



Manual

Rev. 1.0 EN



ADQ-610 cPCI

Isolated 4 or 8 channel voltage output board

Imprint

Manual ADQ-610 series
Rev. 1.0
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Manufacturer and Support

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We are appreciated for notification of possible errors.

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1. Introduction

Please check the box and the content for damages and completeness before taking the device into operation. If any fault should be detected please inform us immediately.

- Shows the packing some evidence to damaging during transport?
- Any traces of use to be recognized at the device?

The device may not be taken into operation if it is damaged. In case of doubt please contact our technical service department.

Please read – before installing the device – this manual watchfully!

1.1 Scope of delivery

- ALLDAQ board of ADQ-610 series for CompactPCI (3 U)
- Driver software and documentation under: www.alldaq.com/downloads

Optional as bundle including:

- Special terminal block for ADQ-610 series (ADQ-TB-COAX-HDMI-HUT)
- 8 coaxial cables from MMCX male connector to MMCX male connector, length: 1 m (ADQ-CR-MMCXM-MMCXM-8x-1m)
- HDMI cable, length: 1 m (ADQ-HDMI-MM-1m)

1.2 Safety instructions



Necessarily note the following advices:

- Necessarily avoid touching of cables and connectors inside the PC with the board.
- Ensure sufficient air circulation in the CompactPCI rack.
- Never expose the device to direct solar radiation during operation.
- Never run the device near heat sources.
- Protect the device before humidity, dust, liquids and fumes.
- Don't use the device in damp rooms and never in explosive areas.
- A repair may only be done by trained and authorized persons.



- Please note before initial operation of the device especially when using voltages greater 42 V the installation rules and all relevant standards (including VDE standards).
- Before connecting or removing cables with your board always disconnect your field wiring from the power supply.



- Ensure that no static discharge can occur passing the board when handling it. Follow the standard ESD safety precautions (see also chapter 2.1 on page 9).

- Never connect devices with voltage-carrying parts, especially not with mains voltage.
- The user must take appropriate precautions to avoid unforeseeable misuse.

For damages caused by improper use and subsequent damages any liability by ALLNET® GmbH Computersysteme is excluded.

1.3 Location of installation and mounting

The CompactPCI resp. PCI-Express boards of the ADQ-610 series are voltage output boards for industrial use. Depending on the version they are for installation...

... into a free CompactPCI slot (ADQ-614/618-cPCI), or

... into a free CompactPCI Serial slot (ADQ-614/618-cPCIS), or

... into a free PCI Express slot (ADQ-614/618-PCIe).

The boards may not be taken into operation outside of appropriate PC systems. For the order of operation on installing the devices please read the chapter „Initial operation“ in this manual and the documentation of your PC.

The ADQ-610 series may only be used in dry rooms. PC boards are not for use with tough environment conditions (e.g. outside). Ensure a very good ventilation. Take care for proper fitting of the connection cables. Installation has to be done in a way that the cables (PC connection and field wiring) are not in tension else they could release itself.

1.4 Short description

	ADQ-614	ADQ-618
PC interface	CompactPCI (CompactPCI Serial / PCI-Express in preparation)	
Analog outputs	4 voltage outputs $\pm 10V$	8 voltage outputs $\pm 10V$
Resolution	16 bit	16 bit
Output rate	500 kS/s	500 kS/s
Trigger inputs	8 digital	8 digital
Digital-I/Os	1 x 8 bit port	1 x 8 bit port

Table 1: Overview ADQ-610 series

The D/A converter boards of the **ALLDAQ ADQ-610 series** are for high-precise voltage output, e. g. for testing of embedded systems in the context of hardware in the loop (HiL) simulations or for generating audio signals. Models for CompactPCI, CompactPCI Serial (in preparation) and PCI-Express (in preparation) are available.

Depending on the version 4 or 8 analog outputs are assembled, which are electrically isolated up to $700V_{RMS}$ between each other and towards PC ground. Each channel is equipped with a 500 kHz 16 bit D/A converter. The output voltage range covers $\pm 10V$ and outputs a 0V level after power-up automatically. All channels can be started independently or synchronously by software or an external trigger signal. The values can be output individually or timer-controlled. Each analog channel has its corresponding external digital trigger input, which is isolated towards PC ground and to the analog channels.

Because of the high isolation voltage of $700V_{RMS}$ a cascading of the voltage outputs is possible. This means you can precisely output up to 80V by cascading all the 8 channels.

The bi-directional **8 bit digital I/O port** and the **8 trigger inputs** can be attached by the HDMI connector at the front panel. If the digital port is configured as input the inputs can be monitored on bit-pattern change and can generate an interrupt.

The **8 bit TTL digital I/O port** can be attached by the HDMI connector at the front panel. If the digital port is configured as input the inputs can be monitored on bit-change and can generate an interrupt.

1.5 System requirements

1.5.1 Hardware

- PC system with a current Intel® or compatible processor based on the x86(-64) architecture
- A free CompactPCI (3 U/4 HP), CompactPCI Serial (3 U/4 HP) or PCI Express x1 slot

1.5.2 Software

System Driver

- Desktop operating systems of Windows 10/8.1/8/7/Vista SP2 (32 and 64 bit)

1.6 Programming support

Software Developer Kit (SDK)

A function library (API) with example code for high-level language programming is included. Please note the corresponding help files included with the SDK.

LabVIEW Support

A library with virtual instruments (VIs) for easy access to the ALLDAQ hardware is included with the ALLDAQ SDK.

MATLAB Support

An adapted MATLAB® interface for the ALLDAQ hardware with examples and a help file is included with the ALLDAQ SDK.

