ANYWAVE

PA-280W

User Manual

Version 1.0 – October 10, 2014

Copyright Notice

FCC Compliance

This equipment complies with relevant portions of Parts 2, 73, & 74 of the FCC rules governing LPTV operation.

Disclaimer

Information provided by Anywave Communication Technologies is believed to be accurate and complete; however, no liability can be assumed for its use.

The manufacturer makes no representations or warranties, either expressed or implied, by or with respect to anything in this manual, and shall not be liable for any implied warranties of fitness for a particular purpose or for any indirect, special, or consequential damages. Information in this document is subject to change without notice and does not represent a commitment on the part of the manufacturer.

USE OF THIS PRODUCT IN A MANNER OTHER THAN DESCRIBED IN THIS MANUAL MAY RESULT IN DAMAGE TO THE EQUIPMENT AND/OR PERSONAL INJURY.

PLEASE READ THIS MANUAL IN ITS ENTIRETY BEFORE ATTEMPTING TO INSTALL THE EQUIPMENT. CONTACT ANYWAVE WITH ANY QUESTIONS OR CONCERNS YOU MAY HAVE.

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Unpacking

Carefully unpack the equipment and perform a visual inspection to determine if any apparent damage has occurred during shipment. Please notify the delivery carrier and Anywave immediately if shipment damage has occurred. Retain all original shipping materials.

Please locate and reference the Packing Check List to verify you have received all components of your system. Retain the Packing Check List for future reference.

Also, please identify and remove all packing materials and supports (foam pads, etc.) prior to initial turn on of the equipment.

Returns and Exchanges

Written approval and a Return Authorization Number (RAN) are required from Anywave for all equipment returns. Please direct all return inquiries to the Anywave Service Department at support_us@anywavecom.com, providing the Sales Order number and Serial Number(s) of the equipment. Complete details regarding the nature and circumstances of your return must be included in your RAN request. Proper handling and return shipping instructions will be provided with an approved RAN number.

Technical Support

Technical support and troubleshooting assistance for Anywave Transmitters is available through the Anywave Service Department during normal business hours (8:00 AM - 5:00 PM CST) at (847) 415-2258. Email questions to support_us@anywavecom.com.

Note: For all service and support requests, you will need to provide the Serial Number of the equipment with your Sales Order number. For future reference, please record that information here:_____

WARNING

THE VOLTAGES, CURRENTS, AND RF ENERGY IN THIS EQUIPMENT ARE DANGEROUS. PERSONNEL MUST AT ALL TIMES OBSERVE ALL SAFETY WARNINGS, INSTRUCTIONS, AND REGULATIONS.

IN THE CASE OF EMERGENCY, ENSURE THAT ALL POWER HAS BEEN DISCONNECTED.

ALWAYS DISCONNECT POWER BEFORE REMOVING COVERS, ENCLOSURES, OR SHIELDS. DO NOT PERFROM SERVICE ON THE EQUIPMENT WHEN ALONE OR FATIGUED. KNOW YOUR EQUIPMENT AND DO NOT TAKE RISKS.

This manual is provided as a general guide for trained and qualified personnel well aware of the dangers inherent in handling potentially hazardous electrical transmission equipment.

The installation, operation, maintenance and service of this equipment involves risks both to personnel and equipment, and must ONLY be performed by qualified personnel exercising due care. Anywave Communication Technologies, Inc. shall not be responsible for injury or damage resulting from improper handling or from the use of improperly trained or inexperienced personnel performing such tasks.

All local building and electrical codes as well as fire protection standards must be observed in the installation and operation of the equipment.

Contents

1 Product Appearance

1.1 Front Panel

- RF Button
  - Press the RF button to turn the RF signal ON (inside blue light will light up).
  - Press the RF button again to turn the RF signal OFF (inside blue light will be off).

- LED_PWR
  - Blue light will be on when the DC voltage of internal power supply is within the normal range (48 VDC ~ 52 VDC).
  - Blue light will flash when the DC voltage of internal power supply is out of the normal range (other than 48 VDC ~ 52 VDC).
  - Blue light will be off when the external power supply is turned off, or internal power supply module does not work.

- LED_FWD
  - Blue light will be on when RF_OUT has power output.
  - Blue light will be off when the TX is turned off, or the PA enters the auto-protection mode and therefore shuts down its RF output. There are several situations which will result in auto-protection mode, such as the input power is too high, the reflected power is too high, or the temperature is too high.

- LED_RFL
  - Red light will be off when the reflected power is normal. (Threshold is configurable only by advanced user)
  - Red light will be on when the reflected power is too high. It may be caused by no load connected to port RF_OUT. In this case, the PA will enter auto-protection mode and there will be no RF output.

