





Video system solutions for security agencies

Headquartered in Lutherstadt Eisleben (Saxony-Anhalt), CT-Video GmbH develops, manufactures and distributes mobile wireless solutions for video, audio and data transmission.

As well as offering standard solutions and specialized custom industrial solutions to suit individual customer requirements, the company also focuses on producing solutions for mobile operations involving government agencies. The product portfolio covers every stage of the transmission workflow, thereby ensuring the best possible compatibility between individual components. CT-Video GmbH not only stands for first-class engineering, but also outstanding quality in the products themselves. These high quality standards are assured by the use of the very latest development tools and 3D engineering technology. This applies not only to the design of all our products, but is a continuous process

running until production handover. These stringent quality standards naturally also apply to our suppliers.

CT-Video core competencies at a glance:

- Mobile wireless solutions for video, audio and data transmission via analog and digital transmission methods (including COFDM modulation)
- Camera technology, including both wireless and wired control systems
- Recording technology for video, audio and data signals
- Power supply components suitable for mobile operations
- Integration of new technologies (e.g. HSDPA, HSUPA, UMTS and network technology) into complex systems

CT-Video GmbH: Versatile – innovative – reliable

The company was formed in 1999 by CeoTronics AG, headquartered in Rödermark, near Frankfurt. The parent company specializes in custom made solutions for wireless and wired communication systems in hard environments. Active in the field since 1985, it has enjoyed a position as market leader in quality and performance for many years now.

CT-Video GmbH is a 100% subsidiary and a self-contained extension to the corporate structure, thanks to its focus on the area of wireless analog and digital video, audio and data transmission. The company operates from 1,850 m² of site space in Lutherstadt Eisleben. Our premises are a modern and motivational environment for our staff and partners, housing our development, sales, technical support, manufacturing, warehousing and administration facilities. The result: top-of-the-line quality that has guaranteed the company its status as a key player on the international market for over 9 years. And our continually expanding customer reference list demonstrates that the company delivers on its promises. CT-Video is naturally represented at specialist trade fairs, to ensure that it can keep up with the increasing demand for products of first-class quality.

Impressive results – developed together

Collaboration begins with in-depth, customer-oriented consultation. CT-Video then uses the resulting data from these discussions to

develop systems that are precisely tailored to the specific needs of the customer.

Accordingly, we are now in a position to draw on a broad spectrum of options and experience as a result of our many years of developing and implementing a wide variety of different systems.

For its engineering activities, CT-Video GmbH utilizes cutting-edge computer-controlled development tools, creating an environment that enables rapid development work. Yet our wealth of experience in expert engineering is only one of several benefits enjoyed by our customers. Another key factor is the comprehensive industry knowledge we can draw on for application development, covering nuclear technology, automotive manufacturing, fire services and state security agencies. Every one of our engineered solutions takes into consideration the specific environmental conditions that will affect its implementation.

The result is a system that optimally performs its allotted task – even where applications must be utterly discreet, meet stringent security requirements or operate under challenging conditions. Steadily increasing turnover, a growing workforce and constant improvements in the area of high-performance technology have all contributed to the international name that CT-Video has made for itself, and are helping to further increase its reputation.



CT-DCOM Transmitter



32
Channels

Click-In
System

100mW
500mW

CT-DCOM-TX-500 mW

CT-DCOM-TX-500mW is a highly-compact COFDM transmitter for the transmission of video, audio and data. The benefits of using this transmitter are especially significant for mobile urban applications. Its highly miniaturized form factor combined with its rugged aluminum casing make it ideally suited for use in covert observation. The transmitter is user-customizable, requiring only minor modifications in order to be suited to a variety of operative and environmental requirements, including integration into diverse system architectures. This process requires no additional cabling: all connectivity requirements are satisfied using the integrated system interface.

Integrated MPEG-2 compression ensures optimal image quality in DVB-T mode, at bandwidths of 6, 7 or 8 MHz. A 2.5 MHz narrowband mode is available as standard to ensure maximum operational range. A 1.25 MHz ultra narrowband mode is also optionally available, offered in combination with MPEG-4 compression technology. Security is ensured via a standard 32-bit encryption system, with AES encryption optionally available in 128- or 256-bit key sizes.



