

The fast multifunction card G09-1005-1 is distinguished by its flexible fields of application, high accuracy, speed and reliability in harsh industrial environments. This card is equipped with two signal processors, so a more flexible allocation of responsibilities to both processors is possible. On this dual-processor card the DSP56311 applies the user-configured signal filters and online functions. The second signal processor DSP56301 is responsible for acquiring, processing, controlling and output tasks. The two digital signal processors (DSPs) on the measurement board both have several independent clocks, which enable the user to configure several different and independent measurement and/or

control sequences, so this card offers a wide range of functions, far beyond the capabilities of a simple multifunction card. The functions can be programmed individually for each functional module using the included software package. This programmability enables you to take customer-specific requirements into account and is always extensible. Due to the FPGA board structure, further counter applications, resp. combinations can be done by software/firmware adaptation: Just contact us! Included is a wide range of application drivers for standard data acquisition software.

Features:

- 1 A/D 16 Bit 800kHz 32SE/16diff. optional: 64SE/32diff. o 64SE
 - D/A 16 Bit 100kHz 4 channel optional: 4 channel
- 1 TTL in/output 32 Bit (expandable to 1024)
- 1 5 timer 32 Bit, 6 internal timer,r (DSP)
 - Externel trigger/clock and synchronization
 -

- 1 Signalprozessor DSP56301 100MHz, 1,5MByte SRAM
 - 5 Counter event counting, frequency measurementh (frequency resolution 10Hz) optional* pulse width, periodlength
 - 2 Channel pulse width modulation

Online-Functionality:

- The boards are offering the following features
- Mathematical functions like filter PID and FFT
- Operating functions like triggering and PWM
- Realtime-PID-controller
- Scaling functions like characteristic
- Clocking the A/D converter polling, controlled -timer, external clock source
- Trigger (window and edge triggering at all measurement types)
- Analog and digital PWM
- Simultaneously acquisition of digital-, counter- and analog signals
- Functiongenerator:
- Output of sine, triangle, square, pulse, sawtooth, noise and files
- Online-scaling of the measurement data
- Realtime-FFT-, IIR- and FIR-filter
- Realtime-oversampling
- Digital onboard controlling

One
realtime
function
for free

Applikationssoftware

DASyLab
DIAdem
EdasWin
LabVIEW
LABWindows/CVI

E.d.a.s.WinPlus™
MH

DASyLab™
Data Acquisition System Laboratory

NATIONAL INSTRUMENTS™
DIAdem

NATIONAL INSTRUMENTS™
LabVIEW

API für C/C++, Delphi, Python
unter Windows und für DotNET
(C#, F#, VB.NET, IronPhython, ...)





