MultiChoice Ethernet USB Series

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

VEE Pro TM

TM

DASYLab™ Data Acquisition System Laboratory

NATIONAL INSTRUMENTS™ DIAdem™

E.d.a.s.WinPlus MH

IPEMOTION™

NATIONAL INSTRUMENTS™ LabVIEW™

ServiceLab™

TM

Mac OS X

TM

TM

Android

TM

API für C/C++, Delphi, Phython under Windows Linux, MacOS and Android and for DotNET(C#, F#, VB.NET, IronPhython, …)

Web: http://www.goldammer.de

Technical features
- ARM©9 32-Bit Prozessor
- Altera Cyclone© FPGA I/O-Prozessor
- 512 MB Memory
- 2 GB Flashmemory
- aluminium case
- Galvanic isolation (optional)

interfaces
- 100 MBit Ethernet
- USB Device (coming soon)
- USB Storageport

system features
- Webserver for configuration and data visualization
- Programming environment based on the scripting language LUA
- SSH Server
- FTP Server
- Samba Server

- Synchronous detection of analog, digital, and Counter data
- Autonomous operation without a PC
- Network-ready and remote control

GOLDAMMER GmbH

Embedded measuring system

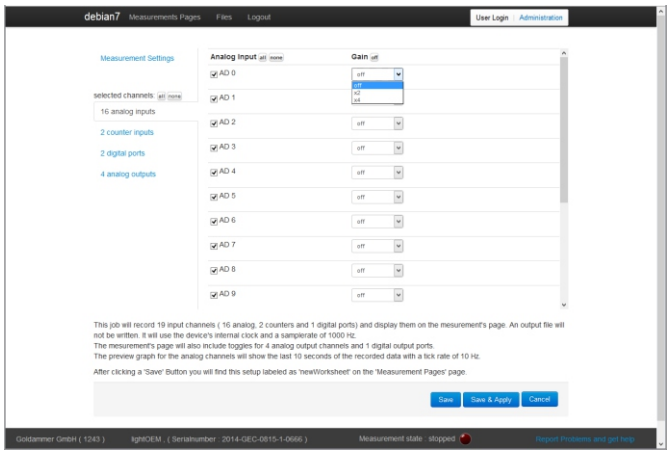
Adaptability and independence are the primary characteristics that describe the intelligent Ethernet / USB systems from the GEx series. The embedded system enables direct and thus reliable processing of measurement and control tasks. The use and the interplay of modern electronic components results not only in high-precision inputs and outputs, but also allows the small device dimensions. With Linux operating system adapted specially for the ARM system-on-chip processor, it includes a strong-performance 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 for connecting a USB mass storage device available.

However, flexibility is not just one aspect of the embedded Linux system but also of the underlying hardware design. A variety of different input and output modules guarantees that there is a device that is optimally adapted to your measurement task.

Just like our other product series the GEx series provides data processing on a PC system under LabView©, DIAdem©, DasyLAB© and IPEmotion©. Regardless of the chosen communication interface, users can utilize it in a familiar software environment. And self-developed measurement applications based on the interface MAIv2 can be used without modification with both GEx as well as all other Goldammer measurement cards.

In autonomous mode the web interface of the GEx pro

vides the ability to configure all channels and measurement types, to control measurements, watch a live view of the input channels and control the output channels. Due to the integrated user-rights management, the layout of the web interface can be customized per user and even be extended to more sophisticated measurement and control applications.
The supplied embedded Linux system may of course be changed eg to use other devices such as WLAN or UMTS sticks or to realize other programming options "on-device" : With the GEx device series your imagination knows no boundaries.