2. Initial operation

2.1 Installing the board

Please read the manual of your computer prior installing the board regarding the installation of additional hardware components.

Handling the board should be done with care to ensure that the device will not be damaged by electrostatic discharge (ESD), mechanical stress or current surges. Ensure to take all safety precautions to avoid an electric shock and follow the standard ESD safety precautions.

Follow this order of operation:

- Unplug the mains plug of your PC system.
- Open the housing as described in the manual of your PC system.
- Make sure that electrostatic discharge cannot occur via the board when you plug it in. At least one hand should be grounded in order to dissipate any static charge.
- Only for PCI Express models: for the +5V supply of the board an additional supply by the PC power supply is necessary (current consumption without load 300 mA typ.). Connect a free power connector of your PC (e. g. as used for powering drives) with the appropriate „MOLEX” male connector of your PCIe board (see the following diagram). On demand adapter (cables), e. g. from 13-pin SATA power supply male connector to 4-pin MOLEX female connector are available in specialized shops.

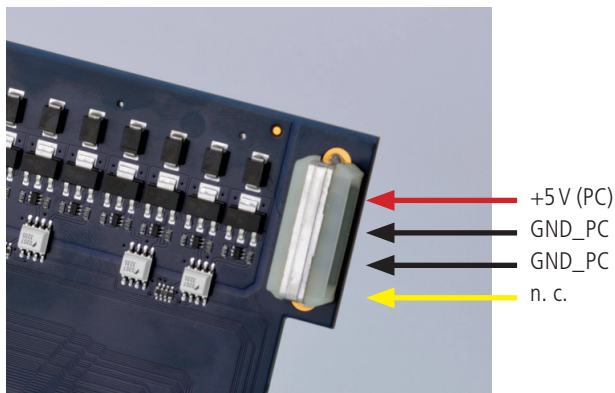


Figure 1: 5V supply for PCI Express models



Attention: If you take the board into operation without connecting the +5V supply the board can be irreversible damaged!

- Push the plug-in board carefully and with only a little force into the appropriate slot. Check that the board is not cant and fully plugged in.
- If you want to use the additional mounting bracket for the TTL digital I/Os choose two slots side by side for installation. Remove (if necessary) an additional blind bracket for the slot.
- Screw all mounting brackets.
- Close the housing as described in the manual of your PC system

2.2 Software installation

2.2.1 Installation under Windows

Run the file *ALLDAQDriverSetup32.exe* for 32 bit systems resp. *ALLDAQDriverSetup64.exe* for 64 bit systems in the target directory of your download. After successful installation the ALLDAQ-Manager can be found in the info area of the taskbar (usually at the bottom right corner) or by the Windows Start menu. By the ALLDAQ-Manager you have access to the software developer kit (SDK), several utility programs and help files.

2.3 Test program

Simple test programs can be found in the ALLDAQ-SDK. For each programming language a sub-directory „Applications“ can be found with test programs for your ALLDAQ hardware.

With the ALLDAQ-Manager you can retrieve several information of the installed ADQ hardware.

2.4 ALLDAQ Manager

By the ALLDAQ-Manager you have central access to the parameters of the ALLDAQ driver system, the software developer kit (SDK), software tools and help files. The ALLDAQ-Manager can be found in the info area of the taskbar (usually at the bottom right corner of the desktop) or by the Windows Start menu.

ALLDAQ-Manager in overview:

- Information on the installed ALLDAQ hardware in overview
- XML export of the driver configuration for archiving and support
- Tool for interactive illustration of the pin-assignment with the possibility to generate a PDF
- Tool for user balancing
- Convenient access to the software developer kit (SDK) for high-level language programming with examples and simple test programs
- Quick access to the help files

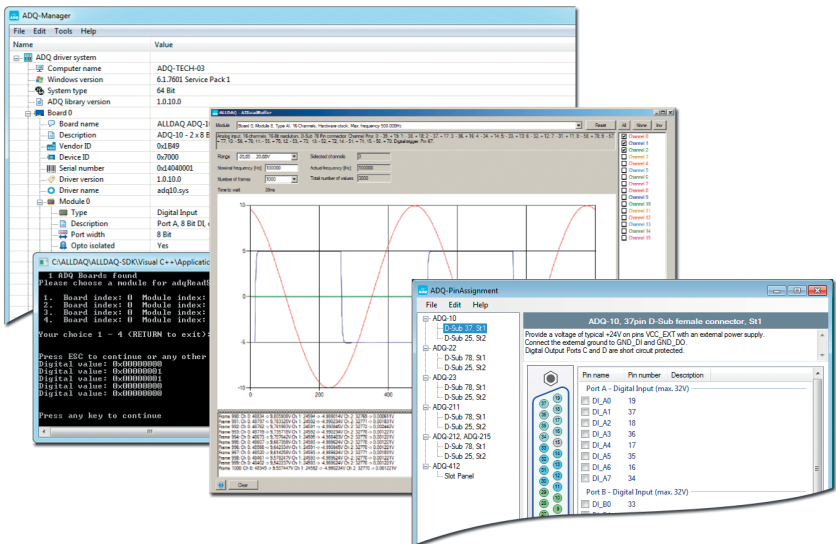


Figure 2: ALLDAQ-Manager and SDK programs

2.5 Balancing/Calibration

By the ALLDAQ-Manager you can select which balancing data record (factory or user balancing) should be activated when booting the computer. You can change the setting via the ALLDAQ-Manager.

2.5.1 Factory balancing

The ADQ-610 series will be balanced before delivery. The balancing data will be stored into an EEPROM. If a re-balancing should be necessary please contact our service department. For contact details see chapter 4.4 on page 29.

