Data sheet

GEN series G072

230 Volt RMS Isolated Digital Event adapter

Special features

- **32 digital event input channels**
- **4 digital event output channels**
- **230 V RMS event channel isolation**
- **Full channel to channel isolation**
- **Removable screw terminals for quick cable connections**
- **Direct interface to GEN DAQ mainframe event connector**
- **GEN DAQ mainframe to adapter cable included**
- **No external power supply required**
- **Optional cable set to connect to GN6470 or GN4070**

230 Volt RMS Isolated Digital Event adapter

The isolated Digital Event Adapter provides an isolation barrier for up to 32 digital event input channels. Furthermore 4 event output channels are available if the adapter is connected to the Digital Event/Timer/Counter connector of GEN DAQ mainframes. The adapter can optionally be connected directly to the GEN DAQ Binary Marker Timer/Counter card.

Using the isolated Digital Event Adapter allows the user to avoid ground loops and improves immunity to electrical noisy environments.

The channel to channel and channel to ground isolation voltage is 230 V RMS. The standard input voltage of 4.5 – 11.5 V for logic “1” can be increased by using external resistors. Therefore higher voltage levels can be used for logic “0” and “1”.

The wiring of the signal cable is easy due to the pluggable screwed joint connectors of the adapter.

For easy connectivity the adapter is powered by the GEN DAQ mainframe or the GEN DAQ Binary Marker Timer/Counter card to avoid the need for a separate power supply.

