DATASHEET

VibSys® A01

Vibration monitoring system & cloud gateway

VibSys A01

Redefining vibration monitoring

VibSys A01 is a compact vibration monitoring system and cloud gateway that delivers reliable machine health insights for any rotating machine. It makes vibration data accessible and actionable through an open ecosystem, enabling predictive maintenance strategies and seamless integration into modern data systems.

A01 is the first release. It provides dependable hardware, consistent data, and a defined core feature set with a seamless Istec Sphere cloud platform connection. This allows early users to start now and expand capability through updates.

Additional firmware features will be released over time. These updates extend onboard data processing and automation capabilities, without requiring hardware replacement. These items are highlighted as '*future*'.



VIBRATION MONITORING FOR A WIDE RANGE OF APPLICATIONS

- Vibration monitoring on rotating equipment.
- Continuous acquisition, verified data, and advanced local signal processing for local alarms.
- Raw and processed data can be transferred onto the Istec Sphere cloud platform for further processing.
- Eliminating the need for inefficient and costly manual vibration measurement rounds.

Typical applications include:

- Balance of Plant (BoP)
- Pumps, compressors and fans

Future:

- *Gas, steam & hydro turbines*
- *Wind turbines*
- *Gearboxes*
- *Marine applications*

KEY FEATURES

- Designed for 2-wire IEPE vibration sensors
- 4-channel system
- Up to 32 pre-defined extractions per channel
- Wide range of connectivity for analysis platform and IoT networks
- Digital and analog I/O for local interfacing
- Modbus TCP connectivity

CYBER SECURITY

VibSys can be deployed as a stand-alone monitoring system, integrated into plant networks, or connected to cloud-based applications. Communications between devices, software platforms, and external systems are protected using HTTPS/TLS encryption. This flexible architecture allows organizations to align connectivity and cybersecurity measures with their own operational and security requirements.

KEY CYBER SECURITY FEATURES

- HTTPS/TLS encrypted communications
- Stand-alone operation possible without network connectivity
- Plant network integration via industrial communication interfaces (e.g. Modbus TCP)
- Deployment within segregated OT networks
- Cloud-connected deployment options
- Flexible integration into existing OT and IT environments

More details are available in the document 'VibSys Cyber Security Overview' (pending).

SYSTEM OVERVIEW

Interfaces

Sensor input	4 × IEPE vibration	
Analog input	2 × current or voltage input	
Digital input	1 × speed and 1 x status	*(future: 2 x speed)*
Relay output	2 × SPST	
Analog output	4 × current output	

INPUT

Sensor input

Sensor type	2-wire IEPE accelerometers directly	
	2-wire externally powered sensor, signal offset required	
	Other sensor types through Signal Bridge / Isolator	
Constant current supply	4.5 mA	
Sensitivity	100 mV/g	
Input voltage range	0 – 24 V_{DC}	
Bandwidth	0.2 Hz – 20 kHz	
Input impedance	100 kΩ	
Resolution A/D conversion	24-bit	
SNR A/D conversion	105 dB	
CMRR	≥ 80 dB	
Amplitude accuracy	≤ 1% of FSD	

Analog input

Range	4 – 20 mA or 0 – 30 V (passive, externally powered)	
Resolution	24-bit	
Function	User-configurable range to receive process parameters to trend and trigger the vibration measurements	

Digital input

Frequency range	0 Hz – 10 kHz	
Input range	0 – 30 V, max. 15 mA	
Trigger level	'High' ≥ 4 V	
Impedance	> 2 kΩ	
Function	DI1: Speed input	DI2: Digital switch to reset the device

OUTPUT

Relay

Number	2 × relay output, SPST (1 × COM 1 × NO)	
Maximum switching capacity	30 V_{DC} / 2 A	(resistive load)
	30 V_{DC} / 100 mA	(inductive load)
Function	User-configurable relays for single channel alarms or voted outputs	

Analog output

Number	4 × analog output
Type	4 – 20 mA current loop (active, device-powered)
Resolution	16-bit (0 – 24 mA)
Accuracy	0.1 %
Function	User-configurable range to transmit current output value

Status LED indicators	
LED indicators	4 × sensor status & 4 × channel status

POWER

Unit power consumption	≤ 10 W
DC Input	
DC input voltage	24 V_{DC} (18 – 31.2 V_{DC}) (SELV required)
Maximum Ethernet port capacity	Max. 16 VibSys units daisy-chained per Ethernet port
Power over Ethernet	
Standard	IEEE 802.3at (PoE+)
Maximum PoE port capacity	Max. 30 W per PoE port → max. 3 VibSys units daisy-chained per PoE port

