



Automatización Eléctrica
Especialistas en Automatización

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ENGINEERING
TOMORROW

Danfoss

VLT® Fieldbus Solutions

Fast installation – easy integration

Dedicated Danfoss fieldbus hardware and software solutions save time and provide efficient control and monitoring.

14+

fieldbus technologies
supported by Danfoss
VLT® frequency
converters

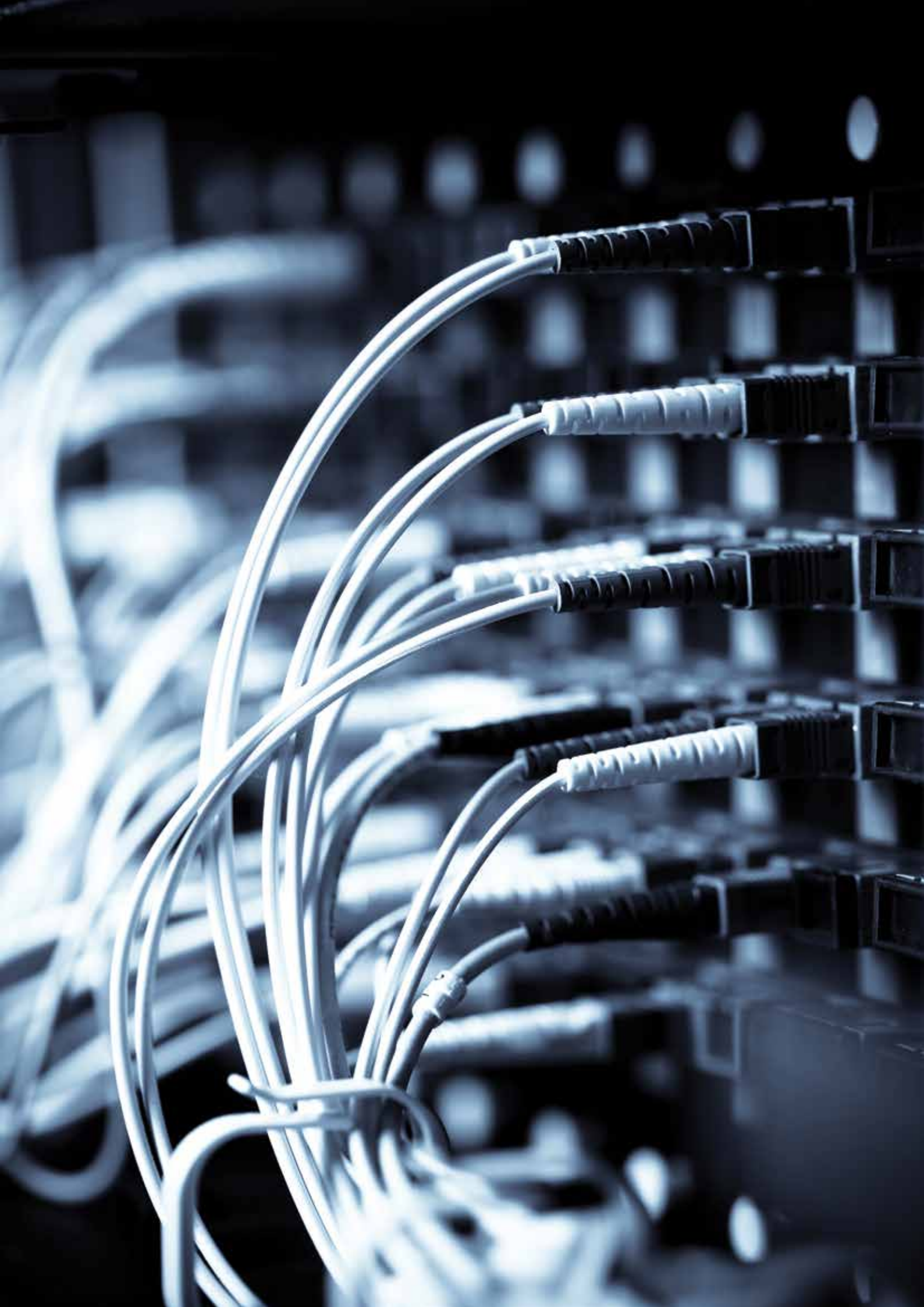
www.danfoss.com/drives

VLT®
THE REAL DRIVE

Efficient communication – reduced costs Fieldbus solutions for any PLC network

Real time information is becoming increasingly important in industrial automation and control systems. Immediate access to data increases transparency in production facilities, while making it possible to optimize system performance, carry out error analysis and provide remote support around the clock from anywhere in the world.

