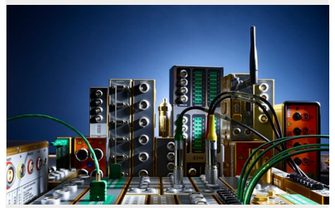
IPETRONIK

Product Highlights

Content

IPETRONIK Product Highlights



Products IPEmeasure

Data Loggers and Modules

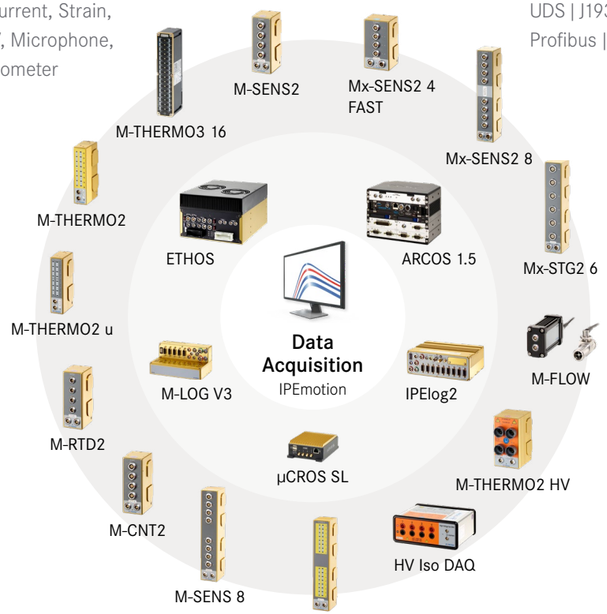
*This image does not correspond to the regular use case

Modular Signal Conditioning up to 400 kHz

- IP 67
- -40 to 125°C (-40 to 257°F)
- Thermal, Voltage, Current, Strain, Frequency, RTD, HV, Microphone, Piezo, IEPE, Accelerometer

Remote Data Logging

- CAN FD, LIN, Automotive Ethernet
- Protocols & Diagnostics: XCP | CCP | UDS | J1939 | OBD | WWH-OBD | ARC429 | Profibus | Serial | Ethernet | Ethercat



High Voltage Equipment

- Highly Isolated Temperature Measurement
- High Potential Voltage Measurement
- Current Measurment on HV

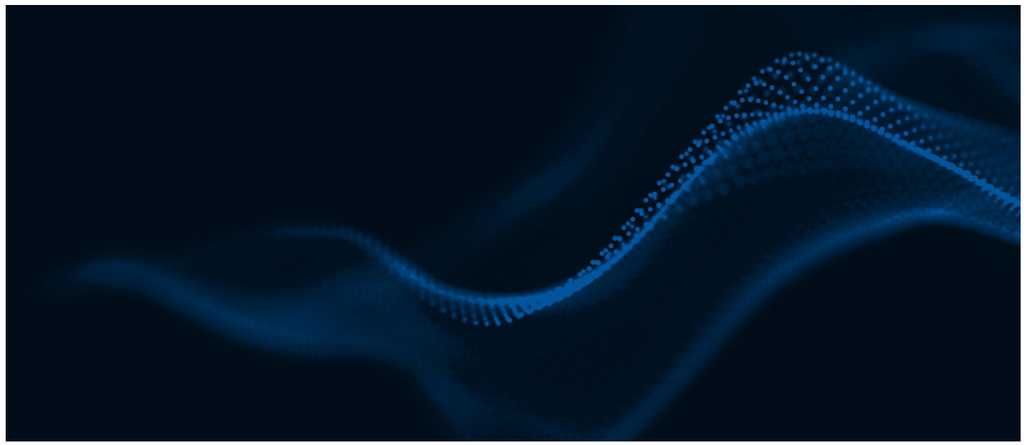
IoT Connected via App

- Global Live Data, Video, GPS
- Android™, iOS®, Browser Support
- Remote Trigger Functions

IPETRONIK

Products IPEmotion

Software and Cloud

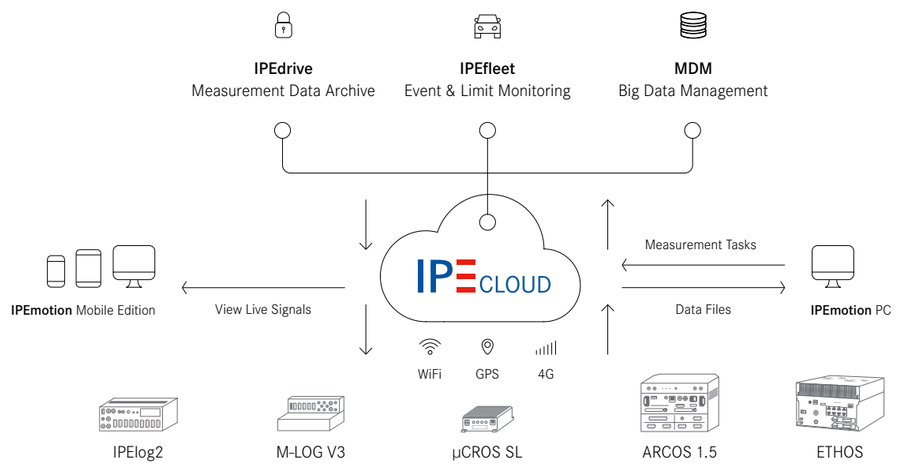


IPEmotion DAQ Software

- Data Recording
- Post Processing & Analysis
- 3rd Party PlugIns
- Acoustics & Thermodynamics
- Test Sequence Control
- Python Scripting
- Automatic Reporting
- Real time Notifications

IPEcloud

- Data Storage
- MATLAB
- Automated Reporting
- Event Tagging
- Unit & Signal Name Standardization
- Data Format Conversion/Export
- Multiple Data Sources



IPEmeasure and IPEmotion

A Comprehensive Hardware and Software Solution

**This image may differ from original product.*

IPEmotion DAQ Software

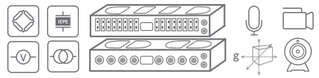
- Live Measurements
- Calculated Channels
- Post Processing & Analysis
- Configuration of IPETRONIK Hardware
- 3rd Party Support

IPEcloud

- Fleet Monitoring
- Automated Reporting
- Live Remote Data Access
- Remote Reconfiguration

Vehicle Bus & ECU Access

- OBDII | SAE J1939 | WWH-OBD
- Seed & Key
- XCP | CCP | KWP
- UDS ISO 14229
- CAN | CAN FD | Automotive Ethernet | FlexRay



Sensors and Accessories

- 3rd Party Support
- Cameras (IP and USB)
- Audio
- Low Speed and High Speed Signal Conditioners

µCROS SL

Compact Data Logger for Fleet Management

- 4 CAN High Speed Interfaces
- Quickstart, No Message Lost (NML), Wake on CAN (WoC)
- Integrated 4G /LTE Modem, WiFi and GPS Receiver
- 1 Digital Output, 2 Digital Inputs
- 2 Analog Inputs 0 ... 40 VDC @ 10 bit/50 Hz Cut-Off Frequency
- Plastic and Aluminum Housing, Gold Anodized
- Configuration with IPEmotion RT.UI Software

M-LOG V3

Modular Data Logger for Fleet Management

- CAN FD, LIN, ETH inputs in combination available
- cFast data storage up to 64 GB
- 4G modem and WiFi interface with COMgate V3
- Microphone input and audio output
- Driver display via IPEmotion ME
- Quickstart, Wake on CAN (WoC)
- Galvanic isolation of CAN FD, LIN, ETH, DIG I/O inputs
- Developed for applications in harsh environments
- Software integration via XCP on ETH / A2L format

IPElog2

Scalable Data Logger for Fleet Management

- Inputs are combinable up to 16 CAN FD, 6 LIN, 2 ETH
- 4 switchable CAN high speed and low speed inputs
- Quickstart, No Message Lost (NML), Wake on CAN/LIN/FlexRay
- cFast data storage up to 120 GB
- Integrated 4G /LTE modem, WiFi and GPS receiver
- Driver display via IPEmotion ME
- Galvanic isolation of CAN FD, LIN, ETH, DIG I/O inputs
- Developed for applications in harsh environments
- Software integration via XCP on ETH / A2L format

IPETRONIK

ARCOS 1.5

Highly Modular Data Logger for Fleet Management

- Full scalability of CAN, LIN, FlexRay, ETH inputs
- 3G modem, WiFi and GPS can be modularly equipped
- HDMI and DVI interface
- Multiple video channels for USB and IP cameras
- Wake on CAN, LIN, FlexRay (WoC, WoL, WoFR)
- Quickstart, No Message Lost (NML), Wake on CAN (WoC)
- Developed for applications in harsh environments
- Configuration via IPEmotion plugIn CAETEC-dataLog & web interface

ETHOS

High Performance Data Logger for Automotive Ethernet Networks

- Developed for validation of large vehicle network architectures
- 28 CAN FD, 8 x 1 GbE, 8 LIN, 2 FlexRay, 8 DIO, 8 analog inputs
- Up to 480 GB internal storage
- 2 slots for removable storage drives (up to 2 TB)
- Data ingest to company network via ingest station
- Multiple video channels for USB and IP cameras
- Wake on CAN, LIN, FlexRay (WoC, WoL, WoFR)
- Configuration with IPEmotion PlugIn CAETEC-dataLog & Web-Interface

IPEmeasure Data Logger Overview

Device	µCROS SL	M-LOG V3	IPElog2
Operating System	Linux (64 bit)	Linux (64 bit)	Linux (64 bit)
Processor	Intel ATOM x5-E3930	Intel ATOM T3805	Intel ATOM E3940
RAM Memory	2 GB	2 GB	4 GB
Data Logger Software	IPEmotion RT	IPEmotion RT	IPEmotion RT
Storage Medium	m2.SATA	cFast	cFast
Storage Capacity	32 GB/256 GB	8/16/32/64 GB	8/16/32/64/120 GB
Software Functions			
Configuration Software	IPEmotion RT.UI	IPEmotion RT.UI	IPEmotion RT.UI
No Message Lost (NML)	■		■
Wake on CAN (WoC)	■	■	■
Wake on LIN (WoL)			■
Wake on FlexRay (WoFR)			
Wake on Real Time (WoRTC)			■
On Board Scripting		■	■
On Board Math & Logic Operations	■	■	■
File Formats for Data Storage	BLF, AVI, WAV, MDF4.0, MDF4.1, ASC, ATFX	ZIPRT, MDF4.1	ZIPRT, MDF4.1
Interfaces			
Ethernet Interface to PC	100 Mbit	100 Mbit	1 GbE
USB 2.0 Ports	2	2	1
USB 3.0 Ports			1
Lemo, 9-Pin for M-CAN Modules		2	1
CAN HS/CAN FD	CAN HS	■	■
CAN LS (Low Speed)		■	■
LIN (1.3 & 2.0)		■	1 … 6
ETH (100 Mbit)		2	1
ETH (1 GbE)			2
ETH (10 GbE)			
SFT+ (10 GbE)			
FlexRay		Via FlexRay Satellite Interface	Via FlexRay Satellite Interface
Digital I/O	2 / 1	4/4	4/4
Audio Input / Output		1	1
Driver Display System		IPEmotion ME	IPEmotion ME

