m+p VibMobile

Measurement Front-end for Mobile Noise & Vibration Analysis, Vibration Testing and Data Acquisition

m+p VibMobile is specifically designed for the requirements of mobile multi-channel data acquisition and dynamic signal analysis in vibration testing, noise and vibration analysis and condition monitoring. The compact form factor, a rugged design and the battery option make it perfectly suited for portable applications in the field, on site and in all kinds of vehicles.

m+p VibMobile front-end

A wide range of analog or digital input and output boards are available for the m+p VibMobile allowing for voltage input, IEPE sensor conditioning, bridge completion, temperature measurement, tacho inputs or voltage outputs for sourcing power amplifiers.

m+p VibMobile is equipped with a powerful embedded CPU running on a Windows operating system for standalone operation. Eight slots for I/O boards allow for up to 64 analog input or source channels within a single m+p VibMobile mainframe. Additionally, four freely selectable CompactPCI® Serial boards can be plugged in, giving the system almost unlimited and unmatched flexibility for specific measurement, communication and data storage requirements.

Multiple mainframes can be used within the measurement task, all being synchronized by daisy-chained master/slave configuration. Synchronization is possible even over hundreds of metres distance between the devices.

Key Features

- Portable, for field and laboratory use
- Standalone or 19" rack mounting, ¾ 19" wide, 4U high
- Rugged housing for harsh conditions
- 15 slots, 12 of them freely selectable
- Up to 8 boards with analog inputs or source channels and up to 4 CompactPCI® Serial boards in a single mainframe
- Vibration, noise and dynamics measurements
- Strain measurements
- Up to 204.8 kHz simultaneous sampling, multiple gain amplifiers
- Up to 10 MHz simultaneous sampling with 3rd party CompactPCI® Serial board
- High-performance CPU (Windows 7 embedded) and SSDs
- Differential and single-ended measurements
- IEPE sensor conditioning
- TEDS support for automatic front-end and transducer detection
- 2 source output channels in standard configuration, expandable up to 34
- Safety shutdown for source channels
- 2 tacho inputs, expandable
- 4 digital inputs and 4 digital outputs
- DSP powered real-time processing
- Multiple m+p VibMobile synchronization, daisy-chain connection
- Ethernet interface, 1 Gbit/s transfer rate
- Silent operation, temperature-controlled fan

Mainframe

The m+p VibMobile mainframe is ¾ 19" wide and 4U high. It houses 15 slots, 12 of them can be configured with your choice of modules.

Configuration from left to right on front panel:

- 1 slot for control unit
- 8 slots for freely selectable m+p VibMobile boards (A/D converters, D/A converter/tacho input module, bridge modules)

- 1 slot for CompactPCI® Serial CPU board
- 1 slot for CompactPCI® Serial USB interface board
- 4 slots for freely selectable CompactPCI® Serial boards (or XMC modules or low-profile PCIe boards via adapters)

Flexibility is essential in today's testing. Therefore we offer the m+p VibMobile in different variants to meet all the challenges you encounter in your daily test activities: The mainframe is equipped with feet and lightweight side panels for use as a standalone desktop instrument, brackets are available for 19" rack mounting.

m+p VibMobile is powered by a 240 V AC or 12 – 16 V DC supply or by an optional internal battery. If one of these sources is no longer available or if the voltage becomes too low, the intelligent power supply unit switches to another supply without interrupting the operation. The battery will be automatically charged when not in use and the current load status is displayed by the Windows operating system.

Temperature-controlled fans guarantee silent operation.

Mainframe

15-slot m+p VibMobile mainframe

Rear view

Mainframe Specifications

General Characteristics	
Mains power supply	100 - 240 V AC
Power consumption	200 W
Total battery capacity	95 Wh
Battery autonomy	30 - 40 min. for fully equipped m+p VibMobile
DC input	12 - 16 V, 300 W
Fans	Silent operation, speed controlled by temperature sensor
Dimensions	Height: 177.8 mm (4U) Width: 330 mm (¾ 19") Depth: 395 mm
Weight	ca. 6 kg with control unit CTGen, CPU board and USB board Battery: 1090 g
Housing material	Steel painted, aluminium blend frames
Protective side panel material	Polyurethane
Connectors, Rear Side	
AC input	C14 connector
DC input	NL2FX speakon connector, lockable
System ground	4 mm banana jack
Switches, Rear Side	
240 V AC power supply on/off	Yes
Battery on/off	Yes

Embedded CPU

m+p VibMobile is used with an embedded CompactPCI® Serial CPU board which establishes the communication to the m+p VibMobile boards and transfers data and measured values to the LAN interface via a Windows Service. For standalone operation all application software is installed on the CPU with monitor, keyboard and mouse directly connected to the CPU. The user can implement custom programs and functions, for example to operate other CompactPCI® Serial boards.

