

**bdi**

**Broadcast Devices, Inc.  
Technical Reference Manual**

# ***DPS-100D RMS RF Power Monitor System***

***Read this manual thoroughly before installing the  
DPS-100D system***



**Revision B.1 FEB 2015 – Firmware Versions  $\geq$  V1.1.015**

**Tel. (914) 737-5032  
Fax. (914) 736-6916**

**[www.Broadcast-Devices.com](http://www.Broadcast-Devices.com)**

## Table of Contents

<b>I. Introduction</b>	<b>3</b>
<b>II. Installation Considerations</b>	<b>3</b>
<b>III. Initial Setup</b>	<b>3-17</b>
<b>A. Login &amp; Security</b>	<b>5-6</b>
<b>B. Network Setup</b>	<b>7-9</b>
<b>C. Email Setup</b>	<b>10</b>
<b>D. Admin Setup</b>	<b>11</b>
<b>E. Time &amp; Date Setup</b>	<b>12</b>
<b>F. RS485 Setup</b>	<b>13</b>
<b>G. Remote I/O Setup</b>	<b>14-15</b>
<b>H. RF Setup</b>	<b>16</b>
<b>I. Input Setup</b>	<b>17</b>
<b>IV. External Connections</b>	<b>18-20</b>
<b>V. Warranty Information</b>	<b>21</b>
<b>VI. Addendum – DPS-100D Application Notes</b>	<b>22-26</b>

## **I. Introduction**

The DPS-100D Power Monitor System is a completely self-contained RMS Power measurement system with accompanying RF transmission line section. The system is capable of measuring RF power in the forward and reflected directions simultaneously and can be configured for power levels from 1 watt to 1 megawatt from 50 MHz to 1 GHz RF transmission line section dependent. The reflected power sample can be configured to detect a threshold dependent on a high reflected power condition and the unit programmed to open a relay upon sustained RF fault conditions. This relay can be used to interface to a transmitter to turn it off or for an external alarm if desired. Other key features include:

On board temperature sensor for line temperature indication

\*External temperature sensor input for a second temperature sensor for any desired purpose

\*External transmission line pressure sensor input for lbs/in.<sup>2</sup> indication reading

Interfaces to BDI SWP-200/206 Motorized Switch Controllers/Antenna Monitor Products

On board web server for convenient remote display and control of parameters

6 programmable general purpose inputs for web display of desired indications

Programmable relays for any – web accessible/configurable

RS232/485 serial and Canbus® interface formats supported

SNMP compatible – Interfaces directly to Burk, Davicom and Relio, Rohde & Schwarz remote control systems

D.C. voltage proportional to forward and reflected power available for interface to conventional remote control metering input

\* requires separate sensors sold separately

## **II. Installation Considerations**

Planning the installation of the DPS-100D should include physical placement in the transmission line where power is to be measured. Three things should be considered and planned for:

1. The placement of the line section – Installation should be such that there is at least 6 inches of clearance to the top of the DPS-100D sensor chassis. The top of the chassis should be kept clear of obstructions as all cabling to and from the unit is done from the top of the chassis. Before installation the position of the line section should be determined such that the display is easily visible. The line section should be mounted paying attention the direction of RF flow.
2. Electrical power source – The DPS-100D is supplied with a modular switching power supply for standalone operation. The unit will operate from 100 – 240 VAC 50-60 Hertz. A six foot cord is supplied. If supplied with the SWP-200 motorized switch controller chassis no external power supply is included because the SWP-200 chassis phantom powers up to two DPS-100D sensors. The DPS-100D can also be supplied with a BDI SWP-206 Antenna Monitor chassis whereby the SWP-206 chassis can phantom power up to 8 – DPS-100D power meters. The DPS-100D may also be powered using phantom power over Ethernet. A PoE injector kit is available from BDI. Contact the factory for availability.
3. Interface wiring – These include RJ45 cable connection to the web server and/or the serial interfaces, a DB15 connector for conventional remote control interface and a multi position Phoenix connector for GPI and external sensor interface. The external sensors are phantom powered by the DPS-100D chassis and simply plug in to their respective connector receptacles. Web connection is made to the jack marked LAN and serial/power connection can be made to an SWP series chassis through the connections marked RS485/CAN. Refer to the SWP series technical reference manual for further information about connection and setup with the SWP series controllers available from BDI.

Once all connections are made and the unit powered the DPS-100D is operational. Forward and reflected power along with temperature and pressure are displayed on the on board display along with any error flags that might exist.

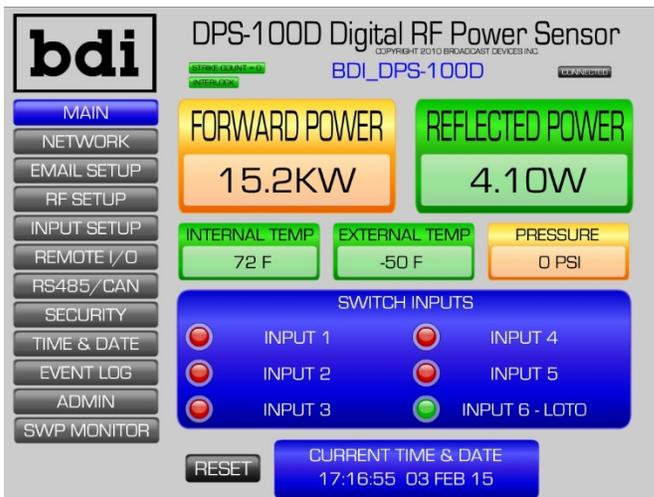
### III. Initial Setup

The initial setup of the DPS-100D consists of first logging into the system from a computer using a standard Ethernet cable. Make a connection from the Ethernet jack on the computer and the DPS-100D Ethernet jack. From a browser enter <http://192.168.1.200> as the local IP address. Once you connect to the system you will see a screen looking like the figure below. It is recommended that after initial login the network settings are set up first then the email settings. After those two screens have been setup the rest of the screens can be set up in any order desired.

Connecting Screen – this screen will show until you connect to the DPS-100D. If you cannot go beyond this screen it means that someone else is logged in to the DPS-100D.