2.5.2 User balancing

To compensate e.g. voltage drops caused by the field wiring you can balance the analog outputs by yourself. The application-specific balancing data can be stored beside the factory balancing data into the EEPROM.

Please follow the procedure below:

1. Power-on the system with the ADQ-610 series.
2. Connect the part of the field wiring you want to include into the balancing.
3. Output a constant voltage with the ADQ-610 and measure the voltage by a high-precision voltmeter (e.g. multimeter). Make sure, that the voltmeter has a higher accuracy than the respective board of the ADQ-610 series.
4. Run the balancing tool in the ALLDAQ-Manager and follow the procedure as described in the appropriate help file.

Note: Repeat the balancing for each channel separately.

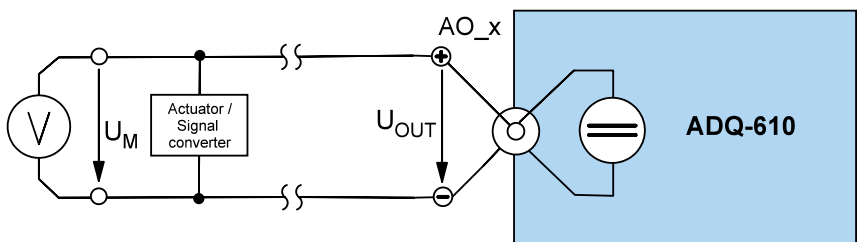


Figure 3: Wiring for balancing

2.5.3 DAkKS calibration

We collaborate with independent test laboratories accredited by the Deutsche Akkreditierungsstelle GmbH (DAkKS). On-demand please contact our service department. For contact details see chapter 4.4 on page 29.

3. Functional groups

3.1 Block diagram

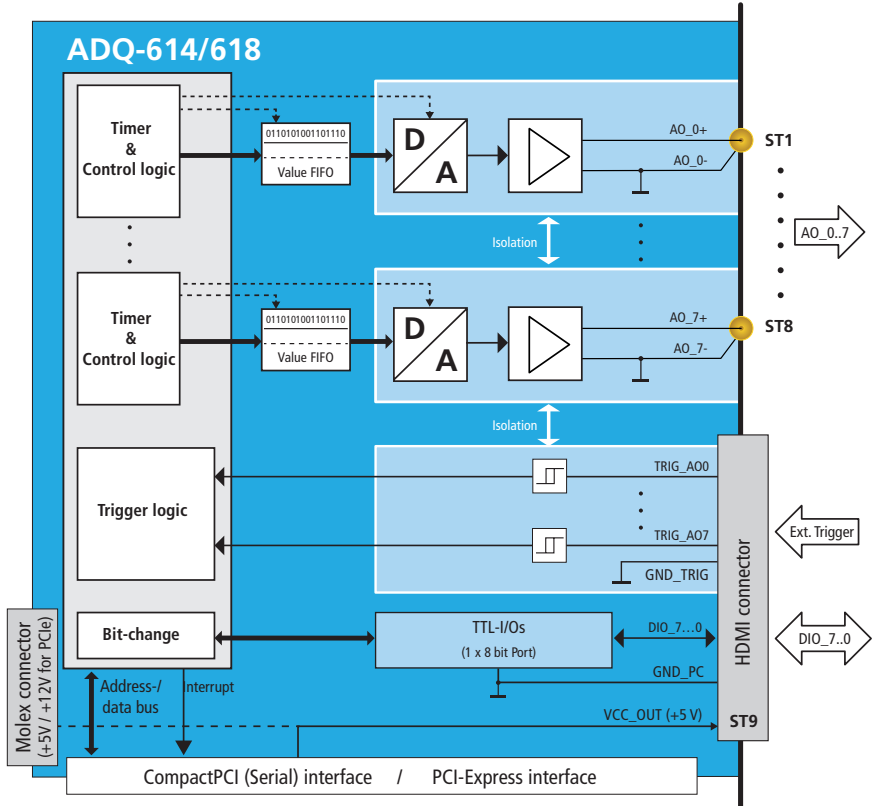


Figure 4: Block diagram ADQ-610 series

- 8 isolated voltage output channels
- 8 isolated external digital trigger inputs
- 8 bi-directional TTL digital I/Os

3.2 Analog output

Nyquist's sampling theorem (Oversampling)

Nyquist's sampling theorem basically applies also to analog output. This means, that the output rate for a periodic signal, whose maximum frequency component should be f_{pmax} , must be at least twice as high, i. e. $2 \cdot f_{pmax}$ or higher. In practice we recommend to choose an output rate by the factor 5 or 10 higher than f_{pmax} to replicate the signal form truly. This issue is also called "oversampling".

Example:

The max. frequency component f_{pmax} . ($1/t_p$) of the signal frequency should be 10kHz. The output rate f_s ($1/t_s$) should be at least $5 \cdot 10 \text{ kHz} = 50 \text{ kHz}$.

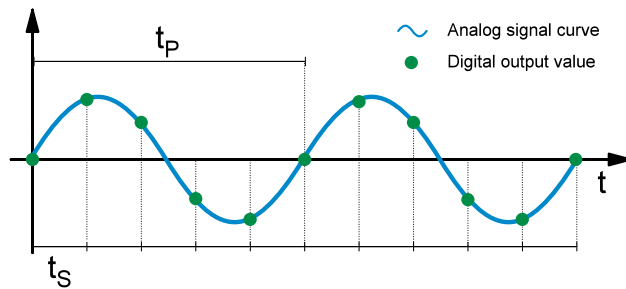


Figure 5: Nyquist-Shannon sampling theorem

3.2.1 Voltage outputs

Depending on the version the ADQ-610 series provides 4 or 8 analog outputs, which are electrically isolated up to $700V_{RMS}$ between each other and towards PC ground. Each channel is assembled with a 500 kHz 16bit D/A converter. The output voltage range covers $\pm 10V$ and outputs a 0V level after power-up automatically.

