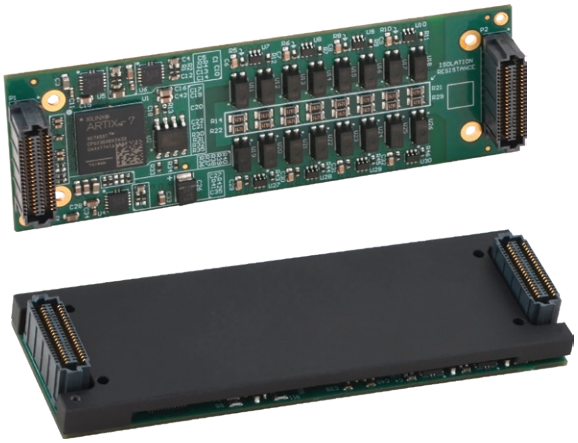
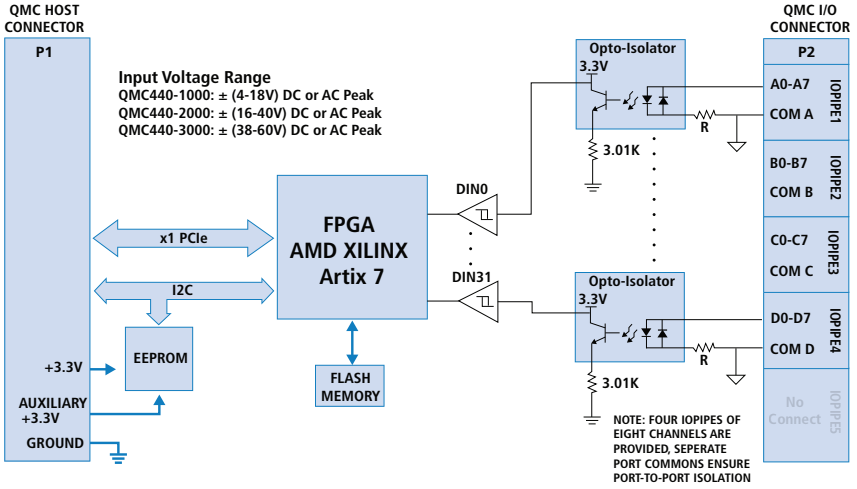
VITA 93 QMC Modules

QMC440 Series Isolated Digital Input





32 Isolated Digital Input Channels ◆ Three Voltage Range Options ◆ Programmable Interrupts ◆ PCIe Bus Interface

Description

QMC mezzanine modules plug into a carrier card to interface connected I/O and provide a variety of signal processing functions. Acromag QMC440 modules offer 32 optically isolated inputs to safely monitor a wide range of digital input signal voltage levels. A PCIe bus interface provides communication to the carrier and host computer.

Isolation protects your computer system from noise, transient signals, and field wiring faults. The inputs are grouped into four 8-channel ports. Ports are isolated from the logic and each other.

Change-of-state, high-to-low and low-to high interrupts are individually programmable for each channel. Debounce eliminates spurious interrupts from noise and switching transients for error-free edge detection.

Closed-loop monitoring of critical control signals is easily accomplished using the QMC440 in conjunction with Acromag's QMC450 digital output module.

QMC modules adhere to the VITA 93 standard for small form factor (SFF) mezzanine modules. Two high-performance 80-pin connectors provide separate field I/O and PCIe bus host interfaces. Modules can deploy on a variety of carrier card platforms including PCIe expansion cards, 3U/6U Eurocards such as VPX and CompactPCI, VNX+ SFF cards, and many other architectures. The rugged design is well-suited for use in laboratory, industrial, defense, and aerospace applications.

QMC modules have a much smaller footprint than PMC/XMC modules. Single-width QMC modules are only 26 x 78.25mm which facilitates mixing and matching of multiple functions on a single carrier card for high-density I/O solutions. They are ideal for computing systems with strict size, weight, power, and cost (SWAP-C) limitations.

