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1 Safety Precautions

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With this software package you can remote-control the frequency converter, thereby starting an electric motor which may act as a drive for dangerous machinery.

Therefore the necessary caution must always be observed when using the software, and suitable measures should be taken to prevent injury and damage to machinery and equipment.

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1.2 Safety Precautions

The voltage of the frequency converter is dangerous whenever connected to mains. Incorrect installation of the motor, frequency converter or fieldbus may cause damage to the equipment, serious personal injury or death. Consequently, the instructions in this manual, as well as national and local rules and safety regulations, must be complied with.

Safety Regulations

- 1. The mains supply to the frequency converter must be disconnected whenever repair work is to be carried out. Check that the mains supply has been disconnected and that the necessary time has elapsed before removing motor and mains supply plugs.
- 2. The [OFF] button on the control panel of the frequency converterr does not disconnect the mains supply and consequently it must not be used as a safety switch.
- 3. The equipment must be properly earthed, the user must be protected against supply voltage and the motor must be protected against overload in accordance with applicable national and local regulations.
- 4. The earth leakage current exceeds 3.5 mA.
- 5. Protection against motor overload is not included in the factory setting. If this function is desired, set par. 1-90 *Motor Thermal Protection* to data value ETR trip 1 [4] or data value ETR warning 1 [3].
- 6. Do not remove the plugs for the motor and mains supply while the frequency converter is connected to mains. Check that the mains supply has been disconnected and that the necessary time has elapsed before removing motor and mains plugs.
- Please note that the frequency converter has more voltage sources than L1, L2 and L3, when load sharing (linking of DC intermediate circuit) or external 24 V DC are installed. Check that all voltage sources have been disconnected and that the necessary time has elapsed before commencing repair work.

Warning against unintended start

- 1. The motor can be brought to a stop by means of digital commands, bus commands, references or a local stop, while the frequency converter is connected to mains. If personal safety considerations (e.g. risk of personal injury caused by contact with moving machine parts following an unintentional start) make it necessary to ensure that no unintended start occurs, these stop functions are not sufficient. In such cases the mains supply must be disconnected or the *Safe Stop* function must be activated.
- 2. The motor may start while setting the parameters. If this means that personal safety may be compromised (e.g. personal injury caused by contact with moving machine parts), motor starting must be prevented, for instance by use of the *Safe Stop* function or secure disconnection of the motor connection.
- 3. A motor that has been stopped with the mains supply connected, may start if faults occur in the electronics of the frequency converter, through temporary overload or if a fault in the power supply grid or motor connection is remedied. If unintended start must be prevented for personal safety reasons (e.g. risk of injury caused by contact with moving machine parts), the normal stop functions of the frequency converter are not sufficient. In such cases the mains supply must be disconnected or the *Safe Stop* function must be activated.



NB!

When using the Safe Stop function, always follow the instructions in the Safe Stop section of the Design Guide.

4. Control signals from, or internally within, the frequency converter may in rare cases be activated in error, be delayed or fail to occur entirely. When used in situations where safety is critical, e.g. when controlling the electromagnetic brake function of a hoist application, these control signals must not be relied on exclusively.



Touching the electrical parts may be fatal - even after the equipment has been disconnected from mains.

Also make sure that other voltage inputs have been disconnected, such as external 24 V DC, load sharing (linkage of DC intermediate circuit), as well as the motor connection for kinetic back up.

MCT 10 Set-up Software

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Systems where frequency converters are installed must, if necessary, be equipped with additional monitoring and protective devices according to the valid safety regulations, e.g law on mechanical tools, regulations for the prevention of accidents etc. Modifications on the frequency converters by means of the operating software are allowed.

Hoisting applications:

The frequency converter functions for controlling mechanical brakes cannot be considered as a primary safety circuit. There must always be a redundancy for controlling external brakes.

Protection Mode

Once a hardware limit on motor current or dc-link voltage is exceeded the drive will enter "Protection mode". "Protection mode" means a change of the PWM modulation strategy and a low switching frequency to minimize losses. This continues 10 sec after the last fault and increases the reliability and the robustness of the drive while re-establishing full control of the motor.

In hoist applications "Protection mode" is not usable because the drive will usually not be able to leave this mode again and therefore it will extend the time before activating the brake – which is not recommendable.

The "Protection mode" can be disabled by setting par. 14-26 *Trip Delay at Inverter Fault* to zero which means that the drive will trip immediately if one of the hardware limits is exceeded.



NB!

It is recommended to disable protection mode in hoisting applications (par. 14-26 Trip Delay at Inverter Fault = 0)



The DC link capacitors remain charged after power has been disconnected. To avoid electrical shock hazard, disconnect the frequency converter from mains before carrying out maintenance. When using a PM-motor, make sure it is disconnected. Before doing service on the frequency converter wait at least the amount of time indicated below:

Voltage	Power	Waiting Time
380 - 500 V	0.25 - 7.5 kW	4 minutes
	11 - 75 kW	15 minutes
	90 - 200 kW	20 minutes
	250 - 800 kW	40 minutes
525 - 690 V	37 - 315 kW	20 minutes
	355 - 1000 kW	30 minutes

For further information, please see http://www.danfoss.com/BusinessAreas/DrivesSolutions/Documentations/Technical+Documentation.htm

1.2.1 Connectivity

NB!



It is recommended not to use a PC power cable with a ground plug when the PC is connected to the frequency converter trough USB.

2 Introduction

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2

2 Introduction

2.1 About this Manual

This manual provides the user with the basic knowledge required to use the MCT 10 Set-up Software with Danfoss Drives VLT frequency converters. Familiarity with the following is assumed:

- MS[®]-Windows[™] at user level
- Set-up and operation of frequency converters, including knowledge of processes of which the drives forms part
- Use of and linkage with communication equipment

The manual does not provide any detailed information regarding specific applications or possible solutions and related parameter combinations in the set-up and use of a frequency converter. Instead, please refer to the Operating Instructions and Design Guide of the frequency converter. An update of the manual and instructions related to the MCT 10 Set-up Software are available on the Danfoss Drives Homepage: http://drives.danfoss.com

2.2 What is MCT 10 Set-up Software?

MCT 10 Set-up Software is designed as an interactive commissioning tool for quick and easy commissioning. The MCT 10 Set-up Software can be used as follows:

- For planning a new communication network off- line. The MCT 10 Set-up Software contains a complete database with all Danfoss Drives products.
- For commissioning frequency converters online.
- If a frequency converter requires replacement.
- If a communication network is to be expanded with more frequency converters.
- For back-up of all parameter settings of frequency converters in a communication network.
- The MCT 10 Set-up Software supports Profibus DP-V1 communication via a Master class 2 connection, which makes it possible to go online on a Profibus network and read from/write to parameters. This will eliminate the need for an extra communication network.
- The MCT 10 Set-up Software supports VLT 2800, VLT 4000, VLT 5000, VLT 6000, VLT 8000, FCD 300, FC 100, FC 200, FC 300 and FCM 300 series frequency converters from Danfoss Drives.



With the MCT 10 Set-up Software PC software tool you can control and configure your system simultaneously, and monitor the entire system more effectively for faster diagnosis, and better preventive maintenance. Simplify commissioning, maintenance and documentation using MCT 10 Set-up Software.

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2.2.1 Features of MCT 10 Set-up Software:

- Project-oriented PC tool, one tool for all series
- Links to all Windows applications possible
- Supports Siemens CP PCMCIA- and PCI cards, for Profibus DP-V1 Master Class 2 connection
- Support of standard interfaces: COMx, USB, RS 232 (Flux)
- Siemens PG / Field PGs already have the necessary hardware
- View is highly individually configurable
- Downwards compatibility with Dos-Dialog (*.mnu) and WinDialog (*.vlt)

2.2.2 Help

The Help feature is located in the main menu, at the far right. Select Help from the main menu, then Help again, and a Help file will be opened, displaying the MCT 10 Set-up Software manual in .pdf format. To open the Help file you will require Acrobat Reader software. If you do not have this software installed, it can be downloaded free of charge at www.adobe.com.

2.3 The MCT 10 Set-up Software Modules

The MCT 10 Set-up Software is supplied in two modules:

MCT 10 Set-up Software for

- setting of the frequency converter parameters
- copying of parameter sets to and from a frequency converter
- documentation/print-out of set-up, including diagrams
- servicing and fault analysis

APoss program for

creating APoss programs.





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2.4 Two Versions

MCT 10 Set-up Software is available in two versions: Basic and Advanced.

MCT 10 Set-up Software Basic is available free of charge, downloadable from http://www.vlt-software.com. MCT 10 Set-up Software Advanced can be purchased under the order-number 130B1000.

The features of each version are listed in the table below.

Version supports:	MCT 10 Set-up SoftwareAdvanced	MCT 10 Set-up Software Basic
Frequency converters per project	Unlimited	Four
FC protocol	Yes	Yes
USB	Yes	Yes
Profibus DP-V1	Yes	Yes
Profibus DP-V1	Yes (improved performance)	N/A
Handling Multiple Danfoss Nodes Concurrently		
Ethernet-TSC	Yes	N/A
Logging and Scope function	8 Channels	2 Channels
Real Time Logging from Drive	4 Channels	N/A
Alarm display	Yes	View only
MCO 305	Yes	Yes
Graphical Smart Logic Contr.	Yes	Yes
VLT5000 to FC 302 Conversion Wizard	Yes	Yes
FC to FC Conversion Wizard		
Import 3000.XLS to FC 302	Yes	N/A
Motor Database	Yes	N/A

2.5 System Requirements

In order to use the MCT 10 Set-up Software, your IBM-compatible personal computer must meet the following minimum system requirements:

- a Pentium PIII 350Mhz or compatible microprocessor
- 256 MB of RAM (512 MB of RAM Recommended)
- a CD-ROM drive
- 200 MB of available space on the hard drive;

Recommended system:

- a Pentium PIII 450Mhz microprocessor
- 256 MB of RAM (512 MB of RAM Recommended)
- a CD-ROM drive
- 200 MB of available space on the hard drive;

MCT 10 Set-up Software runs under MS Windows versions: Windows[™] 2000 (with service pack 3 or higher) Windows[™] XP (Professional when using Siemens Profibus CP Cards).

2.6 Background Knowledge

Familiarity with the PC or PLC you intend to use as a master in your system is assumed. Issues regarding hardware or software produced by other manufacturers are beyond the scope of this manual, and are not the responsibility of Danfoss.

If you have questions regarding set-up of master-to-master communication, or communication to a non-Danfoss slave, please consult the appropriate manuals.

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2



2.7 Related Literature

The following literature related to MCT 10 Set-up Software is available.

Г

Title	Literature no.
SyncPos manual	MN50V102
Profibus DP-V1	MG90E102
Design Guide for the relevant frequency converter(s)	-

Please also refer to drives.danfoss.com for frequently asked questions and additional information.

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3 Installation and De-installation

3.1 Installation and De-installation

The MCT 10 Set-up Software and SyncPos modules are installed by means of a multilingual, self-explanatory installation program.

3.1.1 How to Start the Installation Program

- 1. Choose the sub-menu Run from File in Windows programming control.
- 2. In the command line you enter: [DRIVELETTER]:\SETUP and press the <Return> key.
- 3. Then you just follow the instructions of the installation program.

When the installation process is complete the MCT 10 Set-up Software can be found on the following path:



3.1.2 How to Change Language after Installation

During installation, select the language version required in the installation program. After installation, programs will start with the same language version.

After installation you can change the menu texts of the programs to different languages.





NB!

The parameter language will also be changed. If an LCP display is connected to the frequency converter, the change of program language version does not affect the display language.

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3.1.3 De-installation of MCT 10 Set-up Software under a Windows® Operating System

- 1. Click the Start button
- 2. Select Settings
- 3. Select Control Panel
- 4. Double-click on Remove/Add Programs icon
- 5. Select MCT 10 Set-up Software
- 6. Choose the <u>Remove</u> option



4 Introduction to User Interface

4.1 MCT 10 Set-up Software Features

4.1.1 MS[®] Windows[™] Explorer-like Interface

MCT 10 Set-up Software has a familiar MS[®] Windows[™] Explorer-like interface, to make it quick and easy for you to get started and find your way around the software.

4.1.2 MCT 10 Set-up Software Language

The default language for the MCT 10 Set-up Software is English. If desired, you can change the language of operation as follows. Select the language you wish MCT 10 Set-up Software to be displayed in, by selecting Options from the main menu, then Select Language.... Choose the desired language from the scrollbar and close the window. The new language setting will be activated when MCT 10 Set-up Software is closed and restarted.

4.1.3 Toolbar

A toolbar displays icons for the most commonly used functions.

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	130BT712 10

The toolbar can be activated by selecting *Toolbar* under *View* from the main menu bar, whereupon the Toolbar will be marked with a tick to show it is active. To deactivate the Toolbar, again select *View* and then *Toolbar*, and after this the tick will be removed, indicating that the toolbar is no longer active.

4.1.4 Display

The MCT 10 Set-up Software is displayed in two parts, Left View and Right View.

4.1.5 Left View

The Left View shows the Network (real, online) and Project (simulated, offline) views of the frequency converter network. In the Left View new folders and network elements can be added or existing folders and elements deleted.

It is also in the Left View that the user records changes made to the real online set-up into the Project folder, thus storing the changes in the simulated, offline set-up for later use.

For more information on saving data, please refer to the chapter Saving Data.



4.1.6 Right View

The Right View displays details of the element highlighted in the Left View. In the Right View the elements of the frequency converter network can be programmed.

<u>File Edit View Insert Communication</u>	<u>T</u> ools <u>O</u> pt	ions <u>H</u> elp				
🗅 🗳 🖬 % 🖻 🖨 🎒 🖦 🕁 🏥 🏢	? № 🔘	💷 🌒 🗣 😂				
🖻 🎹 Network	ID	Name	Setup 1	Setup 2	Setup 3	Setup 4
🛄 🛄 SerialCom	001	Language	Enalish	Enalish	English	English
🖻 🦙 Project	002	Active setup	Setup 1	Setup 1	Setup 1	Setup 1
🗄 🎬 Conveyor 001	003	Setup copy	No copy	No copy	No copy	No copy
All Parameters	004	LCD CODY	No copy	No copy	No copy	No copy
Operation and display	005	Custom readout	100.00	100.00	100.00	100.00
l oad and motor	006	Cust. read. unit	%	%	%	%
Beferences and limits	007	Large readout	Frequency [Hz]	Frequency [Hz]	Frequency [Hz]	Frequency [
Toputs and outputs	008	Small readout 1	Reference [%]	Reference [%]	Reference [%]	Reference [4
	009	Small readout 2	Motor current [A]	Motor current [A]	Motor current [A]	Motor currei
	010	Small readout 3	Power [kW]	Power [kW]	Power [kW]	Power [kW]
Serial communication	011	Unit of loc ref	Hz	Hz	Hz	Hz
Etail Technical functions	012	Hand start bttn	Enable	Enable	Enable	Enable
Group 7	013	Stop button	Enable	Enable	Enable	Enable
	014	Auto start bttn	Enable	Enable	Enable	Enable
	015	Reset button	Enable	Enable	Enable	Enable
	016	Data change lock	Not locked	Not locked	Not locked	Not locked
	017	Power up action	Auto restart	Auto restart	Auto restart	Auto restart
	100	Config. mode	Closed loop for	Closed loop for	Closed loop for	Closed loop
	101	Vt charact.	Aeo function	Aeo function	Aeo function	Aeo functior
	102	Motor power	3.00	3.00	3.00	3.00
	103	Motor voltage	550	550	550	550
	104	Motor frequency	50	50	50	50
	105	Motor current	5.09	5.09	5.09	5.09
	106	Motor nom. speed	1420	1420	1420	1420
	107	Auto motor adapt	No ama	No ama	No ama	No ama
	108	Multim.startvolt	жжжжжж	жжжжжжж	жжжжжж	жжжжжжж
	109	Resonance damp.	100	100	100	100
	110	High start torq.	0.0	0.0	0.0	0.0
	111	Start delay	0.0	0.0	0.0	0.0
	112	Motor preheat	Disable	Disable	Disable	Disable
	113	Preheat dc curr.	50	50	50	50
	114	De breke europt	100	150	50	

4.1.7 Tree View

The Left View can be expanded or compressed according to the level of detail the user wishes to view. The Left View has a tree structure, where folders containing un-displayed content are marked with +. By clicking on the + with the mouse, the folder will open and its contents display in a tree structure.

File E	roject X - MCT 10 Set-up Software	ols Ontions Help	
	Eur yew inset communication roc European State (Second rock) Network	K Image: Constraint of the second s	
Ē			130BT640

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Folders containing content which is on display in a tree structure are marked with -. By clicking on the - with the mouse, the folder will close and its contents will be hidden.

Project X - MCT 10 Set-up Software		
e Edit View Insert Communication Tools	Supptions Help	
 Har Folgett 1 De III Conveyor 001 De IIII Al Parameters III New Folder 1		
		1308T406, 11

4.1.8 Network Mode - Online

The Network folder displays details of the frequency converter network as it appears in reality, online. In Network mode the user can make changes to parameters in the frequency converter(s) exactly as if operating the control panel on the frequency converter itself.

Data entered in Network mode will be stored in the frequency converter only, not on the hard disk. For information on saving data to the hard disk, please refer to the chapter *Saving Data*.

4.1.9 Project Mode - Offline

The Project folder displays an offline view of the frequency converter network, as set up by the user. This is where the user can store a copy of those parts of the online set-up he will use for later retrieval and use, perhaps remote to the physical site of the network. The Project folder is also where to store other files related to the network project. These other files can be in any format, for example Word, .pdf, etc.

4.1.10 Folders

Insert a new frequency converter, folder or file folder by selecting the Project icon with a right-click on the mouse:



4 Introduction to User Interface

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Alternatively, you can select Insert on the menu bar, then New, and then Drive, Folder or File Folder:



A **Folder** is a group of frequency converters forming part of a machine or of a system. Folders are used for organising a large system into several smaller systems.



A **File Folder** is a folder for storing files belonging to the Project. These files can be in any format, Word documents, PDF files etc.

A Scope Folder is a folder for doing analysis on how selected parameters behave. The selected parameters can be visualised as curves.



