TECHNICAL MANUAL
888-2608-051
PSU Blade Module

PSU Blade Module

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Technical Assistance

Technical and troubleshooting assistance for HARRIS Transmission products is available from HARRIS Field Service (factory location: Quincy, Illinois, USA) during normal business hours 8:00 AM - 5:00 PM Central Time.
Telephone ***+1-217-222-8200*** to contact the Field Service Department; FAX ***+1-217-221-7086***; or E-mail questions to ***tsupport@harris.com.*** **Emergency service is available 24 hours a day, seven days a week, *by telephone only***. Online assistance, including technical manuals, white papers, software downloads, and service bulletins, is available at ***https://premier.harris.com/broadcast*** (log-in required). Address written correspondence to Field Service Department, HARRIS Broadcast Communications Division, P.O. Box 4290, Quincy, Illinois 62305-4290, USA. For other global service contact information, please visit: ***http://www.broadcast.harris.com/contact***. **NOTE:** For all service and parts correspondence, you will need to provide the Sales Order number, as well as the Serial Number for the transmitter or part in question. For future reference, record those numbers here:
_____/_____

Please provide these numbers for any written request, or have these numbers ready in the event you choose to call regarding any Service, or Parts requests. For warranty claims it will be required, and for out of warranty products, this will help us to best identify what specific hardware was shipped.

Replaceable Parts Service

Replacement parts are available from HARRIS Service Parts Department from 7:00 AM to 7:00 PM Central Time, Monday through Friday, and 8:00 AM to 1:00 PM Central Time on Saturday.

Telephone ***+1-217-222-8200*** or email ***servicepartsreq@harris.com*** to contact the Service Parts Department. **Emergency replacement parts are available *by telephone only,*** 24 hours a day, seven days a week by calling +1-217-222-8200.

Unpacking

Carefully unpack the equipment and perform a visual inspection to determine if any apparent damage was incurred during shipment. Retain the shipping materials until it has been verified that all equipment has been received undamaged. Locate and retain all PACKING CHECK LISTs. Use the PACKING CHECK LIST to help locate and identify any components or assemblies which are removed for shipping and must be reinstalled. Also remove any shipping supports, straps, and packing materials prior to initial turn on.

Returns and Exchanges

No equipment can be returned unless written approval and a Return Authorization is received from HARRIS Broadcast Communications Division. Special shipping instructions and coding will be provided to assure proper handling. Complete details regarding circumstances and reasons for return are to be included in the request for return. Custom equipment or special order equipment is not returnable. In those instances where return or exchange of equipment is at the request of the customer, or convenience of the customer, a restocking fee will be charged. All returns will be sent freight prepaid and properly insured by the customer. When communicating with HARRIS Broadcast Communications Division, specify the HARRIS Order Number or Invoice Number.

Manual Revision History

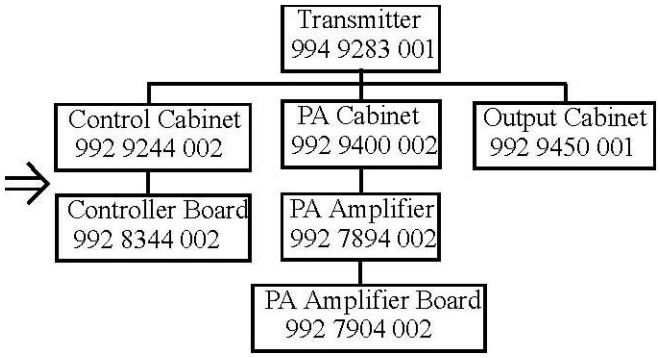
REV	DATE	ECO	Description / Pages Affected
B	3-Feb-2011	P48537	Misc updates over various pages

Guide to Using Harris Parts List Information

The Harris Replaceable Parts List Index portrays a tree structure with the major items being leftmost in the index. The example below shows the Transmitter as the highest item in the tree structure. If you were to look at the bill of materials table for the Transmitter you would find the Control Cabinet, the PA Cabinet, and the Output Cabinet. In the Replaceable Parts List Index the Control Cabinet, PA Cabinet, and Output Cabinet show up one indentation level below the Transmitter and implies that they are used *in* the Transmitter. The Controller Board is indented one level below the Control Cabinet so it will show up in the bill of material for the Control Cabinet. The tree structure of this same index is shown to the right of the table and shows indentation level versus tree structure level.

Example of Replaceable Parts List Index and equivalent tree structure:

Replaceable Parts List Index		Part Number	Page
Table 7-1.	Transmitter	994-9283-001	7-2
Table 7-2.	Control Cabinet	992-9244-002	7-3
Table 7-3.	Controller Board	992-8344-002	7-6
Table 7-4.	PA Cabinet	992-9400-002	7-7
Table 7-5.	PA Amplifier	994-7894-002	7-9
Table 7-6.	PA Amplifier Board	992-7904-002	7-10
Table 7-7.	Output Cabinet	992-9450-001	7-12



The part number of the item is shown to the right of the description as is the page in the manual where the bill for that part number starts. Inside the actual tables, four main headings are used:

- Table #-#. ITEM NAME - HARRIS PART NUMBER - this line gives the information that corresponds to the
- Replaceable Parts List Index entry;
- HARRIS P/N column gives the ten DIGIT Harris part number (usually in ascending order);
- DESCRIPTION column gives a 25 character or less description of the part number;
- REF. SYMBOLS/EXPLANATIONS column 1) gives the reference designators for the item (i.e., C001, R102, etc.) that corresponds to the number found in the schematics (C001 in a bill of material is equivalent to C1 on the schematic) or 2) gives added information or further explanation (i.e., “Used for 208V operation only,” or “Used for HT 10LS only,” etc.).

NOTE: Inside the individual tables some standard conventions are used:

- A # symbol in front of a component such as #C001 under the REF. SYMBOLS/EXPLANATIONS column means that this item is used on or with C001 and is not the actual part number for C001.
- In the ten digit part numbers, if the last three numbers are 000, the item is a part that Harris has purchased and has not manufactured or modified. If the last three numbers are other than 000, the item is either manufactured by Harris or is purchased from a vendor and modified for use in the Harris product.
- The first three digits of the ten DIGIT part number tell which family the part number belongs to - for example, all electrolytic (can) capacitors will be in the same family (524 xxxx 000). If an electrolytic (can) capacitor is found to have a 9xx xxxx xxx part number (a number outside of the normal family of numbers), it has probably been modified in some manner at the Harris factory and will therefore show up farther down into the individual parts list (because each table is normally sorted in ascending order). Most Harris made or modified assemblies will have 9xx xxxx xxx numbers associated with them.

The term “SEE HIGHER LEVEL BILL” in the description column implies that the reference designated part number will show up in a bill that is higher in the tree structure. This is often the case for components that may be frequency determinant or voltage determinant and are called out in a higher level bill structure that is more customer dependent than the bill at a lower level.

PSU General Information

High power switching power supplies have migrated from a power 'block' style to a hot-swap/hot-plug power 'blade' style. Driven by the telecom and main-frame computer markets, this allows easy combining of many blades in a power 'shelf' and power rack DC power plants for dedicated equipment. Flexibility, expandability, redundancy and easy blade replacement are among the attractive features of this approach.

This PSU module utilizes multiple blades modularized into a 'block' format to serve as a replacement for previous high power supplies used in Harris equipment. This format provides the attractive features of the power blade and adds flexible interfacing/configurations which allow it to easily adapt to legacy power applications.

The PSU architecture consists of three basic building blocks:

1. Basic PSU Module package 9710001013
2. 3-Blade Frame 9710001016
3. 6-Blade Frame 9710001015

These are then configured into the following modules:

9810006002: Item 1 + Item 2 = DX-200 style PSU module
(This is provided in retrofit kit 9732101181)
9810006001: Item 1 + Item 3 = 3DX100 style PSU (single PSU)
(This is provided in retrofit kit 9732101011)
9810006003: (2) Item 1 + Item 3 = 3DX100 style PSU (dual PSU for redundancy)
(This is provided in retrofit kit 9732101021)

The block diagram shown (later in this manual) depicts the Basic PSU package (Item 1). The four basic boards employed in the module (A1, A2, A3, A4) are described in the following section and illustrated in the block diagram along with their inter-connections.