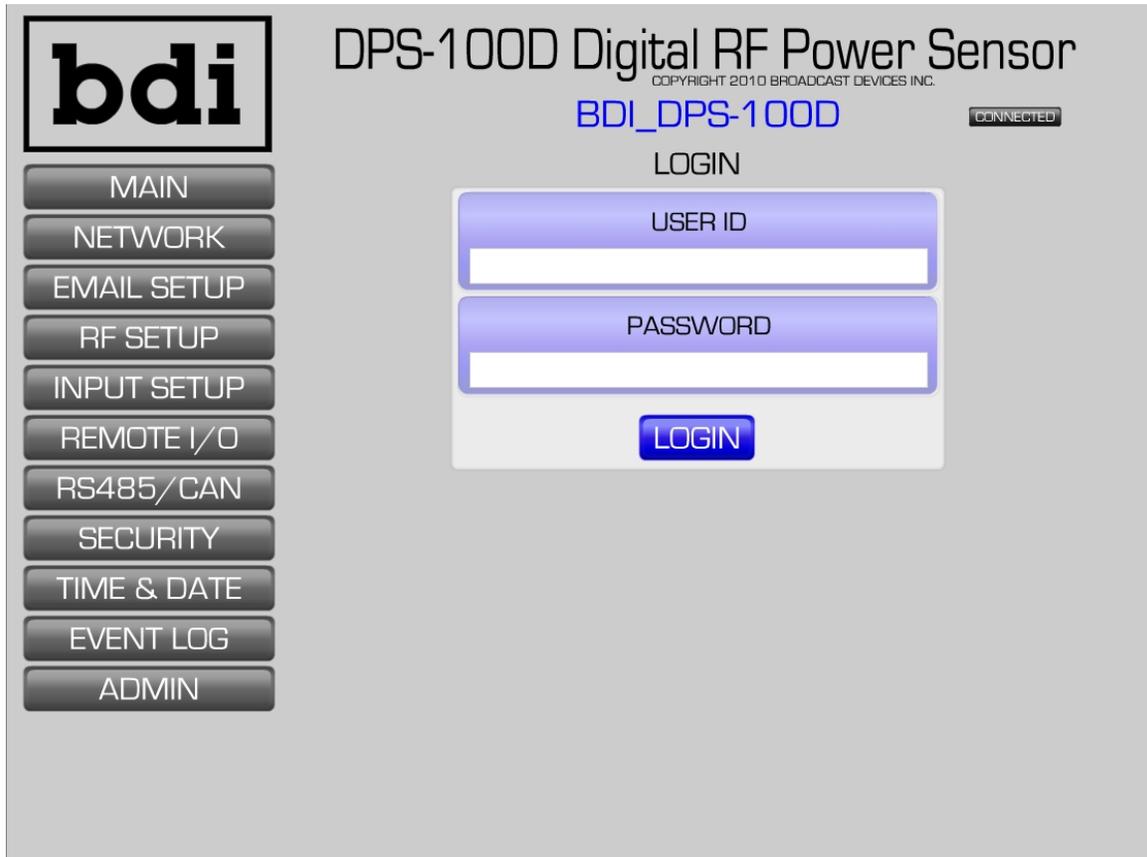
**DPS-100D Main Screen shows all parameters in one convenient screen**



After a successful connection the DPS-100D the screen above should appear in your browser window. Make certain that you are using a browser with *Flash* enabled or the display will not appear.

### A. Login - SECURITY – Username and Password

Log onto the system by clicking on **login** and entering **username** – default and entering **password** – default. To change the default password and user ID click on **security** and enter a new user ID and password. User ID's and passwords can be up to eight characters and are case sensitive.



The screenshot displays the web interface for the BDI DPS-100D Digital RF Power Sensor. On the left side, there is a vertical menu of navigation buttons: MAIN, NETWORK, EMAIL SETUP, RF SETUP, INPUT SETUP, REMOTE I/O, RS485/CAN, SECURITY, TIME & DATE, EVENT LOG, and ADMIN. The main content area features the BDI logo, the product name "DPS-100D Digital RF Power Sensor", and the copyright notice "COPYRIGHT 2010 BROADCAST DEVICES INC.". Below this, the user ID "BDI\_DPS-100D" is displayed next to a "CONNECTED" status indicator. The "LOGIN" section contains two input fields labeled "USER ID" and "PASSWORD", and a "LOGIN" button.

**It is strongly recommended that the user ID and password be recorded once changed!**

**SECURITY**

The screenshot shows the web interface for the BDI DPS-100D Digital RF Power Sensor. On the left is a vertical menu with buttons for MAIN, NETWORK, EMAIL SETUP, RF SETUP, INPUT SETUP, REMOTE I/O, RS485/CAN, SECURITY (highlighted in blue), TIME & DATE, EVENT LOG, and ADMIN. The main content area displays the device name 'DPS-100D Digital RF Power Sensor' with a copyright notice 'COPYRIGHT 2010 BROADCAST DEVICES INC.' and the model 'BDI\_DPS-100D'. A 'CONNECTED' status indicator is visible. Below this is the 'USER NAME/ PASSWORD SETUP' section, which contains five input fields: 'ENTER OLD USER ID' (containing 'username'), 'ENTER OLD PASSWORD', 'ENTER NEW USER ID', 'ENTER NEW PASSWORD', and 'ENTER NEW PASSWORD AGAIN'. A 'CHANGE PASSWORD' button is located at the bottom of this section.

**It is strongly recommended that you record this information for future use!**

**Write your User ID Here:** \_\_\_\_\_

**Write your Password Here:** \_\_\_\_\_

## B. NETWORK SETUP

**bdi**

DPS-100D Digital RF Power Sensor  
COPYRIGHT 2010 BROADCAST DEVICES INC.  
BDI\_DPS-100D CONNECTED

### NETWORK SETUP

USE SNTP

SNTP SERVER: pool.ntp.org    UTC +/-: -    TIME ZONE: 5

USE SNMP

SNMP READ COMMUNITY: public    SNMP WRITE COMMUNITY: private

IP ADDRESS: 108.170.120.155    SUBNET MASK: 255.255.255.248

DEFAULT GATEWAY: 108.170.120.153    DNS SERVER: 167.206.112.138

MAC ADDRESS: 00:04:A3:C5:64:A9

USE SWP

SWP IP ADDRESS: 192.168.1.108

SWP PASSWORD: bdi    SWP PORT NUMBER: 10001

SAVE

Network settings must be set correctly for external access to the DPS-100D and for email notification to work properly. Network settings should be set up before attempting email setup as testing email settings cannot be done without proper network setup. If you are not sure how to do this contact your network administrator for information about your particular network.

Once network settings have been made the DPS-100D should now be connected to a router and login should be repeated through a router connection. This will verify that the networks settings are correct.

SNTP is available with firmware release 1.1.015. To use SNTP click the box marked “Use SNTP” the default SNTP server has been known to be a reliable time reference source. You may have another SNTP server that is desired to be used. Replace the default with any desired SNTP server. In addition, remember to correctly set the time zone referenced to UTC for your local time zone.

SNMP is also available for use with the DPS-100D. To use SNMP communication click the box marked “Use SNMP”. The default read and write communities are provided for basic communication. These can be changed to different names that may be used by your particular system. Read and write community names are essentially passwords for SNMP protocol. All DPS-100D parameters are viewable with a suitable SNMP MIB browser.

