

# Advanced Meteorological Systems and Solutions



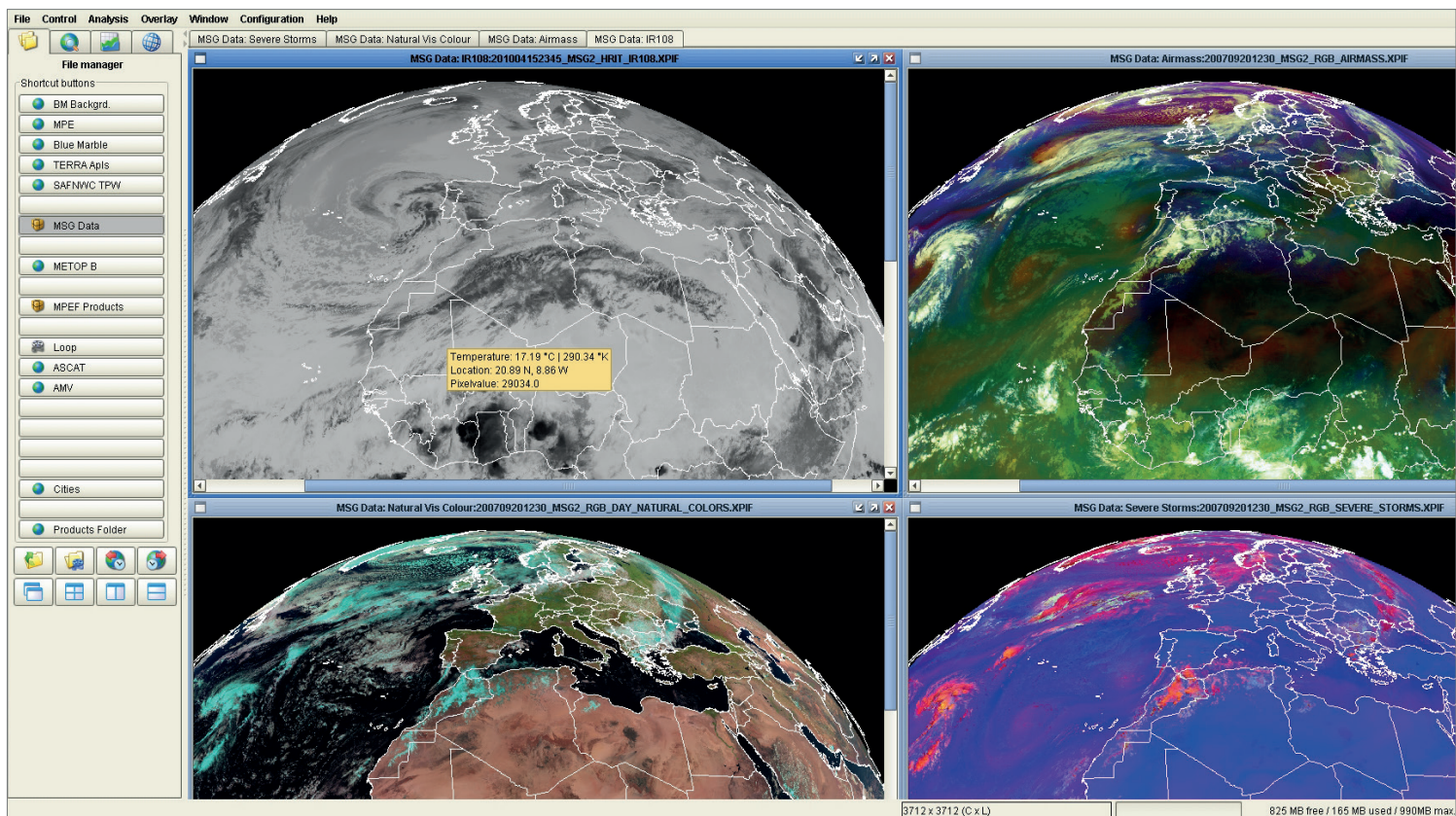
**2met!**® is a multi-mission concept for real-time data acquisition, processing, visualisation and distribution of Earth observation satellite data. It is a commercial off-the-shelf solution, based on standard hardware and software.

**2met!**® supports a variety of remote sensing satellites such as METEOSAT, MSG, GMS, GOES, MTSAT, NOAA, Feng-Yun, METOP, TERRA and AQUA as well as NPP and future JPSS missions.