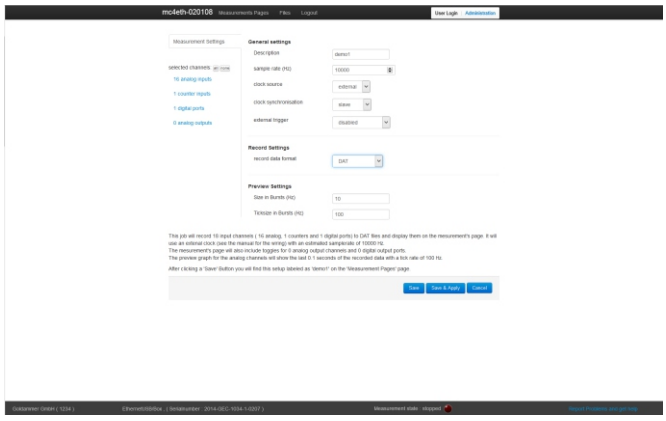


Basic setting of the measurement parameters

Modes of Operation

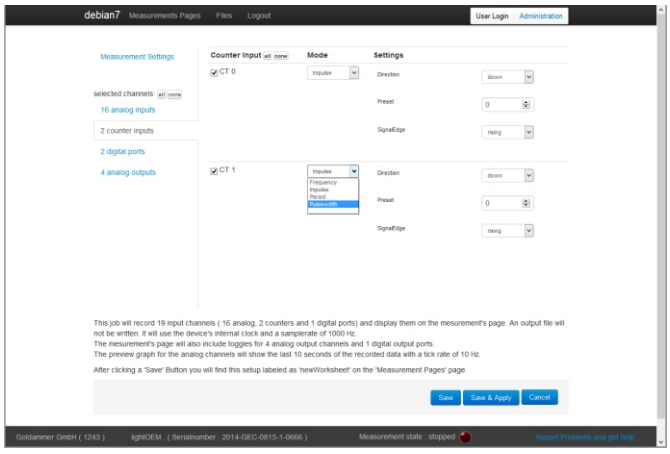
Web-based data collection and Administration

Via the fully menu-driven web interface you can define, manage, and start data acquisition tasks on the remote device with a few mouse clicks. A visualization in the browser and graphical live data preview makes a local software unnecessary for simple measurements and thus in works on any operating system without the need to install any software. The measurement data is saved to a USB storage connected to the device and can also be managed and downloaded via the web interface. Likewise, all administrative tasks, as assigning the IP address, time synchronisation servers etc, can be done via the web interface, of course password secured. Available output data formats are CVS, DasyLAB and binary.


Configuration of analog inputs

Standalone scripted tasks

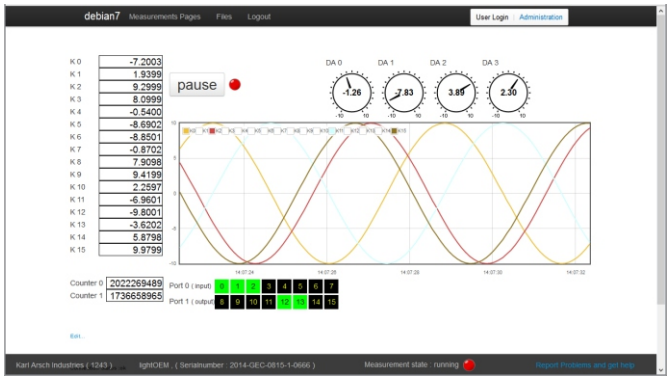
The integrated runtime environment for the Lua scripting language allows access to all input and output channels on the card and on the tasks defined in the web interface. You can create measurement and control scripts that are started either directly via remote login or timer-controlled. All opportunities of the underlying embedded Linux operating system can be used, even for customization of the web server (see above).



Configuration of the counter and the mode

Standard measurement and control applications

As for all Goldammer data acquisition boards drivers or plugins for the measurement and control applications DASYLab, ServiceLab, DIADem and IPEmotion are supplied for the GEx Series. You can use it here exactly like a USBBasic device regardless if it is connected to the measurement computer via the USB device port or via



Online display of measured values in the web browser

ethernet.

Custom software for your measurement and control task

Also uniform for all measurement board series is the "Measurement Application Interface" (MAI), which is available in the following versions "native", ".NET" and "LabVIEW":

The "native" version allows the use of all Goldammer cards in applications that are created for Intel-compatible programs on the operating systems Windows, MacOS X, Debian Linux or Android (on ARM processors). On Windows systems there is a rich LabVIEW VI library including Express VI and also a .NET version of the MAI available, which offers a more intuitive use than the native version. By readymade extensions for GUI and data acquisition, the time required for the application development of your custom software is minimized here.