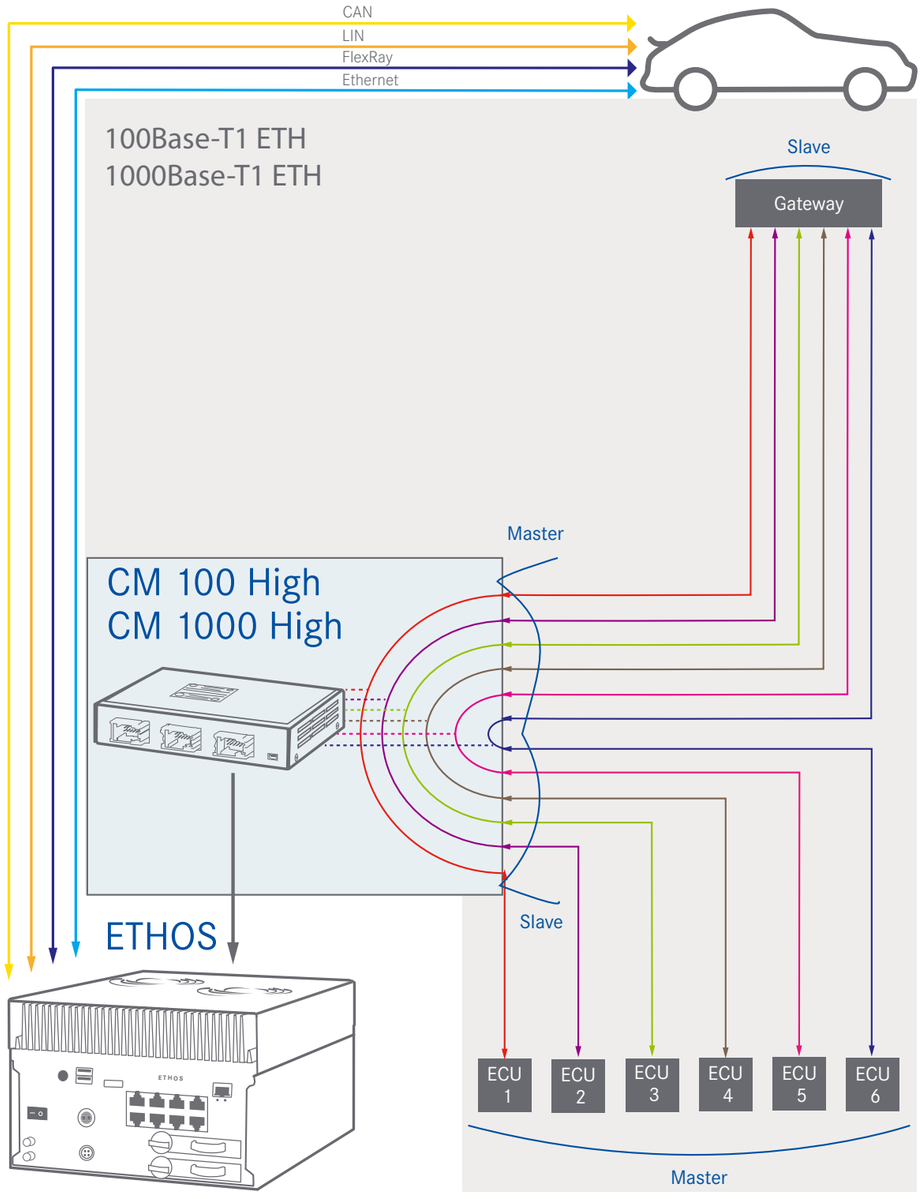
IPETRONIK

Device	ARCOS 1.5	ETHOS
Operating System	Linux (64 bit)	Linux (64 bit)
Processor	Intel i3 (i5 for Windows)	Intel i7-6820EQ
RAM Memory	4 … 16 GB	16 GB
Data Logger Software	dataLog/IPEmotion/ IPEmotion RT	dataLog/IPEmotion/ IPEmotion RT
Storage Medium	cFast + mSATA + 2 x SATA mit DriveBay	m2.SATA
Storage Capacity	8/ 16/ 32/ 64 GB + 4 … 500	32/256/480 + 2 x 960 GB
Software Functions		
Configuration Software	IPEmotion RT.UI	IPEmotion RT.UI
No Message Lost (NML)	■	■
Wake on CAN (WoC)	■	■
Wake on LIN (WoL)	■	■
Wake on FlexRay (WoFR)		
Wake on Real Time (WoRTC)	■	■
On Board Scripting	■	■
On Board Math & Logic Operations	■	■
File Formats for Data Storage	BLF, AVI, WAV, MDF4.0, MDF4.1, ASC, ATFX	BLF, AVI, WAV, MDF4.0, MDF4.1, ASC, ATFX
Interfaces		
Ethernet Interface to PC	1 GbE / 2 x 1 GbE	1 GbE
USB 2.0 Ports	2 … 4	2
USB 3.0 Ports	1 … 2	2 (USB 3.1)
Lemo, 9-Pin for M-CAN Modules	Via PM Module	■
CAN HS/CAN FD	■/ via CAN FD Satellite Interface	■
CAN LS (Low Speed)		
LIN (1.3 & 2.0)	■	8
ETH (100 Mbit)	■	
ETH (1 GbE)	■	2
ETH (10 GbE)		8
SFT+ (10 GbE)		1
FlexRay	■	2
Digital I/O	8/8	8
Audio Input / Output	CAN	CAN
Driver Display System	openABK / HDMI / DVI	

Data Logger in an Automotive Ethernet Network

Usecase: ETHOS connected with Capture Module CM 100 High/CM 1000 High

- Cascading of Several Modules
- Startup Buffer



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Data Logger in an Automotive Ethernet Network

Hardware used for this Usecase

ETHOS

High Performance Data Logger for Automotive Ethernet Networks

- Developed for Validation of Large Vehicle Network Architectures
- 28 CAN FD, 8 x 1 GbE, 8 LIN, 2 FlexRay, 8 DIO, 8 Analog Inputs
- Up to 480 GB Internal Storage
- 2 Slots for Removable Storage Drives (up to 2 TB)
- Data Ingest to Company Network via Ingest Station
- Multiple Video Channels for USB and IP Cameras
- Wake on CAN, LIN, FlexRay (WoC, WoL, WoFR)
- Configuration via PlugIn IPEmotion RT or dataLog (Depending on Operating System)

CM 100 High

Ethernet Capture Module

- Analysis of Automotive Ethernet Networks
- 6 Link Lines 100BASE-T1 (12 ports)
- TECMP Protocol
- Configuration via Web Interface
- Network Time Synchronization (802.1AS)
- Cascading of Several Modules
- Developed for Automotive Applications
- Data Logger Support for ETHOS, ARCOS 1.5, IPElog2

CM 1000 High

Ethernet Capture Module

- Analysis of Automotive Ethernet Networks
- 6 Link Lines 1000BASE-T1 (12 ports)
- TECMP Protocol
- Configuration via Web Interface
- Network Time Synchronization (802.1AS)
- Cascading of Several Modules
- Developed for Automotive Applications
- Data Logger Support for ETHOS, ARCOS 1.5, IPElog2

Packages & Upgrades

IPETRONIK

Packages & Upgrades

IPElog2 Data Logger Packages (with a Price Advantage of up to 30%)

IPElog2 “RT Package 001”

Content:

- 4 Bus Interfaces: e.g. CAN, CAN FD, LIN, ETH, 1x X-LINK, 1x M-CAN
- DBC Import for Signal Measurement
- Traffic: CAN | CAN FD | LIN | ETH | FlexRay
- OBD
- GPS
- Web Visualization
- No Message Lost (NML)
- Quickstart
- Wake on CAN (WoC)
- Gateway: CAN send | XCP Slave for INCA | DIAdem | Vector
- Protocol Package
- Communication Package
- Display Package
- Unlimited Storage Groups
- 60GB CFast Data Storage
- Triple Antenna
- Cables for Configuration and Power

IPElog2 “RT Package 002”

Equipment similar to IPElog2 “RT Package 001” contains additionally:

- In total 8 Bus Interfaces

IPElog2 “RT Package 003”

Equipment similar to IPElog2 “RT Package 001” contains additionally:

- In total 8 Bus Interfaces
- 120 GB CFast Card
- Additional Communication Cables

µCROS SL Data Logger Packages

Available Additional Options for IPElog2 & µCROS SL

- Multimedia License

µCROS SL “Package 2-001”

Content:

- 2 x Bus Interfaces
- 32 GB Storage (on demand 256 GB)
- Protocol Package
- Unlimited Storage Groups
- Communication Package
- Antenna

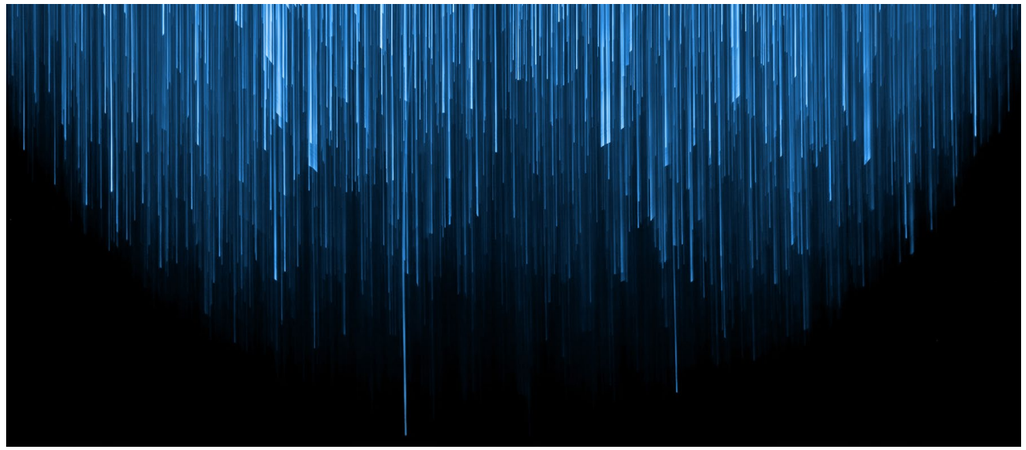
µCROS SL “Package 4-001”

Equipment similar to µCROS SL “Package 2-001” contains additionally:

- In total 4 CAN Bus Interfaces

Packages & Upgrades

Special Upgrades



1 Upgrade TESTdrive to IPEmotion RT (M-LOG V3, IPElog2 001/002)

Migration with Licences

- Software Migration to IPEmotion RT
- Acquisition and Expansion of your Single Software Licenses in IPEmotion RT Packages

2 Upgrade IPElog2 Version 1 to IPElog2 Version 2

New Mainboard – More Power, More Memory

- 3 x 1GB Ethernet Inputs
- 4G Modem
- Including RT Update
- Acquisition and Expansion of your Single Software Licenses in IPEmotion RT Packages

3 Upgrade 4G Modem for IPElog2

Expansion of IPElog2 Logger with Global 4G Modem

All upgrades contain an IPEservices logger service package “Premium”.

