

Model:HT08

Microhard Radio P900



Holybro P900 Radio integrates microhard Pico Series P900 RF module which is capable of delivering high-performance wireless serial communications in robust and secure Mesh, Point to Point or Point to Multipoint topologies.

P900 Radio operate within the 902-928 MHz ISM frequency band, using frequency hopping spread spectrum (FHSS) technology, providing reliable wireless asynchronous data transfer between most equipment types which employ a serial interface.

P900 Radio may be configured as a Primary Coordinator, Secondary Coordinator, Standby Coordinator or Remote in a Mesh Topology, or a Master, Repeater or Remote in a PP or PMP Topology. This versatility is very convenient for the user.

P900 Radio is configured using AT commands through the *Data* port or using PicoConfig application through the *Diagnostic* Port.



BENEFITS

- USB Type-C port, integrated USB to UART converter
- 6-position JST-GH connector, can be directly connected to the TELEM port on various flight controller such as the *pixhawk 4*
- High voltage BEC onboard, Support DC12V voltage supply
- UART transmission LED indicator
- Three-stage RSSI LED indicator
- Transmission within a public, license-exempt band of the radio spectrum
- Transparent, low latency link rates up to 276 kbps
- Supports a robust true Mesh operation with auto-routing
- 32 bits of CRC, selectable retransmission and forward error correction
- Separate diagnostics port, transparent remote diagnostics and online network control

SPECIFICATIONS

Frequency Range	ISM 902 to 928 MHz		
Transmit Power (Software Selectable)	4mW		
Band Segments	Selectable via Freq. Zones		
Link Rate	Up to 276kbps		
Serial Baud Rate	Up to 230.4kbps asynchronous		
	Low and middle data rate: 101;		
Sensitivity	Link Rate	10^{-6} BER	10^{-3} BER
	57.6 kbps	-111dBm	-114dBm
	115.2 kbps	-110 dBm	-113dBm
	172 kbps	-108dBm	-111dBm
	230 kbps	-107dBm	-110dBm
	276 kbps	-106dBm	-109dBm
Range	40 miles (60km)		
Spreading Technology	Frequency Hopping Spread Spectrum (FHSS)		
Supported Network Topologies (Software Selectable)	Coordinator, point-to-point, point-to-multipoint, mesh		
Error Detection	32 bits of CRC, ARQ		
Data Encryption	128, 196 or 256-bit AES Encryption (Requires export permit outside US and Canada.)		



Status LEDs

P900 Radio have 6 status LEDs, there are three blue, two orange and one green LEDs. The meaning of the different LEDs are:



Power LED(green)

This LED will illuminate when the P900 Radio is connected to a power source (7-35VDC).

TX LED (orange)

When illuminated, this LED indicates that the Radio is transmitting data over the air.

RX LED (orange)

This LED indicates that the Radio is synchronized and has received valid packets.

RSSI LEDs (3x Blue)

As the received signal strength increases, starting with the furthest left, the number of active RSSI LEDs increases. Signal strength is calculated based on the last four valid received packets with correct CRC. The value of RSSI is reported in S123.

MODE	Unit Type	LED STATUS		
		RX/SYNC	TX	RSSI 1,2,3
COMMAND	All	OFF	OFF	OFF
DATA	P.Coordinator S.Coordinator	ON while receiving valid data	ON while Transmitting data	1-3 ON in proportion to signal strength received from remotes.
DATA - during sync. acquisition	S.Coordinator Remote/ Standby	OFF	OFF	Cycling with 300ms ON time
DATA - when synchronized	S.Coordinator Remotes/ Standby	ON while synced	ON when transmitting	1-3 ON in proportion to signal strength received from Coordinator



RSSI LEDs(blue) - indicate the receive signal strength.

RSSI <20%	LED-20	off	LED-50	off	LED-100	off
20%<RSSI<50%	LED-20	on	LED-50	off	LED-100	off
50%<RSSI<80%	LED-20	on	LED-50	on	LED-100	off
80%<RSSI	LED-20	on	LED-50	on	LED-100	on

Config Button

Holding this button while powering-up the radio will boot the unit into COMMAND mode: the default serial interface will be active and temporarily set to operate at its default serial settings of 9600/8/N/1.