CONNECTIVITY

Communication		
Ethernet hardware	Dual RJ45 port, ethernet switch functionality	
Module connection	Non PoE: 16 units daisy-chained per ethernet port	
	PoE: 3 units daisy-chained per PoE port	
Cloud connection	Istec Sphere analysis platform	
	External API connections	*future*
Protocols	HTTPS	
	Modbus TCP	
	MQTTS	*future*
	CAN-bus	*future*
Data transmission interval		
Static extraction values	Minimum 5 minutes	
Dynamic waveform and spectrum	Minimum 1 hour	

SYSTEM FEATURES

Housing	
Material	Polyamide (PA 66 GF 30)
Connectors	Push-in type terminals
Dimensions	45 x 127 x 114 mm (1.78 x 5.00 x 4.49”)
Mounting	DIN rail (“top hat”, 35 mm)
Ingress protection	IP20 according to IEC 60529. Indoor use or use in a protective enclosure
Weight	± 245 g (8,64 oz)
Environmental conditions	
Operating temperature	-20 to 60 °C (-4 to 140 °F)
Storage temperature	-40 to 85 °C (-40 to 185 °F)
Operating & storage humidity	< 95%; condensation to be avoided
Conformal coating	Yes
Other	Overvoltage category II / Pollution degree 2

PROCESSING

Measurement resolution	Waveform: up to 65,536 points (16-bit)	
	Spectrum: 32768 lines of resolution	
	Spectrum: configurable lines of resolution	*future*
Sampling rate	48 kHz	
FFT window	Hanning; Rectangular	
Averaging (frequency domain)	*Overlap and averaging*	*future*
Extracted data	Up to 32 processed outputs per channel	
Integration	Acceleration to velocity	
Signal level metrics	True RMS, Scaled RMS, scaled peak	
	True peak, True peak-peak , Scaled peak-peak, Crest factor	*future*

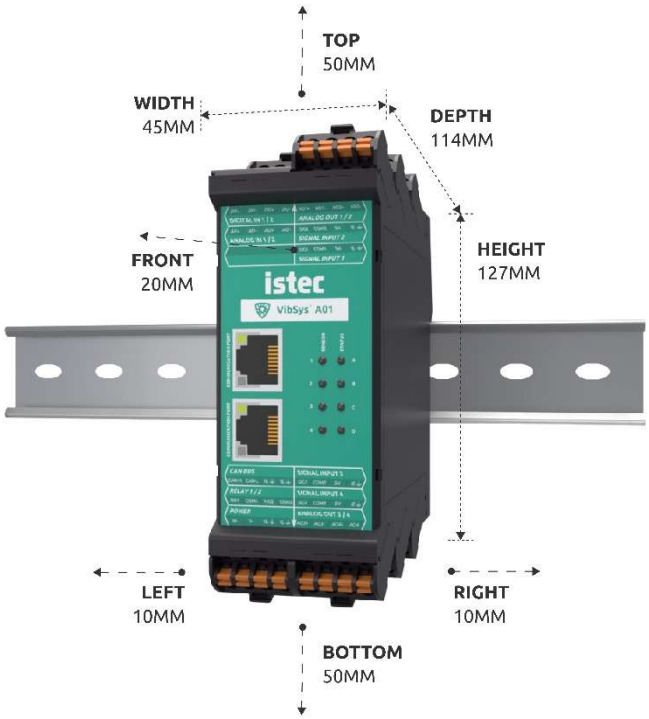
WAVEFORM AND SPECTRUM

Name	Processing	TWF / FFT	HP1	LP1
TWF_A	ADC		0	Fmax
TWF_V (future)	*ADC + filter + integration*		*10*	*Fmax*
FFT_A	Fast Fourier Transform	TWF_raw	0	Fmax
FFT_V (future)	*Fast Fourier Transform*	*FFT_A*	*10*	*Fmax*

