

CODAN | DOMO TACTICAL COMMUNICATIONS

**OEM PRODUCTS**

**COFDM RF, VIDEO ENCODING**

**AND IP MESH SOLUTIONS**



[CODANCOMMS.COM](http://CODANCOMMS.COM)

## PCB DIMENSIONS

Basic Outline	Dimensions
	<b>D340</b> L 160mm W 9mm D 18mm
	<b>D330</b> L 200mm W 175mm D 30mm
	<b>D360</b> L 100mm W 65mm D 5.6mm
	<b>D1500</b> L 38mm W 26mm D 14mm
	<b>D1600</b> L 48mm W 52mm D 15mm
	<b>D196x</b> L 45mm W 49mm D 7.7mm
	<b>D1550</b> L 63mm W 38mm D 14mm
	<b>D68X</b> L 52mm W 63mm D 15mm
	<b>D1740</b> L 110mm W 67mm D 12mm
	<b>D1400</b> L 60mm W 30mm D 15mm
	<b>D15XX</b> L 26mm W 38mm D 10mm

# VIDEO FPGA BASED OEM

		SUPPORTED LICENSING																										
	Secondary capability	PCB family card	PCB family description	PCB variants	RF in base card	Associated cards	MODULATION					STANDARDS					OTHER FEATURES											
							DVB-T	2.5MHz	1.25MHz	625KHz	UMVL	MPEG-2	MPEG-4 ASP	MPEG-4 H.264	SD	HD	License exempt	ASI	4:2:0	4:2:2	Data	Chaining	Audio	IP stream	Diversity	HD to SD down conversion	Recording	Control
RECEIVERS		Decoder	D340	The D340 is a feature rich HD-capable COFDM receiver based around DTC's flagship SOL8SDR platform. It offers a multitude of interfaces including HD-SDI, HDMI and analogue video, IP Streaming, USB device support and serial connectivity. It also offers an optional upgrade to 4 Way diversity.		IF	All Down-converters	●	●	●	●						●	●	●				●	2 or 4*		●	IP and RS232 control	
		Decoder	D360	The DTC D360 PCB is a digital diversity HD video receiver PCB, designed specifically for compact mobile receiver applications. The system allows wireless digital video and audio reception in mobile, urban and NLOS scenarios.		No	Matched downconverters required, see table.	●	●	●	●													2		6MBs	IP and RS232	
		Decoder	D330	The DTC D330 PCB is a dual channel digital diversity video receiver/decoder PCB, designed specifically for professional broadcast and high-end surveillance applications up to 8 way diversity. The system allows wireless digital video and audio reception in mobile, urban and NLOS scenarios.	D331	IF	Down-converters and Tuners (D29X)	●	●	●	●													8		12MBs	IP and RS232	
TRANSMITTERS		Encoder	D1550	Based on DTC's power efficient SOL7 platform, the D1550 is our latest generation of SD COFDM Transmitters. In addition to legacy analogue interfaces, it also offers a combined SD-SDI and ASI input. Designed for easy integration and high performance, the D1550 is the first choice for mainstream SD video transmission applications.		No	Paired to 15XX Upconverters	●	●	●	●														N/A	N/A	RS232	
		Encoder	D1500	The D1500 is DTC's most compact SD COFDM transmitter and is ideal for ultra-miniature "bodywire" applications. It shares the same core technology as the D1550 and includes all of the same interfaces with the exception of SD-SDI/ASI.		No	Paired to 15XX Upconverters	●	●	●	●														N/A	N/A	RS232	
		Encoder	D1600	Ultra-miniature COFDM digital video transmitter solution, designed specifically for body-worn applications. HD/H.264 encoder offers superb image quality with the added benefit of small size, low latency and low power consumption.		No	Paired to 15XX Upconverters D1605	●	●	●	●															Via D1605	N/A	N/A

\* D340 4-way diversity requires additional tuner card D299-OEM

## SOL8SDR-M

The 'Blucore OEM' Software Defined Radio transceiver offers 2x100mW output power in a small, ruggedized package. It is particularly suited for concealment and for small drone platforms. And it comes with two USB interfaces for external devices, including cameras, headsets, and cellular dongles.

### FREQUENCY

MODEL	FREQUENCY
120170	1.2 - 1.70GHz
167235	1.67 - 2.35GHz
210250	2.10 - 2.50GHz



## SOL8SDR2X1W-U - SINGLE BOARD FOR UXV

The SOL8SDR2x1W-U is a compact single-board Software Defined Radio Transceiver with 2x1W RF output power. Leveraging DTC's industry-leading MesUltraTM MANET Mesh waveform and also capable of operating as a unidirectional COFDM Transmitter or Receiver, the SOL8SDR2x1W-U is ideally suited for integration into long range UxV applications.

