

NETNode IP Mesh Radio Phase 5

COFDM – Video, Audio Telemetry and IP Products

COBHAM

October 2015 Data Sheet

The most important thing we build is trust



Cobham NETNode IP mesh radios are the latest innovations in the expanding range of Cobham Tactical Communications and Surveillance solutions.

The Multiple Input/Multiple Output (MIMO) node is the latest breakthrough in mesh technology from Cobham, offering multiple transmit and receive antennas, transmitting extra data on the same frequency by overlaying two signals in the space of one. This technique almost doubles the IP throughput and provides twice as much output power increasing range.

NETNode IP radios can be combined in a fluid self forming, self healing mesh containing up to sixteen radios. The NETNode radios within the mesh exchange data on a single frequency, simplifying frequency management. The Phase 5 unit builds on Cobham's latest technology development and algorithmic improvements contained within the unit resulting in a further reduced noise floor and improved spectral efficiency. The Phase 5 unit also includes Power over Ethernet (POE*) and IP control on all units, enabling the unit to be powered and configured from just one cable. The unit can also be configured to have the 2x2dBi or 2x4dBi antenna directly mounted, making it ideal for instant deployment where high data rates are required.

The entire mesh can operate in a selectable bandwidth of between 2.5 and 10MHz. The NETNode radios employ the unique Cobham COFDM modulation scheme and therefore offer excellent RF penetration and performance in the presence of multipath.

The NETNode mesh radios can provide greater than 25Mb/s of IP data (data rate depends on mode, number of nodes and range between nodes). This available bit-rate can be used to exchange IP data traffic between nodes.

The highly flexible mesh topology means that data can be exchanged between nodes in a point-to-point or multi-point fashion; range can be extended by using nodes as repeaters. The self-forming, self-healing mesh architecture makes the NETNode product ideal for use in mobile surveillance applications, command and control applications, or advanced robotics.

The NETNode can be connected to third party cameras using the SDI/ HD SDI connectors. AVI options are available for composite or Pal camera options.

Security of the entire mesh network can be ensured by the use of the optional AES128 or AES256 encryption.

Control of the deployed mesh is achieved using the inbuilt web browser or comprehensive Mission Commander PC application. This software suite, based around a mapping display, is used to configure and monitor the mesh and wider Cobham Surveillance systems, and to control its nodes and cameras. Video can be viewed on the PC device using the Mission Commander software and recorded using Milestone Compatible recorders.

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Specification:

Interfaces

| | |
|---------------------------------|---------------------------|
| RF Interfaces (Antennas 1-4) | N-Types (2x TX/RX, 2x RX) |
| 12-18V DC Input | 6 – Way Amphenol |
| 18-48V DC Input | 3 – Way Amphenol |
| Ethernet 1 | RJ45 Amphenol |
| Ethernet 2 | RJ45 Amphenol |
| SDI/HD-SDI input 1 | 75R BNC |
| SDI/HD-SDI input 2 | 75R BNC |
| Config & Data | 22 – Way Amphenol |

Typical range

| | |
|----------|------------------------|
| DraftXXX | Ground – Air Link 65km |
|----------|------------------------|

RF Interfaces

| | |
|-----------|-------------------------------------|
| Antenna A | Receive only antenna |
| Antenna B | Switched transmit / Receive antenna |
| Antenna C | Receive only antenna |
| Antenna D | Switched transmit / Receive antenna |

RF and modulation

| | |
|---------------------|--|
| Output frequency | 2.00 to 2.50GHz, |
| Tuning step size | 125kHz step |
| Output power total) | +33dBm per channel in 0.25dB step (4W total) |
| Bandwidth | 2.5, 3.0, 3.5, 5.0, 6.0, 7.0, 8.0, 10.0MHz |
| Mesh capacity | Up to 25Mb/s (MIMO) |
| Modulation | COFDM 360 carrier modulation |
| Carrier Modulation | BPSK/QPSK/16QAM (adaptive) |
| FEC rate | FEC1/2, FEC2/3 (adaptive) |
| Receive diversity | Maximum Ratio Combining |
| Receive sensitivity | -98dBm (BW 2.5MHz / BPSK 1/2) |

