

DATENBLATT

DAI12-4(USB)GY

HABEN SIE FRAGEN ODER WÜNSCHEN SIE EIN INDIVIDUELLES ANGEBOT?

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ADRESSE

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Isolated Analog Output Module for USB2.0

DAI12-4(USB)GY



* Specifications, color and design of the products are subject to change without notice.

Features

Conversion speed 10 μ sec (voltage) or 20 μ sec (current), 12-bit resolution, analog output 4ch

This product includes analog outputs (voltage : 10 μ sec, current : 20 μ sec, 12-bit, 4ch). Compatible to USB1.1/USB2.0 and capable to achieve high speed transfer at HighSpeed (480 Mbps). The voltage or current output range set (voltage : +/-10V, +/-5V, 0 - 10V, 0 - 5V, current : 0 - 20mA). The range is set by software.

Isolated from the bus by a digital isolator

This product is isolated by a digital isolator which improves the noise performance with respect to the PC.

Equipped with the buffer memory (256K data) which can be used in either FIFO or ring format

This product includes buffer memory (256K data for analog output) which can be used in either FIFO or ring format. You can perform analog output in the background, independent of software and the current status of the PC.

Windows compatible driver libraries are attached.

Using the attached driver library API-USBP(WDM) makes it possible to create applications of Windows. In addition, a diagnostic program by which the operations of hardware can be checked is provided.

Output signal can be controlled by a clock or various trigger conditions

The output signal can be started and stopped by software trigger.

The sampling period can be controlled by the internal clock (high-precision timer included on the board).

Easy to increase the output channels using an expansion module

Adding optional modules (up to 3 units) can easily increase the output channels. The unique structure for connection by stacking enables easy and compact system configuration.

Screw-less connector plug facilitating wiring and plugging/unplugging

Wiring and plugging/unplugging are easy as the screw-less connector plug is used.

Capable of being mounted on 35-mm DIN rails

This product is equipped with an attachment for mounting on 35-mm DIN rails on the back, allowing the module to be attached onto and detached from DIN rails.

This product is a USB2.0 compatible terminal module that extends the analog output function of USB port of PCs. This product features 4ch 12-bit analog output and is isolated from the bus line to the PC. The signal lines can be connected directly to the terminals on this product. To simplify use in embedded applications, this product includes a bracket for attaching to a 35mm DIN rail. The number of output channels can be increased by purchasing an optional device module. Windows driver is bundled with this product.

LabVIEW is supported by a plug-in of dedicated library

Using the dedicated library makes it possible to create each application for LabVIEW.

Specification

Hardware Specification

Item	Specification
Analog output	
Output format	Bus-isolated voltage/current output
Output range	Voltage: Bipolar $\pm 10V$, $\pm 5V$ Unipolar 0 - 10V, 0 - 5V (output current $\pm 5mA$) Current: 0 - 20mA
Output impedance	Voltage range: 10 Ω (Max.)
Output channel	4 channels
Resolution	12 bits
Conversion accuracy	Voltage range $\pm 3LSB$, Current range $\pm 5LSB$
Settling time	Voltage range 10 μ sec, Current range 20 μ sec *1
Data buffer	256K data (262, 144 data)
Internal sampling timer	10 μ sec - 1,073,741,824 μ sec *2
Communication	
USB transmission speed	12Mbps (full speed), 480Mbps (high speed) *3
Current consumption	+5VDC 700mA (Max.) *4
Others	
Number of modules used at the same time	127 modules (Max.)
Use condition	0 - 50°C 10 - 90%RH (no condensation)
Physical dimensions (mm)	50.4(W) x 64.7(D) x 94.0(H) (exclusive of protrusions)
Weight of the module itself	100g
Module installation method	One-touch connection to 35mm DIN rails (standard connection mechanism provided in the system)
Expansion module	DAI12-4(FIT)GY: 3 modules (Max.), Current consumption/module: +5VDC 400mA(Max.)
Connectors	FK-MC0.5/12-ST-2.5 (made by PHOENIX CONTACT) 2.5mm-pitch nominal current: 4A (Max.)
Applicable wire	AWG28 - 20 Cross-section 0.08 - 0.51mm
Bundled AC adapter (POA200-20)	90 - 264VAC 5.0VDC $\pm 5\%$ 2.0A (Max.) Length of cable is about 1.5m. Length of AC cable is about 1.5m.

