COBHAM

Cobham Surveillance

COFDM - Video, Audio Telemetry and IP Products

# Product Catalogue

Issue 3 - May 2010

# Contents



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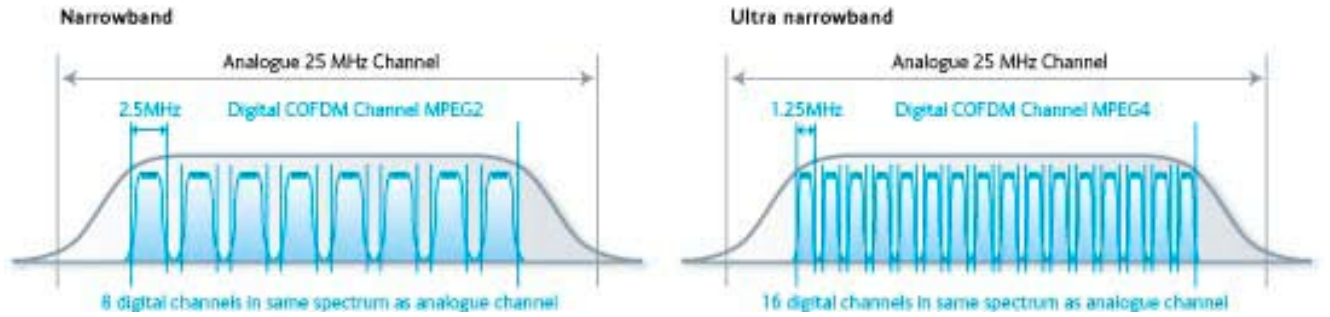
# CS COFDM Digital Video Products




Cobham Surveillance has introduced a new family of COFDM (Coded Orthogonal Frequency Division Multiplexed) digital video products called SOLO, with domo technology at their core. These products support narrowband (1.25MHz and 2.5MHz) and full DVB-T compliant (6, 7, or 8MHz) channelisation. This line has specifically been developed for worldwide customers in the law enforcement and military markets, and for the manufacturers of Unmanned Ground Vehicles (UGV)and Unmanned Aerial Vehicles (UAV)who support their missions.

Digital technology has made rapid advancements in key areas over the past few years. Notably the size, weight, power consumption and cost have dropped by about 30% per year. Cobham now offers digital systems that represent good value to users and are a better fit for operational requirements than analogue systems. It also develops specific implementations of COFDM technology for the public safety and military markets.

Cobham Surveillance is committed to working with customers on developing products that meet specific needs, and invites you to discuss your requirements with its team.

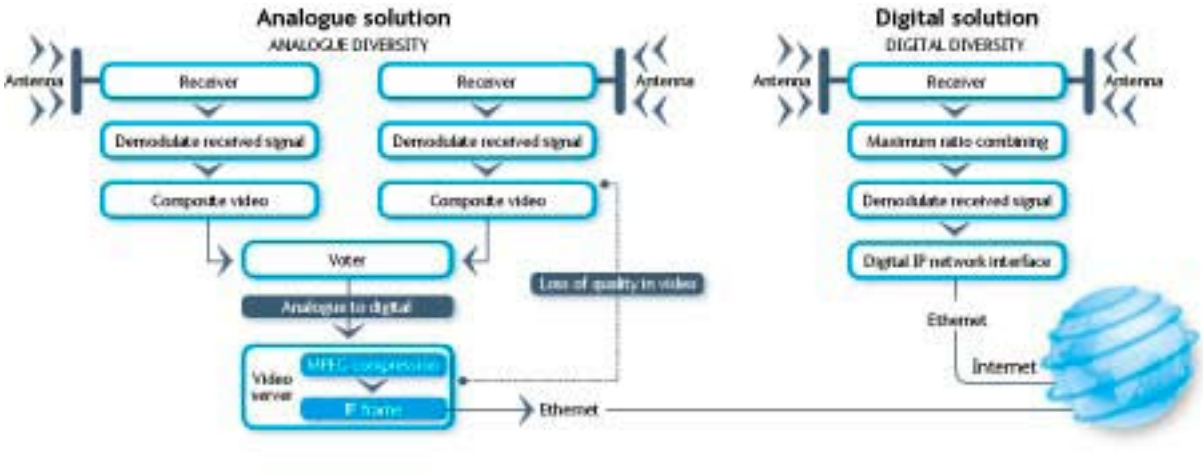
## The benefits of digital transmission

The migration from analogue microwave systems to digital transmission offers several key benefits to users:

**Better Performance -** By using digital modulation and compression techniques, digital microwave provides superior performance in non-line of sight and high multipath applications. Unmanned Ground Vehicles operating in buildings or urban environments, as well as low flying Unmanned Aerial Vehicles, will be able to transmit dramatically clearer video with less break up to remote receive stations. Covert surveillance cameras no longer need to have a clear line of sight to the receive location to have good picture quality. Unlike analogue, digital video picture quality is noise free regardless of distance

- **Efficient Spectrum Utilisation -** Digital video systems operate in a fraction of the spectrum utilised by typical analogue transmitters, offering up to 8 digital video streams in the spectrum previously used to transmit a single analogue channel. Cobham SOLO products support 1.25MHz or 2.5MHz channels in the narrowband configuration or 6-8MHz channels in the full DVB-T compliant configuration. This compares to up to 25MHz for a typical analogue channel. In addition, digital channels can be located adjacent to each other without a guard interval. Analogue systems tend to bleed over their allotted spectrum, requiring several Megahertz of separation between channels at a minimum.

  As regulatory agencies worldwide reallocate spectrum, it's clear that digital transmission enables more users to co-locate channels in an increasingly crowded RF spectrum.
- **Secure Transmission Using Encryption -** Digital transmission enables the secure transmission of video by using AES128 or 256 bit encryption. There is no penalty to the user in terms of performance. Analogue systems don't offer this capability as a feature. Analogue "cut and rotate" encryption modules are expensive, often doubling the price of a system, and not nearly as effective in securing the video data stream. In addition, they add to the size of both the transmitter and the receiver. Digital offers true encryption with no additional size penalty. In the case of the Cobham receiver, AES encryption can be carried on over the IP network
- **Set up for Internet Access -** Many customers are looking at how to access their video from anywhere, at any time, over the internet. Digital transmission makes it easier to send data over the internet, avoiding the need for a separate analogue-to-digital conversion. Cobham receivers have been designed to offer internet connectivity by means of an optional TCP/IP Ethernet network interface, accessed via a convenient RJ45 connection.




How does SOLO technology work?

The basic video source used in Cobham Surveillance products is your current stock of cameras and lenses with a PAL or NTSC output. The SOLO product range has been designed to make use of many common connectors, user interfaces and mounting patterns found on your analogue products, helping to minimise your investment in transitioning to Cobham digital.

It's helpful to think of the transmitter and receiver in three distinct steps:

- The first step is the conversion of your analogue camera's output to a digital, compressed signal consisting of "1s" and "0s", your digital data stream. Cobham has chosen to use the MPEG2 and MPEG4 standard, which is mature and well defined
- The next step is to optionally encrypt the data using AES, and then modulate the data and prepare it for RF transmission. COFDM utilises significant redundancy, producing excellent results in high-multipath environments
- The data is duplicated many times during interleaving process. Because of the interleaving and redundancy the information is presented in different carriers or even within different frames. If one carrier is corrupted, it has little impact on video quality, as the data is repeated on another carrier. This provides the robustness in the system. Digital Signal Processing on the receive side is able to recombine all this data into a single video stream.

In the SOLO product range, you have the option of narrowband transmission at 1.25MHz or 2.5MHz channelisation, or wideband transmission, at 6, 7, or 8MHz per channel.

In the narrowband configuration, approximately 400 carriers are used, versus about 2000 in the wideband configuration. A major benefit of using the 400 carriers, is that fewer carriers give you more power per carrier, which extends the coverage area. 1.25MHz and 2.5MHz are inherently lower noise due to a narrower bandwidth. Although fewer carriers are more susceptible to multipath, this is negated by the full time spatial maximum ratio combining technology that is used. The second benefit simplifies the RF front end design where phase noise is easier to manage.

In testing, the narrower channelisation is often found to be the best mode of operation, in particular when transmitters are within close proximity to each other.

# SOLO – Applications

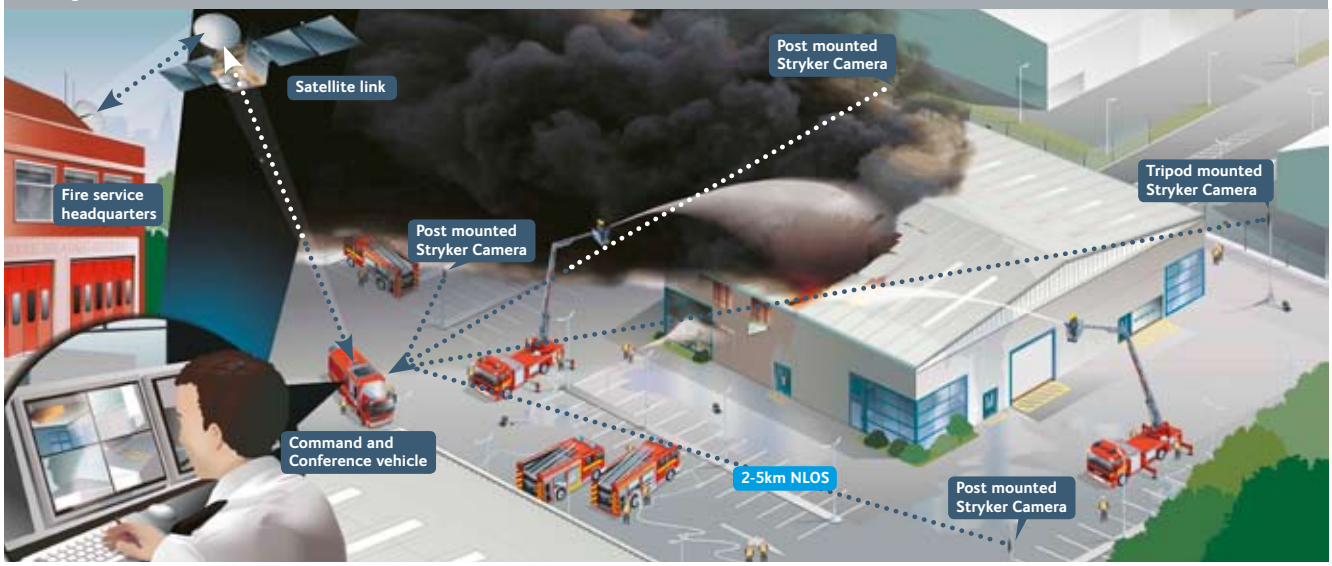
Cobham Surveillance is a leading designer of communication technologies in the field of digital wireless, video, audio, telemetry and IP.

It is expert in taking complex technology and developing it into simple-to-operate, robust solutions with domo technology at their core. System components are designed specifically to integrate easily into personnel and ground vehicle based applications, but are versatile enough to use in robotic and airborne platforms too.

This in-built flexibility means that solutions can meet customer requirements in a vast range of fields, helping military, law enforcement and emergency response personnel to handle extremely demanding scenarios.

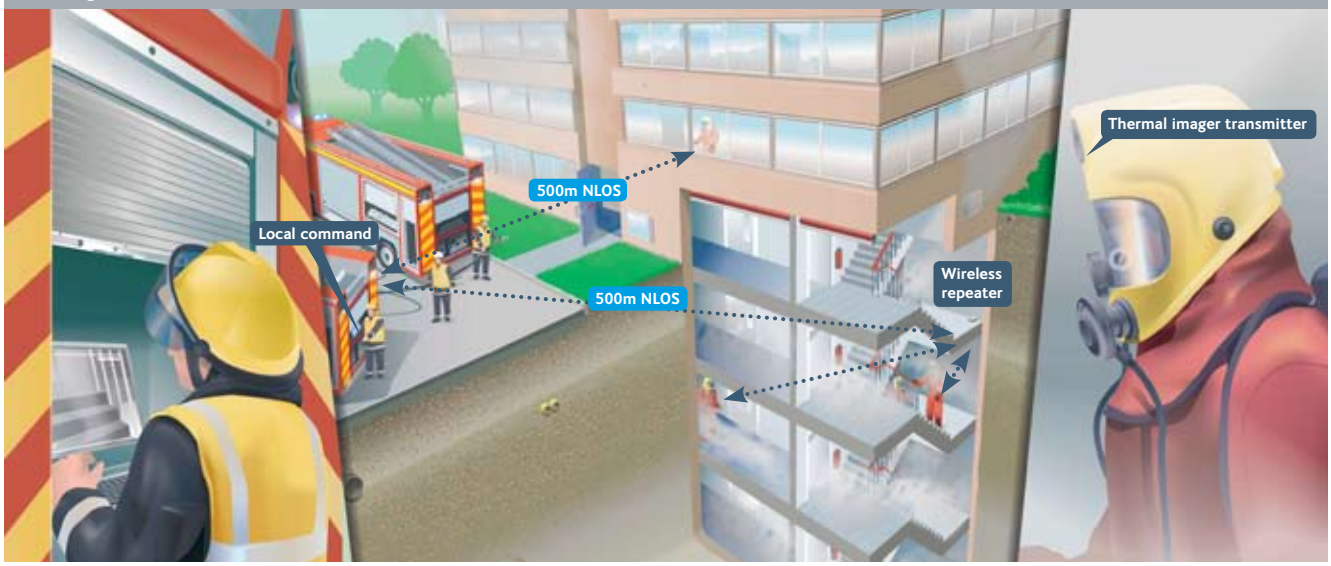
Cobham's team of dedicated engineers has particular expertise in digital video processing, digital modulation schemes and IP interfacing. Here are just a few of the scenarios that Cobham Surveillance solutions are used for.

Fire-ground Solution



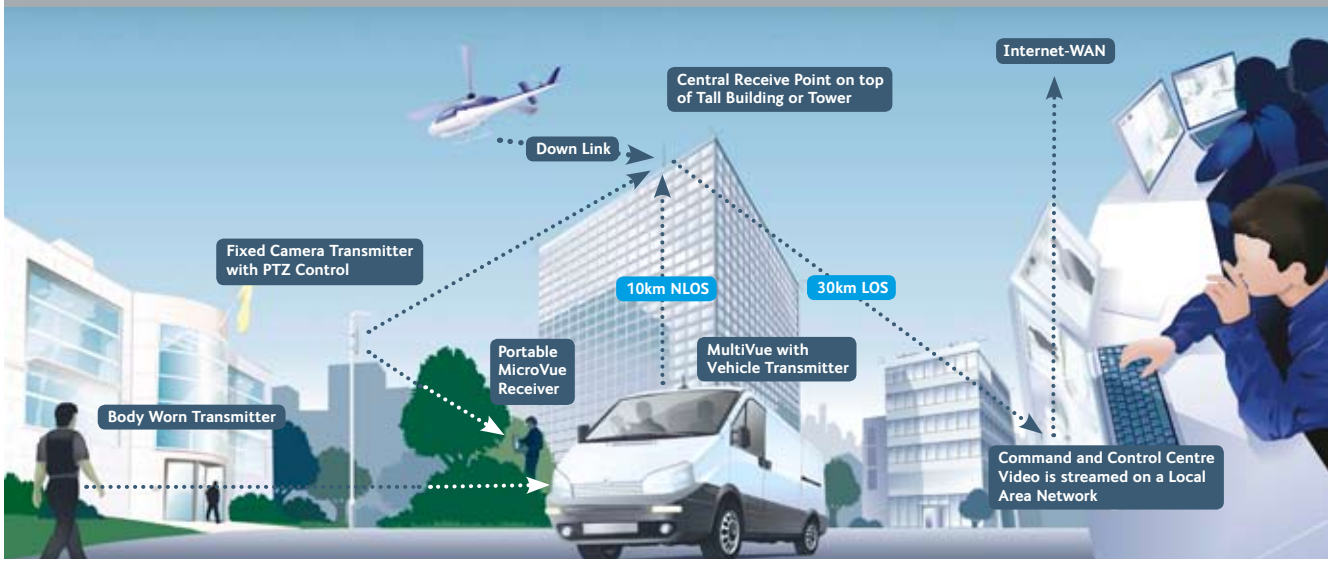

With four rapid deployment PTZ cameras placed around the fire-ground, the situation can be fully assessed and controlled by both on-scene commanders and those monitoring from headquarters.

Underground Fire



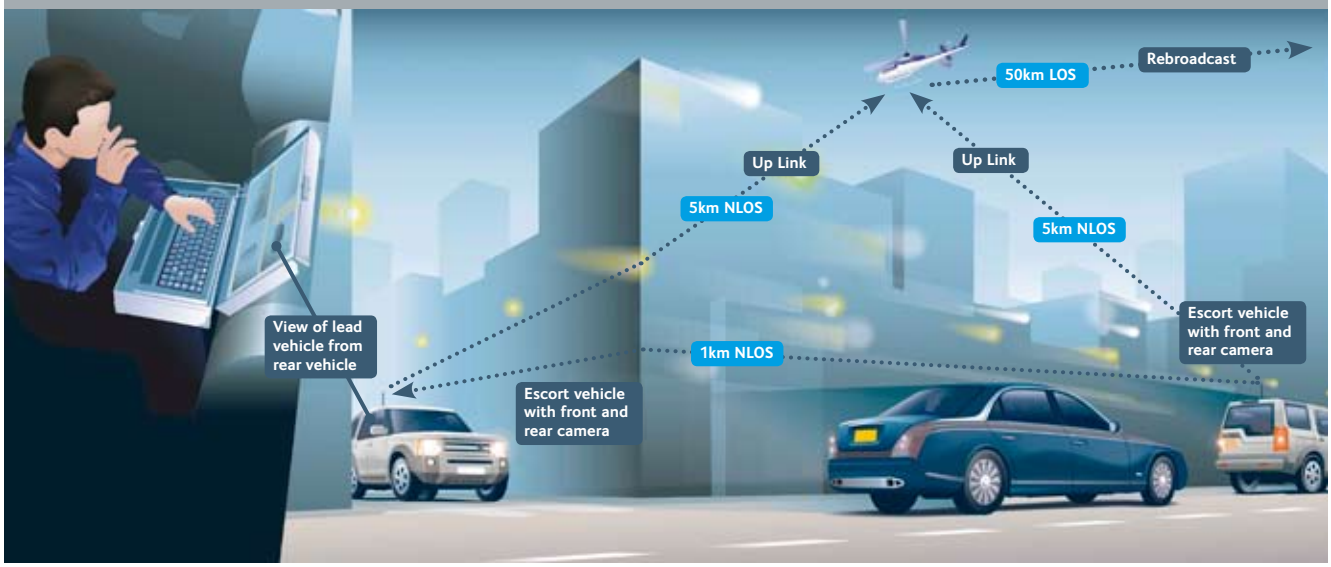

Cobham technology enables communication with firefighters even below-ground, as well as transmission of images.

## Urban




In a busy urban environment, communications from fixed and mobile sources are monitored by a central command centre.

## Protection




A convoy in an urban environment continuously transmits video and location data to HQ, using receive sites along the route.

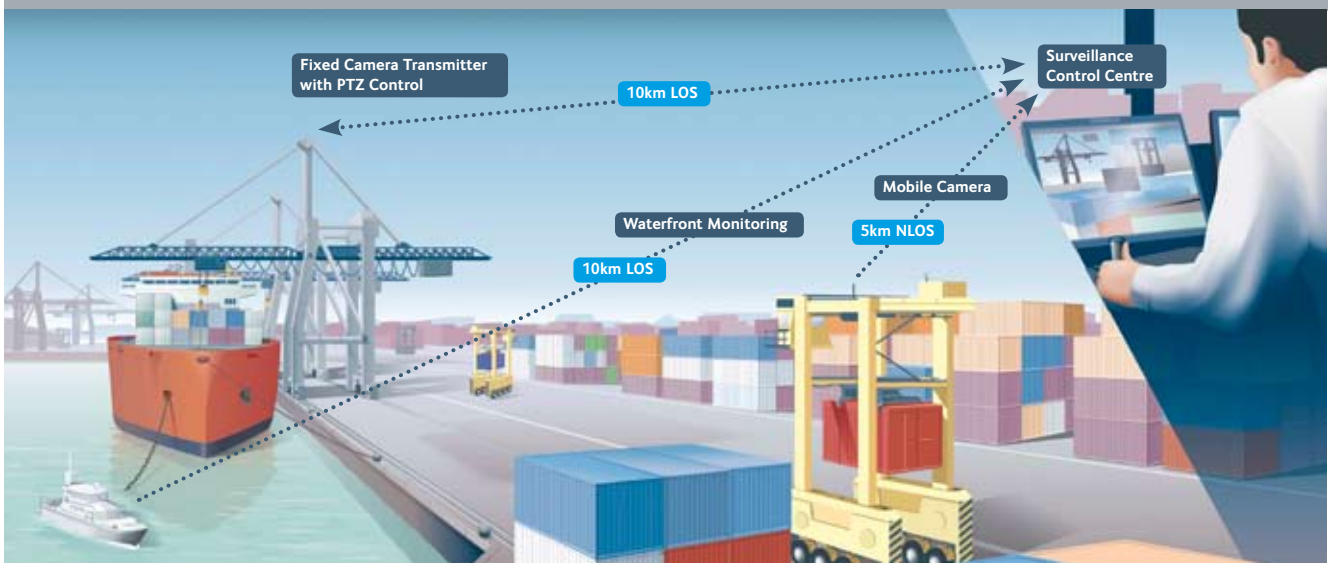
## Community Security


Local communities feel safer with video monitoring.

## Harbour Master / Ports

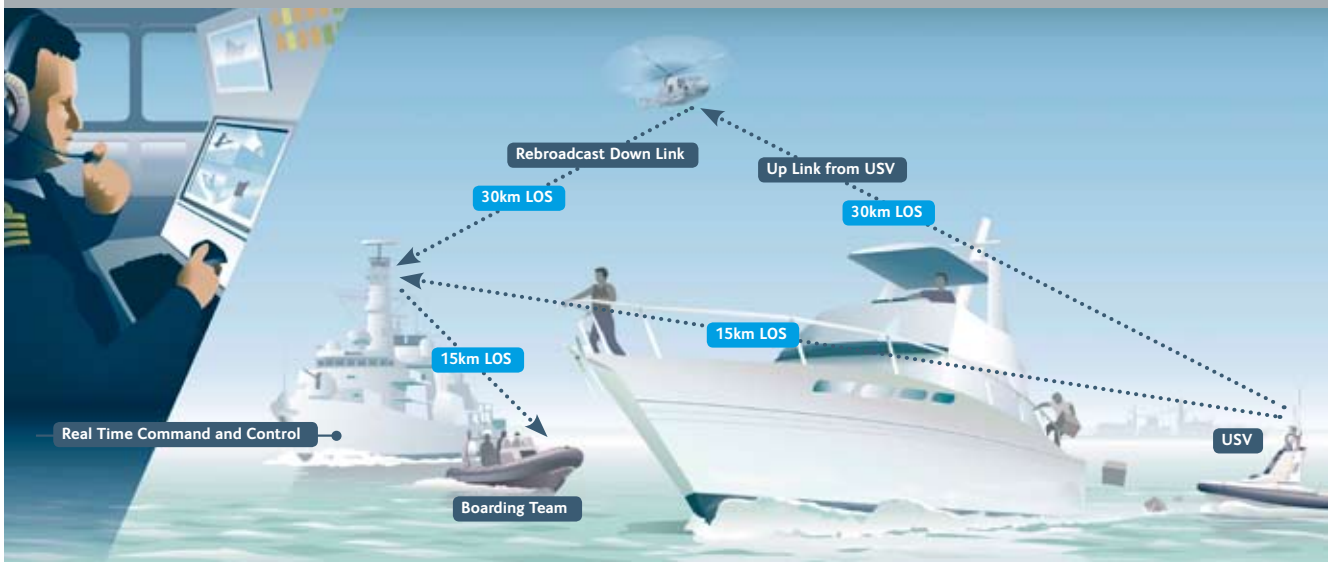

COFDM video has excellent characteristics over water, enabling live video monitoring of vessels for port and harbour shore-based facilities.

## Ports




Vital transport infrastructure is monitored against terrorism, theft and illegal immigration.

## Maritime




Law enforcement at sea is aided by video and audio communication links from Cobham Surveillance.

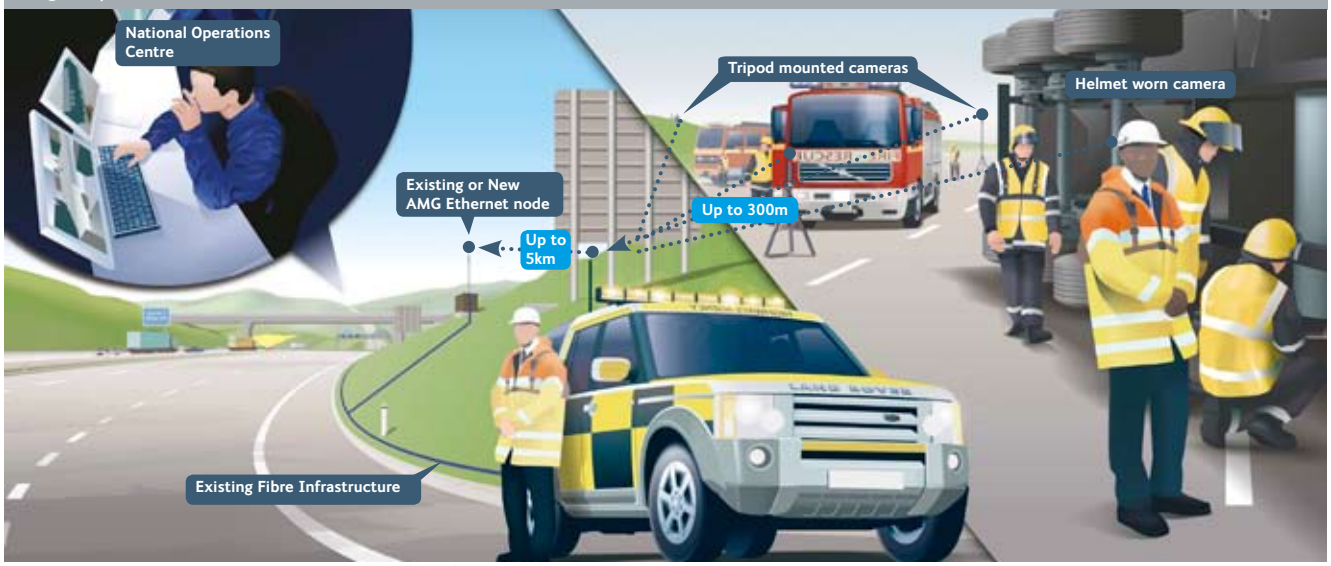
## Fire


Real-time data from a fire scene aids decision-making on the ground and back at HQ.

