vb5 Portable Data Collector

Datasheet

Bently Nevada Machinery Condition Monitoring

Description

The vb5 Portable Data Collector instrument is a portable single channel vibration data collector. It is ergonomically designed and lightweight for all day comfort. You can use this device for on-route as well as off-route data collection.

The vb5 Portable Data Collector provides recordings with up to 6,400 lines of resolution and up to 40 kHz F_{max}. Our patented adaptive settling algorithm and 6Pack recording system offer quick, one-step data recording.

The data collector has plenty of storage and long battery life, and is backed by a five year warranty.

The vb5 Portable Data Collector is one of Bently Nevada hardware monitoring assets that work with System 1 Evolution software.

The vb5 Portable Data Collector offers the following features:

- Single channel recordings
- 6,400 lines FFT resolution
- Supports 40 kHz F_{max}
- 1 GB memory
- ≥ 95 dB dynamic range
- Spectrum and waveform recordings
- Demodulation for early detection of rotating machinery problems such as bearing faults
- Unique 6Pack recording system
- Cable test mode
- Option to add flex features such as balancing and Remote Comms
- Upgradable Proflash system and free firmware updates for 5 years
- Five-year warranty on the instrument hardware

Specifications

Sensors

Sensor Input	One channel
Compatible Sensor Types	Accelerometer
AC Coupled Range	16 V peak-peak Allows for ± 8 V sensor output swing (± 80 g)
Connectors	1 x BNC (CH1) Safety feature: Break-free inline connector
Analog to Digital Conversion	24-bit ADC
Sensor Excitation Current	0 mA or 2.2 mA (configurable), 24 V maximum 2.2 mA required power for IEPE/ICP type accelerometer
Sensor Detection	Warns if short circuit or not connected

Tachometer Sensor (Optional)

Sensor Type	Laser sensor with reflective tape Sensor triggers on beam reflection
Laser Sensor Range	10 cm to 2 m nominal Range depends on size of reflective tape

Tachometer Input

Supported Sensor Types	Laser Tach, Contact, TTL Pulse Instrument has optically isolated input
Power Supply to Sensor	5 V, 50 mA
TTL PulseRating	3.5 V (4 mA) min 28 V (5 mA) max Off-state 0.8 V
Speed Range	10 RPM to 300,000 RPM (0.2 Hz to 5 kHz) Pulse width at least 0.1 ms
Accuracy	± 0.1 %

Parameter Indication

Maximum Levels (peak)	> 1000 g (10,000 m/s2) > 1000 in/sec (25,000 mm/s) > 20 in (500 mm) Effective limit is sensor sensitivity and output voltage
Dynamic Signal Range	> 95 dB typical at 400 line resolution
Harmonic Distortion	Less than -70 dB typical Other distortions and noise are lower
Units	g or m/s2 or adB in/s or mm/s or vdB mil or mm or µm 0-peak, peak-peak or RMS Auto-scale by 1000x when required US and SI options for amps and volts
Magnitude and Cursors	Overall RMS value Waveform True pk-pk Dual cursors Harmonics Digital readouts on chart
Base Accuracy	± 1% of readings approximately 0.1 dB % of reading
High Frequency Attenuation	≤ 0.1 dB 100 Hz to 10 kHz ≤ 3 dB >10 kHz to 40 kHz Attenuation tolerances are in addition to base accuracy.
AC Coupling Attenuation	≤ 0.1 dB 10 Hz to <100 Hz ≤ 3 dB 1 Hz to <10 Hz
Attenuation Due to Integration	≤ 0.1 dB 1 Hz to <100 Hz ≤ 1.5 dB 0.2 Hz to <1 Hz Values apply to single integration. (Acceleration to velocity) Double the values for double integration (Acceleration to displacement)

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Spectrum Display

F$_{max}$ Ranges	25, 50, 100, 125, 150, 200, 300, 400, 500, 600, 800, 1000, 1200, 1600, 2000, 2500, 3000, 4000, 5000, 6000, 8000, 10,000, 15,000, 20,000, 30,000, 40,000 Hz Or equivalent CPM values Or orders-based from 1X to 999X
F$_{min}$ Possible Range	0 to F$_{max}$ Instrument zeroes all spectral lines below F$_{min}$
Resolution	400, 800, 1600, 3200, 6400 lines
Frequency Scale	Hz, CPM, Orders Linear scale with zooming
Amplitude Scale	Acceleration, velocity, displacement Linear or log scales, auto or manual scaling
Window Shapes	Hanning Rectangular
Overlap	(0, 12.5, 25, 37.5, 50, 62.5, 75, 87.5) % Depends on F$_{max}$ and number of lines
Number of Averages	1, 2, 4, 8, 16, 32, 64, 128 Increases sampling time proportionally
Averaging Types	Linear, exponential, peak hold
Demodulation Bandwidths	23 bandwidth options From 125 Hz to 1250 Hz Up to 16 kHz to 20 kHz
6Pack	Up to 40 kHz & 3200 lines (1 channel) Spectrum and waveform for low-frequency, high-frequency and demodulation

