Space

TELECOMMUNICATIONS
GNSS NAVIGATION
RADAR
TT&C

CELESTIA

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Crafted in Europe, delivered worldwide

Elevating excellence

CELESTIA | RTI

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CELESTIA | C

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CELESTIA

European group of multi-technology companies

Our group companies operate **across the globe but share a common purpose.** Together, we exist to lead the **continuous search for cutting-edge solutions** with reliable, affordable, European made high technology.

About us

Put simply, we connect ground to space, producing reliable solutions to communications challenges.

We are creating turnkey communications solutions for a **worldwide market.**

For over 25 years, our business has been synonymous with world-class innovation, quality and engineering excellence with a customer focus.

We deliver technology products, systems and services to our partners across the **aerospace, defence, satellite, scientific and IoT sectors.**

Global in reach, our **multi-disciplined teams** create smart responses to communications challenges using new ideas, new technologies and new ways of thinking.

We have the backing of **Waterland Private Equity** accelerating our growth ambition.

We have a strong heritage in partnering with businesses and international space agencies from development to commercialisation in a wide range of key enabling technologies.

We are built to innovate

Where we are

We have design, manufacturing and testing facilities in Spain, the Netherlands, Belgium, France and the UK.

European team working together as one. Our European origins bring a legacy of quality craftmanship to the global stage, offering solutions that are regionally rooted but internationally recognised.

Our engineering and production facilities are located in **six different countries across Europe,** putting us within close reach of our customers. **Crafted in Europe, delivered worldwide**

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Solid State Power Amplifiers

Based on GaN technology, our SSPAs can deliver high output power maximising DC to RF conversion efficiency. High linearity for maximum useable output power independent of the modulation used.

They are designed in accordance with ECSS standards and optimised to operate without the risks associated with corona discharge and multipactor effects. Commanded by high level pulsed signals where several analogue telemetry signals are implemented in a compact and low weight design.

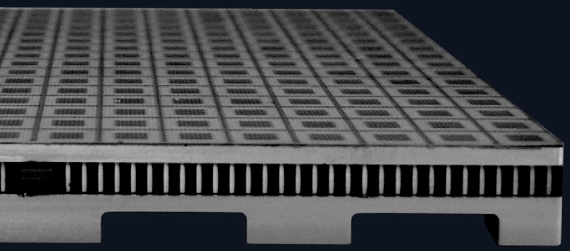
The modular combination of **High Power Modules (HPMs)** gives flexibility and facilitates an easier integration into various systems, ensuring minimum size and mass.

Our SSPAs have achieved TRL-9 in several commercial and military programmes.

RF Front-Ends

Custom RF front-ends including amplification stages **(SSPAs and LNAs),** the switching between Tx and Rx, distribution network and redundancy configurations.

From customer support to define the specifications through to architecture definition, validation of demonstrators and delivery of flying models.



Phase Array Antennas

Engineering solutions for space-qualified phase array antennas for small and medium sized satellites.

Expertise in ground and airborne **Electronically Steered Antenna (ESA)** solutions, combined with space heritage, makes Celestia the best partner for new space solutions.

Electrical Ground Support Equipment

EGSEs consist of hardware and software elements that perform satellite testing, by simulating the interfaces of subsystems to assure full compatibility once integrated within the overall platform. This includes both satellite on-board elements as well as external elements related to communications.

Celestia provides a wide variety of EGSE products:

On-Board Interfaces which can differ at many levels, including physical, electrical and protocol; **Spacecraft RF Interface testing** for the vital stage of spacecraft assembly, integration and test (AIT); **Integrated Systems,** which nominally consist of Celestia's front-end equipment complemented with COTS products, provide customers with a complete test environment to validate their satellite or subsystem.

Software to control a unit under test (UUT), run automated test scripts to speed up testing, monitor real-time statuses, perform data processing of recorded or simulated data and visualise data in many ways.

SSPAs & HPMs

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SSPAs

BAND	TYPE	Psat	FREQUENCY
VHF			
	SSPA	800 W	40 - 50 MHz
UHF			
	SSPA	150 W	240 - 270 MHz
L			
	SSPA	80 W	1100-1305 MHz / 1550 - 1600 MHz
		300 W	1100 - 1600 MHz
			1550 - 1600 MHz
S			
	SSPA	5W / 10 W / 20 W	2.2 - 2.3 GHz
			2.3 - 2.5 GHz
Ka			
	SSPA	125 W	17.3 - 20.2 GHz

HPMs

BAND	TYPE	Psat	FREQUENCY
VHF			
	HPM	120 W	40 - 50 MHz
L			
	HPM	40 W	1100-1305 MHz
		100 W	1100 - 1600 MHz
		40 W	1550 - 1600 MHz
		200 W	
Ka			
	HPM	10 W	17.3 - 20.2 GHz