USB

USB TypeC Port. Internal USB to Serial Converter. The USB port of Holybro P900 Radio is different from MicroHard P900 Enclosed. The USB port of P900 Enclosed provides access to the Diagnostic Port. But Holybro P900 Radio's USB port Provides access to the Serial data Port. That means you can connect Holybro P900 Radio to your ground station via USB port directly. USB Vbus only power the USB to Serial chip, and don't power the Radio.

Data Port

6-position JST-GH. Data Port is used to connect to the telemetry port of a flight controller. When USB TypeC port don't connect, this connector connects to the Serial data Port automatically. When USB TypeC is plugged in, this connector is floating. Data Port don't power the Radio.

Diagnostic Port

4-position JST SH. This connector connects to the Diagnostic Port. If you use PicoConfig application or special diagnostic commands to config the Radio, you should connect to this port. Diagnostic Port is 3.3V logic level compatibility. A USB to Serial board is needed for connecting the radio to your computer.

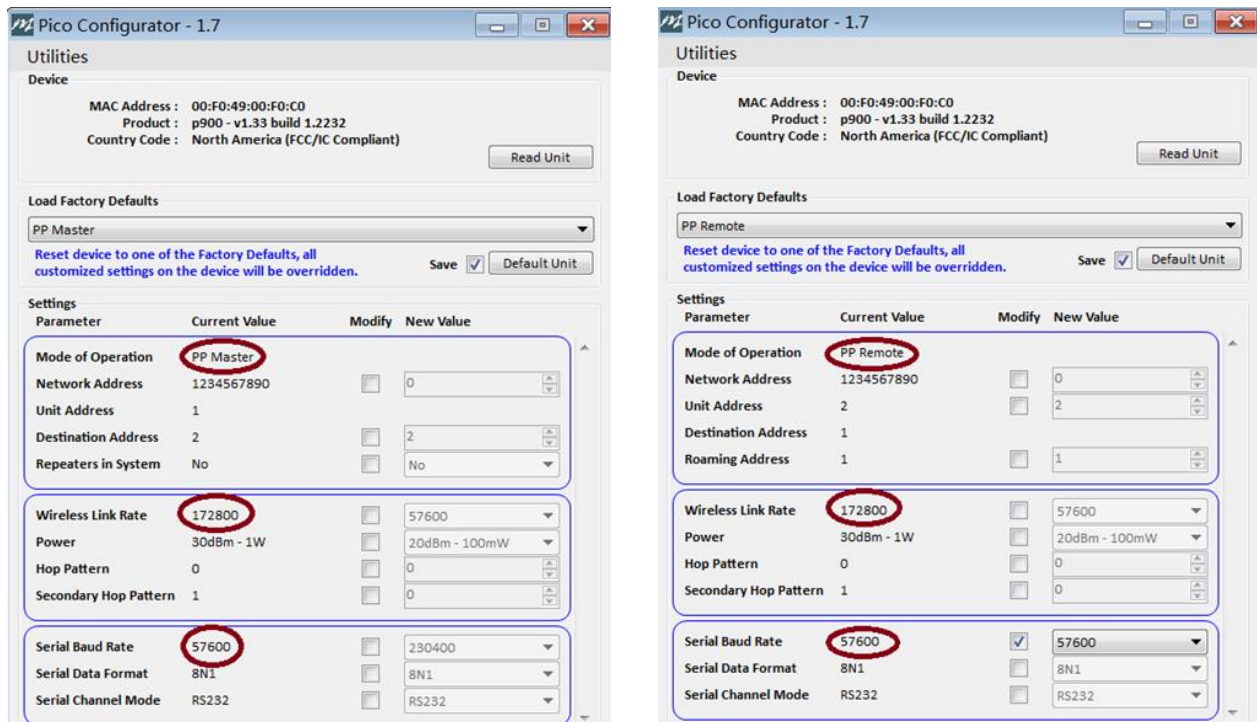


Power Port

4-position JST-GH. The input Voltage range is 7-35 Vdc. The Radio is powered by the Power Port only. Please connect the power supply when in use and configuration.

Default Setting

The default setting of microhard P900 module do not match the telemetry setting of flight controller. Holybro P900 Radio have been configured to Point to Point Operating Mode and 57600 Serial Baud Rate in factory. Using these parameters, the Radio communicates successfully with the pixhawk series flight controller. After Firmware Update or resetting the Radio, you need to re-config them as following.



In Point to Point operating modes, there must be a master to provide network synchronization for the system, so one Radio should be configured to PP Master and another should be configured to PP Remote. Refer to <Pico Series P900.Operating Manual.v1.8.7> for the detail information of Radio Configuration.