Isolated Digital Event Adapter Block Diagram

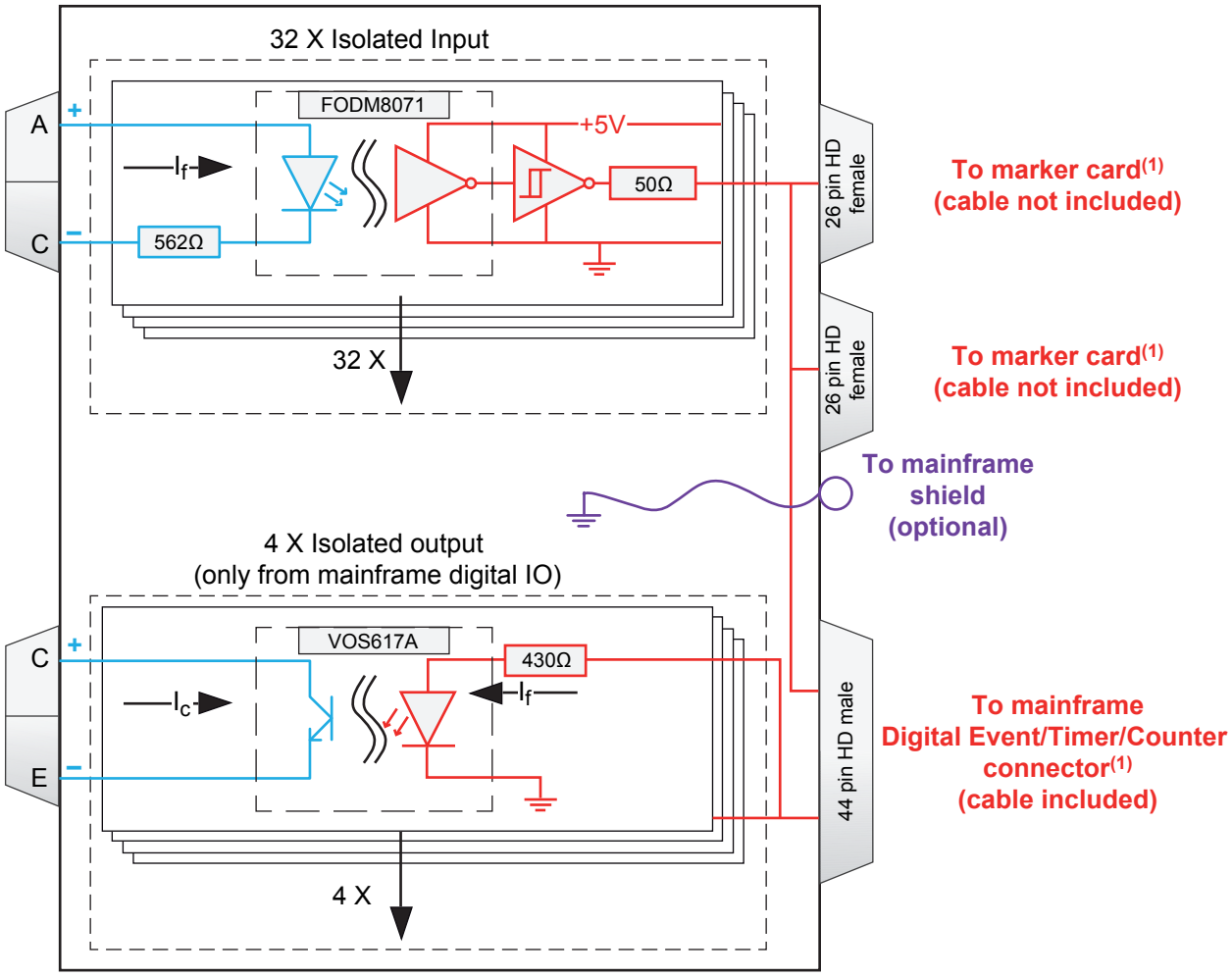


Figure 1.1: Block diagram adapter

(1) Mainframe and marker card output cannot be used simultaneously.

Event Inputs

Inputs	32 event channels (Anode (A), Cathode (C) optocoupler with 562 Ω series resistor)
Isolation voltage	230 V AC RMS or DC (channel to channel and channel to chassis/earth)
Isolation device	Fairchild FOD8071 optocoupler (or comparable)
Switching frequency	10 MHz input block signal tested. The highest frequency supported for the system is limited by the isolator box or acquisition system, whichever is the lowest
Maximum propagation delay	55 ns
Common mode transient voltage	Typically 20 kV/µs
Input switching voltages (see Figure 1.2 and Figure 1.3)	
Logic 0	< 1.0 V + 0.0015 A (562 Ω + R_{ext})
Logic 1	> 1.3 V + 0.0050 A (562 Ω + R_{ext})
Maximum nondestructive voltage	1.8 V + 0.0150 A (562 Ω + R_{ext})
Minimum nondestructive reverse voltage	-5.0 V

