

SCOUT220-IS and SCOUT240-IS Portable Data Collectors

Datasheet

Cordant™

109M0226 Rev. AH

Description

Bently Nevada™ Scout™ SCOUT220IS and SCOUT240IS are intrinsically safe portable data analyzer solutions designed to monitor machinery conditions in hazardous environments. Both are rated ATEX Zone 1 / Zone 21 (for gases and non-conductive dust) and CSA Class 1 / Div 1. These small form-factor, rugged devices take vibration recordings and upload the collected data for detailed analysis in System 1.

This is a two-part solution. The SCOUT data acquisition module uses Bluetooth to communicate with a wireless, industrial handheld device running the SI Collector app.

Vibration recordings are viewed and stored on the **handheld device**. We offer these devices with hazardous area ratings up to Zone 1/21 & Div 1. The handheld runs the Android OS, so you can also use it like any smartphone or tablet to take pictures and video, send text messages, check email, make phone calls, track your location, create SOS alerts, and run other enterprise apps.

The high performance **data acquisition module** (Hardware ID: 109M2380) provides long battery life, yet is light & rugged. It hangs out-of-the-way on a shoulder strap, allowing you to focus on your job and move safely between machines.

The SCOUT220IS can sample two sensor channels simultaneously, while the SCOUT240IS supports up to four channels. Both also support tachometer or Keyphasor triggering. These data acquisition modules provide up to ten hours of continuous use, while supporting an F_{max} up to 80 kHz and 12,800 lines of spectral resolution. Both models are rated IECEx/ATEX Zone 0 / 20 (for gases and non-conductive dust) and CSA Class 1 / Div 1.

The **System 1 software**, paired with SCOUT220IS and SCOUT240IS, enables you to track all of your machinery using a single enterprise monitoring system. Use System 1 to prepare routes, analyze data, detect long-term trends, and set and detect alarms. Then transfer the routes between System 1 and your SCOUT device using WiFi, file transfer, cellular network, or a USB cable.



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Hardware Features

- Battery life of 10 hours allows the data collector to run all day.
- Five year warranty.
- Rugged, water, and dust resistant (IP-65), drop-tested, with intrinsically safe variants.
- Easy to carry: lightweight handheld unit, shoulder strap for data collector, keepers for sensors.
- Safety breakaways on both shoulder strap and sensor cables.
- Upgradable industrial handheld smartphone or tablet.
- Handheld Push-to-Talk (PTT) button is configured to start measurements (where available).
- Up to four channel simultaneous recordings (including on-route).
- SCOUT240 supports Triaxial sensors.
- Up to 12,800 lines of spectral resolution, 80 kHz F_{max} .
- Supports accelerometer, velocity, displacement, and voltage-output sensors of AC and DC coupling types.

Software Features

- Seamless on-and off-route data collection.
- Route overview & easy route navigation.
- Fast sensor settling and data collection.
- Patented 6Pack time-saving measurement type.
- Synchronous sampling, peak demod, and bump test.
- Coast-down, run-up, and interval capture support.
- Custom note and numeric data entry.
- Rotor Balancing, dual plane, reports transferred to System 1.
- Data quality warnings and easy-to-understand alarm annunciation.
- Supports operator driven reliability (ODR).
- Cross Channel Phase measurement & reports.

- Cross Channel FRF measurement & export UFF.
- Modal Impact Testing (requires optional instrumented hammer).
- Set machine speed from spectral peak.



The SCOUT portable connects via Bluetooth to the handheld, which you can then sync with System 1.

Data Collector Specifications

Sensors

Sensor input Simultaneous sampling	SCOUT220IS: 2 channels. SCOUT240IS: 4 channels.
Compatible sensor types	Accelerometer, velocity, displacement, and voltage.
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
Connectors	2 x LEMO connectors for CH1 & CH2+ 1 X LEMO connector for Tach/Keyphasor SCOUT240IS includes a CH 2-4 breakout cable.
Analog to digital conversion	24-bit ADC
Sensor excitation current	0 mA or 2.2 mA (configurable), 24 V maximum 2.2 mA powers IEPE/ICP-type sensors
Sensor detection	Measures sensor bias voltage. Warns if short circuit or not connected.

