Programming Set

DIGISOFT 2000

For CamCon cam controller
Windows® 98, NT, W2K or XP.

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Notification

This booklet corresponds with the state of the software from DIGISOFT 2000 WEB Version 4.35b. The software's version number can be seen in the "?" menu point. The company Digitronic Automationsanlagen GmbH has reserved all rights to alterations without prior notice, if these are followed by an improvement of the quality or the functioning of this piece of equipment.

The instruction booklet has been edited exercising maximum care, but mistakes are not exactly out of the question. We are grateful for any hints concerning possible mistakes in the booklet.

UP-Date: This manual can be downloaded in the newest version on http://www.digitronic.com.

Qualified personal only
Commissioning and operation of the device may only be carried out by qualified personal. Qualified personal are persons, authorized with commissioning, grounding and labeling devices, systems and electrical circuits according to the applicable standards of security

LIABILITY
(1) The salesperson is liable for any damages for which he or the rightful owner is responsible up to the amount of the actual sales price. Liability concerning missed profits, failed-to-appear savings, indirect damages and consequential damage is excluded.

(2) The liability restrictions above are not valid concerning assured characteristics and damages, which are caused by intention or coarse negligence.

PROTECTION

Note: The products of Digitronic are so well constructed that they will not be effected by the millennium.

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

Note: The cam controllers of the CamCon series fulfill the norms regarding electromagnetic emission: EN 55011, EN 55022, EN 55024 Part 2, EN 50082 Part 2, ENV 50140, VDE 0843 Part 2, VDE 0843 Part 4, VDE 0871, VDE 0875 Part 3 ("N"), VDE 0875 Part 11, VDE 0877 Part 2, IEC 801 Part 3, IEC 801 Part 2, IEC 801 Part 4, IEC 801 Part 5.

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Table of contents

1. Introduction

DIGISOFT 2000 is a program designed to program or save data of a CamCon controller DC16/40/51/90/115/300 and DC1756 on PC.

The following 4th version consequently follows the trends towards internet WEB technology, enabling to equip CamCon units with an Ethernet interface (DigiWEB) and maintain them via internet.

Notice: See chapter "9. Differences to older Versions" on page 29.

Using DIGISOFT you can establish the connection to a CamCon online, work at a project offline, read data of a CamCon, write or print in a CamCon or export data into ControlLogix (LK5) or Siemens S7 (AWL) format. Offline, the complete simulation of a CamCon is possible.

1.1. System requirements

Digisoft requires an IBM-PC or compatible PC with a resolution of 1024x768, approximately 5mb hard disk capacity, serial RS232, USB 1.1 or an additional Ethernet interface for programming via DigiWEB, Windows® 95,98, NT, W2K or XP with Internet Explorer 6 and activated JavaScript and hardware connection to a CamCon unit online and data transfer.

Notice: A POPUP - Blocker for the HTTP - domain "http://127.0.0.1" must not be installed.

Attention: *For connecting the CamCon a cable or adapter is necessary. Please also see chapter "*2.2. Hardware installation*" on page 6.*

2. Installation

The installation of the software can be separated into the following steps:

* Installation of the drivers for USB Comuca
* CamCon hardware installation
* Software installation
* Configuration of Software

2.1. Installation of the drivers for COMUCA USB

Whether you got a COMUCA/USB RS485 adapter enclosed to the software or ordered it separately, you first have to install its drivers. This comes on CD or floppy-disk enclosed to the COMUCA or can be downloaded on the internet.

To install the driver, connect the USB-COMUCA to a free USB-port of your PC (you do not need to switch run down your computer for doing this). Windows detects the COMUCA/USB automatically after plugging in and asks for the necessary drivers. Now insert the CD or floppy disk, chose the required drive and path and follow the windows installation-wizard's advices.

Notice: The USB-COMUCA is installed as an additional COM-port. Therefore the USB driver is installed first, followed by the Com driver. Use the DIGISOFT 2000 to choose this virtual COM as an interface.

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Attention: If the COMUCA is plugged out, the virtual Com is also removed and can not be used by DIGISOFT anymore.

See chapter "7.1. Communication processor COMUCA/USB" on page 25.

2.2. Hardware installation

Installing the hardware you first have to establish the connection for the CamCon devices (using the right cable – regard the sticker) to the PC RS232 or the RS485 interface at the level-converter (COMUCA). The following conditions must be regarded:

- Never plug while being on voltage.
- use only the right adapter cables
- do not try to lengthen them by adding additional cable
- take care for a correct contact
- take care for correct polarity.
- Using an RS485 interface, a level- or protocol transformer (COMUCA or COMUCA/USB) is necessary

Using a CamCon with RS485 – interface; connect the RS 485 interfaces of both the CamCon and the COMUCA level converter with the required wire.

At a CamCon device with RS232-interface connect the cable with the PC-Com-interface and the RS232-interface of the CamCon.

Please Notice: Using an RS485 interface, the ends off the data track must be switched with closedown resistors.

Here are the connecting allocations for CamCon-devices known at the moment as well as the order-numbers and specifications (also on stickers at the cables9 for the specific cables.

Specification	CamCon	description
KK16 4-03	DC16	connecting cable from COMUCA to DC16 RS485 interface
KK16 2-03	DC16	connecting cable from a PC-COM interface to a DC16 RS232 interface.
KK40-115 4-03	DC40,51,90,115	connecting cable from a COMUCA RS485 interface to a RS485 interface of a CamCon DC40,51,90 or DC115.
KK33-115 2-03	DC40,51,90,115	Connecting cable from a PC COM interface to a RS232 interface of a CamCon DC40,51,90 or DC115 unit.
KK300 4-03	DC300	connecting cable from a COMUCA to a DC300 RS485 interface.
KK300 2-03	DC300	connecting cable from a PC COM interface to a DC300 RS232 interface.
KK1756 RS485	DC1756	connecting cable from a COMUCA to DC1756 RS485 test - respective. Debug - interface.

2.2.1. Connecting allocations of a serial interface

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2.2.1.1. CamCon DC16 with RS485 interface

Cable type:	"KK16 4-03"	Clamp:	36 B (-)
	Clamp:	35	A (+)
	Clamp:	34	GND

2.2.1.2. CamCon DC16 with RS232 interface (option)

Cable type:	"KK16 2-03"	Clamp:	36 TxD
	Clamp:	35	RxD
	Clamp:	34	GND

2.2.1.3. CamCon DC40, DC51, DC90 and DC115 with RS232 interface

Cable type: "KK33-115 2-03"	Pin	1,4	**must not be used!**
	Pin	2	TxD
	Pin	3	RxD
	Pin	5	GND
	Pin	6-9	not used.

2.2.1.4. CamCon DC40, DC51, DC90 and DC115 with RS485 interface (option)

Cable type:	"KK40-115 4-03"	Pin	1,4	closedown resistors
	Pin 2	B (-)		
	Pin 3	A (+)		
	Pin 5	GND		
	Pin 6-9	not used.		

Notice: The connecting allocations of a serial interface of a CamCon DC40, DC51, DC90 and DC115 are similar.

2.2.1.5. CamCon DC300 with RS485 interface

Cable type: "KK300 4-03"	Clamp:	21	GND
	Clamp:	22	A (+)
	Clamp:	23	B (-)

2.2.1.6. CamCon DC300 with RS232 interface (option)

Cable type: "KK300 2-03"	Clamp:	21	GND
	Clamp:	22	RxD
	Clamp:	23	TxD

Attention: The serial interface of a CamCon DC300 is not free of potentials to an S7 CPU. Wrong connecting or wrong voltage may cause the destruction of the complete S7 PLC

2.2.1.7. CamCon DC1756 with RS485 interface (only for field-tests)

Cable type: "KK1756 RS485"	Pin	2	B (-)
	Pin	3	A (+)
	Pin	5	GND

The flat wire-connecting (length 30 cm) with its ten-poled plug gets plugged into the devices ten pole post plug after being inserted at the devices BUS-side. If the PLC is fully mounted, the cable has to be led between two compartments to the outside.

Attention: The RS485 interface of a CamCon 1756 DICAM is only allowed to be used for field-tests or debug-functions. A permanent assembling is not allowed and could lead to EMV-malfunctions at the PLC.

2.2.1.8. Connecting allocations of a PC RS232 interface

Pin	1,6,8,9	are not used by DIGISOFT 2000.
Pin	2	RxD
Pin	3	TxD
Pin	4	DTR
Pin	5	GND
Pin	7	RTS

Notice: At the RS232 interface RxD of the PC is connected to TxD of the CamCon and TxD of the PC to RxD of the CamCon.

2.2.1.9. Connecting allocations of a RS485 interface at a level-converter

Pin	1,4	not used at COMUCA; at COMUCA/USB and PK232485 the closedown resistors RS485 are situated here.
Pin	2	B (-)
Pin	3	A (+)
Pin	5	signal - GND
Pin	6-9	not used.