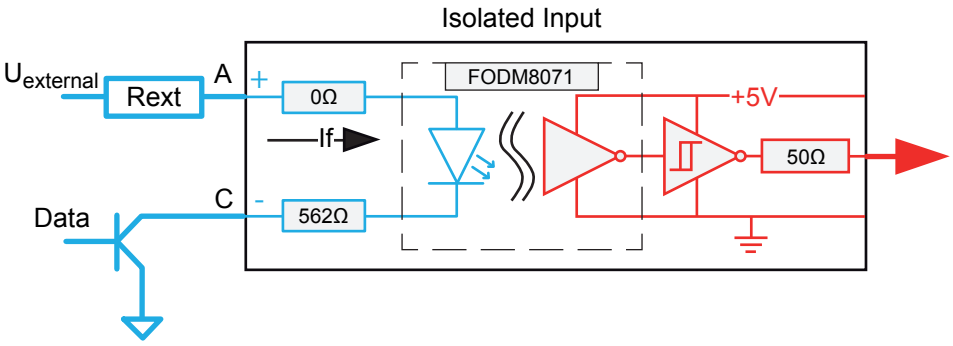


Figure 1.2: Add an external resistor to change input voltage levels

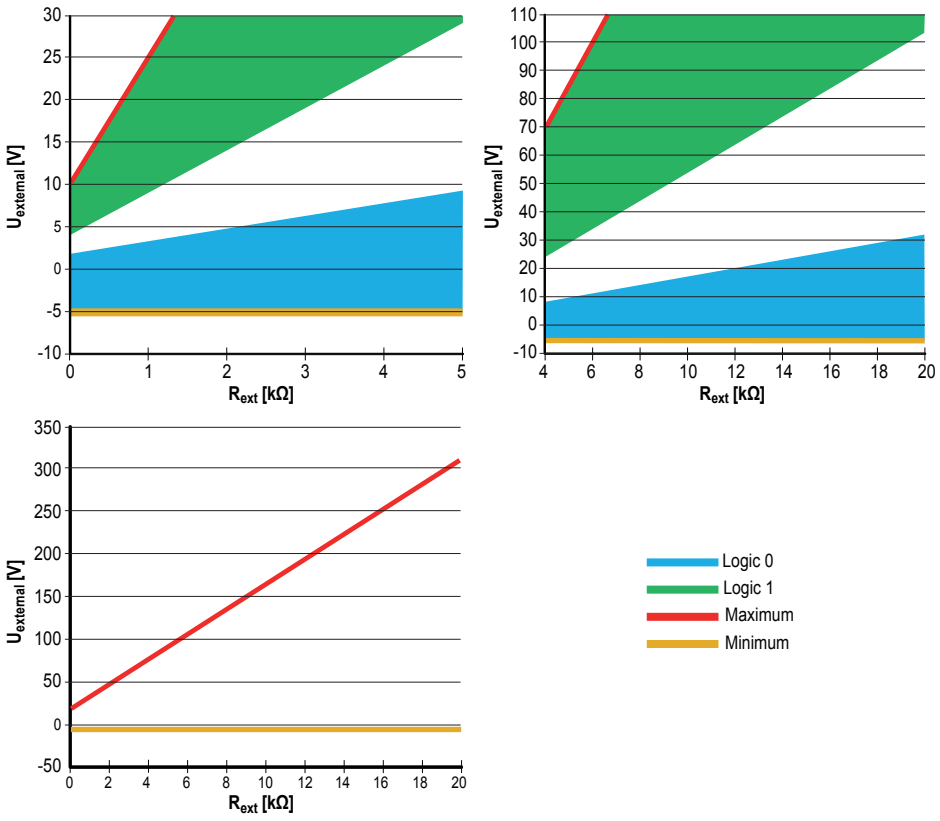


Figure 1.3: Detailed input voltage levels (top graphs)/nondestructive input voltages (below)

Event Outputs

Output channels	4 digital isolated output channels (open Collector, Emitter) Only supported by Digital Event/Timer/Counter connector
Isolation device	Vishay VOS617A optocoupler (or comparable)
Output frequency	170 kHz output signal tested. Maximum useable frequency for the system is limited by the Isolated Digital Event Adapter or acquisition system, whichever is the slowest.
Nondestructive control voltages (see Figure 1.4 and Figure 1.5)	
Maximum voltage	0.007 * R_{ext} and < 80 V
Minimum voltage	-7.0 V