Powerful CompactPCI® Serial CPU board equipped with 4th generation Intel® Core™ processor

The high-performance, rich featured CompactPCI® Serial CPU board is equipped with a 4th generation Intel® Core™ i7 2.4 GHz mobile processor (quad-core) and runs with Windows 7 embedded. The CPU supports 8 GB DDR3L RAM. The front panel is provided with two Gigabit Ethernet jacks, two USB 3.0 receptacles for optional use of keyboard and mouse, and two Mini DisplayPort connectors for attachment of high-resolution digital displays.

One Ethernet controller supports IEEE 1588-2008 Precision Time Protocol including PPS and PPM signals. This synchronizes the internal timebase using PPS (pulse per second) and ensures that measurements of distributed, networked m+p VibMobile systems are started exactly at the same time. Every channel is kept in perfect synchronization with all other channels in the system.

The SATA 6G Raid controller allows for two onboard SSD discs. The controller and a 60 GB mSATA SSD disc module are included in the standard instrument, discs featuring data storage capacities of 120 GB, 240 GB, 480 GB and 1 TB are also provided.

Embedded CPU Specifications

CPU	
	4th generation Intel® Core™ Haswell ECC, i7-4700EQ processor 2.4/1.7GHz, quad-core
Performance Rating	
	Passmark 8.0 performance test (Windows 8.1/64, 16 GB RAM, C47-MSATA mezzanine SSD storage module), SC2-680D (i7-4700EQ): passmark rating 2686, CPU rating 7888
Graphics	
	Integrated HD graphics GT2-4600 engine, enhanced media processing, max. resolution 3200 x 2000 @ 60 Hz, integrated audio
Chipset	
	Intel® QM87 Lynx point platform controller hub, 8 x PCIe Gen2 5GT/s, 6 x SATA 6G, 10 x USB2, 4 x USB3, LPC, audio, legacy
On-Board Controllers	
	3 x Gigabit Ethernet controllers Intel® I210IT, one of them supporting IEEE 1588-2008 Precision Time Protocol including PPS and PPM signals, 1 x Gigabit Ethernet PHY Intel® I217LM, PCIe Gen2 packet switch 16-lane 16-port PLX 8618, SATA 6G RAID controller
Expansion	
	Mezzanine side card connectors, 2 x USB 2.0 & legacy, 3rd DisplayPort, 3 x SATA 6G & 4 x USB 2.0, PCIE
Front Panel I/O	
	2 x Gigabit Ethernet RJ-45, 2 x Mini DisplayPort (mDP), 2 x USB 3.0

Control Unit CTGen

Control unit CTGen

The CTGen board in slot 0 of the m+p VibMobile controls the basic functions. It accommodates the source and tacho channels, the calibration input/output, digital I/Os and the clock in/clock out circuitry and has several LEDs for displaying the current system state.

Analog Outputs

The two analog outputs are used for vibration testing or modal analysis applications requiring drive signals for the shakers. They include a hardware shutdown circuitry which ramps down the source signals in a controlled manner in case of emergency, for example at power failure or when the connection to the host PC is lost.

Tacho Channels

Two tacho inputs are included with 32-bit high-speed up/down counters for measuring synchronous signals on rotating machines or for use as COLA synch inputs for shaker sine reduction applications.

Auxiliary Digital Inputs

These two channels can be programmed as additional trigger or clock inputs, for example to synchronize with GPS receiver or IEEE 1588 clock and to start PPS signal output.

Calibration Input/Output

The built-in "REF IN" input enables easy calibration of the inserted A/D converter boards. The "REF OUT" output measures and checks the internal reference.

Digital Inputs/Outputs

Four digital inputs and four digital outputs support various testing tasks, e.g. combined environmental tests (climatic chamber control) or parallel functional tests. One input channel serves as digital trigger, another one as safety shutdown.

Clock In/Clock Out

When higher channel counts are needed, the m+p VibMobile can be operated with multiple other m+p VibMobile front-ends. This is made possible via a daisy chain connection which leads from the clock output of the master mainframe to the clock input of the first slave in the chain. Every other slave in the network receives its input signal from the data output of the preceeding slave. Connection is done using a standard patch cable between the clock out connector of the first m+p VibMobile and the clock in connector of the next m+p VibMobile.

