An abstract graphic on the right side of the page. It features a glowing blue sphere composed of a grid of dots. Surrounding the sphere is a complex network of thin white lines connecting various glowing blue dots of different sizes, creating a sense of a global or digital network.

# **Nature's Best Information Technology**

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## **CTECH BİLİŞİM TEKNOLOJİLERİ SAN. VE TİC. A.Ş.**

Since 2005 CTech 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.



A close-up photograph of a metallic surface, likely a part of a machine or a component. The surface is highly reflective and shows signs of wear and tear. There is a small rectangular feature in the upper right and a circular hole in the lower left.

CTech, having become a subsidiary of Turkish Aerospace, Inc. (TUSAS) in 2018, today employs more than 200 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 3,000 m<sup>2</sup> 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, ANSI7EIA 649 and AS9100.

## COMMUNICATION SYSTEMS



## SPACE SYSTEMS



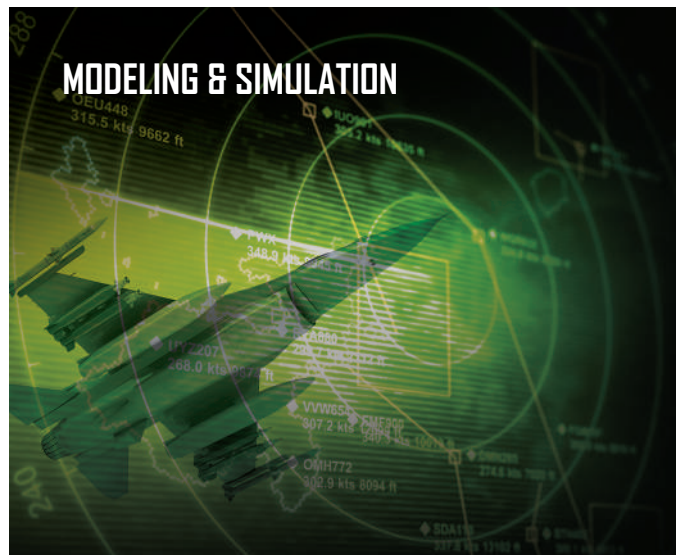
## BROADCASTING & IoT



## CYBER SECURITY



## MODELING & SIMULATION





**Perfection  
in the Production**

---

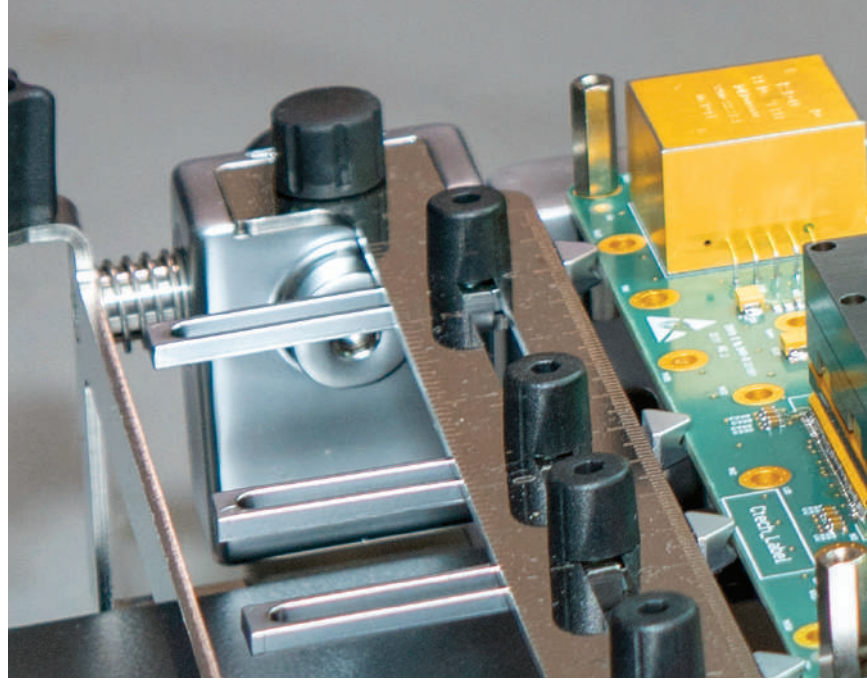
## Our Qualifications and R&D

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.

