



**A PIONEER
IN
SATELLITE
COMMUNICATIONS**

Contents

2 COMPANY PROFILE

4 TECHNOLOGIES

8 BEYOND LINE OF SIGHT COMMUNICATION PRODUCTS (SatCom)

- 10** SkyARX KU-18
- 11** SkyARX KA-12
- 12** SpARX
- 13** HeliARX KA-12
- 14** TerraARX KU-12
- 15** SecureARX
- 16** GssARX - Satcom Ground Station
- 17** Broadband Satcom Solutions

LINE OF SIGHT (LoS) COMMUNICATION PRODUCTS

- 18** Ufuklink DLX45
- 19** Ufuklink DLX20
- 20** Ufuklink FO80HDX
- 21** Network Management System

22 SPECIAL PRODUCTS SPACE SYSTEMS

- 23** Waveguide Components
- 24** Antennas
- 25** Satellite Telecommand Receiver
- 26** Satellite Telemetry Transmitter



C TECH BİLİŞİM TEKNOLOJİLERİ SAN. VE TİC. A.Ş.

Since 2005 C Tech Bilişim Teknolojileri San. Ve Tic. A.Ş. (CTech) offers products and solutions to various stakeholders in the domains such as defense and security, aviation and space, telecom and broadcasting for communication, cyber security and modeling-simulation technologies.



CTech, having become a subsidiary of **Turkish Aerospace, Inc. (TUSAS)** in 2018, today employs more than **250** experts and keeps growing steadily. The Corporate Headquarter is located on Teknopark Istanbul Campus in Kurtköy district of Istanbul. The Ankara office is located on the Cyberpark campus in Bilkent.

CTech has a 5,500 m2 infrastructure including engineering design facilities, a clean room, typesetting workshops, electronics laboratories, system integration test laboratories, warehouses and production hall.

We have the Production Permit Certificate by the Turkish Ministry of National Defense. In addition CTech has the ISO-9001:2021 Certificate as well as National and NATO Secret Facility Security Certificates. Based on our mutual quality perception and to qualify with typical customer expectations we follow internationally accepted standards and guidelines such as ECSS, CMMI Level-3, IEEE-12207, IEEE-15288 and MIL-STD-973, ANSI/EIA 649 and AS9100.