1.5W
AMP

CT-DCOM-AMP-1.5W

CT-DCOM-AMP-1.5W has been designed as a system component for CT-DCOM transmitters. This highly linear amplifier can be used to increase CT-DCOM-TX-500mW transmission power to 1.5W. Both transmitter and amplifier can also be snapped together in just a few seconds to form a robust single unit. The assembly frames that enable this function also simultaneously provide passive cooling. When integrating with vehicles and other equipment, both components may of course be operated in detached mode. The amplifier is automatically recognized, monitored and controlled by the transmitter once connected to it using the system interface.

System features: CT-DCOM-TX-500mW/CT-DCOM AMP-1.5 W

- Transmitter provides shared power supply for all connected components (camera, amplifier)
- Available frequency ranges: 1.3 or 2.3 GHz
- Protective circuit to avoid damage resulting from hardware mismatches (e.g. defective antenna, etc.)
- System latency 43 ms (minimum)
- Bidirectionality possible using system components
- 8 adjustable configurations/32 channels
- Separate data channel with RS-232 interface
- Wireless control via CT-Remote Control (optional)

CT-DCOM Amplifier



CT-DCOM Amplifier



Click-In System

2 x Video per Channel

CT-DCOM Control

CT-DCOM Amplifier Case



CT-DCOM-AMP

The operational scenarios for CT-DCOM transmitters can be quickly and simply extended by using one of a range of highly linear amplifiers or all-in-one system solutions provided with integrated amplifiers.

Units are available for both indoor and outdoor operation, as well as 19" rack or briefcase models for use in mobile scenarios.

CT-Video's product portfolio also enables the following categories of transmission power: 100 mW, 500 mW, 1.5W, 5W and 10W, for both the 1.3 GHz and 2.3 GHz frequency ranges.

Additional modules have been developed especially for the CT-DCOM-TX-500 mW, where the COFDM transmitter can be implemented as a simple, snap-in solution. This enables a very diverse range of operational scenarios:

- All-weather casings/mast brackets
- Automated activation of an internal power supply system if the external power supply fails
- Amplifier power can be regulated using the CT-DCOM transmitter
- Wireless remote control of entire system

CT-DCOM-AMP-CASE

CT-DCOM-AMP-CASE offers a range of systems optimized for volume and weight, built into robust Pelicase 1150 or 1400 cases that are both water- and dust-proof. Integration options for these cases include a range of amplifiers of varying power classes and frequency ranges, as well as a receiver for the remote wireless control of the entire system.

Optionally, the wireless channel can be used for the transmission or external recording of two video signals simultaneously. A 12V/9.9 – 30Ah power unit is also integrated as standard, ensuring power supply to both internal and (optional) external components.

Integrated functions and equipment features:

- System solution implemented in a rugged, all-terrain briefcase format
- 12V/9.9 – 30Ah rechargeable battery for powering internal/external components
- Amplifier compatible with many power classes/frequency ranges
- Receiver for wireless remote control of the CT-DCOM transmitter and connected cameras
- Transmission of two video signals via a single wireless channel
- Operation possible in closed state (outdoors)
- External connectors for repeater mode operation/for external recording of video signals



CT-DCOM Receiver



2-Ways
Diversity

4-Ways
Diversity



Click-In
System

LAN
Ready

32
Channels



CT-DCOM-RX

The CT-DCOM-RX is a compact COFDM receiver with integrated dual MRC diversity reception for video, audio and data signals. As it is a member of the CT-DCOM product family, it provides receiver-side support for the full functional range of the CT-DCOM transmitter. Connectors on the rear of the unit enable not only autonomous operation for the receiver, but also allow it to be integrated into a number of different system solutions. This ensures the unit retains multifunctional capability for the current operational scenario. CT-Video GmbH has developed a comprehensive range of peripheral components to match this capability.

Video data is decompressed to the MPEG-2 standard when using the 2.5, 6, 7 and 8 MHz bands. MPEG-4 decompression is also offered as an option, ensuring that excellent image quality is also possible in ultra narrowband operation using the 1.25 MHz band.

ABS encryption is integrated as standard (32-bit encryption strength), with no increase in stated system latency. Optionally, the COFDM transmission pathway can also be encrypted using 128- or 256-bit AES encryption, a method suitable for highly-sensitive security applications.

