

# Embedded Module

## SWaP-Timised MANET Module

### Transform Your Systems Into Network Devices

- Designed for integration into unmanned systems and sensors.
- Communicate further and faster than ever before.
- Communication, computing and video encoding all in a single device.

### SWaP-timise Your Unmanned Systems

- Consolidate your computing, video encoding, communications, and networking hardware.
- Focus on what matters most: the mission, time on station, and payloads
- Streamlined integration.

### Achieve The Vision

- Bring your unmanned platform into the Wave Relay® Ecosystem.
- MPU5 radio users can now operate your platforms, watch your video feeds, and steer your cameras.
- Take your unmanned systems to the next level by adding swarming, autonomy, and collaborative capabilities.

### Join The Wave Relay® Ecosystem

The Embedded Module is the most advanced, scalable, and efficient Mobile Ad Hoc Networking (MANET) radio in the world, available in an integration-ready, SWaP-timised form factor. Integrate the Embedded Module into your products to unite UAVs, UGVs, and sensors on a single network.

Because the Embedded Module features an HD video encoder and onboard Android™ computer, eliminate redundant equipment from your platform.

The Embedded Module is compatible with Persistent System's full line of Interchangeable Frequency Modules, allowing you to change frequencies to ensure compliance, future-proof your design, and protect your product from obsolescence.

### Go The Distance

The Embedded Module brings your unmanned platform into the Wave Relay® Ecosystem, where all UAVs, UGVs, sensors, and systems are networked.

MPU5 radio users can now operate your platforms, watch your video feeds, and steer your cameras. By establishing a network of unmanned systems, swarming, autonomy, and collaborative behaviours are now possible - **The sky is no longer the limit.**

### Flexible Configuration

The Embedded Module unites your unmanned system's communication, computing, and video subsystems into a single SWaP-timised package.

Replace separate and specialised equipment with a single Embedded Module that performs the same functions but takes up less space, weighs less, consumes less power, and costs fewer dollars and engineering hours to integrate.

Leverage your SWaP savings to accomplish what matters most: the mission, time on station, and the payloads you carry.

### Integrate Into Anything

By integrating the Embedded Module into your unmanned systems and sensors, you turn them into networked assets. Each system with an Embedded Module extends the Wave Relay® MANET, allowing your users to access services - such as video or sensor data - on any node from anywhere.

In addition, unmanned systems and sensors from multiple manufacturers can now communicate on a common network, giving your products more opportunities to perform.



# Specifications

Processor	1GHz Quad core ARM
Memory	2GB Memory onboard
Storage	128GB Flash
I/O	GPS HDMI-in 3G-SDI / Composite-in Control ( <b>Sleep / GPIO / zeroize / 1PPS / GND</b> ) RS-232 serial USB OTG Ethernet Audio in ( <b>Mic</b> ) Audio out ( <b>Speaker</b> )
Operating System	Android™ 6.0 ( <b>Marshmallow</b> )
Networking	<b>Ethernet:</b> 10/100 Mbps Integrated serial-to-Ethernet  <b>Integration &amp; Extension:</b> Seamless layer 2 network Cloud Relay™ compatible  <b>Protocols:</b> Advanced multicast algorithms IPv4 & IPv6 compatible Integrated DHCP server USB RNDIS host & device
Video Input	3G-SDI Composite HDMI
Video Compression	Built-in H.264 Encoder/Decoder Native scaling
Video Bit Rates	240p ( <b>from 500 Kbps</b> ) to 1080p ( <b>up to 20Mbps</b> )
Frame Rates	240p, 480p, 576 PAL & 720p ( <b>up to 60 fps</b> ) 1080p ( <b>up to 30 fps</b> )
Resolutions	240p 480p 576 PAL 720p 1080p
Network Protocols	UDP multicast & unicast ( <b>MPEG-2 transport stream</b> ) RTP multicast & unicast RTSP unicast
Security	CTR-AES-256 encryption SHA-256 & SHA-512 HMAC Cryptographic acceleration suite-B algorithms
MANET	Wave Relay® Self-forming / healing Peer-to-peer No master node

Node Entry Time	<1 Second
Max Number Of Hops	No limit
Max Number Of Nodes	No limit
Max Distance Between Nodes	130 miles ( <b>210 km</b> )
Weight	90.7 grams ( <b>3.2 oz</b> )
Dimensions	5.08 x 8.36 x 1.50 cm ( <b>2.00 x 3.29 x 0.59 in</b> )
Power Input	8 - 30 VDC
Power Consumption	0.3A & 12V
Operating Temperature	-40°C to 85°C ( <b>-40°F to 185°F</b> )
Emissions	RE102
MIL-STD-810G	Vibration High temperature ( <b>operational</b> ) High altitude ( <b>operational</b> )



## Embedded\_Module\_Datasheet\_07\_2019.pdf

Technical Specifications quoted are verified but do not indicate the maximum performance limitations of the equipment. Specifications are subject to change without notice. E & OE Issue A.