Being well-known as system integrator, we are capable of taking the full responsibility for turnkey deliveries of standard satellite receiving systems as well as of large satellite ground station solutions. In addition, we have been rather successful in upgrading existing systems and subsystems based on the **2met!**® software and hardware concept.

## 2met!®

**2met!**® is a multi-mission concept for real-time data acquisition, processing, visualisation and distribution of Earth observation satellite data.



For more than 30 years, our company is acting successfully in the business of Earth Observation and meteorological user stations as one of the leading suppliers. Based on our experience in developing professional Earth Observation systems, we offer a complete product line under the trademark **2met!**®. These products range from satellite receiving components to value-adding applications within the Earth Observation markets.

**2met!**® supports a variety of remote sensing satellites such as METEOSAT, MSG, GMS, GOES, MTSAT, NOAA, Feng-Yun, METOP, TERRA and AQUA as well as NPP and future JPSS missions.

User-specific solutions are offered for the reception and processing of meteorological satellite images disseminated via GEONETCast (EUMETCast/FENGYUNCast and HimawariCast).

The **2met!**® portfolio includes satellite receiving hardware components as well as value-adding SW applications within the Earth Observation area.

- **2met!**® Hardware Products
- **2met!**® Software Products
- **2met!**® Services and Maintenance

# Advanced Meteorological Systems and Solutions

## 2met!® Hardware Products

### 2met!® TRACKING ANTENNA EI/Az

- Automatic satellite acquisition and tracking
- Support of S- and L-band missions like NOAA, METOP, Feng-Yun and OrbView
- Program Track with various data formats (TLE, TBUS)
- Remote control / diagnosis (SLA agreements)

### 2met!® TRACKING ANTENNA X/Y

- Automatic satellite acquisition and tracking
- Support of S-, L- and X-band missions like NOAA, METOP, Feng-Yun, OrbView, TERRA, AQUA, SUOMI NPP and JPSS
- Program Track with various data formats (TLE, TBUS)
- Auto-track capabilities with a **2met!®** DSR III receiver
- Remote control / diagnosis (SLA agreements)



### 2met!® DSR III (Digital Satellite Receiver)

The implementation of the **2met!®** DSR III allows for reception of several Earth Observation Satellites.

It supports data rates from ~0.5Mbps up to ~80Mbps depending on various modulation / coding formats: 45Mbps with Viterbi R=1/2, 67.5Mbps with Viterbi R=3/4, 78Mbps with Reed Solomon RS(255,233) only.

The receiver supports advanced monitoring capabilities and comprehensive user programmability using various utility programs.

Main features:

- standard IF input is 1-1.5GHz
- others can be supplied as well (e.g. a fixed 720MHz IF)
- Modulation BPSK / QPSK / OQPSK / 8PSK
- Software frame synchronisation to various standards, e.g. CCSDS or special formats
- Viterbi decoding for R=1/2 K=7 operation (ESA/NASA standard) in BPSK like “serial” mode (e.g. TERRA), or QPSK like “parallel” mode (e.g. MSG HRIT)
- Provision of monitoring information

### 2met!® DSR II (Digital Satellite Receiver)

The implementation of the **2met!®** DSR II allows for reception of several meteorological satellites. It supports data rates from 75kbps (MTSAT/LRIT) up to 3.5Mbps (A-HRPT) of METOP satellites. The extremely low losses of 0.4dB for the LRIT/HRIT missions at the operating point ( $E_b/N_0 = 2.8\text{dB}$ ) are realised by a mostly digital design.

Main features:

- 2nd conversion of the IF signal including anti-aliasing filtering,
- coherent BPSK/QPSK/PM demodulation,
- symbol / bit synchronisation,
- baseband-pulse shaping,
- Viterbi decoding (if applicable)
- data buffering
- provision of monitoring information





## 2met!® Software Products

Data reception for various satellite missions:

- METEOSAT HRI, MSG XRIT, GOES LRIT, MTSAT XRIT
- NOAA HRPT, FY CHRPT, METOP AHRPT
- TERRA/AQUA MODIS, NPP, JPSS, ....

