## GPIB<->SERIAL ANSI X3.28 INTERFACES

## DESCRIPTION

The Model 4894B-7 and 4804B-7 are both IEEE-488.2 compatible, GPIB to Serial interfaces that are used to adapt serial devices that use the ANSI X3.28 protocol to the GPIB or HP-IB bus. Both interfaces provide RS-232 or RS-422/RS-485 signals at rates up to 57,600 baud. The Models 4894B-7 and 4804B-7 simplify the controlling of ANSI serial devices by automatically handling the ANSI protocol and eliminating the non-printable characters. The user can program with standard ASCII characters and sees an IEEE-488.2 compatible GPIB device with the normal GPIB command-response sequence. Typical applications are interfacing Temperature Controllers such as the Tenny Versatenn or Watlow 942 to the GPIB Bus and replacing ICS's older 4814 GPIB to Serial Interface with a modern IEEE-488.2 interface.

### ANSI Protocol Communication

The ANSI protocol is a packet type protocol that uses non-printable characters to frame the packets and generates a response for every command or query. Communication with an ANSI X3.28 device is initiated by a GPIB Device Clear followed by sending the 4894B-7 or 4804B-7 GPIB Interface a number that matches the Temperature Controller's internal address, which is typically 0. The GPIB Interface responds with '0ACK' if the serial communication link was successfully opened. The user's program can then set the chamber's temperature setpoint, alarms, etc. or query the current temperature or other parameters.

The Interface responds to every GPIB ANSI message with a value or with a status response. If the Interface did not receive a response from the serial device to an ANSI message or if the response was not the expected response, the Interface will respond with an error message when next addressed to talk.

The GPIB Interface's GPIB address and serial interface settings can be changed or queried with SCPI commands from the GPIB interface. OEM users can also set the unit's IDN message to identify the completed assembly as their own. The configuration settings are then stored in flash memory and can be locked to prevent accidental changes. The units revert to the stored settings each time they are powered-on or reset.
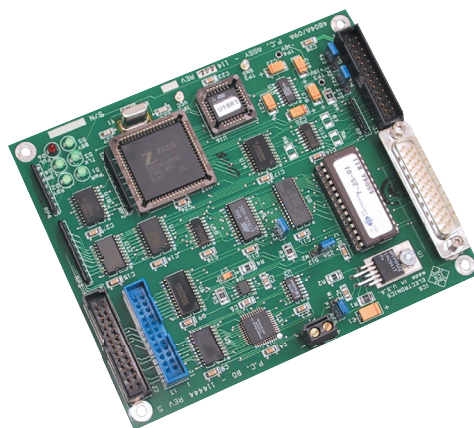


**4894B-7 GPIB<->Serial Interface**

The included Support CD-ROM contains a menu-driven utility program that walks the user through the configuration setup and an interactive GPIBkybd program for controlling GPIB devices. Example programs and optional LabView Drivers simplify integrating the Temperature Chamber or other ANSI device into the test program.

### 4894B-7

The Model 4894B-7 is a 4894B with a special firmware ( program F30146) to handle the ANSI X3.28 protocol. The 4894B-7 is designed for stand-alone operation on a desktop or on top of a temperature chamber. The 4894B-7 is packaged in ICS's small metal Minibox™ case which provides RFI/EMI protection and uses an external power adapter to operate from AC power. Serial connections are made via a DB-25 connector on the 4894B's rear panel. The 4894B is an updated version of the 4894A and is RoHS compatible.



**4804B-7 GPIB<->Serial Interface**

### 4804B-7

The Model 4804B-7 is a 4804B with special firmware (F30145) to handle the ANSI X3.28 protocol. The Model 4804B-7 is a small PC board

- Adapts serial ANSI X3.28 devices to the GPIB Bus
  *Eliminates unprintable characters and simplifies protocol handling.*

- Replaces ICS's older 4814.
  *Smaller 4804B board provides added 488.2 functionality and firmware setup.*

- IEEE-488.2 compatible interfaces.
  *Responds to all IEEE-488.2 Common Commands.*

- User selectable single-ended RS-232 and balanced RS-422/RS-485 serial signals.
  *Matches any asynchronous serial interface.*

- GPIB/Serial configuration set with SCPI commands and stored in Flash.
  *Eliminates removing covers or setting switches to set or query a setting*

- Support includes example programs, LabView Drivers, and menu driven Configuration Programs.
  *Multiple programming options.*

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## 4804B cont'd

assembly that is designed to be mounted inside the chassis or enclosure with the serial device and can be powered by regulated or unregulated DC voltage. The 4804B-7's GPIB address can be set from the GPIB bus and saved in Flash or read from a rear panel rocker switch at power turn-on time. The 4804B is an updated 4804A with flash memory and RoHS components.