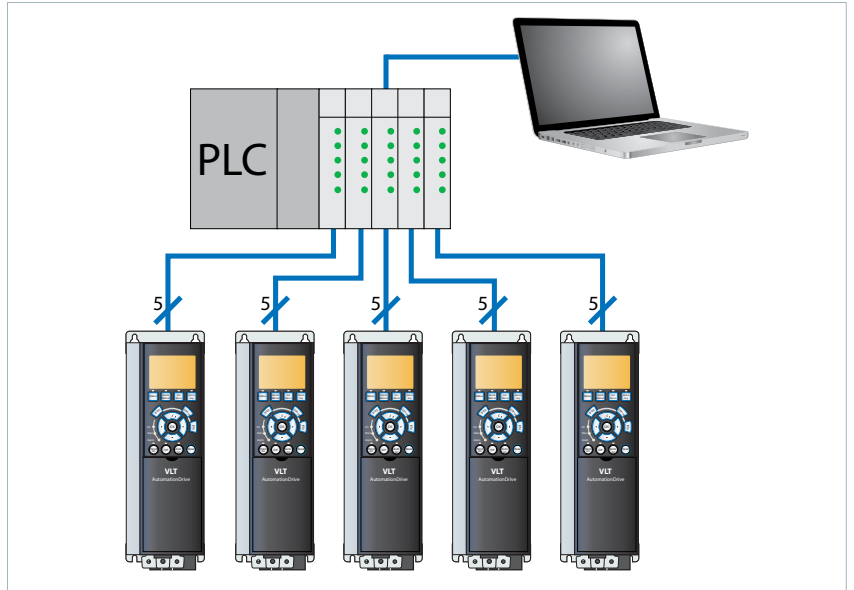
Industrial automation and control communication works in a hierarchy. At the top is a control system that oversees the system. In the middle are Programmable Logic Controllers (PLC) controls and monitors devices that carry out the actual work. At the bottom the many devices and frequency converters that control the motors in the specific application.



Traditional wiring. No fieldbus.

In this type of network, communication between the drive and PLC requires one cable for each parameter that needs to be controlled. The advantage of such a system is that the individual components themselves are relatively cheap, and the system itself is not among the most complex.

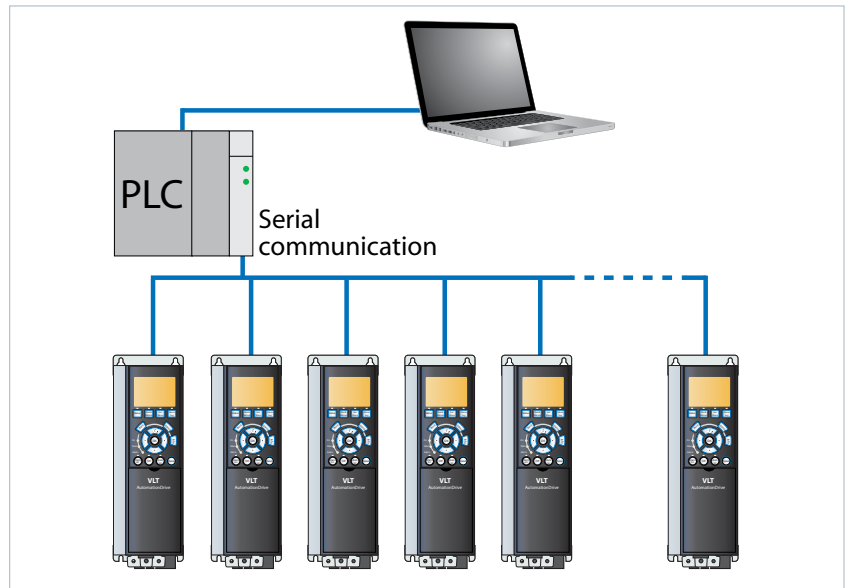
This, however, come at a price, as such systems are relatively expensive both to install and extend, as each additional parameter or drive requires new cabling, PLC programming and often i/o hardware. For owners this means higher capital costs and restricted flexibility. At the same time the risk of error is high, as the risk of a faulty connection to the PLC increases with the number of cables.