The SOL8SDR2x1W-U also includes a rich set of interface options including Ethernet, serial and dual USB as well as an on-board headset audio interface.

### FREQUENCY

MODEL	FREQUENCY
114150	1.14 - 1.50GHz
*167235	1.67 - 2.35GHz
198270	1.98 - 2.70GHz
440500	4.40 - 5.00GHz



## D196X-OEM

The D196x-OEM PCB is an ultra-miniature COFDM digital video transceiver from DTC, designed for weight, power and cost sensitive applications. It is particularly suited to use on swarming drones and other short to medium range robotics applications.

### FREQUENCY

MODEL	FREQUENCY
D1965-OEM	1.2 - 1.70GHz
D1967-OEM	1.67 - 2.35GHz
D1966-OEM	2.10 - 2.50GHz

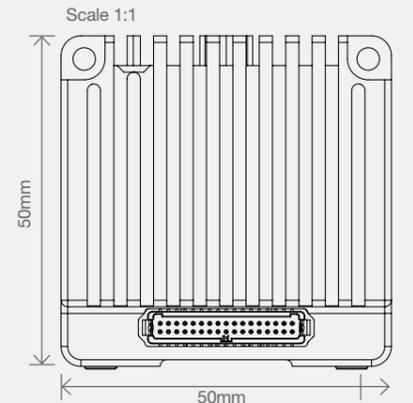


## SOL8SDRC - FLEXIBLE OEM CONCEPT

This unit is supplied with simple to use connectors and interfaces, making OEM integration easier on the new SDR platform. The SOL8SDR Concealment with built-in Narrowband Telemetry can operate as a Transmitter, Receiver, Dual HD Video Encoder, Standard IP Mesh and MiMo IP Mesh and offers rich interfacing options.

### SDR FREQUENCY BANDS

MODEL	FREQUENCY
039091	320 - 470MHz + 915MHz
132043	1.14 - 1.50GHz + 433MHz Telemetry
132086	1.14 - 1.50GHz + 868MHz Telemetry
201043	1.67 - 2.35GHz + 433MHz Telemetry
201086	1.67 - 2.35GHz + 868MHz Telemetry
201091	1.67 - 2.35GHz + 915MHz Telemetry
234043	1.98 - 2.70GHz + 433MHz Telemetry
234086	1.98 - 2.70GHz + 868MHz Telemetry
234091	1.98 - 2.70GHz + 915MHz Telemetry
470043	4.40 - 5.00GHz + 433MHz Telemetry
470086	4.40 - 5.00GHz + 868MHz Telemetry
470091	4.40 - 5.00GHz + 915MHz Telemetry
575091	5.50 - 6.00GHz + 915MHz Telemetry



## MATCHED DOWNCONVERTERS D360 RECEIVERS

BASE PCB	FREQUENCY
D674	150 – 850MHz
D681	1000 – 1500MHz
D682	1650 – 2300MHz
D683	2100 – 2500MHz
D685	3100 – 3700MHz
D688	4400 – 5000MHz
D690	5500 – 6000MHz

## DOWNCONVERTERS FOR IF RECEIVERS

BASE PCB	FREQUENCY	ADDITIONAL FEATURES
D1401	1000 – 1500MHz	Hi/Lo Switch <sup>Δ</sup>
D1402	1600 – 2025MHz	Hi/Lo Switch <sup>Δ</sup>
D1403	2025 – 2555MHz	Hi/Lo Switch <sup>Δ</sup>
D1404	1980 – 2700MHz	Hi/Lo Switch <sup>Δ</sup>
D1405	3100 – 3600MHz	Hi/Lo Switch <sup>Δ</sup>
D1408	4400 – 5000MHz	Hi/Lo Switch <sup>Δ*</sup>
D1410	5500 – 6000MHz	Hi/Lo Switch <sup>Δ</sup>
D1412	6400 – 7000MHz	Hi/Lo Switch <sup>Δ</sup>
D1413	7000 – 7500MHz	Hi/Lo Switch <sup>Δ</sup>
D1415	8100 – 8600MHz	Hi/Lo Switch <sup>Δ</sup>

