XIEGU

100 W Solid-State Linear Power Amplifier

XPA125B

Instruction Manual

This device complies with Part 15 of the FCC Rules.Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

FCC ID: 2ANLH-XPA125B1

Important reminder:

Before operating the equipment please study this instruction manual carefully, and retain it for future reference.

Features:

- RF power amplifier with inbuilt antenna tuner (ATU).
- Maximum RF output power of 125 Watts.
- Auto tuning function.
- Wide frequency range of 1 – 50 MHz.
- Harmonic suppression of 39 dB
- Maximum output power can be automatically regulated via the ALC control when used with an X108G or X5105 transceiver

Safety considerations:

Do not use equipment during an electrical storm.

Do not expose the unit to moisture.

Use this device responsibly and observe all local laws and regulations.

Caution! High RF voltage at antenna connector!

Packing list:

① XPA125B.. 1
② Power supply cable.....1
③ Date cable..... 1
④ Communication cable.....1
⑤ Service card.....1

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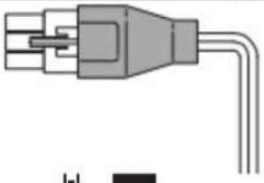

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1 XPA125B Specifications

1.1 Amplifier:

Frequency range: 1.0 – 55 MHz

Maximum output power: 1.8 - 30MHz ≥110W
50 - 54MHz ≥90W

Maximum operating ambient temperature: 55℃

Gain: 13dB (±2dB)

Supply voltage: 12 - 14.5 V DC

Current draw @ maximum output:
Standby: 260 mA @Max
Transmit: 30A @Max

1.2 ATU:

Tuning frequency range: 1.8 – 30 MHz/50 – 54 MHz

Maximum tuning range: 14 - 500Ω

1.3 Product specifications：

Dimensions: 260 x 150 x 100 mm (not including control knobs, feet, handles, etc.)

Weight：2.66 Kg(host only)

2 Equipment description

2.1 Front panel layout:

① **Power** key

When XPA125B is turned on, press this button and hold for 2 seconds, XPA125B will shut down.

When XPA125B is turned off, press this button and hold for 2 seconds, XPA125B will turn on.

② ATU function key

Via this button you can access the automatic antenna tuning function.

③ BAND selection key

Using this button you can select between manual band switching or automatic band switching.

In manual band switching mode, the XPA125B will change bands in the following order:

160m→80m→60m→40m→30m→20m→17m→15m→12m→10m→6m

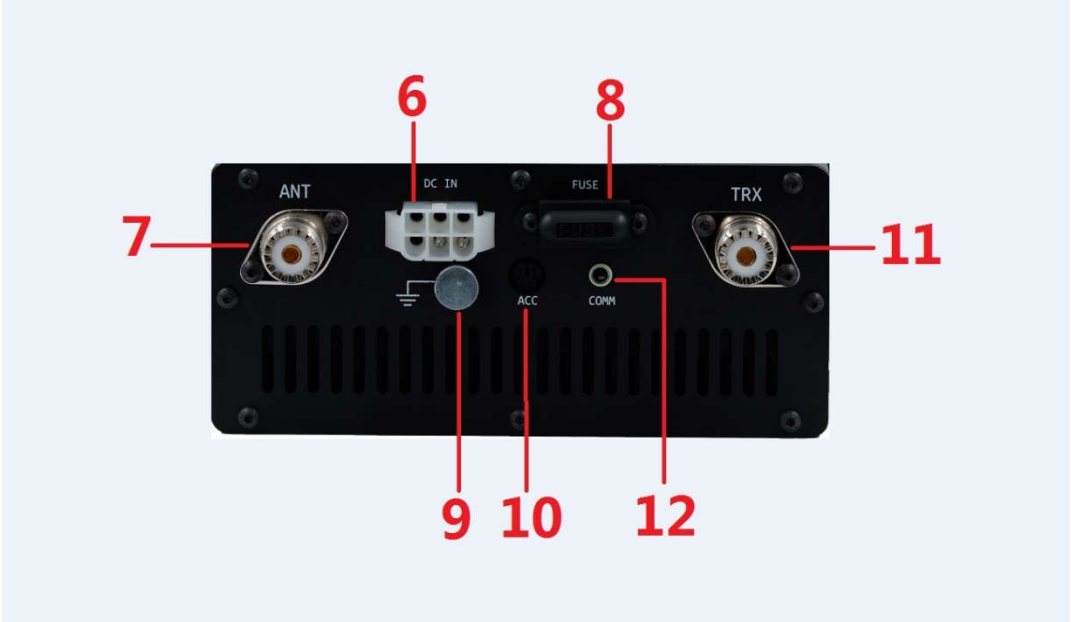
④ PA key

Used to switch the power amplifier into or out of circuit.

