4100+/UT Universal Power Supply Jumper Placements, Switch Settings, and Terminations

Cautions and Warnings

DO NOT INSTALL ANY SIMPLEX PRODUCT THAT APPEARS DAMAGED. Upon unpacking your Simplex product, inspect the contents of the carton for shipping damage. If damage is apparent, immediately file a claim with the carrier and notify Simplex.

ELECTRICAL HAZARD - Disconnect electrical power when making any internal adjustments or repairs. Servicing should be performed by qualified Simplex Representatives.

STATIC HAZARD - Static electricity can damage components. Therefore, handle as follows:

1. Ground yourself before opening or installing components (use the 553-484 Static Control Kit).
2. Keep uninstalled component wrapped in anti-static material at all times.

Introduction

The Universal Power Supply (UPS) consists of two assemblies including a Switcher Assembly (636-341) and a Communicating Power Supply Controller Assembly (565-247). Together, these two assemblies form a power supply which is electrically similar to the Intelligent Power Supply (IPS) previously installed in 4100-Family systems. The UPS has the following features that differ from the IPS.

- 110Ah battery charger.
- NICAD battery charger.
- External battery charger operation.

For further information concerning the UPS, reference field wiring diagrams 841-731 and 841-995.

In This Publication

The following topics are covered in this publication.

Overview

Switcher Assembly

The switcher assembly is the core of the UPS. Operating from a 120/220/240VAC line, via the four place AC connector (see Figure 1), the switcher converts the AC line voltage to 28.5VDC for system use. It provides **8A** maximum continuous current and 4A of current for battery charger use only.

Communicating Power Supply Controller Assembly

The Communicating Power Supply Controller Assembly is attached to the front of the switcher assembly. With the controller assembly installed, the UPS provides both 8VDC and 24VDC power and charges system batteries with up to a 110Ah capacity.

Status Monitoring

The UPS monitors and reports the following status information to the 4100-Family Master Controller using 4100 communications:

- AC power loss/brownout
- Earth troubles
- Low battery
- Battery disconnected
- Overvoltage/undervoltage conditions
- PMSO/PMSI power supply monitor loop
- Supply Tap Current

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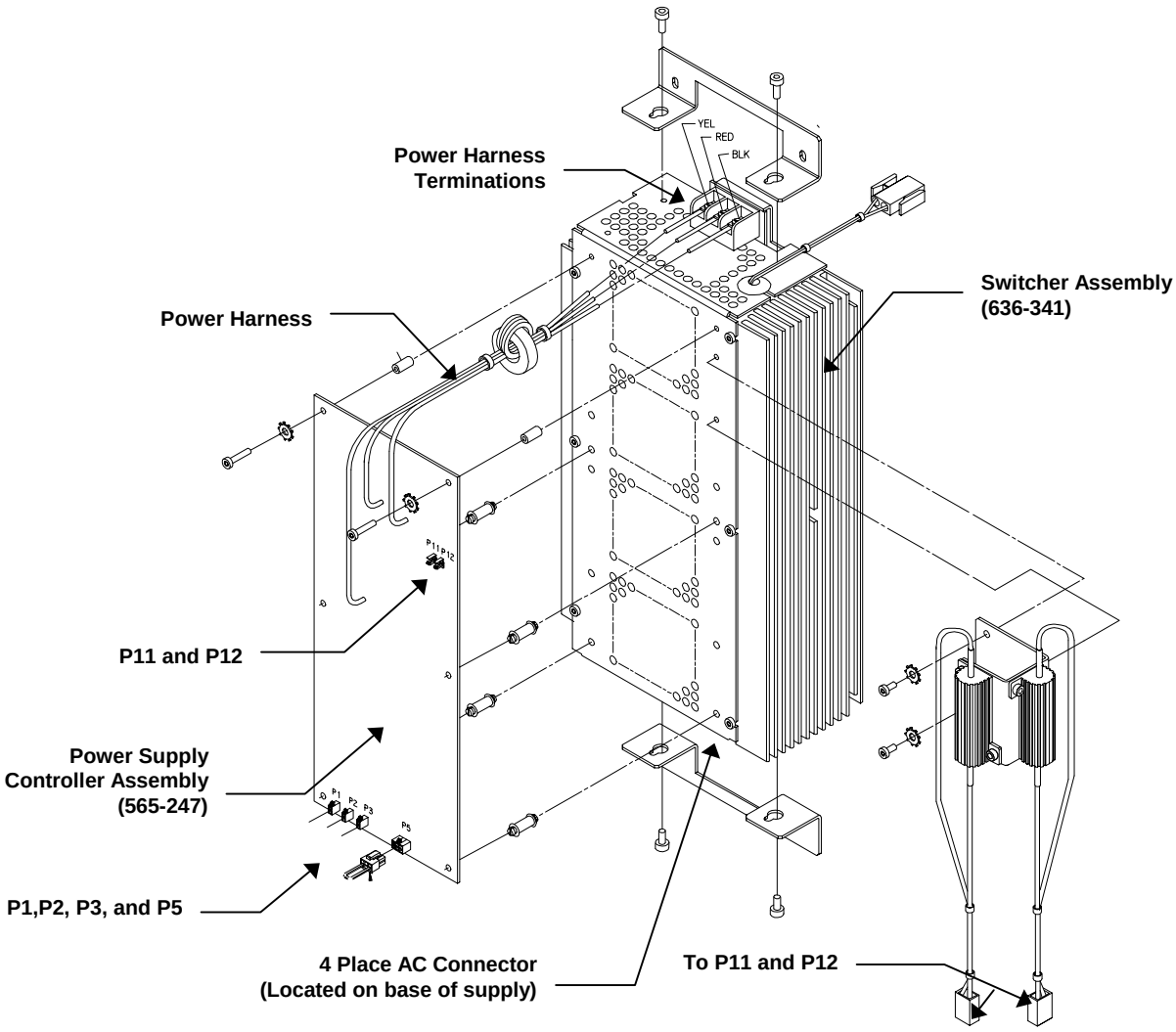
Universal Power Supply



