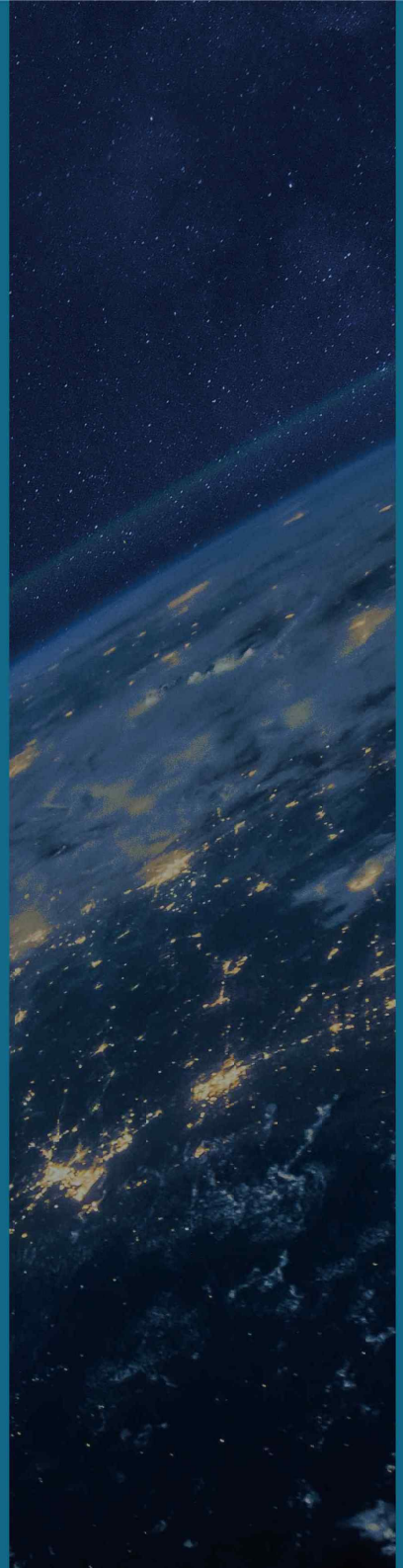
LUMIR
Harmonia et Differentia



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LUMIR
Harmonia et Differentia

루미르 주식회사

LUMIR

Harmonia et Differentia

Lumir has been verified for its excellent product development technology by contributing to the success of Korean space development project, and we have been focusing on the development of satellite subsystem.

We have the first Republic of Korea's certified manufacturing process in accordance with the space quality standards of the Korea Aerospace Research Institute, and we are realizing growth into top-tier in the Korean space business.

Based on the world's best technological competitiveness, Lumir will advance into the global satellite market and contribute to the sustainable growth of the future space.

Milestones

2021
- CAS500-3 On-Board Computer
- Space Pioneer Project
  Control Moment Gyro Assembly Controller
  Ka-band Transmitter and
  Ka-band Active Phased Array Antenna

2020
- CAS500-4 IDHU

2019
- EO/IR Satellite Power System EGSE

2018
- Multi-Channel SAR Control Electronics
- CAS500-1, 2 IDHU

2017
- Satellite CMG Controller
- CAS500-1,2 X-band Downlink Module EGSE
- KOMPSAT-7 Power System EGSE

2016
- KPLO DTN Payload
- KOMPSAT-6 SAR Control Electronics

2015
- Space Wire Router
- NEXTSat-1 Payload Electronics ISSS

2014
2013
- High-speed Vehicle Fuel System Controller
- Launch Vehicle Thruster Solenoid Valve
- (Japan) GAIA-I Satellite On-board Computer

LUMIR
Harmonia et Differentia

Harmonia et Differentia

(ENGLISH : Harmony in Differences | 漢字: 和而不同)

The logo expresses Lumir's open entrepreneurial spirit,
which recognizes and embraces the creativity and
freedom of individuals with different ideas
while uniting and harmonizing with each other.

