



# **CPS3200U**

## **Technical Support Guide**

Product Manual

Comcode CC848853457

Issue 1

September 2008

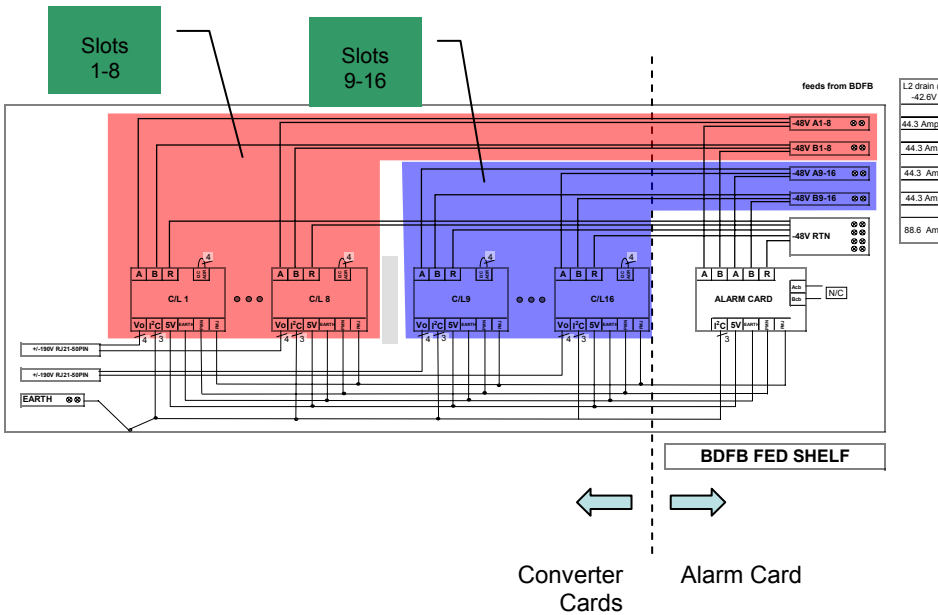


**COMPACT POWER LINE SHELVES – MODELS J85480S1 AND J2007001**

Ordering Guide – June 2008

Matrix File # CC848849397-MAN version 1

# CPS3200U Technical Support Guide



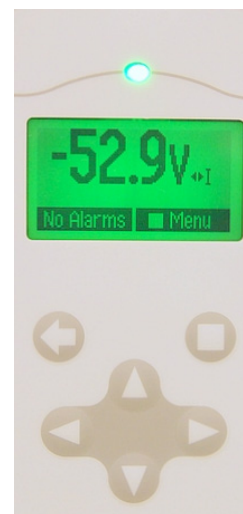
Hardware

Home   Reports   Maintenance   Settings   Installation

**FTTN System Overview**

Groups			Circuits																
Description	Circuits	Current	Capacity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FTTN DEFAULT GROUP	20	12mA	5140mA	382	381	380	379	379	380	382	382	381	381	n/a	n/a	n/a	n/a	n/a	SH01 1.5 A
FTTN GROUP 001	0	0mA	0mA	1	1	1	1	1	0	1	1	1	1	n/a	n/a	n/a	n/a	n/a	A 1-8 9-16 CB
FTTN GROUP 002	0	0mA	0mA																B 1-8 9-16 CB
FTTN GROUP 004	0	0mA	0mA	379	383	379	382	381	380	381	379	382	384	n/a	n/a	n/a	n/a	n/a	upper fan
FTTN GROUP 005	0	0mA	0mA	1	1	1	1	1	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a	lower fan