New

Find out more on **page 24!**

Satellites and Accessories

IPETRONIK

LIN Satellite Interface

Satellite with 8 LIN Inputs

- Extension Unit for ETHOS, ARCOS 1.5, IPElog2, M-LOG V3
- Feature Connector with GbE, Supply and Wake Function
- Daisy-Chaining of Multiple Satellites
- Wake on LAN (WoL) and No Message Lost (NML) Support for ARCOS 1.5 / ETHOS
- Configuration with IPEmotion Software
- 9 Status LEDs

CAN FD Satellite Interface

Satellite with 4 ISO CAN FD Inputs

- Extension Unit for ETHOS, ARCOS 1.5, IPElog2, M-LOG V3
- Feature Connector with GbE, Supply and Wake Function
- Daisy-Chaining of Multiple Satellites
- Wake on Can (WoC), No Message Lost (NML)
- Configuration with IPEmotion Software
- 9 Status LEDs

FlexRay Satellite Interface

Satellite with 2 FlexRay Inputs

- Extension Unit for ETHOS, ARCOS 1.5, IPElog2, M-LOG V3
- Feature Connector with GbE, Supply and Wake Function
- Daisy-Chaining of Multiple Satellites
- Wake of FlexRay (WoFR), No Message Lost (NML)
- Configuration with IPEmotion Software
- 7 Status LEDs

MediaGateway

12 Broadcom 100BASE-T1 Ports

- Analysis of Automotive Ethernet Networks
- Traffic Routing via Ethernet
- Mirroring and Forwarding Functions
- Wake on CAN (WoC) or Wake Line
- 1 SFP+ Gigabit Port
- Supports Virtual LAN Networks (VLAN)
- Configuration via Web Interface
- Network Time Synchronization (802.1AS)
- Developed for Automotive Applications
- Data logger Support for ETHOS, ARCOS 1.5, IPElog2

CM ETH COMBO

Ethernet Capture Module

- Analysis of Automotive Ethernet Networks
- 2 Link Lines 100BASE-T1 (4 Ports)
- 1 Link Lines 1000BASE-T1 (2 Ports)
- Configuration via Web Interface
- Network Time Synchronization (802.1AS)
- Daisy-Chaining of Multiple Satellites
- Developed for Automotive Applications
- Data logger Support for ETHOS, ARCOS 1.5, IPElog2

CM 100 High/CM 1000 High

Ethernet Capture Modules

- Analysis of Automotive Ethernet Networks
- 6 Link Lines 100BASE-T1 / 1000BASE-T1 (12 Ports)
- TECMP Protocol
- Configuration via Web Interface
- Network Time Synchronization (802.1AS)
- Cascading of Several Modules
- Developed for Automotive Applications
- Data logger Support for ETHOS, ARCOS 1.5, IPElog2

ill.: CM 100 High

DRIVEview

Wired Touch Display for IPEmotion ME

- Custom-Developed 7" Touch Display for Automotive Applications
- Versatile Live Display of Measurement Data due to Full IPEmotion ME Support
- Supported IPEmotion RT Loggers: ETHOS, IPElog2, M-LOG V3
- Trouble-Free Measurement Data Display with Cable Connection
- Special Automotive Holder Keeps Everything in View
- Convenient Configuration via Display or PC
- Wired Ethernet Connection
- Working Temperature Range: -20 … 70 °C (-4 … 158 °F)
- Storage Temperature Range: -20 … 70 °C (-4 … 158 °F)
- IP Code: IP 50 (ISO 20653 - 2013)
- Dimensions: W178 mm x H120 mm x D29 mm (7.00 in x 4.72 in x 1.14 in)
- Supported Logger Software: IPEmotion RT

Data Transfer Station/DriveBay

Data Acquisition with Removable Storage

The Data Transfer Station is used to transfer data acquired by loggers to remote servers, using the IPETRONIK NF1 removable storage drivebay. It can accommodate up to 12 trays storing measurement data. The measurement files contain a parameter file specifying the storage target. The Transfer Station is configured to interface with network attached storage through two 10GbE connections by default. Other network interfaces can be chosen to suit the customers‘ needs. The NF1 software detects SSDs automatically after insertion and initiates the transfer according to the configuration on the drive. For user feedback, progress is shown through an user interface on a connected screen and status information for each drive is also provided by two LEDs on the drive.

Performance

- CPU: AMD EPYC 7251 (EPYC 1st Gen)
- RAM: 16GB (1x 16GB)
- SSD: 1x 480 GB M.2 Industrial NVMe
- Power Supply: 500W
- 1x Gbit Ethernet (RJ45)
- 2x 10 Gbit Ethernet (SFP+)
- 3x USB 3.1 GEN. 1 (Type A, 2x Back, 1x Front)
- 2x USB 2.0 (Type A, 2x Back)

Technical Data	
Operating Temperature Range	0 °C to +60 °C
Input Voltage (Operational)	100 – 240V AC
Power Consumption Standby	Typ. 14 VA
Power Consumption Idle	Typ. 115 VA
Power Consumption Load (*)	Typ. 173 VA
Insert Rack	19“
Dimensions	W433 mm x H89 mm x D588 mm
Weight	Typ. 12.8kg

(*) The additional power consumption generated by the DriveBay depends on the SSDs used!

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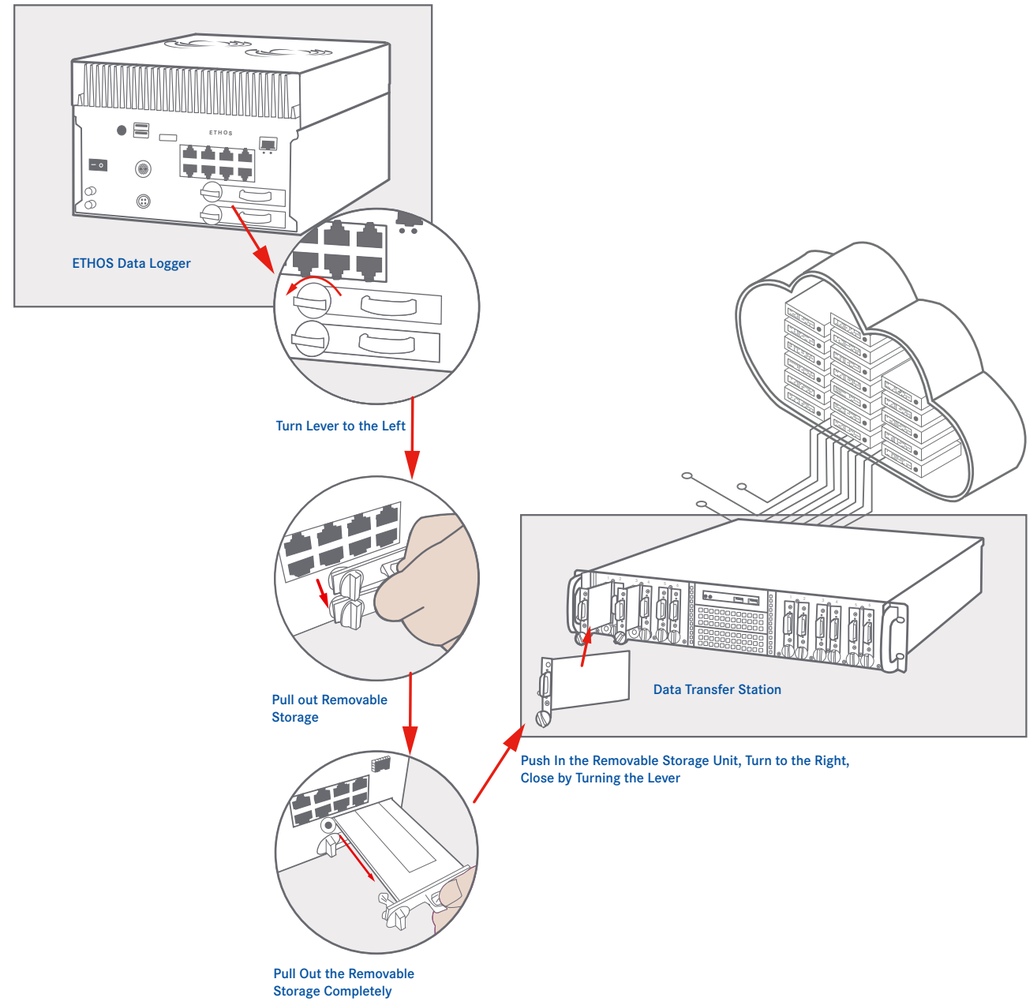
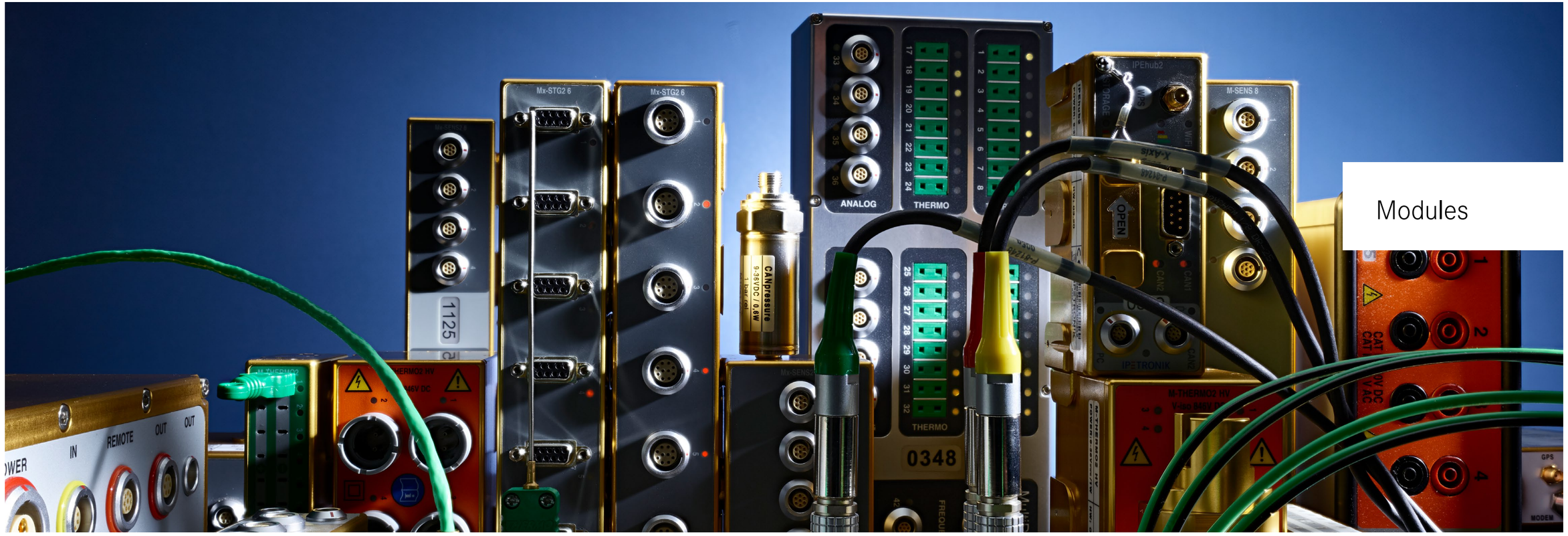
Data Transfer Station/DriveBay

