

# COMMTEST220 AND COMMTEST240

## Portable Data Collectors

### Datasheet

Bently Nevada Machinery Condition Monitoring

109M0792 Rev. V



## Description

COMMTEST220 and COMMTEST240 are portable data analyzer solutions designed to monitor machinery in non-hazardous environments. 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 COMMTEST data acquisition module uses Bluetooth to communicate with a wireless, industrial handheld device running the S1 Collector app.

Vibration recordings are viewed and stored on the **handheld device**. 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** 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 COMMTEST220 can sample two sensor channels simultaneously, while the COMMTEST240 supports up to four channels. Both also support tachometer or Keyphasor triggering. These data acquisition modules provides up to ten hours of continuous use, while supporting an  $F_{max}$  up to 80 kHz and 12,800 lines of spectral resolution.

The **System 1 software**, paired with COMMTEST220 and COMMTEST240, 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 COMMTEST device using WiFi, file transfer, cellular network, or a USB cable.



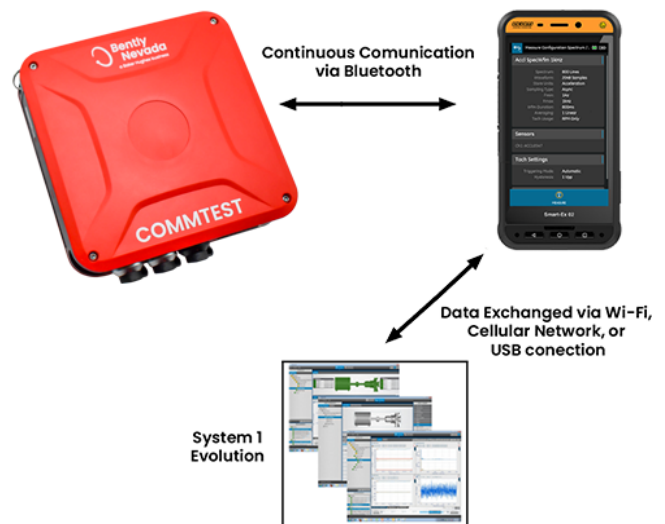
## Hardware Features

- 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.
- 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.
- Handheld Push-to-Talk (PTT) button is configured to start measurements (where available).
- Up to four channel simultaneous recordings (including on-route).
- COMMTEST240 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.

- Set machine speed from spectral peak.



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

## Data Collector Specifications

### Sensors

Sensor input Simultaneous sampling	COMMTEST220: 2 channels. COMMTEST240: 4 channels.
Compatible sensor types	Accelerometer, velocity, displacement, and voltage.
AC coupled range	16 V peak-peak. Allows for $\pm 8$ V sensor output swing ( $\pm 80$ 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 COMMTEST240 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 laser Tach	Laser sensor powered by Portable Data Collector.  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
Input Impedance & max values	100 K $\Omega$ $\pm 28$ V max
Waveform display	$\pm 20$ V range
Threshold	$\pm 20$ V range $\pm 0.4$ V accuracy
Auto-threshold mode	Signal $\geq 3$ V pk-pk Machine speed $\geq 60$ 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 $\mu$ s minimum 2% duty cycle (for auto-threshold)
Accuracy	$\pm (0.1\% + 1$ 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 <sup>2</sup> in/s or mm/s mil or mm or μm 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: ± 1% of readings For DC level: ± 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 <sub>max</sub> 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 equivalen. CPM values or orders-based from 1X to 999X.
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F <sub>min</sub> possible range	0 to F <sub>max</sub> . Instrument zeroes all spectral lines below F <sub>min</sub> .												
Resolution (Spectral lines)	400; 800; 1,600; 3,200; 6,400; 12,800 lines												
	<table border="1"> <thead> <tr> <th>Channels</th> <th>220 max lines</th> <th>240 max lines</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>6,400</td> <td>12,800</td> </tr> <tr> <td>2</td> <td>3,200</td> <td>6,400</td> </tr> <tr> <td>3 or 4</td> <td>N/A</td> <td>3,200</td> </tr> </tbody> </table>	Channels	220 max lines	240 max lines	1	6,400	12,800	2	3,200	6,400	3 or 4	N/A	3,200
	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 <sub>max</sub> 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 types												
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
	3 or 4	N/A	8,192
Time scale	10 ms to 256 seconds or orders based from 1 to 999 revs		