## First Responder

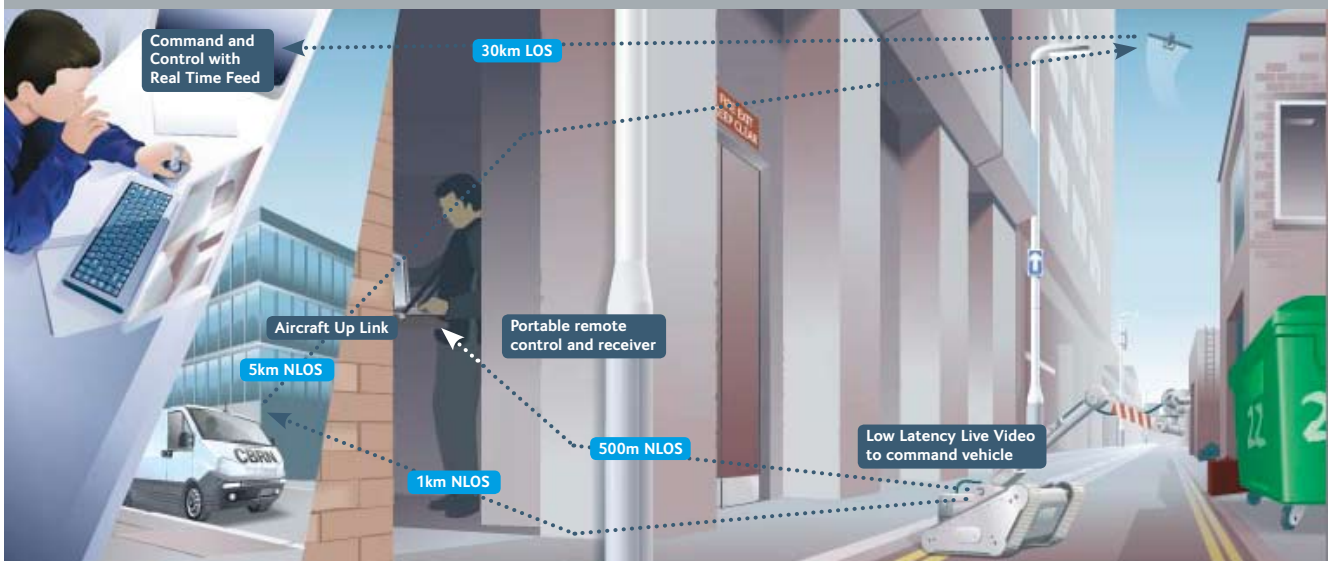

Live pictures transmitted from the ambulance in transit allow the hospital to prepare for admission and treatment.

## Highways



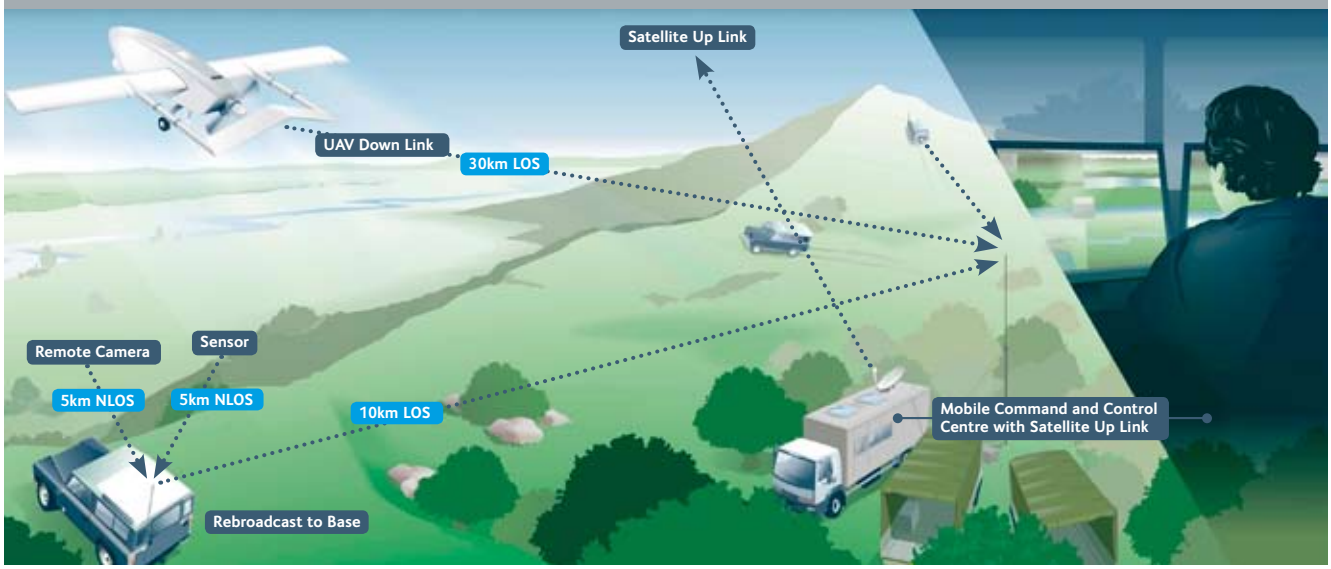

Helping to keep motorways and key routes free-flowing with up-to-the-minute accident monitoring.

## Robotic



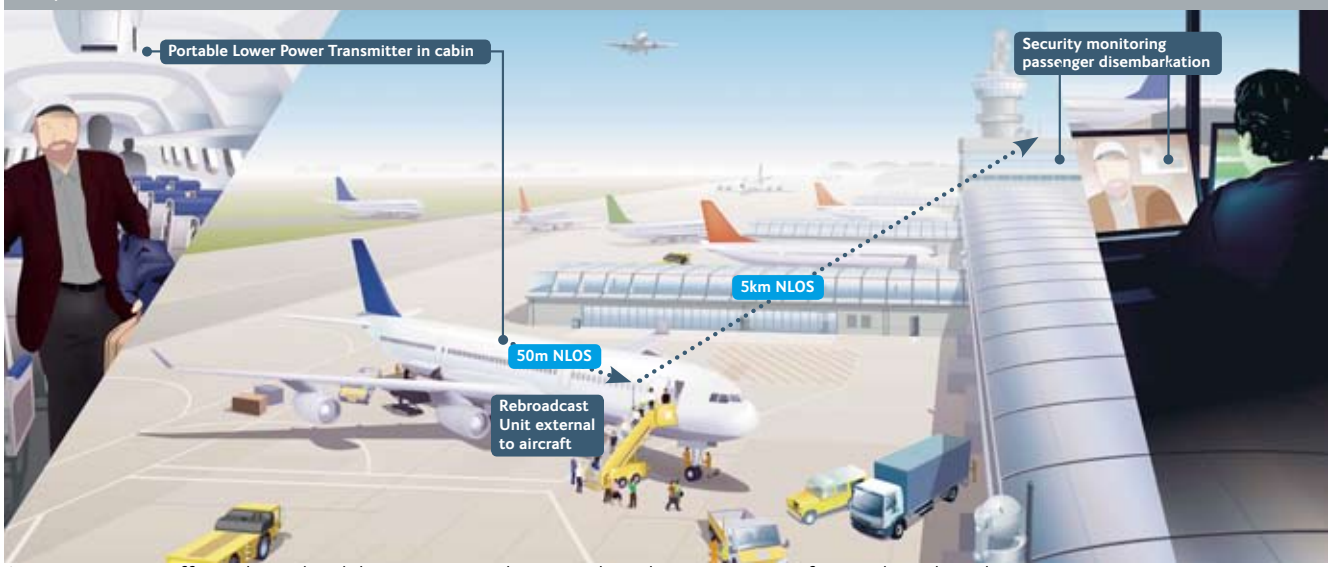

Robots can be controlled, non line of sight, to transmit video from situations hazardous to humans.

## Land / ISR



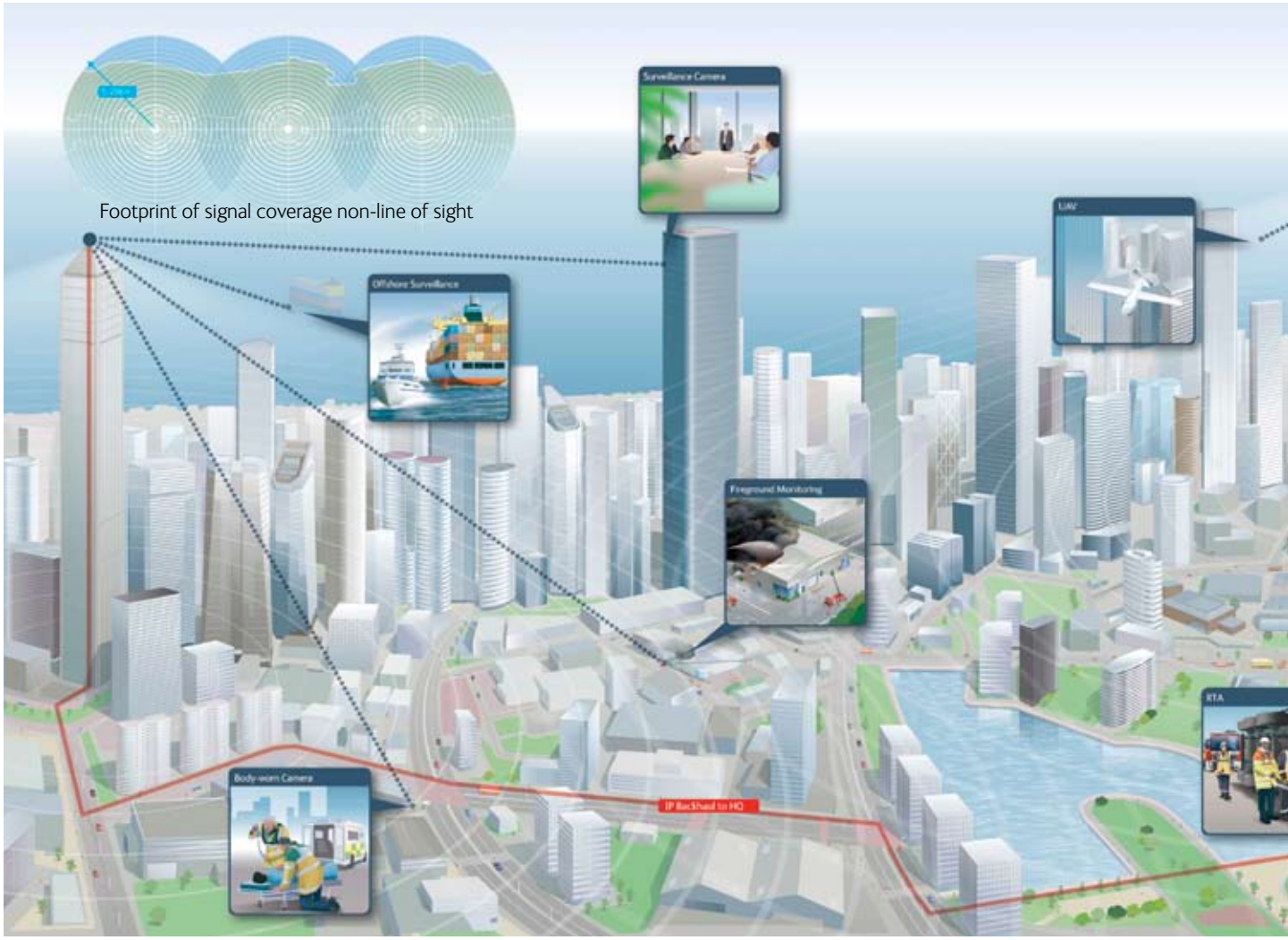

Multiple sensors and aerial surveillance give border security capability and enable remote monitoring at Headquarters via Satellite.

## Airport




Airport security staff now have the ability to monitor threats on board stationary aircraft via video rebroadcast.

# Urban Infrastructures




Cobham Surveillance (domo Products) are leading designers of communication technologies in the field of digital wireless, video, audio, telemetry and IP.

The unique capability of their solutions to transmit and receive information in difficult electronic environments on land, sea and air is in high demand.

An entire city can be covered by COFDM video and IP solutions, enabling government and law enforcement authorities to protect citizens, keep transport infrastructure running smoothly and combat major crime, terrorism and drug trafficking.

With high powered receivers mounted at strategic elevated positions, video and audio information can be transmitted to local and central monitoring points, using Cobham's non-line of sight digital wireless transmission technology.

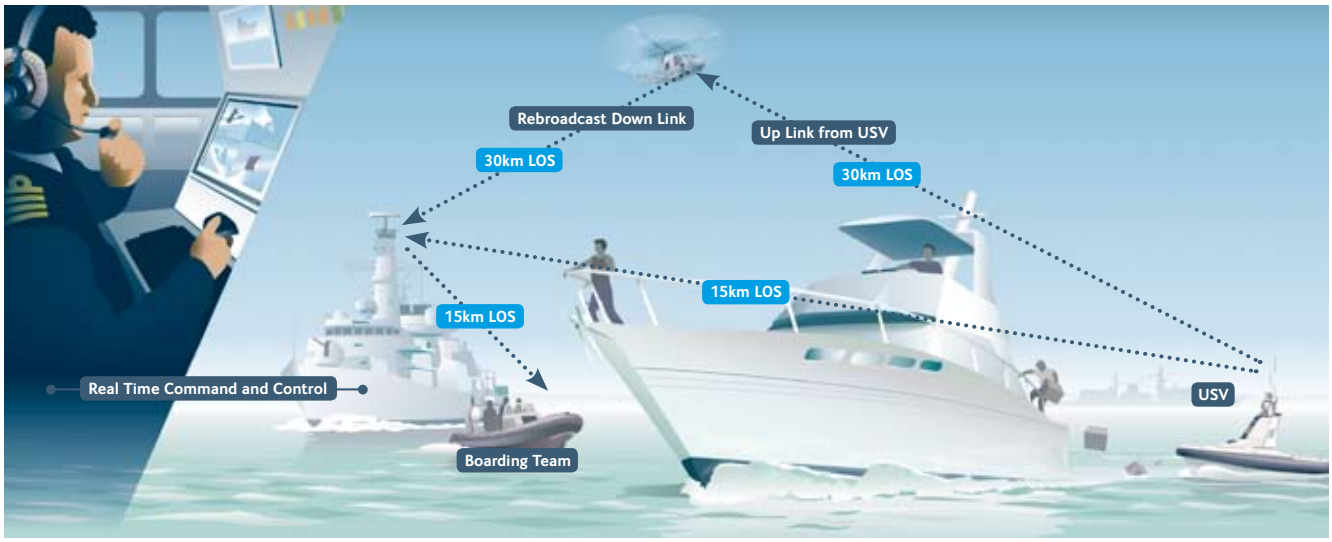
If first responders, such as the ambulance service, utilise body worn cameras at the scene of an accident, they can send pictures via strategically placed receivers direct to the nearest hospital, enabling accident and emergency personnel to prepare for incoming patients. Once mobile in the ambulance, all the patient's vital signs can be shared with the doctors and they can, in turn, offer additional advice to paramedics if needed.

And it's not just on land that Cobham's solutions play a role. At sea, specially designed COFDM digital video transmitters, with integral cameras and GPS, enable law enforcement patrol vessels to be tracked and send real-time video of their missions back to their mother ships. These signals can be broadcast direct, or rebroadcast via aircraft, giving greater range.

Cobham Surveillance (domo Products) are experts in taking complex technology and developing it into simple-to-operate, robust solutions. System components are designed specifically to integrate easily into personnel and ground vehicle based applications, but are versatile enough to use in robotic and airborne platforms too. This in-built flexibility means that Cobham solutions can meet customer requirements in a vast range of fields, helping government, law enforcement and emergency response personnel to handle extremely demanding scenarios.


Maritime Surveillance
VIP Convoy
Rapid Deployment Camera
Mobile Camera
IP Backhaul to HQ
Repeated to HQ
Monitoring Head Quarters

# SeaVue – Maritime Solution




A COFDM digital video transmitter with integral camera and GPS, designed to provide a vital secure situational awareness system for maritime law enforcement and other marine applications. Several selectable modes enable image quality to be offset against range, as each operational scenario dictates.

The SeaVue system will benefit any user during the security of boarding operations, SAR, survey and general patrol duties where real-time information can make the difference to operational safety and capability.

A typical application would allow a Rigid Inflatable Boat (RIB) to be deployed long range from a mother vessel with greatly enhanced safety. The latest digital transmission technology sends GPS data and live, broadcast quality video images of the RIB back to the mothership, displaying the RIB's position, course and speed.

The system also closes the evidential loop as the position and track of the RIB can be recorded and reproduced in the same way as the Automatic Radar Plotting Aid (ARPA) target of the vessel in question. The SeaVue transmitter is available in a variety of frequency bands from 300MHz to 3.5GHz. Licence exempt frequencies are available for general commercial usage.

Features:

- Vital maritime situational awareness
- Secure encrypted transmission - built in AES 128/256 encryption
- Broadcast quality video
- Range 8km-25km+ (dependent on environment & antenna height)
- Repeater options for greater range
- Own vessel tracking.

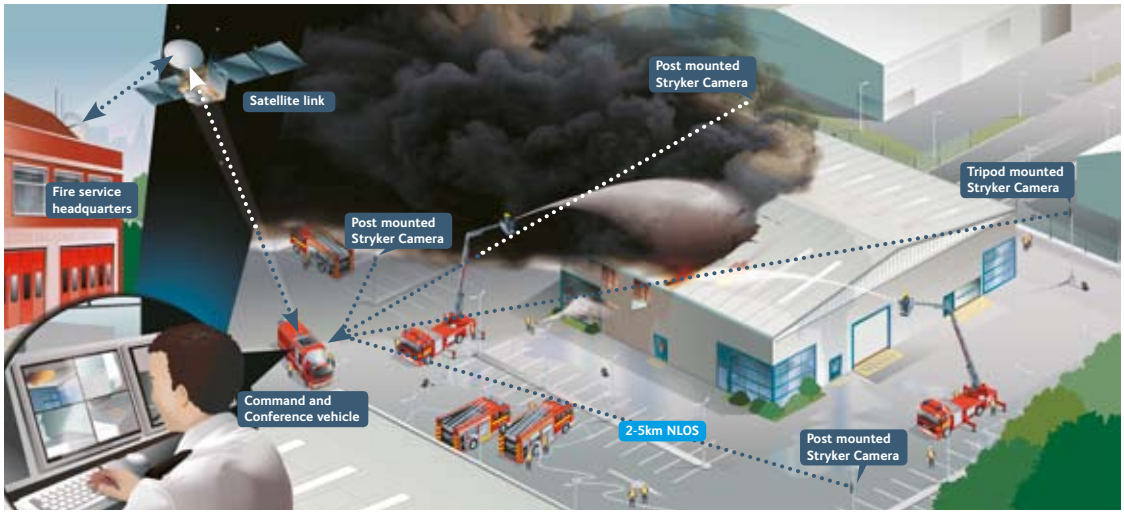
The SeaVue will transmit images in both line of sight (LOS) and non-line of sight (NLOS) environments. The optional input module is available for transmission of additional NMEA or IP data.

Supplied in a rugged, waterproof (IP67) stainless enclosure, the SeaVue system can be fitted with a variety of cameras, including full colour, low light and thermal imager. The GPS tracking can be displayed on the video screen, proprietary plotters or as a secure AIS overlay.

IP67 SeaVue Housing

# Fire-ground Solution

## Fire-ground





Rapidly deployable video camera

Cobham Surveillance have partnered with the Avon Fire & Rescue Service and Stryker Communications Ltd to design and develop a new critical technology solution for improved incident management of fires.

The Fire-Ground Solution provides vital situational awareness information for command personnel, reducing the need for firefighters to describe the scene and significantly improving health and safety. Utilising Cobham's latest digital 'non-line of sight' (NLOS) video transmission technology, the system typically comprises four rapidly deployable video cameras with self-contained power supplies, and can be attached to standard street furniture or mounted on top of an elevated fire platform.

A command vehicle controls camera functions via a Cobham digital telemetry system, whilst making available four camera feeds to the on-scene commander and also distribute these via a satellite up-link to the Fire Service Headquarters. In addition the system can work with a combination of rapid deployed PTZ and mobile body worn cameras.

Features:

- Colour, low light and thermal camera compatibility
- Improved health and safety
- More detailed post-incident analysis
- Range 2-5km (dependent on environment and antenna height)
- Quad receiver with 4 PTZ cameras
- Robust and waterproof construction
- Cobham Surveillance's unique ultra narrowband system enabling operation inside licence-exempt frequencies.

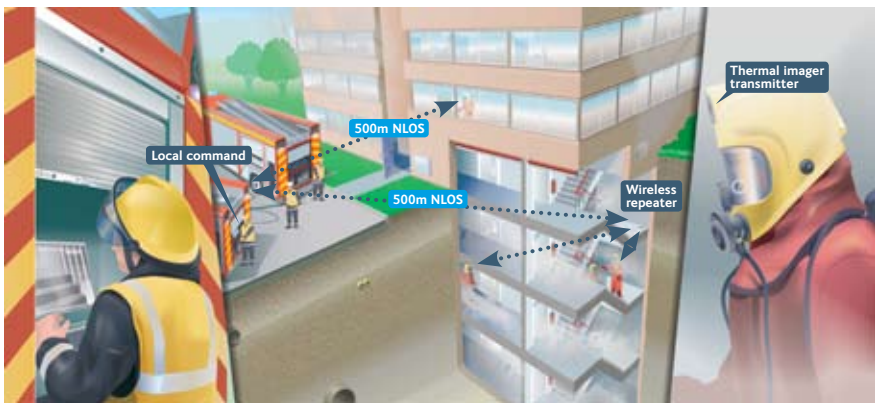
## Underground Fire

In some fire-ground scenarios, assessing the incident is further complicated by the fact that the fire is underground, in a basement or a tunnel. Because this makes the operation more dangerous, it is even more vital to be able to see live images from a thermal camera within the hazard zone.

On-scene commanders need to be able to receive clear, stable audio and video from a body worn transmitter up to three floors below ground, beaming back to a nearby command location. Each transmitter transmits one video channel, two audio channels and one data channel.

Cobham Surveillance's implementation of the COFDM standard is highly resistant to interference and reflection and uses a very narrow bandwidth (1.25MHz) to transmit the images. The narrower the bandwidth, the greater the transmission range and penetration ability to reach surface receivers from underground locations.

The system can work with a combination of rapid deployed PTZ, thermal and mobile body worn cameras, feeding back via a Cobham digital telemetry system. All camera feeds go to the same bank of displays/recorders in the command vehicle where they are available to the on-scene commander and can be distributed via a satellite up-link to the fire services headquarters.




The Underground Fire Solution has been tested by Avon Fire and Rescue within the UK's longest underground rail tunnel.

Video was successfully transmitted from outside the River Severn tunnel entrance in Wales to a receiver located outside the entrance on the England side - a non-line of sight distance of 7km, through a tunnel with many curves and differences in elevation. In a typical fire service operation, the video transmitter would be located within the tunnel, at the incident, and would transmit to a command vehicle located outside.

# SOLO4 – Receiver

SOLO4 Receiver without IP Interface

SOLO4 Receiver with IP Interface

The SOLO4 Receiver from Cobham Surveillance is a feature-rich diversity input digital video receiver, equipped with two antenna inputs normally connected to external down-converters to allow antenna placement remote from the receiver housing. The SOLO4 Receiver operates a maximum ratio combining digital diversity, ensuring video is recovered free from distortions typically associated with fading and multipath. The SOLO4 Receiver is compatible with multiple COFDM transmission formats from 8MHz DVB-T to the unique 2.5 and 1.25MHz narrow band modes proprietary to Cobham Surveillance. Incorporating MPEG2 and MPEG4 video decoding, the SOLO4 Receiver is suitable for all mission types, and has domo technology at its core.

The SOLO4 Receiver is equipped with video, two voice and data channels, and is designed for easy integration into command vehicle, briefcase or central receive applications.

Security of transmission is ensured by the use of ABS encryption as standard or, for greater security, optional AES128/256 bit encryption algorithms, subject to export controls.

## Features:

- Fully featured 8/7/6/2.5MHz (1.25MHz optional)
- Maximum ratio combining antenna diversity for fade and multipath elimination
- Comprehensive on screen display (OSD) diagnostics for link analysis, including spectrum analyser
- Optional IP interface board for IP streaming and network connection
- Very low delay video operation for real time applications
- Optional 4-way diversity.

