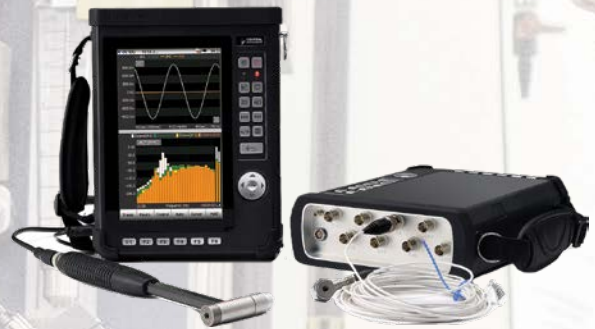# CoCo-80X Hardware Specifications

Featuring the following capabilities:

- GPS Feature Included - Record all location data automatically during signal recording.
- CAN bus feature allows the subsystems of an automobile to communicate among each other.
- CoCo-80X can be wireless equipped. It can connect to the LAN or Internet via Wi-Fi to transfer the data or control signals.

The CoCo-80X is a handheld data recorder, dynamic signal analyzer, and vibration data collector.

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INTRODUCTION

The CoCo-80X is a handheld data recorder, dynamic signal analyzer, and vibration data collector. It is ideal for a wide range of industries including machine condition monitoring, automotive, aviation, aerospace, electronics, and military. These industries demand quick, easy, and accurate data recording in addition to real-time processing in the field. The CoCo-80X is a perfect solution as a low cost, lightweight, battery powered handheld system with unparalleled performance and accuracy. The intuitive user interface is specifically designed for easy operation while still providing a wide variety of analysis functions.

Building on the success of the original CoCo-80, the new CoCo-80X boasts improved speed, a bigger screen, and more connection options. A significantly more powerful processor frees DSP resources for faster, more reliable, and more complex processing in real time. The 7-inch full color LCD display of the CoCo-80X nearly doubles the screen area of the original unit and offers multi-point touch screen functionality that has become the standard for electronic interfaces. On board Wi-Fi and GPS highlight the portability of the CoCo-80X, and the addition of CAN-bus will make this a very powerful tool for automotive and construction applications.

The CoCo-80X hardware platform supports three different software working modes: Dynamic Signal Analyzer (DSA), Vibration Data Collector (VDC), and CoCo Real-Time mode. Each working mode has its own user interface and navigation structure. DSA mode is designed for mechanical structure analysis, testing and optimization, or for electrical, geophysics, and a wide range of other applications. VDC mode is dedicated to route-based machine condition monitoring, vibration data collection, and trending. CoCo Real-Time mode allows for the instrument to be operated as a benchtop testing device where commands are executed and data is displayed in real-time on an accompanying PC. The CoCo-80X is equipped with up to 8 input channels. All hardware will ship with 8 physical BNC connectors, meaning a unit initially purchased as a 2-channel unit can be remotely upgrade to 4, 6, or 8 channels via software. The CoCo-80X accurately measures and records both dynamic and static signals. The flash storage simultaneously records 8 channels of data at up to 102.4 kHz while performing real-time frequency and time domain calculations. An embedded signal source channel provides several standard waveforms that are synchronized with the input sampling rate.

The handheld system is equipped with a bright 7.0-inch color LCD display with multi-point touch functionality as well as a physical keypad. Flexible connections via a USB 2.0 port, 100Base-T Ethernet port, 802.11 b/g/n Wi-Fi connection, SD card interface, HDMI interface, CAN-bus/serial port, stereo headphone and microphone jack, and GPS. Connect the CoCo-80X to a PC to download files, remotely control operations, or upgrade the software through several means of network connections.

In VDC and Real-Time modes, the CoCo-80X utilizes modern database management technology to synchronize the analysis parameters, route map, and measured data with the analysis PC. Data is downloaded to a PC for managing, trending, and analysis, and is then exported to other applications using EDM software from Crystal Instruments.

TERMINOLOGY

Maximum and *minimum* specifications characterize the warranted performance of the instrument within the recommended calibration interval and under the stated operating conditions. These specifications are guaranteed by design.