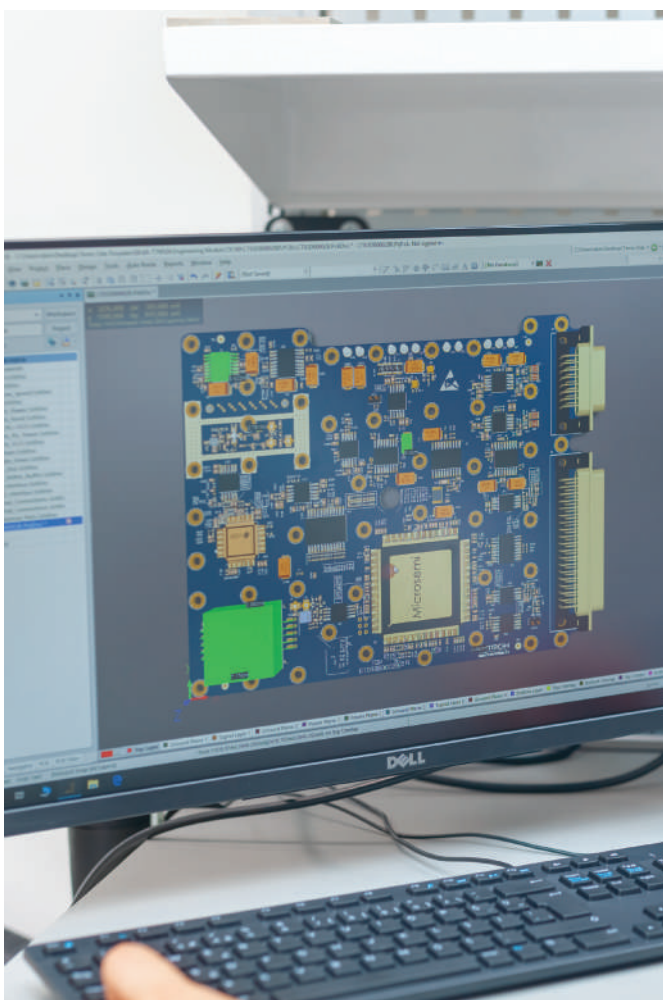
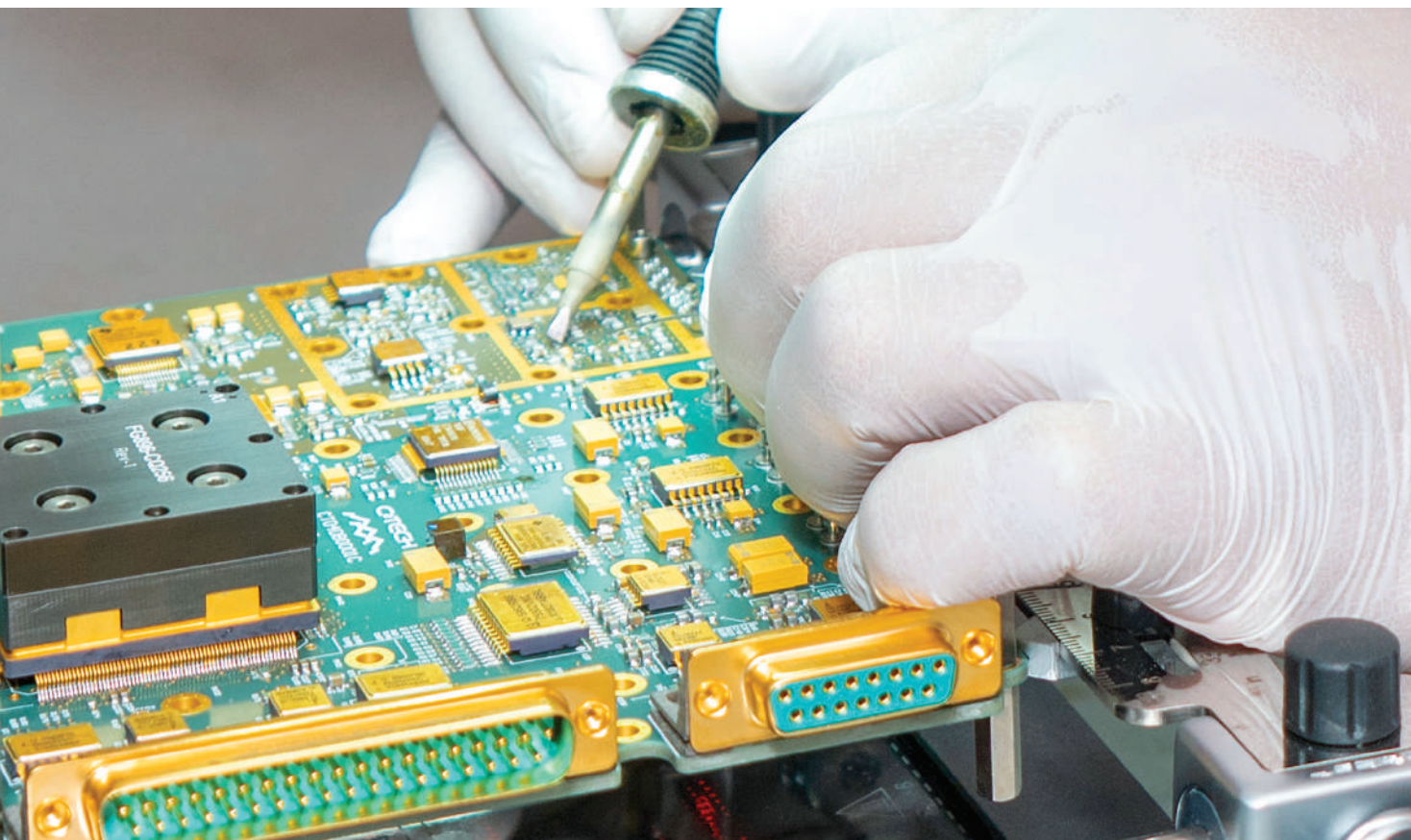
With its well-established infrastructure CTech has many national and international R&D activities and partners. Since 2005 our company has accomplished more than 60 projects and was awarded as the second most EU Eureka Program participating Turkish company by TUBITAK. Such a strong R&D culture is the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



**SkyA**







**RX**  
KU-18

CTECH



## 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<sup>®</sup> 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.



