

MK58

Long-range Wireless Transmission System

User's Manual V2.0 2023.05

Introduction / Installation Guide / Instruction

Disclaimer

- Please read the user's manual carefully before use. Be sure to pay attention to the warnings and understand all points completely.
- Please strictly abide by the local radio frequency management regulations.
- Please follow the installation steps in the manual to use this product. Our company and agent will not take legal responsibility for the damage of equipment or personnel caused by the installation and modification of users.
- This copyright of this manual belongs to Great Mainlink Tech Co., LTD. No one may make copies without written consent.

Caution

Attention to installation

1. Before power on, make sure the antenna connection is reliably . Otherwise, it will cause damage to the device.
2. Make sure that the voltage is within the range of use.
3. Please pay attention to the EMC of all the electronic equipments on your drone.
4. It is recommended that the antenna should be installed downward and keep the antenna away from the metal on the drone.
5. Make sure to use the matching antenna.

Before use

1. Make sure that all cables are connected correctly and firmly.
2. No foreign objects (e.g. liquids, sand, etc.) can be entered inside the device.

3. It takes 15 seconds for the device to start. Video and data cannot be transferred until the device has finished booting.

4. Please ensure that the environment in which the equipment is used is free of other electromagnetic interference.

5. When the signal weakens, you can improve the effect by changing the heading direction of the antenna.

Get instructional video

In order to use the system correctly, you can get the instructional Video at the following address:

<https://mainlinkaero.com/cn/video/video-main.html>



Download Maestro Assistant

Download the software at the following address:

<https://mainlinkaero.com/cn/download/download-main.html>



CONTENTS

Disclaimer	2
Caution	2
Attention to installation	2
Before use	2
Get instructional video	3
Download Maestro Assistant	3
Packing list	6
Overview	8
Features	9
M58 Interface Description	10
Installation	15
Air	15
Ground	15
1.Connect the antenna	16
2. Connect to the Ground Station	16
M58 Instruction	17
Quick start	17
M58 with CODEC module MF05	19
M58 with Mission Planner	20
Improve RC controller distance through SBUS	24
Maestro Assistant	26
Interface of Maestro Assistant	26
How to use Maestro Assistant	27
1. Connect M58 with Maestro Assistant	27
2. Read current parameter。	28
3. Configurations	28
M58 Web UI Configuration Description	31
Login	32

Setting	33
System update	39
Wireless pair	40
Language	41
Advanced User Display	41

Packing list

Device **X 2**



Ground



Air

Accessories

2Pin XT60 cable **x1**



For Power

2Pin XT30 **x2**



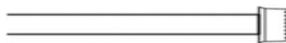
For pairing and reset

2Pin cable **x1**



For pairing and resetting

3Pin cable **x3**



For UART and SBUS

4Pin cable **x1**

c **x2**



For Ethernet

For air unit

Fiber-glass antenna ×1

Long Air Antenna ×2

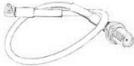


For Ground unit

For air unit

RF feeder ×2

Navigation cable ×1



For air unit

For Ethernet and Power_Out

Overview

Industry drone market is developing very fast in recent years. with the diversification of UAV systems, fixed-wing and vertical takeoff and landing UAV are becoming more and more mature, and the demand of long-distance wireless video systems for drones with high reliability, long distance, light weight and low power consumption is growing. M58 ultra-long distance UAV data link products continue the design and use style of Maestro series image transmission, and are fully compatible with the interface of M52 and other Maestro products. M58 sets a model of UAV wireless data link with advanced radio frequency technology, and with ultra-high cost performance it is used more widely and promote the ultra-long distance UAV inspection industry develop rapidly.

There are two frequency bands——800MHz and 1.4GHz. Users can choose according to their needs. Please choose the suitable frequency band according to local regulations.

M58 adopts advanced RF channel technology, strong anti-interference ability, with encryption function, can ensure the safety of long-distance wireless video and output transmission, transmission distance up to 80km^{*1}. The integrated link makes the UAV operation more concise, and the ground does not need to set up a special antenna which is shortening the operation preparation time. Good industrial thermal design can meet the needs of industry applications.

The use and SDK developed of M58 are compatible with Maestro series wireless video transmission, the interface and use method are basically the same, and it has a unified style web configuration interface, which is convenient for old users to upgrade the product.

^{*1}Test under LOS and no interference conditions.