Likewise, the use of MAIv2 for DotNET in other programming environments eg MATLAB, Mathematica, or AgilentVEE is very easy. For all versions of the API there is a comprehensive collection of examples included.

The measurement modules provide up to 16 analog inputs, 4 analog outputs, 2 counter inputs with switchable modes and up to 48 digital inputs / outputs. Any number of signals can be recorded simultaneously in a synchronous mode. This way an exact temporal assignment of the measured values of different signal is guaranteed. Asynchronous recording is also possible. The analog inputs provide input ranges of +/- 10 V and a per channel, programmable 1/2/4/8 -fold gain with 16 bit resolution, also the analog outputs operate with 16-bit DAC converters in the range +/- 10V.

Acquisition Modes

Single value acquisition

Each channel is recorded individually as required by selecting the corresponding channel number. The time base of the data obtained is provided by the measurement program. This feature is available for analog, digital and counter inputs.

Synchronous acquisition with internal timer

In the synchronous acquisition mode all channels in the channel list are sampled at each timing pulse in burst mode. Analog, counter and digital inputs are recorded synchronously.

Synchronous acquisition with external start

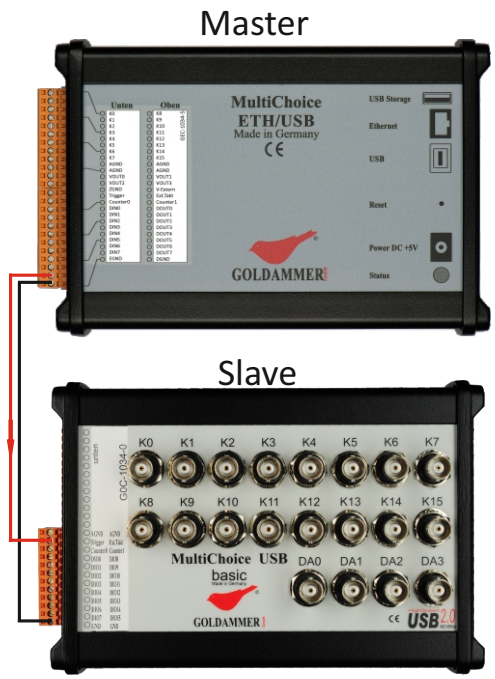
With an external start the measurement only starts recording when a programmable level (high / low) changes. It will record all channels in the channel list in burst mode with the given sampling rate as synchronous acquisition with internal timer (see above).

Synchronous acquisition with external clock

With an external clock the all channels of the channel list are recorded in burst mode once per pulse on the external clock input.