Alternatively, a PPS signal coming from the GPS receiver or the IEEE 1588 Ethernet controller is used for synchronization.

In addition, the control unit has a watchdog function which monitors the communication to the CompactPCI® Serial CPU board. If necessary, this function stops the current measurement in a controlled manner.

Control Unit CTGen Specifications

Analog Output	
Number of channels	2
Channel type	Differential
Coupling	DC
Resolution	24 bits
Sampling rate	Synchronized with analog inputs, 102.4 kHz max.
Output voltage range	± 10 V, max. 10 mA
Output impedance	50 Ω
Signal-to-noise ratio	≥ 100 dB
DC offset	≤ 5 mV calibrated
Calibration	Offset
Frequency range	0 to 40 kHz (- 3 dB)
Signal shutdown	Yes
Tacho Input	
Number of channels	2
Channel type	Differential or single-ended
Coupling	DC
Trigger threshold	- 10 V to + 10 V, programmable
Hysteresis	0 to 1 V, programmable
Input voltage	± 10 V
Overload protection	40 V max.
Counter	32-bit resolution, 24 MHz (max.)
Dynamic Signal Processors	
Number of DSPs	2, 300 MHz floating point
DSP 1	Tacho inputs, D/A converter
DSP 2	Signal processing

Control Unit CTGen Specifications

Calibration	
Number of calibration channels	2
REF IN	Calibration of A/D converters
REF OUT	Measurement of the internal 10 V reference
Digital Input/Output	
Number of digital I/Os	8 (4 inputs, 4 outputs), isolated, one input (port 4) as safety shutdown
Trigger input (port 1)	1 digital input
Level	TTL (H: > 2.4 V, L: < 0.8 V)
Output current	- 25 to + 10 mA
Programmable Auxiliary Digital Input	
Number of digital inputs	2
Level	TTL H: 1.8 - 3.3 V
Connectors	
Analog output channels	2 SMB
Tacho input channels	2 SMB
AUX channels	2 SMB
Calibration source	2, 2 mm banana jacks
Digital input/output	4/4 screw terminal
Clock in/out	2 RJ-45
Indicators	
Power on	1 LED, red: system in standby mode, can be switched on green: system switched on
State	1 LED, off: application not logged in green: application logged in blinking green: application logged in and measurement running red when booting the system: 10 sec LED test red: problem recognized
Battery	1 LED, red: battery operation off: 240 V AC or 12 V DC operation
Analog output channels	2 LEDs, green: signal output
Tacho input channels	2 LEDs, green: trigger
Buttons	
Power on/off	Yes, integrated LED red/green
Setup	For m+p staff only
Reset	For m+p staff only
Dimensions	
Size	7HP/3U

Analog-to-Digital Converter Module VMAI810 (102.4 kHz)

8-channel A/D converter with SMB connectors
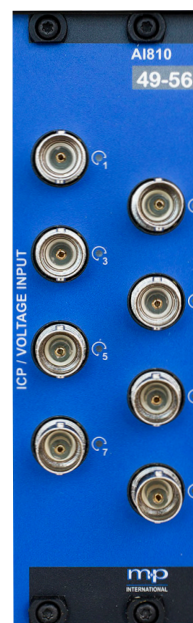
Double-wide front panel with BNC connectors

Analog input circuits have advanced sigma-delta converters which offer advantages such as simultaneous sampling by independent A/D converters on each input, reduced noise and improved accuracy due to 64 times over-sampling on each input. Both analog and digital filtering are used for full anti-aliasing protection and excellent low-level signal-to-noise performance and differential linearity is provided.

Signal conditioning for the analog input channels provides source capabilities for IEPE sensors including cable break indicators as well as an interface for accessing standardised Transducer Electronic Data Sheets (TEDS). TEDS support is a time-saving tool to automatically enter information stored in the transducer, e.g. sensitivity, calibration and serial number.

The input channels can be switched between single-ended and full differential mode for potential-free measurements.

Each A/D converter module has two 300 MHz floating point dynamic signal processors: one DSP for addressing the converters, offset correction and downsampling and the other one for signal processing and TEDS support.

Two versions are available: A single-wide front panel with eight SMB connectors and a double-wide one with eight BNC connectors.