The power-blade PSU's are UL 60950 and CE LVD certified. All interface boards as well as the overall PSU module are also designed toward that goal.
All components and assemblies of the PSU module are RoHS 2002/95/EC compliant.
A detailed OEM specification sheet for the PSU blade is included at the end of this manual.

Interface Boards

PSU Interface (A1) PWA 9010123121G provides three basic functions:

1. Provides blind-mating/hot-pluggable connectorization to each power blade.
2. Provides feed-thru connectorization from each blade to each other interface board.
3. Allows remote or local auto-enable feature of each blade to be utilized. The auto-enable feature allows the PSU to be enabled upon plug-in or application of AC power to the blade without additional user intervention (providing that the remote enable/disable signal is not over-riding the auto-enable signal).

AC Interface (A2) PWA 9010123101G provides five basic functions:

1. Provides connectorization equivalent to the original 7360266000 PSU.
2. Provides distribution of AC power to each of the PSU blades.
3. Provides approx ~9Vrms as auxiliary AC power for Control Interface PWA 9010123181. (Previous PWA was 9010123131).
4. Provides approx ~13Vpk as a rectified AC signal for AC fault detection circuitry on Control Interface board.
5. Provides safety ground connection point from AC mains power grid.

DC Output Interface (A3) PWA 9010123111G provides six basic functions:

1. Provides connectorization equivalent to the original 7360266000 PSU.
2. Provides combining of blade DC outputs.
3. Provides floating return circuit path for PSU blades, allowing either PSU terminal (+ or -) to be referenced (strapped) to chassis ground.
4. Provides fusing limiting each output equivalent to the ampacity of the original PSU.
5. Provides sensing points to indicate fusing fault(s).
6. Provides active DC output bleed-off upon detection of AC power fault (loss). This feature is only available on PWA 9010123111G Rev A and later.

PSU Control Interface (A4) PWA 9010123181G (previously 9010123131) provides eight basic functions:

- *Note: Most features are common between the (old and new) boards. The differing features are discussed separately.*

Common Features

1. DC OK
   Detects signal from PSU blade provided as an open collector low for normal (DC OK) operation. The detection circuit floats with the power blade and has a pull-up resistor converting it to a normal TTL logic level. Sensing is acquired differentially, and then converted to a chassis-ground referenced logic signal. This signal is then distributed (interfaced) to several points:
   a. Discrete Fault (per power blade) signal, presented to J5 as either a (selectable) active-high or active-low status signal.
   b. Summary Fault #1 signal (optional), which itself is presented to J5.
   c. Summary Fault #2 signal (optional), which itself is presented to J5.
   d. LED indicator, where green indicates DC Output OK, and red indicates DC Output Fault.
2. FUSE OK
   Detects open fuse from DC Output Interface board by sensing increased current flow through a shunt resistor. Each detection circuit floats with its corollary output circuit. Sensing is acquired differentially, and then is converted to a normal chassis referenced logic signal. This signal is then distributed (interfaced) to several points:
   a. Discrete Fault (per output circuit) signal, presented to J5 as either a (selectable) active-high or active-low status signal.
   b. Summary Fault #1 signal (optional), which itself is presented to J5.
   c. Summary Fault #2 signal (optional), which itself is presented to J5.
   d. LED indicator, where green indicates Fuse OK, and red indicates Fuse Fault.
3. Over-Temperature Fault

Detects signal from PSU blade provided as an open collector low for normal (Temperature OK) operation. The detection circuit floats with the power blade and has a pull-up resistor converting it to a normal TTL logic level. Sensing is acquired differentially, and then converted to a chassis-ground referenced logic signal. The signal is then combined (OR'd) from each blade as a single summary fault signal, which is then presented to J5 as either a (selectable) active-high or active-low status signal.

4. AC OK
   Detects full-wave rectified AC signal provided from AC Interface board as the indication of the presence of AC power. The method of detection differs between 9010123131 and 9010123181G, and each method will be described later. The signal distribution between boards differs as well, but these following distribution points are common:
   a. Discrete Fault signal, presented to J5 as either a (selectable) active-high or active-low status signal.
   b. Summary Fault #1 signal (optional), which itself is presented to J5.
   c. Summary Fault #2 signal (optional), which itself is presented to J5.
   d. LED indicator, where blinking yellow indicates AC OK (present); a dark LED indicates AC Fault (loss).
5. Remote ON/OFF (Power-Blade DC Output Enable/Disable)
   Command signal as TTL logic-level signal is provided (by PWA) to each PSU blade via opto-coupler to either enable or disable its DC Output. Command signal can be established (by user) remotely via J4 input connector or locally/manually via switches S1, S2, S3 which over-ride any remote input. Remote signal must establish a (selectable) active-high or active-low logic-level signal, +15VDC max input. Input/output chart is provided on schematic. Selection can also be made to allow gang-enable, where one signal can enable all PSU blades, whether remote or local.
   LED indicators provide enable status for each PSU blade, where green indicates DC output enable, yellow indicates DC output disable.
6. Remote Auto-Enable
   If Remote auto-enable feature is selected on the PSU Interface board, JP1, JP2, JP3 can be selected to remotely allow/disallow auto-enable of their corresponding PSU blade.
7. Current Share
   Each PSU blade has a single-wire current share node. JP4 allows connect/disconnect of each individual PSU blade current-share node to a common current-share node.
8. Current Sense
   Detects signal from PSU blade provided as an analog voltage signal proportional to the DC output current at 0.2V/AMP ratio. The detection circuit floats with the power blade and is acquired differentially, then converted to a chassis-ground referenced analog signal, fed through at a 1:1 ratio. This signal is then presented to J7 for user reference/monitoring, if desired. This feature has not been utilized in transmitter operation at this time, and is strictly optional.

Differing Features

1. Mechanical

a. Visual LED Indication
   9010123131 Rev A – Indication provided directly on surface of board
   9010123131 Rev C – Indication provided on rear-mounted daughter board through panel window.
   9010123181G All Revs – Indication provided on rear-mounted daughter board through panel window.

b. Footprint
   9010123131 Rev A Size = 4.225 x 5.000, 4 mounting holes on 3.825 x 4.500 grid.
   Mounted on panel 9435418154.
   9010123131 Rev C Size = 4.225 x 5.750, 5 mounting holes on 3.825 x 5.250 grid.
   Additional mounting hole provided between J2-J3 for mechanical support, offset by 2.375.
   Mounted on panel 9435418108.
   9010123181G Rev A (and later) Size = 5.00 x 5.75, 6 mounting holes on 4.600 x 5.250 grid.
   Additional mounting hole provided between J2-J3 for mechanical support, offset by 2.375.
   Additional mounting hole provided between J5-J6 for mechanical support, offset by 2.300.
   Mounted on panel 9435418109.

c. Connectors/Cabling
   i. J6 Connector

9010123131 (all revs) – J6 is a 10-pin connector routing to J4 on 9010123101 AC Interface and J1 on 9010123111 DC Output Interface via cable 9529005053.
9010123181G (all revs) – J6 is a 12-pin connector routing to J4 on 9010123101G AC Interface and J1, J2 on 9010123111G DC Output Interface via cable 9529005058.

ii. J1, J2, J3 Connectors
9010123131 Rev A – along top edge of PWA, J1 is left-most, J3 is right-most.
9010123131 Rev C – along top edge of PWA, J1 is right-most, J3 is left-most.
9010123181G (All Revs) – along top edge of PWA, J1 is right-most, J3 is left-most.

2. Electrical

a. DC OK – No differing features
b. FUSE OK – No differing features
c. Over-Temperature Fault
9010123131 Rev C – selection can be made to include this fault in Summary Fault #1 and/or Summary Fault #2.
9010123181G All Revs – selection can be made to include this fault in Summary Fault #1 and/or Summary Fault #2.
d. AC OK
9010123131 Rev C – selection can be made to include this fault in Summary Fault #1 and/or Summary Fault #2.
9010123181G All Revs – selection can be made to include this fault in Summary Fault #1 and/or Summary Fault #2.
See Additional Notes for details on differing operation of this feature.
e. Remote ON/OFF (Power-Blade DC Output Enable/Disable)
Operation is the same, although a delay-time has been incorporated into the enable command (on the order of several AC cycles) to stagger the output enable commands per PSU blade. This exists on 9010123181G (All Revs) only.
f. Remote Auto-Enable – No differing features
g. Current Share – No differing features
h. Current Sense – No differing features
i. Polarity requirements – PSU.v2.1+ versions require DC output connections in the positive sense only. Previous versions allowed reverse wiring (although it was never used). This feature is now eliminated. See 'Polarity Requirements' section in User Operation section for further details.