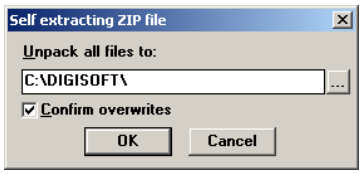
Notice: At an RS485 interface A (+) of the level-transformer gets connected to A (+) of the CamCon and B (-) of the level converter with B (-) of the CamCon.

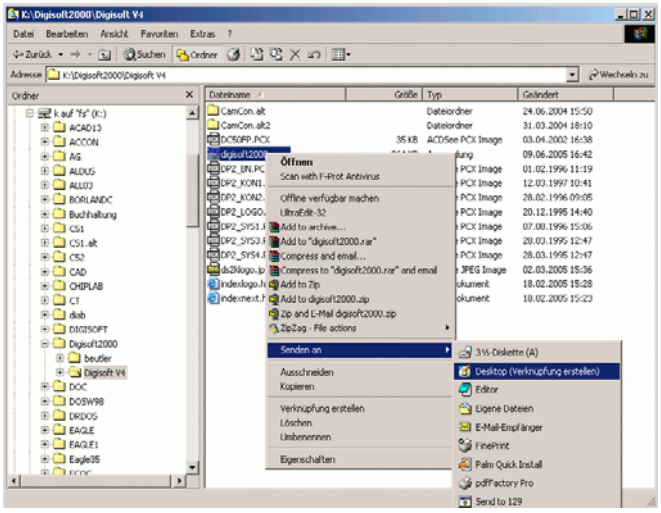
2.2.2. CamCon with Ethernet connection

To program or maintain a CamCon cam controller via Ethernet – interface or via internet, please see the DigiWEB's manual chapter "2.3.2.2. The serial or communication - interface" on page 9.

2.3. Installing the software

Start „DIGISOFT2000.EXE" of the enclosed disk or CD. A dialogue-box as the one shown to the right opens, where you can enter the favoured drive and sub-register (e.g. C:\DIGISOFT). Confirm by pressing OK. The Software is installed at the specified path.





Now open the new created register using the Windows-Explorer and put a linkage of the DIGISOFT2000.EXE file on your desktop.

Shut down the Windows - Explorer and change the new symbol's adjustments on your desktop according to your wishes respective add the desired parameters to configure the program.

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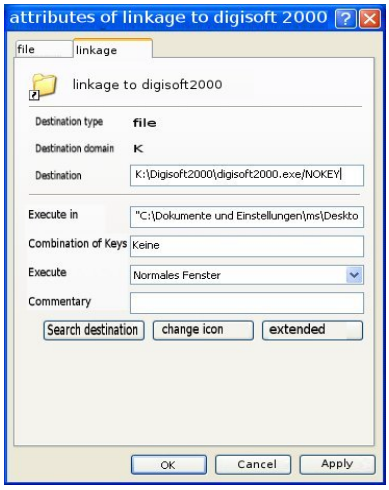
Notice: The linkage's path „execute in" must always lead to the directory in which the Digisoft2000.exe program respectively the HTML – files are situated.

2.3.1. Parameter of the Program

To activate or switch off distinctive features of the software, the program needs parameter or keywords. These are indicated in the attribute menu of the linkage behind the program-name Digisoft2000.exe (accessed by right-clicking on the linkage).

The following parameter can be used:



/NOKEY = No key is requested during data transfer.

/HANDSHAKE1..3

This Parameter sets the mode of the DTR / RTS Handshake conduction on the serial interface.

/HANDSHAKE1 = The DTR and RTS conductions are always switched on (e.g. for a IrDA adapter).

/HANDSHAKE2 = The DTR and RTS conductions are always switched off.

/HANDSHAKE3 = This value has to be set, if using older RS232/485 level-converters. See also chapter "7.3. Level-converter PK232485" on page 27.

Attention: If a COMUCA or COMUCA/USB level converter is used, the parameter /HANDSHAKE must not be chosen.

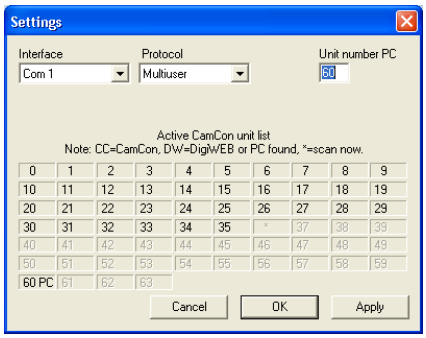
2.3.2. Configuring the software

2.3.2.1. Selecting the language

Start DIGISOFT 2000 and open the menu point "selecting the language" in the menu "Extras" Here you can adjust your favoured language for menus and text-messages of the DIGISOFT 2000 program. At the moment, you can select between 9 languages.

2.3.2.2. The serial or communication - interface

Start DIGISOFT 2000 and open the menu-point „Extras“ in the „Configuration“ menu ".



Here the serial interface, the protocol, the unit-number of the active CamCon and the PC's unit number and for the case of remote maintenance using the DigiWEB, the URL respective IP- and Proxy – address are adjusted and/or the found devices are displayed (CC,PC,DW). E.g. "0 CC" = CamCon devices with number 0 or "7 DW" = DigiWEB with number 7 detected.

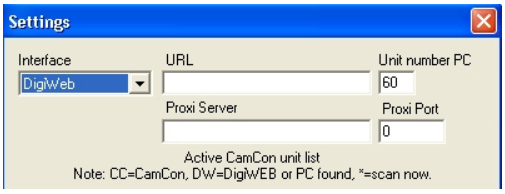
First, choose your favoured communication-interface. This can be set to “Internal”, "Com 1..8", "DigiWEB" or "Ethernet IP".

"Internal" The Digisoft 2000 communication interface is shut down so that the Digisoft program can only be used „offline“ or for simulation purposes.

"Com 1..8" The Digisoft 2000 communication interface is set towards a COM interface. If an interface is chosen that is already being used by another Windows – program, the note „Interface „COMx“ used by Windows or not available!” is displayed.

When using a COMUCA/USB, the virtual COM – interface of the COMUCA/USB is chosen here. This can be detected using the Windows Hardware Manager. In the example shown here COM4 serves as "USB Serial Port". The unit's number depends on your computer's hardware and can alter.

"DigiWEB" The Digisoft 2000 communication interface is set towards a CamCon that is connected to the DigiWEB Ethernet - module.



Enter the IP - respective URL - address of the DigiWEB. When using a PROXI server in your LAN, its address and port number must also be entered here.

"Ethernet IP": The Digisoft 2000 communication interface is set towards CamCon that is installed in a Rockwell ControlLogix 1756 Rack (1756-DICAM).

2.3.2.2.1. Unit number

To identify a PC during „online programming“ or „Data-transfer“ a **„unit number PC“** is required for the setting "Com 1..8" or "DigiWEB".

This number must not be given more than once, therefore every device in an RS485 BUS must have a different unit number. You are allowed to chose unit numbers from °0 to °63 (standard for this is 60).

2.3.2.2.2. Configuration protocol

If "Com 1..8" was chosen as interface, the communication protocol must be additionally set here. At the moment, the CamCon series' devices offer six different communication protocols. These are:

"**Multi-user**", "**Cam-BUS**", "**Standard/ 9600**", "**S5-L1**", "**3964R-n96**" and "**3964R-e38**".

"**Cam-BUS**", "**Standard respective 9600Baud**", "**Multi-user**", "**S5-L1**" and "**3964R**".

If a particular mode is switched on, you have to assure, that the unit to which a connection shall be established supports this communication-mode and is set to the required protocol.

If e.g. the CamCon is set to Standard- or 9600Baud mode and the PC in Multi-user-mode, the PC is unable to establish a connection to the CamCon and the message **“No contact to Unit: XX”** during Online-programming respective “**Contact failed**” during a data-transfer.

If the CamCon's configuration is unknown or for particular reason no contact available, the **„Auto-Contact-Mode“** has to be used. See also chapter "2.3.2.2.3. The "Auto - Contact - Mode" for establishing connections" on page 11.

2.3.2.2.2.1. The "Multi-user" communication mode

This mode in connection with unit number 0 is the factory set standard configuration for CamCon cam controllers. It is also used for RS232 and also for RS485 interface.

If a CamCon with RS485 interface is used, a level- respective protocol converter of the COMUCA/USB type, software version 2 (November 2004) or higher, must be applied or the “Auto-contact-mode” and the “Cam-BUS” protocol must be used.

Hint: An older level converter type PK232485 (for the DOS-program)can be used conditionally in Multi-user protocol, after having started DIGISOFT 2000 V2.16 or later with the parameter "**/HANDSHAKE 3**"..

2.3.2.2.2.2. The "Cam-BUS" communication mode

You should use this configuration (or it gets adjusted automatically) if using a COMUCA-communication processor with RS485 BUS.

Attention: Using this setting, **all** CamCon-devices as well as the PC have to be equipped with a software version 10.1999 or later.

On the contrary to the "**Multi-user**" mode, it is possible to program or monitor several devices from different locations. E.g. CamCon Terminal DC51/T4, the sub display CD10 and a PC.