⑤ LCD

All working status information is displayed here. The display is covered by an organic glass protective plate.

2.2 Rear panel layout:



6 DC IN Power supply socket:

The XPA125B requires a 12 - 14.5 V DC supply

7 ANT Connector:

The ANT socket is connected to the antenna, the connector model is SL16-K.

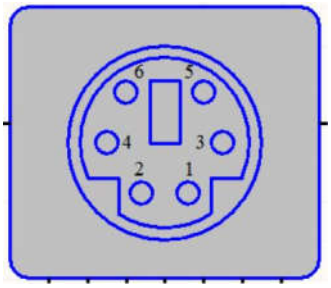
8 FUSE Holder:

Internal fuse holder. Fuse rating is DC 30A.

9 Ground

10 ACC socket:

The data interface connections are as follows:



PIN1： NC	PIN4： ALC input
PIN2： PTT Signal input	PIN5： NC
PIN3： Band voltage input	PIN6： GND

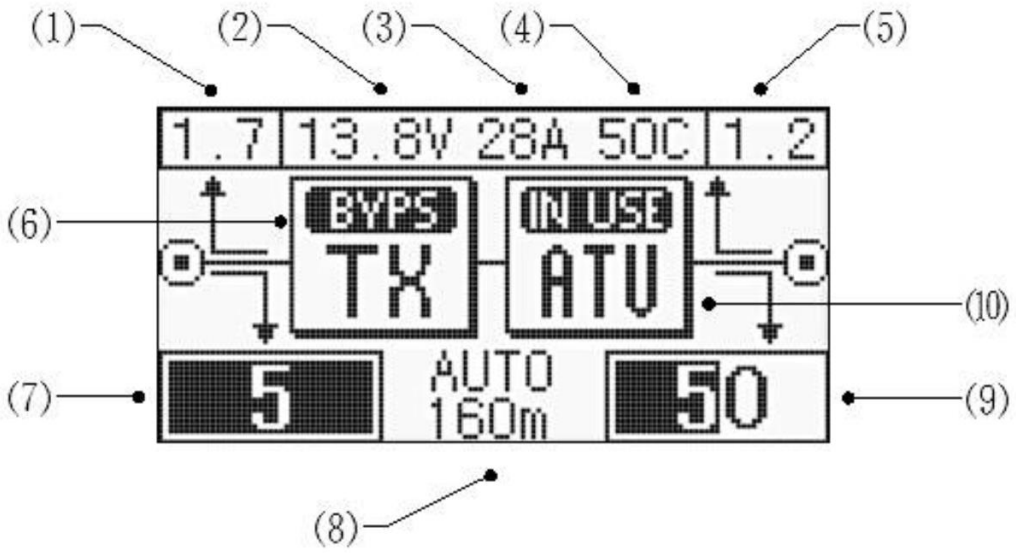
11TRX Socket:

The TRX interface is connected to the transceiver output, the connector model is SL16-K.

12Comm interface:

This interface is for XPA125B firmware updates and connection to a PC.

2.3 **Display interface layout:**



(1) Input SWR value:

Displays the SWR value of the XPA125B input.

(2) Operating voltage:

Displays the value of DC voltage supply to the XPA125B.

(3) Operating current value:

Displays the current being drawn by the XPA125B.

(4) Output stage temperature:

Displays the current temperature of the PA stage.

(5) Output SWR value:

Displays the SWR value of the XPA125B output.

(6) Power amplifier status:

Displays the overall status of the power amplifier as a whole.

Indicates that bypass mode is selected, the power amplifier is switched out of circuit.

Indicates that the power amplifier is operational.

RX Indicates that the unit is in receive mode.

TX Indicates that the unit is in the transmit mode.

(7) Input power value:

Displays the power input value to the XPA125B in Watts.

(8) Current working band status:

Displays the current working band, and whether automatic or manual mode is selected.

(9) Output power value:

Displays the output power being delivered by the XPA125B in Watts.

(10) Automatic antenna tuner unit (ATU) status:

Displays the status of the automatic antenna tuner.

Indicates that the XPA125B is not connected to the automatic antenna tuner unit.

Indicates that the XPA125B is connected to the automatic antenna tuner unit.

When tuning is successful,【INUSE】will be displayed.

If tuning fails,【Fail】will be displayed.

3. Operating instructions

3.1 Wiring connection method

3.1.1 Method for connecting XPA125B with X108G

The XPA125B can be directly connected to an X108G, which can then control the band switching and ALC functions of the amplifier.