## 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	1.3 lb ≈ 590g

## Environmental Limits

Operating temperature	-4°F to 140°F (-20 to 60°C)
Ambient temperature for charging battery	32°F to 77°F (0°C to 25°C)
Storage temperature & humidity	-4°F to 140°F (-20°C to 60°C), 95% relative humidity if storage exceeds one month: up to 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

## SI Collector App

Operating System	Android 5.1 to 12  iOS 12 to 16 (with s/n ≥ 101600 only, requires BT 5 BLE).
Languages	Chinese, English, Finnish, German, Japanese, Russian, Spanish, Turkish



## Handheld Specifications Summary



A handheld device is not included in the COMMTEST kit. 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 COMMTEST200 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 02 DZ2	Tab Ex D2 & DZ2
<b>Device Image</b>		
<b>Display &amp; Touch</b>	5", Gorilla glass, glove touch & wet mode	8" 1920 x 1200, 480 nit, glove touch & wet mode
<b>Wireless &amp; GPS</b>	4G/LTE dual SIM, WiFi 2.4 & 5 GHz, BT 4.2, NFC, GPS	WiFi 2.4 & 5 GHz, BT 5.0, NFC, GPS
<b>Cameras</b>	12 MP rear, 5 MP front	13 MP rear, 5 MP front
<b>OS</b>	Android 9	Android 11 or later
<b>CPU</b>	Qualcomm Snapdragon 450	Exynos 9810, 2.7 GHz, Octa-core
<b>Memory</b>	3 GB RAM, 32 GB ROM up to 128 GB microSD	4 GB RAM, 48 GB internal, up to 1 TB microSD
<b>Battery</b>	Replaceable Li-Ion 4400 mAh	Li-Ion 3.8V, 5050 mAh, up to 11 hrs
<b>Size &amp; Weight</b>	163 x 82 x 22 mm, 380 g	214 x 127 x 10 mm, 610 g
<b>Ruggedness</b>	IP68, MIL-STD-810G, -20 to 60°C	IP68, 1.2m drop, -20°C to +55°C
<b>Warranty</b>	3 years	3 years
<b>Complete Specs, Accessories</b>	<a href="http://www.ecom-ex.com">www.ecom-ex.com</a>	<a href="http://www.ecom-ex.com">www.ecom-ex.com</a>

	Smart Ex 02 DZ2	Tab Ex D2 & DZ2
<b>SCOUT200 Compatibility</b>		<p>These handhelds are WIFI models, so they do not support USB Tethering. This prevents them from using USB Direct comms with System 1.</p> <p>Available comms methods: WiFi, File mode, Remote comms.</p> <p>To use USB Tethering, order WWAN version direct from Pepperl &amp; Fuchs.</p>



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.

## Cyber Security

The COMMTEST220 and COMMTEST240 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



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](http://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"



## 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](http://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
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ROHS	2011/65/EU
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The overall hazardous system rating is defined by the minimum rating of the data collector, industrial handheld, and accessories.

## Ordering Information



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

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### COMMTEST220-AA

#### A: Data Collector Approval Options

00	None
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The COMMTEST220 basic kit does NOT include a handheld device, nor a System 1 software license. They are ordered separately under Optional Accessories below.

Part Number	Description	Qty
	SI Collector app	1
	COMMTEST220 Data Collector	1
108M4044	AC power adapter	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	Qty
AM3100T2-Z0 or 200350*	Accelerometer, top exit	1
AS3100S2-Z0 or 200350*	Accelerometer, side exit	1
151M8244-01	Accelerometer cable, coiled, safety breakaway	2
113M5585	Accelerometer magnetic base	2
109M2385-012	BNC to silver-LEMO cable. Connects rack buffered outputs to CH1/CH2 inputs.	2
110M8172-012	BNC to black-LEMO cable. Connects rack buffered Keyphasor to Tach input.	1
117M1446	Belt Clip	1
109M2384-01	Neck strap with Sensor Keeper	1
112M4551	Hard carrying case	1
109M1269	SCOUT200 Series User Guide	1
109M1270-01	SCOUT200 Series Quick Start Guide	1
Bently Manuals DVD	Contains the COMMTEST220 and COMMTEST240 Product Datasheet (109M0792), the SCOUT200 Series Quick Start Guide (109M1270), and the SCOUT200 Series User Guide (document 109M1269).	1

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



Metrology certification can be requested when an order is placed, however this service is charged. Standard test data can be requested for free, but is not evidence of calibration.

To request a periodic metrology calibration, contact [Bently Nevada Tech Support](#).

## COMMTEST240-AA

### A: Data Collector Approval Options

00	None
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The COMMTEST240 basic kit does NOT include a handheld device, nor a System 1 software license. They are ordered separately under Optional Accessories below.

