MicroStep-MIS

Accessories

catalog

- Accessories for aviation systems
- Calibration accessories
- Communication devices
- Meteorological masts and other mechanical components
- Other accessories

Accessories for aviation systems

MD-24

Desktop FSK Modem

MD-24 is an industrial modem with V.22 bis standard for data transfer over long distances (up to 15 km in leased-line connection). The internal modem software supports the full AT command set. The modem supports software upload via modem line for remote upgrades.

Full AT command set

Software upload via phone line

Built-in over-voltage protection

Rack-mountable

Technical specifications

Mechanical

Dimensions	109 x 168 x 35 mm
Weight	386 g

Environmental

Operating temperature range	-40 to +70 °C
Storage temperature range	-40 to +85 °C
Operating humidity range	0 to 100 %

Performance

Supported ITU-T communication protocols	V.22bis, V.22, V21, BELL 212A, BELL 103
Supported speeds	300 bps, 600 bps, 1200 bps, 2400 bps
Control indicators	• Auto Answer mode (AA) • Read Data (RD) • Send Data (SD) • Carrier Detect (CD) • Off Hook (OH) • Terminal Ready (TR) • Modem Ready (MR) • High Speed mode (HS)
Power supply	8 to 20 V DC/300 mA, 3 W

Modem Rack

Standard 19” rackmount 3U unit is designed to house up to twelve (12) MD-24R rack modems. MD-24R is a rack version of MD-24 industrial modem with V.22 bis standard for data transfer over long distances (up to 15 km in leased-line connection). The internal modem software supports the full AT command set. The modem supports software upload via modem line for remote upgrades.

Full AT command set

Software upload via phone line

Built-in over-voltage protection

Rack mountable

Technical specifications

Mechanical

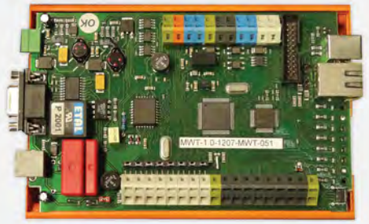
Dimensions	482 x 132 x 367 mm standard 3U 19” rackmount unit
Weight	5800 g

Environmental

Operating temperature range	0 to +50 °C
Operating humidity range	0 to 90 % non-condensing

MD-24R modem characteristics

Supported ITU-T communication protocols	• V.22bis • V.22 • V21 • BELL 212A • BELL 103
Supported speeds	• 300 bps • 600 bps • 1200 bps • 2400 bps
Control indicators	• Auto Answer mode (AA) • Read Data (RD) • Send Data (SD) • Carrier Detect (CD) • Off Hook (OH) • Terminal Ready (TR) • Modem Ready (MR) • High Speed mode (HS)
Removable modules	• MD-24R FSK Rack • Modem MD-PWR Power Module



Transmission of data to remote sensors

Digital inputs

High accuracy

Easy maintenance

MWT-1

Wind Transmitter

MWT-1 Wind Transmitter is a high-end product designed for data acquisition from wind speed and wind direction sensors, calculations, processing, and sending them to remote places.

The instrument is designed for maximum performance and simplicity for the user. Built-in features offer long-term reliable operation. The device is intended to be used primarily at airports, where wind sensors are usually located at long distances from the central data collection system. The Wind Transmitter is adjustable to all these conditions.

It is a single board instrument. The board can be used as a Wind Transmitter or as a Modem. On the board, there are all components including connectors for analog and digital inputs, serial communication ports, and power supply. Assembly includes several jumpers, which are used for appropriate setup. Measuring instrument is supplied in housing for industry-standard DIN35 rail mounting.

Technical specifications

General

Analog inputs	8 channels single ended
Resolution	10 bits
Input voltage range	0 to 2.5 V, 0 to 5 V
Accuracy	0.2 %
Input impedance	80 kΩ min.
Input protection	12 V, 600 W, 10 ns
Digital input	8 channels (one input reserved for wind speed sensors)
Input logic	TTL, CMOS
Input protection	12 V, 600 W, 10 ns
Serial communication	RS-232, RS-485, FSK modem, USB, Ethernet
RS-232 baud rate	300 and 9600 bps
RS-232 setting	8-bit, parity None, 1 start bit, 1 stop bit
RS-485 communication speed	300 and 9600 bps
Modem supported protocols	V.22 bis / V.22 / V.21
Modem output	–10 dBm
Modem sensitivity	–43 dBm
Modem configuration	dial up, leased line
Modem commands	full AT command set
Modem isolation voltage	3.8 kV
Power supply	8 to 21 V AC, 8 to 30 V DC
Power consumption	1 W

Environmental

Operating temperature range	–40 to +80 °C
Storage temperature range	–40 to +85 °C
Operating humidity range	0 to 100 %

SOU

Switch Over Unit

Standard 19” rackmount 3U unit is designed to monitor and control RS-232 and/or analog voice lines connected to two independent computers [main and backup]. In case of the failure of a system, SOU evaluates the failure, status, and switches all external lines to the second computer automatically.

Features

Manual automatic switching of serial lines and/or analog lines, up to 8 independent switching modules.

User - selectable mode of switching:

- switching controlled by DTR signal
- switching controlled by RTS signal
- switching controlled by digital I/O

Technical specifications

Removable modules

SOU-PWR	• hot-swappable power supply module • mounting of two SOU-PWR modules in parallel eliminates a single point of failure • input 120 to 230 V AC, • load 18 V DC, 15 W
SOU-RS-232	• serial line switch module • 2 x RS-232 (dual computer connection) + 1 x RS-232 (external device) • 2 x digital I/O (direct switching, status monitoring)
SOU-Voice	• 2 x analog input (line in C1, C2) • 1 x analog output (-30 dBm to 6 dBm / 600 Ω) • 2 x digital I/O (direct switching, status monitoring) • automatic operation (controlled by digital I/O) or manual mode • 1 x independent analog monitoring output
SOU-PSTN	PSTN line switch module
SOU-ISDN	ISDN line switch module
SOU-PTT	push-to-talk signal module (ground / k kW)

