## MeshUltra<sup>™</sup> IP Mesh Waveform Family

MeshUltra<sup>™</sup> is our most advanced Mesh waveform family yet and it is supported by the industry's widest range of Mesh hardware platforms - from tiny modules, perfect for small drones, to the longest range ruggedized nodes, ideal for maritime or industrial applications. With frequency options spanning

#### The BluSDR<sup>™</sup> Family Hardware Platforms

The BluSDR<sup>™</sup> family is a streamlined range of wideband IP radio links each chosen to offer class-leading performance in a range of Uncrewed systems applications in the air, on the ground and at sea.

# BluSDR<sup>™</sup> - 6

The BluSDR<sup>™</sup>- 6 is ideal for size and weight critical UxV applications. Weighing only 0.9oz / 26g, the BluSDR<sup>™</sup>-6 is smaller than a standard credit card.



BluSDR<sup>™</sup> -6 SHORT RANGE from 26g | 6km | 400mW 3W consumption Up to 87Mbps throughput 2 x USB Ports

Serial

USB PD

Audio

HD-SDI

PAL/NTSC

# BluSDR<sup>™</sup> - 30

The BluSDR<sup>™</sup>-30 has been designed to be the core of a wide range of systems. Weighing only 3oz / 85g, the BluSDR™-30 is the thickness of a pencil and the width of a US dollar bill.



# BluSDR<sup>™</sup> - 90 - L

The BluSDR<sup>™</sup>-90- L is a lighter option that works best for Long Range UxV products. With its small form factor, the BluSDR™-90-L is suitable for installation both as a mobile and fixed site system.



# BluSDR<sup>™</sup> - 90

The BluSDR<sup>™</sup>-90 is a robust option that works best for Long Range UxV products. With its small form factor, and designed for environmental resistance, the BluSDR<sup>™</sup>-90 is suitable for installation both as a mobile and fixed site system.

# BluSDR<sup>™</sup> - 200

The BluSDR<sup>™</sup>-200 is DTC's highest power Mesh product and provides up to 30W total RF power output for extreme long range applications.



BluSDR<sup>™</sup> - 90 LONG RANGE 2.5kg | 90km | 10W HD-SDI p to 87Mbps throughput PAL/NTSC USB Port 2 x Ethernet, 2 x Serial Analogue video

BluSDR<sup>™</sup> - 90-L

LONG RANGE

USB Port

Ethernet

600g | 90km | 10W

Up to 87Mbps throughput

BluSDR<sup>™</sup> - 200 EXTRA LONG RANGE 5kg | 200km | 30W Up to 87Mbps throughput 2 x Serial USB Port Audio 2 x Ethernet 2 x HD-SDI

## MeshUltra<sup>™</sup> SDR

The ultimate in flexibility, the SDR Software Defined Radio is able to operate as a 2x2 MiMo Mesh radio, hosting the latest MeshUltra<sup>™</sup> waveform, or alternatively as a unidirectional COFDM Transmitter or Receiver family.

# Sentry Mesh 6161

The Sentry Mesh 6161 is a Software Defined Radio based on our highly robust MANET waveforms. MeshUltra<sup>™</sup> optimises the use of available bandwidth through a "Token Passing" technology, which avoids collisions and provides a short, predictable data packet latencv.

#### **Key Features**

-Up to 144 total nodes

-Up to 2 watts RF

-SWaP optimised

-Predictable IP latency

-2 x 2 MIMO

-User selectable presets/talkgroup



For more information about our MeshUltra<sup>™</sup> Waveform Family or any other DTC solutions, contact your Sales Account Manager or one of our Regional Sales Offices. Or email us at info@domotactical.com

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# SOL8SDR-H2

The SOL8SDR-H2 is the enhanced next generation Special Role Radio designed to meet a diverse range of applications. With the same rugged body worn form factor, the SOL8SDR-H2 offers enhanced GPS performance with on-board magnetics for a simplified Ethernet interface and future support for dual push-to-talk communications.

#### **Key Features**

-MeshUltra, MIMO, and standard IP Mesh capability

- -Low latency
- -Enhanced GPS performance
- -2 watts total ouput

-Range NLOS ->1.5km single hop; >15km air to ground

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# X MeshUltra

Powering

# MeshUltra<sup>™</sup> Waveform Family

**Revolutionising Mesh Technology for Uncrewed Systems** 

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# MeshUltra™ IP Mesh Waveform Family

## **Revolutionising Mesh Technology**

DTC has long been the leader in Wireless IP Mesh technology. Our Tactical MANET IP Mesh waveforms were designed from the ground up for robust performance in the most demanding dynamic environments, free from the compromises of competitive solutions that are based on consumer standards.

Time and again, DTC Mesh excels not just on the datasheet or in the lab but in the most demanding real-world applications.