2.3.2.2.2.3. The "Standard or 9600Baud" communication mode

The Standard respective 9600Baud communication mode works as a point to point communication with the RS232 interface. This means, that a connection between the PC and **one** CamCon-device with RS232 interface can be established (e.g. DC 51 and PC). Hence this configuration does not use protocol saves, this mode is only allowed for field-tests.

2.3.2.2.2.4. The "S5-L1" communication-mode

This configuration can not be chosen at the DIGISOFT 2000, for the S5-L1 BUS is not available for Windows. Using a CamCon with the protocol set to S5-L1, you have to use the „Auto-Contact“-mode to program the device. See also chapter "2.3.2.2.3. The "Auto - Contact - Mode" for establishing connections" on page 11.

2.3.2.2.2.5. The "3964R n 96" communication-mode

This configuration is necessary if you want to program a CamCon cam switch with RS232 interface that is set to the "**3964R n 96**" communication-mode (9600Baud 8,n,1).This is a so called point to point communication mode, which means that only the PC and the cam switch can be connected (and no additions can be made).

2.3.2.2.2.6. The "3964R e38" Communication mode

This configuration is necessary if you want to program a CamCon cam switch with RS232 interface that is set to the "**3964R e 38**" (38400Baud 8,e,1).

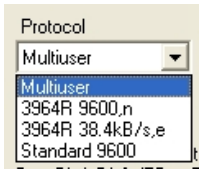
Notice: The communication protocol is set in the CamCon cam switch – choose „Ser:“ main menu "unit configuration “; submenu „unit configuration“.

2.3.2.2.3. The "Auto - Contact - Mode" for establishing connections

If the connection could not be established, the CamCons adjustments are unknown or DIGISOFT 2000 does not provide the protocol that is set at the CamCon, the CamCon’s "auto - contact - mode" must be used, to establish a connection

This mode is only active the moment the CamCon is switched on and also differs depending the type of interface (RS232 and RS485 interface).

2.3.2.2.3.1. The "Auto - Contact - Mode" for RS232 interface

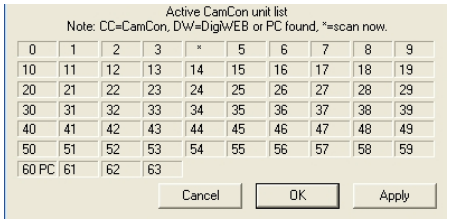


To use the auto-contact-mode for a CamCon with RS232 interface, choose the corresponding PC interface first and set the protocol to "**Multi-user**".

Do **not** leave the configuration menu for from now on an ongoing search for CamCon devices is started.

Connect the CamCon device with the corresponding cable to the Com-interface and switch on and off the CamCon’s voltage

Now the detected device should be shown in the „List of active CamCon units“ window, marked with „CC“. To the right, you will see an active CamCon at position 0.

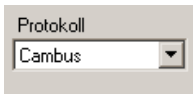


You can establish contact to this unit via the programming menu online, or transfer data to the CamCon and back via the menu “Transfer”.

Now you can configure the favoured protocol mode (Ser:) and the favoured device and unit number in the menu **"unit configuration"**, submenu **"unit configuration"**, if necessary. This configuration is used after the first switching on of the device.

2.3.2.2.3.2. The "Auto - Contact - Mode" for RS485 interface

To use the auto-contact-mode for a CamCon with RS485 interface, you first need a COMUCA respective COMUCA/USB RS485 communication-processor. Connect the COMUCA to the PC (COM or USB), switch on voltage and choose the corresponding COM-interface. The red LED at the COMUCA should flash now.



If the COMUCA got detected by DIGISOFT 2000, the protocol should automatically change to Cam-BUS. If this is not the case, check the configurations, restart DIGISOFT or cut off the COMUCHA’s voltage..

Do **not** leave the configuration menu for from now on an ongoing search for CamCon devices is started.

Now connect the CamCon device (one device once) to the COMUCA’s RS485 interface, using the corresponding cable, and switch on and off voltage at the CamCon (do not switch off the COMUCA).

Now the detected device should be shown in an „Active CamCon“ display, marked with „CC“. You can now establish contact with it „online“ using the “communication” menu or transfer data via the „Transfer“ menu to the CamCon and back.

Set now, if necessary, the protocol-mode (Ser) at the CamCon to Cam-BUS online, as well as the favoured device and unit number using the menu **„unit configuration”**, sub menu **“unit configuration”**. This configuration is used after the first switching on of the device, so that you do not need “auto-contacts” any more.

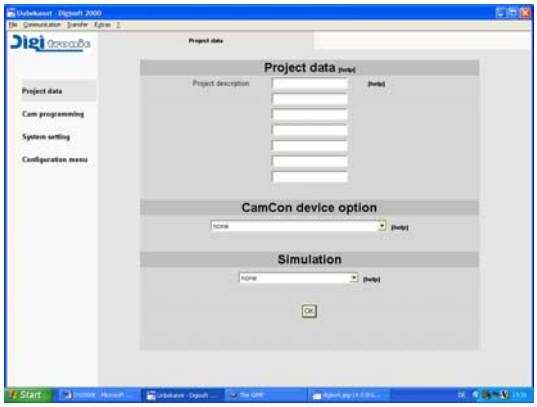
Repeat this for all devices at the RS485-BUS, but with alternating unit numbers (one per unit). If all devices are set and connected rightly, they are displayed in the unit-list.

Notice: If you can not establish contact to a CamCon unit, perhaps the interface is defect, the cable wrong or the firmware at the CamCon to old. In this case please regard chapter "8. Firmware UP - Date at the CamCon" on page 28.

3. Programming

3.1. Programming "Offline "

For this purpose select „new“ in the „file“ – menu or open an existing project using the „open“ button. In both cases the following menu respective the following WEB programming interface will be displayed.



Now you are able to configure the required parameter for your CamCon cam controller.

* Begin with the project data:
  save for example data like unit number, author, date of the last change and further information that you consider important.
* The choose the "**CamCon device option**":
  At the moment 4 options for the CamCons are available for order:

1. PLC - logic - module
2. PLC - logic - module with text display.
3. PLC - logic - module with text display and remanent storage capacity
   Notice: The "remanent storage" is used to save meter readings and flag bits protected from power outages. For this, the hardware option EEProm – storage upgrade "C" is required.
4. PLC - logic - module with text display and tool – protection

Chose here the options available with your CamCon:
On the CamCon’s type-plate the installed options can be detected from the last two digits of the order number (0 = no option / S = PLC – logic – module+ text display + tool protection). The remanent option can be detected from the character C at the storage extension of the CamCon (e.g. DC51 S5**C**24002M or DC16 S5**C**04S).

Attention: If setting an option that is not available at your CamCon, an error-message will occur during the data transfer. As long as this option is active in the project, it can not be switched of. If, for example tool-protection is active, it must be deleted before this option can be disabled.

* Additional the hardware "**simulation**" can be activated. This gives you the possibility, to simulate the encoder, path measuring system, hardware inputs (I) as well as the Black – Plan inputs (V) of an S7 or ControlLogix in “Offline”-programming.

After pressing the "adopt“- button, the menu is reloaded using the chosen settings, so that you are able to begin with the data input fort he CamCon. See also chapter "3.1.1. Data input" on page 13.

Hint: Most of the several menu – points have an attached [Help] – link, that offers a short explanation fort the specific menu point.

Hint: You are still able to use the „traditional“ programming interface for offline programming. For this purpose choose the menu point „terminal offline“ in the „communication“ menu after opening the file.

The „classic" CamCon DC51 programming interface will appear. It is described in the manuals fort he CamCon devices.

3.1.1. Data input

For the data input for a CamCon – project we recommend the following procedure:

* Menu "unit configuration" -> "Hardware"
  - Define the number of hardware inputs and – outputs of the CamCon (CamCon hardware + external hardware, e.g. DC16/IO).
  - If available enter also the data for the CamCon CP16 ProfiBUS – interface.
* Menu "unit configuration" -> "PLC configuration".
  If necessary and available, set the CamCon PLC – logic – module’s parameter.
  - Module switched on or off.
  - Number of flags, counters, shift registers, ... etc.
* Menu "system configuration".
  Set also the parameters for the CamCon cam switch device:
  - Menu "system extension":
    - Set the numbers of in – and (cams) outputs. If the PLC – logic – module is switched off, this has already been done with the hardware – configuration.
    - Define the number of cam – outputs with speed compensation and, if necessary, the number of NLTs (non linear speed compensation) that shall be used.
  - Menu "position measurement system":
    - Configure the position measurement system respective the encoder.
  - Menu "cable length":
    - Set the cable length between the CamCon and the SSI – path measuring system.
      Hint: If neither an SSI – path measuring system nor an IO-extension at the „external interface“ is used, this should always be set to 0 meter.
    - Set the demanded cycle time, if necessary (default = 0,000ms).
  - Menu "path configuration":
    - set the zero-point of the position measurement system respective the encoder.
  - Menu "speed":
    - Set the CamCon’s speed here.
  - Menu "Special Outputs":
    - Configure, if necessary, the optional special outputs.
  - Menu "Master program":
    - Define the master program and master outputs if needed.
* Program the cams using the menu „cam programming“.
* Program the logic in the „PLC – logic – module“ menu if necessary.
  - Enter short descriptions and comments for both in- and outputs as well as fort the flags using the „Symbol Editor“.
    Hint: The symbols are saved in a CSV – file, and can therefore also be altered using e.g. MS-Excel.
* Program, if necessary respective available, control modules using the „WZS“ menu.
* Simulate and test the program using the hardware simulation, menu simulation.
* After finishing the simulation, transfer the project via data transmission to the CamCon. See also chapter "4. Data transfer" on page 16.