BEYOND LINE OF SIGHT COMMUNICATION PRODUCTS



LINE OF SIGHT (LoS) COMMUNICATION PRODUCTS



SPECIAL PRODUCTS SPACE SYSTEMS





**Perfection
in the Production**

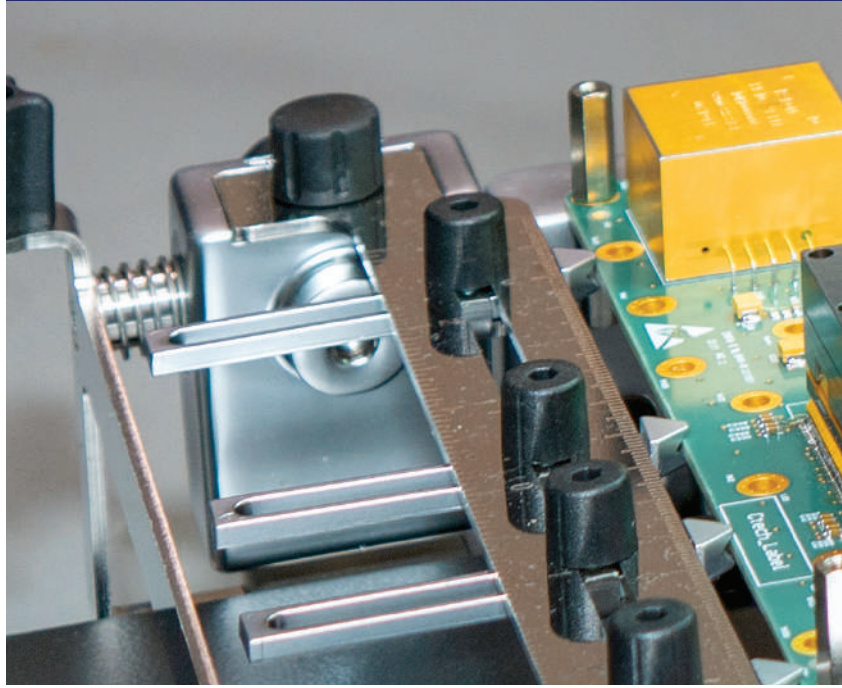
Our Qualifications and R&D

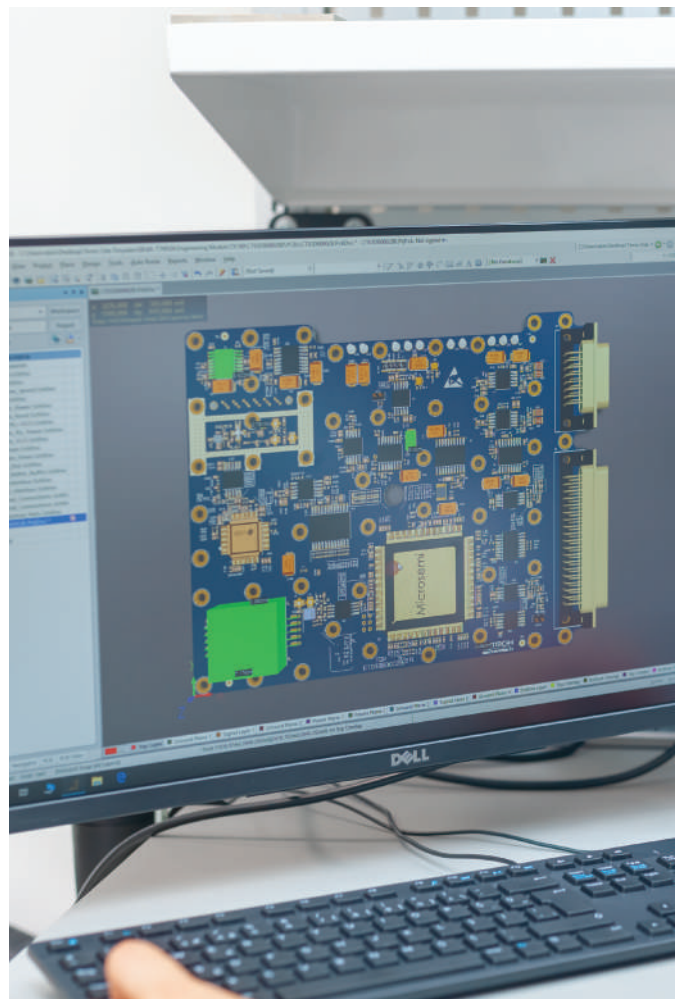
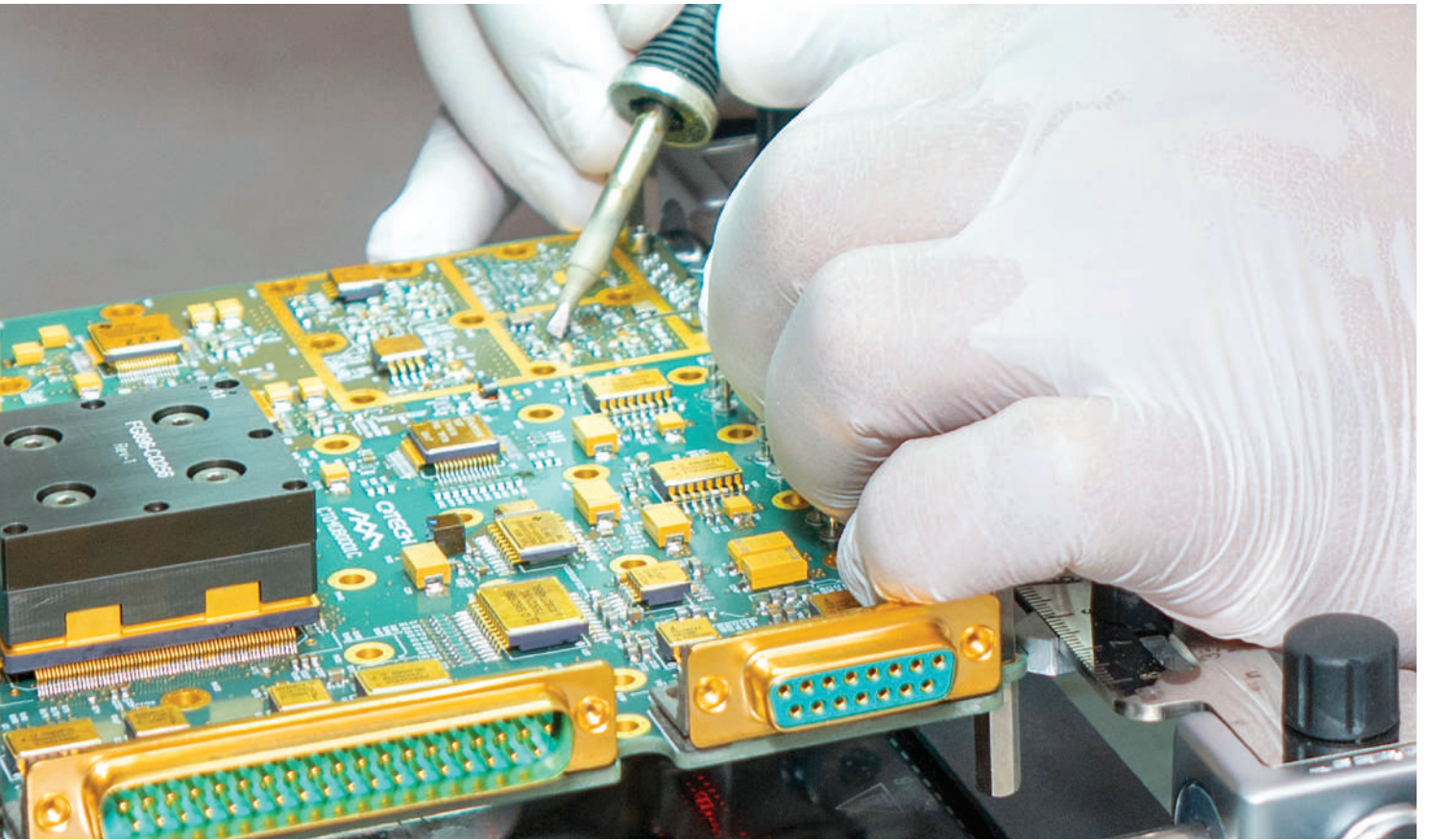
Our company has the National Defense Equipment Production Permission along with National and NATO level facility security certificates. CTech also qualified and certified for various internationally accepted standards such as AS9100D , ISO-9001:2021, CMMI L-3, IEEE-12207, ISO27001 and MILSTD-973.

With its well-established infrastructure CTech has many national and international R&D activities and partners. Since 2005 our company has accomplished more than 60 projects and was awarded as the second most EU Eureka Program participating Turkish company by TUBITAK. Such a strong R&D culture is the basis of the rich and niche product portfolio.



AS9100D , ISO-9001:2021, CMMI L-3,
IEEE-12207, ISO27001 and MIL-STD-973





COMMUNICATION SYSTEMS

1 COMMUNICATION SYSTEMS





RX
KU-18



BROADBAND SATCOM-ON-THE-MOVE

AIRBORNE TERMINAL

The CTech SkyARX Ku-18 Terminal is a complete airborne satellite terminal with an 18" (45.72 cm) antenna and lightweight equipment providing IP communications on the move.

With this Ku-band terminal corporate and government users can send live, full motion high definition video over the sky, make secure data communication and perform mission critical communications during flight.

Powered by integrated technologies and robust waveform this terminal delivers streaming data rates up to 10 Mbps or 20 Mbps with two (2) optional configuration. Broadband communication on-the-move airborne terminal is national and indigenous now.



Airborne Antenna



Airborne Modem



SkyARX[®]

KA-12

The CTech SkyARX Ka-12 Terminal is a complete airborne satellite terminal with an ultra small, compact and efficient 12" (30cm) antenna and lightweight equipment providing IP communications on the move.

With this Ka-band terminal corporate and government users can send live, full motion high definition video over the sky, make secure data communication and perform mission critical communications during flight.

Powered by integrated technologies and robust waveform this terminal delivers streaming data rates up to 13 Mbps. Ka-band SOTM airborne terminal is ultra-small and indigenous now.



Airborne Antenna





SOFTWARE DEFINED RADIO (SDR) MODEM

SpArx SDR Modem is state-of-the-art technology for point-to-point SCPC (Single Channel Per Carrier) connectivity for a wide range of fixed and mobile applications such as IP trunking, cellular backhauling, disaster recovery, enterprise, (broadcasters, corporate, ISP) maritime, aviation, MEO, LEO, GEO operations, government, and defense applications.

SpArx product line fully complies with the DVB-S2 standards, achieving the highest possible efficiency at maximum service availability. The modem increases the profitability of your operations at maximum efficiency and optimum availability. It is the most spectrum efficient and secure high speed SATCOM modem solution available in the market today.