The DTC MeshUltra<sup>™</sup> family offers our most capable and flexible Mesh yet.

## The MeshUltra<sup>™</sup> Family

DTC's MeshUltra<sup>™</sup> waveform family is a range of High Performance Tactical COFDM MANET IP Mesh waveforms optimized for different deployment scenarios to ensure that our customers always get the best possible performance rather than a "one size fits all" compromise solution.

The whole MeshUltra<sup>™</sup> waveform family is supplied as standard on all DTC Phase 5 NETNode products and Mesh-licensed SOL8SDR radios, allowing customers to choose the best waveform for each deployment and to freely swap between waveforms even after purchase.

#### MeshUltra<sup>™</sup>-M

MeshUltra<sup>™</sup>-M has been developed to deliver outstanding throughput and robustness in very dynamic "high mobility" scenarios such as Motor Racing, Uncrewed Vehicle control or street level tactical surveillance. It rapidly updates information on network topology and link quality to ensure that every transmission is delivered via the best available route. Supporting up to 24 nodes and channel bandwidths up to 20MHz and delivering throughputs up to 87Mbps, MeshUltra<sup>™</sup>-M delivers rock solid connectivity in the most demanding of environments.



MeshUltra<sup>™</sup>-X was designed to support very large

Dismounted Soldier communications or networked

of channels. It aggressively minimises metadata in

order to avoid unnecessarily compromising user

payload data capacity and benefits hugely from

the "no contention" network delivered by DTC's

proprietary Token-based channel access mechanism.

MeshUltra<sup>™</sup>-X supports up to 144 nodes in channel

bandwidths as narrow as 1.25MHz and scales to

channel bandwidths up to 5MHz.

Unattended Ground Sensors (UGS) whilst delivering

industry leading real-world throughput in the narrowest

Mesh Networks such as those often required for

MeshUltra<sup>™</sup>-X



# MeshUltra<sup>™</sup>-80 (MeshUltra<sup>™</sup>)

# Previously known simply as MeshUltra<sup>™</sup>, MeshUltra<sup>™</sup>-80 offers support for up to 80 nodes and throughputs of up to 87Mbps in a 20MHz channel. It offers good overall performance in a wide range of deployment scenarios.

# MeshUltra™ Waveform Family Comparison Table

WAVEFORM	MAX NO. OF NODES	CHANNEL BANDWIDTHS	MAX THROUGHPUT	RECOMMENDED NODE COUNT	KEY CHARACTERISTIC	TYPICAL APPLICATIONS		
MeshUltra <sup>™</sup> -M	24	1.25-20MHz	~87Mbps	2-24	Outstanding Mobility Performance	Motor Racing, Broadcasting, Unmanned, Street Level Tactical Suveillance		
MeshUltra <sup>™</sup> -X	144	1.25-5MHz	~22Mbps	25-144	Outstanding Throughput for Large Networks	Dismounted Soldier Systems, Unattended Ground Sensors, Large Drone Swarms, Voice Talkback Systems		
MeshUltra <sup>™</sup> -80	80	1.25-20MHz	~87Mbps	25-80	Balance performance and support for medium/large networks	General wideband Mesh applications		

# Higher Throughput

With channel bandwidths up to 20MHz and adaptive modulation up to 64QAM, DTC MeshUltra<sup>™</sup> waveforms support data rates of up to 87Mbps. Unlike some competitors, we specify real, usable payload data rates – not gross over the air data rate, including overheads.

SQT Value	SNR Threshold/ dB	MiMo Mesh data capacity (Mbps) for each channel bandwidth and SQT value															
			Bandwidth (MHz)														
		1.25	1.5	1.75	2.5	3	3.5	5	6	7	8	10	12	14	16	20	
6	23.1	5.6	6.7	7.9	11.2	13.5	15.7	22.4	26.9	31.4	35.9	44.9	53.3	61.7	70.2	87	
5	17.1	4.0	4.8	5.6	8.0	9.6	11.2	16.0	19.2	22.4	25.6	32.0	38.0	44.0	50.0	62.0	
4	14.1	3.1	3.7	4.3	6.2	7.4	8.6	12.3	14.8	17.2	19.7	24.6	29.2	33.8	38.4	47.6	
3	11.1	2.0	2.4	2.8	4.0	4.8	5.6	8.0	9.6	11.2	12.8	16.0	19.0	22.0	25.0	31.0	
2	8.1	1.5	1.8	2.2	3.1	3.7	4.3	6.2	7.4	8.6	9.8	12.3	14.6	16.9	19.2	23.8	
1	5.1	0.8	0.9	1.1	1.5	1.8	2.2	3.1	3.7	4.3	4.9	6.2	7.4	8.5	9.7	12.0	