WEB



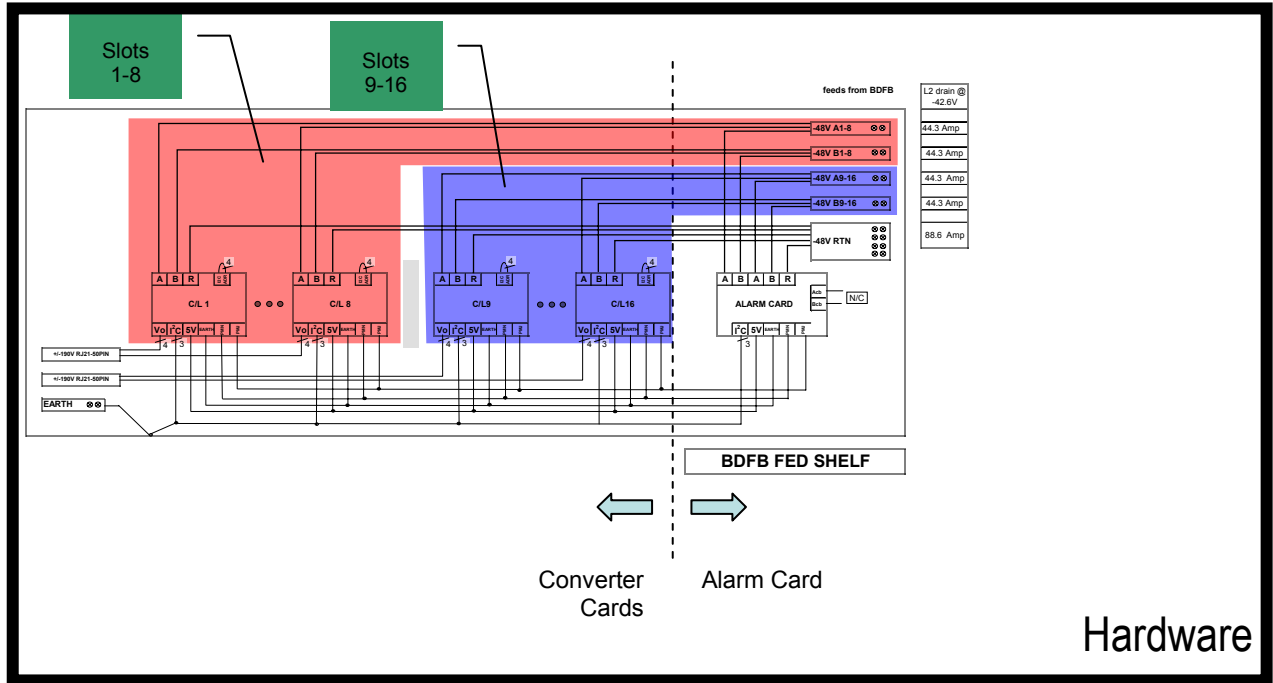
Front Panel

This document is a compilation of class material aimed at people who provide technical support. Information pulled from product manuals is marked with a reference indicator in brackets.

## Table of Contents

- 1 Hardware ..... 5
  - Brief Hardware Orientation..... 6
  - Always look first at the alarm card to establish valid A and B power feeds to both sides of the shelf..... 7
  - This diagram can be used to diagnose powering faults as indicated by the “A” and “B” LEDs ..... 7
  - Once both the “A” and the “B” input power LEDs are green, other LEDs can be used to diagnose other faults. .... 8
  - The Shelf ID rotary DIP switches are as shown here: ..... 8
  - Converter LEDs look like this: ..... 9
  - Alarm Reference Table ..... 10
  - Locating Failed Fans ..... 11
- 2 WEB..... 12
  - The web page reflects the physical configuration of each shelf. .... 13
  - To help find the FTTN relevant information on each tab, please use this guide ..... 13
  - To interact with the QS941 Controller through the WEB interface it is possible to connect a computer to the QS941A directly using server mode or through a LAN using client mode..... 15
- 3 Front Panel ..... 17
  - Most of the detail needed to interact with the front panel is in the QS941A Controller User Interface document available from the Lineage website. .... 18

# 1 Hardware



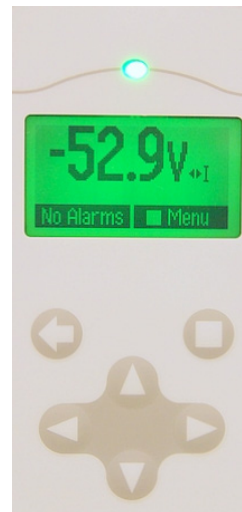
Hardware

Home Reports Maintenance Settings Installation

### FTTN System Overview

Groups				Circuits																
Description	Circuits	Current	Capacity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
FTTN DEFAULT GROUP	20	12mA	5140mA	382	381	380	379	379	380	382	382	381	381	n/a	n/a	n/a	n/a	n/a	n/a	n/a
FTTN GROUP 001	0	0mA	0mA	1	1	1	1	1	0	1	1	1	1	n/a	n/a	n/a	n/a	n/a	n/a	SH01 1.5 A
FTTN GROUP 002	0	0mA	0mA																	A 1-8 9-16 CB
FTTN GROUP 004	0	0mA	0mA																	upper fan
FTTN GROUP 005	0	0mA	0mA																	lower fan

WEB



Front Panel

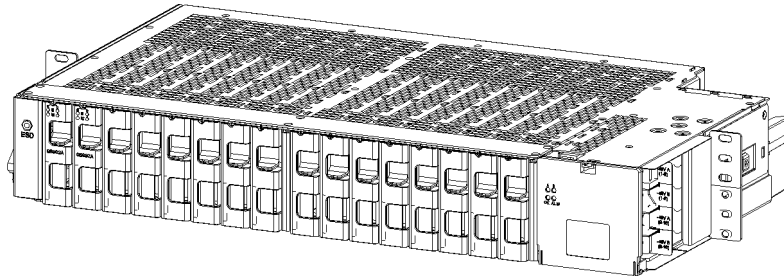


Figure 6-1: QS912A Converter Shelf  
(Shown configured with 2 operational circuits and 14 slot fillers for airflow control)

[CPS3200U Page 21]

To distribute airflow across every card in the shelf make sure each slot is filled with either a converter or an empty slot filler. Converter cards and slot fillers are inserted according to this diagram:

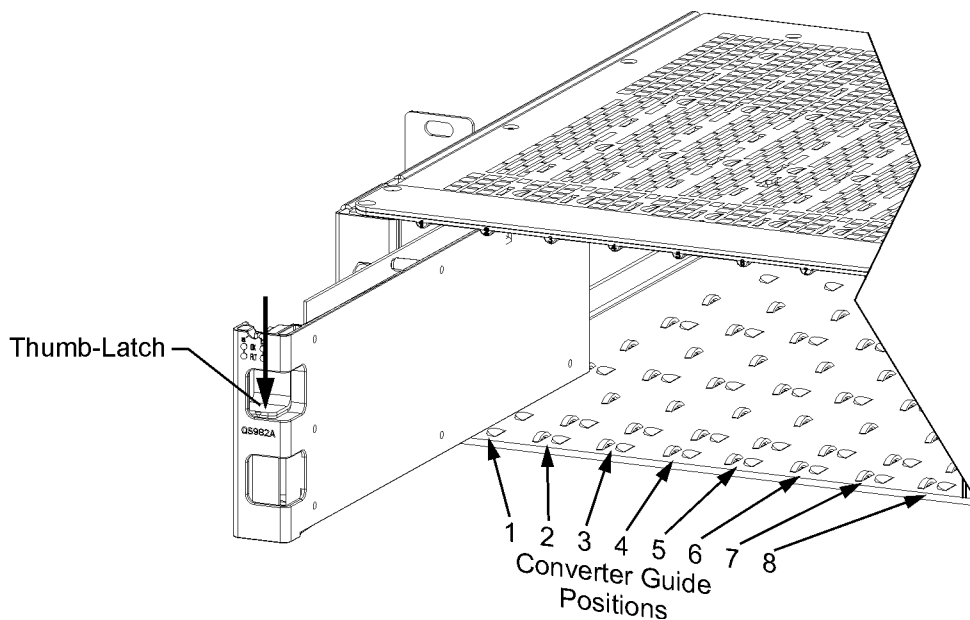
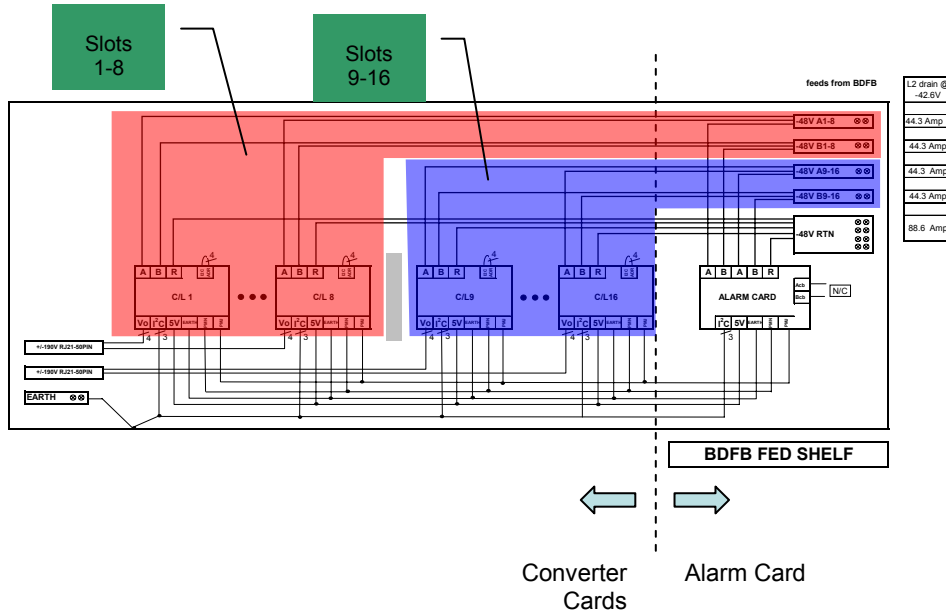


Figure 8-2: Installing Converters

[CPS3200U Page 40]

Please shift focus now to understanding the shelf schematic. This is key to recognizing and correcting errors.

**Always look first at the alarm card to establish valid A and B power feeds to both sides of the shelf.**



[CPS3200U Page 7]

The orange and blue regions above indicates that there is an A and a B feed for the left hand side of the shelf (slots 1-8) and an A and a B feed for the right hand side of the shelf (slots 9-16). The letters “A” and “B” labeling the top two alarm card LEDs refer to these -48V input power feeds.

**This diagram can be used to diagnose powering faults as indicated by the “A” and “B” LEDs.**

[CPS3200U Page 55]

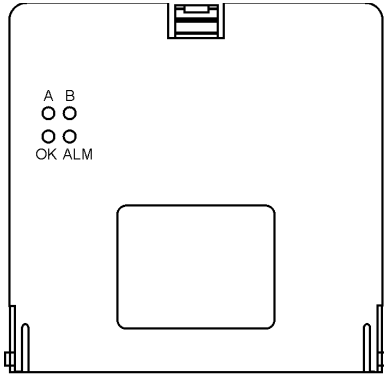
Energized (E) is the normal state. This makes any failures of power to the relay are alarmed:

	-48 V INPUT BUS				Vin LEDs		STATUS LEDs		ALARM RELAYS	
	A <sub>1-8</sub>	B <sub>1-8</sub>	A <sub>9-16</sub>	B <sub>9-16</sub>	A LED	B LED	OK LED	ALM LED	PMN	PMJ
1	OK	OK	OK	OK	GRN	GRN	GRN	OFF	E	E
2	LOW	OK	OK	OK	RED	GRN	OFF	YEL	D	E
3	OK	LOW	OK	OK	GRN	RED	OFF	YEL	D	E
4	OK	OK	LOW	OK	RED	GRN	OFF	YEL	D	E
5	OK	OK	OK	LOW	GRN	RED	OFF	YEL	D	E
6	LOW	LOW	OK	OK	RED	RED	OFF	RED	E	D
7	LOW	OK	LOW	OK	RED	GRN	OFF	RED	E	D
8	LOW	OK	OK	LOW	RED	RED	OFF	RED	E	D
9	OK	LOW	LOW	OK	RED	RED	OFF	RED	E	D
10	OK	LOW	OK	LOW	GRN	RED	OFF	RED	E	D
11	OK	OK	LOW	LOW	RED	RED	OFF	RED	E	D
12	LOW	LOW	LOW	OK	RED	RED	OFF	RED	E	D
13	LOW	LOW	OK	LOW	RED	RED	OFF	RED	E	D
14	LOW	OK	LOW	LOW	RED	RED	OFF	RED	E	D
15	OK	LOW	LOW	LOW	RED	RED	OFF	RED	E	D
16	LOW	LOW	LOW	LOW	OFF	OFF	OFF	OFF	D	D