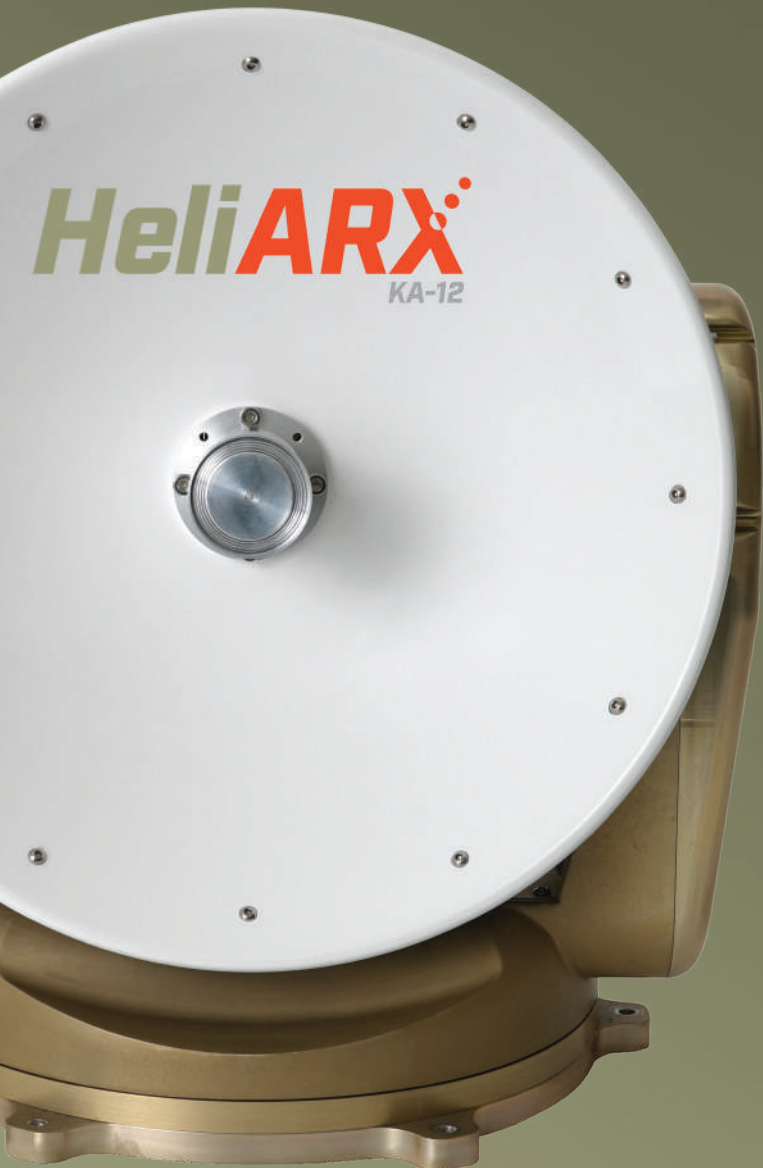


SpArx SDR Modem

Technical specifications:

- SCPC Connectivity Associate with the map
- Wideband options (C-band, X-band, Ku-band and Ka-band)
- DVB-S2 Waveform
- Layer-2 and Layer-3 support
- OpenAMIP antenna interface support for SATCOM on the Move (SOTM) applications
- MIL-STD-810G/MIL-STD- 461E/MIL-STD-704 standards

*HIGH DATA
THROUGHPUT*



Airborne Antenna

HeliARX[®]

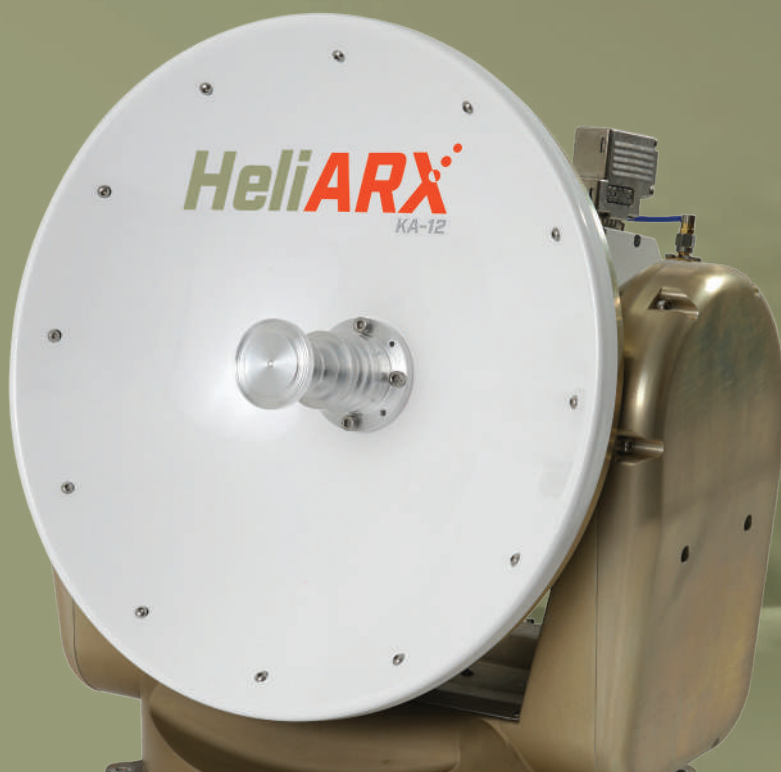
KA-12

SATCOM COMMUNICATIONS FOR HELICOPTERS

Helicopters are critical for operations around the world in search and rescue, disaster response, military operations, troop and equipment transport, border security, intelligence, surveillance, and reconnaissance (ISR) missions. These operations need broadband, seamless, resilient, real-time communication anywhere and everywhere to make mission-critical decisions.

The rotor of the helicopters reflects the radio waves and acts as a jammer in the three-axis. CTech has made broadband communication possible in helicopters with its Modem technology that allows broadband communication to pass through the rotor blades.

The HeliARX consists of a modem (Modem that prevents the jamming effect of the rotor), a 12-inch antenna, and a ground control unit. It transmits sound, image, and data packages instantly wherever needed in the world. Instant data transmission will provide mission flexibility and enable better planning during unexpected situations.



TerraARX[®]

KU-12

The CTech TerraARX Ku-12 Terminal is a complete armored ground vehicle satellite terminal with an 12"(30.4cm) antenna and lightweight equipment providing IP communications on the move.

With this Ku-band terminal corporate and government users can send live, full motion high definition video over the sky, make secure data communication and perform mission critical communications SATCOM on the move.



DVB-S2 Modem

BROADBAND SATCOM-ON-THE-MOVE



SATCOM On The Move Antenna



Ground Modem

SecureARX

EPM SATCOM MODEM

**AUGMENTING YOUR
GOVERNMENT SATELLITE
RESOURCES by OFFERING
MILITARY GRADE
PROTECTION**

Military forces and government rely on robust, secure and jamming resistant communications capabilities with a low probability of Interception in friendly and hostile environments. Similar communication capabilities are needed for government operations during emergencies, natural disasters and hazardous conditions.

