

6601A

Frequency Distribution Amplifier

Operation Instructions

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Safety Requirements

Thank you for choosing our product. Please read this manual carefully before using the instrument for the first time. It will help you operate the instrument proficiently.

We continuously improve our products; therefore, the instrument you are using may differ slightly from this manual. If any changes are made, we will inform you by providing supplementary documentation. Should you have any questions, please contact our after-sales service department.

WARNING: Input and output terminals may carry voltage. Electrical sparks may be generated when connecting or disconnecting test leads and power cords. Exercise caution to avoid electric shock. Always prioritize personal safety.

Prevent Fire or Personal Injury

- Use appropriate power cords. Only use power cords that are specific to this product and meet its specifications.
- Product grounding. This product must be grounded through the grounding wire of the power cord, and the grounding post on the product chassis must also be grounded. To prevent electric shock, the grounding conductor must be connected to earth ground. Before connecting to the input or output terminals of this product, ensure that the product is properly grounded.
- Observe all terminal ratings. To prevent fire or electric shock hazards, please pay attention to all ratings and markings of this product. Before connecting this product, please read this user manual for further information on the rated values.
- Do not operate when a malfunction is suspected. If you suspect that this product is damaged, please contact our maintenance personnel and do not continue to operate it.
- Do not operate in humid environments.
- Do not operate in explosive environments.
- Keep the product surface clean and dry.

Safety Precautions

The product manufacturer has ensured complete safety under correct usage conditions when designing this product.

- Please carefully follow the safety guidelines in this manual to avoid personal injury or damage to the instrument.
- Be sure to operate and use the instrument according to the instructions in this manual.
- This instrument does not contain hazardous substances.
- Instrument maintenance must be performed by qualified technicians only.

A. Specifications

- Outputs feature low-pass (1 MHz) or band-pass filters (20 MHz).
- Input level: 0 to 13 dBm +/-1 dBm.
- Isolation degree between output channels: <= 90 dBc.
- Output frequency: Consistent with input reference.
- 1 x RJ45 network connection; 1 x DB9 UART connection.
- 2 inputs available depending on option; 12 outputs available depending on option.
- Output interface: BNC; output level: 0 to 13 dBm +/-1 dBm over 50 ohm +/-10 ohm.

Parameter	Value
Phase Noise @ 1 Hz	<=-110 dBc/Hz
Phase Noise @ 10 Hz	<=-140 dBc/Hz
Phase Noise @ 100 Hz	<=-150 dBc/Hz
Phase Noise @ 1 kHz	<=-155 dBc/Hz
Phase Noise @ 10 kHz	<=-160 dBc/Hz
Stability	<=3E-13 (1s)
Output Gain	<=1 dBm
Power Consumption	<=20W (@25C), AC: 85~264VAC, 50~60Hz
Operating Temperature	-10C ~ +60C
Storage Temperature	-30C ~ +70C
Weight	<=4 kg

Table 1: Key Technical Specifications

B. Panel Instructions

1. Front Panel

The front panel features eight LED indicators and three buttons. The LED indicators are: POWER, STATE, AUTO, MANUAL, SELECT A, SELECT B, STATE A, and STATE B. The buttons are: AUTO/MANUAL, SELECT, and RESET.

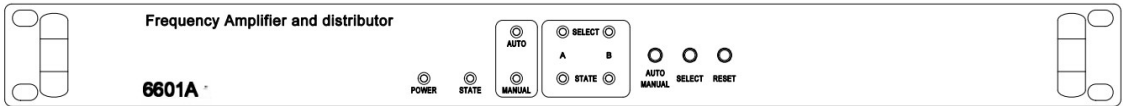


Figure 1: Front Panel Diagram

The functions of the LED indicators and buttons are defined as follows:

Item	Color	State Definition
POWER	Green	Steady: Device powered on; Off: Abnormal power supply
STATE	Green/Red	Green: Output signal normal; Red: Output signal abnormal
AUTO	Green	Steady: Automatic input selection mode
MANUAL	Green	Steady: Manual input selection mode
SELECT A	Green	Steady: Channel A input selected
SELECT B	Green	Steady: Channel B input selected
STATE A	Green	Steady: 10MHz signal detected on Input A; Off: No signal
STATE B	Green	Steady: 10MHz signal detected on Input B; Off: No signal
AUTO/MANUAL	Button	Toggle between automatic and manual input selection mode
SELECT	Button	Manually select Input A or Input B (in manual mode)
RESET	Button	Press and hold 5s to restore factory settings

2. Rear Panel

The rear panel of the device, from left to right, includes: Grounding Pillar, Power Interface, Serial Port (RS232), Input A, Input B, Network Port (M&C), Output Interfaces 1-12, Output State LEDs 1-12, and Output Amplitude Knobs 1-12.