3.1.2. The Simulation

For the development or test of complex programs of the CamCon PLC – logic – module the simulation of the Digisoft – program can be used.

Digisoft works like respectively simulates a CamCon cam controller during offline simulation, except for the hardware components to display the outputs and to read in inputs and position measurement systems.

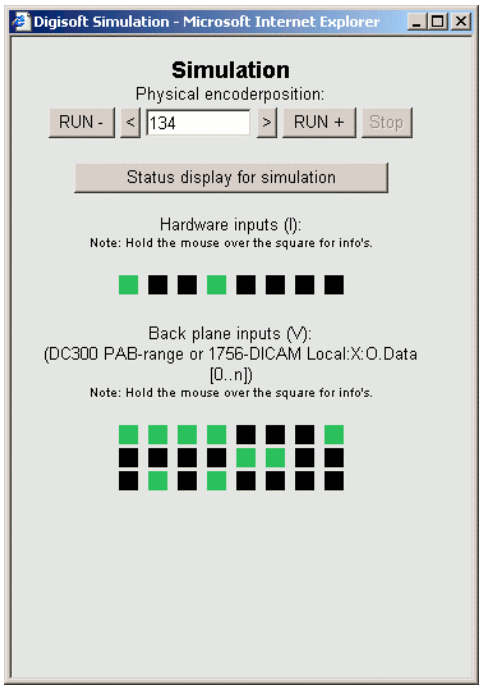
To test a program, a hardware output is not necessary, since the status display shows the situation of the outputs even without hardware. For inputs, a hardware simulation is, nevertheless, necessary.

The following hardware devices can be simulated:

* The position measurement system.
* The CamCon's hardware inputs.
* The virtual CamCon (V-)inputs of the S7 (PA) and of the ControlLogix (Local:X:O) – Back - Plan

it is impossible (at least at the moment) to simulate:

* The special position measurement system AG615.
* The special inputs S001 - S006 of a PLC – logic – module.



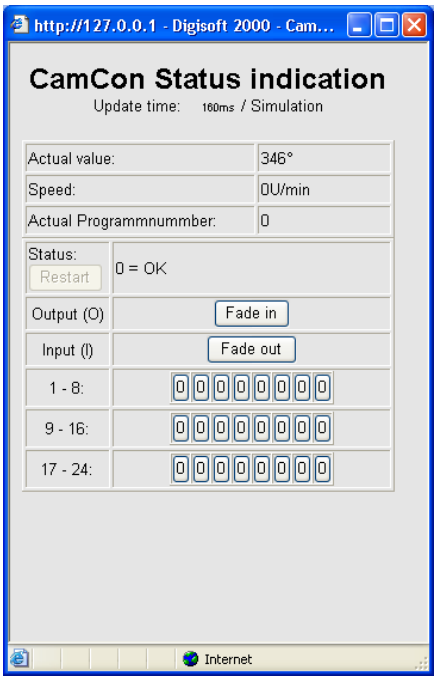
By clicking the menu point "Simulation" the window shown to the right is opened (POPUP).

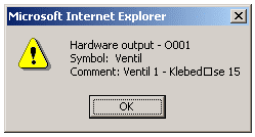
Here the position measurement system can be set to.

The buttons "RUN +" and "RUN -" change the „physical" actual value changed in steps of +1 or -1. Every further click increases or decreases the step's sizes further on. The „Stop"-button will cause the system to come to an immediate halt.

The actual value can be changed using the ">" and "<" buttons (one step per click), or directly get entered into the input line.

Hint: The simulation of the position measurement system is done „physically", that means that if in the system settings a shift of the zero point, a turn in the direction of rotation or a gear shift factor is et, the displayed value does not any longer meet the value in the status display or the value for the calculation of the cams.





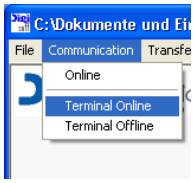
By clicking the "Status display for simulation"-button a "Status display fort he Simulation" of all signals defined in the CamCon, like e.g. outputs, flags etc. will be displayed.

The hardware inputs and the virtual inputs of a PLC will be switched on (green = 1 = set) respective off (black = 0 = reset), by clicking the small squares.

Notice: While holding the cursor above one of the squares, or clicking a signal in the status display, you will get hints concerning its functions from the projects symbol – databank.

Hint: To Increase the display velocity of the status display, you can blank signals which are not necessary for your purpose.

3.2. Communication "Online"

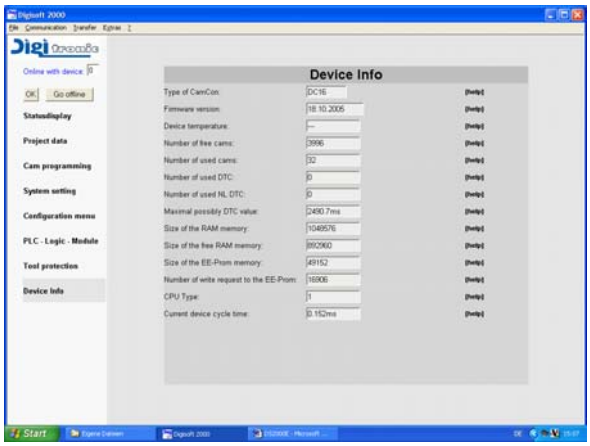


Before going “online“ with a device, save and shut down all remaining offline activities. Connect the CamCon with a level converter (if necessary) to your PC and switch on the CamCon’s voltage supply. Test the “configurations” in the menu „extras“ (see also chapter "2.3.2.2. The serial or communication - interface" on page 9). An available CamCon must be displayed here, for example by a display 0 CC or the text "Scan OK = CamCon Online".

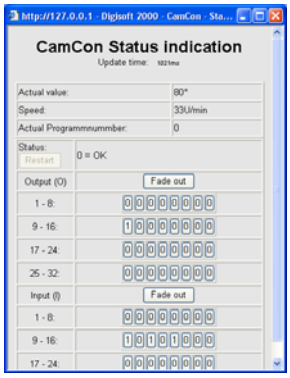
Now you are able to choose between two „online“ modes in the „communication“ menu:

3.2.1. Online

If choosing this menu point and entering a CamCon unit number (according to the selected communication protocol), Digisoft 2000 will open the CamCon’s „WEB“ programming interface.



On the contrary to the „offline“ programming additional features and settings are now available.



The online status display

These are, for example, a „status display“ the menu „unit information“ and the possibility to change online connections or to cut them as well as functions that can only be altered in the “online” unit configuration like e.g. the unit number or the communication protocol or the possibility to delete the whole CamCon’s storage.

The online unit configuration

Hint: To increase the display- or indication speed, the required signals can be masked.

3.2.2. Terminal Online

Choosing this menu point and (according to the used device) entering the CamCon’s unit number, the “classic“ programming display for CamCons will appear. It is well described in the manuals for the CamCon devices.

If the online connection can be established, the CamCon’s main menu will appear in the terminal window (otherwise an error-report like e.g. „no contact to UNIT 2!“ will occur). The CamCon can now be operated online, and the state of the device can be monitored during the process.

Hint: It is possible to manipulate the displayed buttons using the mouse.

3.2.2.1. Error messages during „online“-connection

If an online connection to a CamCon with new "WEB" – surface can not be established, an error message will be displayed in the Digisoft's main window.

Display the message to the right is displayed.
Reason: The CamCon's firmware is not suited fort he new online programming via WEB-surface.
Solution 1: Update the CamCon's firmware. See also chapter "8. Firmware UP - Date at the CamCon" on page 28

Notice: In the line "Date necessary" you will be able to check the firmware's date, that is necessary for online programming, respectively that is installed at the CamCon at the moment.

Attention: Is he CamCon's software from before 8.11.2000, an upgrade is impossible, so that only solution 2 can be taken into account.

Solution 2: Use the classic programming interface for online programming as described above.

Display: the message to the left is displayed.
Reason: An online connection could not be established. No CamCon could be detected, the cable connection is interrupted, the protocol is set wrongly or the voltage supply is down.
Solution: Check in the menu "Extras" -> "Configurations“ the interface's parameter, the protocol and the CamCon device number. The desired device must be among the „list of active CamCon units“(display 0 CC or "Scan OK = CamCon Online"). Repeat the procedure.

4. Data transfer

Before beginning with data transfer, all possibly existing „offline“ projects must be shut down and saved. Connect the CamCon to the PC's level converter, if necessary and switch power on. Check the menu point „configuration“ in the „extras“ menu (see also chapter "2.3.2.2. The serial or communication - interface" on page 9). An available CamCon must be indicated here, for example by showing the display 0 CC or the text message "Scan OK = CamCon Online".