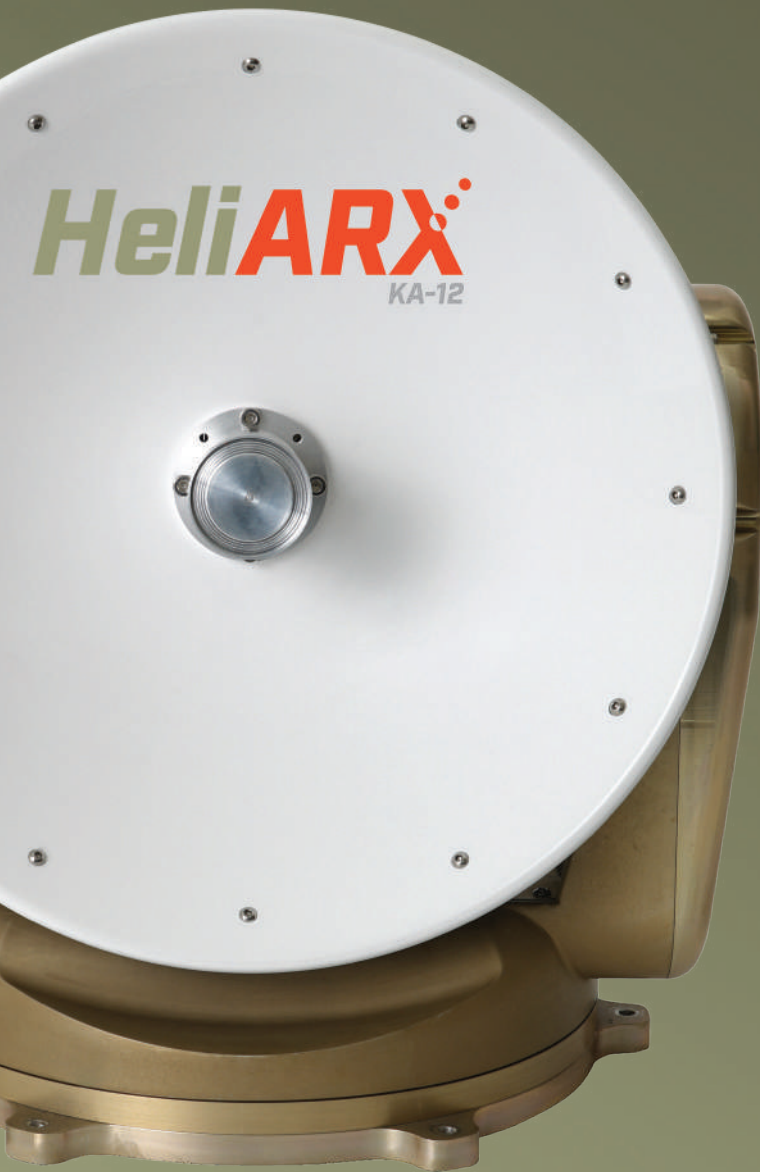
SpArx SDR Modem

### 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

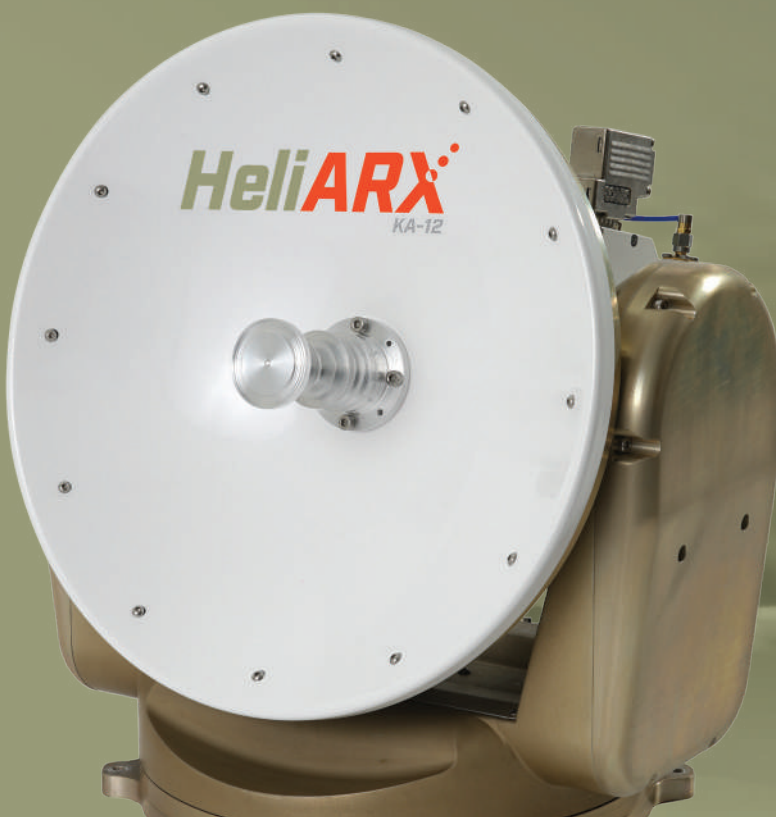
# HeliARX<sup>®</sup> KA-12

## 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<sup>®</sup>

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.

# UFUK

## linkDLKu-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



**45  
Mbps**



Ground Modem



Ground Tracking Antenna



# UFUK

linkDLX20



20  
Mbps



Ground Tracking Antenna

Airborne Modem



Ground Modem

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.

# GssARX

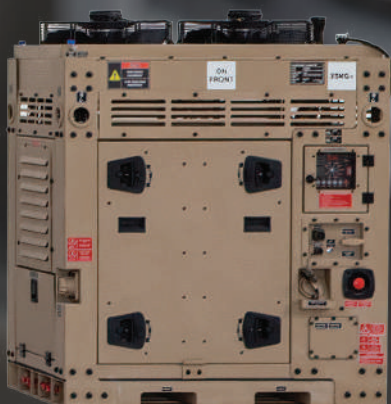
GROUND STATION SOLUTIONS

## 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

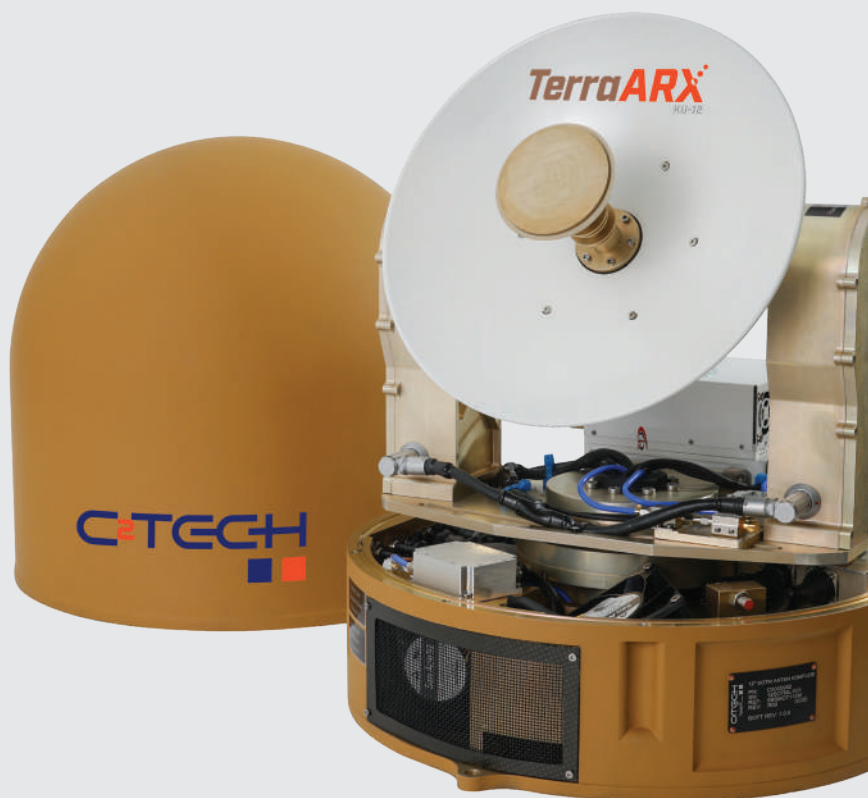
In today's information-based environment, military and governmental mobile users need fast, real-time access to information, headquarters and other users. The powerful CTech satcom-on-the-move (beyond-line-of-site, BLOS) capabilities provides reliable, secure, high speed connectivity to air and land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



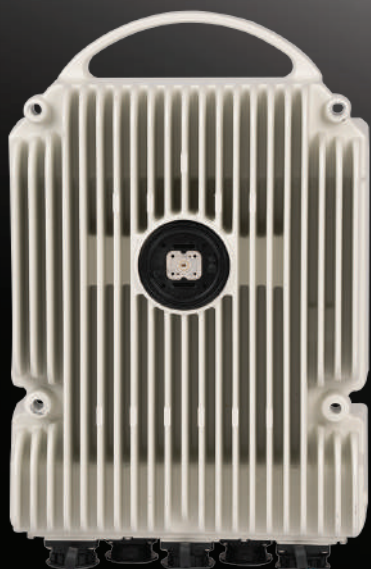
Our Satcom-on-The-Move systems supports X, Ku and Ka frequency bands. By the superior RF performance and dynamic response under the most challenging conditions, it meets the broadband needs of mission land vehicles, uavs, aircrafts and business jets, as well as helicopters.

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 FO80HDX



*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.









# 60 GHz

## 60 GHz RADIO LINK TERMINAL

CTECH V-band solution highly integrates full-outdoor product operating at the V band. Its antenna, RF and baseband units are integrated into a single outdoor unit. So it is much smaller, lighter comparing to traditional microwave systems. Suitable for short-haul transmission and dense deployment.