Mechanical

Dimensions	482 x 132 x 367 mm, standard 3U 19” rackmount unit
Weight	5800 g

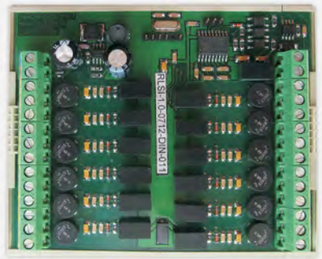
Environmental

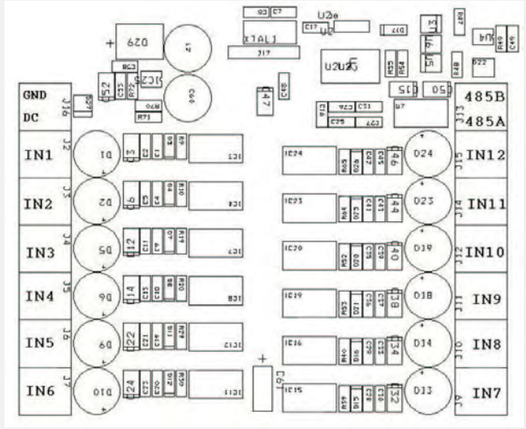
Operating temperature range	0 to + 50 °C
Operating humidity range	0 to 90 % non-condensing

RLSI

Runway Lights Setting Interface

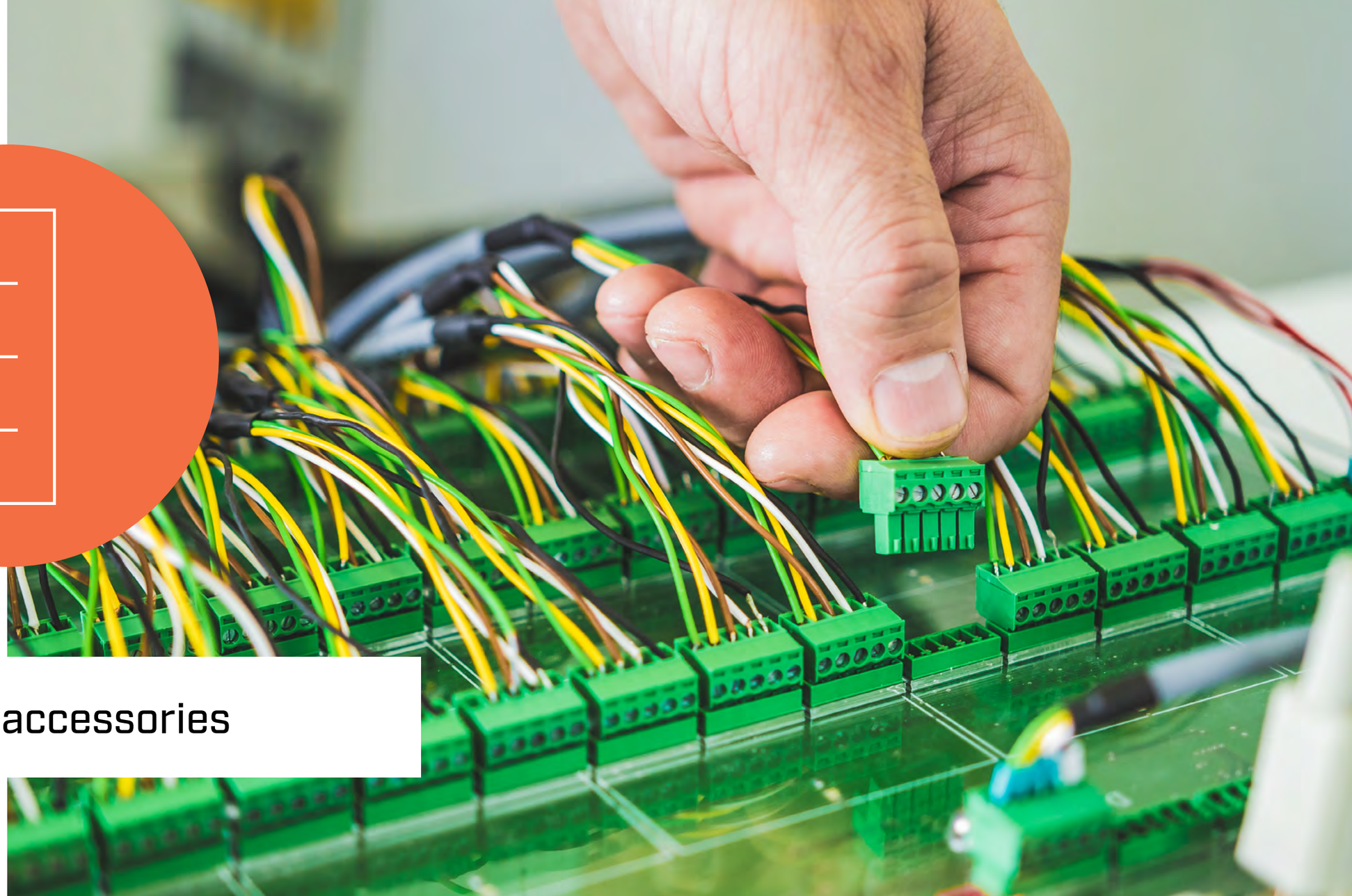
RLSI is an electronic device designed to interface with airport runway light systems and to provide the RVR system with the current intensities of runway central and/or edge lights to be used for the computation of the RVR value based on the runway lights using Allard's law. The RLSI provides 12 inputs, which can be interpreted by software (for example 2 runways / 6 intensity levels).





Technical specifications

12 digital inputs IN1 to IN12	• 0 to 2 V AC/DC logical 0 • 5 to 500 V AC/DC logical 1
Communication	RS-485 (9600 baud, 8 data bits, 1 stop bit, parity none)
Power supply	12 V DC, 3 W
Dimensions	95 x 115 x 45 mm
Weight	216 g
Operating temperature range	-20 to +55 °C
Storage temperature range	-40 to +85 °C
Operating humidity range	0 to 100 % non-condensing