To start the data transfer, open the menu „Data transfer“, where you can choose whether you want to transfer data from the CamCon to the PC or vice versa.

4.1. Data transfer, saving data on the PC

Having selected „cam switch -> PC", you will be asked to enter the CamCon's unit number, if required for the chosen protocol. Enter the selected device number and confirm by pressing “Start” to start the data transfer.

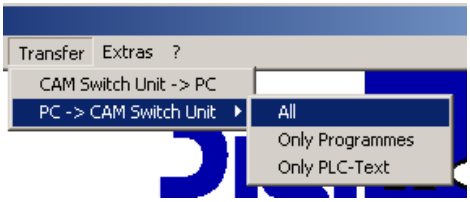
The data transfer state is now displayed by means of the logical record respective block number, beginning with 0 and ending with the number of records saved in the CamCon unit.

Once the data transfer was successful, a file selector opens. Choose now the desired directory on your hard disk and enter a filename, by which the CamCon's data shall be saved. A CamCon data- or project file of Digisoft 2000 WEB V4 always has to have the ending ".DC3" and is not compatible with Digisoft 2000 V2 and it's file ending „DC2“.

Once the data transfer could not be finished successfully, an error message is displayed. For further information on this, see also chapter "4.3. Error messages during data transfer" on page 18.

4.2. Data transfer – transfer data to a CamCon

The menu point „PC-> cam switch“ first gives you the opportunity to choose between three types of transfer. These are:

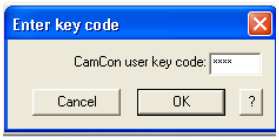


All All data of the chosen DC3-file will be transferred.

Programs only Only Cams or Cam programs from the DC3file are transferred to the CamCon. The system configuration will not be changed.

PLC-Text only Only messages of the CamCon of the “PLC – logic – module” will be transferred from the DC3 file to the CamCon. The system configuration, PLC-Logic and cams will not be changed

Having selected the desired type of transmission, the „.DC3“-file that shall be transmitted is searched. According to the chosen protocol, the CamCon unit number is requested and the data transfer started.



Once a CamCon was detected at the interface, a dialogue box will ask you to enter the „CamCon user key“. Enter the CamCon’s user-key, licensed for unit configuration (menu 4) deposited at the CamCon (standard 5693), so that an accidental overwriting is impossible. If the key is correct the data transmission will be continued.

The data transfer’s status is indicated as a running number (record – respective block number). This starts at 0 and ends at the number of data-blocks already saved in the DC3-file.

Attention: Beginning a transfer type "All" and the display of block-number 0 the complete EEPROM memory of the CamCon will be **ultimately deleted**!

If the data transfer was finished successfully, the message “data transfer successful” is displayed; in any other case an error message is shown. See also chapter "4.3. Error messages during data transfer" on page 18.

4.3. Error messages during data transfer

If an error has been detected during data-transfer/data transmission, a display like the one shown right is displayed.

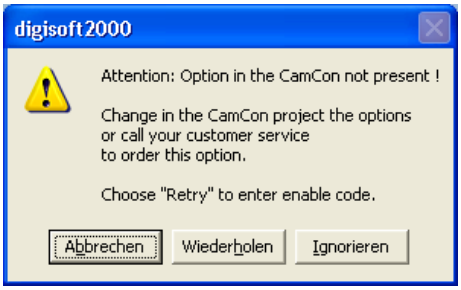
Message: "**Contact-establishing failed**"
Cause: No CamCon was found at the interface or no data transfer was started.
Solution: Check the COM interface's parameter, the protocol or the chosen device-number in the menu „Extras -> Configuration". The favoured device must be marked in the "list of active CamCon units" (displayed as 0 CC or "Scan OK = CamCon Online"). Repeat this procedure.

Message: "**Data transfer failed**"
Cause: Data-transfer was started, but could not be finished. This could be the case, if the CamCon's voltage drops, the interface is interrupted, the data for transfer does not fit into the CamCon's EEPROM storage or the transmission was interrupted by pressing the "cancel-button.
Solution: Check the wiring and the status displays of the COMUCA and the CamCon. Check the files length of the DC3 file. This must not be bigger than the EEPROM storage supported by the CamCon. Regarding the upgrade-status (as shown on the type plate) you can identify the EEPROM storage (0=2kB, S=8kB, M=16kB, E=32kB, L=48kB and C=128kB EEPROM storage). Repeat this procedure.

Attention: Once the data transfer was interrupted, the CamCon's status is not exactly defined!

Message: "**Key wrong**
Cause: Data-transfer could not be started, for the saved user key being wrong or not confirming with the one saved at the CamCon, or has no access to menu 4 "unit configuration".
Solution: Repeat this procedure using the right key. The standard user key is "5693". If you do not know the key, you are able to switch off the request using a program-parameter. See also chapter "2.3.1. Parameter of the Program" on page 8.

Message: "**Option in the CamCon not present!**"
Cause: You are trying to transfer a project hat has at least one option activated which is not available at the CamCon.



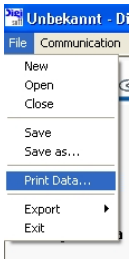
Solution:
- Interrupt the transmission and change the configuration „CamCon unit option" to an option that is supported by the CamCon, in the project's „Project data". Now repeat the procedure. See also chapter "3.1. Programming "Offline " on page 12.
- Click „repeat" and use the „Supervisor Key" you will now get, to ask for an „unlock key" from the service department. Use this to activate the desired option at the CamCon

  Attention: Not all CamCons support all options! In case of doubts contact the service department.

- Choose „ignore" to transfer the project anyhow to the CamCon.

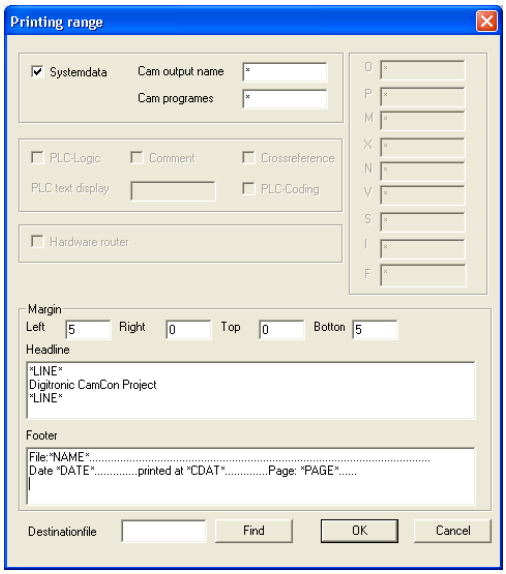
  Notice: Once a project with activated PLC – Logic – module is transferred to a CamCon unit without clearance for PLC - logic – module, this will be deactivated without further acknowledgement.

5.Printing



For printing purposes, a project has to be opened or created using the menu „file“, followed by selecting the menu point “print data” also in the “file” menu.

A dialogue as the one shown to the right opens, where you can configure the data that will be printed. This is necessary since a complex CamCon-project easily has hundreds of pages.



Configurations are:

- **System data**
  Once this checkbox is activated, the system data of the CamCon get printed (position measurement system, number of in- and outputs etc.).
- **Name of Cam**
  The names of the cam tracks in the defined printing range are printed.
- **Cam programs**
  The point of switching in and off the cams and the speed compensation of all selected cams gets printed.
- **PLC-logic**
  Once this checkbox is activated, all networks off the chosen printing range O, P, M and X of the PLC-logic are printed.
- **PLC–Logic – comment**
  Once this checkbox is activated, the comment from the symbol file fort he specific network and its included signals is printed.
- **PLC–Logic - cross references**
  Once this checkbox is activated, a list of **Cross references** for all I/O-signals is printed.
- **PLC - Logic - text display**
  Texts from the PLC – Logic – text display of the selected printing range are printed.
- **PLC - Logic - PLC - encoding**
  A decimal encoding of the PLC – logic – module – matrix is printed. This is only necessary if e.g. CamCon’s logic shall be changed in an S7 program without making use of Digisoft2000’s export function. See also chapter "6. Export" on page 21.
- **Hardware router**
  This checkbox can only be activated, if the extended hardware – routing is active. Once this checkbox is being used, the data of the CamCon’s hardware – router are printed.

5.1. Defining or selecting a printing range

The definition of a printing range is necessary for the cam names, the cam programs, the PLC-text displays and the signals (O, P, M, X, N, V, S, I, F) of the PLC – logic – module, to reduce the amount of printing data.

A printing range can be chosen by the following inputs

- Empty no data will be printed
- * All data will be printed
- 1 only the data for output 1 will be printed
- 1,2 only the data for e.g. outputs 1 and 2 will be printed
- 1-9 only the data for outputs from 1 to 9 will be printed
- 1,5-9 the date for the outputs 2 and 5 to 9 will be printed.