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SPACEBORNE SSPAs

VHF

GaN SSPA - Spaceborne

800 W

40 - 50 MHz

Psat	800 W
Operating mode	Pulsed

UHF

GaN SSPA - Spaceborne

150 W

240 - 270 MHz

Psat	150 W
Operating mode	CW

L

GaN SSPA - Spaceborne

80 W

1100-1305 MHz / 1550 - 1600 MHz

Psat	80 W
Operating mode	CW

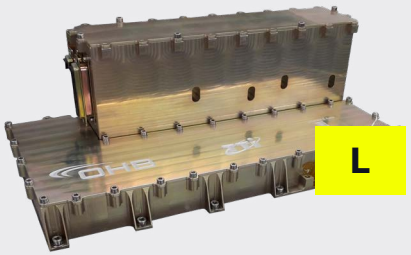
L

GaN SSPA - Spaceborne

300 W

1100 - 1600 MHz

Psat	300 W
Operating mode	CW



L

GaN SSPA - Spaceborne

300 W

1550 - 1600 MHz

Psat	300 W
Operating mode	CW

Space

SPACEBORNE SSPAs

S

GaN SSPA - Spaceborne

5 W / 10 W / 20 W

2.2 - 2.3 GHz / 2.3 - 2.5 GHz

Psat	5 W / 10 W / 20 W
Operating mode	CW

Ka

GaN SSPA - Spaceborne

125 W

17.3 - 20.2 GHz

Psat	125 W
Operating mode	CW

Space

SPACEBORNE HPMs

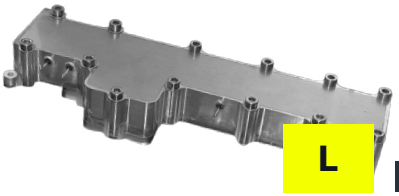
VHF

GaN HPM - Spaceborne

120 W

40 - 50 MHz

Psat	120 W
Operating mode	Pulsed



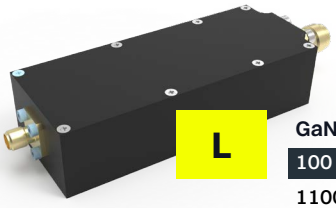
L

GaN HPM - Spaceborne

40 W

1100-1305 MHz

Psat	40 W
Operating mode	CW



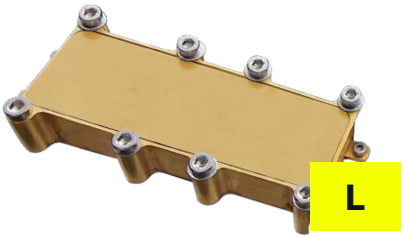
L

GaN HPM - Spaceborne

100 W

1100 - 1600 MHz

Psat	100 W
Operating mode	CW



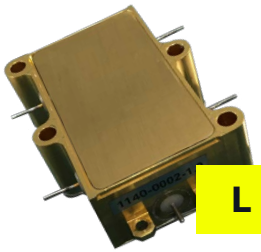
L

GaN HPM - Spaceborne

40 W

1550 - 1600 MHz

Psat	40 W
Operating mode	CW



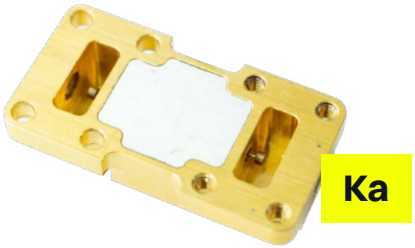
L

GaN HPM - Spaceborne

200 W

1550 - 1600 MHz

Psat	200 W
Operating mode	CW



Ka

GaN HPM - Spaceborne

10 W

17.3 - 20.2 GHz

Psat	10 W
Operating mode	CW

EGSEs

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SATELLITE TEST SYSTEMS

EGSE - On-board interfaces

MODEL	TYPE	APPLICATION	TECHNOLOGY
MPIP	Multi-purpose interface platform	Test and simulate	Electrical interfaces
TM/TC	TM/TC front-end	Spacecraft control	RS422 / LVDS interfaces
WLFE	WizardLink front-end	Multi-channel reception and generation	4 Bi-directional WizardLink channels
PLFE	Parallel LVDS front-end	Multi-channel reception and generation	4 Parallel LVDS inputs and outputs
MILFE	MIL-1553 front-end	Control, monitor and simulate	Simulating spacecraft specific protocol
CANFE	CAN Bus front-end	Control, monitor and simulate	Simulating spacecraft specific protocol

EGSE - RF interfaces

BAND	TYPE	APPLICATION	TECHNOLOGY
TT&C	TT&C modem	Telemetry, tracking and command	Integrated modem and baseband modem
IOTB	In orbit test bench	IOT phase for satellites	Multi-platform and multi-mission

EGSE - Integrated satellite testing systems

BAND	TYPE	APPLICATION	TECHNOLOGY
SCOE	Instrument SCOE	Special check-out equipment	Electrical and protocol interfaces
RFSCOE	RF SCOE	Special check-out equipment	Validate satellite RF subsystems
RFS	RF suitcase	Integrated RF subsystem	Integrates part of the spacecraft comms chain
SIS	Spacecraft interface simulator	Instrument or spacecraft unit testing	All spacecraft electrical interface types
UHFSSPA	SSPA RF suitcase	Qualification for space power amplifiers	RF and high power supply validation