Features

Long distance

- M58 Up to 80km @ LOS

Video interface

- Ethernet *3

Hopping/Fixed Frequency

- Fixed: user defined
- Hopping: automatic

BW

- 5/10/20 MHz

Work temperature

- 40°C ~ +70°C

Modulation

- OFDM

Data interface

- UART*2/SBUS*1, Supports multi-channel data transmission

Frequency Band

- 800MHz/1.4GHz

Working mode

- Air unit can be : Point to point mode
Repeater mode

Power range

- DC 9~28V Battery 3S~6S

M58 Interface Description

Air unit



side view

1. Ethernet

Number	Character	Description	Input/Output
1	T+	TX+	O
2	T-	TX-	O
3	R+	RX+	I
4	R-	RX-	I

2. UART1

Number	Character	Description	Input/Output
1	G	GND	I/O
2	R	RS232 RX	I
3	T	RS232 TX	O

3. UART2

Number	Character	Description	Input/Output
1	G	GND	O
2	R	TTL RX	I

3	T	TTL TX	O
---	---	--------	---

4. Power

Number	Character	Description	Input/Output
1	G	GND	I/O
2	V	+Vcc (9v~28v)	I

5. SBUS1

Number	Character	Description	Input/Output
1	S	SBUS OUT	O
2	V	+5v (I max 1A)	O
3	G	GND	I/O

6. SBUS2

Number	Character	Description	Input/Output
1	S	SBUS OUT	O
2	V	+5v (I max 1A)	O
3	G	GND	I/O

7. Power indicator

This indicator is solid green when air unit is booting.

8. Link indicator

LED Pattern	Description
solid green	Wireless link is established
light off	Wireless link is lost

9. Status Indicator

LED Pattern (Blink only in booting)	Description
Blink 2 times	Initialization OK, Frequency is 1.4G
Blink 1 time	Initialization OK, Frequency is 800M

Blink 3 times	Switch mode (Switch from air to ground, vice verse)
Blink slow all the time	Enter configuration mode
Blink fast all the time	Device abnormal

10. SMA antenna connector.



Ground unit

1. Fiber glass antenna interface

Please connect the standard fiber-glass antenna to this connector.

2. Directional antenna interface

Please connect the Main antenna feeder antenna to this connector.

3. Directional antenna interface

Please connect the Main antenna feeder antenna to this connector.

4. The plate antenna mounting bracket

Install a fixed plate antenna.

5. XT60 power connector

Device power supply port, supports battery and external power supply.

6. Operation button

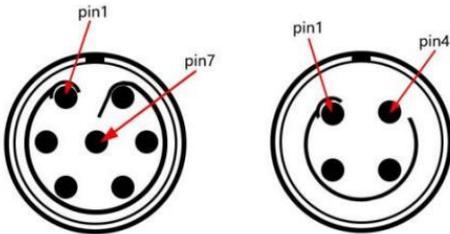
The operation button of LED display is used to switch the display information.

7. Ground signal display area

The OLED screen on the ground displays wireless link parameters such as signal strength, frequency, and bandwidth. The five LED lights correspond to the power indicator, the chain indicator, and the signal strength indicator.

8. Navigation data interface

The navigation plug includes ports, serial ports, SBUS, power supply and other interfaces. The specific definitions are as follows:



A.7-pin navigational plug number

Number	Description	Input/Output
1	UART1 TX (RS232)	O
2	UART1 RX (RS232)	I
3	SBUS-5V	O
4	Vcc (13v~25v)	I
5	GND	I/O
6	GND	I/O
7	SBUS	O

B.4-pin navigational plug number

Number	Description	Input/Output
1	Tx+	O

2	Tx-	O
3	Rx+	I
4	Rx-	I

1. PTZ LCD display

Display PTZ status information and menu.

2. Operation button

Menu operation for PTZ LCD

Installation

Air

1.Installing the air unit on your drone

Fixed the device and RF cable on your drone. Install the antenna. Pay attention to the connection of the antenna to tighten. Make the antenna downward. There is no metal or shielding within 20cm of the antenna.



2. Connecting the gimbal

Connect the gimbal to one ethernet of M58. Connect UART1 to flight control. If you need to control the drone with RC, please connect SBUS_OUT of M58 to flight control SBUS IN.

 Attention: If your gimbal only has HDMI/SDI/AV interface, please refer to the section of “M58 with M05E” . When using the SBUS, please pay more attention to the power.

Do not put the antenna near the motor or ESC, otherwise the device will be interfered.

Ground

1. Connect the antenna

Connect the fiber glass antenna which was supplied along with the device to the ground unit. They have common port—SMA. Make sure to tighten the joint.

Connect the RC receiver and other cables.

Connect the RC receiver SBUS output to the ground unit SBUS_IN and then connect the power cable.

2. Connect to the Ground Station

The M58 ground unit can be connected to the Ground Station with ethernet or UART.

Get Video

You can get video via RTSP, and decode the video with video decoding software such as VLC. Also, you can get video using Mission Planner and QGC.

Get data

1. You can get data from ground unit via UART1 and UART2. Maybe you need a UART to USB converter.

2. You can get data from Ethernet port using UDP/TCP protocol.

M58 Instruction

Quick start

1. Preparing

Make sure all the connections are ready, including the antenna, Ethernet cable and so on. If you connect an ethernet gimbal to M58 air unit, the GH1.25 interface is recommended for high reliability.