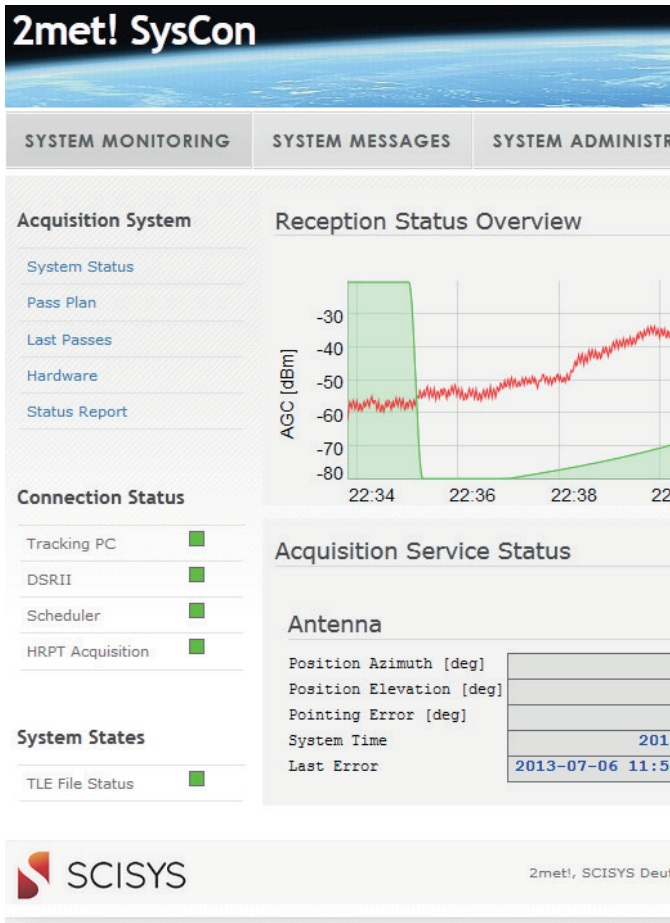
Data Dispatch Software for redundant and stand-alone systems

Data Processing Software for all relevant image operations:

- concatenation
- calibration
- projection/mapping
- combination of spectral channels (Fog - Detection, NDVI, RGB, etc.)
- file conversion to XPIF, PIF, TIF, HDF, GRIB (> 50 data formats)

Display Software for Meteorologists and Forecasters:

- zoom and pan
- false colorization
- animation
- supports broad range of products distributed via EU-METCast Service



## 2met!® GEO Receiving Stations

### 2met!® HRIT/LRIT Receiving Stations

- Supported CCSDS Missions: MSG LRIT, MTSAT HRIT and LRIT, GOES LRIT
- Customers: EUMETSAT, NOAA, JMA, Weather Services, Military Services, Universities
- SCISYS Technology: Digital Satellite Receiver II, Acquisition SW (CCSDS)

### 2met!® DRGS DCP Receiving Stations

- Direct Receive for GOES, EUMETSAT and INSAT DCP Missions (150 to 1200 Baud )
- Customers: SUTRON, OTT, EUMETSAT, IMD, NOAA
- SCISYS Technology: SW Demodulator for Low Rate Systeme

### 2met!® GEONETCast User Stations:

- EUMETCast, HimawariCast and FENGYUNCast,
- completely based on Commercial-Off-The-Shelf (COTS) products
- Platform-independent (Linux and Windows versions available)

## 2met!® LEO Receiving Stations

### 2met!® L-Band Receiving Station

- Supported CCSDS Missions: NOAA HRPT, Metop A-HRPT, FY C-HRPT, SeaWiFS
- Customers: EUMETSAT, National Weather Services, Military Weather Services, Universities, Research Institutions
- SCISYS Technology: Digital Satellite Receiver DSR II (up to 3.5 Mbps), Controller, Acquisition SW (CCSDS)

### 2met!® X-Band Receiving Station

- Direct Receive for TERRA, AQUA MODIS and NPP and JPSS Missions
- Customers: EUMETSAT, National Weather Services, Military Weather Services, Universities, Research Institutions
- SCISYS Technology: Digital Satellite Receiver DSR III (up to 60 Mbps), Controller, Acquisition SW (CCSDS)

### 2met!® X-/L-Band Receiving Station

- Combined System for the (simultaneous) reception of X- and L-Band based Missions
- 2.4m to 3.6m Antennas
- optional Radome

# Advanced Meteorological Systems and Solutions

## SCISYS Services and Maintenance

SCISYS has a long history of developing and maintaining real-time, user-critical systems. SCISYS builds and maintains robust, reliable systems to support vital operations 24 hours a day, 7 days a week. SCISYS contributes consultancy and system studies, subsystem engineering and prime contractor services for satellite ground segment facilities and user stations.

