

## HAWK for Earth Observation (HEO)

Argotec HAWK for Earth Observation is a 65kg micro-satellite designed to operate in constellations. Equipped with a multi-band payload and a powerful Payload Data Processor (PDP), it is capable of acquiring and processing on-the-edge images with a sub-3m/pixel Ground Sampling Distance (GSD). It is optimized to be mass-produced in Argotec Space Park. HEO is more than a traditional imaging satellite; it is a computing platform. In addition to the main OBC&DH unit, the platform hosts a capable PDP equipped with an x86 quad-core processor, a full-fledged GPU and a dedicated Neural Processing unit (NPU), enabling the efficient implementation of a full processing pipeline on-board.

### Key Features

#### Payload

- Available Volume: 300x300x475 mm
- Available Power: 100W

#### Payload Data Processor

- CoreMark v1.0 per CPU core  $\geq 5000$
- FPGA DSP cores 72 (18x18)
- Additional AI acceleration  $\leq 4$  TOPS

#### Orbits

- SSO at 500km – 600km

#### Propulsion

- Chemical Propulsion
- Delta-V Capability 80 m/s

#### Attitude and Orbit Determination and Control

- 3-axis stabilized
- Pointing Accuracy 10.8 asec
- GNSS Accuracy  $\geq 2$  m

#### Spacecraft Mass and Volume

- Wet Mass:  $< 72.6$  kg
- Stowed (mm): L 482 x W 544 x H 693

#### Power

- Power Generation Capability 200 W
- Power Storage Capability 344 Wh

#### On-Board Computation and Data Handling

- On-Board Computer 130 DMIPS
- Payload Data Processor  
 $\leq 40$  GFLOPS (CPU only)  
 $\leq 100$  GFLOPS (GPU only)
- OBC Memory Storage 16 GB  
PDP Memory Storage 240 GB  
Payload Memory Storage 128 GB

#### Telecommunication

- Data Rate  $\leq 218$  Mbps (payload)  
 $\leq 128$  kbps (commands/telemetry)
- Data Volume  $< 9$  GB per window

## Subsystem

### Command & Data Handling (C&DH)

- ✓ Monitors and Controls Subsystems
- ✓ Acquire and Process Telemetry
- ✓ Stores Data
- ✓ Executes On-Board Software and Failure Detection, Isolation and Recovery (FDIR)

Components:

- Argotec's deep-space Onboard Computer (Fermi) previously flown on LICIACube and ArgoMoon.

### Electrical Power Subsystem (EPS)

- ✓ Power generation, storage and conditioning

Components

- solar arrays
- Argotec Power Control and Distribution Unit (ZEUS)
- Argotec ELEKTRA battery units

### Attitude Determination and Control Subsystem

- ✓ Angular Rate Management
- ✓ Attitude Management
- ✓ Position & Velocity Management
- ✓ Pointing & Targeting

### Communication subsystem

- ✓ Command & Telemetry management

Components

- Transceiver
- Antennas

### Propulsion System (PS)

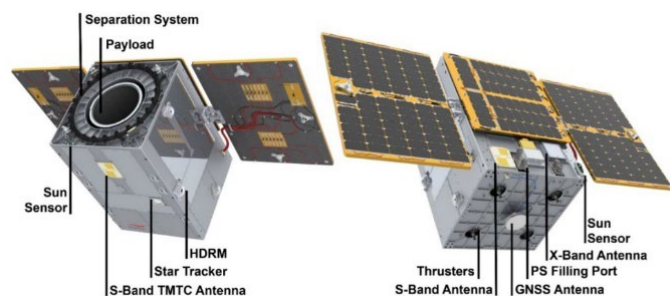
- ✓ Maneuvering (transfer, maintenance)
- ✓ Chemical propulsion

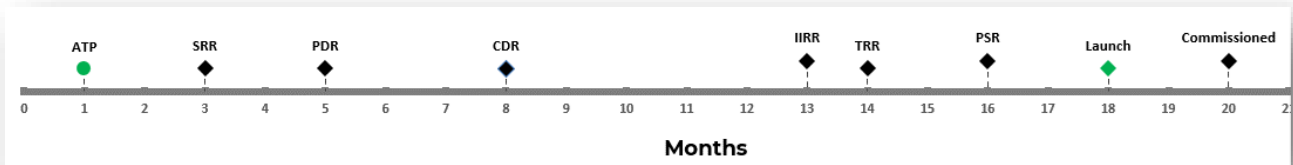
Components

- Storage Tanks
- RCS

### Thermal Control Subsystem (TCS)

- ✓ Passive (surface finishes, radiator tape, MLI, and thermal straps)
- ✓ Currently HEO is designed to operate in a LEO (SSO 500-600km) environment.
- ✓ Simple modification for deep-space





## Facilities

Argotec is built on an All-In-House mentality. This extends from our components, subsystems to our facilities and environmental testing. To support this, Argotec has built the Space Park in Turin, Italy. The Space Park boasts over 120k sqft of manufacturing space which includes:

