optomet.
LASER VIBROMETRY

SMART DAQ

- SMART data acquisition and analysis
- Compact 3 in 1 solution: DAQ box, oscilloscope and arbitrary signal generator
- High-frequency signal analysis up to 50 MHz
- Seamless experience: fully-featured data analysis in SMART Lab
- Synchronization with other SMART devices
- Excellent connectivity: Wi-Fi, Bluetooth & USB
- Noiseless operation through passive cooling

High performance multichannel data acquisition and signal generation, fully synchronized with all other SMART devices, ensuring seamless integration and efficient, real-time data analysis.

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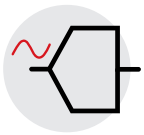
General specifications

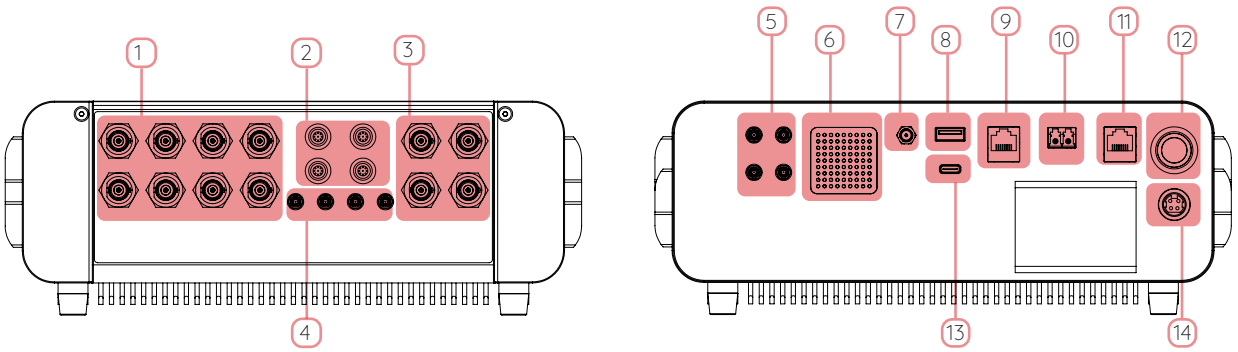


Overview

Max. frequency bandwidth	DC to 50 MHz
Signal processing	Digital (FPGA based)
User interface	7” Full HD+ touchscreen with 1000 nits peak brightness
Operating temperature	0 °C to 40 °C
Dimensions	Length × width × height: 147 × 270 × 95 mm
Weight	~ 2.5 kg
Power supply	100 - 240 V AC (50-60 Hz) or 12 V DC
Portability	Convenient all-in-one design for seamless portability and simple setup
Storage temperature	-10 °C to 65 °C

Connectivity

Schematic



1	Analog signal outputs (BNC)	8	USB port (Type-A)
2	LEMO signal inputs (12 Channels)	9	Ethernet port for device communication/data
3	BNC HF signal inputs (up to 50 MHz)	10	Optical fiber connector (LC-Duplex)
4	Multi-purpose SMB ports	11	Ethernet port for device communication/data
5	Multi-purpose SMB ports	12	Power button
6	Loudspeaker	13	Power input
7	GNSS antenna connector	14	USB port (Type-C)

Analog inputs and outputs

	Connector type	Characteristics	Description
Analog signal inputs	Up to 4 x LEMO Up to 4 x 3 = 12 channels	± 1 V / ± 10 V (switchable) 24-bit A/D converter per channel 1.5 MSPS sample rate	• Synchronous reference signal recording up to 750 kHz on 12 channels • Support for IEPE (Integrated Electronic Piezoelectric), TEDS and DC/AC coupling • Input impedance: 1 MOhm ‖ 20 pF (optional 1 GOhm ‖ 3 pF)
Analog HF signal inputs	Up to 3 x BNC	± 2 V 14-bit A/D converter 312.5 MSPS sample rate	• Synchronous HF signal recording up to 50 MHz on 3 channels • Input impedance: 50 Ohm
Analog signal outputs	Up to 8 x BNC Up to 8 independent channels	± 2 V 16-bit D/A converter 312.5 MSPS sample rate	• Versatile signal outputs: Analog velocity, displacement, acceleration and arbitrary signal generator • Generate various preset functions (sine, chirp, gaussian, ...) or load arbitrary signals • Source impedance: 50 Ohm
Trigger inputs	2 x SMB		• Digital external trigger input for the device • Input impedance: 50 Ohm
Trigger outputs	2 x SMB		• Digital trigger output for external devices • Source impedance: 50 Ohm

Digital interface

	Connector type	Characteristics	Description
Ethernet (copper)	Up to 2 x RJ45	1 Gbit/s data rate	• Stream the measurement data over Ethernet with up to 312.5 MSPS and 48-bit • Digital remote control of device settings • Interface with digital data acquisition and analysis software SMART Lab • Use your device as control hub for your Ethernet-based equipment
Ethernet (fiber optical)	Up to 2 x LC-Duplex	10 Gbit/s / 1 Gbit/s data rate (switchable)	• Stream the measurement data over Ethernet with up to 312.5 MSPS and 48-bit • Digital remote control of device settings • Interface with data acquisition and analysis software SMART Lab • PTP-based synchronization with other SMART series devices • Up to 20 km range (up to 160 km on request)