Δ for short and long cable runs

## UPCONVERTERS FOR TRANSMITTERS

BASE PCB	FREQUENCY	ASSOCIATED CARD
D1510	200 – 300MHz	D1500/D1550/D1600
D1512	300 – 470MHz	D1500/D1550/D1600
D1513	450 – 600MHz	D1500/D1550/D1600
D1515	1000 – 1500MHz	D1500/D1550/D1600
D1516	1650 – 2400MHz	D1500/D1550/D1600
D1517	1980 – 2700MHz	D1500/D1550/D1600
D1520	3000 – 3700MHz	D1500/D1550/D1600
D1525	5500 – 6000MHz	D1500/D1550/D1600
D1527	6400 – 7000MHz	D1500/D1550/D1600
D1528	7000 – 7500MHz	D1500/D1550/D1600
D1530	8100 – 8900MHz	D1500/D1550/D1600
D1540	4400 – 5000MHz	D1500/D1550/D1600

All DTC OEM products are supplied with comprehensive integration documents and customer support helpline details.

## SINGLE CARD MESH WITH INTEGRAL RF - P4

	PCB FAMILY CARD	PRODUCT DESCRIPTION	FREQUENCY BAND
	D1703	Single card Mesh	450 – 600MHz
	D1705	Single card Mesh	1140 – 1500MHz
	D1707	Single card Mesh	1980 – 2550MHz
	D1713	Single card Mesh	4400 – 5000MHz
	D1702	Single card Mesh	320 – 470MHz

Other frequencies are available on request.

## IP MESH - NETNODE PHASE 5

	PCB FAMILY CARD	PRODUCT DESCRIPTION	MATCHING BASEBAND CARD	FREQUENCY BAND
	D1740	MiMo Mesh baseboard		Baseband board requires 2 RF boards
	D1741 <sup>◇</sup>	1 x TX, 2 x RX RF Card	D1740	1.98 – 2.55GHz
	D1744 <sup>◇</sup>	1 x TX, 2 x RX RF Card	D1740	320 – 470MHz
	D1747 <sup>◇</sup>	1 x TX, 2 x RX RF Card	D1740	1.20 – 1.70GHz
	D1748 <sup>◇</sup>	1 x TX, 2 x RX RF Card	D1740	1.65 – 2.40GHz
	D1755 <sup>◇</sup>	1 x TX, 2 x RX RF Card	D1740	4.40 – 5.00GHz

◇ Two identical RF cards are required for each D1740 baseband card

## AMPLIFIERS

POWER	1W	2 X 1W	2W	5W
				
TDD support	No	Yes	Yes	Yes
Bypass path	No	Yes	Optional	Yes
Type	End user	OEM Housing	OEM Housing	OEM Housing
Designator	SOL7NAMP	AMP2x1W	AMP2W	AMP5W
FREQUENCY BAND				
150 – 170MHz	Yes	No	No	No
300 – 420MHz	Yes	No	No	No
320 – 470MHz	No	Yes	Yes	No
1.00 – 1.50GHz	Yes	No	No	No
1.00 – 1.70GHz	No	Yes	No	No
1.20 – 1.70GHz	No	No	Yes	Yes
1.65-2.30GHz	No	No	No	Yes
1.65 – 2.40GHz	Yes	Yes	Yes	No
1.98-2.55GHz	No	No	No	Yes
1.98 – 2.70GHz	Yes	Yes	Yes	No
4.40 – 5.00GHz	No	Yes	Yes	Yes

DTC provides a range of 1W, 2x1W, 2W and 5W COFDM amplifiers covering most frequency bands and offering outstanding performance and efficiency. Most amplifiers have TDD support for Mesh applications and some versions are available with an RX bypass path and preamplifier for use with the SOL8SDR.



## MESHULTRA™ TACTICAL COFDM IP MESH WAVEFORM

### 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.

Now, DTC MeshUltra™ offers our most capable and flexible Mesh yet.

### HIGHER THROUGHPUT

With channel bandwidths up to 20MHz and adaptive modulation up to 64QAM, DTC MeshUltra™ supports 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	