## Specification:

| Down-converters | |
|---|---|
| RF In | TNC |
| UHF Out | TNC |

| Input | |
|---|---|
| UHF Input 1 | TNC |
| UHF Input 2 | TNC |
| Power | 4 pin OB Lemo |

| Output | |
|---|---|
| Composite Video | BNC |
| Stereo Line Level Audio | Lemo |
| Chaining Interface | Lemo |
| RS232 Data | Hirose |
| RS232 Control | Hirose |

| RF | |
|---|---|
| Frequency Bands | 5.62 to 5.9GHz with DCB-550600,<br>4.5 to 5GHz with DCB-450500,<br>3.1 to 3.4GHz with DCB-300350,<br>2 to 2.5GHz with DCB-200250,<br>1.5 to 2GHz with DCB-150200,<br>1 to 1.5GHz with DCB-100150,<br>575 to 675MHz, 470 to 520MHz, 340 to 470MHz |
| Tuning Steps | 250KHz |

| Modulation | |
|---|---|
| DVB-T Bandwidth | 8/7/6MHz |
| DVB-T Guard | 1/32, 1/16, 1/8, 1/4 |
| DVB-T FEC | 1/2, 2/3, 3/4, 5/6 |
| DVB-T Modulation | QPSK, 16QAM, 64QAM |
| SOLO Bandwidth | 2.5MHz (1.25MHz optional) |
| SOLO Guard | 1/16, 1/8 |
| SOLO FEC | 1/3, 2/3 |
| SOLO Modulation | QPSK, 16QAM |
| Sensitivity | -95 to -104dB |

| Video | |
|---|---|
| Line Standard | PAL/NTSC |
| Resolution | 704, 528, 480, 352 |
| Coding Mode | MPEG2 (MPEG4 optional) |
| Delay | 43ms to 120ms depending on mode |
| Frame Rate | Full/Half/Quarter/Eighth (selectable) |

| Audio | |
|---|---|
| Output | Line Level |
| Sample Rate | 32KHz, 16KHz, 8KHz and MPEG L1 and L2 48KHz |
| Bits per Sample | 12 or 8 bit |

| Data Interface | |
|---|---|
| RS232 Data Output | 1K2 to 115K2 baud switchable |

| Encryption | |
|---|---|
| Format | ABS (standard)<br>AES128/256 (optional) |

| Control | |
|---|---|
| Remote Control | RS232 Control from PC GUI Application |
| Local Control | Front Panel 8 channel select,<br>RF on/off, Range mode, Lock, Alarm |
| On Screen Display | Spectrum, RX SNR, RX Power |

| Physical | |
|---|---|
| Dimension Base Unit | L 200mm, W 152mm, H 50mm |
| Base Unit inc. IP Interface | L 175mm, W 200mm, H 66mm |
| Down-converter | L 100mm, 45mm Diameter |
| Weight Base Unit | 2.2kg |
| Down-converter | 300g |

| Power | |
|---|---|
| DC Input | 9 to 16V Reverse Polarity Protected |
| Power Consumption | 10W depending on mode |

| Environment | |
|---|---|
| Temperature Range | -10 to +50 deg C |

| Accessories Supplied |
|---|
| 2 x Down-converter RX TNC Cable 3m |
| 1 x BNC Video Lead 3m |
| 1 x PSU12 Power Supply |
| 1 x 3rd Generation Man-worn Control Cable |
| 1 x Telemetry Audio Out Cable OB(FGA) Lemo-phono 3m |
| 1 x Data Cable (optional) |

## Product Code:

| |
|---|
| SOL4RX (2.5MHz TO MPEG4 1.25MHz UPGRADE ADD SOL4RXUP) |

# SOLO4 – Robust Receiver

The Robust SOLO4 Receiver from Cobham Surveillance is a feature-rich, diversity input digital video receiver, equipped with two antenna inputs and internal down-converters (excluding UHF) to allow direct antenna connection. The Robust SOLO4 Receiver operates a maximum ratio combining digital diversity, ensuring video is recovered free from distortions typically associated with fading and multipath. The Robust SOLO4 Receiver is compatible with multiple COFDM transmission formats from 8MHz DVB-T to the unique 2.5 and 1.25MHz narrow band modes proprietary to Cobham Surveillance. Incorporating MPEG2 and MPEG4 video decoding, the Robust SOLO4 Receiver is suitable for all mission types with domo technology at its core.

The narrow bandwidth modulation offers unprecedented spectral efficiency, while also increasing the system sensitivity and therefore range. The Robust SOLO4 Receiver has comprehensive on screen display (OSD) diagnostic capability to show link quality and spectrum, enabling users to optimise transmission performance with one video, two voice and data channels.

SOLO4 Robust Receiver

Security of transmission is ensured by the use of ABS decryption as standard or, for greater security, optional AES128/256 bit decryption is available, subject to export controls.

The Robust SOLO4 Receiver is supplied in a sealed IP 67 rated aluminium enclosure.

## Features:

- Fully featured 8/7/6/2.5MHz (1.25MHz option)
- Maximum ratio combining antenna diversity for fade and multipath elimination
- Comprehensive OSD diagnostics, including spectrum analyser
- Internal down-converters (Excluding UHF)
- Internal AES128/256bit decryption (option)
- IP interface board for streaming and networking (option)
- Very low video delay for real time applications.

## Specification:

| Input | |
|---|---|
| UHF Input 1 | TNC |
| UHF Input 2 | TNC |
| 12V DC In | 3 pin amphenol |

| Output | |
|---|---|
| Composite Video & Audio | 7 pin amphenol |
| RS232 Control & Data | 7 pin amphenol |
| Ethernet Port | 4 pin amphenol |

| RF | |
|---|---|
| Frequency Bands | 50 to 850 MHz, 1.00 to 1.40 GHz<br>2.285 to 2.65 GHz, 2.70 to 2.90 GHz<br>3.10 to 3.40 GHz |
| Tuning Steps | 250 KHz |

| Modulation | |
|---|---|
| DVB-T Bandwidth | 8/7/6MHz |
| DVB-T Guard | 1/32, 1/16, 1/8, 1/4 |
| DVB-T FEC | 1/2, 2/3, 3/4, 5/6 |
| DVB-T Modulation | QPSK, 16QAM, 64QAM |
| SOLO Bandwidth | 2.5MHz (1.25MHz optional) |
| SOLO Guard | 1/16, 1/8 |
| SOLO FEC | 1/3, 2/3 |
| SOLO Modulation | QPSK, 16QAM |
| Sensitivity | -95 to -105dB |

| Video | |
|---|---|
| Line Standard | PAL/NTSC |
| Resolution | 704, 528, 480, 352 |
| Coding Mode | MPEG2 (MPEG4 optional) |
| Delay | 43ms to 120ms depending on mode |
| Frame Rate | Full/Half/Quarter/Eighth (selectable) |

| Audio | |
|---|---|
| Output | Line Level |
| Sample Rate | 32KHz, 16KHz, 8KHz |
| Bits per Sample | 12 or 8 bit |

| Data Interface | |
|---|---|
| RS232 Data Output | 1K2 to 115K2 baud switchable |

| Encryption | |
|---|---|
| Format | ABS (standard)<br>AES128/256 (optional) |

| Control | |
|---|---|
| Remote Control | RS232 Control from PC GUI Application |
| Local Control | Front Panel 8 channel select,<br>RF on/off, Range mode, Lock, Alarm |
| On Screen Display | Spectrum, RX SNR, RX Power |

| Physical | |
|---|---|
| Dimension Base Unit | L 240mm, W 147mm, H 43mm |

| Power | |
|---|---|
| 12V DC In | 10 to 16V |

| Environment | |
|---|---|
| Temperature Range | -20 to +50 deg C |
| Sealing | IP67 |

## Associated Equipment:

| The following devices are also part of the system | |
|---|---|
| SOL4TXR | Robust SOLO4 Transmitter |
| SOLAMPR1W | Robust Clip-on 1W amplifier |

## Product Code:

| |
|---|
| SOL4RXR-005085 |
| SOL4RXR-100140 |
| SOL4RXR-225265 |
| SOL4RXR-270290 |
| SOL4RXR-310340 |
| SOL4RXUP UPGRADE ADDS 1.25MHZ UNB AND MPEG4 |

# SOLO4 – MicroVue Receive Case

The Cobham Surveillance MicroVue is a briefcase receiver/recorder package for tactical video surveillance operations. Additionally, it can be used as a remote video receiver for UAV and UGV applications.

The MicroVue combines a Cobham SOLO Receiver with two diversity down-converters and two antennae into one rapidly-deployable briefcase kit. An 8.4" colour LCD screen is mounted in the lid, while a comprehensive touch screen control panel is supplied for control and set up.

The MicroVue has domo technology at its core and is supplied with AC, DC and internal battery power. For unusual installations, the internal antennae and down-converters can be bypassed and external ones fitted instead. As standard, the MicroVue is supplied without a recorder, but can optionally be fitted with an FFV based hard disk recorder, or an alternative (available on request).

The Cobham Surveillance narrow bandwidth modulation offers unprecedented spectrum efficiency, while also increasing the system sensitivity and, therefore, range. Security of transmission is ensured by the use of Standard ABS encryption or optional AES128- or 256-bit encryption algorithms.


## Features:

- Comprehensive demodulation 8/7/6/2.5 and 1.25MHz (optional)
- Maximum ratio combining antenna diversity for fade and multipath elimination
- Lid mounted antennae
- AC, DC, internal battery operation
- Batteries recharged internally
- Internal recorders available as options
- Comprehensive On Screen Display (OSD) diagnostics for link analysis, including spectrum analyser
- 5.5" touch screen in base for device configuration
- Headphone output
- Internal AES128 or 256 encryption
- Optional FFV based hard disk recorder with playback on lid monitor

## Specification:

| Input | |
|---|---|
| RF Input 1 | Antenna 1 |
| RF Input 2 | Antenna 2 |
| UHF RF Input 3 (Bypass) | TNC |
| UHF RF Input 4 (Bypass) | TNC |
| Power (12V DC) | Lemo |
| Power (mains) | IEC |
| Composite Video | BNC |
| PC Control Input | Lemo |
| Audio Input | Phono |

| Output | |
|---|---|
| Composite Video | BNC |
| PTZ Control and Umbilical Video (optional) | Lemo |
| Line Level Audio | Phono |
| Headphone Audio (with volume control) | Audio Jack |
| Control Output | Lemo |
| Chaining | Lemo |
| Data | Lemo |

| Antennae | |
|---|---|
| 4dBi Colinear (supplied) | TNC Mount |
| RF Bypass (user's own) | TNC Input |

| RF | |
|---|---|
| Frequency Bands | 4500 to 5000MHz, 2170 to 2500MHz, 1000 to 1500MHz<br>420 to 470MHz (340 to 470MHz with external antenna)<br>340 to 390MHz (340 to 470MHz with external antenna) |
| Tuning Steps | 250KHz |

| Modulation | |
|---|---|
| Receive Modes Narrowband: | |
| Mode 1 - Short Range | 2.5MHz, 16QAM, FEC2/3, Sensitivity -95dBm |
| Mode 2 - Normal Range | 2.5MHz, QPSK, FEC2/3, Sensitivity -99dBm |
| Mode 3 - Long Range | 2.5MHz, QPSK, FEC1/3, Sensitivity -102dBm |
| Mode 4 - Ultra Long Range | 1.25MHz, QPSK, FEC1/3, 600kb/s, Sensitivity -105dBm (optional) |
| Receive Modes Wideband: | |
| DVB-T COFDM Receive | Bandwidth 8/7/6MHz |
| FEC | 2/3, 5/6, 7/8 |

| Video | |
|---|---|
| Line Standard | PAL/NTSC |
| Resolution | 704, 528, 480, 352 |
| Coding Mode | MPEG2 or MPEG4 (optional) |
| Delay | 43ms to 1sec depending on mode |
| Frame Rate | Full/Half/Quarter/Eighth (optional) |

| Audio | |
|---|---|
| Line Level Output | Phono |
| Sample Rate | 32KHz, 16KHz, 8KHz or MPEG L2 48KHz |
| Bits per Sample | 12 or 8 bit |

| Data Interface | |
|---|---|
| RS232 Data Output | 1K2 to 115K2 baud switchable |

| Encryption | |
|---|---|
| Format | ABS (standard)<br>AES128/256 selectable (optional) |

| Control | |
|---|---|
| Remote Control | RS232 Control from PC GUI Application |
| Touch Screen Control | All features<br>Backlight off selectable to minimise light emission |
| On Screen Display | Spectrum, RX SNR, RX Power |

| Physical | |
|---|---|
| Dimension | L 350mm, W 260mm, H 160mm |
| Weight | 5kg |

| Power | |
|---|---|
| AC Input (8A fused) | 110/240V |
| DC Input (8A fused) | 11 to 16V |
| Battery Backup (internal fuse) | 3 hours operation |

| Environment | |
|---|---|
| Operating Temperature | -10 to +50 deg C (not charging batteries) |
| Operating Temperature | +10 to +40 deg C (charging batteries) |
| Storage Temperature | -20 to +60 deg C |

| Accessories Supplied |
|---|
| 1 x Lead, 2 x Phono - 2 x Phono 1m, 1 x RS232 Cable Lemo-DSUB9 3m |
| 1 x BNC Video Lead 3m, 1 x MicroVue External 12V DC In |
| 1 x MicroVue/Solcon External Control Cable (Lemo to Lemo) |
| 1 x MicroVue/Solcon External Control Cable (Lemo to Hirose) |
| 1 x MicroVue Cable Carry Case, 1 x MicroVue DVR Carry Case (DVR optional) |

## Product Code:

| |
|---|
| SOL4MIV-450500 |
| SOL4MIV-310340 |
| SOL4MIV-200250 |
| SOL4MIV-100150 |
| SOL4MIV-058067 |
| SOL4MIV-034047 |
| RECORDER OPTIONS: SOL4DVR |

# SOLO4 – MicroVue Commander Receive Case

The MicroVue Commander is a briefcase receiver/recorder package for tactical video surveillance operations, incorporating a PTZ transmit control function. Designed to be used with remotely deployed ClearCam PTZ cameras, the MicroVue combines a Cobham Surveillance SOLO Receiver, two diversity down converters, two antennae and a telemetry radio. Bypassing of internal antennae and down converters and use of external ones is possible.

The MicroVue is equipped with video, two voice and data channels, and comprehensive touch screen control panel for control and setup.

The built in PTZ control panel includes all the usual PTZ functions, including 4 channel camera select, pan, tilt and zoom. The FFV based hard disk recorder (or other requested recorder) is an optional extra, with playback on the lid-mounted 8.4" colour monitor.

The Cobham Surveillance narrow bandwidth modulation offers unprecedented spectrum efficiency, also increasing the system sensitivity and range. Security of transmission is ensured by the use of Standard ABS encryption or optional AES128- or 256-bit encryption algorithms.

## Features:

- Comprehensive Demodulation 8/7/6/2.5 and 1.25MHz (optional)
- Maximum Ratio Combining antenna diversity for fade and multipath elimination
- Lid mounted antennae
- 110V and 240V AC, DC and internal battery operation and recharging
- Comprehensive On Screen Display (OSD) diagnostics for link analysis, including spectrum analyser
- 5.5" touch screen in base for device configuration
- Headphone output
- Optional FFV based hard disk recorder with playback routed back to lid monitor
- 458, 868MHz telemetry for UK, 903MHz telemetry for Americas, 433MHz special available for Europe.

## Specification:

### Input

| | |
|---|---|
| RF input 1 | Antenna 1 |
| RF input 2 | Antenna 2 |
| UHF RF input 3 (Bypass) | TNC |
| UHF RF input 4 (Bypass) | TNC |
| Power (12V DC) | Lemo |
| Power (mains) | IEC |
| Composite video | BNC |
| PC control input | Lemo |
| Power (mains) | IEC |

### Antennas

| | |
|---|---|
| Receive Antenna | 4dBi Colinear TNC mount flexible |
| Transmit Antenna | 2dBi Coliner BNC mount flexible |

### Output

| | |
|---|---|
| Composite video | BNC |
| Telemetry transmit | BNC |
| Line level audio | Phono |
| Headphone audio | |
| (with volume control) | Audio jack |
| Control output | Lemo |
| Chaining | Lemo |
| Data | Lemo |

### Antennas

| | |
|---|---|
| 4 dBi Colinear (supplied) | TNC mount |
| RF Bypass (user's own) | TNC input |

### RF

| | |
|---|---|
| Input Frequency bands | 2170 to 2500MHz/1000 to 1500MHz (model dependant) |
| Output Frequency | 458MHz, 868MHz or 903MHz (model dependant) |
| Tuning Steps | 250kHz |

### Modulation

| | |
|---|---|
| Receive modes (Narrow band) | |
| Mode 1: Short range | 2.5MHz 16QAM FEC2/3 Sensitivity -95dBm |
| Mode 2: Normal range | 2.5MHz QPSK FEC2/3 Sensitivity - 99dBm |
| Mode 3: Long range | 2.5MHz QPSK FEC1/3 Sensitivity - 102dBm |
| Mode 4: Ultra long range | 1.25MHz QPSK FEC1/3 600kb/s Sensitivity -105dBm (optional) |
| Receive modes (Wide band) | Bandwidth 8/7/6 MHz |
| DVB-T COFDM receive | FEC ½, 2/3, ¾, 5/6, 7/8 |
| Transmit modes | COFDM 25kHz QPSK 100mW |

### Video

| | |
|---|---|
| Line standard | PAL/NTSC |
| Resolution | 704, 528, 480, 352 |
| Coding mode | MPEG2 or MPEG4 (optional) |
| Delay | 43ms to 1sec depending on mode |
| Frame rate | Full/Half/Quarter/Eighth (optional) |

### Audio

| | |
|---|---|
| Line level output | Phono |
| Sample rate | 32kHz, 16kHz, 8kHz or MPEG L2 48kHz |
| Bits per sample | 12- or 8-bit |

### Data Interface

| | |
|---|---|
| RS232 Data output | 1k2 to 115k2 baud switchable |

### Encryption

| | |
|---|---|
| Format | ABS (standard) |
| | AES128/256 selectable (optional) |

### Control

| | |
|---|---|
| Remote control | RS232 control from PC GUI application |
| Touch screen control | All features |
| | Backlight off selectable to minimise light emission |
| On screen display | Spectrum, Rx SNR, Rx Power |

### PTZ Control

| | |
|---|---|
| Button panel | Includes Camera Select, zoom, Day Night Select, Pan and Tilt |

### Physical

| | |
|---|---|
| Dimension | L 350mm W 260mm H 160mm |
| Weight | 5kg |

### Power

| | |
|---|---|
| AC input (2.5A fused) | 110/240V |
| DC input (8A fused) | 11-16V |
| Battery backup (internal fuse) | 3 hours operation |

### Environment

| | |
|---|---|
| Temperature Range | -10 to +50 deg C (operating)<br>+10 to +40 deg C (charging batteries) |

## Product Code:

| | |
|---|---|
| SOL4MIVC-225045 | 2 to 2.5GHz with 458MHz telemetry |
| SOL4MIVC-125045 | 1 to 1.5GHz with 458MHz telemetry |
| SOL4MIVC-225086 | 2 to 2.5GHz with 868MHz telemetry |
| SOL4MIVC-125086 | 1 to 1.5GHz with 868MHz telemetry |
| SOL4MIVC-475086 | 4.5 to 5GHz with 868MHz telemetry |
| SOL4MIVC-225090 | 2 to 2.5GHz with 903MHz telemetry |
| SOL4DVR | Recorder option |

# SOLO4 – MultiVue Receive Case

The Cobham Surveillance MultiVue is a briefcase receiver package for team-based tactical video surveillance operations. Often used by first responder and emergency teams, it simultaneously decodes and displays four separate digital video channels, allowing its operator to observe activities in four different locations or four views of one location. Typical applications include tactical surveillance teams and first responder and emergency teams. Equipped with dual diversity antennae inputs, the MultiVue ensures excellent video reception quality, while narrow bandwidth modulation offers unprecedented spectrum efficiency, increasing the system sensitivity and range.

The MultiVue combines four Cobham SOLO Receivers with two diversity down-converters and two antennae into one rapidly deployable kit. A colour monitor is mounted in the lid and can display one image or all four. Video and audio outputs are provided for recording, with headphone outputs for local audio monitoring.

The MultiVue has comprehensive On Screen Display diagnostic capability to show link quality and spectrum and is equipped with video, two voice and data channels. Optional AES128/256 bit encryption algorithms ensure transmission security.

## Features:

- Comprehensive demodulation 8/7/6/2.5 and 1.25MHz (optional)
- Maximum ratio combining antenna diversity for fade and multipath elimination
- Lid mounted antennae
- Colour monitor in lid with quad or individual viewing
- User touch screen control interface
- Optional IP streaming and microwave relay.

## Commander upgrade:

- Integral triple axis joystick for control of PTZ camera
- Telemetry 100mw Transmitter able to address multiple cameras
- Camera position preset storage
- Multiple PTZ protocols supported.

## Specification:

**Input**

| | |
|---|---|
| Local Antenna Inputs | TNC |
| External UHF Inputs | TNC |
| RS232 Control | 9 Way D-sub |
| Ethernet | RJ45 |
| AC Supply | IEC |
| DC Supply | 4 Pin XLR |

**Output**

| | |
|---|---|
| Four Composite Video | BNC |
| Four S-Video | 4 pin MiniDIN |
| Four Audio Pairs | 5 pin Lemo |
| Monitor Composite Video | BNC |
| Monitor S-Video | Jack Socket |
| Headphone | Audio Socket |

**Antennae**

| | |
|---|---|
| Lid Mounted Antennae | 2dbi Omni |

**RF**

| | |
|---|---|
| Frequency Bands | 2170 to 2500MHz, 1000 to 1500MHz, 575 to 675MHz, 340 to 470MHz (others on request) |
| Tuning Steps | 250KHz |

**Modulation**

| | |
|---|---|
| DVB-T Bandwidth | 8/7/6MHz (optional) |
| DVB-T Guard | 1/32, 1/16, 1/8 |
| DVB-T FEC | 2/3, 5/6 |
| DVB-T Modulation | QPSK, 16QAM, 64QAM |
| Sensitivity | -95dB Plus |
| SOLO Bandwidth | 2.5/1.25MHz (optional) |
| SOLO Guard | 1/16, 1/8 |
| SOLO FEC | 1/3, 2/3 |
| SOLO Modulation | QPSK 16QAM |
| Sensitivity | -95 to -105dB |

**Video**

| | |
|---|---|
| Line Standard | PAL/NTSC |
| Resolution | 704, 528, 480, 352 |
| Coding Mode | MPEG2 or MPEG4 (optional) |
| Delay | 43ms to 1sec depending on mode |
| Frame Rate | Full/Half/Quarter/Eighth (optional) |

**Audio**

| | |
|---|---|
| Output | Line Level |
| Sample Rate | 32KHz, 16KHz, 8KHz or MPEG L2 48KHz |
| Bits per Sample | 12 or 8 bit |

**Encryption**

| | |
|---|---|
| Format | AES128/256 (optional) |

**Control**

| | |
|---|---|
| Local Control | By touch screen control interface |
| Local Control | Via RS232 Control Port |
| Remote Control Over Ethernet | Via RJ45 Ethernet Port |
| On Screen Display | Spectrum, RX SNR, RX Power |

**Physical**

| | |
|---|---|
| Dimension | L 540mm, W 420mm, H 220mm |
| Weight | Less than 12kg |

**Power**

| | |
|---|---|
| AC Input | 110/240V |
| Power Consumption | Approx 120W |

**Environment**

| | |
|---|---|
| Temperature Range | -10 to +50 deg C |

**Accessories Supplied**

| |
|---|
| 1 x Null Cable |
| 2 x Down-converter RX TNC Cable 10m |
| 1 x CRX Data Breakout Cable |
| Audio and Video Cables available on request. |

## Commander option:

| |
|---|
| Addition of joystick and telemetry transmitter |

**Telemetry**

| | |
|---|---|
| RF Frequency Band | 868-870MHz<br>457-459MHz<br>903MHz |
| 1 x PRS Antenna | |
| Power Output | 100mW |
| Joystick | Triple Axis Joystick: left, right, up, down, twist to zoom |

## Product Code:

| | |
|---|---|
| SOL4MUV-217250 | SOL4MUV-100150 |
| SOL4MUV-058067 | SOL4MUV-034047 |
| SOL4MUVC-225086 | SOL4MUVC-225045 |
| SOL4MUVC-125045 | SOL4MUVC-225090 |

# SOLO Central Receiver

SOLO Central Receiver front

SOLO Central Receiver rear

## SOLO Central Receiver

The Cobham SOLO Central Receiver system is a highly flexible solution for use in permanent or temporary installed central receive applications.

The Central Receiver system has domo technology as its core and is supplied with the following flexibility:

- Four built in receivers
- Four way diversity
- Built in rebroadcast transmitter for down link (option)
- Built in ethernet for network connection (option)
- Rack mount or outdoor box for installation.

To enable law enforcement organisations and emergency services to improve efficiency and safety in overt and covert surveillance operations, the Cobham video microwave radio system is specifically designed for the development of urban infrastructures. Its central receivers allow 24x7 unattended operation and are supplied in enclosures for ease of integration with other communication peripherals.

The central receiver receives and decodes the transmissions from up to four transmitters simultaneously. The transmissions are received through one of four antennae typically mounted on the four corners of the building for 360 degree omni-coverage.

Thanks to Cobham microwave down-converters, the receive antennae can be remotely located in optimal locations up to 50 metres away from the Central Receiver base unit. Meanwhile, the base unit is typically installed at a permanent elevated receive point, either enclosed in an appropriate enclosure for exterior use or a rack mounted system.

Onward distribution of up to four feeds from each remote site is possible. Multiple video and audio outputs are typically viewed locally or down-linked using the built-in rebroadcast transmitter to the Down Link Receiver or through NETCRXIPUP modular options designed for contended public or private networks.

The Cobham Surveillance narrow bandwidth modulation offers unprecedented spectrum efficiency, while also increasing the system sensitivity and, therefore, range.

The Central Receiver and Down Link Receiver have comprehensive On Screen Display diagnostic capability to show link quality and spectrum and are equipped with video, two voice and data channels. Security of transmission is ensured by the use of optional AES128/256 bit encryption algorithms.

### Benefits:

- Continuous video coverage in a defined area
- Negates need for deployed surveillance vehicles and personnel
- Efficient use of manpower and improved safety of operatives
- Potential roaming coverage from vehicles or body worn systems
- Multiple receivers enabling city wide coverage with onward distribution to command and control
- Rapid deployment PTZ camera 'drop and go'
- Remote control of PTZ wireless street camera from HQ
- Most economical architecture to deliver capability, with maximum re-use of existing digital video equipment
- Initial investment offset by long term savings
- Maximum operational flexibility in deploying transmitters
- Ease of configuration, use and troubleshooting
- Near term future proofing for added features
- Security of video assets from source to viewer (end-to-end encryption)
- Seamless interoperability and interfacing with Network Provider existing infrastructure
- Ability to extend range at edges with higher power.