The radio link is in full-duplex (FDD) system configuration. In a FDD V-Band system, any two blocks of frequencies between 57-64 GHz are used for transmission or reception, depending upon the availability of Duplexers. This causes higher throughputs. In a TDD system, radio link can work in the TX or RX model independently.

With integrated manageable switch, radio can handle L2, OAM functions.



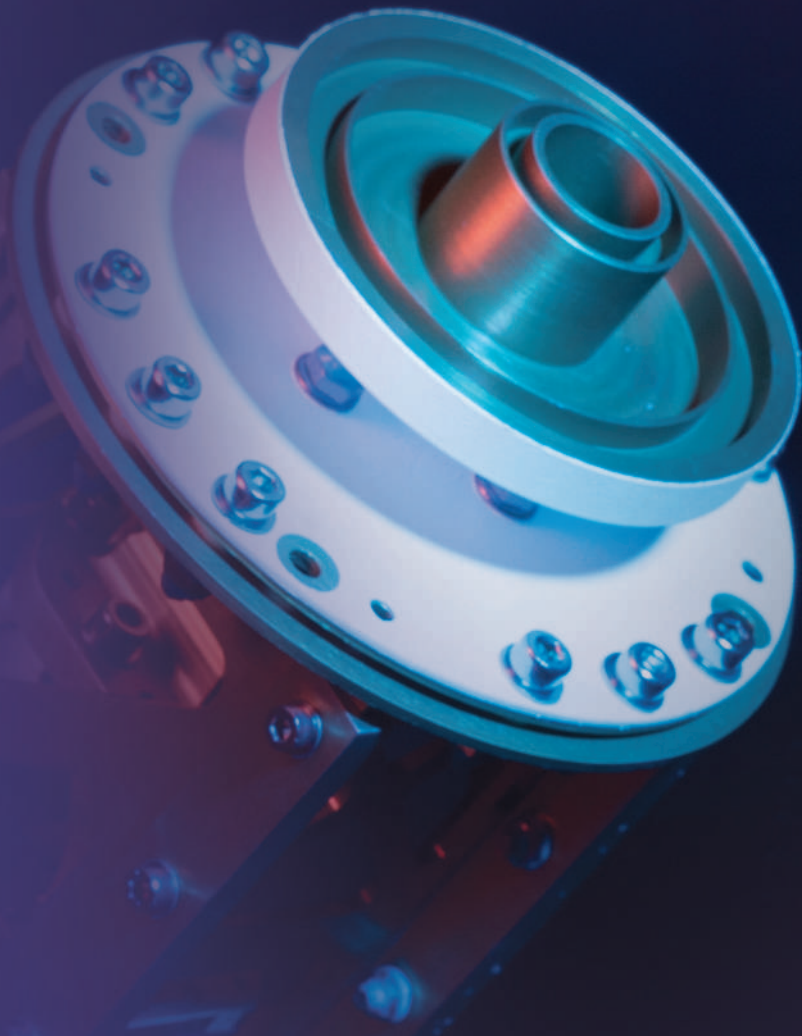


## CUSTOMIZABLE NETWORK MANAGEMENT

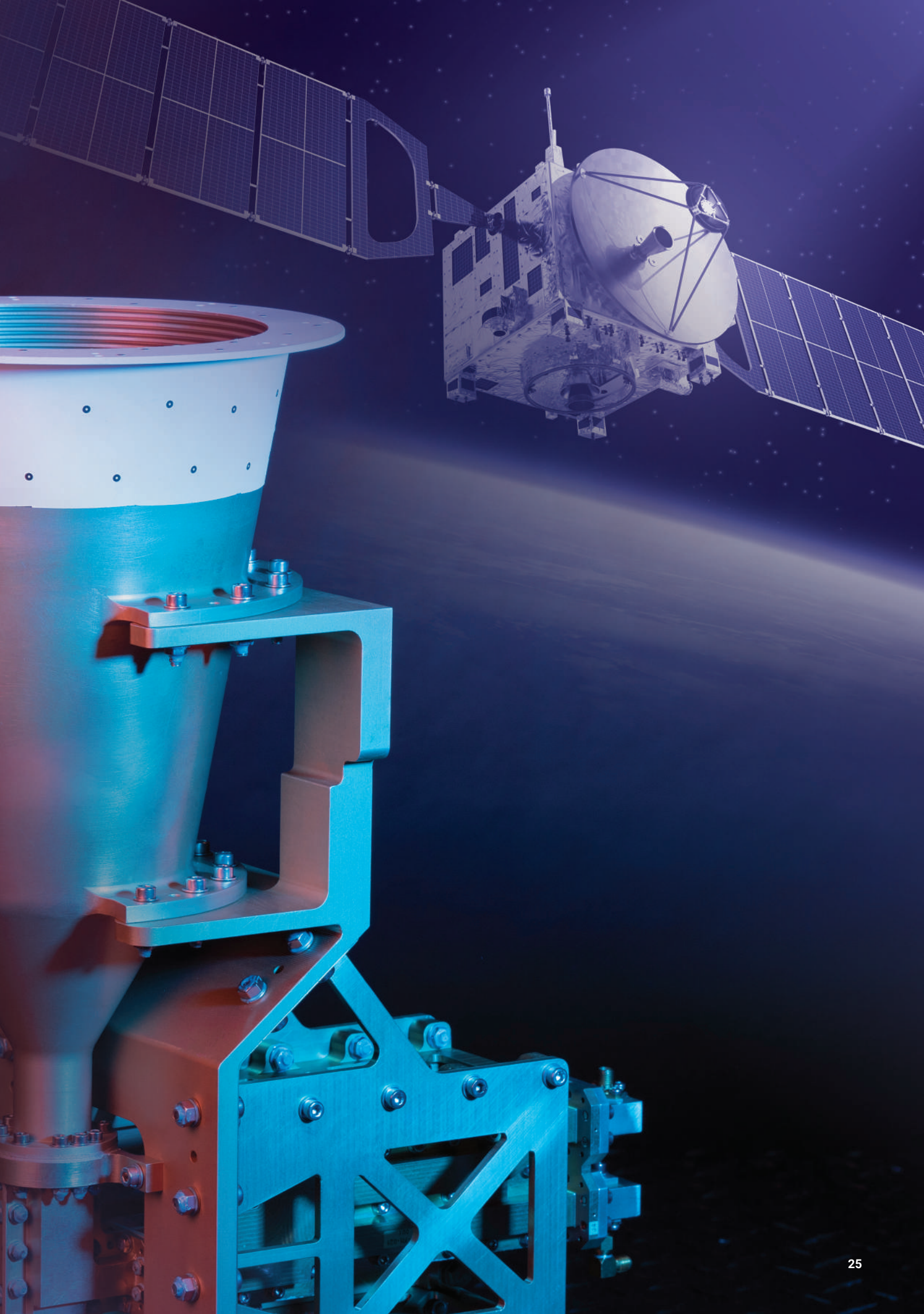
- Understand the information coming from your Network Equipment
- Associate with the map
- Perform Alarm and Performance monitoring
- Flexible and can easily be specialized for any new NE type
- Support up to 2000 NE's
- SNMP v1/v2/v3 and SSH support
- LLDP and ICMP protocols for Network discovery
-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

