

September  
2016

## Events 2016/17

### 13 - 16 September 2016

ESA International Workshop  
on Tracking, Telemetry and  
Command Systems for Space  
Applications, ESTEC, Noordwijk,  
The Netherlands.  
<http://www.esaconferencebureau.com/2016-events/16a05>

### 26 - 30 September 2016

EUMETSAT Meteorological  
Satellite Conference  
Darmstadt, Germany  
<http://www.eumetsat.int>

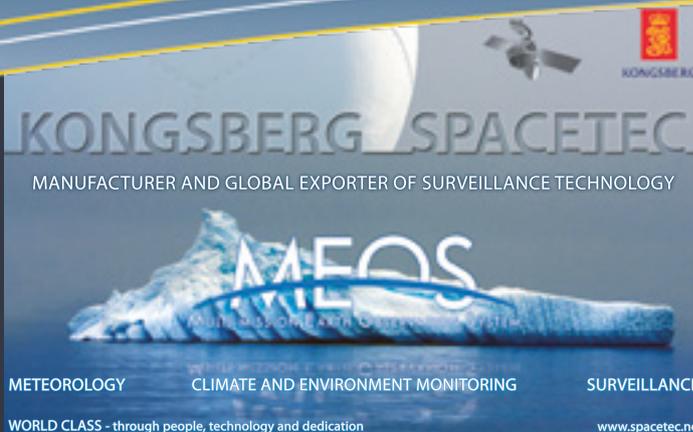
### 27 - 29 September 2016

Meteorological Technology  
World Expo 2016  
Madrid, Spain  
Booth 1035  
<http://www.meteorologicaltechnology-worldexpo.com/>

### 22-26 January 2017

97<sup>th</sup> AMS Annual Meeting  
Seattle, USA  
Booth 723  
<http://annual.ametsoc.org/2017/>

For meeting and appointments  
during the events, e-mail us on  
[marketing@spacotec.no](mailto:marketing@spacotec.no)



## this issue

- 5 m antenna dual polarisation P.1
- Truly Autonomous receiver P.2
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## 5 m antenna dual polarization L/X (both channels) under FAT for customer

The Kongsberg Spacotec MEOS™ 5 m L/X antenna is under delivery and test for a customer. It has dual polarization reception of L- and X- band with simultaneous dual band reception. The intermediate frequency and control interfaces are optical. The antenna is feasible for reception of payload data from meteorological and remote sensing satellites.

The MEOS™ Antenna comes with dish sizes up to 5.0 m. This gives sufficient margin for data reception from direct readout and remote sensing satellites. Designed for optimal maintainability and reliability, the MEOS™ antenna utilizes the most modern industrial components available. 30 years of satellite ground system experience is built into the design.

When integrated with a MEOS™ receiver and processing system, the total unit is a high performance data reception and processing terminal.



MEOS™ Antenna 5.0 m

**New  
product  
release!**

## World' first: The Truly Autonomous Receiver

KSPT has taken a long step in offering cost effective, highly autonomous ground station operations with the new capability introduced in the MEOS™ Capture HRD FEP V4.6: The fully autonomous data receiver.

## MEOS™ HRDFEP V 5- release 2017

The MEOS™ Capture HRDFEP receives IF and ECL or LVDS baseband, and outputs raw and processed data to disk, network and baseband.

It supports conventional satellite downlink standards as well as DVB-S2 and CCSDS SCCC.

Key features:

- Real-time acquisition, processing and distribution
- Fast lock-in times: 0.01 – 0.1 sec. typically
- Data rates from 200 kbps to 2,7 Gbps per channel
- Up to 4 Front-End Processors
- Receiver implementation loss typically less than 0,5 dB
- Receiver adaptive equalizer compensates bandwidth mismatch, group delay, ISI, spectrum tilt and multipath
- Real time and offline status and plots available in GUI and remotely
- WEB and PDF quality reports
- CFDP (CCSDS File Delivery Protocol), Class 1 and 2.
- CCSDS AOS Instrument Source Packets reconstruction
- Real-time buffered distribution, automatic recovery
- SUSE Enterprise Linux, redundant power and SAS RAID disks
- Automatic operation and scheduling
- High rate Space Link Extension (SLE) support
- GUI is displayable on computers in LAN/WAN

## World's First: The Truly Autonomous Receiver

Kongsberg Spacetec (KSPT) has taken a long step in offering cost effective, highly autonomous ground station operations with the new capability introduced in the MEOS™ Capture HRDFEP V4.6: The fully autonomous data receiver.

