



User Guide

Pulse Distribution Unit

Model PDU-240

P/N 018000501

Revision B

June 2017

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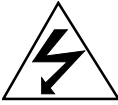
<http://www.brandywinecomm.com/>



Revision History

REVISION	DATE	COMMENTS
A	5-20-2016	Original release of PDU-240 user guide.
B	9-21-2017	Added information on fuse replacement

Safety Warnings



WARNING: This unit contains lethal AC voltages. Disconnect the unit from the AC supply before removing the cover.



WARNING:
The lightning flash with an arrowhead inside of an equilateral triangle is intended to alert the user to the presence of un-insulated “dangerous voltage” within the product’s enclosure. The “dangerous voltage” may be of sufficient magnitude to constitute as a risk of electrical shock to people.



CAUTION:
The exclamation point inside of an equilateral triangle is intended to alert the user to the presence of important operation and maintenance instructions in the user guide.

Table of Contents

1	Specifications	5
1.1	Inputs	5
1.1.1	Reference Pulse Input	5
1.1.2	Fault Discrete (Optional)	5
1.1.3	Fault/Status	5
1.2	Outputs	6
1.2.1	Reference Pulse Output	6
1.3	Switches and Indicators	7
1.3.1	Status LED Indicators	7
1.3.2	Environmental	7
1.3.3	Power	7
1.3.4	Physical	7
2	Option Configuration Sheet	8
3	Unpacking and Installation	9
3.1	Unpacking.....	9
3.2	Installation.....	9
3.3	Connections.....	10
3.3.1	Alarm Input Connection	10
4	Operation.....	11
4.1	Powering the PDU-240	11
4.2	Selecting the Input Reference.....	11
4.3	Fault Indicator	11
5	Maintenance and Troubleshooting	12
6	Calibration	13
7	Drawings	14

1 Specifications

1.1 Inputs

1.1.1 Reference Pulse Input

- Pulse: 1 PPS through 10Mhz
- Input Levels
 - 1 level : 2.5V min, 10.5V max
 - 0 level : 0.25V max
- Input Impedance: 50 ohm or 10k ohm. Settable by link, see figure 1
- Number of Inputs: 2 with auto selection and manual override from the front panel toggle switch
- Connector Type: BNC

1.1.2 Fault Discrete (Optional)

- Number of Inputs: 2
- Level: TTL
- Active low
- Forces a changeover when active for online reference

1.1.3 Fault/Status

- Connector Type: DB-9 Female
- Mating Connector: AMP P/N 747904-2

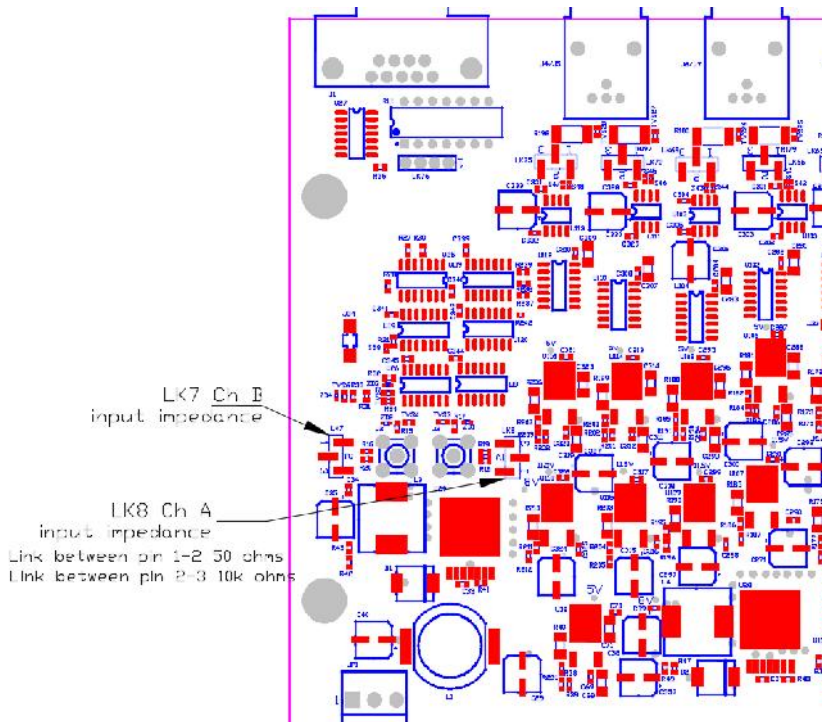


Figure 1

1.2 Outputs

1.2.1 Reference Pulse Output

- Number of Outputs: 24
- Connector Type: BNC
- Output Protection: short circuit proof
- Output Level:
 - 1 level: 5V±5% into 50 ohms (10V ±5% settable with link)
 - Optional 1 level: 2.5V into 50 ohm
 - 0 level: 0.25V max into 50 ohm
- Rise Times (10% to 90%)
 - 0-10V 20ns
 - 0-5V 15ns
 - 0-2.5V 10ns
- Cross talk: -80 dBc
- Spurious: -60dBc