Tachometer

Optional IS Zone 0 rated laser Tach	Battery-powered, handheld laser sensor. Triggers when beam on reflective tape range 10 cm to 2 m. Speed 6 to 250 krpm.
Optional Zone 2 rated laser Tach	Laser sensor powered by Portable Data Collectors. Triggers when beam on reflective tape range 10 cm to 2 m. Speed 6 to 250 krpm.
Other sensor types supported	Contact, TTL Pulse, Keyphasor
Power supply to sensor	5 V, 40 mA Rated for Zone 2, 22 and Division 2 only.
Input Impedance & max values	100 K Ω ± 28 V max
Waveform display	± 20 V range
Threshold	± 20 V range ± 0.4 V accuracy
Auto- threshold mode	Signal ≥ 3 V pk-pk Machine speed ≥ 60 rpm (1 Hz) Settles within < 15 s
Hysteresis	0.2 V to 2.5 V user configurable
Speed range	Minimum: 3 rpm (0.05 Hz) Maximum: 1,200,000 rpm (20 kHz)
Signal pulse width	10 μ s minimum 2% duty cycle (for auto-threshold)
Accuracy	$\pm (0.1\% + 1 \text{ cpm})$ for speeds up to 5 kHz (300 kcpm). $\pm (0.3\%)$ for speeds above 5 kHz (300 kcpm).

Parameter Indication

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/s ² in/s or mm/s mil or mm or μ m peak, or peak-peak, or RMS
Magnitude & cursors	Overall value: RMS, derived pk, derived pk-pk Dual cursors Digital readouts on chart
Base accuracy	For AC signal: $\pm 1\%$ of readings For DC level: $\pm 1\%$ of full scale (1% is approximately 0.1 dB)
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 < 10Hz
Attenuation due to Integration	≤ 0.1 dB 10 Hz to < 100 Hz ≤ 1.5 dB 1 Hz to < 10 Hz. Values apply to single integration (acceleration to velocity). Double the values for double integration (acceleration to displacement).

Spectrum Display

F _{max} ranges	25; 50; 100; 125; 150; 200; 300; 400; 500; 600; 800; 1,000; 1,200; 1,600; 2,000; 2,500; 3,000; 4,000; 5,000; 6,000; 8,000; 10,000; 15,000; 20,000; 30,000; 40,000; 60,000; 80,000 Hz or equivalent. CPM values or orders-based from 1X to 999X.
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Fmin possible range	0 to F _{max} . Instrument zeroes all spectral lines below F _{min} .		
Resolution (Spectral lines)	400; 800; 1,600; 3,200; 6,400; 12,800 lines		
	Channels	220 max lines	240 max lines
	1	6,400	12,800
	2	3,200	6,400
	3 or 4	N/A	3,200
Frequency scale	Hz, CPM, Orders. Linear scale with zooming.		
Amplitude scale	Acceleration, velocity, displacement. Linear auto scaling.		
Window shapes	Hanning, Rectangular		
Overlap	(0, 12.5, 25, 37.5, 50, 62.5, 75, 87.5) % Dependent 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 1,250 Hz and up to 16 kHz to 20 kHz. Peak demod: 500Hz-40kHz, 1-40kHz, 2-40kHz, 5-40kHz		
6Pack	Up to 40 kHz & 3,200 lines (1 channel). Up to 20 kHz & 1,600 lines (2-3 channels). Spectrum and waveform for each of low-frequency, high-frequency, demodulation		

Waveform Display

Number of samples	1,024; 2,048; 4,096; 8,192; 16,384; 32,768		
	Channels	220 max samples	240 max samples
	1	16,384	32,768
	2	8,192	16,384
Time scale	3 or 4	N/A	8,192
	10 ms to 256 seconds or orders based from 1 to 999 revs		

Advanced Analysis

Cross channel spectrum	1 Reference and up to 3 other sensors Calculates Coherence and Frequency Response Function (FRF)
Modal Impact Testing	CHI for hammer, up to 3 response channels, ≤ 10 kHz Calculates Coherence and FRF — Accelerance, Mobility, and Compliance
UFF Export	Export of FRF data in Universal File Format, for import into Modal Analysis/ODS software.

Balancing

Planes	2 planes, 2 sensors
Speed Range	3 to 12,000 RPM
Measurement Type	Acceleration, Velocity, Displacement

Weight modes	Angle 0° to 360° Fixed Positions
Remove Trial Weights	Yes/No Automatic recalculation
Storage	Balance jobs stored on handheld and transferable to System 1

Communication

Bluetooth	BT 4.0 Classic (s/n ≤ 101599) BT 5.0 BLE (s/n ≥ 101600)
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Battery and Charger

Battery type	Custom Lithium Ion pack, 7.4 V, 3920 mAh. Not user accessible but factory replaceable.
Operating Time	10 hours typical on-route data collection
Charger type	Internal charging, automatic control. External power pack 12 V DC, 3 A output.
Charge rate	2 A nominal 3 hours for complete charge.

