Input – Output - extension

CamCon DC16/IO

Digitronic Automationsanlagen GmbH

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For your attention

This instruction manual relates to the CamCon DC16/IO from 3/2017. The company Digitronic Automationsanlagen GmbH reserves the right to make changes which present an improvement of the quality or functionality of the device without prior notice. The instruction manual was created with great care, although it may not be error-proof. We would be grateful for any communication relating to any errors you may have found.

Update
You can also obtain this instruction manual on the Internet at **http://www.digitronic.com** in the latest version as PDF file.

Qualified personnel
This device may only be started and operated by qualified staff. By qualified we mean personnel who are entitled to handle, to earth and to lable devices, systems and power circuits in accordance with the technology safety standards.

Liability
(1) The supplier is liable for damages caused by himself or by the owner of the rights up to the sum of the sales price. He is not liable for loss of profits, forfeited savings, intermediate and successive damages.
(2) The above mentioned limits to liability do not apply to insurance of named characteristics and damages which were caused deliberately or through negligence.

Protection

Note: CamCon is a registered trademark of the company Firma Digitronic Automationsanlagen GmbH.

Note: The devices of the CamCon series comply with norms: DIN EN 61000-6-2, DIN EN 61000-4-2, DIN EN 61000-4-4, DIN EN 61000-4-5, DIN EN 61000-4-8 and DIN EN 55011 and RoHS 2 (2011/65/EU)..

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Content

1. Introduction

The CamCon DC16/IO is used as an input / output extension for the electronic cam-switch mechanisms of the CamCon series. Each CamCon DC16/IO module has got 16 inputs and 16 outputs, it can be connected by means of the external interface of the CamCon DC16, 50, 90 or DC115 devices. By a series connection of several CamCon DC16/IO modules it is possible to increase the total number of inputs and outputs at one Camcon to at maximum 200 inputs and 200 outputs. Thus, at a CamCon DC16 having 16 outputs and 8 inputs another 11 CamCon DC16/IO modules could be connected. With 10 CamCon DC16/IO modules, for instance, you have got additionally 176 outputs and 168 inputs at your disposal. But, please note that the outputs 9 to 16 and the inputs 9 to 16 share one clamp at the CamCon DC16/IO at the time, so that they can be used either as an output only or as an input.

