



The SiBOX acquisition module family contains devices for vibration measurements of machines and civil engineering structures. These devices have been designed based on many years of practical experience in industrial measurements. The applied most advanced digital measurement and signal processing techniques guarantee high precision measurements. They were proven to work in harsh industrial environment. SiBOX acquisition modules are offered in portable and stationary version.



Precision

The applied 24-bit A/D converters together with advanced filtering and signal processing methods make it possible to achieve a high stability of parameters and a very low noise level. The built-in precise self-calibration mechanism guarantees minimization of measurement errors even in the case of varying environmental conditions in a place of installation.

Scalability

Ethernet interface, the advanced data communication protocol and the unique signal sampling synchronization interface enable the SiBOX devices to operate in complex, multichannel measurement systems. Such systems can integrate in their structure acquisition modules designed for operation with other types of transducers (temperature, pressure, position, strain, electrical parameters).

Internal Data Processing

The heart of the SiBOX family devices are advanced multicore microprocessors. They execute complex digital signal processing algorithms, such as signal filtering, frequency spectrum and diagnostic parameters calculation as well as alarm generation extremely fast. It preserves full device functionality also in real-time operation. Data processing functionality is tailored individually taking into account the final application.

Universal Data Communications

Each device from the SiBOX family may be equipped with Ethernet or WiFi interface. With their unique IP addresses devices can be connected to any existing network infrastructure. The outstanding flexibility of this solution makes it possible to build both classic cable-based and wireless measurement systems of a high complexity, consisting of many different measurement devices. The DAQ cards communicate with a supervisory system using dedicated ATC MESbus protocol or optionally Modbus TCP protocol (when configured as stand alone device with WWW user interface). The application of industrial communication standards make the devices compatible with existing automation systems.

Wide Support for Software

The SiBOX acquisition modules cooperate with dedicated software allowing measurement data acquisition and presentation (ATC DAQ™), machine monitoring and diagnostics (VIMEA VIDIA™) and turbogenerator monitoring and diagnostics (VIMEA DAAC/VSIT™). In a case of implementing WiFi interface the can communicate with Android based applications mVIDIA™ or mMonitor™. Each program functionality can be developed to match requirements of the application.

For the ease of implementation in specific applications, special scripts have been prepared for integration with Matlab and LabView environments. API libraries for Java and C/C++ are also available when requested.

Number of analog/digital input channels	8, simultaneous sampling (other configuration as an option)
Analog input type	voltage, bipolar, BINDER connector (other as an option)
Analog input configuration	<ul style="list-style-type: none"> voltage mode voltage mode with constant current source for ICP/ IEPE (CLPS™)
Analog input signal voltage range	±0.1V; ±0.2V; ±0.5V; ±1V; ±2V; ±5V; ±10V; ±25V; (other as an option)
Analog to digital converter type	8 analog to digital converters ΔΣ type
Analog to digital converter resolution	24 bits
Analog input overall noise level	10 μV _{RMS} (input range ±0.5V, frequency range 10 kHz)
Input signal sampling frequency (f _s)	> 8 MHz
Effective signal sampling frequency (f _{out}) (output data update frequency)	max. 65.5 kHz, adjustable
Embedded filters	<ul style="list-style-type: none"> high-pass first-order analog filter, cutoff frequency f_{3dB low} = 0.2 Hz (connected) low-pass anti-aliasing digital filter, linear phase, cutoff frequency automatically adjusted to f_{3dB High} = 0.49 f_{out}
Gain error	±0.02 % (calibration in operation conditions)
Highest overall measurement error	±0.1 % for input range ±0.5 V (calibration in operation conditions)
Calibration	<ul style="list-style-type: none"> factory calibration of the analog reference circuit embedded self-calibration routine for amplification and offset
CLPS™ sensor power supply current loop	3 mA, 20 V
Additional sensor voltage power supply	option: 8 x 5V/50mA or application specified
Communication interface	Ethernet 10/100/1000 Base TX, TCP/IP IEEE802.11g WiFi (option for portable version) System synchronization digital output
Communication protocol	ATC MESbus optionally: Modbus/TCP, Modbus/RTU, application specified
Maximum operating conditions	60°C, 95% RH without condensation
Software	Vimea DAQ, Vimea VIDIA, Vimea DAAC/VSIT optionally: API, Matlab function, LabView driver, application specified
Power supply	9 - 24 VDC, 1.5 A