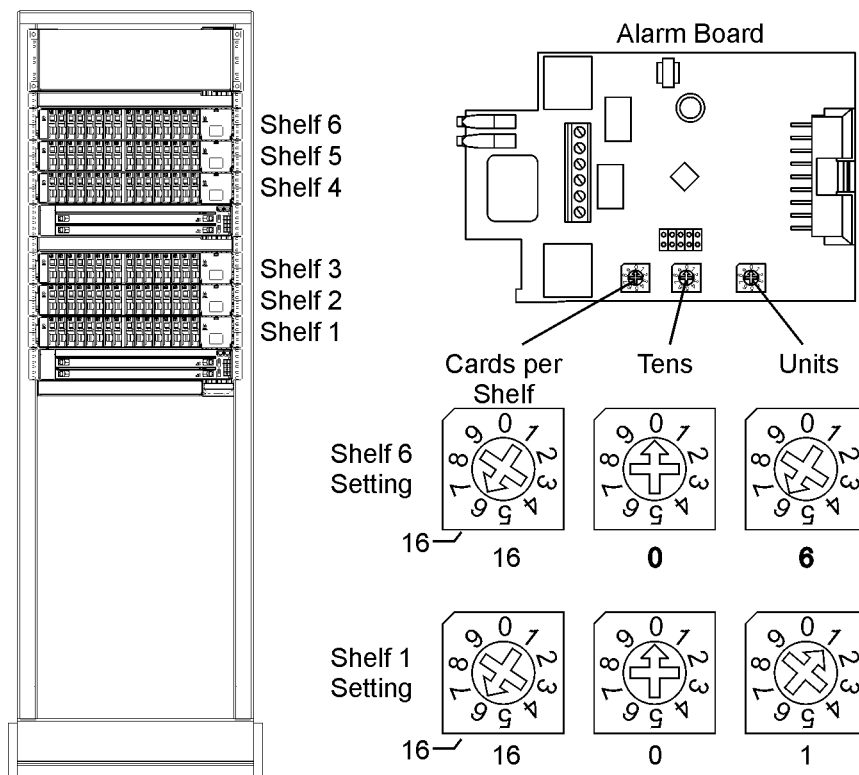
Alarm Relay: E – Energized relay in non-alarm state; D – De-energized relay in alarm state

Once both the “A” and the “B” input power LEDs are green, other LEDs can be used to diagnose other faults.

One fault that may show as a red flashing ALM LED on the alarm card is communications fail. The flashing red ALM light on the alarm card indicates that it is configured to expect a controller and is not seeing one.



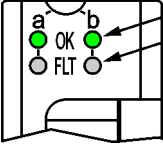
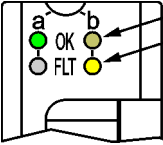
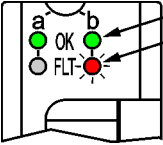
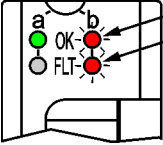
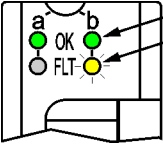
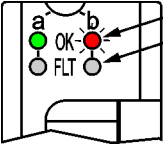
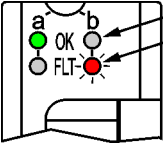
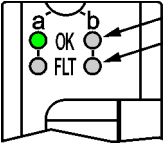
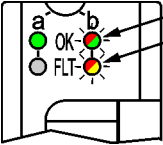
The Shelf ID rotary DIP switches are as shown here:



[CPS3200U Page 53]

If there is no controller present, the flashing red LED can be addressed by switching the Tens and Units rotary switches to positions 0 using a small Phillips screwdriver. If a controller is present the signal between the alarm card and the controller is likely broken. Please examine all wiring. Also note: all shelves in a system must have different addresses to be recognized by the controller.