Data Acquisition with Removable Storage



IPETRONIK



Modules

Device	M-THERMO2	M-THERMO2 u	M-THERMO 16	M-THERMO3 16 (New)
Input Channels	8	8	16	16
Weight	315 g	295 g	630 g	450 g
A/D Converter	24 bit	24 bit	16 bit	24 bit
Channel Sample Rate Hz	100 Hz	100 Hz	20 Hz	200 Hz
Interface	CAN	CAN	CAN	CAN
TEDS				
Thermocouple Type	K	K, E, J, N, R, S, T	K, T	K, B, C, E, J, N, R, S, T + 1 custom
RTD				
Volt / Current				
IEPE				
Frequency				

M-RTD2	M-SENS 2	M-SENS 8	M-CNT2	Mx-SENS2 8	Mx-STG2 6	Mx-SENS2 4 FAST
4	4	8	4	8	6	4
410 g	420 g	695 g	420 g	690 g	800 g	500 g
16 bit	16 bit	16 bit		16 bit	24 bit	16 bit
100 Hz	2 kHz	2 kHz	5 kHz	10 kHz	100 kHz	400 kHz
CAN	CAN	CAN	CAN	ETH	ETH	ETH
	■	■		■	■	■
■						
	■	■		■	■	■
						■
			■			

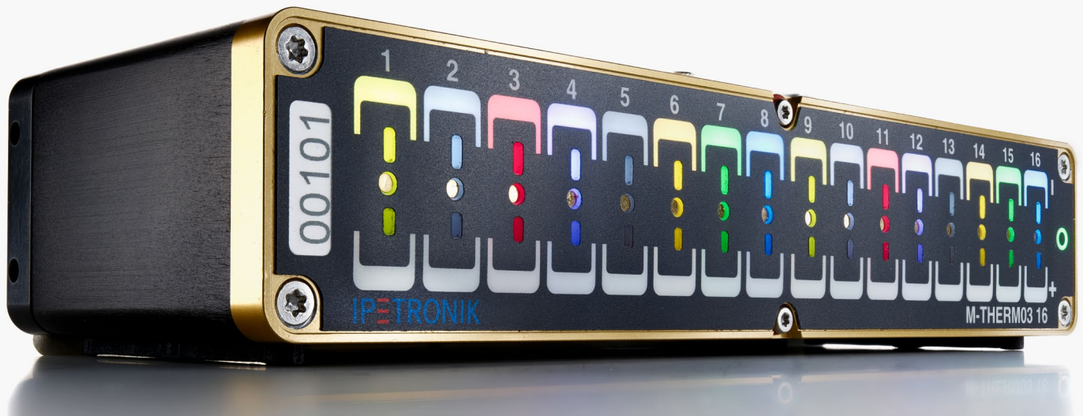
IPETRONIK

M-THERMO3 16

16-Channel Freely Selectable Thermocouple Inputs Type K, B, C, E, J, K, N, R, S, T

The M-THERMO3 is the successor of the globally used, successfully deployed IPETRONIK temperature measurement technology and offers high-precision measurement data acquisition in a small form factor. The 16 channels, freely selectable by thermocouple type, offer the highest possible accuracy and flexibility with a high-resolution 24Bit ADC. The wireless and magnetic connection concept, saves time during installation and best possible security during data connection. With the M-THERMO3, IPETRONIK once again sets the standard in the field of modular measurement technology and the cornerstone for a new generation of devices.

- Separate cold junction compensation for each channel
- Channel status LED at each measuring input with display of the set thermocouple color according to ISO/ANSI
- Galvanic isolation (channel, CAN, supply, housing)
- Undervoltage detection of module supply
- Wireless system connection
- Tool-free, magnetic connection technology
- Ultra-compact module size



General channel properties	
AD converter	24 bit (Sigma/Delta)
Internal sampling rate	500 Hz
Channel Sampling Rates	1/ 2/ 5/ 10/ min – 1/ 2/ 5/ 10/ 20/ 50/ 100/ 200 Hz
Total sampling rate	8000 Hz / 32000 Hz
Hardware filter (static)	22 Hz 2-pole 2nd order, Accuracy 25 %
Input resistance	15 MΩ (NO influence of sensor break detection)
Channel LED	Display of the set thermocouple color according to ISO/ANSI Sensor break signal via channel LED Channel LED flashes during configuration and marking in IPEmotion
Channel temperature	
Measurement deviation type K (preliminary)	Gain error at 23 °C max. ±0,015 % of measured value Offset and scaling error: typ. ±0,11 K max. ±0,33 K → corresponds ±0,102 K ±9 µV at 0°C Zero drift at -40°C to 23°C: max. ±3,35 mK/K Gain drift at -40°C bis 23°C: max +-10ppm/K
Measurement range temperature	Type K (NiCr/NiAl) -270 ... 1372 °C (-454 ... 2502 °F) Type B (Pt30Rh/Pt6Rh) 0 ... 1820 °C (32 ... 3308 °F) Type C (W5Re/W26Re) 0 ... 2320 °C (32 ... 4208 °F) Type E (NiCr/CuNi) -270 ... 950 °C (-454 ... 1742 °F) Type J (Fe/CuNi) -210 ... 1200 °C (-346 ... 2192 °F) Type N (NiCrSi/NiSi) -270 ... 1300 °C (-454 ... 2372 °F) Type R (Pt13Rh/Pt) -50 ... 1768 °C (-58 ... 3214 °F) Type S (Pt10Rh/Pt) -50 ... 1768 °C (-58 ... 3214 °F) Type T (Cu/CuNi) -270 ... 400 °C (-454 ... 752 °F) Custom
Characteristic linearization	Numerically interpolated
Cold junction compensation	One cold junction per channel
Device	
Inputs	16
Permissible input voltage (channel)	Operating safety ±60 V (permanent), Device safety ±60 V (permanent)
Averaging	Depth adjustable (1-100)
Working temperature range	-40 ... 125 °C (-40 ...257 °F)
Storage temperature range	-55 ... 150 °C (-67 ...302 °F)
Voltage supply	9 ... 60 VDC
IP Code	IP 67 (ISO 20653 - 2013)
Dimensions	L164 mm x B33 mm x T58 mm (6.50 in x 1.30 in x 2.28 in)
Weight	450g (0.99 lb)
Galvanic isolation	±100 V (indefinitely), ±500 V (pulse voltage)

Mx-SENS2 4 FAST

4 Fast Analog Measurement Inputs up to 400 kHz

- Measurement Modes: SENS, mA, IEPE, Individual for Each Input
- 4 Separate Dual Sensor Excitations (up to ±15 V, up to ±60 mA)
- Offset Adjust Functions
- TEDS Class-2 Supported
- Measurement Data Output via XCP on Ethernet or CAN
- Designed for Engine Compartment Applications
- Toolless Module-to-Module Connection
- Rugged and Compact Modules for Harsh Environments

Electrical Ballasts for HV Current & Voltage Measurement

HV Iso Divider 100 kHz

Iso Clamp Connector 200 kHz

Mx-SENS2 4
FAST (400 kHz)

For a direct voltage and current measurement, isolated electrical ballasts have been developed. The latest generation offers an expanded signal bandwidth for the acquisition of HV analog signals and can be used for both DC and AC applications. The HV Iso Divider 100 kHz has a signal bandwidth of 100 kHz and is used in combination with a current limiter. The Iso Clamp Connector 200 kHz in combination with a current clamp is ideal for isolated HV current measurements. With its 200 kHz bandwidth, it is also suited for AC applications. Having scaled the output signal to 2 V, it can be measured with the Mx-SENS2 4 FAST.

Mx-STG2 6

6 Fast Strain Gauge Measurement Inputs up to 100 kHz

- 6 Dual Sensor Excitations (up to ±5 V, up to ±45 mA)
- Offset Adjust Functions, Shunt Check
- Internal Resistors for Bridge Completion Selectable
- TEDS Class-2 Supported
- Measurement Data Output via XCP on Ethernet or CAN
- Designed for Engine Compartment Applications
- Secure Module-to-module Connection
- Rugged and Compact Modules for Harsh Environments

M-SENS2

4-Channel Analog Input Module with Sensor Excitation

- Measurement Modes: V, mA Selectable for Each Input
- 4 Sensor Excitations (Unipolar 15 V, up to ±60 mA)
- TEDS Class-2 Supported
- Measurement Data Output to CAN
- Galvanic isolation (Inputs, CAN, Supply, Enclosure)
- Designed for Engine Compartment Applications
- Toolless Module-to-Module Connection
- Rugged and Compact Modules for Harsh Environments

M-THERMO2 u

8-Channel Universal Thermocouple Inputs Type E, J, K, N, R, S, T

- Cold Junction Compensation per Channel
- Status LED at Each Measurement Channel
- Measurement Data Output to CAN
- Galvanic isolation (Inputs, CAN, Supply, Enclosure)
- Designed for Engine Compartment Applications
- Toolless Module-to-Module Connection
- Rugged and Compact Modules for Harsh Environments

M-FLOW

Intelligent Flow Linearization

- Plug & Measure Linearizers
- SMART Pickoff to Store Calibration Data
- Up to 64 Calibration Points for Flow Meters (K-Factor pul/l vs. Frequency/Viscosity Hz/mm²/s)
- Up to 20 Calibration Points for Liquids (Temperature vs. Viscosity or Temperature vs. Density)
- Live Temperature Compensation
- Up to 5 Calibration Curves per Turbine
- CAN Measurement Data Output
- Galvanic Isolation (Channel, CAN, Supply, Enclosure)
- Developed for Engine Compartment Applications
- Secure Connection
- Compact and Rugged Device for Extreme Conditions

New

First Flowmeter Unit with M-System Integration

Device	
Flow Sample Rate	1000 Hz
Temperature Sample Rate	1000 Hz
Voltage Supply	6 ... 36 VDC
Power Consumption, typical	< 0.5 W
Working Temperature Range	-40 ... 125 °C (-40 ... 257 °F)
Storage Temperature Range	-55 ... 150 °C (-67 ... 302 °F)
IP Code	IP 68
Relative Humidity	0 ... 85 %
Dimensions	W122 mm x H34 mm x D55 mm (4,8 in x 1,34 in x 2,17 in)
Weight	145 g (lb)
Configuration Interface	CAN High Speed
Data Transfer Rate	Software Selectable up to 1 Mbit/s (ISO 11898-2)
Test Standards	IEC 61010-2-201
Input Sockets	ODU B G81B0C-P05QJ00/2x
Galvanic Isolation	
Input ↔ Module Power Supply	±100 V (indefinitely), ± 500 V (pulse voltage)
Input ↔ CAN	
Input ↔ Enclosure	
Input ↔ Input	

IPETRONIK

M-FLOW

Turbine Flowmeters

... are the ideal solution for measuring applications in liquids, when high accuracy, very fast response times, compact design, high reliability even in continuous operation and flow changes at fluctuating operating temperatures are required. A variety of selectable connections enables a needs-based use of the measuring devices.