### Features:

- Four simultaneous video reception and viewing
- Comprehensive demodulation 8/7/6/2.5 and 1.25MHz (optional)
- Up to four way maximum ratio combining antenna diversity for fade and multipath elimination
- Built-in options for rebroadcast or IP network distribution (optional)
- Remote control via IP interfaces
- Rack mount hardware solutions. Weatherproof outdoor solutions available on request
- Comprehensive On Screen Display (OSD) diagnostics for link analysis, including spectrum analyser
- Internal AES128/256 (optional)
- Monitor video output, selectable between any of the four channels and a quad split mode.

# SOLO Central Receiver

## Applications:

- Police metropolitan and urban observation
- Key building surveillance
- Military command control posts
- Airport, ports and terminal security
- Border control
- Major incident support.

## Users:

- Police technical support units
- Policy silver and gold command
- Special Forces
- Customs and Excise
- Security Services
- Local/municipal government.

SOLO Central Receiver

## Specification:

### Inputs

| | |
|---|---|
| Antenna Inputs | TNC |
| RS232 Control | 9 way D-sub |
| Ethernet | RJ45 |
| AC Supply | IEC |

### Output

| | |
|---|---|
| Four Composite Video | BNC |
| Four S-Video | 4 pin MiniDIN |
| Four Audio Pairs | 5 pin Lemo |
| Monitor Composite | BNC |
| Video | 4 pin MiniDIN |
| Monitor S-Video | 15 way D-sub |
| Four Way-side Data Outputs | |

### Receive Bands

| | |
|---|---|
| Frequency Bands | 2000 to 2500MHz,<br>1100 to 1400MHz,<br>70 to 850MHz<br>(set by choice of down-converter) |
| Tuning Steps | 250KHz |

### Re-broadcast Bands

| | |
|---|---|
| Frequency Bands | 2000 to 2500MHz,<br>1150 to 1400MHz (optional) |
| Tuning Steps | 250KHz |

### Modulation

| | |
|---|---|
| DVB-T Bandwidth | 8/7/6MHz (optional) |
| DVB-T Guard | 1/32, 1/16, 1/8 |
| DVB-T FEC | 2/3, 5/6 |
| DVB-T Modulation | QPSK, 16QAM and 64QAM |
| Sensitivity | -95dB Plus |
| SOLO Bandwidth | 2.5/1.25MHz (optional) |
| SOLO Guard | 1/16, 1/8 |
| SOLO FEC | 1/3, 2/3 |
| SOLO Modulation | QPSK, 16QAM |
| Sensitivity | -95 to -105dB |

### Video

| | |
|---|---|
| Line Standard | PAL/NTSC |
| Resolution | 704, 528, 480, 352 |
| Coding Mode | MPEG2 or MPEG4 |
| Delay | 43ms to 1sec depending on mode |
| Frame Rate | Full/Half/Quarter/Eighth (selectable in MPEG4) |

### Audio

| | |
|---|---|
| Output | Line Level |
| Sample Rate | 32KHz, 16KHz, 8KHz |
| Bits per Sample | 12 or 8 bit |

### Encryption

| | |
|---|---|
| Format | AES128/256 (optional) |

### Control

| | |
|---|---|
| Local Control | Via RS232 Control Port |
| Remote Control Over Ethernet | Via RJ45 Ethernet Port |
| On Screen Display | Spectrum, RX SNR, RX Power |

### Physical

| | |
|---|---|
| Dimension | L 378mm, W 328mm, H 70mm<br>19" Rack 2U Mounting Kit Supplied |
| Weight | Less than 8kg |

### Power

| | |
|---|---|
| AC Input | 110/240V Autoswitching |
| Power Consumption | 65W Maximum |

### Environment

| | |
|---|---|
| Temperature Range | -10 to +50 deg C |

### Accessories Supplied

| |
|---|
| 1 x Null Modem Cable |
| 4 x Down-converter RX TNC Cable 10m |
| 1 x CRX Data Breakout Cable |
| 1 x Single Heyway Audio Output Cable |

## Product Code:

| |
|---|
| SOLCRX444 - BASE MODEL<br>(DOWN-CONVERTERS, RELAY, NETWORK STREAMING AND AES NOT INCLUDED) |
| SOLCRXT-115140 (RELAY OPTION 1.15 TO 1.4GHz) |
| SOLCRXT-228255 (RELAY OPTION 2.28 TO 2.55GHz) |
| NETCRXIPUP (IP STREAMING OPTION) |

# SOLO4 – Bodywire Transmitter

The SOLO4 Bodywire Transmitter is a COFDM digital video transmitter from Cobham Surveillance, designed specifically for covert video installations and body-worn applications.

With domo technology at its core, the small size and low power consumption (typically 4W or less) of the SOLO4 Bodywire make it the product of choice for covert video hides, or applications requiring long term battery power deployments, small unmanned aerial vehicles, and body-worn or bodywire use.

The SOLO4 Bodywire transmitter employs MPEG2 encoding (MPEG4 is also available) for excellent image quality retention. Equipped with integral COFDM modulation, the SOLO4 transmitter is ideal for establishing rugged wireless video links in all environments, including mobile and urban environments. Offering several user-selectable modes that trade off image quality against range, the SOLO4 transmitter is ideal for all mission types. The SOLO4 Bodywire includes RF up-conversion and PA circuitry to make a complete single board transmitter. SOLO4 Bodywire is supplied in a simple lightweight case with attached Lemo cable connectors.

Security is ensured with optional AES128/256 Encryption.

The SOLO4 Bodywire transmitter will transmit images in a non-line of sight environment up to 750m, depending on mode and frequency; further range can be achieved with the booster PA.

## Specification:

| Inputs | |
|---|---|
| Composite Video | BNC (break out cable) |
| SDI (optional) | BNC (break out cable) |
| Audio 1 | Phono (break out cable) |
| Audio 2 | Phono (break out cable) |
| RS232 Control | Dtype (break out cable) |
| RS232 Data | Dtype (break out cable) |
| Power | Lemo 4 pin (break out cable) |

| Output | |
|---|---|
| RF Out | SMA |

| RF | |
|---|---|
| Power | 100mW (14dBm low power mode) |
| Tuning Range | 5.5 to 6GHz<br>4.5 to 5GHz<br>2.0 to 2.5GHz<br>1.0 to 1.5GHz<br>300 to 450MHz |
| Tuning Steps | 250KHz |

| Modulation | |
|---|---|
| Transmit Modes Narrowband: | |
| Bandwidth | 2.5MHz |
| FEC | 2/3, 1/3 |
| Modulation | QPSK or 16QAM |
| Upgradable to | 1.25MHz narrow bandwidth |
| Transmit Modes Wideband: | |
| DVB-T Bandwidth | 8/7/6MHz |
| FEC | 1/2, 2/3, 3/4 , 5/6, 7/8 |
| Modulation | QPSK, 16QAM and 64QAM |

| Video | |
|---|---|
| Input Format | PAL, NTSC (with or without pedestal)<br>RS170 and SDI (optional) |
| Encoding Narrowband | MPEG2 (or MPEG4 option) |
| Encoding Wideband | MPEG2 Only |
| MPEG2 Frame Rate | Full Frame Rate |
| MPEG4 Frame Rate | Full or 1/2, 1/4, 1/8, 1/24 |
| Delay | 500ms to 43ms (mode dependant) |

| Audio | |
|---|---|
| Input | Line Level or Microphone switchable<br>-2dBu Max input level |
| Audio Encoding MPEG Layer 1:<br>Sample Rate | 32KHz 384Kb/s to 64kb/s |
| Audio Encoding NICAM Style:<br>Sample Rate | 32KHz, 16KHz, 8KHz switchable |
| Bits per sample | 12 or 8 bit switchable |

| Data Interface | |
|---|---|
| RS232 Data Input | 1k2 to 115K2 baud switchable |

| Encryption | |
|---|---|
| Format | ABS Encryption 32 bit<br>AES128/256 (optional) |

| Control | |
|---|---|
| Control Interface | RS232 Control from PC GUI Application |
| Front Panel | None supplied, future external plug in RS232 controller (field gun) |

| Physical | |
|---|---|
| Dimension | L 86mm, W 49mm, H 11mm (main chassis) |
| Weight | 70g |

| Power | |
|---|---|
| DC Input | 5.9V to 16V Reverse Polarity Protected |
| Power Consumption | Normal consumption 4.1W for 100mW out<br>Low power mode 3.7W for 25mW out |

| Environment | |
|---|---|
| Temperature Range | -15 to +60 °C |
| Vibration | Tested with 15g shock and Random with sine vibration 3g<br>Results will depend on chassis installation |

## Product Code:

| |
|---|
| SOL4MTX-550600 |
| SOL4MTX-450500 |
| SOL4MTX-200250 |
| SOL4MTX-100150 |
| SOL4MTX-030045 |

# SOLO4 – Transmitter

The SOLO4 Transmitter from Cobham Surveillance is a feature-rich COFDM digital video transmitter. The SOLO4 Transmitter can operate in a variety of transmission bandwidths allowing the user to trade off image quality against range to suite all types of missions. Excellent range, performance and spectral efficiency are offered when operating in the unique 2.5MHz and 1.25MHz narrow bandwidth modes. For excellent image quality at shorter ranges the 8MHz DVB-T modulation can be employed. The SOLO4 Transmitter is the first to offer this choice in one product. MPEG2 and MPEG4 image compression is also a user selectable feature.

The SOLO4 Transmitter has domo technology at its core and is ideal for establishing rugged wireless video links in all environments including mobile and urban environments. Security is ensured with built-in 32 bit ABS encryption or, for greater security, AES128/256 bit encryption is also available, subject to export controls. The SOLO4 Transmitter is available in a variety of frequency bands from 300MHz to 5.9GHz.

Able to transmit images in a non-line of sight environment up to 1km depending on mode and frequency, the SOLO4 Transmitter can achieve further range with the clip-on booster PA.

The SOLO4 Transmitter is typically used as a stand-alone uni-directional video link, however if a bi-directional system is required, it can be deployed in conjunction with the SOLO Telemetry system.

Supplied in a rugged, lightweight weather proof aluminium chassis, the SOLO4 Transmitter can be used in body-worn applications, or prolonged outdoor deployments.


## Specification:

| Input | |
|---|---|
| Composite Video | 5 pin OB Lemo |
| Audio 1 | 5 pin OB Lemo |
| Audio 2 | 5 pin OB Lemo |
| SVideo | Hirose 16 pin 3500 series |
| RS232 Data | Hirose 16 pin 3500 series |
| RS232 Control | Hirose 16 pin 3500 series |
| Chaining I/O | Hirose 16 pin 3500 series |
| General Purpose I/O | Hirose 16 pin 3500 series |
| Power | 4 pin OB Lemo |

| Output | |
|---|---|
| RF Output | SMA |

| RF | |
|---|---|
| Frequency Bands | 5.62 to 5.9GHz,<br>4.5 to 5GHz,<br>3.1 to 3.4GHz,<br>2.28 to 2.55GHz,<br>1.5 to 2GHz,<br>1.15 to 1.4GHz,<br>575 to 675MHz,<br>470 to 520MHz,<br>340 to 470MHz |
| Power | 100mW |
| Power Control | 30dB in 1dB steps |
| Tuning Steps | 250KHz |

| Modulation | |
|---|---|
| Bandwidths (DVB-T or SOLO) | 8/7/6/2.5MHz (1.25MHz optional) |
| Default Modes: | |
| Mode 1 - Short Range | 2.5MHz, 16QAM, FEC2/3, 4.8Mb/s |
| Mode 2 - Normal Range | 2.5MHz, QPSK, FEC2/3, 2.4Mb/s |
| Mode 3 - Long Range | 2.5MHz, QPSK, FEC1/3, 1.2Mb/s |
| Mode 4 - Ultra Long Range | (1.25MHz, QPSK, FEC1/3, 600kb/s optional) |

| Video | |
|---|---|
| Line Standard | PAL/NTSC |
| Resolution | 704, 528, 480, 352 |
| Coding Mode | MPEG2 (MPEG4 optional) |
| Delay | 43ms to 120ms depending on mode |
| Frame Rate | Full/Half/Quarter/Eighth (selectable) |

| Audio | |
|---|---|
| Input | Line Level or Microphone |
| Sample Rate NICAM | 32KHz, 16KHz, 8KHz switchable |
| Bits per Sample NICAM | 12 or 8 bit switchable |
| MPEG L1 or L2 | 64kbits - 384kbps<br>48KHz sampling |

| Data Interface | |
|---|---|
| RS232 Data Input | 1K2 to 115K2 baud switchable |

| Encryption | |
|---|---|
| Format | ABS 32 bit as standard<br>AES128/256 (optional) |

| Control | |
|---|---|
| Remote Control | RS232 Control from PC GUI Application |
| Local Control | Front Panel 8 channel select,<br>RF on/off, Range mode, Lock, Alarm |

| Physical | |
|---|---|
| Dimension | L 102mm, W 71mm, H 22mm |
| Weight | 350g |

| Power | |
|---|---|
| DC Input | 5.9 to 16V Reverse Polarity Protected |
| Power Consumption | 4.8 to 6W depending on mode |

| Environment | |
|---|---|
| Temperature Range | -20 to +70 deg C |

| Accessories Supplied |
|---|
| 1 x SOLO 12V DC Power Lead Lemo-wire 2m |
| 1 x 3rd Generation Man-worn Control Cable |
| 1 x 3rd Generation Bodycam AV Cable Lemo-BNC/Phono 2m |
| 1 x Data Cable (optional) |

## Product Code:

| |
|---|
| SOL4TX-562590 |
| SOL4TX-450500 |
| SOL4TX-310340 |
| SOL4TX-228255 |
| SOL4TX-150200 |
| SOL4TX-110140 |
| SOL4TX-057067 |
| SOL4TX-047052 |
| SOL4TX-034047 |
| (2.5MHz TO MPEG4 1.25MHz UPGRADE ADD SOL4TXUP) |

# SOLO – Options

## SOLO - Booster 1 Watt Amp

Compatible with SOLO video transmitters.


### Specification:

| Input | |
|---|---|
| RF In | SMA |
| RF Enable | Hirose |
| Power | 3 pin OB Lemo |

| Output | |
|---|---|
| RF Out | TNC |

| RF | |
|---|---|
| Frequency Bands | 1.25 to 2.5GHz |
| Power In | 100mW |
| Power Out | 1W |
| Gain | 10dB |
| Power Ripple | +/- 1dB across band |
| Output Matching | Matching Circuit immune to open or short |

| Physical | |
|---|---|
| Dimension | L 95mm, W 70mm, H 32mm |
| Weight | 350g |

| Power | |
|---|---|
| DC Input | 9 to 16V Reverse Polarity Protected |
| Power Consumption | 10W typical |

| Environment | |
|---|---|
| Temperature Range | -20 to +70 deg C |

| Accessories Supplied |
|---|
| 1 x RS232 Cable Lemo-DSUB9 3m |
| 1 x Bodyworn 1W Amp Power/Control Cable |
| 1 x Bodyworn 1W Amp RF Link Cable |

Note: In normal operation RS232 data input is not available.
If RS232 data input is required contact Cobham Surveillance for a special cable.

### Product Code:

| SOLAMP1W |
|---|

# Digital Microwave C-Band Linear RF Amplifier

The Cobham Digital RF amplifiers bring a new level of performance and reliability to microwave transmission of digitally modulated video. The linear RF power amplifier provides 5 Watts of RF power into any load.

The linear amplifier features domo technology at its core and is ideal for digital transmission applications in surveillance, law enforcement, military UAV and UGV, airborne data/telemetry and television broadcasting. It is designed to amplify COFDM digitally modulated signals (QPSK, 16-QAM) and features broadband operation, while requiring a minimum of DC current.

Only minimum heat sinking is required for the high output models in normal operation. Packaged in a rugged aluminium housing, the amplifier construction lends itself to applications where extreme environmental conditions are the norm. Chassis connectors are environmentally protected, making the amplifier ideal for airborne operations where it can be mounted on a helicopter skid.

The integral lineariser minimises distortions typically associated with conventional RF amplification techniques. The amplifier is designed to meet the stringent requirements of the DVB-T spectral mask and may be used for COFDM, QPSK, QAM and CW applications.

Input and output port protection is provided with a VSWR better than 2,0:1 across the frequency band providing excellent matching into filters. Reverse polarity protection and short circuit protection are standard features.

## Features:

- Designed for Digital Modulation
  - COFDM, QPSK, BPSK
- Ultra linear
- High efficiency
- Operating gain
  - 5W: 17 dB typical
- RF ports are open and short protected
- Short circuit/over-voltage protection
- Reverse polarity protection
- 11 - 28 Vdc input
- Rugged packaging
- Mute function

## Specification:

**Electrical**

| | |
|---|---|
| Frequency range | C band: 3.10 to 3.50 GHz |
| Input/output protection | Open and short circuit |
| VSWR | ≥ -14 dB input and output return loss |
| Non-harmonic spurious output | > -65 dBc Typ. |
| Nominal drive | +20 dBm |
| Overdrive capability | Pin (nom) + 3 dBm (typ.) |
| Modulation formats | COFDM, QAM, CW |
| Reverse polarity protection | |
| Short circuit protection | |
| Gain flatness | ±0.5 dB across operating band |
| Operating gain | 5W: (17 dB typ.) |
| Output power | +37 dBm |
| ACPR | -30 dBc (typ.) |
| OIP3 @ Pop (typ) | 5W: 37 dBm |
| Power added efficiency | 15% typical |
| PA mute on PTO | |
| Status LED | ON/STBY |
| Supply voltage | +11 Vdc to +28 Vdc |
| Supply current | 5W output: 3.8 A (typ.) @ 12 Vdc |

**Environmental**

| | |
|---|---|
| Operating temperature | -15 to +60 °C, Baseplate |
| Relative humidity | 0 to 95%, non-condensing |
| Environmentally protected | |

**Mechanical**

| | |
|---|---|
| DC input connector | PTO 4 pin<br>- A Pin - V+<br>- B Pin - forward power<br>(normal high, goes low if o/p is 6 dB less than 37 dBm)<br>- C Pin - GND<br>- D Pin - Mute - pull low to mute |
| Housing | Milled aluminium (nickel plated) |
| Dimensions | H 35.5mm, W 121.5mm, L 169.5mm |
| Weight | Approx 1.5kg |
| RF input | SMA female (sealed) |
| RF output | TNC female (sealed) |
| User camera type | PAL or NTSC |

## Product Code:

| |
|---|
| SOLAMP5W-310350 |

# Digital Microwave L-Band Linear RF Amplifier

The Cobham Digital RF amplifiers bring a new level of performance and reliability to microwave transmission of digitally modulated video. The linear RF power amplifier provides 5 watts of RF power into any load.

The linear amplifier features domo technology at its core and is ideal for digital transmission applications in surveillance, law enforcement, military UAV and UGV, airborne data/telemetry and television broadcasting. It is designed to amplify COFDM digitally modulated signals (QPSK, 16-QAM) and features broadband operation, while requiring a minimum of DC current.

Only minimum heat sinking is required for the high output models in normal operation. Packaged in a rugged aluminium housing, the amplifier construction lends itself to applications where extreme environmental conditions are the norm. Chassis connectors are environmentally protected, making the amplifier ideal for airborne operations where it can be mounted on a helicopter skid.

The integral lineariser minimises distortions typically associated with conventional RF amplification techniques. The amplifier is designed to meet the stringent requirements of the DVB-T spectral mask and may be used for COFDM, QPSK, QAM and CW applications.

Input and output port protection is provided with a VSWR better than 2.0:1 across the frequency band providing excellent matching into filters. Reverse polarity protection and short circuit protection are standard features.

## Features:

- Designed for Digital Modulation
  - COFDM, QPSK, BPSK
- Ultra linear
- High efficiency
- Operating gain
  - 5W: 17 dB typical
- RF ports are open and short protected
- Short circuit/over-voltage protection
- Reverse polarity protection
- 11 - 28 Vdc input
- Rugged packaging
- Mute function

## Specification:

**Electrical**

| | |
|---|---|
| Frequency range | L band: 1.15 to 1.4GHz |
| Input/output protection | Open and short circuit |
| VSWR | ≥ -14 dB input and output return loss |
| Non-harmonic spurious output | > -65 dBc Typ. |
| Nominal drive | +20 dBm |
| Overdrive capability | Pin (nom) + 3 dBm (typ.) |
| Modulation formats | COFDM, QAM, CW |
| Reverse polarity protection | |
| Short circuit protection | |
| Gain flatness | ±0.5 dB across operating band |
| Operating gain | 5W: (17 dB typ.) |
| Output power | +37 dBm |
| ACPR | -30 dBc (typ.) |
| OIP3 @ Pop (typ) | 5W: 37 dBm |
| Power added efficiency | 15% typical |
| PA mute on PTO | |
| Status LED | ON/STBY |
| Supply voltage | +11 Vdc to +28 Vdc |
| Supply current | 5W output: 3.8 A (typ.) @ 12 Vdc |

**Environmental**

| | |
|---|---|
| Operating temperature | -15 to +60 °C, Baseplate |
| Relative humidity | 0 to 95%, non-condensing |
| Environmentally protected | |

**Mechanical**

| | |
|---|---|
| DC input connector | PTO 4 pin<br>- A Pin - V+<br>- B Pin - forward power<br>(normal high, goes low if o/p is 6 dB less than 37 dBm)<br>- C Pin - GND<br>- D Pin - Mute - pull low to mute |
| Housing | Milled aluminium (nickel plated) |
| Dimensions | H 35.5mm, W 121.5mm, L 169.5mm |
| Weight | Approx 1.5kg |
| RF input | SMA female (sealed) |
| RF output | TNC female (sealed) |

## Product Code:

| |
|---|
| SOLAMP5W-115140 |

# Digital Microwave S-Band Linear RF Amplifier

The Cobham Digital RF amplifiers bring a new level of performance and reliability to microwave transmission of digitally modulated video. The linear RF power amplifier provides 5 watts of RF power into any load.

The linear amplifier features domo technology at its core and is ideal for digital transmission applications in surveillance, law enforcement, military UAV and UGV, airborne data/telemetry and television broadcasting. It is designed to amplify COFDM digitally modulated signals (QPSK, 16-QAM) and features broadband operation, while requiring a minimum of DC current.

Only minimum heat sinking is required for the high output models in normal operation. Packaged in a rugged aluminium housing, the amplifier construction lends itself to applications where extreme environmental conditions are the norm. Chassis connectors are environmentally protected, making the amplifier ideal for airborne operations where it can be mounted on a helicopter skid.

The integral lineariser minimises distortions typically associated with conventional RF amplification techniques. The amplifier is designed to meet the stringent requirements of the DVB-T spectral mask and may be used for COFDM, QPSK, QAM and CW applications.

Input and output port protection is provided with a VSWR better than 2.0:1 across the frequency band providing excellent matching into filters. Reverse polarity protection and short circuit protection are standard features.

## Features:

- Designed for Digital Modulation
  - COFDM, QPSK, BPSK
- Ultra linear
- High efficiency
- Operating gain
  - 5W: 17 dB typical
- RF ports are open and short protected
- Short circuit/over-voltage protection
- Reverse polarity protection
- 11 - 28 Vdc input
- Rugged packaging
- Mute function

## Specification:

**Electrical**

| | |
|---|---|
| Frequency range | S band: 2.25 to 2.55GHz |
| Input/output protection | Open and short circuit |
| VSWR | ≥ -14 dB input and output return loss |
| Non-harmonic spurious output | > -65 dBc Typ. |
| Nominal drive | +20 dBm |
| Overdrive capability | Pin (nom) + 3 dBm (typ.) |
| Modulation formats | COFDM, QAM, CW |
| Reverse polarity protection | |
| Short circuit protection | |
| Gain flatness | ±0.5 dB across operating band |
| Operating gain | 5W: (17 dB typ.) |
| Output power | +37 dBm |
| ACPR | -30 dBc (typ.) |
| OIP3 @ Pop (typ) | 5W: 37 dBm |
| Power added efficiency | 15% typical |
| PA mute on PTO | |
| Status LED | ON/STBY |
| Supply voltage | +11 Vdc to +28 Vdc |
| Supply current | 5W output: 3.8 A (typ.) @ 12 Vdc |

**Environmental**

| | |
|---|---|
| Operating temperature | -15 to +60 °C, Baseplate |
| Relative humidity | 0 to 95%, non-condensing |
| Environmentally protected | |

**Mechanical**

| | |
|---|---|
| DC input connector | PTO 4 pin<br>- A Pin - V+<br>- B Pin - not used<br>- C Pin - GND<br>- D Pin - Mute - pull low to mute |
| Housing | Milled aluminium (nickel plated) |
| Dimensions | H 28mm, W 121.5mm, L 169.5mm |
| Weight | Approx 1.5kg |
| RF input | SMA female (sealed) |
| RF output | TNC female (sealed) |

## Product Code:

| |
|---|
| SOLAMP5W-225255 |

# SOLO4 – Robust Transmitter

The Robust SOLO4 Transmitter unit from Cobham Surveillance is a feature-rich COFDM digital video transmitter, which can operate in a variety of transmission bandwidths allowing the user to trade off image quality against range, to suit all types of missions. Excellent range, performance and spectral efficiency are offered when operating in the unique 2.5MHz and 1.25MHz narrow bandwidth modes.

The Robust SOLO4 Transmitter has domo technology at its core and is ideal for establishing prolonged rugged wireless video links, in harsh external environments. Security is ensured with our built-in 32 bit ABS encryption or, for greater security, AES128/256 bit encryption is also available, subject to export controls. The Robust SOLO4 Transmitter is available in a variety of frequency bands from 340MHz to 3.4GHz.

SOLO4 Robust Transmitter

Able to transmit images in a Non-Line of Sight (NLOS) environment up to 500m depending on mode and frequency, the Robust SOLO4 Transmitter can achieve even further range with the bolt-on booster PA.