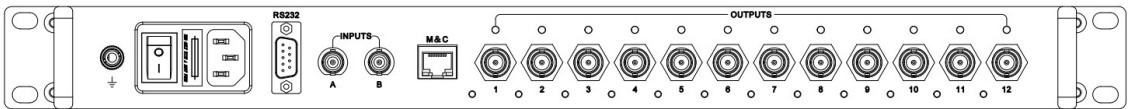


Figure 2: Rear Panel Diagram

- Grounding Pillar: Chassis grounding connection.
- Power Interface: AC power supply socket.
- Serial Port: RS232 monitoring interface for monitoring input and output status.
- Input Interfaces: External frequency standard signal inputs (Input A and Input B).
- Network Port: Device network monitoring interface (M&C).
- Output Interfaces 1-12: Signal output interfaces.
- Output State LEDs 1-12: Signal output state indicators (green = normal, off = abnormal).
- Output Amplitude Knobs 1-12: Signal output amplitude adjustment (-3 dBm to +3 dBm).

C. Instructions

After powering on, connect a valid input signal to the device. Once the device status indicator turns green and stays on, the device is ready for use.

1. Signal Input Selection

The device supports two methods for input signal selection:

- Manual selection: Use the SELECT button on the front panel to switch between Input A and Input B. Manual mode must be enabled first.
- Automatic selection: In AUTO mode, the device automatically selects the input channel based on signal availability and quality.

The automatic selection priority is as follows:

Priority	Input Selected	Condition
1	Input A	Input A is valid, Input B is invalid
2	Input B	Input A is invalid, Input B is valid
3	Input A	Both valid, amplitude of A > B by 1 dBm
4	Input B	Both valid, amplitude of B > A by 1 dBm

2. Control Mode

The device supports two control modes, selectable via the AUTO/MANUAL button on the front panel:

- **AUTO Mode:** The device automatically selects input switching according to the signal input status. Manual selection is disabled in this mode.
- **MANUAL Mode:** The device switches according to the input channel selected by the button or network command. Automatic selection is disabled in this mode.

3. Amplitude Adjustment

The output amplitude of each channel can be adjusted through the corresponding knob on the rear panel. The adjustment range is -3 dBm to +3 dBm.

4. Network Monitoring

The device supports real-time working status monitoring via the network, and network configuration can be set and changed through the upper computer network tool. The network supports TCP/UDP/HTTP protocols.

Default network configuration:

- IP Address: 192.168.1.201
- Subnet Mask: 255.255.255.0
- Gateway: 192.168.1.1
- Net Dest IP: 255.255.255.255
- TCP Server Port: 2000
- UDP Server Port: 3000
- UDP Client Port: 3001

5. Restore Factory Settings

Press and hold the RESET button on the front panel for 5 seconds to restore the device network configuration to factory defaults. After resetting, the default network parameters described above will be applied.

6. WEB Operation

Through the network monitoring port, you can log in using a web browser to view and configure device status and settings.

6.1 Login

Connect the device monitoring network port to your computer. Open a web browser, enter the device IP address, and input the username "admin" and password "123456".