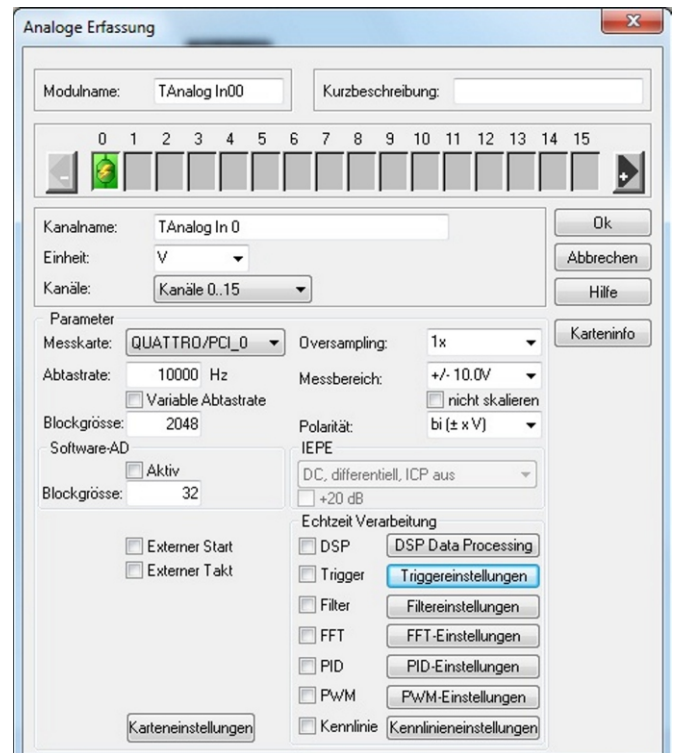
PCI Serie G09-1005-0



Analog Inputs

number of inputs	32 Single-ended/16 differential inputs
resolution	12 Bit
ADC sample rate)	500kHz
input voltage ranges	±125V; ±2,5V; ±5V; ±10V
	0-1,25V, 0-2,5V, 0-5V, 0-10V
precision of system	±0.05 %
A/D conversion	2 µs
input impedance	1 G, 30 pF
maximum input voltage in operation	±13,5 V
maximum input current non operating	± 2 mA
optional G06-30D0-0	±35,0 V
BIAS-current	±40 nA
non linearity	±1 LSB
digitalization error	±1 LSB
quantisation error	< ±1 LSB
range error	adjustable
quantisation error	adjustable
A/D-zero drift	±7 ppm / °C
monotonicity	±1,0 LSB
terminal Connection	SUB-D50-shielded

Analog input settings dialog under DasyLA



Analoge Outputs

number of outputs	4 (8)
resolution	12Bit
DA throughput	200kHz per channel
output voltage ranges	0-10V, ±10V
output current	±5 mA
output impedance	0.2 Ohm
range error	< ±0.1 %, typ.
zero error	< ±0.1 %, typ
settling time up to 0.012 % FSR	5 µs, 20V step
steepness	10 V / µs
A/D zero drift	±5 ppm / °C, typ.
field drift	±5 ppm / °C, typ.
monotonicity	guaranteed

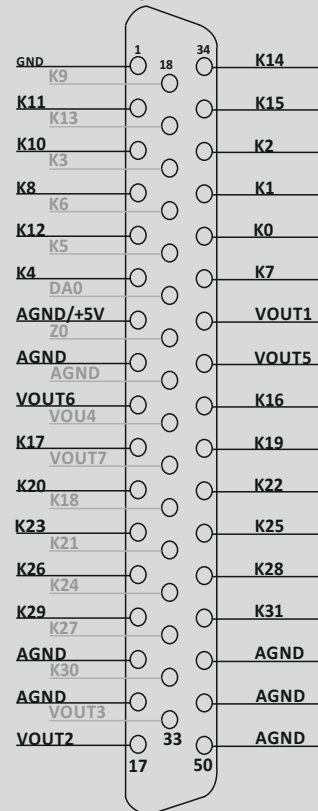


Digitale In/Outputs

number of outputs	32 (switchable per Bit) (1024)
logik family	LVC CMOS
logic sense	2.0 V
logic low Input voltage	0.4 V
logic high input current	0.5 µA
logic low input current	0.1 µA
logic high output voltage	3.1 V min.
logic low output voltage	0.1 V max.
logic high output current	-2,5 mA
logic low output current	-2,5 mA
termination	none
maximum input voltage in operation	+5 V
synchronous capture	of digital and counter inputs
	simulataneously to analog inputs

*

Pin assignment P1



Digitaloutput with option EIPQ-30GI-0	
number of outputs	16 (direct controls of relays)
external supply	from 3,3 to 28 voltage (Vext)
output current	60 mA per channel
maximum external voltage	+30 voltage
outputfrequenz max.	10kHz
terminals	Weidmüller screw terminals
optical isolation	(*) cutoff voltage 1000V

Digitalinput with option EIPQ-30GI-0	
number of inputs	16+2 optical isolation inputs
logic sense high	from 2.4 to 28 voltage
input current	2,4V = 3 mA, 28V= 11mA
maximum input voltage	+30 voltage
inputfrequenz max.	10MHz
terminals	Weidmüller screw terminals
optical isolation	cutoff voltage 1000V

Trig. Trigger	
logic family	LVC MOS
input	1 trigger input
output	1 trigger output
	master/slave programmable

