# Next Generation of Intelligent Measuring Equipment

Agilent Vee
DASYLab
DIAdem
EdasWin
IPEmotion
LabVIEW
LABWindows/CVI
MATLAB
ServiceLAB

API for C/C++, Delhi, Python on Windows, Linux, MacOS and Android and for dotNET (C#,F#,VB.NET, IronPython,...)

compact USB measurement systems in many different designs



autonomously operating measuring systems, also usable on the PC via USB or Ethernet:





USB measuring systems with DSP for filtering, triggering and control of data in real time







PCI measuring systems with DSP for filtering, triggering and control of data in real time









# Elementary solving of complex measurements

The already well established MultiChoice series will now be continued by the new generation of the MultiChoice PCI boards. These new boards do not only have the same top quality and functional stability as it's predecessors but also have a broad wide spectrum of new functions and features. Therefore, the MultiChoice boards are top class at a very competitive price.

The new MultiChoice boards are using the latest technology, e. g. FPGA-components, which allow a fully programmable reconfiguration of the hardware. Due to our modular philosophy, an integration into standard and customized applications is being done easily. The upgradability and expandability of the MultiChoice board makes it flexible and versatile for a wide spectrum of applications. For that reason it opens whole new perspectives in measurement technology.

All boards can be tailor made to meet individual customer requirements.

It's versatility makes the MultiChoice board ideal for all sorts of measurement applications. Due to its functional reliability, it's preferably used particularly for safety relevant and critical applications in industrial and lab environments.

Despite its variety regarding functionality, upgradability and integration into different hard- and software environments, the handling of the boards is easy and intuitive, by using the same user interfaces for all drivers and operating systems.

Even before purchase of the board you have access to a fast, extensive support and a qualified consulting service regarding measurement solutions, possible fields of applications and new, innovative technologies. After sales we also offer -free of charge- the latest drivers, additional software for all popular measurement software, improvements and new features.

The MultiChoice boards come as plug-ins or as USB-options fitted inside an attractive box.

# Flexibility

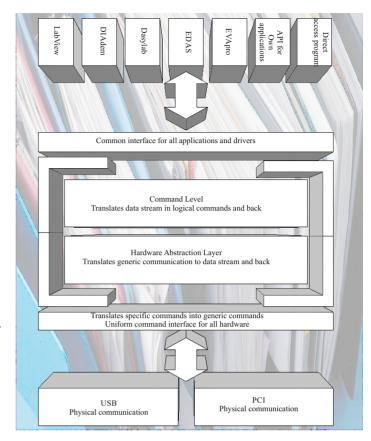
The MultiChoice boards are distinguished by a high degree of flexibility. Numerous problems can be solved widely transcending standard solutions. The boards are fully upgradable in their functions and features. This is related to both the software on your PC and the software on the signal processor ( DSP ), giving you the opportunity to expand the hardware supplementary with additional features.

# Layer Model

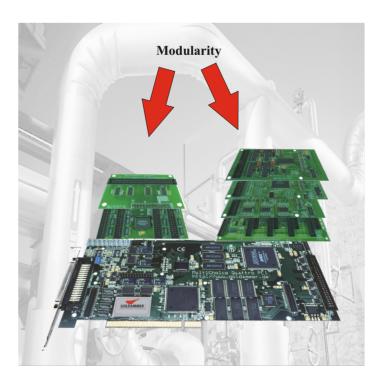
By choosing a layer model in the software any given component can be interchanged, meaning that debugging is only being done at one spot . Extremely high processing speed is either being gained by distributing the tasks onto two processors, or by operating both processors independently parallel. Up to 4 MultiChoice boards can be used simultaneously in one system.

# Modularity

Our philosophy of using modules allows you to order different versions of the same model and choosing additional specific options. There are specific options which have to be ordered



with the board. Furtheron, there are plug-on modules available which supplementary expand the functionality without sending the board in. Due to this outstanding feature most of our boards are individually custom made, and even when already operating the board it can be adapted to meet new requirements. The various plug-on modules are being linked to the software automatically and transparently after being attached to the board.



The variety of combinations is nearly unlimited. Plug-in modules are available for standard- as well as for customized requirements. The following modules are obtainable:

### Standard modules:

A/D, D/A, Counter TTL

# **Special modules:**

optocouplers, relay, cards, current transformers, converters custom made designs.

Software adjustments are either made by the manufacturer or by the customer. Hardware adjustments are made by the manufacturer only.

# **Customized solutions**

The MultiChoice boards are standard products, which are set up individually before or during operation - using different options and modules.

The boards allow the implementation of customized solutions either in hardware or software. By using an easy-to-use self-programming interface, individual software solutions are implemented by the customer with a minimum of development effort at minor costs.

# **Integration and Operation**

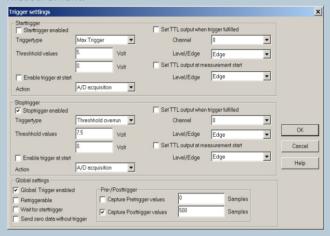
The driver units support all popular operating systems Windows 2k/XP/Vista /7/8 (32/64bit). The same user interface is being used for all operating systems and measurement software, thus changing to MultiChoice boards you save time and money. An intuitive and easy operability is guaranteed. The selfprogramming

After opening the dialog device settings dialog in "Dasylab" the start template shows the general settings of the measurement board.



After pressing the button "trigger settings" a new window opens, which allows you to define the conditions for the chosen channel. Simply adjust the requested parameter. As shown in the example above, a limit of 7.5 volts shall be monitored in the active channel. By exceeding this limit, the AD-measurement will be stopped and the digital output of the channel 0 will raise from low to high, in order to switch an external device or to start a controlled

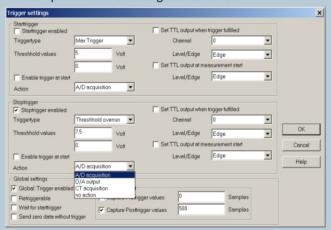
emergency shutdown. To monitor the digital output, 750 samples (posttrigger) are still being recorded after triggering. This channel is meant to monitor the emergency emergency shutdown immediately after starting the measurement.



Due to a change of requirements monitoring shall start now after a minimum voltage has been exceeded (critical

Range ). With a few minor changes conditions will be modified without reconfigurating the whole layout. By simply activating a start trigger which again activates a stop trigger at a certain limit alerting the emergency shutdown at that time.

The template would be changed as followed:



In this changed setup the emergency cutout shutdown would only be monitored, after raising above the 5-volt-limit of the channel. The rest of the configuration remains unchanged.

interface is also independent from the operating system.

The MultiChoice boards are easily integrated in existing and new systems. Moreover, they can be combined with all other boards of the MultiChoice-series without installing further driver units. That enables you to interchange or extend all types of boards without re-programming the layout.

On changing requirements the measurement systems can be extended continuously. By using these exten-sions no new hardware needs be purchased.

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# Online-functions and real-time processing

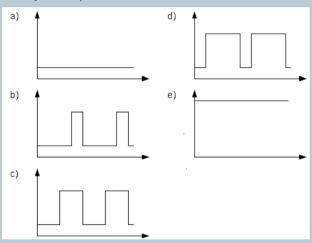
MultiChoice boards are "intelligent" boards, meaning they take over tasks, which are normally executed by the computer and therefore they are independent from latency, speed and load of the computer. By relieving the computer from that load it is free to execute other tasks at the same time. These rolled-out tasks are always executed with the same high speed, but independent from the computer. These are important features for time-critical tasks and for the speed of which measurements are being executed. Such applications are for example proportional relay valves or flow measurements, which have to be monitored and controlled more steadier and at a higher speed as it would be possible than having it controlled by the computer only. These characteristics are extremely important for saftey relevant and realtime processing applications, for example emergency cutouts shutdowns in monitoring systems. The board shuts off a machine immediately,

Below is an example how easy a simultaneous modulation of frequency and pulse width can, for this example Lab-View is being used:





Display of the control inputs: Frequency and pulse width are adjusted by the sliders.



Pulse width a) 0%, b) 25%, c) 50%, d) 75% und e) 100%

Pulse width modulation (PWM)

The PMW modulates the pulse width of a square signal at a constant cycle duration. The pulse width is specified in percentage of the cycle duration. If the pulse width is 0%, the output of the PWM is always Low. If the pulse width is 100%, the output is always High. At 50%, the Low- and the High levels are equal.

Frequency modulation (FM)

FM modulates the cycle durationfrequency of a square signal. The duty cycle remains yet constant. Here, the smallest possible period length is the maximum possible frequency and the highest possible period length is the minimum possible frequency. Periodendauer die minimale mögliche Frequenz.

even when the computer is working at full capacity and reactions would be delayed by this.

All tasks are processed in real-time. Real-time ability is defined as a predefined time in which a certain reaction must be activated; during onboard processing these actions take place within a sampling interval. This is important for the time between action and reaction. For safety relevant applications this time period is critical.

# **Online functions**

The boards are offering the following features:

- Mathematical functions like filter and FFT
- Operating functions like triggering and PWM
- Online-PID-controller
- Scaling functions like characteristic
- Clocking of the A/D-conversion: polling, -timer-controlled, or external clock.

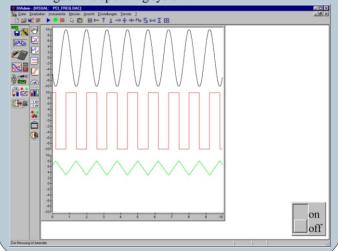
Trigger (window- and edge-triggering at all measurement types)

Analog and digital PWM

- Simultaneously acquisition of digital-, counter- and analog signals
- Function generator: output of sine, square, triangle, impulse, sawtooth, noise and user defined data
- Online-scaling of the measurement data
- Online-FFT, IIR- and FIR-filters
- Online-oversampling
- Digital onboard controlling

As an option MultiChoice boards offer a function generator. Giving the opportunity to use all analog outputs for different signals at different frequencies. Standard signals are sinussine, triangle, square, Impulsimpulse, sawtooth as well as noise and user defined data. Moreover, there is the opportunity to periodically put out recorded signals -stored in a file- to generate any function. Recording can either be done with MultiChoice boards or other measurement boards. These analog outputs run independently from other measurement tasks; analog and digital signals as well as counters can be acquired simultaneously. Even the parallel output of analogue and digital signals to unused channels is possible while using the function generator.