Note: **Product shown exploded for detailed view**

Figure 1. Universal Power Supply

Battery Charger

The UPS battery charger charges the batteries, runs tests to verify capacity, then provides short circuit protection for the batteries. The charger can charge batteries of up to 50Ah capacity using the UPS C-Tap. Batteries with up to 110Ah capacity can be charged if both the B-Tap and the C-Tap are used.

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Overview, *Continued*

Battery Charger *(Continued)*

Every 90 seconds, during normal operation, while the power supply is running on AC power, the charger tests the charge on the batteries. If the batteries are **over 23.2VDC**, a normal battery status is sent to the Master Controller. If the batteries fall below **22.5VDC**, a "**BATTERY LOW**" Trouble is sent to the Master Controller. If less than 2VDC is read, a "**BATTERY DISCONNECTED**" Trouble is sent to the Master Controller, and the charger is turned OFF.
If after 96 hours of continuous charging, the battery charge current has not dropped below 459mA (with lead-acid batteries), the power supply reports a "**BATTERY CAPACITY**" Trouble and the charger turns OFF. This trouble clears when the batteries become fully charged. The trouble is reported so that damaged batteries can be replaced.

Specifications

The UPS requires 6-inches of bay space in a 4100 cabinet. With up to 50Ah batteries, the UPS provides 8A at 28.5VDC power (Tap A and Tap B). With 110Ah batteries the UPS provides 4A at 28.5VDC power (Tap A only). Each option provides 3A at 8VDC for system logic.

Power Harness (See Figure 1)

The power harness connects the switcher to the controller. The **RED** wire goes to the "**+**" connection on the switcher. The **BLACK** wire goes to the "**-**" connection on the switcher. The **YELLOW** wire goes to the "**CHG**" connection on the switcher.

Indicator Functions

The following indicators are present on the Communicating Supply Controller Assembly. (See Figure 2.)

LED 1: Power LED.

The green "**Power ON**" LED indicates normal AC power. When this LED is ON, it does NOT indicate whether the power supply is on batteries or AC, only that the state of the AC power is "normal."

LED 2: Trouble LED.

The yellow "**Trouble**" LED indicates that normal communications with the Master Controller are not taking place when the supply is configured as a communicating supply.

Jumper Placements

Jumper Functions

The PROM Configuration Jumpers listed in Table 1 are factory installed and change only if the PROM type is changed. These jumpers are not field-selectable.

JW1-7: PROM Configuration Jumpers.