## SWP-200/206 Integration Setup

With firmware release 1.1.015 it is now possible to integrate an interconnected SWP-200 motorized switch controller or SWP-206 Antenna monitor so that all parameters of the SWP series controllers can be viewed and controlled through the DPS-100D web server. When enabled the main server screen menu will have an SWP button option. Once the SWP parameters have been setup on the Network Settings page you can log in to the DPS-100D, then press the SWP button and the screen below will appear:

The screenshot displays the web interface for the DPS-100D Digital RF Power Sensor. The interface includes a navigation menu on the left with buttons for MAIN, NETWORK, EMAIL SETUP, RF SETUP, INPUT SETUP, REMOTE I/O, RS485/CAN, SECURITY, TIME & DATE, EVENT LOG, and ADMIN. The main content area shows the following information:

**BDI** DPS-100D Digital RF Power Sensor  
COPYRIGHT 2010 BROADCAST DEVICES INC.  
BDI\_DPS-100D CONNECTED

BROADCAST DEVICES SWP-200  
BDI SWP-200 3.8.18D  
MODE: TX 1>AUX TX 2>TEST  
3-STRIKE COUNT: 0

CHNL	FWD PWR	REF PWR	TEMP(°F)	PRES(PSI)	I	F
MAIN	0.00W	0.00W	48	6	0	0
AUX	0.00W	0.00W	40	0	0	0

CONNECTED

TX1 > AIR    TX2 > AIR    AIR TX OFF    AIR TX ON  
 AIR TX > MAIN    AIR TX > AUX  

It is now possible to monitor the basic parameters of the DPS-100D and show the status of the motorized switch. Remote control is possible through this screen for switching transmitters, performing a TX ON command for the selected to AIR transmitter and a master TX OFF command for both transmitters. In addition, fault reset can be performed. Refer to the SWP series Technical Reference Manual for additional setup details for operation with the DPS-100D series power meter.

## Additional Information Regarding Network Setup

The DPS-100D uses a static IP address to connect to the Internet directly or through a router. There are a number of considerations when making these connections. We will attempt to touch on several topics which may or may not impact your installation. This information is intended to be a general guide but your specific situation may not necessarily be covered. It is suggested that your company IT department be consulted on the proper way to install this equipment within your own Intranet configuration.

The DPS-100D utilizes ports: 80, 1998 and 1999. When used behind a router your router needs to be configured to forward these ports on the internal IP address set up for the DPS-100D for access through the Internet. Some ISP's block certain ports and it may be necessary to have a specific port opened or by use of one of the methods described below. The DPS-100D resides behind a router with the "Default Server" of the router set to the address at which the DPS-100D is configured. This will route ALL incoming traffic to the DPS-100D

### **Methods to Connect to the Internet**

**Static IP address** – ISP provided static IP address allows the DPS-100D to be connected directly to the Internet connection with or without the use of a router.

**Routable IP** address behind a router – ISP provided static IP address allows the DPS-100D to be connected to the Internet behind a router. Check with your router manufacturer and or your IT department to determine whether the router intended for use supports routable IP addresses.

Note: Some ISP's block Port 80. If your ISP blocks this port request that Port 80 be unblocked. Some ISP's may require additional fees to open Port 80/

**VPN** – Virtual private network allows the DPS-100D to be accessed on the local (private) network from offsite devices which are on a different network but are configured with a VPN client or on a network segment connected via VPN to the segment on which the DPS-100D resides. In this case the DPS-100D is accessed by its local network address.

**DDNS service** – This service is available for a nominal monthly fee that allows your IP address to be tracked and translated to any available, desired URL. Most router manufacturers support DDNS routing. Contact your router manufacturer's customer support department for instructions as to how to accomplish DDNS routing with your specific router.

**Note that when the final IP address is programmed into the unit go to the ADMIN page, click store configuration and then reboot the unit by powering it down and back up again. Failure to do this will result in the new IP not being stored.**

## C. EMAIL SETUP

**bdi**

DPS-100D Digital RF Power Sensor  
COPYRIGHT 2010 BROADCAST DEVICES INC.  
BDI\_DPS-100D CONNECTED

### EMAIL SETUP

OUTGOING EMAIL SERVER smtp.googlemail.com	PORT 465
EMAIL USER NAME ENTER EMAIL ACCOUNT	<input checked="" type="checkbox"/> USE SSL
EMAIL PASSWORD ENTER PASSWORD	Periodic Email OFF
EMAIL RECIPIENT 1 ENTER EMAIL RECIPIENT 1	EMAIL 1 NOTIFICATIONS NONE
EMAIL RECIPIENT 2 ENTER EMAIL RECIPIENT 2	EMAIL 2 NOTIFICATIONS NONE
LOG EMAIL RECIPIENT ENTER LOG EMAIL RECIPIENT	LOG EMAILS OFF

**SAVE** **SEND TEST EMAIL**

In order for the DPS-100D to send email alerts, the system must be set up using a valid email account provided by the user. Follow the instructions below as you would with any email account setup.

1. Enter email outgoing server address and outgoing port
2. Enter email username and password – authenticated email only. See note below.
3. Set periodic email as desired
4. Enter up to two email recipient email addresses and set email notification status\*
5. Send a test email by clicking on the Send Test Email button to make sure the settings are correct
6. For SSL use click the box marked “Use SSL” The DPS-100D supports SSL encryption for managing longer keys necessary for use with “free” email services such as GMAIL.
7. Click on the Save button before exiting this screen to save your settings

You can have the DPS-100D send periodic emails by selecting from the Periodic Email pulldown menu. This includes all main screen parameters and a spreadsheet of data for record keeping purposes. The Log Emails pulldown screen also provides periodic main screen parameters but without the spreadsheet. See section V1. Addendum, page 27 for an example of the event log CSV file that is generated and emailed.

Note: The DPS-100D supports authenticated and non-authenticated email. For non-authenticated email servers leave the email username and password fields blank. For authenticated email fill in the username and password fields.

\*Email notification can be set to None, Faults Only or Warnings and Faults.

#### D. ADMIN

Clicking the **ADMIN** button allows for customization of the DPS-100D name as displayed remotely. Enter call letters, frequency or site name of your choice. You can also configure the way forward and reflected power is displayed. Click on the pull down menus for forward and reflected power and select from the menu. Forward power default is KW and reflected default is watts. The serial number and firmware revision of the DPS-100D are also displayed on this screen. In order for changes to take effect you must click on the **STORE CONFIGURATION DATA** button.