- The ACC data cable supplied with the XPA125B is connected between the ACC ports of the two units. Both connectors are the same so either end of the cable can be connected to either socket.
- Use suitable RF coaxial cable to connect the X108G ANT port to the XPA125B TRX port.
- XPA125B ANTportshould beconnected to theantenna.

3.1.2 Method for connecting XPA125B with X5105

Use the dedicated connection cable CN-115 to connect the X5105 ACC port with the XPA125B ACC port. Please note the need to distinguish between the different plugs of the connection cable CN-115.

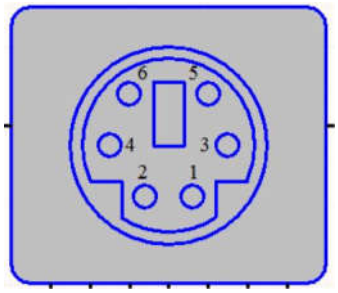
3.1.3 Method for connecting XPA125B with X1M

As the X1M does not have a dedicated ACC interface and PTT signal output, it can’t be directly connected to the XPA125B. A CN-17 converter is required to connect an X1M to the XPA125B.

3.1.4 Connection method between XPA125B and other QRP radio

If you want to start the XPA125B power amplifier and put it into the transmit mode, you need to set the PTT port to a low level **[level≤0.1V].**

If the PTT output signal of the transceiver is at high level, the high level needs to be converted into a low level, and then input to the XPA125B [ACC-PTT] port.



Pin 2 of the XPA125B ACC port is the PTT input port

In order to achieve automatic band switching, the corresponding band voltage is needed. XPA125B band control voltage information is as follows.

BAND	LEVEL(mV)	BAND	LEVEL(mV)	BAND	LEVEL(mV)
1.8 MHz	230	14.0 MHz	1380	50.0 MHz	2530
3.8 MHz	460	18.0 MHz	1610	----	----
5.0 MHz	690	21.0 MHz	1840	----	----
7.0 MHz	920	24.0 MHz	2070	----	----
10.0 MHz	1150	28.0 MHz	2300	----	----

3.2 Procedure:

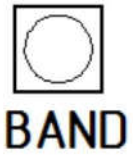
3.2.1 Using the power amplifier unit [PA unit] (ATU unit is set to BYPS)

- PressthePAkey,sothatthestateoftheamplifieris**[INUSE].**
- If your connected transceiver is an X108G or X5105, please set the output power to 5 W.
- If you are using any other QRP transceiver, please set the output power to 1 W.
- Set your transceiver to CW mode, press the CW key to transmit, andtheXPA125B amplifier will be activated.
- Theoutput powerofthe XPA125B canbe adjustedby adjusting theoutputpowerofthe connected transceiver.

Warning:

1. Do not allow the maximum output power of the amplifier to exceed 120 W.
2. Using the XPA125B at high power levels for extended periods can lead to overheating and potential damage to the PA stage.

3.2.2 Band switching



- Youcanswitchbetweenthetwomodesof**[AUTO-MANUAL]** via this key.
- If you want to connect the XPA125B to an X108G or X5105, please setXPA125B to**[AUTO]**mode.
- If you want to connect the XPA125B to other devices, please set XPA125B to **[MANUAL]** mode and manually switch to the desired frequency band.

Manual switching of frequency bands follows this order：
160m→80m→60m→40m→30m→20m→17m→15m→12m→10m→6m

3.2.3 Using the automatic antenna tuner unit **[ATU]** (PA unit is set to BYPS state).

- Pressthe **[ATU]**buttonso thatthecurrentstateof theamplifier is **[INUSE]**.
- SetthetransceivermodetoCW& settheoutputpowerto5 W.
- Press the CW key to transmit, and the XPA125B PA amplifier stage will be activated. The XPA125B ATU unit will start, the screen will display **[TUNE].**
- Iftuningissuccessful,thescreenwilldisplay**[INUSE]**.
- If tuningfails,thescreenwilldisplay**[Fail]**.

If you need to re-tune, you can press the [ATU] button for two seconds to force the XPA125B ATU unit to start re-tuning.
After successful tuning, switch the transceiver to the desired state for use.

