ANYWAVE

PA-VIII1-C-FA

User Manual

Version 1.0 – June 25, 2018

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.

Anywave Communication Technologies Inc.
300 Knightsbridge Parkway, Suite 150, Lincolnshire, IL 60069
Tel: (847) 415-2258
Fax: (847) 415-2112
http://www.anywavecom.net

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

- LAN
  - Connector: 10M/100M Ethernet
  - Note: Ethernet port for web-based remote control (ipaddress: 192.168.1.210, username/password: anywavecom/anywavecom)
- LED_PWR
  - Green light will be on when the DC voltage of internal power supply is within the normal range (48 VDC ~ 52 VDC).
  - Green light will flash when the DC voltage of internal power supply is out of the normal range (48 VDC ~ 52 VDC).
  - Green light will be off when the external power supply is turned off, or internal power supply module does not work.
- LED_RS485
  - Green light will flash once per second when the internal communication is normal.
  - Green light will stay constantly on or off when the internal communication is abnormal.
- LED_FWD
  - Blue light will be on when RF_OUT has power output.
  - Blue light will be off when the RF button 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_ALARM
  - Red light will be off if there is no alarm.
  - Red light will be on if there is any alarm.
- RESET: reserved.

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-A/RF IN-B
  - Connector: N
  - Impedance: 50 Ω
  - 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. 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 preset FWD threshold, it may trigger the current-limiting function. The PA will enter the auto-protection mode, and there will be reduced RF output or even no RF output.
- RF_OUT
  - Connector: 7/16 (with 7/16 to N adapter)
  - Impedance: 50 Ω
  - 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.
- RFMON (loop out of RF_OUT)
  - Connector: SMA
  - Impedance: 50 Ω
  - Note: It is OK to leave this port open without load.
- ERS485
  - Connector: DB9-M
  - Note: Connected to REMOTE (RS232) port of exciter, which is used for control and communication between the PA and the exciter.
- AC INPUT: 176~300VAC, 47~63Hz, 10A/220VAC
- Power Switch: ON/OFF

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: 176 ~ 300 VAC (full load)
  - Frequency: 47 ~ 63 Hz
- RF Performance
  - Frequency: 177 MHz ~ 213 MHz
  - VSWR: ≤ 1.5
  - Shoulder Level: ≥ 36dBc (with pre-correction ON)
  - Size: 480mm(W)*222mm(H)*423mm(L)

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 (Exciter) Interface

Local control and monitoring of the PA unit can be 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:

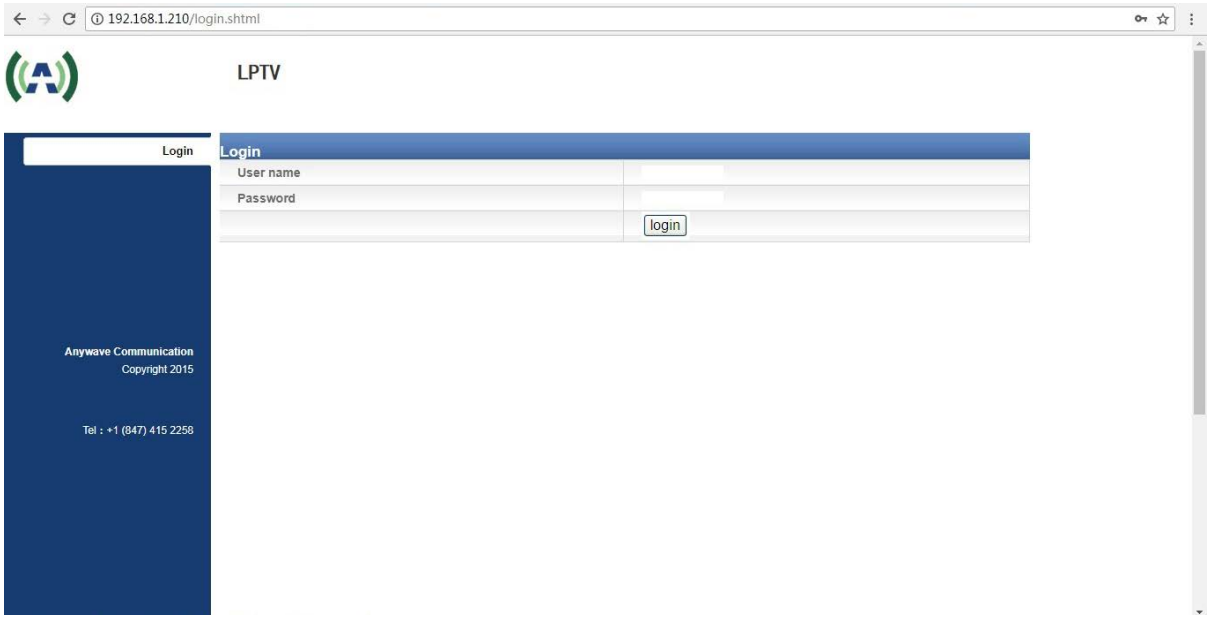
Note: The displayed settings and numbers in the tables below are for illustration purposes only and may be different from those in actual use.

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.


