

# Compact and Powerful: The USB Basic Series

## MultiChoice USB Basic simultan

- USB 2.0 Interface, 480 MBit/sec ( USB 1.1 12MBit compatible)
- Connection options: Screw Terminals or BNC  
OEM Version 160x100x12mm for customized systems
- Analog Inputs/Outputs 16 Bit Version
- Analoge Ein-/Ausgänge 16 Bit Version  
16 Bit Version 6 A/D 16 Bit 225kHz per Channel  
16 Bit Version 12 A/D 16 Bit 225kHz per Channel, 4\*16D/A 20kHz  
16 Bit Version 2 A/D 16 Bit 3MHz per Channel, 4\*16D/A 20kHz
- Digital Inputs and Counters are synchronized to A/D Data
- 1(2)\*32 Bit Counter/Pulse Counter offer 20/100ns resolution
- 1\*32 Bit Incremental Encoder Measurement, 32 Bit Time Stamp



Order code:	Analog In	Resolution	Sample Rate	D/A	Digital In	Digital Out	Counter	Signal Coupling
<b>OEM Version without case, equipped with Pin Terminals</b>								
GOS-1034-9	6SE	16 Bit	225kHz **		4 Bit In Ue. 2,4V-30V	4 Bit Out Ua. 0-35V 60mA	1 * 32 Bit	(optocoupled)
GOS-1034-6	12SE	16 Bit	225kHz **	4*16 Bit	8 Bit In	8 Bit Out	2 * 32 Bit	(optocoupled)
GOM-1034-6	2SE	16 Bit	2500kHz **	4*16 Bit	8 Bit In	8 Bit Out	2 * 32 Bit	(optocoupled)
Ue. 2,4V-30V, Ua. 0-35V 60mA								
GOS-1034-2	12SE	16 Bit	225kHz **	4*16 Bit	16 Bit TTL		2 * 32 Bit	
GOS-1034-3	12SE	16 Bit	225kHz **	4*16 Bit	48 Bit TTL		2 * 32 Bit	
GOM-1034-2	2SE	16 Bit	3000kHz **	4*16 Bit	16 Bit TTL		2 * 32 Bit	
GOM-1034-3	2SE	16 Bit	3000kHz **	4*16 Bit	48 Bit TTL		2 * 32 Bit	
<b>Standard Version in rugged Aluminum Case</b>								
<b>Weidmüller Screw Terminals</b>								
GOS-1034-8	8SE	16 Bit	225kHz **		4 Bit In Ue. 2,4V-30V,	4 Bit Out Ua. 0-35V 60mA	1 * 32 Bit	(optocoupled)
GOS-1034-1	12SE	16 Bit	225kHz **	4*16 Bit	16 Bit TTL		2 * 32 Bit	
GOS-1034-5	12SE	16 Bit	225kHz **	4*16 Bit	8 Bit In	8 Bit Out	2 * 32 Bit	(optocoupled)
Ue. 2,4V-30V, Ua. 0-35V 60mA								
GOM-1034-1	2SE	16 Bit	3000kHz **	4*16 Bit	16 Bit TTL		2 * 32 Bit	
GOM-1034-5	2SE	16 Bit	2500kHz **	4*16 Bit	8 Bit In	8 Bit Out	2 * 32 Bit	(optocoupled)
Ue. 2,4V-30V, Ua. 0-35V 60mA								
<b>Standard Version in rugged Aluminum Case</b>								
<b>Digital Inputs/Outputs are equipped with Weidmüller Screw Terminals</b>								
<b>Analog BNC connectors</b>								
GOS-1034-0	12SE	16 Bit	225kHz **	4*16 Bit	16 Bit TTL		2 * 32 Bit	
GOM-1034-0	2SE	16 Bit	2500kHz **	4*16 Bit	16 Bit TTL		2 * 32 Bit	
GOS-1034-4	12SE	16 Bit	225kHz **	4*16 Bit	8 Bit In	8 Bit Out	2 * 32 Bit	(optocoupled)
GOM-1034-4	2SE	16 Bit	2500kHz **	4*16 Bit	8 Bit In	8 Bit Out	2 * 32 Bit	(optocoupled)
**Per Channel Ue. 2,4V-30V, Ua. 0-35V 60mA								

Due to their unrivaled flexibility and their high transfer speeds USB2.0 based measurement systems have become an important factor; not only in automotive applications, but also in all common industry applications with a high degree of acceptance in maintenance and data acquisition. Goldammer Soft- & Hardwareentwicklung was among the first companies that shaped decisively the worldwide triumphant success of USB based data acquisition systems. The introduction of the well-known MultiChoice USB series set a new standard in mobile data acquisition. Once again, the MultiChoice USB Basic series offers a unique modular structure and a wide variety of products. So Goldammer Soft- & Hardwareentwicklung has gone the next important steps toward making the USB2.0 standard to an industry standard for USB based measurement systems.