3. Additional Notes

AC Mains Voltage OK/Fault detection method – 9010123131 (all revs) simply employs an RC circuit with a full-wave rectified signal from the (stepped-down) AC mains. This sustains a logic-level high input to a logic circuit, whereupon loss transitions the logic state. A fault signal is then presented to J5, whose duration is dependent upon the hold-up time of the auxiliary logic supply circuit.
For 9010123181G (all revs), this circuit was changed to utilize a 'missing-pulse detector' circuit methodology. A full-wave rectified stepped-down signal from the AC mains is converted to a pulse train. The pulse detector allows loss of 3 AC cycles before triggering a fault.

AC Fault response – 9010123131 (all revs) simply present the fault status signal to J5 and/or the Summary Fault circuits, and the LED indicator. 9010123181G does this also, and additionally takes two actions in response:

a. Disables DC output of all PSU blades, immediately.
b. Actively bleeds each DC output network on the DC Output Interface PWA 9010123111G through a 667 milliohm resistance. 9010123111G Rev B (and later) also provides capability to add external resistance leg(s) through connection to E23, E24.

Additionally, the DC outputs have a constant minimum load applied of approximately 2W resistive.

Revision Compatibility

There are some combinations of board revisions which must be observed to ensure proper functionality of the PSU module.

Note: NLU = No Longer Used

1. **PSU Interface, Blind Mating (A1)**
   A1.v1.0 – PWA 9010123121 Rev A (NLU), PWB 8010123123 Rev A (NLU)
   A1.v1.1 – PWA 9010123121G Rev A (and later), PWB 8010123123 Rev A (and later)
   Compatibility – All versions are completely forward and backwards compatible with all other boards in the module.
   Transmitter compatibility – Both DX-200 and 3DX100 applications.
2. **AC Interface (A2)**
   A2.v1.0 – PWA 9010123101 Rev A (NLU), PWB 8010123103 Rev A (NLU)
   A2.v2.0 – PWA 9010123101 Rev B (NLU), PWB 8010123103 Rev B (NLU)
   A2.v2.1 – PWA 9010123101G Rev A (and later), PWB 8010123103G Rev A (and later)
   The only functionality change occurred between Rev A and Rev B of 9010123101/8010123103. This involved the removal of Rev A CR2 bridge diode allowing direct connection of the rectified 9VRMS AC signal directly to the Control interface board through J4-3, J4-4.
   Upgrading – The board can be upgraded from A2.v1.0 to A2.v2.x by simply jumpering (shorting) CR2-1 to CR2-2, and jumpering (shorting) CR2-3 to CR2-4. Removing CR2 is recommended although not required.
   Compatibility – see Table 1
   Transmitter compatibility – see Table 1
3. **DC Output Interface (A3)**
   A3.v1.0 – PWA 9011123111 Rev A (NLU), PWB 8011123113 Rev A (NLU)
   A3.v1.1 – PWA 9011123111 Rev B (NLU), PWB 8011123113 Rev B (NLU), used in board assembly* 9710001014 Rev A
   A3.v2.0 – PWA 9011123111G Rev A, PWB 8011123113G Rev A, used in board assembly** 9710001014G Rev A (and later)
   A3.v2.1 – PWA 9011123111G Rev B (or later), PWB 8011123113G Rev B (or later), used in board assembly** 9710001014G Rev A (and later)
   No A3.v1.0 boards have ever shipped. All A3.v1.0 boards were upgraded to A3.v1.1 prior to shipment.
   Functionality difference between A3.v1.1 and A3.v2.x involves the addition of output bleed networks.
   A3.v2.1 only adds an option for external bleed resistance, so it is backwards compatible to A3.v2.0
   Upgrading – The board cannot be upgraded from A3.v1.x to A3.v2.x, it must be replaced.
   Compatibility – see Table 1
   Transmitter compatibility – see Table 1
4. **PSU Control Interface (A4)**
   A4.v1.0 – PWA 9011123131 Rev A (NLU), PWB 8011123133 Rev A (NLU)
   A4.v1.1 – PWA 9011123131 Rev C (NLU), PWB 8011123133 Rev C (NLU)
   A4.v2.0 – PWA 9011123181G Rev A or B, PWB 8011123183G Rev A
   A4.v2.1 – PWA 9011123181G Rev C (and later), PWB 8011123183G Rev B (and later)
   Very few A4.v1.0 boards have ever shipped, and those only for DX-200 applications. No A4.v1.0 boards have shipped for 3DX100 applications.
   Functionality differences between the three versions are discussed earlier in this document.
   Upgrading – (A4.v1.x to A4.v2.x) the board cannot be upgraded, it must be replaced.
   (A4.v2.0 to A4.v2.1) Although factory modification D01958 can be applied to A4.v2.0, it is recommended to simply replace it with A4.v2.1 (or later) version.
   Compatibility – see Table 1
   Transmitter compatibility – see Table 1

*Board assembly 9710001014 consists of additional mechanical components and fusing appropriate for the application.
**Board assembly 9710001014G consists of additional mechanical components, fusing, and load resistors appropriate for the application.

Table 1 – PSU version configuration compatibility

PSU Module Version 9710001013	PSU.v1.0	PSU.v1.1	PSU.v1.2	PSU.v2.0	PSU.v2.1
A4	A4.v1.0	A4.v1.1		A4.v2.0	A4.v2.1+
A3	A3.v1.x			A3.v2.x	
A2	A2.v1.0*	A2.v2.x			
A1	A1.v1.x				
Front Panel	9435418154	9435418108		9435418109	
Control Cable	9529005053			9529005058	
Other components	N/A	N/A	9710001017 (per module)	N/A	N/A
Transmitter	DX-200	DX-200	3DX100	DX-200, 3DX100	

*A2.v1.0 can be reworked/upgraded to A2.v2.x

Special Consideration

For 3DX100 application, (refer to Table 1), only PSU.v1.2 or later (PSU.v2.x) can be used. This situation arises from a load mismatch between the +12VDC bus and -12VDC bus. The -12VDC bus decays slowly relative to the +12VDC bus, causing a disruption in the transmitter logic control circuitry and thereby introducing nuisance (false) faults, some of which require manual intervention to reset the fault condition.

When using PSU.v2.x, the active bleed-off circuitry resolves this situation. Alternatively, applying a minimum constant resistive load of approx 5% will also reconcile the decay times (without needing active bleed-off). This approach must be used with PSU.v1.2 since it does not have active bleed-off circuitry. It is applied using a 4 ohm resistance to load the -12VDC output (Harris kit 9710001017). The load is required per PSU module; therefore, a dual PSU would require 2 kits.

See ‘External Bleed Resistor’ option in the PSU Operation section for more information.

PSU Operation

General Information

The 'basic' PSU module is designed to provide flexible interfacing for 3 power blades to any desired equipment. Blades are available in various output voltages ranging from 5 to 48VDC, in various power levels from 500W to 2500W.

The module AC input is rated from 85-264Vrms 47-63Hz. DC output per blade is limited to individual blade ratings. DC Output board is rated at 80ADC max for DC Output Network #1, 40ADC max for DC Output Network #2. Max output voltage rating for the module is 48VDC.

AC Input provides #6 screw terminals on a barrier-style terminal block. Output network #1 can provide 3 (#10) screw terminals, or an adapter plate with any desired stud size can be provided. The unit presently ships with a 5/16'' stud lug plate installed. Output network #2 can provide 2 (#10) screw terminals, and is presently shipped as such. Chassis safety ground is provided at two points: #6 screw terminal as part of the AC input terminal block (A2.TB1-1), and also as a #10 lug on a flying lead directly connected to module chassis.

