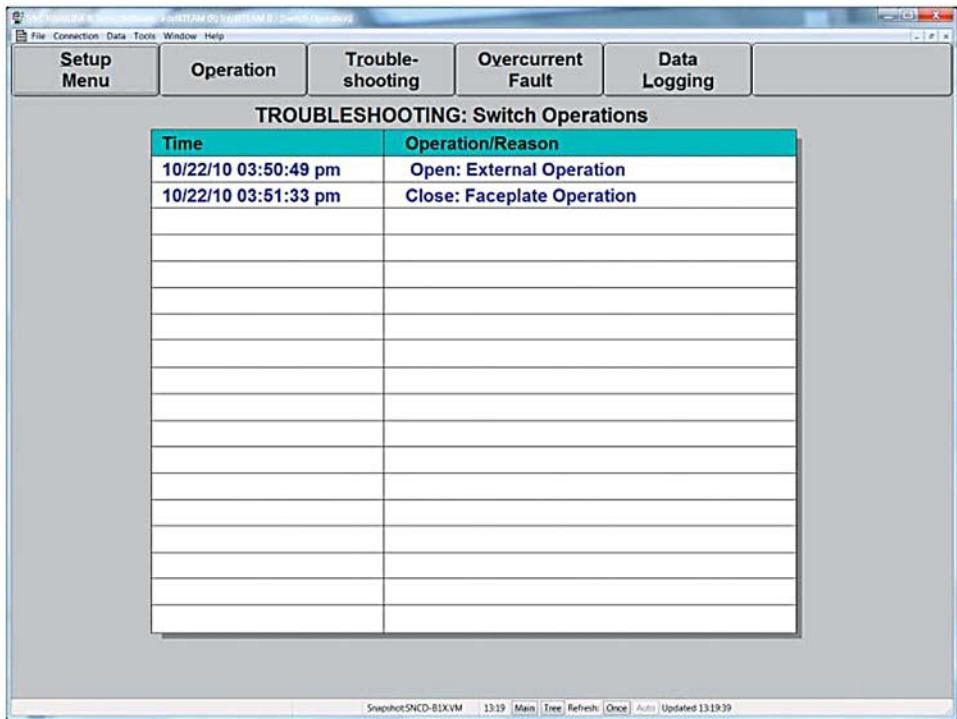

Figure 15. The *Troubleshooting>Switch Operations* screen.

The log holds 18 entries. When the log is full, each new event overwrites the oldest event in the log. To find the most recent event, look for the message with a timestamp older than the time for the message above it.

This screen includes the following fields:

Time
This is the date and time when the event occurred.

Operation/Reason
This is the line switch operation that occurred and the source of the command to change the switch position:

Open	The switch open.
Close	The switch closed.
Faceplate Operation	The command came from the switch control faceplate.
SCADA Communication Operation	The command came from a SCADA master station.
Automatic Operation	The switch control carried out an automatic operation. For example, automatic sectionalizing, phase loss protection, or reclose after restoration of voltage. For details, see the *Overcurrent Fault>Fault Events* screen.
External Operation	A switch operation was performed at the switch hardware rather than at the switch control. For example, a Scada-Mate was opened by operating the visual disconnect lever.

| Operation Failed | A request for switch operation was issued but could not be completed. For example, the switch contacts did not indicate the switch was closed after a **Close** command. |
| Position Grounded | Switch 1 or switch 2 of the Vista Underground Distribution Switchgear has been manually operated to the grounded position. |