Mechanical

Size	5.1" W x 5.1" L x 1.4" H (130 mm W x 130 mm L x 35 mm H)
Weight	1.5 lb $\approx$ 680g

Environmental Limits

Operating temperature	-4°F to 140°F (-20°C to 60°C) 122°F (50°C) max when used in Ex hazardous areas
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Ambient temperature for charging battery	32°F to 77°F (0°C to 25°C)
Storage temperature & humidity	Short term (up to 1 Month): -4°F to 140°F (-20°C to 60°C) & 95% relative humidity. Long term (>1 Month): 95°F (35°C), 85% relative humidity.
Ruggedness drop & sealing	Drop spec MIL-STD-810F-516.5-IV 26 drops at 4' (1.2 m) onto concrete IP65

S1 Collector App

Operating System	Android 5.1 to 16 iOS and iPad OS Supported but not recommended iOS 13 to 17.1.1 (with s/n ≥ 101600 only, requires BT 5 BLE).
Languages	Chinese, English, Finnish, German, Japanese, Russian, Spanish, Turkish



iOS devices are not recommended by Baker Hughes for use in hazardous areas.



The recommended measures are at your discretion and responsibility. Some residual risk may remain.

For details, see the *SCOUT200_Series Cyber Security Hardening Guideline* (document 131M1304) at [BNTechSupport.com](https://www.bentley.com/BNTechSupport.com).

App Updates

The Bently Nevada development team periodically updates the S1 Collector App with new features and enhancements. Built into the app is the new firmware to also automatically update the SCOUT200 data collector. These updates are free to all SCOUT200 owners who have a current Maintenance and Support agreement (M&S) for their System 1 software.

The updates can be obtained from either of these locations:

1. Flexnet Licensing Portal > System 1 > System 1 Collector App.
2. Google Playstore > Search "S1 Collector"

Cyber Security

The SCOUT220IS and SCOUT240IS solutions include an industrial handheld device that runs the Android operating system and uses USB, cellular, Bluetooth and Wi-Fi for communication. These solutions have features that reduce but do not eliminate cyber security risks.

We strongly recommend implementing additional cyber security protections such as:

- Controlling user access
- Scanning for viruses
- Applying timely updates
- Using mobile device management software

Handheld Specifications Summary



A handheld device is not included in the SCOUTkit. To order an Android device, add it as an accessory item, or obtain an appropriately rated device directly from the supplier.



For self-supplied handheld devices, we cannot guarantee SCOUT200 compatibility with every make/model or version of Android. Contact BN TechSupport for a list of tested models, or to request a test.

	Smart Ex DZ2	Smart Ex DZ1	TAB-EX05-DZ2	TAB-EX05-DZ1
Device Image				
Display & Touch	6", 1080×2160, Extreme shock and scratch resistant, Gorilla® Glass, glove usable		8" TFT display, 1920×1200 (WUXGA), 120 Hz adaptive, 600 nits, Gorilla® Glass 3, glove operable	
Wireless & GPS	5G NR, 4G LTE, Wi-Fi 6E, Bluetooth 5.2, NFC, GPS		5G, 4G LTE, Wi-Fi 6, Bluetooth 5.3, GPS (multi-system), NFC	
Cameras	13 MP rear, 5 MP front		13 MP rear, 5 MP front	
OS	Android™ 15		Android™ 15	
CPU	Qualcomm QCM6490		Exynos 1380 (S5E8835) Octa-Core 4 x 2.4 GHz + 4 x 2.0 GHz 64 Bit, 5 nm	
Memory	8 GB RAM, 128 GB storage		6 GB RAM, 128 GB, microSD (1 TB)	
Battery	4400 mAh Li-Ion		Li-Ion 3.8V, 5050 mAh, up to 14 hrs	
Size & Weight	172 × 84 × 25/18 mm, 400 g		229×132×15 mm, 595 g	263 x 162 x 26 mm, 1122 g
Ruggedness	IP68, MIL-STD-810H		IP68, MIL-STD-810H	
Warranty	Not specified		Not specified	
IECEx ATEX	Zone 2/22 Ex ic IIC T4 Gc Ex ic IIIC T135°C Dc	Zone 1/21 Ex ia IIC T4 Gb Ex ia IIIC T135°C Db	Zone 2/22 Ex ic IIC T5 Gc Ex ic IIIC T85°C Dc	Zone 1/21 Ex db ia IIC T6 Gb Ex tb ia IIIC T80°C Db

	Smart Ex DZ2	Smart Ex DZ1	TAB-EX05-DZ2	TAB-EX05-DZ1
CSA	Class I,II Div 2 Groups A .. D, T4 Group F,G T4	Class I,II,III Div 1, Group A .. G, T4	Class I & II Div 2, Class III, Div 1 & 2 Groups A .. D, F, and G, T5	Class I,II,III Div 1, Groups A .. G, T6
Supplied Accessories	Battery, Charger, USB cable, Screwdriver		Tablet, battery, protective cover, S Pen, USB cable, charger, documentation	Tablet, S Pen, USB cable, charger, documentation, Torx T8 tool
Complete Specs, Accessories	www.pepperl-fuchs.com		Optional: Micro SD flash card, Viator Bluetooth HART interface	
SCOUT200 Compatibility	Not specified		Not specified	