IP interface

| | |
|---|---------------------------------------|
| Primary and secondary ethernet electrical | 100BaseT Ethernet (with optional POE) |
| IP address allocation | DHCP dynamic IP addressing/Static IP |

Streaming

| | |
|--------|--|
| Format | UDP Multicast/Unicast RTSP/RTP/UDP Multicast/Unicast ONVIF profile S |
| MJPEG | TCP/HTTP |

Video

| | |
|-------------------|--|
| Video Input | 2 video streams Max total throughput of 1920x1080p30 2 HD streams at half resolution or frame rate |
| Input Format | 1920x1080i 60/59.94/50Hz 1920x1080p 30/29.97/25/24/23.97Hz 1920x1080psf 30/29.97/25/24/23.97Hz 1280x720p 60/59.94/50Hz 720x576i 50Hz or 720x480i 59.94Hz |
| H.264 Compression | AVC / H.264 / MPEG-4 Part 10 High profile level 4.0 |
| Coding Options | Horizontal scaling of 3/4, 2/3, 1/2, 1/4 Vertical scaling of 1/2, 1/4 Sub-frame rate of 1/2, 1/4, 1/8, 1/24 |
| Encoder Delay | 1s to 10ms (mode dependant) |
| Encoder Bitrates | 0.25Mbps to 32Mbps |

Audio

| | |
|----------------------|---|
| Analogue Audio Input | High gain microphone stereo pair |
| Digital Audio Input | SD/HD-SDI 2 digital stereo pairs |
| Sample Rate | 16kHz-48kHz |
| Coding Modes | 4 channels stereo or mono MPEG Audio Layer 1 64-448kbps MPEG Audio Layer 2 32-384kbps MPEG Audio Layer 3 8-256kbps |

Store and Forward options*

| | |
|---------------------------|---|
| Storage format | SD card interface (Secure Digital card) |
| Record options | Continuous or triggered (Milestone) |
| Files download | From web browser interface/RTSP |
| Video and audio clip size | 30 seconds |

Encryption

| | |
|------|----------------------------------|
| Type | AES128 or AES256 (both optional) |
|------|----------------------------------|

Open Audio comms channel (shared voice channel)

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

Encryption

| | |
|------|----------------------------------|
| Type | AES128 or AES256 (both optional) |
|------|----------------------------------|

GPS

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| Dedicated GPS interface | RS232/RS485 |
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Data interface

| | |
|--|---|
| RS232/RS485 data input (shared with user camera control) | 1K2 to 115K2 baud switchable With UDP and TCP routing protocol |
|--|---|

PTZ camera interface (with AVI fitted)

| | |
|---------------------|--|
| User camera type | PAL or NTSC |
| User camera control | From Mesh Commander PC application using VISCA, PELCOD or PELCOP From any user supplied desk controller Requires RS232/RS485 interface |

Triggers*

| | |
|----------------|--|
| Trigger source | Third party equipment remote trigger (e.g. PIR etc) User pre-set time trigger Video motion detection (NETAV option)* Audio level* |
| Trigger action | Start to transmit (silence mode) Activate video stream (NETAV option) Activate audio stream (NETAV option) Move camera to preset position Activate local store feature |

Control

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|----------------|--|
| Local control | LEDs power and mesh status |
| Remote control | Mission Commander PC application Full control of all parameters in a map based application Web Browser control |

Physical

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|----------------------------|---|
| Sealing | IP66 Minimum |
| Dimensions | H 125mm, W 125mm, D 205 (245) mm (including connectors) |
| Mounting options base unit | Tripod mount and captive hole screws |
| Weight | 3.46kg |

Power

| | |
|---------------------------|---------------------------------|
| DC input (12V) | 8-16V |
| DC input (48V) | 20 – 48V |
| PoE x 2 | 50V(nominal) adapter dependant. |
| Power consumed (non-MIMO) | 12W approx |
| Power consumed (MIMO) | 25W (40W pk) approx. |

Environment

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|-------------------|-----------------|
| Temperature range | -10 to 50 deg C |
|-------------------|-----------------|

Product Code:

Pinouts:

| | |
|--------------|-------------|
| 12V DC Input | Pin 1 = 12V |
| 38999 6-Way | Pin 2 = 12V |