The output is absolutely time equidistant and does not depend on timings of the operating system.



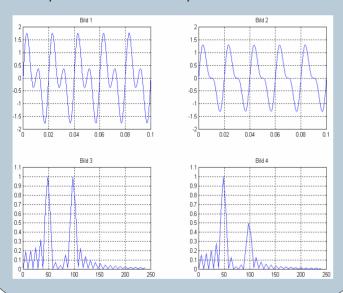
The sampling and processing of the single values can also be controlled by the computer. The online- functions are set up as a modular system. Therefore, innumerable combinations are possible.

# New perspectives for the measurement technology

Various features are realized on the MultiChoice boards which have not been available in the past, like pulse width- (PWM) and frequency modulation. They can be used variably, i. e. for controlling valves. The speciality of this modulations is the ability to change frequency and pulse width without causing signal gaps and timeshifts. This guarantees a consistent and stable operation. The controller can work independently just using it's AD-inputs, so a fully automated operation of the controller is possible. Applications are for example flow controllers, where analog data acquisition takes place directly at the valve. The acquired samples directly control the PWM outputs and by this the flow are controlled directly controlled.

For the onboard filters free frequency settings can be specified. For these frequencies the coefficients are being calculated individually. They can be varified during the acquisition. Before starting the measurement you can get a preview of the frequency spectrum. This is only being offered by the MultiChoice PCI series, giving you a much bigger spectrum as other acquisition boards, where only predefined ranges can be selected.

By only using the time signals charts below, a wave analysis can only be done with lots of experience and mathematical knowledge. Using the Fouriertransformation, frequency ranges and the proportions to each other can be calculated exactly and demonstrated clearly.



MultiChoice boards are able to operate up to 16 independently working PID-controllers at the same time. Modification of any parameter can be done during the system's runtime

# Service

Experts from Goldammer GmbH will give you comprehensive and fast advice regarding applications of the MultiChoice boards. Furtheron we can support you regarding your measurement problems and measurement tasks. And last but not least we will give you an outlook on the technical innovations to come soon. Not just for the acquisition technology but also for adjacent areas of this technology. Giving you, the customer, the opportunity to make your decisions always based on the latest developments in this technology.

Goldammer GmbH also provides widespread support regarding: problems with hard- and software

# Programming the acquisition boards

```
#Include (vindows h)
#Include (vindows h)
#Include (retain h)
#Inc
```

The desire to use standard measurement programs universally often causes them to reach their limits in special applications very quickly. For these requirements, customized solutions or the demand to hide the software algorithms from other people it is suited necessary to develope your own applications. By making your own developments you will get the optimum for your requirements and it's also perfect to protect your own ideas.

With an easy-to-use simple programming interface the MultiChoice PCI+USB and Ethernet systems can be accessed fast and comfortable by almost every standard programming language. We use simple function modules in the programming interface instead of the complex and board-dependent commands which are used in different operating systems. Commands are standarized and independent from the hardware being used. An interchange of the boards is also possible as well as hooking it to special hardware. The full range of the board's abilities can be used via the API-interface. Filters are also belonging to it as well as PID-controllers, FFT, function generators, PWM-and FM-controllers and many more.

The example above shows a Multithread-measurement with the programming interface written in Visual-C. It includes shows the acquisition of 6 analogue channels, with pereach with a sampling rate of 15 kHz.

So far implemented projects in Delphi, C/C++, Visual Basic for applications (VBA), i. e. in Excel, VB, NET,C#,Matlab, Mathematica, LabVIEW,(...)shows the versatility and optimal usability.

Examples provided for various programming languages makes it easy to start.

In case the programming interface is not sufficient for very complicated applications, it is also possible to program all parts of the signal processor by yourself. This opportunity provides the maximum to meet your own requirements, but on the other hand this asks for special knowledge in the field. Goldammer GmbH supports you by providing examples, a demo-driver and of course personal assistance for all your questions.

problems with the application of measurement tasks as well as support with your own developments.

In general support requests are being handled within one working day and appropriate solutions will be provided as soon as possible.

The MultiChoice series is constantly enhanced improved and the present state-of-the-art is the basis base for innovative solutions for this series. Our newsletter constantly informs our customers on every improvements being made. Upgrades are available free of charge either on the internet or via by email.

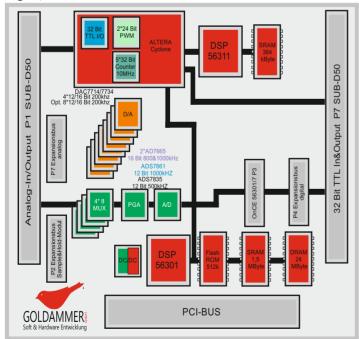
### **Technical features:**

All boards of the new MultiChoice generation do have the following features:

- Up to 2 signal processor
- Internal and external memory (with the exception of a few counter boards)
- Altera chips (updatable )
- Flash-module
- Generating independent function groups; allows parallel operations with own memory areas
- Switchable channelwise programmable options, many Signaltypes
- Input voltage scopes (configurable by the software)
- Oversampling

Different types of signals (analog, digital and counter) are Recorded on an identical time base, making it easy to have the exact time for all data and their relations to each other This is a big advantage to the costly external trigger circuits The connectors are pin-compatible within the PCI series.

Moreover, MultiChoice boards are opening up new oppurtnties and aspects in the measurement technology, you have long been looking for, like:



FM/PWM-control without signal gaps by changing parameters mixing of analogue, digital and counter channels on the same channellist counters for pulse, frequency, cycle duration, pulse width and rotary encoder with the possibility of a direct connecton. Connecting the MultiChoice measurement board is either done by the PCI or USB 2.0

# MultiChoice Quattro G09-1005-(0-1)

This board is equipped with two digital signal processors. Therefore, a more flexible task splitting to both processors is possible. Moreover, these two processors take over different tasks:

On the dual-processor board the DSP56311 processor is responsible for calculating the filters and the online functions whereas the second processor DSP56301 is handling the recording of the data, the control system, controllers and the outputs.

The MultiChoice offers various signal types 32 analogue inputs up to 1 MHz sampling rate with 12/16 bit resolution (upgradeable to 160 inputs) 4/8 analogue outputs with 12/16 bit resolution (upgradeable to 16 outputs) 32 digital I-/O-pins (upgradeable to 1024) 5 counters (pulse-, frequency-, cycle duration-, pulse width-, up/down counter) 2 PWM-/FM-channels 5 counters onboard, (i.e. measuring of 4+1 signals in motorcars)

# MultiChoice Light (G06-1003-1034-1)

This board is equipped with a signal processor. Various processes are executed via time-sharing. The MultiChoice Light board offers various signal types 16 analogue inputs up to 500kHz with 112/16 bit resolution up Up to 4 analogue outputs with 12/16 bit resolution 24 digital I-/O-pins (changeable in 4-bit-groups, changeable per bitwise in the HS version) up to 2 counters (pulse, frequency-, cycle duration-, pulse width-, Up/Down-counter) 1 PWM-/FM-channel (optional) 2\* 32 bit rotary encoder acquisition and 32-bit timestamps

# MultiChoice Light with simultaneous capturing (G06-1044-1)

This board is equipped with a signal processor, too. Various processes are executed via time-sharing.

The MultiChoice simultan board offers various signal types:

16 analog inputs up to 3,6 MHz in sum (225kHz per channel) with 16 bit resolution

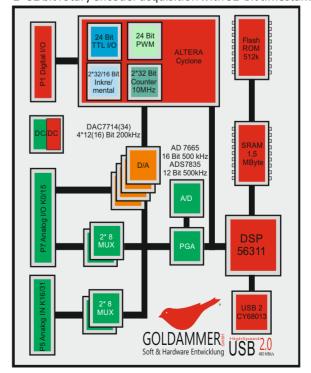
up Up to 4 analogue outputs with 16 bit resolution

24 digital I-/O-pins, bitwise changeable

up to 2 counters (pulse-, frequency-, cycle duration-, pulse width-, up/down counter)

1 PWM-/FM-channel (optional)

2\*32 bit rotary encoder acquisition with 32-bit timestamps



# MultiChoice USB (G0A-1024-(0-9)

This system is also equipped with a signal processor. Multiple processes are executed via time sharing. Die MultiChoice USB offers various signal types 16 (32) analogue inputs up to 500kHz with 12/16 bit resolution up Up to 4 analogue outputs with 12/16 bit resolution 24 digital I-/O-pins (channel wise switchable bidirectional programmable) up to 2 counters (pulse-, frequency-, cycle duration-, pulse width-, up/down) 1 PWM-/FM-channel (optional) 2\*32 bit rotary encoder acquisition and 32-bit timestamps.

# Fields of application:

Typical fields of application for the signal processor systems are research, development, control systems and regulation controllers for industrial operations and also for applications, where speed, accuracy and reliability is absolutely vital.

Most applications ask for a good coordination between registrationinput, processing and output the MultiChoice series handles this perfectly.

- In-vehicle data acqusition
- Motor test stand
- Gear box test stands
- Braking system test stands
- Measuring systems for motorcar wheels
- Generating of periodical and non-periodical signal shapes
- Control systems of proportional relay valves
- Simulation of power supply units
- Engine control units
- Research and testing on all types of combustion motors
- Electronic microscope

### The MultiChoice counter boards

These boards are equipped with a signal processor. Multiple processes are executed via timesharing. This board is beeing used for special counter applications. Up to 12 independent counters on board are available with customized counter modesi.

The MultiChoice counter boards offer a multitude variety of signal types:

Up to 12 counters (pulse-, frequency-, cycle duration-, pulse width-, incremental-, up/down)

Up to 8 PWM-/FM-channels

# **PC-DA PCI output boards**

These boards are equipped with a signal processor. Multiple processes are executed via timesharing. They are predestinated for very fast analogue control units (maximum output rate 100 kHz per channel).

# The PC-DA PCI output boards offer:

Up to 16 analogue outputs with 12/16 bit resolution 1 counter (pulse-, frequency-, cycle duration-, pulse width-, up/down)

# **Hardware connections**

All models are available as PCI plugin boards, as external USB acquisition boxes or as USB-board for panel mounting. Performance and features are identical for all versions.

The USB measurement box has been designed for mobile use. For example in vehicle data acquisition or for using it together with a laptop.