The 4804B has two ribbon connectors for GPIB signals. The 24-pin GPIB connector is designed for a flat-ribbon cable with a panel mounted GPIB ribbon connector. The 26-pin GPIB connector includes the external address input signals and mates with one of ICS's GPIB Connector/Switch Assemblies. These small, business card size assemblies mount a GPIB connector and an address switch on the chassis rear panel. Refer to their separate data sheet for additional information.

The 4804B has two RS-232 and RS-422/RS-485 Serial connectors. A 26-pin header connector accepts a flat-ribbon cable that can plug into the serial device. A DB-25P connector mates with any DB-25S connector and makes an easy connection when only a couple of wires are needed. Pinouts on both connectors conform to EIA Specification RS-530 for direct connection to a standard 25-pin DB style connector or to the user's RS-232 interface.

## Replacing 4814 Boards

4814 and older 4804A Boards can re replaced by ordering the following items:

1 - 4804B-7 with F30145 firmware.

1 - 114439-L Flat-ribbon GPIB Cable. L is the cable length in cm from the rear panel to where the board will be mounted. Stocked lengths are 30, 45, 60 and 90 cm.

1 - 125050 wall-mounted AC to DC power adapter or any 5 to 15 Vdc power supply with 0.5 A capacity.

## ANSI Error Messages

Table 1 lists the error messages that the interfaces generate when they detect a problem with the serial messages from the ANSI device.

### TABLE 1 ANSI Error Messages

| | |
|---|---|
| Error-TMO | No serial response |
| Error-No STX | STX start of message character not received |
| Error-No ETX | ETX end of message character not received. |
| Error-Undefined resp | Unrecognized |

## IEEE 488 Bus Interface

The 4894B-7's and 4804B-7's 488 Bus Interface meets IEEE STD 488.1-1987 and has the following capabilities as a GPIB-to-Serial converter:

SH1, AH1, T5, L3, SR1, PP1, DC1
RL0, DT0, C0 and E1/E2 drivers

Bus drivers incorporate power up/down protection to prevent glitching the bus during power turn-on.

### Address Capability
Primary addresses 0-30.

### SRQ Generation
SRQs are generated per the IEEE-488.2 specification if the unit is not addressed to talk, if SRQs are enabled and if an enabled ESR or STB register bit occurs for:

GPIB Buffer full
GPIB Buffer empty
Serial Buffer not empty
Serial Message received
Serial Buffer full
Command error
Serial error
Execution error
Query error
Power on
MAV

### Buffers

| | |
|---|---|
| GPIB Listen | 2 Kbytes |
| GPIB Talk | 2 Kbytes |
| Serial TX | 256 bytes |
| Serial RX | 256 bytes |

### 488.2 Common Commands
*CLS, *ESE, *ESE?, *ESR?, *IDN?, *OPC, *OPC?, *RST, *SAV, *SRE, *SRE?, *STB, *TST?, AND *WAI.

## Serial Interface

Serial signals conform to EIA Specifications for RS-232 single or RS-485 (RS-422) differential signals.

| | |
|---|---|
| **Baud Rates:** | 300, 600, 1.2K, 2.4K, 4.8K, 9.6K, 19.2K and 38.4K baud |
| **Data Bits** | 7 or 8 bits |
| **Parity** | Odd, even or none |
| **Stop Bits** | 1 or 2 |

### Data Transfer Protocol
Hardware handshake always enabled.

### SCPI Commands
The 4894B-7 and 4804B-7 conforms to the SCPI 1994.0 Specification and uses SCPI commands to select:

GPIB Bus Address
External Address (4804 only)
Baud Rate
Parity Select
7/8 data bits
1/2 stop bits
RS485 Enable
Timeout
IDN Message
Lock Settings