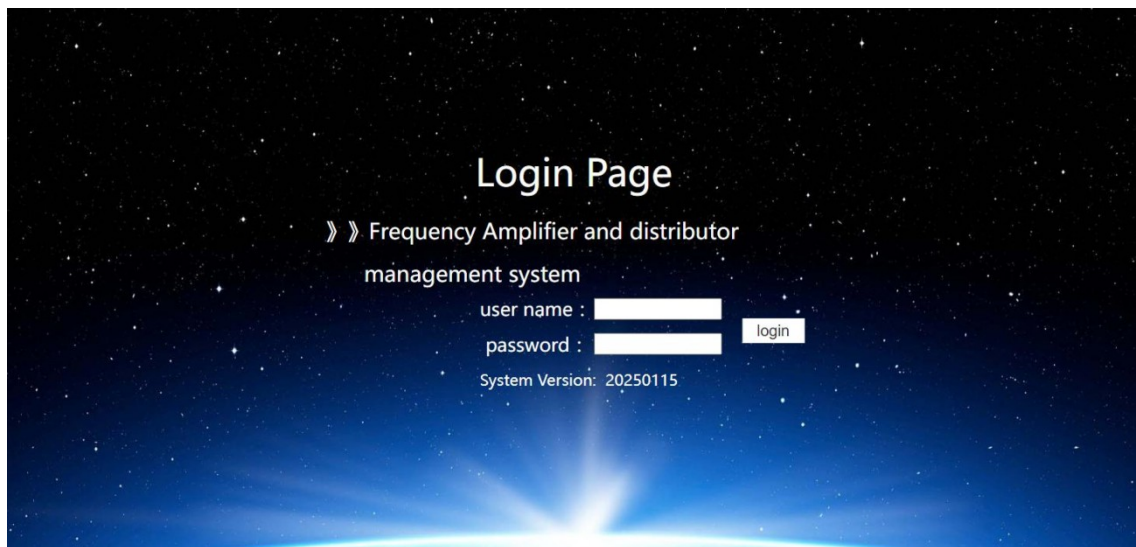


Figure 3: WEB Login Interface

6.2 Status Check

Click the "Device Monitor" tab at the top of the page to view the device's operational status, including input/output channel states and mode settings.

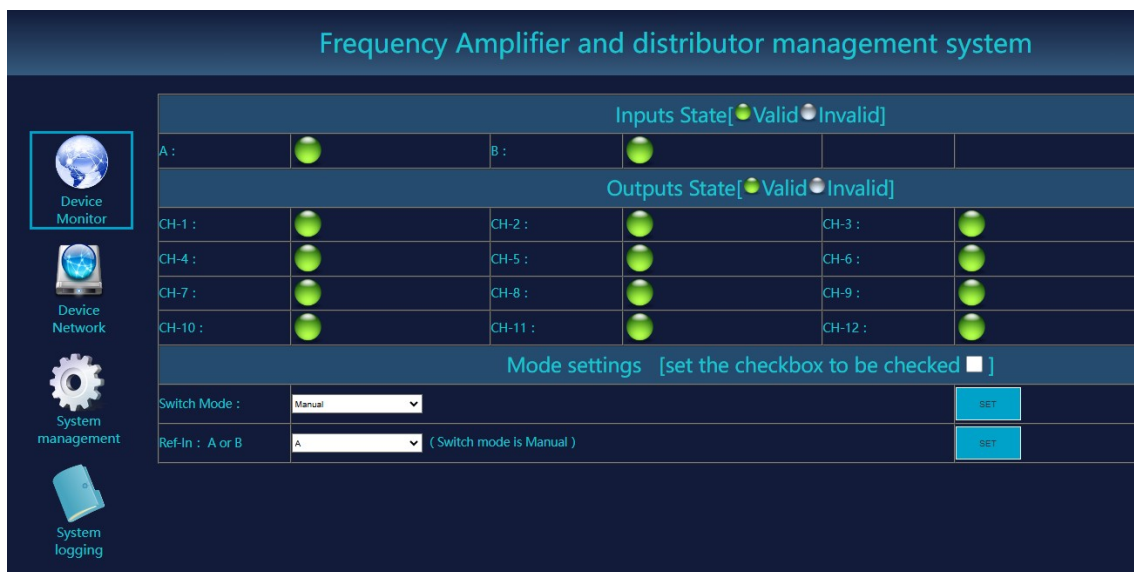


Figure 4: Device Monitor - Status Check

6.3 Parameter Settings

To modify device parameters:

- Select the "Device Monitor" or "Device Network" tab to view the parameters and status.
- Before setting, check the "set the checkbox to be checked" option at the top.
- Select a parameter to modify, then click the corresponding "SET" button.