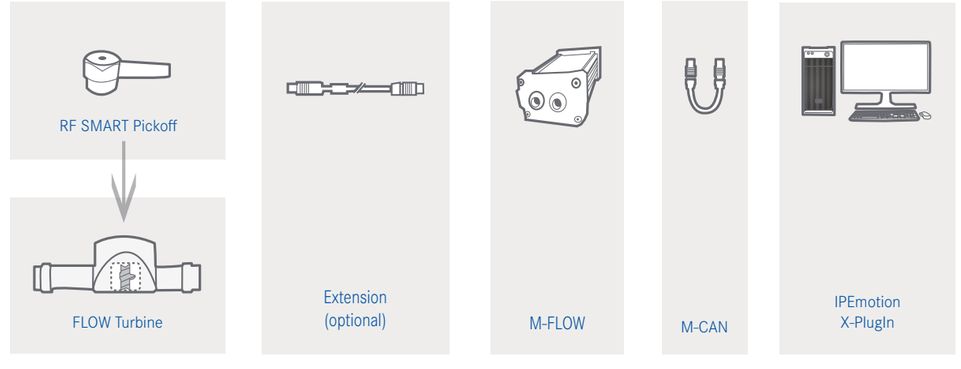
Applications

The turbine wheel flow meters of the DM series have a wide range of applications. This includes, among other things, monitoring the flow rates of fuels and coolants and lubricants in engine and jet engine construction, measuring dosing quantities in the food and pharmaceutical sectors, monitoring and measuring ultrapure water in research and development, measuring quantities for consumption billing and much more.

Benefits

- Novel Helical Rotor Blade Design for Improved Linearity and Lower Pressure Loss
- Interference-free Signal Transmission through Digital Output Signal
- Precision Ball Bearings for Better Repeatability and Optimal Results at Low Flow Rates
- Very Large Measuring Range
- Temperature Sensor Integrated in the Measuring Sensor (Pickoff)

SYSTEM SETUP M-FLOW

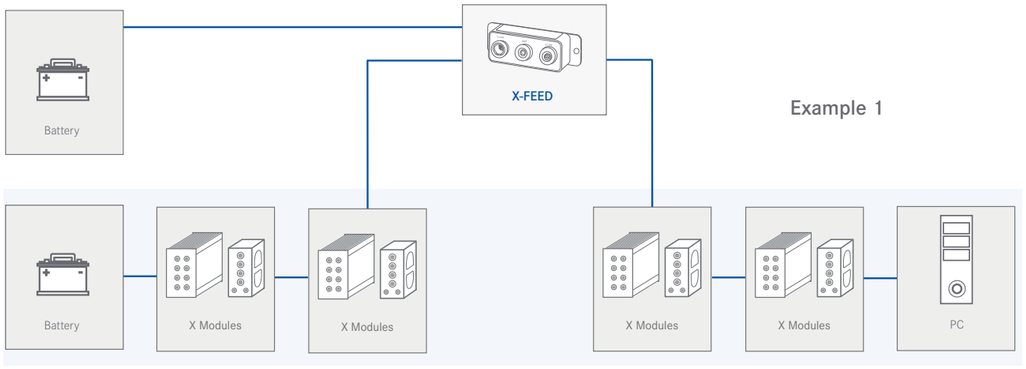


X-FEED

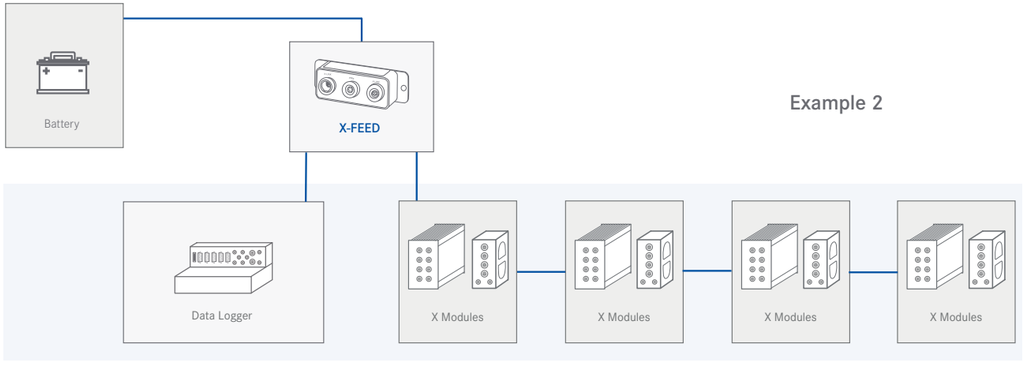
Power Feeder for the Intermediate Feed of X-Module Measurement Chains

- For the Intermediate Feed of PC and Logger X-LINK Module Chains
- Feed Current of up to 10 A
- IP Code 54
- Aluminium, Gold Anodized
- Operating Temperature Range: -40 ... 85 °C
- Dimensions: W 97 mm x H 30 mm x D 30 mm
- Weight: 125 g

Possible System Structures



Example 1



Example 2

High Voltage

HV PMD

Highly Integrated HV Power Measurement Device for Safe Testing on HV Vehicles

- High frequency data acquisition up to 1000V and 1000A
- Measurement data transmission via XCPonETH and OPC UA
- Designed for direct installation in the engine compartment
- Compact and robust devices for extreme requirements

**This image may differ from original product.*

Channel volt	
Input voltage	±1000 V
Cut-off frequency	5 MHz
Input accuracy	DC ±0.03 % of measured value, ±0.02 % of measuring range, ±0.04 V Up to 1 kHz ±0.03 % of measured value ±0.02 % measuring range Up to 10 kHz ±0.1 % of measuring value, ±0.05% of measuring range Up to 100 kHz ±4 % of measured value, ±0.1 % of measuring range Up to 1000 kHz, ±5 % of measured value, ±0.5 % of measuring range
Noise	At 15 MS/s -87 dB At 1MS/s -94 dB At 100 KS/s -107 dB At 10 KS/s -117 dB
CMR, Typ. (Min.)	101 dB (88 dB) @ 50 Hz 75 dB (68 dB) @ 400 Hz
Gain Drift	typ. 40ppm/K (max. 65 ppm/K)
Offset Drift	typ. 0.5 mV/K + 1 ppm of range/K
Gain Linearity	< 0.01 %
Input Coupling	DC
Input Impedance	10 MΩ || 1 pF
Hardwarefilter	1 MHz, AAF (6th order)
Channel current	
Current measurement range	±1000 A
Maximum withstand peak current	min. -1700 A, max. 2000 A
Primary / Secondary Ratio	1 : 1680

Input Accuracy (Ip @ 10 Arms)	DC ±0.1 % of reading ±50 ppm of range ±0.05 A Up to 10kHz 25 mdB +/-0.3% Up to 20 kHz 70 mdB +/-0.8% Up to 200kHz 350 mdB 4%
Gain drift (current)	typ. 40ppm/K
Offset drift	typ. 200 uA/K
Linearity error @ 1000 A range	typ. 50 ppm
Hysteresis	typ. 50uA/A
Flatness DC-50Hz Overall accuracy @25°C	typ. 5mdB
Flatness 50-1kHz Overall accuracy @25°C	typ. 20mdB
CMRR	137 dB (450 uA/V)
General channel properties	
AD converter	24 Bit Hybrid ADC
Device	
Oversampling	15 MS/s
Voltage supply	9 ... 54 VDC (PoE)
Power consumption, typical	13 W (max. 23 W)
Working temperature range	-20 ... +70 °C (-4 ... +158°F)
Storage temperature range	-40 ... 85 °C (-40 ... 185 °F)
IP Code	IP 67 (ISO 20653 - 2013)
Dimensions	B245 x H151 x T63 mm (9.65 in x 5.94 in 2.48 in)
Weight	4.4 kg (max. 7 kg) / 9.7 lb (max. 15.43 lb)
Configuration interface	GbE (XCP, OPC UA)
Cable diameter	Nominal DC current 292 A | 95 mm² / 245 A | 70 mm² / 98 A | 50 mm² / 158 A | 35 mm² Rated AC current 206 A | 95 mm² / 173 A | 70 mm² / 140 A | 50 mm² / 111 A | 35 mm²
High-Voltage Interlock	YES (chassis cover + cables)

Product Overview – HV Systems

HV Temperature Measurement Systems for E-Mobility

M-THERMO2 HV (Multi Plug): 4-Channel

Temperature Measurement in HV Applications

For temperature measurement tasks, e.g. at non-isolated measuring points of electric vehicles, the devices of our product line M-THER-MO2 HV are a perfect fit. In addition to the high galvanic isolation of ±846 VDC, our modules offer TÜV-certified safety acc. to EN 61010-1:2001 and are approved for applications acc. to CAT I and CAT II. The M-THERMO2 HV combines four thermocouples in one cable. This is ideal for measuring points which are very close to each other and reduces sensor costs. Moreover, smaller cable cross-sections equal smaller feedthroughs within the vehicle.

HVshunt 3

HVshunt Measurement Systems

Our HVshunt devices have been developed for high voltage current and voltage measurement applications in electric and hybrid vhicles. The devices measure voltages of up to +/-850 VDC via the integrated HV Iso Divider and currents of up to +/-900 A via current transformer with an overall accuracy of +/-0.2 %. With pre-assembled custmer-specific plugs, the HVshunt can be safely integrated into the on-board HV supply system without the need for tools, reducing setup and removal times.

HV Iso Divider 100 kHz

Iso Clamp Connector 200 kHz

Mx-SENS2 4 FAST (400 kHz)

Electrical Ballasts for HV Current & Voltage Measurement

For a direct voltage and current measurement, we provide isolated electrical ballasts so that you may continue to use your existing IPETRONIK measurement technology. The latest generation offers an expanded signal bandwidth for the acquisition of HV analog signals and can be used for both DC and AC applications. The HV Iso Divider 100 kHz has a signal bandwidth of 100 kHz and can for example be used in combination with our Mx-SENS2 4 FAST. The Iso Clamp Connector 200 kHz and a current clamp are ideal for safe HV current measurements. With its 200 kHz signal bandwidth, you may also use it as a ballast for AC applications, e.g. in combination with the Mx-SENS2 4 FAST.

