

RM-1700-22W3 wearable Mesh Rider® Radio

RM-1700-22W3



FEATURES

- Frequency range: 900MHz & 2.4GHz
- Data rates up to 87 Mbps
- 1.6 Watts Transmit Power
- Low power consumption

Delivering industry leading MANET radio performance for today's advanced UAV platforms, the RM 1700-22W3 unites command & control, telemetry, and video transport in one ultra compact OEM module.

With a full 1.6 W of RF output and mesh network throughput up to 100 Mbps, it brings class leading range and bandwidth to Swap constrained drones. Its self healing, dual band architecture ensures zero failover connectivity even in contested RF environments, while built in spectrum scanning and automatic power control keep your network clean and coordinated.

FREQUENCY BANDS

BAND	FREQUENCY RANGE
915-MHz	902-MHz to 928 MHz Global ISM Band
2450-MHz	2400-MHz to 2482 MHz Global ISM Band
2455-MHz	2402-MHz to 2510 MHz

SYSTEM INTEGRATION



Port No.	Description	Manufacturer	MPN
Port 1	ETH / USB-Host	Ethernet & USB-Host	SS-52400-004
Port 2	PWR-IN / USB-Device	Power Delivery & USB Device	SS-52400-004
Port 3	Antenna 1	TNC Connector	CBC-113-019-C
Port 4	GPS Antenna	SMA Connector	CAA275DEABFM045-D3
Port 5	Antenna 2	TNC Connector	CBC-113-019-C

The Mesh Rider Radio has been designed to be plug and play. Only USB and a power supply are required for integration.

Visit Doodle Labs Knowledge Base for extensive design-in documents.

TECHNICAL SPECIFICATIONS (915 MHZ AND 2450-MHZ)

ORDERING CODES	
Radio Configuration	2 X 2 MIMO
Model #	RM-1700-22W3
Accessories	2x Multi-band Gooseneck Antennas, Battery, Breakout board, Cables, Mounting Bracket.
Design-In Documentation	Doodle Labs Knowledge Base

PERFORMANCE OVERVIEW	
Data Throughput at 10-meter range with Attached 3 dBi Antennas (Indicative)	82.8 Mbps Range Estimation Tool
Over the Air Data Encryption	128-bit AES (Full throughput) 256-bit AES (12 Mbps max throughput)
FIPS Certification (Optional)	FIPS 140-3
Operating Modes	Mesh, WDS AP, WDS Client
Command & Control channel	Ultra-Reliable Low Latency Channel (URLLC). Latency 1.5-10 ms
Video Channel	Optimized video streaming with Unicast and Multicast transmission

RF SPECIFICATIONS	
Frequency Bands (Software Selectable)	902-928 MHz 2400-2482 MHz 2402-2508 MHz
Advanced Band Filters	Dedicated SAW filters for each band for high interference immunity
Minimum Sensitivity UDP Throughput	-101 dbm @ 3 MHz 82.8 mbps@20 MHz
Max RF Power at SMA port (Software control) Each radio individually calibrated	1.6W (32 dBm)
Channel Sizes (Software Selectable)	3, 5, 10, 20 MHz
Radio Data Rate	Auto adapting Modulation Coding Scheme (MCS0-15)
Antenna Signal Strength	-30 to -90 dBm (Recommended), Absolute Maximum= +12 dBm
RF Power Control	In 1 db steps with TPC(Transmit Power Control)
Integrated Antenna Port Protection	Able to withstand open port, >10 KV (contact) and >15KV (open air discharge) as per IEC-61000-4-2
Wireless Error Correction	FEC, ARQ

NETWORKING SPECIFICATIONS	
Mesh Router	Self-Forming/Self-Healing, Peer to Peer
Custom Software Package Manager	Image Builder, OPKG, ipk
Radio Management	Web GUI (HTTPs), SSH and JSON-RPC,Android/Linux/Windows App