EGSE - Software

BAND	TYPE	APPLICATION	TECHNOLOGY
CMS	EGSE control software	Operation of the different FEs and systems	Sophisticated graphical user interface
LZP	Level zero processor software	Source agnostic satcom data processor	Ingestion of data directly from storage
TT&C_E	TT&C emulator	M&C emulator for TTC stations	RF interfaces integrated with emulated M&C

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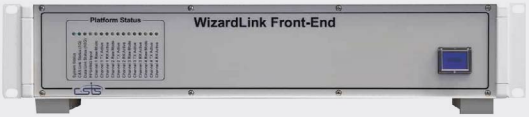
EGSE - ON-BOARD INTERFACES

MPIP Multi-Purpose Interface Platform

Test and simulate

Electrical interfaces

Up to 16 (pluggable) interface modules
Power, discrete and digital data interfaces
Custom interfaces and protocol support

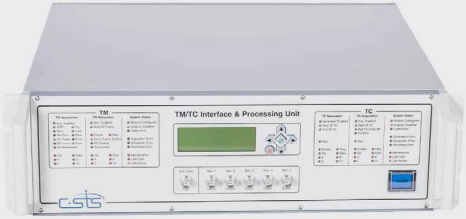


WLFE WizardLink Front-End

Multi-channel reception & generation

4 Bi-Directional WizardLink channels

Up to 4 WizardLink channels in parallel
Up to 2 Gbps data rate per channel
SW for high speed ingest and level 0 processing



TM/TC TM/TC Front-End

Spacecraft control

RS422 / LVDS interfaces

TM acquisition and simulation
TC generation and acquisition
Bit error rate tester

PLFE Parallel LVDS Front-End

Multi-channel reception & generation

4 Parallel LVDS inputs and outputs

Up to 4 parallel LVDS inputs and outputs
16-bit parallel up to 2Gbps per channel
SW for high speed ingest and level 0 processing

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EGSE - ON-BOARD INTERFACES

MILFE

MIL-1553 Front-End

Control, monitor & simulate

Simulating spacecraft specific protocol

Up to 4 independent, dual redundant channels
BC, RT and bus monitoring functionality
External time/reference inputs

CANFE

CAN Bus Front-End

Control, monitor & simulate

Simulating spacecraft specific protocol

Specification 2.0A & 2.0B compliant
Master, slave node and bus monitoring functionality
Support 1 Mbps high-speed CAN bit rate

EGSE - RF INTERFACES

TT&C

TT&C Modem

Telemetry, tracking and command

Integrated modem and baseband modem

Ranging and doppler measurements
Data rates from 7.8125 bps to 10 Mbps
Doppler simulation and uplink sweeping

IOTB

In Orbit Test Bench

IOT phase for satellites

Multi-platform and multi-mission solution

IOT procedures
Orbit validation
Automatic reports

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EGSE - INTEGRATED SATELLITE TESTING SYSTEMS

RFSCOE

RF SCOE

Special check-out equipment

Validate satellite RF subsystems

Integrated RF and bypass interfaces
Multi-channel gigabit interfaces
Science data processing, incl. CFDP

RFS

RF Suitcase

Integrated RF subsystem

Integrates part of the spacecraft comms chain

Turnkey RF compatibility test system
Integrated RF system and OBC
TM/TC data monitoring and generation

SCOE

Instrument SCOE

Special check-out equipment

Electrical and protocol interfaces

Integrated rack of equipment
Galvanic isolation and FMEA compliant
Integrated COTS equipment

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EGSE - INTEGRATED SATELLITE TESTING SYSTEMS

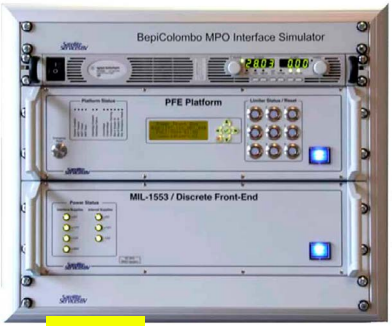
UHFSSPA

TT&C Emulator

Qualification for space power amplifiers

RF and high power supply validation

Automatic report generation
Different test scenarios
Multi-platform



SIS

Spacecraft Interface Simulator

Instrument or spacecraft unit testing equipment

All spacecraft electrical interface types

Turnkey, integrated test system
Mimic of S/C Electrical I/Fs and data protocols
Overall system control software

EGSE-SOFTWARE

CMS

EGSE Control Software

Operation of different FEs & systems

Sophisticated graphical user interface

Control and monitoring of FEs / systems
Data processing
Visualisation of (telemetry) data
Remote interfacing via EDEN, C&C & Python

LZP

Level Zero Processor Software

Source agnostic satcom data processor

Ingestion of data directly from storage

Raw binary or C-STS archive input
CCSDS data processing, incl. data decryption
Statistical presentation and reporting

TT&C_E

TT&C Emulator

M&C emulator for TTC stations

RF interfaces integrated with emulated M&C

Simulated and real mode configuration
Operator training
Qualification upgrades previous OPE chain

CELESTIA

We are here for you

Our team will be delighted to assist you.

Share your idea with us, discuss all your specific needs, and let's make it a reality.

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