

G4 DIGITAL QUADRATURE

Features

- > 4000 Vrms transient optical isolation
- > Built-in LED status indicators
- > 4 times encoder resolution
- > Installs on mistic 200 bricks
- > Input signals in 4-16 VDC range



G4IDC5Q

DESCRIPTION

The G4IDC5Q quadrature input module pair is designed to allow a digital *mistic 200* multi-function I/O Brick to resolve positional information from quadrature encoder devices. The module outputs a pulse to the Brick each time the quadrature state changes. The Brick counts the module outputs and keeps track of the direction of rotation.

NOTE: This module cannot be used with an E1 or B1 brain board.

Module Operation

The G4IDC5Q Quadrature Module pair converts a quadrature signal to a pulse stream, which is output on one of the two logic side outputs. The active output is determined by the direction of rotation of the encoder. One 0.8 microsecond pulse is output for each change of quadrature state transition. The actual resolution of the position count is 4 times the encoder resolution (pulses per revolution).

The G4IDC5Q is actually a pair of modules, one of which is labeled "A", the other "B". When the signal into the module A leads the signal into module B, the output will be on module A. When the signal into module B leads the signal into module A, the output will be on module B.

On a digital *mistic 200* I/O unit, quadrature input channels must be configured in pairs, with the lower channel number being even. Therefore the only quadrature pairs allowed are channels 0 & 1, 2 & 3, 4 & 5, 6 & 7, 8 & 9, 10 & 11, 12 & 13, and 14 & 15.

The positional count is incremented when the signal into the odd-numbered channel leads the signal into the even-numbered channel. It is decremented when the signal into the even-numbered channel leads the signal into the odd-numbered channel.

Since the digital *mistic 200* I/O unit has a maximum input frequency at 50% duty cycle of 12.5 KHz (see "Specifications" on page 2), then:

$$\text{Maximum Allowable Encoder RPM (at 50\% duty cycle)} = \frac{12,000 \text{ pulses/sec}}{\text{encoder pulses/rev}} \times \frac{60 \text{ sec}}{1 \text{ minute}}$$

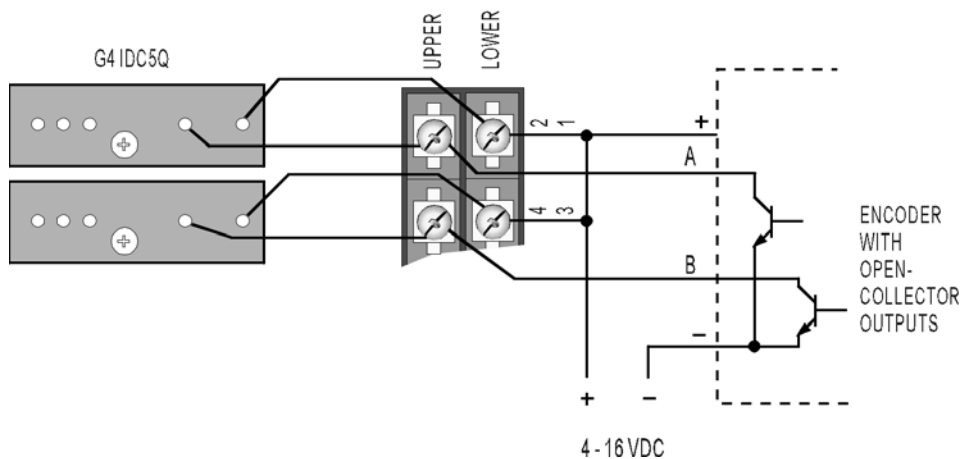
Part Number

Part	Description
G4IDC5Q	G4 DC Input 2.5-16 VDC, 5 VDC Logic, 2-channel Quadrature

SPECIFICATIONS

Logic Voltage	5 VDC
Operating Ambient Temperature	-30 °C to 70 °C
Isolation input-to-output	4,000 V _{RMS}
Input Voltage Range	4–16 VDC
Input Current	8 mA (constant)
Input Allowed for No Output	1 V
Logic Supply Current @ 5 VDC	60 mA
Maximum Input Frequency, 50% Duty Cycle	12.5 kHz
Minimum Time Between Quadrature State Changes at 90°	20 µsec
Agency Approvals	UL, CE, CSA, FM, RoHS; UKCA

WIRING DIAGRAM



PRODUCTS

Opto 22 develops and manufactures reliable, easy-to-use, open standards-based hardware and software products. Industrial automation, process control, remote monitoring, data acquisition, and industrial internet of things (IIoT) applications worldwide all rely on Opto 22.

groov RIO®

groov RIO edge I/O offers a single, compact, PoE-powered industrial package with web-based configuration and IIoT software built in, support for multiple OT and IT protocols, and security features like a device firewall, data encryption, and user account control.