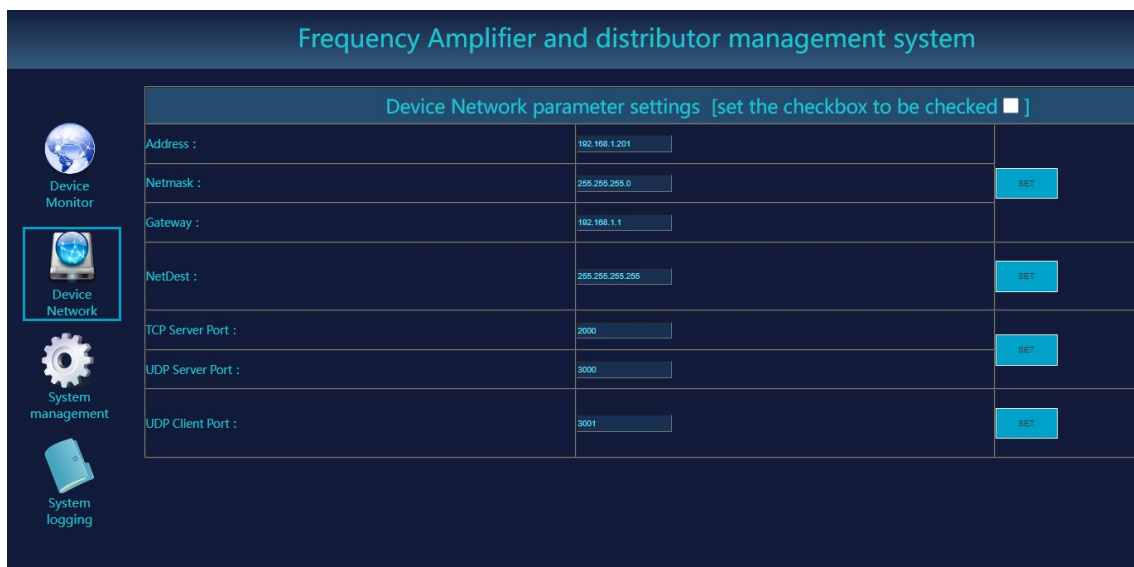


Figure 5: Network Parameter Settings

6.4 System Management

Select the "System Management" tab to view device version information and perform firmware upgrades.

- View the current device model, hardware version, PL version, and PS version.
- Click "Choose File" to select the upgrade file, then click "UpLoad File". After upload completes, click "upgrade" to perform the upgrade.
- Click "Settings" in "Factory Settings" to restore the device to factory defaults. Note: The web connection may be disconnected after restoring.