Fieldbus wiring

A typical fieldbus system only uses twisted pair cables to connect the drive to the PLC. Despite the higher cost of components, fieldbus systems offer several advantages over older, hard-wired systems: fewer cables, faster commissioning and a reduced risk of faults.

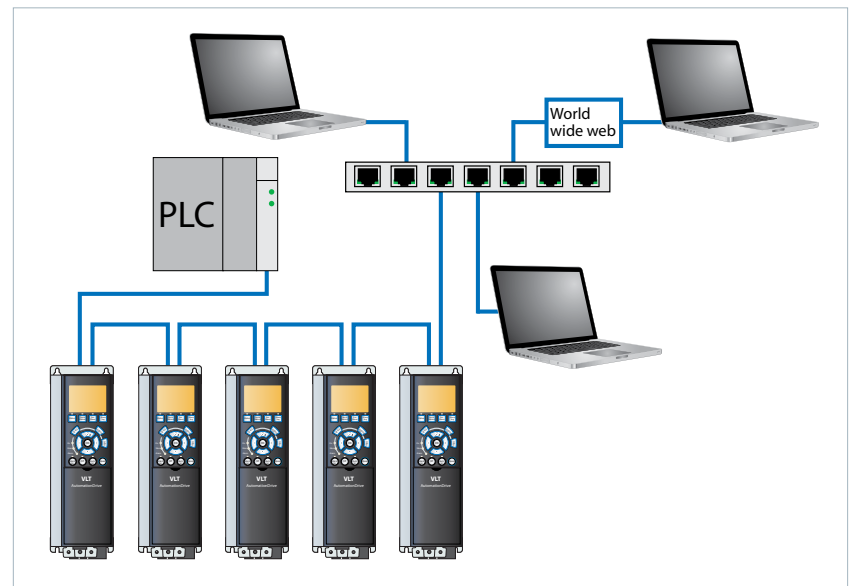
Additional drives are connected in a serial Ethernet based network that can be extended easily. New parameters only needed to be coded into the PLC, which is both faster, safer and at significantly lower cost than a hardwired system.



Fieldbus over Ethernet

The Ethernet interface enables the possibility to access drive parameters and information from locations outside the production facility. This method bypasses the traditional control hierarchy, as communication with the fieldbus fitted drives and other equipment does not necessarily need to pass through the PLC.

External access is routed through a firewall, enabling communication with the fieldbus option's built-in webserver. Not only does this provide a high degree of flexibility during commissioning, it also provides advantages such as external monitoring and application support.



Solutions for all networks

Danfoss VLT® drives support all leading industry fieldbuses.

Increase productivity

Fieldbus communication reduces capital costs in production plants. In addition to the initial savings achieved through the significant reduction in wiring and control boxes, fieldbus networks are easier to maintain, while providing improved systems performance.

Factory fitted plug-and-play

Delivered with the chosen communication protocol installed from the factory, Danfoss drives are easy to integrate with PLC systems and motors regardless of manufacturer.

Danfoss fieldbus options can also be installed as a plug-and-play solution if required at a later stage if the production layout demands a new communication platform.

User friendly and fast setup

Danfoss fieldbuses are configured via the drive's local control panel, which features a 27-language user friendly interface including Chinese. The drive and fieldbus can also be configured using Danfoss' VLT® Motion Control Tool MCT10 software.

The time saving setup procedure is identical whether you use a VLT® AutomationDrive, VLT® HVAC Drive, VLT® Refrigeration Drive or a VLT® AQUA Drive.

Global fieldbus experts

Danfoss' global sales and support organization is trained in the market's many PLC systems. With in-depth knowledge about the challenges in modern production plants, they are perfectly equipped to provide advice and help so your VLT drives perform optimally.

