

DATA SHEET



# EX1200-7416

16-CHANNEL COMPARATOR/EVENT DETECTOR

## FEATURES

Up to 96 differential channels per full rack mainframe

Constantly monitor input signals for fault conditions

Flexible configurations for detecting edges, out-of-bounds conditions and measuring pulse widths

Inputs can be masked, inverted, and combined to produce interrupts

Can be used as a time stamp module and as a digital I/O

Programmable debounce circuitry prevents erroneous readings

10 V and 100 V input ranges

On-board memory stores events with IEEE 1588 timestamps

Synchronize reading of input states with other scanned analog channels



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RELIABLE DATA FIRST TIME EVERY TIME

# OVERVIEW

The EX1200-7416 has sixteen true differential channels of analog comparator input that can be selected to provide an interrupt to the EX1200 system when the input falls outside the software programmed bounds, independent of the scan list operation. The EX1200-7416 is an ideal device in "go/no-go" testing, where a device fails if the voltage outputs exceed a threshold or window, or in control applications where a device or test needs to be shut down if a voltage level is exceeded. Using an analog comparator/interrupter in certain applications, as opposed to a traditional scanning approach, considerably improves the overall response time of the system, providing the ability to 'constantly monitor' signals of interest for fault conditions.

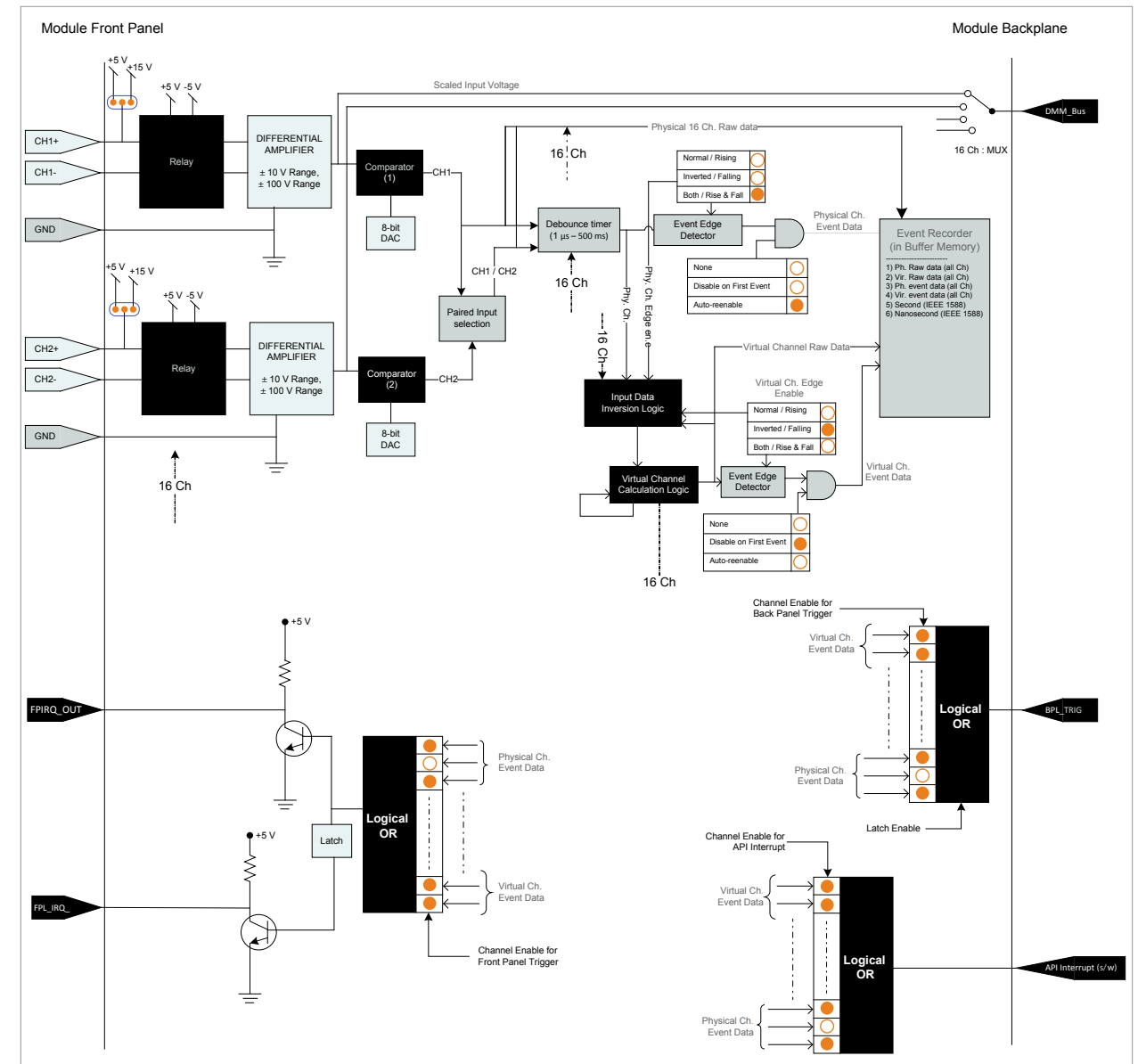
The inputs are independently software programmable, permitting the user to vary input thresholds per channel. Each input signal is also digitally debounced for a programmed time ranging from 1  $\mu$ s to 500 ms, preventing input signal noise from causing undesired interrupts. The threshold polarity can be programmed to detect either a rising or falling edge or can be masked to prevent unused channels from causing interrupts.