Analog-to-Digital Converter Module VMAI810 Specifications

Analog Input	
Number of analog input channels	8
Channel type	Full differential or single-ended, switchable
Analog-to-digital converter type	Sigma-delta
Resolution	24 bits
Sampling rate per channel	Typically 65.536 and 102.4 kHz, programmable
Input voltage range	± 10 V
Overload protection	40 V max.
Input impedance	≥ 1 MΩ
Coupling	AC/DC, switchable per channel
AC coupling 3 dB corner frequency	0.34 Hz
Signal-to-noise ratio	≥ 105 dB (for short-circuited input)
Amplitude accuracy	± 0.06 dB (at 1 kHz)
Amplitude flatness	± 0.015 dB (DC to 40 kHz, relative to 1 kHz)
Spurious-free dynamic range	120 dB (typical 125 dB)
Cross-channel phase match	< 0.1 deg (at 1 kHz)
Channel crosstalk	≤ - 100 dB (at 1 kHz)
Frequency response	DC coupled: 0 Hz to 0.4 * fs - 0.1 dB AC coupled: 3 Hz to 0.4 * fs - 0.1 dB
Total harmonic distortion	- 95 dB (typical)
Alias protection	≥ 100 dB
DC offset	≤ 1.5 mV calibrated
ICP power supply	4 mA, 24 V, switchable per channel
TEDS support	Yes, according to IEEE P1451.4, switchable per channel
Dynamic Signal Processors	
Number of DSPs	2, 300 MHz floating point
DSP 1	Addressing the converters, offset correction, downsampling
DSP 2	Signal processing, TEDS
Connectors	
Analog input channels	Single-wide front panel: 8 SMB Double-wide front panel: 8 BNC
Indicators	
Input signal conditioning per channel	8 LEDs, green: IEPE operation red: IEPE error off: IEPE off
Dimensions	
Size	Single-wide front panel: 4HP/3U Double-wide front panel: 8HP/3U
Weight	Single-wide front panel: 250 g Double-wide front panel: 350 g

Analog-to-Digital Converter Module VMAI820 (204.8 kHz)

8-channel A/D converter with SMB connectors

Double-wide front panel with BNC connectors

The Analog-to-Digital Converter Module VMAI820 is the more powerful version of the VMAI810 module and includes a maximum 204.8 kHz sampling rate, configurable input architecture and gain as well as multiple clocking and trigger options. The VMAI820 is a useful tool for a range of special applications including ultrasonic measurements in sonar, automotive crash testing as well as in other high frequency event analysis such as explosive shock. With a full 24-bit precision at the 204.8 kHz sampling rate the VMAI820 ensures precise signal data is captured for both online and post-processing requirements.

The switchable input voltage ranges provide improved sensitivity for very low level vibration signals and microphone measurements as well as a higher range to handle higher outputs from sources such as tacho sensors. Six input ranges are available: ± 100 mV, 316 mV, 1 V, 3.16 V, 10 V and 20 V.

Another important feature of the VMAI820 module is the analog filter selection. The standard configuration consists of a 0.3 Hz and a 10 Hz AC filter. On request, a 0.05 Hz AC filter can be purchased which replaces the 10 Hz filter.

The 204.8 kHz module is available as single-wide front panel with eight SMB connectors and as double-wide one with eight BNC connectors.

Analog-to-Digital Converter Module VMAI820 Specifications

Analog Input	
Number of analog input channels	8
Channel type	Full differential or single-ended, switchable
Analog-to-digital converter type	Sigma-delta
Resolution	24 bits
Sampling rate per channel	204.8, 102.4, 81.920, 65.536, 51.2 and 32.768 kHz programmable, additional down-sampling in DSP
Input voltage range	± 100 mV, 316 mV, 1 V, 3.16 V, 10 V, 20 V peak full scale
Overload protection	40 V max.
Input impedance	1 MΩ (100 kΩ in 20 V range), capacitance: 20 pF
Coupling	AC/DC switchable per channel
AC coupling	0.3 Hz, 10 Hz (switchable), Optional: 0.05 Hz replacing 10 Hz
Signal-to-noise ratio	At 102.4 kHz sampling: > 105 dB in 1 V, 3.16 V, 10 V, 20 V ranges > 92 dB in 100 mV range > 96 dB in 316 mV range
Amplitude accuracy	± 0.06 dB (at 1 kHz)
Amplitude flatness	± 0.015 dB (DC to 80 kHz, relative to 1 kHz)
Spurious-free dynamic range	120 dB (typically 130 dB)
Cross-channel phase match	< 0.1 deg (at 1 kHz)
Channel crosstalk	< - 100 dB (at 1 kHz)
Frequency response	DC coupled: 0 Hz to 0.4 * fs: 0.1 dB calibrated AC coupled: 10 Hz: 70 Hz to 0.4 * fs - 0.1 dB 0.3 Hz: 2 Hz to 0.4 * fs - 0.1 dB 0.05 Hz: 0.35 Hz to 0.4 * fs - 0.1 dB
Total harmonic distortion	At 102.4 kHz sampling: < 100 dB
Alias protection	> 100 dB
DC offset	< 1.5 mV calibrated
IEPE/ICP power supply	4 mA, 24 V, switchable per channel
TEDS support	Yes, according to IEEE P1451.4, switchable per channel
Dynamic Signal Processors	
Number of DSPs	2, 456 MHz floating point
DSP 1	Addressing the converters, offset correction, downsampling
DSP 2	Signal processing, TEDS
Connectors	
Analog input channels	Single-wide front panel: 8 SMB Double-wide front panel: 8 BNC