Calibration accessories

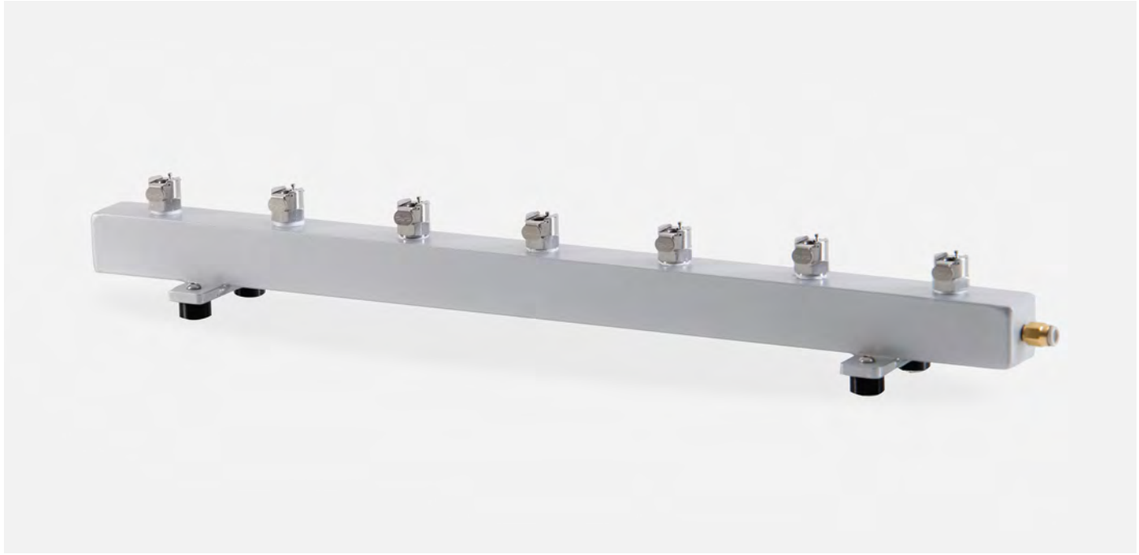
Calibrator Extension Card

The Calibrator Extension card developed and manufactured by MicroStep-MIS is intended for the direct connection of sensors to the calibrator. This handy device, designed to replace complicated large, and expensive loggers, allows the user to communicate with any sensor easily using our calibrator.

6 standard sensors, communicating over UART, SDI-12, or analog, can be connected to the Calibrator Extension Card. Using the RS-485 or RS-232 to the UART converter, almost all commercially sold devices can be connected to the card. The device supplies sensors up to 12 V.

The card does not require any power supply and is connected to the calibrator by an SPI line, which ensures the data flow and power supply of the connected sensors and the card itself. Entering commands and reading responses is done via a calibrator (Pressurewell or Humiwell). With such a connection, no additional equipment is required and the tool is suitable for field use. Channel activity is indicated by LEDs.

Once switched on, the card is ready for operation and no further settings are required. The card can power sensors up to 12 V.



Manifold

The manifold has been designed to connect multiple barometers into one pressure calibration system. It ensures proper and gas-tight connection within the defined ranges of pressure and temperature.

Secure and air-tight

Easy connection of any number of barometers

Automatic shut-off

Durable design

It is possible to use automatic shut-off pressure connector types, making it easy to connect any number of sensors to the system, whilst the unused ports remain shut.

Dimensions, number of pressure ports, spacing between the ports, type of pressure port connector, and other properties can be designed according to individual requirements.

Technical specifications

Length	49 cm
Port spacing	7 cm
Number of ports	7
Material	aluminum alloy
Pressure connector type	5 mm barbed fitting, optional: auto shut-off
Absolute pressure range	0 to 1500 hPa
Temperature range	-40 to +80 °C

Matrix

Relay Channel Switch

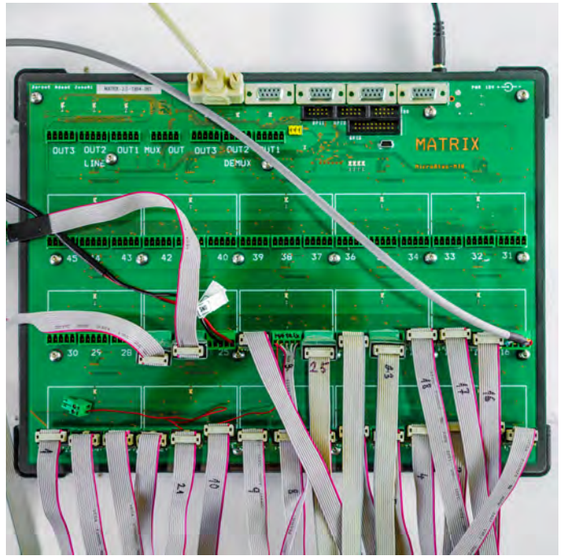
Matrix is an array of signal relays capable of switching 45 four-wire channels or 15 twelve-wire channels. It is designed to calibrate multiple electronic sensors such as RTD thermometers, electronic barometers, hygrometers, anemometers etc.

Analog and digital signal switching

Virtually no leakage current

Multiplexer and demultiplexer

Up to 45 four-wire channels



Thanks to signal relays the signal passing through Matrix is undisturbed, unmodified and it is suitable for both - analog and digital lines such as UART, SDI-12, RS-232, RS-485 etc.

Matrix is controlled by simple commands transmitted via RS-232 interface. It works well with MicroStep-MIS CalibLab software for calibration and adjustment automation. Removable connectors, which can adopt pigtail wires up to 1.5 mm^2 (16 AWG) can be easily used for each channel.

Life cycle of relays reliably last up to 100 million cycles. Contact resistance is bellow 200 mOhm throughout the whole life.

Technical specifications

General

Number of channels	45 (four-wire), 15 (twelve-wire)
Control	RS-232 commands
Baud rate	9600 baud, 8 data bits, no parity, 1 stop bit

Mechanical

Dimensions	320 x 250 x 50 mm
RS-232 connector	DB9 female
Power supply connector	IEC 60130-10 DC coaxial type A: 5.5 mm OD, 2.1 mm ID
Terminal blocks	5 x 1.5 mm^2 (16 AWG)

Electrical

Maximal switched voltage	20 V
Maximal switched current	20 mA
Contact resistance	less than 200 mOhm
Life (number of cycles)	more than 100 million
Power supply voltage	12 V nominal
Power supply current	max 1.1 A

RGcal

Electronic Tipping Bucket Counter

Developed and manufactured by MicroStep-MIS, the device is designed to directly connect tipping bucket precipitation sensors to a computer via USB. RGcal is an electronic impulse counter, that counts the tips of a tipping bucket rain gauge and measures the time between the overturning of a bucket.

The device can be powered from 5 to 35 V DC. Energy consumption during measurement is approximately 0.5 mA and during the power-down mode, it reaches approximately 9 µA.

The converter also provides a 12 V power supply for RGC from a USB port. After connecting the sensor to the computer, use the standard terminal program. Set the serial line parameters.

Technical specifications

Serial interface parameters

Baud rate	9600 Bd
Data bits	8
Parity	None
Stop bits	1

Communication devices

AWS Connect

Communication and reliable data transfer is important requirement for the modern meteorological station. The AWS Connect is an advanced GSM modem with dual SIM capability - all in one box easy to integrate into the meteorological station with its DIN rain mounting bracket.

The primary modem can be a GPRS modem, a 3G modem and can be used with two SIM cards. The Dual SIM modem architecture provides exceptional reliability for areas with unstable signals.