[illegible]

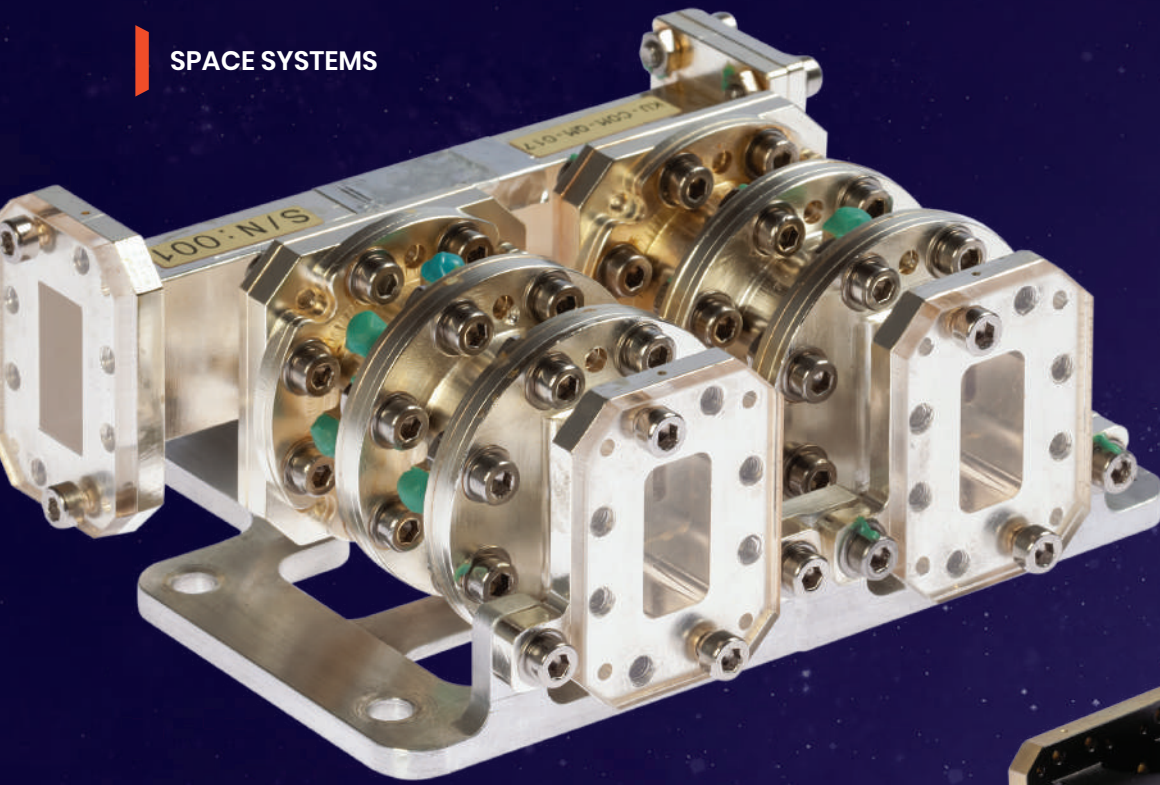
# SPACE 2 SPACE SYSTEMS SYSTEMS











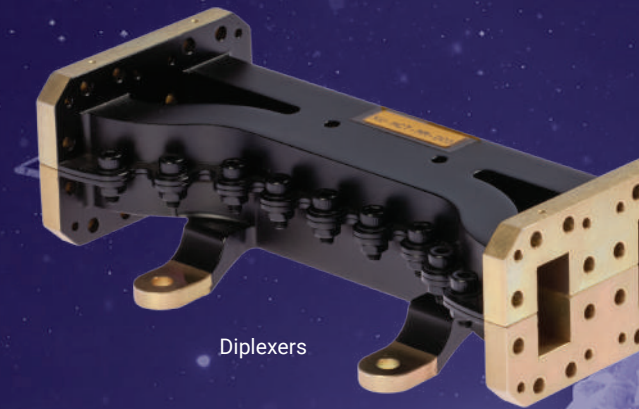
Multiplexers

## WAVEGUIDE COMPONENTS

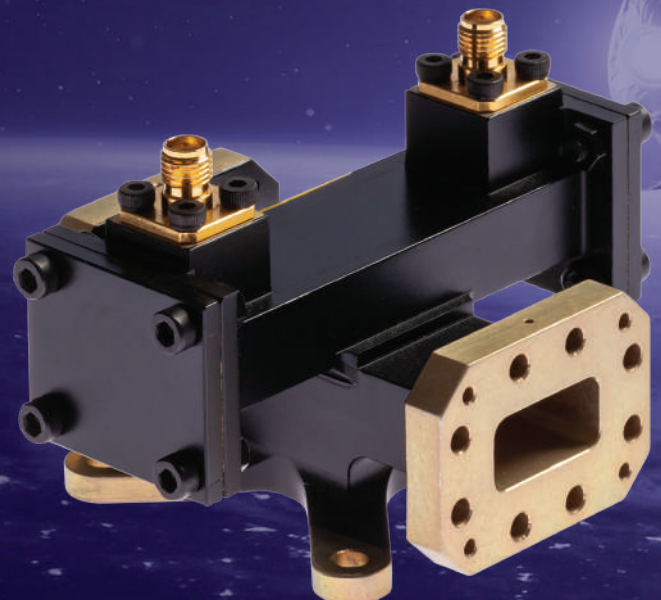
### TELEMETRY, COMMAND & RANGING SUBSYSTEM PRODUCTS

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.

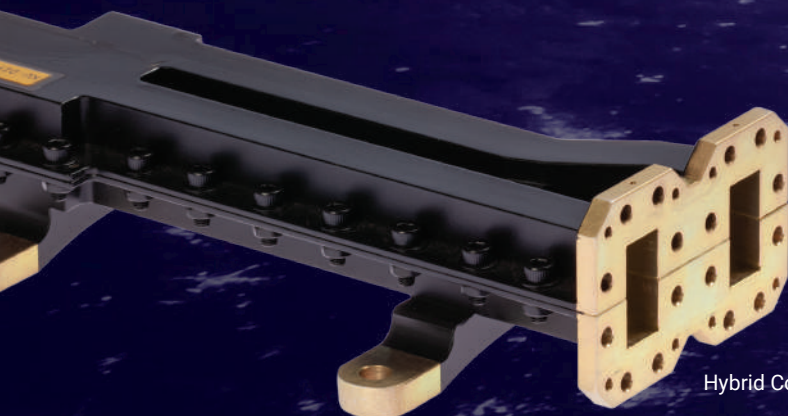
Several different waveguide products with different specifications are available with the possibility of customization according to specific customer or mission requirements. These products can be used to combine, filter or separate RF signals.



