

**EX16 is the high speed, cost-effective alternative solution to a conventional microprocessor controlled PLC. A program is not converted into machine code, but into firmly wired logic. Regardless of how complex the application is, the reaction times between the input and the output signals always remain constant, as no cycle times come about.**

- **High speed - without cycle time**
- 16 digital inputs / 16 digital outputs
- Relay or transistor outputs (EX16T)
- 4 programmable timers, adjustable by potentiometers
- Optionally analog input / analog output
- Integrated programming interface
- Programming to IEC 1131-3 under WINDOWS™
- High interference-protection cause of the mains filter and overvoltage protection
- Easiest programming without programming device
- Absolutely power fail safe
- Plug-in terminals



### EX16 - the High-Speed PLC

16 inputs, 16 outputs and 4 timers permit various possibilities of use, e.g. gate and barrier controls with lights, complete sequence controls, controlling of automatic production machines, substitute of program- or step-by-step switching devices, monitoring and fault-detection systems, control of packaging or gluing units...

As an option, the **EX16** possesses an analog/digital and digital/analog transformer, as a result of which the spectrum of uses is extended by applications such as temperature or pressure monitoring, speed controls ...

All the important functions are implemented by the **EX16** with the help of a single FPGA IC (Field Programmable Gate Array). This results in high speed, maximum reliability and a price/performance ratio unparalleled up to now.

### Functions

Amongst the time functions, any logical connective between inputs and outputs is programmable. With the help of internal registers, signals and linking results can be stored intermediately (markers).

The time ranges can be set even after programming by DIL switches. The times can be infinitely regulated within the time range set by potentiometers, even in ongoing processes.

### Programming

The programming is done either by ZANDER or by the customer with the help of a programming cable which can be connected to the parallel interface of a PC. The production of the software is done with the EX\_PRESS programming system, which runs under WINDOWS™ and represents a sub-quantity of the PLC programming language "Structured Text". EX\_PRESS defines itself from IEC1131-3. The program loaded from the PC into the EX16 is absolutely no-voltage safe without batteries and can be electrically deleted or re-programmed more than 1000 times.

### Mechanical set-up

EX16 can be snapped onto a DIN-rail 35mm. The wiring is done via plug-in screw terminals. 16 green and 16 red LED's give information about the logical state of the inputs and outputs. The potentiometers, just like the programming plugs, are accessible from above, even after installation.

### Customers specified arrangement

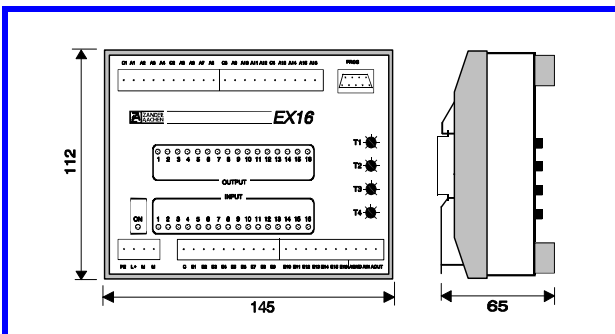
Regarding to your conceptual formulation, in mass production we also fit the hardware. This does not only apply to extensions but also to the renunciation of parts which are not required. So you always get an optimized price-performance-relation.



## Installation

The PLC EX16 needs an unstabilized, smoothed direct voltage supply of DC 24V. Mains filter and over-voltage protection are integrated. The grounding wire must be applied to the connector PE. Because of a higher noise immunity each input is equipped with a signal delay of approx. 1ms (EX16) or approx. 0.1ms (EX16T). As an option the relay-outputs are available with varistor protected connection (EX16V). On the side of the device, there are DIL switches for determining certain operating parameters, such as the basic time ranges.

Specifications	
Operating voltage	DC 24V, +/-20%
Residual ripple	max. 5%
Current consumption	approx. 50mA plus 10mA per activated output
Inputs	each DC 18-30V, also as clock inputs
Outputs:	16 relays or transistors, each 1N/O
Timer	4 integrated programmable timer
Time base	0.1-640s adjustable via potentiometer, via software, also other time bases available
Available internal flags	44 Bit-register add. 1 register per output
Capacity of logical combinations	approx. 5000 AND / 300 OR
LED	each input / output, RUN
Time delay input/output	approx. 100µs
Max. input frequency	ca. 10kHz each input
Temperature range	0 -+50° C
Weight	approx. 550g
<i>EX16, EX16V</i> (16x relays outputs) switching capacity	AC 250V 5A, DC 24V 3A, ohmic load max. sum current of each group: 8A per 4 outputs 1 common connector external fuse required <i>EX16V</i> with additional varistor protected connection 250V
<i>EX16T</i> (16x transistor outputs) switching capacity	DC 10..30V; 0,5A short circuit proof
Analog input/output (option)	1 analog input und 1 analog output each 8 Bit, 0..10V, input also 4..20mA time delay input: 10µs time delay output: 200µs (without multiplexing of inputs)



Conn. Assignment	
Connection	Signal
L+	+DC 24V supply
M	0V supply
PE	PE connector
E1..E16	inputs 1..16
C	0V inputs
AIN	analogue input 0..10V or 0..20mA
AOUT	analogue output 0..10V
AGND	0V analogue input/output
<i>EX16: 16 relay outputs</i>	
A1..A16	outputs 1..16
C1	common conn. A1..A4
C2	common conn. A5..A8
C3	common conn. A9..A12
C4	common conn. A13..A16
<i>EX16T: 16 transistor outputs</i>	
A1..A16	outputs 1..16
U+	10..30V, positive voltage of the outputs
U-	0V potential of the output transistors

Setting of the DIL switches					
Time range	Switches		Time range	Switches	
	3	4		T2..T4	3
0.1..250ms	on	off	0.1..2.5s	on	off
0.03..1s	off	on	0.3..10s	off	on
0.2..8s	off	off	2..80s	off	off
2..64s	on	on	16.640s	on	on

Timer Control T1..T4	
Switch 1:	off - timer runs after switching EX16 on on - start/stop of the timers by A13..A16
Switch 2: o	ff - timer runs for one cycle on - timer runs continuously
CTRL-SW (Control-Switch)	
1: off - A/D transformer inactive; on - A/D transformer active	
2: off - AIN 0..10 V; on - AIN 0..20 mA	
3: off, 4: off - D/A transformer inactive	
3: on, 4: off - D/A transformer permanently active	
3: off, 4: on - multiplexing D/A transformer and A1..A8, controlled by A11	
<b>Attention!</b>	
3 and 4 must not be "on" at the same time!	
5,6: position can be inquired by the program.	
Set 5 and 6 to "off" during programming.	

Order-No	Type
588202	EX16, relay outputs
588210	EX16V, relay outputs with varistors
588215	EX16T, transistor outputs
588220	Analogue-Input/Output EX16V,EX16T (Option)
588290	EX_PRESS for WINDOWS 9x,NT,XP Software with programming cable