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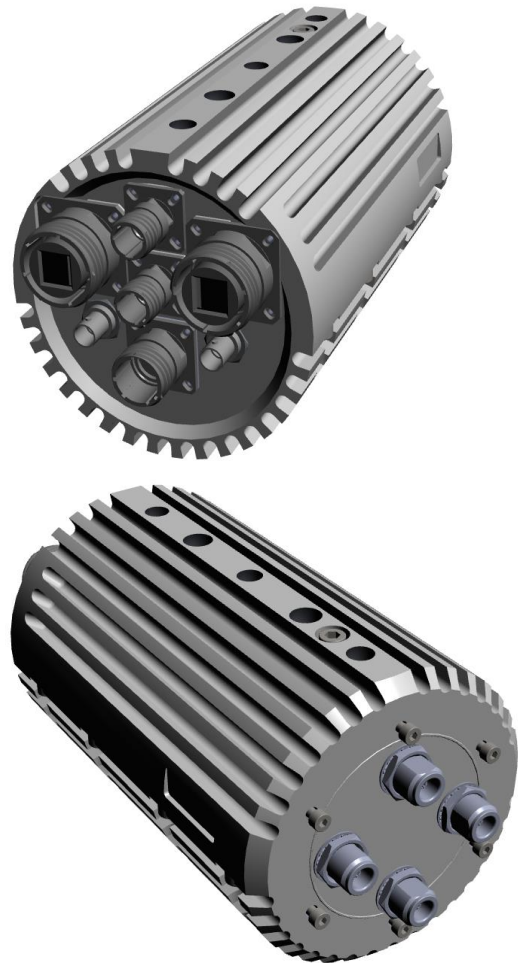
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| | |
|------------------------------------|-----------------------|
| | Pin 3 = 12V |
| | Pin 4 = GND |
| | Pin 5 = GND |
| | Pin 6 = GND |
| 48V DC Input <i>38999 3-Way</i> | Pin 1 = 48V |
| | Pin 2 = |
| | Pin 3 = GND |
| Ethernet 1 – RJ45 | Pin 1 = MDIP0 |
| | Pin 2 = MDIN0 |
| | Pin 3 = MDIP1 |
| | Pin 4 = MDIP2 |
| | Pin 5 = MDIN2 |
| | Pin 6 = MDIN1 |
| | Pin 7 = MDIP3 |
| | Pin 8 = MDIN3 |
| Ethernet 2 – RJ45 | Pin 1 = MDIP0 |
| | Pin 2 = MDIN0 |
| | Pin 3 = MDIP1 |
| | Pin 4 = MDIP2 |
| | Pin 5 = MDIN2 |
| | Pin 6 = MDIN1 |
| | Pin 7 = MDIP3 |
| | Pin 8 = MDIN3 |
| SDI/HD-SDI Video 1 | 75R BNC |
| SDI/HD-SDI Video 2 | 75R BNC |
| Configuration & Data | Pin 1 = 12V SW Out |
| | Pin 2 = GND |
| | Pin 3 = RS232 RX CTRL |
| | Pin 4 = RS232 TX CTRL |
| | Pin 5 = RS485 TX+ |
| | Pin 6 = RS485 TX- |
| | Pin 7 = GND |
| | Pin 8 = RS485 RX+ |
| | Pin 9 = RS485 RX- |
| | Pin 10 = |
| | Pin 11 = |
| | Pin 12 = |
| | Pin 13 = |
| | Pin 14 = |
| | Pin 15 = |
| | Pin 16 = |
| | Pin 17 = AUD_IN R |
| | Pin 18 = AUD_IN L |
| | Pin 19 = GND |
| | Pin 20 = AUD_OUT R |
| | Pin 21 = AUD_OUT L |
| | Pin 22 = GND |

Photographs:



Unit with 2 x 2dbi directly coupled



Products are available to security users in licensed frequency bands. Encryption licences are subject to export control. These products are not approved for use by unlicensed users. Commercial products are available if used in appropriate licensed frequency bands.

Licensing Options:

| | |
|----------|-----------------------|
| AES128NN | 128bit AES Encryption |
| AES256NN | 256bit AES Encryption |

Note:

AES may be subject to export control

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