The values can be output individually or timer-controlled. The output can be started by software or an external trigger signal either independently per channel or several channels synchronously. Each analog channel has its corresponding external digital trigger input, which is isolated towards PC ground and to the analog channels.

Because of the high isolation voltage of $700V_{RMS}$ a cascading of the voltage outputs is possible. This means you can precisely output up to 80V by cascading all the 8 channels.

	ADQ-614	ADQ-618
PC interface	CompactPCI (CompactPCI Serial / PCI-Express in preparation)	
Analog outputs	8 voltage outputs	8 voltage outputs
Output voltage range	$\pm 10\text{V}$	
Resolution	16 bit	
Output rate	500 kS/s	
Output current	$\pm 15\text{ mA}$ per output	
Capacitive load	max. 1 nF	
Total harmonic distortion (THD)	at 10V_{pp} , $f = 100\text{ kHz}$ (sine): -96 dB	
Total accuracy	$\pm 2\text{ LSB}$ ($\pm 0.6\text{ mV}$)	

Table 2: Overview analog outputs

3.2.1.1 Wiring

When connecting the field wiring note that the inner conductor AO_x+ drives the positive potential and the outer conductor AO_x- the negative potential.

We recommend to use high-quality coaxial cables alternatively from MMCX male connector to MMCX male connector (Art. No. 122585) or from MMCX male connector to BNC male connector (Art. No. 122586) in combination with the special terminal block for the ADQ-610 series (Art. No. 127389).

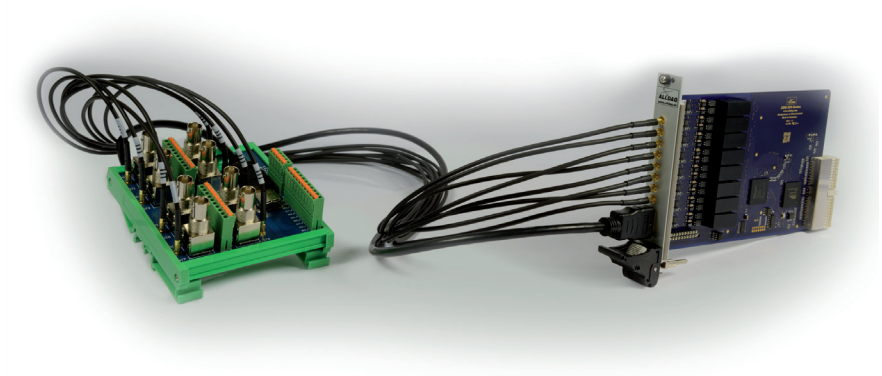


Figure 6: Wiring example with MMCX coaxial cable and special terminal block (fig. similar)

With the special terminal block for the ADQ-610 series the analog outputs can be either connected via 8 BNC female connectors or Phoenix type clamps, the digital I/Os, trigger inputs and auxiliary voltage via 2 x 10-pin Phoenix type clamps.

3.2.1.1.1 Output voltage range

The output voltage range is $\pm 10\text{ V}$. The load for each channel is 15 mA max. The capacitive load at the output should not exceed 1 nF to ensure a stable signal. Individual modifications of the output stage on request.

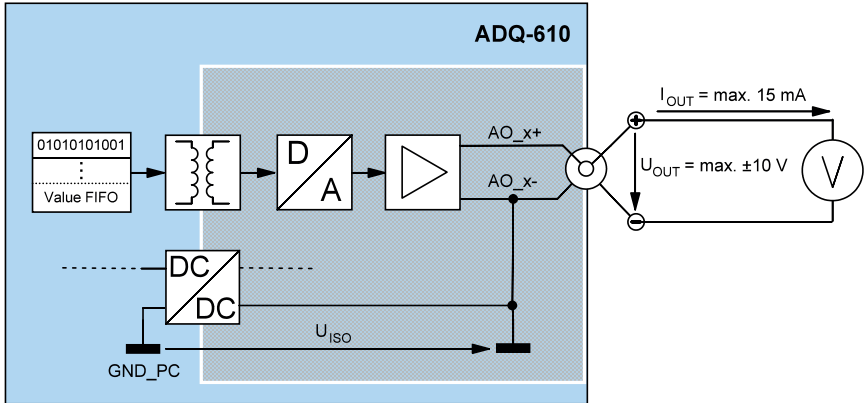


Figure 7: Output stage

The Total Harmonic Distortion (THD) defines the ratio between the accumulated harmonics power P_H to the power of the basic oscillation P_1 . The THD of the ADQ-610 output stage is specified with -96 dB and refers to a sine oscillation of 100 kHz with an amplitude of 10 V_{pp} .

Tip:

Cascading of the voltage outputs is possible. This means you can precisely output up to 80 V by cascading the 8 channels.

3.2.1.1.2 Isolation voltage



Note, that the maximum voltage potential $U_B + U_{OUT}$ this is the sum of the common-mode voltage and the output voltage may not exceed the isolation voltage of $U_{ISO} = 700V_{RMS}$. Else the board can be damaged irreversibly.