MRC diversity technology ensures the best-possible suppression of classical interference induced by multipath scattering, while offering first-rate reception results for mobile operations in urban areas. Currently, the 1.3 and 2.3 GHz frequency ranges are supported, when combined with a variety of extenders.

Integrated functions and equipment features:

- Four-way MRC diversity (optional)
- IP interface (optional)
- Repeater mode
- External antenna connectors
- Max. input sensitivity: -95 to -105 dBm (max.)
- System latency 43 ms (minimum)
- Bidirectionality possible
- Password-protected user interface with LCD display
- Output of serial data via standard RS-232 interface
- OSD with spectrum analyzer



CT-DCOM-RX-Case



CT-RX-Case 1450-C



CT-RX-Case 1520-M



CT-RX-Chassis Covert

Click-In System 2 x Video per Channel

CT-DCOM-RX-Case

The CT-DCOM-RX-Case encapsulates an all-in-one system solution for the reception, recording and display of video, audio and data signals. The integration of this compact unit into a rugged briefcase format ensures best-possible operative mobility and versatility. This product also typifies our entirely modular approach to design and construction. Both the mechanical and electrical interfaces allow recording from a variety of analog and digital receivers, as well as the recording of user-configured recording devices. The realization of dual video signal transmission via one wireless channel is also possible, supporting both display and recording.

A further equipment option is the integration of a remote control receiver, to further increase system autonomy. This feature extends the system's own functionality by making it possible to control a CT-Cylinder Camera (connected via the system interface), meaning that a wireless, autonomously-functioning recording unit can also be configured if required.

An integrated lithium-polymer battery supplies power to all external components as well as all internal modules. To avoid HF loss, the receiver used in any given scenario can be placed in the immediate vicinity of the antenna and connected directly to the CT-DCOM-RX-Case via an external interface.

CT-RX-Case 1450-C

Functions and equipment features:

- Integrated 12V/30Ah power supply for powering internal and external components
- Integrated 7" display
- Integrated remote control receiver (optional)
- Dual video signal transmission (optional)
- External LAN interface (optional)
- Operation possible in closed state (outdoors)
- External connectors for operating in repeater mode/for external recording of video signals

CT-DCOM-RX-Case 1600-M

Functions and equipment features:

- Outdoor-ready system solution for 4 receivers supplied in a rugged briefcase format
- Integrated 12V/60Ah power supply for powering internal and external components (optional)
- Integrated 19" display with quad splitter functionality
- Complex signal switching for video signal allocation
- 4 repeater and 4 recorder interfaces (external)
- 4 CT-Cylinder Camera interfaces
- External LAN interface (optional)



CT-Cylinder Camera Standard



| | | |
|----------------------|------------------------|----------------------|
| Ethernet Port | Anti-reflection filter | Visca |
| Address programmable | Pelco-D | Presets programmable |
| | | |



CT-Cylinder Camera Mini



CT-Cylinder Camera

The CT-Cylinder Camera forms the basis for another product family in the CT-Video GmbH product portfolio. The unusual design conceals a highly-sensitive control mechanism, allowing the camera to be finely adjusted at focal lengths of up to 122 mm. The camera's high degree of miniaturization coupled with its exceptional photosensitivity means that this camera can be used in a wide variety of scenarios, and for both indoor and outdoor operations.

A further option is to equip the camera with an integrated anti-reflection filter. This outstanding equipment feature gives an operator the ability to display objects behind windows/glasses almost completely free of any reflections.

The camera is 100% system-compatible with other CT-DCOM components and the optionally-available integrated Ethernet interface, resulting in the realization of significant practical benefits from its use.

When combined with the CT-DCOM system, the camera's operative range can be extended to mobile outdoor usage through the system cable, turning it into a rugged, autonomous and remote-controllable transmit/receive unit.

