INSTALLATION GUIDE
BNC-2120
Connector Accessory for E/M/S Series Devices

This installation guide describes how to install, configure, and use your BNC-2120 accessory with 68-pin or 100-pin E/M/S Series multifunction data acquisition (DAQ) devices. This document also contains accessory specifications.

The BNC-2120 has the following features:

- Eight BNC connectors for analog input (AI) connection
- Onboard temperature reference
- Thermocouple connector
- Resistor measurement screw terminals
- Two BNC connectors for analog output (AO) connection
- Screw terminals for digital I/O (DIO) connection with state indicators
- Screw terminals for timing I/O (TIO) connection
- Two user-defined BNC connectors
- A function generator with the following outputs:
  - Frequency-adjustable, TTL-compatible square wave
  - Frequency- and amplitude-adjustable sine wave or triangle wave
- Quadrature encoder
- A 68-pin I/O connector that connects to multifunction DAQ devices
- Can be used on a desktop or mounted on a DIN rail

Contents

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Conventions

The following conventions are used in this document:

<>	Angle brackets that contain numbers separated by an ellipsis represent a range of values associated with a bit or signal name—for example, AO <3..0>.
»	The » symbol leads you through nested menu items and dialog box options to a final action. The sequence **File»Page Setup»Options** directs you to pull down the **File** menu, select the **Page Setup** item, and select **Options** from the last dialog box.

This icon denotes a note, which alerts you to important information.

This icon denotes a caution, which advises you of precautions to take to avoid injury, data loss, or a system crash. When this symbol is marked on a product, refer to the *Read Me First: Safety and Radio-Frequency Interference* document for information about precautions to take.

bold	Bold text denotes items that you must select or click in the software, such as menu items and dialog box options. Bold text also denotes parameter names.
italic	Italic text denotes variables, emphasis, a cross-reference, or an introduction to a key concept. Italic text also denotes text that is a placeholder for a word or value that you must supply.
monospace	Text in this font denotes text or characters that you should enter from the keyboard, sections of code, programming examples, and syntax examples. This font is also used for the proper names of disk drives, paths, directories, programs, subprograms, subroutines, device names, functions, operations, variables, filenames, and extensions.

What You Need to Get Started

To set up and use your BNC-2120 accessory, you need the following:

- ❑ BNC-2120 accessory/accessories[1]
- ❑ *BNC-2120 Installation Guide*
- ❑ One of the following DAQ devices:
  - – 68-pin E/M/S Series device (with one or two I/O connectors)[2]
  - – 100-pin E Series device
- ❑ Cable(s) for DAQ device(s), as listed in Table 1
- ❑ The *E Series User Manual*, the *M Series User Manual*, or the *S Series User Manual*
- ❑ BNC cables 28–
- ❑ 16 AWG wire
- ❑ Wire strippers
- ❑ Flathead screwdriver

Installing the BNC-2120

Figure 1 shows the front panel of the BNC-2120.

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[1] You can use two BNC-2120 accessories with both connectors of NI 6224/6229/6254/6259/6284/6289 M Series devices.

[2] You cannot use the BNC-2120 with Connector 1 of NI 6225/6255 devices.