The PCI-plug in version has been designed for the stationary use in laboratories and test benches . Standard personal computers can also be fitted very cost effective with this type.

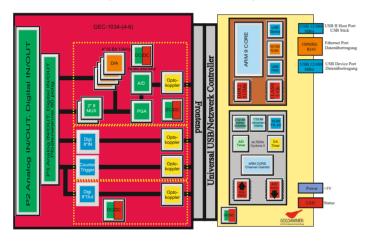
The USB-OEM version has been designed for industrial test benches. Without any problems this version can be installed in switchboards . A perfect integration in existing heterogeneous environments is also possible. The USB-OEM version can be used in small mobile devices as well as in big complex systems.

# MultiChoice Basic and Ethernet

The products from the Basic series in sequentially and simultaneously scanning finishes.

Sequentially operating products are all channels are sampled through a Multiplexer by the A/D converter. At the simultaneously scanning products each channel has an own A/D converter. Adaptability and independence are the primary characteristics that describe the inteligent Ethernet/USB systems from the GEx Series. The embedded system enables a direct and thus reliable processing of measurement and control tasks. The use and the combination of modern electronic components are resulting not only in high precision inputs and outputs, but also allow the small device dimensions. With the Linux operating system adapted specially for the ARM system-on-chip processor, it includes a strongperformance and flexible runtime environment for a variety of measurement tasks. Interactions with the device can be done either via Ethernet or the USB interface already known from the USBBasic Series. For recording of measurement or process data there is also a second USB port available for connecting a USB mass storage device.

The measurement boards consist of two components, the control board with a fast processor and an FPGA chip, as well as the front-



end circuit board connected to it.

This modular design allows attaching a large variety of front-end PCB variants to the control unit so that the Ethernet/USB can be offered at a very competitive price despite the high wide range of models.

The front ends are available in different versions, on sequentially scanning modules all analog inputs are digitized at 250 kHz and 16 bit resolution. The simultaneously scanning products feature a sampling rate from 225 kHz up to 3 MHz per channel. The Modules offer a variety of signal inputs and outputs.

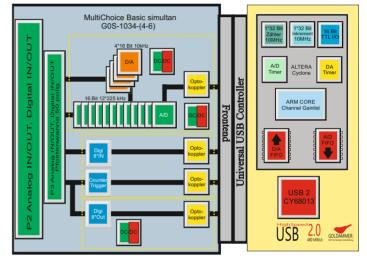
There are also measurement modules with opto couplers available, which galvanic isolation of all connected signals. On such opto-isolated modules all signals are isolated in their own electrical circuit for maximum noise immunity and service reliability.

The digital outputs on the opto coupler modules can be loaded with 60mA per output at 30 volts, so that a direct relay control can be realized. This means for the digital IOs that they each have their own mass (Reference potential) feature. The counter, trigger and the external clock inputs are also decoupled each by a separate coupler.

# The measuring systems are available in three variants:

Two of the variants come in a stable aluminum cast housing with optional BNC jacks or Weidmüller removable screw terminals, a third version "OEM" includes boards with pole connectors and no housing, they come in the euro card format, 100x160mm resp. 100x100mm for the "light" version, and can easily be integrated into existing systems. Other circuits, such as filters, amplifiers or other components, can easily be installed via the pole connectors and mounted together with the board in a compact custom housing and delivered as a complete system.

A flash memory on the measurement boards, as well as the individual IDs of modules identify the board independently, so that, even with a change of modules or measuring boxes, existing software and already created circuit diagrams can still be used without making any adjustments corrections to them.



The preinstalled operating system on MultiChoice Ethernet/USB devices is a LINUX system based on the open source project buildroot. It includes everything a working system entails. In addition to device nodes, configuration settings and libraries the most important component of a Linux system is, the command line or shell. We chose busybox, the most powerful UNIX tool collection currently available, a single program solution tailored for systems with limited resources. It has a built-in DHCP client functionality for file system access, function for time synchronization via the network, and a web server. The file system can be optionally accessed through the USB Device port or via Ethernet over FTP and SSH/SCP or via Samba.

The user management, well-known from other Linux systems, is available on the Multichoice MultiChoice Ethernet/USB with two preconfigured accounts: As an administrator a user may configure access points like the Network Interface or the USB port, a separate account type allows data acquisition tasks. This strict separation prevents configuration errors already in advance. The start and the initialization of the relevant kernel modules 3.12 is based on the System V scheme. Starting from the directory tree root through the start and the initialization of the individual system processes such as module loader, automounter, FTP server, HTTP server and MAI Daemon the system is placed to the appropriate runlevel.

Using opkg, a simplified package management system, additional software components can be installed or uninstalled. The WebFrontend, which is already contained in the base image, provides user interfaces for data acquisition, for managing recorded data and the administration of the device properties.

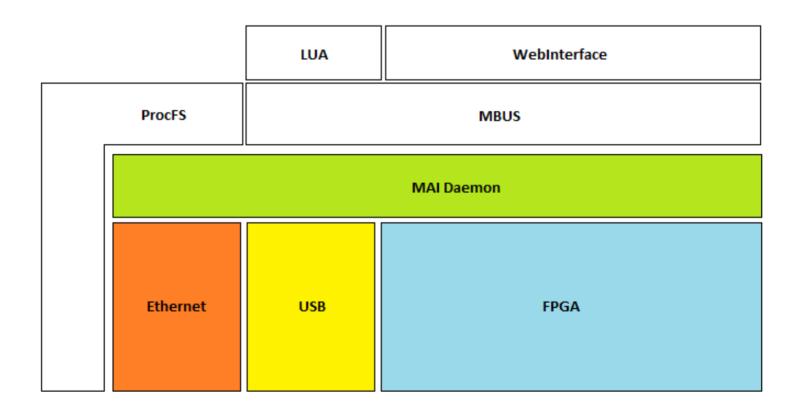
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# G0A-1024-X

# MultiChoice USB



# 16 (32) Analog inputs 12 bit 500 kHz

16 Single-ended 16/(8) differential inputs software switchable

Resolution 12 Bit
ADC sample rate 500 kHz
Precision of system ±0.05 %

Input voltage ranges  $\pm 1,25V, \pm 2,5V, \pm 5V, \pm 10V$ 

0-1,25V, 0-2,5V, 0-5V, 0-10V

Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock Maximum input voltage in operation/non operating ±40 V

A/D conversion, counter and digital inputs with same or different scanning

rates with simultaneous analog output Details to online trigger see description Oversampling (sliding averaging)

All online functions see page 3 applicable

4 Analog outputs 12 bit resolution

DAC sample rate 200 kHz
Output ranges jumperfree 0-10 V, ±10 V
Output current ±5 mA
Non linearity ±1 LSB
Synchronous analog output

One Online functions for free

# 24 digital in-/outputs \*\*

Switchable bit by bit

# 2 Counters

32 bit event counting up/down

Frequency measurement, resolution 10 Hz

The following counting variants and counter are optionally available:

Pulse width and period length measurement resolution 20ns Frequency measurement resolution 1/10/100/1000 Hz

# 2\*32 Bit rotary encoder counting

32-bit rotary encoder counter/timestamp

# 1\* pulse width modulation (PWM)

2 Hz - 2500 kHz adjustable in 100ns steps Pulse width- and frequency modulation

# General data:

Signalprocessor 56311 150 MHz, 255MIPS RAM 1,5 MByte Flash 512 kByte

DSP inside

Dimensions OEM160 x 100x12, terminal strips 117x167 x80, BNC 16 ch 150 x167 x80, BNC 32 ch 201x167x80 mm. Bus system USB 2.0 480 MBit, USB 1.1 12 Mbit komp. Several Connection Options: Screwable Terminals or BNC

OEM Version 160x100x12mm can be integrated in existing systems

# **O**rder information

G0A-1024-6	OEM version 12 bit 16 channel	1.999,00€
G0A-1024-8	OEM version 12 bit 32 channel	2.099,00€
G0A-1024-4	Screwterm. version 12 bit 32 ch	2.199,00 €
G0A-1024-0	BNC version 12 bit 16 channel	2.349,00 €
G0A-1024-2	BNC version 12 bit 32 channel	2.599,00€

# 16 (32) Analog inputs 16 bit 500 kHz

16 Single-ended 16/(8) differential nputs software switchable

Resolution 16 bit
ADC sample rate multi channel 500 kHz
Precision of system 0.009 % = 1,8 mV

0.0025 % = 0,5 mV 16x oversampling

 $\begin{array}{ll} \mbox{Input voltage ranges} & \pm 1,25 \mbox{V}, \pm 2,5 \mbox{V}, \pm 5 \mbox{V}, \pm 10 \mbox{V} \\ \mbox{0-1,25 \mbox{V}, 0-2,5 \mbox{V}, 0-5 \mbox{V}, 0-10 \mbox{V} \end{array}$ 

Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock Maximum input voltage in operation/non operating ±40 V

A/D conversion, counter and digital inputs with same or different scanning

rate with simultaneous analog output Details to online trigger see description Oversampling (sliding averaging)

# All online functions see page 3 applicable

# 4 Analog outputs 16 bit resolution

 $\begin{array}{lll} \text{DAC sample rate} & 100 \text{ kHz} \\ \text{Output ranges jumperfree} & 0-10 \text{ V}, \pm 10 \text{ V} \\ \text{Output current} & \pm 5 \text{ mA} \\ \text{Non linearity} & \pm 2 \text{ LSB} \\ \end{array}$ 

One Online functions for free

Synchronous analog output

Further technical equipment as see \*\*12 Bit version:

# Order information hard and software extensions:

GOA-3090-0 32 Frequency measurement resolution 1/10/100 /1000Hz o. Pulse width and period length ref. 20ns 255,00 € GOA-30A0-0 One Cannel PWM 2Hz-2,5MHz 99,00 €

GOA-3010-0 One Channel Incremental time stamp

1/2/4x Interpolation 149,00€

GOA-30E0-0 Automotiv Version Powersupply 9-85 V SYKO MSR-V 127,00 €

triangle, limpulse, sawtooth, noise and user

# Order information

G0A-1024-7	OEM version 16 bit 16 channel	2.249,00€
G0A-1024-9	OEM version 16 Bit 32 channel	2.349,00 €
G0A-1024-5	Screwterm. version 12 Bit 32 ch.	2.399,00€
G0A-1024-1	BNC version 12 bit 16 channel	2.599,00€
G0A-1024-3	BNC version 12 bit 32 channel	2.849,00€