### GREATER SPECTRAL EFFICIENCY

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



# USEFUL LICENSE ABBREVIATIONS EXPLAINED

ABBREVIATION	DESCRIPTION
AES	Advanced Encryption Standard (AES) is a specification for the encryption of electronic data established by the U.S. National Institute of Standards and Technology. DTC offers two different AES key lengths: 128 and 256 bits. AES 256 uses double the ASCII hexadecimal characters of 128 and is therefore stronger.
ASI	Asynchronous Serial Interface, or ASI, is a streaming data format which often carries an MPEG Transport Stream. Mostly used by engineers and broadcasters.
Chaining	The DTC term for multiplexing and de-multiplexing video streams into a single RF bearer. The interface is used to connect encoders of one board type to modulators of another board type, i.e. TX to TX, TX to RX, TX to Ethernet.
COFDM	COFDM is a modulation scheme that divides a single digital signal across multiple signal carriers simultaneously. The signals are sent at right angles to each other (hence, orthogonal) so they do not interfere with each other.
DVB-T	DVB-T is an abbreviation for "Digital Video Broadcasting — Terrestrial"; it is the DVB European-based consortium standard for the broadcast transmission of digital terrestrial television. This system transmits compressed digital audio, digital video and other data in an MPEG transport stream, using COFDM.
Genlock	Genlock (generator locking) is a common technique where the video output of one source, or a specific reference signal from a signal generator, is used to synchronize other television picture sources together. Generally 'broadcast use' only to manage different video feed latency.
H.264	H.264 or MPEG-4 Part 10, Advanced Video Coding (MPEG-4 AVC) is a video compression format that is currently one of the most commonly used formats for the recording, compression, and distribution of video content. The H.264 standard and the MPEG-4 AVC standard (formally, (MPEG-4 Part 10, Advanced Video Coding) are jointly maintained so that they have identical technical content.
HD	HD High-definition video is video of higher resolution and quality than standard-definition. While there is no standardized meaning for high-definition, generally any video image with more than 480 horizontal lines (North America) or 576 lines (Europe) is considered high-definition. 720 scan lines is generally the minimum however DTC HD greatly exceeds that i.e 1080P. HD typical provides about 5 times the number of pixels of SD.
HDMI	HDMI (High-Definition Multimedia Interface) is a proprietary audio/video interface for transferring uncompressed video data and compressed or uncompressed digital audio data from an HDMI-compliant source device, and in this context from a camera to a compatible radio device.
IP Streaming	IP streaming refers to video content delivered live over an IP Network, requires a form of source media (e.g. a video camera), an encoder to digitize the content, a media publisher, a content delivery network to distribute and deliver the content and a decoder to view the content.
MPEG-4	MPEG-4 is a method of defining compression of audio and visual (AV) digital data. MPEG-4 absorbs many of the features of MPEG-2 and other related standards. MPEG-4 is still an evolving standard and the key parts to be aware of are MPEG-4 Part 2 (including Advanced Simple Profile) and MPEG-4 part 10 (MPEG-4 AVC/H.264).
Narrowband	Proprietary Narrowband (2.5, 1.25MHz and 625kHz). Spectrally efficient transmission modes. These are DTC's key differentiators. See Bandwidth versus instance table in the Video Product Guide for the benefits.
SD	SD Standard-definition is a television system that uses a resolution that is not considered to be high-definition television (1080i, 1080p).The two common SD signal types are 576i, (576 interlaced lines of resolution), derived from the European-developed PAL and 480i based on the American National Television System Committee NTSC system.
SDI	Serial digital interface (SDI) is a family of digital video interface standards for broadcast grade video. Initially developed for Standard Definition SD additional standards have been subsequently added for HD known as HD-SDI. These standards are used for transmission of uncompressed, unencrypted digital video signals (optionally including embedded audio and time code) within television facilities; they can also be used for packetized data.
UMVL	UMVL- Ultra Mobile Video Link. UMVL is a mix of technologies between DVBT and Narrowband. It is optimized for use in high speed mobile environments (like car racing for example). UMVL is also excellent when you are using high frequency (4GHz and above) transmissions.

## FREQUENTLY ASKED QUESTIONS

Are there restrictions on purchasing OEM products?	DTC makes available OEM products to a variety of markets and organisations. This is usually to support integration into larger solutions or working with partners who have local regulatory experience. There are some limitations due to export control or commercial considerations.
What will we get in technical support?	Each OEM sale is supported with comprehensive integration documents, however the customer will need the necessary engineering experience to integrate this into a solution. Additional engineering support is available and is agreed upon at the point of sale, i.e. training courses, phone support, new engineering features, etc.
Can I manufacture my own boards and just purchase a license?	Invariably, the volume purchase benefits of PCB manufacture will make it cost-effective to purchase from DTC. For very high volumes, license and technology transfer packages are available on some products.
What is the most economical way to buy?	High volume production runs will generate price reductions through manufacturing efficiency and DTC passes these benefits onto customers who place larger single orders. There may be benefits of buying unlicensed PCBs in volume at lower prices and adding licensing later at an additional cost. We would be pleased to discuss the options that gives you the best value and fit for your business model.

## OEM PRODUCTS

# SOLUTIONS FOR TECHNOLOGY YOU CAN TRUST AT THE HEART OF YOUR PRODUCTS

## DTC - OEM PRODUCTS FOR THE PROFESSIONAL

Established in 2001, DTC's COFDM Video and Wireless IP Mesh radio business is widely recognised as the global leader, selling into over 110 countries. DTC continues to develop these technologies, combining innovation and ingenuity with reliability and robust performance.