**bdi**

DPS-100D Digital RF Power Sensor  
COPYRIGHT 2010 BROADCAST DEVICES INC.  
BDI\_DPS-100D CONNECTED

ADMIN

FIRMWARE REVISION: DPS-100D 1.1.015 BT  
SERIAL NUMBER: 000361

SENSOR NAME USER FIELD: BDI\_DPS-100D  
POWER UNITS: W / KW  
REF DISPLAY: POWER

RF PRESENT STATISTICS  
CURRENT MONTH: JAN 15 025.70 HRS  
PREVIOUS MONTH: DEC 14 000.00 HRS

STORE CONFIG DATA

FIRMWARE UPDATE

SAVE

A new feature introduced in firmware release 1.1.015 is that of an RF Present Statistics window. The DPS-100D now can log the amount of time on a monthly basis that RF is present above the RF Presence threshold set on the RF Setup page. In addition to this information being available on this page it can be received in the form of an email.

Note!: Under no circumstances should you press the FIRMWARE UPDATE button unless directed to do so from the factory. Pressing this button will cause your DPS-100D to cease its normal operation. If this button is accidentally pressed remove power to the unit immediately. Upon restoration of power the unit will be in normal operation mode.

## E. TIME & DATE

The DPS-100D has a real time clock and calendar and time and date should already be set when installed. If for some reason the time and date are incorrect and need to be adjusted, click on the **TIME & DATE** button and make selections from the pull down menus provided. If the time and date continue to be incorrect after a power cycle it may be indicative of a failed memory battery. Contact the factory for replacement details. The time and date need only be set if you are not using SNTP.

The screenshot displays the web interface for the DPS-100D Digital RF Power Sensor. On the left is a vertical menu with buttons for MAIN, NETWORK, EMAIL SETUP, RF SETUP, INPUT SETUP, REMOTE I/O, RS485/CAN, SECURITY, TIME & DATE (highlighted in blue), EVENT LOG, and ADMIN. The main content area shows the device name 'DPS-100D Digital RF Power Sensor' with a copyright notice for Broadcast Devices Inc. and the device ID 'BDI\_DPS-100D'. A green 'CONNECTED' status indicator is visible. The 'TIME & DATE CONFIGURATION' section contains a form for setting the time and date. The time is set to 10:12 and the date to 12 FEB 15. A green 'SET TIME & DATE' button is located below the form. At the bottom, a blue button displays the 'CURRENT TIME & DATE' as 10:12:46 12 FEB 15.

**bdi**

DPS-100D Digital RF Power Sensor  
COPYRIGHT 2010 BROADCAST DEVICES INC.  
BDI\_DPS-100D CONNECTED

TIME & DATE CONFIGURATION

TIME

H H : M M  
↓ 1 ↓ 0 ↓ 1 ↓ 2

DAY MONTH YEAR

D D MON Y Y  
↓ 1 ↓ 2 ↓ FEB ↓ 1 ↓ 5

SET TIME & DATE

CURRENT TIME & DATE  
10:12:46 12 FEB 15

## F. RS485/CAN

The RS485/CAN button allows access to a screen that allows you to change the RS485 or CAN address of the DPS-100D.



## G. REMOTE I/O

The REMOTE I/O button allows access to several important parameter settings:

1. Programming the function of the two on board relay closures
2. Full Scale Indication of the forward and reflect D.C. sample power indications – Normally Factory Set
3. Configuration of up to four interlock groups

**Note:** If you are planning to use the two relays for remote control/TX ON/OFF functionality then skip to the next section entitled Remote Select.

Relay 1 can be configured to provide an interlock closure or alarm closure upon triggered alarms. When set to interlock the relay will remain closed as long as the reflected power is under the programmed threshold and that the conditions of the enabled interlock groups are satisfied. To configure an interlock group, click the GPI input to provide status of an interlock closure from a patch panel, lock out tag out switch, dummy load switch, etc. When the selected inputs are pulled low and the interlock group is enabled the interlock relay #1 will remain closed. A change in state of any of the selected inputs will cause the interlock relay to open.

Relay 2 can be programmed to be a second interlock or alarm relay. In addition there is a PTT function which provides for remote closure of the relay for any purpose. A fourth selection is for RF Presence. This provides a relay closure whenever RF is present over a programmed threshold. This setting is a valuable tool for RF safety plans allowing remote or local indication of RF presence.

### Remote Select

The remote select menu is provided so that the user can configure the DPS-100D relays for normal Interlock/Alarm function default, or for momentary/latched operation. The default selection is “None” which defers to the Relay 1 and Relay 2 menu selections. Selection of momentary from the Remote Select menu makes the Relay 1 and Relay 2 operation momentary TX ON/TX OFF respectively. For latched control the TX ON button latches Relay 1 and unlatches Relay 2. TX OFF command unlatches Relay 1 and latches Relay 2. Real time status of TX ON/OFF function can be accomplished if status outputs are available from the transmitter. A low input to Remote Input 2 of the DB15 connector will cause the TX ON button to change from blue to green and the TX OFF button to change from red to blue. A high will cause the TX ON button to change back to blue and the TX OFF button to change to red. This feature was provided so that simple TX ON/OFF control of a transmitter can be accomplished by use of the DPS-100D power meter. This can provide remote control and status of typical single transmitter sites for LPFM, LPTV, translators and/or remote STL transmitters. Or for two transmitter sites whereby use of individual DPS-100D power meters each transmitter can have independent remote control. Refer to page 20 section IV. External Connections for the DB15 connector pin assignment.

FWD VO SCALE and REF VO SCALE allow scaling of the 0 to 4.0V DC FWD and REF voltage outputs. These are typically factory set but can be changed to meet customer preferences or to “Zoom In” making small changes more visible. Changing these settings does not affect the actual power measurements and setting either lower than the measured value will simply result in a full scale output with no damage being done to the DPS-100D. For more detailed information consult DPS-100D Application Note #3 - “DC Voltage Outputs”.

## Remote I/O Setup Page

**bdi** DPS-100D Digital RF Power Sensor  
COPYRIGHT 2010 BROADCAST DEVICES INC.  
BDI\_DPS-100D CONNECTED

REMOTE I/O SETUP

RELAY 1: INTERLOCK  
REMOTE SELECT: INT MOM  
FWD VO SCALE: 10KW  
REF VO SCALE: 1KW

RELAY 2: ALARM

INTERLOCK GRP 1	INTERLOCK GRP 2	INTERLOCK GRP 3	INTERLOCK GRP 4
<input checked="" type="checkbox"/> INPUT 1	<input type="checkbox"/> INPUT 1	<input type="checkbox"/> INPUT 1	<input type="checkbox"/> INPUT 1
<input type="checkbox"/> INPUT 2	<input checked="" type="checkbox"/> INPUT 2	<input type="checkbox"/> INPUT 2	<input type="checkbox"/> INPUT 2
<input type="checkbox"/> INPUT 3	<input type="checkbox"/> INPUT 3	<input checked="" type="checkbox"/> INPUT 3	<input type="checkbox"/> INPUT 3
<input type="checkbox"/> INPUT 4	<input type="checkbox"/> INPUT 4	<input type="checkbox"/> INPUT 4	<input checked="" type="checkbox"/> INPUT 4
<input type="checkbox"/> INPUT 5			
<input type="checkbox"/> ENABLE	<input type="checkbox"/> ENABLE	<input type="checkbox"/> ENABLE	<input type="checkbox"/> ENABLE