# Optionen G0A-1024(0-3)



# 16 Analog inputs with IEPE solution 16 bit 400 kHz

Single-ended 16/(8) differential inputs software switchable

Resolution 16 Bit

ADC sample rate multi channel/one channel 400/500 kHz

IEPE sensor supply (24V/4mA) Precision of system ±0.009 %

Gain 1/2/4/8/10/20/40/80 Input voltage ranges ±1,25V, ±2,5V, ±5V, ±10V

0-1,25V, 0-2,5V, 0-5V, 0-10V

Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock Maximum input voltage in operation/non operating ±40 V

A/D conversion, counter and digital inputs with same or different scanning

rates with simultaneous analog output Details to online trigger see description Oversampling (sliding averaging) Include FIR- und –IIR-Filter, Online-FFT

# 4 Analog outputs 16 bit resolution

DAC sample rate 200 kHz
Output ranges jumperfree 0-10 V, ±10 V
Output current ±5 mA
Non linearity ±1 LSB

Synchronous analog output

# 24 digital in-/outputs \*\*

Switchable bit by bit

# 2 Counters

32 bit event counting up/down

Pulse width and period length measurement resolution 20ns Frequency measurement resolution 1/10/100/1000 Hz

# 1\* pulse width modulation (PWM)

2 Hz - 2500 kHz adjustable in 100ns steps Pulse width- and frequency modulation

The following counting variants and counter are optionally available:

**DSP** 

inside

# 2\*32 Bit rotary encoder counting

32-bit rotary encoder counter/time stamp

# General data:

Signalprocessor 56311 150 MHz, 255MIPS RAM 1,5 MByte

Flash 512 kByte Dimensions BNC 16 ch..150 x167 x80,

Bus system USB 2.0 480 MBit, USB 1.1 12 Mbit komp.

### 16 channel differential amplifier inputs

inputs BNC version only: Any of the channels is equipped individually with a differential amplifier. Option: For any channel an input voltage prescaler and an amplifier can be inserted.

The 16 channel differential amplifier can use for the Basic Serie

# 32 channel differential amplifier inputs

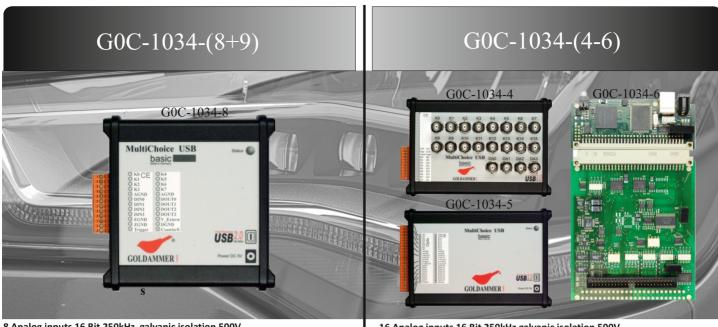
inputs BNC version only: Any of the channels is equipped individually with a differential amplifier. Option: For any channel an input voltage prescaler and an amplifier can be inserted.

# Order information

GOA-1024-i BNC version 16 bit 16 channel 4.699,00 €

# Order information

GOA-30D0-0 16 channel differential amplifier 399,00 € GOA-30D0-0 16 channel differential amplifier 799,00 €



# 8 Analog inputs 16 Bit 250kHz galvanic isolation 500V

Single-ended/8 inputs

Resolution 16 Bit ADC sample rate 250 kHz Precision of system ±0.009 %

Input voltage ranges ±1,25V, ±2,5V, ±5V, ±10V Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock Maximum input voltage in operation/non operating ±40 V

A/D conversion, counter and digital inputs with same scanning rates with

simultaneous analog input

# 4 digital input optocoupled 500V

Logic sense high from 2,4V maximal inputvoltage +30VDC (Monitoring of SPS controls)

# 4 digitale output optocoupled 500V

Output current per channel 60mA, maximum outputvoltage +30VDC (Direct controls of relays)

# 1 Counters

32 bit event counting up/down

Logic sense high from 2,4V maximal inputvoltage +30VDC

Frequency measurement, resolution 10 Hz

Counter and digital input simultaneous analog input

USB 2.0 1.1 12 Mbit compatibel, buspowered USB-bus



# Order information

GOC-1034-8 Screwterm. version 16 bit 8 channel 599,00€ G0C-1034-9 OEM version 16 bit 8 channel 499,00€

# 16 Analog inputs 16 Bit 250kHz galvanic isolation 500V

Single-ended 16/(8) differential inputs software switchable

Resolution 16 Bit ADC sample rate 250 kHz Precision of system ±0.009 %

±1,25V, ±2,5V, ±5V, ±10V Input voltage ranges Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock Maximum input voltage in operation/non operating ±40 V A/D conversion, counter and digital inputs with same scanning rates with simultaneous analog input

# 8 digital input optocoupled 500V

Logic sense high from 2,4V maximal inputvoltage +30VDC (Monitoring of SPS controls)

# 8 digitale output optocoupled 500V

Output current per channel 60mA, maximum outputvoltage +30VDC (Direct controls of relays)

# 2 Counters

32 bit event counting up/down

Logic sense high from 2,4V maximal inputvoltage +30VDC

Frequency measurement, resolution 10 Hz

Counter and digital input simultaneous analog input

# 1\*32 Bit rotary encoder counting with timestamp

# 4 Analog outputs 16 bit resolution

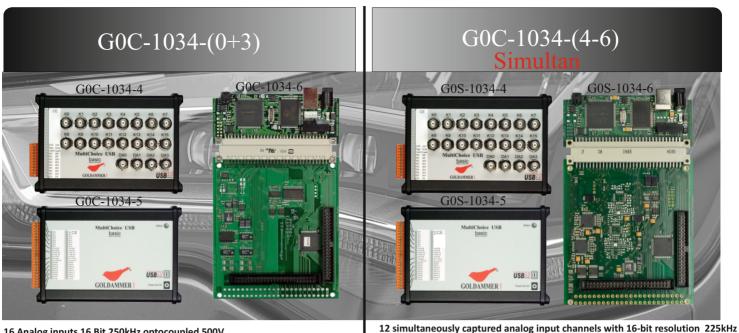
DAC sample rate 10 kHz Output ranges jumperfree ±10 V Output current ±5 mA Non linearity Synchronous analog output

# General data:

USB 2.0 1.1 12 Mbit compatibel, powert by powersupply 5Volt

# Order information

GOC-1034-4 BNC version 16 bit 16 channel 1.549,00€ GOC-1034-5 Screwterm. version 16 bit 16 ch 1.399,00 € G0C-1034-6 OEM version 16 bit 16 channel 1.149,00 €



### 16 Analog inputs 16 Bit 250kHz optocoupled 500V

Single-ended 16/(8) differential inputs software switchable

Resolution 16 Bit ADC sample rate 250 kHz ±0.009 % Precision of system

Input voltage ranges ±1,25V, ±2,5V, ±5V, ±10V Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock Maximum input voltage in operation/non operating ±40 V

A/D conversion, counter and digital inputs with same scanning rates with simultaneous analog input

# 16 Digital in-/outout

Switchable in four bit groups

# 48 Digital in-/outout (G0C-1034-3)

Switchable in 8 bit groups

# 2 Counters

32 bit event counting up/down

Frequency measurement, resolution 10 Hz

Counter and digital input simultaneous analog input

# 1\*32 Bit rotary encoder counting with timestamp

# 4 Analog outputs 16 bit resolution

DAC sample rate 10 kHz Output ranges jumperfree ±10 V Output current +5 mA Non linearity ±2 LSB

Synchronous analog output

# General data:

USB 2.0 1.1 12 Mbit compatibel, buspowered USB-bus or external powersupply 5Volt by the order.

# per channel galvanic isolation. 500V Single-ended/ 12 input Resolution

16 Bit

ADC sample rate 2,7MHz, 225 per channel

Precision of system ±0.009 % Input voltage range +10V

Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock Maximum input voltage in operation/non operating ±40 V

A/D conversion, counter and digital inputs with same scanning rates with

simultaneous analog input

# 2 simultaneously captured analog input channels with 16-bit resolution 3MHz per channel galvanic isolation. 500V

Single-Ended/ 12 Inputs

Resolution 16 Bit

6MHz, 3MHz per channel ADC sample rate

±0.009 % Precision of system Input voltage range +10V

Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock Maximum input voltage in operation/non operating ±40 V

A/D conversion, counter and digital inputs with same scanning rates with

simultaneous analog input

# 8 digital input optocoupled 500V

Logic sense high from 2,4V maximal inputvoltage +30VDC

(Monitoring of SPS controls)

# 8 digitale output optocoupled 500V

Output current per channel 60mA, maximum outputvoltage +30VDC

(Direct controls of relays)

# 2 Counters

32 bit event counting up/down

Logic sense high from 2,4V maximal inputvoltage +30VDC

Frequency measurement, resolution 10 Hz

# Counter and digital input simultaneous analog input

# 1\*32 Bit rotary encoder counting with timestamp

# 4 Analog outputs 16 bit resolution

DAC sample rate 20 kHz Output ranges jumperfree ±10 V Output current ±5 mA Non linearity ±2 LSB Synchronous analog output

# General data:

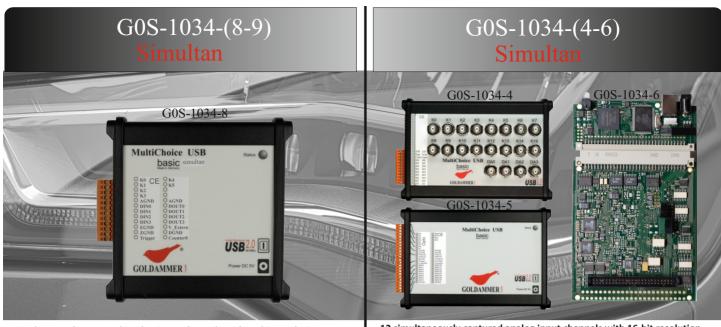
USB 2.0 1.1 12 Mbit compatibel, powert by externel powersupply 5Volt

# Order information

G0C-1034-0 BNC version 16 Bit 16 channel 1.399,00€ GOC-1034-1 Screwterm, version 16 Bit 16 chan. 1.199.00 € GOC-1034-2 OEM version 16 Bit 16 channel 16 TTL GOC-1034-3 OEM version 16 Bit 16 channel 48 TTL 1.099,00 €