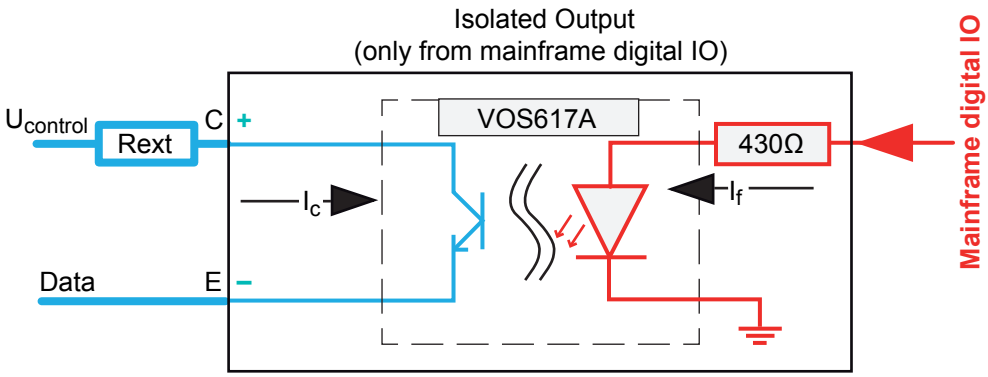


Figure 1.4: Add an external resistor to change output voltage levels

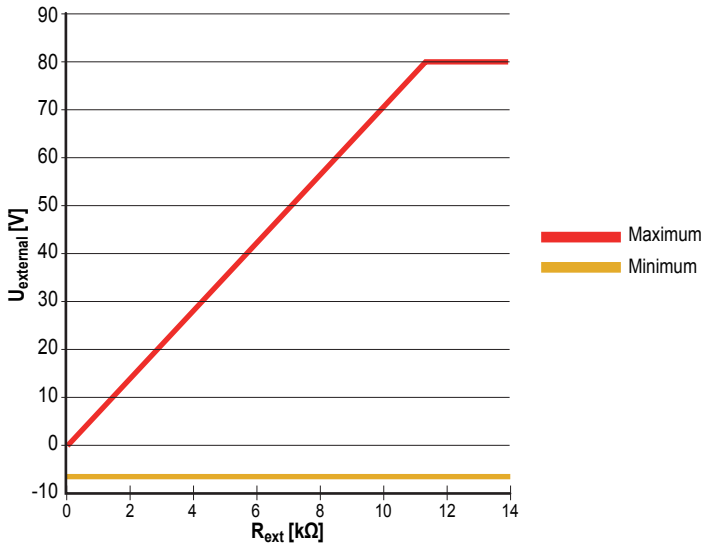


Figure 1.5: Nondestructive output voltages

Output Connectors (Only one output connector option can be used at the same time)	
Digital Event/Timer/Counter	HD22 sub-D 44 pin male (connecting cable included)
Digital marker group A and B	15 pin, female sub-D type (connecting cable 1-KAB2116-1.5, to be ordered separately)
Output Cables	
GEN DAQ mainframe to adapter	0.7 m (2.30 ft), included with adapter
GEN DAQ marker card to adapter	1-KAB2116-1.5, 1.5 m (4.92 ft) needs to be ordered separately
Power	
GEN DAQ mainframe to adapter	Powered by GEN DAQ mainframe or marker card