*1 Converting speed of D/A converter. The minimum executable outputting period is depending on internal processing time and is about 400msec (using one channel) - 1msec (using 16 channels).

*2 It takes the unit of 1000msec (1000msec, 2000msec, 3000msec,...) when expansion module being used.

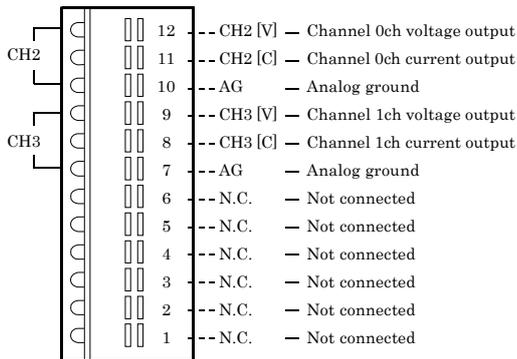
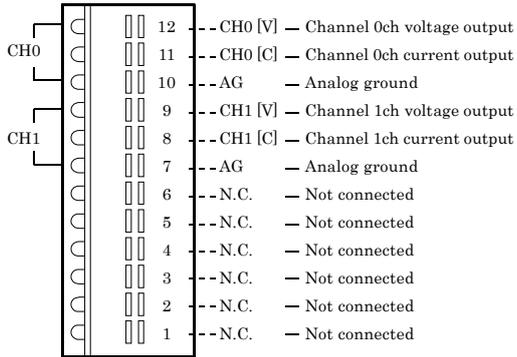
*3 USB module executes API function by USB communication. The executing time of API function by USB communication is about several msec in practice (Depending on the contents handled by API function, it may be longer than that). The responding speed of USB module is based on the environment of the host PC being used.

*4 Always use the supplied AC adapter or power supply unit.

Connecting to an External Device

Signal Layout

The Module can be connected to an external device using a 12-pin connector that is provided on the Module face.

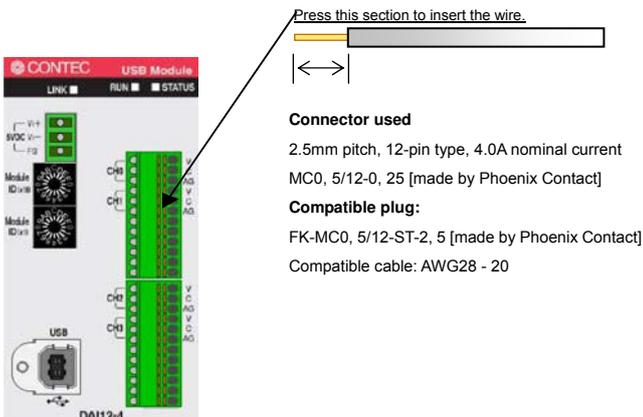


Connection Method

When connecting the module to an external device, you can use the supplied connector plug. When wiring the module, strip off approximately 7 - 8 mm of the covering for the cable, and insert the bare wire by pressing the orange button on the connector plug. Releasing the orange button after the wire is inserted fixes the cable. Compatible wires are AWG 28 - 20.