Traditional data receivers are controlled by explicit commanding, i.e. configuration, starting and stopping for each satellite pass. This requires a control system to configure and control the receiver according to the satellites' schedules. The technical complexity, reliability risk and costs associated with this operational scenario can be significant.

To address these challenges, KSPT has developed the Data Driven IF (DD IF) capability in the newest version of the MEOS™ Capture HRDFEP. The receiver has a detector and signal analyzer that will identify an incoming signal and automatically start receiving, processing and distributing data as soon as a supported satellite is identified. The complete process is fully autonomous: The HRDFEP operates fully on its own, without any commanding from the ground station control system, and without requesting attention from an operator.

The benefits of this solution increase by the operational complexity of a ground station: With multiple supported satellites the traditional operational scenario can become a challenge.

MEOS™ Capture HRDFEP V4.6 contributes to reduce operational costs and increasing availability at ground station level.

MEOS™ Capture HRDFEP V4.6 offers two operational modes: The new autonomous mode, as well as the traditional mode, where it is controlled from an external control system or by a schedule. The user can change operational mode at any time.

KSPT has recently performed a successful demonstration of the new capability to representatives for NASA. Four operational satellites were used as data sources during the demonstration. Data was successfully captured and stored in the system for all missions during a period of four days. Following this period the HRDFEP was left unattended for a period of several weeks. At the end of this period it was inspected again and found to have been operating nominally during the entire period.

Conclusively, the new MEOS™ Capture HRDFEP V4.6 is a significant step towards cost effective ground station autonomy.

For more detailed information about this new product and its benefits for your application, please contact KSPT: [marketing@spacetec.no](mailto:marketing@spacetec.no)



## New MEOS™ Control

Kongsberg Spacetec is developing a new MEOS™ Control for a customer.

The upgraded system will be able to control multiple antennas and resolve conflicts in case of overlapping satellite overpasses based on the priority lists. An upgraded GUI will also be available and will show overpasses from all antennas on a single schedule using colour coding. The automatic scheduling functionality will be upgraded to handle multiple antennas. To support different antenna configurations and site operator preferences, each antenna will require its own auto schedule configuration, containing a list of supported satellites and mutual priority.

## NRT SAR processing contract

The Norwegian Space Center has awarded Kongsberg Spacetec a contract to demonstrate their lightning-fast SAR processor MEOS™ NRT-SAR.

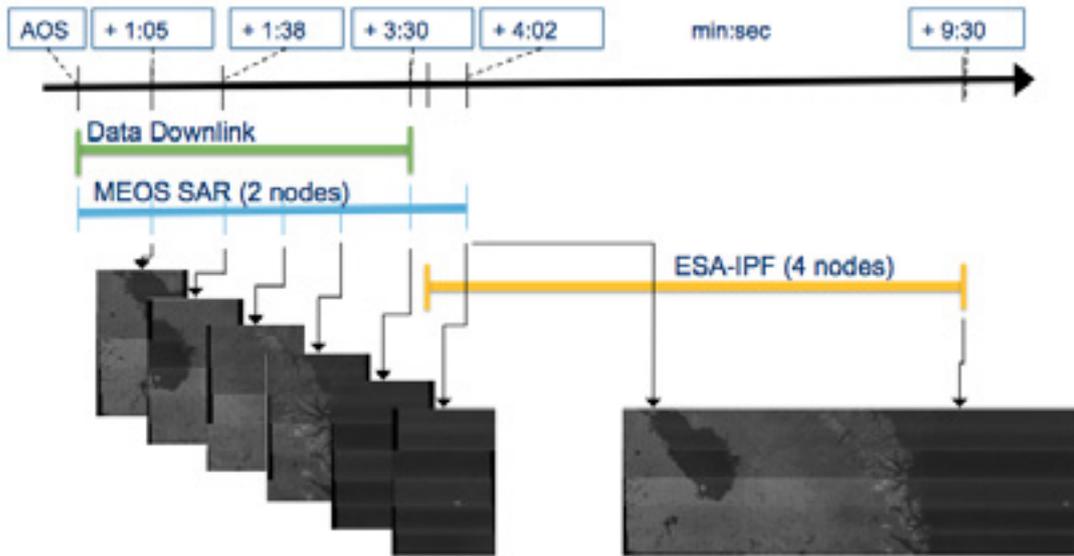
Where traditional processors generate standardized products from pre-processed level-0 data, the MEOS™ NRT-SAR processes directly on the raw data stream as it is received from the satellite saving several minutes in processing time. In addition, this processor can be tuned to generate optimized products for each specific end user or downstream application.