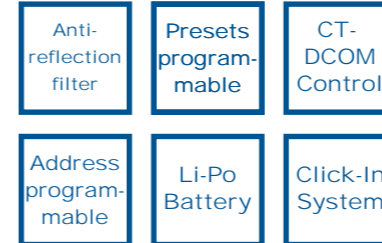
Other functions and equipment features:

- Integration of a wide variety of camera modules, e.g. Sony FCB EX480 CP/FCB EX 1020P
- Up to 36x (optical) zoom, focal length max. 122 mm
- Day/night mode switching for camera
- Manual and automatic activation of physical IR cut-off filter
- Increased dynamic range for camera module (optional)
- Wireless and wired remote control
- System interface to other CT-DCOM components
- Motion detection (optional)
- Microphone (optional)

- Masking of image areas „privacy zone masking“ (optional)
- RS-232 interface for configuring camera parameters
- 5-position preset feature
- Electronic image inversion feature for ceiling mounting
- Parameterization software (optional)
- Image Stabilisation
- Integrated Ethernet Port (optional)
- Adjustable filter for minimizing the reflections on windows or other glasses (optional)
- Firmware upgradable via RS-232



CT-Cylinder Camera Modular



CT-Cylinder Camera Modular

CT-Cylinder Camera Modular encapsulates a highly-portable, compact, and yet – as suggested by its name – modular video surveillance system. A key benefit of this system is its immediate operative readiness – for use in outdoor applications, for example. Suitable for installation in a wide variety of locations, its subsequent control is handled by wired or wireless systems. The system is based on the following three core components:

The upper segment is the CT-Cylinder Camera, with an integrated pan/tilt mechanism for image acquisition.

The middle segment contains all of the necessary antennas and (optional) amplifiers, and also contains a quick and easy snap-in socket for a variety of video transmitters – such as the CT-DCOM-TX-500 mW, for example.

The lower segment holds the integrated lithium polymer batteries that enable uninterrupted transmission lasting from 36 to 90 hours. In order to achieve longer operational durations, the system is equipped with a “sleep mode”, which can be activated via remote control.

Other functions and equipment features:

- Integration of a wide variety of camera modules, e.g. Sony FCB EX480 CP/FCB EX 1020P
- Up to 36x (optical) zoom, focal length max. 122 mm
- Day/night mode switching for camera
- Manual and automatic activation of physical IR cut-off filter
- Increased dynamic range for camera module (optional)
- Ability to feed in external video, audio and data signals
- Dual video signal transmission (optional)
- Motion detection (optional)
- RS-232 interface for configuring camera parameters
- Masking of image areas „privacy zone masking“ (optional)

- Interface for external recording device
- 5-position preset feature
- Microphone (optional)
- Power supply capacity extension via external batteries
- Operation of several cameras via a single remote control unit
- System-compatible with other CT-Video products
- Camera and transmitter modules can be used as autonomous units
- Image Stabilization
- Adjustable filter for minimizing the reflections on windows or other glasses (optional)
- Firmware upgradable via RS-232



CT-Remote Control Transmitter



CT-DCOM Control

Visca

Pelco-D

Presets programmable

Address programmable

CT-Remote Control Receiver



CT-Remote-Control-5W-TX

The CT-Remote-Control-TX is a wireless remote control transmitter for the remote control of pan/tilt heads and other electronic modules, over distances ranging up to several kilometers. Its rugged aluminum casing makes it suitable for remote control operations even in harsh conditions. Long power-on times are guaranteed by the built-in 3.3Ah/12V battery. Depending on the scenario, both transmit power and frequency as well as other parameters can be configured by using the user interface with its integrated LCD display. The user is also kept informed of the remaining battery power at all times. This remote control system is offered for a variety of frequency ranges.

Depending on model and frequency range, transmission power of up to 5W is possible.

Other functions and equipment features:

- 3.3Ah/12V LiPo battery
- RS-232 interface (optional)
- Joystick (optional)
- Wired operation also possible
- Multi-camera control possible

CT-Remote-Control-RX

When combined with the CT-Remote-Control-TX, this device works as a wireless remote control receiver. Automatic error correction ensures uninterrupted transmission even under difficult receiving conditions. A range of models are available, making the device suitable for both indoor and outdoor use. The unit can also be prepared for bidirectional use if this is required.