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5 Set-up of Communication

5.1 How to Establish Communication

Data communication between a PC and the frequency converter(s) can be established via a hardwired connection. The hardwired connection can be via the standard built-in RS 485 or USB port. If the MCA101 or MCA121 fieldbus option is mounted in the frequency converter(s), the connection can be obtained via a Profibus Master Class 2 connection (MSAC 2) or an Ethernet based network.

The USB interface socket is controlled by the Microsoft operating system providing plug-and-play capabilities by allowing devices to be connected and disconnected using hot swapping. Connecting a frequency converter using USB MCT 10 Set-up Software will automatically add on to the bus list.

The communication framework part of MCT 10 Set-up Software is handling the control of the fieldbusses. It provides enhanced capabilities allowing multiple concurrent fieldbus communication. Several fieldbusses can be configured and combined in the same Network within MCT 10 Set-up Software. If several fieldbusses are created with the same type, please make sure they are configured with different scan ranges.

Starting MCT 10 Set-up Software the first time after installation the non plug-and-play fieldbusses must be manually configured from the fieldbus configuration dialog. This is available from the standard Windows Control Panel or from the 10 Network.



📲 Untitle d	- MCT 10 Set-up Software	
<u>File Edit Vi</u>	ew Insert Communication Tools	Options
0 🖻 🖬	X 🖻 🖻 🎒 💁 📴 🖽	111 ?
Pri	Morel <u>R</u> efresh Bus List <u>A</u> dd/Remove/Configure Busses	

From the fieldbus configuration dialog non plug-and-play fieldbusses can be added, removed or reconfigured from the installed list.

If the installed fieldbus list is updated from the Windows Control Panel while MCT 10 Set-up Software is running the user needs to refresh the bus list by right clicking on *Network*.

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For MCT 10 Set-up Software to indicate the available frequency converter(s) on the non plug-and-play fieldbusses the user manually has to scan the network for active drives. The scanning is available from a right click on the appropriate fieldbus.

	105051			2
Туре	Fieldbus name	Installation		8
Profibus	DPv1 1	Manual		
Ethernet	Ethernet	Manual		
SerialFCBus	RS485_1	Manual		
SerialFCBus	RS485_2	Manual		
Add	Rer	nove	Properties	13
Add	Rer	move	Properties	130B

5.2 RS 485 Data Communication

The majority of Danfoss Drives products have the FC protocol as standard RS 485 data communication. Communication from a PC can be established via RS 232 to 485 converters or via USB to 485 converters.



All frequency converters are default set to 9600 baud, but can also be configured to 300, 1200, 4800, 19200, 38400, 57600 or 115200 baud. The serial configuration is always configured with 8 data bits, 1 stop bit and even parity.



NB!

Choose a relevant scan range. It takes too much time to scan all available addresses (1-126). Using the VLT FC 100, FC 200 and FC 300 series: FC MC Protocol (par. 8-30 "FC MC") is required for correct functionality. The parameter is only available from the LCP.

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5.2.1 Serial Configuration

When using a RS485 converter as the Advantech ADAM converter, MCT 10 Set-up Software will indicate online frequency converter(s) available on the serial bus after scanning the bus.

The bus can be configured from the Fieldbus Configuration dialog or from *right-click* on the appropriate serial bus.

General Protocol Advanced	
Port:	
Baud rate: Parity: Stop bits:	
Start scanning from address: 1	
Stop scanning at address: 126	
Reset to default	

The COM port number must be set to the appropriate one used. When using USB to RS485 converters, the actual comport number can be identified from the Device Manager part of the Windows Control Panel.

The Baud rate, Parity and the number of Stop bits must match the settings in the drive.

The Fieldbus scanning range should be set to the available addresses only to limit the time scanning for active drives.

Reset to default bottom restores the Line settings and Fieldbus scanning to factory configuration values.

Read numeric parameter :
Write numeric parameter: 200 msec On fieldbus scanning: 3
Read text or binary parameter: 100 msec On file I/O (per packet): 10
Write text or binary parameter: 0 msec
Read process data: 50 msec
Write control word: 50 msec
Read file response timeout: 200 msec

The Response Timeouts and Retransmissions are settings editable for performance optimization, but should normally not be changed.

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Reset to default bottom restores the Protocol settings to factory configuration values.

General Protocol Advanced
FC-MC Protocol
Read file telegram length: 251
Number of telegrams per request: 10
Reset to default

The FC-MC Protocol are settings editable for performance optimization, but should normally not be changed.

Reset to default bottom restores the Protocol settings to factory configuration values.

5.3 Profibus DP-V1 Data Communication

To setup a Profibus DP-V1 communication, the MCA101 Profibus option module is required. Communication from a PC using Profibus DP-V1 can be established using a Profibus PCMCIA card or a card installed in the PC. The Profibus cable from the frequency converter is connected to the 9-pin sub D socket connector located on the card.



The following Master class 2 cards are currently supported from Siemens:

- CP 5411
- CP 5511
- CP 5512
- CP 5611
- CP 5613
- CP 5614

(Please also consult the Siemens website for latest supported cards for PC's.)

5



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NB!

Please consult the chapter: Guide to DP-V1 connection and Simatic Manager, covering more details about setting up the Simatic Manager.

5.3.1 Profibus DP-V1 configuration

When using a Profibus interface card with the associated driver installed, MCT 10 Set-up Software will indicate online frequency converter(s) available on the specific Profibus after scanning the bus for active drives.

The bus can be configured from the Fieldbus Configuration dialog or from right click on the appropriate Profibus bus.

The Board number must be set to the appropriate one used.

The Fieldbus scanning range should be set to the available addresses only to limit the time used for scanning active drives.

Reset to default bottom restores the Hardware settings and Fieldbus scanning to factory configuration values.

The Connection, Parameter I/O and File I/O are settings editable for performance optimization, but should normally not be changed.

Reset to default bottom restores the Protocol settings to factory configuration values.

veral Protocol	
Hardinane Board number: 1	Plebbu & scanning Start scanning from address: Stop scanning at address: 126
Reset to default	

onnection	Parameter I/O		
Number of connection retries: 10	Read parameter timeouts	10	msec
Number of reconnection retries: 3	Write parameter timeout:	100	msec
	Fie 1/0		
	File telegram timeouit:	50	msec
	Max failures on file read:	10	
Reset to default			

The Connection, Parameter I/O and File I/O are settings editable for performance optimization, but should normally not be changed.

Reset to default bottom restores the Protocol settings to factory configuration values.

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5.4 USB Data Communication

Danfoss frequency converters in the FC 100, FC 200 and FC 300 series are standard equipped with a USB port. Communication from a PC can be established using a standard A – B male to male USB cable connected to the frequency converter. No extra hardware or bus configuration is required. If the PC is equipped with more than one USB port several frequency converters can be connected. The USB bus will in MCT 10 Set-up Software automatically be add on to the Network bus list.

file	Edit	View	Insert	Com	mun	icati	on	Tool	s C
D	🗳 🕻	3 %		16	<u>a</u>	6- 6-	0-0- 0-0- 0-0-	T	?
7		letwork							
		DP	/1_1						
		Eth	ernet						
		RS4	85_1						
		E. RS4	85_2						
	H .	LUSE	81						
1		raiart							

When the USB cable is disconnected, the frequency converter connected via the USB port will be removed from the Network bus list.



NB!

A USB bus has no address-setting capacity and no bus name to configure. Connecting more than one frequency converter through USB, the bus name will be auto incremented in the MCT 10 Set-up Software Network bus list.

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5.5 Ethernet-TSC Data Communication

To setup an Ethernet-TSC (Transparent Socket Channel) communication, the MCA121 option module is required within the drive. Communication from a PC can be established using a standard Ethernet cable connected to the drive.

5.5.1 Ethernet-TSC Configuration

When using an Ethernet-TSC with the default installed Ethernet driver, MCT 10 Set-up Software will indicate online frequency converter(s) available on the specific Ethernet bus after scanning the bus for active drives.

The bus can be configured from the Fieldbus Configuration dialog or from *right-click* on the appropriate Ethernet bus.

The IP address scanning range should be set to the available addresses only, to limit the time used for scanning active drives.

IP port number 4000 is the default one used within the Ethernet option module for TSC. It should match the setting in par. 12-89.

IP scan start address:	192	×	168	×	1	-	1	
IP scan end address:	192		168		1		10	
Port:	4000	_		î.F		Scar	n	1

Scan bottom initiates a scanning for the active drives connected to the bus.



NB! The PC must be in the same sub-net as the frequency converter(s) for scanning.

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6 Parameter Handling

6.1 Set-up

This chapter explains how to control a frequency converter using the MCT 10 Set-up Software. After starting the MCT 10 Set-up Software, the main window looks like this:

File Edit View Insert Communication Tools	Options Help
0 🛩 🖬 X 🖻 💼 🎒 🏪 🗁 🏥 🔳	? ₩ @ @ ● ₽ ₩ + ₽
Image: Wetwork Image: Metwork Image:	Folders

Insert a new drive, folder or file folder by selecting the Project icon with a right-click on the mouse. Alternatively, you can select Insert on the menu bar, then select New, then Drive, Folder or File Folder.

Drive refers to the type of frequency converter you wish to set up. Inserting a frequency converter will bring up the drive selector window.

New Drive	
Drive Name: Conveyor A-01	Software Version: 04.96 Voltage: 200V-240V
Power Size: 3.70KW	Regional Settings Region: International (50Hz)
Option A: MCA121 EtherNet/IP Option A: MCB105 Relay Card Option C: No Option Option C1: MCB113 Ext.Relay	Connection Field-bus: Ethernet
ОК	Cancel

6 Parameter Handling

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The New Drive window consists of four main parts; Name, Drive Identification, Regional Settings and Connection. All parts are mandatory to be Fill in:

Name is the name you want to identify the frequency converter with. This can be any text/number combination.

Drive Identification is the information regarding the frequency converter series, power size, options installed, software version and voltage level. The different selections are available from the drop down menus.

Regional Settings is configurable for International 50Hz or North America 60Hz settings. These discriminate mainly between horse power, kW and voltage level. The following screen shot shows an example of regional settings for a VLT 2800 frequency converter.

Connection means the fieldbus used between the PC and the frequency converter associated with the address to communicate. The specific fieldbus type is available from the drop down menu.

Drive Name	Conveyor A-01	Software Version:	1.0x	-
Salart Drive Tune		Voltage:	200V-240/	-
Serie:	TR1 2000 💌	Becippel Settings		_
Drive Type:	2803 •	Region	International (50Hz)	-
Options		Connection	International (50Hz) North America (50Hz)	
Communication Option:	None	Field-bus:	Ethernet	-
And a feature Defense		Address	192.168.16.1	
Appecation uption.	None			

Once the new frequency converter is added in the Project folder, the drive icon is selectable to display the database information as entered above:

- B DP/1_1 - B Ethernet	Dia Caia	Connected Drive Information	Database Information	
Ethernet	Daire Carles			
DCADE 1	Drive Series		FC-302	
M, K5485_1	Power Size	, ,	3.70KW	
E- Project	Voltage	,	200V-240V	
E Conveyor A-01	Basic SW Version		04.96	
	Option A		MCA121 EtherNet/IP	
	Option B		MCB105 Relay Card	
	Option C0		No Option	
	Option C1		MCB113 Ext.Relay	
	Type Code		FC-302P3K7T2E20H1BG2000(S)0C	
	Drive Address	192 168 16 1		
	Bus Name	Ethemet		
	Region	International (50Hz)		
	Last synchronized			
	Description			
			*	
	- History log			

The frequency converter(s) located in the offline project folder are reconfigurable right click on the specific drive icon and choose Properties. The Drive's Properties dialog appears providing the possibility to rename the drive Name and reconfiguring the Connection Set-up.

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	Drive Name:	Conveyor A-01		Software Version:	04.96	Ŧ
Select Drive T	уре			Voltage:	200V-240V	.
	Series:	FC-302	-	Regional Settings		
	Power Size:	3.70KW	_	Region:		Ŧ
Options	Association and a			Connection	-	
	Option A:	MCA121 EtherNet/IP	~	Field-bus:	Ethernet	-
	Option B:	MCB105 Relay Card	~	Address:	192.168.16.1	
	Option CO:	No Option	-			
	Option C1:	MCB113 Ext.Relay	-			
	,					
				-		

Note that the Connected Drive Information fields are empty. This is because at this point, you have not yet accessed the online frequency converter represented by the new frequency converter created offline. To view information from the online frequency converter, please refer to the Read From Drive feature.

6.1.1 Parameter Folders

When you have set up a drive within the Project folder, you can create new parameter folders within that drive. Create a new Parameter Folder by right-clicking on the Drive icon, then selecting New, then Parameter Folder. The default name for the new parameter folder will be New Folder 1, New Folder 2, etc.



6.1.2 Custom Parameter Folders

You can give the new parameter folder the desired identity using the Rename function, accessible by right-clicking on the New Folder icon.

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6.1.3 Generic Folders

When a new drive is set up according to drive, it will take the form of a folder named by the user, containing an All Parameters folder, which comprises a series of inner folders with generic names. These generic names cannot be changed or personalised, i.e. there is no rename function for these folders. The generic folders within most frequency converters are as follows:

- Operation and Display
- Load and Motor
- References and Limits
- Inputs and outputs
- Special functions
- Serial communication
- Technical functions

The generic folders can vary according to the type of frequency converter selected.



The contents of the generic folders are fixed, and comprise the parameters relevant to the frequency converter type selected. The ID, name and settings of these parameters become visible in the Right View, with a left-click on the generic folder icon or name in the Left View.

	A R R	Def				
R Metwork	ID	Name	Setup 1	Setup 2	Setup 3	Setup 4
B Seracom	001	Language	English	English	English	English
E CA Project	002	Active setup	Setup 1	Setup 1	Setup 1	Setup 1
E Conveyor 001	003	Setup copy	No copy	No copy	No copy	No copy
Al Parameters	004	Lcp copy	No copy	No copy	No copy	No copy
Operation and display	005	Custom readout	100.00	100.00	100.00	100.00
- Coad and motor	006	Cust. read. unit	96	96	96	96
	007	Large readout	Frequency [Hz]	Frequency [Hz]	Frequency [Hz]	Frequency [
Inputs and outputs	008	Small readout 1	Reference [%]	Reference [%]	Reference [%]	Reference [1
- Ct Special functions	009	Small readout 2	Motor current [A]	Motor current [A]	Motor current [A]	Motor currer
Serial communication	010	Small readout 3	Power [kW]	Power [kW]	Power [kW]	Power [kW]
Tachnical 6 motions	011	Unit of loc ref	Hz	Hz	Hz	HZ
Coup 7	012	Hand start btth	Enable	Enable	Enable	Enable
aloop /	013	Stop Dutton	Enable	Enable	Enable	Enable
	015	Auto start bits	Enable	Enable	Enable	Enable
	015	Data change lock	Ant locked	Mot bried	that look ad	Lindler And
	015	Downer in school	Auto contact	Ruto rectort	Not locked	NOCIOCIEG
	017	Fower up accort	Autorestars	ALICO TESCARC	AUTO LESTER C	Autorestart

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6.1.4 Display Options

Display Options By selecting View in the main menu bar, a range of display options are presented. The user can choose to display or hide the Toolbar and the Status Bar.

The user can also select the desired form of the Right View:

- Large icons
- Small icons
- The Right View display can be presented in the form of a List of folders and elements
- The Right View display can present Details of Network and Project elements



The final four display options (Large icons, Small icons, List and Details) are also accessible by clicking on the toolbar, options 8 through 11 from the left.



6.1.5 Parameter View Settings

You can apply the chosen parameter view settings described above to subfolders, to an entire project, or to the entire application, i.e. all MCT 10 Set-up Software folders in Network or Project mode.

Right-click on the parameter cell or set-up column then select Apply Parameter View Settings. Alternatively, select Apply Parameter View Settings under Tools on the main menu bar. The following pop-up will appear:

Select the option you wish to apply then click OK to activate that option.



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6.2 Filters

The MCT 10 Set-up Software can be configured by view filters to display parameters in a special way or to display parameters of interest. This is a powerful tool in maintaining an overview of the drive, without becoming confused by irrelevant parameters.

Filters can be applied to the parameter set-ups, which are displayed in the Right View when highlighting a generic folder in the Left View, i.e. one of

- Operation and Display
- Load and Motor
- References and Limits
- Inputs and outputs
- Special functions
- Serial communication
- Technical functions

The parameters displayed in the Right View are presented in a series of columns, containing ID, parameter name, four set-ups, units and factory set-up.

Each set-up can be hidden by removing it. This is done by selecting the set-up in the parameter view and then selecting the remove menu. Changes made to the removed set-up are still stored inside the MCT 10 Set-up Software and can be displayed again by selecting Customize Columns. By adding or removing columns the user can decide which information he wants to view.



The actual view can also be made valid for the complete Project or for the Folder only. This allows the user to adjust his view setting quickly for parts or the complete Project.



Another flexible way to adjust the display is via the Filter function.



Just by selecting Change Parameters, the number of Parameters displayed is reduced to 5 Parameters in this example.

6.2.1 Parameter Filters

To find the Parameter Filter dialog:

Right-click on any column in Right View, then select Filter Parameter.





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6.2.2 Read Only

In the Right View showing details of parameter set-ups, the user can select the Read Only filter to display those parameters which are read only and cannot be changed by the user. Right-click on any parameter column in the Right View, and then select the Filter Parameter option. Under Filter By, the user can then mark Read Only, and the display will show only those parameters which are read only.

6.2.3 Read & Write

In the Right View showing details of parameter set-ups, the user can select the Read & Write filter to display those parameters which are read/write and can thus be changed by the user. Right-click on any parameter column in the Right View, then select the Filter Parameter option. Under Filter By the user can then mark Read & Write, and the display will show only those parameters which are read/write, i.e. can be changed by the user.

6.2.4 Changed

In the Right View showing details of parameter set-ups, the user can select the Changed Value filter to display those parameters which have been changed by the user in the current session. Right-click on any parameter column in the Right View, and then select the Filter Parameter option. Under Filter By, the user can then mark Changed Value and the display will show only those parameters which have been changed during the current session.

6.2.5 All

To display all parameters in the Right View, following a filtering which has hidden some of the parameters, right-click on any parameter column in the Right View, and then select the Filter Parameter option. Under Filter By, the user can then mark All, and the display will show all parameters.