*
255.255.255.000

3.2 Web Interface

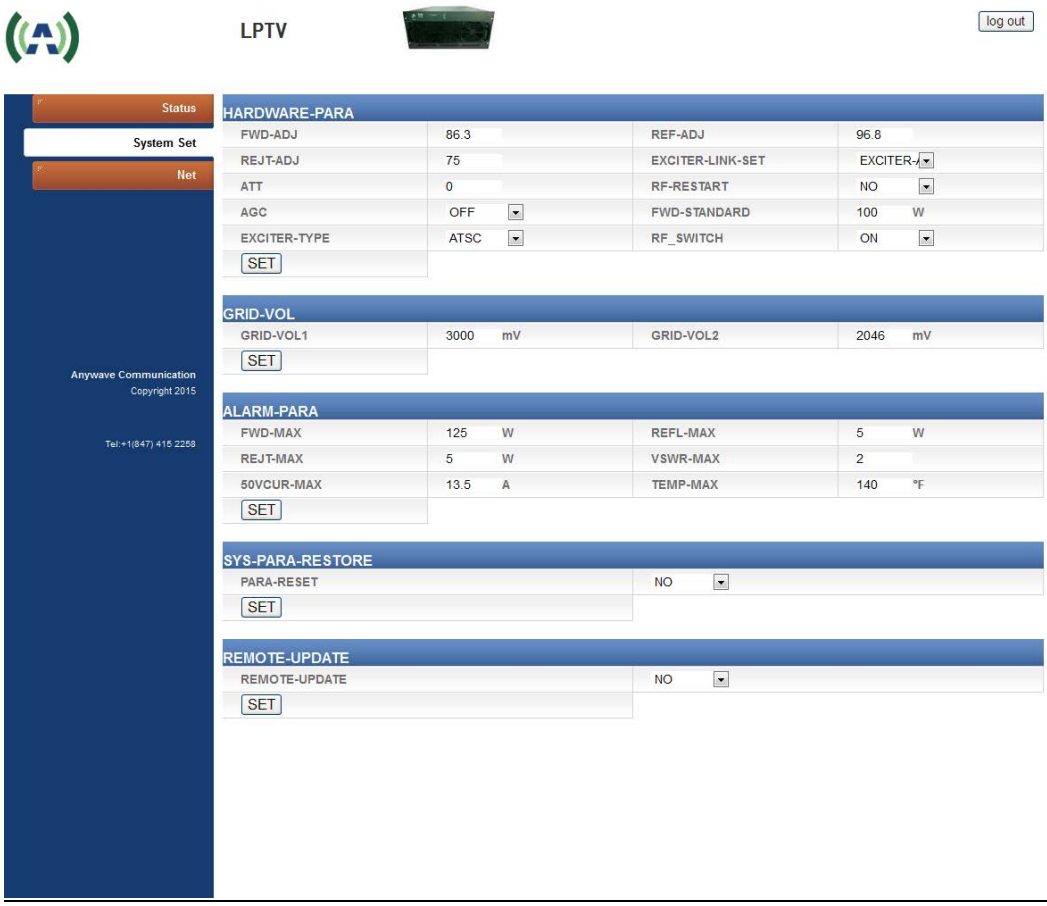
Enter the IP address of the PA (the default value is 192.168.1.210) in a web browser's address bar to cause a login window to pop up.

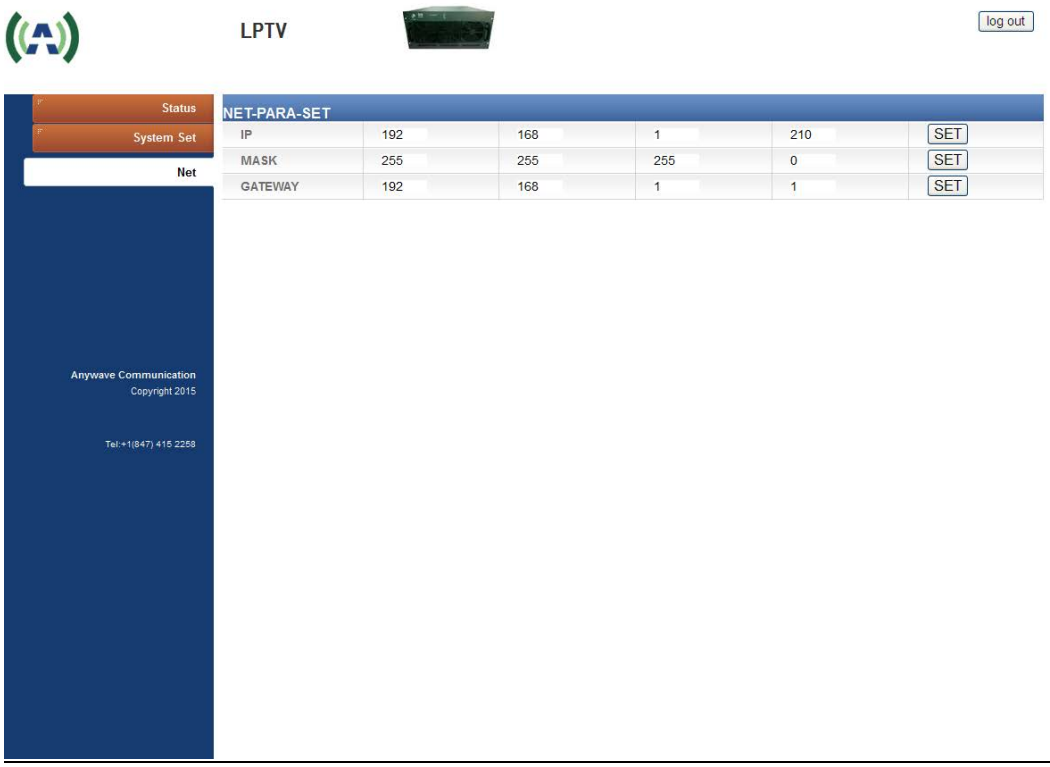


The “admin” tier provides full status and control of the PA and is accessed with a username and password of "anywavecom" and "anywavecom" (case sensitive).

Admin Web Page


LPTV
log out
Status
System Set
Net
Anywave Communication
Copyright 2015
Tel:+1(847) 415 2268
Status
FWD-POW 108.7 W
REFL-POW 1.17 W
REJT-POW 0 W
ATT 0
AMP-TEMP 102.03 °F
VSWR 1.23
50V-CUR1 10.66 A
EXCITER A_EXCITE
FREQ 177 MHz
Alarm Infomation
FWD-POW OK
REF-POW OK
REJT OK
VSWR OK
AMP-TEMP OK
50V-CUR OK
Version
MCU V1.0-180717 50W


LPTV
log out
Status
System Set
Net
Anywave Communication
Copyright 2015
Tel:+1(847) 415 2268
HARDWARE-PARA
FWD-ADJ 86.3
REF-ADJ 96.8
REJT-ADJ 75
EXCITER-LINK-SET EXCITER-
ATT 0
RF-RESTART NO
AGC OFF
FWD-STANDARD 100 W
EXCITER-TYPE ATSC
RF_SWITCH ON
SET
GRID-VOL
GRID-VOL1 3000 mV
GRID-VOL2 2046 mV
SET
ALARM-PARA
FWD-MAX 125 W
REFL-MAX 5 W
REJT-MAX 5 W
VSWR-MAX 2
50VCUR-MAX 13.5 A
TEMP-MAX 140 °F
SET
SYS-PARA-RESTORE
PARA-RESET NO
SET
REMOTE-UPDATE
REMOTE-UPDATE NO
SET