3.2.4 Combined use of power amplifier + automatic antenna tuner

- Press the [PA] button so the current state of the PA unit displays **[INUSE]**.
- Pressthe[ATU]buttonsothecurrentstateoftheATUunit displays **[INUSE]**.
- Set the transceiver mode to CW, the output power to 5 W, and press the CW key.
- If the current SWR value is more than 3.0, the ATU unit will start tuningautomatically. Atthistime the PA unit will be disabled.
- If the current SWR value is less than 3.0, the ATU unit will start tuningautomatically,andthePAunitwill be activated.
- If the current SWR value is more than 3.0, and automatic tuning fails, the XPA125B will automatically switch to bypass mode and display this informationonthescreen.

3.2.5 Flexible configuration of PA unit and ATU unit

The ATU unit and PA unit of XPA125B can be used independently of each other. You can therefore use the XPA125B as either an automatic antenna tuner or a separate power amplifier. You can also bypass both units, and your transceiver will then be connected directly to the antenna.

3.2.6 Protection and warning

The XPA125B incorporates a variety of intelligent protection functions to ensure as far as possible the safety of the equipment in daily use. When the XPA125B enters an abnormal state, it will immediately enter protection mode and switch to bypass mode.

3.2.7 Remove protection and warning

Release the PTT button. Protection will be disabled and the XPA125B will return to the receiving state.

Warning messages are as follows:

SWRI too high! (Input value of SWR is high)	Idd too high! (Operating current is too high)
PIN too high! (High input power)	Vdd too high! (Input voltage is too high)
SWRO too high! (Output value of SWR is high)	Wrong band! (Filter error)
PO too high! (High output power)	Gain too low!
Temp too high! (Operating temperature is too high)	Efficiency too low!

When high SWR, high current, high voltage, over temperature and other error states are detected, the XPA125B's internal sensors will trigger the protection function beyond a certain threshold. The threshold of each sensor is as follows:

- High SWR：≥3.0
- High current：≥30A
- High voltage：≥15V DC
- Over temperature：≥100℃

Warning：

When the XPA125B current draw is too high (more than 30A), or a short circuit occurs, the fuse on the rear panel may blow. The unit will then no longer turn on. Please check the status of the fuse if this occurs.

4. General troubleshooting

The following are general troubleshooting suggestions. If they do not resolve the problem the unit will need to be returned to your distributor. Please do not disassemble the unit as this will invalidate the warranty.

Fault description	Possible reasons	Solution
Unable to turn on your XPA125B	Power cord is not connected	Connect power cable correctly
	The fuse on the back of the machine has blown	Replace fuse（30A）
	Power cable connection is bad	Replace or repair power cord
	Power supply connection reversed	Return to distributor
	Other circumstances	Return to distributor
No reception	Antenna is not connected	Properly connect the antenna
	Antenna failure	Replace or repair antenna coax
	No communication	Please confirm the propagation characteristics of the current band
	Other circumstances	Return to distributor
No trasmission	Antenna is not connected	Connect antenna
	Inadequate power supply current	Replace the power supply
	SWR is too high, protection has been triggered	Start ATU/replace antenna/coax
	Incorrect working mode	Select the correct working mode
	Power amplifier unit not enabled	Set the PA unit to **INUSE**
	Other circumstances	Return to distributor
Antenna tuning function does not work	Antenna tuning function is not enabled	Set the ATU unit to **INUSE**
Screen has no display	Power cord is not connected	Connect power cable correctly
	The fuse on the back of the machine has been blown off	Replace fuse（30A）
	Other circumstances	Return to distributor
Smoke comes from equipment		Replace smoke – Only joking, return to distributor

After-sales service policy

1. Warranty:

This product has a one-year warranty effective from the date of purchase. This warranty covers only manufacturing- and parts defects. It does not cover damage caused by lightning, excess voltage on the power supply, accidental damage or purposeful damage or misuse.

If the product needs warranty repair within two weeks of receiving the product, XieGu will pay for the shipping both ways. After two weeks XieGu will pay only for return shipping.

If the product is not covered under warranty, the customer pays for shipping both ways plus the cost of the repair.

2. Warranty limitations:

Any of the following will void the warranty applicable to the product and its accessories:

A. Modification-, removal-, or maintenance of the internal circuitry, without permission and authorization;

B. Unauthorized change of product's embedded software;

C. Immersion in liquid or signs of external damage;

D. Warranty period expired;

E. Product's serial number is missing, torn or blurred so we cannot determine if

the radio is under warranty;

F. Product was not bought from XieGu or authorized distributor of XieGu.

***** None of the following conditions, are covered by the warranty:

A. Damage caused by improper use by the user；

B. Damage caused by an accident；

C. Damage due to incorrect testing, maintenance, debugging, or other changes；

D. Damage is not caused by the material or the quality of production；

E. Damage to the shell or other external components due to improper use.

Contact us: **service@cqxiegu.com**

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