4804A Board Outline
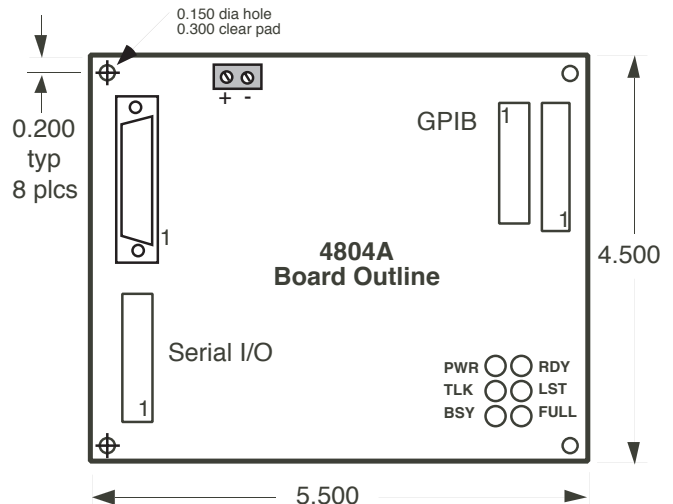
## Indicators

4894B-7 indicators are on the front panel. The 4804B-7 has LED indicators on the PC board.

| | |
|---|---|
| **PWR** | Indicates power on |
| **RDY** | Unit has passed self test |
| **TALK** | Unit has recognized its Talk Address |
| **LSTN** | Unit has recognized its Listen address |
| **BUSY** | Unit is receiving serial data |
| **FULL** | An internal data buffer is full |

## 4894B-7 Physical

Size
  7.45"L x 5.57"W x 1.52"H
  (18.92cmL x 14.15cmW x 3.86cmH)

Weight
  3lbs. (1.4kg.) including adapter

Connectors
GPIB:          Amphenol 57-20240 with metric lock studs
Serial:        DB-25S with lock studs

Temperature
  Operating    -10 °C to +55 °C
  Storage      -20 °C to + 70 °C

Humidity
  0-90% RH without condensation

Shock/Vibration
  Normal handling only

Construction   All metal case

Power          9 to 32 Vdc @ 3.5 VA

## 4894B-7 Included Accessories

Instruction Manual
Support CD-ROM with sample and configuration programs.
UL/CSA/VDE approved AC power adapters provided for:
  US - 115 ± 10% Vac, 60 Hz (std)
  Europe - 230 ±10% Vac, 50/60 Hz
  UK - 230 ±10% Vac, 60 Hz
  Japan - 100 ±10% Vac, 50/60 Hz

## 4804B-7 Physical

Size
  5.5"L x 4.5"W x 0.5"H inches
  (139.7mmL x 114.3mmW x 12.7mmH)

Connectors
  GPIB:        24-pin 3M 2524 male conn.
  GPIB/Addr:   26-pin 3M 2526 male connector
  Serial:      26-pin 3M 2526 male conn. DB-25P male conn.

Temperature
  Operation    -10 °C to +70 °C
  Storage      -20 °C to +85 °C

Humidity
  0-90% RH without condensation

Shock/Vibration
  Normal handling only

Construction   Fiberglass PC Board Assy

Power          Regulated +5 Vdc or Unregulated +5.5 to +15 Vdc @ 300 mA (typ)

## 4804B-7 Included Accessories

Instruction Manual
Support CD-ROM with sample and configuration programs.

## Available Accessories

GPIB Flat Ribbon Cable, 90 cm max., P/N 114439-90.
GPIB Connector/Address Switch Assembly with flat ribbon cable, 90 cm max., P/N 113640-90 or P/N 113642-90.
Serial cable, 4894B to Watlow, 5 feet long with tined leads. P/N 115119
LabView Driver Library for 4814B type GPIB to ANSI X3.28 interfaces, P/N 123167

## ORDERING INFORMATION

| | Part Number |
|---|---|
| GPIB - Serial Interface in Minibox case (includes 115 VAC Adapter, Manual and Configuration Disk) | 4894B-7 w/F30146 |
| For 230 VAC adapter, add suffix to specify country/plug style) -U(Universal) | |
| Rack Mounting Kits (holds one or two units) | Single - 114710, Dual - 114711 |
| GPIB - Serial Interface Board (includes Manual and Configuration Disk) | 4804B-7 w/F30145 |
| GPIB Connector/Address Switch Assemblies and GPIB Flat Ribbon Cables | see separate data sheet |
| LabView Driver Library for 4814 type GPIB to ANSI x3.28 Inerfaces | Contact Suppport |