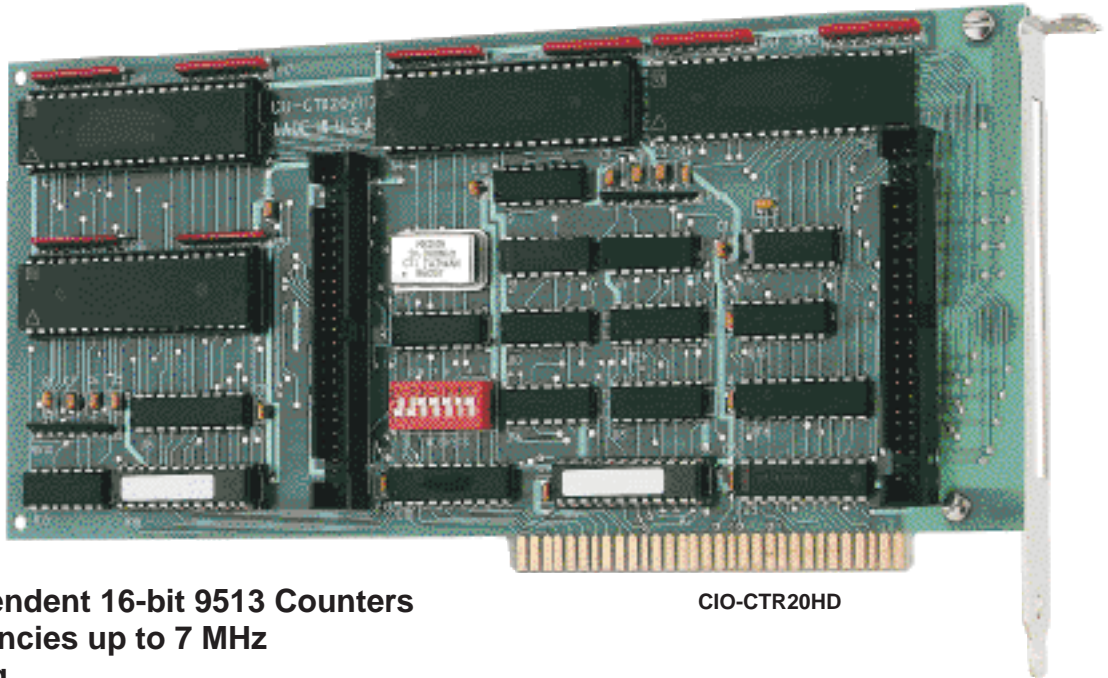# CIO-CTR10HD & CIO-CTR20HD
10 and 20 channel counter/timer boards

$219
Basic Unit

CIO-CTR20HD

✔ **10 or 20 Independent 16-bit 9513 Counters**
✔ **Counts Frequencies up to 7 MHz**
✔ **Event Counting**
✔ **Pulse and Frequency Measurement**
✔ **Generate Frequencies with Complex Duty Cycles**

CIO-CTR10HD & CIO-CTR20HD are high performance AMD9513 based counter/timer boards utilized in IBM PC compatible computers with ISA expansion slots. Each AMD9513 provides five counters with 16-bit (65,536 counts) registers. The 9513 is an extremely powerful and flexible component which is software programmable for event counting, pulse and frequency measurement, alarm comparator and other input functions.
As an output device the 9513 can generate frequencies with complex duty cycles and provide one-shot and continuous outputs. The CIO-CTR10 contains two AMD9513 chips and the CIO-CTR20HD contains four AMD9513 chips.

PROGRAMMING
The 9513 counters one through five may be chained via software, enabling a 32, 48, 64, or 80-bit counter to be constructed within the chip. In addition, the gate source and gating functions are software programmable and may be reconfigured as counter inputs. Chaining across chips is possible with a single wire allowing the construction of up to 160-bit counters (as a point of interest, at 1MHZ, a 160 bit counter would take 4.63×10^{25} years to reach terminal count.

The source of pulses to the AMD9513 is fully programmable. Three sources are available. These are External, 1MHz or 5MHz. The default counter source (power up or reset) is 1MHz, which is compatible with the CIO-CTR05.

An external interrupt pin provides access to the personal computer interrupts 2-7. Once an interrupt level is selected, the rising edge on the IR INPUT (pin 26) will cause a PC IRQ, which will branch program control to that IRQ handler. Use an interrupt to initiate program execution on terminal count, set off an alarm or reconfigure counters after a prescribed interval.