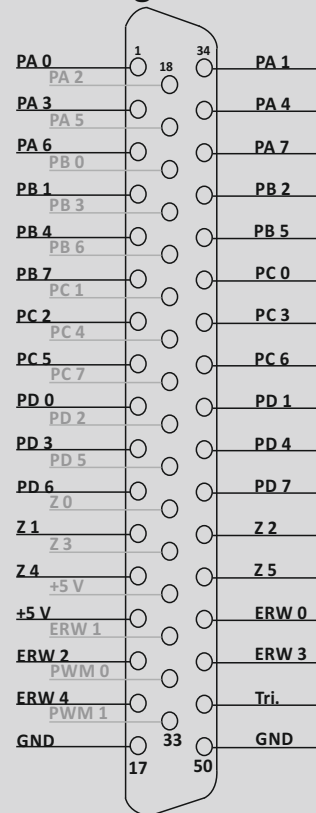
Sync Synchronisation	
logic family	LVC MOS
input	1 synchronisation in/output
output	1 master/slavecontrol
	master/slave programmable
	all devices from the series G06, G0E and G09 can be synchronized with each other

Counter	
logic family	LVC MOS
number of counters	5
resolution	32 Bit
counter resolution	10/50 MHz
counter modes	event counting, frequency measure-ment (frequency resolution 10Hz)
optional*(G06-3090-0)	pulse width, periodlength

Others:	
bussystem	PCI.Rev, 2,1
signalprocessor	56301 100Mhz, 100MIPS
signalprocessor	56311 150 MHz, 100/255MIPS
memory	1,5 MByte 24MByte DRAM
flash	512 kByte
expansionsbus	
dimensions	250x119x13mm
connectitons	2xSUB-D50 shielded
RoHS konform	yes
weight	ca. 150g.
inputcurrent	+5V, max. 750mA
customs tariff number	84733020

**DSP
inside**

Pin assignment P1

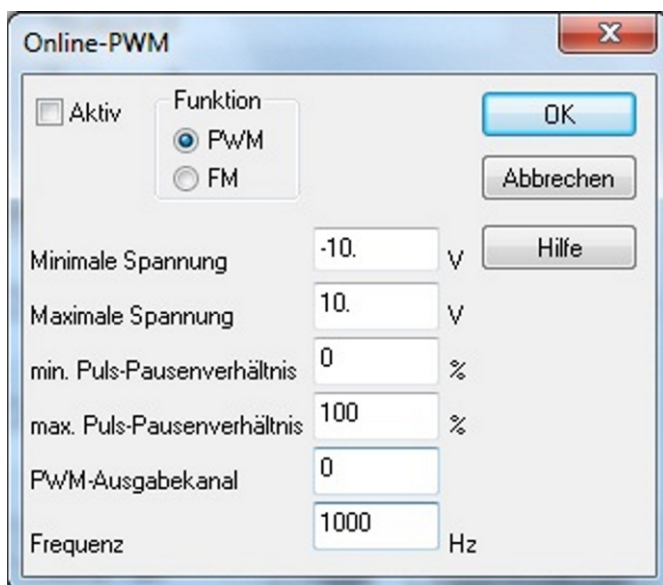


Ordering information hardware-extensions::	
G09-1005-0	2.849,00€
12 Bit A/D, 12 Bit D/A,	
K00-1012-0	115,00€
50 pin connection panel for DIN rail mounting with cable	
EIPQ-3000-0	550,00€
BNC-Connection unit	
K00-1011-0	45,00€
50 pin round ribbon cable	
G09-3090-0	499,00€
24 Bit Frequency measurement resolution 1/10/100/ 1000Hz	
o. pulse width and period length ref.100ns	
G09-3031-0	199,00€
Samplingfrequency 1 Mhz, 12 Bit resolution	
G09-3041-0	189,00€
4-Kanal -12 Bit D/A Ua. 0-10V o. ± 10 V	
G09-30D0-0	249,00€
With voltage resistent multiplexers ±40 V	
G09-4010-0	400,00€
Realtime-FFT	
G09-4020-0	400,00€
Online-scaling of the measurement data	
G09-4030-0	400,00€
Realtime-FIR-and IIR-filter	
G09-4040-0	400,00€
Realtime-PID	
G09-4050-0	800,00€
Functiongenerator	
Output of sine, triangle, square, pulse, sawtooth, noise and files	
G09-40x0-0	1600,00€
All functions to the package price	
For additional accessories and options please refer to the price list.	