IPETRONIK

HVshunt 3

High-Precision Shunt for HV and Current Measurement

- For Electric and Hybrid Vehicle Applications
- High Voltage Measurement of up to 850 VDC
- Current Measurement of up to 300 ADC via Shunt Resistor, Depending on the Plug Configuration
- Customer-specific Plugs for Connection to High Voltage Network
- Direct Connection to IPETRONIK Modules
- Voltage Supply 5.5 V to 40 V
- Customer-specific Solution

Device		
Current Consumption, typical	30 mA	
Voltage Supply	5.5 ... 40VDC	
Working Temperature Range	-20 ... 100 °C	
Storage Temperature Range	-20 ... 100 °C	
Relative Humidity	Up to 95 %	
IP Code	IP 65 (ISO 20653 – 2013)	
Dimensions	W108 mm x H100 mm x D42 mm (4.25 in x 3.94 in x 1.65 in)	
Weight	776 g (1.71 lb)	
Input Sockets	Customer-specific	
Housing Material	Diecast Aluminium Enclosure	
High Voltage Input		
Input Voltage	850 VDC	
Current Measurement Range via Shunt Resistor	100 A	300 A
Tolerance Shunt Resistor	+/- 0.4 %	
Voltage Measurement	Up to 1000 VDC	
Measurement Accuracy Voltage	0.5%	

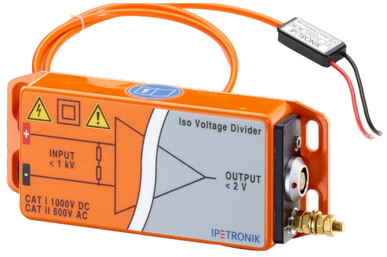
Safety instructions

Do not use in AC voltages of three-phase current drives of electric and hybrid vehicles due to extremely high transient voltages and HF currents! All users working on HV applications must be trained and approved for this kind of work.

HV Iso Divider 100 kHz

DC High Voltage Divider up to 1 kV Input Range

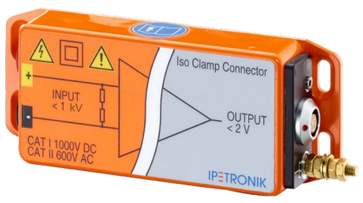
- Bandwidth up to 100 kHz
- Reliable Voltage Measurement on High Voltage DC Systems
- Electrically Isolated High Voltage Divider
- Short-Circuit Current Limitation via HV Current Limiter
- For Hybrid and Electric Vehicle Applications
- Direct Connection to SENS Modules
- Approved Applications According to CAT I and CAT II
- Use Only in Combination with HV Current Limiter



Iso Clamp Connector 200 kHz

DC High Voltage Current Clamp Front-End Device

- Bandwidth up to 200 kHz
- Current Measurement in High Voltage Networks up to 1 kV
- Reliable Current Measurement with Battery Powered Current Clamp Adapters
- For Hybrid and Electric Vehicle Applications
- Direct Connection to all IPETRONIK SENS Modules
- Approved Applications According to CAT I and CAT II



M-THERMO2 HV (multi plug)

4 High Voltage Thermocouple Measurement Inputs Type K (NiCr/NiAl)

- Multi Channel High Voltage Safety Connector
- Cold Junction Compensation per Channel
- Status LED at Each Measurement Channel
- Measurement Data Output to CAN
- Galvanic Isolation, Bipolar up to ±846 VDC
- Approved Applications According to CAT I and CAT II
- Designed for Engine Compartment Applications
- Secure Module-to-Module Connection
- Rugged and Compact Modules for Harsh Environments

Acoustics in E-Mobility

Acoustic Chamber with HV Charging Station

With our acoustic chamber, charging station, and acoustic camera, we can identify noise sources in or on the vehicle, air-conditioning system, and charging station. Our acoustics team will optimize the noise emission if necessary.

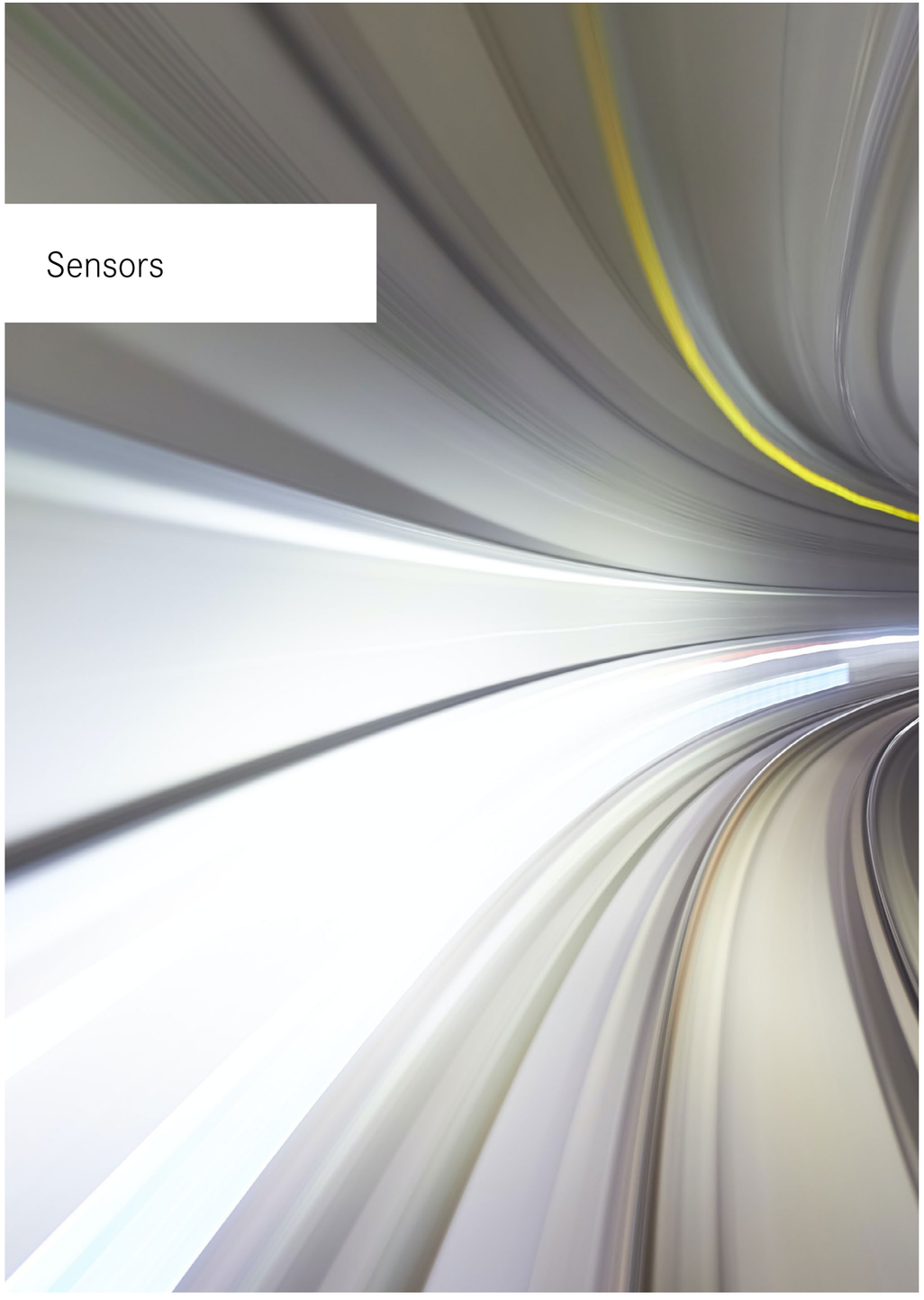
Technical Features:

Acoustic Chamber

- Free Hemifield for Vehicle Testing
- Dimensions: 6.5 m x 4.7 m x 4.1 m (L x W x H)
- PAK System (MüllerBBM) with 120 Channels to Measure Acoustics and Vibration, Pressure Pulsation and CAN Bus
- Integrated Vehicle Lift
- Loadbox Measurement (IPEload)
- Acoustic Camera
- Workshop and Laboratory for Vehicle Modification Nearby
- Air Temperature: 20 °C
- Exhaust Extraction

Charging Station

- Up to 350 kW Charging Capacity
- Measurement of the Specific Parameters (Charging Current, Voltage, Temperature, etc.)
- CCS-2 with DC Charging Function
- AC: 480V, 63A | DC: 850V, 125A
- Manufacturer: PORSCHE Engineering



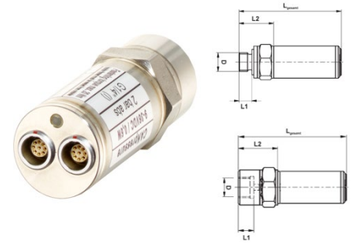
Sensors

IPETRONIK

CANpressure

Pressure Transducer with CAN Output for Automotive Applications

- Absolute and relative pressure gauge in the range of 1 ... 250 bar
- Internal temperature sensor at gauge point
- Measurement data output to CAN
- Galvanic isolation (inputs, CAN, supply, enclosure)
- Designed for engine compartment applications
- Toolless module to module connection
- Ruggedized and compact modules for harsh environments

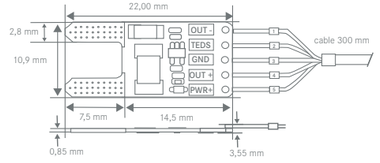


Device	
Overload Pressure	3 x full scale / burst pressure > 200 bar
Channel sampling rates	1/ 2/ 5/ 10/ 20/ 50/ 100/ 200/ 500/ 1000/ 2000 Hz
Oversampling	10 kHz
Aggregate sample rate	2 kHz
Voltage supply	6 ... 36 VDC
Supply voltage thresholds	Switch-on 6 ±0.3 VDC / Switch-off 6 ±0.3 VDC
Power consumption, typical	0.7 W
Working temperature range	-40 ... 125 °C (-40 ... 257 °F)
Storage temperature range	-55 ... 150 °C (-67 ... 302 °F)
IP Code	Relative IP 52 / absolute IP 65 (ISO 20653 - 2013)
Relative humidity	5 ... 95 %
Dimensions	L76 mm x D24 mm (L2.99 in x 0.94 in)
Weight	120 g (0.26 lb)
Configuration interface	CAN high speed
Data transfer rate	Software selectable up to 1 Mbit/s (ISO 11898-2)
Housing material	Stainless steel 4435
Wrench size	24 mm (0.94 in)
Connecting thread	M 10x1 / M 14x1.5 / G¼ / 7/16 UNF / 1/8“NPT (male / female thread)
Tightening torque	17 ... 23 Nm
Thread dimensions M8 (male)	D = 8 mm / L1 = 8.5 mm / L2 = 25.5 mm
Thread dimensions M8 (female)	D = 8 mm / L1 = 9.5 mm / L2 = 26.5 mm
Thread dimensions M10 (male)	D = 10 mm / L1 = 8.5 mm / L2 = 25.5 mm
Thread dimensions M10 (female)	D = 10 mm / L1 = 9.5 mm / L2 = 26.5 mm
Thread dimensions M14 (male)	D = 14 mm / L1 = 9.5 mm / L2 = 25.5 mm
Thread dimensions M14 (female)	D = 14 mm / L1 = 10.5 mm / L2 = 26.5 mm
Thread dimensions 7/16UNF (male)	D = 11 mm / L1 = 10.5 mm / L2 = 25.5 mm
Thread dimensions 1/8“NPT (female)	L1 = 9.5 mm / L2 = 26.5 mm
Thread dimensions G¼ (male)	D = 13.2 mm / L1 = 9.5 mm / L2 = 25.5 mm
Thread dimensions G¼ (female)	D = 13.2 mm / L1 = 10.5 mm / L2 = 26.5 mm

