

SCOUT100EX Vibration Data Collector, Analyzer and Balancer

Datasheet

Bently Nevada Machinery Condition Monitoring

323223 Rev. T



Description

The SCOUT100EX Vibration Data Collector, Analyzer and Balancer is a portable hardware monitoring device that supports dual-channel vibration data collection, analysis, and balancing. Use the device to collect data from sensors on a route, for machine-side analysis and diagnosis, and on-site dynamic balance correction.

The SCOUT100EX is ATEX Zone 2 and IECEx Zone 2 compliant and safe for hazardous areas. It is both light and rugged. The neck strap includes an integrated Sensor Keeper that restrains your sensor while you walk or climb to reach other machines.

The device includes a complete suite of advanced recording and analysis capabilities, including 6Pack recordings, coast-down and long time waveform.

The SCOUT100EX offers plenty of storage and long battery life. The device comes with a five year warranty. It works with System 1 software.

The SCOUT100EX Vibration Data Collector, Analyzer and Balancer offers the following features:

- Up to two-channel, simultaneous on-route recordings
- Unique 6Pack recording system
- DC-coupled sensor support
- One GB memory plus virtually unlimited spectra and waveform storage
- Ten hours of battery life
- 6,400 lines FFT resolution
- 40 kHz Fmax



- Wide measurement range — 1,000 g, 25,000mm/s, 2,500mm
- Two-plane balancing
- Laser speed sensor for automatic capture of machine running speed
- Keyphasor tach mode
- Dynamic range ≥ 95 dB
- USB host port for data transfer to external USB memory
- Excellent ergonomics for walk-around data collection
- High contrast, backlit and direct-sunlight readable LCD
- True left and right-handed operation
- Sensor cable self-test feature
- Lightweight, rugged IP65 rated case
- Five-year warranty on the instrument hardware
- ATEX and IECEx Zone 2 hazardous location certification
- Field-upgradable Proflash system and free firmware updates for five years

Calibration Service

Bently Nevada Technical Support provides calibration services for the SCOUT100EX. To obtain assistance from your nearest repair facility:

1. Visit bently.com/services
2. Select **Repair, Spare and Replacement Parts**.
3. Under Inspection Technologies, choose Repair and Calibration Services.
4. Download the list of repair facility contacts.
5. Contact the facility nearest you for service.



Specifications

Sensors

Sensor input	Two Channels Simultaneous sampling
Compatible sensor types	Accelerometer, velocity, displacement, current
AC coupled range	16 V peak-peak Allows for ± 8 V sensor output swing (± 80 g)
DC coupled ranges	0 to 20 V -10 to 10 V -20 to 0 V E.g. for reading prox-probe gap
Connectors	2 x BNC (CH1/CH2) 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

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
Time synchronous averages	1, 2, 4, 8, 16, 32, 64, 128 Only available when tachometer is triggered
Long time waveform Fmax	25 Hz to 40 kHz 20 kHz dual channel
Long time waveform duration	14.7 million samples (total over channels) E.g. for Fmax 1 kHz Fsample = 2.56 kHz and Duration = 1.6 hrs

Tachometer

Sensor	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
Other sensor types supported	Contact, TTL Pulse, Keyphasor Instrument has optically isolated input
Power supply to sensor	5 V, 50 mA
TTL pulse rating	3.5 V (4 mA) min 28 V (5 mA) max Off-state 0.8 V
Keyphasor threshold	7.7 \pm 0.5 V 13.2 \pm 0.8 V 18.5 \pm 1 V Nominally 8 V, 13 V, 18 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 %
Output to drive strobe	Up to 140 Hz (8400 CPM) Typical Depends on strobe type Special cable required

Logging and Analysis

Output formats	LCD screen, Ascent, XML, System 1
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