Note:

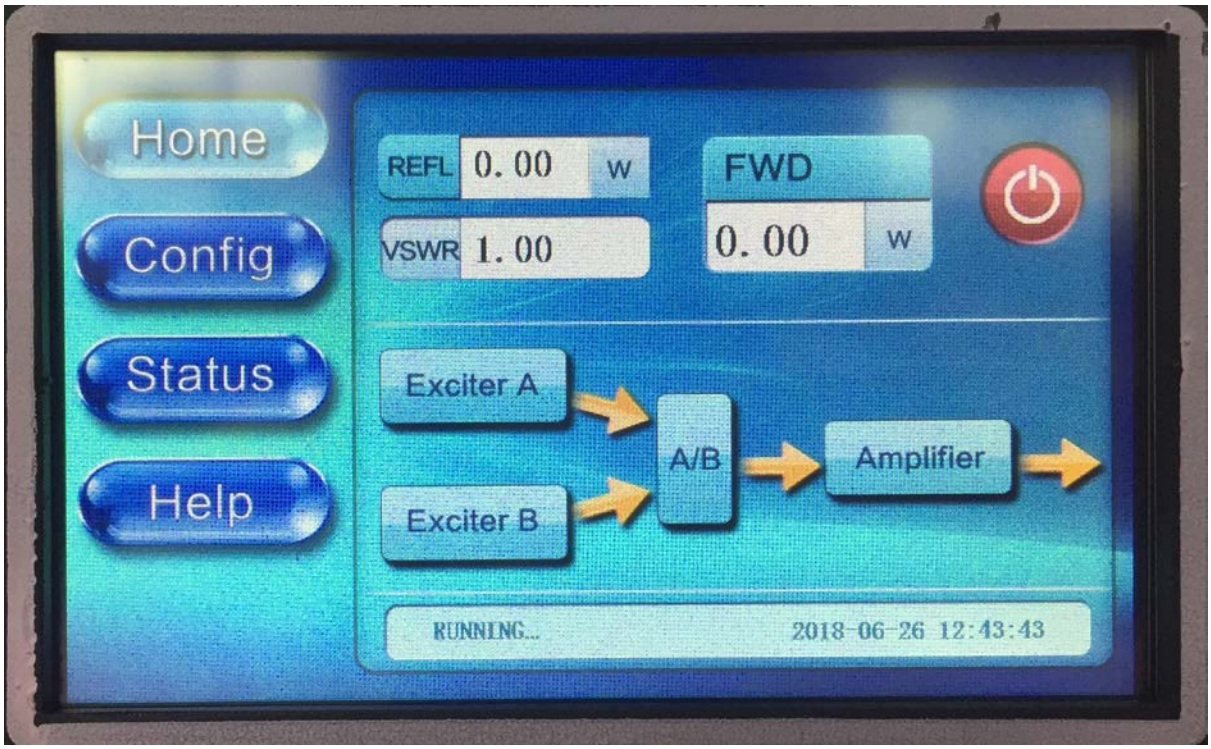
1) FWD-ADJ/REF-ADJ are used to calibrate the forward power and reflected power readings. All PAs have been calibrated in the factory before shipment. If you would like to calibrate the readings again for any reason, please contact the manufacturer first for technical support. Or inaccurate readings caused by wrong calibration may damage the unit and void warranty.
2) Usually ATT setting in System Set tap should be the same as the ATT reading in Status tap. If not, it is likely the unit has entered auto-protection mode. Set RF-RESTART to ON in System Set tap to clear the alarm(s) and restart the unit. And check again to see if the alarm is gone and the unit is out of protection mode.

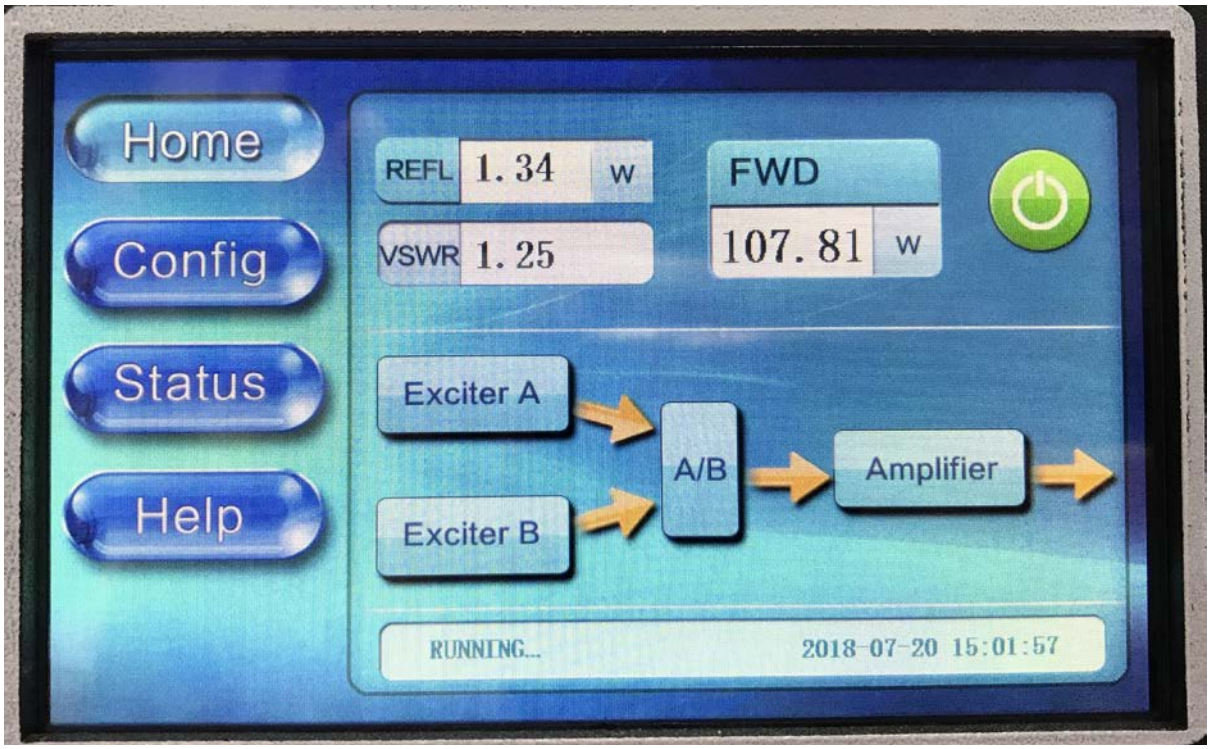
   Important: unit entering auto-protection mode may be at reduced power for protection purpose. If you notice the output power drop, please to check if there is any alarm and what the current ATT value (in Status tap) it is. Don't increase the input of the PA without checking alarm/ATT, otherwise once the alarm has been cleared, you may have a much higher input level than needed and it may damage the unit.
3) It is not recommended to change GRID-VOLT and ALARM-PARA without the permission of the manufacturer. It may leave the unit in insufficient protection and may void the warranty.
4) Every unit's parameters have been calibrated and optimized for its application. Please do not run PARA-RESET unless it is told by the manufacturer.