Synchronous acquisition as Master/Slave

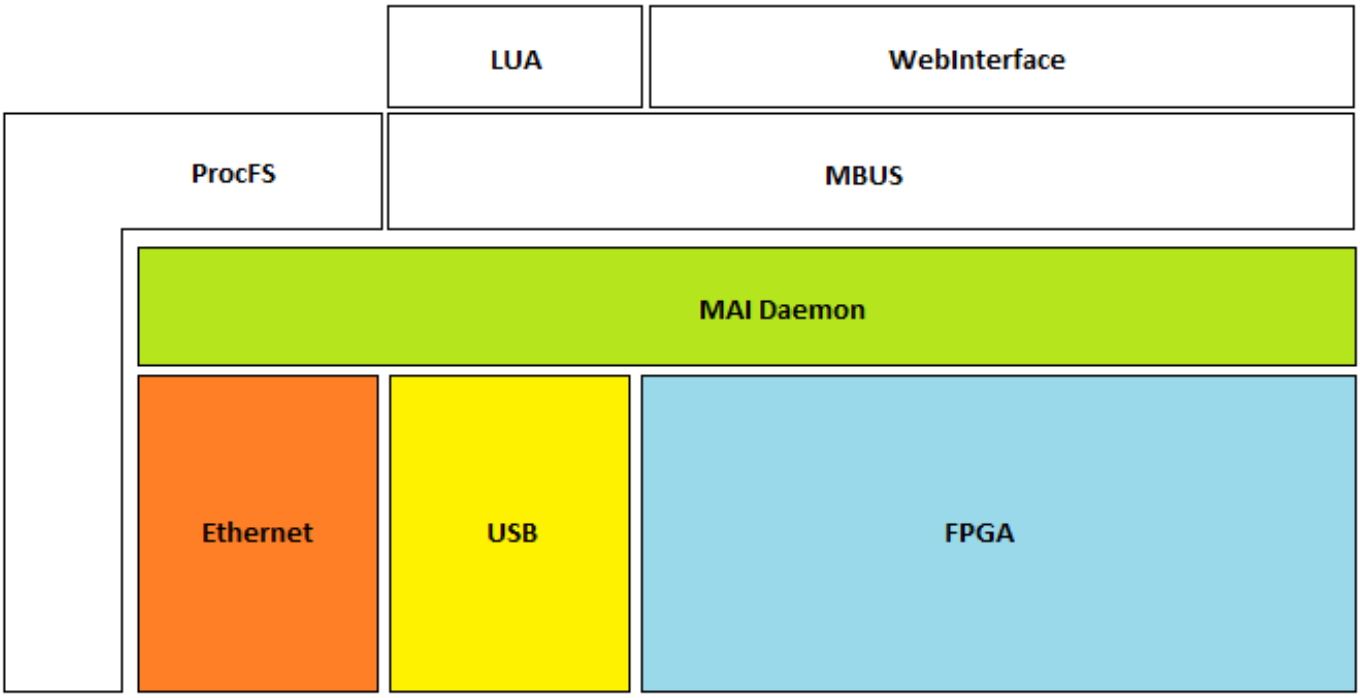
If two or more Goldammer devices are to record data independent of an external clock source but in sync with each other, use the operating mode Master / Slave. The card configured as a master in this case provides the clock for all slave devices (see connection diagram).



The operating system and the measured core

The measurement core of the Multichoice.LAN series is a well-balanced combination of hardware and software. Input and output channels are provided by a modern field programmable gate array, FPGA in short, which represents the software layer. The control of the peripheral units, as well as the actual pre-processing of the data is done by a central service on the ARM9 processor, the MAI daemon. This as a miniature version of the MAIv2 (Maesurement Application Interface V2) specifically adapted to the characteristics of the underlying system and manages the different access points to the relevant measurement data. In addition to the classic access via USB, in which the GEx behaves like a MultiChoice USB Basic device and can easily be integrated into existing applications without any adaptation, the access via Ethernet opens ou new fields of application.

An Advantage of operating via Ethernet is the possibility of spatial separation of the sensing system to the system with the graphical data processing, such as NI LabView or Dasylab. Locally or remote, you can directly take influence to relevant measurement parameters such as gain, voltage range, direction, condition or counter mode. The interaction at the protocol level is done completely transparent between MAIv2 on the part of the controlling system and the MAI Daemon on the GEx device. Parallel operation of USB and Ethernet as the measurement data channel is not provided and is prevented by appropriate control mechanisms from that device. All I / O interfaces that are listed in the data sheet (see table on the next page), are available