Connectivity options

	Connection type	Description
Synchronization	4 x SMB	• 2 x synchronization inputs (Input impedance: 50 Ohm, 3.3 V or 5 V) • 2 x synchronization outputs (Source impedance: 50 Ohm, 3.3 V) • Frequency synchronization with external devices using 10 MHz signals • Frequency & phase synchronization with external devices via PPS (Pulse per second)
USB	1 x USB-C (USB 3.2) 1 x USB-A (USB 3.0)	• Connect USB devices such as cameras, keyboards or storage devices to the vibrometer for direct data recording
Wireless	Bluetooth 5.2 Wi-Fi 7	• Bluetooth: connect human interface devices such as keyboard, mouse or headphones to the vibrometer • Wi-Fi: control your vibrometer wirelessly and stream measurement data over the air
GNSS-module	GPS, Galileo, GLONASS and BeiDou	• Precise absolute time and position information using global navigation satellite systems (GNSS) • External antenna connector
Inertial measurement unit (IMU)		• Synchronous recording of the vibrometer's acceleration and orientation • Vibration monitoring of vibrometer enables detection of disturbances • More accurate alignment with your test object

Configurable options

Warranty

Waranty	12 months	S
Warranty extension	Extension of standard warranty by 12 months	O

Maintenance

Extended maintenance	Additional extension of hardware maintenance by 12+ months	O
Recalibration & cleaning	Check, cleaning & realignment of optical parts, check of laser output power, and factory calibration	O

Accessories

Transport case	• Stable and waterproof Peli case for safe storage and transport of the vibrometer • External dimensions (L x W x H): 62 x 49 x 22 cm	S	
Transport bag	Compact and light transport bag for outdoor measurements	O	

Software SMART Lab

Highlights

- Lifetime license with no recurring costs
- Installation on any capable computer with Windows 10 / Windows 11
- 1 x license key included (via dongle or online license key)
- Analysis of measurement files for up to 3 users with a single software license
- Connect and control multiple devices at the same time for effortless data acquisition
- Selection of measurement point on loaded 3D-model
- Convenient access to all data in a single software - from vibrometers to multiple reference sensors
- Seamless switching between time and frequency domain representation
- Multichannel arbitrary signal generator for generating predefined signals (sine, sine sweep, square, random, etc.) or custom signals from imported .csv or .wav files
- Calculation of various frequency functions: FRF, FFT, auto-spectrum, cross-spectrum, coherence
- Multithreading export of time data, all frequency functions, and reference channel data into the Universal File Format (.uff), Hierarchical Data Format (.hdf5), and MATLAB® file format (.mat)
- Save and load all settings and measurement data in Optomet File Format

SMART Lab - Features

Remote control	• All DAQ settings via a single ethernet connection • Multiple vibrometers at once for reference, multipoint and 3D vibration measurements
Acquisition module	• Phase correct and fully-synchronized reference data acquisition • Convenient access to all your data in a single software - from vibrometers to multiple reference sensors • Live view of measured time and frequency data • Multi-channel arbitrary signal generator to generate predefined signals (sine, sine sweep, rectangle, random, etc.) or custom signals from imported .csv or .wav files • Triggering on measured signals or external triggers • Trace history to record and recall multiple traces of the acquisition data
Analysis module	• Real-time Fast Fourier Transform (FFT) for responsive data analysis • Frequency domain representation with up to 536 Mio FFT lines • Fourier boundaries to limit FFT calculations to certain time ranges of the time data • Several window functions for FFT calculations, including rectangular, hanning, hamming, exponential • Phase correct calculation of the frequency response function (FRF) • Live Spectrogram of the ongoing measurements FFT's
Data export	• Export time and frequency data to .csv, .h5, or .mat files • Export time data as .wav audio file • Take screenshots from within our software and export with up to 4K resolution • Save projects to and load projects from the native file format

SMART Lab runs on any modern computer with Microsoft Windows.

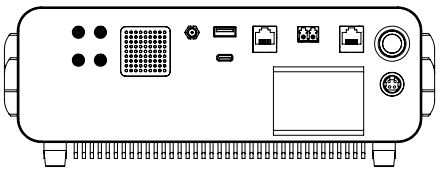
SMART Lab - Software updates

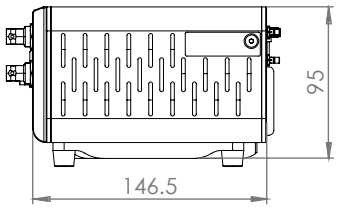
2 years of included software updates	S
Extension of software updates by 2 years	O

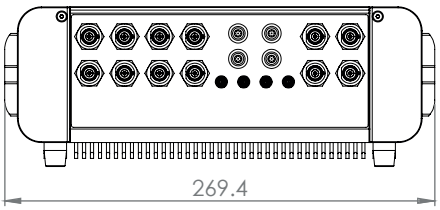
Mechanical parameters

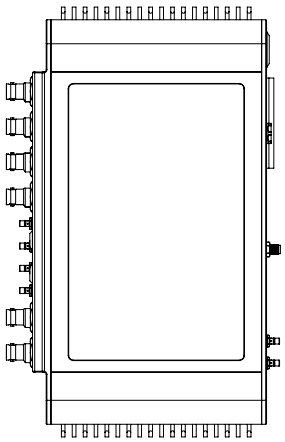
Overview

Dimensions	Length × width × height: 147 × 270 × 95 mm
Weight	~ 2.5 kg
Operating Temperature	0 °C to 40 °C
Storage Temperature	-10 °C to 65 °C
Relative Humidity	max. 80 %, non-condensing









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