Typical specifications would be met by the instrument within the recommended calibration interval at the specified operating conditions. These measurements are taken during production verification of the finalized engineering prototype. The performance of the instrument is not warranted.

All performance specifications are typical unless otherwise noted. These specifications are valid within the full operating temperature range. Accuracy specifications are valid within ±5 °C after calibrating the unit unless otherwise noted.

HARDWARE SPECIFICATIONS

The following specifications are typical specifications at 25°C unless otherwise noted.

System

- **System CPU:** Dual-core Da-Vinci Series ARM+DSP Processor

- **Total RAM:** 1 GB

- **Internal Storage:** 512 MB

- **LCD:** 7" color TFT WVGA display 800x480 resolution with P-Cap touch screen, 1300 NITS

- **SD Card Storage:** 128 GB included. Supports up to 256 GB. Removable SD Card.

- **Hard Keys:**

  - **Power:** Power on, open shutdown menu, long-press for reset

  - **Settings:** Open the main Setup page

  - **Analysis**
    DSA: Open the Analysis Groups page
    VDC: Open the Onsite Measurements page

  - **Display:** Returns to active test display

  - **File:** Opens the file browser to display saved data

  - **Input Channels:** Opens the Input Channel Table to

configure sensitivity, input type, and filter settings

- ○ **Previous Trace:** Switch to the previous configured trace while in a measurement
- ○ **Next Trace:** Switch to the next configured trace while in a measurement
- ○ **Record/Stop:** Records selected timestreams, stops recording if the unit is already recording
- ○ **Save:** Save the selected signal data
- ○ **Back:** Returns to previous screen
- ○ **Direction Arrows:** Navigate options displayed on the screen
- ○ **Enter:** Select the highlighted item to edit or open
- **LED Indicators:** Wi-Fi activity
  - ○ Power lights up red when charging, green when fully charged
  - ○ Power Button LED turns red when the unit is on
- **Internal Clock:** Real-time Clock with dedicated battery

Analog Input Channel

- **Number of Input Channels:** 2, 4, or 8 (configured at factory)
- **Connector Type:** Isolated BNC
- **Coupling:** AC, DC, or IEPE (ICP©)
- **Input Type:** Differential or single-ended
- **Input Range:** ±20 V
- **A/D Resolution:** 2 x 24-bit per input channel
- **Sampling Rate:** 0.48 Hz to 102.4 kHz, with 54 stages
- **Maximum Bandwidth:** 46.08 kHz
- **Input Impedance:** 444 kΩ Differential, 222 kΩ Single-End
- **AC Coupling:** Analog high-pass filter (-3 dB @ 0.375 Hz; -0.1 dB @ 2.45 Hz)
- **Input Protection Voltage:** ±40 V
- **Anti-Aliasing Filter:** Analog anti-aliasing filters (-3 dB @ 500 kHz)
- **Digital Filter:** Digital high-, low-, and band-pass filters
- **Dynamic Range:** 150 dBFS
- **THD:**
  - ○ Better than -100 dB @ 1 kHz, 4 V (-14 dBFS)
  - ○ Better than -95 dB @ 1 kHz, 10 V (-6 dBFS)
  - ○ Better than -80 dB @ 1 kHz, 17.83 V (-1 dBFS)
- **Crosstalk:** Less than -90 dB
- **Phase Channel Match:** Better than 1 degree up to 20 kHz
- **Common Mode Range:** ±20 V

Tachometer Input Channel

- **Number of Tacho Channels:** 2
- **Connector Type:** LEMO (LEMO to BNC adaptor cable available)
- **Tachometer 1:** Full feature tachometer
- **Input Range:** ±10 V
- **A/D Resolution:** 24 bits
- **Max Sampling Rate:** 102.4 kHz
- **Tachometer 2:** Pulse counter
- **Counter Resolution:** 50 MHz
- **Threshold Voltage:** 3.2 V

Note: Tachometer 1 and 2 share a LEMO connector. The operating modes for both are configured by software.