**bdi** DPS-100D Digital RF Power Sensor  
COPYRIGHT 2010 BROADCAST DEVICES INC.  
BDI\_DPS-100D CONNECTED

STRIKE COUNT - 0  
INTERLOCK

FORWARD POWER: 15.2KW  
REFLECTED POWER: 4.10W

INTERNAL TEMP: 73 F  
EXTERNAL TEMP: -50 F  
PRESSURE: 0 PSI

SWITCH INPUTS

<input type="checkbox"/> INPUT 1	<input type="checkbox"/> INPUT 4
<input type="checkbox"/> INPUT 2	<input type="checkbox"/> INPUT 5
<input type="checkbox"/> INPUT 3	<input checked="" type="checkbox"/> INPUT 6 - LOTO

RESET | CURRENT TIME & DATE: 17:20:35 03 FEB 15 | TX ON | TX OFF

Main screen depiction with Remote Select set to momentary or latched command. TX ON/OFF buttons appear with active status.

## H. RF SETUP

### CAUTION!

The RF setup screen has adjustments for forward and reflected power coupling and attenuator settings which are normally factory set. **DO NOT CHANGE THESE VALUES WITHOUT CONSULTATION WITH THE FACTORY AS THE ACCURACY OF THE MEASUREMENT SYSTEM WILL BE AFFECTED.**

**FORWARD POWER HIGH / LOW WARNING** – sets the thresholds for High and Low Power warnings

**REFLECTED POWER HIGH WARNING** – sets the threshold for High Reflected Power warning

**REFLECTED POWER FAULT** – sets the threshold at which a reflected power fault will cause the interlock relay to open and fault emails to be generated if configured for this action.

**INTERNAL TEMP** – sets the threshold for when the temperature of the on board temperature sensors has been exceeded.

**EXTERNAL TEMP** - sets the threshold for when the optional external temperature sensor threshold has been exceeded if installed. If no external temperature sensor is installed the display will indicate -50 degrees.

**PRESSURE** – sets the low pressure threshold for the optional external pressure sensor if installed.

**RF PRESENT THRESHOLD** – sets the threshold for when the forward power indication will close the programmable relay for “RF PRESENT”.

**bd**i

DPS-100D Digital RF Power Sensor  
COPYRIGHT 2010 BROADCAST DEVICES INC.  
BDI\_DPS-100D CONNECTED

### RF SETUP

FORWARD		REFLECTED	
COUPLING 60.55 db	ATTEN 15 db	COUPLING 60.00 db	ATTEN NONE
HIGH WARN 11.32 KW		HIGH WARN 0.175 KW	
LOW WARN 9.025 KW		HIGH FAULT 0.400 KW	

INTERNAL TEMP	EXTERNAL TEMP	PRESSURE
TEMP WARN 150 F	TEMP WARN 150 F	PRES WARN 2 PSI

RF PRESENT THRESHOLD  
RF PRESENT  
0.005 KW

## I. INPUT SETUP

Input setup allows the user to label each of the configurable general purpose inputs. In addition email alerts for various alarm conditions and GPI input status can be enabled by clicking the desired functions.

Forward Power Thresholds:

**FORWARD POWER LOW**

**FORWARD POWER HIGH**

Reflected Power Thresholds:

**REFLECTED POWER WARNING** – User set to warn of an upward trend in reflected power

**REFLECTED POWER ALARM** – User set to notify when a reflected power level has exceeded the fault threshold

**INTERNAL TEMPERATURE WARNING** – warning that the internal temperature sensor threshold has been exceeded

**EXTERNAL TEMPERATURE WARNING** – warning that the optional external temperature sensor threshold has been exceeded

**PRESSURE WARNING** – warning that the optional pressure sensor threshold (low pressure) has been crossed.

### INPUT STATES

Email alarms can be generated for any of the six GPI inputs and for an interlock open condition by selecting the desired inputs. When finished configuring the INPUT SETUP screen be sure to click the SAVE button so that your selections are stored.

The screenshot shows the web interface for the DPS-100D Digital RF Power Sensor. The interface includes a navigation menu on the left with buttons for MAIN, NETWORK, EMAIL SETUP, RF SETUP, INPUT SETUP (highlighted), REMOTE I/O, RS485/CAN, SECURITY, TIME & DATE, EVENT LOG, and ADMIN. A large green SAVE button is at the bottom left. The main content area displays the device name 'DPS-100D Digital RF Power Sensor' and 'BDI\_DPS-100D' with a 'CONNECTED' status. It features six input configuration boxes: INPUT 1 USER NAME (INPUT 1), INPUT 2 USER NAME (INPUT 2), INPUT 3 USER NAME (INPUT 3), INPUT 4 USER NAME (INPUT 4), INPUT 5 USER NAME (INPUT 5), and INPUT 6 USER NAME (INPUT 6 - LOTO). Below these is an 'ALARM / EMAIL ENABLE' section with a grid of checkboxes for various conditions: FWD PWR LOW, FWD PWR HIGH, REF PWR WARN, REF PWR FAULT, INT TEMP WARN, EXT TEMP WARN, PRESSURE WARN, INPUT 1 STATE, INPUT 2 STATE, INPUT 3 STATE, INPUT 4 STATE, INPUT 5 STATE, INPUT 6 STATE, and INTLOCK OPEN.

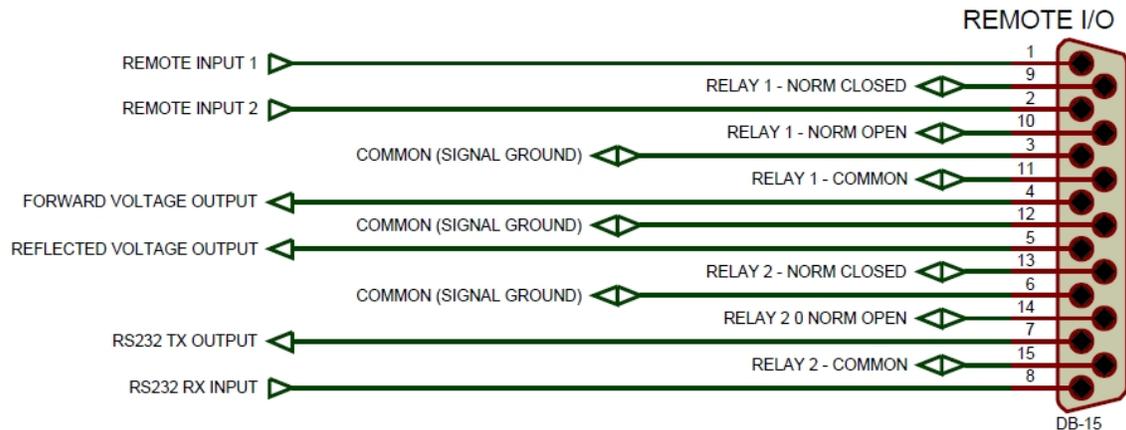
#### IV. External Connections

The DPS-100D has numerous connection points to external equipment listed below.