Power Consumption

Supply voltage: DC7~35V from 4-position JST-GH

Transmit current: 200 mA/7V at 20dBm

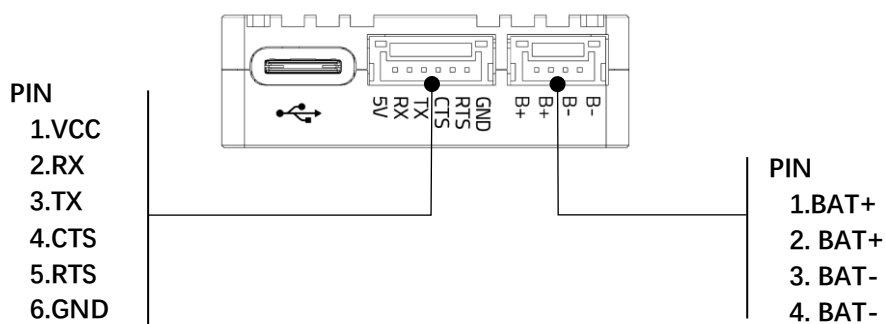
350mA/7V at 27dBm

800 mA/7V at 30dBm

Receive current: 100 mA

Weight: 42g (without antenna)

PIN OUTS



Data Port

Pin	Signal	Volt
1(red)	NC	--
2(black)	RX	+3.3V
3(black)	TX	+3.3V
4(black)	CTS	+3.3V
5(black)	RTS	+3.3V
6(black)	GND	GND

Diagnostic Port

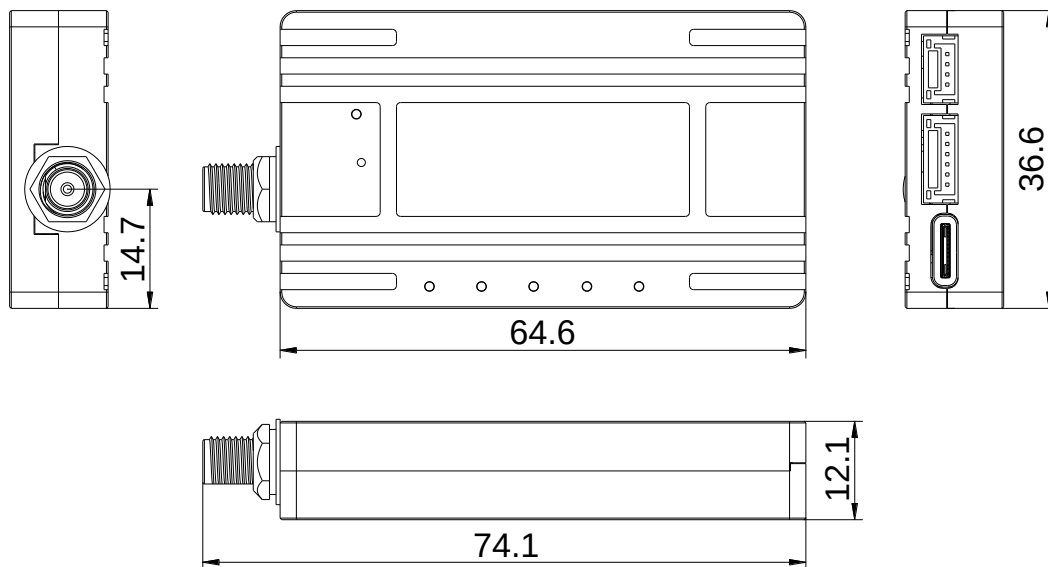
Pin	Signal	Volt
1	NC	--
2(black)	RX	+3.3V
3(black)	TX	+3.3V
4(black)	GND	GND

Power Port

Pin	Signal	Volt
1(red)	BAT+	7-35V
2(red)	BAT+	7-35V
3(black)	BAT-	GND
4(black)	BAT-	GND



Dimensions



DIMENSIONS IN MILLIMETERS

FCC Statement

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. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

.Increase the separation between the equipment and receiver.

.Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

.Consult the dealer or an experienced radio/TV technician for help.

Caution: This device not explicitly approved by manufacturer could Cause:

.Any changes or modivoid your authority to operate this equipment.RF Exposure Information

.The device has been evaluated to meet general RF exposure requirement.

.The device can be used in portable exposure condition without restriction.

.This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.

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