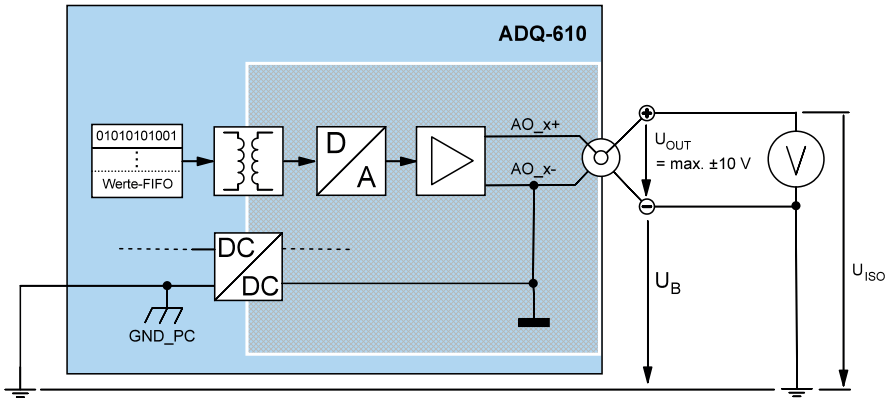


Figure 8: Isolation voltage

3.2.1.2 External trigger D/A section

The ADQ-610 series provides 8 external digital trigger inputs which are isolated from PC ground and against the analog outputs. With it you can trigger each D/A channel independently or synchronously. Depending on configuration the output operation can be started or stopped by a rising, falling or any edge.

The digital trigger inputs (TRIG_AOx) are designed for a TTL high-level of +5V. They use GND_TRIG as common ground reference.

The trigger inputs can be attached by the HDMI connector ST9 at the front panel. A suitable terminal block is available as an option (see chapter 4.2.3 on page 28).

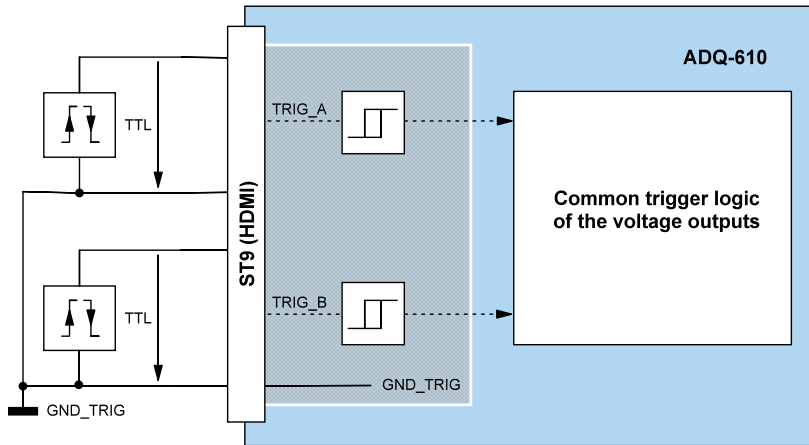


Figure 9: Wiring of the external trigger inputs

3.2.2 Programming

For programming the analog output there is a differentiation between the so-called "Single value output" and the "Timer-controlled output". All channels can be started or stopped independently or synchronously by software or an external trigger signal.

3.2.2.1 Single value output

This operation mode is for output of single values without fixed time reference.

Depending on configuration the output can be started or stopped by software or by a rising and/or falling edge at the corresponding external trigger input (TRIG_AOx).

Please note the order of operation as described in the online help.

3.2.2.2 Timer-controlled output

With the timer-controlled output you can output signal curves continuously. The so-called value FIFO is a fast buffer memory per channel which enables a continuous operation of all channels at maximum output rate.

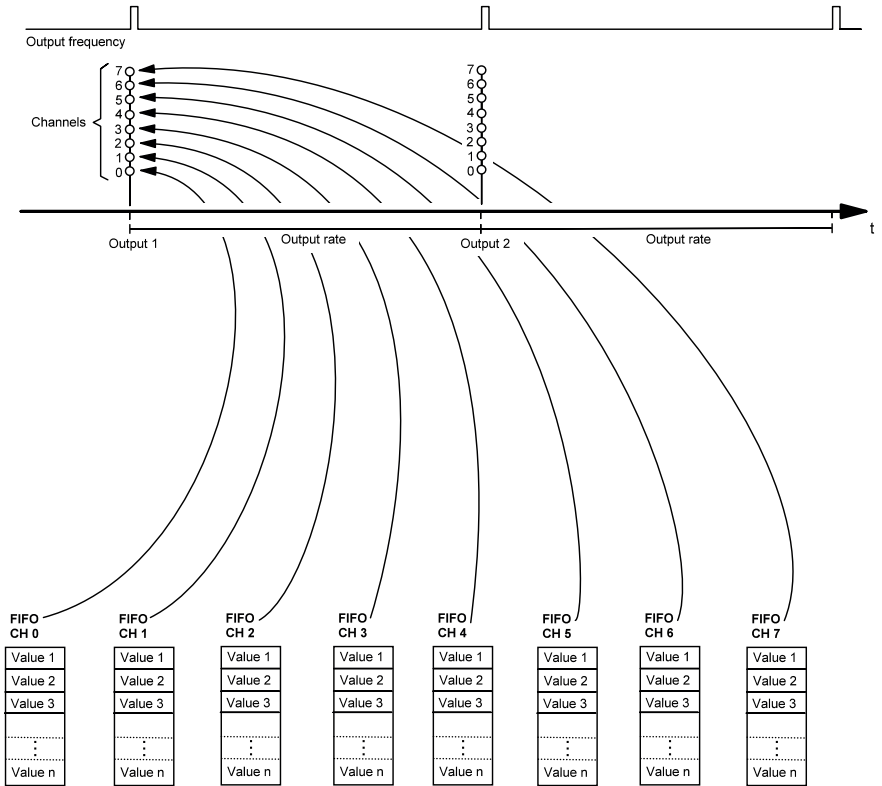


Figure 10: Timer-controlled output

Please note the order of operation as described in the online help.