Configurations

- GPRS modem, dual SIM
- 3G modem, dual SIM
- 4G modem, dual SIM

3G modem

- Advanced E-GPRS / WCDMA / HSDPA / HSUPA Software protocol stack (Layer 1 to 3) – Version: 3GPP Release 7
- GSM Quad band (900 / 1800 MHz for EUx, 850 / 1900 MHz for NAx)
- WCDMA dual-band: B1 & B8 for the EUx models and B2 & B5 for the NAx models
- HSDPA up 7.2 Mbps
- HSUPA up to 5.76 Mbps
- WCDMA up to 384 kbps downlink/uplink
- DTM (Dual Transfer Mode)
- CPC (DRX/DTX) (Continuous Packet Connectivity)
- DARP
- SIM application Tool Kits 3GPP TS 51.014
- Output power:
  - Class 4 (2 W) @ 850 / 900 MHz, GSM
  - Class 1 (1 W) @ 1800 / 1900 MHz, GSM
  - Class E2 (0.5 W) @ 850 / 900 MHz, EDGE
  - Class E2 (0.4 W) @ 1800 / 1900 MHz, EDGE
  - Class 3 (0.25 W) @ 850 / 900 / 1900 / 2100 MHz, WCDMA
- HSPA: category 8 in downlink, category 6 in uplink
  - DL up to 7.2 Mbps
  - UL up to 5.76 Mbps
- WCDMA: up to 384 kbps downlink/uplink

GPRS modem

- Quad-band GSM 850 / 900 / 1800 / 1900 MHz
- GSM /GPRS protocol stack 3GPP Release 4 compliant
- Output power:
  - Class 4 (2 W) @ 900 MHz
  - Class 1 (1 W) @ 1800 MHz
- SIM Application Toolkit 3GPP TS 51.014
- SIM Access Profile
- TCP / IP stack access via AT commands
- Sensitivity:
  - ≤ -108 dBm (typ.) @ 850 / 900 MHz

Technical specifications

Power supply	5 - 30 V DC
Interfaces	RS-232, USB

LE70

Radiomodem

The LE70 operates in the 868 MHz ISM license-free frequency bands with Tx power up to 27 dBm. It is ideally suited for replacing communication over cables such as RS-485 links (Profibus, Modbus) and half-duplex RS-232 links (transparent mode), with wireless technology for use in one or two-way data links for up to 10 km in range.

Product Features

- Range up to 10,000 m
- Configurable output power

Networking

- Frequency: 863 - 870 MHz (EU: 500 mW, from 869.4 to 869.65 MHz)
- Modulation: GFSK
- Number of channels: 11
- ACK
- Addressed Mode
- Repeater Mode - bridge function (line propagation on the long distances)
- Listen Before Talk
- Telemetry
- Cyclic wake up
- Remote CTS/RTS control
- Hayes Mode
- Download Over-the-Air
- AES encryption

Technical specifications

Data

Serial data rate	up to 115.2 Kbps
Radio data rate	from 4.8 to 57.6 kbps

Environmental

Temperature	-40 to +85 °C

Interfaces

Serial interface	RS-232 (Tx, Rx, Cts, RTS)

Electrical specifications & sensitivity

Output power	15 to 27 dBm
Power supply	8 V - 30 V DC
Maximum consumption at 500 mW	Rx: 25 mA Tx: 335 mA
Sensitivity (PER ‹ 0,8)	-117 dBm

Multipass

Multipass developed and manufactured by MicroStep-MIS is designed for connecting industry buses RS-232, RS-485/RS-422, SDI-12, and USB.

Independent baud rate and communication data frames

Communication buffers

Isolated RS-485/RS-422

SDI-12 communication interface

Multipass can connect 4 standard industry buses - RS-232, RS-485/RS-422, USB 2.0, and SDI-12 1.3. USB 2.0 support implemented in the Multipass allows monitoring of the communication via the standard USB port of a PC. Multipass supports the SDI-12 bus in version 1.3 and acts as a master device. Multipass is based on a microprocessor, which allows buffering of the communication and support of different communication speeds and data frames. The activity of buses is shown by four LEDs. The converter can be powered by the industry power supply or USB. Multipass is housed in DIN 43880 compatible enclosure.

Technical specifications

General

Power supply	5 V - 15 V
Power consumption	15 mA (@12 V)
Communication interfaces	• RS-232 baud rate: 300 to 230.400 bit/s • RS-485 / RS-422 baud rate: 300 to 230.400 bit/s • USB 2.0 • SDI-12 1.3

Mechanical

Housing classification	IP 20
Housing material	polyamide
Type of connection	terminal block, mini USB B
Dimensions (h x w x d)	98 x 17.5 x 57 mm
Weight	48 g

Environmental

Operating temperature range	-40 to +85 °C
Humidity (non-condensing)	0 - 100 %

SID

SDI-12 Interface Dongle

The SID is a handy device enabling the user to talk with any SDI-12 sensor simply using a PC and terminal program. SID is designed for use by AWS network maintainers and calibration laboratories. It has a very easy-to-use functionality.

Powers the sensors from USB, or external power supply

Two connectors for SDI-12 sensors

Virtual USB serial port, RS-232 port

Bus monitor function

Bus voltage analyzer function

SDI-12 data logger

SID acts as an SDI-12 data logger, which transmits commands to a sensor and collects its responses. It is designed to substitute complicated, big, and expensive loggers with a small and simple device. It is ideal for testing sensor responses, setting addresses, etc. After power-up, SID is ready to work. No settings are required. SID can supply the sensors by up to 2 A current at 12 V by connecting an external power supply.

Bus monitor

By simply connecting it to an existing SDI-12 bus, SID will listen to the ongoing communication and retransmit it to both RS-232 and virtual USB buses. This may be helpful when debugging a system with a data logger and sensors connected to it.

Bus voltage analyzer

SID is capable of sampling analog voltage values on the SDI-12 bus. This is an advanced function for debugging SDI-12.

Technical specifications

Interfaces	RS-232, USB (virtual COM port)
RS-232 connector	DB9, female
USB connector	mini USB
Baud rate	9600, 8N1
External power supply (supplied)	12 V DC, 2 A
Supply for SDI-12 sensor	12 V DC, 2 A max.
Dimensions (without connectors)	81 x 50 x 18 mm
Supply for SDI-12 sensor from USB	12 V DC, 100 mA

USB-SDI / SDI-SIM

The USB-SDI / SDI-SIM serves as a converter between the SDI-12 bus and the USB bus. The SDI-12 is a communication standard for interfacing a data recorder with sensors. The USB-SDI / SDI-SIM can be set to act as a data recorder or as a sensor simulator.