Table 1. PROM Configuration Jumpers (For Reference Only)

PROM	INSTALLED	REMOVED
27C64	1, 2, 5	3, 4, 6, 7
27C256	1, 3, 4, 5	2, 6, 7
27C512	3, 4, 6, 7	1, 2, 5

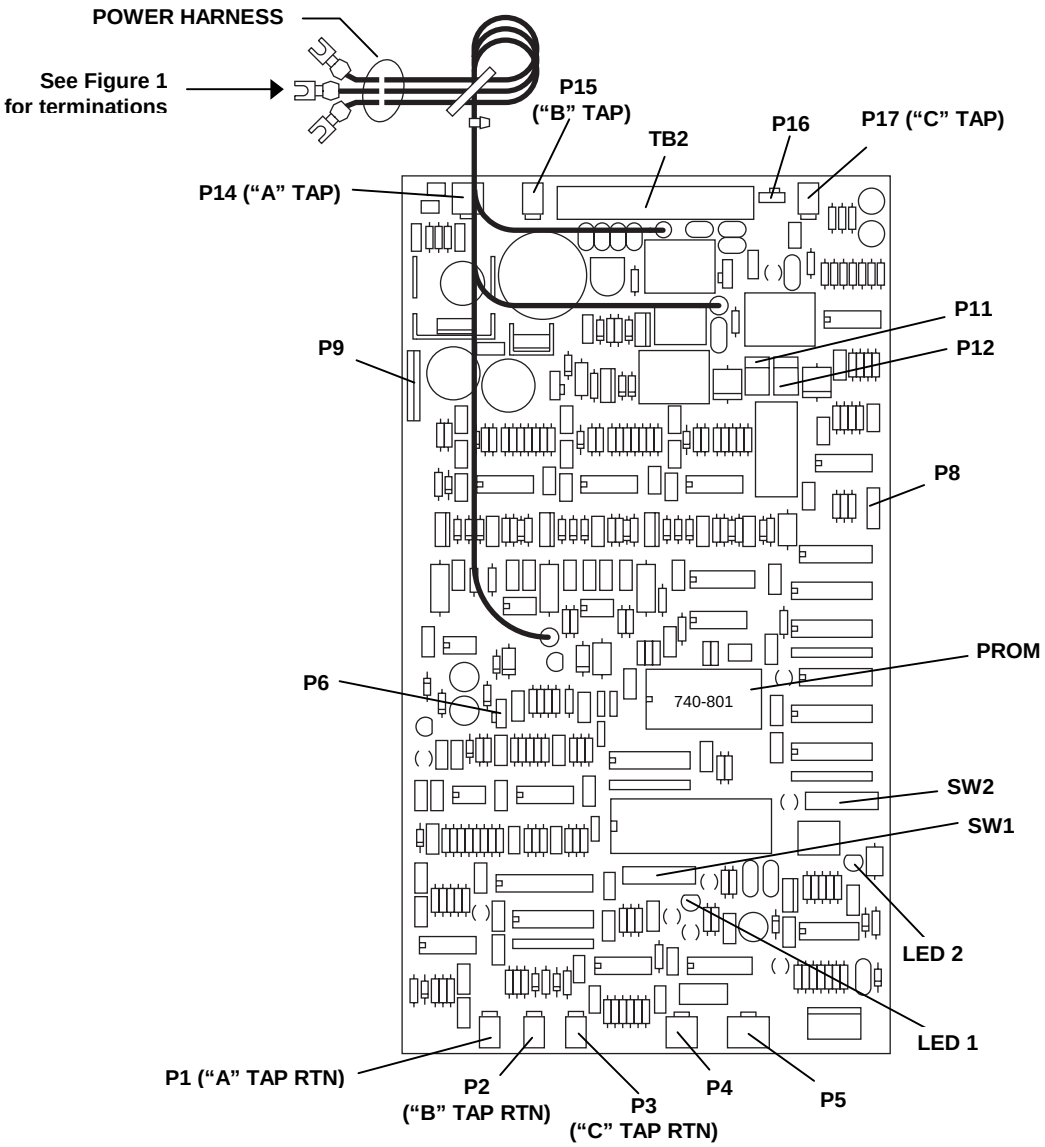

Figure 2. Communicating Power Supply Controller Assembly

Jumper Functions *(Continued)*

P6: Battery Disconnect.