2. Power on

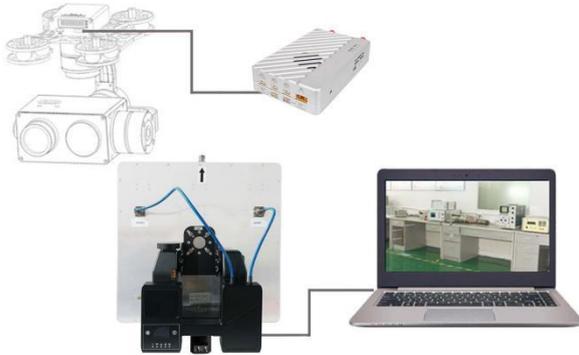
The DC voltage is 9~28V. After power on, the POWER LED will be solid green.

Any question, please refer to the FAQ. It takes 30 seconds to start up. After the system starts, the wireless transmission can be established.

After the chain is built, the current wireless signal strength, wireless signal-to-noise ratio, communication distance and real-time data can be viewed on the LCD screen of ground.



3. Using PC to get video from ethernet gimbal.



3.1 Connect gimbal、M58 and PC as shown above.

Attention: Please ensure that gimbal and PC on the same network segment. The default IP of M58 is in the table below. The network segment of gimbal and M58 can be the same or different. M58 can transmit video and data transparent.



M58 air unit default IP	192.168.1.200
M58 ground unit default IP	192.168.1.236

3.2 Get video

User can get video in PC through the software provided by the gimbal manufacturer. Also, user can use some common software such as VLC.

Take VLC for an example.

In the “open media” page, please input the following address:

rtsp://192.168.1.36:554/stream0



You can get video after click “play” .

M58 with CODEC module MF05

If your gimbal has a HDMI/SDI/AV interface, you can add CODEC module MF05 to work with M58. MF05 contains encoding module MF05E and decoding module MF05D. You only need one single cable in the accessory box to connect M58 and MF05. It is shown in the picture below.

For more information, please refer to the MF05 user's manual.



M58 with Mission Planner

Follow the steps to use M58 with Mission Planner:

1. Connect the UART1 of M58 air unit to flight controller, such as Pixhawk. Connect the gimbal to one ethernet of M58.
2. Making sure all the air and ground cable connection is finished. Power on the system.
3. Install Mission Planner to your computer.
4. Set the IP address of the computer.

Open "Network and Internet" setting.

Select "Internet Protocol version 4 (TCP / IPv4) properties".

Change IP address to "192.168.1.xxx" (xxx is in 0 ~ 255 , you can't use IP 192.168.1.200 and 192.168.1.236, because these IP were set in M58) .



Attention: The IP "192.168.1.XXX" is just an example. You need to set up your PC the same IP section as your gimbal.



5. Get data

There are three methods to get data from M58 ground unit, using Mission Planner:

- UDP port via Ethernet;
- TCP port via Ethernet;
- UART (COM)

5.1 Get data from UDP port.



Open Mission Planner, select UDP, click the “connect” button, it will bring up a new window ‘Listen port’, change the port to 14550 (If the UDP port number has been changed on the web page, please fill in the new number. For more information, please go to the web page configuration) .Then click “OK”, Mission Planner will get flight data.

5.2 Get data from TCP port.

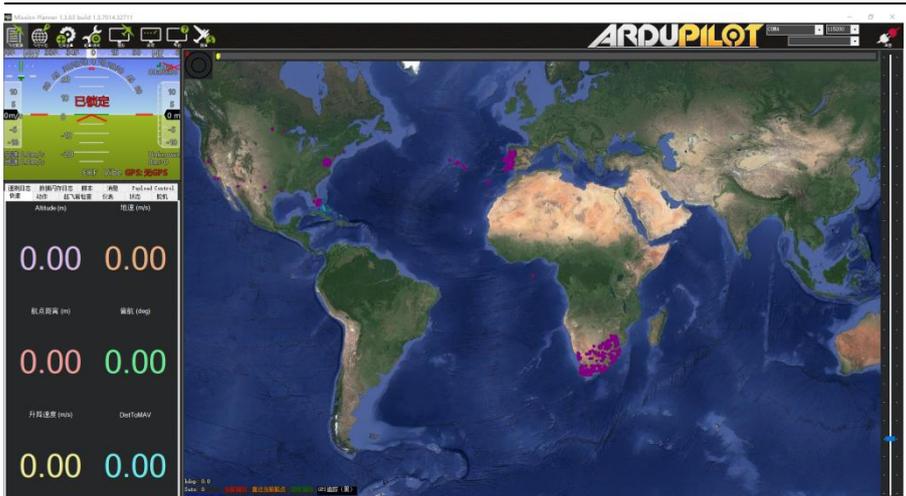


Open Mission Planner, select TCP, click the “connect” button, it will bring up a new window ‘Listen port’, fill in the blank with IP: 192.168.1.236, remote port is 5760  (If the IP address and TCP port number has been changed on the web page, please fill in the new IP and port number. For more information, please go to the web page configuration) .Then click “OK”, Mission Planner will get flight data.