Waveform Display

Number of Samples	1024, 2048, 4096, 8192, 16,384
Time Scale	10 ms to 256 seconds or orders based from 1 to 999 revs

Logging and Analysis

Output Formats	Instrument screen, transfer to System 1 Evolution, XML
Data Storage	Dual 1 GB non-volatile flash memories Database mirror copy on second flash memory
Data Storage Structure	Folders/machines/points/locations/routes No limits are applied 50 character names

Max Folder Size	10,000 measurement locations

Display and Communication

Display	Graphic Grayscale LCD LED Backlight
Resolution and Size	480 x 320 (HVGA), 5.5" (140 mm) Readable in direct sunlight
Supported Languages	English, Chinese, French, German, Japanese, Portuguese, Russian and Spanish
Communication with PC	USB or Ethernet Use PROFLASH to upgrade instrument firmware
USB Host Port	USB 2.0, supplying 5V, 250mA Save folders to USB flash drive

Battery and Charger

Battery Type	Custom Lithium Ion pack, 7.4 V, 5 Ah
Operating Time	10 hours Backlight on — 60 second timeout
Charger Type	Internal charging, automatic control External power pack 12 V DC, 3 A output
Charge Rate	3 A nominal 3 hours for complete charge

Mechanical

Size	9.9" W x 5.8" L x 2.4" H (252 x 148 x 60 mm)
Weight	2.7 lb (1.2 kg) Including battery and strap

Environmental Limits

Operating Temperature	14 °F to 122 °F (-10 to 50 °C)
Storage Temperature and Humidity	-4 °F to 140 °F (-20 to 60 °C), 95% RH Up to 95 F (35 C), 85% RH if storage exceeds 1 month
Ruggedness	IP65 sealed 4' (1.2 m) drop onto concrete Procedure: 26 drops following MIL-STD-810F-516.5-IV

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Compliance and Certifications

FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

EMC

EN 61326-1: 2012

EN 61326-2-3: 2012

EMC Directive 2014/30/EU

Electrical Safety

EN 62133: 2002

LV Directive 2014/35/EU

RoHS

RoHS Directive 2011/65/EU

Hazardous Area Approvals

For the detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (108M1756) available from Bently.com.

CSA/NRTL/C (Approval Option 01)	Class I, Division 2, Groups A, B, C, D

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Ordering Information

For the detailed listing of country and product specific approvals, refer to the *Approvals Quick Reference Guide* (108M1756) available from Bently.com.

VB5-AA

A: Agency Approval	
01	CSA

Basic Kit

We offer the vb5 Portable Data Collector instrument in a basic kit with the option to purchase the System 1 Evolution software and license separately.

> * Kit items with multiple part numbers listed have limited regional availability due to certification requirements.

Part Number	Description	Quantity
	vb5 Portable Data Collector single-channel portable data collector	1
ACCL0547 or 200350 *	Straight accelerometer	1
138M7748	Transducer cable, 4 ft. straight	1
MAGF0104	Accelerometer magnetic base	1
CABB0560	BNC to BNC cable, 1 m	1
CABU0213	USB data transfer cable	1
110M8172-012	LEMO-BNC TTL Tach/Keyphasor cable	1
PLUS0230	Category A power plug, USA / Canada	1
PLSA0241	Category D power plug, South Africa / India	1
PLAU0228	Category M power plug, Australia / New Zealand / China	1
PLHK0245	Category G power plug, Hong Kong / UK	1
PLEU0229	Category C Power plug, Europe	1

Part Number	Description	Quantity
CBVB0552	vbx instrument carry bag	1
NKST0553	vbx neck strap with Sensor Keeper	1
108M4044	AC power adapter	1
DCCA0041	DC car adapter	1
108M3536	SCOUT100 Series and vbSeries Quick Start Guide	1
MVBX0250	Instrument Reference guide	1

Additional Accessories

Software

Part Number	Description
3071/01	System 1 Evolution

Hardware

Part Number	Description
100M5828	The vbSeries hard case
DTC70262	The vbSeries dust cover
BATT0575	Replacement battery pack, Li-Ion 7.4 V 5 Ah
108M4069	Laser Tach powered by vb5 Portable Data Collector
CBL50216	Five-meter laser Tach cable for 108M4069
113M5529-01	Reflective tape One roll, 60 cm (23.7 in)

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