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

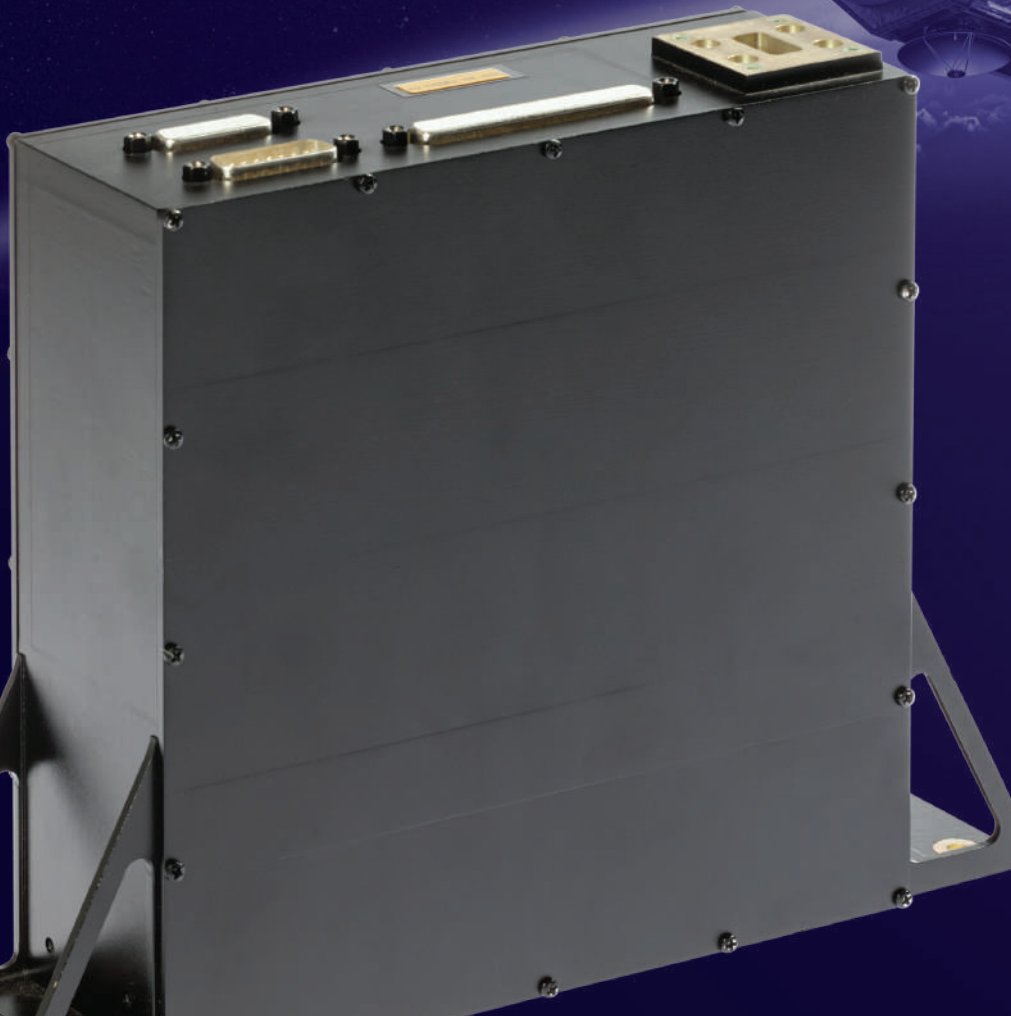
Telecommand Receiver, which has been developed and qualified to operate on geostationary satellites, is responsible for receiving the commands uplinked from the ground stations and transmit the demodulated data to satellite management unit which is responsible for executing them.

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.

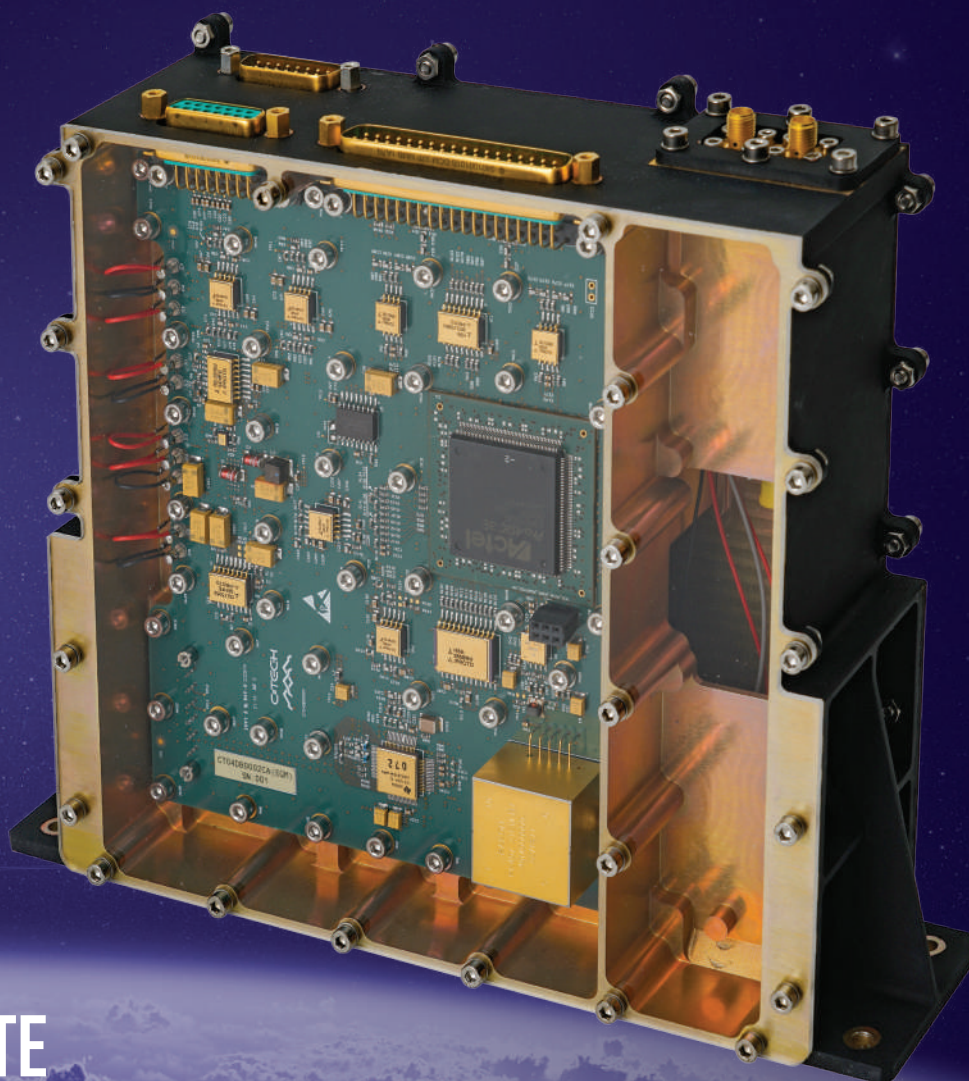
Telecommand Receiver is a state-of-the-art RF equipment with the flexibility to change the frequency in orbit and works on Ku-Band frequencies.