CTech's SecureARX Modem is intended for military and government applications, and can satisfy all the requirements for fixed, land-mobile, naval and airborne SATCOM use cases and scenarios. It is the most spectrum efficient and secure high speed SATCOM modem solution available in the market, today.

By using a mix of fixed, transportable and on-the-move terminals at the same time, reliable, flexible, survivable and secure networks can easily be established, managed and operated under extreme circumstances. CTech's SecureARX Modem is a world class SATCOM modem solution available for military, government and official applications.



EPM-1000
Single Channel

It is compatible with NATO standards, however national waveforms can easily be implemented on the same flexible design platform. Maintenance and upgrades can easily be performed by SW/FW changes. CTech's proprietary management system provides users with flexible planning, control and monitoring tools while sustaining end-to-end secure and reliable communication links and networks.

GSSARX

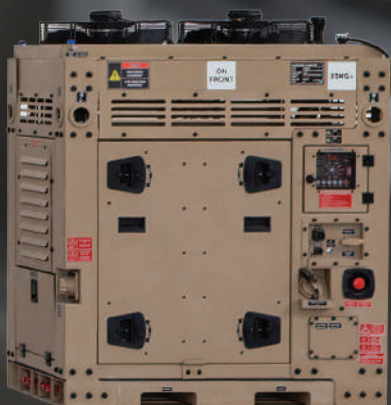
GROUND STATION SOLUTIONS

GROUND STATION SOLUTIONS

Surveillance and reconnaissance from the air and space are indispensable for successful military operations. Space-based platforms provide periodic surveillance capability for large areas with no geographical limitation with different information. Such capabilities are critical for troop protection, situational awareness, mission planning, damage assessment, and others. All these capabilities can be integrated into a system application and presented as a project that can be tailored to specific needs.

For example, Unmanned Aerial, Land, and Surface Vehicles require transferring of massive amounts of video and data. Data collected from these vehicles must be quickly reviewed to support real-time operations in the field, as well as analyzed in greater depth and over longer time periods to support mission planning and intelligence gathering. In particular, by providing point-to-point communication to reduce delay with the Satcom Ground Station established by CTEch, fast actions can be taken with low delay.

SECURE, WIDE COVERAGE WITH CTECH SATELLITE GROUND STATIONS



CTech offer a full range of connectivity options, from simple point-to-point connections to complete end-to-end, global solutions. CTEch is a multi-solution provider with the expertise to design, integrate, test, operate, maintain and support your infrastructure as needed.

BROADBAND SATCOM SOLUTIONS

POWERFUL SOLUTIONS FOR AIR & LAND PLATFORMS

In today's information-based environment, military and governmental mobile users need fast, real-time access to information, headquarters and other users. The powerful CTech satcom-on-the-move (beyond-line-of-site, BLOS) capabilities provides reliable, secure, high speed connectivity to air and land platforms—even fast moving edge users.

We offer increasingly capable, compact and secure satellite communication terminals to manned / unmanned air platforms and tactical ground forces.



Our Satcom-on-The-Move systems supports X, Ku and Ka frequency bands. By the superior RF performance and dynamic response under the most challenging conditions, it meets the broadband needs of mission land vehicles, uavs, aircrafts and business jets, as well as helicopters.

CTech provides complete, pre-assembled and qualified systems, configurable from range of modular systems- including modems. Additionally, CTech provides ground stations to help establish and scale user networks. CTech's Devsat Series SOTM Terminals complies with the most stringent regulations and meets the MIL-STD standards.



UFUK

link DLKu-45

LOS DATA LINK SYSTEM SOLUTION FOR AIRBORNE PLATFORMS

CTech designs, manufactures and provides novel and complete end-to-end communication solutions for Unmanned Aerial Vehicles (UAVs). UFUK Link DLKu-45 and DLX20 are intended for Line-of-Sight (LOS) data communication applications, and consists of all the components to establish a secure and robust data link for the most severe environments and conditions.



A COMPLETE
LINE-OF-SIGHT (LOS)
DATA LINK SYSTEM
SOLUTION FOR
AIRBORNE PLATFORMS

Airborne Modem



Ground Modem



Ground Tracking Antenna

UFUK

linkDLX20



Airborne Modem



Ground Modem

20
Mbps

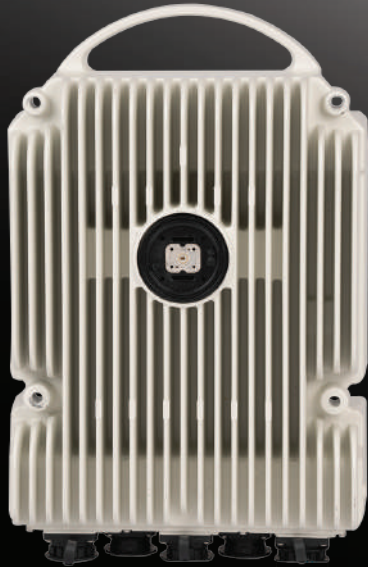


Ground Tracking Antenna

It is a complete Full Duplex (FD) communication system solution containing the paired data modems, RF blocks and antennas for both ground and airborne terminals. The up-link carries the command and control information for the real time operation of the UAV, while the down-link conveys all the onboard sensor data, video and audio payload to the ground station. The video encoder on the airborne modem processes the payload information so that the simultaneous HD and SD video transmissions are possible.

UFUK

linkFO80HDX



*FROM 10 TO 20 GBPS
E-BAND FULL OUTDOOR*

80 GHz RADIO LINK TERMINAL

Whether in mobile, fixed or private networks, the E-band millimetre wave solution represents a fundamental technology tool bridging the gap between fibre high capacity systems and flexible cost effective wireless transmission.

UFUK-FO80HDX provides fibre like capacity, highest deployment flexibility and homogeneous operational behaviour as traditional microwave, allowing operators to fully liaise on existing knowledge and skills, minimizing introduction costs, while modernizing the transport network.

UNIVERSAL PRODUCT ARCHITECTURE

Millimetre wave radio products have evolved in terms of functionality and physical arrangements to cover in an effective and efficient way they can be employed in any application.