The typical, expected configuration is to connect 2 blades in current-share mode to Output network #1, and connect the third blade to network 2, although this is not required. All three can be connected to either network, or all three can be run independently (with the third blade connected directly into the application/load). Direct connection, however, bypasses some features/protections of the module and is not recommended.

Both output networks float with respect to chassis potential (ground). Terminals are provided to allow the strapping of either positive or negative terminals to chassis, allowing creation of negative voltage (referenced to chassis) output to the load. It is important to read the *'Polarity Requirements'* section concerning this.

Typical Configuration

The following discussion applies to 12VDC, 42.5ADC, 500W power blades being utilized in the PSU module.

Interface board settings

First two blades are connected in current-share mode to Output network #1 with 60ADC fusing, ***negative*** terminal strapped to chassis, connection via 5/16'' stud posts. Third blade is connected to network 2 with 25ADC fusing, ***positive*** terminal strapped to chassis, connection via #10 screw terminals.

- Auto-enable feature is set to 'local'
- Summary Fault 1 includes all viable faults: DC OK, FUSE OK, AC OK, OVERTEMP (Note: all status faults indicate with active-low output *(i.e. TTL logic-level 'LOW' = fault indication)*
- Summary Fault 2 includes all viable faults: DC OK, FUSE OK, AC OK, OVERTEMP
- Over-Temperature status fault with active-low output
- AC OK status fault with active-low output
- DC Output Enable set to active-high input *(TTL logic-level 'HIGH' = DC Output Enabled)*
- For models prior to PSU.v2.1, fuse-detect polarity switches S4 and S5 both set to positive.
- Current-share jumper JP4 set to connect PSU blades 1 and 2 current-share nodes to common node. PSU blade 3 current-share node should ***NOT*** be connected to the common node.
- Gang-enable jumpers are not set to allow gang enable

Output Voltage Adjustment

Each power blade has a trimpot accessed through a hole in the side of its chassis near the connector end. A correlating hole is provided in the module chassis. Due to the side-by-side arrangement of the blades in the module, only one blade can be adjusted at a time, so each module must be swapped into the first blade position and adjusted. The blade offers 5% adjustment range, so maximum is approx 12.6VDC. It is recommended,

although not required, that the voltages be set to 12.5VDC. It is also recommended (whatever final output voltage is used) that all blades be equal to that voltage within 50mVDC under 80% loads.
Such adjustment is performed at the Harris facility under 80% resistive loads provided at a test station fixture, which is capable of 400W power dissipation. It is not recommended that the end-user attempt to adjust the PSU module while it is installed and energized in equipment. Dangerous voltages and ampacity energies can endanger the person attempting such adjustments. Additionally, the location/position of the PSU in the transmitter cabinet makes it physically difficult to perform the adjustment.

Power blade installation/removal

This must be done ***carefully*** to avoid damage to the PSU blade blind-mate connector. The pins and/or contact blades of the blind-mate connector can become bent or broken, which can then in turn damage the mating connector if an attempt is made to insert a damaged connector into its mate. The power blade ***must remain parallel*** to the back panel of the module during the ***entire insertion or removal action*** into the blade slot – I.e. ***DO NOT TILT*** the power blade forward at an angle.

Insertion:

1. Completely insert blade into the target slot, keeping bottom edge of blade parallel to back panel of module during the entire process. Ensure that the PSU connector does not strike the PCB connector during the insertion process.
2. Fully seat bottom edge of blade to module back panel.
3. Only then, slide module forward until connector mating is fully completed.
4. Tighten thumbscrew on handle grip, thus ensuring the connector has completed full engagement travel and guarding against disengagement.
5. Visually confirm that the connectors are successfully mated.

Removal:

1. Loosen thumbscrew on handle grip until it is free from lower bracket.
2. Slide module back from mating connector as far back in the slot as possible. Keep bottom edge of power blade fully seated against back panel of module during this process.
3. Carefully lift power blade from slot, keeping bottom edge of blade parallel to back panel of module during the entire process. Ensure that the PSU connector does not strike the PCB connector during the removal process.

Switch operation for manual DC Output Enable.

Figure 2 – Switch in right-most position DISABLES PSU blade

S1 corresponds to PSU blade 1, S2 to blade 2, S3 to blade 3. These are located at top edge of board next to the control connectors for each blade. (Note: older control boards locate these switches just below the connectors).

Figure 2 shows a switch with actuator thrown to the right-most position when viewing the switch face. These switches (S1, S2, and S3) are three-position SPDT switches. The switch common terminal connects to the N.C. terminal with the actuator in the right-most position; it connects to the N.O. terminal with the actuator in the left-most position; and it connects to neither the N.C. nor the N.O. terminal with the actuator in the center position (i.e. floating).

The right-most position will DISABLE its respective PSU; the left-most position will ENABLE its respective PSU. The center position is used when remote enable signals are desired to be employed. (Note: The present applications in DX-200 and 3DX100 transmitters do not use a remote enable signal).

In older control boards, the switch actuator thrown in the down-most position will DISABLE the PSU, the up-most position will ENABLE the PSU, center position allows remote enable.

Before initial operation, it is recommended to set manual enable switches to 'OFF'. After power is applied, manually throw each switch to 'ON'.

Polarity Requirements

The PSU blades provide floating output voltages with respect to its chassis. The 'Positive' terminal is 'positive' only with respect to the 'Return' or 'Negative' terminal. Although this provides the user with flexibility, care must be taken regarding the polarity of connections and how they ultimately are referenced to chassis potential.
Each PSU blade is then connected to either DC Output Network #1 or #2, and ***MUST BE*** connected with appropriate polarity. The PSU blade positive and negative terminals must connect as follows to the DC Output Network terminals:

DC Output Network #1
Positive terminals can connect to: E1, E2, and E3
Negative terminals can connect to: E4, E5, and E6

DC Output Network #2
Positive terminals can connect to: E7 and E8
Negative terminals can connect to: E9 and E10

This is essential for the PSU module control board to operate correctly and to avoid damage.
Once proper polarity is observed for the DC Output Network connections, the DC Output Networks can be properly referenced to chassis ground potential using (additional) wire jumpers.

DC Output Network #1
To provide positive (+) VDC out (from E11, E12, E13) – connect E4, E5, or E6 to chassis
To provide negative (-) VDC out (from E11, E12, E13) – connect E1, E2, or E3 to chassis

DC Output Network #2
To provide positive (+) VDC out (from E17, E18) – connect E9 or E10 to chassis
To provide negative (-) VDC out (from E17, E18) – connect E7 or E8 to chassis

AC Fault Master/Slave Mode operation

With PSU.v2.1 (or later) module, there is an option to operate the backup PSU module (secondary unit in a dual/redundant PSU option (9810006003)) in a slaved AC Fault mode. This feature is available with control board 9010123181G Rev C or later installed.

This feature can be enabled only when PSU is not in operation and no AC power is applied or energized in the PSU module or related equipment.
The feature is enabled as follows:

1. Set jumper JP35 as follows:
   Connect 1-2 = Master (independent) AC Fault operation. This is the default setting.
   Connect 2-3 = Slave AC Fault operation. *Note: only one of the control boards can be set to Slave mode, while the other remains Master.*
2. Connect a jumper wire between the control boards.
   Use 24awg 300V UL rated hookup wire (Harris # 2520551024 or equiv); terminate wire into Wago plugs mated to J5, position 2. (I.e. jumper J5-2 of the first control board to J5-2 of the second control board)

When in master mode, each control board independently senses the presence of AC voltage. When AC voltage is lost to a specific control board (i.e. PSU module), then that module will shut down, while the other module can remaining running. This scenario can only occur when a fuse to only one of the modules interrupts the AC mains, while the fuse to the other module is intact.

The control board that is set to slave mode operation will turn off its own PSU module if AC is lost to *either* of the modules. The control board that remains in Master mode will continue to operate independently of the status of the other control board.

External Bleed Resistance option

With PSU.v2.1 (or later) module, there is an option to utilize an external bleed resistance leg. This feature is available with DC Output board 9010123111G Rev B or later installed.
This connection is made by connecting an external resistor from either Output Network 1 Positive terminals to E23, or Output Network 2 Positive terminals to E24. The active bleed circuitry will then draw current through this additional (parallel) resistance leg when actuated.