Ku-band Satellite  
Telecommand  
Receiver







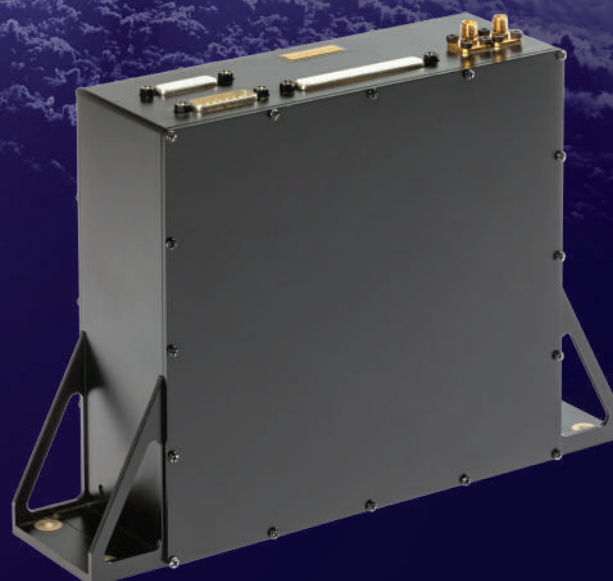
# SATELLITE TELEMETRY TRANSMITTER

## 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.



# BROADCASTING & IoT

## 3 BROADCASTING & IoT







modeo



MOBIOT (Mobile Internet of Things) has compact design and superior data transmission capability over multiple transmission channels. Fulfilling highly demanding professional video market and IoT requirements reliably and securely.

3G/4G/LTE/Wi-Fi or Ethernet Bonding.







**SIMPLE, RELIABLE, FLAWLESS,  
SECURE & AFFORDABLE  
BONDING GATEWAY**



Modeo is a daredevil for live video broadcasting and wide-band transmission over a bandwidth constrained networks with bonding and adaptive bit rating.

The broadcast and media industry relies on wireless communications to transport video and data from virtually anywhere in the world.





*STRIKE THE CENTER OF  
SEAMLESS LIVE VIDEO &  
DATA TRANSMISSION*

---





# SCOFUS

MOBLoT SCOFUS creates one broadband channel by fusing different communication channels. constrained networks with bonding and adaptive bit rating.

All communication resources like SATCOM, RF-LOS, LTE/5G act as single wideband channel.

Each communications technology such as SATCOM, RF Radio-link or Cellular has its own unique limitations. Relying on a single type of communication channel for autonomous Air, Land and Marine Platforms, may cause interruptions and operational issues.

CTech's MOBLoT SCOFUS technology developed to use all communication channels actively to create one uninterrupted broadband channel for seamless communication.

## BENEFITS:

- Increased bandwidth
- Providing uninterrupted communication
- Extend the operational coverage area
- Remotely control autonomous vehicles
- Two way, low delay data/telemetry communication
- Multi-channel high quality live video transmission





# AUTONOMOUS AIR/LAND/MARINE COMMUNICATIONS SOLUTION



# CYBER SECURITY

## 4 CYBER SECURITY









*HIGHEST SECURITY  
FOR YOUR FILES,  
FROM ANYWHERE,  
MADE SIMPLE*

---

# KRYPTOS

## ENCRYPT ALL YOUR FILES

With cloud storage services becoming a standard for business, data security is an increasing concern for enterprises. It's clear that cloud storages either public or private aren't exactly as secure as they were made out to be.

By encrypting your data, you can add a layer of protection before they synchronize to the cloud. But who will hold the keys? No matter what security measure you have, you can't be sure where your data will end up when someone else handles the keys.

KRYPTOS decouples the data, that is stored either on Dropbox, Google Drive, etc. or on your private cloud, and the encryption keys required to access it.

KRYPTOS makes use of the most secure encryption algorithm, to date. Therefore, KRYPTOS is considered to be an "appropriate technical and organizational encryption measure" to protect personal data according to EU-GDPR.





*FULL DISC ENCRYPTION,  
256 BIT AES,  
FIPS 140-3 LEVEL 4,  
MULTI-FACTOR  
AUTHENTICATION*

---



# DISKRIPTO®

## HIGH SECURITY DATA PROTECTION SOLUTION FOR PCS

DISKRIPTO® is an hardware-based Full Disk Encryption device that is designed to protect Data-at-Rest by encrypting content and securely sharing sensitive information, and can be used for several data categories including protection of Financial Data, Private Individual Data, Military Data, Government Data to meet regulatory and contractual requirements, and comply with audits.



# MODELING & SIMULATION SOLUTIONS

5

MODELING & SIMULATION  
SOLUTIONS





3Sphere Route Note Camera Coverage SmallMap Line Control Region

Scale: 925 • | 100 | 100 | Side Blue • 1000000





# JAMIDS

## **DESIGN AIR DEFENSE OF TOMORROW**

JAMIDS is CTech's complete simulation solution, a realistic and constructive simulation system that simulates Joint Air and Missile Defense operations with battlefield, maritime and airspace activity. JAMIDS is used to assess the effectiveness of defense systems against the air and missile threats.

JAMIDS is used by operational commanders and analysts to model the performance and predict the effectiveness of TBM's, Cruise Missiles, air-to-ground and surface-to-air missiles, platforms, communication systems, and sensors in a variety of user-developed scenarios.

Whether evaluating the effectiveness and performance of new or existing defense systems and subsystems, JAMIDS provides a flexible simulation environment for answering your Joint Air and Missile Defense questions.