LED Display	Conditions (on b circuit)	Action Required
 <p>Green OK (a) Green Off (b) FLT (a) FLT (b)</p>	All OK	None
 <p>Off (b) Yellow (b) Green OK (a) FLT (a) FLT (b)</p>	Circuit Placed in Standby	None depending on desired state of circuit b. Standby state can be set using the QS941 controller or web browser.
 <p>Green OK (a) Green Off (b) Red Blinking (b) FLT (a) FLT (b)</p>	Loss of comm.	Check seating on Alarm card and converter card
 <p>Red Blinking (a) Red Blinking (b) Green OK (a) Green Off (b) FLT (a) FLT (b)</p>	Ground fault	Check 5 pin protectors and faults to ground
 <p>Green OK (a) Green Off (b) Yellow Blinking (b) FLT (a) FLT (b)</p>	Overcurrent or under voltage	Check output lines for shorts to each other
 <p>Red Blinking (a) Red Blinking (b) Off (b) Green OK (a) Green Off (b) FLT (a) FLT (b)</p>	OV or internal failure	Replace unit
 <p>Off (a) Off (b) Red Blinking (b) Green OK (a) Green Off (b) FLT (a) FLT (b)</p>	Thermal Alarm	Solve Thermal problem
 <p>Off (a) Off (b) Green OK (a) Green Off (b) FLT (a) FLT (b)</p>	card not powered or input fuse failure	Check source voltage
 <p>Red/Green Alternating (a) Red/Yellow Alternating (b) Green OK (a) Green Off (b) FLT (a) FLT (b)</p>	Lamps test requested from controller	Observe Lamp Test

## Alarm Reference Table

This Alarm Table shows how FTTN Alarms are categorized by the QS941 Controller. Many alarms are best processed at the converter shelf alarm card and converter card level. In other words columns 4, and 5, can be used to select the appropriate action from column 6.

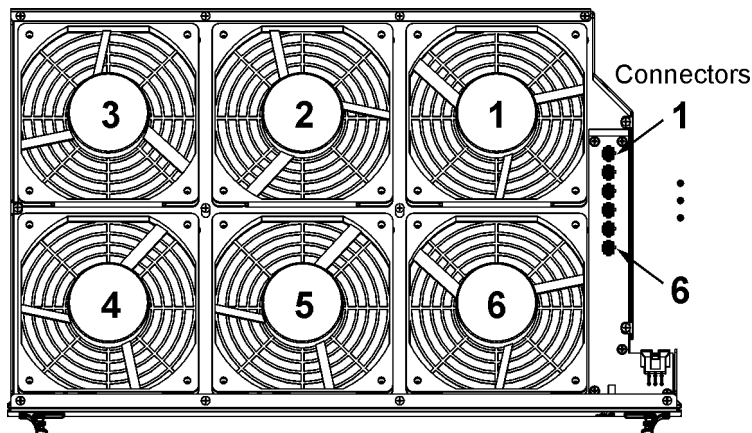
[QS941 Controller Page 27]

1. Alarm Display	2. What it means	3. QS941		4. Alarm Card		5. Converter Card		6. Human Response  Corrective Action
		LED State	Relay State	Alarm LED State	Relay State	OK LED State	Alarm LED State	
Circuit Fail	Short + to -	Yellow	Min	Yellow	Min	Green	Flashing Yellow	Make sure each converter has an independent isolated send and return path.
Circuit Fail	Short to Ground	Yellow	Min	Yellow	Min	Flashing Red	Flashing Red	Make sure each converter has an independent isolated send and return path.
Comm. Fail	1 Card Removed	Yellow	Min	Yellow	Min	Green	Off	Check to see that all cards are seated. Replace non-functioning cards.
Comm. Fail	2 Cards Removed	Red	Maj					Check to see that all cards are seated. Replace non-functioning cards.
Comm. Fail	Comm. Cable Removed	Red	Maj	Flashing Red		Green	Off	Check communication path from alarm cards to QS941 controller. If no controller is present, set alarm card rotary switch to position 0 for contact closures only communication.
Comm. Fail	Alarm Card Removed	Red	Maj			Green	Flashing Red	Replace Alarm card.
None	Standby	Green		Green			Yellow	Remove unit from standby if desired using QS941 or Ethernet interface
Circuit Fail	Open Fuse	Yellow	Min	Yellow	Min	Green	Flashing Yellow	Replace unit. Note: Restoring service to one line will interrupt service to the other line served by that card.
Circuit Fail	Under Voltage	Yellow	Min	Yellow	Min		Flashing Yellow	Replace unit. Note: Restoring service to one line will interrupt service to the other line served by that card.
Fan Fail	1 Fan Tray Failed	Yellow	Min	Yellow	Min	Green	Off	Replace fan tray.
Fan Fail	1 of 6 fans Failed on one Fan Tray	Yellow	Min	Yellow	Min	Green	Off	Replace fan tray.
Fan Fail	2 Fan Trays Failed	Red	Maj	Red	Maj	Green	Off	Replace fan trays.
Input Power	A1-8 Power Fail	Yellow	Min	A Red	Min	Green	Off	Reconnect DC input power flowing to the A1-8 input terminal.
Input Power	B1-8 Power Fail	Yellow	Min	B Red	Min	Green	Off	Reconnect DC input power flowing to the B1-8 input terminal
Input Power	A9-16 Power Fail	Yellow	Min	A Red	Min	Green	Off	Reconnect DC input power flowing to the A9-16 input terminal