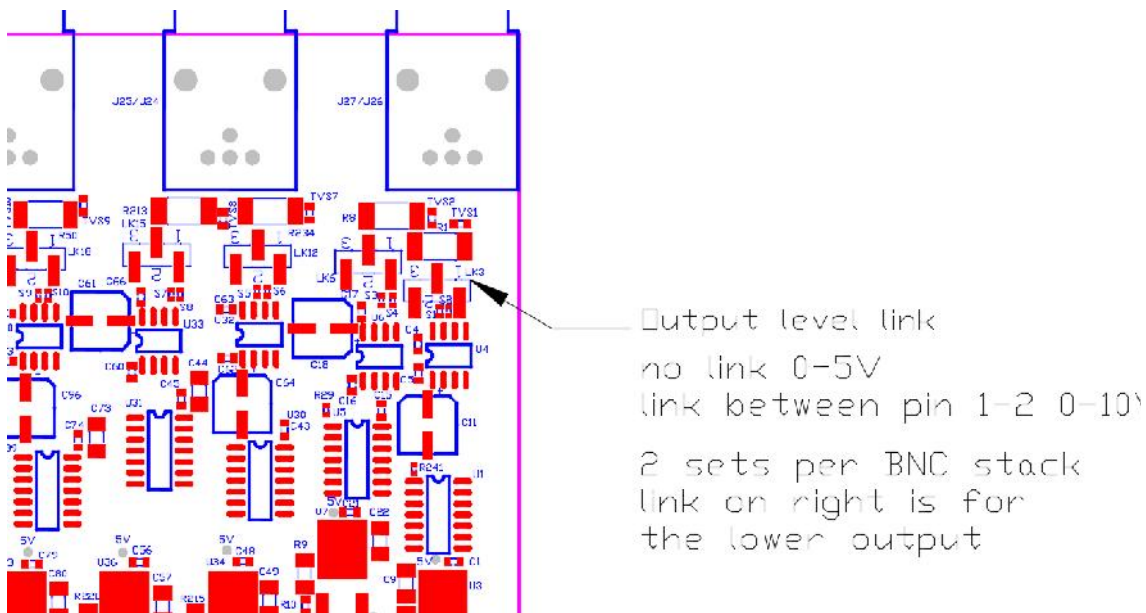


Figure 2

1.3 Switches and Indicators

1.3.1 Status LED Indicators

- Power (Green)
- Reference Input A Available (Green)
- Reference Input A Online (Green)
- Reference Input B Available (Green)
- Reference Input B Online (Green)
- IAutomatic Reference Selection Selected (Green)
- Fault (Red)

1.3.2 Environmental

- Temperature:
 - Operating: -30 to +60°C
 - Storage: -40 to +85°C
- Humidity: 10 - 95% non-condensing

1.3.3 Power

- 115/230 VAC 50/60 Hz
- < 25 W
- Fuse Value: T1, 250V, 1A

1.3.4 Physical

- 1.72" H x 14.5" D x 17.00" W and 1U 19" rack mount
- Weight: 7.5 lbs nominal

1.3.5 Input detection time

- Setting input available LED time.
 - The detection time in seconds can be adjusted for low frequency pulses. Set with DIP switch on LED board. Figure 3
 - 1PPS: default at 1 second
 - 10PPS: set to 10 second
 - 1PPM: set to 60 second

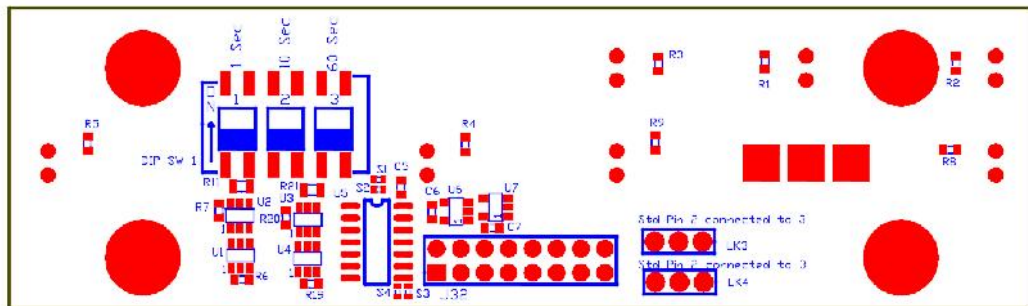


Figure 3

2 Option Configuration Sheet

Configuration Options	
2.1 Base Unit	Part Number
2 switched input 24 output 10V level	018000501
2 switched input 24 output 5V levels	018000502
2 switched input 24 output 3.3V levels	018000503
2 independent input 12 output Group 1 10V Group 2 10V	018000504
2 independent input 12 output Group 1 10V Group 2 5V	018000505
2 independent input 12 output Group 1 10V Group 2 3V	018000506
2 independent input 12 output Group 1 5V Group 2 5V	018000507
2 independent input 12 output Group 1 5V Group 2 3V	018000508
2 independent input 12 output Group 1 3V Group 2 3V	018000509
Power Supply Options	
85 - 265 VAC 50/60 Hz	018001000
36 - 72VDC Isolated	018001001
18 - 36VDC Isolated	018001002
9 - 18 VDC Isolated	018001003

3 Unpacking and Installation

3.1 Unpacking

Carefully remove the PDU-240 from its shipping carton. The following items should be included in the shipment:

- 1 PDU-240
- 1 power cord
- 1 user guide

Note the power entry module on the rear of the PDU-240 chassis. Please take note of the voltage displayed on the rear of the power entry module and verify that the voltage matches the local line's voltage.