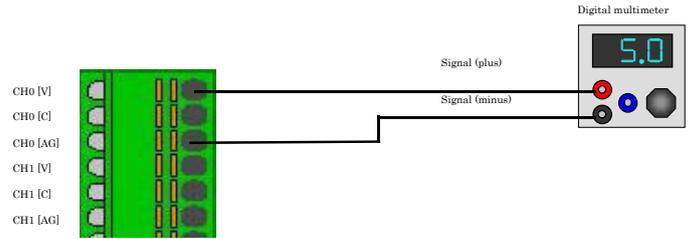
⚠ CAUTION

Removing the connector plug by grasping the cable can break the wire.

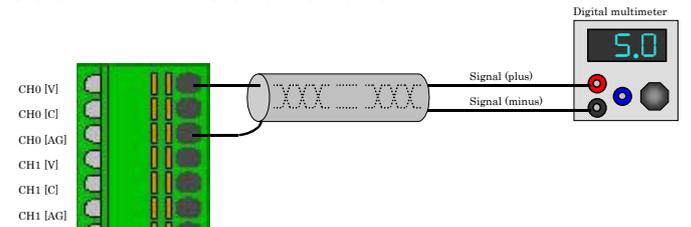


Input voltage output to an external device

Connecting digital multimeter with flat cable.



A coaxial cable can be used in situations where the module is at a relatively large distance from the external device or when the noise immunity of the module must be improved. In this case, the voltage output and the analog ground for each channel are connected to the input and the ground, respectively, of the external device by using the core wire and the shield braid of the coaxial cable.



⚠ CAUTION

When the power is turned on or the USB cable is plugged, the voltage output signal will be 0V.

To avoid any malfunction, the voltage output signal should not be connected to the analog ground.

To avoid any malfunction, the voltage output signal should not be connected to another analog ground signal or the output signal of external device.

To avoid any malfunction, the connector plug should not be attached or detached when the power for the module or the external device is on.

The maximum current capacity for a voltage output signal is $\pm 5\text{mA}$. To avoid any malfunction, do not connect an external device that generates a load exceeding this range.

In situations where the connecting cable is subject to the effects of noise, the accurate voltage output can fail. The connecting cable should be installed away from any source of noise.

In situations where the connecting cable is excessively long, the accurate voltage output can fail. Use a cable that is as short as possible.

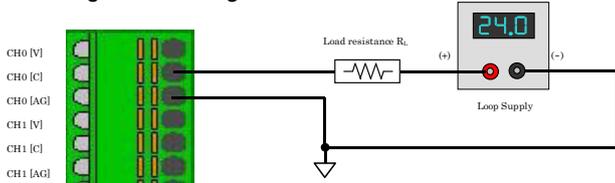
Because the D/A converter in the module does not contain a built-in deglitcher, a glitch can sometimes occur.

Controlling external device by current loop

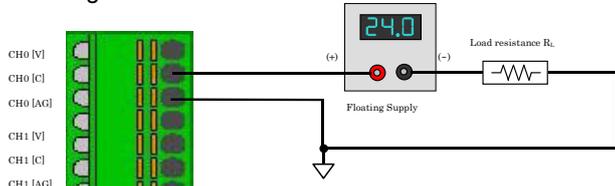
Load that can be controlled by current loop have two sorts, floating load and fixed load. If the module is used as a floating load, multiple current loops can be implemented by using the same power supply. The use of current output requires an external power supply (10 - 24V). In such a case, a power supply with a small ripple should be used in order to avoid an adverse impact on the conversion accuracy due to a large power supply ripple.

Moreover, the load resistance R_L that is connected to the current output of each channel should be less than 500Ω , including the wire resistance.

Connecting to a Floating Load



Connecting to a Fixed Load



CAUTION

When the power is turned on or the module is reset, the current output signal will be 0mA.

To avoid any malfunction, the current output signal should not be connected to the analog ground.

To avoid any malfunction, the current output signal should not be connected to another analog output signal or the output signal of an external device.

To avoid any malfunction, the connector plug should not be attached or detached when the power for the module or the external device is on.