3.3 Bi-directional digital I/Os

The ADQ-610 series provides one bi-directional 8 bit wide digital I/O port (DIO_7..0). If the digital port is configured as input the pins can be monitored on bit-change and can generate an interrupt event.

The port can be attached by the HDMI connector ST9 at the front panel. A suitable terminal block is available as an option (see chapter 4.2.3 on page 28).

Note: After power-up all ports are configured as input.

3.3.1 Wiring

When wiring digital I/Os take care that the TTL level is met (see specifications on page 24) and that a reference to PC ground (GND_PC at ST9) must be established. The max. output current is $I_O = 24 \text{ mA}$.

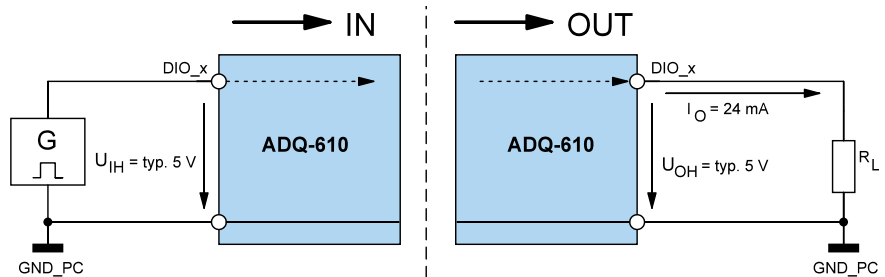


Figure 11: Wiring of the digital I/Os

3.3.2 Programming

The bi-directional 8 bit digital I/O port (DIO_x) can be programmed by port as input or output. After power-up the port is configured as input.

3.3.2.1 Single value input/output

In this operation mode one digital value can be read resp. output port-wise. The port direction is defined by software.

Note: A port configured as output can be read back also!

Follow the order of operation as described in the online help.

3.3.2.2 Streaming Operation

Depending on the port direction the software-controlled streaming operation enables a continuous reading of digital inputs resp. the output of a bit pattern stream.

Follow the order of operation as described in the online help.

3.3.2.3 Interrupt modes

On demand the digital I/O port configured as input can be monitored on bit change and can be evaluated as an interrupt event. Programming is done in the operation mode „interrupt“.

3.3.2.3.1 Bit change

In the operation mode „bit change“ one or more input bits which should be monitored for toggling can be masked. For each rising and falling edge, a bit mask defines which bit and which edge should generate an interrupt. As soon as an appropriate edge at minimum one bit masked with „1“ occurs, an interrupt is triggered (see next figure).

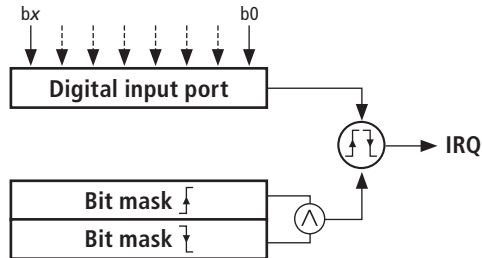


Figure 12: Bit change

Example for bit change:

- When passing the value FFHex in the member variable `uiPortBitChangeRisingEdge` of the structure `SADQIRQEnable` in function `adqEnableIRQ()` all bits of a port are monitored on a rising edge for example. If only single bits should be monitored (e. g. monitoring of bit b2 on rising edge), the corresponding bit of the bit mask must be set to „1“ (e. g. `uiPortBitChangeRisingEdge = 04Hex`).
- An interrupt is triggered as soon as a rising edge at bit b2 is detected.
- For evaluation of the interrupt event use the member variable `uiPortBitChangeRisingEdge` resp. `uiPortBitChangeFallingEdge` of the structure `SADQIRQStatus` in the function `adqWaitIRQ()`. You get the information which bit with which edge (rising/falling) triggered the interrupt.

4. Appendix

4.1 Specifications

Conditions: $T_A = 23^\circ\text{C}$ if not otherwise specified; warm-up time: 30 minutes.

In line with continuous tests we monitor the long-term stability of the specifications regularly.

Analog outputs

Element	Condition	Specification
Number of channels	ADQ-618	8 differential voltage outputs
	ADQ-614	4 differential voltage outputs
Signal curves		free definable, for periodic signals we recommend 5 values per period, rectangular signals up to 250 kHz
Resolution		16 bit (1 LSB = 0.305 mV)
Output voltage range		-10V..(+10V - 1 LSB)
Output current		± 15 mA each output
Capacitive load		max. 1 nF
Total Harmonic Distortion (THD)		at 10V _{pp} , $f = 100$ kHz (sine): -96 dB
Transfer rate in streaming operation	PC -> board	max. 25 MHz (cPCI) resp. 30 MHz (PCIe) depending on system*
Output rate max.		500 kS/s (synchronously)
Output time range		2 μ s up to ~65 s
Timer resolution	programmable	in steps of 15.15 ns
Settling time		0.9 μ s
Triggermodi	Start	Software, digital trigger input (TRIG_A00..7)
	Stop	Software, digital trigger input (TRIG_A00..7)
External trigger	via HDMI	see chapter trigger inputs
Isolation voltage	Channel to PC GND	700 VDC / 700 VAC _{eff} (60 Hz)
	Channel to channel	700 VDC / 700 VAC _{eff} (60 Hz)
Total accuracy		$\pm 0.01\%$ (± 1 mV) at full-scale
Temperature drift		20 ppm/ $^\circ\text{C}$
Ground reference		full differential channels

* The effective output rate depends largely on the performance of your computer, the number of installed boards and the number of channels used.