5.3 Get data from UART(COM);

Connect the ground unit UART1 with a UART (TTL) to USB converter to the computer. Before this, please install the driver in the computer.





Open Mission Planner, select COM (Please check the COM number) and the right baud rate, click the “connect” button, Mission Planner will get flight data.

6. Get video

When you open the Mission Planner, click Video and then Set GStreamer Source, as show below:





Input the address: `rtspsrc location=rtsp://192.168.1.36/stream0 latency=0 ! decodebin ! videoconvert ! video/x-raw,format=BGRA ! appsink name=outsink`

⚠ Attention: The IP `"192.168.1.36/stream0"` is an example of the gimbal, please use your own gimbal RTSP address.

Improve RC controller distance through SBUS

1. Connect air unit SBUS_OUT to flight controller RC IN.

Using the SBUS cable in the accessory box to connect the air unit and the flight controller. The cable is 3 pin.

⚠ Attention: The SBUS_OUT port of air unit is output. The maximum of +5V output current is 1A. If you don't need the +5V, let it open. Do not take it as input. Otherwise, the stability of the system will be affected.

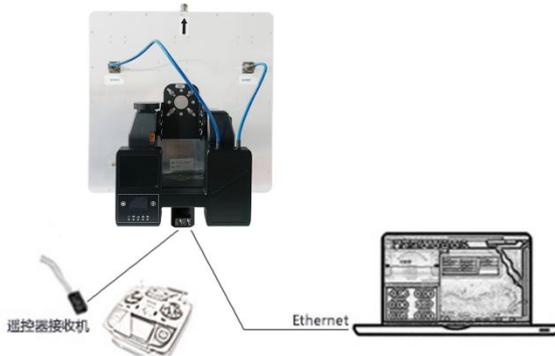


2. Connect the RC receiver to the ground unit

Using the SBUS cable in the accessory box to connect the ground unit to the RC receiver.

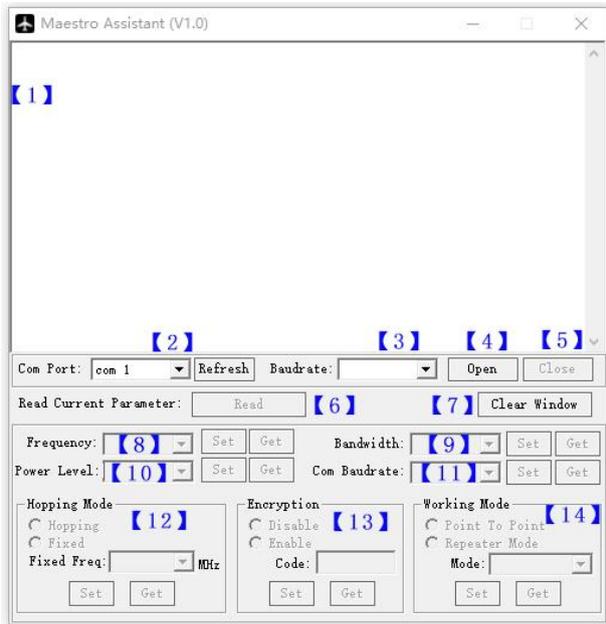


Attention: The SBUS_IN port of ground unit is input. The maximum of +5V output current is 1A. You can use it to power the RC receiver. Please pay more attention to the cable line order.



Maestro Assistant

Interface of Maestro Assistant



Function description:

- [1] Information display: display status information for the M58.
- [2] UART(COM) select: Select the right COM number of the computer to connect M58. If you want to change to another COM , please click the 'Refresh' button.
- [3] Baud rate select: Select the right baud rate for the COM. Make it the same as M58 UART2.
- [4] Open COM button.
- [5] Close COM button.
- [6] Read current parameter button: click this button to get the current parameter of device.

【7】 Clear window button: to clear the information display.

【8】 Select frequency: The M58 frequency band has been set. User can't change. You can click 'Get' button to get current frequency band.

【9】 Select BW: There are four BW to be selected——3MHz/5MHz/10MHz/20MHz. Choose the BW you needed, and click 'Set' button to complete setup. Click the 'Get' button to get current BW.

【10】 Select Power Level: There are three power level to be selected——High/Mid/Low Choose the power level you needed, and click 'Set' button to complete setup. Click the 'Get' button to get current power level.

【11】 Select baud rate: You can select the right baud rate for M58 Uart1 in this box. Choose the baud rate you needed, and click 'Set' button to complete setup. Click the 'Get' button to get current baud rate.