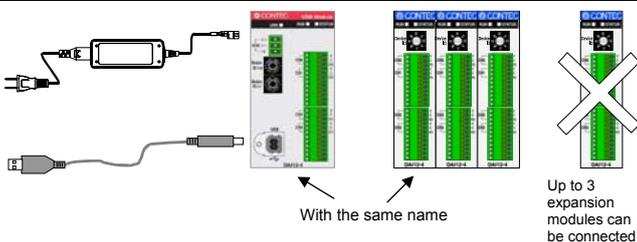
In situations where the connecting cable is subject to the effects of noise, the accurate current output can fail. The connecting cable should be installed away from any source of noise.

Connecting with Expansion Accessories

When lacking of analog output channel used to connecting external device, you have to purchase a new same module, and thus it not only increases cost but also doubles installation space. At the same time, adding channels is considered when designing this module, and additional module can be connected by the connector on module side, so that not only the cost but also the installation space are controlled. Up to 3 modules DAI12-4(FIT)GY can be connected when adding channels.

In the case of combination of the USB module "DAI12-4(USB)GY" and three expansion modules "DAI12-4(FIT)GY", it is possible to control 16 channels output by way of one USB port.

Model	Output channel	Current consumption	Function
DAI12-4(FIT)GY	4	+5VDC 400mA (Max.)	Expansion module for DAI12-4(USB)GY



Points

Up to 3 modules can be connected.

Please use the supplied AC adapter when adding modules.

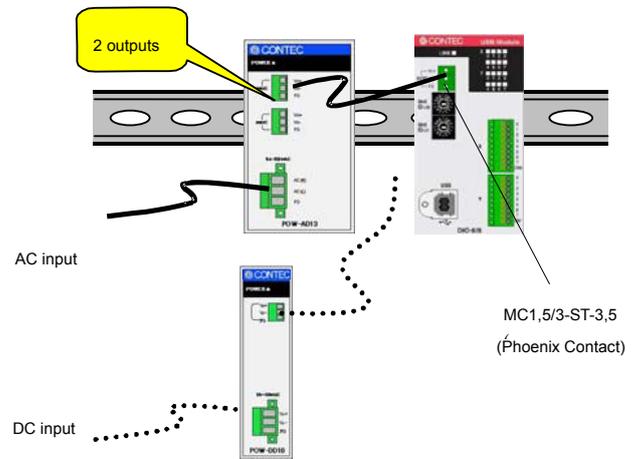
The analog grounds of both USB module and expansion module are isolated from each other.

Modules with different function from the USB module can not be connected

In addition, besides the Ac adapter, the power supplies (Option) installable on DIN rail are provided.

You can choose by the environment and purpose.

Category	Model	Input	Output	External dimensions(mm)	DIN rail
AC adapter	POA200-20 (Bundled)	90 · 264VAC	5.0VDC \pm 5% 2.0A (Max.)	40.0(W) x 105.0(D) x 30.0(H) (exclusive of protrusions)	No
AC-DC power	POW-AD13GY	85 · 132VAC	5.0VDC \pm 5% 3.0A (Max.)	52.4(W) x 64.7(D) x 94.0(H) (exclusive of protrusions)	Yes
AC-DC power	POW-AD22GY	85 · 265VAC	5.0VDC \pm 5% 2.0A (Max.)	52.4(W) x 64.7(D) x 94.0(H) (exclusive of protrusions)	Yes
DC-DC power	POW-DD10GY	10 · 30VDC	5.0VDC \pm 5% 3.0A (Max.)	25.2(W) x 64.7(D) x 94.0(H) (exclusive of protrusions)	Yes



When using the power supply installable on DIN rail, please use the connector MC1,5/3-ST-3,5(Phoenix Contact).

Points

If you use external power supply, please connect in the following order.

- (1) Connect the external power connector to supply power for the USB module.
- (2) Connect the USB module with computer using USB cable.

You can Remove the external power supply in the following order.

- (1) Remove USB cable.
- (2) Remove external power connector, stop power supplying to the USB module.