IPEshunt 3

Operating Current Measurement via Automotive Fuse Carrier

- Mounting in Automotive Fuse Carrier
- Overload Protected up to Factor 1.5 of Rated Current
- Direct Connection to SENS Modules
- TEDS Class-2 Integrated for Sensor Scaling
- Shape: Mini Fuse



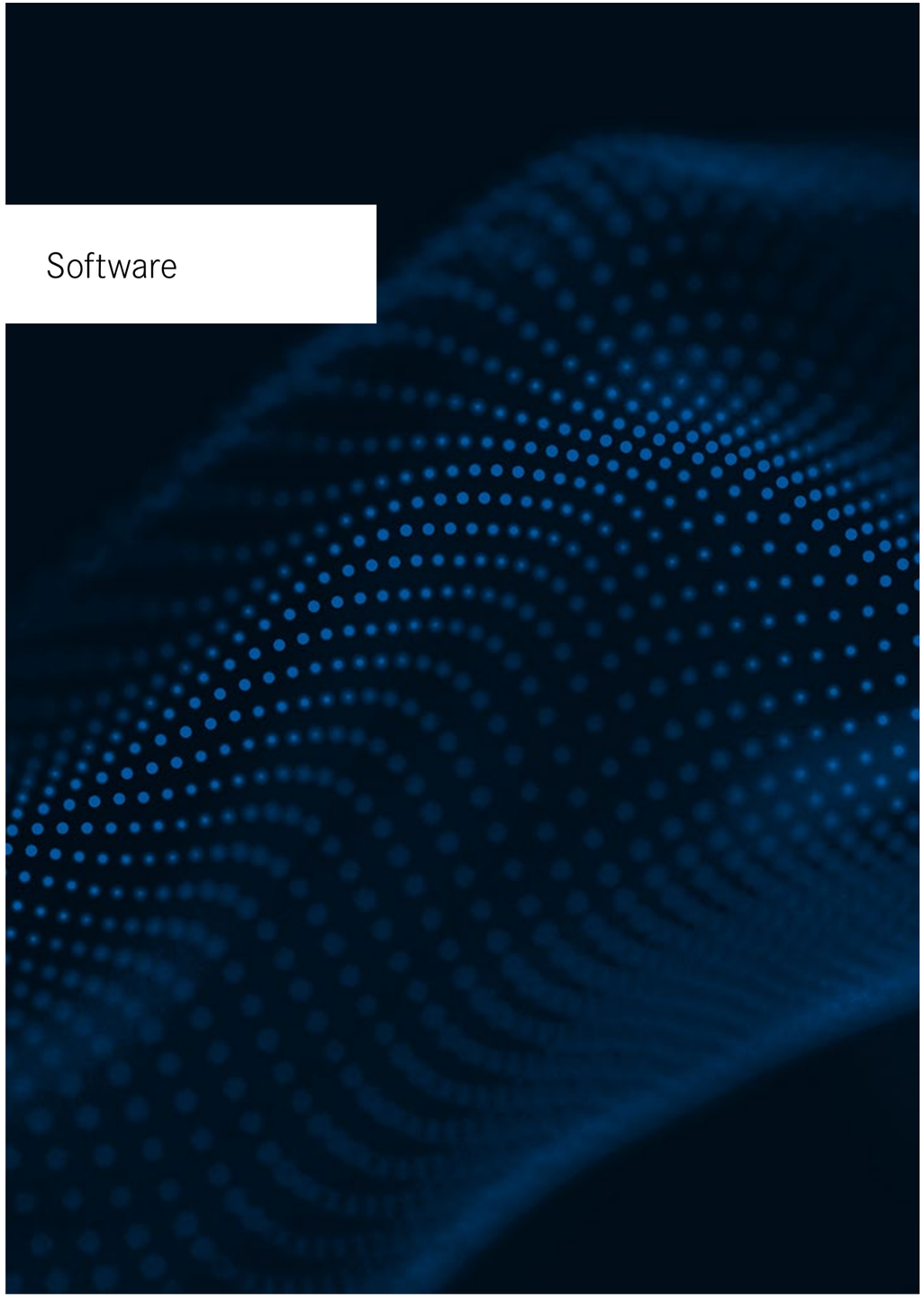
Device	
Voltage Supply	6 ... 15 VDC
Current Consumption	< 4 mA
Working Temperature Range	-40 ... 85 °C (-40 ... 185 °F)
Dimensions	W10.9 mm x H22 mm x D3 mm (0.43 in x 0.87 in x 0.12 in)
Weight	3 g (0.11 oz)
Measurement Range	±10/ 30 A (depending on type)
Operating Current ±10 A	±0 ... 1 V | 0.1 V/A
Operating Current ±30 A	±0 ... 1.5 V | 0.05 V/A
Offset Deviation at Ambient Temperature 25 °C	±0.04 mV
Accuracy at Ambient Temperature 25 °C	±1 % of reading
Temperature Effect on Accuracy	±250 ppm/K
Overload	Max. 1.5 x Nominal Current (pulse duration max. 1s)
	Ensure Ventilation, Avoid Thermal Overheating
3 dB Cut-off Frequency	13 kHz (± 500 Hz)

CANWAY-CW

Current Clamp with CAN Interface

- Non-contact Current Measurement for DC Current
- Measurement Ranges: ±10, 30, 50 A
- Application According to CAT I (Maximum Voltage 48 V)
- Configuration with IPEmotion PlugIn CANWAY
- Designed for Engine Compartment Applications
- Secure Module-to-Module Connection
- Rugged and Compact Modules for Harsh Environments

Device	
Channel Sampling Rates	1/ 2/ 5/ 10/ 50/ 100/ 200/ 500/ 1000/ 2000 Hz
Aggregate Sample Rate	2 kHz
Power Supply	9 ... 30 VDC
Power Consumption, typical	0.5 W
Working Temperature Range	-20 ... 110 °C (-4 ... 230 °F)
IP Code	IP 65 (ISO 20653 - 2013)
Dimensions	W38 mm x H21.5 mm x D65 mm (1.50 in x 0.85 in x 2.56 in)
Weight	100 g (0.22 lb)
Configuration Interface	CAN High Speed
Data Transfer Rate	Software Selectable up to 1 Mbit/s (ISO 11898-2)
Housing Material	Metal Housing
Test Cable Diameter, max.	6.1 mm (0.24)
Current Measurement Input	
Measurement Range	±10/ 30/ 50 A
Accuracy	1 % (additionally ± 50 mA relative to range)
Resolution	1 mA
Special Functions	Offset Adjust, During Measurement
	Temperature Compensation, Remanence Correction
	Averaging



Software

IPEmotion PC

The Easiest Form of Data Management

Any hardware is only as good as the software that runs on it. With IPETRONIK's software tools, you have full control over your information and every step of the data acquisition process at all times. From configuration, visualisation, analysis to reporting: we have simplified every step for you.

Manufacturer-Independent Measurement Data Acquisition

IPEmotion supports measurement applications for many areas through special plug-ins – regardless of the hardware used. Likewise, the software easily connects complex ECU applications with high-precision measurement technology for physical quantities. Through customised setup, IPEmotion becomes an individual software solution whose data presentation can be flexibly adapted – even during ongoing measurement and data storage. The measurement data acquisition software is available in several languages. It is designed for the acquisition and management of large amounts of data and, in addition to live visualisation, also enables automated evaluation.

**This image may differ from original product.*

One Software for All Applications

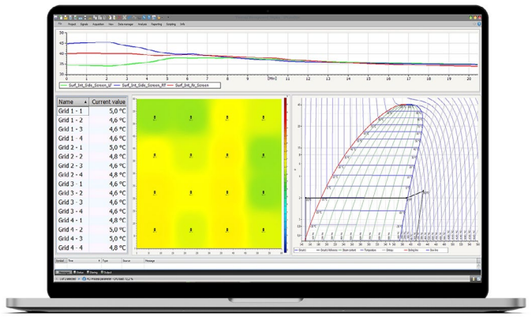
Practice-oriented use of measuring equipment and reliable data acquisition are our top priorities. For this purpose, we have developed IPEmotion PC – an easy-to-use DAQ software for all applications in the inspection process: perfect for configuration, data recording, analysis and reporting.

- Thermal Management
- ECU Software & Bus Validation
- Brake Tests
- Compressor Tests
- Process Monitoring
- ...and much more

Thermal Management

Are you concerned with thermal management? Then IPEmotion is the right choice for you: IPEmotion offers you everything from a single source, from simple temperature monitoring as a numerical display to the visualisation of a highly complex heat pump system. Whether you are looking at system components such as vehicle batteries, refrigerant compressors, evaporators or an entire system, our software can provide you with the right solution in just a few clicks.

- Log p/H diagram display
- Heatflow matrix display
- Signal / trend display via y/t diagram
- Determination of overheating, undercooling, enthalpy etc.
- REFPROP integration



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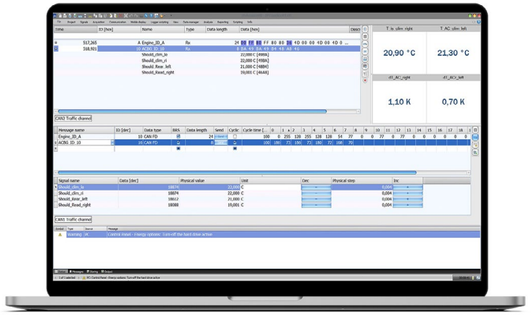

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ECU Software and Bus Validation

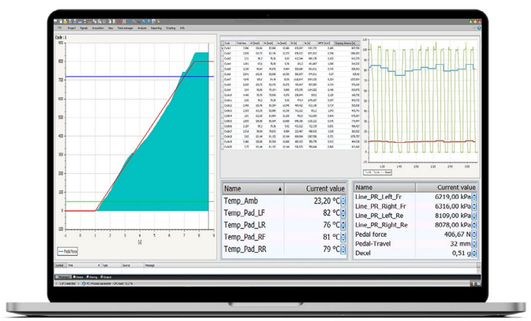
With every new vehicle platform and every update of the ECU software, the requirements for the validation of the implemented functions change. IPEmotion offers a variety of easy-to-use tools to accomplish these tasks. With our capabilities to record, display and analyse vehicle buses, we offer you a powerful yet cost-effective software solution.

- Transmission of freely configurable CAN messages
- Bus traffic display in decimal and hexadecimal form
- Bus traffic signal conversion via description file
- Bus traffic storage and file conversion to ASCII, BLF, MDF
- ID filter functions and marking of changing data

Brake Tests

With every new vehicle platform and every update of the ECU software, the requirements for the validation of the implemented functions change. IPEmotion offers a variety of easy-to-use tools to accomplish these tasks. With our capabilities to record, display and analyse vehicle buses, we offer you a powerful yet cost-effective software solution.