Other functions and equipment features:

- Output of control data using standard CTV protocol, Visca and Pelco-D
- System interface for CT-Cylinder Camera
- Control data via floating contacts (optional)
- Ruggedized casing (optional)
- Mast bracket (optional)
- Channel and address selection
- RS-232 interface (optional)
- External antenna connector



CT-Sniper Fire Control System



CT-Sniper Fire Control System

This system is a prime example of user-specific customization, reflecting the competence of CT-Video GmbH in the fields of optics, engineering and electronics. The system also highlights the universal application of the CT-DCOM components that provide its core functionality. This solution enables the transmission of 4 telescopic sight images to a training or command center. Audio signals can also be transmitted, as can status informations, via keyboard input. Bidirectional transmission of user data is also possible. The CT-Cylinder Camera can be integrated as an extension to this system.

Other functions and equipment features of the camera unit/optics:

- Highly-sensitive day/night camera
- Modular construction allows easy modification for a variety of telescopic sights and eye-piece cups
- Vision correction
- Sniper sees original telescopic sight image
- Outdoor-ready

CT-Sniper Transmitter Case

This COFDM transmitter can be universally deployed: as a result of uncompromising weight and volume reduction it all fits into a small, rugged briefcase form-factor. The CT-Sniper Transmitter Case is available in a number of power classes and sizes, has an integrated system extension for the CT-Sniper Control System and can also be optionally delivered with 256-bit AES encryption. Power-on time can be extended using external batteries and users can be informed of status updates sent by wireless carrier with visual or acoustic signals.

CT-Sniper Receiver Case

The CT-Sniper Receiver Case is based on the CT-DCOM-RX Case and also comes equipped with an integrated system extension for the CT-Sniper Control System. It is possible to switch between wired and wireless operation, depending on the situation. External connectors are available for repeater mode operation and the external recording of video signals. If required, 256-bit AES encryption is also available for this product, as is the inclusion of visual and acoustic signals to indicate that status updates have been received.





CT-IP-Mesh System

The CT-IP-Mesh components constitute a highly-flexible, bidirectional COFDM-based radio system for the ad hoc networking of standard TCP/IP components under mobile operating conditions. Offering compatibility with the unidirectional COFDM transmission pathways from the CT-DCOM system and the CT-Cylinder Camera, the result is a broad spectrum of possible applications for audio and video data transmission scenarios.

Overall, a system can be achieved that permits the integration of digital and analog equipment, thus combining the specific advantages offered by each individual device. The product portfolio offered by CT-Video GmbH includes mesh components for indoor

and outdoor use and permits mixed-mode operation of up to 8 nodes per network. The CT-IP-Mesh Case in particular offers the best preconditions for wirelessly connecting digital and analog cameras.

The integrated LiPo battery supplies power to all of the assemblies in the case and to any peripheral components connected. As an integral part of a self-forming, self-healing mesh system, this case solution offers the best preconditions for deployment in dynamic mission scenarios with units that work autonomously from several locations. Map-based tracking of corresponding changes to location and levels of connection quality is ensured via the GPS

interface integrated into the case solution. Each node can feed data into the network while simultaneously acting as a repeater. Accordingly, the network is formed autonomously in a way that ensures transmission ranges are kept optimal even as the distances between the individual nodes vary. Optionally, data transmitted by radio can be encrypted to the AES standard, ensuring that the overall system can satisfy stringent levels of data security if required.

System features

CT-IP-Mesh Case based on PeliCase 1450:

- LiPo battery 30 Ah/12 V DC (optional)

- Frequency band 2.3 GHz (other bands on request)
- Maximum transmitting power 1 W (variable)
- Variable bandwidth: 2.5/3 und 3.5 MHz
- Receiver sensitivity to -98 dBm
- Dual MRC diversity
- Socket (IP65) for 12–14 V DC external power supply
- 2 external ports (IP65) for analog cameras
- Integrated MPEG-4 compression (optional)
- External 100BASE-T Ethernet port (IP65)
- DHCP/DNS/integrated firewall/multicast
- 128- or 256-bit AES
- External GPS port (RS-232/IP65)



CT-UMTS Case

The CT-UMTS Case joins the CT-Video GmbH product portfolio as an additional system component. Its level of compatibility enables the rapid and simple connection of camera and radio components to the regionally available mobile radio equipment infrastructure. This means, the user is then able to monitor the operational status of previously installed audio and video transmission components or observe a situation in real time from a considerable distance. In conjunction with the optionally available VPN client software, the integrated VPN server ensures secure access to an existing network. After being powered on or con-

nected to a supply voltage, the CT-UMTS Case connects automatically to the corresponding server or VPN client. When operated redundantly or in conjunction with CT-DCOM components, the benefits of a realtime-capable system are combined with the options offered by a modern mobile radio network. When used with the CT-Cylinder Camera, the CT-UMTS Case forms an outdoor-ready, mobile, autonomous, controllable unit, that can be deployed to any location desired without installation being required.