Under this new contract, Kongsberg Spacetec will put MEOS™ NRT-SAR into semi-operational use in parallel with the national Collaborative Ground Segment.

The Norwegian Space Center will use the system to assess the benefits of faster processing, shorter delivery times and custom processing parameters for the national services and key users.

At present the system is installed and going through the final verification stage. It is already acquiring and processing data in parallel with the Norwegian Collaborative Ground Segment, and the results are promising. Image quality is very good, while some work still remains for getting all the meta data according to standards.

When adjusting for different hardware configurations on the two systems, the MEOS™ NRT-SAR systems prove to be up to four times faster than the official Sentinel-1 Instrument Processing Facility.



### Upgrade of EARS stations

KSPT has been awarded a contract with EUMETSAT to upgrade the EARS station operated by HNMS in Kavouri (Greece) and the EARS station operated by DMI in Kangerlussuaq (Greenland) with MEOS™ Polar 4.x systems fully capable of acquiring L/X-band data up to 100 Mbps from a wide set of meteorology satellites, including EPS -SG.

The first upgrade was installed in Kavouri operated by Hellenic Meteorological Institute (HNMS), June 2016. The second installation is planned in September 2016, in Kangerlussuaq, Greenland, the EARS station operated by Danish Meteorological Institute (DMI).



HNMS station Kavouri, Greece



DMI station Kangerlussuaq

## MEOS™ Polar V4

MEOS™ Polar v4 is now released as a true 64-bit only system. It runs on a HP ML350 Gen9 with SUSE Linux Enterprise Server 12.1 This means that it performs both acquisition and full processing of NPP, TERRA/AQUA, METOP, NOAA and FY3 on the same host.

The v4 of MEOS™ Polar is also fully prepared for JPSS and EPS-SG acquisition and processing. Testing shows that NPP level 1 data is available in less than 5 minutes after the pass is finished and all level 2 geophysical products from VIIRS, CrIS and ATMS are available within 25 minutes after the pass.



## New contracts

The Norwegian Space Center has awarded Kongsberg Spacotec AS a contract to demonstrate their lightning-fast SAR processor MEOS<sup>M</sup> NRT-SAR. FEB 2016

Siemens, Austria, signed a contract with KSPT to deliver two HRDFEP with 8 bit parallel LVDS input/output for Sentinel-6/Jason. APRIL 2016

KSPT is currently executing a contract with the Norwegian Space Center to develop a tool that provides auto correction of images from Sentinel 1. JUNE 2016

Kongsberg Spacotec has signed a new contract with the Finnish Meteorological Institute (FMI) for an upgrade of their existing MEOS<sup>TM</sup> Control. The upgraded system will be able to control two antennas and resolve conflicts in case of overlapping satellite overpasses based on the priority lists. AUG 2016

Kongsberg Spacotec has been awarded a contract with KSAT to deliver one HRTG and five HRDFEPS, delivery in November 2016. AUG 2016

*MEOS<sup>TM</sup> is a registered trademark of Kongsberg Spacotec AS, in Norway and other countries.*

## Test of 3.2 m antenna for Sentinel

During summer 2016 we have been testing a 3.2 m antenna for Copernicus Sentinel, you can read more about the test in the February 2017 edition.



## Customer Training

Kongsberg Spacotec signed a contract with the Chinese company Beijing Zhongdian Tianxiang communication technology Ltd, November 2015, to provide our MEOS<sup>TM</sup> Polar system for NPP, Terra and Aqua.

In January 2016 they visited our company in Tromsø, for a four days training sessions. In addition to the training, we also had the possibility to introduce our Chinese customers to the wonderful surroundings of Northern Norway and Tromsø. Among other things, we were hunting the northern lights, Aurora Borealis. North of the Arctic Circle, the sun does not rise above the horizon during the middle of winter (from around mid-November to mid-January). This time of the year provides many hours of favorable, dark conditions for Northern Lights observation.

We were also able to see humpback whales feeding, when we boarded a local whale safari ship just outside the island of Tromsø. The humpback whale is 12–16 m long and weighs about 36,000 kilos. An impressive day for both our customers and sales team.



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