5.2. Configuration of printing rims

The input windows „left“, „right“, „above“ and „below“ enable to enter the distance to the page’s rim in digits.

5.3. Defining Headline and Footer

Both entry boxes „Headline“ and „Footer“ can be used to include your specific layout ort he one of your company. Apart from the possibility to enter any text independently, you can use preset variables to format or put out additional information.
Predefined variable:

- *LINE* = A line covering the entire page is printed from the left to the right
- *CDAT* = the actual date is printed.
- *NAME* = the filename is printed.
- *DATE* = the date „last changed at …“is printed.
- *PAGE* = the number of the actual page is printed.

Notice: Take care to have all variables (except for *LINE*) followed by enough spaces to enter he expected signs.

Example headline:

```
*LINE*
Digitronic CamCon Project
*LINE*
```

Example footer:

```
*LINE*
File:*NAME*.....
Date *DATE*.....printed at *CDAT*.....Page: *PAGE*.....
```

5.4. Print in file

If you have the wish to embed the CamCon unit’s project data in a word processing like e.g. Word, you can use the entry box „target file“ to enter a filename or click “search” to search for a text file (.txt) that shall be written.

After having confirmed by pressing “OK”, the output is written into the selected text – file.

6. Export

The „Export“-function enables, converting a CamCon-project into the PLC-form of an S7 (AWL) or ControlLogix 1756 (L5K).

The exported data’s structure is made up in a way that it can be integrated in already exciting DIGITRONIC handling-components for DC300, CP16/P and 1756 DICAM without problems.

Condition: Using a 1756-DICAM assembly, the English handling-components version 1.40 or later; using a DC300, version 1.20 or later and for CP16 version 1.40 or later have to be used.

All system-, Cam-, delay-time-, and PLC-Logic-module-parameter can be exported, so that the complete data of a DC300 and 1756DICAM can be saved in the PLC. This enables exchanging devices with following re-programming by the PLC.

Notice: With a CP16/P (profibus module) the re-programming can only be done if the hardware-configuration and the profibus address are already configured at the CamCon, the profibus address is already adjusted and the communication with the S7 - CPU has been successfully established (green LED has to light permanently).

The main procedure to create or develop a project for a DC300 or a 1756-DICAM is similar.

Creating a project can only be done „offline“ at the PC or „online“, using a serial interface at the CamCon-device. While programming “online” you can simultaneously test- or monitor a software.

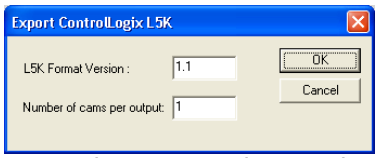
- If choosing the "Online" procedure, all required CamCon parameter such as hardware-configuration, measuring system, number of Cam outputs, number of outputs with speed-compensation, PLC-Logic-module networks and so on are created and configured “online” and can be tested directly.

  After having finished this creation, transfer the project’s data via DIGISOFT 2000 transfer-menu from the CamCon to the PC. After that, open the project in “Offline” mode and save all data. Now, the actual export can be done.

- If choosing the "Offline" procedure, for the reason that e.g. no interface is present (1756-DICAM), all required CamCon parameter the likes of hardware-configuration, measuring system, number of Cam outputs, number of outputs with speed-compensation, PLC-Logic-module networks and so on have to be created or programmed “offline” by the DIGISOFT 2000. For, this purpose, the DIGISOFT 2000 simulates a complete CamCon.
  By doing this, you are now able to enter the parameter, cams, speed compensation – and logic.-functions and test them using a PC. See also chapter "3.1.2. The Simulation" on page 14.

  If the simulation was successfully finished, the actual export can be done.
  Using the "Offline" process, it is most certainly necessary to repeat the whole procedure several times.

6.1. Export to ControlLogix (L5K) for 1756-DICAM



Open the desired project and continue by choosing "File" -> "Export" -> "ControlLogix L5K". A dialogue box will appear, in which you can enter the needed L5K parameter.

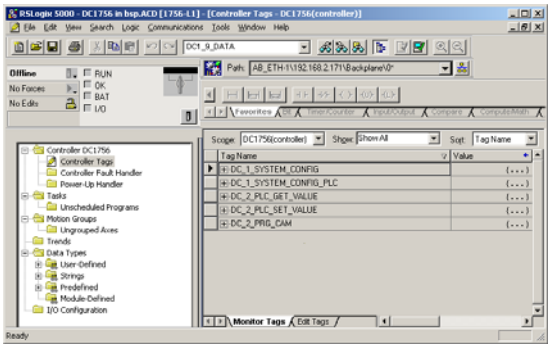
Depending on the particular used RSLogix 5000 version, you know enter the L5K version-number. This is e.g. 1.1 for RSLogix 5000 V8 or 2.3. for RSLogix 5000 V12.

Notice: Should you be not sure about the version, create a L5K file with version 1.1 and open it with your actual RSLogix 5000 version. An error message as following will be displayed: `"Error: Line 7: Import Export version mismatch. Expected version is 2.3."`. By doing so, you are able to identify your program's version.

The second parameter defines the number of Cams per output (Cam-track) that can be programmed by an PLC in 1756 DICAM later on. Having, for example, defined 32 outputs and made an input of 5, a TAG to save 32*5=160 cams is created.

After having confirmed your input by pressing "OK", the data is exported. If the exportation has been successful, the message "successful converting" is displayed. Otherwise, an error message is displayed. See also chapter "6.3. Export, Error messages" on page 24.

In the same register on hard disk as the DC3-file, a new LK5K-file is located. Open it using the RSLogix 5000 program. The program now waits for the data to be imported into an ACD-file. Create a "DUMMY" file for this purpose. If the import was finished without error messages, you know have the project's data of the 1756 DICAM in the controller TAGs



Now open the actual project in a second RSLogix-session and copy the TAGs from the „DUMMY"-project via clipboard into this project.

Because the TAGs at the "DUMMY" project have the same name, the TAG-names of the copy automatically get an ending with an additional "1".

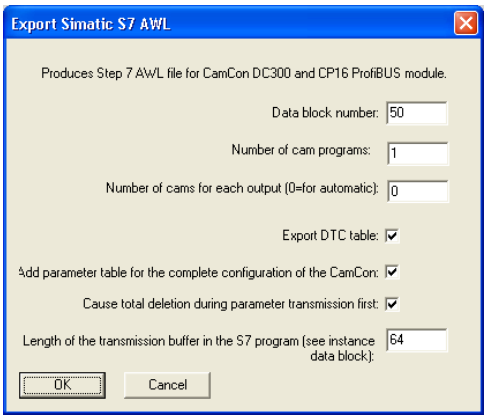
To activate these TAGs, delete the old TAGs in the actual project and re-name the new Tags (remove the "1").

After having downloaded the project into the ControlLogix, you just have to set for the particular TAGs the Bit "ADR.CMD.WRITE" (for an ARRAY e.g. TAG "DC_1_SYSTEM_CONFIG_PLC" – best using a loop), to transfer data into the DICAM.

If the data-transfer was successful, the Bit "ADR.CMD.OK" in the particular TAG is set to 1.

For the TAGs of an ARRAY (e.g. "DC_1_SYSTEM_CONFIG_PLC") the handling components always get a separate OK Bit (e.g. "DC_1_SYSTEM_CONFIG_PLC_OK"). This is set to "1", if in **all** elements of an ARRAY the Bits "ADR.CMD.OK" are set to "1".

6.2. Export to a S7 (AWL) for DC300 and CP16/P



After having chosen and opened the desired project, choose „File“ -> "Export" -> "Simatic S7 AWL". A dialogue box in which the S7 AWL parameters are entered will open.

- **Data-component Number:**
  Number of the data component in your S7 program, which contains the CamCon data.

- **Number of Cam-programs**
  Number of Cam-programs, beginning with 0, that will be exported from the DC3 file. Example: 0 = no Cam-chart is created. 2 = Program 0 and 1 of the CamCon-project are created in the DB

- **Number of Cams per output**
  Number of Cams, for which storage is reserved in the DB and that later on can be programmed by the S7 of the CamCon. If a 0 is entered here, only the storage is reserved in the DB, that is needed for Cams that are already entered or do exist in the DC3-file.

- **Speed-compensation table:**
  Depending on this checkbox, a speed compensation table is created for the outputs with speed-compensation (DTC).

- **Table of parameter:**
  Depending on this checkbox, a table of parameter RK512) is created for the complete parameterisation of the CamCon.
  This table provides all required parameter for the CamCon Hardware, the measuring-system, the speed-measuring, the special functions, the tool protection and the CamCon’s PLC-Logic-module’s network.

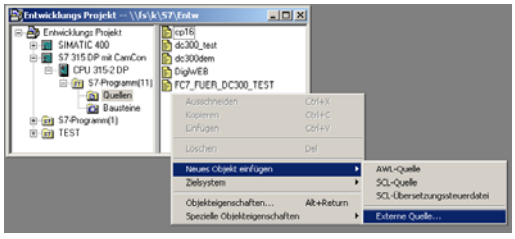
- **When transferring parameter release complete deletion first:**
  Depending on this checkbox, delete the EEProms data-storage, if the parameters are written (if a parameter sheet was created) (Bit 1.4 in the FB command word of the handling components).