Trigger inputs for analog outputs

Element	Condition	Specification
Number	via HDMI	8 external trigger inputs isolated
Level max.		-0,5..+5.5V (different input level on request)
Input level	U_{IH} VCC = 5V	min. 2.2V
	U_{IL} VCC = 5V	max. 0.8V
Input current	I_F	typ. ± 1.6 mA
Trigger clock	Rectangular	max. sample rate of the board
Trigger edges		rising, falling, any
Delay time		max. 30.30 ns
Isolation voltage	Signal to PC ground	max. 500V
Ground reference		GND_TRIG

Bi-directional digital I/Os (TTL)

Conditions: $T_A = 25^\circ\text{C}$

Element	Condition	Specification
Number	via HDMI	1 x 8 bit port bi-directional
Type		TTL (bi-directional, direction configurable per 8 bit port)
Input level	U_{IH} VCC = 5V	min. 2.0V
	U_{IL} VCC = 5V	max. 0.8V
Input current	I_I	typ. ± 1 μA
Output level	U_{OH} $I_O = -24$ mA	min. 2.4V
	U_{OL} $I_O = 24$ mA	max. 0.5V
Output current	I_O each Pin	± 24 mA
Operation modes	Single	Read/write of single values
	Streaming	max. 1 kHz (via software timer)
	Interrupt	Monitoring the digital port for bit-change
Ground reference		PC ground (GND_PC)

General

Element	Condition	Specification
PC interface	cPCI models	CompactPCI (32 bit, 33 MHz) Rev. 2.2
	cPCIS models	CompactPCI Serial Rev. 1.0a
	PCIe models	PCI-Express x1 Rev. 1.0
Auxiliary power supply	only for PCI-Express	+5V/+12V supply via MOLEX connector to connect with the PC power supply
Power consumption cPCI models	8 AO 500 kS/s, 8 DIO	+3.3V: max 170 mA +5V: max. 1.3 mA; +12V: max. 1.5 A

Element	Condition	Specification
Power consumption cPCIS models	8 AO 500 kS/s, 8 DIO	+3.3 V: tbd. +5 V: max. 1.3 mA; +12 V: max. 1.5 A
Power consumption PCIe models	8 AO 500 kS/s, 8 DIO	+3.3 V: tbd. +5 V: max. 1.3 mA; +12 V: max. 1.5 A
Temperature range	Operation	0..70 °C (standard)
	Storage	-40..100 °C
Humidity	Operation	20%..55% (not condensing)
	Storage	5%..90% (not condensing)
Physical size (without mounting bracket and connectors)	cPCI models	3 U CompactPCI board (4 HP)
	cPCIS models	3 U CompactPCI Serial board (4 HP)
	PCIe models	158 mm x 111.15 mm (B x H)
Connectors	ST1..8	8 MMCX coaxial female connectors
	ST9	HDMI connector, type HEC
Certifications		EMC directive 2004/108/EG, Emission EN 55022, Noise immunity EN 50082-2, RoHS
Manufacturer warranty		36 months

4.2 Pinouts

4.2.1 MMCX connectors (analog outputs)

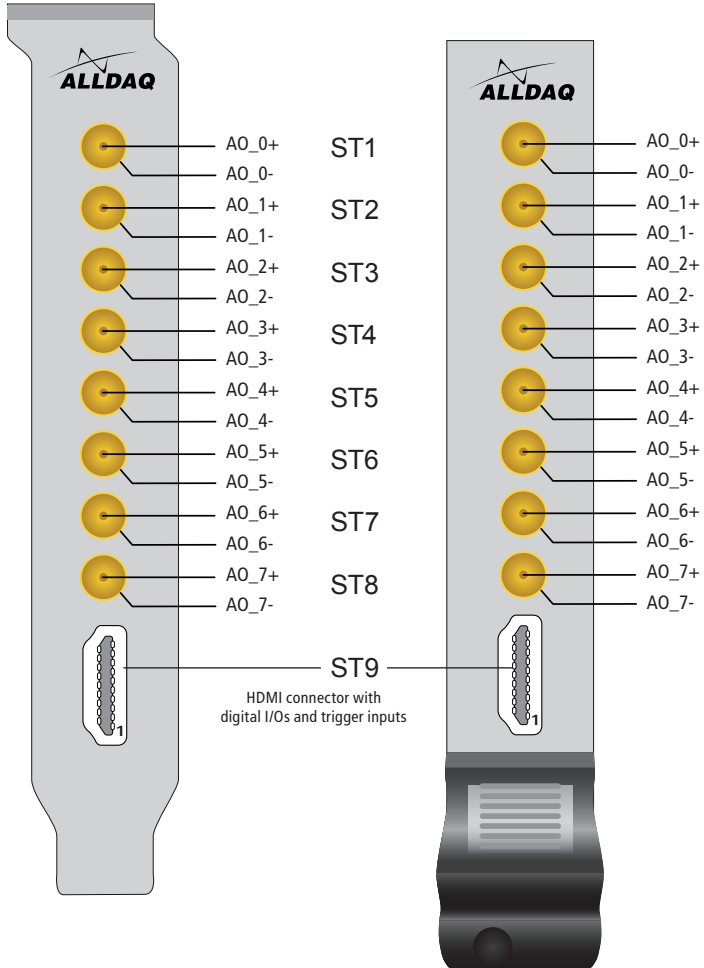


Figure 13: Connectors of the ADQ-610 series

ST1..ST8 are MMCX coax female connectors.

4.2.2 HDMI connector (ST9)

HDMI connector type HEC for digital I/Os and trigger inputs.