WARNING:
REMOVE THE POWER CORD FROM THE PDU-240 BEFORE ADJUSTING THE LINE VOLTAGE.



CAUTION:
THE PDU-240 WILL BE DAMAGED IF THE INCORRECT AC LINE SETTING IS USED.

If the AC line setting is incorrect, detach the power cord from the power entry module. Use a small screwdriver to lift up the fuse cover on the power entry module to remove the fuse holder. Reverse the fuse holder and re-insert the fuse holder, making sure that the correct AC line voltage is now displayed on the rear panel.

3.2 Installation

The PDU-240 should be bolted directly into a 19" rack mount enclosure or mounted on a shelf. The PDU-240 when fully populated has up to 27 cables attached to the rear panel, *therefore it is recommended that some appropriate cable strain-relief system be used to support these cables, particularly when the unit is not supported by a shelf.*

3.3 Connections

Insert the power cord provided in the shipment into the rear power entry module. Connect the input reference signals to the appropriate connectors on the rear panel.



NOTE:

FOR CORRECT OPERATION, REFERENCE PULSE A AND REFERENCE PULSE B MUST BE THE SAME PULSE RATE, WHICH IS TYPICALLY 1 PPS.

Connect the output cables to the desired output connectors. Any unused connectors may be left un-terminated.

3.3.1 Alarm Input Connection

The PDU-240 may be used with an external reference such as the Brandywine Communications GPS8 or PTS system that incorporates a discrete alarm signal. This alarm signal is used to indicate a fault (e.g. rubidium out of lock) on the reference signal, although the 1 PPS input signals may be present.

The factory standard PDU-240 configuration is a logic HI signal on the ALARM IN pin indicating that the input is GOOD. A built in pull-up resistor ensures that if no ALARM IN connection is made the reference is considered good.

4 Operation

Refer to Figure 1 for a guide of the front panel controls and indicators.

4.1 Powering the PDU-240

Once all connections to the PDU-240 have been made, apply power to the unit by placing the on/off switch to the on position. The on/off switch is located on the rear panel power entry module.

If an external reference is fitted, verify that the two green LEDs Reference A Available (1) and Reference B Available (2) are illuminated. This indicates that the PDU-240 has detected the presence of the external references.

Place the Reference Select Switch (3) in the center (AUTO) position. The green Reference A Online LED (4) and the AUTO LED (6) should illuminate. This indicates that the PDU-240 outputs will be driven from Reference A and if Reference A fails, it will automatically switch to Reference B.

If an internal oscillator is installed, allow 5 - 10 minutes for the initial warm up of the Pulse reference. The PDU-240 is now ready for operation.

4.2 Selecting the Input Reference

The external pulse source used is selected by the Reference Select Switch (3). Moving the switch to the left position will select input A as the reference. Moving the switch to the right position will select input B as the reference. The center (AUTO) position will use Reference A as the input if it is present and the status indicator indicates that it is good.

Either one or two internal oscillators may be installed. If one is installed, it is always installed as Reference A. To operate as a free running standard, leave the reference select switch in the left position.

4.3 Fault Indicator

The red LED on the front panel indicates that one or more of the outputs has a low signal. There are four potential causes for this as listed below:

1. There is no input signal or the internal OCXO (if fitted) has failed.
2. Input B has been manually selected and there is no input signal connected to reference Input B.
3. One or more output buffers have failed.
4. There is a short on an output cable.

5 Maintenance and Troubleshooting

There is no preventive maintenance required for the PDU-240.

SYMPTOM	POTENTIAL CAUSE	CORRECTIVE ACTION
No signal outputs	<ol style="list-style-type: none"> 1. There is no input reference. 2. The Reference Select switch is set to a channel with no input 	<ol style="list-style-type: none"> 1. Connect the reference input. 2. Set the selector switch to auto or to a channel with a valid input.
Fault light illuminated	<ol style="list-style-type: none"> 1. One or both of the status inputs are pulled low 	<ol style="list-style-type: none"> 1. Check the status of the source. Repair the source or remove the low input to the status inputs

6 Calibration

No calibration is required for the PDU-240



NOTE:

The pulse counter **MUST** be configured to use an external reference such as a Cesium, Rubidium, or GPS disciplined OCXO as its time-base. The calibration accuracy of the PDU-240 can only be as accurate as the reference against which it is calibrated. It should be better than 1×10^{-10}

7 Drawings

FIGURE	DESCRIPTION
1	PDU-240 Front Panel
2	PDU-240 Rear Panel
3	PDU-240 Mechanical Outline
4	PDU-240 Link Location