1. DB-15 Connector for remote control and relay connection
2. TB1 - 12 Position Phoenix Connector for General Purpose Input
3. TB2 & TB3 - 3 position Phoenix Connectors for external temperature and pressure sensor input
4. 3 - RJ45 Connectors 1- TCP/IP, 2 – RS485 Serial I/O
5. 1 – Coaxial Power Supply Connector for supplied Switching Power Supply

Each connector is described below

#### DB-15 Connector Pinout



Relay 1 – Programmable Relay. Relay 1 can be configured to provide an interlock closure or alarm closure upon triggered alarms. See Section H – Remote I/O.

Relay 2 – Programmable Relay. Relay 2 can be programmed to be a second interlock or alarm relay. See Section H – Remote I/O.

Alternately Relay 1 and 2 can be configured for momentary/latched ON/OFF see page 15 Remote Select option for a description of this operation and status

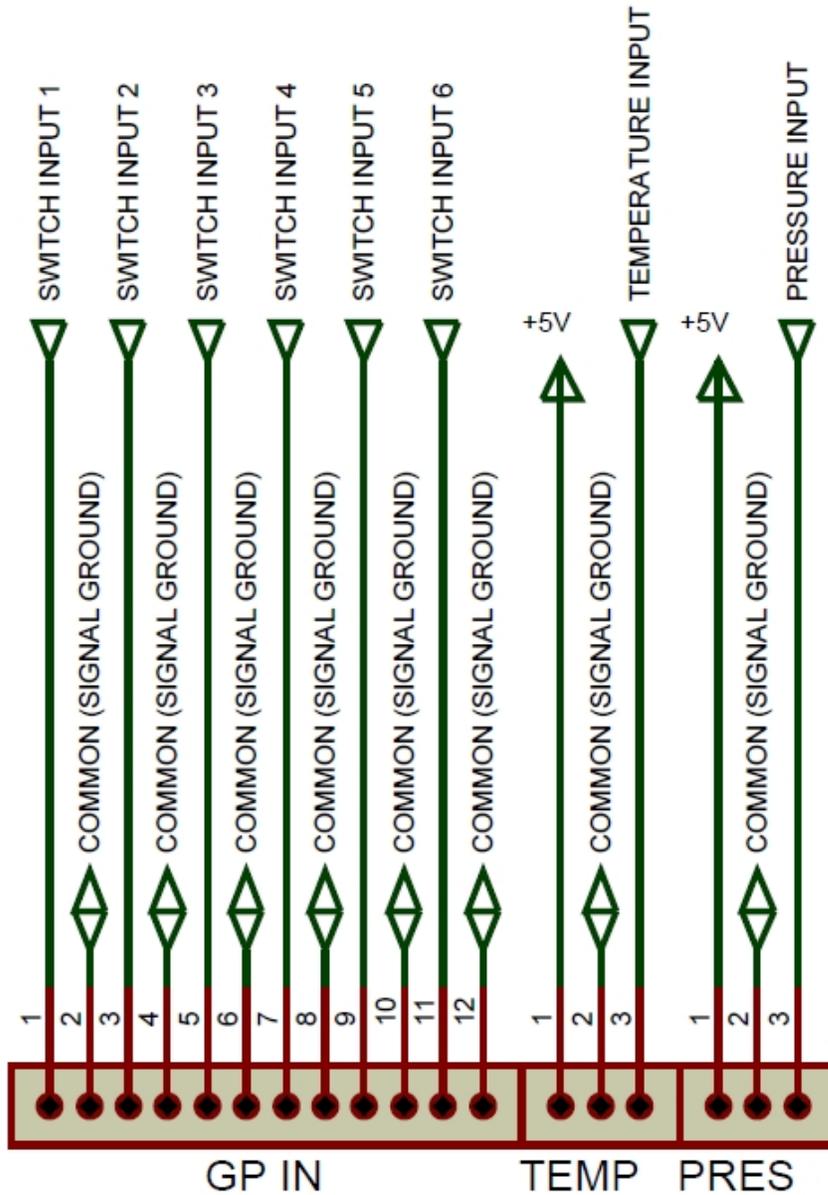
Forward & Reflected Voltage Outputs – Voltage outputs proportional to the forward and reflected power measurements is provided for interface to external meters or remote control systems. Output is 0-4V DC and can be scaled to provide a full scale output appropriate for the system being measured. See Section G – Remote I/O.

Remote Input 1 – A closure between this input and common will reset a 3-Strike Fault condition if present.

Remote Input 2 – Remote input status of TX ON/OFF Status Low level = TX ON

RS232 TX Output and RS232 RX Input – Currently Unused

**Terminal Blocks TB1-TB3**



BDI PN: 2150-8  
 DIGI-KEY PN: 277-1440-ND  
 PHOENIX PN: 1881422

BDI PN: 2150-2  
 DIGI-KEY PN: 277-1431-ND  
 PHOENIX PN: 1881338

**TB1 – General Purpose Inputs 1-6**

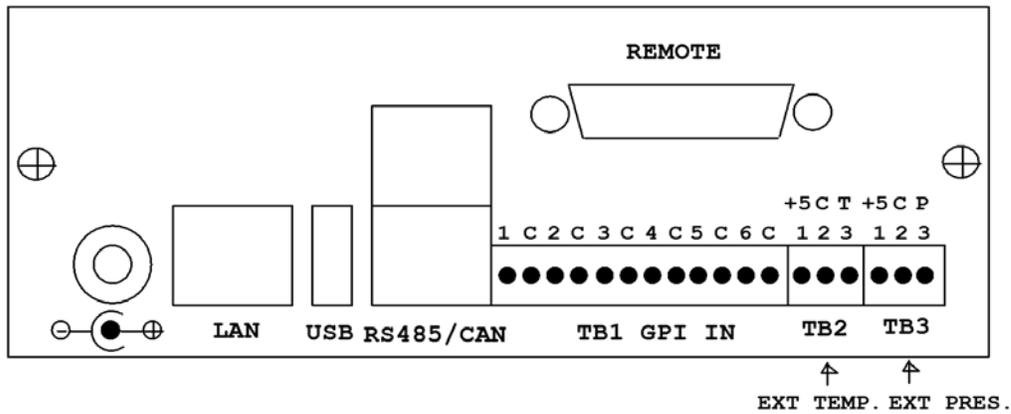
These connections are for the labeled external General Purpose Inputs used to set up interlock groups. Each GPI is internally pulled up to 3.3 VDC. An active low is expected at the respective input for an interlock connection to be recognized. If the respective GPI goes high it is an indication that an interlock string has been broken and this will cause K1 to open if the respective GPI is selected as part of an interlock group. Switch input #6 input pins 11/12 are factory default connected. Failure to have this connection made will not allow the interlock relay to close.

