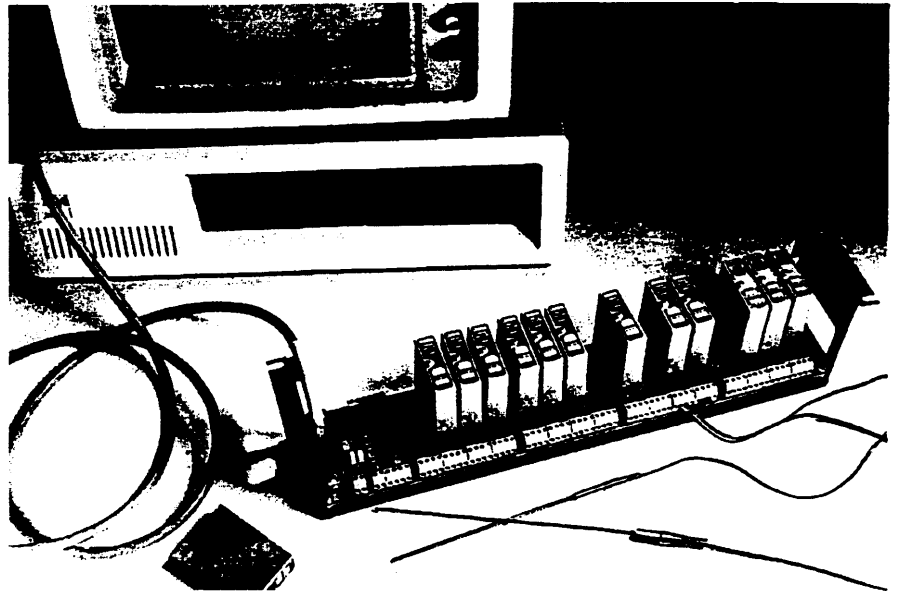


Configurable, Digitizing Signal Conditioners

6B Series

Features

- Complete Sensor to RS-232 or RS-485 Interface; Complete Data Acquisition System in Each Module
- Input Modules for Thermocouples, RTDs, mV, V and Current
- Linearized Outputs in Engineering Units
- Field Configurable Modules via Software
- High Resolution 16 Bit Integrating Converter
- Galvanic Isolation to 1500V rms
- Mix and Match Capability



The 6B Series Configurable, Digitizing Signal Conditioners represent a new generation of low cost data acquisition modules that provide a complete sensor to host solution. It is designed to interface directly to thermocouples, RTDs, mV, V, and process current signals, convert these signals to engineering units and transmit to any host computer with a standard RS-232C or RS-485 port. This modular design enables anyone familiar with a personal computer to construct a flexible and cost effective data acquisition system without the hassle of analog problems since all of the information is processed in the digital domain.

Each module performs signal conditioning, isolation, ranging, A/D conversion and digital communications. All user configurable options (sensor type, address, baud rate, etc) are done through the communications port and stored in nonvolatile memory onboard the module, which eliminates the need for external adjustments of any kind.