Adapter Front Connector Pinning

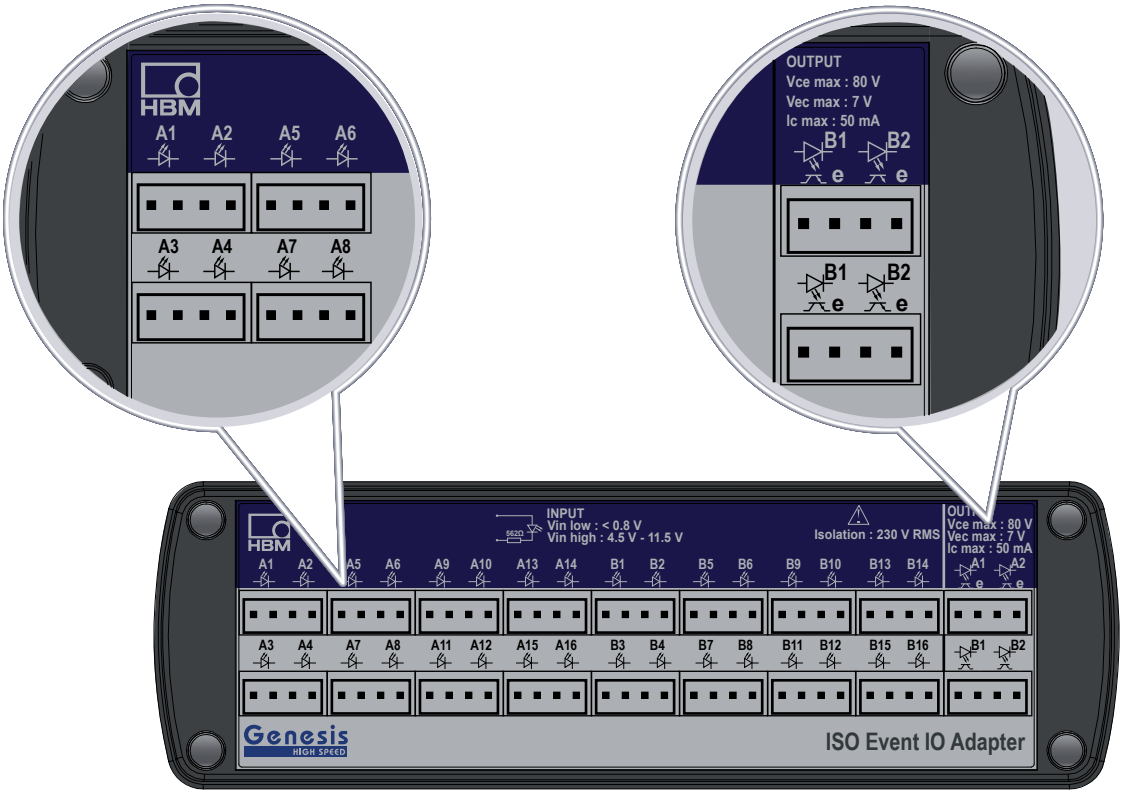


Figure 1.6: G072 front connectors

Isolated Digital Event Input Cable Connector Details

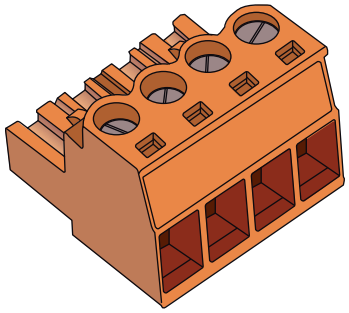


Figure 1.7: Input connector

Cable connector type	Weidmuller BL 3.50/04/180 SN or BX (Weidmuller order number 1597380000) 1x4 pole cable screw clamp (included with adapter, 18 pieces altogether)

Adapter Rear Connector Pinning

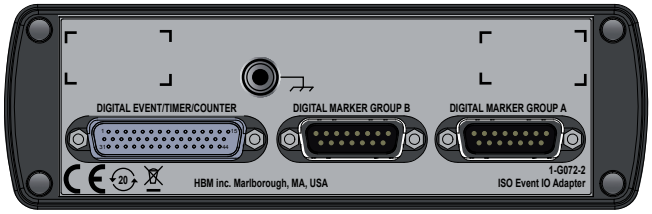
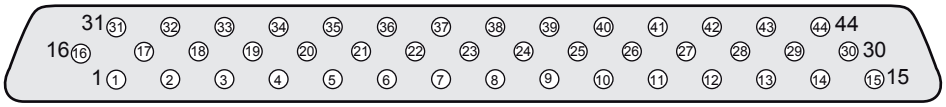
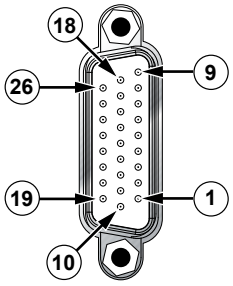


Figure 1.8: G072 rear connectors



PIN 1 - Event Input 1A & Reset Timer/Counter 2A
PIN 2 - Event Input 2A & Direction Timer/Counter 2A
PIN 3 - Event Input 3A & Clock Timer/Counter 2A
PIN 4 - Event Input 4A
PIN 5 - Event Input 5A
PIN 6 - Event Input 6A
PIN 7 - Event Input 7A
PIN 8 - Event Input 8A
PIN 9 - Event Input 9A
PIN 10 - Event Input 10A & Reset Timer/Counter 1A
PIN 11 - Event Input 11A & Direction Timer/Counter 1A
PIN 12 - Event Input 12A & Clock Timer/Counter 1A
PIN 13 - Event Input 1B & Reset Timer/Counter 2B
PIN 14 - Event Input 2B & Direction Timer/Counter 2B
PIN 15 - Event Input 3B & Clock Timer/Counter 2B
PIN 16 - Event Input 4B
PIN 17 - Event Input 5B
PIN 18 - Event Input 6B
PIN 19 - Event Input 7B
PIN 20 - Event Input 8B
PIN 21 - Event Input 9B
PIN 22 - Event Input 10B & Reset Timer/Counter 1B
PIN 23 - Event Input 11B & Direction Timer/Counter 1B
PIN 24 - Event Input 12B & Clock Timer/Counter 1B
PIN 25 - Event Input 13B
PIN 26 - Event Input 14B
PIN 27 - Ground
PIN 28 - Ground
PIN 29 - Ground
PIN 30 - Ground
PIN 31 - Event Input 15B & External Stop B
PIN 32 - Event Input 16B & External Start B
PIN 33 - Event Input 13A
PIN 34 - Event Input 14A
PIN 35 - Event Input 15A & External Stop A
PIN 36 - Event Input 16A & External Start A
PIN 37 - Event Output 2B
PIN 38 - Event Output 1B
PIN 39 - Event Output 2A
PIN 40 - Event Output 1A
PIN 41 - Ground
PIN 42 - Ground
PIN 43 - +5 V Power
PIN 44 - +5 V Power