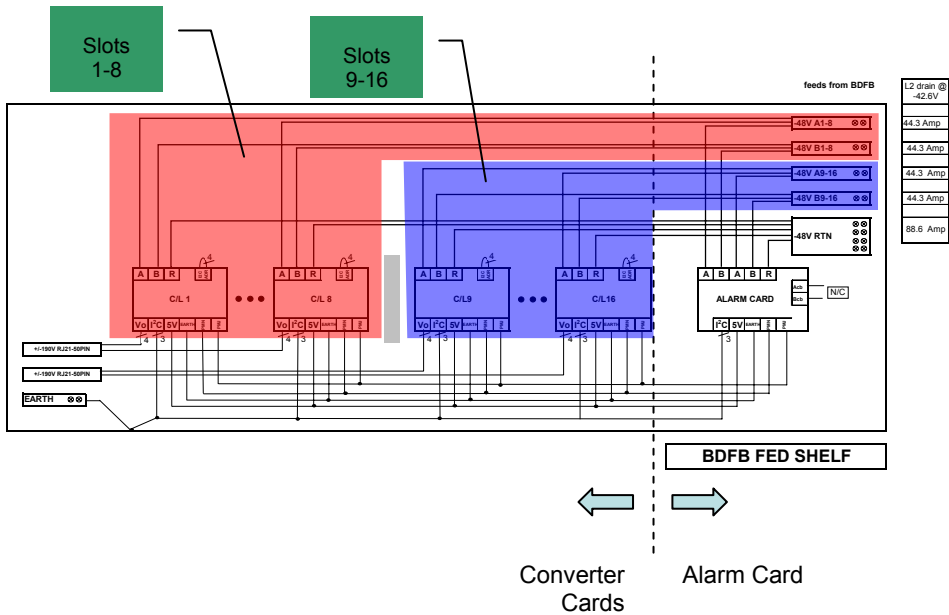
1. Alarm Display	2. What it means	3. QS941		4. Alarm Card		5. Converter Card		6. Human Response
		LED State	Relay State	Alarm LED State	Relay State	OK LED State	Alarm LED State	Corrective Action
Input Power	B9-16 Power Fail	Yellow	Min	B Red	Min	Green	Off	Reconnect DC input power flowing to the B9-16 input terminal.
Input Power Mul Circuit Fail	A1-8 & B1-8 Power Fail	Red	Maj	A Red B Red	Maj	Green	Off	Reconnect DC input power flowing to the A1-8 input terminal and Reconnect DC input power flowing to the B1-8 input terminal
Input Power Mul Circuit Fail	A9-16 & B9-16 Power Fail	Red	Maj	A Red B Red	Maj	Green	Off	Reconnect DC input power flowing to the A9-16 input terminal. Reconnect DC input power flowing to the B9-16 input terminal.
Load Drop	Load Drop	Yellow	Min	A, B & OK Green		Green	Off	Check the integrity of the circuits going to the load. Or Adjust load drop threshold to 0 to disable this feature.
Load Share	As set of circuits assigned to one remote destination are not sharing current as would be expected .	Yellow	Min	A, B & OK Green		Green	Off	Check the integrity of the circuits going to the load. Or Adjust load share threshold to disable this feature.
Line Test	OK, Fail or Aborted			A, B & OK Green		Green	Off	Estimated line resistance has increased since last measurement.
Loss Of Redundancy		Yellow	Min	A, B & OK Green		Green	Off	The loss of n additional circuits will cause customers to lose service. Check redundancy threshold in the configuration.

### Locating Failed Fans

Fan failures within a tray can be found by correlating the number of LED flashes to this map:



# 2 WEB

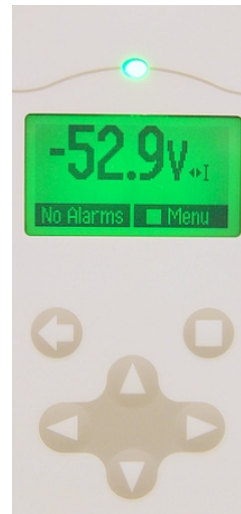


Hardware

The screenshot shows the FTTN System Overview web interface. It includes a navigation menu with Home, Reports, Maintenance, Settings, and Installation. The main content area is divided into Groups and Circuits sections.

Groups				Circuits																
Description	Circuits	Current	Capacity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
FTTN DEFAULT GROUP	20	12mA	5140mA	382	381	380	379	379	380	382	382	381	381	n/a	n/a	n/a	n/a	n/a	n/a	SH01 1.5 A
FTTN GROUP 001	0	0mA	0mA	1	1	1	1	1	0	1	1	1	1	n/a	n/a	n/a	n/a	n/a	n/a	A 1-8 9-16 CB
FTTN GROUP 002	0	0mA	0mA																	B 1-8 9-16 CB
FTTN GROUP 004	0	0mA	0mA	379	383	379	382	381	380	381	379	382	384	n/a	n/a	n/a	n/a	n/a	n/a	upper fan
FTTN GROUP 005	0	0mA	0mA	1	1	1	1	1	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a	n/a	lower fan

WEB



Front Panel

**The web page reflects the physical configuration of each shelf.**

The right hand side shows the 48V input current and alarm states for each of the DC inputs. Text changes to yellow for power minor and red for power major. Fan tray status is also alarmed on the right hand side of the figure. The output voltage and current of each circuit on each card is also shown on the physical representation of the shelf. The 'a' circuit output is shown on the top and the 'b' circuit output is shown below. The left hand side of the WEB display shows how circuits are grouped, including group name, number of circuits assigned, current draw, and current capacity.