System features:

CT-UMTS Case based on PeliCase 1450:

- LiPo battery 30 Ah/12 V DC (optional)
- Integrated HSPA+ modem (850/900/1900/2100 MHz)
- External antennas for UMTS/3G and WLAN
- Internal recording of up to 2 video signals (optional)
- USB removable hard drive (optional)
- 7" system monitor (optional)
- Recording and transmission using a range of data speeds
- 2 external ports (IP65) for analog cameras (CT-Cylinder Camera)

- Peripheral components (e.g. cameras) powered via internal battery
- Integrated H.264 compression (optional)
- 2 external ports (IP65) for 100BASE-T Ethernet
- DHCP/multicast
- Integrated VPN server
- External GPS port (RS-232/IP65)



CT-LiPo Battery Case

The CT-LiPo Battery Case represents the implementation of one of the leading mobile power supply system technologies as a highly compact weight- and size-minimized solution stowed in a PeliCase 1400. The integrated power management system permits redundant protection against over- and underloading, plus a load-independent charge status display.

The CT-LiPo Battery Case also permits the cascading of multiple mobile power sources, thus offering the greatest level of flexibility for missions in the field. Thanks to its modular character and full compatibility with the CT-Video system solutions, the CT-Power-

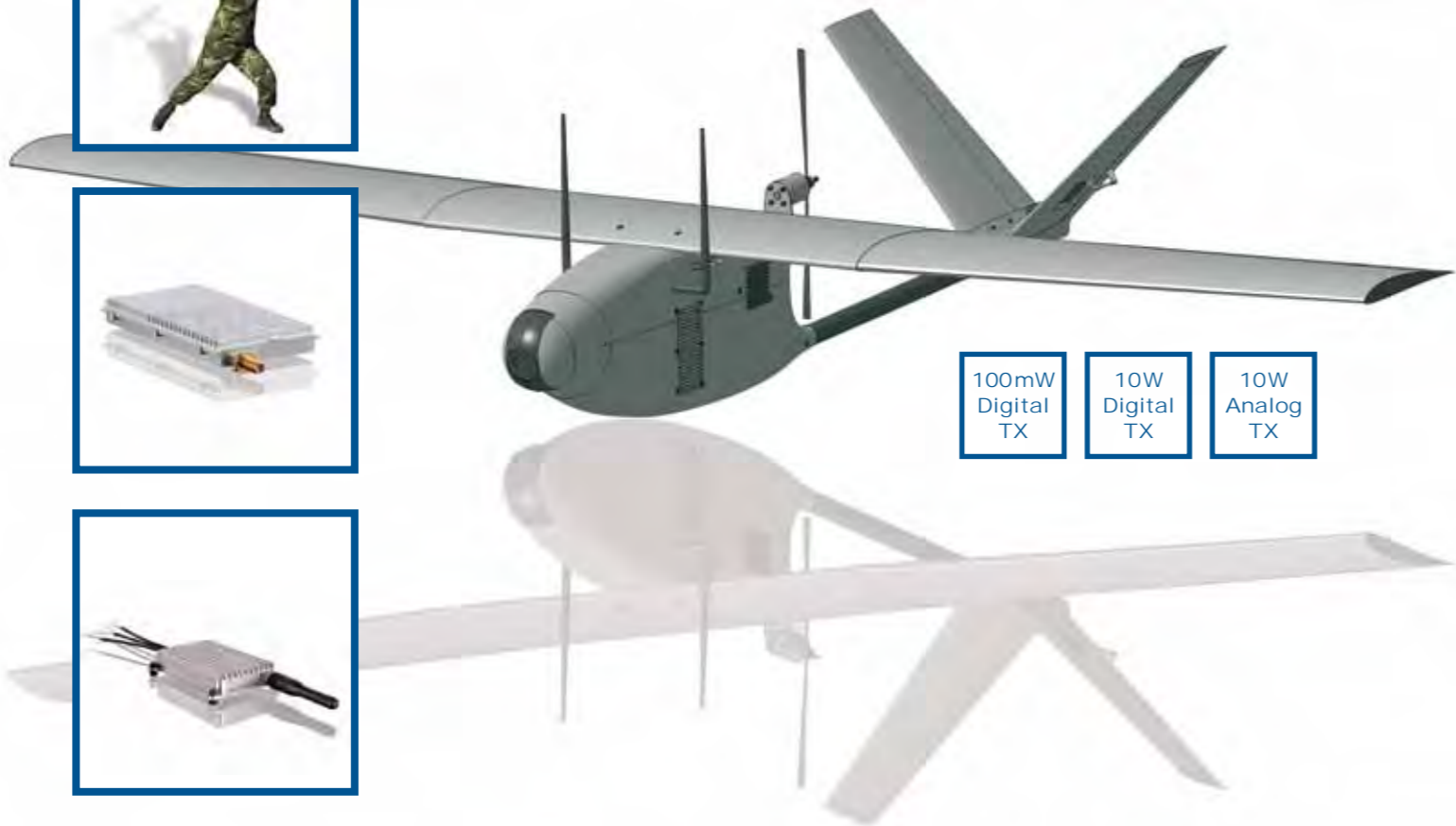
Solution components can be deployed extremely cost-effectively. Accredited testing bodies were consulted early on during the development of the rechargeable batteries. All of the designs utilized in the area of battery technology have been certified by independent testing bodies in accordance with the UN Manual of Tests, Part III, Section 38.3.