Supplied in a sealed IP 67 rated aluminium enclosure, the Robust SOLO4 Transmitter can be used in a variety of applications and is available in microwave and UHF frequencies.

## Specification:

| Input | |
|---|---|
| Composite Video | 4 pin amphenol |
| Audio | 3 pin amphenol |
| RS-232 Control and Data | 7 pin amphenol |
| 12V DC In | 3 pin amphenol |

| Output | |
|---|---|
| RF Out | TNC |

| RF | |
|---|---|
| Frequency Bands | 340 to 470 MHz<br>470 to 520 MHz<br>570 to 670 MHz<br>1.15 to 1.40 GHz<br>2.28 to 2.55 GHz<br>2.70 to 2.90 GHz<br>3.10 to 3.40 GHz |
| Power | 100mW |
| Power Control | 20dB in 1dB steps |
| Tuning Steps | 250 KHz |

| Modulation | |
|---|---|
| Bandwidths (DVB-T or SOLO) | 8/7/6/2.5MHz (1.25MHz optional) |
| Default Modes:<br>Mode 1 - Short Range<br>Mode 2 - Normal Range<br>Mode 3 - Long Range<br>Mode 4 - Ultra Long Range | <br>2.5MHz, 16QAM, FEC2/3, 4.8Mb/s<br>2.5MHz, QPSK, FEC2/3, 2.4Mb/s<br>2.5MHz, QPSK, FEC1/3, 1.2Mb/s<br>(1.25MHz, QPSK, FEC1/3, 600kb/s optional) |

| Video | |
|---|---|
| Line Standard | PAL/NTSC |
| Resolution | 704, 528, 480, 352 |
| Coding Mode | MPEG2 (MPEG4 optional) |
| Delay | 43ms to 120ms depending on mode |
| Frame Rate | Full/Half/Quarter/Eighth (selectable) |

| Audio | |
|---|---|
| Input | Line Level or Microphone |
| Sample Rate | 32KHz, 16KHz, 8KHz switchable |
| Bits per Sample | 12 or 8 bit switchable |

| Data Interface | |
|---|---|
| RS232 Data Input | 1K2 to 115K2 baud switchable |

| Encryption | |
|---|---|
| Format | ABS 32 bit as standard<br>AES128/256 (optional) |

| Control | |
|---|---|
| Remote Control | RS232 Control from PC GUI Application |
| Local Control | Front Panel 8 channel select,<br>RF on/off, Range mode, Lock, Alarm |

| Physical | |
|---|---|
| Dimension | L 150mm, W 120mm, H 35mm |

| Power | |
|---|---|
| DC Input | 10 to 16V |
| Power Consumption | 4.8 to 6W depending on mode |

| Environment | |
|---|---|
| Temperature Range | -20 to +50 deg C |
| Sealing | IP67 |

## Associated Equipment:

| The following devices are also part of the system | |
|---|---|
| SOL4RXR | Robust SOLO4 Receiver 1 video, 2-way diversity with integral down converters |
| SOLAMPR1W | Robust Clip-on 1W amplifier |

## Product Code:

| |
|---|
| SOL4TXR-034047 |
| SOL4TXR-047052 |
| SOL4TXR-057067 |
| SOL4TXR-115140 |
| SOL4TXR-228255 |
| SOL4TXR-270290 |
| SOL4TXR-310340 |
| SOL4TXUP UPGRADE ADDS 1.25MHZ UNB AND MPEG4 |

# SOLO4 – Robust Clip-on 1W Amplifier

The Robust SOLO4 Bolt-on 1W Amplifier from Cobham Surveillance provides increased range for our robust range of digital video transmitters.

The narrow bandwidth associated with COFDM means that this unit provides exceptional spectral efficiency allowing multiple high quality video links to operate within the same bandwidth traditionally held by a single analogue video signal. The multicarrier modulation scheme has the ability to cope with severe channel interference such as fading and multi-path, making it ideal for surveillance operations.

The Robust 1W Amplifier combined with the Robust SOLO4 Transmitter provides a rugged non line-of-sight (NLOS) link over a range of around 1km with non-directional antennae, and gives line-of-sight (LOS) operation to several kilometres, whilst the sealed IP 67 rated aluminium enclosure allows the unit to be deployed in external environments for prolonged periods of time.


SOLO4 Robust Clip-on 1W Amplifier (L & S-Band)

## Specification:

| | |
|---|---|
| **Input** | |
| RF In | TNC |
| 12V DC In | 3 pin amphenol |
| **Output** | |
| RF Output | TNC |
| **RF** | |
| Frequency Bands | 1.25 to 2.50 GHz<br>3.10 to 3.40 GHz |
| Power In | 100mW |
| Power Out | 1W |
| **Physical** | |
| Dimensions<br>L & S-Band<br>C-Band | <br>L 150mm, W 116mm, H 43mm<br>L 199mm, W 116mm, H 43mm |
| **Power** | |
| DC input | 10 to 16V |
| Power Consumption | 10W typical |
| **Environment** | |
| Temperature Range | -20 to +50 deg C |
| Sealing | IP67 |

## Associated Equipment:

The following devices are also part of the system

| | |
|---|---|
| SOL4TXR | Robust SOLO4 Transmitter |
| SOL4RXR | Robust SOLO4 Receiver |

## Product Code:

| |
|---|
| SOLAMPR1W-125250 |
| SOLAMPR1W-310340 |

# SOLO4 – ClearCam Deployable Camera

The Cobham Surveillance ClearCam system is ideal for surveillance, perimeter security, fire control and CBRN applications. A robust PTZ camera designed specifically for rapid deployment, the on board status display gives at-a-glance link status, confirming that the ClearCam is in range of the receive station.

This tactical system incorporates a periscope PTZ camera, digital video transmitter, telemetry receiver and battery technology into a weatherproof package for long term outdoor deployment. The ClearCam will typically operate at a range of up to 1km.

The robust ClearCam chassis is IP66 rated, and supplied with a variety of mounting options to enable tripod, mast or simple deployment on the base. The integral periscope camera can be detached from the ClearCam base, and is supplied with a 10m umbilical cable for maximum deployment flexibility.

Integral battery life can be extended by the connection of sensors to automatically wake the camera from sleep mode in the event of trigger activity.

The Cobham Surveillance narrow bandwidth modulation offers unprecedented spectrum efficiency, while increasing the system sensitivity and range. Standard ABS encryption or optional AES128- or 256-bit encryption algorithms ensure transmission security.

## Features:

- External DC input for long duration deployments
- External sensor trigger inputs
- 36x Optical zoom, low light colour camera
- 400 degree pan, -20 to +40 degree tilt
- Available in a range of frequencies
- Secure communications
- Long deployment range
- Sophisticated user features to enable rapid deployment.

## Specification:

| Antennas | |
|---|---|
| Transmit Antenna | TNC |
| Receive Antenna | TNC |
| **Input/Output** | Amphenol connectors |
| DC Power | 62GB-12E10-02SN |
| GPIO trigger inputs | 62GB-12E12-08SN |
| RS-232 control | 62GB-12E08-03SN |
| Audio Input and output | 62GB-12E10-06SN |
| Camera 1 connector | 62GB-12E12-14SN |
| Camera 2 connector | 62GB-12E12-14SN |

| Antennas | |
|---|---|
| Transmit Antenna | 4dBi Colinear TNC mount flexible |
| Receive Antenna | 2dBi Coliner BNC mount flexible |

| RF | |
|---|---|
| Transmit Frequency Bands | SOL4CLCx-240045 and SOL4CLCx-240086<br>2.28 to 2.55GHz tuneable<br>SOL4CLCx-120045<br>1.15 to 1.4GHz tuneable |
| Transmit Power | 30dBm (1W) |
| Tuning Steps | 250kHz |
| Receive Frequency Bands | SOL4CLCx-240045 and SOL4CLCx-120045<br>456 to 458MHz tuneable<br>SOL4CLCx-240086<br>868 to 870MHz tuneable |
| Receive Sensitivity | -118dBm typical |

| Modulation | |
|---|---|
| Transmit modes | |
| Bandwidth | 2.5MHz or 1.25MHz |
| Modulation | QPSK or 16QAM |
| FEC | 1/3 or 2/3 |
| Bitrate | 600kb/s to 4.8Mb/s |

| PTZ Camera | |
|---|---|
| Range of PTZ | 400 degree pan, -20 to +40 vertical |
| Zoom | 36X Optical and 12X digital |
| Low Light | Yes |
| Line standard | P model PAL, N model NTSC |

| Video Encoding | |
|---|---|
| Resolution | 704, 528, 480, 352 |
| Coding mode | MPEG2 or MPEG4 (optional) |
| Delay | 43ms to 1sec depending on model |
| Frame rate | Full/Half/Quarter/Eighth (optional) |

| Audio | |
|---|---|
| Level | Line Level |
| Sample rate | 32kHz, 16kHz, 8kHz |
| Bits per sample | 12- or 8-bit |

| Sensors Inputs | |
|---|---|
| Quantity | 2 |
| Format | Closed Contact Detection |

| Sleep Options | |
|---|---|
| Modes | Wake on trigger input/Wake on user instruction |
| Wake Period | User defineable |

| Encryption | |
|---|---|
| Format | ABS (standard)<br>AES128 / 256 selectable (optional) |

| Control | |
|---|---|
| Remote control | Over air from MicroVue Commander case<br>On/Off switch, transmit switch, channel switch and status switch<br>User status display indicates battery life and link status |
| PC Control | Using PC RS232 Application |

| Physical | |
|---|---|
| Dimension | Base unit - L 280mm, W 245mm, H 90mm<br>Turret and Plinth - H 350mm, 75mm Diameter |
| Weight | Base unit - 6.4kg<br>Turret unit - 1.5kg |

| Power | |
|---|---|
| DC input (8A fused) | 11-16V (Reverse Polarity Protected) |
| Battery backup (internal fuse) | 3.5 hours operation in 1W mode (NiMH) |

| Environment | |
|---|---|
| Temperature Range | -20 to +50 deg C |
| Protection | Dry Nitrogen |

## Product Code:

| |
|---|
| SOL4CLCN-240090 |
| SOL4CLCN-240086 |
| SOL4CLCN-240045 |
| SOL4CLCN-120045 |
| SOL4CLCP-240086 |
| SOL4CLCP-240045 |
| SOL4CLCP-120045 |

# SOLO4 – 'DropCam' Transmitter

The SOLO4 DropCam Transmitter is an integrated rapid deployment wireless video surveillance solution, integrating camera, microphone, user data, battery and digital COFDM transmitter into a single rugged housing. The DropCam is ideal for rapid deployment surveillance scenarios such as event or room monitoring or fire and safety applications. The COFDM modulator ensures excellent range even in mobile and non-line of sight applications (typically 300-500m). The DropCam is available in a range of frequency bands from 300MHz to 6GHz and is supplied with interchangeable lenses (3mm, 8mm and 16mm) to suit all applications.

The rugged but lightweight IP66 chassis enables the unit to be used in prolonged outdoor deployments, while tripod mount and magnetic mount fittings enable the SOLO4 DropCam Transmitter to be positioned easily.

The Transmitter can be mounted on standard baton-style torches such as the Maglite by employing the optional DropCam Torch Clip Mount, creating an ideal solution for first responder and emergency services workers.

The re-chargeable integral battery can power the unit for 3 hours of continuous transmissions. For longer deployments the DropCam is supplied with an external DC input.

Privacy is ensured with built-in 32-bit ABS encryption or, for greater security, AES128- or 256-bit encryption can also be provided, subject to export controls.

## Specification:

**Camera**

| | |
|---|---|
| Type | ¼" CMOS Fixed Focal 3.4mm (56deg H-FOV), F2.0 |
| Interchangeable Lenses | 8mm and 16mm |
| Pixels | 640x480 |
| Resolution | >460 TVL |
| Sensitivity | 0.05Lux |
| Signal to noise | >46dB |

**Microphone**

| | |
|---|---|
| Type | Microphone Omni 50-13KHz |
| Sensitivity | 60dB +/-3dB |

**Output**

| | |
|---|---|
| RF Output | SMA |
| Antenna Type | 2dBi Vertical Polarisation Omni Flexi antenna |

**RF**

| | |
|---|---|
| Frequency Bands | 2.00 to 2.5GHz,<br>1.0 to 1.5GHz (supplied antenna 1.2 to 1.5Ghz),<br>300 to 450MHz |
| Power | 100mW |
| Power Control | 30dB in 1dB steps |
| Tuning Steps | 250KHz |

**Modulation**

| | |
|---|---|
| Bandwidth | 8/7/6/2.5 MHz |
| FEC | 1/2, 2/3, 3/4, 5/6 (bandwidth dependent) |
| Modulation | QPSK, 16QAM and 64QAM (bandwidth dependent) |

**Video**

| | |
|---|---|
| Line Standard | PAL (P variant), NTSC (N variant) |
| Resolution | 704, 528, 480, 352 |
| Coding Mode | MPEG2 |
| Delay | Less than 50 - 250ms (mode dependent) |

**Audio Encoding**

| | |
|---|---|
| Sample Rate | 32/48KHz |
| Format | MPEG2 Audio 384Kb/s to 64Kb/s mono |

**Encryption**

| | |
|---|---|
| Format | ABS 32-bit as standard, AES128/256 (optional) |

**Remote Control**

RS232 Control from PC GUI Application

**Data Input**

RS232 1K2 to 115K6 User data input

**External DC input**

6 – 16V (internal battery charges with >12.5V only)

**Trigger Input**

Close contact input pins for 'wake-up' and 'sleep'

**Battery**

| | |
|---|---|
| Voltage | 7.5V |
| Capacity | 2200mA/h |
| Duration | Typically 3 hours plus |

**Physical**

| | |
|---|---|
| Dimension | L 110mm, H 55mm, W 37mm |
| Weight | 340g |
| Power Consumption | 4.8 to 5W depending on mode |

**Power**

| | |
|---|---|
| DC input (8A fused) | 11-16V (Reverse Polarity Protected) |
| Battery backup (internal fuse) | 3.5 hours operation in 1W mode (NiMH) |

**Environment**

| | |
|---|---|
| Temperature Range | -10 to +60 deg C |
| Enclosure | IP66 |

**Control and DC Connector - 7pin Binder 712 Series PN. 99 0422 0007**

Pin 1. Vin
Pin 2. Gnd
Pin 3. 232 Control Out of Unit
Pin 4. 232 Control Into Unit
Pin 5. 232 User Data In
Pin 6. Close Contact 1
Pin 7. Close Contact 2

## Product Code:

| | |
|---|---|
| SOL4DCAM-N-030045 | Drop Camera NTSC 300-450MHz |
| SOL4DCAM-N-120150 | Drop Camera NTSC 1.20-1.50GHz |
| SOL4DCAM-N-200250 | Drop Camera NTSC 2.00-2.50GHz |
| SOL4DCAM-P-030045 | Drop Camera PAL 300-450MHz |
| SOL4DCAM-P-120150 | Drop Camera PAL 1.20-1.50GHz |
| SOL4DCAM-P-200250 | Drop Camera PAL 2.00-2.50GHz |
| TORCP | Torch Clip Bracket for Drop Camera |

# SOLO4 – 'DropCam' Accessories

The SOLO4 DropCam is supplied in kit form with the following accessories:

| Accessories supplied |
|---|
| 1 x rugged carry case with operator instructions |
| 1 x Control and DC cable |
| 1 x AC to DC adaptors |
| 1 x 8mm lens (blue band) |
| 1 x 16mm lens (red band) |
| 1 x right angle magnetic clip |
| 1 x 2dBi Omni antenna |
| 1 x tools for lens replacement |

# SOLO4 – 'DropCam' Optional Accessories - Torch Clip

The DropCam can be mounted on standard baton style torches such as the Maglite by employing the optional DropCam Torch Clip Mount, creating an ideal solution for first responder and emergency services workers:

| Part number |
|---|
| TORCP – Torch Clip bracket for DropCam |

| Accessories supplied with Torch Clip |
|---|
| 1 x Torch Clip |
| 1 x screw for tripod mount |
| 1 x Allen key |

# COFDM IP Mesh


Data can be exchanged between moving nodes in a point-to-point or point-to-multipoint.

COFDM IP Mesh radios are the latest innovations in the expanding range of Cobham Surveillance solutions with domo technology at their core.

Up to 8 of the radios can be combined into a ground-breaking IP mesh network - Cobham's first fluid, self-forming, self-healing mesh. Offering genuine non-line of sight coverage (COFDM), the system is truly mobile and therefore supplies a network with extended range - one which will deliver in environments too tough for other radio solutions to cope with.

Wireless networks no longer need to be static. Unlike other wireless options, the COFDM IP Mesh constantly readjusts itself as nodes move, working out which are in range and finding the best route to send data between them. When one node can no longer operate, the rest of the nodes can still communicate with each other - directly or through one or more intermediate nodes.

The highly flexible mesh topology means that data can be exchanged between moving nodes in a point to point or point to multipoint fashion, and range can be extended by using nodes as repeaters.

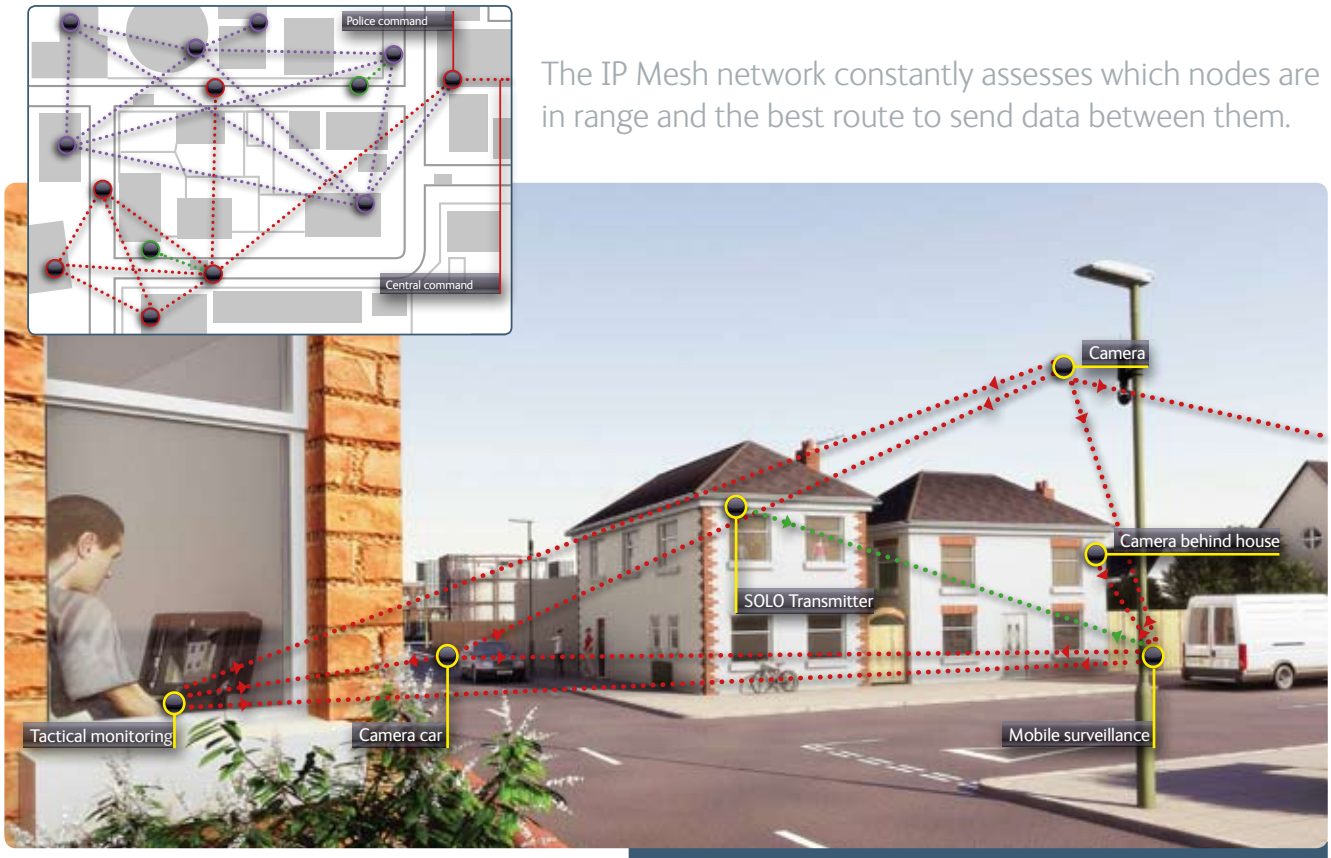
With a COFDM IP Mesh system, any shape of mesh network can be built:

**A chain network:** Ideal for range extension, each node is placed at the outer range limit of the node before. These then chain together to feed information back. This network can be operated and maintained whilst mobile.

- **A star network:** Good for urban coverage, a central node is situated at a high point to act as a relay and all other nodes feed information back via that one, enabling bi-directional communications.
- **A random network:** Evolves organically to any shape.
- **A combined network:** Any of the above shapes can be linked - if they are operating at different frequencies, they can be combined at the IP layer.

COFDM IP Mesh from Cobham offers true networked integration of video, audio and GPS, with seamless transfer of MPEG4 video even when the mesh is reconfiguring to a different shape.

The robust, self-healing mesh architecture makes the product ideal for use in mobile surveillance applications, command and control, or advanced robotics.




The IP Mesh network constantly assesses which nodes are in range and the best route to send data between them.

## Technical features

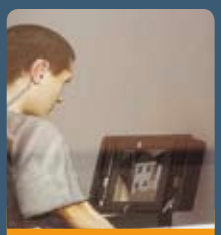
COFDM IP Mesh radios exchange data on a single frequency, simplifying frequency management. The entire mesh occupies just 2.5MHz (3 and 3.5MHz also available) of bandwidth. Far narrower than WiFi or WiMax bandwidth, this gives less noise in the channel, better sensitivity and increased spectrum for more users. Utilising proprietary domo narrowband video compression technology, very high quality video can be transmitted over the mesh network.

Custom-designed for the security and military markets, the IP Mesh radios employ the unique Cobham COFDM modulation scheme and therefore have excellent RF penetration and performance in the presence of multipath. An IP data rate of up to 3.5Mb/s is possible (data rate depends on mode, number of nodes, and range between nodes), and this can be symmetric to match network requirements. Diversity gives protection against fading, and there are built-in guard intervals and error correction.

Security of the entire mesh network can be ensured by the use of the optional AES128 or AES256 encryption. Control of the whole deployed mesh is achieved using a comprehensive web browser application with a built-in user-loaded mapping facility and PTZ controls.

The COFDM IP Mesh solution is available in a Plain, or Robust (IP66) enclosure with 1W for long range. It can also be upgraded with composite video and audio, input and output options.

KEY: Mesh 1 Mesh 2 SOLO link out



*IP mesh systems enable the backhaul of multiple audio feeds for monitoring by surveillance teams.*

*Networked integration of video, audio and GPS, with seamless transfer of MPEG4 video even during network reconfiguration.*

*Robust, self-healing mesh architecture makes the COFDM IP Mesh ideal for use in mobile tracking applications.*

*A Mesh network takes data from its nodes and broadcasts, non-line of sight, to a nearby police command point.*

*Data can be filtered and sent onward to central command centres from a local monitoring point.*

COFDM IP Mesh Features:

- Single frequency fluid self-healing mesh, up to 8 nodes
- Immediate joining as additional nodes come within range
- Multiple interconnected meshes can be operated in the same area
- 2.5, 3, 3.5MHz bandwidth, giving typically 3.5Mb/s network capacity
- IP interface as standard for easy connection of cameras, sensors and data
- GPS and/or RS232 interface and mapping software available
- Web browser control interface
- Web browser mapping interface (user loaded)
- RF Silent mode - listen only, transmit only when required
- Mesh allows range extension by making chains, or easy bi-directional relays*
- Composite video and audio input options for streaming video
- Composite video and audio output options for connection to recorders
- Easy control of cameras for PTZ
- Encryption for security with AES128/256
- IP Mesh capability
- Automatic Adaptive Modulation
- NETAV Video and Audio Input Interface
  (For composite video and audio out use Net IPH IP Hardware decoder)

For more information, please refer to the following pages:

NETNode IP Mesh Radio (Plain) - P35
NETNode IP Mesh Radio (Robust) - P37

* Starred items in text will be supported in future releases

# NETNode IP Mesh Radio (Plain)

Cobham NETNode IP mesh radios are the latest innovations in the expanding range of Cobham Surveillance solutions that feature domo technology at their core.

NETNode IP radios can be combined in a fluid self forming, self healing mesh containing up to eight radios. The NETNode radios within the mesh exchange data on a single frequency, simplifying frequency management. The entire mesh occupies just 2.5MHz of bandwidth (3 and 3.5MHz also available). 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 up to 3.5Mb/s of IP data (data rate depends on mode, number of nodes and range between nodes). This available IP data 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, or advanced robotics.

The NETNode can be connected to third party cameras using the NETAV option. Alternatively, there are two dedicated PTZ camera solutions available for direct connection to the NETNode: NETPTZ* is a high performance, high quality day/night PTZ camera for long range and overt surveillance; NETuPT is a miniature pan and tilt camera suitable for up-close surveillance. The NETuPT and NETPTZ* options require the NETAV option to be fitted.

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 Mesh Commander* PC application. This software suite, based around a mapping display, is used to configure and monitor the mesh, and to control its nodes and cameras. Video can be viewed on the PC device using the Mesh Commander* software or, if IP Hardware Decoder devices are employed, video can be viewed on conventional monitors and recorded on conventional recorders. Remote users simply wishing to monitor the network, control cameras or view video, can make use of the Mesh Viewer* application available for smaller hand held devices such as PDAs.

