MVX ONLINE MONITORING SYSTEM
Technical datasheet

MONITORING AND DIAGNOSIS OF CRITICAL MACHINES

The self-contained and intelligent ONEPROD MVX system is intended for continuous multi-channel monitoring of rotating machinery, enabling the early detection of faults, even on the most complex machines. It is the culmination of ONEPROD's 25 years' experience of machinery monitoring throughout the industrial sector.

ONEPROD MVX is a versatile system offering 8 to 32 data acquisition channels for all signal types (IEPE, AC voltage, DC voltage, 4-20 mA, impulses). With its flexible configuration options and extensive calculation capacity, this system makes it possible to implement intelligent and targeted localized monitoring.

General		
Monitoring	Number of channels	8, 16, 24 or 32
	Type of inputs	IEPE AC, IEPE DC, 4-20 mA, voltage input (AC+DC, DC), impulse counter
	Logical inputs	4 or 8 logical inputs
	Long-time waveform option (DAT)	Up to 82 s of signal on 30 channels regardless of the sampling frequency with a max of 4 Msamples
	Management of variable operating conditions	Up to 10 operating conditions per machine (including a default condition in case of communication loss with the PLC or OPC server)
	Number & type of operating parameters	Up to 6 parameters (3 process scalar information + 3 logical inputs)
	Monitoring frequency	Up to real-time capabilities
	Low-speed shaft monitoring	Suited for low-speed shafts starting from a few RPM. Automatic early fault detection with Shock Finder algorithm
	Storage to database	Periodic, condition-based, alarm-based, triggered manually
	Prevention against false alarms	Customizable parameters: Hysteresis management, stabilization delay, operating condition time-out
Interfaces	Modbus	I/O (RS485 or TCP/IP)
	OPC	I/O
Physical	Dimensions	MVX-160: 350 x 171 x 86 mm
		MVX-320: 350 x 171 x 100 mm
	Weight	about 3.1 kg (or 6.8 lbs)
	Casing matter	galvanised steel
	Mounting	DIN TS 35 rail; optional: pre-equipped cabinet
	Transportable version	Check our ONEPROD VMS datasheet (transportable case with BNC inputs)
	Compliances	CE
Environmental	Protection	IP 20
	Operating temperature	from -20 to +60°C
	Humidity	95% max, with no condensation
	Storage temperature	from -20 to +75°C
	Vibrations	NF60-002 compliant according the following limits:
		0.4 m/s between 5 Hz and 20 Hz
		5g pick between 20 Hz and 120 Hz
	Cooling system	through forced air
	Air flow rate	up to 35 m^3/h

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Processing Details

General	Frequency range	50 Hz; 100 Hz; 200 Hz; 500 Hz; 1 kHz; 2 kHz; 5 kHz; 10 kHz; 20 kHz.
	Number of lines	400; 800; 1,600 or 3,200
	Number of averages	from 1 to 4,096
	Multichannel acquisition type	independent or synchronous
	Type of average	linear, exponential, peak
	Overlap	0%; 50%; 75%
	High-pass filter	2 Hz; 10 Hz; 3 kHz
	Integration	none, 1 or 2
	Zoom factor	none; x2; x4; x8; x16; x32; x64; x128; Maximum resolution: 30 MHz
	Windowing	Hanning; Rectangular; Flat-top
	Synchronous analysis	yes / no
	Envelope detection	yes / no
Embedded post-processing of time waveforms	SFI (Shock Finder)	Automatic abnormal periodic shock detection; binary result; number of shocks. *requires DAT option*
Embedded post-processing of FFT	Number max of post-processed parameters	Up to 10 indicators can be defined from a spectrum
	Broadband indicators	RMS, equivalent peak or equivalent peak-to-peak level between two fixed frequencies
	Narrow band indicators	RMS, equivalent peak or equivalent peak-to-peak level defined over a few spectral lines centered on a fixed or variable frequency the number of lines can be parameterized the center frequency is defined by two coefficients, A and B (integer), and by the following formula: Fc = A.F0 + B (with F0= rotation frequency)
Real-time processing	High-pass filter	2 Hz or 10 Hz
	Signal integration	0 or 1
	Low-pass filter	1,000 Hz or no filter (i.e., 20 kHz)
	Processing	RMS, pk or pk-pk
	Averaging	continuous exponential with time constant between 1 s and 25 s averaged DC level (for process and GAP signals)
	BGI indicator (Blade Guard Index)	Specific indicator dedicated to the monitoring of structural resonance, particularly suitable for wind turbine blades
	GCI indicator (Gearbox Condition Index)	Oil particle counting interface with GASTOPS METALSCAN unit. The following indicators are available: • GCI-h: number of particles detected in the last hour • GCI-d: number of particles detected in the last 24 hours (performed in a slipping mode) • GCI-t: Total number of detected particles
	Broad band and narrow band extraction on real-time FFT	FFT 400 pts, 800 pts, 1,600 pts or 3,200 pts FFT 1 kHz, 2 kHz, 5 kHz, 10 kHz or 20 kHz, FFT with 50% fixed overlapping
Time wave on event *requires DAT option*	Fixed sampling rate	51.2 kHz.
	Length	1s to 30 s on 32 channels. Up to 480 s on 2 channels
	Pre-trigger duration	0 to total time wave length