Analog-to-Digital Converter Module VMAI820 Specifications

Indicators	
Input signal conditioning per channel	8 LEDs, green: IEPE operation red: IEPE error off: IEPE off
Dimensions	
Size	Single-wide front panel: 4HP/3U Double-wide front panel: 8HP/3U
Weight	Single-wide front panel: 250 g Double-wide front panel: 350 g

Digital-to-Analog Converter/Tacho Input Module VMT4S4
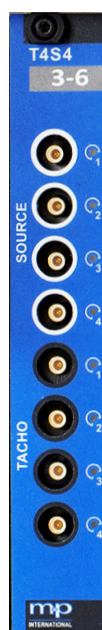
4-channel analog output/4-channel tacho input

This module provides four analog outputs for vibration testing or modal analysis applications requiring drive signals for the shakers and four tacho inputs for rotating machinery testing.

The analog outputs include a hardware shutdown circuitry which ramps down the source signals in a controlled manner in case of emergency, for example at power failure or when the connection to the host PC is lost. The tacho inputs with 32-bit high-speed up/down counters are used to measure synchronous signals on rotating machines.

Digital-to-Analog Converter/Tacho Input Module VMT4S4 Specifications

Tacho Input	
Number of channels	4
Channel type	Differential or single-ended
Coupling	DC
Trigger threshold	- 10 V to + 10 V, programmable
Hysteresis	0 to 1 V, programmable
Input voltage	± 10 V
Overload protection	40 V max.
Counter	32-bit resolution, 24 MHz (max.)
Analog Output	
Number of channels	4
Channel type	Differential
Coupling	DC
Resolution	24 bits
Sampling rate	Synchronized with analog inputs, 102.4 kHz max.
Output voltage range	± 10 V, max. 10 mA
Output impedance	50 Ω
Signal-to-noise ratio	≥ 100 dB
DC offset	≤ 5 mV calibrated
Calibration	Offset
Frequency range	0 to 40 kHz (- 3 dB)
Signal shutdown	Yes
Dynamic Signal Processors	
Number of DSPs	2, 300 MHz floating point
DSP 1	Tacho inputs, D/A converter
DSP 2	Signal processing
Connectors	
Tacho input channels	4 SMB
Analog output channels	4 SMB
Indicators	
Tacho input channels	4 LEDs, on: trigger
Analog output channels	4 LEDs, on: signal output

Bridge Module VMBR810L

8-channel bridge module with 9 pin LEMO 0B connectors

Double-wide front panel with 7 pin LEMO 1B connectors

The m+p VibMobile bridge module simplifies experimental stress analysis and fatigue testing of mechanical structures. A single module enables connection of 8 strain gauges in full-, half-, or quarter-bridge configurations. The built-in bridge excitation and completion is individually programmable for each channel, thus making time-consuming hardware re-configuration of different gauge types unnecessary.

Typical applications include both static and dynamic strain measurements, load tests, fatigue tests for durability analyses, structural testing in aerospace, material testing and residual stress analysis.

LEMO connectors are used for wiring. These robust and reliable connectors have proved ideal for flexible strain measurement configurations. The standard module has 9 pin LEMO 0B front panel connectors. A double-wide front panel with 7 pin LEMO 1B connectors is also available. All channels support TEDS to ensure fast, convenient and secure transfer of your transducer details to the m+p VibMobile bridge module.

Thermocouple amplifier

One input channel can be used for temperature measurements. The bridge module allows connection of a thermocouple amplifier type J or K with internal cold junction compensation. The amplifier produces a high level (5 mV/°C) output directly from a thermocouple signal.