PWM Puls width modulation *	
channels	2
resolution	24Bit in 100ns Schritten pro.
range	2Hz - 2500kHz
Logic family	LVC MOS output

Pulse width modulation*

MultiChoice can output PWM signals with a resolution of 100ns and output frequencies between 2Hz up to 2,500,000Hz. Pulse width modulation is a kind of special feature in the world of measurement. It is a design of Goldammer GmbH. For this kind of pulse width modulation no interruptions or pulse discontinuities are permitted. If frequency or pulse width is changed, the actual period is emitted until it is fully completed and then the new settings are used without any discontinuities. Modulation of frequency and pulse width is supported at the same time and it is fully transparent to the user who only specifies a frequency and the pulse width in percent. If the frequency is changed the percentage is kept, if the pulse width is changed, the corresponding frequency is kept.



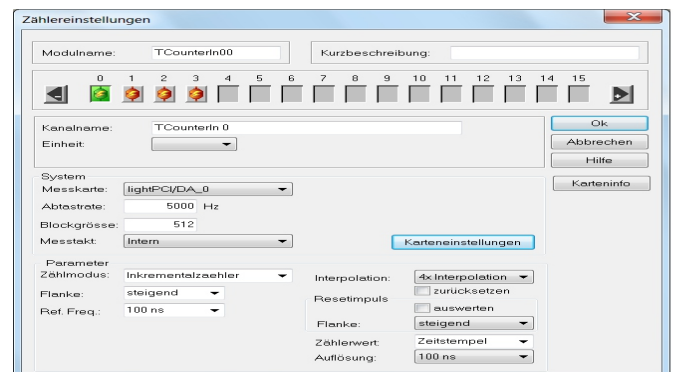
Order information

G09-1005-0	12 Bit A/D, 12 Bit D/A	2.629,00 €
K00-1012-0	50 pin connectionpanel for DIN rail mounting with cable	97,00 €
Additional accessories and options see price list		

Rotary Counter with OptionG09-3093-5	
channels	6 rotary + 6 timestamp
resolution	6 * 32 bit incr. encoder mesurement
resolution	6 * 32 bit timestamp
timestamp resolution	100ns
timestamp modes	timestamp/volume flow per channel
interpolation	selectable 1-2- and fold
reset counter	programmable
input frequency	max. 20MHz

Rotary Counter *

There are six counters available with a resolution of 32 bit, direction detection for incremental encoders and an additional 32 bit counter for its time stamp, the interpolation can be switched between 1-, 2- or 4 fold. Optional zero pass detection with programmable edge and a maximum input frequency of 20 MHz predestine this card for applications such as flow measurement. The time stamp is used for accurate speed measurement of the device under test.



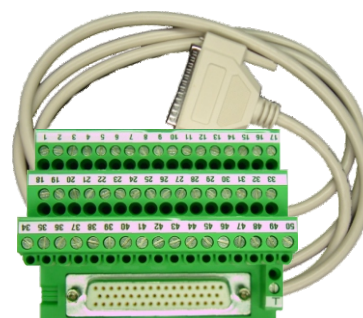
Connector chassis:

K00-2011-0 34,00€

50 pin round ribbon cable used to connect the analogue and digital channels of the PCI Light/quattro (Multichoice IV) cards.

K06-1012-0 97,00€

50 pin connector-panel for top hat rail installation and 50 pin SUB-D connector cable used to connect the analogue and digital channels of the Multichoice IV PCI cards.



Online functionality:

The measurement cards offer a wide variety of online functions like filters, signal analysis like FFT, control algorithms (PID), and threshold observation. Any of these functions are run on the signal processor without any effort of the PC. So any of the measured values can be processed immediately after measuring it.

A controller is able to adjust the manipulated value in an extremely short period of time if the input value changes respectively. For none of these operations any effort has to be made by the PC. The processing of data is achieved immediately after measuring it without any additional delay. Filters suppress undesired frequencies and distortions. Therefore the user gets useful data only. A combination of filters and controllers permit to remove distortions first and depending on the data to control the control loop then.