DOWNLOAD DRIVERS FOR EASY PLC INTEGRATION

Integrating a drive into an existing bus system can be time consuming and complicated. To make this process easy and more efficient, Danfoss offers fieldbus drivers and PLC examples, which can be downloaded for free from the Danfoss website. After installation the bus parameters, typically only a few, can be set directly in the VLT® drive.

ETHERNET
POWERLINK



Ether**CAT**



CANopen





Easy engineering and setup

VLT® Motion Control Tool MCT 10

In addition to operating the drive via LCP (local control panel), VLT® drives can also be configured and monitored with Danfoss own PC software. This provides plant managers with a comprehensive overview over the system at any point in time, adding a new level of flexibility in configuration, monitoring and troubleshooting.

MCT 10 is a windows based engineering tool with a clearly structured interface that provides an instant overview of all the drives in a system of any size.

Parameter configuration is possible both online on a connected drive and offline in the tool itself, and the

software can be configured to link to the system's electrical diagrams or operating manuals. This helps to reduce the risk of incorrect configuration while offering fast access to troubleshooting.

Easy communication

Besides a single point to point connection via standard USB cable, the tool offers the possibility to connect via an RS 485 interface, allowing connecting to several drives in an easy and simple network, up to communication through existing fieldbus networks like PROFIBUS. Furthermore also connection through Ethernet based technology, in point to point or through existing networks, is available and providing a simple access to all the given functionality.

VLT® Motion Control Tool MCT 10 supports:

- VLT® PROFIBUS DP-V1 MCA 101
- VLT® PROFIBUS Converter MCA 114
- VLT® PROFINET MCA 120
- VLT® EtherNet/IP MCA 121
- VLT® Modbus TCP MCA 122
- VLT® POWERLINK MCA 123
- FC RS484 Protocol
- USB port on FC 102/FC 103/FC 202/ FC 301/FC 302/ FCD 302



PROFINET stars in PLC setup

The electronic control system for the main line at the Ulanhot cigarette factory in China includes over 130 VLT® AutomationDrive FC 302 equipped with PROFINET cards. The stability and reliability of the PROFINET system is a significant improvement compared with the original system.

Star-structure automation system

Using Danfoss VLT® PROFINET, the Siemens PLC and SCALANCE switch form a star network with the frequency converters, each drive working independently without affecting other nodes' communication. The star or tree topology ensures that all nodes are independent and free from the influence of other bus segments, the whole prime line automation network being divided into management and equipment levels.

The Benefits

This has produced a number of benefits. The VLT® drive's proven reliability ensures its continuous operation in a variety of industrial environments throughout the factory. The system creates a star-structure automation system of greater reliability and functionality than is possible with PROFIBUS. If one sub-station fails, the other stations remain operational to ensure that each node within the network is independent of each other.

The system's data processing capabilities have been strengthened, simplifying overall operation and also making the operators' tasks easy and convenient. In addition, managers are able to access much more data, thereby increasing the prime line efficiency.

PROFINET on AIDA cruise ships

AIDA Cruise's two cruise ships of a new generation of energy efficient and environmentally friendly ocean liners will be equipped with more than 100 VLT® AutomationDrive FC 302 on each ship – ranging from 2.2 to 400kW - all with a PROFINET interface.

VLT® AutomationDrive FC 302 drives have been specified as standard for all electric motors in the engine room, utilities, deck machinery and hotel/HVAC systems which will be delivered by leading suppliers of marine equipment from all over the world.

"With PROFINET installed throughout the vessel, the engineers on board have the complete overview of the many systems at any given time. Warnings, malfunctions or alarms can be spotted and handled immediately. This is good for safety and not least the passenger experience of comfort", says Ulf Hirsekorn, Senior Superintendent Electric, AIDA.



Fieldbus overview

An overview of available fieldbuses for
 VLT® HVAC Drive, VLT® Refrigeration Drive, VLT® AQUA Drive,
 VLT® AutomationDrive and VLT® Decentral Drive.

