

# NETNode2x2W-5RM

## NETNode IP Mesh Radio Phase 5 (Robust Mobile)

### Overview:

Phase 5 is the latest generation of DTC's NETNode IP Mesh Radio family offering built-in dual HD video encoders and MIMO capability for our highest ever data capacities. The NETNode 5RM is a Robust Mobile variant which offers an alternative form factor to its sister, the NETNode Phase 5 Robust, but being smaller allows a wider variety of applications. The 5RM is ideal for extended outdoor deployment and feature rich with new additions including built in GPS receiver and both composite and SDI video inputs comparable to the previous Phase 3 and 4 Robust products. Interoperable with DTC's Phase 3, 4 and 5 Mesh allowing simple upgrade in the field, while adding flexibility and ease of use as nodes can be integrated into existing infrastructure, reducing cost and making it easy to expand any network.



### Product Information:

#### Product Includes

|        |  |
|--------|--|
| CA2585 | Microphone/headphone and control/debug screened cable 1m |
| CA3229 | Screened power/Ethernet cable                            |
| CA3256 | Short bananas to XLR power cable                         |

#### Accessory Options (sold separately)

|           |   |
|-----------|---|
| AP000481  | UK IEC power supply cable for use with CA0649                                       |
| AP001483  | US IEC power supply cable for use with CA0649                                       |
| AP004634  | EU IEC power supply cable for use with CA0649                                       |
| AP007192  | AU IEC power supply cable for use with CA0649                                       |
| AP009259  | IP55 water resistant enclosure for use with CA0649                                  |
| AP009445  | Pelicans case to house NETNode2x2W-5RM kit (contact DTC)                            |
| AP009562  | Antenna GPS/GLONASS, 1.575-1.6GHz, SMA  |
| CA0649    | 12VDC power supply unit for use with CA3229   |
| CA3254    | 5m XLR to XLR extension for use with CA3229   |
| CA3255    | 10m XLR to XLR extension for use with CA3229  |
| CA3259    | Video input and DC power output cable   |
| CA3606    | Microphone/headphone and RS232/RS485 data cable                                     |
| NETR-MB   | NETNode robust mounting bracket   |
| MISCDRTAC | Mission Commander Tactical application for desktop or tablet - refer to datasheet   |
| MCS       | Mission Commander Strategic advanced client/server application - refer to datasheet |
| SOL8SDI   | HDMI or composite video to SDI converter  |

#### Related Documents

|        |                                     |
|--------|-------------------------------------|
| 100232 | NETNode Phase 5 Hardware User Guide |
| 100219 | NETNode Phase 5 Software User Guide |

### Features and Benefits:

Self-forming, self-healing mesh architecture

Ideal for use for wide area coverage & multi-hop, mobile applications such as robotics

Low latency IP communication

HD video encoder - data capacity of greater than 32Mbps of IP data possible

Built in composite video encoder

Built in GPS receiver

Software configurable RF bandwidth between 1.25MHz and 20MHz

Interlink mode for enhanced capability and large scale systems

64Gb of on-board storage with store & forward functionality

Built in encryption (DES as standard, AES128/256 available subject to export control)

Mission Commander compatible

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### Technical Specification:

#### Interfaces

|                           |                                |
|---------------------------|--------------------------------|
| COFDM RF interfaces       | N-Type x 4 (2 x Tx/Rx, 2 x Rx) |
| GPS antenna interface     | SMA female                     |
| Power and Ethernet (Eth0) | 6-way Amphenol 38999 series 3  |
| Ethernet (Eth1)           | RJ45                           |
| Config & data             | 22-way Amphenol 38999 series 3 |
| Camera video & power      | 4-way Amphenol 62GB            |
| SDI/HD-SDI                | BNC female 75Ω                 |
| USB                       | Type A                         |

#### IP Interface

|                                |                                      |
|--------------------------------|--------------------------------------|
| Primary and secondary Ethernet | 100/1000Base-T                       |
| IP address allocation          | DHCP dynamic IP addressing/static IP |

#### RF Interfaces

|           |                                     |
|-----------|-------------------------------------|
| Antenna A | Channel 1 receive only              |
| Antenna B | Channel 1 switched transmit/receive |
| Antenna C | Channel 2 receive only              |
| Antenna D | Channel 2 switched transmit/receive |

#### RF and Modulation

|                     |   |
|---------------------|---|
| Output frequency    | Frequency variant dependent   |
| Tuning step size    | 125kHz step   |
| Output power        | +33dBm per channel in 0.25dB step (4W total)  |
| Bandwidth           | 1.25, 1.5, 1.75, 2.5, 3.0, 3.5, 5.0, 6.0, 7.0, 8.0, 10.0MHz (video and IP Mesh)<br>12.0, 14.0, 16.0, 20.0MHz (IP Mesh only) |
| Mesh capacity       | Up to 87Mbps MIMO, 17Mbps standard Mesh   |
| Modulation          | COFDM 360 carrier modulation  |
| Carrier modulation  | BPSK/QPSK/16QAM/64QAM (adaptive)  |
| FEC rate            | FEC1/2, FEC2/3 (adaptive)   |
| Receive diversity   | Maximum ratio combining   |
| Receive sensitivity | -98dBm (BW 2.5MHz/BPSK 1/2)   |

#### Typical Range

|                          |         |
|--------------------------|---------|
| NLOS light urban         | 1400m † |
| LOS (e.g. ground to air) | 106km † |