Figure 1. BNC-2120 Front Panel
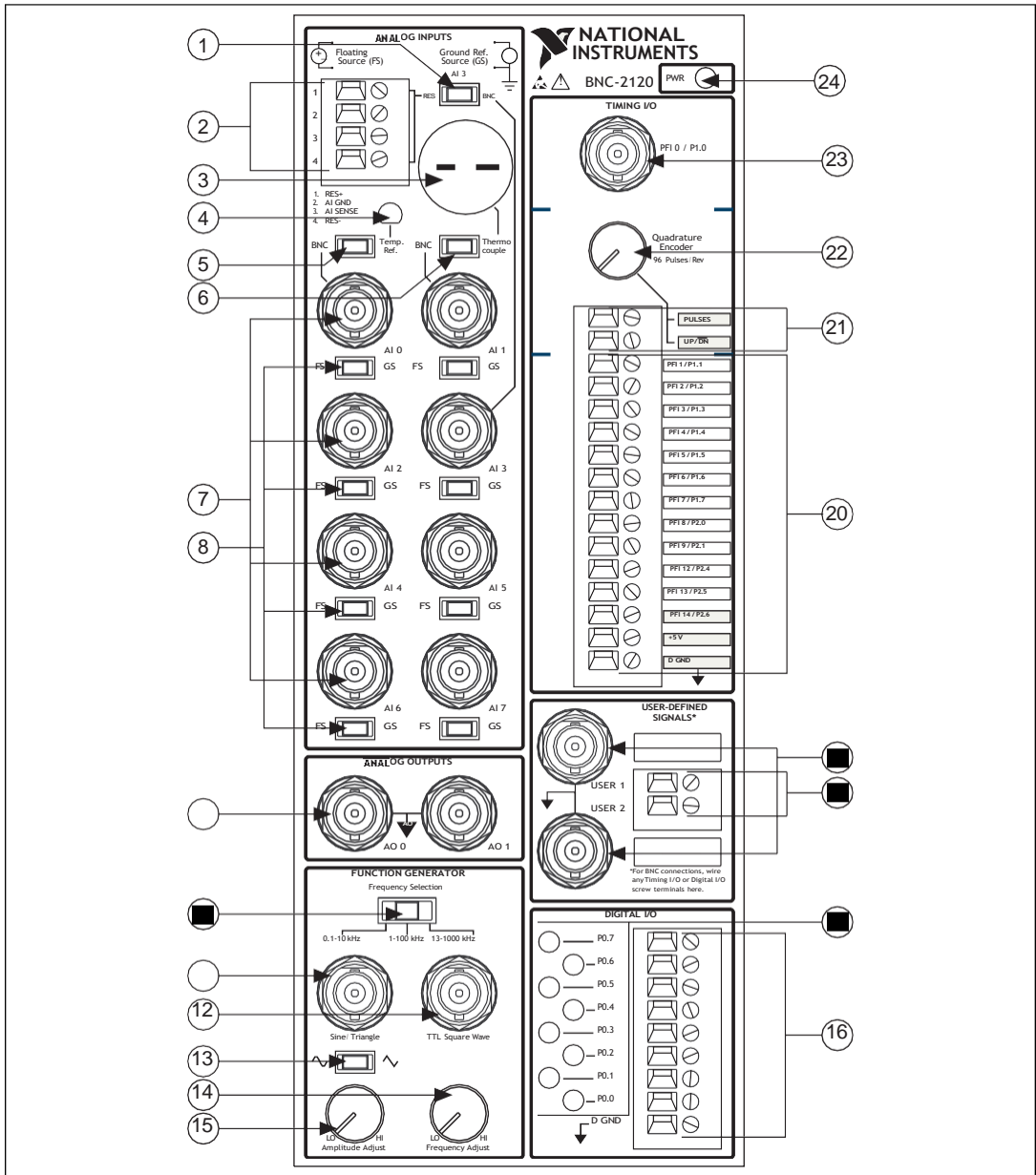
1	RES/BNC Switch (AI 3)	9 Analog Output BNC Connector	18 User-Defined Screw Terminals
2	Resistor Measurement Screw Terminals	10 Frequency Range Selection Switch	19 User-Defined BNC Connectors
3	Thermocouple Input Connector	11 Sine/Triangle BNC Connector	20 Timing I/O Screw Terminals
4	Temperature Reference	12 TTL Square Wave BNC Connector	21 Quadrature Encoder Screw Terminals
5	BNC/Temp. Ref. Switch (AI 0)	13 Sine/Triangle Waveform Switch	22 Quadrature Encoder Knob
6	BNC/Thermocouple Switch (AI 1)	14 Frequency Adjust Knob	23 Timing I/O BNC Connector
7	Analog Input BNC Connectors	15 Amplitude Adjust Knob	24 Power Indicator LED
8	FS/GS Switches	16 Digital I/O Screw Terminals	
		17 Digital I/O LEDs	

To connect the BNC-2120 to your DAQ device, complete the following steps. Consult your computer or PXI/PXI Express chassis user manual for specific instructions and warnings.

Note If you have not already installed your DAQ device, refer to the *DAQ Getting Started Guide* for instructions.

Caution Do *not* connect the BNC-2120 to any device other than National Instruments E/M/S Series multifunction DAQ devices. Doing so can damage the BNC-2120, the DAQ device, or the host computer. National Instruments is *not* liable for damage resulting from these connections.

1. Place the BNC-2120 near the host computer or PXI/PXI Express chassis or use the optional DIN Rail Mounting kit for UMI-FLEX-6 and BNC boxes (part number 777972-01), which you can order from National Instruments at   .

Caution Do *not* connect input voltages greater than 42.4 V_{pk}/60 VDC to the BNC-2120. The BNC-2120 is not designed for any input voltages greater than 42.4 V_{pk}/60 VDC, even if a user-installed voltage divider reduces the voltage to within the input range of the DAQ device. Input voltages greater than 42.4 V_{pk}/60 VDC can damage the BNC-2120, all devices connected to it, and the host computer. Overvoltage can also cause an electric shock hazard for the operator. National Instruments is *not* liable for damage or injury resulting from such misuse.

2. Connect the BNC-2120 to the DAQ device using the appropriate cable for your DAQ device, as   listed in Table 1.

Table 1. BNC-2120 Cabling Options

Number of Pins	DAQ Device	Recommended Cable(s)
68-pin	DAQCard E Series, NI PCI/PCIe/PXI/PXIe M Series[*] NI 6143 S Series	SHC68-68-EPM or RC68-68
	PCI/PXI E Series, USB Mass Termination M Series[*], NI 611*x*/612*x*/613*x* S Series[†]	SH68-68-EPM or R6868[†]
100-pin	PCI/PXI E Series	SH

[*] You cannot connect the BNC-2120 to Connector 1 of NI 6225/6255 devices.
[†] Do *not* use the R6868 cable with NI 6115/6120 S Series devices; use *only* the SH68-68-EPM cable.

The power indicator LED, shown in Figure 1, lights. If it does not light, check the cable connections.

3. Launch Measurement & Automation Explorer (MAX), confirm that your DAQ device is recognized, and configure your device settings. Refer to the *DAQ Getting Started Guide* for more information.

4. Connect signals to the BNC connectors and screw terminal block as described in the following sections.

Note With NI-DAQmx, National Instruments has revised its terminal names so they are easier to understand and more consistent among NI hardware and software products. The revised terminal names used in this document are usually similar to the names they replace. For a complete list of Traditional NI-DAQ (Legacy) terminal names and their NI-DAQmx equivalents, refer to the *Terminal Name Equivalents* table in the *NI-DAQmx Help*.