6.2.6 Filter By Group

To display only parameters from a particular group or groups in the Right View, the user can right-click on any parameter column in the Right View, and then select the Filter Parameter option. Under Filter By Group, the user can then mark the desired group or groups to be displayed and the Right View display will show only those group(s).

6.2.7 Column Select

Select a column in the Right View by left-clicking on the column title cell.

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6.2.8 Folder Select

Select a folder in the Left View by left-clicking on the folder name or folder icon.

6.2.9 Parameter Display

By selecting a parameter folder in the Left View you can view the parameters in the Right View, including their ID code, name and configuration details.



6.2.10 Customize Columns

The user can rearrange the display of columns in the Right View display by right-clicking on any column title, then selecting Customize Columns.

Bestation DO Name Setup1 Corr	III Naturek	-				1			and the	
August Copy <	- SerieCom	10	Name	setup 1			Setup 4	Factory Setup	Unit	-
Bit Convert 001 Dock Added Babb Solution Convert 001 Image: Serial control digitize Dock Added Babb Solution Book control digitize Book contro digitize Book contro digitize	- Contact	001	Language	English c	ору	Ctrl+C	English			
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B Drive Information 132 Motor prefeat Oxobie Deable Deable Deable B Data readouts 132 Motor prefeat S0 S0 <td>Special functions</td> <td>111</td> <td>Start delay</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td>0.0</td> <td></td> <td>5</td> <td></td>	Special functions	111	Start delay	0.0	0.0	0.0	0.0		5	
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114 Obstraining Stress 50 50 50 50 90 96 115 Obstraining Stress 10.0 10.0 10.0 10.0 5 116 Obstraining Stress 0.0 0.0 0.0 0.0 10.0 5 117 Modersymer facts 0.75 0.75 0.75 0.75 120 118 Modersymer facts 0.75 0.75 0.75 0.75 120 201 Mins. frequency: rongo: 0.120 hz 0.120 hz 0.120 hz 0.120 hz 120 202 Mins. Frequency: rongo: 90.0 50.0 50.0 50.0 120 hz 0.120 hz	🗈 强 Data readouts	113	Preheat dc curr.	50	50	50	50		96	
115 Debrains time 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 11.1 10.0 10.0 10.0 10.0 10.0 11.1 10.0 11.1 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 11.1 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0		114	Dc brake current	50	50	50	50		96	
11.6 Obstramm protect 0.0 0.0 0.0 0.0 0.0 Hz 11.77 Moder pure fact: 0.75 0.75 0.75 0.75 0.75 10.00 Moder pure fact: 0.75 0.75 0.75 0.75 0.75 200 Frequency range 0.20 hz 0.120 hz 0.120 hz 0.120 hz 0.120 hz 201 Min: frequency range 90.0 20.0 20.0 20.0 100 10 202 Min: reference 0.000 0.000 100.000 100.000 100.000 100.000 203 Reference site Unied to hard/ U		115	Do braking time	10.0	10.0	10.0	10.0		ŝ	
117 Modetherm product Etr trp 1 118 Modet pure fisc. 0.75 0.75 0.75 0.75 200 Frequency range 0.120 hz 0.120 hz 0.120 hz 0.120 hz 201 Min. frequency 20.0 20.0 20.0 20.0 40.0 202 Mars. frequency 50.0 50.0 50.0 50.0 40.0 203 Min. reference stc 1.000 min. Unied to hand/ Unied to hand/ 40.0 204 Min. reference stc 0.00.000 100.000 100.000 50.0 205 Ramp. ub time 1 1 1 5 206 Ramp. ub time 1 1 1 5 207 Ramp. down time 1 1 1 5 208 Addre engrity 6mbit 5 5 209 Addre engrity 6mbit 5 5 200 Ramp. ub ti		116	Do brake out-in	0.0	0.0	0.0	0.0		Hz	
118 Motor pare fact: 0.75 0.75 0.75 0.75 200 Frequency strongs 0-120 hz 0-120 hz 0-120 hz 0-120 hz 201 Min. frequency strongs 50.0 20.0 20.0 20.0 20.0 20.0 202 Mins. frequency strongs 50.0 50.0 50.0 Hg 203 References the Unked to hand/ Unked to hand/ Unked to hand/ Unked to hand/ 204 Mins. reference 0.0000 0.0000 0.0000 0.0000 205 Miss. reference 10.0000 100.000 100.000 100.000 206 Ramp down time 1 1 1 5 2 207 Ramp down time Endele Endele Endele 5 209 Jost frequency 70.0 20.0 70.0 20.0 20.0 20.0 20.0		117	Mot therm protec	Etr trip 1	Etr trip 1	Etr trip 1	Etr trip 1			
200 Frequency range (http://www.sec.edu/) 0-120 hz 20.0 0-120 hz 20.0 0-120 hz 20.0 0-120 hz 20.0 20.0 20.0 20.0 40.0 Het 202 Max. Breazency 2020 Soc.0 Soc.0 Soc.0 Soc.0 Het 203 Max. Breazency 204 Max. Breazency 205 Max. Breazency 206 Soc.0 Soc.0 Soc.0 Het 204 Mm.reference stc. 0.00.00 0.0000 0.0000 0.0000 200.0000 Soc.0000 Soc.00000		118	Motor pwr fact	0.75	0.75	0.75	0.75			
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203 Reference sate Linked to hand/ Linked to hand/ Linked to hand/ 204 Min. reference 0.000 0.000 0.000 0.000 205 Min. reference 100.000 100.000 100.000 100.000 206 Rame down time 1 1 1 1 5 207 Rame down time 1 1 1 5 209 Jog fragmency 20.0 20.0 20.0 He 209 Jog fragmency 20.0 20.0 20.0 He		202	Max. frequency	50.0	50.0	50.0	50.0		Hz	
204 Min.reference C0000 0.0000 0.0000 0.0000 205 Mane.reference 0.00.000 100.000 100.000 5 206 Ramp.up time 1 1 1 1 5 200 Ramp.up time 1 1 1 5 5 200 Addressript Endels 5 5 5 200 Addressript Endels 5 5 200 Solo 200 Endels 5 200 Solo 200 Solo 5 200 Solo 200 Solo 5		203	Reference ste	Linked to hand,	/ Linked to hand/	Linked to hand/	. Linked to hand/			
205 Main: reference 100:000 100:000 100:000 100:000 206 Ramp Up time 1 1 1 1 5 207 Ramp down time 1 1 1 5 208 Autoramping Enside Enside Enside 209 Jog frequency 20.0 20.0 20.0 He 209 Sum Sum Sum Sum Sum		204	Min. reterence	0.000	0.000	0.000	0.000			
dots r.almp.dots 1 1 1 1 1 5 2007 Rading dots 1 1 1 1 1 5 2007 Rading dots 1 1 1 1 1 5 2007 Rading dots 1 1 1 1 1 5 2007 Rading dots 1 1 1 1 1 5 2008 Addressing of the state 1 1 1 1 5 5 2008 Addressing of the state 1 1 1 1 5 5 2009 Addressing of the state 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000 2000		205	Max. reterence	100.000	100.000	100.000	100.000			
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		210	Ref firstion	Sim	20.0 Sum	Sim	Sum.		1.	
211 Depend rolf 1 0,000 0,000 0,000 0,000 %		211	Preset ref. 1	0.00	0.00	0.00	0.00		06	

6 Parameter Handling

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The Customize Columns window will be displayed and there, the user can change the order of fields in the display by highlighting a field, then selecting Move Up, Move Down or Remove.





Removed columns are still stored in memory and can be retrieved into the Right View by highlighting the relevant field name and selecting Add.

6.2.11 Read/Write Parameters

The majority of parameters are read/write, i.e. they can be configured by the user. Use the Filter function to view which parameters are read/write.

6.2.12 Read Only Parameters

A few parameters are read only, i.e. they provide data only and cannot be configured by the user. Use the Filter function to view which parameters are read only.

6.2.13 Factory Defaults

The parameter factory defaults are viewable by highlighting the parameter folder in the Left View, whereupon the parameter details will be displayed in the Right View. The factory defaults will be displayed in the Set-up columns unless a user has changed the parameter configuration. If the parameter configuration has been changed since factory supply, the factory defaults are displayed in the Factory Set-up column.
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6.2.14 Array Parameters - MCT 10 Set-up Software

Parameters containing data in the form of an array are displayed as a matrix in the Right View, where the rows of the matrix are identified as ID.1, ID. 2, etc. For example, in the view below, array parameters 9-15 and 9-16 are displayed over several entries as 915.1, 915.2, 915.3, and 916.1, 916.2, 916.3,. in the Right View below.



6.3 Special Parameters

6.3.1 Edit Set-up

The user can change parameter set-up by manually entering new value(s) into the cells in the Right View. Alternatively, the parameter set-up can be altered by importing values from an active drive, using the Read From Drive function.

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6.4 Parameter Edit

Parameters are organized into the same groups found on the LCP of the drive. A parameter can easily be modified by simply double-clicking on the desired parameter entry. If an entry cell is shaded in light grey it means that it is read only, and cannot be modified.



The settings of a parameter are checked for correct value upon their entry. If a parameter value is set to an illegal value the MCT 10 Set-up Software displays an error. Parameters can be edited in two different modes, dialog-based and inline. In dialog-based edit mode MCT 10 Setup Software will make a window pop up explaining the usages of the parameter.



6.4.1 Inline Edit

In inline edit mode, MCT 10 Set-up Software displays only the setting options available for a parameter. This works faster but is recommended only for the experienced user, since each possible setting is not followed by a detailed description of the setting.

6.4.2 Dialog Based Edit

If you would prefer to have details of parameters available whilst editing, use Dialog Based Edit. Parameter options, ranges and functions will be displayed whilst you edit the parameters. You will automatically enter Dialog Based Edit if you de-select Inline Edit.

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6.5 Comparison of Parameters

Parameter settings can be compared to the parameter settings in another drive. Comparisons can be made either to another drive inside the project or to an online drive. The comparison function is a powerful tool that evaluates whether settings inside the drive have been changed, or checks if two or more drives have the same settings. The compare function is activated by highlighting the desired drive and selecting Compare.



The compare window asks the user for a drive with which to make the comparison. This can be an online drive from the network, or it can be a drive in the offline folder (Project folder).

The result of a comparison can be stored in an ASCII text file for documentation or for subsequent import into a spreadsheet.

It is possible to compare all set-ups, or to compare one set-up against another. The result of a comparison could look like this:



Drive I Drive I Drive I Drive SW W Optior Optior	ompared Drive Into Name: Conveyc001 Address: 1 Name: SensiLCom Sense: FC-302 Type: 2.20KW 200V-240V per: 2.00 KW 200V-240V resion: 02.52 A. No option S. B. No option S. Ch. option S. Ch. option		Second Comp Drive Name: Drive Addres Driver Name: Drive Series: SW Version: Option A: No Option B: No Option C1: N	ared Drive Info Conveyor002 :::1 SetialCom FC-302 : 2010W 200W-240V 102 52 option o option o option o option	
ID	Name	1st Setup#	2nd Setup#	1st Value	2nd Value
121 125 181	Motor Power [HP] Motor Nominal Speed Min Speed for Eurotion at	1		2.86 1298	3.00 1420
					Show Warnings

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6.6 Read Frequency Converter Database

In the event that the MCT 10 Set-up Software database information is outdated, for example when a drive newer than the software version is introduced to the network, the MCT 10 Set-up Software database can be updated either by download from Internet or when this is not possible, by reading from the frequency converter itself.

When the MCT 10 Set-up Software database for a frequency converter is outdated, the frequency converter icon will be displayed with a red line through it and the Database Information cells will display the message Not supported, as shown:

		k l	
	Connected Drive Information	Database Information	- Î
Project Drive Serie	VLT 5000 Standard	Not Supported	1
Drive Typ	e 5001	Not Supported	
Voltag	e 200V-240V	Not Supported	
Basic SW Versio	n 3.71	Not Supported	
Communication Optio	A 43 PROFIBUS DPV1	Not Supported	1
Application Optio	n None	Not Support	
Drive Addres Drives Nam	t 2 SeiaCom		
			13087649

Update the database by uploading the DLL file as follows:

Right-click on the frequency converter icon and select Download Drive Info.

Lonnected Linve Information	Distahasa k
Download Drive Info	Not Supported
Read Trom Drive Type 5001	Not Supported
Write to Drive Voltage 200V-240V	Not Supported
Compare Basic SW Version 371	Not Supported
Anply Parameter View Settingson Communication Option 4.43 PROFIBUS DPV1	Not Supported
Cot Application Uption None	Not Supported
Patra	
Delete Retrainé	
Properties	
Drive Address 2	-
Driver Name SerialCom	1
Preire	-
Deleter Penand Properties Drive Address 2 Drive Address	1
Driver Name SerialCom	1
Partie	-



The following message will appear. To read from the frequency converter select Yes and reading from the frequency converter will commence.



When reading from the frequency converter is complete, the frequency converter icon will no longer have a red line through it and the Database Information in the Right View will display settings identical to the Connected Drive Information.

In addition, the parameter settings will be displayed in capital letters.



The capital letters indicate data which has been read directly from the frequency converter. Copy the frequency converter from the Network folder and paste into the Project folder to save the data.



NB!

When the data is displayed in capital letters, a change of parameter settings in one set-up will not automatically be transferred to the other set-ups:

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In order to ensure that changes in settings are transferred to all set-ups, perform a Write to drive then Read From drive as the final step in updating parameter settings.



The change(s) in setting will then be transferred and displayed in all set-ups.





7 Read/Write between MCT 10 Set-up Software and Frequency Converter

7.1 Reading and Writing Parameters

Parameter settings can be read from or written to an online connected frequency converter. The options for reading from or writing to parameters are manifold.

One single set-up value can be read/written.

All four set-ups of a parameter can be read/written.

A group of parameters can be read/written and so on.

The user performs reading or writing by selecting the value(s) to be read/written and then selecting the Read From drive or Write to drive menu.

You can select

- A single parameter in the Right View
- All Parameters in the Left View
- One group of parameters in the Left View, e.g. Load and Motor group

and the Read From drive and Write to drive functions will apply to the whole selection.

7.2 Read/Write Settings

Access a range of functions by selecting Options on the main menu bar:



7 Read/Write between MCT 10 Set-up Software and Frequency Converter

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7.2.1 Read From Drive Settings

Select the desired options for reading from an active frequency converter, which will then become applicable for all reading from frequency converter(s).

Include Factory Set-up

If this option is selected, the factory set-up data (i.e. default values) will be included in the data read from the frequency converter. The factory set-up is not always standard, it can be changed, and therefore this can be a useful option when needing to check the actual default values.

Set-ups

Select whether you wish to read only visible set-ups or wish to read all set-ups.

Compatibility Errors

If the field device software is not exactly identical with the MCT 10 Setup Software version of the device, this is where you can specify what level of compatibility is acceptable. You can choose to *Ignore All Errors*, i.e. ignore all compatibility errors.

Alternatively, if this is unacceptably broad, you can choose *Ignore Drive Major Version Errors* to restrict the acceptable compatibility errors to those occurring in a major software version. Minor version differences such as v3.1 to v3.4 will be ignored, but major version differences such as v3.1 to v4.1 will not be accepted.

Save as Default Settings

Selecting this option will activate the above settings for all reads from drive.

7.2.2 Write to Drive Settings

Select the desired options for writing to an active drive, which will then become applicable for all writing to drive(s).

Write to Drive(s) Settings	
Write Option Write Changed Parameters Write All Parameters Setups Visible Setups Only All Setups Compatibility Errors Ignore All Errors Ignore Drive Major Version Errors Save as default settings	
OK Cancel	

Head Opt				
	Factory Setup			
- Setups	-			T.
C Visib	le Setups Only			
• All Se	etups			
-				
Compatibil	ity Errors			
Ignore.	All Errors			
🗖 Igr	tore Dri∨e Majo	r Version Errors		
Save as (default settings			
Г	OV	0	1	

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7.2.3 Communication Fault Tolerance

Here you can set up the number of communication faults tolerable before breaking off the connection. The default Number of Failures value is 0 or 1, which in practice is usually too low a fault tolerance for smooth communications, i.e. the connection will constantly be cut off.

For normal operating conditions, set Number of Failures to 3 to achieve reasonably smooth communications. For operating conditions where the electrical noise level is high, or where the standard of the installation is low, set Number of Failures to 5.



7.3 Read From Drive

Values can be read from an active frequency converter by right-clicking on the desired selection (in this example a parameter column title in the Right View), then selecting Read From Drive.



Once Read From Drive is selected, the software accesses the online device and the Drive Check window pops up, showing the compatibility of the properties of the offline Project drive (where the properties are based on database information) with the online device, i.e. Connected Drive, as in the following example:

ve Check		
	Project Drive	Connected Drive
Drive Series	FC-302	FC-302
Drive Type	0.25KW	0.55KW
Device Type	220V-240V	380V-500V
Basic SW Version	01.23	01.21
Option A	Profibus DP V1	00.00 No option
Option B	No option	00.00 No option
Option C	No option	00.00 No option
Full Compatability, all p	arameters will be written.	Update drive from connected
Limited Compatability, :	some parameters may be skipped.	Continue
No Compatability, Grou	ıp(s) will be skipped	Cancel

The colour codes indicate the level of compatibility between the theoretical Project Drive and the actual Connected Drive, for each property.

In the Drive Check pop-up you can select one of three options: Cancel, Continue, or Update drive from connected. Cancel will stop the Read From Drive process, for example if the level of compatibility between Project drive and Connected drive is unacceptably low.

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Continue will activate the Read From Drive process to show the properties of the connected drive. *Update drive from connected* will activate the Read From Drive process, deleting the data in the Project drive and replacing it with the data from the Connected drive.



The Update *drive from connected* selection will cause all information stored in the Project Drive to be deleted and then replaced in the Read From Drive process. If you wish to retain the information entered into the Project Drive, *Continue* is the appropriate selection.

Once the Read From Drive process is completed, the display shows details of both the Connected Drive Information and the Database Information.