3.3 Local (Touch Screen) User Interface

3.3.1.Home Screen

Turn on the power supply and the PA enters the initialization process, and after 5 seconds, the PA enters the home screen (as shown below).





The home screen is divided into 4 parts: Title Bar (left column), Power Metering (upper right), Block Diagram (middle right) and Status Bar (lower right), as shown below.

- **Title Bar**: Shown in the picture above, the "Home" button is highlighted, indicating the Home screen is now displayed. This screen is a touch screen. You may navigate to the other screens (Config, Status, Help) by simply touching the coresponding button in the Title Bar.

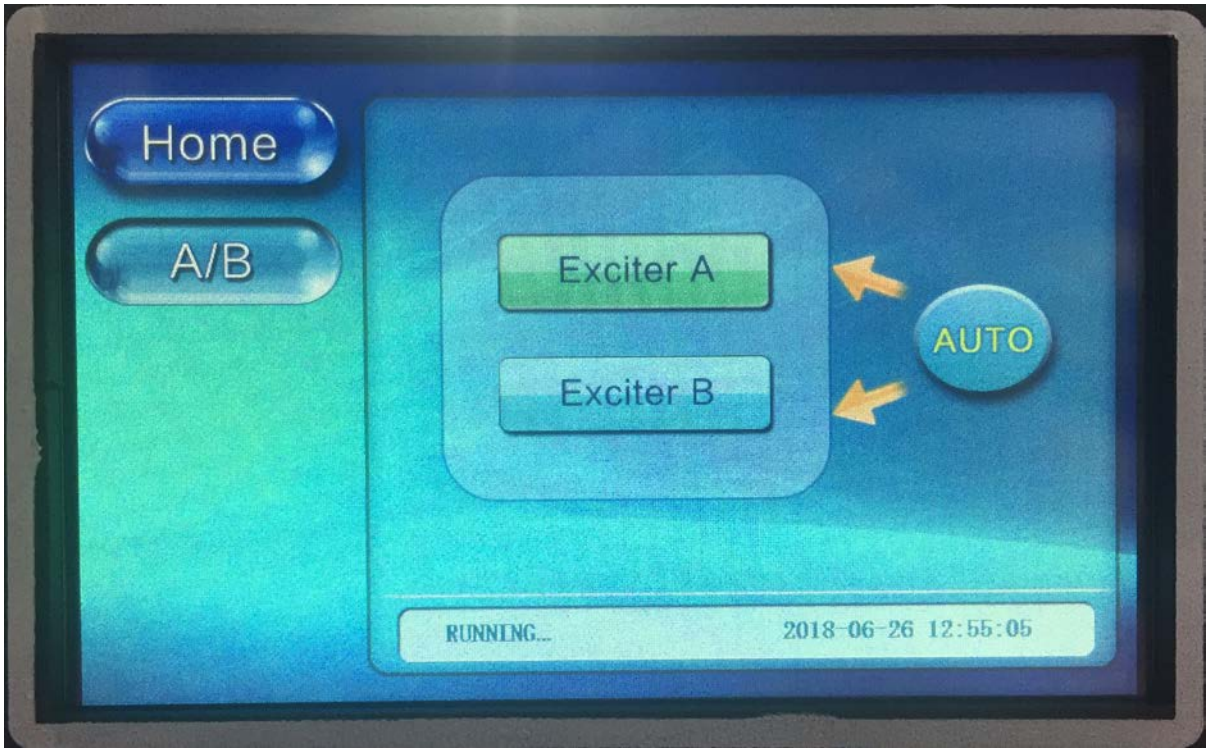
- **Power Metering**
  - ON/OFF (Green) Button : Provides TX ON/OFF control. When GREEN (as shown above), this indicates the TX is ON. When RED, this indicates the TX is OFF.
  - FWD: Forward Power Meter. Touching the white display box of FWD will toggle its display units between "dBm" and "W".
  - REFL: Reflected Power Meter. Touching the white display box of REFL will toggle its display units between "dBm" and "W".
  - VSWR: Voltage Standing Wave Ratio

- **Status Bar**: During normal operation, the default status is "RUNNING OK". If there is any alarm, the alarm will show up in the Status Bar of each screen.

- **Block Diagram**: Press the "Exc A/B" graphic to navigate to the Dual Exciters Switching screen (shown below). This screen shows which exciter is currently on-air (highlighted GREEN) and allows the user to manually change the on-air exciter.