- System integration expertise - dealing with turn-key integration services, satellite ground stations, control centers and complex LAN/WAN networks
- Consultancy – system and feasibility studies as well as technical concepts for end-to-end communication solutions
- Engineering Support – requirements specification, systems engineering, advanced engineering analyses, system installation and integration, testing (AIV support)
- Training – Operator, System Administrator and User Training (in-house training facilities)
- Maintenance – Service Levels according to customer needs (reaction time, ad-hoc, remote access, etc.)

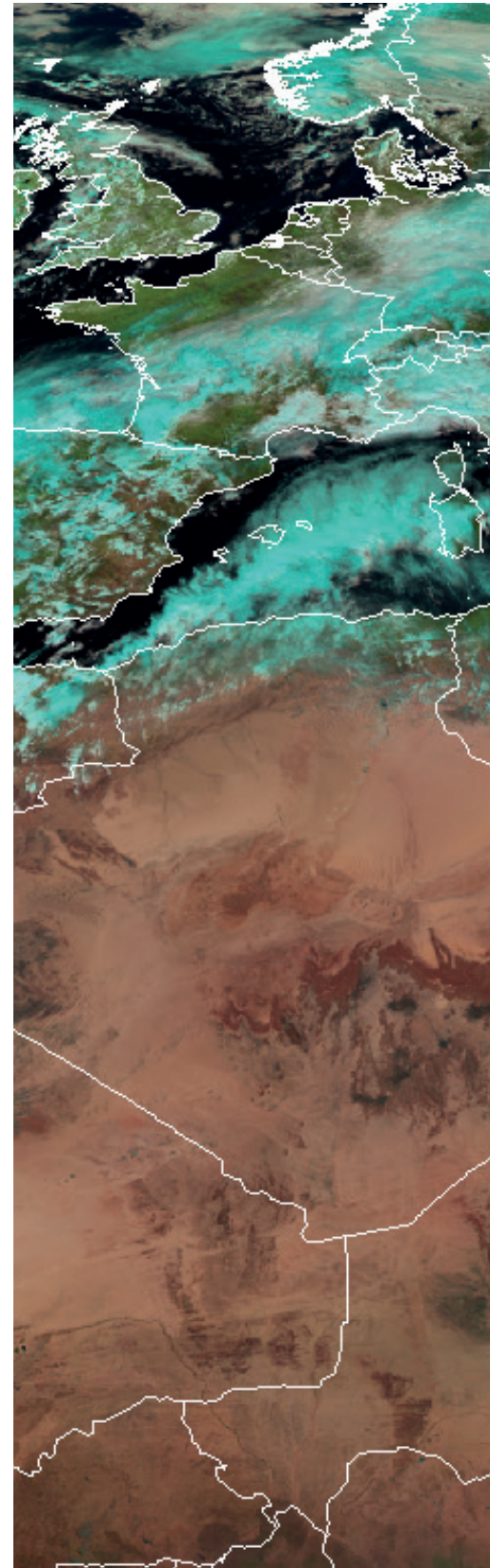
## The Next Generation of 2met!® Software and Systems

After more than 15 years of successful operations with **2met!**® Software Suite for acquisition, processing and visualization of weather and climate images from geostationary and polar-orbiting satellites, SCISYS uses this experience to upgrade the **2met!**® software and system components to support users world-wide in processing data from present and future satellite missions.

The Next Generation of **2met!**® software enables users to work even more efficiently with existing missions (like SUOMI NPP), but also to be prepared for higher data rates with EUMETCast DVB-S2, JPSS-1 and MTG.

## Highlights of 2met!® Next Generation

- Platform-independent software components allow deployments on LINUX, UNIX and WINDOWS hosts
- Enhancing the acquisition capabilities to support future direct-broadcast missions like JPSS and EPS SG
- Turning **2met!**® Processing into a powerful data image processing engine with better integration of image processors, support for distributed processing and enhanced monitoring and control capabilities
- Better integration of existing processing tools like IMAPP, IPOPP, CSPP and RT-STPS



## Contact us

If you are interested in 2met products or services, please contact:

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or send an E-Mail to:

**[2met@scisys.de](mailto:2met@scisys.de)**