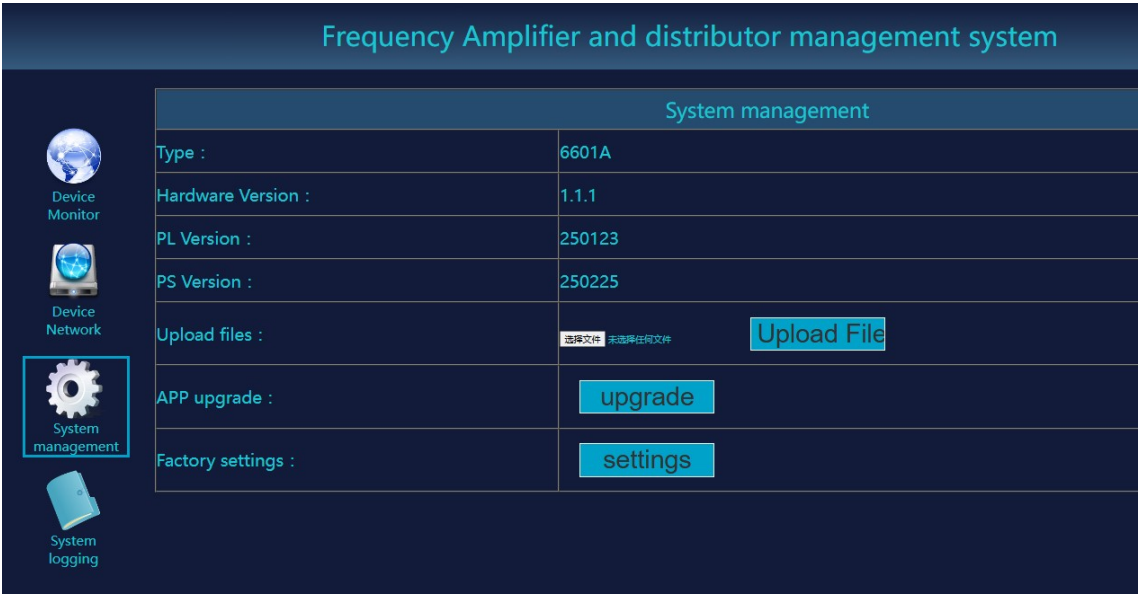


Figure 6: System Management Interface

6.5 Log Viewing

Select the "System logging" tab to view the records of device settings and operations.

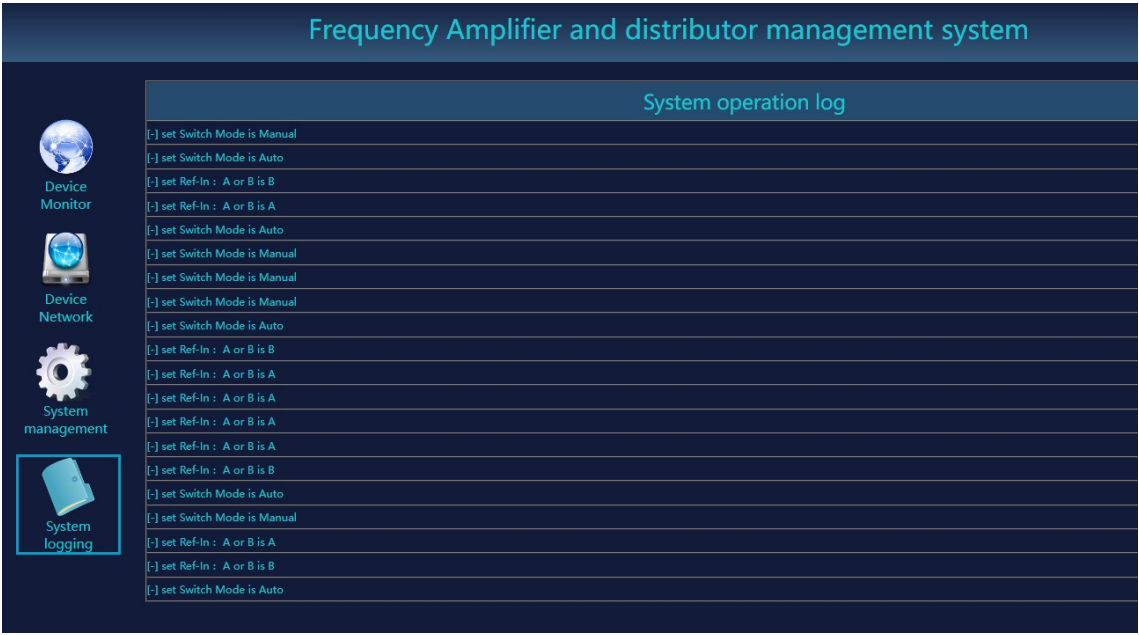


Figure 7: System Log Interface

D. Communication Protocol

The serial port can be used for data monitoring and parameter setting. Pin definition: Pin 2: TX; Pin 3: RX; Pin 5: GND. Serial port parameters: baud rate 115200, 8-bit data, no parity, 1 stop bit. Output format: ASCII code.

The device supports remote control functions through both serial port and network port (TCP/UDP) using the same protocol format.

1. Working Status Protocol

1.1 Input and Output Status Protocol

Format: \$HTQ,<1>,<2>,<3>,<4>*XX\r\n

Example: \$HTQ,1,0,11,111111111111*4C\r\n

Field	Definition	Description
\$HTQ	Frame header	Status query frame
,	Delimiter	Comma separator
<1>	Module number	1: Net port 1
<2>	Info type	0: Input/output status

Field	Definition	Description
<3>	Input status	2 bytes: Input A (0=Inv,1=Valid), Input B
<4>	Output status	12 bytes: CH1-CH12 status (0=Abnormal,1=Normal)
*	Delimiter	Asterisk separator
XX	Checksum	XOR of data between \$ and *
\r\n	Frame end	CRLF terminator