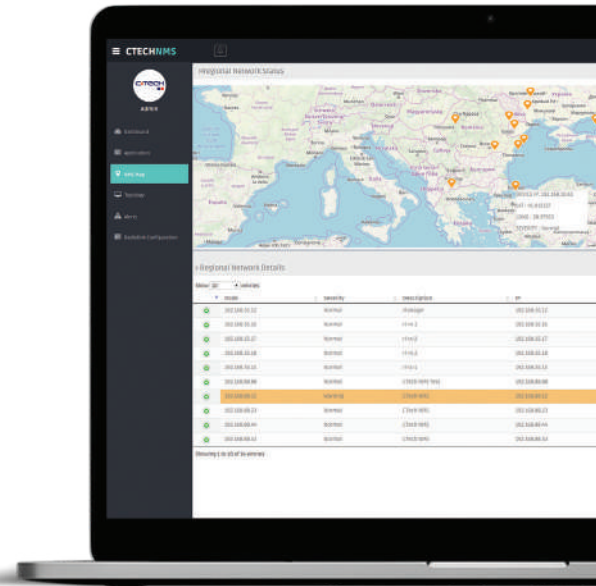
NETWORK MANAGEMENT SYSTEM

CUSTOMIZABLE NETWORK MANAGEMENT

With NMS:

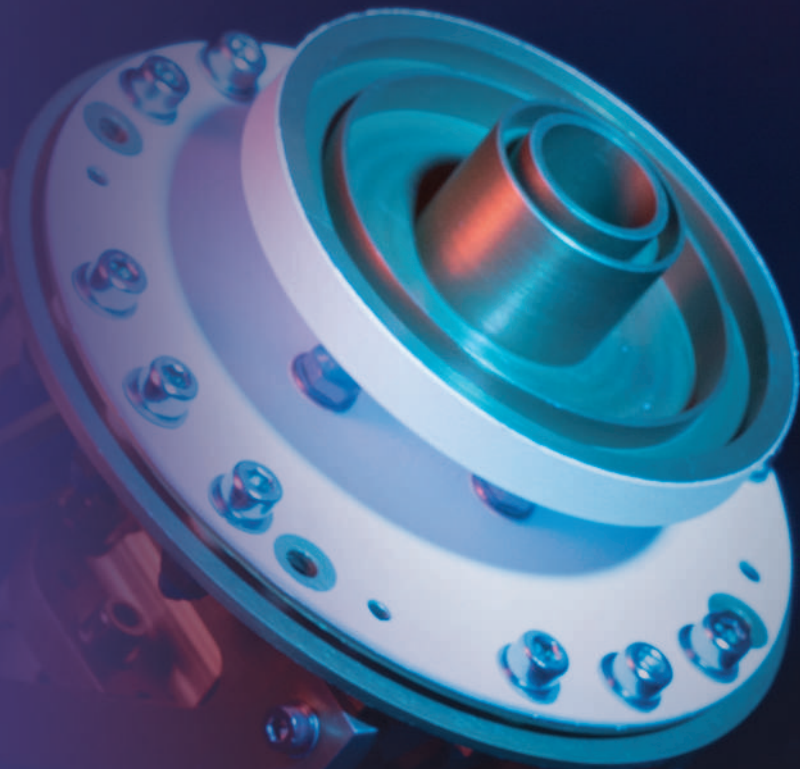
- Understand the information coming from your Network Equipment
- Associate with the map
- Perform Alarm and Performance monitoring
- Flexible and can easily be specialized for any new NE type
- Support up to 2000 NE's
- SNMP v1/v2/v3 and SSH support
- LLDP and ICMP protocols for Network discovery
- Link & Modem monitoring via NMS Map module

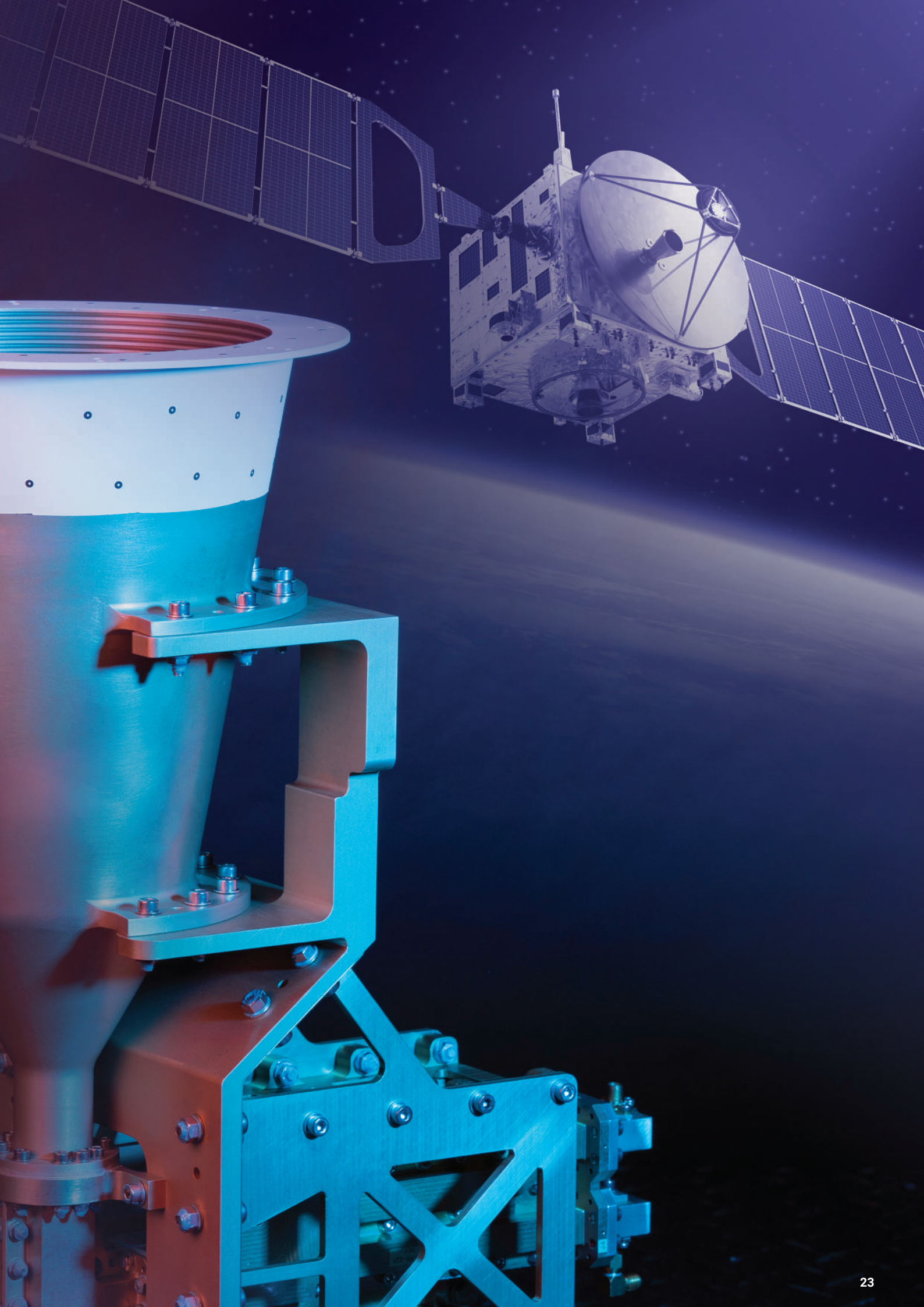
You can manage the relevant details of each module through the modules on the system.