LUMIR
Harmonia et Differentia

Products

Satellite SAR

(Synthetic Aperture Radar)

- SAR Control Electronics Unit
- RF Front End
- SAR Antenna

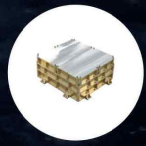
Satellite PDTS

(Payload Data Transmission Subsystem)

- IDHU(Image Data Handling Unit)
- XDM(X -band Downlink Module)
- Ka-band Transmitter
- Ka-band Active Phased Array Antenna

Satellite Bus Components

- AOCS CMG
  (Control Moment Gyroscope)Controller
- TC&R OBC



EGSE

(Electrical Ground Support Equipment)

- Spacecraft Power EGSE
- PDTS EGSE
- SAR EGSE

SAR Image Processing and Solutions

- Level-1 Processing
- Level-2 Processing
- Customer-oriented, Customized Solution

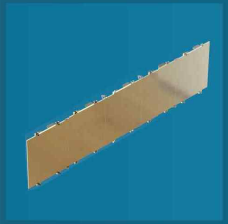
CATIS™

Compact Any-Time Imaging Sensor System

Space-borne Synthetic Aperture Radar

SCEU
SAR Control Electronics Unit

SATA
SAR Antenna &TRM Assembly



OVERVIEW

- SAR System for 100-kg-Class Micro-satellites (High-resolution X-band and Quad-pol C-band)
- Digital signal processing to minimize signal distortion
- Active Electronic Scanning Antenna with Solid-State TRM Technology

FEATURES

Operational Mode	Stripmap, Spotlight, Wide-Swath
Resolution	0.3 m @ Spotlight
Swath	120 km @ Wide-Swath
Frequency	X-band 9.66 GHz (Option: C-band)
Chirp Bandwidth	500 MHz
Antenna Type	Waveguide Slot Array
Antenna Gain	43 dBi
Transmission Output Power	3 kW RF Peak Power Output
Beam steering Range	-10° to +10°
Storage Capacity	2 TBytes
Data Downlink Speed	Ka-band, 2 Gbps

DATA

TM/TC: CAN

POWER

Input: Nominal +28 Vcc

TEMPERATURE

(- 40°C) to (+85°C)

MECHANICAL

Size
SCEU: 214 x 194 x 134 mm
SATA: 3300 x 800 x 70 mm

Mass
SCEU: 8kg / SATA: 55kg

SARDIP™

SAR Data and Image Processor

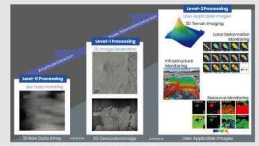
Web-based SAR Data and Image Processing S/W Platform

OVERVIEW

- Supports Level-0, 1, and 2 Processing Algorithms (InSAR,DInSAR, PS-InSAR, PolSAR, PolInSAR, Polarimetric Decomposition)
- Customized Solution Available

Processing Chain

- SARDIP™ supports image processing from level-0 to level-2 and aims to provide intuitive solutions



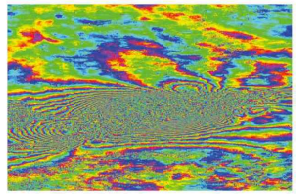
FEATURES

Level-1 Processing

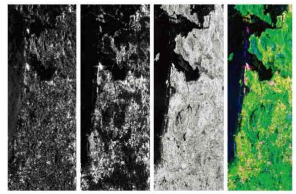
- Single Look Complex (SLC)
- Ground Range Detected (GRD)

Level-2 Processing

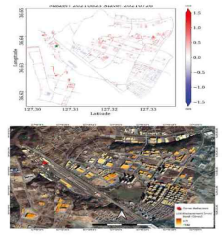
- Interferometric Processing Libraries



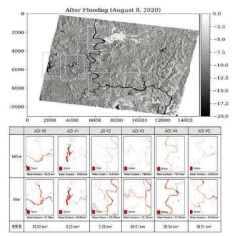
- Polarimetric Decomposition Libraries



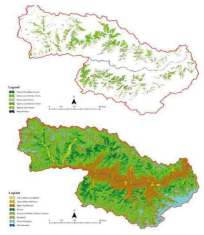
Customized Solutions (Only by Lumir)