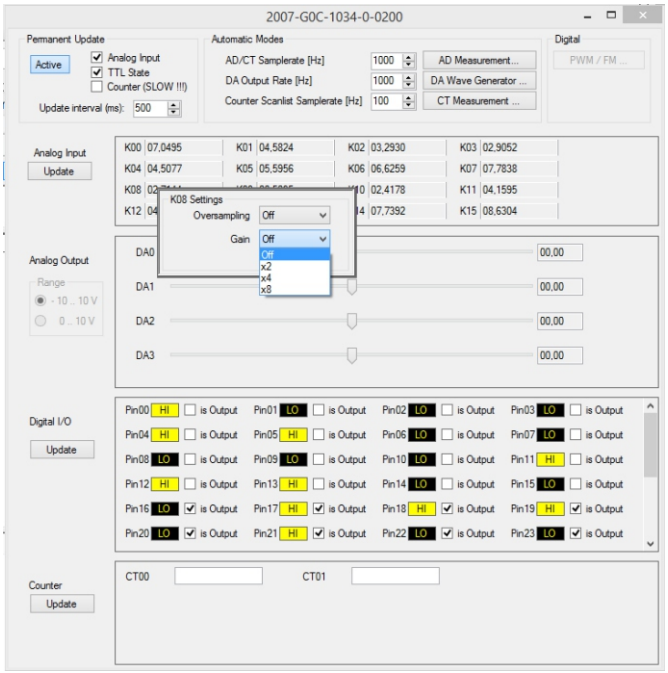


without any restriction on any access method. The GEx devices offer two different models of data acquisition: The classical model (using a controlling software on aPC) and the model of autonomous operating data acquisition. In the latter the data processing is carried out exclusively on the device itself and is determined solely by parameters that are set by the user via one of the possible control points : The preinstalled web interface of the DAQ board, the Linux procfs and an MBUS integration. Data acquisition configurations, so-called measurement jobs are stored as sheets in JSON syntax the DAQ card and can be distributed to multiple devices as needed. The web interface here offers greatest comfort for creation, modification or deletion of measuring jobs. Besides a guided measurement parameter setup it can show a live view of the measurement data. A distinction is made between the measuring user and an administrator of the measurement card to prevent misconfiguration. The separation is achieved by the user administration of the Linux operating system. Configured measurement jobs can be changed only by the corresponding user. An autonomously working measurement system is only useful if the relevant measurement data is not lost and can be analyzed in a possible post-process. For this purpose, the MAI-daemon offers a recording function that stores the recorded data including the setup parameters onto a connected memory stick or USB hard drive. The file formats ready to use for the data recording are currently ASCII, Diadem DAT and the NI TDM format. This way it can be post-processed or transferred into a presentation without any problems.

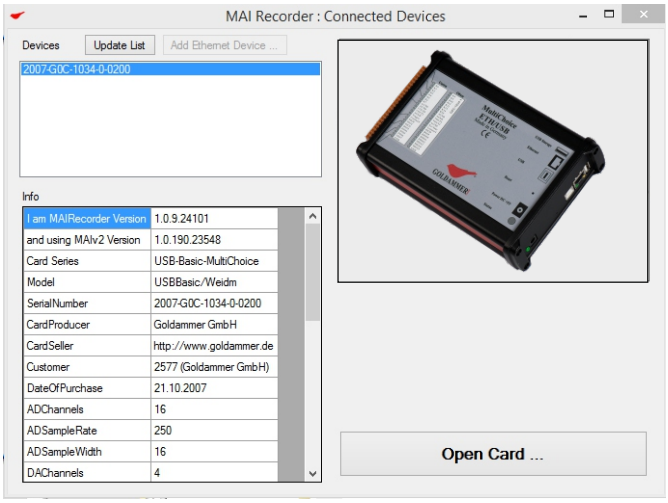
Depending on the selected sample rate of the measuring channels and the available storage data, it is possible, that data is collected over several days and stored on the USB storage device.

Included Software MAIRecorder

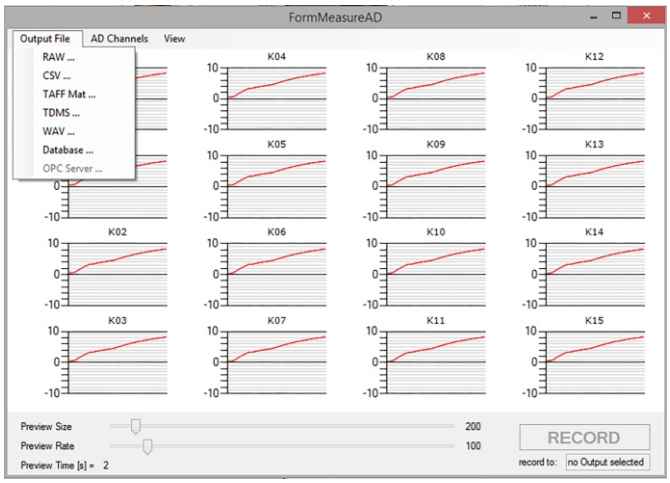
The open-source testing program MAIRecorder demonstrates the simplicity of use of the MAI for DotNET in your C# measurement and control applications, and, in its original version, the opportunity to test all board features.