【12】 Select hopping mode: There are two mode to be selected——Hopping/Fixed. Choose the mode you needed, and click 'Set' button to complete setup. Click the 'Get' button to get mode. When you select Fixed mode, you need to choose a fixed frequency below. The fixed frequency is related to frequency band and BW.

【13】 Select Encryption: You can disable/enable the encryption. When enable this function, you can set your private password. The password should in the range of 100000~999999. Devices with different password do not link.

【14】 Select Working mode: There are two working mode of M58——Point to Point mode and Repeater mode. Choose the working mode you needed, and click 'Set' button to complete setup. Click the 'Get' button to get current working mode. This function only needs to be set up on the M51 air unit. The ground unit can synchronize automatically. If you select Repeater mode, you need to select the air unit whether it is TX or repeater.

How to use Maestro Assistant

1. Connect M58 with Maestro Assistant.

Maestro Assistant is a Windows software that configures M58. Before configuration, please

connect the UART2 to computer via UART(TTL) to USB converter.
 Select the right COM and baud rate. Click 'open' button.

2. Read current parameter.



After step1, click 'Read' button. All current parameter will print on the information display. Because the Working mode is only for air unit. The Working mode box will turn grey on ground unit configuration.

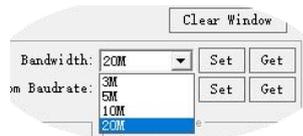
3. Configurations

3.1 Frequency Band

The M58 frequency band has been set. User can not change. You can click 'Get' button to get current frequency band.

3.2 Bandwidth

There are four BW to be selected——3MHz/



5MHz/10MHz/20MHz. The greater the BW, the more data can be transmitted, but the weaker the anti-interference. In Fixed frequency mode, M58 will have more frequency to fix with small BW.

3.3 RF Power

M58 has three levels of power to choose. In order to avoid affecting other devices, please select the appropriate transmission power. The specific RF power values are as follow

- 1-Low: 20dBm;
- 2-Mid: 27dBm;
- 3-High: 32dBm.



3.4 Hopping/Fixed Mode

There are two mode to be selected——Hopping /Fixed. In Hopping mode, M51 can automatically adjust frequency when there is interference. In fixed mode, the device is fixed to a special frequency . So in one frequency band, up to four sets of devices can be used.

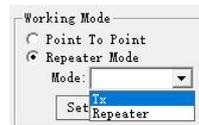


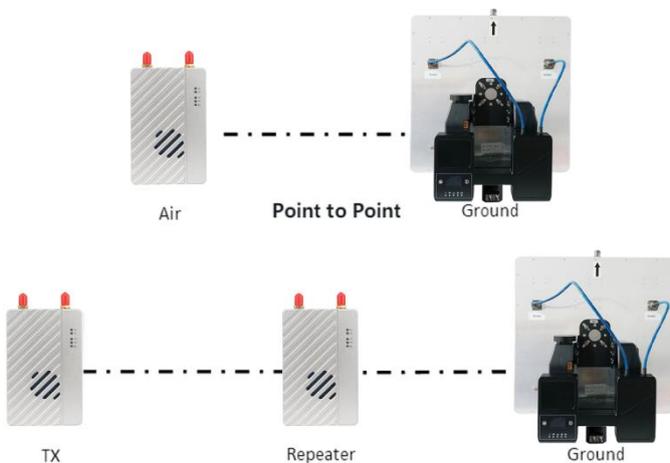
3.5 Encryption

The wireless signal can be encrypted during transmission. When enable this function, you can set your private password. The password should in the range of 100000~999999. Devices with different password do not link. When disable this function, different M58 air and ground can link each other..

3.6 Working Mode

M58 can work in Point to Point Mode and Repeater Mode. Only the air unit of M58 need to be set. The ground unit can synchronize automatically. In Repeater mode, the air unit can be set to TX (transmitter) or Repeater.





Repeater Mode

With Repeater mode, M58 can be easily used under NLOS situation. You only need to buy one more air unit and then can establish a repeater system easily.

M58 Web UI Configuration Description

Parameter of M58 can also be set through web UI. User can enter IP address through the browser to access the web UI. The air unit default IP is 192.168.1.200. The ground is 192.168.1.236. In Repeater mode, TX is 192.168.1.200. Repeater is 192.168.1.201.

If you change the device to another IP address, please access the web UI through the new IP. If you forget the IP you changed, press the button on the device for 10 seconds when the device is power on to restore to factory settings.

You need to change your computer IP to 192.168.1.X so as to access the device web UI. As shown in the following figure:



Login



After you enter IP address in the browser, you will see the 'Welcome' page. Default username is: admin, password is: 123456. Then you can login.



The system configuration page of Air includes four Settings menus, such as Settings, upgrades, wireless pairing and language Settings. Click on any menu on the left, you can switch the Settings page.

Setting

The Settings page includes network Settings, data Settings, wireless Settings, system restore and system reboot, as shown in the picture below. Click on anyone to switch.