2. Assembling

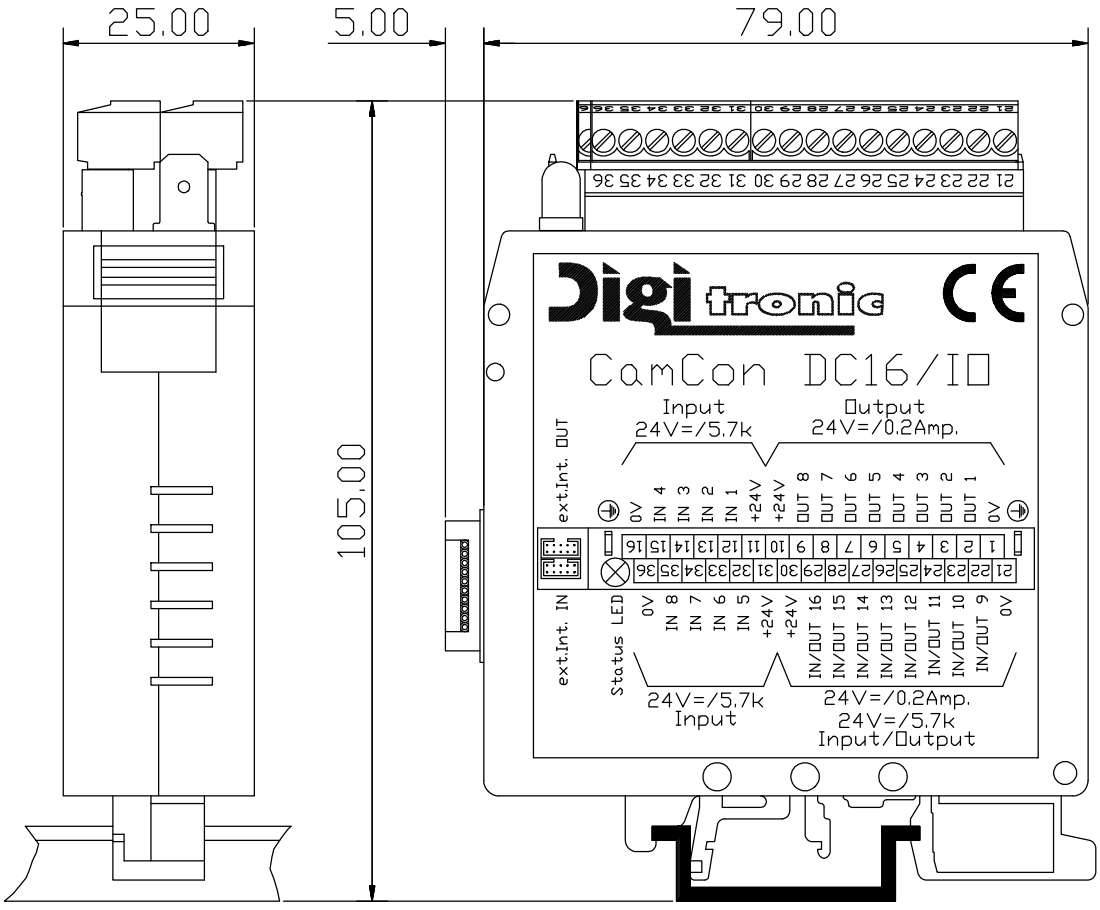
The CamCon DC16/IO input – output extension is locked on an EN carrier bar in the switch cabinet. In order to avoid the overheating of the module there should be an air gap of 10 mm between the devices. The earthing clamps shall be connected to the central earth connection point of the mounting panel on the shortest possible way. By means of the enclosed ten-pole flat cable the external interface of the CamCon DC16 is connected to the ten-pole pin plug **"ext.Int.IN"** at the CamCon DC16/IO module. Each other CamCon DC16/IO module is connected to the plug **"ext.Int.OUT"** by the respective ten-pole flat cable. Each CamCon DC16/IO module shall be connected with the supply voltage which amounts to 24VDC +/-20 %. The data line of the CamCon DC16/IO modules are connected to each other via optical-couplers, thus being free of potentials. For monitoring the data exchange you should program the safety output of the CamCon at the last CamCon DC16/IO module, because this will switch off in the case of an interruption of the cable connection. All cable connections should be established in cold state!

3. Status LED

Depending on the version, the CamCon DC16/IO module has got a three-coloured status LED or a **r**ed and a **g**reen Status LED:

1 LED	2 LEDs	Meaning
dark	**g**+**r** off	There is no supply voltage.
green	**g** on + **r** off	Indicates an operation without errors.
red	**g** off + **r** on	Indicates that the outputs were switched off due to overload or short circuit.
orange:	**g** on + **r** on	Indicates that there is no data exchange by a CamCon at the moment. The possible reasons are: the cable length adjusted at the CamCon exceeds the admissible limit of 300 metres, the CamCon is switched off or the data exchange is interrupted (e. g. by a cable break). In all cases all outputs of the CamCon DC16/IO module are set back.

4. Dimensions



5. Electrical connections

Before you begin with wiring, please consult the following chapters: "6. Outputs" on page 7, "7. Inputs" on page 7.

5.1. Clamping allocation

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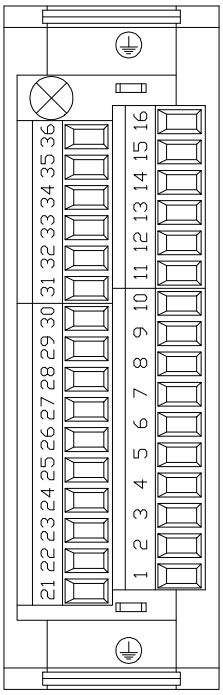


5.1.1. Clamping allocation of the voltage supply

The voltage supply of the device is performed by the voltage supply of the outputs.