This jumper allows the "**NO BATTERY**" Trouble to be defeated in systems without batteries.

IMPORTANT: Do not use this jumper to bypass troubles from a temporarily disconnected battery.

Jumper P6 is configured in the following manner:

- Position 1-2: Normal Configuration.
- Position 2-3: No Battery Configuration.

P7: Not used.

P10 and P13: Must remain in positions 1-2.

NICAD Battery Charger Adjustment

Position 1-2: Normal operating configuration
Position 2-3: Charger adjustment configuration

Follow Steps 1 through 6 for NICAD batteries **only** (there are not adjustments for lead acid batteries).

1. Disconnect the batteries.
2. Set Jumpers P10 and P13 to Position 2-3.
3. Measure the voltage at the battery charge output with respect to 0V.
4. Slowly adjust R143 until the voltage reads 25.5 +/- .1 VDC
5. Set Jumpers P10 and P13 to Position 1-2.
6. Reconnect the batteries.

P16: Earth Detect Jumper.

Jumper P16 enables or disables the Earth Detect feature of the UPS. P16 is configured in the following manner:

- Position 1-2: Earth Detect Enabled (Default).
- Position 2-3: Earth Detect Disabled.

DIP Swich Settings

Jumper Functions

SW1-3 through SW1-6: See Table 2.

SW1-7: This switch configures the battery charger. Position **ON** enables 50 Ah battery charging. Position **OFF** enables 110 Ah battery charging.

Note: With position **OFF** is selected, the B-Tap is not available for system power.

SW1-8: Spare.

The eight-position DIP switch SW1 (located on the Communicating Power Supply Controller Assembly board) identifies the configuration of the power supply. The various positions of Switch SW1 are described below.

SW1-1: This switch allows retrofit of the IPS. Position **ON** tells the supply to act like an IPS in terms of the messages sent to and received from the 4100-Family Master Controller. Place this switch in the **ON** position (default).

SW1-2: This switch is used for audio applications. Position **ON** indicates that amplifiers powered by the "B Tap" must switch to battery when told to do so by the 4100 Master Controller.

WARNING: B-Tap power is removed on AC fail.

Position **OFF** indicates that amplifiers should switch to battery when AC is lost.

Power Supply DIP Switch Settings

The power supply can operate in the following modes shown in Table 2 below:

Table 2. SW1-3 through SW1-6 DIP Switch Settings

DIP Switch Position				Configuration Interpretation
3	4	5	6	
OFF	ON	ON	ON	Power Supply with NICAD Battery
OFF	ON	ON	OFF	Power Supply with Lead-Acid Battery
OFF	ON	OFF	ON	Power Supply without Battery Charger
OFF	OFF*	ON	ON	Power Supply w/Audio (25W Amp) and NICAD Battery
OFF	OFF*	ON	OFF	Power Supply with Audio (25W Amp) and Lead-Acid Battery
OFF	OFF*	OFF	ON	Power Supply with Audio (25W Amp) without Battery Charger

*** Requires proper programming selection (6005) Power Supply and charger**

DIP Swich Settings, *Continued*

Address/Baud Rate DIP Switch SW2

DIP Switch SW2 has eight-positions that are used to set the power supply address and baud rate. The switch is configured in the same manner as the Address/Baud Rate DIP Switches on the other 4100 daughter cards.

SW2-1: Communications baud rate.

ON: 9600 Baud
OFF: 1200 Baud

SW2-2 through SW2-8: Board address, with the LSB (least significant bit) of the address being set by SW2-8.

Table 3. Typical Address 1 and 2 Settings for SW2

	LSB						MSB
Address #	**8**	**7**	**6**	**5**	**4**	**3**	**2**
Address 1	OFF	ON	ON	ON	ON	ON	ON
Address 2	ON	OFF	ON	ON	ON	ON	ON

Note: The **OFF** (or open) position of the switch is a logic "**1**"; the **ON** (or closed) position of the switch is a logic "**0**."

Connections and Terminations

Connections and Terminations

The following I/O connections and terminations are available on the Communicating Supply Controller Assembly. (Refer to Figure 2.)