## Specification:

| Interfaces | |
|---|---|
| RF Interfaces (Antenna 1 and 2) | SMA |
| Power | Lemo |
| Ethernet 1 | RJ45 |
| Ethernet 2 | RJ45 |
| Control and misc I/O | DType |
| Camera | Lemo |

| Typical range | |
|---|---|
| NETNode-P-217250 (1W) | Non Line of Sight Light urban 500-700m<br>Line of Sight 40km+ |

| RF Interfaces | |
|---|---|
| Antenna 1 | Switched transmit receive antenna |
| Antenna 2 | Receive only antenna |

| RF and modulation | |
|---|---|
| Output frequency | 340 to 470MHz, 1000 to 1500MHz, 2170 to 2500MHz, 4500 to 5000MHz*, or 5500 to 6000MHz* |
| Tuning step size | 125kHz step |
| Output power | +30 to 0dBm in 0.25dB steps |
| Bandwidth | 2.5, 3 or 3.5MHz |
| Mesh capacity | Up to 3.5Mb/s |
| Modulation | COFDM 360 carrier modulation |
| Carrier Modulation | BPSK, QPSK or 16QAM (adaptive) |
| FEC rate | FEC1/2 |
| Receive diversity | Maximum Ratio Combining |
| Receive sensitivity | -98dBm for most robust mode |

| IP interface | |
|---|---|
| Primary and secondary ethernet electrical | 100BaseT Ethernet |
| IP address allocation | DHCP dynamic IP addressing |
| Video and audio streaming format | Multicast VLC compatible<br>RTSP Support |

| A/V input option | |
|---|---|
| Video input | Composite or SDI (selectable) |
| Video format | 525 or 625 (PAL or NTSC) |
| Video encoding | MPEG4 |
| Quality | User selectable quality level |
| Video bit-rate | 2.4Mb/s to 50kb/s (variable) |
| Resolution | 704, 576, 480 or 352 |
| Frame rate | Self selecting 30 to 2F/s |
| Stills capture feature | HiRes JPEG file |
| Audio input | Line level or microphone level |
| Audio sample frequency | 48KHz |
| Audio encoding | MPEG audio layer 1 G726 |
| Audio bit-rate | 384 to 64kb/s |

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

| Open Audio comms channel (shared voice channel) | |
|---|---|
| Multi-user audio comms channel | Interface microphone level/headphone o/p |
| Compression | G726 32kbit audio |

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

| GPS | |
|---|---|
| Dedicated GPS interface | RS232 |

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

# NETNode IP Mesh Radio (Plain)

**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<br>From any user supplied desk controller<br>Requires RS232 interface |
| NETNode bespoke cameras | NETPTZ long range PTZ<br>NETuPT short range pan tilt |

**Triggers***

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

**Control**

| | |
|---|---|
| Local control | LEDs power and mesh status |
| Remote control application | Mesh Commander* PC application<br>Full control of all parameters in a map based |

**Physical**

| | |
|---|---|
| Sealing | No IP rating - splash proof |
| Dimensions | H 155mm, W 153mm, D 45mm |
| Mounting options base unit | Through hole screws |
| Weight | 1.24kg (including heat sink) |

**Power**

| | |
|---|---|
| DC input | 12-14V |
| Power consumed 1W | 14W |

**Environment**

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

**Connectors**

| | |
|---|---|
| Power:<br>Female Lemo 4 pin 0B | Pin 1 +12VDC<br>Pin 2 +12VDC<br>Pin 3 GND<br>Pin 4 GND |
| Ethernet 1:<br>RJ45 connector | Ethernet OP<br>Ethernet ON<br>Ethernet IP<br>Ethernet IN |
| Ethernet 2:<br>RJ45 connector | Secondary Ethernet OP<br>Secondary Ethernet ON<br>Secondary Ethernet IP<br>Secondary Ethernet IN |
| DB-15 (male) | Pin 1 RS485 TX+<br>Pin 2 RS485 TX-<br>Pin 3 GND<br>Pin 4 RS485 RX+<br>Pin 5 RS485 RX-<br>Pin 6 GND<br>Pin 7 Engineering use only<br>Pin 8 Engineering use only<br>Pin 9 GNS<br>Pin 10 RS232 Control TX<br>Pin 11 RS232 Control RX<br>Pin 12 GND<br>Pin 13 Radio Controller Trainer +<br>Pin 14 Radio Controller Trainer -<br>Pin 15 GND |

**PLUS the following two optional connectors for use when an encoder card is fitted**

| | |
|---|---|
| Female Lemo 5 pin 0B | Pin 1 Audio right channel<br>Pin 2 Audio left channel<br>Pin 3 Ground for audio<br>Pin 4 Composite video<br>Pin 5 Ground for composite video |
| Female Lemo 3 pin 0B (for RS232 input when encoder is fitted) | Pin 1 TX<br>Pin 2 RX<br>Pin 3 GND |

## Options:

| | |
|---|---|
| NETNode-AVI-UP2P | Composite Video and Audio input for COFDM IP Mesh Node Plain |
| NETPTZ* | Pan, Tilt and Zoom camera for NETNode |
| NETuPT | Micro Pan and Tilt camera option for NETNode |
| NETIPHW | IP in with either 1,2 or 4 Video and 2,4 or 8 Audio Out Decoder |
| Mesh Commander* | |
| Mesh Viewer* | |

## Product Code:

| | |
|---|---|
| NETNode-P-100150 | IP Mesh Node 1W 1.00-1.50GHz excl ants, incl PSU12/4 |
| NETNode-P-217250 | IP Mesh Node 1W 2.17-2.50GHz excl ants, incl PSU12/4 |
| NETNode-P-450500* | IP Mesh Node 1W 4.50-5.00GHz excl ants, incl PSU12/4 |
| NETNode-P-550600* | IP Mesh Node 1W 5.50-6.00GHz excl ants, incl PSU12/4 |


* Starred items in italics will be supported in future releases

# NETNode IP Mesh Radio (Robust)

Cobham NETNode IP mesh radios are the latest innovations in the expanding range of Cobham Surveillance solutions that feature domo technology at their core.

NETNode IP radios can be combined in a fluid self forming, self healing mesh containing up to eight radios. The NETNode radios within the mesh exchange data on a single frequency, simplifying frequency management. The entire mesh occupies just 2.5MHz of bandwidth (3 and 3.5MHz also available). 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 up to 3.5Mb/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 NETAV option. Alternatively, there are two dedicated PTZ camera solutions available for direct connection to the NETNode: NETPTZ* is a high performance, high quality day/night PTZ camera for long range and overt surveillance; NETuPT is a miniature pan and tilt camera suitable for up-close surveillance. The NETuPT and NETPTZ* options require the NETAV option to be fitted.


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 Mesh 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 Mesh Commander* software or, if IP Hardware Decoder devices are employed, video can be viewed on conventional monitors and recorded on conventional recorders.

## Specification:

### Interfaces

| | |
|---|---|
| RF Interfaces (Antenna 1 and 2) | NType |
| Power and Ethernet | Amphenol 38999 Series 3 |
| Control and misc I/O | Amphenol 38999 Series 3 |
| Camera | Amphenol 38999 Series 3 |

### Typical range

| | |
|---|---|
| NETNode-R-217250 (1W) | Non Line of Sight Light urban 500-700m<br>Line of Sight 40km+ |

### RF Interfaces

| | |
|---|---|
| Antenna 1 | Switched transmit receive antenna |
| Antenna 2 | Receive only antenna |

### RF and modulation

| | |
|---|---|
| Output frequency | 340 to 470MHz, 1000 to 1500MHz, 2170 to 2500MHz, 4500 to 5000MHz*, or 5500 to 6000MHz* |
| Tuning step size | 125kHz step |
| Output power | +30 to 10dBm in 0.25dB steps |
| Bandwidth | 2.5, 3 or 3.5MHz |
| Mesh capacity | Up to 3.5Mb/s |
| Modulation | COFDM 360 carrier modulation |
| Carrier Modulation | QPSK/16QAM (adaptive) |
| FEC rate | FEC1/2 |
| Receive diversity | Maximum Ratio Combining |
| Receive sensitivity | -98dBm for most robust mode |

### IP interface

| | |
|---|---|
| Primary and secondary ethernet electrical | 100BaseT Ethernet |
| IP address allocation | DHCP dynamic IP addressing/Static IP |
| Video and audio streaming format | Multicast VLC compatible<br>RTSP Support |

### A/V input option

| | |
|---|---|
| Video input | Composite or SDI (selectable) |
| Video format | 525 or 625 (PAL or NTSC) |
| Video encoding | MPEG4 |
| Quality | User selectable quality level |
| Video bit-rate | 2.4Mb/s to 50kb/s (variable) |
| Resolution | 704, 576, 480, 352 or SIF (1/4 Resolution) |
| Frame rate | Self selecting 30 to 2F/s |
| Stills capture feature | HiRes JPEG file* |
| Audio input | Line level or microphone level |
| Audio sample frequency | 48KHz |
| Audio encoding | MPEG audio layer 1 G726 |
| Audio bit-rate | 384 to 64kb/s |

### Store and Forward options*

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

### 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

| | |
|---|---|
| Dedicated GPS interface | RS232/RS485 |

### Data interface

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

# NETNode IP Mesh Radio (Robust)

**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<br>From any user supplied desk controller<br>Requires RS232/RS485 interface |
| NETNode bespoke camera | NETPTZ long range PTZ<br>NETuPT short range pan tilt |

**Triggers***

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

**Control**

| | |
|---|---|
| Local control | LEDs power and mesh status |
| Remote control application | Mesh Commander* PC application<br>Full control of all parameters in a map based |

**Physical**

| | |
|---|---|
| Sealing | IP66 |
| Dimensions | H 180mm, W 180mm, D 65mm |
| Mounting options base unit | Tripod mount and through hole screws |
| Mounting options adaptation plate | Pole mounting kit |
| Weight | 1.80kg |

**Power**

| | |
|---|---|
| DC input | 12-14V |
| Power consumed 1W | 14W |

**Environment**

| | |
|---|---|
| Temperature range | -20 to 50 deg C |

## Options:

| | |
|---|---|
| NETNode-AVI-UP2R | Composite Video and Audio input for COFDM IP Mesh Node Robust |
| NETPTZ* | Pan, Tilt and Zoom camera for NETNode |
| NETuPT | Micro Pan and Tilt camera for NETNode |
| NETIPHW | IP in with either 1,2 or 4 Video and 2,4 or 8 Audio Out Decoder |
| Mesh Commander* | |
| Mesh Viewer* | |

## Product Code:

| | |
|---|---|
| NETNode-R-100150 | IP Mesh Node 1W 1.00-1.50GHz excl ants, incl PSU12/4 |
| NETNode-R-217250 | IP Mesh Node 1W 2.17-2.50GHz excl ants, incl PSU12/4 |
| NETNode-R-450500* | IP Mesh Node 1W 4.50-5.00GHz excl ants, incl PSU12/4 |

# Netstream IP Solutions

Urban Surveillance Mobile and Fixed Infrastructure


## Introduction to Cobham Surveillance NET-IP products

Cobham Surveillance has designed a range of products with domo technology at their core (under the common name of NET-IP) that allow the secure transmission of video data across IP networks. Distribution of high quality video data across real-world IP networks is non-trivial, because typically networks are restricted in terms of capacity and may contain security features that prevent such transmissions. The following brief guide is aimed at helping customers understand these issues and select appropriate products. For more detailed information, contact Cobham Surveillance, and a training course can be arranged.

### What is Streaming Video?

The transmission of compressed video across an IP network is often known as 'streaming' video and can vary from full frame rate high quality to reduced resolution low quality (often called 'thumbnails'). Streaming video connections can be point-to-point, going from one source to one receiver (uni-cast) or from one source to multiple receivers (multi-cast).

### Private Networks v Public Networks

IP Networks can be either private networks, operated by a single organisation (usually described as Private LANs or WANs - Local Area or Wide Area Networks), or public networks, where the capacity is shared between many users (the internet or 3G networks are typical of public networks).

In a private network such as those operated by many police and security customers, the capacity available on the network is typically 10 to 100Mb/s and the network is rarely operated close to this capacity.

In a public network the capacity is usually purchased by the user on a 'pay per use' scheme, and the capacity is typically very limited and is contended in nature. The capacity on contended networks is both limited and variable. Normally, 200kb/s is available on average, but this might vary at times from 0kb/s to 500kb/s. This limited, but variable, capacity makes streaming video of any quality very difficult.

### Uni-cast v Multi-cast

Private networks will often allow multi-cast transmissions, but this may require intervention of the network controller to configure routers and switches to allow multi-cast video streaming. Public networks, on the other hand, rarely allow multi-cast transmissions.

### Cobham Surveillance NET-IP Products

Cobham Surveillance produces two types of IP products - IP video streamers and IP video receivers.

## Net-IP Products

### Cobham Surveillance NET-IP video streamers

The Netstream video streaming device is suitable for private networks only, whilst NetLink is suitable for public and private networks alike.

### Netstream

This can be installed as an option to some Cobham receivers, including the SOLO4 receiver, the Central Receiver and the new PRO-RX and NanoVue receiver products. In some receivers this is a software option, in others it requires the installation of dedicated hardware - contact Cobham for details. The Netstream option allows receivers to stream multi-cast high quality video onto IP networks. Because of high capacity and the multi-cast nature of the transmission, the Netstream option will only work on private networks. Typically, it requires 1.2 to 4.8Mb/s of capacity per video service streamed (depends on user RF transmission parameters). Netstream is most often used as a mechanism for connecting a remote RF reception point (mast or tower) to the user control centre (e.g. police station) via a private LAN network. The Netstream product adds very little delay to the RF video, maintains the selected AES security and causes no loss of quality.

### NetLink

Cobham NetLink is a stand-alone boxed product that can connect to Cobham receivers and enables streaming video on to public or private networks. When connected to private networks, the NetLink generates a high quality multi-cast video stream. When connected to a public network, it produces a reduced frame rate thumbnail stream at a data rate matching that available on the network.

### Cobham Surveillance IP receivers

There are two main types of IP receiver products in Cobham's range: the PC based software IP receivers (also called 'players'); and hardware based IP receivers.

### Software players

We have two types of PC based software receivers - NETSWDR and NETEPLAY. The first is a standard PC decoder that presents video in a window on the PC. It can be used with multi-service streams and has built in AES decryption for secure operation. The NETSWDR also has a basic option for recoding and playing from file. The NETEPLAY is the software decoder and control application that accompanies the NetLink IP Streamer described above. The NETEPLAY can be used to decode and play streams in a window on the PC - playing from files of decoded live and full frame rate streams, as well as thumbnails. The NETEPLAY software incorporates sophisticated tools for trigger analysis, programming remote recording events, file transfer and even remote PTZ.

### Hardware receiver

For those who do not wish to view the IP stream on a PC platform, but instead want to view the video on a traditional video monitor, Cobham Surveillance produces the NETIPHW hardware decoder (and the NETIPHW2 additional 2 channel version). This 19" rack device will decode video and audio streams back to composite PAL or NTSC for viewing on traditional video monitors. More detail on NETIPHW can be found opposite.

Note: it cannot be used with NetLink.

## IP Products

### IP Hardware Decoder

The IP Hardware Decoder from Cobham Surveillance is a professional digital video decoder designed to receive multicast audio/video streams from Ethernet networks and output decoded video in composite and S-Video formats, as well as stereo audio. The IP decoder is designed to be used with Netstream and other Cobham streaming video products, such as the CRX Central Receiver.

The NETIPHW2 incorporates two decoders in one chassis, whilst the NETIPHW incorporates one decoder in one chassis. The unit decodes Ethernet network video streams back to video, for connection to monitoring equipment in control room facilities. The IP Hardware Decoder incorporates low delay decoding technology and built-in buffering to remove network jitter, as well as optional AES decryption for security.

The IP Hardware Decoder complements the Cobham SOLO4 and SOLO2 product range, which enable the user to build wireless digital microwave video systems. The standard SOLO4 and SOLO2 Encoder/Transmitter and Receiver/Decoder products have been designed to provide rugged point-to-point links for high quality full frame rate video and audio, even in non-line of sight and urban environments.

### Features:

- Ethernet or RS232 control
- Internal AES128 or 256 encryption.

Net-IP Decoder Hardware

### Specification:

| Input | |
|---|---|
| DS | 4 pin Lemo |
| Ethernet | RJ45 |
| RS232 | 3 pin Lemo |

| Output | |
|---|---|
| Composite Video | BNC (2 x on NETIPHW2) |
| S-Video | S-Video Connector (2 x on NETIPHW2) |
| Audio | 5 pin Lemo (2 x on NETIPHW2) |

| Ethernet | |
|---|---|
| Format | 10/100BaseT |

| Video | |
|---|---|
| Line Standard | PAL/NTSC |
| Resolution | 704, 528, 480, 352 |
| Coding Mode | MPEG2 or MPEG4 |
| Delay | 150ms to 1sec depending on mode |
| Frame Rate | Full/Half/Quarter/Eighth (optional) |

| Audio | |
|---|---|
| Line Level Output | Phono |
| Sample Rate | 32KHz, 16KHz, 8KHz |
| Bits per Sample | 12 or 8 bit |

| Data Interface | |
|---|---|
| RS232 Data Output | 1k2 to 115k2 baud switchable |

| Encryption | |
|---|---|
| Format | ABS (standard)<br>AES128/256 (optional) |

| Control | |
|---|---|
| Interfaces | RS232 or Ethernet |

| Physical | |
|---|---|
| Dimension | 19" Rack 1RU height |
| Weight | 3kg |

| Power | |
|---|---|
| DC Input | 11-13V |
| AC | When using adaptor supplied |

| Environment | |
|---|---|
| Temperature Range | -10 to +50 deg C |

### Product Code:

| |
|---|
| NETIPHW |
| NETIPHW2 |

# NetLink Store and Forward Solutions

The NetLink product, which has domo technology at its core, allows Cobham Surveillance equipment to be connected to IP networks. In its basic form the NetLink can be connected to the output of any standard Cobham receiver, and translates the receiver signal into a streaming video service.

NetLink can be set to stream at rates suitable for either private or public networks. In private network mode it will stream full frame rate, full resolution video for maximum quality. When connected to public networks where the data rates are limited, it will produce a reduced frame rate and resolution stream at a data rate appropriate for the network[1]. NetLink uses AES128 or AES256 encryption to ensure the security of the transmission. These transmissions can then be decoded in software using the NETEPLAY application or in hardware using the NETIPH IP Hardware (Private Network mode only) decoder. The NetLink also has an RS232 output suitable for control of any PTZ camera that might be connected to it. NetLink is fitted with a USB interface for WiFi connectivity.

Net-link's video streams can also be delivered to BlackBerry smartphones for use in the field. Users can choose a video stream from multiple cameras and Net-links. BlackBerrys can be CESG-accredited to Restricted.

NetLink is supplied in a sealed rugged aluminium box suitable for long term security deployments.

The NetLink product can be upgraded with some powerful options:

- **NetLink DVRI** – Upgrading the NetLink with an internal or remote DVR option, which creates a sophisticated 'store and forward' product, allows the viewing of video across real world low bitrate public networks, such as 3G or the internet. The DVR option records the incoming high quality video to a local hard disk, whilst streaming out a live low bitrate thumbnail service to the user at a capacity which matches that available on the public network. If the user is interested in something seen on the thumbnail stream, then the high quality video can be retrieved in non-real time by download from the hard disk. To assist the user to retrieve the video of interest, NetLink offers a sophisticated range of time logging and trigger functions, and also fast forward and rewind viewing options. It can be connected to external sensors to trigger recording or build a time-stamped graph of events. By clicking on a specific event, the software will automatically download the corresponding video fragment. NetLink is a multi-cast product when used on a private LAN or a uni-cast product when used over the internet.
- **NetLink AV** – Upgrading the NetLink with the video input option enables the NetLink to connect direct to a camera, in addition to being able to connect to the output of a Cobham microwave receiver. This function enables IP video and audio transmission across public and private networks.

1 ADSL/3G/Satellite Modem required.

Features:

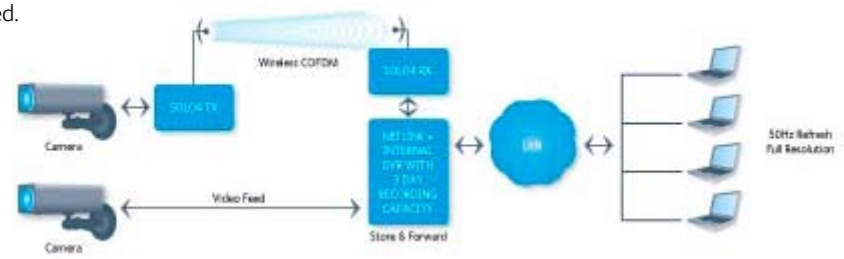
- 10/100 Ethernet port
- Streaming onto public or private networks
- Transcoding to low frame rate/resolution to match available capacity on public networks
- PTZ output port to support local camera (multiple PTZ protocols supported)
- AES128/256 encryption for end-to-end security
- Local video input option
- Support for built-in remote DVR option with video download and trigger logging
- Runs on 8-16 Volt DC, or 100-240 Volt AC with included power supply unit.
- USB Key or SD card based User login
- USB port Fast User configuration
- Multiple User 'levels'

Features (BlackBerry mode)

- Real-time streaming video from Net-link cameras to Blackberry Smartphone
- Easily installed on existing BlackBerry deployments
- Secure end-to-end AES encryption, accredited to Restricted
- Extendable with further Net-link devices'.

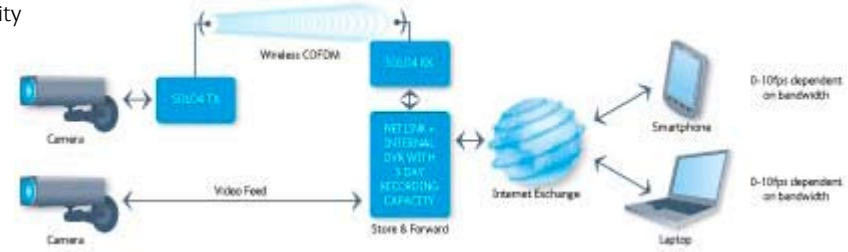
Option A - NetLink receives direct video input for 'store and forward' and multi-casts over Private Networks

- NetLink can be upgraded to receive direct AV feed.




Option B - NetLink receives direct video input for 'store and forward' and uni-casts over the internet

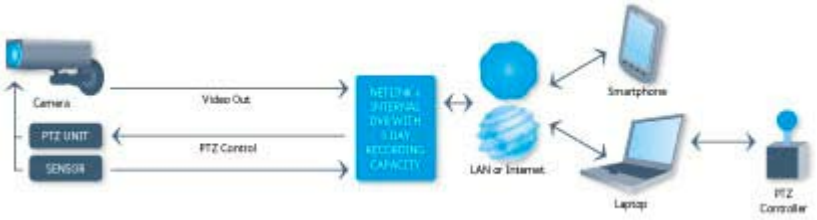
- NetLink offers a variety of 'Store and Forward' options enabling the capture of evidential quality video from remote locations.



# NetLink Store and Forward Solutions

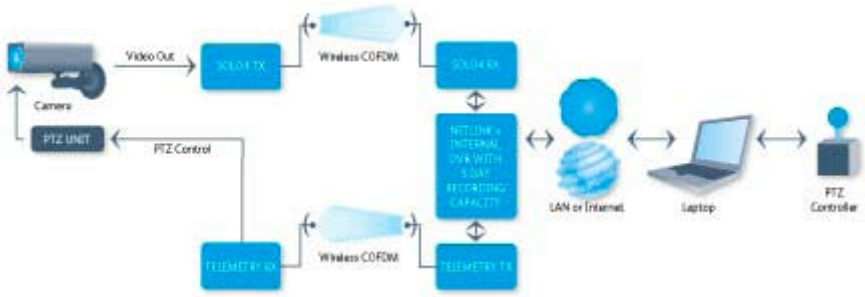
## Option D - NetLink can be used to view and control PTZ camera over IP Networks

- NetLink also has an RS232 output suitable for control of any PTZ camera that might be connected to it.



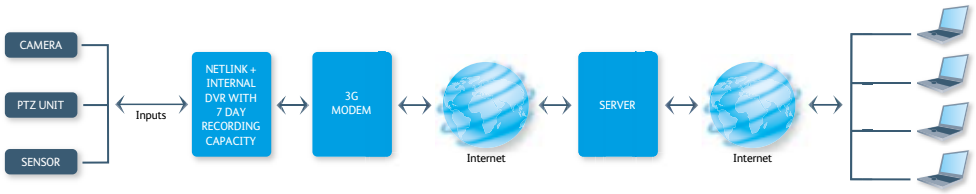

## Option E - NetLink offers a sophisticated range of time logging and trigger functions, and also fast forward and rewind viewing options

- NetLink can be upgraded to a high capacity remote DVR option
- The NetLink range offers a variety of IP Solutions for integration into numerous wireless surveillance applications.




## Option E - Server-based scenarios

- Multiple users can connect to multiple NetLinks via a server.




## Specification:

| Input | |
|---|---|
| Composite Video 1 | 5 pin OB Lemo (optional) |
| Audio 1, 2 | 5 pin OB Lemo (optional with AV Input option) |
| Chaining Input | 6 pin Lemo |
| Trigger I/O | 6 pin Lemo |
| Power | 4 pin OB Lemo |
| **Output** | |
| PTZ Control Out | 3 pin Lemo |
| **Network/Modem Ports** | |
| Ethernet Port 1 | RJ45 |
| **USB Key Configuration** | |
| USB Host Port 1 | USB-A |
| **Network Interfacing** | |
| Ethernet | 10/100Mb/s |
| **Storage Capacity** | |
| Internal Hard Disk Capacity | 250Gb (NETLINK DVRI) |
| **Video** | |
| Line Standard | PAL/NTSC |
| Resolution | 704, 528, 480, 352 |
| Coding Mode | MPEG2 |
| **Thumbnails** | |
| Image Standard | Encrypted JPEG |
| Resolution | User Controllable |
| Frame Rate | 0-10fps depending on network bandwidth |
| **PTZ Standards** | |
| Forward Vision<br>Sony Visca<br>Pelco B<br>Pelco P | |

| Audio | |
|---|---|
| Output | Line Level |
| Sample Rate | 32KHz, 16KHz, 8KHz |
| Bits per Sample | 12 or 8 bit |
| **Encryption** | |
| Format | ABS 32 bit as standard<br>AES128/256 (optional) |
| **Control** | |
| Unit Set-up | Ethernet/RS232/USB key control via PC application |
| **Physical** | |
| Rugged Aluminium Box | L 150mm, W 200mm, H 70mm |
| **Power** | |
| DC Input | 9 to 16V Reverse Polarity Protected |
| Power Consumption | From 10W depending on options fitted |
| **Environment** | |
| Temperature Range | -10 to +50 deg C |

## Product Code:

| | |
|---|---|
| NETLINK | Basic LAN or public network streamer |
| NETLINK DVRI | Adds Internal Hard Drive |
| NETLINK AV | Adds direct composite video input |
| | |
| NETSWDR | Private LAN software video decoder |
| NETEPLAY | Public network software video decoder |

# DUO IP Radio

A unique range of point-to-point bi-directional single frequency COFDM radios, DUO IP radios offer robust performance and range.