Bridge Module VMBR810L Specifications

Analog Input	
Number of analog inputs	8 resistive bridge transducers
Resistor values	120, 350, 1000 Ω
Connector	9-pin LEMO 0B
Voltage mode	8 differential inputs, ± 10 V
Resolution	24 bits
Sampling rate per channel	max. 102.4 kHz, programmable
Bridge excitation	DC, symmetrical, 0 to ± 6 V, programmable for each channel, 12-bit resolution short-circuit protected, max. current 42 mA
Bridge completion	Half-bridge: programmable for each channel, 0.05 % Quarter-bridge: programmable for each channel 120, 350, 1000 Ω, 0.1 %
Shunt calibration	Built-in
Input voltage range	Signal inputs: ± 100 mV, ± 1 V, ± 10 V, programmable for each channel Sense inputs: ±10 V
Noise	100 mV range: SNR = 90 dB at 102.4 kHz sampling, input terminated with 120 Ω = 1.4 µV RMS/V at ± 1.25 V bridge supply 0.7 µV RMS/V at ± 2.5 V bridge supply 0.35 µV RMS/V at ± 5 V bridge supply 1 V range: SNR = 98 dB at 102.4 kHz sampling, input terminated with 50 Ω 10 V range: SNR = 104 dB at 102.4 kHz sampling, input terminated with 50 Ω Additional downsampling in DSP will improve SNR by 3 dB for each downsampling step
Total harmonic distortion	< - 90 dB
Crosstalk	< - 100 dB at 1 kHz between channels
Phase error	< 1° at 1 kHz between channels
Input protection	max. ± 25 V
CMRR	DC to 60 Hz, > 85 dB
Calibration	Offset and gain Internal programmable shunt calibration for each channel, 55 kΩ 0.05 %
TEDS support	8 channels, class 2
Filter	Per channel programmable digital filter: 4th order low-pass, or 4th order high-pass, or 2nd order bandpass low-pass 1 Hz to 100 Hz, high-pass 10 Hz to 10 kHz (max. 0.25 * fs)
Dynamic Signal Processors	
Number of DSPs	2, 300 MHz floating point, 64 Mbytes SDRAM, 8 Mbytes non-volatile flash memory

Bridge Module VMBR810L Specifications

Connectors	
Analog input channels	8 LEMO Single-wide front panel: 9 pin LEMO 0B Double-wide front panel: 7 pin LEMO 1B
Dimensions	
Size	Single-wide front panel: 4HP/3U Double-wide front panel: 8HP/3U
Weight	Single-wide front panel: 250 g Double-wide front panel: 400 g
Thermocouple Amplifier	
Types	J, K
Number of channels	1
Connectors	9 pin LEMO 0B, mini-TC
Output	5 mV/°C
Cold junction compensation	Yes
Initial accuracy	1 °C
Ambient temperature rejection	0.025 °C/°C
Ambient temperature range	0-50 °C or 25-100 °C

CompactPCI® Serial Boards

CompactPCI® Serial boards for special test applications and highest system flexibility

m+p VibMobile accomodates 4HP/3U CompactPCI® Serial boards. Four CompactPCI® Serial board slots can be freely equipped by the user. This enables tailor-made solutions matching special requirements exactly. With many 3rd party boards available m+p VibMobile supports CANbus, GPS receivers, IRIG or ARINC time protocol interfaces, RS-232 and RS-485 serial interfaces, fixed or removable disc modules with terabytes of storage capacity. For high-speed transient recording up to three 12-channel A/D converter XMC modules are mounted into the CompactPCI® Serial slots. They provide up to 10 MSa/s sampling rate per channel and 1.8M gate FPGA and are synchronized by a XMC sample clock generation module.

Fast swap of the removable disc drive

The hot plug 2.5-inch size SATA drive, either SSD or HDD, is available as fixed module or accommodated in a mobile rack. A push button on the front panel unlocks the door and ejects the removable disc drive. Storage capacities of 1 or 2 TB are available.