Parameter Indication

Maximum levels (peak)	<p>> 1000 g (10,000 m/s²) > 1000 in/sec (25,000 mm/s) > 20 in (500 mm) > 10,000 Amps</p> <p>Effective limit is sensor sensitivity and output voltage</p>
Dynamic signal range	<p>> 95 dB</p> <p>typical at 400 line resolution</p>
Harmonic distortion	<p>Less than -70 dB typical</p> <p>Other distortions and noise are lower</p>
Units	<p>g or m/s² or adB in/s or mm/s or vdB mil or mm or μm amps</p> <p>0-peak, peak-peak or RMS Auto-scale by 1000x when required</p> <p>US and SI options for adB and vdB</p>
Magnitude & cursors	<p>Overall RMS value Waveform True pk-pk Dual cursors Harmonics</p> <p>Digital readouts on chart</p>
Base accuracy	<p>\pm 1% of readings approximately 0.1 dB</p> <p>For DC level — % of full scale For AC signal — % of reading</p>
High frequency attenuation	<p>\leq 0.1 dB >100 Hz to 10 kHz \leq 3 dB >10 kHz to 40 kHz</p> <p>Attenuation tolerances are in addition to base accuracy.</p>
AC coupling attenuation	<p>\leq 0.1 dB 10 Hz to <100 Hz \leq 3 dB 1 Hz to <10 Hz</p>

Attenuation due to Integration

\leq 0.1 dB 1 Hz to <100 Hz
 \leq 1.5 dB 0.2 Hz to <1 Hz
 \leq 0.1 dB 10 Hz to <100 Hz
 \leq 1.5 dB 1 Hz to <10 Hz

Low frequency mode:
 When Coupling = DC and Fmax \leq 100 Hz

Normal mode is applicable in all other cases.

Values apply to single integration.
 (Acceleration to velocity)

Double the values for double integration
 (Acceleration to displacement)

Balancing

Planes	Up to 2 planes, 2 sensors
Speed range	30 to 60,000 RPM
Measurement type	Acceleration, velocity, displacement
Weight modes	<p>Angle 0° to 360°, fixed position, circumference arc</p> <p>E.g. weights on fan blades, linear distance around circumference</p>
Remove trial weights	Yes/No Automatic recalculation
Manual data entry	Yes Allows re-entry of previous balance jobs
Storage	Against machines in data structure No limits applied

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

Spectrum Display

Fmax 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
Fmin possible range	0 to Fmax Instrument zeroes all spectral lines below Fmin.
Resolution	400, 800, 1600, 3200, 6400 lines 3200 lines max. for dual channel measurements
Frequency scale	Hz, CPM, Orders Linear scale with zooming
Amplitude scale	Acceleration, velocity, displacement or current 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 Fmax 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, synchronous
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) Up to 20 kHz & 1600 lines (2 channels) Spectrum and waveform for low-frequency, high-frequency demodulation
Order tracking	Up to 6 kHz Fmax, orders-based Tachometer required Mounted on high-speed shaft
Order tracking - Distortion	Less than -65 dB Within 50% to 200% speed variation during recording

Display and Communication

Display	Graphic Grayscale LCD White LED Backlight
Resolution & size	480 x 320 (HVGA), 5.5" (140 mm) Readable in direct sunlight
Supported Languages	English, French, Spanish, Portuguese, Russian, Chinese
Communication with PC	US and Ethernet (optional USB dongle) 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, 5000 mAh
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

Environmental Limits

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

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 61000-6-2

EN 61000-6-4

EMC Directive 2014/30/EU

RoHS

RoHS Directive 2011/65/EU

LVD

EN 61010-1

LV Directive 2014/35/EU

ATEX

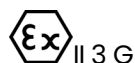
ATEX Directive 2014/34/EU

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.

ATEX/IECEx



Ex ic IIB T4 Gc

T4 @ Ta= -10°C ≤ Ta ≤ +50°C

(+14°F ≤ Ta ≤ +122°F)

Ordering Information



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

SCOUT100EX-AA-B

A: Agency Approvals

02	ATEX
05	ATEX / IECEx / CSA (Class 1, Zone 2)

B: FLEX Options

FLEXFRF	FRF Pack <ul style="list-style-type: none"> Modal Impact Testing Cross Channel Spectrum (ODS) Export via UFF — for example, to ME'scope <p>Available for these devices:</p> <ul style="list-style-type: none"> All vb6 and vb7 devices Only vb8 devices manufactured before January 3, 2013. <div> Not available on single-channel vb5. </div> <div> UFF export supported for serial number 40800 and later only. </div>

Advanced Recording Pack 1

- 80kHz Fmax
- Extended Measure Units — for example, voltage, temperature pressure.