3.3.2. A/B Exciter Icon Screen

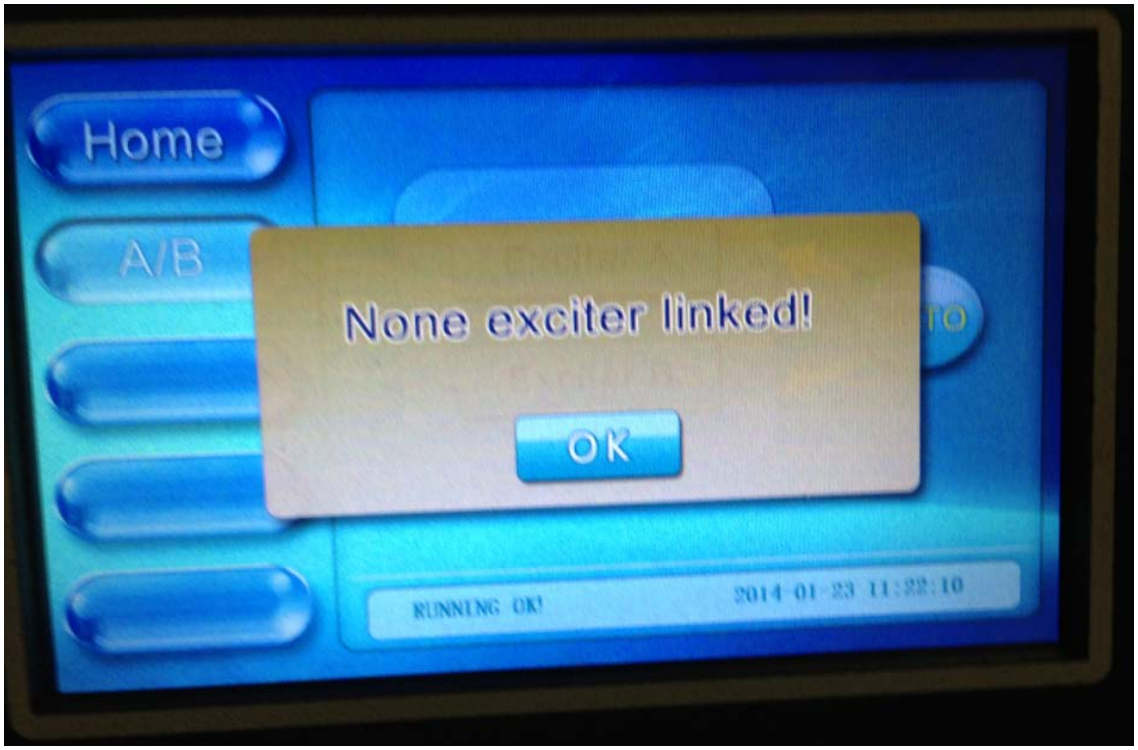
Dual Exciters - Switching Screen: As mentioned above, pressing the “Exc A/B” icon will bring you to the Dual Exciters Switching Screen, a shown below.



Manual Exciter Switchover: Exciter A is the default on-air exciter. The on-air exciter’s status will be “GREEN”, as shown in the screen above, indicating that Exciter B is the current on-air exciter. Pressing the “Exciter A” or “Exciter B” button on this screen will cause a manual switch between exciters, that is if the PA is “linked” to both exciters. (Note: In a dual exciter configuration, both exciters are on at the same time, producing an RF output signal a the same time, and the PA is considered “linked” with an exciter when the PA detects an RF output present from the exciter as monitored).

Auto Exciter Switchover: In a Dual Drive configuration, the PA is set to auotmatically switch to the standby exciter in the event a problem occurs with the on-air exciter. The PA will not automatically switch back to the original Exciter as long as the standby Exciter is operating properly. However, the PA will automatically switch back to the original Exciter in the event of a problem with the on-air (standby) exciter. So the PA will continue to automatically switch to the standby exciter in the event of a problem with the on-air exciter.

If neither of the exciters can be linked successfully (i.e. the PA does not detect a valid RF ouptut present from either exciter), a window will pop up, indicating “No Exciter Linked”, as shown below.



If the manual switching is successful, a window will pop up indicating “Change succeed!”, as shown below.

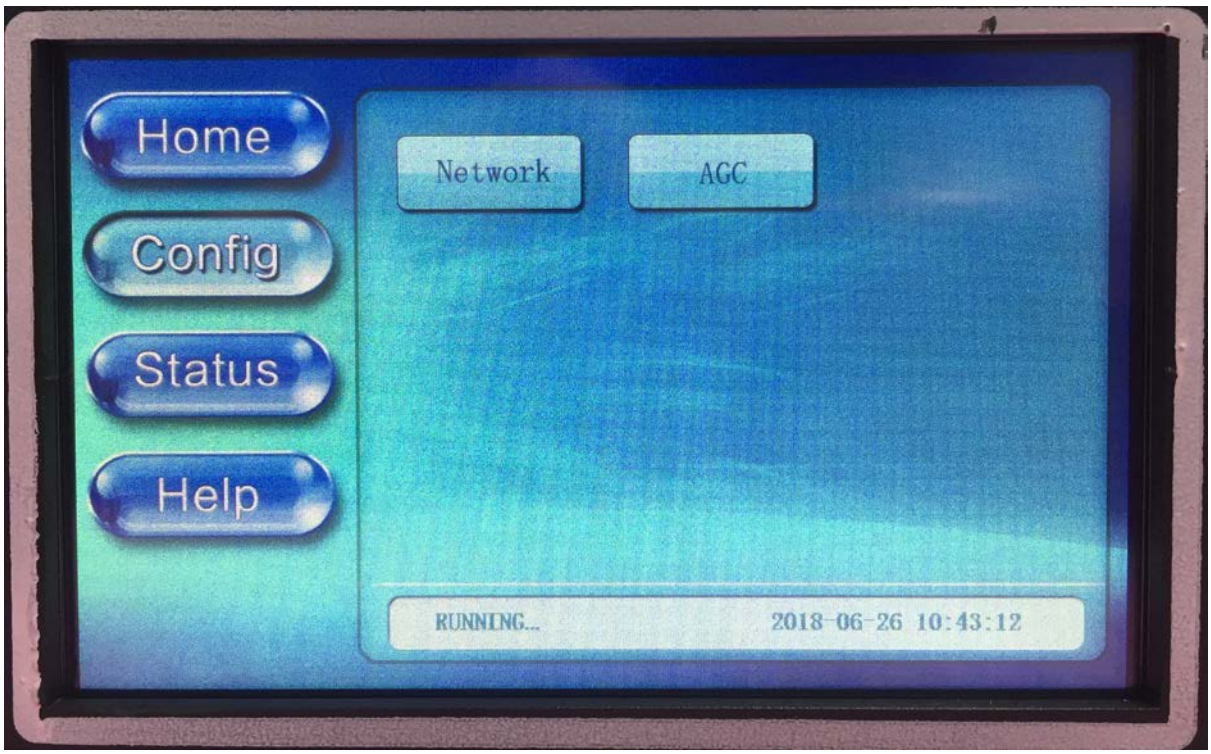
If the manual switching is not successful, a window will pop up indicating “Change failed!”, as shown below.

