Bently Nevada
a Baker Hughes business

Orbit DCM

S1 Enabled

A powerful, advanced edge device for Distributed Condition Monitoring (DCM) with plantwide connectivity and asset performance management

Bently Nevada's new Orbit DCM device is a flexible and scalable system fully supported by our System 1 condition monitoring and diagnostic software. It delivers economic vibration monitoring along with Bently Nevada's reliable signal processing for important assets.

With high-speed data collection, processing on the edge, and synchronous data acquisition across all 16 channels, Orbit DCM gives operators the machine health insights they need to succeed.

Machinery applications

Orbit DCM is an ideal condition monitoring instrument for machinery with rolling element bearings and complex gearboxes, including:

- Agitators
- Air compressors
- Blowers
- Centrifuges
- Cooling tower fans and pumps
- Extruders
- Machine tool spindles
- Mill stands
- Motors
- Paper machines
- Pumps
- Small centrifugal compressors
- Wind turbine generators

Key features

System 1 enables strategic, data-driven maintenance planning and decision-making to optimize asset reliability.

- Compact and easy to install
- Cybersecure with built-in tamper detection
- Simultaneous 16-channel data sampling, 4 digital inputs
- Configurable channels support a variety of transducers
- Four keyphasor channels for synchronous sampling
- Support for use with single PC or network
- Three wired ethernet connections
- RS485 interface for serial communication
- 24-bit A/D conversion with high precision
- Offline data storage on communication loss
- Supports two-wire IEPE/ICP accelerometers up to 10 mA
- Multiple user-configurable waveforms per channel
- Configurable setpoints with alarming and events
- Data storage and alarming based on machine operating state
- Built-in modbus (server & client) support (RTU, TCP)

The Orbit DCM and System 1 software complement your predictive maintenance program by performing cost-effective data collection and condition monitoring analysis.

System 1 is at the core of all our condition monitoring solutions—providing an innovative, single ecosystem for full plant-wide machinery management.

Capability

Scalable database management, diagnostics, and work prioritization via System 1 software platform.

- High-resolution trends and alarming
- Short-term “black box” flight recorder
- Anti-friction rolling element bearings
- Diagnostic reporting

Specifications

Input channel specifications

16 dynamic vibration channels	
Signal range	+24 V to -24 V 10 mV constant current IEPE/ICP @ 24 V
Dynamic range	108 dB (for ±24 V full scale)
A/D sampling	102.4 ksps
Bandwidth	0 to 40 KHz
Input impedance	100K Ω
Transducer power supply	10 mA (available on each of 16 channels) +24 V (external needed) -24 V (external needed)

4 KPH (speed) channels	
Signal range	3.5 V to -23 V -50 V to +50 V (magnetic pickups)
Speed range	0 to 120,000 RPM
Events per revolution (EPR)	1 to 10,000 (configurable)
Input frequency	20,000 pps
Transducer power supply	-24 V (available on each 4 KPH channel) +24 V (external)

4 digital Inputs	
Configurable	For state trigger
Levels supported	5 V TTL compatible (high: open drain)

Instrument configuration

Security	Installed certificate authentication. Username and password based
Deployment and commissioning	via Orbit Studio
Condition monitoring configuration	via System 1
Status indicators	7 LEDs indicating power, OK, network, and device status

Advanced features

Measurements, waveforms, and spectrum support	
Samples per waveform (sync and async)	Up to 32K samples per waveform
Max. frequency	Up to 40 KHz
Spectrum window techniques	User-configurable: flat top, Hanning, Blackman, rectangular
Spectral lines/resolution	Up to 12,800
Scalar measurements	Direct, bias, speed, gap, RMS, integrated
Spectrum-based extractions	Spectral overall, energy and peak extractions

Data storage	
Storage frequency	User-configurable (fastest up to every 30 seconds)
Offline storage	Over 7 days data storage onboard

Alarming and state evaluation	
Alarming types	In-band, out-of-band, over, under (4 severity levels each)
Alarm and state processing	Evaluation every 1 second
Event and data	Events generated and high-resolution data storage for every alarm

Communication and protocols	
Ethernet ports	3 RJ45, 10/100/1000 BASE-T
RS485	Serial interface (115,200 baud)
System 1 protocol	Bently Nevada proprietory protocol for communication with S1
Modbus TCP (client and server)	For data imports/exports to/from external controllers and DCS via ethernet
Modbus RTU (client and server)	For data imports/exports to/from external controllers and DCS via RS485

Power, mechanical, environmental, and EMC

Power supply	3 A @ 24 V
Boot-up time	< 3 minutes
Operating temperature	-30°C to 65°C (adherance to EN/IES 60068-2-2) mounted inside IP66 cabinet
EMC and RoHS 2014/30/EU directives	According to EN/IEC 61326-1, EN/IEC 61000-6-2 and 61000-6-3
IP rating	IP20 according to EN/IEC 60529 without cabinet; IP66 in cabinet
CE marking	EMC and RoHS 2014/30/EU directives
Dimensions (L x W x H)	291 x 211 x 79 (mm)
Weight	2.7 kg
Mounting	DIN rail mounting, bracket mounting

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