CompactPCI® Serial Boards
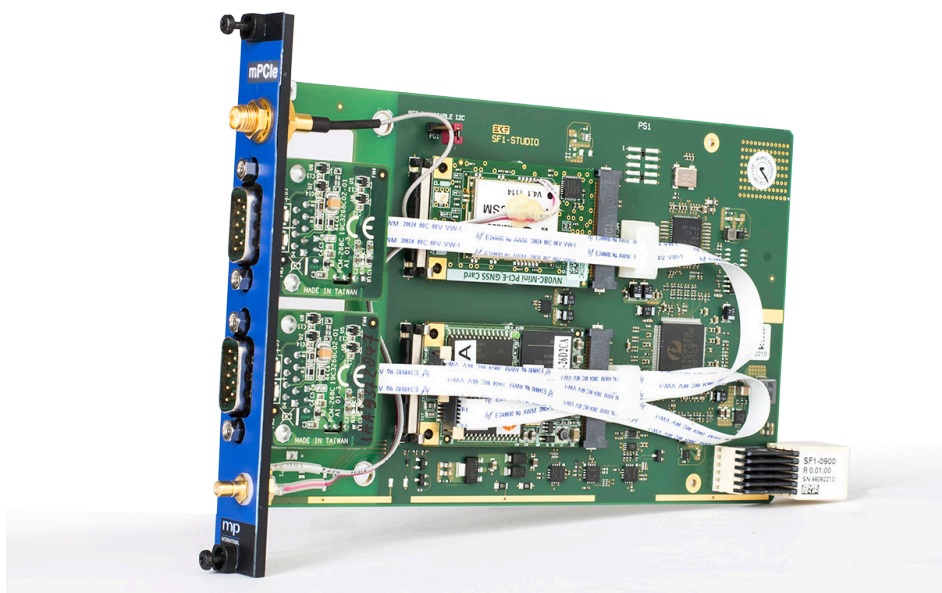
Two-port CANbus and GPS receiver incl. active antenna and PPS signal on a single board

The 2-port CANbus MiniPCIe module operates two separated CAN networks simultaneously. It allows for high-speed transmission up to 1 Mbps and supports CAN 2.0 A/B protocol. An optical isolation protection of 2,500 V_{DC} ensures system reliability.

The GPS MiniPCIe module is the first choice for distributed measurements over large distances. The GPS signal serving as time reference ensures synchronous measurement start of the independent m+p VibMobile systems even with very large test structures. The module provides the PPS (pulse per second) signal via the SMB connector on the front panel, which allows to synchronize measurements exactly over the whole world.

Operation and System Configuration

The m+p VibMobile can be operated as a front-end via Ethernet and laptop or remote PC. Alternatively, all application programs run on the embedded CPU: In this case, either monitor, keyboard and mouse or a high-resolution digital display can be directly connected to the CPU.
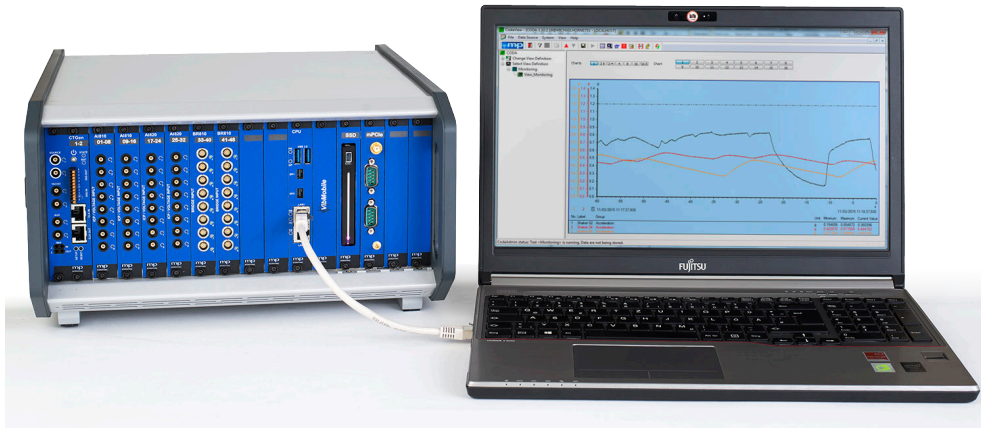

Operation with a laptop

Standalone operation: Application software installed on the
powerful embedded CPU

When testing campaigns require very high channel counts or for distributed measurements over long distances, multiple m+p VibMobile front-ends are networked to act as one multi-channel system. They can be placed close to the measuring points which minimizes costly transducer cabling and increases measurement quality. Fully synchronized, precise data of all devices are transferred via Ethernet to the host PC.