Note: 0V clamps 1, 21, 16 and 36 are interconnected.
+24VDC clamps 10, 11, 30 and 31 are interconnected.

5.1.2. Clamping allocation of the outputs 1 - 8

Clamp 1: 0V voltage supply for the outputs 1 - 8
Clamp 2: Output 1
Clamp 3: Output 2
Clamp 4: Output 3
Clamp 5: Output 4
Clamp 6: Output 5
Clamp 7: Output 6
Clamp 8: Output 7
Clamp 9: Output 8
Clamp 10: +24VDC voltage supply for the outputs 1 - 8

5.1.3. Clamping allocation of the outputs 9 - 16 / inputs 9 - 16

The connecting clamps of the outputs 9 - 16 are double used. If, for instance output, 13 is set at the same time input 13 is activated.

Clamp 21: 0V voltage supply for the outputs / inputs 9 - 16
Clamp 22: Output 9 / Input 9
Clamp 23: Output 10 / Input 10
Clamp 24: Output 11 / Input 11
Clamp 25: Output 12 / Input 12
Clamp 26: Output 13 / Input 13
Clamp 27: Output 14 / Input 14
Clamp 28: Output 15 / Input 15
Clamp 29: Output 16 / Input 16
Clamp 30: +24VDC voltage supply for the outputs / inputs 9 - 16

5.1.4. Clamping allocation of the inputs 1 - 4

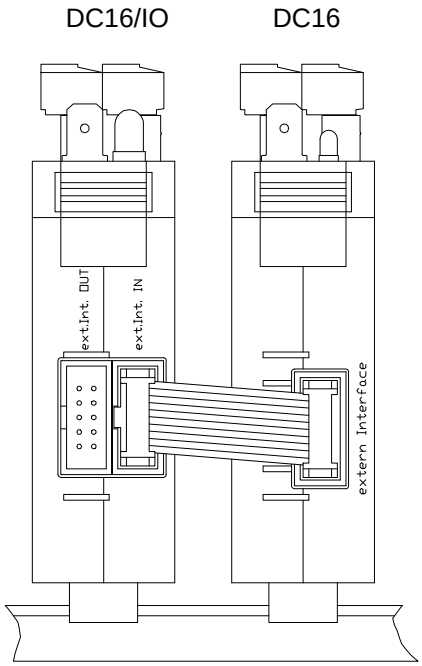
Clamp 11: +24VDC voltage supply, connected with the clamps 10, 30 and 31
Clamp 12: Input 1
Clamp 13: Input 2
Clamp 14: Input 3
Clamp 15: Input 4
Clamp 16: 0V reference potential for inputs, connected with the clamps 1, 21 and 36

5.1.5. Clamping allocation of the inputs 5-8

Clamp 31: +24VDC voltage supply, connected with the clamps 10, 11 and 30
Clamp 32: Input 5
Clamp 33: Input 6
Clamp 34: Input 7
Clamp 35: Input 8
Clamp 36: 0V reference potential for inputs, connected with the clamps 1, 21 and 16

5.2. External interface

The data exchange with the CamCon cam-switch mechanism is performed via the external interface. The CamCon DAC16 module has got two ten-pole pin plugs, the connections **"ext.Int.IN"** and **"ext.Int.OUT"**. The data exchange with the CamCon cam-switch mechanism is carried out via ext.Int.IN. The data exchange with another CamCon module (e. g.. CamCon DAC16, CamCon DC16/IO or CamCon DC91/IO and DC92/I respectively) is carried out via ext.Int.OUT. the data exchange is performed by optical-couplers so that the connection remains free of potentials. By this connection system a bus system can be established for the most various applications. For connecting the DC16/IO module with the CamCon DC16 an approximately 4.5 cm long ten-pole flat cable is enclosed.