Air Network Setting can set the Air IP address and gateway address. The following table describes the parameter values. The Device IP address and Gateway must be on the same network segment.

Parameter	Value	Description
Device IP	Default address	User can change
	Air : 192.168.1.200	
	Relay : 192.168.1.201	
	Ground: 192.168.1.236	
Gateway	Default 192.168.1.1	User can change

If you change the device parameter, it will be in effect after rebooting. If you change IP address, please enter the new address in your browser after rebooting.

Ground Network Setting

Device IP	192 . 168 . 1 . 236
Gateway	192 . 168 . 1 . 1
Remoute Air IP	192 . 168 . 1 . 200

Save

小贴士:

Device IP、Gateway、Remoute Air IP 必需要设置在同一个网段

Remoute Air IP: 集群模式下当有多个天空端同时连接地面端时, 通过该IP地址指定对应天空端的UART2数据从本地UART2输出

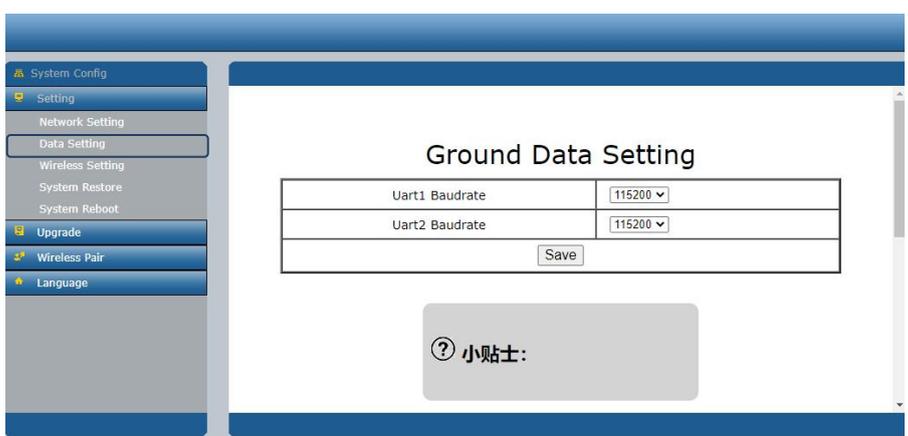
The Ground Network Setting can set the ground IP address, device gateway address, and remote air IP address in cluster mode. As the following table describes, the Device IP, Gateway, and Remote Air IP must be on the same network segment. In cluster mode, when multiple airs are connected to the ground at the same time, the UART2 data of the corresponding air is output from the local UART2 through the Remote Air IP address.



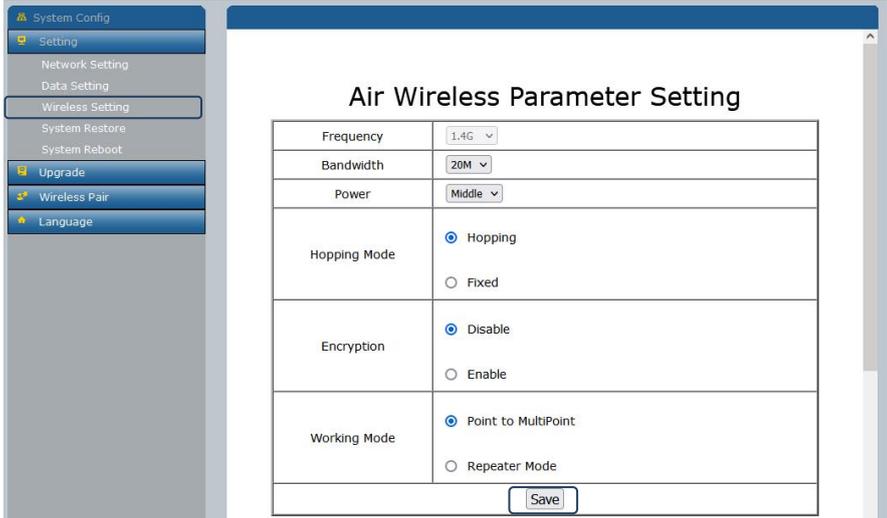
The Air Data setting can set the baud rate of the serial port on the air, the packet protocol for data transfer from serial port 2 to network forwarding, the TCP/UDP port number for network forwarding, and the output timeout period after SBUS data lost. The following table describes the parameter values.

Parameter	Values	Description
Uart1 Baud rate	9600/19200/38400 57600/115200	User can change, Default 115200
Uart2 Baud rate	9600/19200/38400 57600/115200	User can change, Default 115200
Data Protocol	Transparent/Mavlink	User can change, Default Transparent
TCP Port	1~65535	User can change, Default 5760
UDP Port	1~65535	User can change, Default 14550

SBUS1 Timeout (After SBUS1 data loss, the time of outputting the last frame of data)	0~10s	User can change, Default 1s
SBUS2 Timeout (After SBUS2 data loss, the time of outputting the last frame of data)	0~10s	User can change, Default 1s



The Ground Data setting can set the baud rate of the serial port on the ground. The values of the parameters are described in the above table: Uart1 baud rate and Uart2 baud rate.