[QS941A WEB Interface page 8]

Groups			Circuits																
Description	Circuits	Current Capacity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
FTTN DEFAULT GROUP	20	12mA 5140mA	382	381	380	379	379	380	382	382	381	381	n/a	n/a	n/a	n/a	n/a	n/a	SH01 1.5 A
FTTN GROUP 001	0	0mA 0mA	1	1	1	1	1	0	1	1	1	1	n/a	n/a	n/a	n/a	n/a	n/a	A 1-8-9-16 CB
FTTN GROUP 002	0	0mA 0mA																	B 1-8-9-16 CB
FTTN GROUP 004	0	0mA 0mA																	upper fan
FTTN GROUP 005	0	0mA 0mA																	lower fan

Details about the WEB interface can be found in the *QS941A Controller WEB Interface*. This pdf document can be found at the bottom of the CPS2300U page located at: <http://www.power.tycoelectronics.com/Family.aspx?FID=928472a2-742b-46c6-8188-1fbb92e73510>

**To help find the FTTN relevant information on each tab, please use this guide** (ovals show start links):

Home: >

Think of the FTTN shelf as protected power distribution panel similar to a circuit breaker distribution. Estimate of 48V current is shown.

Reports: >

FTTN data is under these links

Home Reports Maintenance Settings Installation

System	Clear Data	Disconnects	Start Equipment	Stop Equipment
restart rectifiers	clear missing devices	no Battery contactors	Rectifiers No rectifiers in standby	Rectifiers No rectifiers are on
restart ringers	clear latched events	no Load 1 contactors	Ringers No ringers in standby	Ringers No ringers are on
boost	clear history (select item)	no Load 2 contactors		
factory defaults	clear statistics (select item)	no Load 3 contactors		
start battery test				
start alarm test				

last updated 08:21:51

Maintenance: >  
Clear missing devices declares the current state as good, retiring all alarms.

On/Standby control is available for FTN starting here, too.

Home Reports Maintenance Settings Installation

Please select which settings you would like to adjust:

System	Reserve	Power	Communication	Programming
<a href="#">Plant</a>	<a href="#">Battery Management</a>	<a href="#">Rectifiers</a>	<a href="#">Passwords</a>	<a href="#">Auxiliary Inputs</a>
<a href="#">Shelves</a>	<a href="#">Temperature Compensation</a>	<a href="#">Ringers</a>	<a href="#">Security</a>	<a href="#">User Defined Events</a>
<a href="#">Shunts</a>	<a href="#">Boost</a>	<a href="#">Converters</a>	<a href="#">Network</a>	<a href="#">Derived Channels</a>
<a href="#">Contactors</a>	<a href="#">Battery Types</a>	<a href="#">Part Numbers</a>	<a href="#">Email</a>	<a href="#">Periodic Call Out</a>
<a href="#">FTN</a>	<a href="#">Battery Testing</a>		<a href="#">Local Ports</a>	
<a href="#">Time</a>			<a href="#">Modem</a>	
<a href="#">Display</a>			<a href="#">Call Outs</a>	
<a href="#">Alarm Test</a>			<a href="#">Alarm Notification</a>	
			<a href="#">TL1</a>	

© 2000 Tyco Electronics Corporation. All rights reserved.

Settings: >  
Details of FTN setting can be found here.

Home Reports Maintenance Settings Installation

**Confirm Equipment Installed**

- Rectifiers
- Ringer Chassis
- Ringers
- Distribution Modules
- Thermal Probes
- Mid-String Probes

**Set/Reset Default Battery Type Values**

VALVE-REG

Submit Battery Type

**Set Basic System Information**

Enter the Site ID:

Set the date for this system:

Set the time for this system:

Submit

Installation: >  
This is where one sets the date and time.

Please note: loop resistance measurements only work for a small subset of applications.



**To interact with the QS941 Controller through the WEB interface it is possible to connect a computer to the QS941A directly using server mode or through a LAN using client mode.**

This section details how to set up the controller as either a server or a Client.

## Change LAN to Server Mode

To access the controller directly from a PC, you must first change LAN connection to server mode.

Step	Action
1.	Press Menu or Accept key, ■.
2.	Press down arrow, ▼, to Configuration.
3.	Press the right arrow key, ► (or square “accept” key, ■) to advance.
4.	Press down arrow, ▼, to Communications Ports.
5.	Press the right arrow key, ► (or square “accept” key, ■) to advance.
6.	Press down arrow, ▼, to Network Settings.
7.	P Press the right arrow key, ► (or square “accept” key, ■) to advance.
8.	Press down arrow, ▼, to highlight DHCP.
9.	Press the right arrow key, ► (or square “accept” key, ■) to advance.
10.	Press down arrow, ▼, to toggle to SERVER.
11.	Press save, ■.
12.	Press the Back Arrow, ◀, to return to the default screen.
13.	Wait 2 minutes.
14.	Activate changes by removing the QS941 controller circuit card from the backplane. Wait until the LEDs extinguish.
15.	Reapply power by reinserting the circuit card connection until seated.
16.	Verify Server Mode by pressing Menu>Status>Network Settings>Port 1> to find 192.168.2.1 as the network address.