  Notice: If the Logic in a network of the CamCon’s PLC-Logic module is changed, the CamCon should always be deleted, if a new Logic is transferred, for the purpose of saving storage (in the S7) the parts of the S7 are not transferred, that are not used in the DC2. These could still be programmed in the CamCon and so cause malfunctions.

  At a CP16 this configuration is ignored, since a complete deletion would switch off the communication with the S7.

- **Length of the send-compartment in the S7:**
  This parameter has to be set to 64 at the moment. It was designed for alternations at the S7 handlings components in the future.

After having confirmed the input by pressing "OK" the data is exported. If the export is finished successfully, the message “Successful converting" will be displayed. In all other cases an error message is shown. See also chapter "6.3. Export, Error messages" on page 24.



In the same register on your hard disk as the DC3 file an AWL-file will appear. Put this as a „new object“ in the „Source folder“ of your actual Step 7 project and open it double clicking.

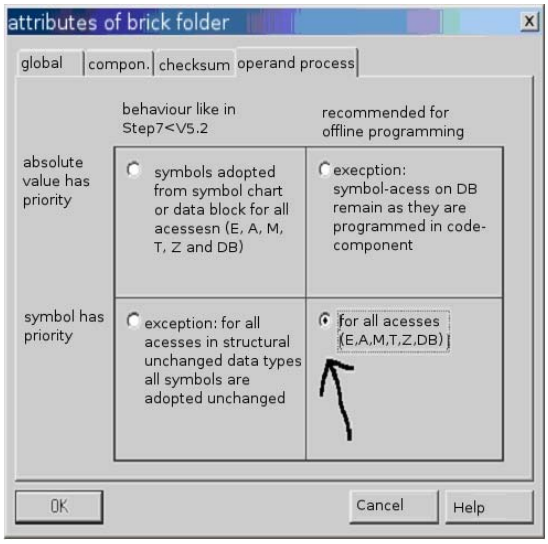
!!! Caution!!! Now choose the point „translate“ in the menu „File“. The corresponding data-component in the component-folder of the Step 7 will be overwritten or created anew without any further warning!

After downloading the DB into the S7 you just have to set the corresponding Bits in the FB command word (IN_BEFEHLE) of the handling components, to transfer data to the CamCon.

Attention: Check categorical the Bit 0.3 in the status word of the FB during transfer. If this is set to 1 during transfer, an error during the parameterisation occurred and the data-transfer was stopped. The number that following occurs in the actual data block's variable "ACT_DATASETNMB", tells you, at which parameter an error message occurred.

Hint 1: Use the symbolic addressing during a following necessary access to the CamCon's data-component in the S7. This prevents you from having to re-input the accesses into the CamCon every following AWL-import, if the dates in the DB shift. A condition for this is anyhow that yourS7 project is set to symbolic programming.

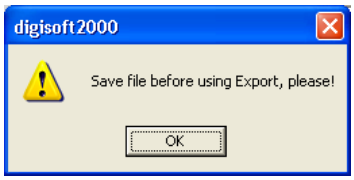
Hint 2: Additionally to the parameter-table for the complete CamCon device-parameter to additionally parameter-tables with the denomination "PLC_SET" and "PLC_GET" are created, if using times, counter or shift registers in the CamCon PLC-Logic-module. These charts enable to read or write their presets and actual values. For the controlling of the communication in case you want to use these tables, the starting points of the charts were deposited in the additional variables "OFFSET_CONFIG_0", "OFFSET_GET_0" ad "OFFSET_SET_0" in the data component. If you want to use the corresponding table, copy the variables content to the beginning of the DB in the data word 4 (OFFSET_RK 512). By doing so, the table is chosen and the bits in the command-word of the FB (Bits 1.2 – 1.5) now have influence on it.

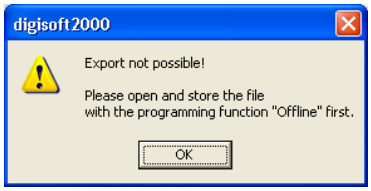


Attention !: The value at the "OFFSET_RK512" register may only be changed, if none of the command-Bits 1.2 to 1.5 are active.

6.3. Export, Error messages

This error message is displayed if the active project has been altered but not yet saved.





This error message will occur if the DC3 file you want to export has not been opened and saved (using the Digisoft's „offline" programming) before

The example to the right illustrates a successful conversion

7. The RS485 level converter respective communication processors

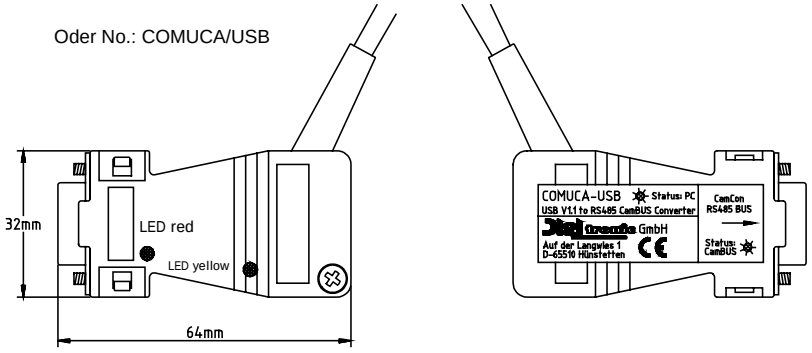
7.1. Communication processor COMUCA/USB

The COMUCA/USB is a level- and protocol adapter, that connects a PC with USB - interface (USB1.1) with the RS485 CamCon network (CAMBUS or multi-user protocol) of the DIGITRONIC company. On the contrary to level converter PK232485 it has some “intelligence” of its own. This is necessary since a real-time-controlling of the RS485 data-conduction is not possible any longer on Windows operation-systems. The COMUCA/USB needs no additional power supply.

NEW: The COMUCA/USB supports the CAMBUS - RS485 protocol, and, provided it is equipped with Firmware Version 2 (November 2004), also the CamCon cam switch’s multi-user protocol.

7.1.1. Connection allocation

Pin 1,4 closedown resistors
Pin 2 B (-)
Pin 3 A (+)
Pin 5 Signal GND
Pin 6-9 not used.



7.1.2. LED Status display

The red LED on the CAM-BUS plug’s side indicates the CAM-BUS’ status:

1 * flashing	RS485 BUS is OK, COMUCA is CAM-BUS MASTER
2 * flashing	RS485 BUS is OK, COMUCA is CAM-BUS SLAVE
3 * flashing	Error, COMUCA/USB is in reconfiguration phase
4 * flashing	COMUCA/USB is in Flash - Loader - Mode

The yellow LED shows the status concerning the PC

Flashing	A data-exchange with the PC is in progress

7.1.3. COMUCA/USB commissioning

To commission the COMUCA, please absolutely regard the following procedure.

* Connect the COMUCA to a free USB interface at your PC and install the USB-driver. See chapter "2.1. Installation of the drivers for COMUCA USB" on page 5. The LEDs at the COMUCA should now flash.
* Now establish RS485 cable-connection to the CamCon.

Please Notice: At the RS485 interface, the ends of the data conductions must be switched. For this purpose use the Pins 1+4 of the DSUB plug. If wanting to activate the closedown resistor, connect as well Pin 1+2 as 3+4 with each other.

* Switch on the CamCon device or interrupt the power supply (if this was already switched on), to activate the CamCon’s "Auto - Contact - Mode".

Notice: If the CamCon is already set to CamBus protocol, it is not necessary to interrupt the power supply. The CamCon’s factory setting is „Multi-user“.

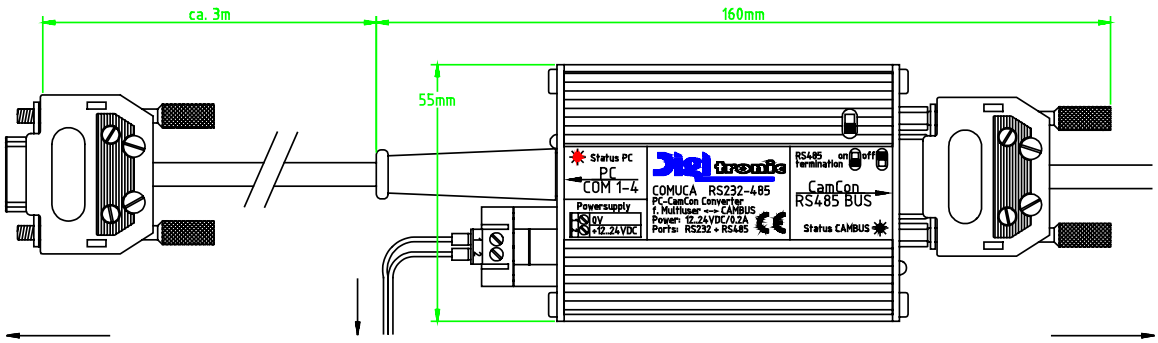
* Now start the DIGISOFT 2000 and configure the software. See also chapter "2.3.2. Configuring the software" on page 9.