- Transmission of freely configurable CAN messages
- Bus traffic display in decimal and hexadecimal form
- Bus traffic signal conversion via description file
- Bus traffic storage and file conversion to ASCII, BLF, MDF
- ID filter functions and marking of changing data



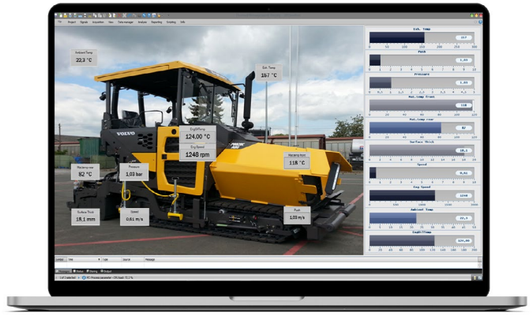
*This image may differ from original product.

Compressor Tests

With the advent of e-mobility, many new tasks have arisen around refrigerant compressors. Whether mechanical compressors or electric compressors - with IPEmotion you have all the possibilities to carry out test bench tasks and benchmark investigations or to determine the COP (coefficient of performance).

- Adjustment of setpoints, e.g. speed via CAN and LIN
- Display of the high pressure or suction pressure side
- Comparison of setpoint and actual values
- Calculation of superheat and subcooling
- Standard calculations for cooling circuits

*This image may differ from original product.



*This image may differ from original product.

Process Monitoring

Many industrial processes or plants require continuous and highly accurate monitoring. Our IPEmotion software in combination with IPETRONIK measurement technology can take over exactly this task for you. We provide all data at a glance, even in direct overlay with your system image. If a single display page or screen is not enough for your presentation, you can combine as many as you like and take advantage of the full flexibility of our data visualisation.

- System / plant screen integration
- Numerical displays
- Numerous display pages
- Display distribution across several screens
- Alarms and limit value monitoring

Fleet Management

In many areas, the fleet test under real conditions is the last approval stage before a product leaves the development department. At this point in the development cycle, as much data as possible is collected as a final safeguard before the pre-series product is handed over to production. In order to be able to sift through, verify and analyse these large amounts of data, IPEmotion offers you various options for data analysis and post-processing.

- Measurement data management (MDM)
- File and channel metadata
- Adaptable / movable x- and y-axes
- Measurement data overlay
- Script-based data evaluation

*This image may differ from original product.

IPEmotion PC

Edition Overview

Features	Demo/ Student	Basic	Standard	Professional	Developer	Analysis (offline)
License	Free	Free	■	■	■	■
Supported PlugIns	■	■	■	■	■	■
Number of Channels for Live Data	■	250	256	■	■	250
Number of Storage Groups (online)	■	0	2	■	■	0
Number of Display Pages for Online Data	■	20	20	■	■	20
Number of Display Pages for Offline Analysis	■	1	5	■	■	■
Number of Channels for Offline Analysis	■	10	256	■	■	■
Additional Online Tools: Traffic Analyzer, Traffic Simulator, Map	■			■	■	
Additional Offline Tools: Traffic Analyzer, 3D Model, Map, Campbell	■			■	■	■
Macro Recorder - VBS & IronPython Scripting	■			■	■	■
COM Interface - External Access	■		■	■	■	■
Create Runtime Editions					■	
Measurement Data Management (MDM)				■	■	■
Additional Module: Control - Test Sequencing	optional			optional	optional	
Additional Module: Climate - Thermodynamics	optional			optional	optional	optional
Software Maintenance			■	■	■	■

■ = no limitation

IPETRONIK

IPEmotion PC

PlugIn Overview

PlugIn	Description	Hardware	Picture
Automotive			
IPETRONIK-X	Configuration and data acquisition (TEDS, Strain, ICP, Volt, High Voltage, mA, RTD, TC, DIO, PWN, Encoder, of IPETRONIK CAN modules or with X-LINK technology based on XCPonEthernet. With the X-Modules Mx-SENS2 4 FAST and Mx-STG2 6 sample rates up 100 kHz / channel are supported.	M-SENS2 M-THERMO2 Mx-SENS2 4 FAST etc.	
IPETRONIK-LOG	Configuration and data acquisition for all IPETRONIK data logger series and add-on modules.	IPElog2 FLEETlog2 M-LOG V3	
PROTOCOLS	ECU protocol measurement and calibration based on CCP, XCPonCAN, XCPonETH. Bus traffic analysis CAN, LIN and FlexRay and CAN traffic output simulation. Diagnostics measurements using OBD, WWH-OBD, KWP, GM-LAN, UDS, J1939. Intelligent imports for CAN dbc / XML, LDF, Fibex, FlexRay, Autosar, A2L und GM-LAN description files.	IPETRONIK Vector Kvaser Peak NI Softing TRAMA ICS-CAN Drewtech I+ME Actia Ethernet	 IPEhub2 (LAN & WiFi CAN Card)
PCAN-USB PRO LIN	LIN bus measurement with configuration as master, slave or listener. Signals are imported via .LDF description file.	IPEcan FD Pro	
CAETEC dataLog	Configuration and data recording for CAETEC data logger.	ETHOS ARCOS 1.5 µCROS Series	
CANWAY	Current clamp. Configuration and data output via CAN bus.	CW-401 MKII	
Other			
GPS	Recording GPS data based on the NMEA standard protocol.	GPS receiver based on NMEA standard	
VIDEO	Recording of video data in IPEmotion from USB web cams and IP cameras with the Real Time Streaming Protocol.	USB and IP cameras	

Find more PlugIns here: https://www.ipetronik.com/en/products-services/software-digitalization/plugins.html

IPEmotion ME (Mobile Edition)

Wireless Data Logger Display

- Display System for All Data Loggers with IPEmotion RT
- Free Display Configuration via Apps or Web Browser
- Cross-Platform Technology for Android and iOS Devices
- Display Configuration with IPEmotion RT.UI
- Set Alphanumerical Variables on Logger
- Multi-Tablet Operation and Logger Remote-Control Function
- Worldwide Access to Online Data via IoT Technology
- Available Free of Charge from Google Play Store and Apple App Store

**This image may differ from original product.*

IPEmotion ME (Mobile Edition)	
Supports IPEmotion RT Data Loggers	IPElog2, M-LOG V3, µCROS SL
Android Version	7.0
iOS Version	11.3
Screen Resolution	800 x 480 / 1280 x 720 (recommended)
Languages	German / English
Software Functions	
Instruments	Map
	yt-Chart
	Alphanumerical
	LED
	Barchart
	Tachometer
	Table
	Video
	Switch
	Slide Control
	Parameter Input
	Audio Marker
Instrument configuration functions	Copy/Paste Page Layouts
	Add/Delete Channels
	yt-Chart Time Axis 30 s ... 180 min
	yt-Chart Line Color / Thickness
	Multiple y-Axis / Separate Coordinate Systems
	Night Shift Mode
Functions	Live Data Tracking and Remote Control (IoT)
	Event Control on Logger
	Write Outputs
	Multi-Tablet Operation
	Add Marker Comments to Data Files
Security	Encrypted Data Transfer WPA2
	No Data Storage on Mobile Devices

IPETRONIK

Quality Campaign Loggers and Modules

Extend your warranty and keep your equipment precise and working as it should.

Why are Maintenance and Calibration Important?

Extreme operating conditions, such as hot and cold climate testing as well as fleet testing in climate chambers and on test benches, stress the electric components of measurement modules and data loggers. Regular maintenance, calibration, and adjustment of the measuring equipment is crucial to ensure the precision of the devices.

When Do You Need Maintenance or Calibration?

- New Device
- Modification or Repair
- End of Service Life (Operating Hours)
  Recommendation: Maintenance/Calibration Once A Year, Adjustment Every Two Years
- Crucial Measurement – Before And/Or After
- Unforeseen Events, Such As Damage
- Compliance with Standards, Such As DIN EN ISO 9001

IPEservices – Maintenance Packages

IPEservices offers the following well-proven maintenance packages. If required, customized packages can be tailored.

	Maintenance Packages				
	Basic	**Standard**	**Premium**	**Repair with Premium Calibration**	**Calibration acc. to ISO 17025**
Calibration at Various Measurement Points and Room Temperature (23 °C)	■	■	■	■	■
Calibration at Various Measurement Points and Extreme Ambient Temperatures			■	■	
Adjustment at Room Temperature (23 °C)		■	■	■	As required
Firmware Update	■	■	■	■	■
Calibration Date Update in Device Firmware		■	■	■	■
Testing of Device-specific Functions, e.g. Sensor Excitation, Filters		■	■	■	■
Calibration Certificate	■	■	■	■	■
Calibration Tag for the Device	■	■	■	■	■
Calibration Data Exchange according to VDI/VDE 2623 After Consultation (testing required)		■	■	■	■
Warranty Renewal for 12 Months Following the Calibration			■	■	
Initial Inspection for Mechanical Damage			■	■	■
Hardware Repair				■	
Pick-up and Delivery Service upon Request	Optional	Optional	Optional	Optional	Optional

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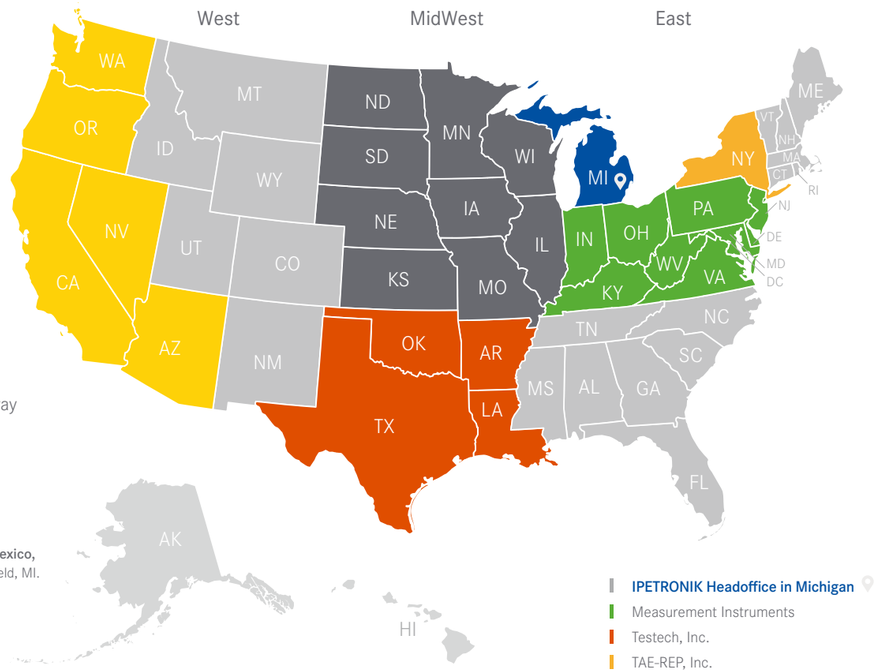
Contact



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Subject to technical alterations

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