Fieldbus	VLT® HVAC Drive	VLT® Refrigeration Drive	VLT® AQUA Drive	VLT® Automation Drive		VLT® Decentral Drive	
	FC 102	FC 103	FC 202	FC 301	FC 302	FCD 300	FCD 302
VLT® PROFIBUS DP-V1 MCA 101	■	■	■	■	■	■	■
VLT® PROFINET MCA 120	■	■	■	■	■		■
VLT® PROFIBUS Converter MCA 113					■		
VLT® PROFIBUS Converter MCA 114					■		
VLT® DeviceNet MCA 104	■		■	■	■		
VLT® EtherNet/IP MCA 121	■		■	■	■		■
VLT® DeviceNet Converter MCA 194					■		
Modbus RTU (integrated)	■	■	■	■	■	■	■
VLT® Modbus TCP MCA 122	■		■	■	■		
VLT® CANopen MCA 105				■	■		
VLT® EtherCAT MCA 124					■		■
VLT® POWERLINK MCA 123				■	■		■
VLT® BACnet MCA 109	■						
VLT® LonWorks MCA 108	■						
VLT® AK-LonWorks MCA 107		■					
Metasys N2 (integrated)	■						
ASi Bus (integrated)						■	
VLT® Interbus MCA 110					■		

VLT® PROFIBUS DP-V1 MCA 101

Operating the frequency converter via a fieldbus lets you reduce the cost of your system, communicate faster and more efficiently, and benefit from an easier user interface.

- PROFIBUS DP-V1 gives you wide compatibility, a high level of availability, support for all major PLC vendors, and compatibility with future versions
- Fast, efficient communication, transparent installation, advanced diagnosis and parameterisation and auto-configuration of process data via GSD-file
- A-cyclic parameterisation using PROFIBUS DP-V1, PROFIdrive or Danfoss FC profile state machines, PROFIBUS DP-V1, Master Class 1 and 2

Ordering number:

130B1100 uncoated
130B1200 coated

VLT® PROFINET MCA 120

The MCA120 gives the user access to the power of Ethernet, and the options is designed, so that many of the features from the PROFIBUS MCA 101 can be reused, giving the user lowest effort to migrate PROFINET, securing the investment in PLC program.

Other features:

- Built-in web server for remote diagnosis and reading out of basic drive parameters.
- Support of DP-V1 Diagnostic, allows a easy, fast and standardized handling of warning and fault information into the PLC, which improve bandwidth in the system.

PROFINET encompasses a suite of messages and services for a variety of manufacturing automation applications, including control, configuration and information.

Ordering number:

130B1135 uncoated
130B1235 coated

ASi Bus (integrated)

The ASi Bus connects the VLT® Decentral Drive FCD 300 to the ASi bus network. ASi Bus is a cost effective fieldbus choice, where the application demands only few predefined speed values and where a detailed drive status is not necessary.

- Configurable I/O
- ASi protocol ver. 2.11 profile 7.F
- Up to 31 drives pr. ASi bus line
- 150µSec update time pr. drive
- FCD300 monitored ASi bus with selectable action on loss of communication

Ordering number:

175N2324 uncoated

VLT® Interbus MCA 110

(DIN Rail option)

The VLT® Interbus MCA 110 connects the AutomationDrive to the Interbus network. The gateway not only provides connection to the Interbus network, it also has local digital I/O's, that can be monitored/controlled from the PLC.

- Variable I/O size
- Support of Drivecom 21 statemachine
- Four digital inputs 24V
- Two digital outputs 24V/25mA
- PCP communication for parameter access

Ordering number:

130B1211 uncoated

VLT® DeviceNet MCA 104

DeviceNet offers robust, efficient data handling thanks to advanced Producer/Consumer technology.

- This modern communications model offers key capabilities that let you effectively determine what information is needed and when.
- You will also benefit from ODVA's strong conformance testing policies, which ensure that products are interoperable.

Ordering number:

130B1102 uncoated
130B1202 coated

VLT® EtherNet/IP MCA 121

Ethernet will become the future standard for communication on the factory floor. The EtherNet/IP Option is based on the newest technology available for the Industrial use and handles even the most demanding requirements. EtherNet/IP extends commercial off-the-shelf Ethernet to the Common Industrial Protocol (CIP™) – the same upper-layer protocol and object model found in DeviceNet.