Please note that the Exciter(s) comunicates via a RS-485 bus to the PA. In a single drive TX, the Exciter will be configured with an RS-485 addess ID of 80H (as found under the Exciter CONFIG submenu) corresponding with Exciter A. In a dual drive TX, Exciter B will be configured with an RS-485 ID of 81H.

Pressing the Exciter A or Exciter B button will bring up a window displaying the Exciter Channel Frequency and well as the TX System SNR and Upper and Lower Shoulder metrics. Please note: only the on-air exciter has valid readings.

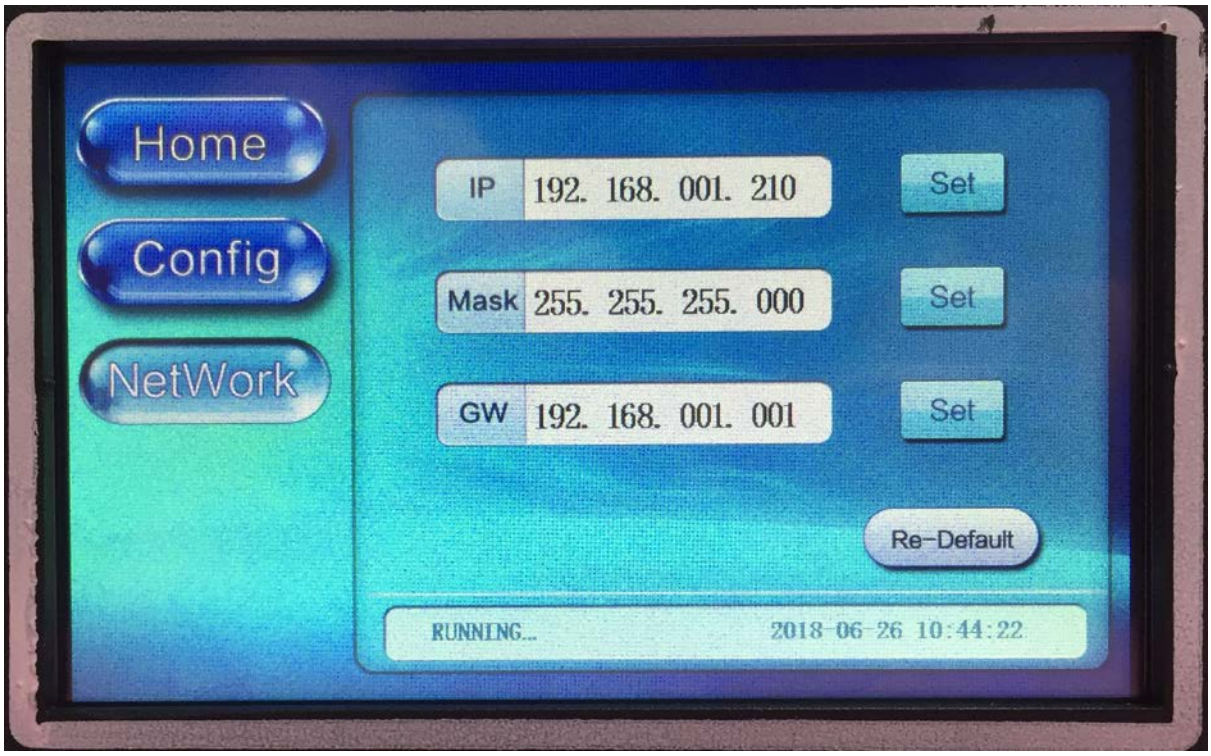
3.3.3. Config Screen

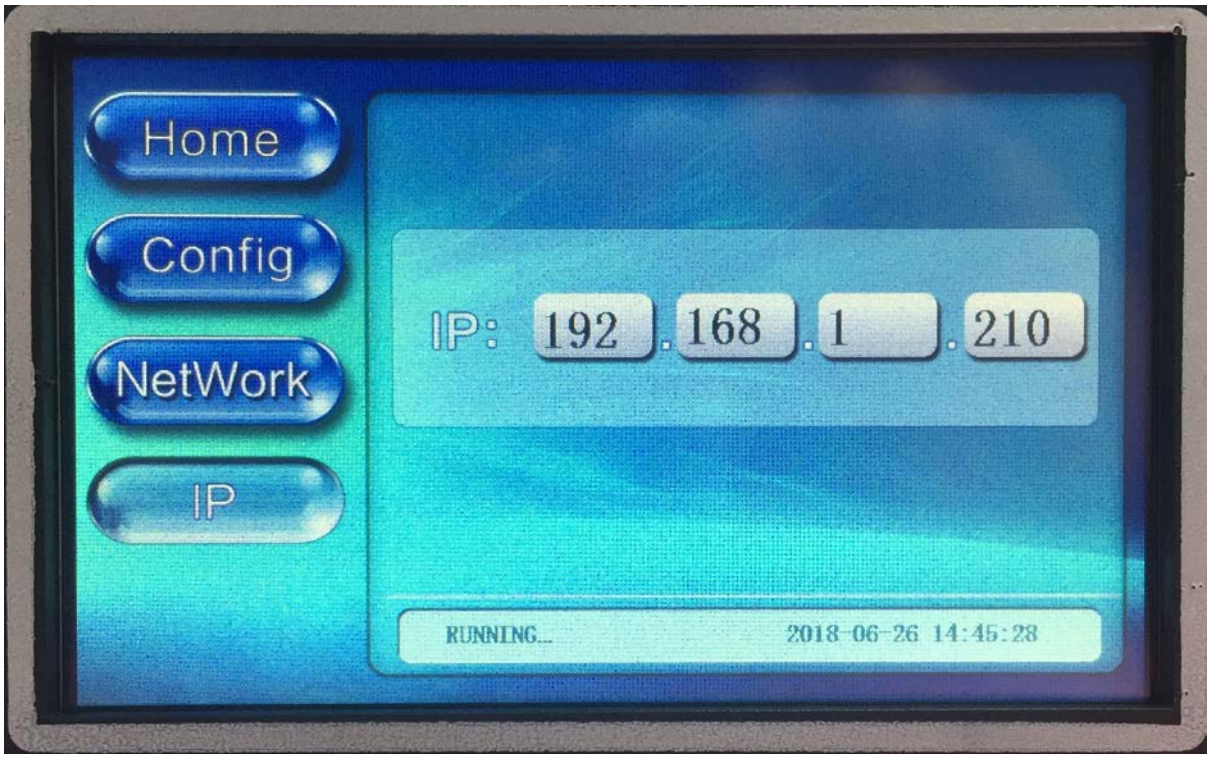
Touching the Config button on theTitle Bar of the Home Screen, will navigate to the Config Screen, as shown below. The Config Screen has two functional sections on the right. Press any of these buttons to navigate to that config screen. The Network screen is used to configure all the TX networking parameters including IP, Mask, and Gateway. The Time screen is used to set the current time. The AGC screen is used to turn the PA AGC On/Off and to change the target AGC output power level.

