TRANSPORT RISK

STORAGE RISK

OPERATIONAL RISK

MONILOG®

Sensor network

SMART WIRELESS NETWORK SYSTEM

SHOCK INCLINATION VIBRATION TEMPERATURE

HUMIDITY PRESSURE GPS TRACKING LIGHT INCIDENCE

- Radio sensor network compromising up to 8 autonomous sensor modules
- Provide real-time monitoring of sensitive transports for optimum conditions in transport, packaging and storage
- Highly configurable and flexibly adaptable for various applications
- Automatic transmission of GPS geo-position, data measurements, alarm and status signals by e-mail
- Centralized GSM/UMTS transmission unit with integrated GPS receiver for exact position determination
- Individually-adjustable registration and alarm thresholds, scalable number of measuring points
- Ultra-long operating time and high reliability even under extreme environmental conditions
- Cloud-based Web portal for convenient on-line administration and tracking of transportation route
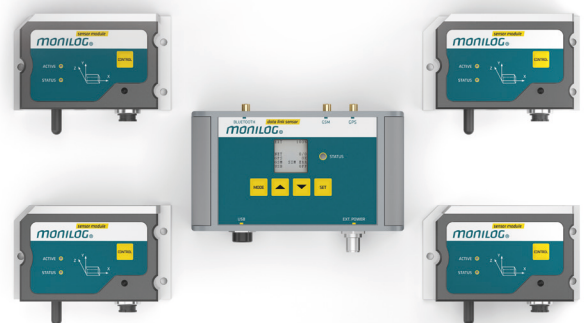
SMART NETWORK SYSTEM FOR TRANSPORT MONITORING

The **MONILOG® Sensor network** consists of the **MONILOG® data link sensor** base station and up to 8 **MONILOG® sensor modules** of radio data loggers. ✚ The compact, energy-efficient and high-sensitivity sensor modules capture data relevant to transport, such as shocks, acceleration, temperature, humidity, air pressure, inclination and light. ✚ All data are collected via a Bluetooth low-energy radio interface in the base station. ✚ It transmits them at adjustable intervals via a mobile network as an e-mail to the desired recipient or directly to the **MONILOG®** web portal. ✚ If a configured limit value for measured data is exceeded, a message is sent to the base station. ✚ It records the current GPS position and immediately sends an alarm mail. ✚ Critical events during a transport can thus be tracked in real time and the user can react to possible risks for his sensitive freight. ✚ If a UMTS connection is not possible, the base station automatically switches to an available GPRS network. ✚ The stored GPS coordinates can be imported and clearly displayed in Google Earth®, Bing or Openstreetmap. ✚ In addition to the event-controlled position determination in the event

of an alarm, route tracking is also possible. ✚ The small radio data loggers can be installed particularly well in places which are difficult to access or move. ✚ Robust housings protect the devices of the sensor network from dust and splash water. ✚ An optimised energy management ensures a long and maintenance-free operating time. ✚ Commercially available alkaline or lithium batteries guarantee running times of more than 2 years under extremely harsh conditions. ✚ The functions of the base station and the individual sensor modules can be intuitively adapted to the respective requirements with a license-free PC software. ✚ All collected data is displayed in the table of measured values and diagrams and can be exported to external programs such as Microsoft Excel. ✚ The analysis of the data helps to reconstruct possible damage cases, analyse and optimize shipping processes. ✚ The **MONILOG® Sensor network** is an indispensable goods companion for international freight transport both on rails and on roads, on water and in the air, on transhipment points and in storage rooms.