Caution: A CamCon Software version 10.1999 or later is required.

7.2. Communication processor COMUCA

The COMUCA/USB is a level - and protocol adapter, that connects a PC with a standard serial interface (RS232) to an RS485 CamCon network (CAMBUS) of the DIGITRONIC Company. On the contrary to level converter PK232485 it has some “intelligence” of its own. This is necessary since a real-time-controlling of the RS485 data-conduction is not possible any longer on Windows operation-systems. The COMUCA/USB needs an external power-supply that can be created by means of a power transformer (order. No.: COMUCA/NETZ) or via the 24Volt supplied by the switch cabinet.

Order .No.: COMUCA



To the PC
COM 1..4

power supply
12..24VDC
(E.g. power-supply plug
(Order .No.: COMUCA/NETZ)

to the CamCon
with RS485 interface
(e.g. CamCon DC16 connection cable)
(Order .No.: KK16/485-03)

7.2.1. COMUCA LED Status display

The red LED on the side of the CAM-BUS plug displays the CAM-BUS’ status:

1 * flashing	RS485 BUS is OK, COMUCA is CAM-BUS MASTER
2 * flashing	RS485 BUS is OK, COMUCA is CAM-BUS SLAVE
3 * flashing	error, COMUCA is in reconfiguration phase
4 * flashing	COMUCA during Flash - Loader - Mode

The yellow LED on the side of the serial RS-232 plug is used to display the MULTIUSER status:

1 * flashing	MULTIUSER Mode-3
2 * flashing	MULTIUSER Mode-4

7.2.2. DSUB 9 Pin-ledge RS485 interfaces.

Pin	2	B (-)
Pin	3	A (+)
Pin	5	signal GND
Pin	1,4,6-9	not used.

7.2.3. COMUCA commissioning

Please absolutely regard the following procedure to commission a COMUCA:

* At first all wiring has to be done.

Please note At an RS485 interface the ends of the data-conduction have to be switched with closedown resistors. For this purpose, use the small “Dip-switch”.

* First switch on the COMUCA respective plug in the power-supply. The LEDs at the COMUCA should now flash.

* Switch on the CamCon unit or interrupt the power supply (if this was already switched on), to activate the CamCon’s "Auto - Contact - Mode.

Notice: If the CamCon is already set to CamBus protocol, it is not necessary to interrupt the power supply. The CamCon’s factory setting is „Multi-user“.

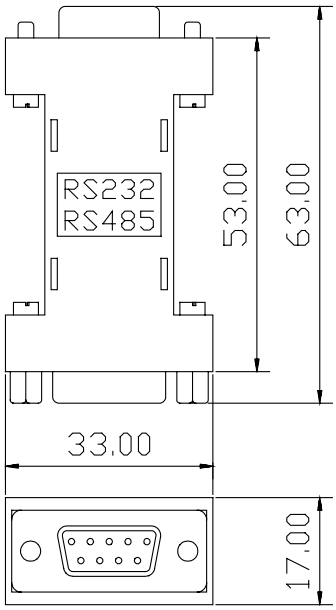
* Now start the DIGISOFT 2000 and configure the software. See also chapter "2.3.2. Configuring the software" on page 9.

Caution: A CamCon Software version 10.1999 or later is required.

7.3. Level-converter PK232485

The PK232485 is a level converter, which transforms the standard RS232 PC interface into a RS485 interface. On the contrary to the COMUCA and COMUCA/USB, this device has no “intelligence of its own”. So that it can only be used conditionally for DIGISOFT 2000 version 2.16 or later. A condition is a DIGISOFT 2000 version 2.16 or higher, using of the Multi-user-protocol and the parameter “HANDSHAKE” set to 3. This level converter does not need external power supply.

Level converter 232/485
Order .No.: PK232485



7.3.1. Clamping-allocation of the RS232 to RS485 interface-transformer

7.3.2. DSUB 9 Pin-out (female) = RS232 interface.

Pin	1,6,8,9	not used	
Pin	2	TxD	PC Pin 2 RxD
Pin	3	RxD	PC Pin 3 TxD
Pin	4	Inverse switch	PC Pin 4 DTR
		Send / Receive (+12V = Receive) (-12V = Send)	
Pin	5	Signal GND	PC Pin 5 Signal GND
Pin	7	Switch	PC Pin 7 RTS
		Send / Receive (-12V = Receive) (+12V = Send)	

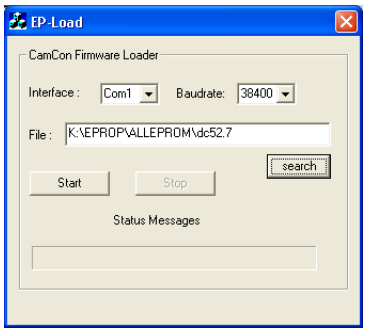
Notice: The DTR and RTS conductions must be driven inverted to each other.

7.3.3. DSUB 9 Pin-out (male) = RS485 interface.

Pin	1,4	closedown-resistors
Pin	2	B (-)
Pin	3	A (+)
Pin	5	signal GND
Pin	6-9	not used.

Please Notice: At an RS485 interface, the data conductions ends must be switched. Use Pin 1 + 4 of the DSUB plug at the RS485 interface. Shall the closedown resistors be activated connect Pin 1+2 as well as Pin 3+4 with each other.

8. Firmware UP - Date at the CamCon



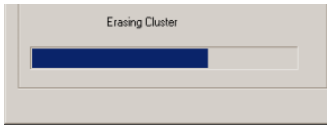
If a Firmware UP - Date at a CamCon is necessary or you want to use new functions of the CamCon, you first have to get the new firmware as a file (e.g. DC52.7 or DC302.7) and the Flash - Loader - program EPLOAD.EXE for Windows or LOADER.EXE for DOS. In case you want to do a firmware up-date, all those three programs as well as the newest firmware can be downloaded at the company's internet-page (http://www.digitronic.com).

Having started the "EPLOAD" program, the dialogue shown to the right opens.

"Search" here the new firmware that you want to establish on your device.

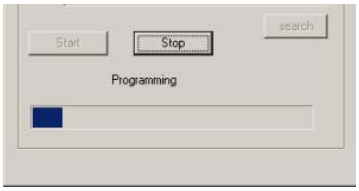
Select the COM interface and Baud rate. The Baud rate can be set to AUTO, 38400, 57600 and 115200. Now set it to AUTO.

Notice: At an RS232 interface, you can also adjust the Baud rate to 57600 or 115200 or at an RS485 device with a COMUCA to 38400.



Having done set configurations, confirm your changes by pressing „Start" and switch the power-supply at the CamCon off and on again. The message "Erasing cluster" followed by "Programming" should now be displayed.

The bar graph visualises the progress of the Programming.



Once the programming finished, the message "Transmission complete" is shown. After waiting approximately one minute, interrupt the CamCon's power supply again.

The firmware Up-date should be successfully finished. Check this using the CamCon's "unit configuration" menu.

Attention: Only devices with a flash-memory can be updated. These are all CamCon DC300 and 1796-DICAM as well as CamCon DC16, 40 and 51 with upgrade-levels 5 or higher (e.g. DC51 S**5**.... , DC16 J**5** .. , DC300 S**5** and so on). Older devices are equipped with an EPROM-firmware storage and can not be updated at the face

9. Differences to older Versions

Differences between V2.19 -> V4.35b:

- The programming interface „offline“ underwent certain changes. It is now based upon HTML – pages, created using the DigiWEB format. The old, “classic” programming is still possible via “communication”->”Terminal offline”/”Terminal online”.
- The data format of the project data ".DC2" got changed. All files of version 4 have the file extension “DC3” and must not be saved or transmitted to a CamCon (risk of loosing data) using a program Version 2. DC2 files, can, nevertheless be converted for this purpose.
- The programming interface “offline” got changed. It is now based upon HTML – pages, created using the DigiWEB format.
- The programming interface "Online" also changed to HTML – pages, nevertheless requires a new firmware in the CamCon: The firmware version is detected by the software, so that a message might occur that programming has to be done using the „classic“ surface.
- An online help-function was included, which can be accessed using either F1 or the „help“ – link.
- Corrections for Windows XP/SP2 were made.
- It is now possible to equip CamCon units with an Ethernet interface (DigiWEB) to maintain them via internet.
- The PLC logic can now be documented using a symbol editor respective a CSV file.
- Digital tool protection was added to expand the export function..
- To test developments for the „PLC – logic – module“ an offline simulation at the PC is possible. It is possible to simulate the position measurement system, the hardware – (I)inputs and the rear panel BUS – signals (V – inputs) of the S7 respectively ControlLogix
- The DigiWEB communication interface got change. Since the Digisoft 2000 version 4.35 is now a firmware version 2.152 required.
- The Ethernet IP communication interface now enables programming 1756-DICAM devices in a ControlLogix 1756 Rack. Anyhow, a 1756 DICAM firmware date 9/2005 is required for this purpose.

10. Register