Cabling & Signal Connection
Counter intensive applications benefit from the 10 counters on a single high density 50-pin connector. Cabling to the CIO-CTR is via a standard 50-pin header type connector. Each cable carries all counter inputs, outputs and gates for two AMD9513s, the interrupt input, +5 volts and ground. All I/O on the CIO-CTR10HD may be accessed using a CIO-TERM100 or CIO-MINI50 terminal panel. The terminal panel connects to the CIO-CTR10HD using a C50FF-2 cable. The CIO-CTR10HD requires two terminal panels and two cables.
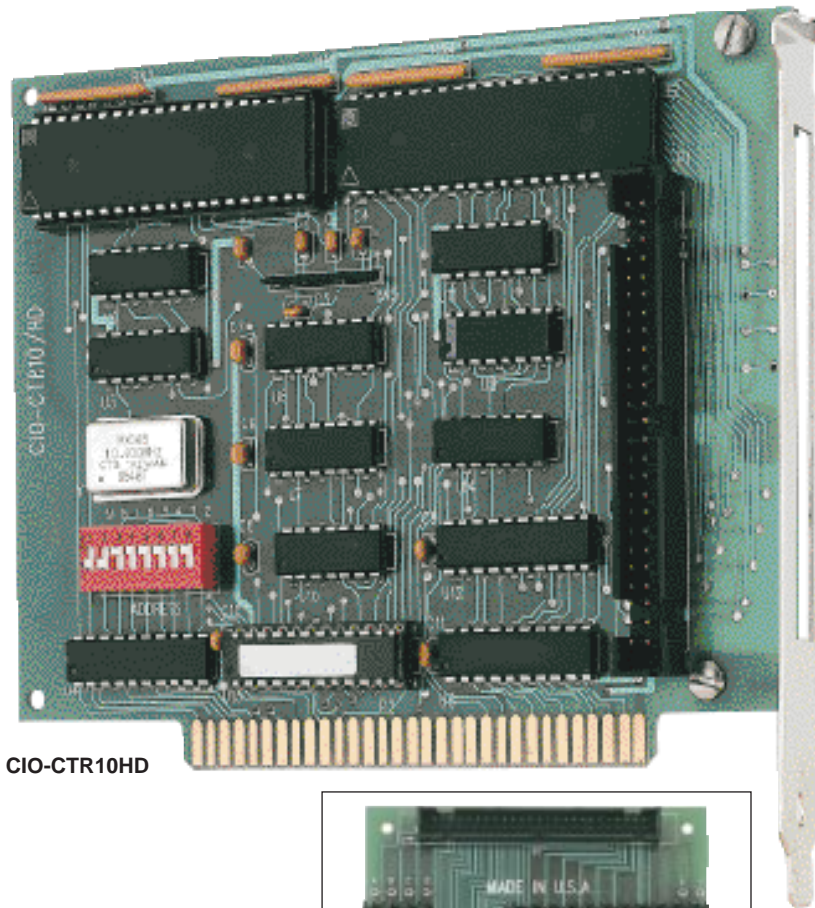
Software
The CIO-CTR boards include a test and configuration program. The program provides a step-by-step procedure for installing and configuring the card. It also creates a configuration file used by the optional Universal Library.
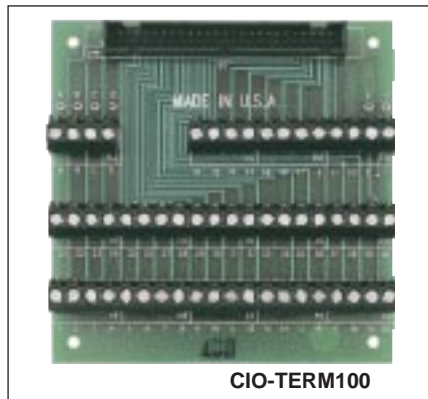
NEW™

The Universal Library is a set of I/O libraries and drivers for those users creating their own custom programs. The Universal Library is compatible with most DOS and Windows based languages and supports the entire CIO family of boards. The Library includes an extensive set of programming examples written in Visual Basic, C and Pascal for both Windows and DOS languages.

An optional driver for LabView is also available. The LabView driver works in conjunction with the Universal Library, so both are needed to use the CIO-CTR in LabView.

The CIO-DAS1400 is also compatible with many off-the-shelf programs including Labtech, DASYLab and SnapMaster.

CIO-CTR10HD

CIO-TERM100

Specifications

COUNTER I/O
Out Low: 0.4 V max. @ 3.2 mA
Out High: 2.4 V min. @ -200 µA
Input Low: -0.5 V min., 0.8 V max.
Input High: 2.0 V min., 7.0 V max.

INTERRUPT PIN
Type: positive edge triggered
PC Bus IRQ: IRQ2-IRQ7
Enable: Interrupt enable, pin 26

POWER CONSUMPTION
CIO-CTR10HD:
+5 V @ 300 mA typ/ 500 mA max.
CIO-CTR20HD:
+5 V @ 450 mA typ/ 700 mA max.

ENVIRONMENTAL
Operating Temperature:
0 to 50°C (32 to 122°F)
Storage Temperature:
-20 to 70°C (-4 to 158°F)
Humidity:
0 to 90% non-condensing
Weight: 5 oz. (142 g.)

To Order *(Specify Model No.)*

Model Number	Price	Description
CIO-CTR10HD	$219	10-channel 16-Bit Counter/Timer board, requires terminal panel and cable
CIO-CTR20HD	359	20-channel 16-Bit Counter/Timer board, requires two terminal panels and two cables
CIO-TERM100	149	16"x4" screw terminal board with prototype area, requires one C50FF-2 cable
CIO-MINI50	49	4"x4" screw terminal board contains 50 screw terminals and one 50-pin connector, requires one C50FF-2 cable
C50FF-2	25	Connection cable, 2 ft.
UNIV-DRVR	49	Universal Driver Library
CIO-LABVIEW-DRVR	49	LabView Driver Software (requires Universal Driver Library)

Each CIO-CTR board includes test and configuration software and a user's manual.
Ordering Example: CIO-CTR10HD *counter board with* **CIO-MINI50** *terminal panel and* **C50FF-2** *cable, $219 + 49 + 25 =* **$293.**