Land Subsidence Monitoring



Water Content Detect on



Forest Type Classification

SAR Control Electronics Unit

SCEU

OVERVIEW

- SAR Control Electronics
- Compact and lightweight design with RF and Digital Integration
- Digital signal processing for signal distortion minimization
- Operation and processing of up to 1 GHz chirp bandwidth
- 2 TB storage for high-resolution image data
- 2 Gbps Data Downlink with Adaptive Coding & Modulation

FEATURES

Frequency	X-band (Option: C-band)
Chirp Bandwidth	1 GHz
Modulation/Demodulation	Digital IQ method
Storage Capacity	2 TB
Data Downlink Speed	2 Gbps

DATA

Mission Data: X-band (Option: C-band)
TM/TC : CAN, SpaceWire

POWER

Input: Nominal +28 Vdc

TEMPERATURE

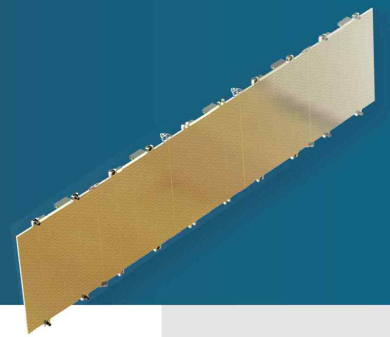
- 40°C to +85°C

MECHANICAL

Size 214 x 194 x 134 mm
Mass 8 kg

SAR Antenna & TRM Assembly

SATA



OVERVIEW

- Waveguide Slot Array Antenna for X-band Satellite SAR Applications
- Active Electronic Scanning Antenna with Solid-State TRM Technology
- Lightweight Antenna with Diffusion Bonding Process
- Up to 3 kW Output Power with TRM Assembly
- Foldable Antenna with 5 Panels

FEATURES

Frequency	X-band (Option: C-band)
Bandwidth	1 GHz
Antenna Type	Waveguide Slot Array
Polarization	VV, Single-Pol (C-Band, Quad-Pol)
Antenna Gain	43 dBi
Transmission Output Power	3 kW RF Peak Power Output
Beam Steering Range	-10° to +10°

DATA

X-band Input & Output : SMA
TM/TC : CAN, RS-422

POWER

Input: Nominal +28 Vdc

TEMPERATURE

- 40°C to +85°C

MECHANICAL

Size 3300 x 800 x 70 mm

Image Data Handling Unit

IDHU

OVERVIEW

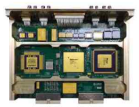
- Satellite projects: CAS500-1/2/4
- Satellite Electro-Optical Sensor Image Data Handling Unit
- High-speed Data Rate Handling and Processing
- Compact Size and Lightweight Design using RTG4 FPGA

FEATURES

Storage Capacity	1.5 Tbits(up to 3 Tbits) Flash Memory
Input Speed	6.0 Gbps(Channel-Link, 4 x PAN, 2 x MS)
Output Speed	640 Mbps (Channel-Link)
Processor	GR712 ASIC Processor
Operating System	RTEMS
Power Consumption	< 75 W
Fully Redundant and Cross-strapped Interface	

Input & Compression Board(ICB)

Flash Memory Board (FMB)



Control & Output Board (COB)

Power Supply Board (PSB)

DATA

Mission Data : Channel-Link
TM/TC : 1553B, SpaceWire, RS-422

POWER

Input: +36 Vdc to +50.4 Vdc

TEMPERATURE

(- 40°C) to (+85°C)

MECHANICAL

Size 280 x 336 x 197 mm
Mass < 10.5 kg

Delay Tolerant Network Payload

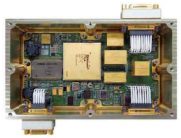
DTNPL

OVERVIEW

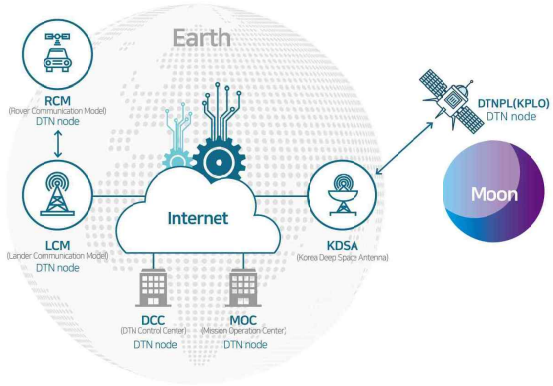
- Satellite Project : Korea Pathfinder Lunar Orbiter (KPLO)
- Space Communications Using DTN Technology