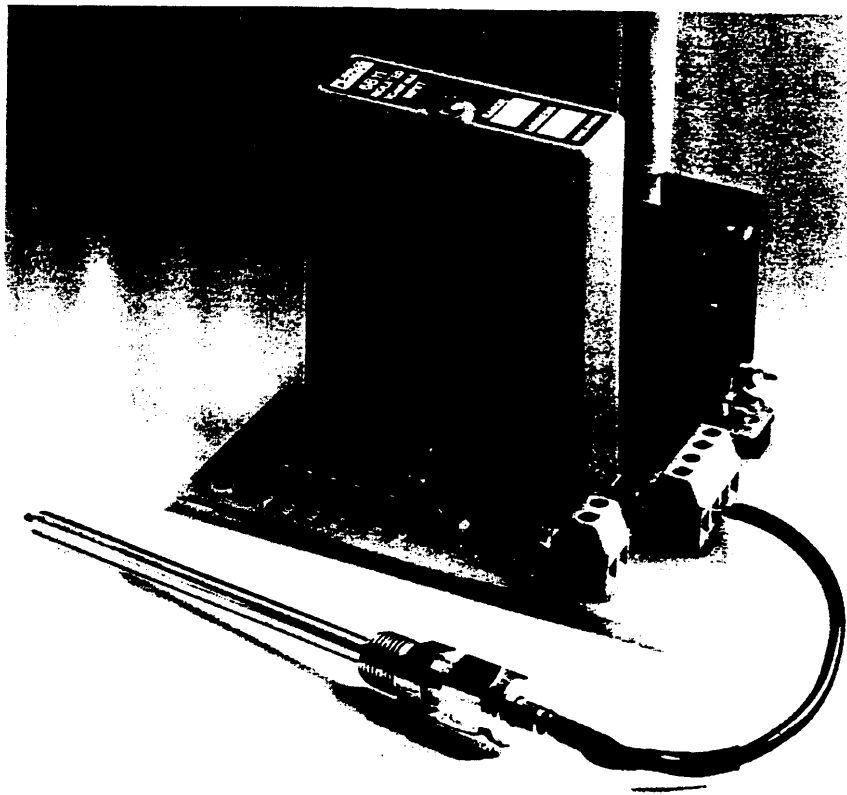
6B Series

Configurability is the keyword for the 6B Series module family. The onboard microprocessor provides the ability to reconfigure each 6B Series module for various sensor types and input ranges; thermocouples, RTDs, mV, V and mA. As a result, only a few modules are needed to address a broad range of sensor inputs. The ability to reconfigure in software has allowed a single module to represent a broad based module family.

The 6B Series incorporates transformer based isolation with automated surface mount manufacturing technology for increased reliability at low cost. These compact, rugged modules can be mixed and matched on a 19" backplane for high density, remote data acquisition applications. As many as 256 modules can be connected on one 4 wire cable. They can be placed remote from the host computer and from each other.

For transmitting long distances, RS-485 is the communications format that should be used. This permits operation up to 4000 feet from the host computer. RS-232C format can be used as the interface to a PC. Both backplane versions can be used together to provide remote data acquisition over the RS-485 link and a PC interface with the RS-232C port. Each backplane incorporates screw terminals for sensor inputs, power connections and communication outputs.

A utility disk is shipped with each manual, which eliminates the need for programming skills to easily communicate with the modules. This allows for the functionality to be tested as well as for programming all module configuration parameters. This program can also be used to scan the network and identify all modules that respond. Help and



Print commands are also included to facilitate use and system documentation. The utility disk also includes Basic and Pascal listings of all 6B Series commands.

Industry standard software packages are also available. These packages provide a transparent access to the modules from a serial port and maintain a user friendly interface. These packages include Labtech Notebook, Control EG and The Fix, and allow you to turn your PC into a complete data acquisition system.

Input Module Description

The 6B input modules cover all signal ranges from $\pm 15\text{mV}$ to $\pm 50\text{V}$ and all thermocouple and RTD types. The input signal is conditioned and scaled by the programmable gain amplifier and digitized by a 16 bit integrating converter under microprocessor control. The digitized

value is passed serially across a magnetically isolated barrier and clocked in by a custom controller chip. The on board microcontroller converts the data into engineering units as determined by the channel parameters.

The 6B modules have a simple master slave relationship with the host and respond only when spoken to. Each module has a unique ID number stored in non-volatile memory for addressing. The format is ASCII and all standard baud rates up to 19.2k baud are possible.

Each 6B module can be recalibrated in the field or lab to an external reference. Similarly, it can be reconfigured for a different transfer function. The parameters are also stored in the non-volatile memory of the module.

Configurable, Digitizing Signal Conditioners

INPUT MODULE SPECIFICATIONS (typical @ +25°C and +5V dc)