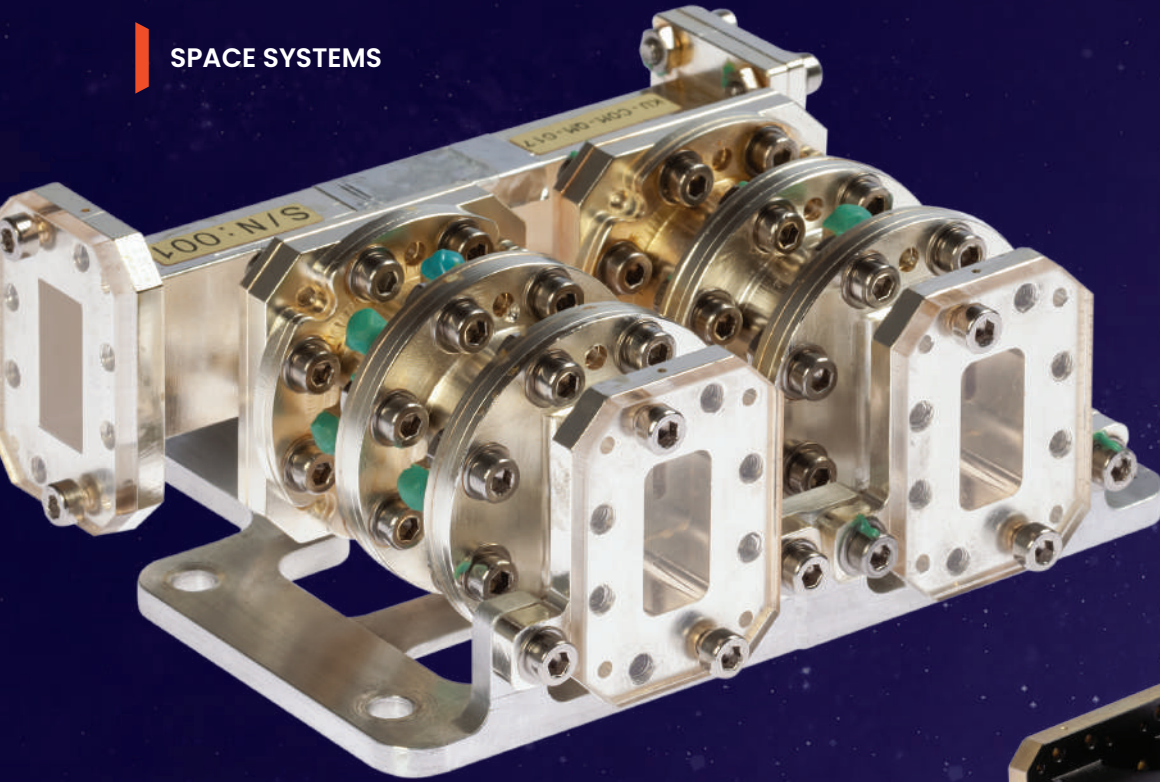


SPACE SYSTEMS

SPACE
SYSTEMS







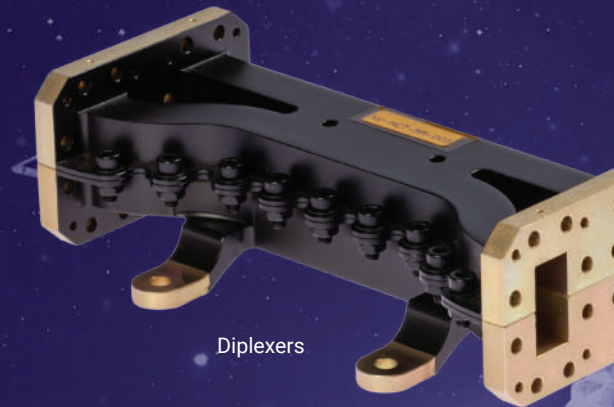
Multiplexers

WAVEGUIDE COMPONENTS

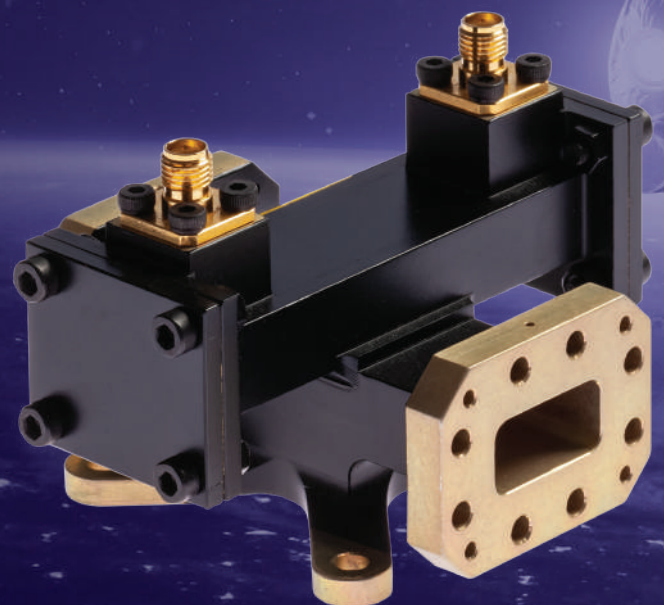
TELEMETRY, COMMAND & RANGING SUBSYSTEM PRODUCTS

Waveguide components, which aim to transmit RF signals with low loss or which allows transmission of high power RF signals, are qualified for geostationary satellites.

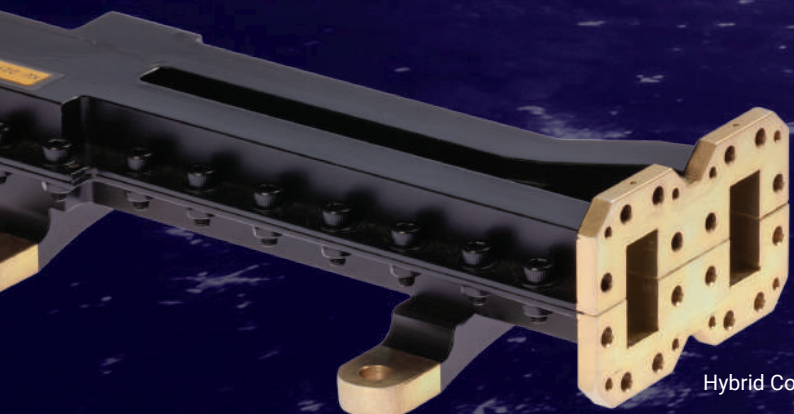
Several different waveguide products with different specifications are available with the possibility of customization according to specific customer or mission requirements. These products can be used to combine, filter or separate RF signals.