The Air Wireless Parameter Setting can set the wireless transmission data of device, the parameter values and function descriptions shows at the following table.

Parameter	Value	Description
Frequency	800M/1.4G	User can query
Bandwidth	3/5/10/20M	Optional
Power	High/Middle/low	Optional
Hopping Mode	Hopping/Fixed	Optional
Encryption	Disable/Enable	Optional
Working Mode	Point to Point Repeater Mode	Only the air unit of M58 need to be set. The ground unit can synchronize automatically

Web UI configuration is the same as Maestro Assistant. User can check it in 'How to use Maestro Assistant' part 3 for more details.

When you configure parameter through Web UI, It will be in effect after rebooting.

The Ground Wireless Parameter Setting can set the wireless transmission data of device, the parameter values is the same as the air. As showed in above table.



The Air System Restore can make air of M58 to factory settings. Please click on the "Restore" button to confirm if you need "Restore to factory settings?".



Please click on the "Sure" button to set the parameter to factory default value.

The Ground System Restore can make ground of M58 to factory settings, the detail operation is the same as air.



The Air System Reboot can make air of M58 to restart. Please click on the "Reboot" button to confirm if you need "Reboot device now?". Please click on the "Sure" button and enter the IP address in the browser and log in again.



The Ground System Reboot can make ground of M58 to restart, the detail operation is the same as air.

System update

Current Version	
Software Version	V132.13
Hardware Version	Not Set

Update	
Select file:	<input type="button" value="浏览..."/> 未选择文件.
<input type="button" value="Send"/>	

小贴士:

通过本操作实现系统的固件升级，升级过程中会有进度条显示升级进度

升级完成后系统会自动重启，用户可再次进入该页面查看固件版本，确认升级是否生效

The Air System Update function is used for firmware upgrade. Before the upgrade, please download the required firmware from our official website to your computer. Please click "Browse..." to select the upgrade file and click "send" to confirm. The system sends the upgrade file and displays the upgrade progress on the web page. After the upgrade is complete, the system automatically restarts. Log in to the IP address again to check whether the firmware version is updated.

The operation of the Ground System Update function is the same as that of air.

Wireless pair



The Wireless Pair function is used to pair the air and the ground. The operation process is as follows: Power on the device. Click " Pair "button to start pairing, and there will be a progress bar to show the pairing progress; The pairing process lasts up to 2 minutes; When the pairing is complete, the page will display a message indicating that the pairing succeeded or failed. The signal strength indicator light will indicate the current pairing state in the form of a water lamp.

Language



The Air Language Setting is used to set the page language, it supports “English” and “Simplified Chinese”. Please click “ Save ” button to save the setting, it will take effect immediately.

Advanced User Display

After enter the IP address of air, please input user name as “root” and the password as “root123” at the login interface. Click login, then enter the advanced user configuration page of air. As shown in the following picture.

- System Config
- Setting
- Upgrade
- Wireless Pair
- Language
- Band Infor

Air Baseband Information

Frequency	14379	Distance	0
Air ANT1 RSSI	0	Air ANT2 RSSI	0
Air ANT1 SNR	0	Air ANT2 SNR	0
Air ANT1 PathLoss	0	Air ANT2 PathLoss	0
Ground ANT1 RSSI	0	Ground ANT2 RSSI	0
Ground ANT1 SNR	0	Ground ANT2 SNR	0
Ground ANT1 PathLoss	0	Ground ANT2 PathLoss	0
Air Netlink Udp Send	0	Air Netlink Udp Recv	0
Air Netlink Tcp Send	0	Air Netlink Tcp Recv	0
Uart2 Local Submit	0	Uart2 Remote Recv	0
Uart2 Remote Submit	0	Uart2 Local Recv	0
SBUS1 Local Submit	0	SBUS1 Remote Recv	0
SBUS1 Remote Submit	0	SBUS1 Local Recv	0
SBUS2 Local Submit	0	SBUS2 Remote Recv	0
SBUS2 Remote Submit	0	SBUS2 Local Recv	0

The advanced user configuration page has an extra “Air Baseband Information” than the common user page. You can dynamically refresh and observe the wireless communication quality, antenna connection, and wireless data transmission of air in real time. The following table describes the parameter values.

