

# Robust Compact Real-Time System

## ADwin-Gold



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## Compact Real-Time Designs

The **ADwin-Gold** is a powerful Real-Time systems in very compact and robust design. It includes many system features in a small package at a reasonable price. The **ADwin-Gold** is built in a reliable metal enclosure and includes a fast, local Real-Time CPU and memory, analog and digital inputs and outputs, as well as an USB or Ethernet interface for the communication with a PC.

The analog inputs are connected via two 8-channel MUX and two PGA to  $2 \times 16$ bit and  $2 \times 14$ bit ADCs. The signal acquisition is controlled by the **ADwin-CPU**. The sampling rate is determined by the ADC conversion time, MUX settling time, and CPU workload. It is always possible to acquire two channels without any phase-shift, important for correlated signals.

The **ADwin-Gold** has 2 or 8 analog outputs. The output range is  $\pm 10$ V with a settling time of 10 $\mu$ s to FSR and 3 $\mu$ s FSR/10. Parallel updating is achieved by using one DAC per channel, with one register per DAC. It is

possible to first write new values into the register, and then start the conversion for all channels with a single command synchronously.

**ADwin-Gold** provides 32 programmable digital input and output channels at 5V TTL /CMOS level, plus an Event input. The channels can be software selected in blocks of 8 as inputs or outputs. After power-up all channels are configured as inputs.

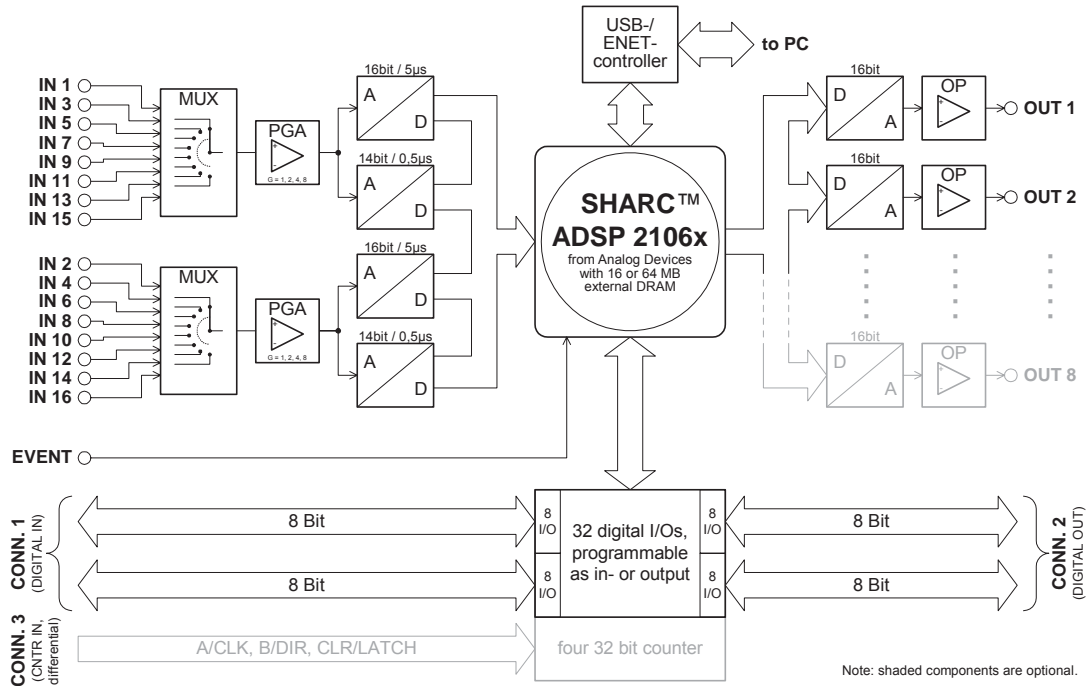
Optional configurations allow additional features such as counters, quadrature encoder interfaces, RS-232/-485, automotive CAN bus interfaces, CANopen<sup>1)</sup>, LINbus<sup>2)</sup> and SSI interfaces.

**ADwin-Gold** can be used in laboratories, on a DIN-rail in industrial machines, or in mobile and in-vehicle applications.