### TB2 – 3 Position External Temperature Sensor Input

Broadcast Devices, Inc. offers the TMP-100 temperature sensor which is designed to plug in to TB2. The sensor is powered by the DPS-100D and can be attached anywhere temperature measurement is desired such as a filter cavity, transmission line or for ambient temperature measurement.

### TB3 – 3 Position Pressure Sensor Input

Broadcast Devices, Inc. offers the PSW-100 Pressure Sensor which is designed to plug directly into TB3. The sensor is powered by the DPS-100D chassis and can be attached to any suitable gas block fitting available.



**DPS-100D Connector Identification**

## V. Warranty

Broadcast Devices, Inc. products are warranted against failure due to faulty materials or workmanship for a period of one year from the date of shipment to the ultimate user. The warranty covers repair or replacement of defective parts at the factory, provided the unit has been returned prepaid by the user. All shipments to the factory shall have affixed to the outside of the container an R. A. number obtained from the factory. The above warranty is void if the unit has been modified by the user outside of any recommendations from the factory or if the unit has been abused or operated outside of its electrical or environmental specifications. If customer conducted field tests suggest that the unit may be faulty, whether or not the unit is in warranty, a full report of the difficulty should be sent to Broadcast Devices, Inc. factory customer service may suggest further tests or authorize return for factory evaluation. Email questions or trouble reports to:

[Customer.Service@broadcast-devices.com](mailto:Customer.Service@broadcast-devices.com)

Tel.: (914) 737-5032

Fax. (914) 736-6916

Units sent to the factory should be well packed in the original packing if possible and shipped to Broadcast Devices, Inc. Check our web site main page for ship to address: [www.broadcast-devices.com](http://www.broadcast-devices.com) Remember to affix the R.A. number to the outside of the carton In addition please enclose a trouble report in the carton with complete contact information and return shipping information. Any packages received without such R.A. number will be refused. Note: freight collect shipments will also be refused. When the unit has been received, inspected and tested, the customer will receive a report of the findings along with a quotation for recommended repairs, which are found falling outside of the standard warranty. Units returned for in-warranty repairs which are found not to be defective will be subject to an evaluation and handling charge. In-warranty units will be repaired at no charge and returned via prepaid freight.

Out-of-warranty units needing repair require a purchase order and will be invoiced for parts, labor, and shipping charges.

When ordering replacement part, always specify A) Part number or Description, and Quantity; B) Date of Purchase, Where Purchased; C) Any Special Shipping Instructions. Always specify a street address, as shipping companies cannot deliver to a postal box.

Broadcast Devices, Inc. is not responsible for any other manufacturer's warranty on original equipment. Nor are we responsible for any failure, damage, or loss of property that may occur due to the installation or operation of our equipment outside of recommended specifications.

Broadcast Devices, Inc. may from time to time make changes to the materials used in the manufacture of its equipment and reserves the right to do so without further notice.

## **VI. Addendum**

The following pages contain some helpful application notes intended for the user to get the maximum benefit from the investment in the DPS-100D power meter series. While planning your installation of the DPS-100D you may want to consider use of the following information. Of course if you have any questions about the DPS-100D operation or about any of these application notes please contact us by email: [customer.support@broadcast-devices.com](mailto:customer.support@broadcast-devices.com) or by telephone: (914) 737-5032. We will be happy to assist you.



## DPS-100D Application Note #1 Sending Text Message Alerts Using the DPS-100D

The DPS-100D is equipped with an SMTP client which is capable of sending email alerts based on a number of user configurable conditions. In many cases it might be desirable to have these alerts sent to one's cellphone as an SMS message. Fortunately most cellular carriers provide an email SMS gateway which allows an email to be sent to the gateway which is subsequently sent as a text message to the target phone.

In most cases the "To" field of the email should be populated as follows:

**AAANNNNNN @ msggateway**

Where: AAA = 3 area code of the target cell phone  
NNNNNNN = 7 digit telephone number of the phone  
msggateway = cellular carrier's SMS gateway

Some common US cellular carrier gateways are:

Verizon Wireless	@vtext.com
ATT	@txt.att.net
Sprint/Nextel	@messaging.nextel.com
Sprint PCS	@messaging.sprintpcs.com

Users should consult with their cellular carrier to obtain the correct address for their SMS gateway.

To configure the DPS-100D to send alerts as an SMS simply enter the number of the target phone followed by "@" and the SMS gateway into one of the EMAIL RECIPIENT fields on the EMAIL SETUP page of the DPS-100D browser interface.

© Copyright 2011 Broadcast Devices, Inc.

(914) 737-5032

[www.broadcast-devices.com](http://www.broadcast-devices.com)



## DPS-100D Application Note #2 Using Netbios Names with the DPS-100D

The DPS-100D supports Netbios name access. To access the DPS-100D using a Netbios name instead of an IP address the SENSOR NAME field must conform to the rules below and be unique on the local network.

The default sensor name is **BDI\_DPS-100D** and is a legal Netbios name. It can be used in the browser URL window instead of the IP address:



If you have more than one DPS-100D or would like to use a name which reflects the station callsign or site you may do so as long as the name meets the following rules:

**Names can be up to 15 characters including letters, numbers and the following special characters:**

**! @ # \$ % ^ & ( ) - \_ ' { } . ~**

**They may NOT contain any of the following characters:**

**\ \* + = | : ; " ? < > ,**

**To be a valid Netbios name it must NOT contain any space characters.  
Netbios names are NOT case sensitive.**

If a Sensor Name is entered which is not a valid Netbios name it will be displayed in the SENSOR NAME field of DPS-100D GUI but they will NOT be able to access the sensor by typing the netbios name into the URL field of the browser.

© Copyright 2011 Broadcast Devices, Inc.