- LED_TEMP
  - Red light will be off when temperature is normal (≤ 140 ^{o}F).
  - Red light will be on when system temperature is too high (> 140 ^{o}F). It may be caused by a broken cooling system. In this situation, the PA will enter auto-protection mode and there will be no RF output.

Note:

1) The front fan covers can be removed to clean the air intake path. No screw driver is needed, and no disassembly of the PA is required.
2) When a warning occurs and the PA enters auto-protection mode, the only way to clear this state is to cycle power on the PA module once the problem(s) is resolved. Otherwise all warning LEDs will remain on even if the problem(s) no longer exists.

1.2 Back Panel

- RF_IN
  - Connector: N
  - Impedance: 50 Ω
  - Rated Power: -2 dBm ± 1 dB @ 360 W output (before BPF)
  - Note: If input power from RF_IN is lower than rated input value, the output power will be lower than rated output power accordingly. This is because the PA has a fixed gain of 57 dB ± 1 dB. If the input level from RF_IN is higher than the rated value, it will result in RF output distortion and performance deterioration. If the input level is more than 1 dB higher than the rated value or the output power is higher than 360 W, it may trigger the current-limiting function of the internal power supply. The PA will enter the auto-protection mode, and there will be no RF output.

- RF_OUT
  - Connector: 7/16 DIN
  - Impedance: 50 Ω
  - Rated Power: 360 W (ATSC) before filter
  - Note: RF_OUT must be connected with a load, otherwise the PA will enter the auto-protection mode and there will be in no RF output. Please note that the PA is designed to withstand any load conditions, including no load at all, without damaging the PA. However it is strongly suggested to have a load connected with proper impedance.

- MONITOR (loop out of RF_OUT)
  - Connector: BNC female
  - Impedance: 50 Ω
  - Rated Power: 0 dBm ± 3 dB @ 360 W
  - Note: It is OK to leave this port open without load.

- RS232-A
  - Connector: DB9-M
  - Note: Connected to REMOTE (RS232) port of ACT-5X, which is used for control and communication between the PA and the exciter.

- RS232-B:
  - Connector: DB9-M
  - Note: Reserved

- RJ45
  - Connector: 10M/100M Ethernet
  - Note: For customers' remote control to the PA.

- FWD
  - Connector: SMA
  - Input Level: -20 to +10 dBm
  - Note: External Coupler Forward sample for PA_FWD Power Meter.

- REF
  - Connector: SMA
  - Input Level: -20 to +10 dBm
  - Note: External Coupler Reflected sample for PA_REF Power Meter.

Note:

1) The back fan covers can also be removed to clean the air intake path. No screw driver is needed, and no disassembly of the PA is required.

2 Specifications

- Environment
  - Operation Temperature: -10 ºC ~ +60 ºC (+14 ºF ~ +140 ºF)
  - Operation Humidity: 20 % ~ 90 % (non-condensing)
  - Atmospheric Pressure: 86 kPa ~ 106 kPa

- Power Supply
  - Voltage: 90 ~ 300 VAC
  - Frequency: 47 ~ 63 Hz

- Others
  - Frequency: 473 MHz ~ 794 MHz
  - VSWR: ≤ 1.5
  - Shoulder Level: ≥ 28 dBc (before pre-correction @ 360 W before filter)
  - Power consumption (full power): 1760 W @ 360 W output (8 A/220 V)
  - Power consumption (half power): 1100 W @ 180 W output (5 A/220 V)
  - Size: 19” W x 7” H x 27.2” D
  - Weight: 84 LBS

Note

1) The electrical interface characteristics are measured at rated power. Values may change.
2) Operating in abnormal conditions may result in damage to the equipment. Long operating hours in severe environments may reduce the reliability of the entire system, which may cause permanent damage to equipment. Make sure all electrical interface characteristics and environmental parameters are within the defined range listed above before operating this equipment.

3 Control Interface

3.1 Local Control Interface

Local control and monitoring of the PA unit is accomplished via the ACT-5X Exciter front panel user interface. Use a standard serial cable to connect the PA D9 RS232-A port to the ACT-5X Exciter D9 REMOTE (RS232) port. With this connection established, all the PA information will be displayed in the PAC sub-menu in the advanced menu of ACT-5X exciter, as shown below:

Table 1 PAC sub-menu in Advanced Menu

	VOL_9	VOL_12	VOL_50	PA_FWD	PA_REF	PA_In	GV	VSWR	PA_TEMP	PA__LVL	CUR1_50	Cur2_50
Value	8.9V	NULL	50.1V	280.2WW	1.92W	NULL	1.68V	1.16	105.1℉	310W	11.76A	13.05A
Content	Voltage of 9V DC supply	N/A	Voltage of 50V DC supply	Forward power of PA	Reflected power of PA	N/A	Grid Voltage (bias voltage)	Voltage standing wave ratio	Temperature of PA	280W(ATSC)	Current 1	Current2

Note: The displayed settings and numbers in the tables below are for illustration purposes only and may be different from those in actual use.