A resistor of adequate wattage and pulse withstanding capability should be used. A resistance value should be selected providing a maximum instantaneous bleed current of 18 amps. (For 12VDC, 12/18 = 2/3 ohm). Since the present bleed resistance leg (residing on the PWA) already presents 2/3 ohm to the bleed transistor, it is not recommended that an additional (external) leg be added without prior removal of these resistors.

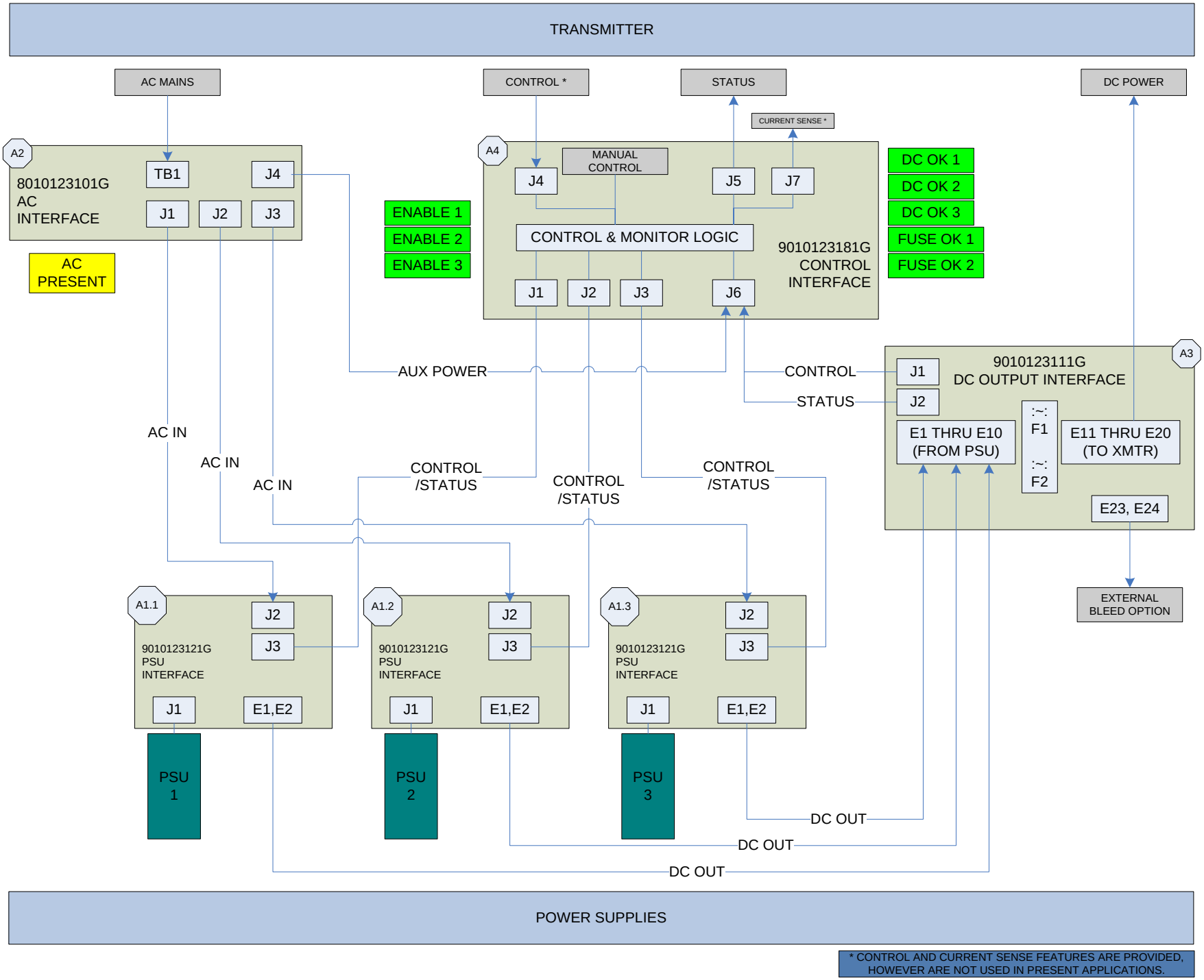
Expected Outputs

When PSU module has been setup in the typical configuration cited above, the outputs should be as follows:

Output Network #1 = +12.5VDC referenced to chassis.
Output Network #2 = -12.5VDC referenced to chassis.
The 'AC PRESENT' LED should blink yellow, All other LED's should indicate green.

All status signals should show +5VDC:
J5-2 AC OK = 5V
J5-3 SUM FAULT1 = 5V
J5-4 SUM FAULT2 = 5V
J5-5 OVERTEMP = 5V
J5-7 PSU1 DC OK = 5V
J5-8 PSU2 DC OK = 5V
J5-9 PSU3 DC OK = 5V
J5-10 FUSE1 OK = 5V
J5-11 FUSE2 OK = 5V
(Pins 1, 6, 12 are chassis/ground reference)

J6-1 DC Out #2 reference potential = 0V)
J6-2 DC Out #1 reference potential = -12.5V
J6-7 DC Out #1 Bleed Control = less than 1V above DC Out #1 reference potential (i.e. <1V)
J6-8 DC Out #2 Bleed Control = less than 1V above DC Out #2 reference potential (i.e. <-11.5V)


TRANSMITTER
AC MAINS
CONTROL *
STATUS
DC POWER
CURRENT SENSE *
A2
8010123101G
AC
INTERFACE
TB1
J4
J1
J2
J3
AC
PRESENT
A4
MANUAL
CONTROL
J4
J5
J7
CONTROL & MONITOR LOGIC
9010123181G
CONTROL
INTERFACE
J1
J2
J3
J6
ENABLE 1
ENABLE 2
ENABLE 3
DC OK 1
DC OK 2
DC OK 3
FUSE OK 1
FUSE OK 2
AUX POWER
CONTROL
STATUS
A3
9010123111G
DC OUTPUT INTERFACE
J1
J2
E1 THRU E10
(FROM PSU)
F1
F2
E11 THRU E20
(TO XMTR)
E23, E24
EXTERNAL
BLEED OPTION
AC IN
AC IN
AC IN
CONTROL
/STATUS
CONTROL
/STATUS
CONTROL
/STATUS
A1.1
A1.2
A1.3
9010123121G
PSU
INTERFACE
J2
J3
J1
E1,E2
PSU
1
PSU
2
PSU
3
DC OUT
DC OUT
DC OUT
POWER SUPPLIES
* CONTROL AND CURRENT SENSE FEATURES ARE PROVIDED,
HOWEVER ARE NOT USED IN PRESENT APPLICATIONS.