# **Order information**

GOS-1034-4 BNC version 16 Bit 12 channel 1.749,00€ G0S-1034-5 Screwterm. version 16 Bit 12 chan. 1.599,00 € GOS-1034-6 OEM version 16 Bit 12channel 1.349,00€ G0M-1034-4 BNC version 16 Bit 2 channel 2.199,00 €



# 6 simultaneously captured analog input channels with 16-bit resolution 225kHz per channel galvanic isolation. 500V.

Single-ended/6 input

Resolution 16 Bit

ADC sample rate 1,35MHz, 225 per channel

Precision of system ±0.009 % Input voltage range ±10V

Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock Maximum input voltage in operation/non operating  $\pm 40~V$ 

A/D conversion, counter and digital inputs with same scanning rates with simultaneous analog input

# 4 digital input optocoupled 500V

Logic sense high from 2,4V maximal inputvoltage +30VDC (Monitoring of SPS controls)

# 4 digitale output optocoupled 500V

Output current per channel 60mA, maximum outputvoltage +30VDC (Direct controls of relays)

# 1 Counters

32 bit event counting up/down

Logic sense high from 2,4V maximal inputvoltage +30VDC

Frequency measurement, resolution 10 Hz

# Counter and digital input simultaneous analog input

# General data:

USB 2.0 1.1 12 Mbit compatibel, buspowered USB-bus



# Order information

GOS-1034-8 crewterm. version 16 bit 6 channel 649,00 € GOS-1034-9 OEM version 16 bit 6 channel 549,00 €

# 12 simultaneously captured analog input channels with 16-bit resolution 225kHz per channel

Single-ended/ 12 input

Resolution 16 Bit

ADC sample rate 2,7MHz, 225 per channel

Precision of system  $\pm 0.009 \%$ Input voltage range  $\pm 10 V$ 

Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock Maximum input voltage in operation/non operating  $\pm 40~\text{V}$ 

A/D conversion, counter and digital inputs with same scanning rates with simultaneous analog input

# 2 simultaneously captured analog input channels with 16-bit resolution 3MHz per channel

Single-Ended/ 12 Eingänge

Auflösung 16 Bit

ADC sample rate 6MHz, 6MHz per channel

Precision of system ±0.009 % Input voltage range ±10V

Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock Maximum input voltage in operation/non operating ±40 V

 $\ensuremath{\mathsf{A/D}}$  conversion, counter and digital inputs with same scanning rates with simultaneous analog input

# 16 Digital in-/outout

Switchable in four bit groups

48 Digital in-/outout(G0S[H]-1034-3)

Switchable in 8 bit groups

# 2 Counters

32 bit event counting up/down

Logic sense high from 2,4V maximal inputvoltage +30VDC

Frequency measurement, resolution 10 Hz

# Counter and digital input simultaneous analog input

# 1\*32 Bit rotary encoder counting with timestamp

# 4 Analog outputs 16 bit resolution

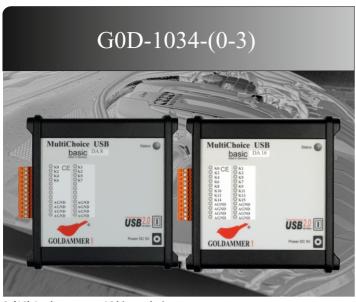
DAC sample rate 20 kHz
Output ranges jumperfree ±10 V
Output current ±5 mA
Non linearity ±2 LSB
Synchronous analog output

# General data:

USB 2.0 1.1 12 Mbit compatibel, buspowered USB-bus or externe powersupply 5Volt by the order.

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Order information	
GOS-1034-0 BNC version 16 bit 12 channel	1.599,00€
GOS-1034-1 Screwterm. version 16 Bit 12 chan.	1.399,00€
GOS-1034-2 OEM version 16 bit 12 channel	1.199,00€
GOS-1034-3 OEM version 16 bit 12 channel	1.299,00€
GOM-1034-0 BNC version 16 bit 2 channel	2.099,00€
G0M-1034-1 Screwterm. version 16 Bit 2 chan	1.899,00€
G0M-1034-2 OEM version 16 bit 2 channel	1.699,00€
G0M-1034-4 OEM version 16 bit 12 channel	1.499.00 €



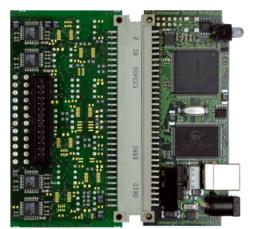
# 8 (16) Analog outputs 16 bit resolution

DAC sample rate 10 kHz Output ranges jumperfree ±10 V Output current ±5 mA Non linearity ±2 LSB Synchronous analog output

# General data:

USB 2.0 1.1 12 Mbit compatibel, 8 channel version buspowered from USB-bus 16 channel powered by externel powersupply 5Volt.

# G0D-1034-3



Order information		
GOD-1034-0 8 channel, screwterm	599,00€	
GOD-1034-1 16 channel, screwterm	899,00€	
GOD-1034-2 8 channel, OEM version	499,00€	

G0D-1034-3 16 channel, OEM version 799,00€ G0V-1034-0 MultiChoice USB USB20 GOLDAMMER 0

Analog In

**Number of Inputs** 24 Bit Resolution A/D Throughput per Channel 48 kHz; 96 kHz & 192 kHz

Sampling rate (simultaneous sampling 24-bit) 192 kHz, 96kHz, 48 kHz, 44.1 kHz, 32 kHz, 24 kHz,

16 KHz, 8 KHz (only analog inputs)

500 kOhm Impedanz **IEPE-power supply** 24V/4mA Software selectable AC / DC coupling

Switchable single ended / differential

Input Voltage Range ±1V, ±10 V Maximum input voltage +30 V

bandwidth 3.5 Hz to 96 kHz (-3dB)

Type A/D Converter TI PCM4220 (Delta-Sigma)

**Absolute Accuracy** 0,46% typ. Offset ±0,04% typ. 20 degree Gain Accuracy 0.2% or better f = 1 10kHz, -1 dB 135dB Channel separation >118dB (123 dB typical) Signal to Noise Ratio Total harmonic distortion + noise -100dB (up to 0.4535xfs) Low Passband Ripple Classic ±0.00015dB Precision timer 98.304-MHz, ±25ppm **BNC-females** Signal connection

**Analog Output** 

Number of outputs Resolution 24 Bit 48 kHz; 96 kHz & 192 kHz DA throughput ±5 V, 100 Ohm Output voltage range bandwidth 1Hz-96KHz (+/-0.5dB, 48KHz FS) 0.5Hz-96KHz (-3dB, 192KHz FS)

Type D/A Converter TI PCM1798

2% Absolute Accuracy 0.001% typ.Total Harmonic Distortion 123 dB THD+N: 0.0005% Dynamic Range:

Counter Input

Number of counters Cutoff Voltage 1000V Optical isolation Resolution 32 Bit Period Length Logic Sense high ab 2.4 bis 28 V Input current 2,4V = 3mA. 28V = 11mA Maximum input voltage +30 V Lemo Type EPG.0B.303.HLN signal connection

synchrone samling the counter with the analog

values detected.

220VAC/5DC **External Supply** Operating temperature range +/-0 to +50°C -10 to +60°C Storage temperature range 180 x 118 x 64 mm **Dimensions** Weight 850 gr.

# Order information

GOV-1034-0 24 Bit 4\* A/D, 2\*D/A, 2\*32 Count 1.998,00€

# GEC-1034-(8-9) GEC-1034-8 Ethernet + USB

# 8 Analog inputs 16 Bit 250kHz galvanic isolation 500V

Single-ended/8 inputs

Resolution 16 Bit ADC sample rate 250 kHz Precision of system ±0.009 %

Input voltage ranges ±1,25V, ±2,5V, ±5V, ±10V Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock Maximum input voltage in operation/non operating ±40 V

A/D conversion, counter and digital inputs with same scanning rates with simultaneous analog input

# 4 digital input optocoupled 500V

Logic sense high from 2,4V maximal inputvoltage +30VDC (Monitoring of SPS controls)

# 4 digitale output optocoupled 500V

Output current per channel 60mA, maximum outputvoltage +30VDC (Direct controls of relays)

32 bit event counting up/down

Logic sense high from 2,4V maximal inputvoltage +30VDC

Frequency measurement, resolution 10 Hz

# Counter and digital input simultaneous analog input

USB 2.0 (Deviceport) Data transfer witht Host-System USB 2.0 (Storageport) data Storage on USB- Stick or hard drive Ethernet-interface 10/100 MBit/s for PC-communication

# General data:

CPU ARM9 main memory 512 Megabyte DDR2 memory Flash 2GB Autonomous operation Webserver, SSH, FTP and Samba Power supply 220/5Volt

ARM'9

GEC-1034-9



# Order information

GEC-1034-8 crewterm. version 16 bit 8 channel 1.299,00 € GEC-1034-9 OEM version 16 bt 8 channel 1.199,00 €

# GEC-1034-(4-6)



# 16 Analog inputs 16 Bit 250kHz optocoupled 500V

Single-Ended/8(16) differential inputs software switchable

Resolution 16 Bit ADC sample rate 250 kHz Precision of system ±0.009 %

 $\pm 1,25V, \pm 2,5V, \pm 5V, \pm 10V$ Input voltage range Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock Maximum input voltage in operation/non operating ±40 V

# 8 digital input optocoupled 500V

Logic sense high from 2,4V maximal inputvoltage +30VDC (Monitoring of SPS controls)

# 8 digitale output optocoupled 500V

Output current per channel 60mA, maximum outputvoltage +30VDC (Direct controls of relays)

# 2 Counters

32 bit event counting up/down

Logic sense high from 2,4V maximal inputvoltage +30VDC

Frequency measurement, resolution 10 Hz

# Counter and digital input simultaneous analog input

# 1\*32 Bit rotary encoder counting with timestamp

# 4 Analog outputs 16 bit resolution

DAC sample rate Output ranges jumperfree ±10 V Output current ±5 mA Non linearity ±2 LSB Synchronous analog output

# Interfaces

USB 2.0 (Deviceport) Data transfer with Host-System USB 2.0 (Storageport) data Storage on USB- Stick or hard drive Ethernet-interface 10/100 MBit/s for PC-communication