Part Number	Description	Qty
	SI Collector app	1
	COMMTEST240 Data Collector	1
108M4044	AC power adapter	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
AM3100T2-Z0 or 200350*	Accelerometer, top exit	3
AS3100S2-Z0 or 200350*	Accelerometer, side exit	1

Part Number	Description	Qty
151M8244-01	Accelerometer cable, coiled, safety breakaway	4
113M5585	Accelerometer magnetic base	4
109M2385-012	BNC to silver-LEMO cable. Connects rack buffered outputs to CH1/CH2 inputs.	2
110M8172-012	BNC to black-LEMO cable. Connects rack buffered Keyphasor to Tach input.	1
113M9350	Channel 2-4 breakout cable	1
117M1446	Belt Clip	1
109M2384-01	Neck strap with Sensor Keeper	1
112M4551	Hard carrying case	1
109M1269	SCOUT200 Series User Guide	1
109M1270-01	SCOUT200 Series Quick Start Guide	1
Bently_Manuals DVD	Contains the COMMTEST220 and COMMTEST240 Product Datasheet (109M0792), the SCOUT200 Series Quick Start Guide (109M1270), and the SCOUT200 Series User Guide (109M1269)	1

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




Metrology certification can be requested when an order is placed, however this service is charged. Standard test data can be requested for free, but is not evidence of calibration.

To request a periodic metrology calibration, contact [Bently Nevada Tech Support](#).

## Optional Accessories

Hand Held Devices	
146M8212-01	Smart-Ex 02 DZ2 (North America & Europe)
175M2586-01	Tab-Ex D2 North America
145M3278-01	Tab-Ex DZ2 North America
146M8220-01	Tab-Ex DZ2 Europe

 To obtain a handheld device suitable for a location not listed above, contact a handheld device distributor within the destination country.

Other Accessories	
3071/01	System 1 software and license
108M4069	Laser Tach powered by COMMTEST220 and COMMTEST240.  Order cable separately.
CBL50216	5-meter cable for laser Tach 108M4069.
122M9408	Monarch Compact Smart Laser Sensor (CSLS). Higher powered (3 mW) but larger size (2.6" x 2.4" x 2"). Order cable separately.
125M2099-01	Cable for CSLS laser, 1.5 m
113M5529-01	Reflective tape One roll, 60 cm (23.7 in)
VBMR0222	Pair of safety rings for attaching strap to data collector
138M7749	Accelerometer cable, 4 ft, straight, safety breakaway

Other Accessories	
TP500	Accelerometer, top exit, 500 mV/g, 10 g pk, 0.2 Hz - 14 kHz

## Accessory Kits

### Balancing Kit - 161M0958


Part Number	Description	Qty
113M5529-01	Reflective tape One roll, 60 cm	1
LASA0315	Laser Tach Kit Zone 2 rated	1
CBL50216	Laser cable Five meters	1
MAGA0063	Laser magnetic stand	1
159M9583*	Sensor extension cable, 5 m	2
CBBL0026	Carrying case for the kit	1

\* Depending on availability, this cable may be substituted with the CB5G0024 and CB5R0025 cables and two 161M2913 adapters.

### Zone 2 Laser Tach Kit - LASA0315

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

## Triax Sensor Kits

 Triaxial sensor kits are certified for hazardous area use in limited regions (NAM, EU, etc). Other regions may need to source locally. Contact TechSupport for suggested manufacturer part numbers.

**157M0806-01**

Part Number	Description
156M6189	Triaxial sensor, 100 mV/g ± 20%, 0.5 Hz .. 5 kHz, 8 µg/√Hz noise @ 10Hz
157M0852-01	Cable for SCOUT200 to triax 156M6189, 1.5 m, straight, safety breakaway
156M6204	Magnet, 2 pole, 38 mm diameter, 32 mm high, 25 kg pull, ¼-28 female thread

**157M0809-01**

Part Number	Description
155M3055	Triaxial sensor, 100 mV/g ± 10%, 0.6 Hz .. 10 kHz, 27 µg/√Hz noise @ 10 Hz
156M6180	Cable for SCOUT200 to triax 155M3055, 1.5 m, straight, safety breakaway
154M1355	Magnet, 2 pole, 35 mm diameter, 22 mm high, 23 kg pull, ¼-28 female thread, triax alignment notch

**Language Specific Warning Labels**

110M9913	Magnet base label
110M9914	Sensor keeper side label
110M9915	Sensor keeper front label
111M7144	Hard carrying case label

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