Figure 1.9: Pin assignment for Digital Event/Timer/Counter connector



Pin number	GROUP A	GROUP B	Pin number	GROUP A	GROUP B
PIN 1	A 16	B 16	PIN 14	A 3	B 19
PIN 2	A 15	B 15	PIN 15	A 2	B 18
PIN 3	A 14	B 14	PIN 16	A 1	B 1
PIN 4	A 13	B 13	PIN 17	Ground	Ground
PIN 5	A 12	B 12	PIN 18	Ground	Ground
PIN 6	A 11	B 11	PIN 19	Ground	Ground
PIN 7	A 10	B 10	PIN 20	Ground	Ground
PIN 8	A 9	B 9	PIN 21	Ground	Ground
PIN 9	A 8	B 8	PIN 22	Ground	Ground
PIN 10	A 7	B 7	PIN 23	Ground	Ground
PIN 11	A 6	B 6	PIN 24	Ground	Ground
PIN 12	A 5	B 5	PIN 25	+ 5 V	+ 5 V
PIN 13	A 4	B 4	PIN 26	+ 5 V	+ 5 V

Figure 1.10: Digital marker group A/B pinning

Isolated Input Application Examples

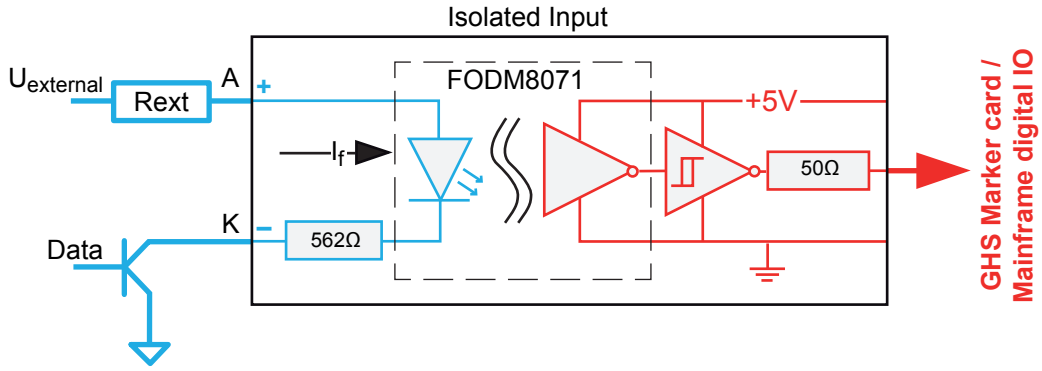


Figure 1.11: Isolated input switched to negative input

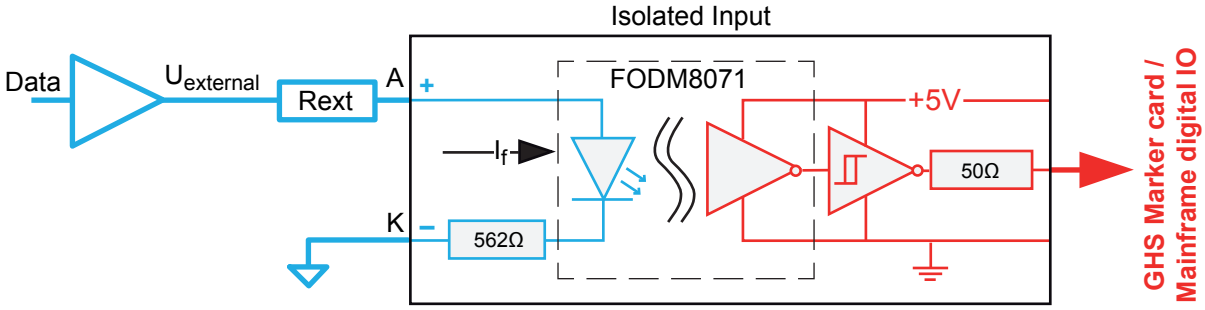


Figure 1.12: Isolated input switched to positive input

Isolated Output Application Examples

(Only supported by Digital Event/Timer/Counter connectors)