CPU ARM9 main memory 512 Megabyte DDR2 memory Flash 2GB Autonomus operation Webserver, SSH, FTP and Samba Power supply 220/5Volt

# Order information

GEC-1034-4 BNC version 16 bit 16 channel 2.299,00 € GEC-1034-5 crewterm. version 16 bit 16 channel 2.099,00 € GEC-1034-6 OEM version 16 bit 16 channel 1.849,00 €

# GES-1034-(8-9) Simultan Ethernet + USB

# 6 simultaneously captured analog input channels with 16-bit resolution 225kHz per channel galvanic isolation. 500V.

Single-ended/6 input

Resolution 16 Bit

ADC sample rate 1,35MHz, 225 per channel

Precision of system ±0.009 % Input voltage range ±10V

Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock Maximum input voltage in operation/non operating  $\pm 40~\text{V}$  A/D conversion, counter and digital inputs with same scanning

rates with simultaneous analog input

# 4 digital input optocoupled 500V

Logic sense high from 2,4V maximal inputvoltage +30VDC (Monitoring of SPS controls)

# 4 digitale output optocoupled 500V

Output current per channel 60mA, maximum outputvoltage +30VDC (Direct controls of relays)

# 1 Counters

32 bit event counting up/down

Logic sense high from 2,4V maximal inputvoltage +30VDC Frequency measurement, resolution 10 Hz

# Counter and digital input simultaneous analog input

# Interfaces

USB 2.0 (Deviceport) Data transfer witht Host-System
USB 2.0 (Storageport) data Storage on USB- Stick or hard drive
Ethernet-interface 10/100 MBit/s for PC-communication

# General data:

CPU ARM9 main memory 512 Megabyte DDR2 memory Flash 2GB Autonomus operation Webserver, SSH, FTP und Samba power supply 220/5Volt



# Order information

GES-1034-8 crewterm. version 16 bit 6 channel  $1.349,00 \in$  GES-1034-9 OEM version 16 bit 6 channel  $1.249,00 \in$ 

# GES-1034-(4-6) Simultan



# 12 simultaneously captured analog input channels with 16-bit resolution 225kHz per channel galvanic isolation. 500V

Single-ended/ 12 input

Resolution 16 Bit

ADC sample rate 2,7MHz, 225 per channel

Precision of system ±0.009 % Input voltage range ±10V

Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock Maximum input voltage in operation/non operating ±40 V A/D conversion, counter and digital inputs with same scanning rates with simultaneous analog input

# 8 digital input optocoupled 500V

Logic sense high from 2,4V maximal inputvoltage +30VDC (Monitoring of SPS controls)

# 8 digitale output optocoupled 500V

Output current per channel 60mA, maximum outputvoltage +30VDC (Direct controls of relays)

# 2 Counters

32 bit event counting up/down

Logik Pegel high ab 2,2V maximum inputvoltage +30VDC

Frequency measurement, resolution 10 Hz

Counter and digital input simultaneous analog input

# 1\*32 Bit rotary encoder counting with timestamp 4 Analog outputs 16 bit resolution

DAC sample rate 20 kHz
Output ranges jumperfree ±10 V
Output current ±5 mA
Non linearity ±2 LSB
Synchronous analog output

# **Interfaces**

USB 2.0 (Deviceport) Data transfer with Host-System USB 2.0 (Storageport) data Storage on USB- Stick oder hard drive Ethernet-interface 10/100 MBit/s for PC-communication

# General data:

CPU ARM9 main memory 512 Megabyte DDR2 memory Flash 2GB Autonomus operation Webserver, SSH, FTP und Samba power supply 220/5Volt

# Order information

GES-1034-4 BNC version 16 bit 12 channel 2.449,00 € GES-1034-5 crewterm. version 16 bit 12 channel 2.249,00 € GES-1034-6 OEM version 16 bit 12 channel 2.049,00 €

# G06-1003-0 G06-1013-0

# 16 Analog inputs 12 bit 200 kHz

16 Eingle-ended/(8) differential inputs software switchable

 $\begin{array}{lll} \mbox{Resolution} & \mbox{12 Bit} \\ \mbox{ADC sample rate} & \mbox{200 kHz} \\ \mbox{Precision of system} & \mbox{\pm}0.05\,\% \\ \end{array}$ 

Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock

Maximum input voltage in operation ±13,5 V
Maximum input current non operating ± 2 mA

Optional: maximum input voltage in operation/non operating ±40 V

# 24 Digital in-/outout

Switchable in four bit groups

# 1 Counters

32 Bit event counting up/down

Frequency measurement, resolution 10 Hz

The following counting variants and counter are optionally available: Pulse width and period length measurement resolution 100ns

Frequency measurement resolution 1/10/100/1000 Hz

# 2\*32 Bit rotary encoder counting

32-bit rotary encoder counter/timestamp

# 1\* pulse width modulation (PWM)

2 Hz - 2500 kHz adjustable in 100ns steps Pulse width- and frequency modulation

# General data:

Signalprocessor 56301 80 MHz, 80MIPS RAM 384 KByte Flash 512 KByte



K00-1012-0



# Order information

G06-1003-0 12 Bit A/D, 873,00 €
K00-1012-0 50 pin connection panel for DIN rail mounting
with cable 97,00 €
EIPL-3000-0 BNC-Connection unit 275,00 €

Further accessories and options see price list

# 16 Analog inputs 12 bit 200 kHz

16 Single-ended/(8) differential nputs software switchable

 $\begin{array}{lll} \mbox{Resolution} & \mbox{12 Bit} \\ \mbox{ADC sample rate} & \mbox{200 kHz} \\ \mbox{Precision of system} & \mbox{\pm}0.05\,\% \\ \end{array}$ 

Input voltage ranges ±1,25V, ±2,5V, ±5V, ±10V 0-1,25V, 0-2,5V, 0-5V, 0-10V

Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock

Maximum input voltage in operation ±13,5 V Maximum input current non operating ± 2 mA

Optional: maximum input voltage in operation/non operating ±40 V

# 4 Analog outputs 12 bit resolution

DAC sample rate 200 kHz
Output ranges jumperfree 0-10 V, ±10 V
Output current ±5 mA

Non linearity ±1 LSB

Further technical equipment as see \*\*12 Bit version:

counter, digital in-/outout etc

# Order information hard and software extensions:

G06-3090-0... 24 Frequency measurement resolution

1/10/100 /1000Hz o. Pulse width and period length ref.100ns

G06-30A0-0 one cannel PWM 2Hz-2,5MHz 99,00 €

255,00€

G06-30I0-0 2 channel rotary ancoder time stamp

1/2/4x Interpolation 149,00 €

EIPL-3000-0



# Order information

G06-1013-0 12 Bit A/D, 12 Bit D/A 981,00 €
K00-1012-0 50 pin connection panel for DIN rail mounting
with cable 97,00 €
EIPL-3000-0 BNC-Connection unit 275,00 €
Further accessories and options see price list

# G06-1034-0 G06-1024-0

# 16 Analog inputs 12 Bit 500 kHz

16 Single-ended /(8) differential inputs software switchable

Resolution 12 Bit 500 kHz ADC sample rate Precision of system ±0.05 %

±1,25V, ±2,5V, ±5V, ±10V Input voltage ranges 0-1,25V, 0-2,5V, 0-5V, 0-10V

Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock

Maximum input voltage in operation ±13,5 V Maximum input current non operating ± 2 mA Optional: With voltage resistant multiplexers ±40 V

A/D conversion, counter and digital inputs with same or different scanning rates with simultaneous analog output.

Details to online trigger see description Oversampling (sliding averaging)

# All online functions see page 3 applicable

4 Analog outputs 12 bit resolution DAC sample rate 200 kHz Output ranges jumperfree 0-10 V. ±10 V Output current ±5 mA

Non linearity ±1 LSB Synchronous analogoutput

One Online functions for free

# 24 digital in-/outputs \*\*

Switchable bit by bit

# 2 Counters

32 Bit event counting up/down

Frequency measurement, resolution 10 Hz

The following counting variants and counter are optionally available:

Pulse width and period length measurement resolution 100ns Frequency measurement resolution 1/10/100/1000 Hz

# 2\*32 Bit rotary encoder counting

32-bit rotary encoder counter/timestamp

# 1\* pulse width modulation (PWM)

2 Hz - 2500 kHz adjustable in 100ns steps Pulse width- and frequency modulation

# General data:

Signalprocessor 56301 100 MHz, 100MIPS RAM 1.5 MBvte 512 KByte Flash 139x88mm Dimensions

DSP inside

Bussystem PCI Rev 2.1 Connector SUB-D50 Buchse

# **Order** information

G06-1024-0 12 Bit A/D, 12 Bit D/A 1.550,00 € K00-1012-0..50 pin connection panel for DIN rail mounting 97.00€ with cable EIPL-3000-0 BNC-Connection unit 275,00 € Further accessories and options see price list

# 16 Analog inputs 16 Bit 500 kHz

16 Single-ended /(8) differential inputs software switchable

Resolution 16 bit ADC sample rate multi channel 500 kHz Precision of system 0.009 % = 1.8 mV

0.0025 % = 0,5 mV 16x oversampling

±1.25V. ±2.5V. ±5V. ±10V Input voltage ranges

0-1,25V, 0-2,5V, 0-5V, 0-10V

Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock

Maximum input voltage in operation ±13,5 V Maximum input current non operating ± 2 mA Optional: With voltage resistant multiplexers ±40 V

A/D conversion, counter and digital inputs with same or different scanning

rates with simultaneous analog output.