Powered by USB

Analyzes SDI-12 communication

SDI-12 bus simulator function

SDI-12 monitor function

The USB-SDI / SDI-SIM in data recorder mode allows sending commands on the SDI-12 bus via a USB. This mode is mainly used to test sensors or to monitor communication on the SDI-12 bus. This mode allows using a standard PC as a data recorder using a serial terminal application or custom software.

In sensor mode, the USB-SDI/SDI-SIM acts as a standard SDI-12 sensor and responds to SDI-12 recorder commands. All responses are programmable and adjustable; therefore, the USB-SDI / SDI-SIM can act as any sensor. In the sensor mode, the USB-SDI / SDI-SIM analyzes the communication via the SDI-12 bus and sends reports via a USB bus to a PC.

Technical specifications

General

Power supply	5 - 16 V
Power consumption	13 mA (@12 V)
Communication interfaces	• USB 2.0 • SDI-12 1.3

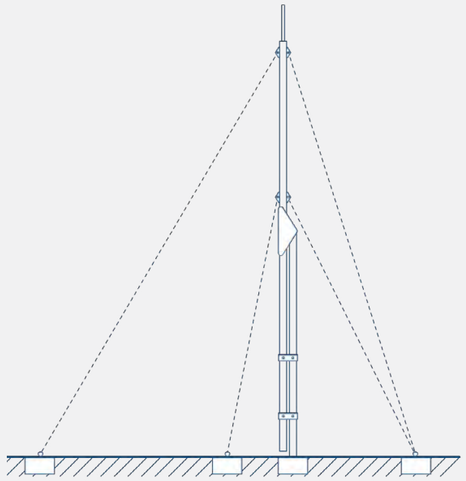
Mechanical

Type of connection	• USB-A plug • pluggable terminal block
Dimensions	54 x 11 x 20.5 mm
Weight	14 g

Environmental

Operating temperature range	-40 to +85 °C
Humidity (non-condensing)	0 - 100 %

Meteorological masts and other mechanical components



Tiltable Alluminium Meteorological Mast (10 metres)

The MM10 meteorological mast is ideal for meteorological systems. It is easy to install and maintain. Once assembled, the entire mast can be easily installed by four people (concrete foundation required). Sensor servicing requires only one person for all necessary manipulations.

Models

- MM10met - Meteorological Mast 10 m (white)
- MM10avi - Meteorological Mast for airports 10 m (red RAL3000 / white RAL9016)

Accesories

- Lightning conductor
- Optional recommended accessories
- Cross arm for wind sensors
- Cross arm for meteorological sensors
- Obstacle light

Technical specifications

Mechanical

Length	10 m
Decomposed staff	0.5 x 0.5 x 3 m
Weight	110 kg
Installation area diameter	12.7 m
Material	aluminum alloy
Color	white, red / white red RAL3000 / white RAL9016
Fixation	6 stainless steel guy ropes in the height 5 m
Load	60 m/s
Paint color category	super durable polyester powder coating (for exteriors)

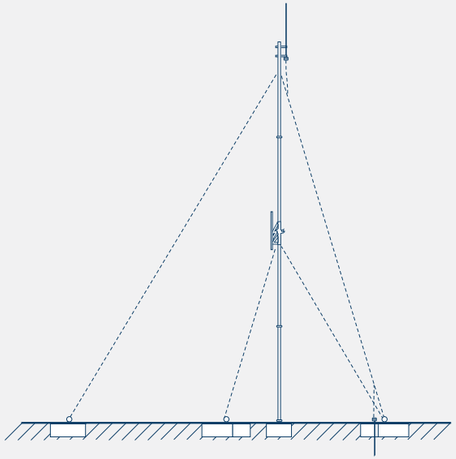
Obstruction lights (optional)

Type	LI-10-230-F
Certification	ICAO Type a Low Intensity Fixed Obstacle Light (Annex 14 Vol.1, Fourth edition - July 2004, Chapter 6)

Different types of obstruction lights can be mounted upon request.

Frangibility

Breakable coupling (optional)	BrCo20kN
Certification	Civil Aviation Authority, Slovak Republic (Type Approval No. LPZ-S-021/2012)
Certification basis	ICAO ANNEX 14 - Volume I, 3rd Edition 1999 FAAAC No.: 150/5345-46A



Tiltable Stainless Steel Meteorological Mast (10 metres)

MicroStep-MIS introduces the new superstrong meteorological masts well designed to withstand extreme weather conditions.

The superstrong MM10-100 is usable in winds up to 100 m/s and provides a stable platform for measuring equipment. Both MM10-75 and MM10-100 are easily installed by three persons. The new innovative design makes usage of the masts the most comfortable and allows quick access to instrumentation for maintenance purposes. The meteorological masts MM10-75 and MM10-100 are made of stainless steel and are highly resistant to corrosion.

Models

- Standard version MM10-75
- Superstrong version MM10-100

Accessories

- Lightning protection

Optional Recommended Accessories

- Cross arm for wind sensors
- Cross arm for meteorological sensors
- Obstacle light

Technical specifications

Mechanical

Length	9.95 m
Decomposed staff	0.57 x 0.3 x 2.65 m
Weight	• 115 kg (MM10-75) • 135 kg (MM10-100)
Installation area diameter	12 m
Material	stainless steel
Color	white, red/white, red RAL3000/white RAL9016
Fixation	6 stainless steel guy ropes in the height 5 m and 9 m
Load (Terrain category 0 - Exposed open terrain)	• 75 m/s (270 km/h) • 100 m/s (360 km/h)
Paint color category	super durable polyester powder coating (for exteriors)

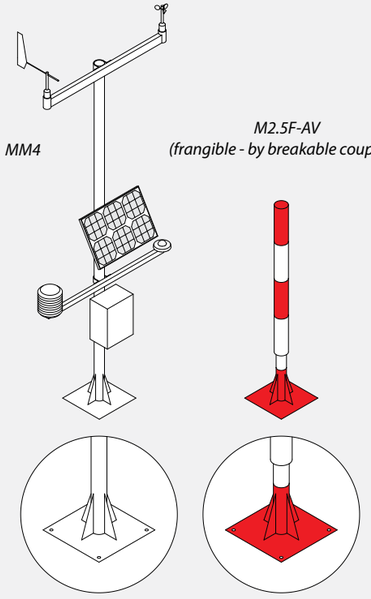
Obstruction lights (optional)

Type	LI-10-230-F
Certification	ICAO Type A Low Intensity Fixed Obstacle Light (Annex 14 Vol.1, Fourth edition - July 2004, Chapter 6)

Different types of obstruction lights can be mounted upon request.