A wireless duplex Ethernet link alongside a one way low latency video link; with exceptional performance in mobile and urban environments and it has excellent spectral efficiency, with a variety of frequency bands.

Equipped with Ethernet and RS485 interfaces as standard, the DUO radio can be upgraded with video and audio interfaces for direct connection of conventional video solutions. The optional AES128/256 encryption system ensures transmission security.

The standard 1W DUO radio system offers ranges in excess of 20km (line of sight), and greater than 1000m in typical urban environments.

The DUO radio system has a rugged waterproof chassis, designed specifically for permanent mast mounting. It is ideal for applications such as:

- Control of remote vehicles such as Unmanned Ground, Surface and Aerial Vehicles
- Surveillance from remote cameras requiring PTZ, particularly IP cameras
- Rugged IP links in mobile applications such as between command vehicles.

Antennas shown are for illustration only.

## Typical Application:


## Specification:

### Interfaces

| | |
|---|---|
| Antenna 1 | TNC |
| Antenna 2 | TNC |
| Ethernet I/O | 4-Way Amphenol Socket |
| RS485/ RS232 I/O | 19-Way Amphenol Socket |
| Audio/Video | 10-Way Amphenol Socket |
| Power | 2-Way Amphenol Socket |

### RF

| | |
|---|---|
| Frequency Bands | 2170 to 2500MHz,<br>1000 to 1500MHz |
| Power | 1W (100mW optional) |
| Power Control | 30dB |
| Tuning Steps | 250KHz |

### Modulation

| | |
|---|---|
| Bandwidth | 2.5MHz |
| FEC | 2/3 |
| Modulation Forward Link | QPSK |
| Modulation Return Link | BPSK |
| Sensitivity Forward Link | -95 to -102dBm (mode) |
| Sensitivity Return Link | -97 to -101dBm (mode) |

### Ethernet

| | |
|---|---|
| Physical | 100 BaseT |
| Data Rate Forward Link | 3.6Mb/s in 16QAM 2/3<br>2.7Mb/s 8PSK 2/3<br>1.8Mb/s QPSK 2/3<br>900Kb/s QSK 13 |
| Data Rate Return Link | 80kb/s or 160kb/s selectable |
| Protocols | ARP, UDP control, Ping, TFTP upgrade<br>IP and ICMP protocols between the radios<br>MPEG over IP Encapsulation (UDP multicast + SAP) |
| Delay | 15ms (Minimum in 16QAM) |

### Video I/O (option)

| | |
|---|---|
| Line Standard | PAL/NTSC |
| Resolution | 704, 528, 480, 352 |
| Coding Mode | MPEG2 or MPEG4 |
| Delay | 60ms to 0.5 sec depending on mode |
| Frame Rate | Full/Half/Quarter/Eighth (optional) |

### Audio I/O (option)

| | |
|---|---|
| Input | Line Level or Microphone |
| Sample Rate | 32KHz, 16KHz, 8KHz switchable |
| Bits per Sample | 12 or 8 bit switchable |

### Data Interface

| | |
|---|---|
| RS485 Data I/O | 1K2 to 115K6 baud switchable |

### Encryption

| | |
|---|---|
| Format | ABS 32 bit as standard<br>AES128/256 selectable (optional) |

### Control

| | |
|---|---|
| RS232 Local Control | 9K6 Control Port |
| Remote Control Ethernet | Ethernet control with comprehensive diagnostic capability |

### Physical

| | |
|---|---|
| Dimension | L 260mm, W 194mm, H 57mm |
| Weight | 2.5Kg |

### Power

| | |
|---|---|
| DC input | 11.5 to 14V Reverse Polarity Protected |
| Power Consumption | 16W (100mw no AV)<br>24 to 29W 1W with AV option |

### Environment

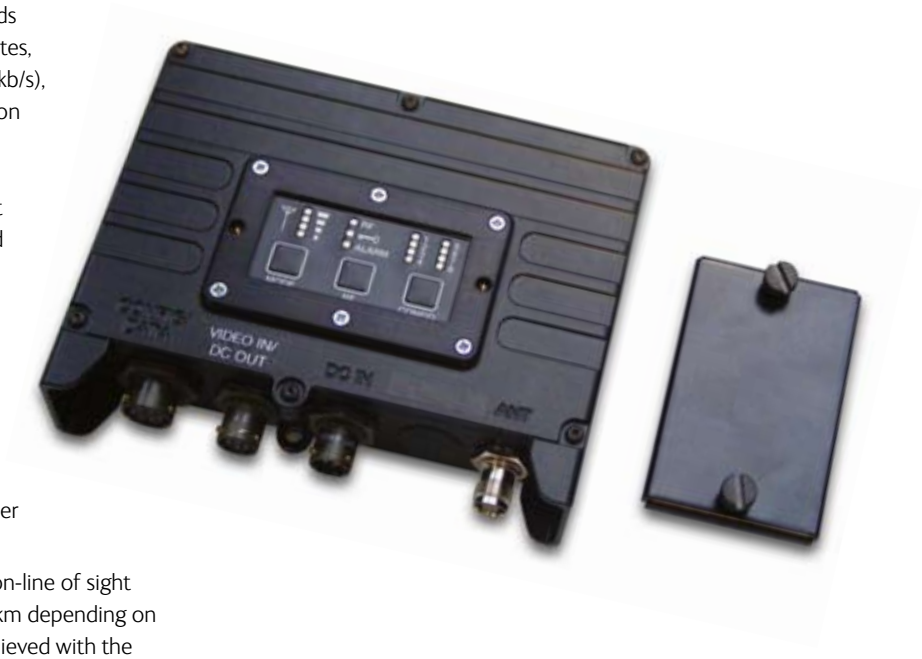
| | |
|---|---|
| Temperature Range | -20 to +50 deg C |
| Case | Waterproof Robust Enclosure |

## Product Code:

| |
|---|
| DUOIP1W-217250 |
| DUOIP1W-100150 |
| DUO-AVI (Video/Audio Input Option) |
| DUO-AVO (Video/Audio Output Option) |
| AES256 (Option) |
| AES128 (Option) |
| SOL4CLC-PSU (AC to 12V Power Supply Option) |

# SOLO – LDR Transmitter

The LDR (Low Data Rate) transmitter from Cobham Surveillance is a long-range digital video transmitter with domo technology at its core. The LDR transmitter sends informational quality video at reduced frame rates, compressed to very low data rates (typically 30kb/s), to an LDR receiver. This high level of compression and reduced data rate means that the LDR transmitter can send images over very long distances. The LDR transmitter occupies at least 50kHz of bandwidth, and can therefore be used more easily at UHF frequencies. Housed in a robust, water sealed enclosure and consuming only 3W, the LDR transmitter is ideal for long-term outdoor deployments.




Security is ensured with optional AES128/256 bit encryption.

The LDR transmitter is available in a variety of frequency bands from 300MHz to 1GHz, other frequencies are available on request.

The LDR transmitter will transmit images in a non-line of sight environment up to 2km, and line of sight to 20km depending on mode and frequency - further range can be achieved with the optional clip-on booster PA.

## Specification:

| Input | |
|---|---|
| Composite Video | Amphenol |
| RS232 Control | Amphenol |
| Power | Amphenol |

| Output | |
|---|---|
| RF Output | TNC |

| RF | |
|---|---|
| Frequency Bands | 902 to 905MHz,<br>868 to 870MHz,<br>457 to 458MHz (others on request) |
| Power | 100mW |
| Power Control | 30dB in 1dB steps |
| Tuning Steps | 12KHz |

| Modulation | |
|---|---|
| Bandwidths | 50, 75, 100 or 125KHz selectable |
| Type | COFDM |

| Video | |
|---|---|
| Line Standard | PAL/NTSC |
| Resolution | SIF (352 * 288) QSIF (176 * 144) |
| Coding Mode | MPEG4 |
| Delay | 1 to 1.5 second |
| Frame Rate | 12, 5 or 2 frames/s |

| Encryption | |
|---|---|
| Format | AES128/256 Selectable (optional) |

| Control | |
|---|---|
| Remote Control | RS232 Control from PC GUI Application |
| Local Control | Front Panel 8 channel select,<br>RF on/off, Range mode, Lock, Alarm |

| Physical | |
|---|---|
| Dimension | L 150mm, W 120mm, H 35mm |
| Sealing | IP67 |

| Power | |
|---|---|
| DC input | 10 to 16V Reverse Polarity Protected |
| Power Consumption | 3.5W |

| Environment | |
|---|---|
| Temperature Range | -20 to +60 deg C |

## Product Code:

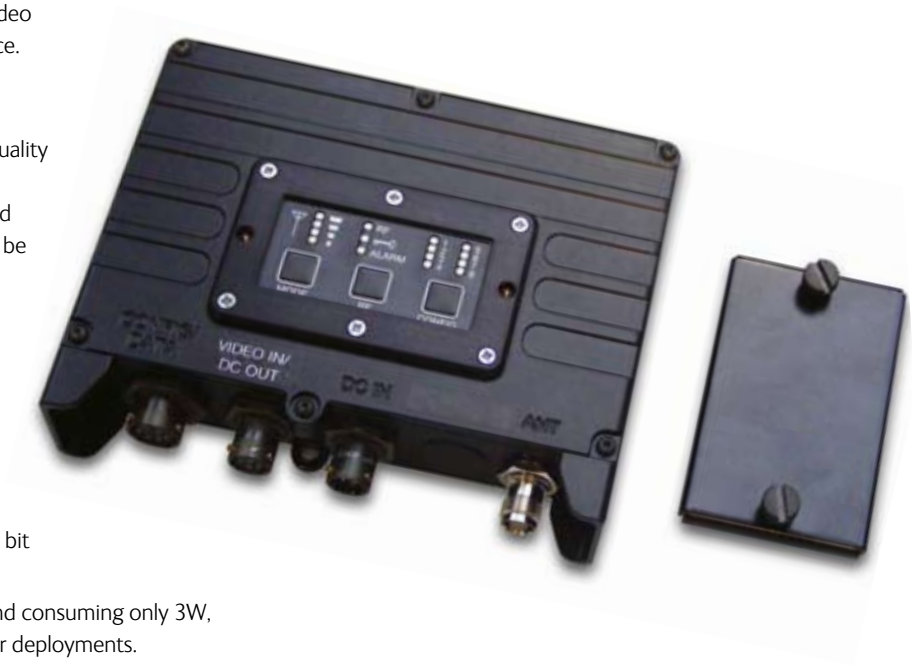
| |
|---|
| LDRTX-090090 |
| LDRTX-086087 |
| LDRTX-045045 |
| AES256TX (AES Encryption) |
| AES128TX |

# SOLO – LDR Receiver

The LDR (Low Data Rate) system is a digital video transmission system from Cobham Surveillance. Designed to operate over very long ranges, it features domo technology at its core.

The LDR receiver picks up the informational quality video sent by the LDR transmitter at reduced frame rates. The high level of compression and reduced data rate means that the images can be sent over great distances.

Narrowband digital transmissions - occupying as little as 50KHz of bandwidth and therefore more easily used at UHF frequencies - are sent over the system. The LDR receiver is available in a variety of frequency bands from 300MHz to 1GHz - other frequencies are available on request. Security is ensured with optional AES128/256 bit encryption.




Housed in a robust, water-sealed enclosure and consuming only 3W, the LDR receiver is ideal for long term outdoor deployments.

The LDR system will transmit images in a non line of sight environment up to 2km, and line of sight to 20km depending on mode and frequency, further range can be achieved with the optional clip-on booster PA.

## Specification:

| Output | |
|---|---|
| Composite Video | Amphenol |

| Input | |
|---|---|
| RF Input 1 and 2 | TNC |
| RS232 Control | Amphenol |
| Power | Amphenol |

| RF | |
|---|---|
| Frequency Bands | 902 to 905MHz,<br>868 to 870MHz,<br>457 to 458MHz (others on request) |
| Receive Sensitivity | -112 to -118 dBm |
| Tuning Steps | 12KHz |

| Modulation | |
|---|---|
| Bandwidths | 50, 75, 100 or 125KHz selectable |
| Type | COFDM, QPSK and 16QAM |

| Video | |
|---|---|
| Line Standard | PAL/NTSC |
| Resolution | SIF (352 * 288) QSIF (176 * 144) |
| Coding Mode | MPEG4 |
| Delay | 1 to 1.5 second end-to-end |
| Frame Rate | 12, 5 or 2 frames/s |
| Decryption Format | AES128/256 selectable (optional) |

| Control | |
|---|---|
| Remote Control | RS232 Control from PC GUI Application |
| Local Control | Front Panel 8 channel select, RF On/Off, Range mode, Lock, Alarm |

| Physical | |
|---|---|
| Dimension | L 150mm, W 120mm, H 35mm |
| Sealing | IP67 |

| Power | |
|---|---|
| D.C Input | 10 to 16V Reverse Polarity Protected |
| Power Consumption | 3.5W |

| Environment | |
|---|---|
| Temperature Range | -20 to +60 deg C |

## Product Code:

| |
|---|
| LDRRX-090090 |
| LDRRX-086087 |
| LDRRX-045045 |
| AES256RX |
| AES128RX |

# SOLO4 – Audio and Telemetry Transmitter

The SOLO4 Audio and Telemetry Transmitter from Cobham Surveillance is a COFDM transmitter, designed specifically for the transmission of audio and telemetry data. The SOLO4 Audio and Telemetry Transmitter has domo technology at its core and can be configured into different user selectable bandwidths, to satisfy a variety of requirements. Bandwidths from 25KHz to 125KHz are available offering user capacity from 14 to 146kb/s. This capacity can be shared between audio and user RS232 telemetry data, in any combination. Wider bandwidths are available on request.

The SOLO4 Audio and Telemetry Transmitter employs a unique narrow band COFDM modulation and will transmit telemetry data and audio in a non-line of sight environment up to 5km, depending on mode and frequency. The SOLO4 Audio and Telemetry Transmitter is typically employed to provide talk back and also telemetry data for PTZ control in Cobham wireless video systems, especially mobile systems.

Security is ensured with AES128/256 bit encryption subject to export controls.

The SOLO4 Audio and Telemetry Transmitter can also be connected to Cobham IP solutions to create rugged wireless IP Bridge applications.

Supplied in a rugged, lightweight weather proof aluminium chassis, the SOLO4 Audio and Telemetry Transmitter can be used in body-worn applications, or prolonged outdoor deployments.


## Specification:

| Input | |
|---|---|
| Audio | 5 pin OB Lemo |
| GPIO | 16 pin Hirose |
| RS232 Data | 16 pin Hirose |
| RS232 Control | 16 pin Hirose |
| Power | 4 pin OB Lemo |

| Output | |
|---|---|
| RF Out | SMA |

| RF | |
|---|---|
| Frequency Bands | 903MHz<br>868 to 870MHz<br>457 to 459MHz (others available) |
| Power | 100mW |
| Power Control | 30dB in 1dB steps |
| Tuning Steps | 12.5KHz |

| Modulation | |
|---|---|
| Bandwidth | 75 to 125KHz (A model only)<br>25 to 125KHz |
| Carriers | 99 |
| Modulation | QPSK or 16QAM |
| FEC | 1/2 |

| Settings | | | | | |
|---|---|---|---|---|---|
| Channel Spacing | 25KHz | 50KHz | 75KHz | 100KHz | 125KHz |
| Bandwidth | 20KHz | 40KHz | 60KHz | 80KHz | 100KHz |
| Bitrate QPSK | 14kb/s | 29kb/s | 44kb/s | 58kb/s | 73kb/s |
| 16QAM | 28kb/s | 58kb/s | 88kb/s | 116kb/s | 146kb/s |

| Audio (A model only) | |
|---|---|
| Input | Line Level or Microphone |
| Sample Rate | 8KHz |
| Bits per Sample | 24Kbit (Toll) or 32Kbit (Phone) Quality |
| Algorithm | G726 |

| Encryption | |
|---|---|
| Format | AES128/256 (optional) |

| Data Interface | |
|---|---|
| Format | RS232 |
| Baud Rate | 1200, 2400, 4800, 9600, 19200,<br>38400, 57600 or 115200 baud |
| Parity | None, Even, Odd switchable |
| Flow Control | XON/XOFF (optional) |
| IP Interface | RS232 style interface for IP Card |

| Control | |
|---|---|
| Remote Control | RS232 Control from PC GUI Application |
| Local Control | Front Panel 8 channel select,<br>RF on/off, Range mode, Lock, Alarm |

| Physical | |
|---|---|
| Dimension Base Unit | L 102mm, W 71mm, H 22mm |
| Weight Base Unit | 350g |

| Power | |
|---|---|
| DC Input | 5.9 to 16V Reverse Polarity Protected |
| Power Consumption | 2.4 to 3W depending on mode |

| Environment | |
|---|---|
| Temperature Range | -20 to +70 deg C |

| Accessories Supplied |
|---|
| 1 x LPRS Antenna |
| 1 x SOLO 12V DC Power Lead Lemo-wire 2m |
| 1 x 3rd Generation Man-worn Control Cable |
| 1 x Data Cable |

## Product Code:

| | |
|---|---|
| TELTX-092093 | 920 to 928MHz |
| TELTXA-092093 | 920 to 928MHz |
| TELTX-090090 | 902.1 to 903.6MHz |
| TELTXA-090090 | 902.1 to 903.6MHz |
| TELTX-086087 | 868 to 870MHz |
| TELTXA-086087 | 868 to 870MHz |
| TELTX-045045 | 458.5 to 459.5MHz |
| TELTXA-045045 | 458.5 to 459.5MHz |

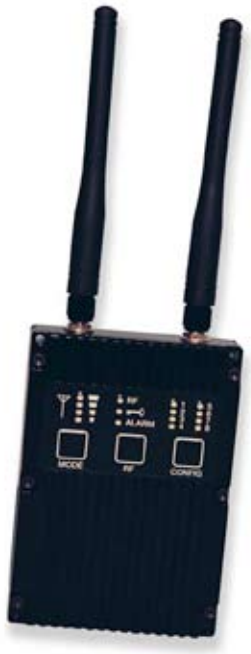
# SOLO4 – Audio and Telemetry Receiver

The SOLO4 Audio and Telemetry Receiver from Cobham Surveillance is a diversity COFDM receiver, designed specifically for the reception of audio and telemetry data. The SOLO4 Audio and Telemetry Receiver has domo technology at its core and can be configured into different user selectable bandwidths, to satisfy a variety of requirements. Bandwidths from 25KHz to 125KHz are available offering user capacity from 14 to 146kb/s. This capacity can be shared between audio and user RS232 telemetry data, in any combination. Additional bandwidths will be available in the future.

The SOLO4 Audio and Telemetry Receiver employs diversity reception and a unique narrow band COFDM modulation. It will receive telemetry data and audio in a non-line of sight environment up to 5km, depending on mode and frequency. The SOLO4 Audio and Telemetry Receiver is typically employed to provide talk back and also telemetry data for PTZ control in Cobham wireless video systems.

Security is ensured with AES128/256 bit encryption subject to export controls.

Supplied in a rugged, lightweight weather proof aluminium chassis, the SOLO4 Audio and Telemetry Receiver can be used in body-worn applications, or prolonged outdoor deployments.



## Specification:

| Input | |
|---|---|
| RF Input 1 | SMA |
| RF Input 2 | SMA |
| Power | 4 pin OB Lemo |

| Output | |
|---|---|
| Audio 1 | 5 pin OB Lemo |
| Audio 2 | 5 pin OB Lemo |
| GPIO | 16 pin Hirose |
| RS232 Data | 16 pin Hirose |
| RS232 Control | 16 pin Hirose |

| RF | |
|---|---|
| Frequency Bands | 903MHz<br>868 to 870MHz<br>457 to 459MHz (others available) |
| Input | Maximum Ratio Combining Diversity |
| Sensitivity | -110 to -120dBm depending on mode |
| Tuning Steps | 12.5KHz |

| De-Modulation | |
|---|---|
| Bandwidth | 75 to 125KHz (A model only)<br>25 to 125KHz |
| Carriers | 99 |
| Modulation | QPSK or 16QAM |
| FEC | 1/2 |

| Settings | | | | | |
|---|---|---|---|---|---|
| Channel Spacing | 25KHz | 50KHz | 75KHz | 100KHz | 125KHz |
| Bandwidth | 20KHz | 40KHz | 60KHz | 80KHz | 100KHz |
| Bitrate QPSK | 14kb/s | 29kb/s | 44kb/s | 58kb/s | 73kb/s |
| 16QAM | 28kb/s | 58kb/s | 88kb/s | 116kb/s | 146kb/s |

| Audio (A model only) | |
|---|---|
| Output | Line Level or Headphone Level |
| Sample Rate | 8KHz |
| Bits per Sample | 24Kbit (Toll) or 32Kbit (Phone) Quality |
| Algorithm | G726 |

| Encryption | |
|---|---|
| Format | AES128/256 (optional) |

| Data Interface | |
|---|---|
| Format | RS232 |
| Baud Rate | 1200, 2400, 4800, 9600, 19200,<br>38400, 57600 or 115200 baud |
| Parity | None, Even, Odd switchable |
| Flow Control | XON/XOFF (optional) |
| IP Interface | RS232 style interface for IP Card |

| Control | |
|---|---|
| Remote Control | RS232 Control from PC GUI Application |
| Local Control | Front Panel 8 channel select,<br>RF on/off, Range mode, Lock, Alarm |

| Physical | |
|---|---|
| Dimension Base Unit | L 102mm, W 71mm, H 22mm |
| Weight Base Unit | 350g |

| Power | |
|---|---|
| DC Input | 5.9 to 16V Reverse Polarity Protected |
| Power Consumption | 2.4W to 3W depending on mode |

| Environment | |
|---|---|
| Temperature Range | -20 to +70 deg C |

| Accessories Supplied |
|---|
| 2 x LPRS Antenna |
| 1 x SOLO 12V DC Power Lead Lemo-wire 2m |
| 1 x 3rd Generation Man-worn Control Cable |
| 1 x Telemetry Audio Out Cable OB(FGA) Lemo-phono 3m |
| 1 x 3rd Generation Data Cable |

## Product Code:

| | |
|---|---|
| TELRX-092093 | 920 to 928MHz |
| TELRXA-092093 | 920 to 928MHz |
| TELRX-090090 | 902.1 to 903.6MHz |
| TELRXA-090090 | 902.1 to 903.6MHz |
| TELRX-086087 | 868 to 870MHz |
| TELRXA-086087 | 868 to 870MHz |
| TELRX-045045 | 458.5 to 459.5MHz |
| TELRXA-045045 | 458.5 to 459.5MHz |

# SOLO – Broadcast Micro Transmitter

The Broadcast Micro Transmitter, a fully-featured COFDM digital video transmitter, is a Cobham Surveillance product with domo technology at its core.

The unique small size and low power consumption of the Broadcast Micro Transmitter make it the product of choice for high mobility sporting applications, such as cycle racing, yachting and body-worn video applications.

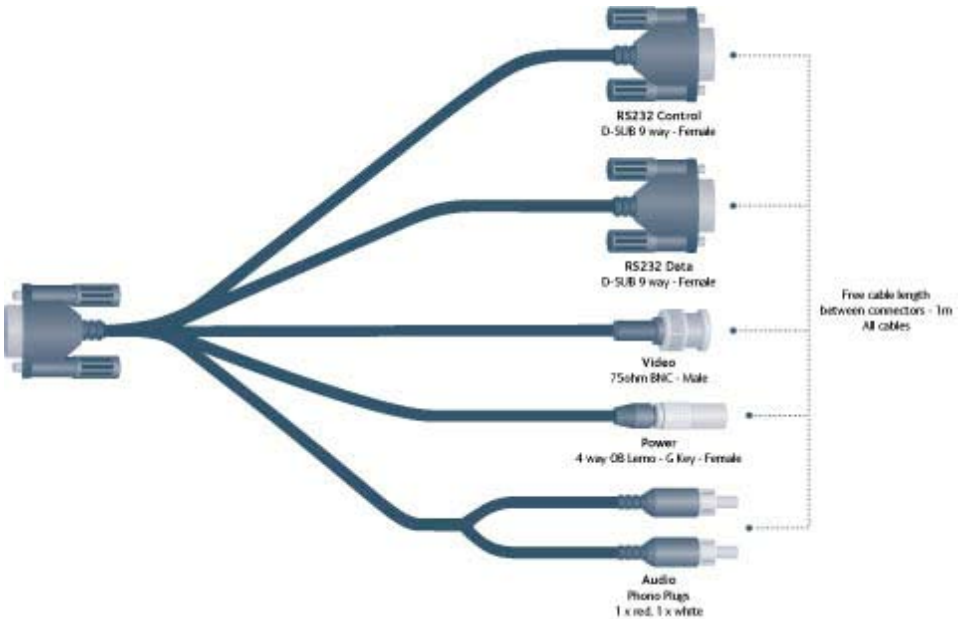
The Broadcast Micro Transmitter employs MPEG encoding for excellent image quality retention, with an integral COFDM modulation. It is ideal for establishing rugged wireless video links in all environments including mobile and urban environments and offers a typical range of 750m.