FEATURES

Operating System	RTEMS 4.13
Processor	LEON3 FPGA IP Processor
FPGA	Microsemi RT4G150
Memory	MRAM / SDRAM / Nand Flash
Power consumption	< 12W



Single Board Computer



DATA

Mission Data: RS-422 USART
TM/TC : RS-422 UART

POWER

Input: +24 Vdc to +32 Vdc

TEMPERATURE

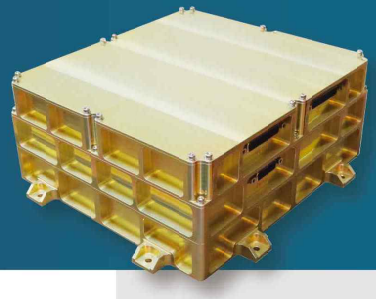
(- 40°C) to (+85°C)

MECHANICAL

Size 120 x 170 x 39 mm
Mass < 0.79 kg

Control Moment Gyro Controller

CMGC



OVERVIEW

- Target satellite: 400 - 700kg medium-sized satellite
- Power Control for the CMG(Control Moment Gyro) Motors in AOCS
- Controls the unit according to the command received from the OBC
- Using components that reflects raciation-resistant design
- 1 box CMG Controller consists of 4 CMG Motor Control Electronics

FEATURES

• Speed Range of Momentum Wheel	< 6000 RPM
• Control Resolution	24 bits, 8ch simultaneously
• Processor	LEON3FT TMRed FPGA IP in RTG4
• Operating System	RTEMS
• Power Consumption	< 15 W per CMG
• Radiation resistance	(TID) > 35 krad
• EDAC on Memories	

Servo Amplify Unit (SAU)

Servo Control Unit (SCU)

Servo Power Unit (SPU)

DATA

(External) MIL-STD-1553B
(Internal) CAN, RS-422

POWER

Input: Nominal 28 VDC (26.6~29.4 VDC)

TEMPERATURE

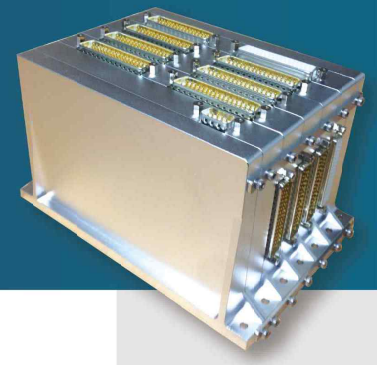
(- 40°C) to (+85°C)

MECHANICAL

Size 250 x 230 x 95 mm
Mass 4 kg
per CMG Motor Control Electronics

Modular Small On-Board Computer

MOSOC



OVERVIEW

• Modularity & Compactness	Interchangeable Cards Assembly System-on-Chip CPU and AMBA-based FPGAs IPs
• Fault Tolerant CPU	LEON3 Processor with TMR Logic 8051 Processor protected by Internal Hamming codes
• Re-configurability	On-orbit FPGA Re-configuration On-orbit Flight Software update

FEATURES

• Processor	LEON3 Processor
• Operating System	RTEMS
• Storage Capacity	512 Gbits
• I/O	32 Digital-Out, 16 Digital-In, 4 Analog-Out, 40 Analog-In
• CCSDS Compatible	CCSDS 100.0-G-1, CCSDS 101.0-B-4, CCSDS 130.1-G-1, CCSDS 131.0-B-1, CCSDS 200.0-G-6, CCSDS 201.0-B-3, CCSDS 202.0-B-3, CCSDS 203.0-B-1, CCSDS 230.1-G-1, CCSDS 231.0-B-2, CCSDS 232.0-B01

Leon3 Processor Card

TNC Card

I/C Card

LVPS Card

DATA

TM/TC : SpaceWire ,1553B, CAN, UART

POWER

Input: +24 Vdc to +34 Vdc

TEMPERATURE

(- 40°C) to (+85°C)

MECHANICAL

Size 200 x 116 x 120 mm
Mass < 4.0 kg