Non-tiltable Aluminum Meteorological Mast

Easy to install and maintain, the meteorological masts MM2, MM4, MM6 and mast for RVR equipment MM2.5F-AV are ideal for weather systems where a 10 m mast is not required. The product is designed to serve for years without the necessary maintenance and it offers comfortable usage. Once installed, it is easy to supply it with meteorological sensors, data logger and all necessary accessories (solar panel, antenna, etc.).



Identification

- MM2 Meteorological Mast
- MM2.5F-AV Mast for RVR (Runway Visual Range) equiment
- MM4 Meteorological Mast
- MM5 Meteorological Mast
- MM6 Meteorological Mast
- other mast lengths could be delivered on special request

Models

- MMmet - Meteorological Mast (white)
- MMavi - Meteorological Mast for Airports (red RAL3000 / white RAL9016)

Accessories

- Lightning conductor
- Cross arm for wind sensors (optional)
- Cross arm for meteorological sensors (optional)
- Obstacle light (MM6, (optional)

Technical specifications

Mechanical

Height	2 m / 2.5 m / 4 m / 5 m / 6 m and other options per request
Material	aluminum alloy
Color	white, red / white red RAL3000 / white RAL9016
Paint color category	super durable polyester powder coating (for exteriors)
Fixation	4 mounting screws
Reinforcement (optional)	tripod legs, guy wires

Frangibility

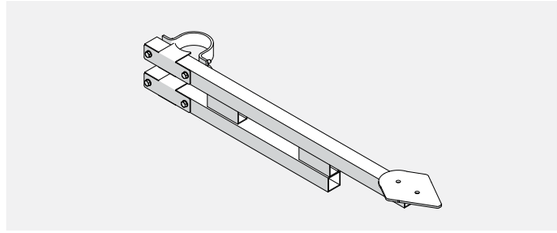
Breakable coupling (optional)	BrCo20kN
Certification	Civil Aviation Authority, Slovak Republic (Type Approval No. LPZ-S-021/2012)
Certification basis	ICAO ANNEX 14 - Volume I, 3rd Edition 1999; FAAAC No.: 150/5345-46A

Cross Arms

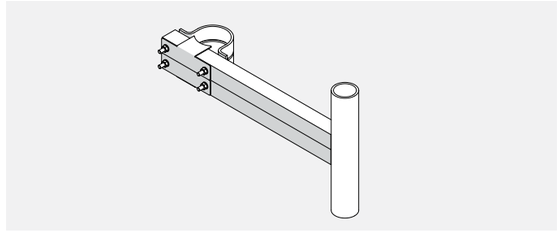
MicroStep-MIS cross arms are designed to mount various sensors. They are made of aluminum and fit a mast with a diameter of 50, 60, or 80 mm. Custom designs are available upon request.

Categories and their specifications

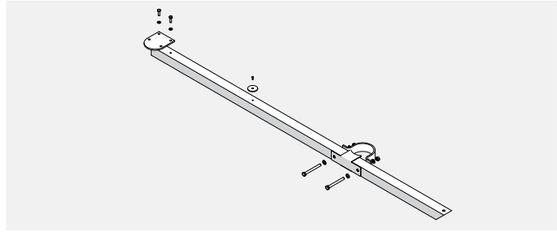
Name	Order code	Supported sensors	Length
Cross arm for precipitation sensors	MMCRG.	Tipping bucket rain gauges	947 mm
Cross arm for visibility sensors	MMCV.	Visibility and present weather sensors	566 mm
Cross arm for meteorological sensors (standard)	MMCM.STD.	Temperature and relative humidity probes in radiation shield, pyranometers	1500 mm
Cross arm for meteorological sensors (half length)	MMCM.HALF.	Temperature and relative humidity probes in radiation shield	750 mm
Cross arm for meteorological sensors (long)	MMCM.LONG.	Temperature and relative humidity probes in radiation shield, pyranometers, sunshine duration sensors, net radiometers	1700 mm
Cross arm for ultrasonic wind sensors	MMCW.GILLWO. (Gill Wind Observer) MMCW.GILLWS. (Gill Windsonic) MMCW.US2D. (Thies Ultrasonic 2D)	Ultrasonic wind speed and direction sensors	742 mm
Cross arm for mechanical wind sensors	MMCW.CLASSIC	Mechanical wind wave and cup anemometers	1034 mm



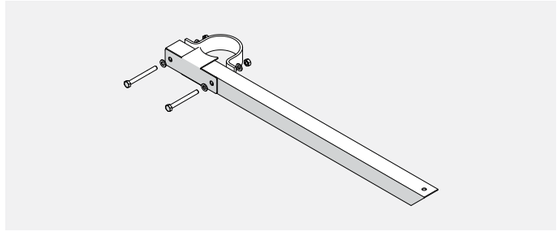
Cross arm for precipitation sensors



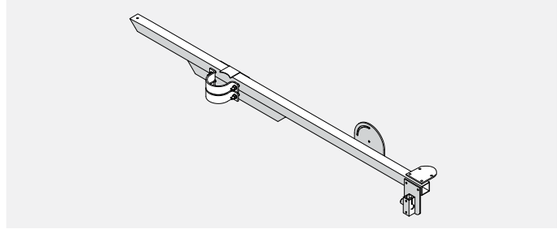
Cross arm for visibility sensors



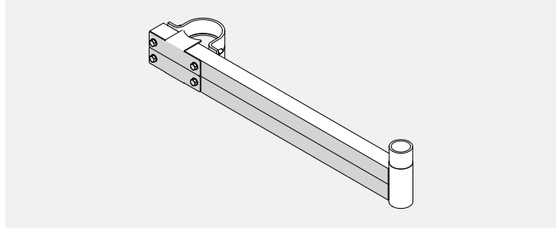
Cross arm for meteorological sensors (standard)



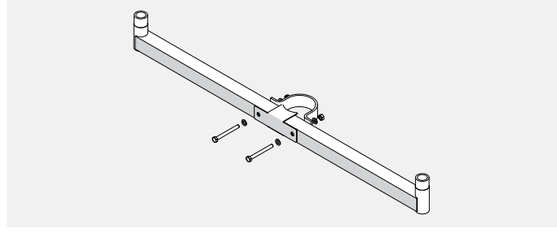
Cross arm for meteorological sensors (half length)



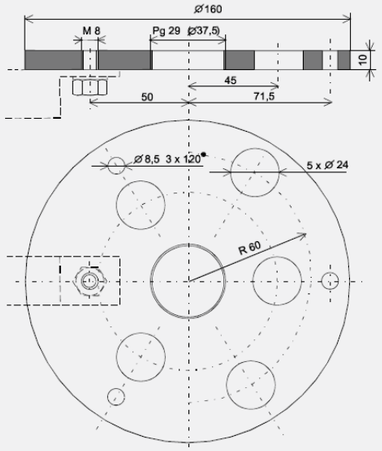
Cross arm for meteorological sensors (long)



Cross arm for ultrasonic wind sensors



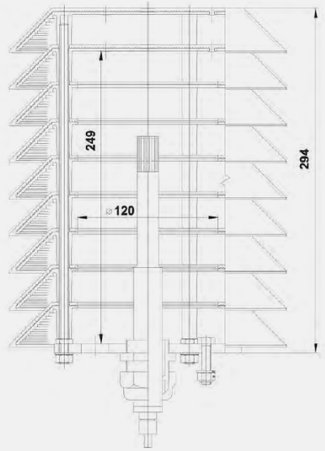
Cross arm for mechanical wind sensors



The fastening and the ventilating holes placement on the shield base

MetCover Radiation Shield

Radiation shield serves as shading for temperature or relative air humidity sensing units against solar radiation and rain.