Battery System

The *Troubleshooting>Battery System* screen shows the status of the battery system. To display the screen, click on the **Troubleshooting** button on any IntelliLink screen, and then click on the **Battery System** button. See Figure 16.
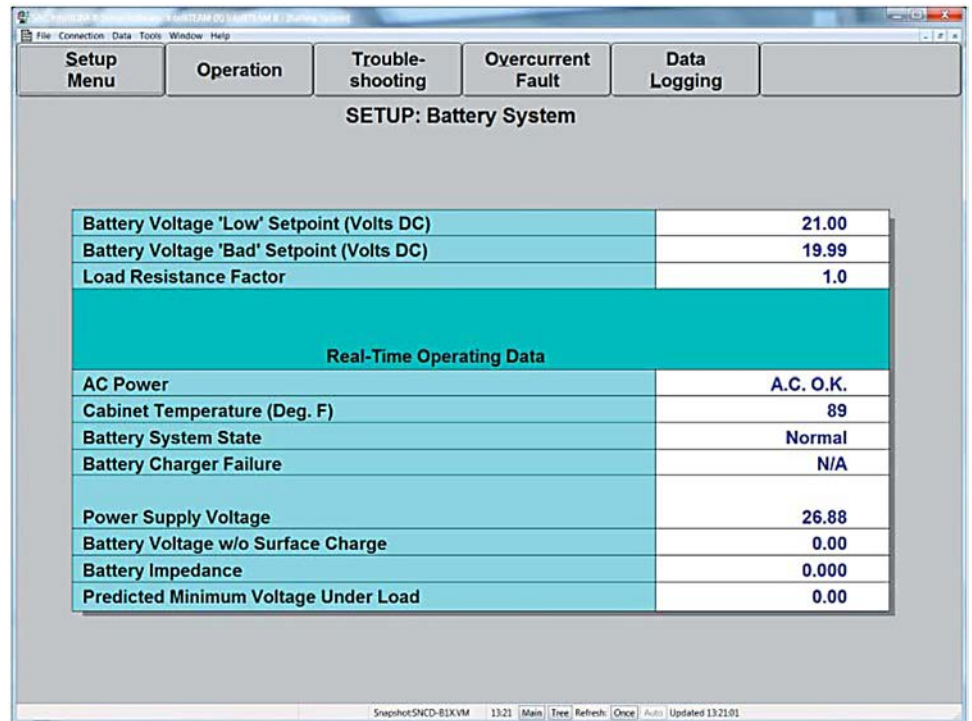

Figure 16. The *Troubleshooting>Battery System* screen.

The upper part of this screen shows the factory-defined values for this switch installation. The lower part of the screen displays real-time battery data.

This screen includes the following fields:

Battery Voltage "Low" Setpoint (Volts DC)
When battery voltage is between this value and the **Battery Bad** setpoint, switch operation is still possible but only for a limited time. When the calculated voltage under load drops below this value, the switch control displays the "Battery Low" message.

Battery Voltage "Bad" Setpoint (Volts DC)
The switch will not reliably operate at voltages below this value. When the calculated voltage under load drops below this value, the switch control displays the "Battery Bad" message.

Load Resistance Factor
This is a correction factor the switch control applies to the calculation of battery voltage under load. This value is entered at the factory.

Real-Time Operating Data

AC Power
This field indicates whether the switch control is presently running on ac power (sensor power, if applicable) or battery power.

Cabinet Temperture (Deg. F)

This is the present temperature inside the switch control enclosure, measured by the thermistor on the front of the power supply/control I/O board. The control uses this value to make corrections to the calendar-clock and ac waveform conditioning electronics.

Battery System State

This field shows whether the battery presently contains enough charge to operate the switch.

Three states are possible:

Normal	Enough charge is present to operate the switch.
Low	The battery is in marginal condition; it will soon be depleted and unable to operate the switch. No damage should occur to the switch if the switch is operated.
Bad	The battery charge is too low to operate the switch.

Battery Charger Failure

This field indicates the type of charger failure. The field is set or cleared during a battery test. Four states are possible:

Normal	Not applicable; no alarms are present.
Overvoltage	A high voltage was applied to the battery by the charging system. The battery charger is shut down when this alarm occurs.
Low Impedance	The calculated battery impedance is too low to be valid.
Over Volt/Low Imped	Both overvoltage and low-impedance conditions are present.

Power Supply Voltage

This field shows the actual voltage presently supplied to the 24-volt or 36-volt power system. When ac power (or sensor power, if applicable) is present, this voltage is supplied from the power supply/control I/O module. When ac power (and sensor power, if applicable) is absent, this is the actual battery voltage. During battery testing, this voltage varies as the switch control connects test loads to the battery system.