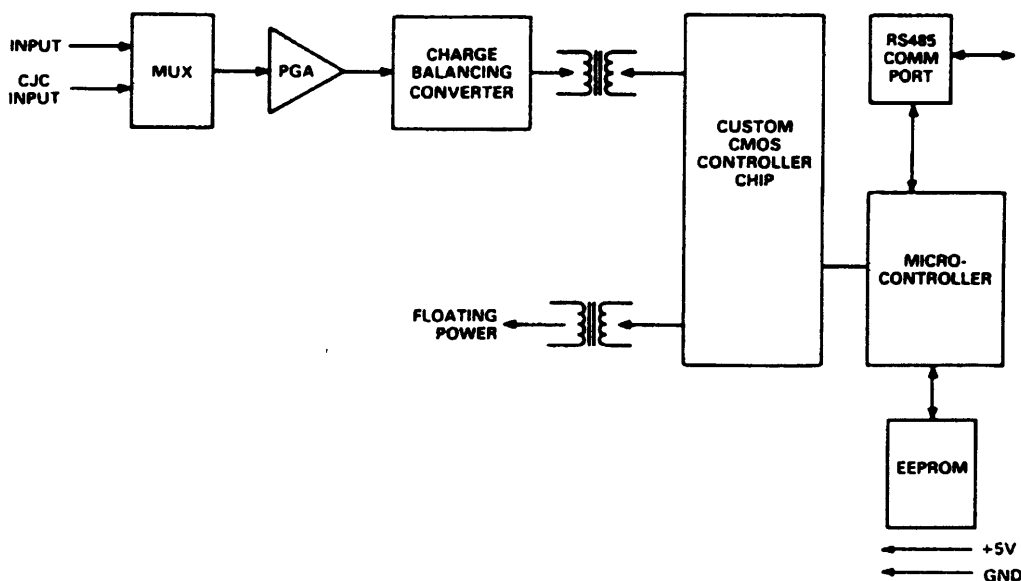
Model	6B11	6B12	6B13
Input Ranges	Thermocouple, mV V, mA	V, mA	Pt, Ni, Cu RTD
Output	RS-485	.	.
Accuracy	±0.05% or better ¹	.	±0.01% or better
Zero Drift	±0.3µV/°C	.	±0.005°C/°C
Span Drift	±25ppm/°C max	.	}
CMV, Input to Output	1500V rms Cont.	.	.
CMR @ 50Hz or 60 Hz 1kΩ Source Imbalance	160dB	108dB	145dB
NMR @ 50Hz or 60Hz	58dB	56dB	58dB
Differential Input Protection	240V rms Cont.	.	.
Bandwidth	4Hz	.	.
Conversion Rate	9 samples/sec.	.	.
Power Supply	5V ±5%	.	.
Power Consumption	1.12W (225mA)	.	.
Size	2.3" x 3.1" x 0.75"	.	.
Environmental			
Temperature Range, Rated	-25°C to +85°C	.	.
Temperature Range, Storage	-40°C to +85°C	.	.
Relative Humidity (MIL Spec 202)	0 to 95% @ 60°C	.	.

NOTES

*Specifications same as 6B11.

1. Excluding CJC Sensor.

Specifications subject to change without notice.



6B Input Module Block Diagram

INPUT MODULES

6B11

The model 6B11 accepts inputs from J,K,T,E,R,S and B thermocouples, millivolt, Volt and current signals and provide an isolated RS-485 output. For thermocouple inputs all signals are linearized and cold junction compensation is accounted for. The output can be in Volts, millivolts, milliamps or °C.

ORDERING INFORMATION

V/mV/mA Ranges	Thermocouple Ranges
15mV	J Thermocouple, 0 to +760°C
50mV	K Thermocouple, 0 to +1000°C
100mV	T Thermocouple, -100 to +400°C
500mV	E Thermocouple, 0 to +1400°C
1V	R Thermocouple, 500 to +1750°C
5V	S Thermocouple, 500 to +1750°C
0-20mA	B Thermocouple, 500 to +1800°C

6B12

The model 6B12 accepts voltage inputs from $\pm 150\text{mV}$ up to $\pm 50\text{V}$ as well as current signals and provides an isolated RS-485 output.

V/mV/mA Ranges	
$\pm 50\text{V}$	$\pm 10\text{V}$
$\pm 5\text{V}$	$\pm 1\text{V}$
$\pm 500\text{mV}$	$\pm 150\text{mV}$
	0-20mA

Configurable, Digitizing Signal Conditioner

6B13

The model 6B13 accepts Platinum, Nickel and Copper RTD inputs and provides a linearized, isolated output signal.

RTD Ranges		
Pt	-100°C to +100°C	Alpha=0.00385
Pt	0°C to +100°C	Alpha=0.00385
Pt	0°C to +200°C	Alpha=0.00385
Pt	0°C to +600°C	Alpha=0.00385
Pt	-100°C to +100°C	Alpha=0.003916
Pt	0°C to +100°C	Alpha=0.003916
Pt	0°C to +200°C	Alpha=0.003916
Pt	0°C to +600°C	Alpha=0.003916
Ni	-80°C to +100°C	
Ni	0°C to +100°C	
Cu	0°C to +120°C	10Ω @ 25°C
Cu	0°C to +120°C	10Ω @ 0°C

BACKPLANES

Backplanes are available that are compatible with RS-232C or RS-485 interfaces. Select the one that best fits your needs.

Model	Channels	Output
6BP01-1	1	RS-485
6BP01-2	1	RS-232C
6BP04-1	4	RS-485
6BP04-2	4	RS-232C
6BP16-1	16	RS-485
6BP16-2	16	RS-232C

ACCESSORIES

AC1380	Rack Mount Kit for 16 Channel Backplane.
AC1381	50Ω Current Conversion Resistor for use with the 6B11 and 6B12.
AC1382	RS-232C Cable

SOFTWARE

AC1904	Control EG
AC1530	Labtech Notebook