All of the enabled inputs are OR'd together to produce a single interrupt signal. Input can be combined via math functions to create virtual channels when multiple conditions must be satisfied before an event is recorded. On board memory stores events with precise IEEE 1588 timestamps. The interrupt signal can be routed through the front panel connector for distribution to other devices in the test system for absolute deterministic communication.

There are three modes of operation that satisfy a wide range of applications. In normal mode, any channel crossing a threshold with the programmed polarity will cause an event to be latched into memory. Window mode automatically parallels two adjacent input channels and is used when an input signal is expected to be within upper and lower bounds. Pulse mode provides a means for measuring the pulse width of input signals by automatically changing the threshold polarity at each crossing.

The EX1200-7416, as part of the EX1200 family of switching and I/O, can be combined with up to five other modules and a DMM to form a high-density test subsystem in a 1U footprint.

## BLOCK DIAGRAM



## General Specifications

NUMBER OF CHANNELS	16 physical and 16 virtual
INPUT RANGES	$\pm 10$ V, $\pm 100$ V (default power-on/off state)
INPUT THRESHOLD	$\pm 10$ V range with 82 mV resolution (8-bit), independent per channel $\pm 100$ V range with 820 mV resolution (8-bit), independent per channel
INPUT TYPE	Differential
INPUT IMPEDANCE	844 k $\Omega$ between positive and negative 422 k $\Omega$ between any channel and ground
THRESHOLD HYSTERESIS AND ACCURACY	
10 V range	-82 mV to 82 mV
100 V range	-820 mV to 820 mV
INPUT EDGE DETECTION	Normal (rising) or inverted (falling) edge detection, per channel
MODES	
Normal	(edge detect)
Paired	(upper/lower bounds)
Pulse	(positive/negative polarity)
DEBOUNCE TIME <sup>1</sup>	1 $\mu$ s to 1.6777216 s
MEMORY	43,690 events
TIMESTAMP FORMAT	IEEE 1588
TIMESTAMP ACCURACY	
EX1200-7416	500 ns
Mainframe PTP Error	200 $\mu$ s worst case (when the IsSynchronized property = True)
MATH FUNCTIONS	AND/OR
WARM UP TIME	30 minutes
POWER CONSUMPTION	
3.3 V	0.250 A
5 V	0.0051 A (plus 24 mA per relay closure)
24 V	0.133 A
WEIGHT	0.719 lb (0.326 kg)
CONNECTOR TYPE	44-pin

### Notes:

1. Note: The rising edge prop time is slower than falling edge at the low end of this range. For example, to catch a 1  $\mu$ s high pulse a debounce time of ~400 ns should be used rather than 1  $\mu$ s. The instrument can be set to as low as 200 ns with an accuracy that is not specified.

## Ordering Information

EX1200-7416	16-channel comparator/event detector
ACCESSORIES AND TOOLS	
70-0363-502	44-pin HD D-sub mating connector and backshell, with 3ft unterminated 22 AWG wire
70-0367-007	EX1200-TB44, 44p DIN connector with internal CJC reference
27-0390-044	44-pin HD D-sub mating connector, backshell and pins, crimp style
70-0297-001	Crimp tooling, includes handle and positioner, 22 AWG