1.2 Mode Status Protocol

Format: \$HTQ,<1>,<2>,<3>,<4>*XX\r\n

Example: \$HTQ,1,1,1,0*4C\r\n

Field	Definition	Description
\$HTQ	Frame header	Status query frame
,	Delimiter	Comma separator
<1>	Module number	1: Net port 1
<2>	Info type	1: Mode status
<3>	Switch mode	0: Auto; 1: Manual
<4>	Current selection	0: Output uses Input A; 1: Output uses Input B
*	Delimiter	Asterisk separator
XX	Checksum	XOR of data between \$ and *
\r\n	Frame end	CRLF terminator

1.3 Network Status Protocol

Format: \$HTN,<1>,<2>,<3>,<4>,<5>,<6>,<7>,<8>,<9>*xx\r\n

Example:

\$HTN,1,0,192.168.1.201,255.255.255.0,192.168.1.1,255.255.255.255,2000,3000,3001*7C\r\n

Field	Definition	Description
\$HTN	Frame header	Network status frame
,	Delimiter	Comma separator
<1>	Module number	1: Net port 1
<2>	Info type	0: Network status
<3>	IP address	Example: 192.168.1.201

Field	Definition	Description
<4>	Subnet mask	Example: 255.255.255.0
<5>	Gateway	Example: 192.168.1.1
<6>	Dest address	Example: 255.255.255.255
<7>	TCP server port	Example: 2000
<8>	UDP server port	Example: 3000
<9>	UDP client port	Example: 3001
*	Delimiter	Asterisk separator
xx	Checksum	XOR of data between \$ and *
\r\n	Frame end	CRLF terminator

1.4 Version Information Protocol

Format: \$HTV,<1>,<2>,<3>,<4>*XX\r\n

Example: \$HTV,6601A,1.1.1,241129,241129*3B\r\n

Field	Definition	Description
\$HTV	Frame header	Version information frame
<1>	Type	Model: 6601A
<2>	Hardware version	Example: 1.1.1
<3>	PL version	Example: 241129
<4>	PS version	Example: 241129
*	Delimiter	Asterisk separator
XX	Checksum	XOR of data between \$ and *
\r\n	Frame end	CRLF terminator

2. Control Protocol

2.1 Network Address Configuration

Format: \$HTSETN,<1>,<2>,<3>,<4>,<5>*XX\r\n

Example: \$HTSETN,1,1,192.168.1.201,255.255.255.0,192.168.1.1*12\r\n

Field	Definition	Description
\$HTSETN	Frame header	Network configuration
<1>	Module number	1: Net port 1

Field	Definition	Description
<2>	Set command	1: Network address
<3>	IP address	Example: 192.168.1.201
<4>	Subnet mask	Example: 255.255.255.0
<5>	Gateway	Example: 192.168.1.1
*	Delimiter	Asterisk separator
XX	Checksum	XOR of data between \$ and *
\r\n	Frame end	CRLF terminator

2.2 Net Dest Address Configuration

Format: \$HTSETN,<1>,<2>,<3>*XX\r\n

Example: \$HTSETN,1,2,255.255.255.255*11\r\n

Field	Definition	Description
\$HTSETN	Frame header	Net dest configuration
<1>	Module number	1: Net port 1
<2>	Set command	2: Net dest address
<3>	Net dest address	Example: 255.255.255.255
*	Delimiter	Asterisk separator
XX	Checksum	XOR of data between \$ and *
\r\n	Frame end	CRLF terminator

2.3 Server Port Configuration

Format: \$HTSETN,<1>,<2>,<3>,<4>*XX\r\n

Example: \$HTSETN,1,3,2000,3000*13\r\n

Field	Definition	Description
\$HTSETN	Frame header	Server port configuration
<1>	Module number	1: Net port 1
<2>	Set command	3: Server port number
<3>	TCP server port	Example: 2000
<4>	UDP server port	Example: 3000
*	Delimiter	Asterisk separator
XX	Checksum	XOR of data between \$ and *

Field	Definition	Description
\r\n	Frame end	CRLF terminator

2.4 Client Port Configuration

Format: \$HTSETN,<1>,<2>,<3>*XX\r\n

Example: \$HTSETN,1,4,3001*3B\r\n

Field	Definition	Description
\$HTSETN	Frame header	Client port configuration
<1>	Module number	1: Net port 1
<2>	Set command	4: UDP client port
<3>	UDP client port	Example: 3001
*	Delimiter	Asterisk separator
XX	Checksum	XOR of data between \$ and *
\r\n	Frame end	CRLF terminator