Diplexers



Test Couplers



Hybrid Couplers

ANTENNAS

TELEMETRY, COMMAND & RANGING SUBSYSTEM PRODUCTS

The antennas, designed and qualified for geostationary satellites, are responsible for receiving RF signals sent from ground or transmitting RF signals generated on-board using the transmitters, to ground.

Horn antennas and hemispherical antennas are designed, developed and tested by CTech for satellites using state-of-the-art design and manufacturing techniques.

Horn Antenna

Hemispherical
Antenna

SATELLITE TELECOMMAND RECEIVER

TELEMETRY, COMMAND & RANGING SUBSYSTEM PRODUCTS

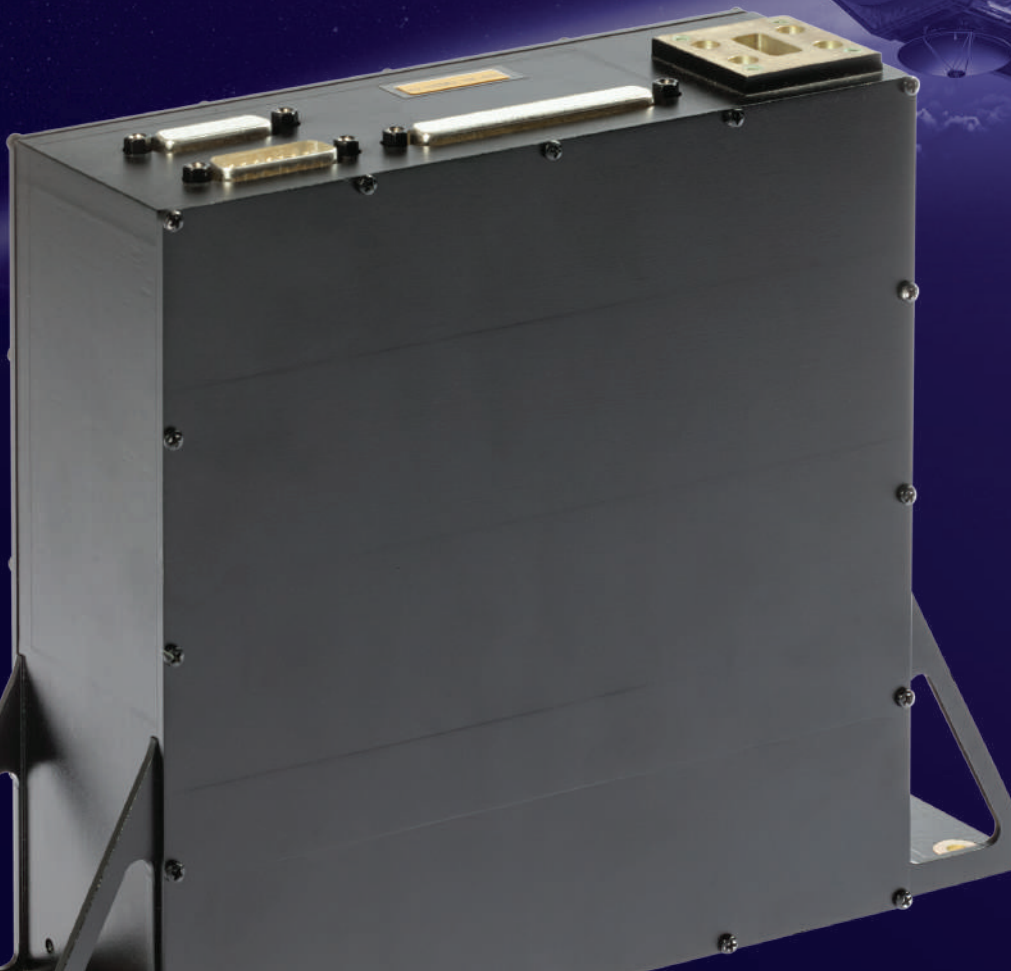
Telecommand Receiver, which has been developed and qualified to operate on geostationary satellites, is responsible for receiving the commands uplinked from the ground stations and transmit the demodulated data to satellite management unit which is responsible for executing them.

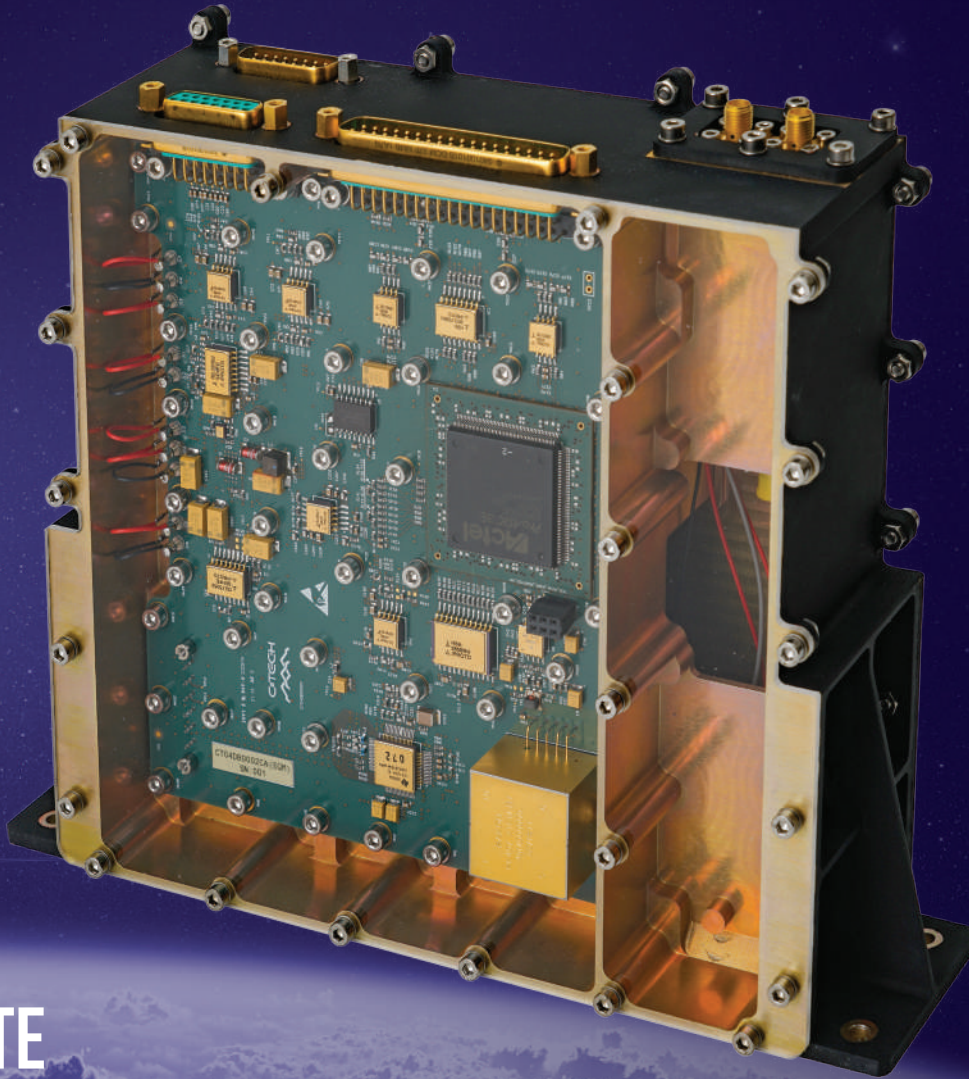
These time tagged control commands are sent to the satellite for actions such as controlling the movement of the satellite or turning on and off of other equipment on the satellite.