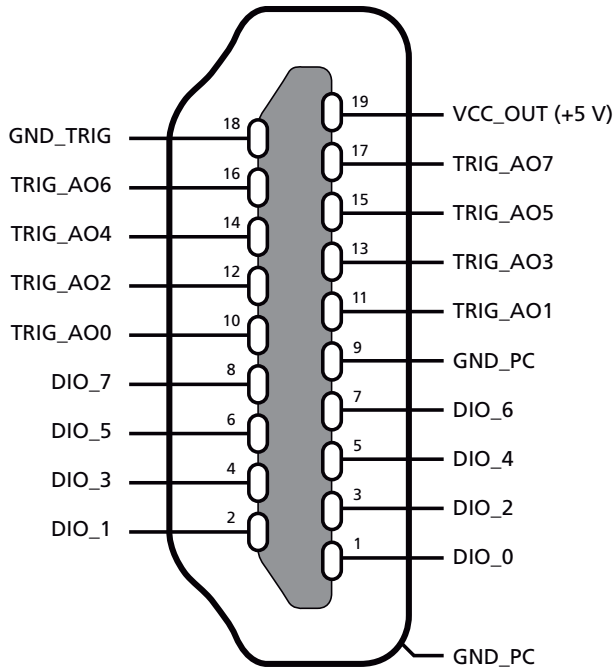


Figure 14: HDMI connector for digital I/Os and trigger inputs

Note:

Take care that the HDMI connector of the ADQ-610 is not used as "High Definition Multimedia Interface" according to HDMI standard. Only the form factor of the HDMI connector (type A) was assumed.

HDMI® is a registered trademark of HDMI Licensing L.L.C.

4.2.3 Terminal block for ADQ-610

Special terminal block for the ADQ-610 series. The connection to the board is made by 8 MMCX female connectors and a HDMI connector. The analog channels can be connected alternatively via 8 BNC female connectors or Phoenix type clamps. The digital I/Os, trigger inputs and the +5V auxiliary power are available at the two 10-pin Phoenix type clamps ST9A and ST9B.

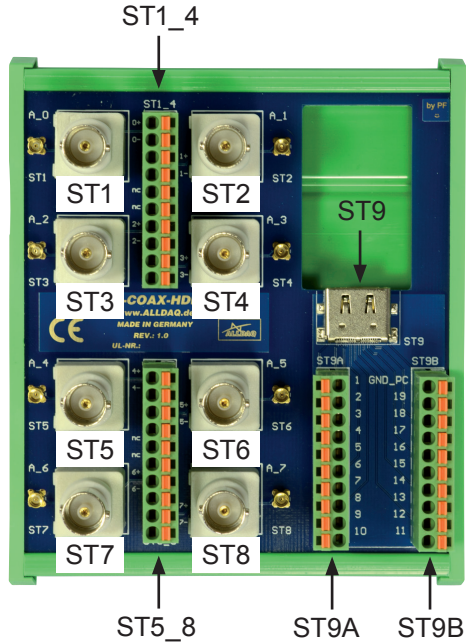


Figure 15: Terminal block for ADQ-610 series

Pin ST9A	Description	Pin ST9B	Description
1	DIO_0	20	GND_PC
2	DIO_1	19	VCC_OUT (+5V)
3	DIO_2	18	GND_TRIG
4	DIO_3	17	TRIG_A07
5	DIO_4	16	TRIG_A06
6	DIO_5	15	TRIG_A05
7	DIO_6	14	TRIG_A04
8	DIO_7	13	TRIG_A03
9	GND_PC	12	TRIG_A02
10	TRIG_A00	11	TRIG_A01

Table 3: Pinout of ST9A/B at the special terminal block

4.3 Accessories

ADQ-TB-COAX-HDMI-HUT (Art. No. 127389)

Special terminal block for ADQ-610 series, including cable set

ADQ-CR-MMCXM-MMCXM-8x-1m (Art. No. 122585)

8 x Coaxial cable from MMCX male connector to MMCX male connector (1 m)

ADQ-CR-MMCXM-BNCM-8x-1m (Art. No. 122586)

8 x Coaxial cable from MMCX male connector to BNC male connector (1 m)

ADQ-CR-HDMI-MM-1m (Art. No. 127015)

HDMI cable to connect the digital-I/Os and trigger signals with the terminal block (1 m)

4.4 Manufacturer and support

ALLNET® and ALLDAQ® are registered trademarks of the ALLNET® GmbH Computersysteme. For questions, problems and product information please contact the manufacturer directly:

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4.5 Important notes

4.5.1 Packaging ordinance

Basically manufacturer and distributors are committed to take care, that sales packaging are withdrawn after use from the end user and applied to a new disposal or to a material recycling as a matter of principle (translated according to § 4 sentence 1 of VerpackVO). If you have problems as customer on disposal of packaging and shipping material please write an email to info@allnet.de.

4.5.2 Recycling note and RoHS compliance



Please note, that parts of products of ALLNET® GmbH should be disposed in recycling centers resp. may not be disposed via the household waste (printed circuit boards, power adapters and so on).



ALLNET® products are manufactured in accordance with RoHS (RoHS = Restriction of the use of certain hazardous substances).

4.5.3 CE certification

The ADQ-610 series is CE certified.



This device is compliant to the EU directive: 2004/108/EG regarding the electromagnetic compatibility (EMC) and the cross approval of their conformity. The conformity with the directive as stated above is confirmed by the CE sign on the device.

4.5.4 Warranty

Within the warranty time we eliminate manufacturing and material defects free of charge. The warranty terms valid for your country can be found on the homepage of your distributor. If you have questions or problems applying the warranty you can contact us during our normal opening hours under the following phone number +49 (0)89 894 222 – 74 or by email: support@allda.com.

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