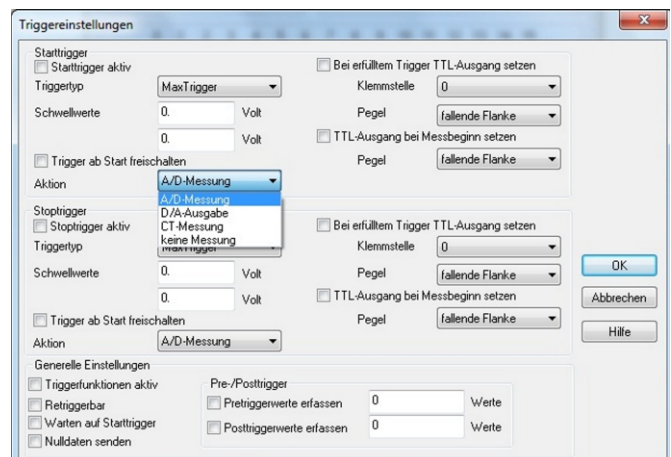
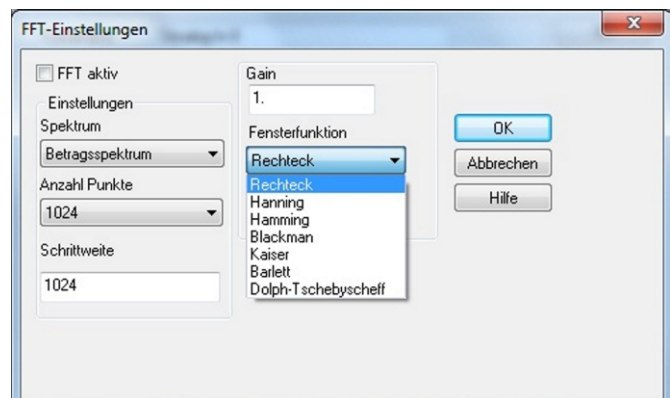
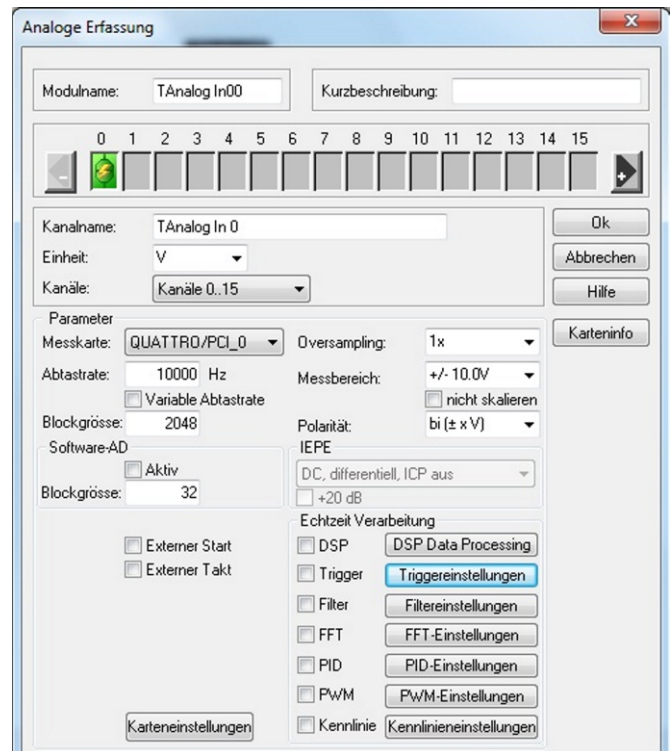
All of these functions are part of the boards without any additional hardware. So distortions caused by cabling, signal conditioning inbetween, or several contacts are avoided. Furthermore the delay between input and output is extremely short which permits real time control. Sometimes the different time associations of measurement hardware of different manufacturers can lead to problems.

If analog channels, digital inputs and counter readings are measured with different components it is normally impossible to associate this signals to a certain time. This gap is closed by MultiChoice too. The signal processor offers the possibility to observe digital inputs and counter signals like analog inputs and to measure data with synchronized time. Channels of any type are measured and stored as a single sample which ensures time synchronization.

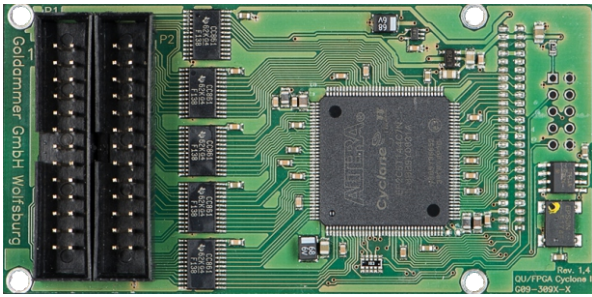
Trigger:

There are several trigger conditions available: Borders, threshold checking, checking of edges, limits, or window conditions. Measured data can be processed mathematically and in dependence of the steepness of the resulting curve (steepness of gradient), processing can be initiated even in threshold and window conditions. Trigger conditions becoming true can start or stop a measurement, can set digital outputs or control analog outputs.