Accuracy

For All Dynamic Input Channels:

- **Frequency Accuracy (crystal based):** 0.01%
- **Spectral Amplitude Accuracy**
  - ○ Typical:
    < 0.1% (1 kHz to 10 kHz; 100 mV to 10 V)
    < 0.3% (3 Hz to 20 kHz; 100 mV to 10 V)
  - ○ Maximum:
    < 1% (3 Hz to 20 kHz; 100 mV to 10 V)
    < 3% (10 mV to 100 mV)
- **DC Accuracy**
  - ○ Typical:
    < 0.1% (100 mV to 10 V)
    < 0.2% (10 mV to 100 mV)
  - ○ Maximum:
    <1% (100 mV to 10 V)
    < 2% (10 mV to 100 mV)
- **Tachometer Frequency Accuracy:**
  - ○ Typical: 0.01%
  - ○ Maximum: 0.1%

Output Channel

- **Number of Outputs:** 1
- **Connector Type:** LEMO (LEMO to BNC adaptor cable available)
- **Max Frequency:** 46 kHz
- **Output Range:** ±10 V
- **D/A Resolution:** 24 bits
- **Dynamic Range:** 120 dB
- **Output Impedance:** 50 Ω
- **Maximum Output Current:** 25 mA

- **Sine Amplitude Accuracy:**
  - ±0.2 dB at 1 kHz for 200 µV to 10 V
  - ±0.5 dB at 1 kHz for 10 µV to 200 µV
- **Anti-Imaging Filtering:** 160 dB/octave digital filter in addition to analog low pass filters with 66 kHz cutoff frequency
- **Digital Filter:** low-pass digital filter

CAN-Bus Interface

- **Standard:** ISO 11898-1 (Bosch CAN protocol 2.0 part A, B)
  - Standard (11-bit) and Extended (29-bit) identifiers (Extended by default)
- **Channels:** 1
- **Connector Type:** 4-pin LEMO
  - Breakout Cable: 4-pin LEMO to OBD2 (car industry)
  - LEMO to screw terminal
- **Bit Rate:** up to 1 Mbit/s
  - Manual selection or Auto-detect

Interface Ports

- **Video Output:** Micro-HDMI v1.3a compliant
  - 1280x720 @ 60 Hz, 1920x1800 @ 30 Hz
- **Audio:** 3.5mm stereo headphone jack, built-in speaker
- **Ethernet:** 100Base-T Ethernet. RJ 45 connector
- **Wi-Fi:** IEEE 802.11 b/g/n wireless compliant. Transmit range roughly 10 meters
- **GPS:** NMEA 0183, UART 4800 BPR
- **USB:** Mini-USB 2.0 client connection to PC and
  - Mini-USB 2.0 Host via OTG cable
  - Client and host share a single port, only one mode is supported at a time
- **SD Card:** SD/SDHC up to 32 GB. Default is 4 GB.
  - SDXC up to 128 GB

- **Grounding:** Ground terminal to chassis

Environmental and General Specification

- **Enclosure:**
  - **Size:** 239.6 x189 x75mm (L X W X H)
  - **Weight:** 2.27 kg
- **Power Consumption:** 14 W maximum, 8 W with LCD off
- **Battery:** 8700 mAh rechargeable Li-ion type
- **Operating time:** 6 – 8 hours
- **Charge Time:** 4 hours
- **Power Supply:** 100 to 240 V_{AC} (50/60 Hz), DC power 15 V (±10%)/3A
- **Safety Standard:** EN 61326:1997+A1:1998+A2:2001
- **EN61000-3-2:** 2000
- **EN61000-3-3:** 1995 + A1:2001
- **Protection Rating:** IP31
- **Cooling:** No cooling fan required
- **Temperature:**
- **Operational:** -20 °C to +55 °C (LCD dims below -20 °C),
- **Storage:** -25 °C to +70 °C
- **Vibration:**
  - **Shock:** 50 g's, 315 in/sec, tested at 6 sides, non-operational test
  - **Operational, 3 sides** 0.3 g_{rms} from 5–500 Hz
  - **Non-operational, 3 sides:** 2.42 g_{rms} from 5–500 Hz

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Aufgrund laufender Weiterentwicklungen sind Änderungen der Spezifikationen vorbehalten. Alle Angaben vorbehaltlich Satz- und Druckfehler.

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