Telecommand Receiver is a state-of-the-art RF equipment with the flexibility to change the frequency in orbit and works on Ku-Band frequencies.



Ku-band Satellite
Telecommand
Receiver





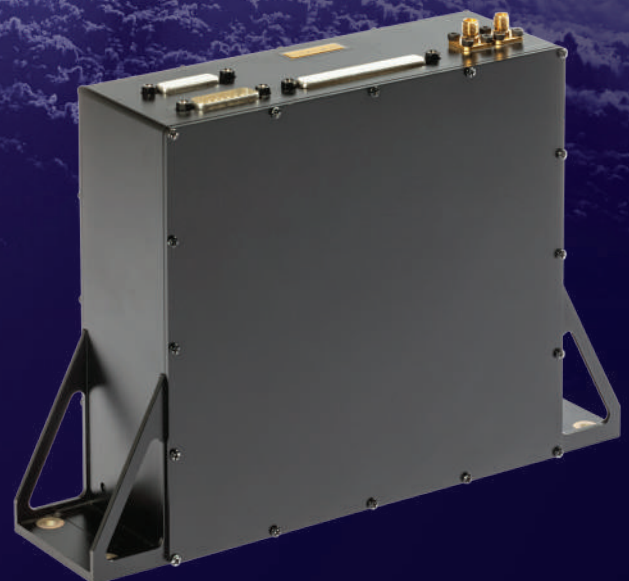
SATELLITE TELEMETRY TRANSMITTER

TELEMETRY, COMMAND & RANGING SUBSYSTEM PRODUCTS

Telemetry Transmitter, which has been developed and qualified to operate on geostationary satellites, is responsible for transmitting the telemetry and health status data, that has been collected from the sensors on-board, to ground stations.

These status data include mission critical data such as the operational status of the equipment or the exact attitude of the satellite. Telemetry Transmitter is a state-of-the-art RF equipment with the flexibility to change the frequency in-orbit and works on Ku-Band frequencies.

It has the capability to work as a modulated telemetry transmitter or an unmodulated beacon signal transmitter.





Seamless & Secure Communication on UAVs & Ground Vehicles





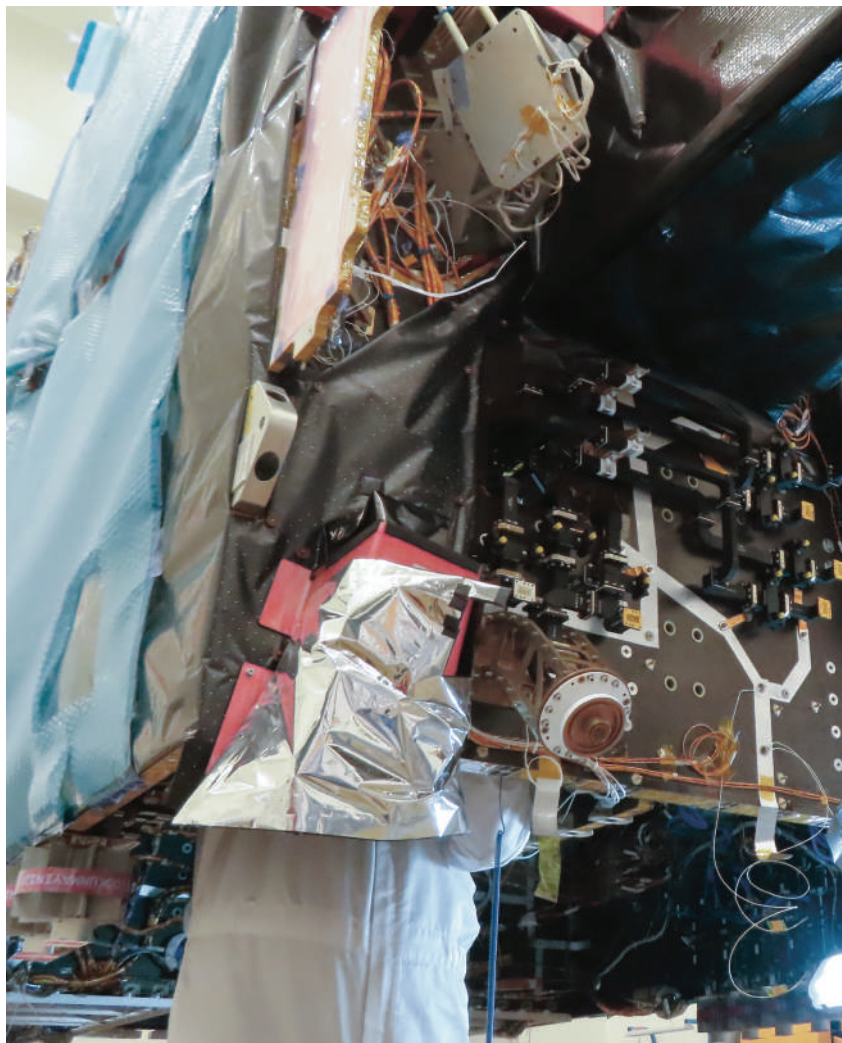
TerraARX
KU-12

C2TECH

12" SDR ANTEN KOMPLEX
C2TECH
REV. 1.0.0



**They Rely on
CTech**





C2TECH







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