As an option trigger conditions can activate or deactivate themselves crossover. So a network of dynamic triggers is available depending on the proceedings of the measurement. Trigger conditions can be configured to be retriggerable. After a certain condition becomes true, they are activated or deactivated to achieve the same or a changed observation.



Optional hard and software extensions:



QU/Inkre/6/32 G09-3093-5 1299,00 €

Incremental counting, 6x32bit incremental up/down counter, programmable interpolation 1x/2x/4x, maximum signal input frequency 20MHz, programmable reset impulse

QU/Count8/P G09-3023-0 1299,00 €

8x32bit multifunction counter 10MHz, pulse counting, frequency measurement 1/10/100/1000Hz, period length measurement, pulse width measurement, resolution 100ns

QU/8/UP G09-3094-5 1299,00 €

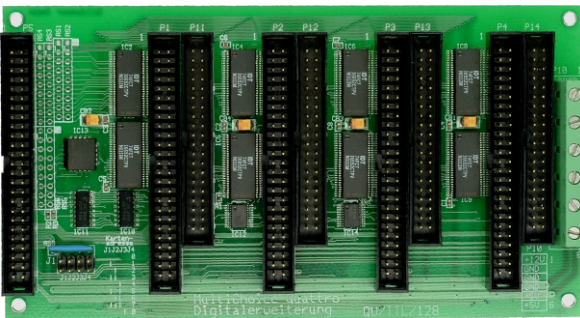
8x32bit up/down counter, maximum input frequency 10MHz

QU/PWM G09-3095-5 1299,00 €

Attachable Module: 8x16bit pulse width modulated output, output frequency 7Hz 167kHz

QU/TTL/128 G09-3090-0 499,00 €

Counter upgrade: 24 bit impulse counting, maximum input frequency 10MHz, frequency measurement, programmable resolution 1/10/100/1000Hz, period length measurement, resolution 100ns, pulse width measurement, resolution 100ns

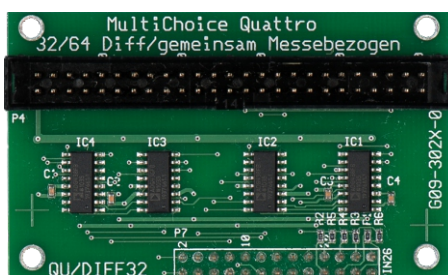


QU/Rel8 G09-3097-0 199,00 €

8x relay output, maximum current 1A, 30W, max. 110V DC, 125V AC

QU/DIFF32 G09-3020-5 199,00 €

Attachable Module: Extension board for MultiChoice QUATTRO, increases number of channels to 32 differential/64 single ended inputs, maximum sampling frequency 300kHz.



QU/DIFF32/FMUX G09-3025-5 349,00 €

Extension board for MultiChoice QUATTRO, increases number of channels to 32 differential/64 single ended inputs, maximum sampling frequency 300.000 samples/s, high voltage protection $\pm 40V$ in powered and powerless condition

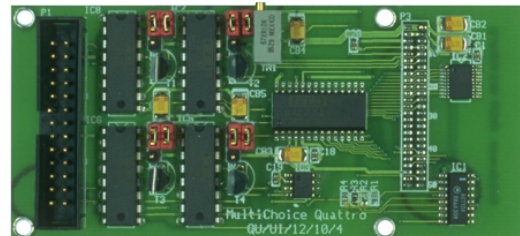
QU/ANA/128 G09-3010-0 749,00 €

Digital extension board of MultiChoice QUATTRO, increases to 128 bidirectional bits, direction programmable in 16bit groups, maximum number of 8 boards usable



QU/UI12/10/4 G09-3041-5 499,00 €

U/I converter for MultiChoice QUATTRO, 4 channel 12bit U/I converter, conversion rate 50.000 samples/s, output voltage 15V, output current 0 20mA or 4 20mA