2.5 Switch Mode Configuration

Format: \$HTSETQ,<1>,<2>,<3>*XX\r\n

Example: \$HTSETQ,1,0,0*12\r\n or \$HTSETQ,1,0,1*13\r\n

Field	Definition	Description
\$HTSETQ	Frame header	Switch mode configuration
<1>	Module number	1: Net port 1
<2>	Set command	0: Switch mode setting
<3>	Switch mode	0: Auto; 1: Manual
*	Delimiter	Asterisk separator
XX	Checksum	XOR of data between \$ and *
\r\n	Frame end	CRLF terminator

2.6 Output Selection Configuration

Format: \$HTSETQ,<1>,<2>,<3>*XX\r\n

Example: \$HTSETQ,1,1,0*13\r\n or \$HTSETQ,1,1,1*12\r\n

Field	Definition	Description
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Field	Definition	Description
\$HTSETQ	Frame header	Output selection configuration
<1>	Module number	1: Net port 1
<2>	Set command	1: Output signal selection
<3>	Output selection	0: Use Input A; 1: Use Input B
*	Delimiter	Asterisk separator
XX	Checksum	XOR of data between \$ and *
\r\n	Frame end	CRLF terminator

2.7 Factory Reset

Format: \$HTSETQ,<1>,<2>,<3>*XX\r\n

Example: \$HTSETQ,1,5,1*16\r\n

Field	Definition	Description
\$HTSETQ	Frame header	Factory reset
<1>	Module number	1: Net port 1
<2>	Set command	5: Factory reset
<3>	Reset value	1: Restore factory settings
*	Delimiter	Asterisk separator
XX	Checksum	XOR of data between \$ and *
\r\n	Frame end	CRLF terminator

2.8 Command Reply Protocol

Format: <1>,<2>,<3>*xx\r\n

Example: \$HTSETQ,4,1*0A\r\n (success) / \$HTSETQ,4,0*0B\r\n (fail)

Field	Definition	Description
<1>	Frame header	Same as the setting command frame header
<2>	Info type	Same as the setting command info identifier
<3>	Reply result	0: Setting failed; 1: Setting successful
*	Delimiter	Asterisk separator
xx	Checksum	XOR of data between \$ and *
\r\n	Frame end	CRLF terminator

3. Verification Calculation Method

The communication protocol uses ASCII code format. XOR checksum is used for verification. The checksum consists of two bytes and is the XOR sum of all data between the '\$' and '*' characters, excluding the '\$' and '*' characters themselves.

Example: Sending the command '\$HTSETQ,4,1*XX\r\n'

Step 1. Convert all data 'HTSETQ,4,1' between '\$' and '*' to hexadecimal: 48 54 53 45 54 51 2C 34 2C 31

Step 2. XOR all the converted hexadecimal bytes sequentially to obtain a single byte '0A' (hexadecimal).

Step 3. Convert the hexadecimal result to two ASCII bytes, '0A' (uppercase letters required).

Step 4. The checksum XX is therefore calculated as '0A'.

Step 5. The final correct command to send is: '\$HTSETQ,4,1*0A\r\n'

E. Common Fault Handling

Power Indicator Does Not Light Up

- a) Check whether the power cable is properly connected.
- b) Check whether the fuse is blown. If blown, replace with a 220V-1A fuse.
- c) If the above are normal, contact the manufacturer for troubleshooting or return for maintenance.

Input Indicator Is Not On

- a) Check whether the input signal meets the equipment input requirements.
- b) Check whether the signal input connector is damaged.
- c) If the above are normal, contact the manufacturer for troubleshooting or return for maintenance.

Status Indicator Is Steady Red

- a) Check whether the input signal meets the equipment input requirements.
- b) Check whether the output signal of the device is normal.
- c) If the above are normal, contact the manufacturer for troubleshooting or return for maintenance.

Thank You

For Choosing Our Product

Technical Support: tech@go-satcom.com

China Go-Sat Microwave Co., Ltd.

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