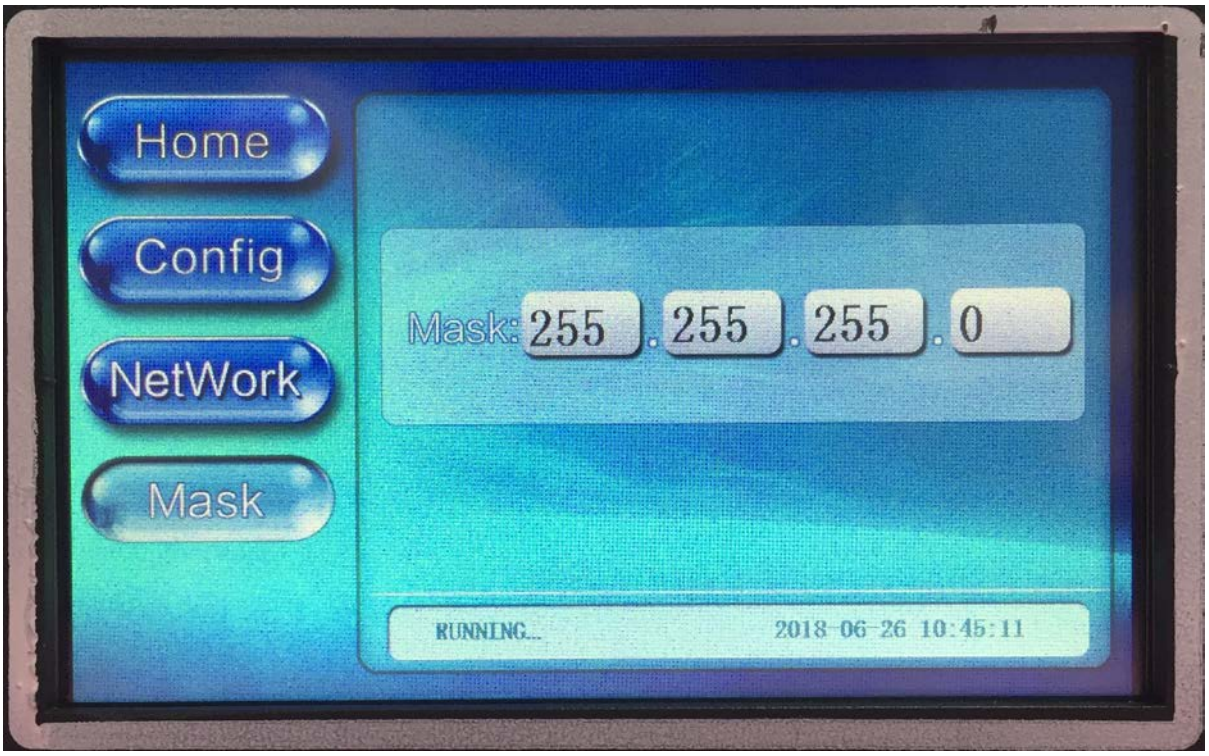


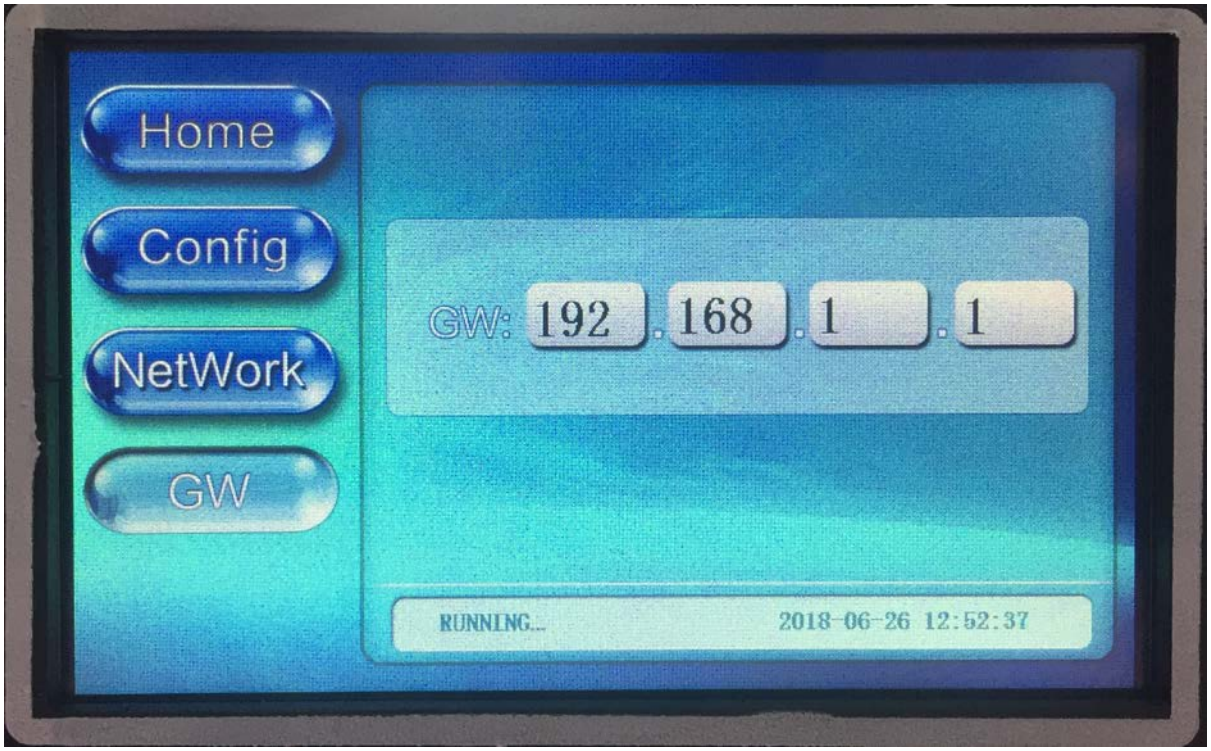
Network Screen: The User can check and set all the Contoller network information in this screen.