In addition to the single-value acquisition and output the synchronous acquisition of all inputs is possible



Together with a license for the extension assembly MAIExtensionDAQ the MAIRecoder becomes a complete mini data acquisition solution.



Type: GEC-1034-6

Type: GEC-1034-8

The models and functions at a glance

		samplerate D/A			digital in/out						sync.		counter			galvanic isolated				connection					
articelcode	analog in	resolution 16 Bit	250 kHz sum	225kHz per channel	D/A 16 Bit	4 Ue.2,4 V-30V	8 Ue.2,4 V-30V	4 Ua.0-35V 60mA	8 Ua.0-35V 60mA	4*4 16Bit TTL I/O	6*8 48Bit TTL I/O	master	slave	incremental (*)	without reset function	32 bit universacounter pulse / frequency pulse width / period.	analog in/out	digtalinput	digitaloutput	counter triiger/clock	*analog In/Out*	BNC	Weidmüller	connector for ribbon cable	*Digital I/O*	Weidmüller	connector for ribbon cable
GEC-1034-0	16SE/8DI	•	•		4							•	•	1		2						•				•	
GEC-1034-1	16SE/8DI	•	•		4							•	•	1		2							•			•	
GEC-1034-2	16SE/8DI	•	•		4							•	•	1		2								•			•
GEC-1034-3	16SE/8DI	•	•		4							•	•	1		2								•			•
GEC-1034-4	16SE/8DI	•	•		4							•	•	1		2	•	•	•	•		•	•			•	
GEC-1034-5	16SE/8DI	•	•		4							•	•	1		2	•	•	•	•			•			•	
GEC-1034-6	16SE/8DI	•	•		4							•	•	1		2	•	•	•	•			•			•	
GEC-1034-8	8SE	•	•			•		•				•	•	1	•	1	•	•	•	•			•			•	
GEC-1034-9	8SE	•	•			•		•				•	•	1	•	1	•	•	•	•				•			•
GES-1034-0	12SE	•		•	4							•	•	1		2						•				•	
GES-1034-1	12SE	•		•	4							•	•	1		2							•			•	
GES-1034-2	12SE	•		•	4							•	•	1		2								•			•
GES-1034-3	12SE	•		•	4							•	•	1		2								•			•
GES-1034-4	12SE	•		•	4							•	•	1		2	•	•	•	•		•	•			•	
GES-1034-5	12SE	•		•	4							•	•	1		2	•	•	•	•			•			•	
GES-1034-6	12SE	•		•	4							•	•	1		2	•	•	•	•			•			•	
GEC-1034-8	6SE	•		•		•		•				•	•	1	•	1	•	•	•	•			•			•	
GEC-1034-9	6SE	•		•		•		•				•	•	1	•	1	•	•	•	•				•			•
GED-1034-0					8																		•				
GED-1034-1					16																		•				
GED-1034-2					8																			•			
GED-1034-3					16																			•			
GEC-1015-0													•	6		8										•	
GEC-1015-1													•	6		8										•	
GEC-1015-2													•	6		8				•							•
GEC-1015-3													•	6		8				•							•
GEC-1023-0												•	•													•	
GEC-1023-1												•	•													•	
GEC-1023-2												•	•							•							•
GEC-1023-3												•	•							•							•

Optional hard and software extensions

G0C-30C0-0 Clip for wall mounting of aluminium cases

G0C-30C0-1 Clip for wall mounting of aluminium cases

G0C-30D0-0 16 channel instrumentation amplifier

G0C-30D0-2 16-channel instrumentation amplifier with extended input voltage range ±50V

G0C-30D0-5 16-channel instrumentation amplifier with extended input voltage range ±50V

G0A-30E0-4 Automotive extension. Power supply: 9-60V DC / 10W (for G0A-30D0-x)

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