	Connected Drive Information	Database Information	
Drive Series	FC-302	FC-302	
Power Size	0.55KW	0.55KW	
Voltage	380\-500\	380V-500V	
Basic SW Version	01.21	01.21	
Option A	00.00 No option	No option	
Option B	00.00 No option	No option	
Option C	00.00 No option	No option	
Type Code	FC-302PK55T5E20H1BGXXXSXXXA		
Drive Address	1		
Driver Name	USB		
Region	International (50Hz)		

7.4 Write to Drive

Values can be written to an active frequency converter by right-clicking on a parameter column title in the Right View and then selecting Write To Drive.

Project X - MGT 10 Set-up Software File Edit View Insert Communication To C IP III X Part III III III III III III	ols Op 147 (E	tons Help				_				_ 8 ×
B Ketwork	ID	Name	Se	O.A.	Ctr(+X		Setup 4	Factory Setup	Unit	-
Generation and deplay Generation	002 003 004 005 006 007 008	Active setup Setup copy Lop copy Custom readout Cust, read, unit Large readout Small readout	Set No No 10 96 Fre	Copy Paste Read From drive Write to drive Remove Column(s)	CITI+C CITI+V	12]	Setup 1 No copy No copy 100.00 % Frequency [Hz] Reference [%]			
Prouts and outputs Special functions Serial communication Group 7	009 010 011 012 013	Small readout 2 Small readout 3 Unit of loc ref Hand start bttn Stop button	Mo Poi Hz Enat	Apply Parameter View Settings Filter Parameter	Enable	4 [A]	Motor current [A] Power [kW] Hz Enable Enable			

Alternatively, access Read From Drive and Write To Drive by selecting Communication in the main menu:

Project X - MCT 10 S	et-up Software									_ 8 ×
File Edit View Insert	Communication Tool	s op	tions Help							
🗅 🥔 🖬 🕺 🖏 📾 🕯		18	000							
B- Network		D	Name	Setup 1	Setup 2	Setup 3	Setup 4	Factory Setup	Unit	-
SerialCom		01	Language	English	English	English	English			
🗄 🎡 Project		02	Active setup	Setup 1	Setup 1	Setup 1	Setup 1			
B Conveyor 001		-03	Setup copy	No copy	No copy	No copy	No copy			
Al Parameters	Read From Drive	04	Lop copy	No copy	No copy	No copy	No copy			
Operation a	Write To Drive	05	Custom readout	100.00	100.00	100.00	100.00			
- Coad and m	2227	-006	Cust read unit	96	96	96	96			

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7.5 Views

The MCT 10 Set-up Software can be configured by view filters to display parameters in a special way or to display parameters of interest. This is a powerful tool when wanting to maintain an overview of the frequency converter, without becoming confused by irrelevant parameters. Each set-up can be hidden by removing it. This is done by selecting the set-up in the parameter view and then selecting the remove menu. Changes made to the removed set-up are still stored inside the MCT 10 Set-up Software and can be displayed again by selecting "Customize Columns". By adding or removing columns the user can decide which information he wants to view.

The actual view can also be made valid for the complete Project or for the Folder only. This allows the user to adjust his view setting quickly for parts or the complete Project.

Another flexible way to adjust the display is via the Filter function.

Just by selecting Change Parameters, the number of parameters displayed is reduced to 5 in this example.

7.6 Scan

Before starting to work in Network mode, perform a scan of the network to detect all the active frequency converters on the network.

7.6.1 Scan Configuration

You can enter your preferred scan settings by right-clicking on SerialCom and then selecting Configure Driver.



The following configuration window will pop up:

	Character Timeout (mS) 10	OK Cancel	
Port	SyncPos Timeout (mS) 500		
COM1	Slave Timeout (mS) 200		
Baud Rate	Write		130BT

7/

7 Read/Write between MCT 10 Set-up Software and Frequency Converter



7.6.2 Scan Network

You can scan the network in three ways:

- 1. Right-click on the SerialCom icon in the Left View and then select Scan Network.
- 2. Select Scan Network under Communication on the main menu bar.
- 3. Select the Scan Network icon on the toolbar:



The Scanning for Drives window will pop up, and will indicate the progress of the scan:

	100%	
10%		L.
	10%	10%

7.7 Poll

When in Network mode, MCT 10 Set-up Software will automatically poll the parameters in the Right View to continuously update their status to reflect live operation.

However, if you wish to stop polling, for example to freeze and analyse a particular moment, you can do this in two ways:

- 1. Select Stop Polling under Communication on the main menu bar
- 2. Select Stop Polling from the toolbar

You can also resume polling in two ways:

- 1. Select Resume Polling under Communication on the main menu bar.
- 2. Select Resume Polling from the toolbar:







8 Saving Data

8.1 Network and Project Folders

It is important to note the difference between Network and Project folders in the Left View.

Through the Network folder the user gains access to physical devices operating in the field. Here the user can configure the physical frequency converters just as if he were configuring them on the LCD panel of the device. Configuration changes made in the Network folder are therefore saved only in the physical device in the field. The Network folder contains online data.

The Project folder contains those data saved to the user's hard disk, remote from the field. The Project folder therefore contains offline data.



NB!

Changes made in the Network folder are not automatically saved to the Project folder. That is, the user must actively save changes to his hard disk.

8.2 Changing the Set-up of a Device in the Field

In order to change settings for a field device, the user opens the Network folder and selects the relevant device. The configuration window will pop up, showing where the user sets the scan range, scans for frequency converters and finds the device he is seeking.

The user can stop polling by selecting the stop icon on the tool bar, and then make changes to settings directly in the set-up columns in the Right View.

At this point the changes will be implemented online in the field device, but are not recorded elsewhere.

8.3 How to Save Data

8.3.1 Save Changes to a Hard Disk

To record online changes to a hard disk, select the relevant device in the Network folder. Right-click on the device and select *Copy*. Select the Project folder, right-click and select *Paste*. Then select *File* from the main menu bar, and select *Save As*. The user can then save the device file under the desired title into a directory on his hard disk.

8.3.2 Save a Project

Save a project by selecting File from the main menu bar, then Save. Alternatively, select the Save icon on the toolbar, the third icon from the left.

8.3.3 Archive / Unarchive

Projects that include links to other documents, can store not only the drives but also the linked files. By selecting the *Archive* function the MCT 10 Set-up Software generates a file that contains all drives and the linked files into a *.ssa File. If this file is sent to other computers the user will get a copy of the linked files on his computer. 9 SyncPos

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9 SyncPos

9.1 SyncPos Handling

The VLT 5000 and VLT 5000 FLUX series have a SyncPos application option, which consists of a print card with processor. This manual does not describe the SyncPos functionality in detail. For detailed information please consult the separate SyncPos program manual.

MCT 10 Set-up Software can directly modify, read from and write to SyncPos files. SyncPos Files are stored within the MCT 10 Set-up Software files, and do therefore not require separate handling.

When a VLT 5000 has a SyncPos option installed, the MCT 10 Set-up Software will display two icons upon selection of the frequency converter: an All Parameters folder icon and a separate icon for the SyncPos option. A group 7 series of parameters is incorporated under All Parameters. The group 7 parameters apply to SyncPos.



NB!

MCT 10 Set-up Software has not true support for SyncPos application options ver 1.xx and 2.xx. The Syncpos folder will be available due to the lag of functionality in these initial versions.

9.2 Programs and Configuration File

Select the SyncPos icon and two more folders will become visible. The SyncPos program consists of two main parts: Configuration file (*.cnf) and Program Files(s) (*.m). A configuration file consists of a series of SyncPos parameters which can be programmed. MCT 10 Set-up Software can import or export SyncPos Configuration files. If no Configuration file exists it can be set up.

9.2.1 Programs

Programs can be inserted in the MCT 10 Set-up Software Project folder. When a new SyncPos program is selected, an untitled program is inserted in the SyncPos folder. The program can be edited, written and exported just as in the stand alone SyncPos program. If a SyncPos program already exists it can be imported into the MCT 10 Set-up Software project.

9.2.2 Configuration

Select the Configuration icon to view the available frequency converter configuration file in the Right View. Select the icon for the relevant frequency converter in the Right View to open a new editor (Cam Editor), which is used to change the SyncPos settings. Details of how to use the editor are dealt with in the separate SyncPos manual.



Once the desired settings are made, you can either Compile (under Settings in the main menu) or Exit Program (under File in the main menu).

Upon selecting Exit Program, a window will pop up: SyncPos Application Closed, providing you with two options for how to save and exit, including an explanation. Select Read or Write. A Confirm SyncPos Write (or Read) window will pop up, with two options for saving to the SyncPos card. Mark the desired selection and select Yes or No. Upon selecting Yes, the information will be written to the frequency converter.

If Write to Drive is selected at the root of a frequency converter, the MCT 10 Set-up Software also writes the SyncPos Files to the SyncPos options. If this function is called, the MCT 10 Set-up Software warns the user for unattended stop of the SyncPos Card.

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9.2.3 Import and Export of a Configuration File

To import a configuration file saved elsewhere, for example in another project, to the SyncPos card, left-click on the configuration file displayed in the Right View as shown below.



A window will pop up enabling you to select a configuration file for import from your computer directory:

Look in	: 🔄 SyncPos	à	 •••••••	· 1	
	slavesync.cni				
Desktop					
My Documents					
My Computer					
	File name:		Ŧ	Open	130
My Network P	Files of type:	Pursenes Elles (2 en 0		Cancel	BT50

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Select the desired file, click Open, and the file will be imported to the Configuration folder.



Export of configuration files is performed in the same manner.

9.2.4 Edit and Save Configuration File

View and edit the content of the configuration file by selecting it, whereupon the configuration editor will open.

After editing is complete, close the SyncPos application and the following window will pop up:

You have close	ed the Supcros applic	ation		
Tourneye diest		duon.		
If you wrote to to undate your	the drive using the Sy MCT 10 project	nepos application,	then you should click	the read button
		u e r		1.2
the Syncposies	litor, then you should	click the write butto	ation, but you did sav on to update your drive	e your work in 9.
				130
	Read	Write	Cancel	3T66

To save your changes, select Read or Write to save changes to the MCT 10 Set-up Software project or to the frequency converter, respectively. Reading or Writing can take some time.

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9.2.5 Import and Export of Programs

To import a program to the SyncPos card, left-click on a program displayed in the Right View as shown below.



9

A window will pop up enabling you to find the desired program for import in the computer directory.

Select Syncpos File			<u>? ×</u>
Look in: 🔄 SyncPos		- E 🛉 🗉	I •
Image: Second system Image: Second system Image: Second system Image: Second system Image: History Image: Second system Image: Desktop Image: Second syst	n		
File name:		•	Open
My Network P Files of type:	Syncpos Files (*.m)	•	Cancel

Select the desired program, click Open, and the program will be imported to the Programs folder. The import is now complete.

9.2.6 Autostart

If more than one program is stored in the Programs folder, you can set one of them to start automatically when the device is turned on.

In the Right View, select the program you wish to be the start-up program, and then right-click to select Set As Autostart. The program selected is thereafter indicated with Yes in the Autostart column.



9.2.7 Source Code

Refer to SyncPos manual.

9.2.8 Edit Source Code

Double-click on the program icon in the Right View to view and edit the source code.



A range of editing operations are possible, described in detail in the SyncPos manual.

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9.2.9 Save and Exit Program

If you wish to save your work when editing is complete, select Save under File in the menu bar. This will save the changes to the program file opened from the MCT 10 Set-up Software project.

To leave SyncPos, select Exit Program under File in the menu bar:

SyncPos-[Enc-S.m] File Edt Development Controler Testrun Con-Edtor Settings Windows Help New Image: Setting encoder connection */ Seve Seve Seve Fint Fint Expression Print Expression Image: Seve Seve	SyncPos-[int-S.m] File Edt Development Controler Testrun com-Edtor Settings Windows Help New Image: Setting accoder connection */ Settings Image: Setting accoder connection */ Image: Setting accoder connection is ok. Image: Setting accoder connection is ok. Image: Setting accoder accoder connection is ok. Image: Setting accoder acc	SyncPas-[int-S.m] File Edt Development Controler Testum Con-Edtor Settings Windows Help New Image: Setting encoder connection */ Settings Image: Setting encoder connection */ Setting encoder connection */ Image: Setting encoder connection */ Image: Setting encoder connection is ok. Image: Setting encoder encoder encoder Image: Setting encoder encoder encoder Image: Setting encoder encoder Image: Setting encoder Image: Seting encoder <t< th=""><th>Dotitled - MET 10 Set-up Software</th><th></th></t<>	Dotitled - MET 10 Set-up Software	
File Edt Development Controler Texturn Controler Settings Windows Help New. New. Close an for testing encoder connection */ Save sat he connected. Fint Print Local. n is counting positive the encoder connection is ok. n is counting negative, A and B track of the encoder Print forgram /* Start of program */ MOTOR OFF /* Motor coast */ start:	File Edt Development Controler Texturn Controler Settings Windows Help New New Image: Set Development Controler Texturn Controler Settings Windows Help New Image: Set Development Controler Texturn Controler Settings Windows Help New Image: Set Development Controler Texturn Controler Settings Windows Help Image: Set Development Controler Texturn Control Settings Windows Help Set Development Controler Connection */ Set Development Controler Connection */ Print Image: Development Control Connected. Print Image: Development Control Connection Forwar in local mode Print Image: Development Control Connection Image: Development Control	File Edt Development Controler Tetrun Controler Settings Windows Help Image: Start Image: Start PitR: *Position: *.amos /* read actual position */	Martin SyncPos - [Enc-5.m]	_ 🗆 🛛
<pre>New Open n for testing encoder connection */ Seve st be connected. ram and run the motor forwar in local mode - Local). Next study n is counting positive the encoder connection is ok. n is counting negative, A and B track of the encoder or phases must be swapped. Prover the start of program */ HOTTER OFF /* Motor coast */ start:</pre>	<pre>New New New New New New New New New New</pre>	<pre>New</pre>	E File Edit Development Controller Testrun Carr-Editor Settings Windows Help	_ @ ×
Close Close a for the connected. For the connected. For the motor forwar in local mode Frit = Local. Frit setup In is counting positive the encoder connection is ok. In is counting megative, A and B track of the encoder or phases must be swapped. Exprogram /* Start of program */ MOTOR GEF /* Motor coast */ start:	Close an in the connected. Save at the connected. Tan and run the motor forwar in local mode = Local). Print = Local). In is counting positive the encoder connection is ok. In is counting megative, A and B track of the encoder or phases must be swapped. Exprogram /* Start of program */ MOTOR GEF /* Motor coast */ start: PRINT "Position: ".amos /* read actual vesition */	Close at the connected. Save st be connected. Fint = Local). Print = Local). In is counting positive the encoder connection is ok. In is counting magative, X and B track of the encoder or phases must be swapped. Exprogram /* Start of program */ MOTOR GEF /* Motor coast */ start: MRINT *Position: *.amos /* read actual vosition */		
<pre>- Local). Prictsup In: counting positive the encoder connection is ok. n is counting negative, % and B track of the encoder or phases must be anapped. Exprogram /* Start of program */ POTOR GEP /* Notor coast */ start: </pre>	<pre></pre>	<pre>/*** - Local). n is counting positive the encoder connection is ok. n is counting negative, A and B track of the encoder or phases must be swapped. /* Start of program */ POTOR GFF /* Motor coast */ start: REDNT *Position: *.amos /* read actual position */ **********************************</pre>	Close Save Save st be connected. Tran and run the motor forwar in local mode Trans.	<u> </u>
ESProgram /* Start of program */ MOTOR GEF /* Motor coast */ start:	Exprogram /* Start of program */ MOTOR OFF /* Motor coast */ start: PRINT "Position: ".amos /* read actual position */	/* Start of program */ MOTOR GEF /* Motor coast */ start: MRINT *Position: *.amos /* read actual position */ *	Print is becall. Print setup in is counting positive the encoder connection is ok. in is counting negative, A and B track of the encoder or phases must be swapped.	
start:	start: REINT *Position: *.amos /* read actual vosition */	Start: RUMT *Position: *.amos /* read actual position */	/* Start of program */	
	PRINT "Position: ".amos /* read actual vosition */	REINT "Position: ".amos /* read actual position */	start:	

9

As for editing of a configuration file, a SyncPos Application Closed dialog box will pop up and you should select Read or Write according to the instructions in the box.



NB!

If there are programs in the SyncPos card they will be deleted without further warning.

onfirm Syncpas write	X
If may be necessary to stop the Synapos card, and the Synapos programs on yo overwritten with the ones you have in your project. This may take several minute continue?	ur drivejaj wil be es. Do jou went to
L ²	
Delete Existing Programs on Drive Before Writing	
Yes No.	

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9.3 SyncPos Read From Drive

Read all parameters and SyncPos files from a frequency converter to a project in one step by selecting Read from Drive. Select the root drive and then right-click to find Read from Drive:

le Edit View	Insert Communication T	cols Option	s Helo		
	BRASS	E 11	8 H H C .	10 10 10 10 10 10 10 10 10 10 10 10 10 1	
Network	om 11.T 5001 2009-2409		Drive Series	Connected Drive Information	Database Information
	New	•	Drive Type	5001	5001
E 🤽 Syr	Print Selected Folder(s).	•••	Voltage	200V-240V	2001-2401
	Wribiso Drive		Basic SW Version	5.22	5.22
	Compare		Communication Option	None	None
	Apply Parameter View S	etongs	Application Option	4.21 SYNC-POS	4.21 SYNC-POS
	Cut Copy Partie				
	Delete Rename				
	Properties		Drive Address	8	
			Driver Name	SeriaCom	
			Region	International (50Hz)	
		Descript	tion		

Use this feature with caution. Files in the project can be permanently lost. The following warning will appear, explaining that files of the same name will be permanently overwritten:

Do you really want to replace the syncpos programs in your project with the ones read from the drive(s)? This may	A MET TU	sec-up sortware	
take several minutes. It necessary, any running Syncpos programs will be stopped.		Do you really want to replace the syncpos programs in your project with the ones read from the drive(s)? This n take several minutes. If necessary, any running Syncpos programs will be stopped. Yes No	ο8T719.10

If you select Yes, reading from the frequency converter will commence, and Configuration Files and Programs from the frequency converter will be saved to the Project.