The MCA 121 offers advanced features:

- Built-in high performance switch enabling line-topology, and eliminating the need for external switches
- Advanced switch and diagnosis functions
- Built-in web server
- E-mail client for service notification
- Unicast and Multicast communication
- AOI available for easy programming

Ordering number:

130B1119 uncoated
130B1219 coated

VLT® Modbus TCP MCA 122

Modbus TCP is the first industrial Ethernet based protocol for automation. The MCA 122 Modbus TCP option connects to Modbus TCP based networks. It is able to handle connection intervals down to 5 ms in both directions, positioning it among the fastest performing Modbus TCP devices in the market. For master redundancy the option features hot swapping between two masters.

Other features:

- Built-in web-server for remote diagnosis and reading out basic drive parameters
- An e-mail noticator can be configured for sending an e-mail message to one or several receivers, if certain warnings or alarms occurs, or has cleared again

Ordering number:

130B1196 uncoated
130B1296 coated

Modbus RTU (integrated)

Modbus RTU is one of the most widespread fieldbus protocols. It runs on standard RS485 and provides a cost effective system without sacrificing speed. The Danfoss Modbus RTU is flexible and can be configured for optimal performance in most applications. Modbus RTU is well suited for applications in oil & gas, water and HVAC.

- User definable register blocks for fast access to control & status of the drive (128 read/write registers)
- Access to drive parameters via holding registers
- 10 different Modbus function codes for support of major controllers.
- Diagnostic counters for fast fault detection
- Supervise communication with user definable action if communication is lost.
- Monitor the drives inputs and controls the outputs utilizing them as remote I/O's

VLT® BACnet MCA 109

The open communications protocol for worldwide building automation use. The BACnet protocol is an international protocol that efficiently integrates all parts of building automation equipment from the actuator level to the building management system.

- BACnet is the world standard for building automation
- International standard ISO 16484-5
- With no license fees, the protocol can be used in building automation systems of all sizes
- The BACnet option lets the drive communicate with building management systems running the BACnet protocol
- BACnet is typically used for heating, ventilation, cooling and climate equipment control
- The BACnet protocol is easily integrated into existing control equipment networks

Ordering number:

130B1144 uncoated,
130B1244 coated

VLT® LonWorks for ADAP-KOOL® MCA 107

ADAP-KOOL® is a complete electronic refrigeration and control system for monitoring and controlling refrigeration plants. Connecting this drive to an ADAP-KOOL® Lon network is simple. After entering a network address, pressing a service pin starts the automatic configuration procedure.

Ordering number:

130B1169 uncoated,
130B1269 coated

VLT® LonWorks MCA 108

LonWorks is a fieldbus system developed for building automation. It enables communication between individual units in the same system (peer-to-peer) and thus supports decentralising of control.

- No need for main station (master-follower)
- Units receive signals directly
- Supports Echelon free-topology interface (flexible cabling and installation)
- Supports embedded I/Os and I/O options (easy implementation of de-central I/Os)
- Sensor signals can quickly be moved to another controller via bus cables
- Certified as compliant with Lon-Mark ver. 3.4 specifications

Ordering number:

130B1106 uncoated,
130B1206 coated

Metasys N2 (integrated)

Within HVAC the Metasys N2 protocol has gained a loyal customer base. Metasys N2 works seamlessly with most BMS controllers making it easy to handle with low commissioning costs.

- Easy control of the drive via Metasys Objects
- Set basic drives parameters via internal floating point and internal integer point
- 15 different commands and subcommands supported for full control of the drive
- Diagnostic counters for fast fault detection
- Supervise communication with user definable action if communication is lost.
- Monitors the inputs and controls the outputs utilizing them as remote I/Os
- Synchronizes the drives and the BMS clocks, eliminating the need for batteries inside the drive

VLT® CANopen MCA 105

High flexibility and low cost are two of the cornerstones for CANopen. The CANopen option for the VLT® AutomationDrive is fully equipped with both high priority access to control and status of the Drive (PDO Communication) and access to all Parameters through acyclic data (SDO Communication). For interoperability the option has implemented the DSP402 AC drive Profile. This all guarantees standardised handling, interoperability and low cost.

- Supports Danfoss FC profile and CANopen DS 402 Profile
- Access to all drive parameters via SDO communication.

Ordering number:

130B1103 uncoated,
130B1205 coated

VLT® EtherCAT MCA 124

The VLT® EtherCAT Option offers connectivity to EtherCAT based networks via the EtherCAT Protocol. The option handles the EtherCAT line communication at full speed and connection towards the drive down to 4 ms intervals in both directions. This allows the MCA 124 to participate in networks from low performance up to servo applications.