Details to online trigger see description Oversampling (sliding averaging)

# 4 Analog outputs 12 bit resolution

DAC sample rate 200 kHz Output ranges jumperfree 0-10 V, ±10 V Output current +5 mA Non linearity

Synchronous analogoutput

Further technical equipment as see \*\*12 Bit version:

counter, digital in-/outout etc

# Order information hard and software extensions:

G06-3090-0 24 Frequency measurement resolution

1/10/100 /1000Hz o. Pulse width and period length

ref.100ns 255,00€ G06-30A0-0... one channel PWM 2Hz-2,5MHz. 99,00€

G06-3010-0... 2 channel rotary ancoder time stamp

149,00 € 1/2/4x Interpolation

G06-30D0-0 With voltage resistant multiplexers ±40V

127,00€

G06-4010-0 Online-FFT 400,00€ G06-4020-0 Scaling functions like characteristic 400,00€

G06-4030-0 Online-FIR-und IIR-filters 400.00€ G06-4040-0 Online-PID-controllers 400,00€

G06-4010-0...Function generator: output of sine, square,

# Order information

G06-1034-0 16 Bit A/D, 12 Bit D/A 1.625,00€ K00-1012-0.50 pin connection panel for DIN rail mounting with cable. 97,00€ EIPL-3000-0 BNC-Connection unit 275,00€ Further accessories and options see price list

# G06-1034-1







### 16 Analog inputs 16 bit 500 kHz

16 Single-ended /(8) differential inputs software switchable

Resolution 16 bit
ADC sample rate multi channel 500 kHz
Precision of system 0.009 % = 1,8 mV

0.0025 % = 0,5 mV 16x oversampling

Input voltage ranges ±1,25V, ±2,5V, ±5V, ±10V 0-1,25V, 0-2,5V, 0-5V, 0-10V

Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock

Clocking the A/D conversion by internal or external clo Maximum input voltage in operation ±13,5 V Maximum input current non operating ± 2 mA

Optional: With voltage resistant multiplexers ±40 V

A/D conversion, counter and digital inputs with same or different scanning rates with simultaneous analog output

Details to online trigger see description Oversampling (sliding averaging)

# All online functions see page 3 applicable

# 4 Analog outputs 16 bit resolution

DAC sample rate 100 kHz
Output ranges jumperfree 0-10 V, ±10 V
Output current ±5 mA
Non linearity ±2 LSB
Synchronous analog output

One Online functions for free

# 24 digital in-/outputs \*\*

Switchable bit by bit

# 2 Counters

32 Bit event counting up/down

Frequency measurement, resolution 10 Hz

The following counting variants and counter are optionally available:

Pulse width and period length measurement resolution 100ns

Frequency measurement resolution 1/10/100/1000 Hz

# 2\*32 Bit rotary encoder counting

32-bit rotary encoder counter/timestamp

# 1\* pulse width modulation (PWM)

2 Hz - 2500 kHz adjustable in 100ns steps Pulse width- and frequency modulation

# General data:

Signalprocessor
RAM 1,5 MByte
Flash 512 KByte
Dimensions 139x88mm
Connector 50pin SUB-D 90
Bussystem PCI Rev 2.1



# Order information

G06-1034-1 16 Bit A/D, 16 Bit D/A 1.750,00 €
K00-1012-0 50 pin connection panel for DIN rail mounting
with cable 97,00 €
EIPL-3000-0 BNC-Connection unit 275,00 €

Further accessories and options see price list

# 16 Analog inputs 16 bit 1 MHz

16 Single-ended /(8) differential inputs software switchable

Resolution 16 bit
ADC sample rate multi channel 1 MHz
Precision of system 0.009 % = 1,8 mV

0.0025 % = 0,5 mV 16x oversampling

Input voltage ranges ±1,25V, ±2,5V, ±5V, ±10V 0-1,25V, 0-2,5V, 0-5V, 0-10V

Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock

Maximum input voltage in operation  $\pm 13,5 \text{ V}$  Maximum input current non operating  $\pm 2 \text{ mA}$  Optional: With voltage resistant multiplexers  $\pm 40 \text{ V}$ 

A/D conversion, counter and digital inputs with same or different scanning rates with simultaneous analog output

Details to online trigger see description Oversampling (sliding averaging)

# All online functions see page 3 applicable

# 4 Analog outputs 16 bit resolution

DAC sample rate 100 kHz
Output ranges jumperfree 0-10 V, ±10 V
Output current ±5 mA
Non linearity ±2 LSB
Synchronous analog output

# 24 digital in-/outputs \*\*

Switchable bit by bit

# 2 Counters

32 Bit event counting up/down

Frequency measurement, resolution 10 Hz

The following counting variants and counter are optionally available:

Pulse width and period length measurement resolution 100ns

Frequency measurement resolution 1/10/100/1000 Hz

# 2\*32 Bit rotary encoder counting

32-bit rotary encoder counter/timestamp

# 1\* pulse width modulation (PWM)

2 Hz - 2500 kHz adjustable in 100ns steps Pulse width- and frequency modulation

# General data:

Signalprocessor 56301 100 MHz, 100MIPS

 RAM
 1,5 MByte

 Flash
 512 KByte

 Dimensions
 139x88mm

 Connector
 50pin SUB-D 90

 Bussystem PCI
 Rev 2.1

# Order information

G06-1034-2 16 Bit A/D, 16 Bit D/A 1.850,00 €
K00-1012-0 50 pin connection panel for DIN rail mounting
with cable 97,00 €
EIPL-3000-0 BNC-Connection unit 275,00 €
Further accessories and options see price list

# G06-1044-1



# G07-1003-1074



### 16 Analog inputs 16 bit 3,6 MHz

Single-ended 16 with simultaneous sampling

Resolution 16 bit

ADC sample rate per 225 kHz, all channel 3,6 Mhz Precision of system 0.014 % = 2,8 mV

0.0025 % = 0,5 mV 16x oversampling

Input voltage ranges ±5V, ±10V

Input voltage ranges free programmable per Group Clocking the A/D conversion by internal or external clock

Maximum input voltage in operation  $\pm 20 \text{ V}$  Maximum input current non operating  $\pm 2 \text{ mA}$ 

A/D conversion, counter and digital inputs with same or different scanning rates with simultaneous analog output

Details to online trigger see description Oversampling (sliding averaging)

# All online functions see page 3 applicable

# 4 Analog outputs 16 bit resolution

DAC sample rate 100 kHz
Output ranges jumperfree 0-10 V, ±10 V
Output current ±5 mA
Non linearity ±2 LSB

One Online functions for free

Synchronous analog output

# 24 digital in-/outputs \*\*

Switchable bit by bit

# 2 Counters

32 Bit event counting up/down

Frequency measurement, resolution 10 Hz

The following counting variants and counter are optionally available:

Pulse width and period length measurement resolution 100ns

Frequency measurement resolution 1/10/100/1000 Hz

# 2\*32 Bit rotary encoder counting

32-bit rotary encoder counter/time stamp

# $\mathbf{1}^*$ pulse width modulation (PWM)

2 Hz - 2500 kHz adjustable in 100ns steps Pulse width- and frequency modulation

# General data:

Signalprocessor

56301 100 Mhz, 100MIPS 1.5 MByte

 RAM
 1,5 MByte

 Flash
 512 kByte

 Dimensions
 139x88mm

 Connector
 50pin SUB-D 90

 Bussystem
 PCI Rev 2.1



# **O**rder information

G06-1044-1 16 Bit A/D, 16 Bit D/A 1.850,00 €
K00-1012-0 50 pin connection panel for DIN rail mounting
with cable 97,00 €
EIPL-3000-0 BNC-Connection unit 275,00 €
Further accessories and options see price list

# G07-1003-0

Four 24-Bit-period length measurement resolution 100ns, maximum read frequency 1 kHz

### G07-1013-0

Four 24-Bit-rotary encoder counting, 1-,2- und 4fach interpolation maximum Input frequency 20 Mhz, zero detection,

maximum read frequency 1 kHz.

# G07-1013-1

Technical data see MU/CountInkr4 additionally also time stamp-resolution 100 ns. time stamp information showing the period length to the last value which allows to determine the exact time relation read frequency 1 kHz

# G07-1013-2

Technical data see MU/CountInkr4/S, maximum read frequency 100 kHz G07-1014-1

Six 24-bit-rotary encoder counting. technical data see MU/CountInkr4/HS **G07-1023-0** 

Eight 32-bit-10-MHz-event counting up/down, frequency feasurement, resolution 1/10/100/1000 Hz, pulse width and period length measurement resolution 100ns,16 digital-in-/output, switchable bit by bit.

# G07-1043-0

Eight digital-in-/output, eight 24-bit-up&down-counter

# G07-1033-0

Has eight autonomous 24 bit PWM outputs available, 2 Hz - 2500 kHz adjustable in 100ns steps, pulse width and frequency modulation

# G07-1053-0

12\*16 bit, 10 MHz event counting up/down, frequency measurement, resolution 1/10/100/1000 Hz, pulse width and period length measurement resolution 100ns, eight digital-in-/output, switchable bit by bit.

# G07-1064-0

Eight 24 bit-50-MHz event counting up/down, frequency measurement, resolution 1/10/100/1000 Hz, pulse width and period length measurement resolution 20ns, 16 digital-in-/output, switchable bit by bit.

# G07-1074-0

12\*16 Bit, 50 Mhz event counting up/down, frequency measurement, resolution 1/10/100/1000 Hz, pulse width and period length measurement resolution 20ns, eight digital-in-/output, switchable bit by bit.

# General data:

Signalprocessor 56301 100 MHz, 100MIPS

 RAM
 384 kByte

 Flash
 512 kByte

 Dimensions
 139x88mm

 Bussystem
 PCI Rev 2.1

 Connector
 50pin SUB-D 90

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G07-1003-0	613,00€
G07-1013-0	713,00€
G07-1013-2	913,00€
G07-1014-2	1.113,00€
G07-1023-0, 1033-0, 1043-0, 1053-0	1.399,00€

# G08-1003-1033



# G08-1064-10B4



# 12 Bit version

# 8 (16) Analog outputs 12 Bit resolution

DAC sample rate 200 kHz
Output ranges 0-10 V, ±10 V
Output ranges switchable in four bit groups
Output current ±5 mA
Non linearity ±1 LSB

### 16 Bit version

# 8 (16) Analog outputs 16 Bit resolution

DAC sample rate 100 kHz
Output ranges 0-10 V, ±10 V
Output ranges switchable in four bit groups
Output current ±5 mA
Non linearity ±2 LSB

# 1 Counters

24 Bit event counting up/down

Frequency measurement, resolution 10 Hz

The following counting variants and counter are optionally available: Pulse width and period length measurement resolution 100ns Frequency measurement resolution 1/10/100/1000 Hz

# General data:

Connector

Signalprocessor
RAM 384 kByte
Flash 512 kByte
Dimensions 139x88mm
Bussystem PCI Rev 2.1