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9.4 SyncPos Write to Drive

Write all parameters and SyncPos files from a project to a frequency converter in one step by selecting Write to Drive. Select the root drive and then right-click to find Write to Drive:

Network					
E SerialCo	m T 5001 2009-2409			Connected Drive Information	Database Information
Project		-	Drive Series	VLT 5000 Ekin	VLT 5000
	New	•	Drive Type	5001	5001
🖻 🔽 Syr	Print Selected Folder(s)		Voltage	200V-240V	200V-240V
	Writesto Drive	Ba	sic SW Version	5.22	5.22
	Compare	Commu	nication Option	None	None
	Apply Parameter vie;9 Set	tangs App	lication Option	4.21 SYNC-POS	4.21 SYNC-POS
	Cut Copy Paste				
	Delete Rename				
	Properties		Drive Address	8	
			Driver Name	SerialCom	
		5	Region	International (50Hz)	
		Description			

NB!

Use this feature with caution. If incorrectly used, files on the drive can be permanently lost. The following warning will appear, explaining that files of the same name can be permanently overwritten:

onfirm Syncpos Write	×
It may be necessary to stop the Syncpos card, and the Syncpos programs on your drive(s) will b overwritten with the ones you have in your project. This may take several minutes. Do you wa continue?	nt to
☑ Write SyncPos Program Source Files to the Drive	
Delete Existing Programs on Drive Before Writing	
Yes No	

Choose the settings you require. Then to write, select Yes. For the above settings, the existing programs will first be deleted, and then the SyncPos Program Source Files will be written to the frequency converter. Once the write is complete, you can check the contents for the Network folder to confirm that the Write to Drive was successful.



10 Import of Files

10.1 Import of Older Dialog Files

For users working with VLT set-up software dialog, the files generated under these software packages can be imported into the MCT 10 Set-up Software.

Files from DOS versions as well as Windows versions can be imported to the MCT 10 Set-up Software. Following a successful import, the MCT 10 Set-up Software places the imported files in an imported files folder.



Due to limitations in some of the former PC tools some functionality is not importable. Functions such as displaying changed values only, are not available in MCT 10 Set-up Software.

11 Printing

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11

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11 Printing

There are two options for printing from MCT 10 Set-up Software: Print Project or Print Selected Folders. Both options are located under File in the main menu bar.

Alternatively, Print Project can be selected by right-clicking on the Project icon. Print Selected Folders can be selected by right-clicking on the icon for a folder within the Project.

If you wish to print parameter settings for an entire project, select Print Project. If you wish to print parameter settings for part of a project, select Print Selected Folders

The following dialog box will pop up:

Output Language		OK
Select Output Language: English	•	Cancel
		Groups >>
Changed Parameters	Options ———	
C Changed from default	Setups 1	
C Changed from Factory Default		
All Parameters	Print all Folders unde	er this one

In this box you can set the options as follows.

11.1.1 Output Language

Select the desired print language from the list, which appears by left-clicking on the default language displayed.

11.1.2 Changed Parameters

Select this option to print all parameters, or if you only wish to print the parameters which have changed. Select between parameters

- Changed from default
- Change from factory default
- All parameters

Make your selection, and then press ok for printing to begin.

11.1.3 Options

Specify which set-up you wish to print.



11.1.4 Groups

You can choose to print only selected parameter groups. If you select Groups >> the Print dialog box will expand to look like this:



Make your selection of which parameter groups to print.

To return to the original unexpanded Print dialog box, select Groups <<.

To print, select OK.

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12 Alarm, Warning and Fault Log Readout

From Version 2.0, MCT 10 Set-up Software supports the feature of reading out the alarms, warnings and fault logs of the online frequency converters. This allows the user to quickly locate alarms and warnings in the connected drive system, and investigate the fault log for previous trips. This feature also allows the user to gather and store events in the project file for later evaluation or the project file can be sent to a remote specialist for further investigation.

12.2 Localisation of Alarms and Warning

After a complete scanning of a Drive Network, the MCT 10 Set-up Software indicates if the connected drives have active warnings or alarms. Both warnings and alarms are indicated by a ! sign in front of the drive icon. A missing ! indicates that no alarms or warnings are present at the time the Network was scanned.

The picture below shows a small network with four drives, where the VLT 5000 at address 6 has an active Alarm or Warning.



By selecting the + sign the view of the VLT 5000 is expanded. In this view the user has the active alarm/warning icon, which is represented by the double triangle icon. The single triangle icon indicates no warning/alarms.

Active Alarms/Warnings	130BT716.10
No Active Alarms/Warnings	130BT717.10



Selecting the active alarm/warning icon will split the right view into three main areas:

b_232_graph - MCT 10 Set-up Software							_ 🗆 🗙
ile Edit View Insert Communication Tools	Options Help						
🗅 🚅 🖬 X 🖻 💼 🍜 🏤 🗁 🔡	E 🗰 🤻 🌾 🌆) i 💿 🌒 🎚	▶ 韓 会 ♥				
E III SerialCom	Alarms						
4; FC-302 0.55kW 380V-500 5; VLT 2815 200V-240V	Date Read	Time Read	Op. Hours At Read	Code	Alarm Text		
All Parameters							
Alarms							
T							
• Project	Warnings						
	Date Read	Time Read	Op. Hours At Read	Code	Warning Text		1
	dec-07-2004	12:53:01	1726.6	44	Encoder loss		
	Fault Log						
	Date Read	Time Read	Op. Hours At Read	Code	FaultLog Text	Value FaultLog	Time
	dec-07-2004	12:53:01	1726.6	8	Undervoltage	196 1726.0	
					_		
r Help, press F1							

The alarms and warnings are displayed at the top of the Right View. Both views consist of five columns. The first two columns are the date and time of the PC at the time the information was read from the drive. The third column is the Drives Operating Hours counter. Column for is the code for the warning/alarm. For a more detailed description of the code, please consult your Operating Instructions for the particular drive. The last column is the warning in clear text.

In case of a trip the drive stores the reason for the trip in a fault log buffer. The log consist of three values; code, value and time. When MCT 10 Set-up Software reads the fault log it displays the PC's time and date at the time where the log was read.

5

NB!

Since the drives do not have a built-in real time clock, the actual time of when a fault occurs can only be estimated. This requires that the user knows exactly the total amount of time in which the drive has been disconnected, between the time the fault occurred and the time the loggings were read.

12.3 Handling Alarms/Warnings in Project Files

Before alarms/warnings and the fault loggings are stored into the Project File, the user has to enable this function in MCT 10 Set-up Software. This is done under the main menu Options Updating Alarms and Warnings. By simply adding the checkmark, the MCT 10 Set-up Software now automatically reads the alarms, warnings and fault loggings at every read from/write to the drive.



12.4 Handling the Alarms and Warning Loggings

Every time the MCT 10 Set-up Software reads from or writes data to a connected drive the loggings are updated. Since the drive has no real time clock built-in there is no way to evaluate if a fault has occurred only once or if it has occurred twice or more. Due to this behaviour in the drive, MCT 10 Set-up Software consequently stores active alarms and warnings in the project file at each read/write command. These functions ensure that no alarm is lost, but can lead to a situation where one alarm has multiple entries in the log.

File Edit View Insert Communication Tools Optic	ns Help ? № @	oo 🕒 🔂 :	雄 全 手				
IDE Network IDE SetratCon IDE SetratCon IDE SetratCon IDE SetratCon IDE SetratCon IDE SetratCon IDE SetratCon 6; VL15001 2007-2407 IDE IDE IDE IDE IDE IDE IDE Decention and display IDE IDE IDE Decention and motor IDE IDE	Alarms	Time Read	Op. Hours At Read	Code	Alarm Text		
	Warnings Date Read dec-07-2004 dec-07-2004 dec-07-2004	Time Read 01:49:14 01:48:37 01:48:23	Op. Hours At Read 1727.3 1727.3 1727.3	Code 44 44 44	Warning Text Encoder loss Encoder loss Encoder loss		
All Parameters	Fault Log	ļ					
	Date Read dec-07-2004 dec-07-2004	Time Read 01:47:27 01:32:21	Op. Hours At Read 1727.3 1727.2	Code 8 8	FaultLog Text Undervoltage Undervoltage	Va 196 196	FaultLog Time 1726.0 1726.0
	•						•



MCT 10 Set-up Software stores space for more than 200 alarms and warnings for each drive in the project. The loggings can be individual cleared. This is done by entering the loggings you wish to clear, and right-click with the mouse. Clearing the log only clears the PC log, the drives onboard information is unaffected by this handling.





13 Smart Logic Controller Plug-in

13.1.1 Smart Logic Controller Plug-in

From Version 2.13, MCT 10 Set-up Software supports the Smart Logic Controller Plug-in for the AutomationDrive series. This feature enables the user to do very quick set-up of logical sequence programs by means of a graphical user interface, instead of setting up each single parameter by hand.



This plug-in is easy to use, and items can be added, just by performing a right-click in the sequence tree area. It is recommended to consult the AutomationDrive's Design guide to get a full overview of the Smart Logic Controller features.

One of the great advantages of the built-in Logic Condition Controller is its easy-to-use programmability. You can easily configure it without previous training and it enables a host of advanced functionalities.

The condition controller is a simple, but at the same time very clever way to have your drive, motor and application work together. The principle is this: The controller monitors a pre-determined event. When the specified event occurs, it performs a pre-determined act and starts monitoring the next predetermined event – and continues that way in up to twenty different steps until it returns to step one – monitoring the first specified event.

The logic controller is able to monitor any parameter that can be characterised as "true" or "false". This includes digital commands and also logic expressions, which allows sensor outputs to determine the operation. Temperature, pressure, flow, time, load, frequency, voltage and other parameters combined with the operators ">", "<", "=", "and" and "or" forms logic expressions that controls the drive logically in any application. That is why Danfoss calls it a "logic" controller.

- Makes the drive act according to your specific application
- Standard feature
- Simple to programme
- Easy to correct
- Program via MCT 10 Set-up Software or LCP

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13.1.2 Components Simple to Learn

- Comparators
- Logic rules
- Events
- Actions
- Done!





14 Scope Function

14.1 Introduction to the Scope Function

In many situations the use of viewing a variable as a curve provides a better and faster way to understanding your system. Curves also give you the possibility to graphically evaluate if a system is unstable e.g. PID loops.

Many faults that exist in a very short time (e.g. over current) can also be traced by this function, and thus be a valuable feature to the user.

14.2 Activating the Scope

The Scope is inserted like a new File folder or a new Parameter Folder, by right-clicking the mouse cursor over the Project Folder, Drive Folder or a drive.

File Edit View	Insert Communication Tools	Options Help	
⊕ ■ Network ■ Project	Folders	T 5004 0000 0400	
	New Print Project Show Drives Aliases	Drive Folder File Folder Scope Folder	
	Read from Drive Write to Drive		
	Compare Apply Parameter View Settings.		
	Cut Copy Paste		
	Delete Rename		r678.10
	Properties		130BT

The Scope folder can be inserted at any place, under the Project, under a Drive folder or under a drive. There are no limitations related to the place where a Scope is inserted. As soon as the Insert new Scope folder has been selected, the icon is inserted.



The default name of the Scope folder can be renamed.





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14.3 Channel Types

Using the scope function in MCT 10 Set-up Software gives by default the possibility to use two different channel types, depending on what the actual drive supports.

The normal channel is selected as a PC polling channel, a channel where the PC-SW itself request values from the drive to, through this channel.

The second channel type, which for instance is available in specific FC30x drives, is called Drive Real Time Channel. This channel is started when filling up a buffer in drive, the data here can be set up with a very precise sample-rate. The rate is depending on what the single drive supports.

14.4 Initial "Add Channel" (PC Polling Channel)

The first time you select the Scope Folder, MCT 10 Set-up Software will pop-up with the Add new Channel Box.

In this Box you will be able to browse your Network for the drives and signal that you want to add to your Scope view. The first task is to select the channel type and to locate the drive that you want to monitor. The default channel type is PC Polling Channel.

Add Cha	nnel Network Project	C-302 0.554 drives	<₩ 200V-240V		_
PC Pollir Paramete	ng Channel (r	•	Drive Real Tim	ne Channel 🤇	
PC Pollir Paramete	ng Channel (r Name	•	Drive Real Tim	e Channel C	
PC Pollir Paramete ID 1500 1501 1502 1600 1601 1602	ng Channel (Name Operating Running H kWh Cou Control W Reference Reference	← Hours Hours hours hter iord s [Unit] > %	Drive Real Tim	e Channel 🕥	

By selecting the drive (2) the available Signals will be shown in the box with Parameter ID number and the parameter name (3). Selecting the Signal and pressing OK brings up the add channel box again, and the setting for value/divisions (in this case Amps/Div) can be set. Setting a wrong value is not critical. MCT 10 Set-up Software stores the values, but the value may not be shown within the visible area. You can adjust the Amps/Div later to fit the level inside the visible area without losing information.



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The position number is vertical Zero line (on the Y Axis). If you have many signals on top of each other it is useful to have them plotted apart. The marker allows you to differentiate the different curves in a black and white printout. Each curve gets a marker as box, triangle, cross etc. Colour sets the colour of the curve.

Add Chan	nel 🛛 🔀
Signal	200V-240V 3.04\1614 {Motor Current}
Name	1:Motor Current
A/div	1 Position 0
Color	Marker 📰
	OK Cancel
	130

The selection done by now, gives the following graph window:



If more channels are needed, the user can insert more channels by right-clicking the mouse cursor in the channel box:

14 Scope Function

MCT10_graph - MCT 10 Set-up Softwar	e	
File Edit View Insert Scope Communicat	ion Tools Options Help	
D 🛎 🖬 👗 🖻 🖻 🎒 🖦 🔭	🌐 🏢 💡 🧐 💷 🌒 🕸 🖏 🛧 🕂 🚫 🚍 🕨 🖩 🕂 🏟	ର୍ ବ୍ 🛯 🎼 🗔 🙌 🎊 🔀
Metwork Escrit/Com Scrit/Com Scri/Com Scrit/Com Scri/Com Scri/Com Scri/Com Sc		- 7:Motor current Empty
		00:00:05:000
Cha	annel Color Name Signal 7:Meter current brochNetwork/SerialCom/7: VIII. 5001-2004-2404/	Units/Div Position
I ch.	A motor currence global polyterwork (senal contry) #E1 5001 200#-240#)	μεύζι 0.3000 - 0
	Add Channel Properties	

This will activate a new Add Channel Box, which will be handled like the first channel insert.

Add Channel
PC Polling Channel Drive Real Time Channel Parameter D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name D Name
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14.5 Initial "Add Channel" (Drive Real Time Channel)

The first time you select the Scope Folder, MCT 10 Set-up Software will pop up with the Add new Channel Box.



In this box you will be able to browse your Network for the drives and signal that you want to add to your Scope view.

The first task is to select the channel type and to locate the drive that you want to monitor. The default channel type is PC Polling Channel, which must be set to Drive Real Time Channel.

By selecting the drive and Drive Real Time Channel, the scope properties dialog will be shown. In this dialog it is possible to set up a specific number of channels, depending on what the actual drive supports.

In this example four channels can be configured. In the selection lists under the Logging source column, the available signals will be shown by parameter name. In the logging interval column, the sample rate for the channel can be set.

The trigger set-up is in this example set up to be in continuous mode, which will have the drive to read data into its internal buffer continuously. The Samples before Trigger can in this example be ignored.



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14.6 Using Advanced Triggers in a "Drive Real

The following example explains the set-up of a trigger, which triggers the collection of data in the drive when the motor speed exceeds a certain limit.

First we need to set up a comparator in the Smart Logic Control in order to be able to have a trigger signal when the motor speed exceeds a certain limit.

- 1. Select the Smart Logic group
- 2. Select a free available comparator not in use, 1310.0, and set it up to motor speed
- 3. Select Comparator operate 1311.0 to greater than >.
- 4. Select Comparator Value 1312.0 to the needed value.
- 5. Set up the trigger event in the Drive Real Time Channel Properties dialog to Comparator 0, and set the Logging mode to log once on trigger. Press OK to enable the set-up.





Now the MCT 10 Set-up Software logging can be started by pressing Start (resume) Poll:



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14.7 Communication Control

By now we have pointed out the variable that will be shown. The next vital part of MCT 10 Set-up Software Scope is the control of the Communication Driver. The toolbar of the Scope has four main buttons for the communication.

Start (Data Acquisition):

This icon controls the driver of MCT 10 Set-up Software. By pressing this button the driver of MCT 10 Set-up Software starts collecting the requested data from the drive network.

Stop (Data Acquisition):

The driver of MCT 10 Set-up Software is stopped no communication to the drive network while the Scope part is active on the screen.

Start (resume) all tracking:

Activating the tracking mechanism of MCT 10 Set-up Software starts the readout of variables to the screen and to the buffer of MCT 10 Set-up Software. Variables are checked up against the trigger settings. If the buffer has been partially filled (use of the Pause All Tracking button), MCT 10 Set-up Software will continue to fill data into the buffer.

Pause All Tracking:

Deactivates the tracking. Buffer remains at its current state, no new data is entered into the buffer. The buffer pointer keeps its current value. The screen remains at its current state, no new data is visualised.



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14.7.1 Additional Settings

The Scope tool has more settings, which can be adjusted by right-clicking on the Scope window, and selecting Properties (depending on channel type the scope properties dialog will differ):



The General tab holds four basic settings for the Scope, seconds per division (SEC/DIV), Time Format, Buffer Size and Polling Rate.

The SEC/DIV sets the time base on the X-axis. The number can be set between 0.01 sec and 100000 sec. Time format can be set to contain year, month, date, hour, seconds and milliseconds in eight different formats. The buffer size is the number of data sets in the buffer. The number can be set to a number between 0 and 1 .000.000

The last of the General setting for the Scope is the Polling Rate. Polling rate is time in milliseconds between two samples.

For systems with large inertia a high time may be used, since the value changes slowly. For systems with low inertia a high polling rate (low time between the samples) is needed. Setting the polling rate to As fast as possible, lets MCT 10 Set-up Software run without a fixed sample time between each sample. By doing so, MCT 10 Set-up Software does not control the actual time between each sample and this can lead to a high jitter between two samples.

eneral Trigger Cursor			- 1
Time Base			
SEC/DIV 1	Time Format	hh:nn:ss:zzz	-
Buffer Size 500	Trigger Pos.	10 🛋	[%]
,	_	5	
– Polling Rate –			
Specify	1	•	
C As fast as possible			
<u> </u>]

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Knowing the first four buttons allows the user to generate a graph out of one drive variable. By selecting the Resume Poll button, MCT 10 Set-up Software starts tracing the motor current, which based on the motor load can generate a current curve like this:



To stop the tracing press the Stop Poll button or Pause All Tracking. The tracking will continue until the buffer is filled (default 1000 samples). If the tracing stops due to a filled buffer, the buffer has to be emptied before a new trace can be activated. To clear the buffer and to reset the Scope, the following two buttons are defined:

Clear all buffer for the channel:



By selecting the trace with: The buffer for this channel can be individually emptied.