Parameter	Values	Description
Frequency	14279~14479M Hz	Communication Frequency
Distance	0~50000m	Distance of Air to Ground
Air ANT1 RSSI	-141 ~ -44	RSSI of Main Antenna of Air
Air ANT2 RSSI	-141 ~ -44	RSSI of Auxiliary Antenna of Air
Air ANT1 SNR	-50 ~ 50	SNR of Main Antenna of Air
Air ANT2 SNR	-50 ~ 50	SNR of Auxiliary Antenna of Air
Air ANT1 PathLoss	0~191	Path loss of Main Antenna of Air
Air ANT2 PathLoss	0~191	Path loss of Auxiliary Antenna of Air
Ground ANT1 RSSI	-141 ~ -44	RSSI of Main Antenna of Ground

Ground ANT2 RSSI	-141 ~ -44	RSSI of Auxiliary Antenna of Ground
Ground ANT1 SNR	-50 ~ 50	SNR of Main Antenna of Ground
Ground ANT2 SNR	-50 ~ 50	SNR of Auxiliary Antenna of Ground
Ground ANT1 PathLoss	0~191	Path loss of Main Antenna of Ground
Ground ANT2 PathLoss	0~191	Path loss of Auxiliary Antenna of Ground
Air Netlink Udp Send	0~4294967295	The total number of byte through UDP protocol which send from serial port 2 of Air
Air Netlink Udp Recv	0~4294967295	The total number of byte through UDP protocol which receive from serial port 2 of Air
Air Netlink Tcp Send	0~4294967295	The total number of byte through TCP protocol which send from serial port 2 of Air
Air Netlink Tcp Recv	0~4294967295	The total number of byte through TCP protocol which receive from serial port 2 of Air
Uart2 Local Submit	0~4294967295	The total number of byte through network transparent transmission to opposite terminal which input from local serial port 2
Uart2 Remote Recv	0~4294967295	The total number of byte through network transparent transmission to serial port 2 which receive from opposite terminal
Uart2 Remote Submit	0~4294967295	The total number of byte through network transparent transmission to serial port 2 which input from opposite terminal
Uart2 Local Recv	0~4294967295	The total number of byte through network transparent transmission to opposite terminal which receive from local serial port 2
SBUS1 Local Submit	0~4294967295	The total number of byte through network transparent transmission to opposite terminal which input from local SBUS 1

SBUS1 Remote Recv	0~4294967295	The total number of byte through network transparent transmission to SBUS 1 which receive from opposite terminal
SBUS1 Remote Submit	0~4294967295	The total number of byte through network transparent transmission to SBUS 1 which input from opposite terminal
SBUS1 Local Recv	0~4294967295	The total number of byte through network transparent transmission to opposite terminal which receive from local SBUS 1
SBUS2 Local Submit	0~4294967295	The total number of byte through network transparent transmission to opposite terminal which input from local SBUS 2
SBUS2 Remote Recv	0~4294967295	The total number of byte through network transparent transmission to SBUS 2 which receive from opposite terminal
SBUS2 Remote Submit	0~4294967295	The total number of byte through network transparent transmission to SBUS 2 which input from opposite terminal
SBUS2 Local Recv	0~4294967295	The total number of byte through network transparent transmission to opposite terminal which receive from local SBUS 2

After enter the IP address of ground, please input user name as "root" and the password as "root123" at the login interface. Click login, then enter the advanced user configuration page of ground. The advanced user configuration page has an extra "Air Baseband Information" than the common user page. The operation of the Ground Baseband Information function is the same as that of air.

Specification

Category	Item	Detail	
Wireless Performance	Frequency band	800MHz/1.4GHz	
	Frequency range	800MHz: 806MHz~825MHz 1.4GHz: 1427MHz~1447MHz	
	Band width	5MHz/10MHz/20MHz	
	Modulation	OFDM	
	EIRP	35dBm±1dB	
	Sensitivity	≤-95dBm	
	Range	80km ¹	
	Bit rate	30Mbps@20MHz ²	
Power Range	DC 9~28V		
Power consumption	≤10W		
Interface	Antenna	SMA *2	
	Power	XT60*1 (Ground) ; XT30 *2 (Air)	
	UART	TTL 3.3V, 1 start bit, 8 data bit, 1 stop bit, no parity., Baud rate 115200 (default) , 57600, 38400, 19200, 9600	
		UART1 and UART2	
	SBUS	SBUS_IN*2	
		SBUS_OUT*2	
	Ethernet	RJ45	
		4 Pin	
		7Pin (With +12V Output)	
	Button	1	
Switch	For air and ground switch		

Antenna	Interface	SMA
	Type	Air: Glue stick antenna 20cm Ground: Fiber glass antenna, 30cm
	Polarization type	Vertical
	Gain	Air: 2.5dBi Ground: 12dBi
	SWR	≤2.0
Environment	Work temperature	-40°C ~ +70°C
	Storage temperature	-40°C ~ +85°C
	Humidity	5~95%, non-condensing
Appearance	Size	Air: 100 X 63 X 22 mm Ground: 450 X 390 X 175mm
	weight	Air: 140.8g Ground: 5kg

*1 The distance is tested under the condition of no interference and LOS.

*2The air rate is related to the communication conditions. When the sex/noise ratio of the wireless signal is reduced, the air rate will decrease.