DSP inside

P08-1021-1

25pin SUB-D 90



# Order information

• 1 4 6 1 1111 6 1		
G08-1003	8 Kanal, 12 Bit D/A	.561,00€
G08-1013	16 Kanal, 12 Bit D/A	970,00€
G08-1023	8 Kanal, 16 Bit D/A	868,00€
G08-1033	16 Kanal, 16 Bit D/A	1.277,00€
P08-1021-1 16 Channel BNC Connection unit.with cable		

### 12 Bit version

# 8 (16) Analog outputs 12 bit resolution

DAC sample rate 200 kHz
Output ranges 0-10 V, ±10 V
Output ranges switchable in four bit groups
Output current ±5 mA
Non linearity ±1 LSB

### 16 Bit version

# 8 (16) Analog outputs 16 bit resolution

DAC sample rate 100 kHz
Output ranges 0-10 V, ±10 V
Output ranges switchable in four bit groups
Output current ±5 mA
Non linearity ±2 LSB

# Functiongenerator:

output of sine, square, triangle, impulse, sawtooth, noise and user defined data

# 1 Counters

24 Bit event counting up/down

Frequency measurement, resolution 10 Hz

The following counting variants and counter are optionally available: Pulse width and period length measurement resolution 100ns Frequency measurement resolution 1/10/100/1000 Hz

# General data:

Signalprocessor
RAM 1,5 MByte
Flash 512 kByte
Dimensions 139x88mm
Bussystem PCI Rev 2.1
Connector 25pin SUB-D 90

DSP inside

K03-1023-0



# **O**rder information

G08-1064-0 8 Kanal, 12 Bit D/A	1.533,00€
G08-1094-0 16 Kanal, 12 Bit D/A	1.890,00€
G08-10A4-0 8 Kanal, 16 Bit D/A	1.839,00€
G08-10B4-0. 16 Kanal, 16 Bit D/A	2.198,00€
K03-1023-0 25 pin connection panel for DIN ra	il mounting
with cable	66.00€

281.00 €



# G09-1005-1



### 32 (160)Analog inputs 12 bit 500 kHz

32 Single-ended/ 16 differential inputs software switchable

(Optional 160 ended inputs, maximum multi channel scanrate 100 kHz)

Resolution 12 Bit

ADC sample rate 500 kHz optional 1MHz G09-3031-0

Precision of system +0.05%

±1,25V, ±2,5V, ±5V, ±10V Input voltage ranges 0-1,25V, 0-2,5V, 0-5V, 0-10V

Input voltage ranges free programmable for each channel Clocking the A/D conversion by internal or external clock

Maximum input voltage in operation ±13,5 V Maximum input current non operating ± 2 mA Optional: With voltage resistant multiplexers ±40 V

A/D conversion, counter and digital inputs with same or different scanning

rates with simultaneous analog output Details to online trigger see description Oversampling (sliding averaging)

# All online functions see page 3 applicable

# 4 (8) Analog outputs 12 bit resolution

DAC sample rate 200 kHz Output ranges jumperfree 0-10 V. ±10 V Output current ±5 mA Non linearity ±1 LSB

One Online functions for free

Synchronous analog output

# 32 digital in-/outputs\*\*

Switchable in eight bit groups (expandable up 1024)

# **5 Counters**

32 Bit event counting up/downFrequency measurement, resolution 10 Hz The following counting variants and counter are optionally available: Pulse width and period lengthmeasurement resolution 20ns Frequency measurement resolution 1/10/100/1000 Hz

# 2\*24 Bit pulse width modulation (PWM)

2 Hz to 2,5 MHz, adjustable in 100ns steps Pulse width- and frequency modulation

# General data:

Signalprocessor 56301 u. 56311 80/150 MHz, 80/255MIPS RAM 1,5 MByte 24MByte DRAM DSP Flash 512 kByte

Expansionsbus for numerous extension modules Dimensions 250x119x13mm

**Bussystem PCI** Rev 2.1

2x50pin SUB-D 90 Connector

# inside

# Order information

G09-1005-0...12 Bit A/D, 12 Bit D/A 2.629,00€ G09-1005-1...16 Bit A/D, 16 Bit D/A 3.248,00 € K00-1012-0 ... 50 pin connection panel for DIN rail mounting

with cable 97,00€ EIPQ-3000-1 **BNC-Connection unit** 475,00€

# 32 Analog inputs 16 bit 800 kHz

Single-ended 32/(16) differential inputs software switchable

Resolution 16 bit

ADC sample rate multi channel/one channel 400/800 kHz

Precision of system 0.009 % = 1.8 mV

0.0025 % = 0,5 mV 16x oversampling

±1.25V. ±2.5V. ±5V. ±10V Input voltage ranges 0-1,25V, 0-2,5V, 0-5V, 0-10V

Input voltage ranges free programmable for each channel

Clocking the A/D conversion by internal or external clock Maximum input voltage in operation ±13,5 V

Maximum input current non operating ± 2 mA Optional: With voltage resistant multiplexers ±40 V

A/D conversion, counter and digital inputs with same or different scanning

ates with simultaneous analog output Details to online trigger see description Oversampling (sliding averaging)

# All online functions see page 3 applicable

# 4 (8) Analog outputs 16 bit resolution

DAC sample rate 100 kHz Output ranges jumperfree 0-10 V, ±10 V Output current ±5 mA Non linearity ±2 LSB

One Online functions for free

Synchronous analog output

# 32 digital in-/outputs\*\*

Switchable in eight bit groups (expandable up 1024)

# 5 Counters

32 Bit event counting up/down

Frequency measurement, resolution 10 Hz

The following counting variants and counter are optionally available:

Pulse width and period length measurement resolution 20ns

Frequency measurement resolution 1/10/100/1000 Hz

Further technical equipment as see \*\*12 Bit version:

counter, PWM, digital in-/outout etc.

# Order information hard and software extensions:

G09-3031-0 Multichannel scanrate 1 Mhz, 12 Bit rev 1 99,00 € G09-3090-0 32 Frequency measurement resolution 1/10/100 /1000Hz o. Pulse width and period length ref.100ns. 499,00 € G09-30D0-0 With voltage resistant multiplexers ±40V 199,00 € G09-3041-0 4 Channel-12Bit D/A Ua.0-10V o.±10V 149,00€ G09-3042-0 4 Channel 16Bit D/A Ua.0-10V o.±10V 249,00€ G06-4010-0 Online-FFT 400,00€ G06-4020-0 Scaling functions like characteristic 400,00€ G06-4030-0 Online-FIR-und IIR-filters 400,00€ G06-4040-0 Online-PID-controllers 400,00€ G06-4010-0 Function generator: output of sine, square, triangle, impulse, sawtooth, noise and user defined data 800,00€ G06-40X0-0...All functions to the package price 1.600,00€

# Order information of plug-on modules and hardware extensions:

QU/Inkre/4 G09-3091-5 499,00 €
Four 24 Bit rotary encoder counter, 1-,2-, und 4x interpolation programmable, maximum input frequency 20MHz, zero detection.



QU/Inkre/8 G09-3092-5
Eight 24 bit rotary encoder counter, 1-,2-, und 4x interpolation programmable, maximum input frequency 20MHz, zero detection.

QU/Inkre/4/S G09-3096-5 599,00 €
 Technical data see QU/Inkre/4 additionally also time stamp-resolution 100 ns. time stamp information showing the period length to the last value which allows to determine the exact time relation

QU/Inkre/8/S G09-3097-5 1099,00 €
 Technical data see QU/Inkre/4 additionally also time stamp-resolution
 100 ns. time stamp information showing the period length to the last value which allows to determine the exact time relation

QU/Inkre/6/32 G09-3093-5 1299,00 €
 Six 32 bit rotary encoder counter, 1-,2-, und 4x interpolation programmable, maximum input frequency 20MHz, zero detection

QU/Count8/P G09-3023-0 1299,00 €
 Eight 24-bit-10-MHz-event counting up/down, frequency measurement,
 resolution 1/10/100/1000 Hz, pulse width and period length measurement
 resolution 100ns.

QU/8/UP G09-3094-5 1299,00 €
 Eight 24 bit up&cown counter, maximum input frequency 10MHz
 QU/PWM G09-3095-5 1299,00 €
 Has eight autonomous 24 bit PWM outputs available, 2 Hz - 2500 kHz
 adjustable in 100ns steps, pulse width- and frequency modulation

QU/TTL/128 G09-3090-0 499,00 € Extension the MultiChoice QUATTRO digitalports of 128 bit, switchable in 16 bit groups, maximum 8 modul connectablly.



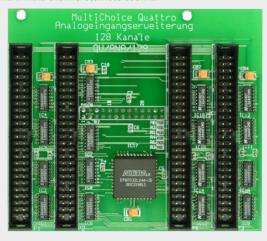
QU/Opto16/16 G09-3096-0 299,00 €
 16 channel optically isolated inputs & output
 QU/Rel8 G09-3097-0 199,00 €
 8x relay card . Power max. 1A, 30W, max 110V DC, 125 AC.

QU/DIFF32 G09-3020-5 199,00 €
Extension the MultiChoice QUATTRO of 32/64 differential / single-ended, inputs, maximum multi channel scanrate .300kHz.



• QU/DIFF32/FMUX G09-3025-5 349,00 €
Extension the MultiChoice QUATTRO of 32/64 differential / single-ended, inputs, maximum multi channel scanrate .300kHz, with voltage resistant multiplexers ±40 V

QU/ANA/128 G09-3010-0 749,00 €
 Extension the MultiChoice QUATTRO of 128 single-ended, inputs as 160, maximum multi channel scanrate 100kHz.



• QU/ANA/128/FMUX G09-3014-0 949,00 €

Extension the MultiChoice QUATTRO of 128 single-ended, inputs as 160, maximum multi channel scanrate 100kHz., with voltage resistant multiplexers ±40 V

QU/UI12/10/4 G09-3041-5 499,00 €
 U/I-converter for MultiChoice QUATTRO: 4-Channel 12-Bit-U/I-converter, sample rate 50 kHz, output range 15V, 0-20mA or 4-20mA.



QU/DA16/10/4 G09-3023-5 499,00 €
 D/A-converter for MultiChoice QUATTRO: 4-Channel-16-Bit-D/A-converter, sample rate 100 kHz, output range ±10V.

• QU/DA16/10/8 G09-3024-5 699,00 € D/A-converter for MultiChoice QUATTRO: 8-Channel-16-Bit-D/A-converter, sample rate 100 kHz, output range ±10V.



EIPQ-3000-1



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