Battery Voltage w/o Surface Charge

This is the battery voltage under normal operating load. When ac power is present, this value is only updated during battery testing. When ac power and sensor power are absent, this is the real-time measurement of battery voltage.

Battery Impedance

The switch control calculates this value during a battery test. This is a measure of battery health. A fully charged battery in good condition typically has an impedance of 0.125 - 0.150 ohms.

Predicted Minimum Voltage Under Load

This is the battery-terminal voltage the switch control estimates will be present when the switch is operated.

The switch control calculates this value using the **Battery Voltage w/o Surface Charge, Load Resistance Factor** setpoint, and **Battery Impedance** values.

Communications

The *Troubleshooting>Communications* screen shows a chronological list of DNP communications problems. To display the screen, click on the **Troubleshooting** button on any IntelliLink screen, and then click on the **Communications** button. See Figure 17.

Figure 17. The *Troubleshooting>Communications* screen.

The log holds 10 entries. When the log is full, each new event overwrites the oldest event in the log. To find the most recent event, look for the message with a timestamp that is older than the time for the message above it.

This screen includes the following fields:

Date/Time...MSec
This is the time, to the nearest 6.25 milliseconds, when the event occurred.

Reason for Communications Failure
If a message fails at the data link layer of DNP, one of the following messages appears, including the port if applicable. This is the reason that communications failed:

- Simultaneous transmit and receive interrupts
- Character received with bad framing
- Mismatched RTU address
- Bad packet preamble
- Bad packet length
- Bad CRC in received packet
- Receive channel in use
- Transmit channel in use

One of the following messages appears for application layer events:

- Invalid function variation received
- Invalid object variation received
- Invalid object type received
- Invalid index size received
- Invalid qualifier code received
- Invalid object range received
- Invalid object header parameters
- Control is in local mode
- Message received with broadcast address
- Timer synchronization required
- DNP packet sequence number mismatch
- FIR or FIN bits not set in AC byte
- Communication failed to record x (where x ranges from 1 to 16)

DNP Internal Indications (most recent transaction only)

The DNP IIN bits status fields contain diagnostic information about the application layer. A "1" (or up arrow) indicates an active state, and a "0" (or down arrow) indicates an inactive state. For example, the "1" in Figure 18 indicates that the configuration is corrupt.

DNP Internal Indications (most recent transaction only)																
First IIN									**Second IIN**							
Bit #	7	6	5	4	3	2	1	0	Bit #	7	6	5	4	3	2	1	0
	0	0	0	0	0	0	0	0		0	0	1	0	0	0	0	0

Figure 18. The Application Layer information in the DNP IIN fields.

The status of the bits is valid for the most recent transaction only. For an explanation of the bit codes, see Table 3.

Table 3. DNP Internal Indication Bits Status Field Codes

Bit #	First IIN Byte Definition	Second IIN Byte Definition
0	Broadcast message received	Function code not implemented
1	Class 1 data available	Request object unknown
2	Class 2 data available	Parameters in the qualifier, range, or data fields are not valid or out of range
3	Class 3 data available	Event or application buffers have overflowed
4	Time-synchronization required from the master	Requested operation is already executing
5	Control is in local mode	Configuration corrupt
6	Device trouble	Reserved
7	Device restart	Reserved

Various Counters

The *Troubleshooting>Various Counters* screens show counters and statistics associated with DNP communications and the IntelliTeam II system. To display the screen, click on the **Troubleshooting** button on any IntelliLink screen, and then click on the **Various Counters** button. See Figure 19.

Figure 19. The *Troubleshooting>Various Counters* screen.

This page shows counter information for each team member and for the team as a whole.

The switch control counts and records errors and events associated with the interrupt service routine, the data-link layer, and the application layer. The counts are stored in non-volatile memory and may be cleared if necessary.

Follow these steps to clear the counts in both pages of this screen:

STEP 1. To save the count information on the screen, generate a report. When the counts and statistics have been cleared, the data cannot be recovered.