† Dependent on antenna height and gain

#### Streaming

|        |  |
|--------|--|
| Format | UDP multicast/unicast<br>RTSP/RTP/UDP multicast/unicast<br>ONVIF Profile S |
| MJPEG  | TCP/HTTP   |

#### Video

|                         |  |
|-------------------------|--|
| Video input             | Two video streams<br>Max total throughput of 1920x1080p30<br>Currently both video input resolutions must be identical  |
| SDI input formats       | 1920x1080i 60/59.94/50Hz<br>1920x1080p 30/29.97/25/24/23.97Hz<br>1920x1080psf 30/29.97/25/24/23.97Hz<br>1280x720p 60/59.94/50Hz<br>720x576i 50Hz or 720x480i 59.94Hz |
| Composite input formats | PAL<br>NTSC  |
| H.264 compression       | AVC / H.264 / MPEG-4 Part 10<br>High profile level 4.0   |
| Coding options          | Horizontal scaling of 3/4, 2/3, 1/2, 1/4<br>Vertical scaling of 1/2, 1/4<br>Sub-frame rate of 1/2, 1/4, 1/8, 1/24  |
| Encoder delay           | 1s to 10ms (mode dependent)  |
| Encoder bitrates        | 0.25Mbps to 32Mbps   |

#### Audio

|                      |   |
|----------------------|---|
| Talkback audio input | High gain microphone stereo pair or talkback  |
| Digital audio input  | SD/HD-SDI digital stereo pair   |
| Sample rate          | 16kHz-48kHz   |
| Coding modes         | 4 channels stereo or mono<br>MPEG Audio Layer 1 64-448kbps<br>MPEG Audio Layer 2 32-384kbps<br>MPEG Audio Layer 3 8-256kbps |

#### Store and Forward Options

|                           |   |
|---------------------------|---|
| Storage format            | SD card interface (Secure Digital card) - not user accessible |
| Record options            | Continuous or triggered (Milestone)                           |
| Files download            | From web browser interface/RTSP                               |
| Video and audio clip size | 30 seconds  |

#### Encryption

|               |                                      |
|---------------|--------------------------------------|
| DES           | Standard                             |
| AES128/AES256 | Licensed (subject to export control) |

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## NETNode IP Mesh Radio Phase 5 (Robust Mobile)

### Technical Specification (con't):

#### Open Audio Comms Channel (shared voice channel)

|                                |   |
|--------------------------------|---|
| Multi-user audio comms channel | Interface microphone level/headphone output |
| Compression                    | G726 32kbit audio 8kHz sampling and mute    |

#### GPS

|                       |                   |
|-----------------------|-------------------|
| Built in GPS receiver | Garmin GPS-15xH-W |
|-----------------------|-------------------|

#### Data Interface

|   |  |
|---|--|
| RS232/RS485 bi-directional data (shared with user camera control) | 1k2 to 115k2 baud switchable with UDP and TCP routing protocol |
|---|--|

#### Camera Interface

|                     |  |
|---------------------|--|
| User camera type    | One HD-SDI or SD-SDI<br>One PAL or NTSC  |
| User camera control | Mission Commander PC application using VISCA, PELCOD or PELCOP<br>User supplied desk controller (requires RS232/RS485 interface) |

#### Triggers

|                |                                      |
|----------------|--------------------------------------|
| Trigger source | Video motion detection<br>Brightness |
| Trigger action | Enable Mesh<br>Record                |

#### Control

|                |   |
|----------------|---|
| Local control  | LEDs power and Mesh status  |
| Remote control | Web browser GUI<br>Mission Commander - control of all parameters in a map based application |

#### Power

|                           |                      |
|---------------------------|----------------------|
| DC input (12V)            | 10-18V               |
| Power consumed (non-MIMO) | 12W approx.          |
| Power consumed (MIMO)     | 25W (40W pk) approx. |

#### Physical

|                                 |                                      |
|---------------------------------|--------------------------------------|
| Dimensions                      | H 160mm, W 160mm, D 70mm             |
| Mounting options base unit      | Tripod mount and through hole screws |
| Mounting options adaption plate | Post mounting kit                    |
| Weight                          | <2.0kg                               |

#### Environment

|                   |                |
|-------------------|----------------|
| Sealing           | IP66 minimum   |
| Temperature range | -20°C to +50°C |

#### Frequency

|         |              |
|---------|--------------|
| 032047  | 320-470MHz   |
| 120170  | 1.20-1.70GHz |
| 165240  | 1.65-2.40GHz |
| 198255  | 1.98-2.55GHz |
| 300370* | 3.00-3.70GHz |
| 440500  | 4.40-5.00GHz |

#### Software License Code

|                   |   |
|-------------------|---|
| Silver (included) | Standard Mesh, MIMO Mesh, DES Encryption, Recording and Streaming |
| Gold              | Silver plus SD H.264 Encoder                                      |
| Platinum          | Gold plus HD H.264 Encoder  |
| AES128NN          | AES NETNode 128 bit decryption                                    |
| AES256NN          | AES NETNode 256 bit decryption                                    |

\* Future development

Export of encrypted products is subject to regulatory export controls.

For further information contact your Sales Account Manager, one of our Regional Sales Offices, or email [solent.enquiries@domotactical.com](mailto:solent.enquiries@domotactical.com)

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