Standing alone, *groov RIO* connects to sensors, equipment, and legacy systems, collecting and securely publishing data from field to cloud. Choose a universal I/O model with thousands of possible field I/O configurations, with or without Ignition from Inductive Automation®, or a *RIO EMU energy monitoring unit* that reports 64 energy data values from 3-phase loads up to 600 VAC, Delta or Wye.

You can also use *groov RIO* with a Modbus/TCP master or as remote I/O for a *groov EPIC* system.

groov EPIC® System

Opto 22's *groov Edge Programmable Industrial Controller (EPIC) system* gives you industrially hardened control with a flexible Linux®-based processor with gateway functions, guaranteed-for-life I/O, and software for your automation and IIoT applications.

groov EPIC Processor

The heart of the system is the *groov EPIC* processor. It handles a wide range of digital, analog, and serial functions for data collection, remote monitoring, process control, and discrete and hybrid manufacturing.

In addition, the EPIC provides secure data communications among physical assets, control systems, software applications, and online services, both on premises and in the cloud. No industrial PC needed.

Configuring and troubleshooting I/O and networking is easier with the EPIC's integrated high-resolution color touchscreen. Authorized users can manage the system locally on the touchscreen, on a monitor connected via the HDMI or USB ports, or on a PC or mobile device with a web browser.

groov EPIC I/O

groov I/O connects locally to sensors and equipment. Modules have a spring-clamp terminal strip, integrated wireway, swing-away cover, and LEDs indicating module health and discrete channel status. *groov I/O* is hot swappable, UL Hazardous Locations approved, and ATEX compliant.

groov EPIC Software

The *groov EPIC* processor comes ready to run the software you need:

- Programming: Choose flowchart-based PAC Control, CODESYS Development System for IEC61131-3 compliant programs, or secure shell access (SSH) to the Linux OS for custom applications
- Node-RED for creating simple IIoT logic flows from pre-built nodes
- Efficient MQTT data communications with string or Sparkplug data formats
- Multiple OPC UA server options
- HMI: *groov View* to build your own HMI viewable on touchscreen, PCs, and mobile devices; PAC Display for a

Windows HMI; Node-RED dashboard UI

- Ignition or Ignition Edge® from Inductive Automation (requires license purchase) with OPC-UA drivers to Allen-Bradley®, Siemens®, and other control systems, and MQTT communications

Older products

From solid state relays, to world-famous G4 and SNAP I/O, to SNAP PAC controllers, older Opto 22 products are still supported and working hard at thousands of installations worldwide. You can count on us for the reliability and service you expect, now and in the future.

QUALITY

Founded in 1974, Opto 22 has established a worldwide reputation for high-quality products. All are made in the U.S.A. at our manufacturing facility in Temecula, California.

Because we test each product twice before it leaves our factory rather than testing a sample of each batch, we can afford to guarantee most solid-state relays and optically isolated I/O modules for life.

FREE PRODUCT SUPPORT

Opto 22's California-based Product Support Group offers free technical support for Opto 22 products from engineers with decades of training and experience. Support is available in English and Spanish by phone or email, Monday–Friday, 7 a.m. to 5 p.m. PST.

Support is always available on our website, including [free online training](#) at OptoU, how-to [videos](#), [user's guides](#), the Opto 22 KnowledgeBase, and [OptoForums](#).

PURCHASING OPTO 22 PRODUCTS

Opto 22 products are sold directly and through a worldwide network of distributors, partners, and system integrators. For more information, contact Opto 22 headquarters at **800-321-6786** (toll-free in the U.S. and Canada) or **+1-951-695-3000**, or visit our website at www.opto22.com.