SQT Value	SNR Threshold/ dB		Reduced MiMo Mesh data capacity (Mbps) for each channel bandwidth and SQT value														
			Bandwidth (MHz)														
		1.25	1.5	1.75	2.5	3	3.5	5	6	7	8	10	12	14	16	20	
6	23.1	3.0	3.6	4.2	6.0	7.2	8.3	11.9	14.3	16.7	19.1	23.9	27.5	31.2	34.8	44	
5	17.1	2.1	2.6	3.0	4.3	5.1	6.0	8.5	10.2	11.9	13.6	17.0	19.6	22.2	24.8	30.0	
4	14.1	1.6	2.0	2.3	3.3	3.9	4.6	6.5	7.8	9.2	10.5	13.1	15.0	17.0	19.0	23.8	
3	11.1	1.1	1.3	1.5	2.1	2.6	3.0	4.3	5.1	6.0	6.8	8.5	9.8	11.1	12.4	15.5	
2	8.1	0.8	1.0	1.1	1.6	2.0	2.3	3.3	3.9	4.6	5.2	6.5	7.5	8.5	9.5	11.5	
1	5.1	0.4	0.5	0.6	0.8	1.0	1.1	1.6	2.0	2.3	2.6	3.3	3.8	4.3	4.8	5.8	

MeshUltra<sup>™</sup>-X supports channel bandwidths up to 5MHz

# **Greater Spectral Efficiency**

With Auto-Adaptive Modulation up to 64QAM, MiMo transmission and DTC's unique token-based channel access mechanism, MeshUltra<sup>™</sup> works to achieve the highest possible real-world throughput from even the narrowest channels. With bandwidth options down to 1.25MHz, MeshUltra<sup>™</sup> can access spectrum in which competing Mesh systems simply will not fit.

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#### **Channel Access Mechanisms**

Most Mesh systems use "contention-based" channel access – also known as CSMA – which essentially means that radios listen to see if the channel appears to be free before transmitting their data. Contention-based access works pretty well when there is not much data traffic, but as the traffic level increases, there is a higher chance of collisions when two or more radios make a decision to transmit at the same time. The normal outcome of this is that all messages are lost and need to be sent again. This can become a self-feeding problem - the more traffic, the more chance of collisions

#### More Nodes

The DTC MeshUltra<sup>™</sup> Family supports flat, single frequency Mesh networks of up to 144 nodes in channel bandwidths as narrow as 1.25MHz. With DTC's unique token-based channel access, more nodes does not need to mean more transmission clashes. MeshUltra<sup>™</sup> also has no hard limit to the number of network hops.

#### Multiple Talk Groups

DTC is well known for its low latency Mesh talkback, facilitating crystal clear full duplex communications between multiple users. MeshUltra<sup>™</sup> waveforms add to this capability with 32 selectable talk groups to allow multiple separate conversations or hierarchical talk schemes.

#### Greater Range

Noise-optimized RF design and high performance LDPC error correction coding, together with our custom developed Tactical Mesh waveforms and automatic MiMo mode switching allows MeshUltra<sup>™</sup> to deliver DTC's longest ranges yet – up to 20% further than our previous MiMo Mesh mode.

For the longest range requirements, DTC offers a full line of Mesh hardware supporting power outputs up to 30 Watts, which together with our narrow channel bandwidth options can offer ranges previously unheard of for IP Mesh systems.

#### **Cognitive Radio Capabilities**

With Auto Adaptive Modulation and seamless automatic full MiMo to reduced MiMo switching, MeshUltra<sup>™</sup> constantly works to maintain the most robust link possible and the highest possible throughput as conditions change. DTC's optional Interference Avoidance Scheme (IAS) takes things one step further, offering true cognitive radio capabilities for the first time in a DTC radio. and the more retries are required, increasing the traffic level further and leading to yet more collisions – and so on.

DTC takes a completely different approach to channel access, based instead around the use of an access "token" which is passed around all the Mesh nodes in turn. Only when it has this token can a node transmit data, after which it passes the token on to the next node. DTC's token-based access mechanism leads to extremely efficient channel utilization and very consistent latency.

#### Interference Avoidance (IAS) Scheme

With IAS, every radio is a sensor, contributing data on local noise levels on a selection of pre-agreed frequencies. This data is brought together to drive a cognitive radio capability which can coordinate a move in frequency to avoid interference or jamming – or simply to ease in-theater frequency coordination.



#### Interlink Support

MeshUltra<sup>™</sup> waveforms include DTC's innovative Interlink functionality, allowing nodes to be bridged together across different IP bearers, even between different networks on different RF frequencies. Interlink offers support for a range of different communication options - including direct support for a variety of USB Cellular and Wi-Fi dongles.