The Cypress USB2.0 controller is used in the whole USB

**Agilent Vee**

**DASyLab**

**DIAdem**

**EdasWin**

**EVApro**

**IPEmotion**

**LabVIEW**

**LabWindows/CVI**

**MATLAB**

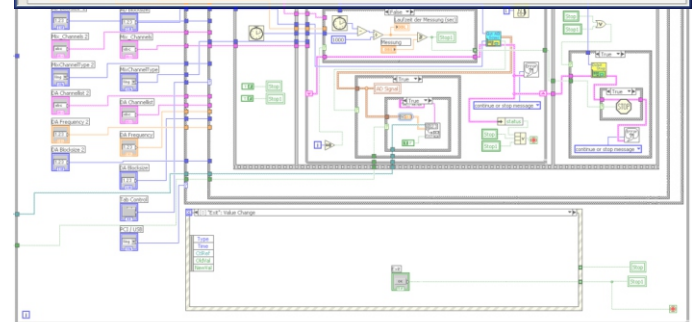
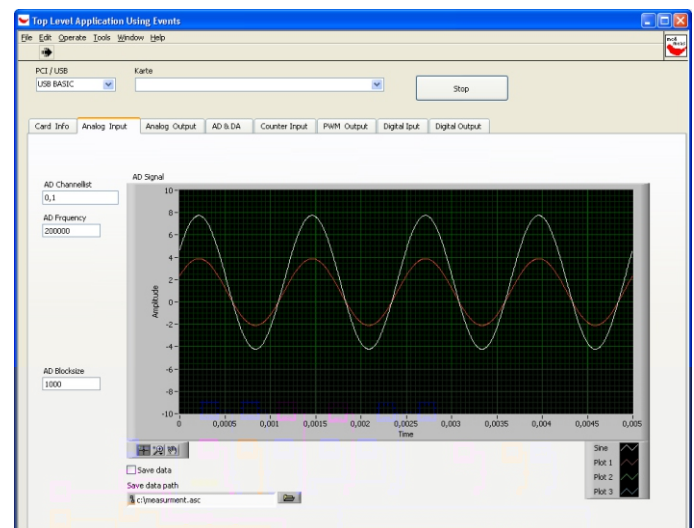
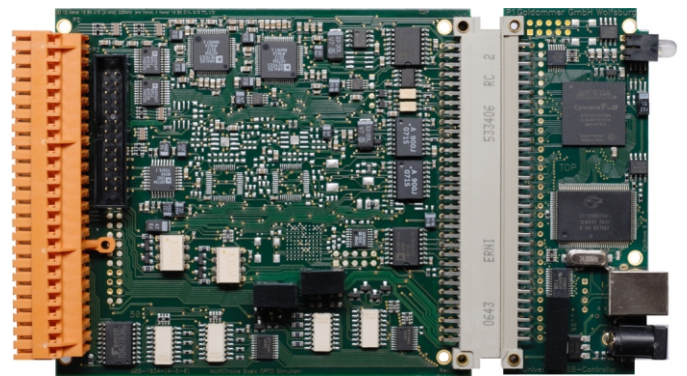
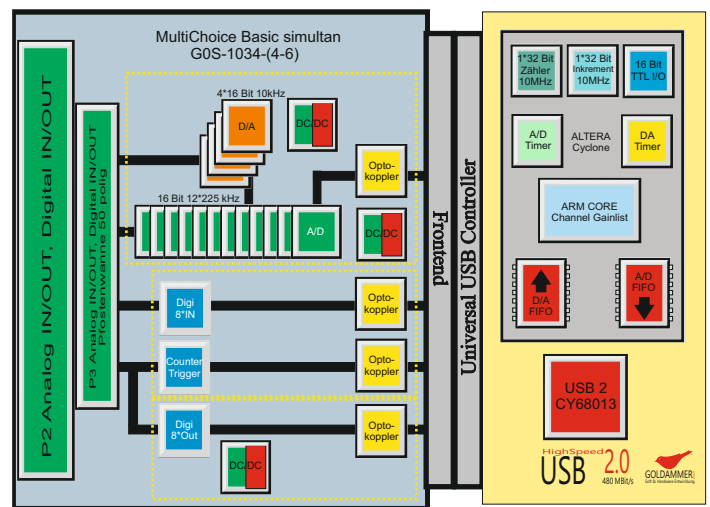
API Schnittstelle  
Visual C++, Visual Basic  
Borland Delphi, WDM  
Windows 7/8 (32&64)



E.d.a.s.WinPlus [M]



# Schema



product line. It is not only downward compatible to USB1.1, but it is also one of the few controllers on the market, which supports the USB high-speed mode (480MBit/sec). Products based on this interface are not only seminal. The fact that nearly any PC is equipped with this interface makes those products the perfect future investment.