An Intelligent Platform Management Interface (IPMI) facilitates system management. The QMC EEPROM holds module information and sensor data that is accessible by a smart carrier card with an IPMC controller over an I2C interface.

Key Features & Benefits

- 32 port-isolated input channels
- Low, medium, and high voltage versions:
  - ±4 to ±18V input
  - ±16 to ±40V input
  - ±38 to ±60V input
- Interrupt support for each channel
- Programmable event interrupts (change-of-state, low-to-high, high-to-low)
- Programmable debounce
- Input hysteresis
- Reverse polarity protection
- Software configured (no jumpers/switches) allowing "on-the-fly" changes without removing modules
- Pins are compatible with QMC450 output module for loopback monitoring
- Loopback monitoring enables self-test and fault detection of open switches or shorts
- Extended temperature range and support for conduction-cooled systems

Acromag
THE LEADER IN INDUSTRIAL I/O

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VITA 93 QMC Modules

ISO9001
AS9100
MADE IN USA

Performance Specifications

Digital Inputs

Input channel configuration
32 optically isolated bipolar inputs

Isolation
Individual opto-couplers provide isolation. Four groups (ports) of 8 channels, each with separate port commons, ensure port-to-port isolation. Individual ports are isolated from each other and from the PCIe interface logic.

Host connector to I/O connector isolation
IPC-2221B: 548.64V (peak) at sea level
IPC-9592: 425V (peak)
UL61010C-1: 250V (rms)

IOPIPE to IOPIPE isolation
IPC-2221B: 30V (peak) at sea level
IPC-9592: 30V (peak)
UL61010C-1: 60V (rms)

Bipolar input voltage range
QMC44x-1xxx: ±4 to ±18V DC or AC peak
QMC44x-2xxx: ±16 to ±40V DC or AC peak
QMC44x-3xxx: ±38 to ±60V DC or AC peak

Input low-to-high threshold
QMC44x-1xxx: ±4V maximum
QMC44x-2xxx: ±16V maximum
QMC44x-3xxx: ±38V maximum

Input response time
On to off: 15µS typical
Off to on: 35µS typical

Interrupts: 32 channels configurable as below
High-to-low transitions
Low-to-high transitions
Change-of-state

Debounce
Selectable for 4µs, 64µs, 1ms, or 8ms

PCI Express Base Specification

Conforms to revision 2.1

Lanes
1 lane in each direction

Bus Speed
2.5 Gbps (Generation 1)

Memory
256k space: Base address register 0
1M space: Base address register 2

Environmental

Operating temperature range
Air-cooled: 0 to 70°C (200 LFM airflow)
Conduction-cooled: -40°C to +85°C

Storage temperature
-55 to 125°C

Relative humidity
5 to 95% non-condensing

Power
+3.3 VDC(±5%): 0.50A typical
+3.3 VDC AUX(±5%): 0.20A typical
+12 VDC(±5%): Not used

MTBF
Contact the factory

Physical

Size
Length: 78.25mm (3.08 in)
Width: 26.00mm (1.02 in)
Height: 11.00mm (0.43 in)

Weight
Unit weight: 8.9g (0.31 oz)

Ordering Information

QMC Modules

Go to on-line ordering page >

QMC441-1111
QMC442-1111
Isolated Digital input, ±4 to ±18V range
Air-cooled (QMC441) or Conduction (QMC442)

QMC441-2111
QMC442-2111
Isolated Digital input, ±16 to ±40V range
Air-cooled (QMC441) or Conduction (QMC442)

QMC441-3111
QMC442-3111
Isolated Digital input, ±38 to ±60V range
Air-cooled (QMC441) or Conduction (QMC442)

Carrier Cards

See Acromag.com/QMC-Carriers for a full list of QMC carrier cards.

Software *(see software documentation for details)*

USW-API
Universal Embedded Design Suite with software support for VxWorks®, Windows®, and Linux®.

Example QMC Module shown with attatched heatsink inlcluded with conduction-cooled QMC Modules.

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