- ISO 7 clean room (11k sqft)
- ISO 5 clean room (500 sqft)
- Labs (electronic, mechanical, structural)
  - Vapor phase oven for printed circuit board and board production
  - Flying Probe Test for electronic board assembly testing, and equipment
  - Electrical components managed through our Pic & Place production line
- Mechanical workshop with both 5-axis and 3-axis CNCs (4.4k sqft)
- Fully automatic painting facility for insulating and protective coatings
- Shock and Vibe labs plus a Thermal-Vac chamber
- Production areas to support up to 52 satellites per year
- Additional ~13,000 sq. ft of space for incubating innovation and start-ups
- Mission Control Center

Production is overseen by an advanced MES/APS system that integrates with all company functions. At the warehouse level, there is a temperature- and humidity-controlled area equipped to store raw materials, components, and finished products in addition to the automated warehouse.

## US Facilities

Argotec is investing \$25M to design, build, test and operate satellites in the US. This new ~20,000 sq. ft facility will include:

- Lab Space (Electrical, Mechanical)
- AI&T Clean Room standard ISO 7 – ISO 5
- Mission Control Center
- Logistic & Storage Area
- Offices / Meeting Rooms
- Data Center & Technical Areas

**ARGOTEC Inc.**

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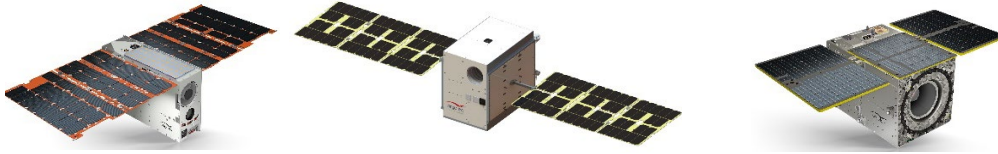
Largo, MD 20774

[www.argotecgroup.com](http://www.argotecgroup.com)



# argotec®

SPACE FOR AMBITIONS



	6U	12U Earth	12U Deep Space	HEO
Payload	3 kg, 3.5 U, Up to 40 W	8 kg, 6U, Up to 130 W		Envelope: 300x300x475 mm
Data Interfaces	RS422, LVDS, SpaceWire, SPI, CAN			
Electrical Interfaces	5V, 12V 22V to 32V (Unregulated)			
BOL Solar Array Peak Power	Up to 80 W	Up to 95 W	Up to 220 W	Up to 200 W
Battery Capacity	120 Wh	160 Wh	120 Wh	344 Wh BOL
Target Orbits	LEO, Interplanetary	LEO, MEO	GEO, Cislunar, Interplanetary	LEO (SSO)
Computing Capabilities:	130 DMIPS (CPU only, FPGA available)	130 DMIPS (CPU only, FPGA available) Dedicated PDP option available		130 DMIPS (CPU only, FPGA available) Dedicated PDP option available
On-board storage:	Up to 32 GB	Up to 32 GB Up to 240 GB with PDP option		Up to 128 GB Up to 240 GB with PDP option
OBC&DH Protocol	CCSDS, PUS			
COMMS data band	S-Band, X-Band Upon request: UHF	S-Band, X-Band Upon request: UHF	X-Band Upon Request: S-Band, K-Band, Ka-band	S-Band, X-Band
Payload Downlink Rate	Up to 218 Mbps	Up to 218 Mbps	Up to 100 Mbps	Up to 218 Mbps (X-Band)
TM/TC Downlink and Uplink Rate	Up to 10 Mbps (X-band) Up to 128 kbps (S-Band)			Up to 128 kbps (S-Band)
Propulsion	60 m/s (Chemical)	60 m/s (Chemical) Upon request: Electrical	120 m/s (Chemical) 2.5 km/s (Electrical)	Up to 80 m/s (Chemical) Upon request: Electrical
Navigation	Optical NAV, GNSS, Sequential Ranging, PN Ranging	GNSS	Optical NAV, GNSS, Sequential Ranging, PN Ranging	GNSS
Position Knowledge	Up to ±10 m			Up to ± 2 m
Attitude Strategy	3-axis stabilized		3-axis stabilized Upon request: Spinning Mode	3-axis stabilized
Pointing Accuracy	Up to ±10 arcsec (1σ) for 2 axes Up to ±25 arcsec (1σ) for 3rd axis			Up to ±7 arcsec (1σ) with 2x Star Tracker
Absolute Knowledge Error	Up to ±6 arcsec (1σ) for 2 axes Up to ±40 arcsec (1σ) for 3rd axis			Up to ±10 arcsec (1σ)
Momentum Storage	Up to 50 mNms per axis	Up to 100 mNms per axis		1 Nms per axis
Maximum Slew rate	Up to 10 deg/s			
Maximum Wet Mass	16 kg	35.5 kg	36 kg	72.6 kg
Design Lifetime	Up to 5 years			

**For More Information:**

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