Pinout Map — Control Board

SIGNAL TYPE	PWA REFDES	REF DES	PIN	SIGNAL DESCRIPTION	CONDITIONS / NOTES	GROUND REFERENCE	TO
CONTROL	A4	J4	1	REMOTE ON COMMAND, PSU1	TTL-H = ON		-
CONTROL	A4	J4	2	REMOTE ON COMMAND, PSU2	TTL-H = ON		-
CONTROL	A4	J4	3	REMOTE ON COMMAND, PSU3	TTL-H = ON		-
RETURN	A4	J5	1	*-----STATUS RETURN*		XMTR CHASSIS	-
STATUS	A4	J5	2	FAULT, AC VOLTAGE MAINS	TTL-L = FAULT (STANDARD SENSE)		-
STATUS	A4	J5	3	FAULT, SUMMARY #1	TTL-L = FAULT (STANDARD SENSE)		-
STATUS	A4	J5	4	FAULT, SUMMARY #2	TTL-L = FAULT (STANDARD SENSE)		-
STATUS	A4	J5	5	FAULT, SUMMARY, OVER TEMPERATURE	TTL-L = FAULT (STANDARD SENSE)		-
RETURN	A4	J5	6	*-----STATUS RETURN*		XMTR CHASSIS	-
STATUS	A4	J5	7	FAULT, DC OUTPUT, PSU1	TTL-L = FAULT (STANDARD SENSE)		-
STATUS	A4	J5	8	FAULT, DC OUTPUT, PSU2	TTL-L = FAULT (STANDARD SENSE)		-
STATUS	A4	J5	9	FAULT, DC OUTPUT, PSU3	TTL-L = FAULT (STANDARD SENSE)		-
STATUS	A4	J5	10	FAULT, FUSE1	TTL-L = FAULT (STANDARD SENSE)		-
STATUS	A4	J5	11	FAULT, FUSE2	TTL-L = FAULT (STANDARD SENSE)		-
RETURN	A4	J5	12	*-----STATUS RETURN*		XMTR CHASSIS	-
STATUS	A4	J6	1	DC V2 RETURN		FLOATING	A3.J1-1
STATUS	A4	J6	2	DC V1 RETURN		FLOATING	A3.J1-2
STATUS	A4	J6	3	SAMPLE, DC V1	ANALOG VOLTAGE	DC V1 RETURN	A3.J2-1
STATUS	A4	J6	4	SAMPLE, DC V2	ANALOG VOLTAGE	DC V2 RETURN	A3.J2-2
STATUS	A4	J6	5	SAMPLE, DC FUSED V2	ANALOG VOLTAGE	DC V2 RETURN	A3.J2-3
STATUS	A4	J6	6	SAMPLE, DC FUSED V1	ANALOG VOLTAGE	DC V1 RETURN	A3.J2-4
CONTROL	A4	J6	7	CONTROL, V1 BLEED	TTL-H = ENABLE BLEED *(applies only to 9010123181G)*	DC V1 RETURN	A3.J1-3
CONTROL	A4	J6	8	CONTROL, V2 BLEED	TTL-H = ENABLE BLEED *(applies only to 9010123181G)*	DC V2 RETURN	A3.J1-4
AC	A4	J6	9	RECTIFIED VAC			A2.J4-1
RETURN	A4	J6	10	*-----RECTIFIED VAC RETURN*		XMTR CHASSIS	A2.J4-2
AC	A4	J6	11	~AC VOLTAGE (~9VRMS)		FLOATING	A2.J4-3
AC	A4	J6	12	~AC VOLTAGE (~9VRMS)		FLOATING	A2.J4-4
STATUS	A4	J7	1	CURRENT SENSE, PSU1	ANALOG 0.2V/AMP		-
STATUS	A4	J7	2	CURRENT SENSE, PSU2	ANALOG 0.2V/AMP		-
STATUS	A4	J7	3	CURRENT SENSE, PSU3	ANALOG 0.2V/AMP		-
RETURN	A4	J7	4	*-----CURRENT SENSE RETURN*		XMTR CHASSIS	-
RETURN	A4	J1	1	*-----CONTROL RETURN (PSU1)*		NEG DC OUTPUT, PSU1	A1.1.J3-1
STATUS	A4	J1	2	DC OK (FROM PSU1)	TTL-L OR OC CLOSE = OK		A1.1.J3-2
STATUS	A4	J1	3	OVER TEMPERATURE FAULT (FROM PSU1)	TTL-L OR OC CLOSE = OK		A1.1.J3-3
CONTROL	A4	J1	4	REMOTE ON (TO PSU1)	TTL-H OR OC OPEN = ON		A1.1.J3-4
STATUS	A4	J1	5	CURRENT SENSE (FROM PSU1)	ANALOG 0.2V/AMP		A1.1.J3-5
-	A4	J1	6	OVER-VOLTAGE (NOT USED)	NO CONNECT		A1.1.J3-6
CONTROL	A4	J1	7	CURRENT SHARE (FROM PSU1)	1-WIRE ANALOG 5V = FULL LOAD		A1.1.J3-7
CONTROL	A4	J1	8	DC OUTPUT AUTO-ENABLE (PSU1)	INTERLOCK		A1.1.J3-8
RETURN	A4	J2	1	*-----CONTROL RETURN (PSU2)*		NEG DC OUTPUT, PSU2	A1.2.J3-1
STATUS	A4	J2	2	DC OK (FROM PSU2)	TTL-L OR OC CLOSE = OK		A1.2.J3-2
STATUS	A4	J2	3	OVER TEMPERATURE FAULT (FROM PSU2)	TTL-L OR OC CLOSE = OK		A1.2.J3-3
CONTROL	A4	J2	4	REMOTE ON (TO PSU2)	TTL-H OR OC OPEN = ON		A1.2.J3-4
STATUS	A4	J2	5	CURRENT SENSE (FROM PSU2)	ANALOG 0.2V/AMP		A1.2.J3-5
-	A4	J2	6	OVER-VOLTAGE FAULT (FROM PSU2)	NO CONNECT		A1.2.J3-6
CONTROL	A4	J2	7	CURRENT SHARE (FROM PSU2)	1-WIRE ANALOG 5V = FULL LOAD		A1.2.J3-7
CONTROL	A4	J2	8	DC OUTPUT AUTO-ENABLE (PSU2)	INTERLOCK		A1.2.J3-8
RETURN	A4	J3	1	*-----CONTROL RETURN (PSU3)*		NEG DC OUTPUT, PSU3	A1.3.J3-1
STATUS	A4	J3	2	DC OK (FROM PSU3)	TTL-L OR OC CLOSE = OK		A1.3.J3-2
STATUS	A4	J3	3	OVER TEMPERATURE FAULT (FROM PSU3)	TTL-L OR OC CLOSE = OK		A1.3.J3-3
CONTROL	A4	J3	4	REMOTE ON (TO PSU3)	TTL-H OR OC OPEN = ON		A1.3.J3-4
STATUS	A4	J3	5	CURRENT SENSE (FROM PSU3)	ANALOG 0.2V/AMP		A1.3.J3-5
-	A4	J3	6	OVER-VOLTAGE FAULT (FROM PSU3)	NO CONNECT		A1.3.J3-6
CONTROL	A4	J3	7	CURRENT SHARE (FROM PSU3)	1-WIRE ANALOG 5V = FULL LOAD		A1.3.J3-7
CONTROL	A4	J3	8	DC OUTPUT AUTO-ENABLE (PSU3)	INTERLOCK		A1.3.J3-8