- Re-Defualt: Reset Default settings - This button is used to set all the network settings to the default values, as show below:
  IP: 192.168.1.210
  MASK: 255.255.255.0
  GateWay: 192.168.1.1
- Set: There is a Set button for each bar in this screen. Pressing the Set button will lead to the corresponding configuration screen of IP or Mask or GateWay accordingly. Using the IP setting as example, Press any part of the white bar on the IP Setting Screen and the keyboard (shown below) will be enabled, turing from grey to yellow. The user can only set 3-digits of one bar at a time. When the configuration is finished, press OK to confirm. If the keyboard is enabled by mistake, press Cancel to exit the setting mode. Don’t press Ok without entering a valid number, otherwise the system will fill it with all zeros instead.


Home
Config
NetWork
IP 192. 168. 001. 210
Set
Mask 255. 255. 255. 000
Set
GW 192. 168. 001. 001
Set
Re-Default
RUNNING...
2018-06-26 10:44:22


Home
Config
NetWork
IP
IP: 192 . 168 . 1 . 210
RUNNING...
2018-06-26 14:45:28





AGC Screen: This screen is used to set the AGC Reference output power of the PA and to turn the PA AGC ON/OFF. Press the AGC button to turn AGC ON (button will turn green).


Home
Config
AGC
Rated Power:
100
W
AGC
RUNNING...
2018-07-20 10:05:00

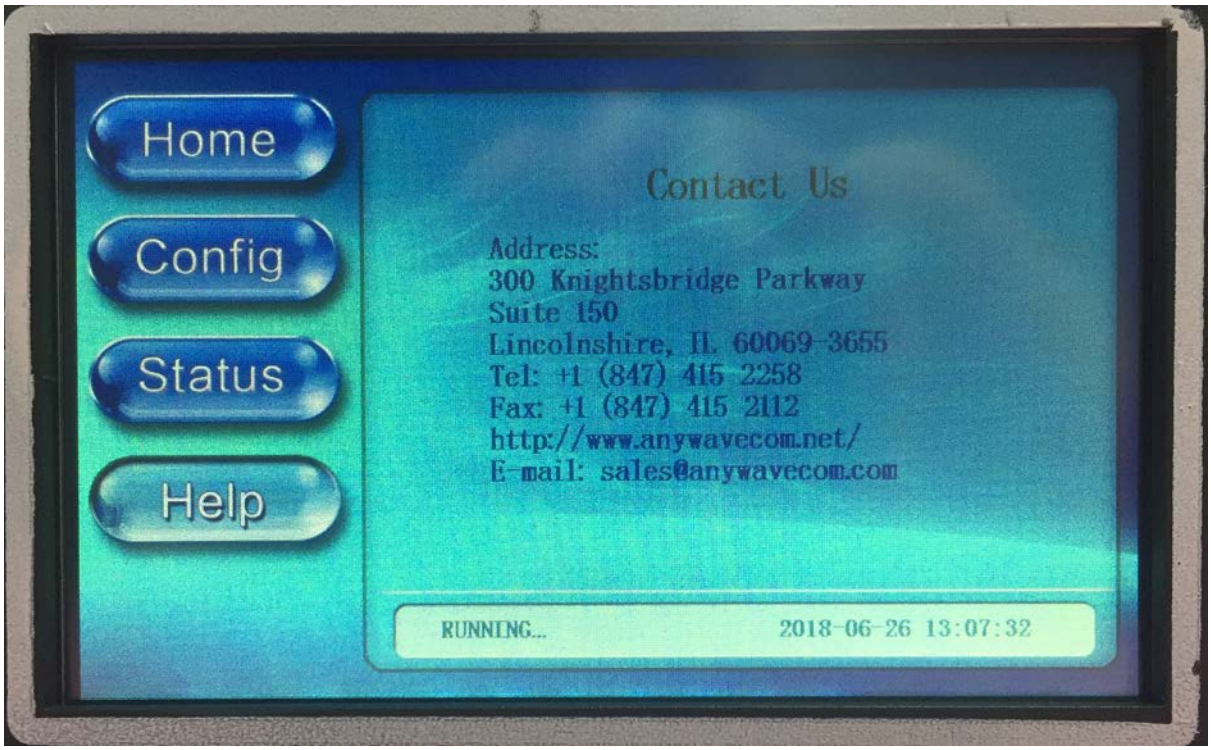

Home
Config
AGC
Rated Power:
100
W
AGC
RUNNING...
2018-07-20 10:06:15

3.3.4. Status Screen

Status Screens: As mentioned above, pressing the “Amplifier” icon on the Home page, will navigate to the Amplifier Status Screens.

- Temp: Temperature of the amplifier
- V50: Reading of 50 V power supply of the amplifier
- Cur1: Device current.
- Cur2~5: N/A for 60W amplifier.
- ATT: the internal attenuation value of the amplifier.
- FREQ: current frequency of the amplifier.
- EXC-S: the selected exciter of the amplifier.

3.3.5. HELP SCREEN



Anywave Communication Technologies Inc.
300 Knightsbridge Parkway, Suite 150, Lincolnshire, IL 60069
Tel: (847) 415-2258
Fax: (847) 415-2112
Email: sales_us@anywavecom.com
http://www.anywavecom.net/