***BE PREPARED!  
WITH OUR JOINT  
AIR & MISSILE DEFENSE  
SIMULATION SOLUTION***

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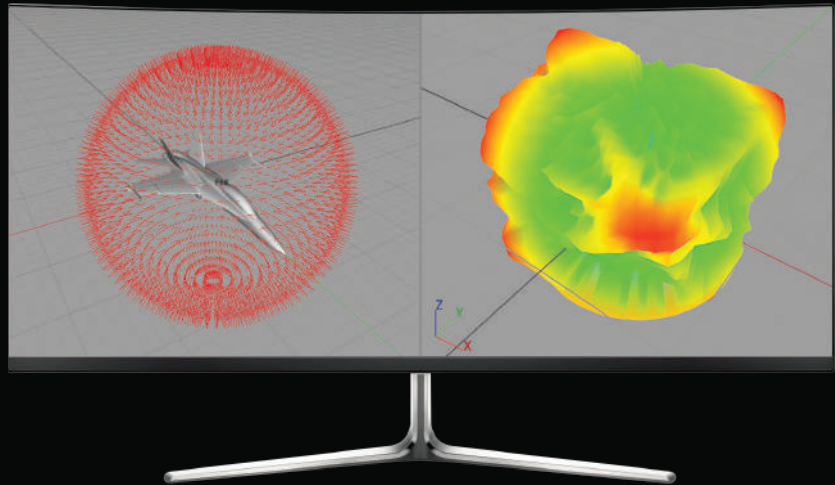
# RIKA

## RADAR SIGNATURE PREDICTION & ANALYSIS

Radar signature reduction is a must in order to increase the battle-field effectiveness of any contemporary platform or long-range armament. The crucial step in radar signature reduction or stealth technologies is the determination of the radar signature of the platform under consideration. The following actions can be performed upon the determination of the signature:

- Shape changes can be affected for platforms under development
- Radar absorbing coatings such as RAM can be applied on certain regions of the platform
- Tactical plans for approach-to-target patterns can be tailored

The RIKA software analyzes the radar signature of any platform based on its CAD model and provides all the necessary information to realize these actions.



**UNDETECTABLE  
OR NOT?**

---

# Seamless & Secure Communication on UAVs & Ground Vehicles

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**TerraARX**  
KU-12

**C2TECH**

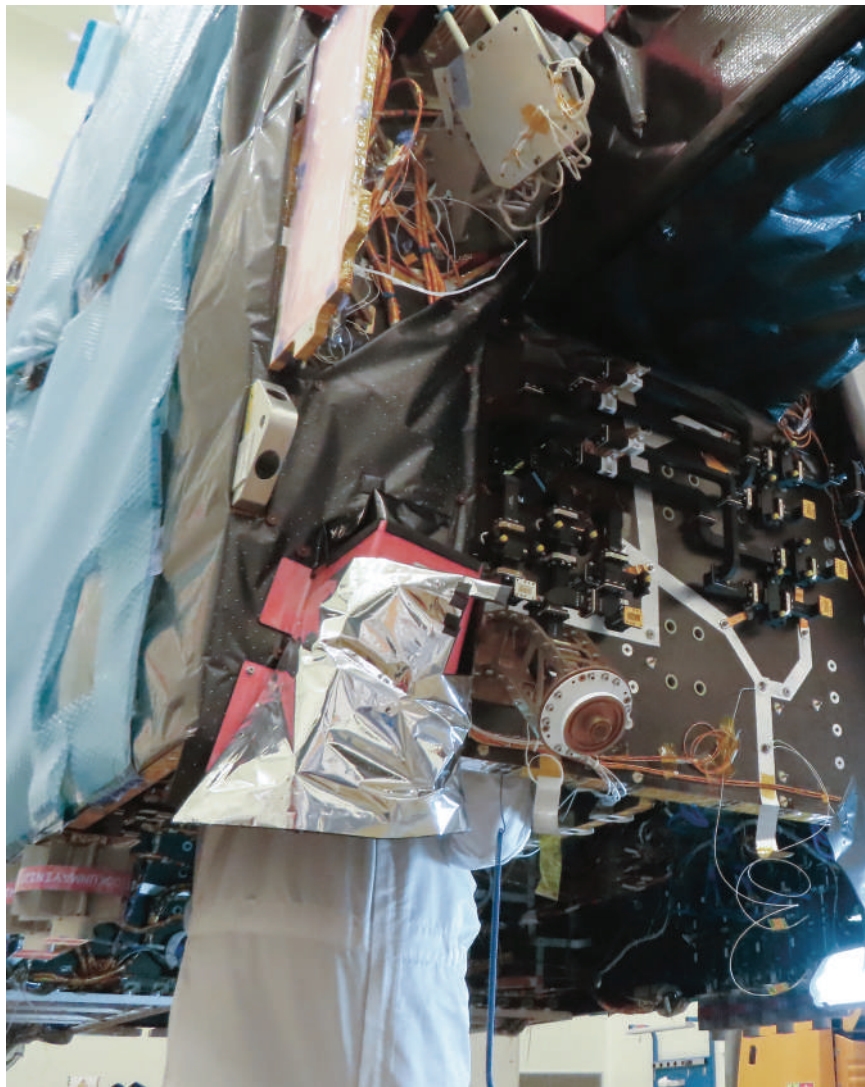
12" DOW ANTENNA W/COMPASS  
PH: 00000002  
SN: 12500000000000000000  
REV: 800 0000  
SOFT REV: 1.0.0



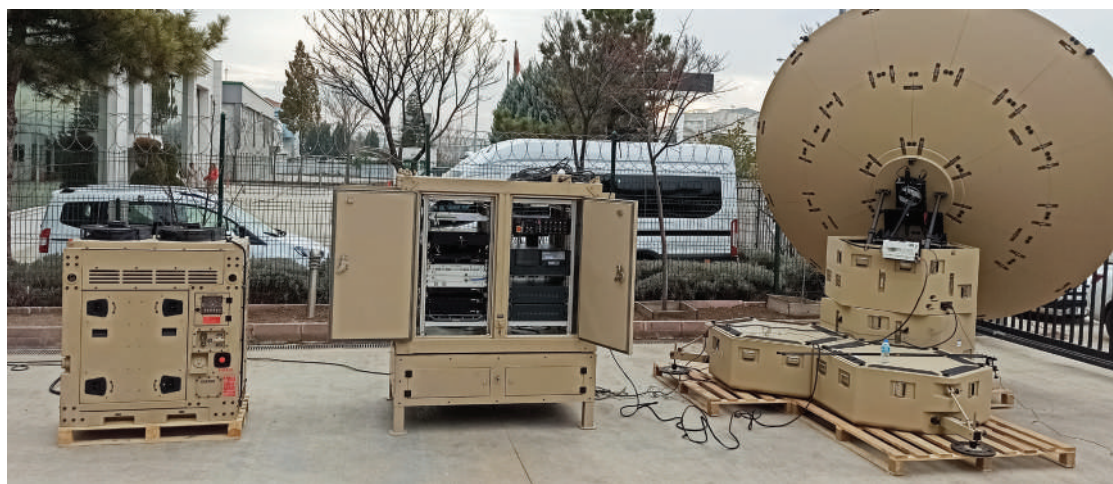


**They Rely on  
CTech**

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Teknopark İstanbul 1. Blok Kat 2  
Pendik, İstanbul / TÜRKİYE  
T : +90 850 480 77 44  
+90 216 290 52 86

[www.ctech.com.tr](http://www.ctech.com.tr)

