

## NETNode IP Mesh Radio Phase 5 (Plain)

Domo – Video, IP and Sensors

June 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 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 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 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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## Specification:

### Interfaces

RF Interfaces	SMA female (2x TX/RX, 2x RX)
12-18V DC Input	XLR (4 pin)
Ethernet 1	RJ45
Ethernet 2	RJ45
USB Host*	Type A
SDI/HD-SDI input 1	DIN 1.0/2.3 (female 75Ω)
SDI/HD-SDI input 2	DIN 1.0/2.3 (female 75Ω)
Config & Data	D-sub (15 way)
Microphone/Line Input	3.5mm socket (4 pole)
Headphone Output (stereo)	Combined with Microphone

### Typical range

NLOS Light Urban	500-700m typ.
LOS (e.g. ground to air)	30km+

### RF Interfaces

Antenna A $\uparrow$	Receive only antenna
Antenna B $\downarrow$	Switched transmit / Receive antenna
Antenna C $\uparrow$	Receive only antenna
Antenna D $\downarrow$	Switched transmit / Receive antenna

### RF and modulation

Output frequency	Frequency variant dependant
Tuning step size	125kHz step
Output power	+28.7dBm (750mW) per chan. in 0.25dB step (1.5W 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

\* Future Development

### Audio

Analogue Audio Input	High gain microphone mono
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 preset 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	IP31
Dimensions	L 165mm, W 160mm, H 43mm
Mounting options base unit	1U rack mounting kit included as standard
Weight	1kg

### Power

DC input	8-18V
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 Codes:

NETNode2X750mW-5P-200250	IP Mesh Node Phase 5 Plain 2x750mW 2.0-2.5GHz incl PSU, excl ANTs
NETNode2X2W-5P-200250*	IP Mesh Node Phase 5 Plain 2x2W 2.0-2.5GHz incl PSU, excl ANTs

\*Available Q4 2016

Other options may be available on request.

BOM Includes Silver license

### Product Code Includes:

CA0649	12VDC Power Supply Unit 1m
CA2787	External DC power cable 3m
AP000481	Mains Lead UK plug to IEC socket 2m

### Accessory Options (sold separately):

MW2479	Rack mount IP encoder ear (2 required)
AP006819	S band 3G Cavity Filter
PRORXCPLKT-1RU	Coupler kit 1RU

### Licensing Options:

Silver**	SIMO Mesh, MIMO Mesh, DES
GOLD – NETNode2x2W-5P	<b>Silver plus</b> SD H.264 Encoder
PLATINUM – NETNode2x2W-5P	<b>Gold plus</b> HD H.264 Encoder
AES128NN	128bit AES Encryption
AES256NN	256bit AES Encryption

\*\*Included in BOM as standard

### Export of Encrypted Products is Subject to United Kingdom Regulatory Export Controls

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