Reset Scope

The reset Scope works in the same way in that it clears all buffers for the channel. The difference is that it clears all buffers at once. This is more convenient if many channels are activated at the same time, or if a new channel is added to an existing track. Before new values can be added to a track all channel buffers must be emptied, since MCT 10 Set-up Software requires that all buffers have the same amount of data.



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Export to Excel

The export to Excel enables the user to have the scope data stored in a file which Microsoft Excel can open.

A save file dialog will appear, so the user can store the file in an appropriate place.



14.8 Triggers

A trigger is a tool that allows only starting the sampling of values when a certain value is reached. This will reduce the need for large buffer sizes. A trigger is also a valuable tool to see if values cross border where the drive does not store any warnings.

Setting up Trigger:

By right-clicking on the Scope window and selecting Properties (See under Polling Rate) the property for the Scope is brought up.

Under the Trigger tab the Source for triggering, the level for activating, Mode and Slope for the trigger can be set.



The source is selected out of the channels that are currently active. The level is the level for the source where the Trigger has to be activated. For Mode, there are two different modes, Auto and Normal. With Auto the user will trigger the trigger automatically by pressing the Resume All button. This means that the trigger line will be set to the time when the user pressed the Resume button. Selecting Normal (Norm) the trigger is activated when the level and the slope settings are fulfilled. The slope sets if the value has to be rising (source value goes from low values to higher values) or the slope has to be falling (source value goes from high values to low values).

14.8.1 Trigger Position

In many cases it is worth knowing what happens before the trigger is activated. This can be achieved by setting the trigger position value to a value different from the default, which is 0%. If the buffer has a size of 1000 samples and the trigger position is set to 10%, the buffer will contain 100 samples before the triggering point and 900 after the triggering point.

General Trigger Cursor		
Time Base		
SEC/DIV 1	Time Format hh:nn:	\$\$:ZZZ
Buffer Size 500	Trigger Pos. 10	· [%]
- Polling Bate		<i>₽</i>
 Specify 	1	
C As fast as possible	•	

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14.8.2 Cursors

To evaluate a trace or show the actual values of the buffer, the cursor is used to point out the data. The Cursor tab contains four different settings:

The style contains six different possibilities:

Value XY Value X Value Y Delta X Delta Y Inverse Delta X

Value XY shows the time and value of each signal at the cursor location, Value X the time alone. Value Y the value alone. Delta X shows two cursors, and the time between the two cursors are calculated. Delta Y works like Delta X, but this time the difference between two levels is calculated.

General Trigger Lu	ISOL	
Style	Value XY	
Pointer 1 Position	44.393592	
Pointer 2 Position	0	
Color		
		130
		BT 5
	OK Cancel	Help 1

15 Update Drives Firmware Support in MCT 10 Set-up Software

MCT 10 Set-up Software can be updated, regarding what firmware versions of drives are supported.

The updates must manually be downloaded from the Danfoss web-site http://www.vlt-software.com for storage on local disk drive. It is also possible to find video training material on this site for operating MCT 10 Set-up Software.



The update files can be installed without the user having administrator rights in Microsoft operating systems, which has been a major disadvantage for standard users which were not allowed to install software on their computers (laptops).

15.2 Background Details

MCT 10 Set-up Software project files are in principle having the same features as Microsoft Office Word. Newer versions of MCT 10 Set-up Software can open legacy version project files.

The example in the illustration below visualises a version 2.00 of MCT 10 Set-up Software supporting offline the firmware version 2.01 of FC 302. This file can be used by the newer version 2.02 of MCT 10 Set-up Software. However, if a project file from the newer version 2.02 of MCT 10 Set-up Software containing firmware version 2.51 of FC 302 cannot be opened or used offline by the legacy version 2.00 of MCT 10 Set-up Software, since the firmware is unknown.



When MCT 10 Set-up Software has been updated, project-files saved as with newer version firmware can be opened and used. This scenario is shown in the below example.



15.3 How to Find Out if MCT 10 Set-up Software Has Been Updated

Finally MCT 10 Set-up Software can be checked in the About box, regarding what updates the user has installed.

Also when contacting the hot-line support, system information can be copied directly to the Windows Clipboard.



16 Guide to DP-V1 Connection and Simatic Manager

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16 Guide to DP-V1 Connection and Simatic Manager

The following guide explains how set-up SIMATIC NET to work together with MCT 10 Set-up Software. *Start Configuration Console:*

A	Danfoss IT Tools	•		_		
f	SIMATIC	•	AuthorsW			
Comp Library	Component Library	6	Information	۶.		
	My Bluetooth Places	Í	🛅 License Management	۶.		
			SIMATIC NET	•	Industrial Ethernet	
8	New Office Document	1		1	PROFIBUS	. Constantanta di Frand
10	Open Office Document		SIMATIC Manager	-	Commissioning PC Stations	Continussioning wizard
	DDM 2.0				Industrial Communication with PG PC	Configuration Information Service
	1 PDM 2.0					Set PG-PC Interface
	Station Configurator					Symbol File Configurator
	Programs	•				
onal 📀	Documents	•				
essi	Settings	•				
8 📎	Search	•				
¥ 🕐	Help and Support					
Nop	<u>R</u> un					
ž 👩	Shut Down					

Set the Mode of the module to Configure mode and press apply:

PC Station SIMATIC NET Configuration Applications Modules OPC settings OPC Settings	General Module properties Type of module: Mode of the module: Interface profile for: CP5511(FWL) CP5511(PROFIBUS) <actives)< td=""> CP5511(Auto) Module reaction: Restart:</actives)<>	PROFIBUS Configured mode Name of the module: CP5511	Index: 1	
	Apply Cancel	Help	1	

Close the Configuration Console.



Start Commissioning Wizard:

in	Danfoss IT Tools	•		_			
1	SIMATIC	·	AuthorsW	Ľ			
Comp Library	Component Library		Information				
8	My Bluetooth Places		License Management SIMATIC NET) 	Industrial Ethernet		
Ē	New Office Document		STEP 7	•	PROFIBUS		
	Open Office Document	i	SIMATIC Manager		Settings Commissioning PC Stations		Commissioning Wizard
	PDM 2.0			8	Industrial Communication with PG PC	뮡	Configuration Information Service
	Station Configurator						🖞 Set PG-PC Interface 🕄 Symbol File Configurator
	Programs	•					
	Documents	•					
	Settings	•					
	Search	•					
< ?	Help and Support						
	<u>R</u> un						
	Shut Down						

Press Next and the following screen is shown:

Configuration 2(4) Here, you specify the	configuration that will be used f	or this PC.	<u></u>
The SIMATIC NET PC Sta configuration: <u>P</u> C Station Wizard	ation Wizard will guide you throu	igh creating, modifying, or a	adopting a
When you have created y	our configuration, please click t	he "Next" button.	
	< <u>B</u> ack Next>	Cancel	Help



Press on PC Station Wizard and Change local setting and then on Next:



Choose Open project with Simatic Step7/NCM PC Manager.

Which settings do you want to change? If you select 'Change hardware configuration' or 'Edit connections', you must also specify the name of the PC station. If you change local settings, the local station is the default.
 Change hardware configuration (module properties, DP) You can configure hardware settings and settings for specific drivers, for example, module addresses or operating modes. PC station name: pc038169 Edit network and connection configuration You can modify the configuration of an attached network or edit, add, or delete communication connections. PC station name: pc038169
 <pre>Cancel Help 01 02 03 03 04 04 04 04 04 04 04 04 04 04 04 04 04</pre>

Simatic Manager is now opening a new project.

Open Configuration:

Г

Docprj C:\Program File	s\Siemens\Step7\Proje	cts\locprj	
⊡- ⊉ locpri <u>@</u> pc038169	Configuration	: :CP5511	130BT688.10

Drag and Drop a Application to the PC index 2.

변화[HW Config - [pct39169 (Config 백) Sation Edt Insert BLC Yew 다 같은 국가 제 책임 중에 관했다.	ration) locprj Options Window Holp R San San (The R M?)		× 0 × 8 × 10	
2 Apples 4 Apples 5 5 7 7 0			End: A1 Profile: Standard ▼ Image: Standard ▼ Image: Standard ▼ Image: Standard ■ Image: Standard ■	
			Sima II - PL State Control studened Sima II - PL State Control studened Sima II - PL State Control studened Controler Con	
		×	⊕-@ ŪPC Server	
Index Module I Ht CP5511 2 Application 3 4	Dider number Firmware MPI addre 6GK1 551-1AA00 V6.0.5	ss Comment		13087689.10



Open the properties on your Master Class 2 card (here shown as a CP5511 card).

Short Description: CP 5511 SIMATIC NET CP 5511 PROFIBUS, S7 connections, DP master, DPV1, DP slave, PG functions, DP master class 2, PCMCIA, routing, SIMATIC Order No. / firmware 6GK1 551-1AA00 / V6.0.5 Name: Interface Interface Interface Ivpe: PROFIBUS Address: 125 Networked: Yes	Short Description: CP 5511 SIMATIC NET CP 5511 PROFIBUS, S7 connections, DP master, DPV1, DP slave, PG functions, DP master class 2, PCMCIA, routing, SIMATIC Order No./ firmware 6GK1 551-1AA00 / V6.0.5 Name: CP5511 Interface Immerit Jype: PROFIBUS Address: 125 Networked: Yes Comment: Comment:	Short Description: CP 5511 SIMATIC NET CP 5511 PROFIBUS, S7 connections, DP master, DPV1, DP slave, PG functions, DP master class 2, PCMCIA, routing, SIMATIC NET CD 7/2001 SP5 Order No. / firmware 6GK1 551-1AA00 / V6.0.5 Name: Interface Imper: PROFIBUS Address: 125 Networked: Yes Properties Comment: Comment:	General Assignment	Operating Mode Reserve LSAPs
Order No. / firmware 6GK1 551-1AA00 / V6.0.5 Name: Image: Ima	Order No. / firmware 6GK1 551-1AA00 / V6.0.5 Name:	Order No. / firmware 6GK1 551-1AA00 / V6.0.5 Name: Interface Iype: PROFIBUS Address: 125 Networked: Yes Properties Comment:	Short Description:	CP 5511 SIMATIC NET CP 5511 PROFIBUS, S7 connections, DP master, DPV1, DP slave, PG functions, DP master class 2, PCMCIA, routing, SIMATIC NET CD 7/2001 SP5
Name: CP5511 Interface Iype: Iype: PROFIBUS Address: 125 Networked: Yes Properties	Name: Interface Interface Iype: Iype: PROFIBUS Address: 125 Networked: Yes Properties	Name: Interface Iype: PROFIBUS Address: 125 Networked: Yes Comment:	Order No./ firmware	6GK1 551-1AA00 / V6.0.5
Interface <u>Iype:</u> Address: 125 Networked: Yes Properties	Interface Iype: PROFIBUS Address: 125 Networked: Yes Properties Comment:	Interface Iype: PROFIBUS Address: 125 Networked: Yes Properties Comment:	<u>N</u> ame:	CP5511
		Lomment:	Interface <u>Iype:</u> Address: 12 Networked: Ye	ROFIBUS 5 s Properties

Press on Operating Mode and select DP master class 2 and assign an Application. Press on OK and on Save and Compile.

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16 Guide to DP-V1 Connection and Simatic Manager

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Press on Download and select to download CP5511 (index 1) and the Application (index 2).

Earget modules:	
Module	Index
CP5511	1
Application	2
orationinanager	120
оц. (All 1	
Select All	

Press OK and also OK to the Warning:

Download (33:16656)	×	Download (13:4708)
Online: Connection could not be established. The connection partner is not responding.	593,10	Unable to establish the connection to the module Application (Index 2) in station pc038169. Do you want to continue downloading without this module?
Help	130BTG	<u>Yes</u> <u>No</u> Help

Press Yes to this Warning:

Press OK to Stop Target Modules and the download and set-up of the CP5511 card is completed. Close Simatic Manager.

Click on Simatic Net Commissioning Wizard and on Next.

Symbols 3(4) Here, you specify whether and which symbolic names will be communication.	ie used for	······································
If you want to use symbolic names for the variables, you must sp Select "Edit list" to define existing symbol files, create new symbol name (X) for downloaded symbol information. Active symbol files: Prefix File name	ecify one or more sym ol files or to constitute	ibol files. the file
Additional settings for PROFInet and SIMOTION:	<u>E</u> dit li: <u>A</u> dvanced S	st Symbols

Click on Next again and click on finished.



By Configuration Console and by Access points set the CP_L2_1 and CP_L2_2 Interface parameter assignment to CP5511(PROFIBUS).



Set the Mode of the module from Configure mode to PG Operation and press apply and OK. Close the program.

Eile Action View Help ⇔ → € 💽 😫	
C Station C Station C Station C Stations C Statio	I mode Station
I Description of the second	



Open the Set PG-PC Interface:

î.	SIMATIC	, 🖻	AuthorsW	•			
Comp	Component Library		Documentation				
	My Bluetooth Places	ē	License Management	•			
	Hy bidecourriaces		SIMATIC NET		Industrial Ethernet		
5	New Office Document		STEP 7		PROFIBUS Settings		Commissioning Wizard
CO.	Open Office Document	-	y Sanierric Hanagor	1	Commissioning PC Stations		Configuration Console
2	PDM 2.0			3	Industrial Communication with PG PC	l	Configuration Information Service
Ĩ	Challen Carllingaban						🐺 Set PG-PC Interface
inni	Station Configurator					ļ	Symbol File Contigurator
6	Programs	•					
e 🗟	Documents	•					
ssio	Settings	•					
	Search	•					
	Help and Support						
SN IT	Run						
ğ	<u> </u>	- 1					
20	Shut Down						

Set Interface Parameter Assignment Used to CP5511(Profibus) and click on Properties:

perties - CP5511(PROFIBUS)		×
ROFIBUS		
Station Parameters		
PG/PC is the only master on	the bus	
Address:	125 📑	
🔲 <u>C</u> heck address		
<u>⊥</u> imeout:	1 s 💌	
Network Parameters		
Transmission <u>R</u> ate:	1.5 Mbps	
Highest Station Address:	126 💌	
Profile:	DP Standard Universal (DP/FMS)	
	User-Defined	
	<u>B</u> us Parameters	
– Network Configuration		
Linclude network configuratio	n below	
Master: 1	Slaves: 0 📷	9.10
OK Default	Cancel Help	0BT69

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The tag *PG/PC is the only master on the bus* should only be set active if <u>no</u> PLC is active on the bus. Set the Transmission Rate (Baud Rate) to the same baud rate as the PLC and click on OK. Click on *Diagnostic* and on *Test* and *Read* and the CP5511 card will read all nodes on the Profibus network. In this example it finds a Slave on address 6.



SIMATIC NET diagnostics - CP5511(PROFIBUS)
PROFIBUS/MPI Network Diagnostics Hardware Status/Network Diagnostics Image: Comparison of the state of th
Bus Nodes 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 0 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10<
OK Cancel Help

Open MCT 10 Set-up Software and a DP-V1 connection should be detected by Network. In this example a VLT 5000 is found at address 6.

Manager



Name	Version	Release	Release number
AuthorsW	V2.5 + ServicePack 1	R2.5.1.8	V25.1.0
Automation License Manager	V2.0	V02.00.00.00_01.16.00.01	V02.00.00.00
CP PIP Modbus Master	V3.1+3P2 VE1 - Cautan Park 2	H3.1.21	V31.20
SIMATIC NET PC Software	Vo.1 + ServiceFlock 2	Ruld 3045	6100
STEP 7	V5.3+SP2	K5320 11 501	K5320



17 FC 102 and FC 202 Series Functions

17.1 New Features

In MCT 10 Set-up Software there is added special support for some new features in the FC 10x series of frequency converters. The following section describes how to access and set these new features.



NB!

Consult the FC 102 and FC 102 Design Guide for detailed functionality of the frequency converters.

17.1.1 Clock Features

MCT 10 Set-up Software supports the clock features in FC 102, by means of intuitive dialogs, enabling the user to set-up the clock features

The Clock Features are grouped in two sub-levels:

- 1. Date and Time
- 2. Working days

17.1.2 Date and Time

In the Date and Time dialog, the user can see three groups of settings:



Display format on LCP:

In this group the user can select how to get date and time presented on the local control panel on the FC 102. In MCT 10 Set-up Software parameters Date and Time format depends on PC Regional Options (Date and Time format).

17 FC 102 and FC 202 Series Functions

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Set Date and Time:

In this group the user can actively select to change the date and time in the FC 102 from the PC. Normally it should be set to use the local PC's date and time, connected. When the connected PC's time is in another time zone, then it can be beneficial to set the date and time manually. Date and time will be changed in MCT 10 Set-up Software project file or in drive only when "Change" check box is checked.

Setting the date and time manually, this dialog appears.

Edit Paramete × Start Date and Time Date Value 4 Þ Mon Tue Wed Th Fri 2099-1-1 Max 31 7 14 21 28 2 9 16 23 30 7 6 8 15 22 29 10 17 24 1 11 18 25 2 13 12 19 26 3 10 Min 2000-1-1 20 27 Default 2005-11-3 Date 2005-11-05 Time Vali 23:59:59 03:00:00 00:00:00 . Time Min 11:56:24 Default -130BT707.10 -OK Cancel

Daylight Saving Time:

In this group the user can set the date and time for daylight saving.

Daylight Saving Time begins for most of the United States at 2:00 a.m. on the first Sunday of April. Time reverts to standard time at 2:00 a.m. on the last Sunday of October. In the U.S., each time zone switches at a different time. In the European Union, Summer Time begins and ends at 1:00 a.m. Universal Time (Greenwich Mean Time). It begins the last Sunday in March and ends the last Sunday in October. In the EU, all time zones change at the same moment.