**Warning: It is always safer to leave the controller in Client mode. This avoids LAN conflicts should the controller ever be connected to a Local Area Network.**

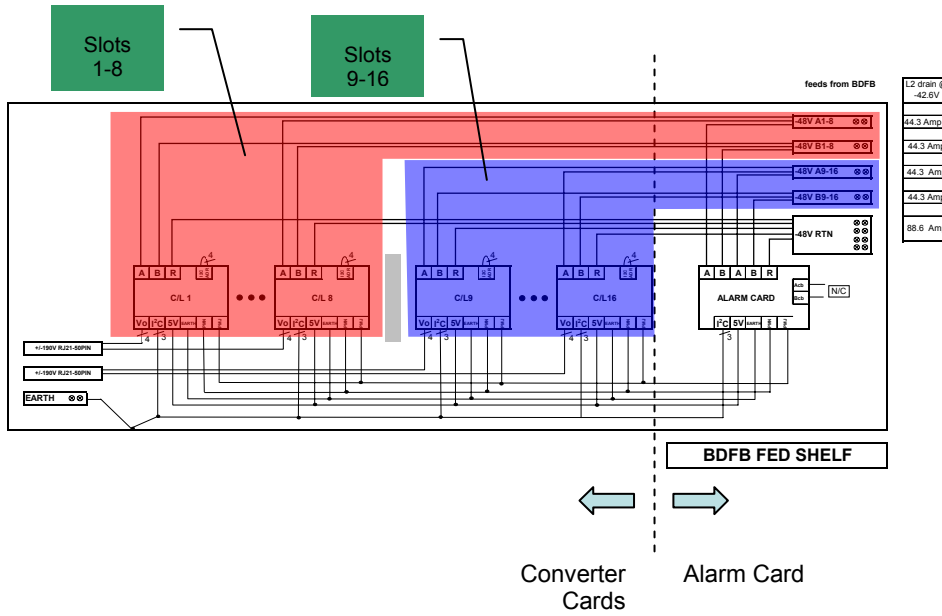
## Restore the LAN Connection to Client Mode

As good policy, always leave the controller in Client mode.

Step	Action
1.	Press Menu or Accept key, ■.
2.	Press down arrow, ▼, to Configuration.
3.	Press the right arrow key, ► (or square “accept” key, ■) to advance.
4.	Press down arrow, ▼, to Communications Ports.
5.	Press the right arrow key, ► (or square “accept” key, ■) to advance.
6.	Press down arrow, ▼, to Network Settings.
7.	P Press the right arrow key, ► (or square “accept” key, ■) to advance.
8.	Press down arrow, ▼, to highlight DHCP.
9.	Press the right arrow key, ► (or square “accept” key, ■) to advance.
10.	Press down arrow, ▼, to toggle to CLIENT.
11.	Press save, ■.
12.	Press the Back Arrow, ◀, to return to the default screen.
13.	Wait 2 minutes.
14.	Activate changes by removing the QS941 controller circuit card from the backplane. Wait until the LEDs extinguish.
15.	Reapply power by reinserting the circuit card connection until seated.
16.	Verify Client Mode by pressing Menu>Configuration>Communications Ports>Network Settings> to show Client mode.



# 3 Front Panel



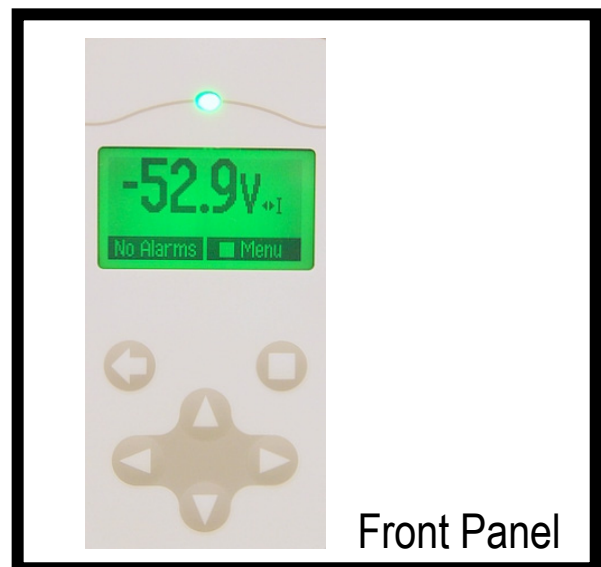
Hardware

Home   Reports   Maintenance   Settings   Installation

### FTTN System Overview

Groups				Circuits																		
Description	Circuits	Current	Capacity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			
FTTN DEFAULT GROUP	20	12mA	5140mA	a	v	382	381	380	379	379	380	382	382	381	381	n/a	n/a	n/a	n/a	n/a	n/a	SH01 1.5 A
FTTN GROUP 001	0	0mA	0mA	mA	1	1	1	1	1	0	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a	A 1-8 9-16 CB	
FTTN GROUP 002	0	0mA	0mA	b	v	379	383	379	382	381	380	381	379	382	384	n/a	n/a	n/a	n/a	n/a	B 1-8 9-16 CB	
FTTN GROUP 004	0	0mA	0mA	mA	1	1	1	1	1	1	1	1	1	1	1	n/a	n/a	n/a	n/a	n/a	upper fan	
FTTN GROUP 005	0	0mA	0mA																		lower fan	

WEB



**Most of the detail needed to interact with the front panel is in the QS941A Controller User Interface document available from the website.**

Key to getting started is understanding that the top row keys on the faceplate are soft keys. Text on the lower edge of the display indicates key function.



The QS941A Controller User Interface manual is the best reference to use when discussing interacting with the display with a customer. It can be found at this WEB address:

<http://www.power.tycoelectronics.com/BinaryGet.aspx?ID=f8386d76-2f10-4e63-9a84-54e506447b07>