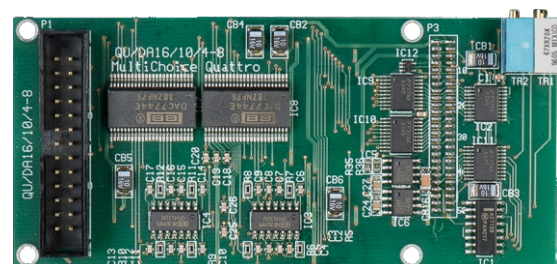


QU/DA16/10/4 G09-3023-5 499,00 €

D/A converter module for MultiChoice QUATTRO, 4 channel 16bit DAC, conversion rate 100kHz, output range $\pm 10V$

QU/DA16/10/8 G09-3024-5 699,00 €

D/A converter module for MultiChoice QUATTRO, 8 channel 16bit DAC, conversion rate 100kHz, output range $\pm 10V$



Connector chassis

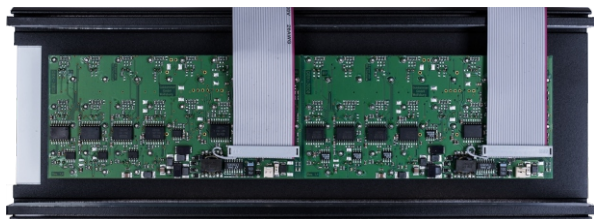
EIPQ-3000-1 BNC-connector with 2x SUB D50 female for Quattro cards **475,00€**

Passive(Active) BNC-connector chassis with one 68 pin SCSI-III connector. The analog channels are connected to BNC-connectors on the top of the case. The digital channels are connected to detachable Weidmueller screw-terminals on the left side of the case. The box can be switched between 32 analog single-ended input channels or 16 analog differential input channels. 24 digital TTL I/O-channels, 5 counter channels, 1 trigger-channel. Dimensions 320 x 118 x 64 mm. Connector-cable K00-2012-0 (SAK01-268) will be needed.



EIPQ-30DI-1 **898,00€**

32 channel instrumentation-amplifier for BNC-version only. Each channel has its own instrumentation amplifier INA2128. Optional every input-channel can be equipped with its own voltage divider and amplifier.



EIPQ-30DI-6 **998,00€**

32 channel instrumentation-amplifier for BNC-version only. Each channel has its own instrumentation amplifier. Common mode voltage-range ± 100 Volt (instrumentation amplifier INA117)

EIPQ-30DI-7 **898,00€**

32 channel instrumentation-amplifier for BNC-version only. Each channel has its own instrumentation amplifier. Input-range conversion from ± 50 Volt to ± 10 Volt. Optional every input-channel can be equipped with its own voltage divider. (instrumentation amplifier INA2128)

EIPQ-30GI-1 **299,00€**

Galvanic isolation of the digital I/O channels . 22 opto coupled input channels (Ue. 2,4 -30 Volt) Port (PC0 to PD7, Z0-4 and Trigger), 16 opto coupled output channels 30V 50mA Port (PA0 to PB7), 2 PWM channel. All channels are using the Thoshiba TD62783 driver. All output-channels can be used to actuate relais. Inc. Powersupply.



P09-1011-3 Passive BNC-connector chassis 32se. AD **780,00€**

Connector chassis for MultiChoice Quattro, rugged metal chassis (gray/dark blue) with aluminum front and rear plate, configurable for 32 single ended or 16 differential analog inputs, 450x100x250mm (WHD), depth with hold 290mm.



P09-1011-4 Passive BNC-connector chassis 32diff. AD **830,00€**

Connector chassis for MultiChoice Quattro, rugged metal chassis (gray/dark blue) with aluminum front and rear plate, 32 differential analog inputs, 450x100x250mm (WHD), depth with hold 290mm.



B09-1011-0 Adapter QUATTRO 32 AD for 5B-Module **82,00€**

32 channel adapter between MultiChoice QUATTRO and module carrier SCMPB01 (Dataforth) including cable to connect module carrier to modules, for connection to MultiChoice QUATTRO the cable K00 2011 0 (SAK01 250) is required, the adapter is equipped with 50 pin SUB D female