STEP 2. Click on the **(Clear All)** entry in the upper right corner of the screen.

    (a) This causes all counters and statistics to return to 0, except the **Min 2way** counter, which clears to the maximum value of 255.

    (b) The **Various Counters Last Cleared** field shows the date and time the counts were last cleared.

The fields on these screens are grouped into four categories: Receiver Interrupt Counts, Application Layer Counts, Data Link Layer Counts, and Communication Statistics.

Receive Interrupt Counts

These are errors associated with the communications interrupt routine. If applicable, the data for each port is shown separately.

Bad CRC

This field shows the number of failed CRC calculations on incoming packets.

Simul. Rcv/Xmt

This field shows the number of times the receiver and transmitter were enabled simultaneously.

Bad Address

This field shows the number of packets received with a destination address that does not match the RTU address of the local team member.

Bad Preamble

This field shows the number of packets received without the required 2-byte DNP packet preamble of 0564 hex.

Bad Length

This field displays the number of packets received with an invalid length. Invalid packet lengths are values less than 5 bytes.

Bad Framing

This field shows the number of times an improperly framed byte was received.

Rcv Busy

This field shows the number of times a packet was unable to be received due to a busy receive channel.

Xmt Busy

This field shows the number of times a packet was unable to be transmitted due to a busy transmit channel.

Application Layer Counts

Bad Function

This field shows the number of times an invalid or unsupported function code was received.

Bad Object

This field shows the number of times an invalid or unsupported object code was received.

Bad Pkt Param

This field shows the number of times an invalid or unsupported packet parameter was received. Packet parameters include the variation, qualifier, and indexing associated with the object.

Comm in Local

This field shows the number of times that **Remote** mode was changed to **Local** mode during communications.

Rcvd Broadcast

This field shows the number of times a packet containing the broadcast destination address was received.

Time Sync Req

This field shows the number of requests made for timestamps by toggling the associated **IIN** bit on.

Bad Pkt Seq

This field shows the number of mismatched application layer sequence numbers that were received in packets.

Bad Fir/Fin

This field shows the number of packets received with the **Fir** and **Fin** bits set improperly.

Defr Rd Lost

This field counts the number of deferred-read requests overwritten by subsequent deferred reads. DNP requires the switch control to defer simple read requests if it is waiting to receive confirmation from the master station for an outstanding event data response message.

Other Err
This field shows the number of unidentified errors encountered.

Data-Link Layer Counts
These are errors associated with the data link layer of DNP communications.

App Layer Busy
This field shows the number of times a confirmed-user data packet was received into the data link layer but could not be delivered to the application layer due to existing application layer activity. Confirmed packets that cannot reach the application layer cause a "nack" confirmation to be sent to the sender of the packet.

Unconf Fail
This field shows the number of times an unconfirmed user data packet was received into the data link layer but could not be delivered to the application layer due to existing application layer activity. These unconfirmed packets are dropped without notifying the sender.

FCB Mismatch
This field shows mismatch occurrences of the Frame Control Bit (FCB) in the data link layer.

To display Page 2 of the *Troubleshooting>Various Counters* screen, click on the **Pg Dn** button on Page 1 of the screen.

This page tracks communications statistics for each team member in the team(s) where this switch control is a member. See Figure 20.

Figure 20. Page 2 of the *Troubleshooting>Various Counters* screen.

RTU Address
This field shows the DNP/RTU Address for the team member associated with the counts in the column below.

Xmit Count
This field shows the number of original packets transmitted to a single team member.

Retry Count

This field shows the number of packets transmitted to a single team member due to a retry of an original packet.

Fail Count

This field shows the number of communications failures with a single team member. A failure is counted when a response to a specific request was not received from that team member after all applicable retries.

Last 2way

This field shows the latency, in seconds, associated with the last request sent to a single team member.

Min 2way

This field shows the minimum latency, in seconds, recorded for a request sent to a single team member.

Max 2way

This field shows the maximum latency, in seconds, recorded for a request sent to a single team member.