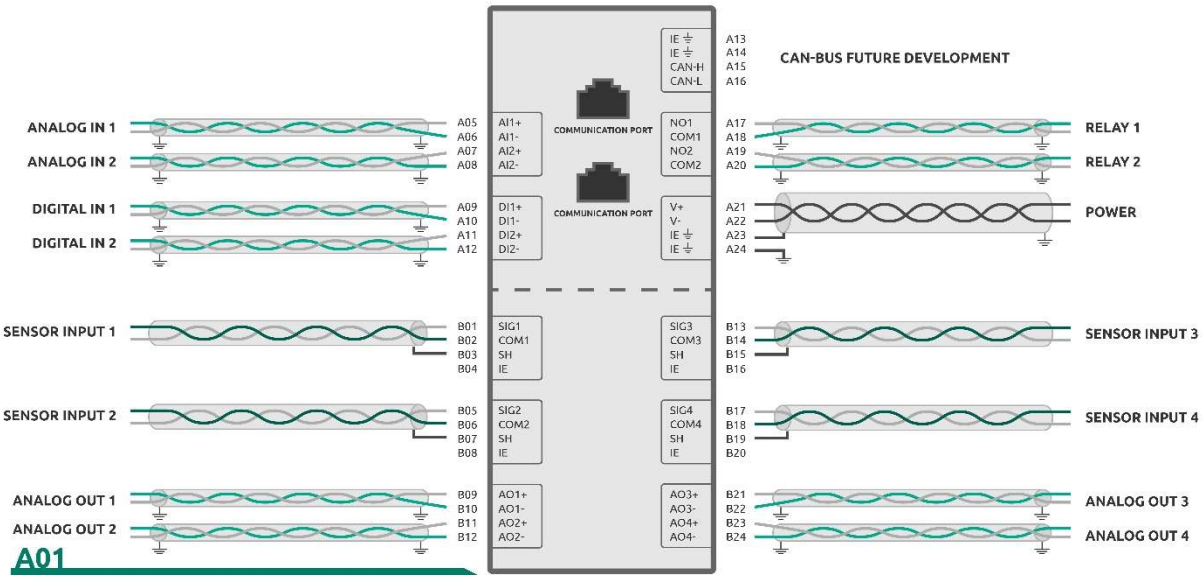
EXTRACTIONS

Name	Processing	TWF / FFT	HP1	LP1	Detection
Overall	Time domain	TWF_V	3	1000	True RMS
Band_2_1k_A_RMS	Frequency domain extraction	FFT_A	2	1000	RMS
Band_10_1k_A_RMS	Frequency domain extraction	FFT_A	10	1000	RMS
Band_10_5k_A_RMS	Frequency domain extraction	FFT_A	10	5000	RMS
Band_10_10k_A_RMS	Frequency domain extraction	FFT_A	10	10000	RMS
Band_2k_10k_A_RMS	Frequency domain extraction	FFT_A	2000	10000	RMS
Band_2_1k_A_Pk	Frequency domain extraction	FFT_A	2	1000	Peak
Band_10_1k_A_Pk	Frequency domain extraction	FFT_A	10	1000	Peak
Band_10_5k_A_Pk	Frequency domain extraction	FFT_A	10	5000	Peak
Band_10_10k_A_Pk	Frequency domain extraction	FFT_A	10	10000	Peak
Band_2k_10k_A_Pk	Frequency domain extraction	FFT_A	2000	10000	Peak
Band_2_1k_V_RMS	Frequency domain extraction	FFT_V	2	1000	RMS
Band_10_1k_V_RMS	Frequency domain extraction	FFT_V	10	1000	RMS
Band_10_5k_V_RMS	Frequency domain extraction	FFT_V	10	5000	RMS
Band_10_10k_V_RMS	Frequency domain extraction	FFT_V	10	10000	RMS
Band_2_1k_V_Pk	Frequency domain extraction	FFT_V	2	1000	Peak
Band_10_1k_V_Pk	Frequency domain extraction	FFT_V	10	1000	Peak
Band_10_5k_V_Pk	Frequency domain extraction	FFT_V	10	5000	Peak
Band_10_10k_V_Pk	Frequency domain extraction	FFT_V	10	10000	Peak
1xHarmonic_V	Frequency domain extraction	FFT_V	0.9nX	1.1nX	Peak
2xHarmonic_V	Frequency domain extraction	FFT_V	1.9nX	2.1nX	Peak
3xHarmonic_V	Frequency domain extraction	FFT_V	2.9nX	3.1nX	Peak
Not_1xHarmonic_V	Frequency domain extraction	FFT_V	0.9nX	1.1nX	Peak
SumHarmonics	Frequency domain extraction	FFT_V	1X + 2X + 3X		

DIMENSIONS AND MOUNTING



WIRING DIAGRAM



APPROVALS

International standards	CE	
Electromagnetic compatibility	EN 55011:2016 + A1:2017 + A11:2020 + A2:2021 (Group 1, Class A)	
	EN 55032:2015 + A11:2020 + A1:2020 (Class A)	
	EN IEC 61000-6-2:2019	
Environmental / RoHS	EN IEC 63000:2018 (RoHS 3)	
Marine type approval	*DNV type approved product*	*future*

ABOUT ISTEC

We ensure maximal value generation of your critical machinery with advanced protection and monitoring solutions. Every Istec product is designed to meet the increasing demands of industrial applications and taps into our 50 years of experience in the industry.

Our expertise is to support and maintain these critical sensors and systems in the field throughout their operational life; to increase safety, maximize machine availability and to provide new monitoring data and machine insights.

Questions and support?	**Contact Istec International**	
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This product has been tested according to the listed standards. If the product is used in a manner not specified by manufacturer the degree of protection may be impaired. Therefore, the product documentation must be read completely, carefully and all safety instructions must be followed.

The information in this document, like descriptions, drawings, recommendations and other statements, was drawn in good faith to be correct, but the completeness and accuracy of this data cannot be guaranteed. Not all possibilities or situations are described in the product documentation. Before using this product, the user must evaluate it and determine its suitability to the intended application.

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