<b>ADwin-Gold</b>	
	<b>System features ADwin-Gold:</b> 2 $\times$ 8 analog inputs, $\pm 10$ V multiplexed to 2 $\times$ 16bit ADC (5 $\mu$ s) and 2 $\times$ 14bit ADC (0.5 $\mu$ s), 2 analog outputs 16bit DAC (3 $\mu$ s), 16 digital inputs, 16 digital outputs D-SUB, 1 trigger input, 1 processor ADSP21062, 32bit, 40MHz, 256kB int. RAM, 16MB ext. RAM, 2m power supply cable to the desktop computer, compact metal enclosure
<b>ADwin-Gold-ENET</b>	<b>ADwin-Gold</b> with integrated Ethernet interface (10/100 Mbit/s), BNC sockets for analog signals
<b>ADwin-Gold-D-ENET</b>	<b>ADwin-Gold</b> with integrated Ethernet interface (10/100 Mbit/s), D-SUB sockets for analog signals
<b>ADwin-Gold-USB</b>	<b>ADwin-Gold</b> with integrated USB interface, BNC sockets for analog signals
<b>ADwin-Gold-D-USB</b>	<b>ADwin-Gold</b> with integrated USB interface, D-SUB sockets for analog signals
<b>ADwin-Gold Options</b> (manufacturing options only, later upgrading is not possible)	
<b>ADwin-G-CAN</b>	Option of 2 $\times$ CAN-BUS (High-Speed), 2 $\times$ RS232/485, 4 $\times$ SSI decoder (only available for <b>ADwin-Gold-D</b> )
<b>ADwin-G-CAN-LS</b>	Option of 2 $\times$ CAN-BUS (Low-Speed), 2 $\times$ RS232/485, 4 $\times$ SSI decoder (only available for <b>ADwin-Gold-D</b> )
<b>ADwin-G-CO1</b>	Option of four 32bit counters, which can individually operate in the following modes: period width measurement, impulse measurement or up/down counters with clock/direction or 4-edge evaluation. Input signal: 5V differential (RS422)
<b>ADwin-G-DA</b>	6 additional analog outputs, 16bit DACs (3 $\mu$ s)
<b>ADwin-G-MEM64</b>	Memory expansion from 16MB ext. memory to 64MB and memory expansion from 256kB int. memory to 512kB
<b>ADwin-G-Boot</b>	Flash EPROM boot-loader for stand-alone operation without PC, only in combination with an Ethernet interface
<b>ADwin-G-Mount</b>	DIN-rail installation kit
<b>Accessories</b>	
<b>ADwin-G-Pow</b>	External power supply (12V DC) for the <b>ADwin-Gold</b> (10–35V)

<sup>1)</sup> via software; <sup>2)</sup> via software and driver

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Analog Inputs		Digital I/Os		Serial Interfaces	
Input Channels	16	Input/output channel	4 × 8, in blocks of 8 software selectable	serial channels	2
ADC/Resolution	2 × ADC @ 14bit	Range	5V TTL/CMOS	Type	RS-232/-485
	2 × ADC @ 16bit	Resistance	10kΩ pull down	Mode	Software selectable
ADC conversion time	14bit: 0.5µs	Input current	10 (1) µA	Baud rate	2,304Mbaud
	16bit: 5µs	Output current	35 (8) mA/ch.	alternative via software	LIN bus
Multiplexer	2	Event input	TTL/CMOS		
MUX settling time	14bit: 3µs	Connector	25 pin D-Type		
	16bit: 5µs				
Input range	±10V				
Input over-voltage	±35V			<b>CAN Bus</b>	
Input resistance	330kΩ			CAN channels	2
Isolation	no			max. clock	1Mbit/s
Gain	1, 2, 4, 8			type	High-speed, automotive
Input type	Differential	<b>Counter<sup>1)</sup></b>		alternative	Low-speed, automotive
Typical INL	±2 LSB	Number of counter	4	alternative via software	CANopen
Typical DNL	±1 LSB	Resolution	32bit		
		Type of counter	multifunctional		
		Frequencies <sup>2)</sup>		<b>General</b>	
<b>Analog Outputs</b>		Event/pulse	20MHz	CPU	ADSP21062/21060 <sup>1)</sup>
Output Channels	2/8 <sup>3)</sup>	Period, internal ref.	40MHz	Memory	16MByte/64MByte <sup>1)</sup>
No. of DAC	2/8 <sup>3)</sup>	PWM, internal ref.	40MHz	CPU RAM	256kByte/512kByte <sup>1)</sup>
Resolution	16bit	Encoder A, B, 0	5MHz	PC interface	USB or Ethernet
settling time – FSR	10µs	Encoder clk/dir	20MHz	Boot-loader	With Ethernet <sup>1)</sup>
– FSR/10	3µs	SSI	1Mbit/s max.	Dimensions	214×67×109mm/ 214×97×109mm <sup>4)</sup>
Output range	±10V	Range	5V TTL or diff. TTL (RS485)	Weight	1320g/1760g <sup>4)</sup>
Output current max.	±25mA	Resistance	10kΩ pull down	Voltage range	10..35V DC
	GND shortcircuit proof	Termination	120Ω <sup>3)</sup>	Current	see datasheet
Typical INL	±2	Resistance diff. TTL		Operating temp. range	+5°C..50°C
Typical DNL	±1			Storage temp. range	-20°C..70°C

<sup>1)</sup> Optional configuration; <sup>2)</sup> min. pulse length -tp- for high or low is equal to  $tp=1/(2 \times f_{max})$ ,  $f_{max}=1/(2 \times tp)$

<sup>3)</sup> between pos./neg. of differential input <sup>4)</sup> with option **ADwin-G-CAN** or **ADwin-G-CAN-LS**;

INL – Integral Non-Linearity; DNL – Differential Non-Linearity; FSR – Full Scale Range;

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