Jumper Selection — Control Board

CIRCUIT SECTION	AFFECTS	9010123131 REV A	TYPICAL SETTING	9010123131 REV C	TYPICAL SETTING	9010123181G	TYPICAL SETTING	USED	DESCRIPTION
PSU ENABLE	PSU1	JP01	1-2	JP01	1-2	**JP01**	**1-2**		ALLOW LOCAL/REMOTE PSU AUTO-ENABLE (1)
PSU ENABLE	PSU2	JP02	1-2	JP02	1-2	**JP02**	**1-2**		ALLOW LOCAL/REMOTE PSU AUTO-ENABLE (1)
PSU ENABLE	PSU3	JP03	1-2	JP03	1-2	**JP03**	**1-2**		ALLOW LOCAL/REMOTE PSU AUTO-ENABLE (1)
CURRENT SHARE	ALL	JP04	1-2, 3-4	JP04	1-2, 3-4	**JP04**	**1-2, 3-4**	**ALL**	CURRENT SHARE BUS CONNECT
PSU ENABLE	PSU2		N/A		N/A	**JP05**	**1-2**		GANG PSU ENABLE BUS CONNECT
PSU ENABLE	PSU3		N/A		N/A	**JP06**	**1-2**		GANG PSU ENABLE BUS CONNECT
AC OK	AC OK	JP16	1-2	JP31	1-2	**JP07**	**1-2**	**3DX**	SELECT POS/NEG LOGIC SENSE (ACTIVE-HIGH/ACTIVE-LOW)
OVERTEMP	SUM FAULT OT	JP17	1-2	JP16	1-2	**JP08**	**1-2**	**3DX**	SELECT POS/NEG LOGIC SENSE (ACTIVE-HIGH/ACTIVE-LOW)
SUM	SUM FAULT1	JP14	1-2	JP15	1-2	**JP09**	**1-2**	**ALL**	SELECT POS/NEG LOGIC SENSE (ACTIVE-HIGH/ACTIVE-LOW)
SUM	SUM FAULT2	JP05	1-2	JP29	1-2	**JP10**	**1-2**		SELECT POS/NEG LOGIC SENSE (ACTIVE-HIGH/ACTIVE-LOW)
PSU DC OK	PSU1	JP22	1-2	JP12	1-2	**JP11**	**1-2**		SELECT POS/NEG LOGIC SENSE (ACTIVE-HIGH/ACTIVE-LOW)
PSU DC OK	PSU2	JP25	1-2	JP23	1-2	**JP12**	**1-2**		SELECT POS/NEG LOGIC SENSE (ACTIVE-HIGH/ACTIVE-LOW)
PSU DC OK	PSU3	JP28	1-2	JP26	1-2	**JP13**	**1-2**		SELECT POS/NEG LOGIC SENSE (ACTIVE-HIGH/ACTIVE-LOW)
FUSE OK	FUSE1	JP13	1-2	JP14	1-2	**JP14**	**1-2**		SELECT POS/NEG LOGIC SENSE (ACTIVE-HIGH/ACTIVE-LOW)
FUSE OK	FUSE2	JP08	1-2	JP13	1-2	**JP15**	**1-2**		SELECT POS/NEG LOGIC SENSE (ACTIVE-HIGH/ACTIVE-LOW)
AC OK	AC OK		N/A	JP11	2-3	**JP16**	**1-2**		BYPASS/INCLUDE STATUS IN SUMMARY FAULT 1
AC OK	AC OK		N/A	JP34	2-3	**JP17**	**1-2**		BYPASS/INCLUDE STATUS IN SUMMARY FAULT 2
OVERTEMP	SUM FAULT OT		N/A	JP08	2-3	**JP18**	**1-2**		BYPASS/INCLUDE STATUS IN SUMMARY FAULT 1
OVERTEMP	SUM FAULT OT		N/A	JP09	2-3	**JP19**	**1-2**		BYPASS/INCLUDE STATUS IN SUMMARY FAULT 2
OUTPUT BLEED	OUTPUT2		N/A		N/A	**JP20**	**1-2**		SELECT GROUND REF FOR OUTPUT #2 BLEED (2)
PSU ENABLE	PSU1	JP15	NONE	JP10	NONE	**JP21**	**1-2**		SELECT POS/NEG LOGIC SENSE (ACTIVE-HIGH/ACTIVE-LOW)
PSU ENABLE	PSU2	JP10	NONE	JP07	NONE	**JP22**	**1-2**		SELECT POS/NEG LOGIC SENSE (ACTIVE-HIGH/ACTIVE-LOW)
PSU ENABLE	PSU3	JP11	NONE	JP06	NONE	**JP23**	**1-2**		SELECT POS/NEG LOGIC SENSE (ACTIVE-HIGH/ACTIVE-LOW)
PSU DC OK	PSU1	JP23	1-2	JP17	1-2	**JP24**	**1-2**		BYPASS/INCLUDE STATUS IN SUMMARY FAULT 1
PSU DC OK	PSU1	JP24	1-2	JP18	1-2	**JP25**	**1-2**		BYPASS/INCLUDE STATUS IN SUMMARY FAULT 2
PSU DC OK	PSU2	JP26	1-2	JP24	1-2	**JP26**	**1-2**		BYPASS/INCLUDE STATUS IN SUMMARY FAULT 1
PSU DC OK	PSU2	JP27	1-2	JP25	1-2	**JP27**	**1-2**		BYPASS/INCLUDE STATUS IN SUMMARY FAULT 2
PSU DC OK	PSU3	JP29	1-2	JP28	1-2	**JP28**	**1-2**		BYPASS/INCLUDE STATUS IN SUMMARY FAULT 1
PSU DC OK	PSU3	JP30	1-2	JP27	1-2	**JP29**	**1-2**		BYPASS/INCLUDE STATUS IN SUMMARY FAULT 2
FUSE OK	FUSE1	JP09	2-3	JP20	2-3	**JP30**	**1-2**		BYPASS/INCLUDE STATUS IN SUMMARY FAULT 1
FUSE OK	FUSE1	JP12	2-3	JP21	2-3	**JP31**	**1-2**		BYPASS/INCLUDE STATUS IN SUMMARY FAULT 2
FUSE OK	FUSE2	JP07	2-3	JP19	2-3	**JP32**	**1-2**		BYPASS/INCLUDE STATUS IN SUMMARY FAULT 1
FUSE OK	FUSE2	JP06	2-3	JP22	2-3	**JP33**	**1-2**		BYPASS/INCLUDE STATUS IN SUMMARY FAULT 2
OUTPUT BLEED	OUTPUT2		N/A		N/A	(4) **JP34**	**1-2**		SELECT VOLT REF FOR OUTPUT #2 BLEED (2)
AC OK	AC OK		N/A		N/A	(4) **JP35**	**1-2**		SELECT MASTER/SLAVE FOR AC FAULT SENSE
PSU ENABLE	ALL	JP18	NONE	JP05	NONE		N/A		GANG PSU ENABLE BUS CONNECT
PSU ENABLE	PSU3	JP21	1-2	JP30	1-2		N/A		SELECT INPUT RES: PULL-UP, PULL-DOWN OR NONE
PSU ENABLE	PSU1	JP19	1-2	JP32	1-2		N/A		SELECT INPUT RES: PULL-UP, PULL-DOWN OR NONE
PSU ENABLE	PSU2	JP20	1-2	JP33	1-2		N/A		SELECT INPUT RES: PULL-UP, PULL-DOWN OR NONE

Jumper Selection — Interface Board

CIRCUIT SECTION	AFFECTS	9010123121 REV A	SETTING			9010123121G ALL REVS	SETTING	USED	DESCRIPTION
PSU ENABLE	mated PSU	JP01	2-3			**JP01**	**2-3**		ALLOW LOCAL/REMOTE PSU AUTO-ENABLE (3)

Footnotes:

1. 9010123131 versions provided this jumper as a header/shunt style, whereas 9010123181G versions provide this as a zero-ohm jumper chip set to positions 1-2
2. Provided as a zero-ohm jumper chip set to positions 1-2
3. 9010123121 versions provided this jumper as a header/shunt style, whereas 9010123121G versions provide this as a zero-ohm jumper chip set to positions 2-3
4. This jumper does not exist prior to Rev C

LED Indicators — Control Board

INDICATION	PWA REFDES	9010123131 REV A	9010123131 REV C	9010123181G	COLOR	SIGNAL DESCRIPTION	CONDITIONS / NOTES
PSU ENABLE	A4	DS10	DS01	DS01	YEL	PSU1 DISABLED	
PSU ENABLE	A4	DS02	DS02	DS02	GRN	PSU1 ENABLED	
PSU ENABLE	A4	DS11	DS03	DS03	YEL	PSU2 DISABLED	
PSU ENABLE	A4	DS03	DS04	DS04	GRN	PSU2 ENABLED	
PSU ENABLE	A4	DS12	DS05	DS05	YEL	PSU3 DISABLED	
PSU ENABLE	A4	DS04	DS06	DS06	GRN	PSU3 ENABLED	
DC OUTPUT	A4	DS13	DS07	DS07	RED	PSU1 DC OUTPUT VOLTAGE FAULT	
DC OUTPUT	A4	DS05	DS08	DS08	GRN	PSU1 DC OUTPUT VOLTAGE OK	
DC OUTPUT	A4	DS14	DS09	DS09	RED	PSU2 DC OUTPUT VOLTAGE FAULT	
DC OUTPUT	A4	DS06	DS10	DS10	GRN	PSU2 DC OUTPUT VOLTAGE OK	
DC OUTPUT	A4	DS15	DS11	DS11	RED	PSU3 DC OUTPUT VOLTAGE FAULT	
DC OUTPUT	A4	DS07	DS12	DS12	GRN	PSU3 DC OUTPUT VOLTAGE OK	
DC OUTPUT	A4	DS16	DS13	DS13	RED	FUSE1 FAULT	
DC OUTPUT	A4	DS08	DS14	DS14	GRN	FUSE1 OK	
AC MAINS	A4	DS01	DS15	DS15	YEL	AC VOLTAGE PRESENT	BLINKING
DC OUTPUT	A4	DS17	DS16	DS16	RED	FUSE2 FAULT	
DC OUTPUT	A4	DS09	DS17	DS17	GRN	FUSE2 OK	

cherokee INTERNATIONAL™

CAR0512FP

500 Watt +12V Front End Power Supply

Features:

- 1U Horizontal or 2U Vertical Form Factor
- Small size of only 10.20 x 3.39 x 1.59” / 259 x 86 x 40.5mm
- Hot swap - Fault Tolerant
- Active current Sharing
- Remote ON/OFF
- Extended temperature range
- UL, CSA, CE Certification
- EMI Level B

RoHS COMPLIANT CE cULus

FEATURES	BENEFITS
High Density 12V Front-End	True front-end for mid power DPA applications
1U x 2U high form factor	Minimize space required for power needs
Load Sharing / Fault Redundant	Increased system reliability. Stress balancing.
Universal Input & Certifications	Reduced logistic costs
Retractable handle	Easy installation and maintenance

KEY MARKETS & APPLICATIONS

- Distributed power
- Network Storage
- Blade servers
- Mid-end servers
- Storage Area Networks
- Network equipment

SPECIFICATIONS	500 Watt +12V Front End Power Supply
Input Voltage Range	85-264 VAC, 47-63 Hz
Input Current Maximum	6.5A @ 90VAC, full Load
Inrush Current	20A max. peak (per ETS 300 132-1 and bellcore specifications)
Power Factor	0.99 typical complies with IEC555, EN60555-2, EN61000-3-2
Efficiency	82% typical (including ORing diode)
Output Power	500W
Output Voltage Range	+12VDC (±10%)
Output Current	41.67A @ 12VDC
Output Regulation	±2% of Vnom for any combination of line, load and temperature effect
Ouput Ripple & Noise	Complies with ETS300 132-2, 32dBnrc. Bandwidth: 25Hz - 20kHz. ±1% pk-pk with 0.1μF ceramic and 10μF electrolytic caps at the output
Transient Response	Overshoot 20mV max. Recovery time: 300μs @ 50% load step and di/dt < 1A/μs
Switching Frequeny	100kHz input (200 kHz Output) Hold-up Time 16.7 msec typical
Remote on/off	Logic 1 (TTL High) or open enables unit (ON). Logic 0 (TTL Low) or short shuts unit down (OFF)
Current Limit Protection	110% - 130% of Iout nominal
Over Voltage Protection	14 - 15.5Vdc. Reset by recycling AC power or applying Remote ON/OFF
Operating Temperature	-20°C to +70°C. power derating above 55°C at 10W per °C (-40°C start-up)
Over Temperature Protection	Non latching; protection active at 110°C internal temperature, restart at 95°C (typical)
Cooling	Fan cooled front to back; variable speed
EMI	Class B (FCC and CISPR compliant) - EN55022 level B, CE marked
LED Indicators	LED: DC good (green)
Controls and Signals	Output voltage margining, Output current monitoring, Load sharing, Remote ON/OFF, DC fault, Over temperature protection
Shock & Vibration	IEC68-2-27, MIL-STD-810E
Isolation	Input to Ground: 1500VAC, Input to Output: 3000VAC
Dimensions	10.20 x 3.39 x 1.59” / 259 x 86 x 40.5mm
Weight	2.8 lbs / 1.28kg
Safety Approvals	UL/cUL/EN 60950, CE Mark (LVD)

Cherokee International (North America)
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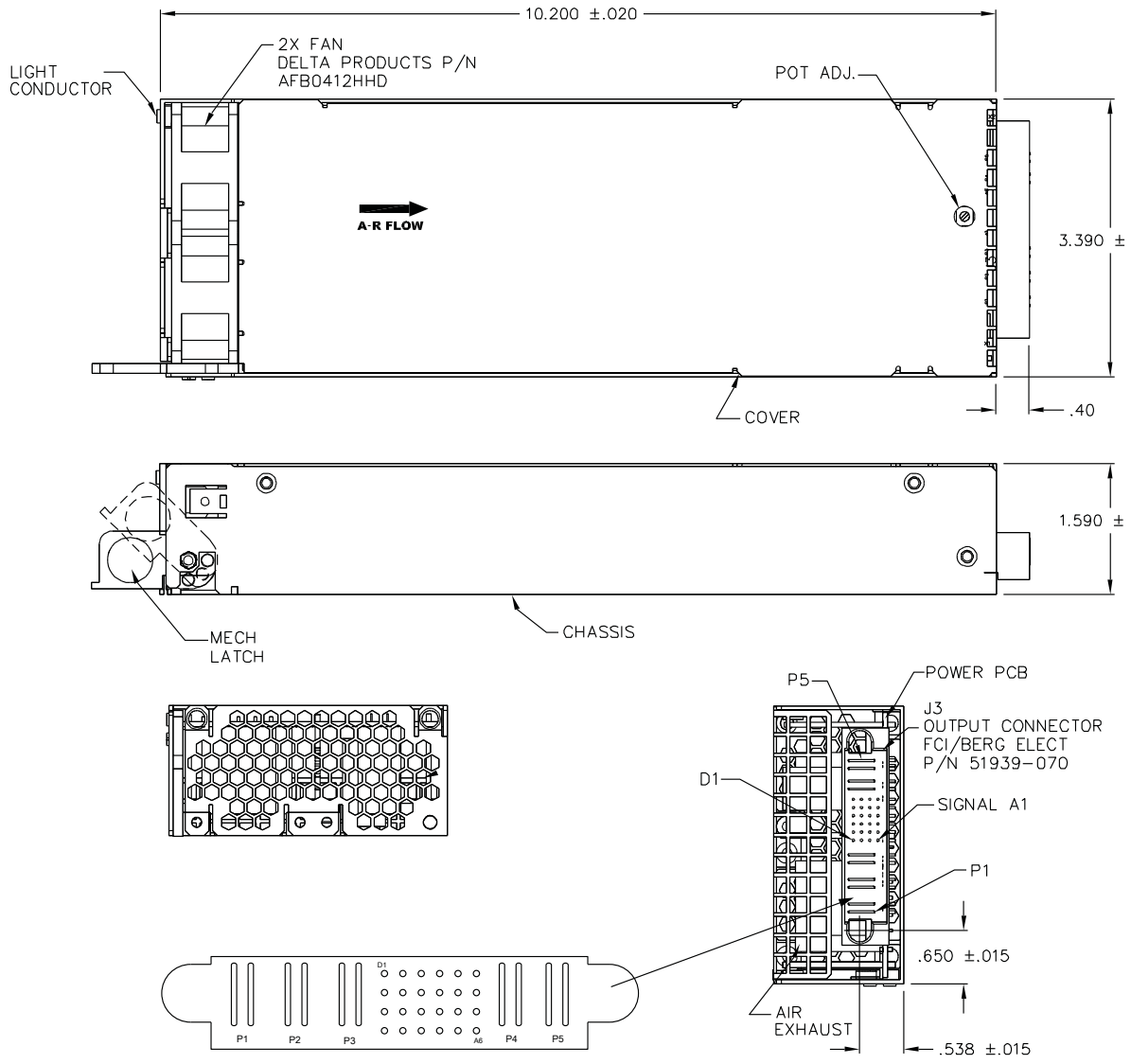
CAR0512FP

500 Watt +12V Front End Power Supply

OUTLINE DRAWING



Pin Out Information (Connector FCI/Berg 51939-070, mates with 51915-050):			
Power Blades		Signal Pins	
P1	AC LINE	A3	RETURN
P2	AC NEUTRAL	B2	I SENSE
P3	CHASSIS GROUND	B3	INHIBIT
P4	+12V	C1	I SHARE
P5	+12V RETURN	C3	OTP TEST POINT
		D1	N/C
		D2	OVP TEST POINT
		D3	ENABLE
		D4	DC FAULT

PART NUMBER DEFINITION GUIDE:

CAR 05 12 F P XX -1A

- XX -1A — RoHS: Blank:Not RoHs, Y0:RoHs 5, Z0:RoHs 6
- P — Polarity P: Postive
- F — Type F: Front End
- 12 — Output Voltage 12 : 12 VDC
- 05 — Output Power 05 : 500 Watts
- CAR — Series Name

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