Table 3. Signal Supervisory Inputs

Connection	Description
P1	**"A Tap" Signal Supervisory Input. P1 is used to monitor the "A Tap" Signal Power Harness.**
P2	**"B Tap" Signal Supervisory Input. P2 is used to monitor the "B Tap" Signal Power Harness.**
P3	**"C Tap" Signal Supervisory Input. P3 is used to monitor the "C Tap" Signal Power Harness.**

Note: Default is 733-664 Jumper Plug.

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Connections and Terminations *(Continued)*

Use Tables 4 through 13 for reference purposes.

Table 4. P4-4100 Communications Interface

Connection	Description
P4	**P4 is a communications interface with 4100-style communications for use by the communicating supply. The following connections are available.**
P4-1	Common - Communication 0V.
P4-2	Code - Coding Bus (not used by UPS).
P4-3	TXD - Transmit data to system. Open collector with 620 Ohm output impedance.
P4-4	RXD - Receive data from system. 0 to 28.5VDC input.

Table 5. P5-PMSI Interface

Connection	Description
P5	**The PMSI interface allows connection to and control of existing non-intelligent supplies via the Power Module Supervisory Input. The following connections are available.**
P5-1	24V Common.
P5-2	Coil - Open drain output sinks current for battery changeover relay coil on expansion power supplies. Maximum current of 1 Amp.
P5-3	PMSI - Input; 100K pullup. Monitors power supply loop. Normally pulled low by the electrically furthest supply in a “daisy chain.”
P5-4	Not used.
P5-5	Not used.
P5-6	Not used.

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Connections and Terminations *(Continued)*

Table 6. P8-Audio Control Interface

Connection	Description
P8	**P8 is a ten position ribbon cable connector. The signals on this connector monitor and control amplifiers. The following connections are available:**
P8-2, -4, -6, -8, -10	24V Common.
P8-1	Music Active - Output, open collector, 150mA maximum.
P8-3	Amp Reset - Output, open collector, 150mA maximum.
P8-5	Amp Has Sw to Backup - Input, 15K pullup, normally held low by amplifier.
P8-7	Amp Trouble - Input, 15K pullup, normally held low by amplifier.
P8-9	Amp Switch to Battery - Output, open collector, 150mA maximum.

Table 7. P9-Switcher Interface

Connection	Description
P9	**P9 is an eight position flex cable connector. The signals on this connector are used to monitor and control the 565-341 switcher assembly. The following connections are available:**
P9-2, -4	+24V UPS - Power input, provides power for controller board and 8V converter.
P9-3	+24V Main A/D - A/D input. Used by A/D to determine the output of the switcher portion of the supply.
P9-6	Power Loss/Brown Out - Comparator input; 2.2K pullup. Normally high; pulled low by switcher on power loss or brownout.
P9-8	Battery Changeover - Output; open collector. Activates relay coil on switcher board when low for normal AC operation; releases for battery operation.

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Connections and Terminations *(Continued)*

Table 8. P11-Current Limit Resistor 2

Connection	Description
P11	**P11 is the connection to the 2 Ohm current-limiting resistor for the "C" Tap charger output.**

Table 9. P12-Current Limit Resistor 1

Connection	Description
P12	**P12 is the connection to the 2 Ohm current-limiting resistor for the "B" Tap charger output.**

Table 10. P14-"A" Tap/8 Volt Output

Connection	Description
P14-1	0V
P14-2	8V Common
P14-3	"A" Tap output
P14-4	8V output

Table 11. P15-"B" Tap Output

Connection	Description
P15-1	0V
P15-2	"B" Tap output

Table 12. P17-"C" Tap Output

Connection	Description
P17-1	0V (Not Used).
P17-2	"C" Tap output. (Not Used).

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Connections and Terminations *(Continued)*

Table 13. Terminations

Termination	Description
TB1	**Option Interface (Not Available).**
TB2	**Output Connections. Terminal Block TB2 provides extra connection points for the "A", "B", and "C" Taps. Transient suppression is provided at the block. The following connections are available on TB2:**
TB2-1	0V.
TB2-2	0V.
TB2-3	"C" Tap output (Not Used).
TB2-4	"C" Tap output (Not Used).
TB2-5	0V.
TB2-6	0V.
TB2-7	"B" Tap output.
TB2-8	"B" Tap output.
TB2-9	0V.
TB2-10	0V.
TB2-11	"A" Tap output.
TB2-12	"A" Tap output.