Enable Clock Fault:

If the clock is not set up, then the drive shows a specific warning. (Also MCT 10 Set-up Software shows warning in Warnings folder). If the user does not want to set up clock or can not set up clock then he probably also does not want to see this warning all the time. For that case is the parameter Clock Fault. If Clock fault is enabled, the user can see this specific warning and if clock fault is disabled then user can not see the warning.

Enable Clock Fault is checked - drive is showing warning. Enable Clock Fault is unchecked - drive is not showing warning.

17.1.3 Working Days

In the Working days dialog, the user can easily define the working days for time based actions.

Start of the week can be Monday or Sunday. The visual Calendar will change.

Only 5 additional working days (dates) are allowed.

Only 15 additional non-working days (dates) are allowed.



Please notice Additional working dates and non-working dates have year and must be updated every year.

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17.2 Preventive Maintenance

The intension of the "preventive maintenance" feature is to provide the user's with the capability to plan periodic maintenance of both the drive and other technical equipment within the same plant. Preventive maintenance should be seen as time based scheduling of periodic checks that manually should be done.

In the right view grid, it is possible by means of double clicking in the cells to activate dialogs to enter application item, action and how the interval must be defined.

	「圓」 🌚 🗢 🗣 端 1				
Network	o Application item	Action	Time-based	Date and Time	Interval [h]
Broject	Fan bearings	Replace	Date & Time	2005-11-03 12:37:55	
E	Temperature transmitter	Renew	Operating Hours		32
Initial Initial Optick Menus	UD 4 : Licence	Renew	Date & Time	2005-11-25 12:39:38	
All Parameters	Fan belt	Inspect/Check	Running Hours		99
Alarms 5	Motor bearings	Clean	Operating Hours		8
E Clock Functions					
Preventive Maintenance 7	-				
del Smart Logic					
1 Sindi Coge	0				
	1				
1	2				
1:	3				
1	4				
11	5				
11	6				
1:	7				
11	8				
1	9				
2	0				
		1	Save Cano	el Delete	Help
x					

The clock parameters (parameters in the Clock Functions folder) must be correctly programmed for Preventive Maintenance to function correctly.

If Preventive Maintenance item Date and Time is passed then the line is marked as red.

Before writing new Preventive items to FC 102 do not forgot to reset Maintenance Word (par 23-15).

17.3 Times Actions

MCT 10 Set-up Software can by means of an intuitive user interface, easily setup the possible "time based actions" supported in the FC 102.

The purpose of "Time-based Actions" is to automate the drive by giving the user the possibility to define real-time controlled events. The basic idea is to have a possibility to define time of day and which day(s) of the week, when the drive automatically must perform a selected action.

In this way the user doesn't have to execute the actions defined manually, instead the drive automatically does the job on the days needed.

The programmed actions will be repeated on a weekly basis. Additional working days and additional non-working days can be programmed.

The clock parameters (parameters in the Clock Functions folder) must be correctly programmed for Timed Actions to function correctly.

Actions, which can be programmed, are the same as known from the SLC (Smart Logic Controller).

Time Action 1 - At Action 2 - At	1		DN Acti															
Time Action 1 - A Action 2 - A	1	(ON Acti	-													_	
Action 1 - A: Action 2 - A2	1			ion		OFF	Action		Re	curren	се	ON T	ime		OFF Ti	me		
Action 2 - A2		2	Select s	etup 2	2	Selec	t setup	01	Mo	onday		12:44	:03		16:44:	06		
	2	9	Select p	preset	ref. 2	Selec	t setup	1	Wo	orking (days	17:45	5:06		08:45:	18		
Action 3 - A3	3	2	Select p	preset	ref. 1	Selec	t setup	2	Nor	n-worl	ing days	08:45	:51		17:46:	15		
Action 4 - A	1																	
Action 5 - AS	5																	
Action 6 - Ac	5																	
Action 7 - A	7																_	
Action 8 - At	3																	
Action 9 - AS	9																	
Action 10 - A	410																	
								1.1	S	ave	1	ancel	1	Delete		Help		
												ancor	_	00000	_	Troip		
	0		1 2	3	4	5 6	7	8	9 10	0 11	12 13	14 1	5 16	17 18	3 19	20 21	22 2	23 2
Monday	A1			-	_	-	_	-										
	A2											5					i i i i	<u>وز م</u>
Tuesday	A2			\vdash														
Wednesday	A2																	
Thursday	A2																	
Friday	A2																	
Saturday	A3	•																
Sunday	A3	;																
-																		
																		_
	Action 6 - Al Action 7 - A Action 9 - A Action 9 - A Action 10 - A Action 10 - A Action 10 - A Monday Tuesday Wednesday Thursday Friday Saturday Saturday	Action 6 - A6 Action 7 - A7 Action 9 - A8 Action 9 - A9 Action 10 - A10 Monday A1 A2 Thursday A2 Thursday A2 Thursday A2 Saturday A3 Sunday A3	Action 6 - A6 Action 7 - A7 Action 8 - A8 Action 9 - A9 Action 10 - A10 Monday A1 Monday A1 Monday A1 Monday A2 Thursday A2 Friday A2 Friday A2 Saturday A3 Sunday A3	Action 6 - A6 Action 7 - A7 Action 9 - A8 Action 10 - A10 Action 10 - A10 Monday A1 A2 Tuesday A2 Thursday A2 Thursday A2 Saturday A3 Sunday A3	Action 6 - A6 Action 7 - A7 Action 9 - A9 Action 10 - A10 Image: Image of the state of	Action 6 - A6 Action 7 - A7 Action 9 - A8 Action 9 - A9 Action 10 - A10 Monday A1 A2 A2 Tuesday A2 Thursday A2 Thursday A2 Saturday A3	Action 6 - A6 Action 7 - A7 Action 8 - A8 Action 9 - A9 Action 10 - A10 Action 10 - A10	Action 5 - A6 Action 7 - A7 Action 8 - A8 Action 9 - A9 Action 10 - A10 Action 10 - A10 Image: state sta	Action 6 - A6 Action 7 - A7 Action 9 - A9 Action 10 - A10 Monday A1 A2 A2 A2 A3 Saturday A3	Action 6 - A6 Action 7 - A7 Action 8 - A8 Action 9 - A9 Action 10 - A10 Action 10 - A10 Monday A1 Action 9 - A9 Action 10 - A10 Monday A1 Action 9 - A9 Action 10 - A10 Monday A1 Action 9 - A9 Action 10 - A10 Monday A1 Action 9 - A9 Action 9 - A9 Action 10 - A10 Action 10 - A10 Action 9 - A9 Action 9 - A9 Monday A1 Action 9 - A9 Action 9 - A9 Action 9 - A9 Action 10 - A10 Action 9 - A9 Action 9 - A9 Action 9 - A9 Action 9 - A9 Monday A1 Action 9 - A9 Action 9 - A1 Action 9 - A1 Action 9 - A1 Mednesdy A2 Action 9 - A1 Action 9 - A1 Action 9 - A1 Action 9 - A1 Thursday A2 Action 9 - A1 Action 9 - A1 Action 9 - A1 Action 9 - A1 Saturday A3 Action 9 - A1 Sunday A3 Action 9 - A1 Action 9 - A1 Action 9 - A1 Action 9 - A	Action 6 - A6	Action 6 - A6	Action 6 - A6 Action 7 - A7 Action 7 - A7 Action 8 - A8 Action 9 - A9 Action 10 - A10 Action 10 - A10 Save Cancel Monday A1 Ation 8 - A8 Action 2 - A10 Save Cancel Image: Save Cancel Image: Save Monday A1 Image: Save Cancel Image: Save Image: Save Image: Save Image: Save Tuesday A2 Image: Save Image: Save Image: Save Thursday A2 Image: Save Image: Save Image: Save Image: Save Sinday A3 Image: Save Image: Save Image: Save Image: Save Image: Save Sinday A3 Image: Save Image: Save Image: Save Image: Save Image: Save Max Image: Save Sinday A3 Image: Save Image: Save Image: Save Image: Save Image: Save Image: Save Max Image: Save Image: Sa	Action 6 - A6	Action 6 - A6 Action 7 - A7 Action 7 - A7 Action 9 - A8 Action 9 - A9 Action 10 - A10 Action 10 - A10 Save Cancel Delete 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 10 Monday A1 A2 Action 10 Act	Action 6 - A6 Action 7 - A7 Delete Action 9 - A9 Action 10 - A10 Action 10 - A10 Save Cancel Delete 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 Monday A1 A2 A2 A2 A2 A2 A2 A3 A4 A4	Action 6 - A6	Action 6 - A6 Action 7 - A7 Action 7 - A7 Action 9 - A9 Action 10 - A10 Action 10 - A10 Save Cancel Delete Help Monday A1 Action 2 - A7 Action 2 - A7 Action 10 - A10 Save Cancel Delete Help Monday A1 Action 2 - A7 Action 2 - A7 Action 2 - A7 Monday A1 A2 Action 2 - A7 Action 2 - A7 Action 2 - A7 Yeednesday A2 A2 Action 2 - A7 Action 2 - A7 Action 2 - A7 Thursday A2 Action 2 - A7 Action 2 - A7 Action 2 - A7 Action 2 - A7 Saturday A3 Action 2 - A7 Action 2 - A7 Action 2 - A7 Action 2 - A7 Sunday A3 Action 2 - A7 Action 2 - A7 Action 2 - A7 Action 2 - A7 Action 2 - A7

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It is easy to by means of double clicking in the cells to activate dialogs to enter the required data.

17.4.1 Quick Menus

The quick menus can be viewed in MCT 10 Set-up Software.

The quick menus allow easy access to the relevant parameters for specific application set-up. The user should just follow the steps through the tree-view in MCT 10 Set-up Software as on the LCP on the drive.

	RY (1)		+	Calue 2	Colum 2	Enhur d	11-11	1.0
A SerialCom	10	Name	Secup I	Secup 2	Secup 3	Secup 4	Unix	10
B- 🙀 Project	120	Mater Down David	a an	engen 2.00	2.30	2.20	Law	
日本語 1; FC-102 2.20KW 380V-480V	120	Motor Power [Kw]	2.20	400	2-20	2.20	10	
E Quick Menus	122	Motor Vocage	100	900	100	900	V Lin	
 My Personal Menu 	125	Motor Prequency	50	50	50	50	0	
E protion Salury	125	Motor Nominal Cread	1420	1420	1420	1420	DDM	
B General Settings	241	Parco I Ramo Lio Time	10.00	10.00	10.00	10.00	6	
- a Adv. Motor Settings	342	Ramp I Ramp Op Time	20.00	20.00	20.00	20.00		
- Analog Output	411	Motor Speed Low Limit	0	0	0	0	RPM	
o Clock Settings	412	Motor Speed Hoh Linit	1500	1500	1500	1500	RPM	
 Display Settings 	319	3on Sneed [RPM]	300	300	300	300	RPM	
Open Loop Settings	512	Terminal 27 Dinital Innut	Coast inverse	Coast inverse	Coast inverse	Coast inverse		
- Apalon Reference	540.0	Function Relay	No alarm	No alarm	No alarm	No alarm	_	
Cosed Loop Settings	540.1	Function Relay	Running	Running	Running	Running	_	
- o Single Zone Int. Setpoi	540.2	Function Relay	No operation	No operation	No operation	No operation		
— –a Single Zone Ext. Setpo	540.3	Function Relay	No operation	No operation	No operation	No operation		
-a Multi Zone / Adv	540.4	Function Relay	No operation	No operation	No operation	No operation		
— — Application Settings	\$40.S	Function Relay	No operation	No operation	No operation	No operation		
- Pan Functions	\$40.6	Function Relay	No operation	No operation	No operation	No operation		
-a Concressor Functions	540.7	Function Relay	No operation	No operation	No operation	No operation		
+ All Parameters	540.8	Function Relay	No operation	No operation	No operation	No operation		
Alorns 4 Short Logic Cick function Cick function								

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18 Conversion Wizard

If the parameter database of a source drive is different or contains differences compared to destination drive, it cannot be written without errors signalled during write to drive. Writing parameters, it is required the database versions, power size, voltage range and option configuration to match between the source- and destination drive. Any differences can be converted using one of the two conversion wizards available in MCT 10 Set-up Software:

- VLT to FC series conversion
- FC to FC series conversion

18.2 VLT to FC Series Converter Function

In MCT 10 Set-up Software it is possible to have a VLT5000 drive in the project folder converted to a FC302 Automation Drive. This is easy done by means of a build in function in MCT 10 Set-up Software.

Easy converting in MCT 10 Set-up Software:

The conversion matrix (Excel sheet) can be edited by the Advanced user, when necessary.



Easy conversion of multiple drives:

- Select the Tools menu and activate the "Drive Conversion Wizard" item
- In the following dialogs select the drives for conversion.
- When converted a new FC302 drives will be created in the project folder.



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18.2.1 Import Drive from Excel

This function can create an FC30x drive out from an Excel sheet. The objective with this function is that the user himself can import VLT3000 settings, from settings copied into an excel sheet and have these settings copied into the selected parameter numbers into a new FC302.

An example file is attached in MCT 10 Set-up Software (vlt3000conversion.xls), this example file can be edited by the user and be used for converting from vlt3000 to FC302. This requires however that the user must have detailed knowledge of Microsoft Excel formula editing.

The user must enter VLT3000 settings into column G8 !

Γ

		Reply wi		to this cell.	opy the value	from G8	• B
	G G			arsion 1	K D <i>ary</i> table	loss_	M
VLT 3000	FC 5		FC 302 (SW 3.06)		Value Fo	rmula	
r. Funktion	Value	Par.	Funktion	Setup 1	Setup 2	Setup 3	Setup 4
0 Sprachauswahl		001	Sprache	0	0	0	0
1 Paras. Betrieb		010	Aktiver Satz		0	0	0
2 Kopierfunktion		051	Parametersatz Kopie	0	0	0	0
3 Betriebsart		nV					
4 Ort-Sollwert		nV	1		1		
5 Anzeigewert bei f _{Max}		002		0	0	0	0
6 Taste Reset		043	Taste Reset	0	0	0	0
7 Taste Stopp		041	Taste Stop	0	0	0	0
8 Taste Revers		nV				1	1
9 Taste Jog		nV					
0 Sollwert Ort		nV			i i		
1 kWh-Zähler		1506	Reset Zähler-kWh	0	0	0	0
	B → S = IF(A) B VLT 3000 VLT 3000 r. Funktion 0 Sprachauswahl 1 Paras. Betrieb 2 Kopierfunktion 3 Betriebsart 4 Ort-Sollwert 5 Anzeigewert bei Mex 6 Taste Reset 7 Taste Stopp 8 Taste Revers 9 Taste Jog 0 Sollwert Ort 1 KWh-Zähler	3	3 B G H A B G H A B G H VLT 3000 F F F VLT 3000 VLT 3000 Par. O 0 Sprachauswahl D01 D10 1 Paras. Betrieb D10 D51 3 Betriebsart nV D51 3 Betriebsart NV D51 5 Anzeigewert bei fMex 002 D02 6 Taste Reset 043 T 7 Taste Stopp 041 NV 9 Taste Jog nV 0 0 Sollwert Ort nV 1 1 KWh-Zähler 1506 NV	3 Image: Section of the symplection of the	3 Image: Second Sec	3 B G H J K A B G H I J K VLT 3000 FC 302 Simple conversion table VLT 3000 FC 302 (SW 3.06) Value Fo VLT 3000 FC 302 (SW 3.06) Value Fo I Par. Funktion Setup 1 Setup 2 0 Sprachauswahl D01 Sprache 0 0 1 Paras. Betrieb D10 Aktiver Satz 0 0 2 Kopierfunktion 051 Parametersatz Kopie 0 0 3 Betriebsart nV 002 0 0 5 Anzeigewert bei Mex 002 0 0 0 6 Taste Reset 043 Taste Reset 0 0 0 7 Taste Stopp 041 Taste Stop 0 0 0 8 Taste Revers nV 0 0 </td <td>B G H J K L B G H J K L Description Description Description Description VLT 3000 FC 302 (SW 3.06) Value Formula VLT 3000 FC 302 (SW 3.06) Value Formula r. Funktion Value Par. Funktion Setup 1 Setup 2 Setup 3 0 Sprachauswahl D01 Sprache D 0 0 0 1<paras. betrieb<="" td=""> D10 Aktiver Satz 0 0 0 0 2 Kopierfunktion 051 Parametersatz Kopie 0 0 0 0 3 Betriebsart nV 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 <</paras.></td>	B G H J K L B G H J K L Description Description Description Description VLT 3000 FC 302 (SW 3.06) Value Formula VLT 3000 FC 302 (SW 3.06) Value Formula r. Funktion Value Par. Funktion Setup 1 Setup 2 Setup 3 0 Sprachauswahl D01 Sprache D 0 0 0 1 <paras. betrieb<="" td=""> D10 Aktiver Satz 0 0 0 0 2 Kopierfunktion 051 Parametersatz Kopie 0 0 0 0 3 Betriebsart nV 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 <</paras.>

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18.3 FC to FC Series Conversion

The drive converter tool is capable to migrate between different software versions, power size, voltage range and option configuration of the same drive series. It covers the FC 102, FC 202, FC 3xx, LD 302 and all OEM versions based on the FC xxx series. Any difference can easily be matched by using the Conversion Table Manager, creating a table to convert between source and destination drive. When a conversion table is made, the user can apply transparently from:

- Online to Online Drive
- Online to Offline Drive
- Offline to Online Drive
- Offline to Offline Drive

Users with different knowledge and competence, it is possible to configure among two profiles providing different user rights.

- Administrator is the one qualifying and managing the conversion table(s) through access to the Conversion Table Manager. From the Conversion Table Manager new conversion table(s) can be created and deployed to other MCT 10 Set-up Software installations.
- User is the one not concerned about any drive compatibility issues. With proper conversion tables in the database, all projects can be written to the destination, by using the conversion tables transparently. The user is restricted from accessing the Conversion Table Manager. Deployed conversion tables can be imported to the database.

Default MCT 10 Set-up Software is installed with user rights. Enabling the Conversion Table Manger is done from the checkbox in the Converter Tools Settings dialog.



Default the conversion tables are stored locally on the hard disk. Using the database non distributed, the path to the network location can be reconfigured from the Converter Tool Settings dialog.

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18.3.1 Conversion Table Manager

The Conversion Table Manager can be accessed through the MCT 10 Set-up Software tools menu. From the same location, new conversion tables can be imported into the database.