Avgd 2way

This field shows the average latency, in seconds, recorded for requests sent to a single team member.

Team Member Task Operations

To display the *Operation>Member Tasks* screen, click on the **Operation** button on any IntelliLink screen, click on the **Misc Operation** button, and then click on the **Member Tasks** button.

Figure 21. The *Operation>Misc Operation>Member Tasks* screen.

The *Operation>Misc Operation>Member Tasks* screen shows a table of the team member tasks presently being executed. This information is used for diagnostic purposes when working with S&C support engineers. See Figure 21.

This screen includes the following fields:

ID
This is the identification for the task to be executed.

Own
This is the team database record associated with the execution of this task.

Seq
This is the sequence number of the executing task.

TTR
This is the Time-to-Run of the executing task.

Attrib
This is the Lock and Execute attributes associated with the executing task.

Team
This is the team number associated with the execution of this task.

Locating Problems with IntelliLink® Setup Software

Contracts

The *Contract Status* screen shows information about contracts associated with the contract agent at this control.

If a contract is required for a particular line segment, a contract agent is used to track and secure the contract. Every contract request is uniquely identified by the requesting agent, the originating segment, and the timestamp when the request was made.

To display the *Contract Status* screen, click on the **Misc Operation** button on any IntelliLink screen, click on the **Contract Status** button. See Figure 22.

Figure 22. The *Contract Status* screen.

This screen includes the following fields:

Contract State

This is the identification for the task to be executed.

Active	The contract has been granted and is presently active.
Rqst unsent	The contract agent received a contract request from the team member but has not yet sent the request to the next contract agent.
Rqst pending	The contract request is pending.
Rqst travel	The contract agent is forwarding the contract further; the decision whether to grant the contract cannot be made at this location.
Rqst accept	The contract request was accepted by this agent; the contract approval is headed back to the originating agent. When this message appears at the granting agent, the contract has been approved.
Rqst decline	The contract request was declined by this agent. The request will be sent back to the originating agent.
Decline cont.	A declined message is being passed along to the requesting agent.
Dissolve start	An agent is dissolving the contract. This is generally done by the requesting agent.
Dissolve cont.	A dissolve message is being passed along.
Maint start	The maintenance timer on an active contract has expired, causing a maintenance action to occur.

Maint tickle	This contract agent has not seen a maintenance message for the contract lately. The agent sends a reminder to the requesting agent to see if the contract is still needed.
Maint travel	A maintenance message is being passed from the requesting agent to other agents along the contract route.
Maint tra NF	The contract agent has received a maintenance message for a contract that is not found in its list.
Maint tra NF rt	A Maint tra NF message, see above, is being returned to the requesting agent. This message can also appear at other agents along the contract route.
Maint tic NF	The contract agent has received a tickle message for a contract that is not found in its list.
Maint tic NF rt	A Maint tic NF message, see above, is being returned to the agent that initiated the tickle. This message can also appear at other agents along the contract route.
Maint restart	The requesting agent has confirmed that it still needs the contract. The maintenance timer is restarted.
Maint res cont.	A restart message is being passed to other agents along the contract route.

Rqst Agent

This field shows which agent requested the contract.

Grant Agent

This field shows which agent approved the contract.

Orig Segmt

This field shows the team record number for the segment where the contract request originated.

Temp Segmt

This field shows the present team record number for the location of the contract request.

Line Count

This field shows how many line segments will be picked up if the contract request is granted. This value is generally "1."

Load Rqst

This field shows how much load will be picked up if the contract request is granted.

Maint Timer

Once a request is granted, this field shows the time remaining before contract maintenance should be performed. Normally, when a contract is no longer needed, the requesting agent sends a message to dissolve the contract. However, if the local contract agent does not hear anything within the **Maint** timer, it checks with the requesting agent. The requesting agent can then extend the contract if it is still needed, or dissolve the contract if it is not.

Rqst Time

This is the date and time when the contract was requested.