System properties and key features:

- Highly versatile, flexible power supply, noiseless in operation
- Can be cascaded
- Very low self-discharge
- Load-independent charge status display
- 30, 60, 90 Ah / 11.1 V nominal
- -20 to +60 °C (operating temperature range)
- Other capacities also available as OEM components on request



Real-time video transmission for UAVs



100mW Digital TX

10W Digital TX

10W Analog TX

Custom Made Solutions



100mW Digital TX

Real-time video transmission for unmanned aerial vehicles (UAVs)

Since these applications place restrictions on size and weight, standard components are generally unsuitable. However, CT-Video GmbH has been very successful in designing and implementing a number of different video transmission systems to overcome the difficulties facing UAV integration. With its large portfolio of analog and digital transmitters and complementary peripheral modules, CT-Video GmbH is also ideally positioned to ensure that an optimal, model-specific integration solution can be achieved for any UAV.

The specific prerequisites can be gone through in detail with the manufacturer, before supplying the acquired data as input for an application-specific design. Examples of systems created using this methodology include a specialized ultra-light video transmitter (only approx. 100 g) with an output rated at 5W. On the receiver

side, the mobile components of the CT-DCOM system provide a solid initial framework that can be subsequently extended as required via specialized equipment such as antenna tracking systems and HF modules. The portable, lithium-polymer-based briefcase battery pack from CT-Video GmbH caters to the necessary power requirements.

Civil and military application scope for UAVs:

- Urban surveillance
- Convoy protection
- Monitoring of areas affected by natural disasters
- Ocean monitoring and/or applications in meteorology
- Monitoring and treatment of land used for agricultural purposes
- Pipeline surveillance

Custom Made Solutions

Since its formation, CT-Video GmbH has viewed its core business as the development of in-house components that can form the basis for the realization of highly-complex customer-specific solutions. Implemented within a modular approach to system design, even complex solutions are capable of being realized with realistic development and production effort. The most recent example in this area is the design and manufacture of OEM components for a well-known producer of remote-controlled manipulators. By applying an in-depth technical consultancy process, CT-Video's R&D department ensured that the system integration went smoothly and matched requirements perfectly.

Sample requirements profile:

- System design for transmission systems with over 50 participants (including repeater systems)
- Mobile, automotive-mounted solutions for operation both inside and outside the vehicle and under a wide range of environmental conditions
- Mechanical, electrical and software-based integration of components into existing systems and vehicles





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