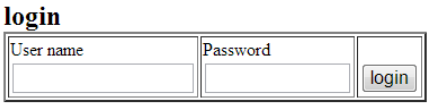
A second sub-menu is available for configuring the PA networking settings. Enter the main menu of ACT-5X exciter and locate the PA_CNFG sub-menu to setup the IP, GATEWAY and MASK PA networking parameters.

Table 2 PA_CNFG sub-menu in Control Mode

	IP	GATEWAY	MASK
Default	192.168.001.210	192.168.001.001	255.255.255.000
Options	***.***.***.***	***.***.***.***	***.***.***.***

3.2 Web Interface

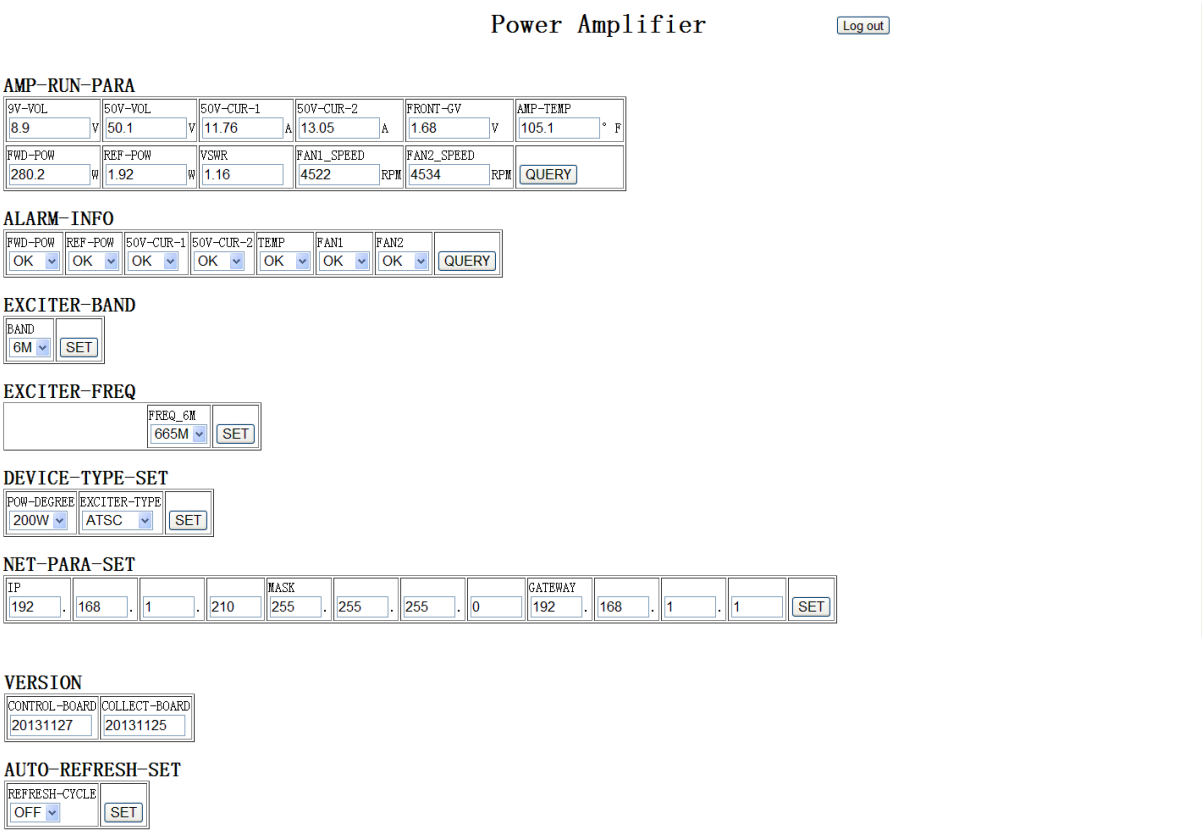
Enter the IP address of the PA (the default value is 192.168.1.210) in a web browser's address bar to cause a login window to pop up.