The modular concept of the Measurement cards of the MultiChoice Basic series allows the customer to select the data acquisition system, which fits best to the customer's individual needs. The system is divided into two parts. The first one is a controller board that contains the high-speed USB2.0 interface and a programmable logic circuit (FPGA). The second one is a front-end unit that is used to process the measurement signals. This concept not only makes it possible to run a wide variety of front end units together with a control unit, but it allows also to place a product on the market which can be offered with attractive pricing though it is based on high quality electronic parts.

The MultiChoice USB Basic Simultan series makes even more front-end units available. It is focused to set a new definition for the common principle for analog data acquisition. Modules with 8 or 16 analog inputs digitize analog input signals with a multiplex processing. Usually, within the same group of eight (8) channels, each channel is switched by a multiplexer to an analog/digital converter where it is digitized. The drawback of this kind of processing is obvious. The time needed by the multiplexer does not allow a time synchronous measurement of the analog input signals. The simultaneous conversion that works with an analog-/digital converter per channel turns

out to be much better. So analog input channels can be measured with an unbelievable maximum sample rate of 225kHz. Therefore, the fastest version allows digitizing 16 bits resolution running at 3MHz per channel. This not only shows new ways to new industrial application areas, but it also is focused directly to applications where several analog channels have to be measured at exactly the same time as this is necessary in medical applications when in example nerve signals are processed.

Similar to the present members of the USB series these modules offer a wide variety of signal inputs and outputs. All available with optocouplers which allow galvanic separation of the module against any other connected signals. These kinds of modules offer a maximum of noise immunity and reliability. All kinds of signals are separated against each other with individual circuits. One of the very special features of this version is its ability to drive 60mA at 30V (any channel), which allows direct relay control. Input channels for counters, triggers and external clocking are optically decoupled with additional couplers.

The single members of the USB Basic Simultan version are available with up to twelve (12) analog inputs and four (4) analog outputs. Processing of pure digital signals is achieved with up to two 32 bits digital counters that can be run in several modes like incremental measurement and up to 48 digital I/O channels. The synchronism of the different kinds of signals is ensured by a special hardware control contained in the FPGA. This logic was designed for automatic processing and it measures the pre-selected channels with hardware precision. The main task of a connected PC system

is reduced to collect data is possible to use the sent from the measurement bandwidth of USB2.0 for card and keep it at hand for high efficient transmission post processing. Because of of measurement data. In this implementation and its addition, the programmable related hardware concept, it logic circuit offers

functionality to asynchronously process further kinds of signals.

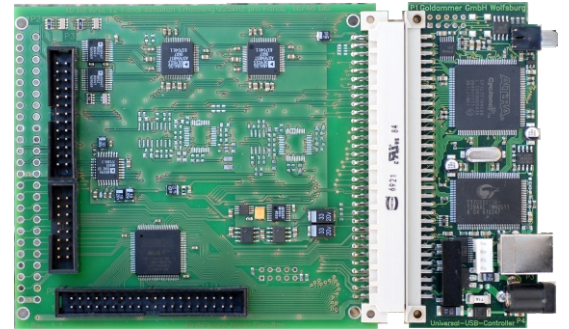
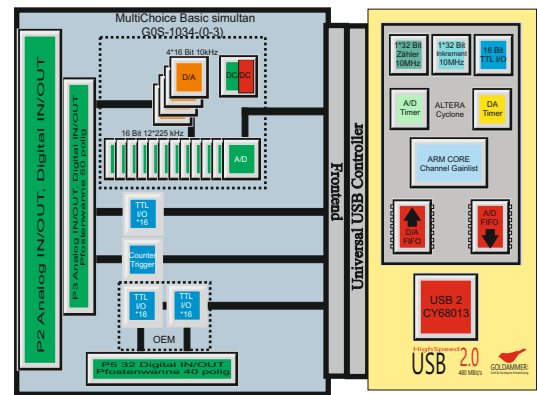
It is designed for an operation range of +/- 10V and a resolution of 16 bit.