Electrical monitoring ESA (Electrical Signature Analysis)

	Type of inputs	Voltage transducers (typically, AV100-750, covering voltages ranging from 100 V to 750 V RMS); Current transducers (typically, HASxxx-SB, HTRxxx-SB or HOPxxx-SB, covering currents ranging from a few amps to 2,000 A RMS)
	Additional accessories (required)	Mandatory connection through MVX EIM modules
	Automatic diagnosis	Rotor bar damage, Static eccentricity, Dynamic Eccentricity, etc.

Communication Details

Ethernet	10/100 base T ports can be used; compatible with Wi-Fi, 3G modems.
Number of Ethernet ports	2 ports Typical use: 1 for the PLC Modbus TCP, 1 for the office network and communication with NEST software
Modbus	RS485 or TCP/IP (Ethernet port)
Modbus mode	MVX is Modbus Slave. In this case MVX can exchange data in both directions (input and output) with one PLC.
	MVX is Modbus Master. In this case MVX can read data (input) on 1 to 3 PLCs.
Available data on Modbus output	Number of indicators, Values of indicators, Status of indicators, Units of indicators, Values of operating parameters
Available data on Modbus input	Values of operating parameters; Values of indicators
Logical output	4 or 8 logical alarm outputs + 1 integrity relay
OPC Server (through NEST software)	Publishing of machine alarm status and expert advice; publishing of parameters values and alarm statuses
CMMS interface (through NEST software)	Automatic triggering of work requests, monitoring of updates on work orders
Management of communication loss	Data integrity guaranteed with embedded storage and automatic retry in case of communication failure. 3G compatible.
SMS / E-mail sending	On any alarm status change or aggravating status change only, through NEST software.

VERSIONING

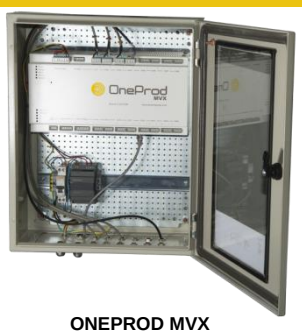
Function	EASY	PREMIUM
Time acquisition	☑	☑
Spectral acquisition	☑	☑
Continuous monitoring	☑	☑
Periodic acquisition	☑	☑
Taking into account of operating conditions	☑	☑
Elaboration of “standard” indicators” **(*)**	☑	☑
Elaboration of indicators based on other filters		☑
Elaboration of Kurtosis indicators		☑
Elaboration of $Smax_{pp}$ indicators		☑
Elaboration of *Blade Guard Index* (BGI)		☑
Elaboration of *Shock Finder Index* (SFI)	☑	☑
Elaboration of *Gearbox Condition Index* (GCI)	☑	☑
Calculation of the RMS value	☑	☑
Calculation of the “equivalent peak” value	☑	☑
Calculation of the “equivalent peak-to-peak” value	☑	☑
Calculation of the “true peak” value		☑
Calculation of the “true peak-to-peak” value		☑
Calculation of broad-band indicators from spectrum		☑
Calculation of narrow-band indicators from spectrum		☑
Envelope spectra		☑
Short term trend	☑	☑
ESA (requires DAT option and XPR software)	☑	☑
Real-time monitoring capability: 100% of signal		☑
Time wave on event with pre-trigger		☑ Requires DAT option
DAT mode (long-time signal)	(Option)	(Option)

***List of standard indicators:**

- Broad-band 2 Hz / 20 kHz acceleration
- HF 3 kHz / 20 kHz acceleration
- 2 Hz / 1,000 Hz velocity
- 10 Hz / 1,000 Hz velocity
- 2 Hz / 1,000 Hz absolute displacement
- 10 Hz / 1,000 Hz absolute displacement
- 2 Hz / 20 kHz relative displacement
- Relative position (GAP)
- Bearing defect factor

SPECIFIC VERSION AND ACCESSORIES

ONEPROD VMS transportable case
16 or 32 channels with BNC connectors
(Available with different functionality levels and with or without PC)



ONEPROD MVX
Pre-equipped cabinet
(solution on request)

ONEPROD EIM connection box
for ESA Electrical Monitoring
MVX3003000