Conversion Tables:	Preview:	
EC102 V2 07 to V2 14 vm	Source drive	
FC302 V4.4 to V5.61.xml	Series	-
FC302_V4.40_to_V5.61.xml EC302_V4.40_to_V5.84_xml	Major Software version	12
FC302_V4_85_to_V5_42.xml	Minor Software version	
	Power size	-
	Voltage range	
	Option A	
	Option B	
	Option C0	
	Option C1	
	Destination Drive	
	Series	844
	Major Software version	
	Minor Software version	
	Power size	
	Voltage range	
	Option A	s
	Option B	22
EditDelete	Option C0	5 7
	Option C1	2 <u></u>
Import		
Export	OK	

The dialog is divided in a Conversion Table containing the list of conversion tables in the database and a Preview pane. New conversion tables can be created, existing ones edited or deleted.

Distributing to other MCT 10 Set-up Software installations, the user can select a number of tables in the database to be exported to a *.cvt file. The Preview pane list the conversion table source and destination drive info and can be converted among the following combinations:

- Drive series based on the FC 102/FC 202/FC 3xx platform
- Software version. Is divided in the database into a major and minor software version
- Power size
- Voltage range
- Option A
- Option B
- Option C0
- Option C1

New conversion table(s) can be created from the Conversion Table Manager or by right clicking on the source drive and choose Convert Drive. Both options opens the Drive Conversion dialog, but with the last one only the destination drive info configurable.

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Converting a drive by right clicking and choose Convert Drive do not include the par. group 19-**. The settings are written when the user writes from source to destination transparently.

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Source drive	1		Destination drive -		
Series	FC-302	<u> </u>	Series	FC-302	-
Software version	04.40	<u> </u>	Software version	05.84	•
Power size	1.10KW	-	Power size	1.10KW	-
Voltage range	200V-240V	-	Voltage range	200V-240V	-
Option A	No Option	-	Option A	MCA121 EtherNet/IP	•
Option B	No Option	-	Option B	No Option	-
Option C0	No Option	-	Option C0	No Option	-
Option C1	No Option	-	Option C1	No Option	•
		Cancel	ОК		

Source and Destination drive info defined, opens the conversion table editor listing the parameter database differences.

In the conversion table editor, the user can create the conversion table from scratch or loading an existing one. Loading an existing conversion table must match according to the drive series, software version, power size, voltage range and option configuration. Any difference MCT 10 Set-up Software will not find any usable conversion table. When a conversion table is found, the user have the ability to reedit the table or to convert the source drive and store the converted drive in an offline folder.

Default the parameter database is listed and sorted according to the parameter ID. To simplify conversion process, the parameter database can be filtered to list only alerts or the changes applied by the user. Alerts coloured by read corresponds to the differences between the source and destination, requiring a formula, to be able to apply settings to destination drive. Alerts coloured in blue, the formula is per default ignored and can be applied to the destination drive. If a formula is applied to all alerts, the source parameter database can be converted to the destination parameter database without any further configurations required.

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Source drive			Destination Drive	-	-
Series	FC-302		Series	FC-302	
Major Software version	04		Major Software version	05	
Minor Software version	40		Minor Software version	84	
Power size	1.10KW		Power size	1.10KW	
Voltage range	2007-2407		Voltage range	200V-240V	
Option A	No Option		Option A	MCA121 EtherNet/IP	
Option B	No Option		Option B	No Option	
Option C0	No Option		Option C0	No Option	
Option C1	No Option		Option C1	No Ontion	
Image: Filter S, Image: Filter S, # Source ID c 1 C 1 C	Filter by estination ID 30 31	y changed items formula ignored ignored	comment parameter does not exist in parameter does not exist in	the source drive the source drive	
# source ID c ● c	Filter by estination ID 30	v changed items formula ignored	comment parameter does not exist in	the source drive	
# source ID c 0 0 0 0 0 0	Filter by estination ID 30 31 32	/ changed items formula ignored ignored	comment parameter does not exist in parameter does not exist in parameter does not exist in	the source drive the source drive the source drive	
# source ID c •• •• •• •• •• •• •• •• •• •• •• •• •• •• •• •• •• •• •• •• •• •• •• •• •• •• •• ••	Filter by estination ID 30 31 32 06	/ changed items formula ignored ignored ignored	comment parameter does not exist in parameter does not exist in parameter does not exist in parameter does not exist in	the source drive the source drive the source drive	
# source ID c • 0 • 0 • 0 • 0 • 0 • 137 1	Filter by estination ID 30 31 32 06 37	r changed items formula ignored ignored ignored ignored default	comment parameter does not exist in parameter does not exist in parameter does not exist in parameter does not exist in destination parameter is oat	the source drive the source drive the source drive the source drive undromedient	
# source ID c ● 0 ● 0 ● 0 ● 137 1	Filter by estination ID 30 31 32 06 37 54	r changed items formula ignored ignored ignored default ignored	comment parameter does not exist in parameter does not exist in parameter does not exist in parameter does not exist in destination parameter is sett parameter does not exist in	the source drive the source drive the source drive the source drive ap-indipendent the source drive	
# source ID c ● 0 ● 0 ● 0 ● 137 1 ● 1	Filter by estination ID 30 31 32 06 37 54 58	r changed items formula ignored ignored ignored default ignored ignored	comment parameter does not exist in parameter does not exist in parameter does not exist in parameter does not exist in destination parameter is set parameter does not exist in parameter does not exist in	the source drive the source drive the source drive the source drive up-indipendent the source drive the source drive	
Image: Stress - Image: Stress - # source ID c 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C	Filter by estination ID 30 31 32 06 37 54 58 59	r changed items formula ignored ignored ignored ignored ignored ignored ignored	comment parameter does not exist in parameter does not exist in parameter does not exist in parameter does not exist in destination parameter is set parameter does not exist in parameter does not exist in parameter does not exist in	the source drive the source drive the source drive the source drive up-indipendent the source drive the source drive the source drive	,
# source ID c # source ID c 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C 2 C	Filter by estination ID 30 31 32 06 37 54 58 59 11	v changed items formula ignored ignored ignored default ignored ignored ignored default	comment parameter does not exist in parameter does not exist in parameter does not exist in parameter does not exist in destination parameter is set parameter does not exist in parameter does not exist in parameter does not exist in destination parameter is set	the source drive the source drive the source drive the source drive up-indipendent the source drive the source drive up-indipendent	
# source ID c 1 0 1 0 1 0 1 0 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 1	Filter by estination ID 30 31 32 06 37 54 58 59 11 18	v changed items formula ignored ignored ignored ignored ignored ignored ignored ignored ignored ignored	comment parameter does not exist in parameter does not exist in parameter does not exist in destination parameter is set parameter does not exist in parameter does not exist in parameter does not exist in destination parameter is set parameter does not exist in	the source drive the source drive the source drive up-indipendent the source drive the source drive the source drive up-indipendent the source drive	
# source ID d # source ID d 1 0 1 0 1 0 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1	Filter by estination ID 30 31 32 06 37 54 58 59 11 18 82	r changed items formula ignored ignored ignored ignored ignored ignored ignored ignored ignored ignored ignored	comment parameter does not exist in parameter does not exist in parameter does not exist in parameter does not exist in destination parameter is set parameter does not exist in parameter does not exist in destination parameter is set parameter does not exist in parameter does not exist in parameter does not exist in	the source drive the source drive the source drive up-indipendent the source drive the source drive up-indipendent the source drive the source drive	
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Double clicking on an alert opens the Formula Editor dialog to specify the destination parameter mapping. The following configurations are possible:

- Destination parameter is set to default value corresponding to the drive factory configuration. Is the default setting for alerts coloured in read.
- Destination parameter = source parameter ID.
- Destination parameter = source parameter multiplied by a user defined numeric value.
- Destination parameter = destination choice list or numerical value.
- Ignore this parameter. Is the default setting for alerts coloured in blue.

Each formula applied can be associated with a comment containing a user defined text. The comment is optional to each alert.

Source Param	eter:	and the second states		-	an bab
ID:	137	setup values:	-	choi	
Name -		Setup 1 0.0	_	····	narameter is not a choice-li
Name:	d-axis Inductance (Ld)	Setup 2 0.0	- 1	1000	
min Value:	0.00000	Setup 3 0.0	- 1		
max Value:	1000000.015000	1 Jetup 4 0.0			
Default Value:	0.0	•	,	•	
- Destination Pa	arameter:				
		setup values:			choice list:
ID:	137	setup value		V	description
Name:	d-axis Inductance (Ld)	Setup 1 0.0			parameter is not a choice-li
min Value:	0.000000	Setup 2 0.0			
max Value:	1000000.015000	Setup 4 0.0			
Default Value	0.0	<		•	III F
Formula:					
C Destination	on Parameter is set to Default v	alue			
C Destination	on Parameter = Source Paramet	ier ID:			
C Destinatio	on Parameter = Source Paramet	ter * 1			
Destination	n Parameter =	10000 0 edit	(if ch	oicelis	t type the numeric value)
C Ignore th	is parameter		(i ci)	orcens	cy cype are numeric valuey
Comment:					
User defined	i text				

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When a formula is applied to all red coloured alerts, the user must assign a name to save the conversion table in the database.

actions:	
🔽 Update the pro	pject with the converted drive
Save the conv	ersion table
FC302_V4_40)_to_V5_84
	· · · · · · · · · · · · · · · · · · ·
Cancel	ОК

If differences is detected when writing from a source to destination drive, MCT 10 Set-up Software uses the drive series, major software version, power size, voltage range and option configuration as search criteria's. With the proper conversion table in the database, any drive can be written transparently to a destination even if the minor software version do not match. If several conversion tables are found matching the criterias, MCT 10 Set-up Software will use the minor software version to find the closest match. Only one drive can be written to destination transparently.

If par. group 19-** is available the settings will be written to the destination drive.



18.3.2 Convert Offline to Offline

Writing between two offline drives is done marking the appropriate number of set-ups from All Parameters, right click and choose copy.

000000000000000000000000000000000000000	EE mm 8 H2 10		#						
🗐 – 🛄 Network	ID	Name	Setup 1	Satur 7	Catura 2	Satup 4	Factory Setup	Unit	-
Ethernet	001	Language	English	Cut	Ctrl+)	lish	English		1
Profibus DPv1_1	002	Motor Speed Unit	RPM	Copy	Ctrl+0	1	RPM		μ
- B RS485_1	003	Regional Settings	International	Paste	Ctd+	mational	International		
	004	Operating State at Po	Forced stop, ref.			ed stop, ref=old	Forced stop, ref=old		
🔚 📕 SerialBus	010	Active Set-up	Set up 1	Read From drive		up1	Set-up1		
Project	011	Edit Set-up	Active Set-up	Write to drive		we Set-up	Active Set-up		
E FC302_V4_40	0 012 This Set-up Linked to Not linked	24 1.24 2.		linked	Not linked				
	013.0	Readout: Linked Set	(0)	Remove Column(s)			(0)		
Alarms	013.1	Readout: Linked Set	0.1	Customize Column	ns		(1)		
Smart Logic	013.2 Readout: Linked Set	(2)	Apply Parameter Vi	iew Settings		(2)			
E- FC302_V5_84	013.3	Readout: Linked Set	(3)				(3)		
🗄 📰 All Parameters	013.4	Readout: Linked Set	(4)	Filter Parameter			(4)		
Alarms	014	Readout: Edit Set-up	AAAAAAAAhex	AAAAAAAAhex	AAAAAAAAhex	AAAAAAAAhex	AAAAAAAAhex		
Interference in the second	0.20	Display Line 1.1 Small	Speed [RPM]	Speed [RPM]	Speed (RPM)	Speed [RPM]	Speed [RPM]		
	021	Display Line 1.2 Small	Motor Current	Motor Current	Motor Current	Motor Current	Motor Current		
	022	Display Line 1.3 Small	Power [kW]	Power (kW)	Power (kW)	Power [kW]	Power [kW]		
	023	Display Line 2 Large	Frequency	Frequency	Frequency	Frequency	Frequency		
	024	Display Line 3 Large	Reference %	Reference %	Reference %	Reference %	Reference %		
	025.0	My Personal Menu	1				1		

Pasting the parameters to destination drive, MCT 10 Set-up Software will recognize the difference and automatically applies a conversion table, if a matching one is available in the database.

	8 1/2 1 但		+						
E Network	ID	Name	Setup 1	Setup 2	Setup 3	Setup 4	Factory Setup	Unit	P
- Ethernet	001	Language	English	English	English	English	English		1
Profibus DPv1_1	002	Motor Speed Unit	RPM	RPM	RPM	RPM	RPM		
B. RS485_1	003	Regional Settings	International	International	International	International	International		
	004	Operating State at Po	Forced stop, ref=old	Forced stop, ref=old	Forced stop, ref=old	Forced stop, ref=old	Forced stop, ref=old		
🖳 📕 SerialBus	010	Active Set-up	Set up 1	Set-up 1	Set-up 1	Set-up1	Set-up 1		
E- Project	011	Edit Set-up	Active Set-up	Active Set-up	Active Set-up	Active Set-up	Active Set-up		
E- FC302_V4_40	012	This Set-up Linked to	Not linked	Not linked	Not linked	Not linked	Not linked		
All Parameters	013.0	Readout: Linked Set	(0)				(0)		
- Alarms	013.1	Readout: Linked Set	(1)		(1) (1) (1)	(1)			
1. Smart Logic	013.2	Readout: Linked Set	{2}				{2}		
E- FC302_V5_84	013.3	Readout: Linked Set	(8)				(3)		
All Parameters	013.4	Readout: Linked Set	(4)				{4}		
Alarms	014	Ref MCT 10 Cat un Salt				AAAAAAAAhex	AAAAAAAAhex		
1+} Smart Logic	.0.20	Dis Dis	tware.			Speed [RPM]	Speed [RPM]		
	021	Dis				Motor Current	Motor Current		
	022	Dis A source	and destination are diff	ferent! MCT10 will appl	y a conversion	Power [kW]	Power [kW]		
	023	Dis Able			-		Frequency		
	024	024 Dis					Reference %		
	025.0	My					1		
	025.1	My			OK		20		
	025.2	My					21		
		111 111	122	1997	122	21-	27		

18.3.3 Convert Online to Online

Writing between two online drives is done by copy and paste the appropriate number of set-ups similar the way writing between two offline drives.

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18.3.4 Convert Online to Offline

Writing from online to an offline drive is done by right clicking on the offline drive and chose to read from drive. MCT 10 Set-up Software will recognize the difference and automatically applies a conversion table if a matching one is available in the database.

Network			Connected Drive Information	Distabase Information
	et	Drive Series		FC-302
	1	Power Size	1	1 10KW
	2	Voltage		2007-5407
□	us	- Basic SW Version	-	05.84
🖥 🖥 1	FC-302 1.10KW 200V-240V	Option A	, [MCA121 EtherNet/IP
Project		Option B	, 	No Option
	New	Option CO	í	No Option
	Print Selected Folder(s)	Option C1	[No Option
•••	Edit setup names	Type Code	1	FC-302P1K1T2E20H1BGXXXSXX
	Read from Drive		1927.	
	Write to Drive	Drive Address	1	
	Compare	Bus Name	USB 1	
	Apply Parameter View Settings	Region	International (50Hz)	
	Convert Drive	Last synchronized	_	
	Cut	ion		
	Сору			*
	Paste			_
	Delete			
	Rename	bg		
	Load motor data			
	Properties			



NB! Make sure the offline drive connection properties corresponds with the online drive.

18.3.5 Convert Offline to Online

Writing from offline to an online drive is done by right clicking on the offline drive and chose write to drive. MCT 10 Set-up Software will recognize the difference and automatically applies a conversion table if a matching one is available in the database.

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19 Troubleshooting

19.1 Save Error Dialog

When an error dialog appears on the screen MCT 10 Set-up Software has a facility for saving to a text file to record the error message for later reference, for example to obtain help from Support. Within the error dialog window, select the option Save As and you will be able to record the error message as a text file with free choice of file name and location.

For example, when scanning the network for frequency converters, an error dialog will appear showing the frequency converters not detected:

%
- ω - ω - · · · · · · · · · · · · · · ·
8

Select Save As.. to store the error log and the following dialog will appear:

Save in:	🐌 Testfolder			\star 🔁 🖆 🧱		
œ.	Name	Date modif	Туре	Size		
Recent Places Desktop Danfoss Computer Network			This folder	r is empty.		
	File name:	ErrorLog			•	Save
	Save as type:	Text Files (*.)	xt)		-	Cancel

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19.2 Common Problems and Solutions

19.2.1 Changes Are Not Saved to PC

Checks that changes made in the Network folder have been copied over to the Project folder, and then saved to a directory on the users hard disk. Changes made in the Network folder are implemented in the field device only, and are not automatically saved to a PC.

19.2.2 Error Message Whilst Installing MCT 10 Set-up Software

Message such as "MCT 10 SET UP SOFTWARE ERROR OPENING FC DRIVER" This error may occur if there is a second PC program installed, using the same COM port of the PC. Such a program could be a PLC programming tool, Palm pilot driver or Cellular Phone driver etc. Investigate whether other programs use the same COM port. If this is the case make sure that the other PC tool does not lock or reserve the COM port.

Error message whilst storing parameter settings and reading / writing via Profibus DP-V1 using the function Database readout from the Drive.

19.2.3 Error Message Communication Failed

The communications error comes and goes sporadically:

This type of communications error typically occurs when cables are inadequately screened, in which case EMC noise can affect the communications. Check that the cables are installed according to the guidelines in the Operating Instructions for the frequency converter.

The communications error is permanent:

This type of communications error is typically due to an error in network configuration. Check that the network configuration is in accordance with the frequency converter Operating Instructions guidelines.

The Communication Failed error message appears in the status bar as shown:



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19.2.4 Communication Errors

If an erroneous/illegal action has been attempted, an error highlight will appear in the status bar at the bottom of the MCT 10 Set-up Software window.

When a communications error arises, the status bar at the bottom of the MCT 10 Set-up Software window will be highlighted and display a *Communications Failed* error message, as shown in the following example:



When no communications error has occurred the same window will appear as:



Communications errors typically occur due to inadequate screening of cables, i.e. cable is not installed in accordance with installation instructions.