Operation and System Configuration
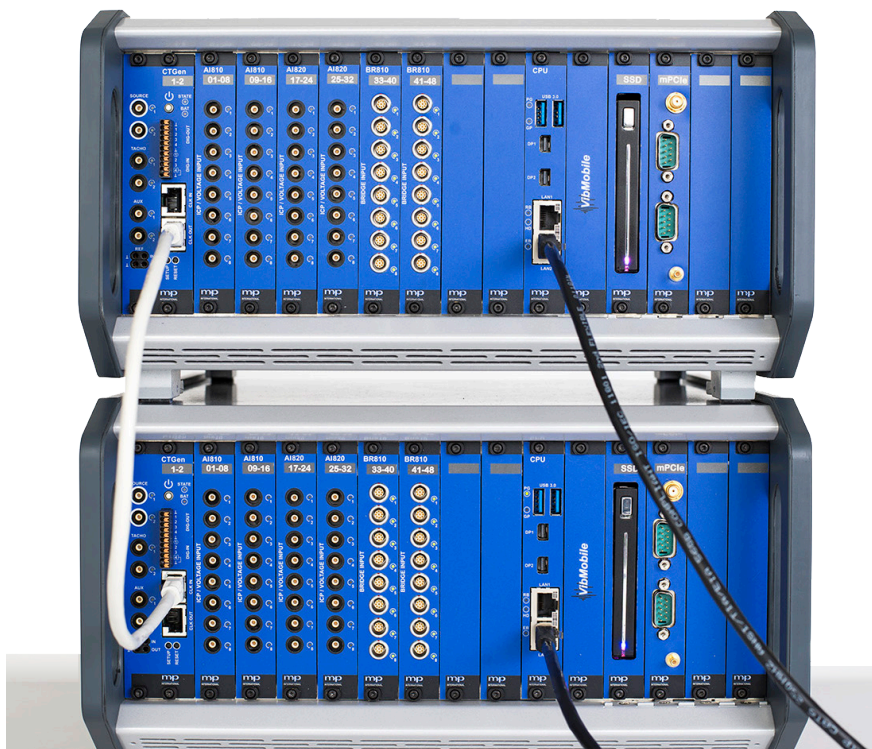
Operation of two m+p VibMobile front-ends via clock in/clock out

m+p VibMobile offers three choices for synchronization of multiple devices:

- Daisy-chain master/slave configuration, clock in/clock out connectors on CTGen board
- PPS signal provided by IEEE 1588 Ethernet on CPU board
- PPS signal provided by GPS receiver module

The PPS signal is used as a "start measurement" trigger.

Combinations of these and signal line triggers are also possible.

Networking Specifications

Synchronization	
Clock out	Master clock and synchronization pulse output
Clock in	Master clock and synchronization pulse input
Master/slave	Configured in software
Connection cable clock in/clock out	Patch cable
PPS signal generated by GPS receiver	Once per second, ± 100 ns
PPS signal generated by IEEE 1588 Ethernet	Once per second

Accessories

3/4 19" shock protected ZARGES box for transportation and operation

Explorer transportation box for m+p VibMobile mainframe and laptop

Blank Panel	
	1 slot
Filter Insert	
	Incl. filter pad
Boxes	
ZARGES box	For m+p VibMobile mainframe, 3/4 19 inch wide, shock protected, for transportation and operation, front and rear cover, olive-green; including rack-mount kit for m+p VibMobile, 4U, 11.7 kg
Explorer transportation box	For m+p VibMobile mainframe and laptop, shock protected, vapour tight, on wheels, Polypropylen, according to NATO specs, 627 x 475 x 292 mm (l x w x h), 10 kg
Adapters	
SMB-BNC adapter cable	1 m, female-female
LEMO 0B 9 pin-RJ-45 adapter cable	0.5 m, male-male
Gigabit Ethernet Switches	
Netgear ProSafe GS105E	5 port Gigabit Ethernet switch incl. power supply
Netgear ProSafe GS716T	16 port Gigabit Ethernet switch incl. power supply

Environmental and Safety Specifications

Environment	
Operating temperature	0° C to + 50° C
Storage temperature	- 25° C to + 70° C
Humidity	0 to 95% rel. humidity, non-condensing
Standards	
EMC compliance	Certified with DIN EN 55011, DIN EN 61000-4 (-2, -3, -4, -5, -6, -11), FCC Part 15 B, ICES-003: Issue 4 Contact discharge: 4 kV Air discharge: 8 kV

Warranty, Calibration, Upgrade and Repair Services

Warranty	
	12 months, optional 24 or 36 months
Calibration	
	m+p VibMobile front-end is calibrated before delivery and delivered with calibration certificate; factory re-calibration (return to m+p) and on-site calibration is provided
Upgrade	
	On-site addition of one or more modules
Repair	
	On-site or return-to-factory repair service

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Specifications subject to change without notice.

ISO 9001
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listens to customers ...

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