Placement of sensor (relative humidity, air temperature) inside the shield

The shield is composed of nine gradually overlapping circular diaphragms, which create louvers around the sensing unit. This enables the free flow of air between the diaphragms. The body of diaphragms and the base is made from plastic, connecting material is made from stainless material or aluminum alloys.

To ensure better screening of luminous or thermal energy, the inside surface of diaphragms is painted in matt black color and it is not smooth, but it is indented as well.

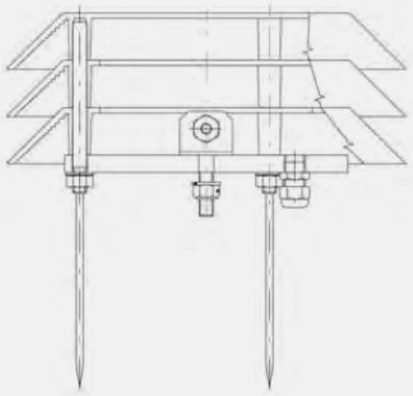
The shield design enables - with help of a bolt - its quick installation on the mast arm, and with help of the cable bushing with the thread Pg 29 - an easy fastening on the sensing unit inside the shield.

Technical specifications

Outer height without bushing	294 mm
Outer diameter	238 mm
Inner height	249 mm
Inner diameter	120 mm
Weight	2470 g
Radiation error	1 °C at WS > 1 m/s

Met Cover 3 Ground Shield

MetCover 3 Ground Shield is a smaller version of the MetCover 3 Radiation Shield designed for shielding ground temperature sensor.



Needles in the bottom part serve for fixation of the shield in terrain

The shield is composed of three gradually overlapping circular diaphragms, which create louvers for the sensing unit. This enables the free flow of air and other disturbing elements between the diaphragms.

The body of diaphragms and the base is made from plastic, connecting material is made from stainless material or aluminum alloys.

Portable Meteorological Mast

3 m Telescopic Aluminum Mast

Easy to deploy, the telescopic version of the meteorological mast is a suitable solution for mobile and temporarily installed meteorological stations.

Easily deployable

Made of aluminum alloy

Suitable for mobile stations

Travel bag included

The telescopic mast is supplemented by a customized sensor holder on the top or equipped with a cross arm. The MFS-12 Field Standard with the Data Logger AMS 111 IV can be fixed in the middle part of the mast.

The central part of the mast consists of two stages and it can be deployed up to the height of 3 m. The mast is self-standing on its 3 legs. To achieve better stability in windy conditions, it is possible to use ground screws to fix the legs to the soil.

Technical specifications

Mechanical

Material	aluminum alloy
Color	white RAL9016
Paint color category	super durable polyester powder coating (for exteriors)
Fixation	self-standing on 3 legs (possibility to use ground screws for higher stability)
Weight (mast)	11.6 kg
Weight (grounding screws)	0.8 kg
Weight (packed in a bag with grounding screws)	13.4 kg

Dimensions of the deployed mast

Height	from 190 cm up to 300 cm (when fully extended)
Footprint	from 130 cm to 180 cm (when fully extended)

Dimensions of the folded mast

Length x width x height	125 x 18 x 18 cm
Folded mast in the travel bag (length x width x height)	130 x 22 x 22 cm

Optional recommended accessories

- Cross arm for wind sensors
- Cross arm for meteorological sensors

Related products

- MFS-12 Meteorological Field Standard

Light Portable Meteorological Mast

2 m Folding Aluminum Mast

Easy to deploy, the portable version of the meteorological mast is a suitable solution for mobile and temporarily installed meteorological stations.

Easily deployable

Made of aluminum alloy

Suitable for mobile stations

Travel bag included

The mast is supplemented by a customized sensor holder on the top or equipped with a cross arm(s). The MFS-12 meteorological field standard with Data Logger AMS 111 IV can be fixed in the middle part of the mast. The mast is self-standing on its 3 legs.

Technical specifications

Mechanical

Material	aluminum alloy
Color	white RAL9016
Paint color category	super durable polyester powder coating (for exteriors)
Fixation	self-standing on 3 legs
Weight (mast)	4.5 kg
Weight (packed in a bag with grounding screws)	9 kg

Dimensions of the deployed mast

Height	200 cm (when fully extended)
Footprint	from 130 to 180 cm (when fully extended)

Dimensions of the folded mast

Length x width x height	125 x 18 x 18 cm
Folded mast in the travel bag (length x width x height)	130 x 22 x 22 cm

Other accessories

Electronic Compass

The E-Compass is a device primary intended for use as an electronic compass. It combines a precision 3-axis solid-state magnetometer and linear accelerometer to provide accurate heading and tilt measurement over a wide range of environmental conditions with magnetic declination compensation.

In addition, the device functions as an impact and anti-theft detection sensor. The IP 66 provides sufficient protection against intensely splashing water and enables mounting to the sea buoys or external environment without any additional enclosure.