	IS930.1	IS540.1	IS540.2
Device Image			
Display & Touch	8" 1920 x 1200, glove touch	6" FHD (1080 × 2160), Corning Gorilla Glass 3	
Wireless & GPS	WiFi 2.4 & 5 GHz, BT 5, NFC, GPS	Wi-Fi 6, Bluetooth 5.2, GPS / A-GPS / GLONASS / Beidou / Galileo, NFC	
Cameras	13 MP rear, 5 MP front	48 MP Rear, 5 MP Front	
OS	Android 10	Android™ 14	
CPU	Qualcomm Snapdragon SDM660 Octa-Core	Qualcomm QCM6490 Octa Core	
Memory	64 GB internal memory, up to 128 GB microSD	8 GB RAM, 128 GB Storage, microSD support	
Battery	Li-Ion 8400 mAh	4400 mAh (replaceable)	

	IS930.1	IS540.1	IS540.2
Size & Weight	237 x 156 x 22 mm, 890 g	180 × 84.9 × 20.6 mm, 422 g	
Ruggedness	IP68, -20°C to +60°C	IP68, MIL-STD-810H, -20°C to +55°C	
Warranty	3 years	Not specified	
IECEX ATEX	Zone 1/21, Ex ib IIC T4 Gb, Ex ib IIIC T135°C Db	EX-Zone 1/21 Ex ib IIC T4 Gb, Ex ib IIIC T135°C Db	EX-Zone 2/22 Ex ic IIC T4 Gc, Ex ic IIIC T135°C Dc
CSA	Class I,II,III Div 1, Groups A..G, T4	Class I Div. 1 Groups A, B, C, D, T4 Class II Div. 1 Groups E, F, G, T4 Class III Div. 1 T4	Class I Div. 2 Groups A, B, C, D, T4 Class II Div. 2 Groups F, G, T4 Class III Div. 2 T4
Supplied Accessories	Not specified	Smartphone, Battery, i.safe PROTECTOR 2.0 USB-C Cable, Power Adapter universal, Screwdriver, Display Protection Foil, Quick Start Manual and Safety Instructions	Smartphone, Battery, USB-C Cable, Power Adapter universal, Screwdriver, Display Protection Foil, Quick Start Manual and Safety Instructions
Complete Specs, Accessories	www.isafe-mobile.com	Not specified	
SCOUT200 Compatibility		Not specified	



Numerous accessories are available for these handhelds, direct from each handheld manufacturer (e.g. charging stations, belt-clips for the smartphones, and cases for the tablets). You can find the accessories pages on the handheld manufacturers websites.

Compliance and Certifications



This section applies only to the Data Collector, not the handheld device.

This device complies with Industry Canada license-exempt RSS standard(s) and complies with part 15 of the FCC Rules, Class A device. Operation is subject to the following two conditions:

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



Changes or modifications not expressly approved by Bently Nevada could void the user's authority to operate the equipment.



This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.



For the detailed listing of country and product-specific approvals, refer to the [Approvals Quick Reference Guide \(108M1756\)](#).

For additional technical documentation, please log in to bntechsupport.com and access the Bently Nevada Media Library.

RED/EMC	EN 61000-6-2 EN 61000-6-4 EN 300 328 EN 301 489-1 EN 301 489-17 EN 61326-1 2014/53/EU 2014/30/EU
ATEX/IECEX	 II 1 (1) GD II 3 (3) GD Ex ia [ia] IIC T4 Ga Ex ic [ic] IIC T4 Gc Ex ia [ia Ga] IIIB T135°C Da Ex ic [ic Gc] IIIB T135°C Dc
CSA/NRTL/C	Class I Division 1 Groups ABCD Class I Division 2 Groups ABCD Class II Division 1 Groups FG Class II Division 2 Groups FG Class I Zone 0, Ex/AEx ia [ia] IIC T4 Ga Class I Zone 2, Ex/AEx ic [ic] IIC T4 Gc Zone 20, Ex/AEx ia [ia Ga] IIIB T135°C Da Zone 22, Ex/AEx ic [ic Gc] IIIB T135°C Dc T4 @ Ta = -20°C to +50°C The installation must comply with the SCOUT200 Hazardous Location Installation Control Drawing (document 111M0029).
ROHS	2011/65/EU
India - Battery EPR Marking	GE Oil & Gas India Private Limited EPR Certificate No.: 1.1595372902047E+20

The above ratings include the following areas:

- Intrinsically safe Zone 0, 20 and Division 1
- Lower level protection of Zone 2, 22 and Division 2