Advanced Satellite Ground System for the New Generation of Meteorological Satellites

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With the emergence of Himawari-8, GOES-R, and Geosatellite-2A and FY-4 going operational in the near future, the user community is faced with the huge volume of data which put a strain on the current ground system infrastructure. Since the declaration as the next operational satellite, GOES-16 has transmitted more data in the first 6 months of operations than all previous GOES weather satellites combined. The order of magnitude increase in sensor capability in terms of number of spectral channels, pixel resolution, and frequency of observation demand powerful and robust processing computers. In addition, users are and will have to deal with a large number of level-2 and higher products that need to be handled and digested in order to utilize these products efficiently and effectively in order to better serve the public. Enterprise Electronics Corporation, a giant in the weather radar business now offers satellite data reception and processing systems that are most advanced among its kind in a cost-effective way. The Proteus system is powerful, efficient, and user-friendly to serve the new generation of satellite user community.

JMA's latest-generation Himawari-8 geostationary meteorological satellite began operation in July 2015, with the corresponding Himawari-9 unit entering a state of backup operation in March 2017. The Advanced Geostationary Imager (AMI) successfully launched on board the Geostationary Ocean Color Multi-Purpose Satellite (GEO-OCSMPAT-TSA) on December 4, 2018. The first, GOES-R, was launched Nov. 19, 2016. Now, in geostationary orbit, NOAA has re-named it to GOES-16. The second, GOES-S, was launched March 1, 2018. GOES-16 went operational on Dec. 18, 2017 followed by GOES-17 on Feb. 12, 2019.

**PROTEUS BASELINE LEVEL 2 PRODUCTS**

1. Dust and Fog
2. Day Micro-Physics
3. Night Micro-Physics
4. Snow and Ice
5. Precipitation
6. Volcanic Ash
7. Snow and Ice
8. Snow and Ice
9. Cloud Phase Detection
10. True Color with non-linear adjustment (for AHI only)

**COLOR KEY:**
- Cloud type
- Cloud top temperature
- Cloud top height
- Cloud optical thickness
- Cloud single scattering albedo
- Cloud effective radius
- Cloud optical thickness
- Day Micro-Physics
- Night Micro-Physics
- Snow and Ice
- Snow and Ice
- Cloud Phase Detection
- True Color with non-linear adjustment (for AHI only)

**ECC PROVIDED GOES-R/S, HIMAWARI, EUMETCAST & GEONETCAST-AMERICAS GROUND SYSTEMS**

**RGB PRODUCT SAMPLES**

**LEVEL 2 CLOUD PRODUCT SAMPLES**

**ADVANTAGE of ABI, AHI and AMI**

- Flexible
- High-resolution
- High temporal resolution
- High spectral resolution
- High coverage
- High accuracy
- High stability

**BACKGROUND and INTRODUCTION**

**ADVANTAGE OF ABI, AHI AND AMI**

- Spatial
- Temporal
- Spectral
- Flexible

**DATA DISSEMINATION**

**VISUALIZATION**

**GOES FEED and RECEIVER SPECIFICATIONS**

**DESIGNING HIGH PERFORMANCE DIRECT BROADCAST GROUND SYSTEM**

The Enterprise Electronics Corporation TeleSpace CAPELLA-GII ground station is a high performance, turnkey system that receives and processes data from the GOES-R/S Series of Meteorological Satellites. Likewise TeleSpace eTeleCast system is a versatile high performance, turnkey system that can be used to receive data from the HimawariCast, Geostationary, and EumetCast downlinks. The pedestal is a rugged, precision design that manufactured to meet the challenges of L, C, or Ku band reception in all areas around the globe. The pedestal is designed for full orbit arc coverage and are readily adaptable to ground or rooftop installations, and comes equipped with a motorized antenna controller that is rack mounted.

Acquisition Workstation (AWS) for satellite reception. The AWS interfaces with the DVB-S2 based EEC100-R receiver, to receive data from the GOES-R/S series of satellites. The RF signal from the satellite antenna system is sent to the AWS via the provided RF cables. The AWS processes the data into Level 1 and 2 products. The DFS receives Level 1b data from the AWS via TCP/IP. Products are then sent to the Visualization Workstations and any other authorized computers connected to the network.

**EC TELESPACE SATELLITE PRODUCT LINE**

**LEVEL 2 PRODUCTS**

**GOES-R/S Ground System**

**Training**

**HimawariCast System**

**PROTEUS BASELINE LEVEL 2 PRODUCTS**

1. Cloud pressure
2. Cloud height
3. Cloud top temperature
4. Cloud liquid water
5. Cloud amount
6. Sea surface temperature
7. Land surface temperature
8. Fire points
9. Flood
10. Vegetation
11. Continent Area
12. Dust and Fog
13. Rain Rate Estimation
14. Laminar Air
15. Clear Sky Radiance
16. RSD Products

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