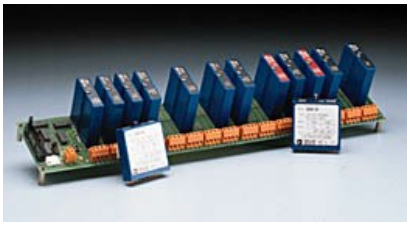
3B Series Configuration Guide

Introduction



The 3B Series Signal Conditioning I/O Subsystem transfers analog signals from sensors and transducers to high-level data acquisition, monitoring and/or control systems. It is designed to interface directly to analog signals, such as the outputs of thermocouples, RTDs, AC and DC strain gages, torque transducers, frequency inputs, AC inputs, LVDTs, millivolt and voltage inputs, and process current signals. The 3B Series Subsystem converts these analog outputs to standardized analog inputs compatible with high-level analog I/0 subsystems.

This guide contains configuration and ordering information for the 3B Series products. The areas to be addressed when ordering are: system configuration, module ranges, and recommended accessories.

Configuring 3B Series Systems

For users designing their own backplane, the only configuring required is to select the 3B Series modules appropriate to the application.

For users of Analog Devices' designed backplanes, configuring modules is accomplished by selecting one or more of the following parts:

- 3B Series Modules
- 3B Series Backplane
- 3B Series Power Supply
- Interface Cables

Accessories are also available to help you configure your 3B Series system.

The following subsections describe how to select the parts of a 3B Series system.

Selecting Modules

Configuring the subsystem involves choosing the types and number of 3B modules (for RTDs, thermocouples, etc.) that the application requires. Each 3B Series module is available in a variety of standard ranges indicated by the suffix attached to the module number (e.g., 3B32-02 is a current input module with an input range of 0-20mA). 3B users who require modules with special ranges can meet their needs in one of the following ways:

By field-ranging the module using the AC1310 plug-on ranging card. By ordering a 3B module with the -00 suffix (externally programmable) and an AC1310, user-supplied resistors determine the zero and span range of modules. (Selection of resistors is described in the 3B Series User's Manual or the 3B-CUSTOM Program software)

By ordering modules with special ranges that are pre-configured by Analog Devices. To order a pre-configured module, indicate the desired module type with a suffix of "-CUSTOM" as well as the desired range (e.g., 3B34-CUSTOM, Range: +500°C to +600°C or 3B37-CUSTOM, Type K, 0 to +1000°C). Refer to the following examples for assistance in selecting and ordering "-Custom" 3B models. There is an additional charge for custom ranging.

By building their own 3B modules with custom functions using the AC1350 or AC1351 empty module cases.

For more information on a particular 3B Series Module, choose the module from the Available 3B Series Modules.

Selecting a Backplane

Analog Devices provides three backplanes: a 4-channel, an 8-channel, and a 16-channel version. Each channel of the backplane contains a CJC temperature sensor for thermocouple modules. 3B Series input and output modules can be located in any socket on the backplane. Screw terminal blocks are provided for easy power connections and field wiring. To interface to host systems and other backplanes, 3B Series backplanes provide two 26-pin connectors. Additionally, each 3B Series backplane can be mounted in a 19-inch rack or panel or NEMA enclosure with optional kits.

Select the type and number of backplanes according to the total number of input and output modules used in your application. Table 1 summarizes the ordering information for the 3B Series backplanes. For more information on the 3B Series Backplanes, go to the backplanes section.

Table 1. 3B Series Backplanes

Model	Description
3B03	4-Channel Backplane
3B02	8-Channel Backplane
3B01	16-Channel Backplane

Selecting a Power Supply and Power Cord

The 3B Series modules are powered by either an AC/DC power supply or a DC/DC (+24 V DC input) converter. The supply is mounted on the backplane using a supplied mounting bracket. External ±15 V DC and +24 V DC supplies can also be used to power both the modules and the current outputs. A required optional AC power cord is offered: AC1340-D. This cable plugs into the AC power line and connects to on-board power screw terminals. The AC1341, a DC power cable, is also available.

The power supply voltages are bussed to all signal conditioners in the system. Several power supplies are available to satisfy various current requirements. Each power supply operates over a -25°C to a +70°C temperature range. Table 2 summarizes the ordering information for the 3B Series power supplies. For more information on the 3B Series Power Supplies, go to the power supplies section.