UP TO **8** SENSOR MODULES

MONILOG® data link sensor
RADIO BASE STATION

VIEW **360°**

www.monilog.com/products

MONILOG® sensor module

VIEW **360°**

www.monilog.com/products

cicor

MONILOG® DATA LINK SENSOR – RADIO BASE STATION WITH GPS RECEIVER AND GSM/UMTS TRANSMISSION UNIT

Technical data of MONILOG® data link TM

Housing:	Housing material: Aluminium, paint-coated Degree of protection: IP 65 Weight: 1,15 kg (standard implementation including batteries); 3,35 kg (option with external battery box, batteries, magnetic mounting feet) Dimensions (H x W x D): 160 x 90 x 60 mm³ (standard implementation) 230 x 130 x145 mm³ (option with external battery box and magnetic mounting feet) Assembly type: Surface mounting (screwed connection recommended), alternatively magnetic-foot mounting
Operation / Storage conditions:	-20 °C to +70 °C with alkaline batteries -40 °C to +85 °C with lithium batteries
Internal voltage supply:	4 batteries of the type C and R14 (replaceable), alkaline batteries (each 1,5 V), lithium batteries (each 3,6 V) Operating time up to 1 year (with email interval of 24 h) or for 2 years with external battery box
External voltage supply:	5 – 15 V (max. 3 A) or battery box with 4 battery types D (R20)
External interfaces:	USB 2.0 Client (Mini-USB AB) Digital inputs/outputs: 2 switching inlets and 2 switching outputs (M12-plug optional)
Display and operating elements:	Display: Bistable monochrome display (96 x 96 pixels) LED: Status-LED (red/green) Keys: 4 operating keys for menu navigation and user inputs
GPS:	Channels: 22 Antenna: SMA socket for the connection of an external active antenna 50 Ω (3 – 30 mA/3 V/rod or cable antenna)
Mobile communications:	Frequency ranges: Quad Band EGSM/GPRS (850/900/1800/1900 MHz) Triple Band UMTS/HSPA (850/1900/2100 MHz) SIM card: Receptacle for 1,8 or 3 V SIM card Standard SIM, micro SIM (on request)
Bluetooth:	Bluetooth 4.0 Low Energy (master role) Encryption: AES-128 Radio link: Simultaneous 2,4 GHz radio link to up to 8 MONILOG® sensor modules (for data synchronisation and device configuration)
Data storage:	Data receipt for a minimum of 10 years (independent of battery status) Memory type/size: 512 MB flash parameter and data storage
Device approval:	CE, UKCA, IC, FCC, registration with Bluetooth SIG

MONILOG® SENSOR-MODULE – UNIVERSAL RADIO DATA LOGGER TO RECORD ACCELERATION/SHOCK, INCLINATION, TEMPERATURE, HUMIDITY, AIR PRESSURE AND INCIDENCE OF LIGHT

Technical data of MONILOG® sensor module

Housing:	Housing material: PVC + Aluminium Degree of protection: IP65 Weight: 0,385 kg (standard implementation including 1 battery) 0,455 kg (variant 2LR6 including 2 batteries) Dimensions (H x W x D) 120 x 72 x 41 mm³ (standard implementation) 120 x 72 x 54 mm³ (variant 2LR6), Ø 25 mm x 15 mm (small magnetic base) Assembly type: Surface mounting (screwed connection recommended), alternatively magnetic-foot mounting (on request)
Operation/Storage conditions:	-20 °C to +70 °C with alkaline batteries -40 °C to +85 °C with lithium batteries
Internal voltage supply:	1 battery type AA or R6 lithium 3,6 V or 2 batteries type AA or R6 lithium or alkaline (variant 2LR6 or 2LR6AL) or 6 batteries type AA or alkaline R6 as a battery pack (variant 6LR6AL), Operating time dependent on the model and settings e.g. 1*R6 und 2LR6: 1 year (with synchronisation interval 10 min), 6LR6AL: 2 years
External interfaces:	USB 2.0 Client (Mini-USB AB)
Display and operating elements:	LED 1: green activity-LED + 1 red status-LED Keys: 1 operating key
Bluetooth:	Version: Bluetooth 4.0 Low Energy (slave role) Encryption: AES-128 Radio link: 2,4 GHz to MONILOG® data link sensor
Data storage:	Data receipt for a minimum of 10 years, independent of battery status Storage type / size: 32 MB flash parameter and data storage
Device sensors:	
Acceleration / Shock (Shock-sensor modules only):	Measuring range: ±16 g (3-axes) Tolerance: ±0,32 g Data records: 256 curves In case of exceeding a registration threshold of 0,3 g, a shock curve is recorded (2 kHz, 1 s) The 256 highest shock curves are stored, optionally 3 g - 100 g (1 kHz, tolerance: ±2 g)
Temperature:	Measuring range: -40 °C to 85 °C Tolerance: ±0,5 °C Data records: 200,000
Relative humidity:	Measuring range: 0% RH –100% RH Tolerance: ±2% RH Data records: 200,000
Air pressure:	Measuring range: 260 – 1260 mbar (optional 10 – 2000 mbar) Tolerance: ±2 mbar (±4 mbar) Data records: 200.000
Light:	Measuring range: 0 lx – 188000 lx Tolerance: ±10% Data records: 200.000
Inclination:	Inclination calculation from static acceleration In case of exceeding a inclination threshold, a inclination curve (10 Hz, 8 s) is recorded Tolerance: ±3 degree Data records: 320 curves
Conformity:	Device certification according to CE, UKCA, IC, FCC Registration with Bluetooth SIG Shock evaluation according to DIN EN 15433-6 Frequency analysis according to DIN EN 13011 Use according to IEEE C 57.150-2012