### VERSATILE TECHNOLOGY

DTC's ongoing investment in research and development, combined with an award-winning engineering team, ensures that we remain at the cutting-edge of new wireless video and MANET IP Mesh radio technology. DTC is known for its unique development approach, building integrated teams with vast expertise from video encoding/ decoding to COFDM (Coded Orthogonal Frequency Division Multiplex) while leveraging the flexibility that FPGA-based platforms offer developers.

DTC's technology is particularly suited to supporting solutions in unmanned ground vehicles, unmanned aerial vehicles, security, surveillance, safe cities and remote control applications.

### SPECIAL DEVELOPMENTS

Most solutions can be derived from existing standard software and hardware capabilities. However, DTC can also offer specific development solutions where appropriate. These become especially attractive when the one-off costs are amortised over larger production runs.

### ENCODER / DECODER STANDARDS

DTC supports industry video standards such as MPEG4 (H.264) and DVB-T in addition to proprietary modulation for range extension and improved Non-Line-of-Sight (NLOS) performance. If a customer already has an in-house encode or decode solution, DTC will investigate compatibility with company standard encoder/decoder and can support optimization studies, including the reduction of latency. DTC ensures that all video products can be decoded by the market-leading COTS video viewing platforms as part of the standard product development. Products can also be integrated into large solutions adopting encoder/decoder or RF element.

### IP MESH TECHNOLOGIES

DTC's fluid self-forming, self-healing MANET wireless IP Mesh solutions are widely adopted in many applications, including Law Enforcement, Military Radios, Safe Cities and Natural Resources. DTC's Phase 4 Mesh is an attractive solution for 'data only' requirements as it offers class-leading Non-Line-of-Sight penetration and range; maintains bandwidths to support multiple high-quality video (typically up to 16Mbs); automatically adjusts for short and long range applications and has proven network management software. Phase 5 MiMo Mesh and SOL8SDR offers the same benefits together with industry leading data rates and dual on-board HD video encoding capability.

### ALWAYS SECURE

All DTC radios are available with embedded encryption standards that offer a basic commercial encryption and then increases in strength to AES 256. This may be subject to export control. If special encryption standards or external encryption needs to be considered, the DTC technical team will assist with the necessary integration.

### LEADING THE WAY

Whether the customer is purchasing existing products or taking part in initial design and development discussions on new projects, DTC's team is fully committed to ensuring all products and solutions are delivered on time and to budget, managing every aspect from new product launches to through-life service, obsolescence and support agreements.

With customers in over 110 countries and tens of thousands of units in service, DTC continues to lead the way, working in partnership with key customers to deliver best-in-class products and solutions.

### A WIDE RANGE OF SOLUTIONS

DTC OEM COFDM video and wireless COFDM IP Mesh products offer a huge range of options for wireless connectivity and wireless digital video transmission. Solutions are available for point-to-point, point-to-multipoint and multipoint-to-multipoint applications and for both unidirectional and bidirectional links. Utilising industry standard, MPEG-4 (H.264) video compression along with DVB-T and proprietary narrowband COFDM waveforms, DTC's digital composite (SD) and HD video performance is leading the way in both the surveillance and broadcast industries, whilst our IP Mesh products have repeatedly demonstrated longer range, higher real-world data rate and superior robustness to competing products.

### AWARD-WINNING

DTC also recognizes that, for some customers, basic standards are not enough and that they require industry-specific enhancements. Therefore, narrowband, ultra-narrowband, ultra-low delay and other optional software improvements have been developed to ensure the customer always has the right tools to complete their tasks. This attention to detail is why DTC has been recognized on two occasions, winning The Queen's Award for both Innovation and Export.

# OUR PROCESS

Solving challenging requirements is what we do best



## ASSESS

Our technical consultants will conduct a detailed on-the-ground assessment of:

- Human needs
- Operational environment
- Opportunities and challenges
- Cultural context
- Scenario planning



## DESIGN

Our field service team will then design a custom solution for those challenges, using the right hardware and software from Codan or one of our technology partners.



## DEPLOY

Our specialist logistics team gets the hardware and the resources to wherever you are, getting your system up and running fast.



## TRAIN

We'll train operators and communications staff on how to use the system – which will be a short process, thanks to our easy-to-use interfaces and interoperability.



## SUPPORT

We're available to be deployed within 24 hours for any support required. And we're always on hand for any advice you require.