Multipurpose sensor

Wide operating range

Multiple interfaces

In-system configuration

Wide data output

Technical specifications

General

Temperature range	operating from -40 to 85 °C storage from -50 to 85 °C
Humidity	0 – 100 %
Housing	plastic case
Heat dissipation	passive
Type of connection	6 - wires cable
Dimensions (length x width x height)	93.88 x 93.88 x 56.74 mm
Weight	approximately 180 g

E-compass mode

Magnetic measurement range	±8 Gauss
Magnetic sensitivity	0.29 milliGauss
Sampling frequency	20 Hz
Single measurement time	952 ms
Continual measurement time	50 ms

Impact detection mode

Linear acceleration measurement range	±8 Gal
Linear acceleration sensitivity	0.244 milliGal
Sampling frequency	119 Hz
Single measurement time	818 ms
Continual measurement time	270 ms

Anti-theft detection mode

Linear acceleration measurement range	±8 Gal
Linear acceleration sensitivity	0.244 milliGal
Sampling frequency	50 Hz
Single measurement time	1 s
Continual measurement time	514 ms

RAW mode

Magnetic measurement range	±8 Gauss
Magnetic sensitivity	0.29 milliGauss
Magnetic sampling frequency	20 Hz
Linear acceleration measurement range	±8 Gal
Linear acceleration sensitivity	0.244 milliGal
Linear acceleration sampling frequency	119 Hz
Continual measurement time	50 ms

Operating values

Power supply	+12 to +30 V DC
Current consumption operating	max. 8.6 mA
Current consumption sample	max. 6.4 mA
Current consumption in sleep mode (RS-232 OFF)	max. 250 uA
SDI-12 (SDI-12 - GND) tolerant	3.5 V

Multipurpose sensor

- E-compass
- Impact detection (optional)
- Anti-theft detection (optional)
- MEMS raw output
- Simultaneous measurement (e-compass & impact detection, impact and anti-theft detection or e-Compass and impact and anti-theft detection, etc.)

Accuracy

- Heading within ±5° or better
- Tilt within 0.3° or better

Wide operating range

- ±180° pitch
- ±90° roll
- ±8G magnetic range
- ±8G acceleration range
- Temperature -40 to 85 °C

Wide data output

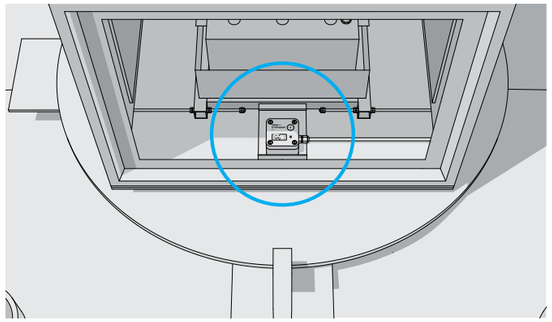
- Heading geographic, heading magnetic, pitch and roll, acceleration vector
- Magnetometer X, Y, Z
- Accelerometer X, Y, Z
- Gyroscope X, Y, Z
- Statistic of detections

In-system configuration

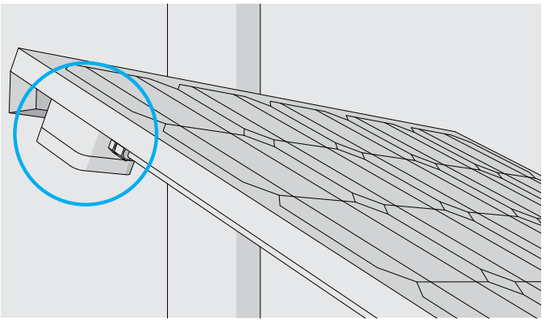
- PC or laptop can be connected while unit operates
- Perform hard and soft iron calibration
- Accelerometer calibration
- Declination setting for true north
- Alarm threshold for impact and anti-theft detections

Multiple interfaces

- SDI-12
- RS-232



Marine Buoy Station: *Firstly, the sensor serves as an electronic compass by determining the direction rotation of the buoy against the north pole for the best wind direction measurement. Secondly, it functions as an impact detection sensor and generates notifications about an eventual crash of a sea ship into the marine buoy.*



Automatic Weather Station: *The sensor is installed on the back side of a solar panel or any other device to protect it from theft.*

GPTR

GNSS Position and Time Reference

Precise timing is a vital requirement of the meteorological measurements. The requirement applies to the weather stations as well as to the data center.

GPS, Glonass

Small dimensions

Ethernet

PPS output

GPTR time reference is designed to provide precise timing to automatic weather stations or computer systems. GPTR reference is produced in two configurations - GPTR232 has a standard RS-232 serial interface and PPS output, GPTRETH provides an output on the standard Ethernet interface and can be attached to the NTP server in the data center. GPTR supports GPS as well as Glonass positioning systems.

Accessories

GPTRBB Breakout box. Breakout box for connecting the GPTRETH to standard RJ45 terminated cable and feed power to the receiver. PoE powering is enabled with this box. GPTRHH GPS holder for mounting GPTR reference on horizontal surfaces. GPTRHV GPS holder for mounting GPTR reference on vertical surfaces.

Technical specifications

GPS parameters

Receiver	GPS, Glonass
Horizontal position accuracy	2.5 m
Timing accuracy	10 ns
Reacquisition time	cold start < 35 s warm start < 30 s hot start < 1 s

Environmental

Operating temperature	-40 °C to +85 °C
Protection	IP 68

GPTR232

Output ports	RS-232 pulse-per-second
Power supply	5 - 20 V DC, 0.2 W

GPTRETH

Output ports	Ethernet
Power supply	5 - 48 V DC, 0.4 W

Several variants

Standardized DIN size

Two level surge protection

Fast response time

OVP

Overvoltage Protection Devices

DIN35 rail-mounted overvoltage protection devices are designed for protection of communication lines and sensor inputs/outputs from surges generated in an industrial noisy environment (switching inductive loads in close areas), from atmospheric discharges (lightning / LEMP) and electrostatic discharges, thus minimizing the probability of damage of communication ports, sensors, and other equipment.

Installation

The OVP is designed for attachment on the DIN35 rail. It is recommended to install them as close as possible to the protected device, or at the entry of external cables into the building.

OVP has the input for high-quality ground connection. The ground connection must be screwed in with mechanical stability. The improper ground connection may result in high impedance to ground and low quality of protection.

Technical specifications

Maximal working voltage (OVPs are delivered in several modifications)

OVP Phone	± 160 V (4 protected lines)
OVP Data	± 12 V (4 protected lines)
OVP Data UNI	12 V (4 protected lines)
OVP Power	30 V (2 protected lines)
OVP 485	± 5 V (4 protected lines)
OVP Power 485	Power: ±30 V (1 protected line) 485: ±12 V (1 protected line)
OVP Power Data	Power: 30 V (1 protected line) Data: ±12 V (1 protected lines)

First level protection (GDT)

Max. impulse discharge current	2.5 kA / 4 kA (10 / 350 µs)

Second level protection (TVS)

Peak pulse power dissipation	600 W (10 / 1000 µs)

Mechanical

Housing classification	IP 20
Housing material	polyamide
Type of connection	terminal block 16 A (max 2.5 mm^2)
Dimensions (length x width x height)	98 x 17.5 x 57 mm
Weight	60 g


roStep - MIS

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