**Team Member
Action Path**

The *Team Member Action Path* screen shows a table of the actions taken during the execution of switch operation. This information is used for diagnostic purposes when working with S&C support engineers.

Some switchgear requires a unique set of operating instructions, which may be further modified by the configured switch parameters, team parameters, and the operational requirements of a specific event situation. The operation steps are called the Action Path. The Action Path displayed in this table is created on the fly based on the present conditions during each event.

Some Action Paths are complex and require the ability go back out of a series of steps, if one of the steps cannot be performed. Backing out of an Action Path can also put the switch back into its **Normal** state.

To display the *Team Member Task Operation* screen, click on the **Operation** button at any IntelliLink screen, click on the **Misc Operation** button, and then click on the **Action Path** button.
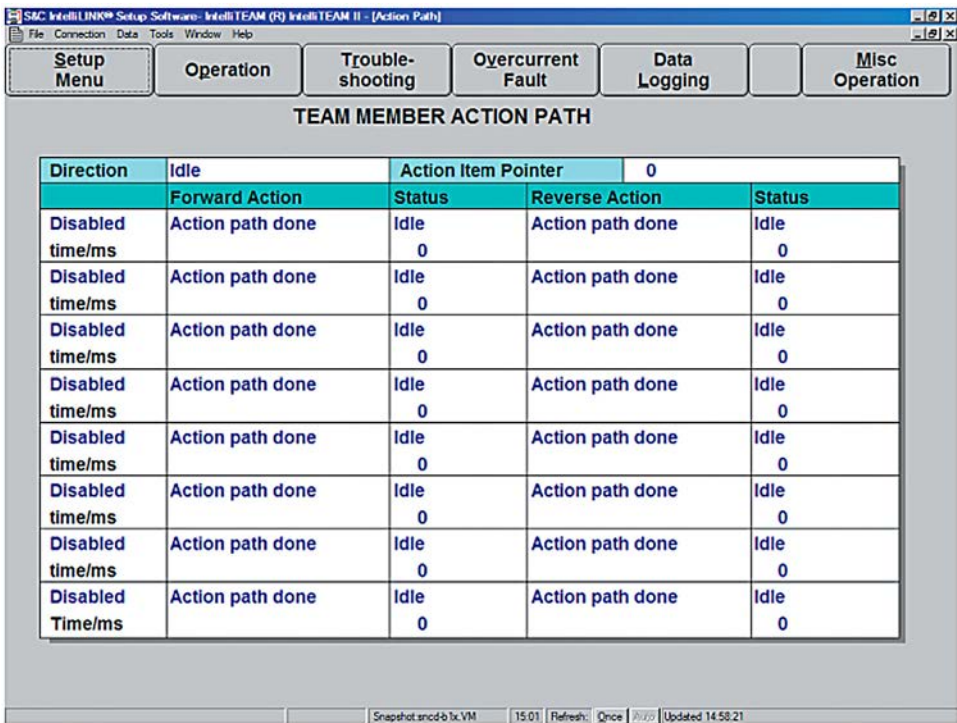

Figure 23. The *Team Member Action Path* screen.

This screen includes the following fields:

Direction
This is the forward or reverse direction that the Action Path is presently taking. Reverse will only occur if the forward path is stopped before completion.

Action Item Pointer
For diagnostic purposes only, when working with S&C support engineers. This indicates the record within the Action Path that is presently being executed.

Forward Action / Reverse Action

These columns display two pieces of information. One is the name of the step that will be taken during execution of the Action Path. The other is the timestamp associated with the start of that step. The list of actions that will be displayed is:

Action path done

Close for xfer

Contract request

Contract terminate

Block recloser

Unblock recloser

Block ground trip

Unblock ground trip

Alternate settings

Normal settings

The far left column displays the present **Enabled** or **Disabled** state of the step in the associated row. Any step within the Action Path may be disabled due to configuration or event conditions even though that step is normally included in the Action Path for that type of switch.

Status

These columns display the status of the associated step in the Action Path and the relative millisecond at which this step occurred. The status can be: Idle, Running, Failed, or Success.