With optional SDI video interfaces, the Broadcast Micro Transmitter can be used where the highest image quality preservation is required.

## Features:

- Fully featured 8/7/6MHz demodulation
- SDI video input (optional)
- High quality video encoder
- Low delay
- 100mW output power.

CA0317 Break Out Cable




## Specification:

| Input | |
|---|---|
| SDI Video (option) | BNC |
| Composite Video | BNC |
| Stereo Balanced Audio | Phono |
| RS232 Control | Dtype |
| Power | 4 way OB Lemo |

| Output | |
|---|---|
| RF Output | SMA |

| RF | |
|---|---|
| Frequency Bands | 2.0 to 2.50GHz |
| Power | 100mW |
| Tuning Steps | 250KHz |

| Modulation | |
|---|---|
| DVB-T Bandwidth | 8/7/6MHz |
| DVB-T Guard | 1/32, 1/16, 1/8, 1/4 |
| DVB-T FEC | 1/2, 2/3, 3/4, 5/6, 7/8 |
| DVB-T Modulation | QPSK, 16QAM, 64QAM |
| Sensitivity | -95dB plus |

| Video | |
|---|---|
| Line Standard | PAL/NTSC |
| Video Input Format | SDI (optional) or Composite |
| Resolution | 720 (others selectable) |
| Coding Mode | MPEG |
| Delay | 80ms |

| Audio | |
|---|---|
| Input | Balanced Audio (12dB clip) or MIC Level |
| Sample Rate | 48KHz |
| Format | MPEG Audio 384Kb/s to 64Kb/s mono or stereo |

| Control | |
|---|---|
| Remote Control | RS232 Control from PC GUI Application |

| Physical | |
|---|---|
| Dimension | L 89mm, W 49mm, H 11mm |
| Weight Base Unit | 100g (target) |

| Power | |
|---|---|
| DC Input | 5.9 to 15V Reverse Polarity Protected |
| Power Consumption | 3.5 to 4.5W depending on mode |

| Environment | |
|---|---|
| Temperature Range | -10 to +50 deg C |

## Product Code:

| |
|---|
| SOLMTX-200250 OPTION TX-SDI |

# SOLBTX – Broadcast Transmitter


The SOLO Broadcast Transmitter is a rugged digital video transmitter, ideal for sports and news link applications. A Cobham Surveillance product with domo technology at its core, it is small and low powered enough to facilitate easy connection in any broadcast application.

The SOLO Broadcast Transmitter incorporates a high quality MPEG encoder, with a compliant DVB-T modulator and 100mW RF up-converter into a single low power consumption package. The unit is equipped with SDI (optional) and composite video interfaces, as well as ASI interfaces for easy connectivity to third party equipment.

The Transmitter is ideal for use in locations such as stadiums and studios, or mounted in vehicles at sports events.

Security of the transmission can be ensured using the optional embedded AES128/256 encryption.

## Features:

- Fully featured 8/7/6MHz demodulation
- SDI video input (optional)
- High quality video encoder
- Low delay
- ASI input and output
- 100mW output power.

## Specification:

**Input**

| | |
|---|---|
| Video | BNC |
| Stereo Balanced Audio | 5 way OB Lemo |
| RS232 Control | 3 way OB Lemo |
| Power | 4 way OB Lemo |
| ASI In | SMB |

**Output**

| | |
|---|---|
| RF Output | SMA |
| ASI Out | SMB |

**RF**

| | |
|---|---|
| Frequency Bands | 2.0 to 2.50GHz |
| Power | 100mW |
| Tuning Steps | 250KHz |

**Modulation**

| | |
|---|---|
| DVB-T Bandwidth | 8/7/6MHz |
| DVB-T Guard | 1/32, 1/16, 1/8, 1/4 |
| DVB-T FEC | 1/2, 2/3, 3/4, 5/6, 7/8 |
| DVB-T Modulation | QPSK, 16QAM, 64QAM |
| Sensitivity | -95dB plus |

**Video**

| | |
|---|---|
| Line Standard | PAL/NTSC |
| Video Input Format | SDI (optional) or Composite |
| Resolution | 720 (others selectable) |
| Coding Mode | MPEG |
| Delay | 80ms |

**ASI**

| | |
|---|---|
| Mode | Byte mode |

**Audio**

| | |
|---|---|
| Input | Balanced Audio (12dB clip) or MIC Level |
| Sample Rate | 48KHz |
| Format | MPEG Audio 384Kb/s to 64Kb/s mono or stereo |

**Control**

| | |
|---|---|
| Remote Control | RS232 Control from PC GUI Application |

**Physical**

| | |
|---|---|
| Dimension | L 102mm, W 71mm, H 30mm |
| Weight Base Unit | 350g |

**Power**

| | |
|---|---|
| DC Input | 6 to 16V Reverse Polarity Protected |
| Power Consumption | 4 to 5W depending on mode |

**Environment**

| | |
|---|---|
| Temperature Range | -10 to +50 deg C |

## Product Code:

| |
|---|
| SOLBTX-200250 optional TX-SDI |

# SOLBRXD – Broadcast Receiver Decoder

The SOLO Broadcast Receiver Decoder is an economical, high-quality diversity input digital video receiver. A Cobham Surveillance product with domo technology at its core, the SOLO Broadcast Receiver Decoder supports interoperation with other manufacturers' DVB-T systems and is able to receive the Cobham Surveillance (domo Products) transmitter family.

The SOLO Broadcast Receiver incorporates a fully compliant DVB-T COFDM diversity demodulator, with a compliant MPEG2 decoder, and high quality interfaces such as SDE video. The SOLO Broadcast Receiver is equipped with two antenna inputs with external down-converters to allow antenna placement remote from the receiver housing. The SOLO Broadcast Receiver operates a maximum ratio combining digital diversity; ensuring video is recovered free from distortions typically associated with fading and multipath.

The SOLO Broadcast Receiver has comprehensive on-screen display diagnostic capability to show link quality and spectrum, enabling users to optimise transmission performance.

The SOLO Broadcast Receiver is equipped with video, two voice and data channels, and is designed for easy integration into command vehicle, briefcase or central receive applications.

The SOLO Broadcast Receiver is ideal for use in locations such as stadiums and studios, or as a film assist receiver on film set locations.


## Features:

- Fully featured 8/7/6MHz demodulation
- ASI and SDI interfaces
- Maximum ratio combining antenna diversity for fade and multipath elimination
- Comprehensive on-screen display (OSD) diagnostics for link analysis, including spectrum analyser
- External down-converters for convenient antenna placement
- Internal AES128/256 bit encryption (option)
- Very low delay video operation for real time applications.

## Specification:

| Down-converters | |
|---|---|
| RF In | TNC |
| UHF Out | TNC |

| Input | |
|---|---|
| UHF Input 1 | TNC |
| UHF Input 2 | TNC |
| Power | 4 pin OB Lemo |

| Output | |
|---|---|
| SDI Video | BNC |
| Composite Video | BNC |
| Stereo Line Level Audio | Lemo |
| Chaining Interface | Lemo |
| RS232 Data | Lemo |
| RS232 Control | Lemo |
| ASI Out | BNC |

| RF | |
|---|---|
| Frequency Bands | 70 to 850MHz |
| With additional Down-Converter | 5.62 to 5.9GHz,<br>4.5 to 5GHz with DCB450500<br>2 to 2.5GHz with DCB200250 |
| Tuning Steps | 250KHz |

| Modulation | |
|---|---|
| DVB-T Bandwidth | 8/7/6MHz |
| DVB-T Guard | 1/32, 1/16, 1/8, 1/4 |
| DVB-T FEC | 1/2, 2/3, 3/4, 5/6 |
| DVB-T Modulation | QPSK, 16QAM, 64QAM |
| Sensitivity | -95dB plus |

| Video | |
|---|---|
| Line Standard | PAL/NTSC |
| Resolution | 704, 528, 480, 352 |
| Coding Mode | MPEG 4:2:2 or 4:2:0 |
| Delay | 80ms |

| Audio | |
|---|---|
| Output | Line Level |
| Sample Rate | 48KHz |
| Format | MPEG Audio 384Kb/s to 64Kb/s mono or stereo |

| Data Interface | |
|---|---|
| RS232 Data Output | 1K2 to 115K2 baud switchable |

| Control | |
|---|---|
| Remote Control | RS232 Control from PC GUI Application |
| Local Control | Front Panel 8 channel select,<br>RF on/off, Range mode, Lock, Alarm |
| On Screen Display | Spectrum, RX SNR, RX Power |

| Physical | |
|---|---|
| Dimension Base Unit | L 200mm, W 152mm, H 50mm |
| Down-converter | L 102mm, W 100mm, H 35mm |
| Weight Base Unit | 2.2kg |
| Down-converter | 300g |

| Power | |
|---|---|
| DC Input | 9 to 16V Reverse Polarity Protected |
| Power Consumption | 12W depending on mode |

| Environment | |
|---|---|
| Temperature Range | -10 to +50 deg C |

| Accessories Supplied |
|---|
| 1 x BNC Video Lead 3m |
| 1 x PSU12 Power Supply |
| 1 x Control Cable |
| 1 x Audio Out Cable OB(FGA) Lemo-phono 3m |
| 1 x Data Cable (optional) |

## Product Code:

| SOLBRXD |
|---|

# SOLO2 – Broadcast Hand Held Receiver

The SOLO2 Broadcast Hand Held Receiver - a Cobham Surveillance product with domo technology at its core - is a fully portable digital diversity receiver.

It incorporates a high resolution, daylight viewable screen, with a diversity digital receiver, antennae and clip-on batteries, into a robust, lightweight housing. This makes it ideal for use as a confidence or monitoring receiver at outside broadcast and sports events, or as a directors' viewing tool.

The SOLO2 Broadcast Hand Held Receiver is supplied with two long life batteries, for rapid interchange, and also a battery charger. With its comprehensive on-screen display diagnostic capability to show link quality and spectrum it enables users to optimise transmission performance, making it ideal for use in locations such as stadiums and studios, or as a film assist receiver on film set locations.

## Features:

- Fully featured 8/7/6MHz demodulation
- Interoperable with other manufacturers
- Maximum ratio combining antenna diversity
- High Resolution Display
- Easy use menu display for channel changing.

## Specification:

| Input | |
|---|---|
| RF Input 1 | Quick Lock |
| RF Input 2 | Quick Lock |
| Power | Lemo |

| Output | |
|---|---|
| Composite Video I/O | BNC |
| Stereo Line Level Audio | Lemo |
| RS232 Control | Lemo |

| RF | |
|---|---|
| Frequency Bands | 2.20 to 2.55GHz |
| Tuning Steps | 250KHz |

| Modulation | |
|---|---|
| DVB-T Bandwidth | 8/7/6MHz |
| DVB-T Guard | 1/32, 1/16, 1/8, 1/4 |
| DVB-T FEC | 1/2, 2/3, 3/4, 5/6 |
| DVB-T Modulation | QPSK, 16QAM, 64QAM |
| Sensitivity | -95dB plus |

| Video | |
|---|---|
| Line Standard | PAL/NTSC |
| Resolution | 704, 528, 480, 352 |
| Coding Mode | MPEG2 |
| Delay | 80ms |
| Test Pattern Generation | Yes |

| Screen | |
|---|---|
| Resolution | 800*480 |

| Audio | |
|---|---|
| Output | Line Level |
| Sample Rate | 32KHz |
| Format | MPEG Audio 384Kb/s to 64Kb/s mono or stereo |

| Control | |
|---|---|
| Remote Control | RS232 Control from PC GUI Application |
| Local Control | Touch buttons for on screen menu |
| On Screen Display | Spectrum, RX SNR, RX Power |

| Physical | |
|---|---|
| Dimension | L 300mm, W 50mm, H 150mm |
| Weight Base Unit | 3kg |

| Power | |
|---|---|
| DC Input | 11 to 13V Reverse Polarity Protected |
| Power Consumption | 15W depending on mode |

| Environment | |
|---|---|
| Temperature Range | -10 to +50 deg C |

| Accessories Supplied |
|---|
| 2 x Antenna |
| 2 x Battery |
| 1 x Battery Charger |
| 1 x Combined Audio/Control Cable |
| 1 x Neck Strap |

## Product Code:

| |
|---|
| SOLHHRX-220255 |

# SOLO – Accessories

## Cobham Down Converters

All Cobham receivers operating at frequencies above 850MHz require a down converter. Cobham block down converters sit in line between the antenna and the receiver, and draw power remotely from the receiver. Down converters are supplied in high and low gain variants and this dictates how much cable they can drive (typically 10-15m for the low gain and 50-100m for high gain). For precise cable run length calculations contact domo. Cobham down converters offer excellent low noise performance, and are designed for permanent outdoor deployment, a variety of mounting kits are available.
A separate data sheet is available on request for those users requiring detailed information regarding, noise performance, gain or LO frequencies.

### Cobham Barrel Down-converter

The Cobham barrel down-converter is designed for permanent outdoor installations on the base of the receive antenna. The down-converter will successfully drive 10m of cable with down-converted UHF signal with no loss of performance.

Product Code:

| |
|---|
| DCB-550600 |
| DCB-450500 |
| DCB-300350 |
| DCB-250300 |
| DCB-200250 |
| DCB-150200 |
| DCB-100150 |

### Cobham High Gain Barrel Down-converter

The Cobham high gain barrel down-converter is designed for permanent outdoor installations on the base of the receive antenna. The down-converter will successfully drive 50-100m of cable with down-converted UHF signal with no loss of performance.

Product Code:

| |
|---|
| DCBX-200250 |
| DCBX-100150 |

### Cobham Legacy Square Down-converter

The Cobham square down-converter is designed for permanent outdoor installations on the base of the receive antenna. The down-converter will successfully drive 10m of cable with down-converted UHF signal with no loss of performance. This square style of down converter is being phased out and replaced by the barrel style.

Product Code:

| |
|---|
| DC-562590 |
| DC-488515 |
| DC-310340 |
| DC-225265 |
| DC-100140 |

### Cobham Legacy Square High Gain Down-converter

The Cobham square high gain down-converter is designed for permanent outdoor installations on the base of the receive antenna. The down-converter will successfully drive 50-100m of cable with down-converted UHF signal with no loss of performance. This square style of high gain down converter is being phased out and replaced by the barrel style.

Product Code:

| |
|---|
| DCX-562590 |
| DCX-488515 |
| DCX-310340 |
| DCX-225265 |
| DCX-100140 |

Cobham Produce a broad range of antennas and accessories to complement its range of transmission equipment. The items below are a selection of the more popular. For details of other antenna types including covert patches, contact Cobham directly.

### 180 deg Directional Antenna

Small compact directional antenna, specifically designed for use with SOLO Transmitter, including short interconnecting cable terminated to suit TX.

Product Code:

ANTBW-560590
ANTBW-228255
ANTBW-126140
ANTBW-115125

### Omni Directional Antenna

Omni-directional antenna 2dbi. Suitable for use with either transmitter or receiver. TNC based mounted connection.

Product Code:

ANT2-228250
ANT2-115140

### Co-linear Omni Directional Antenna

Co-linear omni-directional antenna 4.5dbi. Suitable for use with either transmitter or receiver. TNC base mounted connection.

Product Code:

ANT4-560590
ANT4-440500
ANT4-310340
ANT4-228255
ANT4-115140

### Sector Directional Antenna

Directional antenna 12dbi. Suitable for use with either transmitter or receiver. TNC base mounted connection.

Product Code:

ANT12-560590
ANT12-330370
ANT12-228255
ANT12-115140

### Battery Pack for SOL4TX

Rechargeable battery pack, including interconnecting power cable, for use in conjunction with SOLO Transmitter.

Product Code:

SOLBAT
SOLBAT2

### SOL4TX Harness Kit

Slim fit overt body harness suitable for use with SOLO or SOLO Transmitter.

Product Code:

ACCBCH

### Power Supply

AC input 100-240V. DC output 12V 3.0 Amp. Standard cable and connector. For use with SOLO2 or SOLO4 TX or RX unit.

Product Code:

PSU12

### Cables

A variety of standard cables are available for most applications.

For additional antenna solutions, contact your account manager.

# SOLO – Transmission and Receiver Kit

Transmission and Receiver Kit supplied in a rugged compact case


The Cobham Surveillance SOLO product range, with domo technology at its core, includes the Transmission and Receiver Kit briefcase. The kit is supplied with all the components needed for an easy deployment in any type of operation. The kit includes the SOLO4 Transmitter, SOLO4 Receiver and all the associated accessories, to enable use in any type of video microwave transmission. The entire SOLO Transmission and Receiver Kit is housed in a rugged compact case for easy storage and deployment.

Each SOLO Transmission and Receiver Kit is supplied with the following items:

- SOLO4 100MW Transmitter
- SOLO4 Receiver
- SOLO 1 Watt Amplifier
- 2 x S or L Band Down-converters
- 3 x Omni Antennae
- 2 x Directional Antennae (packaged separately)
- 2 x AC Supply Adaptors
- 1 x DC Supply Cables
- Universal Interface Cables to support a variety of cameras and monitors
- 2 x 3m Cables from Down-converters to Receiver
- Rugged Compact Case
- Instruction Manual on website.

Features:

- General purpose Transmission and Receiver Kit
- Digital transmitter for high quality video and audio even in highly multipath environments
- Full set of antennae to suit all missions.

Product Code:

| |
|---|
| SOL4TK-228255 |
| SOL4TK-115140 |
| SOL2TK-228255 |
| SOL2TK-115140 |
| (2.5MHz TO MPEG4 1.25MHz UPGRADE ADD SOL4TXUP AND SOL4RXUP) |

# NETuPT Camera for NETNode IP Mesh

This Cobham NETuPT camera is a unique miniature pan and tilt solution, suitable for umbilical connection to a NETNode IP Mesh radio. When connected, the user can enjoy full pan and tilt functionality, including 400 degree horizontal rotation, 270 degree vertical rotation and low light capability. The miniature NETuPT has no zoom capability.

The NETuPT camera has domo technology at its core and offers comprehensive capability. It can be controlled by the NETCTRL hand controller device. Its rugged, weather-proof construction enables deployment in a range of surveillance scenarios - when coupled to the IP Mesh Radio, it is ideal for use in covert hides or concealment in undergrowth. The base of the camera has magnetic inserts, through holes and tripod fittings, giving the user a range of mounting options.

NETuPT Camera for NETNode IP Mesh (actual size)

## Specification:

**Interfaces**

| | |
|---|---|
| Video, power and control | Lemo |

**PTZ**

| | |
|---|---|
| PTZ horizontal | 400 degree continuous |
| PTZ vertical | 270 degree |
| PTZ speed | 5 to 100 degree/s |
| Preset positions | 0 |

**Camera**

| | |
|---|---|
| Resolution | 640 x 480 (>420 TVL) |
| Sensor | ¼" CMOS |
| Sensitivity | 0.2 Lux (full moon) |
| Signal to noise | >46dB |
| Zoom | None |
| Command protocol | VISCA on RS232 |

**Physical**

| | |
|---|---|
| Size | L 96mm, H 56mm, W 52mm including base |
| Weight | 250g |
| Connector | 8 Pin Lemo 1B |
| DC input | 6 -18V |
| Power consumed | 1.8W (active), 1.2W (quiescent) |
| Base mount | Magnetic, Through hole and Tripod |
| Colour | Black anodised |

**Environment**

| | |
|---|---|
| Temperature range | -10 to 50 deg C |
| Sealing | IP66 |

**Connector Type 6 Pin Lemo 1B:**

| |
|---|
| 1. Vin |
| 2. Gnd |
| 3. CVBS |
| 4. VGnd |
| 5. RS232 TX |
| 6. RS232 RX |
| 7. Y (not used) |
| 8. C (not used) |

## Product Code:

| | |
|---|---|
| NETuPT | Micro Pan and Tilt camera option for NETNode |

# Hand Controller for NETuPT Camera

NETCTRL - Hand Controller for NETuPT (actual size)

The Cobham Hand Camera Controller is a miniature control solution, suitable for direct connection to Cobham camera solutions such as the NETuPT, or for connection via wireless telemetry links.

The Hand Camera Controller has domo technology at its core and features a miniature thumb-operated joystick, offering pan and tilt camera control.

A rugged, lightweight solution suitable for rapid deployment operations, its joystick and camera connection are protected by weather proof covers when not in use..

## Specification:

| Interfaces | |
|---|---|
| Control and Power | Binder 712, 7 way socket |

| Control Protocol | |
|---|---|
| Physical | RS232 9K6 baud |
| Protocol | VISCA (sub set) |

| Physical | |
|---|---|
| Size | H 68mm, W 40mm |
| Weight | 80g |
| Connector | Binder 712, 7 way socket |
| DC input | 6-16V |
| Power consumed | 0.25W |
| Colour | Black |

| Environment | |
|---|---|
| Temperature range | -10 to 50 deg C |
| Sealing | Splash proof |

## Product Code:

| |
|---|
| NETCTRL - Hand Controller for NETuPT |

# Pin-hole Camera for SOLO4 transmitters

The Cobham range of miniature colour pin-hole cameras is supplied for use with the SOLO4 range of transmitters. With domo technology at their core, they are ideal for body-worn or covert concealment.

The PCAMMTX range (-N = NTSC, -P = PAL) is supplied with a CA381 cable suitable for direct connection to the SOLO4 Micro Bodywire Transmitter.

The PCAMSTX range (-N = NTSC, -P = PAL) is supplied with a CA380 cable suitable for direct connection to the standard SOLO4 Transmitter range.

## Specification:

**Interfaces**

| | |
|---|---|
| Video, power and control | 6 pin Lemo |

**Camera**

| | |
|---|---|
| Sensor | 1/3" Sony SuperHAD Colour CCD |
| Resolution | PAL (-P variant) 500 * 582<br>NTSC (-N variant) 512 * 492 |
| Lens | 3.7mm |
| Sensitivity | 0.5 Lux |
| Signal to noise | >48dB |
| Zoom | None |

**Physical**

| | |
|---|---|
| Size | L 25mm, W 25mm |
| Weight | 50g + cable |
| Connector | 6 Pin Lemo 1B |
| DC input | 12V |
| Power consumed | 1.4W |
| Colour | Black |

**Environment**

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

**Connectors:**

| | | |
|---|---|---|
| V.IN | Red | 1 |
| GND | Black | 2 - Link to pin 4 |
| VIDEO | Yellow | 3 |
| VID.GND | N/C | 4 |
| | N/C | 5 |
| | N/C | 6 |

## Product Code:

| | |
|---|---|
| PCAMMTX-N | Pin-hole Covert Camera NTSC for Micro TX |
| PCAMMTX-P | Pin-hole Covert Camera PAL for Micro TX |
| PCAMSTX-N | Pin-hole Covert Camera NTSC for Standard TX |
| PCAMSTX-P | Pin-hole Covert Camera PAL for Standard TX |

# FCON – Field Controller


FCON Field Controller (actual size)

The Cobham Field Controller is designed to provide operators of domo and Cobham equipment with a discrete and comprehensive controller, whilst avoiding the need to take a PC into the field.

The Field Controller has domo technology at its core and connects to Cobham equipment using a single cable, presenting the user with a clear menu structure for configuration. The menu system can be navigated and selections made using the buttons provided on the front panel of the Field Controller.

As well as acting as a portable controller, it can also act as a remote agent for the Cobham CryptoWizard application. In this mode, the Field Controller can be pre-loaded with encryption keys destined for different Cobham transmitters and receivers powered by domo technology. On connection to a target device the Field Controller will automatically update the encryption keys whilst logging the serial number, time and date of the update. The Field Controller therefore acts as a secure carriage mechanism for field management of encryption data.

## Features:

- In line standalone controller
- Or USB to RS232 converter
- Remote client for CryptoWizard
- Controls transmitters and receivers with domo technology at their core.

## Specification:

| Connectors | |
|---|---|
| Unit Connector | Lemo |
| PC Connector | Lemo |

| Dimensions | |
|---|---|
| Length | 110mm |
| Width | 21mm |
| Depth | 15mm |
| Weight | 35g |
| Environmental | -10 to +50 deg |

| Power | |
|---|---|
| Consumption | 20mA @ 12V |
| Internal battery | 3 year life |

| Connection cables |
|---|
| CA0345 for SOLO4 TX and RX |
| CA0344 for domo bodywire |

Unit Connector: EEB.0B.305.CLV

| | |
|---|---|
| Pin 1. | RS232TX |
| Pin 2. | RS232RX |
| Pin 3. | GND |
| Pin 4. | VCC |
| Pin 5. | GPIO (unused) |

PC Connector: EEB.0B.306.CLV

| | |
|---|---|
| Pin 1. | Debug RS232TX |
| Pin 2. | Debug RS232RX |
| Pin 3. | GND |
| Pin 4. | VCC |
| Pin 5. | USB DP |
| Pin 6. | USB DM |

## Product Code:

| |
|---|
| FCON |

# SOLO – OEM and Bespoke Applications

## OEM applications

Cobham Surveillance can offer a range of PCB level product opportunities with domo technology at their core, for OEM applications. Standard designs such as those used in its range of SOLO2 and SOLO4 products can be offered, or unique design work can be undertaken which allows bespoke requirements for interfaces, power supply arrangements and form factor to be met.

Collaborative development programmes with customers can be undertaken to fulfil specific needs in the RF designs. The Cobham Surveillance team have developed video solutions for UGV and UAV applications.

A dedicated website specifically for our OEM customers is available. Please talk to your Cobham Surveillance account manager for information.

## Bespoke applications

Bespoke products can also be offered to ensure optimal integration between standard technology building blocks.

Typical Cobham Surveillance bespoke applications:

- Installation of a central receiver and integration into wired systems
- Installation of Cobham systems into special enclosures such as suitcases
- Site surveys and advice on installation of fixed infrastructure systems
- Applying the technology into new scenarios and environments
- Special testing, waterproofing and rugged enclosures
- Point to point wireless IP link equipment
- Relays and custom control solution for aircraft fitment
- Rebroadcast units to bring back video and audio TX from difficult environments.

For further information on Cobham Surveillance products, please contact:

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(for Tracking, Tagging and Locating)

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