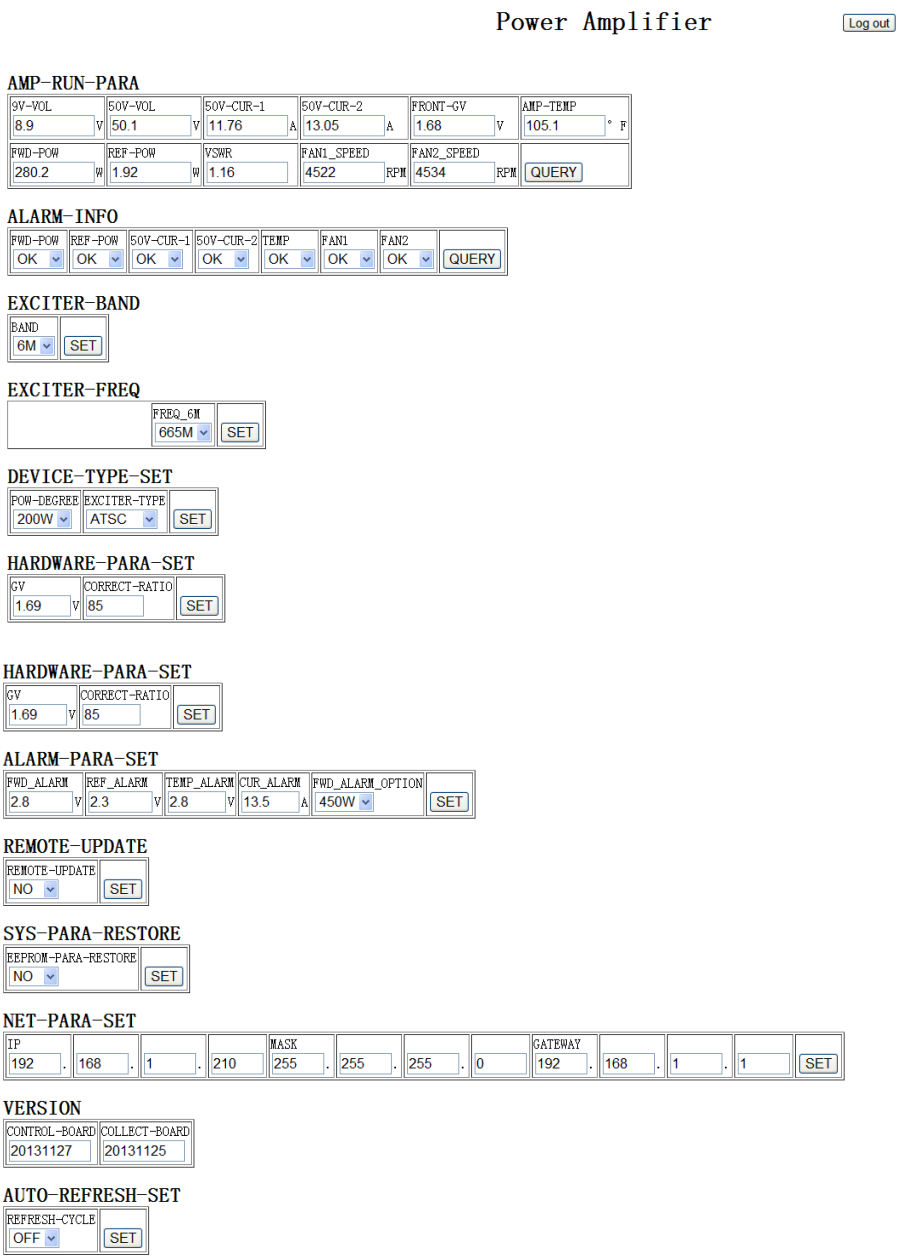
There are two tiers of web interface available. The first “guest” tier is limited in monitoring and control, allowing users to retrieve information such as PA status, network configuration, and alarms. The guest account is accessed with a user name and password of "guest" and "guest" (case sensitive). The second “admin” tier provides full status and control of the PA and is accessed with a username and password of "anywavecom" and "anywavecom" (case sensitive).

The screenshots below highlight the status and control available via the guest and admin web interfaces.

Web Interface of Guest account:



Web Interface of Admin account:



Note:

1) To refresh the status of the PA unit, one could manually click the “Query” button(s) on the page, or set up the “AUTO-REFRESH-CYCLE” for the auto periodic refreshing of status.
2) Configuration settings including “POWER_DEGREE”, “EXCITER_TYPE”, internet access settings and “REFRESH-CYCLK” may be modified via this PA web GUI.

3.3 Serial Port Interface

The port RS232-B of PA is reserved to be used as serial port interface for remote control.

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