The measurement systems are offered in three different versions: In addition to two versions contained in a shapely aluminum cast case which can be equipped with BNC receptacles or Weidmüller screw terminals, the third version is shipped as OEM board with pin terminals. Its size is 100mmx160mm which allows easy integration into present systems. The pin terminals can be used to integrate further functionality like filters, amplifiers, or other components into a compact case and to ship it as a turnkey system.

The USB Basic series is supported with several driver routines for

commonly used measurement programs like DIAdem, DasyLab, LabView, EDASWin, EVAPro and Agilent Vee. A comfortable Delphi, C, C++ and Visual Basic programming interface allows easy integration of the measurement hardware into present or future software projects. The internal software architecture was designed as a layer model, so the used driver routines are consistent, error free, and allow shipping a maximum of performance.

For purposes of first time testing of Goldammer hardware, a free of charge software package named MC4Measurement is available. Its graphical user interface allows it to be run easily. It makes possible fast and easy changes of signal types of the product lines Multichoice PCI, Multichoice USB, and Multichoice USB Basic series. This application offers the user any measurement



card available for testing purposes in the system.

Analog Input	Light	Basic	Analog Output 16 Bit
Converter	Ad7656	Ad7656	Ad7664
Number of Inputs	6	12	4
A/D Throughput	225kHz pro Kanal	225kHz pro Kanal	20kHz
Resolution	16 Bit	16 Bit	16 Bit
Conversion Time	4µ	4µ	±20V 10µ
Input Voltage Range	±5, ±10V	±5, ±10V	±1V 1µ
Positive Full-Scale Error Matching	±0,35% FS max	±0,35% FS max	±10 V
System Accuracy	0,013 %	0,013%	±5 mA
Isolation Voltage	1000V		0.2 R
Input Voltage max.	±10V	±10V	
Operation/Non-Operating	±40V/±20V	±40V/±20V	
BIAS Current	±40 nA	±40 nA	
Non Linearity	±3 LSB	±3 LSB	±2 LSB
Digitalization Error	±3 LSB	±3 LSB	±2 LSB
Quantization Error	< ±1 LSB	< ±1 LSB	
Effective Accuracy	13,5 Bit	13,5 Bit	
Range Error	Abgleichbar	Abgleichbar	< ±0,025 %, typ
Zero Error	Abgleichbar	Abgleichbar	< ±0,025 %, typ
A/D Zero Shift	±7 ppm / °C	±7 ppm / °C	±5 ppm / °C
Monotonicity	±1,5 LSB	±1,5 LSB	15 Bit

Digital Ein-/Ausgang	Counter	Optocoupled	Counter
Number of Inputs	16 (OEM48)	4/8 In - 4/8 Outputs	Number of Counters 1/2
Logic Family	LVC MOS	0-24 VDC	Resolution 32 Bit
Logic Sense	High	High	Up/Down Event Counting 10MHz
Input Voltage			Frequency Measurement Resolution 10Hz
Max. (Operation)	+5 V	+5 V	Incremental/time stamp +30 VDC
Logic High Input Voltage	2.0 V	2.0 V	20MHz max. 2.4 V
Logic Low Input Voltage	0.8 V	0.8 V	Interpolation 1/2/4 1.5 V
Logic High Input Current	0.5 µA	0.5 µA	2.0 V 2 mA
Logic Low Input Current	0.1 µA	0.1 µA	0.8 V 1 mA
Logic High Output Current	2.5 mA	0.5 µA	60 mA 0.5 µA
Logic Low Output Current	-2.5 mA	0.1 µA	-60 mA 0.1 µA
Output Voltage max.	3.3 V		35 VDC(TD62083)
Input/Output Borderfrequency	500kHz	10 MHz	10 kHz 10 MHz

Anschluss Weidmüller Schraubklemmen oder BNC, OEM Pfostenwanne USB 2.0 480MBit, USB 1.1 12MBit kompatibel Spannungsvers. HighSpeed USB 2.0 480 MBit/s  
 Alle Module werden über den USB-Port mit Spannung versorgt, es ist keine externe Versorgung nötig. Auf Wunsch können die Opto-Module über eine externe Spannungsversorgung versorgt werden.  
 Dimensions: OEM160 x 100 x 14, Basic light 100 x 100 x 14 mm Screw Terminals 180 x 118 x 49mm, BNC 16 channels 180 x 118 x 64