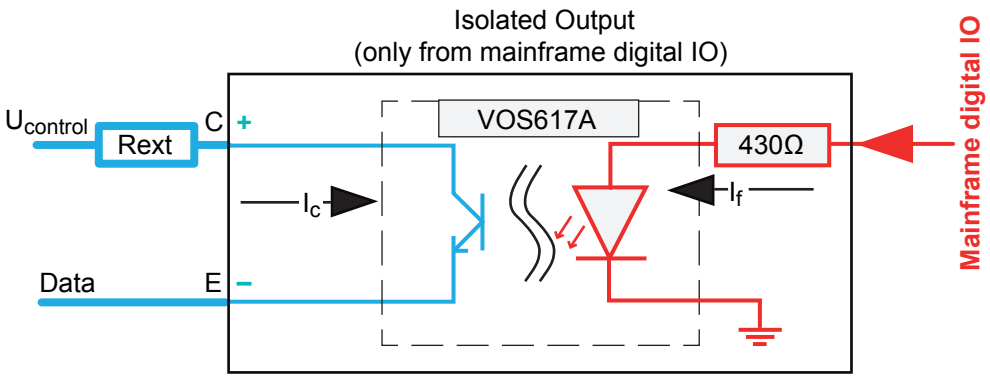


Figure 1.13: Isolated output switched to negative output

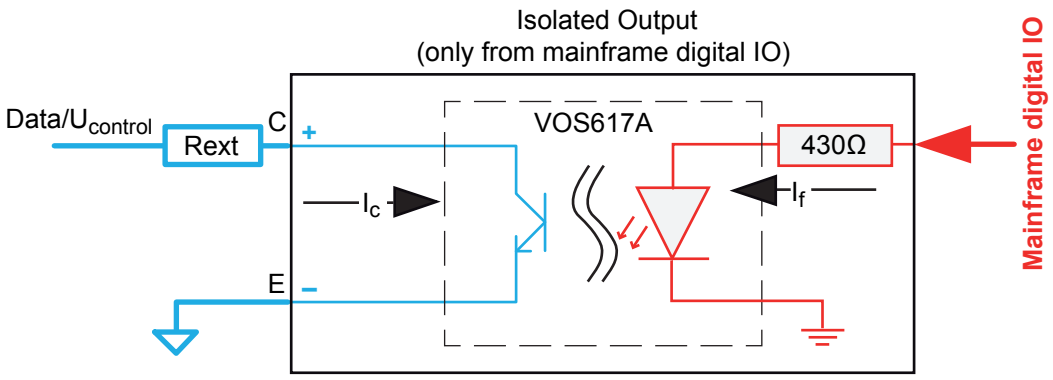


Figure 1.14: Isolated output switched to positive output

Physical, Weight and Dimensions

Weight	
Adapter	0.75 kg (1.65 lbs)
Dimensions	
Height	54.6 mm (2.15”)
Width	171.6 mm (6.76")
Depth	130.14 mm (4.86")
Grounding	Uses shield for GEN DAQ cable connection
Casing	Aluminum

