



MultiChoice USB-Basic/Count8 im aluminium cast case, eight 32-Bit-20-MHz-event, frequency, pulse width, cycle duration counter, resolution 100ns/20ns, input-voltage TTL, OEM; 50 pin connector for ribbon cable.

## Supported application software

E.d.a.s. WinPlus <sup>TM</sup> 

**DASYLab** <sup>TM</sup>  
Data Acquisition System Laboratory



**NATIONAL INSTRUMENTS** <sup>TM</sup>  
**DIAdem** <sup>TM</sup>

**NATIONAL INSTRUMENTS** <sup>TM</sup>  
**LabVIEW** <sup>TM</sup>

API für C/C++, Delphi, Python unter Windows Linux, MacOS und Android und für DotNET(C#, F#, VB.NET, IronPython, ...)

### Trig. Trigger

logic family	properties see digital input/ output
input	1 trigger input
output	1 trigger output
	master/slave programmable

### Sync Synchronization

logic family	properties see digital input/ output
input	1 synchronization input
output	1 synchronization output
	master/slave programmable
	all devices from the series GEC, GES,
	GOC, GES and GOA can be
	synchronized with each other.

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#### pulse counting:

Counting pulses up to 32 bit values 4294967295 and a maximum frequency of approx. 10/60 MHz. It is possible to set an initial value. The counter can be used in up or in down mode.

### Counter

logic family	properties see digital input
number of counters	8
resolution	32 Bit
counter resolution	10/50 MHz
counter modes	event counting, frequency measurement (frequency resolution 1/10/100/10000Hz)
	pulse width, periodlength

### Properties Digital Inputs/Outputs

logic family	LVCMS0
logic sense	2.0 V
logic low input voltage	0.4 V
logic high input current	0.5 µA
logic low input current	0.1 µA
logic high output voltage	3.1 V min.
logic low output voltage	0.1 V max.
logic high output current	-2,5 mA
logic low output current	-2,5 mA
termination	None
maximum input voltage	
in operation	+5 V
terminals	50 pin connector for ribbon cable

### Interface

USB 2.0 (Deviceport)	USB 2.0 highspeed, 1,1 compatibel
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#### Other

Optocoupled	-
case	-
dimensions	160 x 100 x 13 mm
roHS konform	yes
external supply	+5V DC USB powered
current consumption	+5V, max. 270mA
weight	100gr.
price	1.399,00 €
customs tariff number	84733020

### Hz

#### frequency measurement:

The method of „measuring frequencies by counting in a time window“ depends on the definition of the frequency (number of oscillations or periods per second). After starting the measurement a clock

generator keeps open the „time window“ for a certain period of time. The time window can be set in steps of 100 milliseconds. Within the time window the number of pulses of the frequency signal to determine is counted. The number of pulses can be read directly as frequency value shown in Hz and can be used for the display. The display shows the following with an input frequency of 12560 Hz depending on the setting of the reference frequency:

Resolution	Display
1 Hz	12563 Hz
10 Hz	12560 Hz
100 Hz	12600 Hz
1000 Hz	13000 Hz



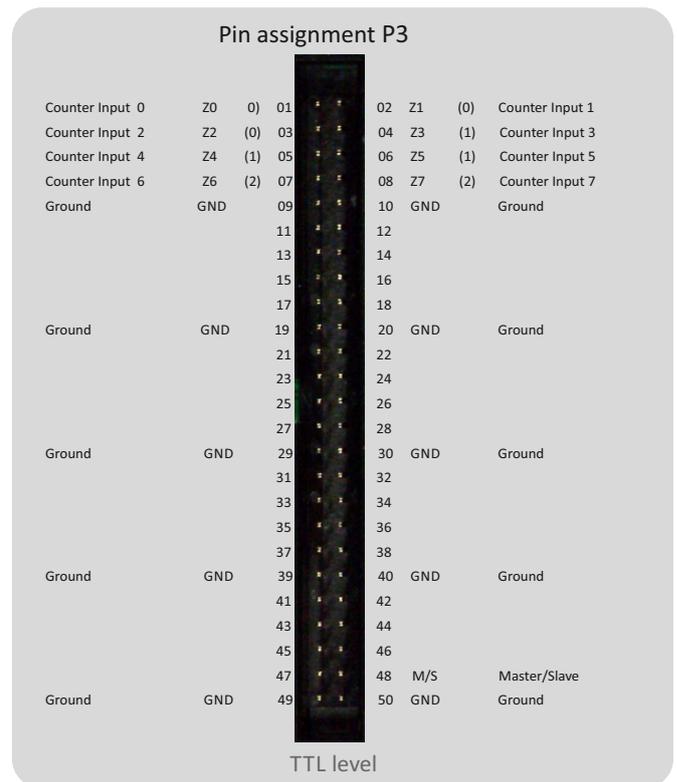
### Period measurement:

To measure the length of a period a time window is compared with the length of the period of the signal to determine and the number of pulses within this window are counted. The counting pulses are generated by a 10/60 MHz clock oscillator. This is the equivalent of a counter resolution of 100ns/20ns. The measuring of the length of the period is to prefer for high precision or very fast frequency measures because for each period a new reciprocal value of the frequency is available. If an input frequency of 1kHz is fed into the counter the display shows 10000 which means  $10000 * 100\text{ns}/20\text{ns}$ . Other than the frequency measurement the counter reading without a signal, in example if a pulse generator is not turned on any more, is not refreshed because the second reference pulse is missing. The calculation into rotations per second or into a frequency will not lead to a zero value in the display, instead the last value is displayed. This is caused by technical details because a zero frequency means the length of the period had to be infinite – a value that is limited by the properties of the real hardware.

	10Mhz	50Mhz
32Bit	429,00000s	85,00000s
24Bit	1,67778s	0,33550s
16Bit	0,00655s	0,00131s
8Bit	0,00003s	

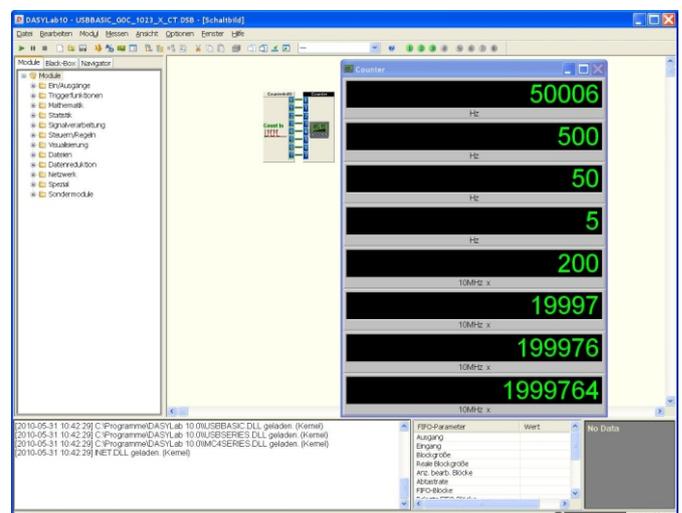
### Example measurement with DasyLab::

Counter 0-3 shows a frequency measurement with a resolution of 4-7 1Hz. Counter a period measurement shows in the same order of frequencies as they rest on counter 1-4.



### Measuring the pulse width (pulse/pause ratio):

Measuring the pulse width is used to determine pulse width modulated signals. Depending on the selected mode the positive or the negative part of the signal is processed. If two counters are used to measure the pulse width, and one of them is programmed to be triggered by the negative and the other one by the positive edge of the input signal, the summed up result will show the period length. If the input signals are stopped the last measured value becomes available.



### Optional hard and software extensions

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