Available for these devices:

- Only vb5 and vb7 instruments manufactured before January 3, 2013.



80 kHz Fmax supported on single-channel recordings only.



Two-channel instruments made before the Ascent 2013 release do not support 4–20mA sensors or 12 800 lines of resolution.

FLEXARPI

Advanced Recording Pack 2

- 80kHz Fmax
- Extended Measure Units
- 4–20mA sensor support
- 12 800 lines of resolution

Available for these devices

- All vb6 devices
- All vb5 and vb7 devices manufactured after January 3, 2013.



80 kHz Fmax supported on single-channel recordings only.

FLEXARP2

SCOUT100EX Basic Kit



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

Part Number	Description	Qty
108M3239	SCOUT100EX two-channel portable data collector	1
ACCL0547 or 200350 *	Straight accelerometer	1
ACCL0561 or 200350 *	Right-angled accelerometer or straight accelerometer	1
108M4044	AC power adapter	1
CABB0560	BNC to BNC Cable, 1 meter	2
110M8172-012	Cable, BNC to Lemo, Tach/Keyphasor, 1.2 meters	1
CABU0213	USB data transfer cable	1
138M7748	Transducer cable, 4 ft. straight	2
CBVB0032	SCOUT instrument carrying bag	1
DCCA0041	DC car adapter	1
113M5585	Accelerometer magnetic base	2
MVBX0250	Reference Guide	1
109M2384-01	Neck strap with Sensor Keeper	1
PLUS0230	USA/Canada – Category A power plug	1
PLSA0241	South Africa/India – Category D power plug	1
PLAU0228	Australia/New Zealand / China – Category M power plug	1
PLHK0245	Hong Kong/UK Category – G power plug	1
PLEU0229	Europe – Category C power plug	1
108M4045	SCOUT quick start guide	1
110M8172-012	LEMO-BNC TTL Tach/Keyphasor cable	1

Spares

Part Number	Description	Quantity
113M5529-01	Reflective tape One roll, 60 cm	1
LASA0315	Laser Zone 2 rated	1
CBL50216	Laser cable Five meters	1

Part Number	Description	Quantity
MAGA0063	Laser magnetic stand	1
CB5G0024	Sensor Cable Five meters, green	1 for two channel 2 for four channel
CB5R0025	Sensor Cable Five meters, red	1 for two channel 2 for four channel
CBBL0026	Carrying case for the kit	1

Accessory Kits

Balancing Kit – 108M4050-AA

A: Number of Channels

02	Two channels
04	Four channels

Zone 2 Laser Tach Kit – LASA0315

Part Number	Description	Quantity
108M4064	Laser Tacho Holder	1
108M4066	Circlips – 20Mm Stainless	1
108M4067	Arp115 Oring	2
108M4069	Laser Tach Zone 2 rated	1

Additional Accessories

Software Accessories

Part Number	Description
DGLU0219	Dongle for software seat or license mobility
CLK20399	Additional L2 user activation
SUNW0401	Network upgrade

Accelerometers

Part Number	Description
AS3100S2-Z2	General purpose accelerometer 100mV/g +/- 5% Side (right angle) exit 80g peak acceleration range ¼-28 mounting thread 0.92 inch base Zone 0
AM3100T2-Z2	General purpose accelerometer 100mV/g +/- 5% Top (straight) exit 80g peak acceleration range ¼-28 mounting thread Zone 2
AP3500T2-Z1	Low frequency accelerometer 500mV/g +/- 5% Top (straight) exit 10g peak acceleration range Zone 0/1
AP3500S2-Z1	Low frequency accelerometer 500mV/g +/- 5% Side (right angle) exit 10g peak acceleration range Zone 2

Miscellaneous Parts

Part Number	Description
MAGM0064	Accelerometer magnetic base Male connection
BATT0575	Battery pack ATEX
DTC70262	Neoprene dust cover
VBMR0222	Stainless safety rings (1 pair)
100M5828	SCOUT/vb Series Hard Case



All accessories included in the basic kit may also be ordered separately.

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