(914) 737-5032

[www.broadcast-devices.com](http://www.broadcast-devices.com)



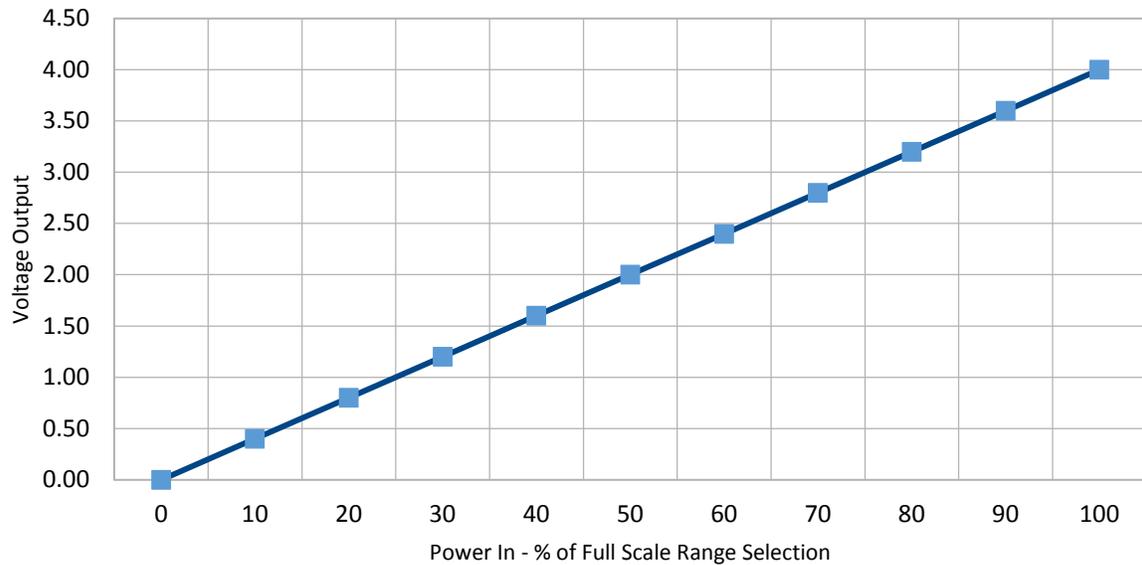
## DPS-100D Application Note #3 DC Voltage Outputs

The DPS-100D provides voltage outputs which are proportional to the forward and reflected power being measured. The voltage output is 0 to 4.00V over a power input range of 0 to 100% of a “Full Scale” value selected by the user.

The transfer curve is therefore represented by the equation:

$$V_o = (P_{wr\ In} / \text{Full Scale Selection}) \times 4.00V$$

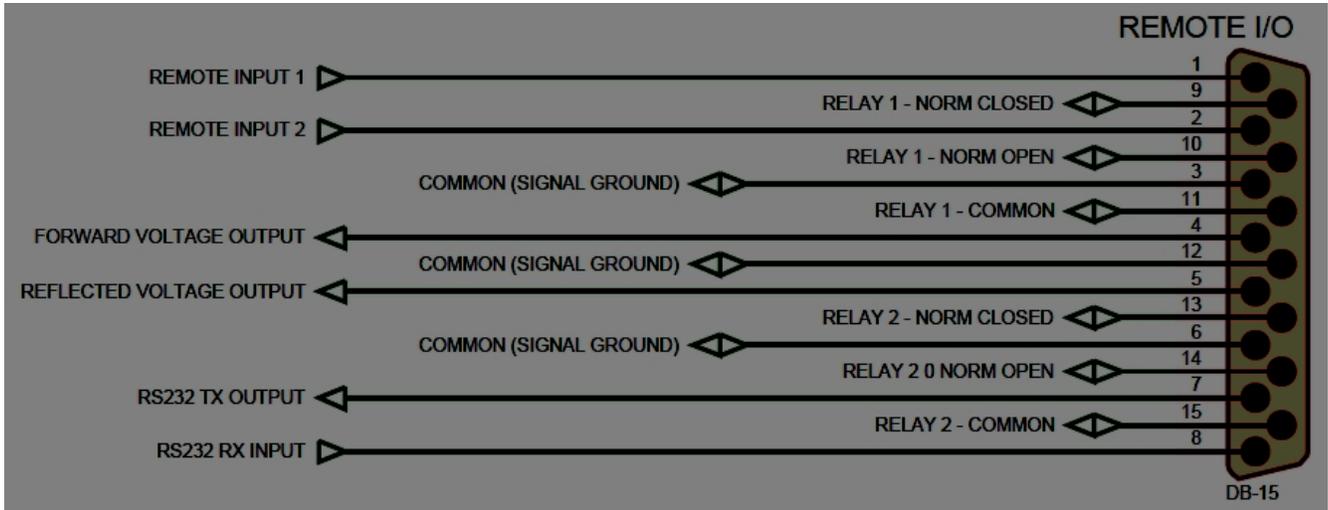
DPS-100D Voltage Output vs % Full Scale Range



## Full Scale Range Selections

1W	10W	100W	1KW	10KW	100KW
2.5W	25W	250W	2.5KW	25KW	250KW
5W	50W	500W	5KW	50KW	500KW

## DPS-100D Remote Connector



© Copyright 2011 Broadcast Devices, Inc.

(914) 737-5032

[www.broadcast-devices.com](http://www.broadcast-devices.com)

## Sample Screen shot of typical CSV file event log contents

Sample CSV File.csv - OpenOffice.org Calc

File Edit View Insert Format Tools Data Window Help

Arial 10 B / U

A1 = DATE

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	DATE	TIME	EVENT TYPE	FWD PWR	REF PWR	3-STRIKE	INT TEMP	EXT TEMP	PRES	PATCH PANEL	INPUT 2	INPUT 3	INPUT 4	INPUT 5	INPUT 6 - LOTO
2	11 SEP 11	18:58:14	LOW PRESSURE WARNING	0.00W	46.0W	0	85	77	1	CLOSED	OPEN	OPEN	OPEN	OPEN	CLOSED
3	09 SEP 11	20:59:28	DPS-100D EMAIL TEST MESSAGE	0.00W	46.0W	0	85	76	5	CLOSED	OPEN	OPEN	OPEN	OPEN	CLOSED
4	09 SEP 11	20:26:44	HIGH REFLECTED POWER FAULT	0.00W	473W	1	85	77	3	CLOSED	OPEN	OPEN	OPEN	OPEN	CLOSED
5	09 SEP 11	20:23:32	LOW PRESSURE WARNING	0.00W	14.4W	0	85	77	1	CLOSED	OPEN	OPEN	OPEN	OPEN	CLOSED
6	09 SEP 11	20:01:18	DPS-100D EMAIL TEST MESSAGE	0.00W	14.3W	0	84	77	3	CLOSED	OPEN	OPEN	OPEN	OPEN	CLOSED
7	09 SEP 11	19:59:22	INTERLOCK OPEN FAULT	0.00W	14.3W	0	84	77	3	OPEN	OPEN	OPEN	OPEN	OPEN	CLOSED
8	09 SEP 11	19:59:14	HIGH REFLECTED POWER WARNING	0.00W	183W	0	84	76	3	CLOSED	OPEN	OPEN	OPEN	OPEN	CLOSED
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															
23															
24															
25															
26															
27															
28															
29															

Sheet 1 / 1 Default STD Sum=0 100%