HARDWARE SPECIFICATIONS	
Power Input	DC workbench power supplies: 6V - 24V USB-PD Wall Charger: 9V/3A, 12V/2.5A Doodle Labs' Battery Pack BAT-W01-A (optional)
DC Power Consumption	915-MHz: Average 4W (50% Tx/Rx duty cycle), 6W Peak Tx power @ max range, 2.7W Rx mode 2450-MHz: Average 3W (50% Tx/Rx duty cycle), 4.5W Peak Tx power @ max range, 1.2W Rx mode
Dimensions	134.3mm x 63.0mm x 17.0 mm 311 grams
Mesh Rider Antenna Ports	1x MMCX-Female Connector
Host Interface	Ethernet (100 Base-T), 1x USB -Dev (Ethernet over USB only), 1x UART (3.3V), 1x USB-H, 3x GPIO
Temperature range (Operating)	Industrial: -40°C to +85°C * System's thermal design should ensure that the radio's case temperature is maintained within these specifications.
Temperature range (Non-Operating)	-40°C to +100°C
Ingress Protection	Waterproof (IP67)
Relative Humidity	5% to 95% noncondensing

Shock and Vibration Resistance	Compliant to MIL-STD-810H for high shock and vibration
Reliability	Extreme Reliability, IPC Class 2 standard with Class 3 options
Integrated CPU	MIPS 24Kc, 540 MHz, 32MB Flash, 64MB DDR2 RAM
ESD Protection	IEC 61000-4-2 test criteria, Level 3 (±6KV) for Contact Discharge and Level 4 (±15KV) for Air Discharge
MTBF	>235k hours (25 years)
Life Cycle Planning	Extended lifespan with 7 years guaranteed availability

REGULATORY INFORMATION	
J/F-12 Certification	N.A.
FCC ID	2AG87RM1700-1N
Industry Canada (IC)	21411-RM17001N (in progress)
CE	Fully Certified
Regulatory Requirements	Designed and verified to meet various regulatory requirements. Formal testing and approval are required for the Integrator's antenna type. The Integrator is responsible for obtaining all regulatory approvals in target markets for the finished product.
RoHS/WEEE Compliance	Yes. 100% Recyclable/Biodegradable packaging
Temperature range (Non-Operating)	-40°C to +100°C
ESD Protection	IEC 61000-4-2 test criteria, Level 3 (±6KV) for Contact Discharge and Level 4 (±15KV) for Air Discharge
MTBF	>235k hours (25 years)
Life Cycle Planning	Extended lifespan with 7 years guaranteed availability

EXPORT INFORMATION	
ECCN Code	5A992
HS Code	85256010

ADDITIONAL RF SPECIFICATIONS (A1000 Model)

MCS Rate	Modulation	Combined Output Power (dBm)	Sensitivity (dBm) @ 3 MHz	UDP Throughput (Mbps) @ 20 MHz
0	BPSK (1/2)	32	-101	5.4
1	QPSK (1/2)	29	-99	10.62
2	QPSK (3/4)	29	-97	15.66
3	16-QAM (1/2)	29	-95	20.52
4	16-QAM (3/4)	28	-91	29.88
5	64-QAM (2/3)	27	-87	38.88
6	64-QAM (3/4)	26	-85	43.11
7	64-QAM (5/6)	24	-83	47.34
8	BPSK (1/2)	30	-98	10.53
9	QPSK (1/2)	29	-96	20.43
10	QPSK (3/4)	29	-94	29.7
11	16-QAM (1/2)	29	-92	38.52
12	16-QAM (3/4)	28	-88	54.72
13	64-QAM (2/3)	27	-84	69.3
14	64-QAM (3/4)	26	-82	76.14
15	64-QAM (5/6)	24	-80	82.8

Note 1: Performance based on 20-MHz bandwidth
Note 2: Sensitivity and throughput are approximately proportional to bandwidth.

REGULATORY STATEMENTS

FCC Statement

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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

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.

IC Statement

This device complies with Industry Canada’s licence-exempt RSSs. Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

The term "IC: " before the certification/registration number only signifies that the Industry Canada technical specifications were met. This product meets the applicable Industry Canada technical specifications.
Le présent appareil est conforme aux CNR d'Industrie Canada applicable aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement

CE Statement

This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.
CAUTION: To comply with the Europe CE requirement, this device must be installed with CE certified computer equipment which meet with Class A limits. Be aware that outdoor installations require special attention and will only be handled by trained and qualified installation personnel.
All cables used to connect this device must be shielded and grounded. Operation with non-certified computers or incorrect cables may result in interference to other devices or undesired effects to the product. Particular attention has to be given allowed operational frequencies.