5.2.1. Pin allocation of the external interface IN

Pin	1,10:	not engaged
Pin	4,7:	Earth (0V)
Pin	2:	RxD -
Pin	3:	RxD +
Pin	5:	CLK -
Pin	6:	CLK +
Pin	8:	TxD -
Pin	9:	TxD +

5.2.2. Pin allocation of the external interface OUT

Pin	1,4,7,10:	not engaged
Pin	2:	TxD -
Pin	3:	TxD +
Pin	5:	CLK -
Pin	6:	CLK +
Pin	8:	RxD -
Pin	9:	RxD +

5.2.3. External interface having a cable length from 0.5 to 300m

The maximum cable length of the external interface is 300 metres. For this purpose a shielded six-pole data cable with cores twisted in pairs and an adapter cable from the ten-pole flat cable to the nine-pole DSUB plug are needed. The shielding of this cable shall be placed upon the earth plugs at both sides.

6. Outputs

The CamCon DC16/IO has got 16 short-circuit-proof outputs. They deliver 24V highly active signals and they are not free of potentials to the supply voltage of the device. They are supplied with +24 V via the clamps 10 and 30 and with 0 V via the clamps 1 and 21.

At a surrounding temperature of 25°C one output delivers up to 200 mA permanent current. Is the output overloaded or is there a short circuit, the status LED will emit a red light and at the CamCon cam-switch mechanism the fault signal "**Off-Err**" will occur. The fault signal can be acknowledged by pressing the # button at the CamCon or by switching the voltage supply off and on.

Please, note: The outputs 9 - 16 share the clamps with the inputs 9 - 16.

Note: *For inductive loads the outputs shall be wired with a free-wheeling diode. Contactors or inductors, which are located in the switch cabinet in the immediate vicinity of the device or which influence the device or the wiring of the device by their wiring, shall be wired with commutating elements.*

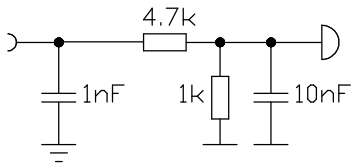
7. Inputs

The CamCon DC16/IO has got 16 inputs. These inputs function with highly active 24 V signals and are not free of potentials. The reference potential (0V) of the inputs is on clamps 1,16, 21 and 36.

Please, note: The inputs 9 - 16 share the clamps with the outputs 9 - 16.

The input resistance amounts to approx. 5.7 KOhm.

Input circuit:



8. Comissioning

Before switching the device on for the first time, please check the wiring of the device. See chapter "5. Electrical connections" at page 5. In order to configurate the outputs, please refer to the sub-chapter “System extension” in the chapter “System adjustment” and to the sub-chapter “SPS configuration” (Option) in the chapter ”Configuration of the device” in the manual of the cam-switch device.

9. Technical data

Indication	three-colour status LED
Number of outputs	16, whereby the outputs 9 – 16 are connected with the inputs 9 - 16.
Number of inputs	16, whereby the inputs 9 – 16 are connected with the outputs 9 - 16.
Length of the connecting cable between CamCon and CamCon DC16/IO	max. 300 m.
Supply voltage	24VDC ±20 %
Output voltage	24VDC, positively connecting
Output current	0,2A per output, short-circuit-proof
Current consumption	approx. 80mA without load.
Connections for:	
Voltage supply and outputs	via plug-in screw clamps IP20
Inputs	via plug-in screw clamps IP20
Assembly	convenient snap-on assembly; carrier bar according to EN 50 022, can be put together with an air gap of 10 mm.
Dismantling	by pulling back the snap lock.
Dimensions	Please see chapter 4. Dimensions at page 4.
International protection	The case fulfils IP20.
Operation temperature	0°C ... + 50° C
Weight	approx. 150 g