

## NETNode IP Mesh Radio Phase 5 (Robust)

COFDM – Video, Audio Telemetry and IP Products

March 2016 Data Sheet



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

The Multiple Input/Multiple Output (MIMO) node is the latest breakthrough in mesh technology from DTC, 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 DTC'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 DTC 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 in-built 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 DTC 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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Domo – Video, IP and Sensors

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## Specification:

### Interfaces

RF Interfaces	N-Types (2x TX/RX, 2x RX)
12-18V DC Input	Amphenol 38999 Series 3 (6 way)
18-48V DC Input	Amphenol 38999 Series 3 (3 way)
Ethernet 1	RJ45 Amphenol RJ Field Cat 6 Series
Ethernet 2	RJ45 Amphenol RJ Field Cat 6 Series
SDI/HD-SDI input 1	BNC (female 75Ω)
SDI/HD-SDI input 2	BNC (female 75Ω)
Config & Data	Amphenol 38999 Series 3 (22 way)

### Typical range

NLOS Light Urban	800-1400m typ.
LOS (e.g. ground to air)	50km+

### 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	Frequency variant dependant
Tuning step size	125kHz step
Output power	+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 ½)

### IP interface

Primary and secondary ethernet electrical	100Base-T 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)
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### 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

### GPS

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
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### 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* Audio level*
Trigger action	Start to transmit (silence mode) Activate video stream Activate audio stream Move camera to pre-set position Activate local store feature

### Control

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

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)	10-18V
DC input (48V)	20 – 52V
PoE x 2	50V(nominal) adapter dependant.
Power consumed (non-MIMO)	12W approx.
Power consumed (MIMO)	25W (40W pk) approx.

### Environment

Temperature range	-10 to 50 °C
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\*Future development

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