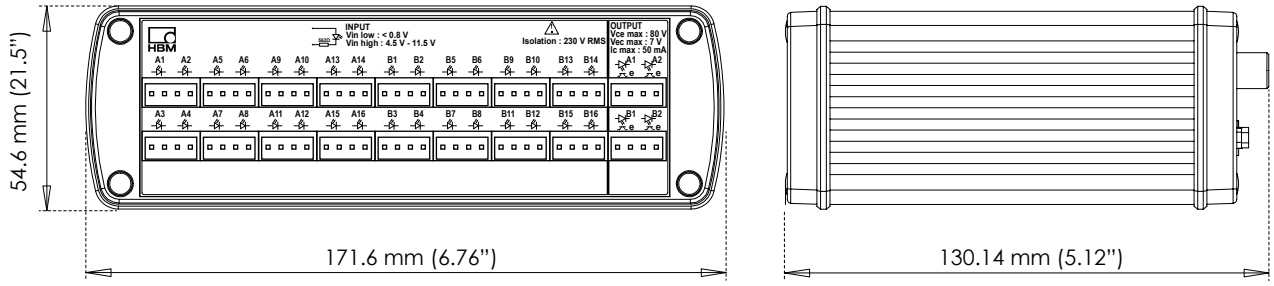


Figure 1.15: G072 dimensions

Environmental Specifications

Temperature Range	
Operational	0 °C to +40 °C (+32 °F to +104 °F)
Non-operational (Storage)	-25 °C to +70 °C (-13 °F to +158 °F)
Relative humidity	0% to 80%; non-condensing; operational
Protection class	IP20
Altitude	Maximum 2000 m (6562 ft) above sea level; operational
Shock: IEC 60068-2-27	
Operational	Half-sine 10 g/11 ms; 3-axis, 1000 shocks in positive and negative direction
Non-operational	Half-sine 25 g/6 ms; 3-axis, 3 shocks in positive and negative direction
Vibration: IEC 60068-2-64	
Operational	1 g RMS, ½ h; 3-axis, random 5 to 500 Hz
Non-operational	2 g RMS, 1 h; 3-axis, random 5 to 500 Hz
Operational Environmental Tests	
Cold test IEC60068-2-1 Test Ad	-5 °C (+23 °F) for 2 hours
Dry heat test IEC-60068-2-2 Test Bd	+40 °C (+104 °F) for 2 hours
Damp heat test IEC60068-2-3 Test Ca	+40 °C (+104 °F), humidity > 93% RH for 4 days
Non-Operational (Storage) Environmental Tests	
Cold test IEC-60068-2-1 Test Ab	-25 °C (-13 °F) for 72 hours
Dry heat test IEC-60068-2-2 Test Bb	+70 °C (+158 °F) humidity < 50% RH for 96 hours
Change of temperature test IEC60068-2-14 Test Na	-25 °C to +70 °C (-13 °F to +158 °F) 5 cycles, rate 2 to 3 minutes, dwell time 3 hours
Damp heat cyclic test IEC60068-2-30 Test Db variant 1	+25 °C/+40 °C (+77 °F/+104 °F), humidity >95/90% RH 6 Cycles, cycle duration 24 hours

Harmonized Standards for CE Compliance, According to the Following Directives

Low Voltage Directive (LVD): 2014/35/EU
ElectroMagnetic Compatibility Directive (EMC): 2014/30/EU

Electrical Safety	
EN 61010-1 (2010)	Safety requirements for electrical equipment for measurement, control, and laboratory use - General requirements
EN 61010-2-030 (2010)	Particular requirements for testing and measuring circuits
Electromagnetic Compatibility	
EN 61326-1 (2013)	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
Emission	
EN 55011	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement Radiated disturbance: class A
Immunity	
EN 61000-4-2	Electrostatic discharge immunity test (ESD); contact discharge ± 4 kV/air discharge ± 8 kV: performance criteria B
EN 61000-4-3	Radiated, radio-frequency, electromagnetic field immunity test; 80 MHz to 2.7 GHz using 10 V/m, 1000 Hz AM: performance criteria A
EN 61000-4-4	Electrical fast transient/burst immunity test All input and output connections ± 2 kV using capacitive clamp: performance criteria B
EN 61000-4-6	Immunity to conducted disturbances, induced by radio-frequency fields 150 kHz to 80 MHz, 1000 Hz AM; 10 V RMS @ all inputs, both using clamp: performance criteria A

Ordering Information[1]

Article		Description	Order No.
Isolated digital event adapter		230 V RMS Isolated Digital Event adapter. Supports 32 channel to channel isolated digital event inputs. The inputs can either be used to connect to the GEN series mainframes that support the Digital Event Timer/Counter connector or optionally connect to a GN6470 or GN4070 acquisition card. Input connectors and cable to connect to the GEN series mainframe are included in a standard delivery. Connection cables to connect to the GN6470 or GN4070 card directly must be ordered separately.	1-G072-2

(1) All GEN series systems are intended for exclusive professional and industrial use.

Accessories, to be ordered separately

Article		Description	Order No.
Isolated digital event adapter to marker card cable		Set of two cables to connect the digital marker A and digital marker B output connectors of the G072 isolated digital event adapter to either a GN6470 or a GN4070 marker card. Cable length of 1.5 m (4.92 ft)	1-KAB2116-1.5

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B4232-1.1 en HBM: public