Table 2. 3B Series Power Supplies

Model	Type	Input	Output
AC1300	AC/DC (With Mounting Bracket)	115 V rms, 60 Hz	±15 V DC @ ±200 mA
AC1301	AC/DC (With Mounting Bracket)	115 V rms, 60 Hz	±15 V DC @ ±350 mA
AC1302 (Obsolete)	DC/DC	+24 V DC	±15 V DC @ ±190 mA
AC1307	AC/DC	115 V rms, 60 Hz	+15 V DC -15 V DC +24 V DC.

Selecting an Interface Cable and Connectors

The requirements for cables and connectors are determined by the specific user application. The following serves as a guideline only.

From your 3B backplane to your system(s) or adapter board(s), you can use a maximum of two cables. The AC1315 can be used with a 3B Series subsystem and an adapter board such as Model AC1324. Additional cable(s) are needed to connect the selected adapter board(s) to your system(s).

Several cables are available to interface to the Analog Devices family of RTI boards.

If you plan to use +24 V DC power, order the AC1352 for cable connection.

For more information on Interface Cables and Connectors, go to the Interface Cables and Connector sections on the Accessories page.

Selecting Rack Mount and Surface-Mount Kits

Depending on available mounting space, both 19-inch rack mount kits and surface mount kits are available to mount the 3B Series backplanes. Table 3 summarizes the ordering information for the 3B Series Rack Mount and Surface Mount Kits. For more information on Rack Mount and Surface-Mount Kits, go to the Mounting Kits sections on the Accessories Page.

Table 3. 3B Series Rack Mount and Surface Mount Kits

Model	Type	Description
AC1330	19-inch Rack Mount Kit	Mounts either the 16-channel 3B01, 8-channel 3B02 or 4-channel 3B03 backplanes in a 19-inch rack

AC1331	Surface-Mount Kit	Mounts the 16-channel 3B01 backplane in a panel or NEMA enclosure
AC1332	Surface-Mount Kit	Mounts the 8-channel 3B02 backplane in a panel or NEMA enclosure
AC1333	Surface-Mount Kit	Mounts the 4-channel 3B03 backplane in a panel or NEMA enclosure

Selecting Accessories

Analog Devices also provides accessories to help you configure your 3B system. A spare 100 Ω current conversion resistor, Model AC1342, is available. Two kits with an empty 3B Series case, Models AC1350 and AC1351, are available for those users who would like to design their own function within the 3B Series mechanical footprint.

Table 4 summarizes the ordering information for the 3B Series accessories. For more information on a particular accessory, go to the Accessories page.

Table 4. 3B Series Accessories

Model	Description
AC1342	Empty 3B Case, Board and Connectors
AC1350	Empty 3B Case and Connectors
AC1351	16-Channel Backplane
AC1346	3B Series User's Manual

Documentation

A 3B Series User's manual, Model AC1346, is shipped with each 3B Series backplane.

Download the 3B Series User's Manual (PDF)

System Configuration Example

A typical 3B Series System application might consist of eight thermocouples and three RTDs, requiring eight type J thermocouple input modules, including one unit that needs custom ranging, and three 3-wire RTD input modules over a 0°C to 200°C temperature range. This requirement could be satisfied with the units listed in Table 5 below.

Table 5. 3B Series Rack Mount and Surface-Mount Kits

Quantity	Model	Description/Comments
3	3B34-03	3-Wire RTD Input (0°C to 200°C Input Range)
7	3B37-J-01	Type J Thermocouple Input
1	3B37-X-00	User Programmable Thermocouple Input
1	AC1310	Custom Ranging Card, which houses customer-supplied resistors that determine TC type and the zero and span of the custom range
1	3B01	16-Channel Backplane - includes AC1346 User's Manual
1	AC1330	19-inch Rack-Mount Kit
1	AC1300	AC Power Supply with Hold Down Bracket
1	AC1340-D	AC Power Cord
1	AC1315	2-foot Ribbon Cable with 2 Connectors
1	AC1324	Universal Adapter Screw Terminal Outputs

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