- CoE CAN over EtherCAT Support
- EoE Ethernet over EtherCAT support
- HTTP (Hypertext Transfer Protocol) for diagnosis via built-in web server
- SMTP (Simple Mail Transfer Protocol) for e-mail notification
- TCP/IP for easy access to drive configuration data from MCT 10

Ordering number:

130B5546 uncoated
130B5646 coated

VLT® POWERLINK MCA 123

POWERLINK represents the second generation of fieldbus. The high bit rate of Industrial Ethernet is used making the full power of IT technologies from automation world is now available for the factory world.

POWERLINK does not only provide high performance real-time and time synchronisation features. Due to its CANopen-based communication models, network management and device description model, the technology offers much more than just a fast communication network.

The perfect solution for:

- Dynamic motion control applications
- Material handling
- Synchronisation and positioning applications

Ordering number:

130B1489 uncoated
130B1490 coated

VLT® DeviceNet Converter MCA 194

The VLT® DeviceNet Converter MCA 194 turns the FC 302 into a VLT® 5000 on a DeviceNet network. This will eliminate the need for rewriting the PLC program, and lower the cost exchanging a VLT 5000 with a FC 302. Machines can be updated to new standards and support new motor technology and be updated to new safety standards, via the FC 302 build in STO function.

- Support VLT 5000 I/O Instances
- No change to the PLC program
- No need for VLT 5000 spare parts
- Converts access of VLT 5000 parameters from DeviceNet into FC302 parameters
- Reduces the spare parts stock to FC 302 only.

Ordering number:

NA uncoated, 130B5601 coated

VLT® PROFIBUS Converter MCA 113

The VLT® PROFIBUS converter MCA 113 turns the FC 302 into a VLT® 3000 on a Profibus network. This will eliminate the need for rewriting the PLC program, and lower the cost exchanging a VLT® 3000 with a FC 302. Machines can be updated to new standards and support new motor technology and be updated to new safety standards, via the FC 302 build in STO function.

- Support VLT 3000 PPOs
- No change to the PLC program
- No need for VLT 3000 spare parts
- Converts access from Profibus of VLT 3000 parameters into FC 302 parameters
- Reduces the spare parts stock to FC 302 only.

Ordering number:

NA uncoated, 130B1245 coated

VLT® PROFIBUS Converter MCA 114

The VLT® PROFIBUS Converter MCA 114 turns the FC 302 into a VLT® 5000 on a Profibus network. This will eliminate the need for rewriting the PLC program, and lower the cost exchanging a VLT 5000 with a FC 302. Machines can be updated to new standards and support new motor technology and be updated to new safety standards, via the FC 302 build in STO function.

- Support VLT 5000 PPO's
- No change to the PLC program
- No need for VLT 5000 spare parts
- Converts access from Profibus of VLT 5000 parameters into FC 302 parameters
- Reduces the spare parts stock to FC 302 only.

Ordering number:

NA uncoated, 130B1246 coated

Mechanical adapter plates

Installations that have VLT® 3000 or VLT® 5000 installed will need to upgrade to the successor drive VLT® AutomationDrive FC 302, when the old drives are replaced. This means that the cabinet has to be modified in order to mount the new drive. Danfoss supplies a number of adapter plates that reduce this task to a minimum.

- Install the new drive in a few minutes
- No need for drilling new mounting holes in the cabinet
- No risk that burrs from drilling enters the electronic components
- More drives can be mounted on the same footprint

Ordering number:

For VLT® 3000 – 130B0056
130B0058
For VLT® 5000 – 130B0183
130B0184
130B0185

What VLT[®] is all about

Danfoss VLT Drives is the world leader among dedicated drives providers – and still gaining market share.

Environmentally responsible

VLT[®] products are manufactured with respect for the safety and well-being of people and the environment.

All frequency converter factories are certified according to ISO 14001 and ISO 9001 standards.

All activities are planned and performed taking into account the individual employee, the work environment and the external environment. Production takes place with a minimum of noise, smoke or other pollution and environmentally safe disposal of the products is pre-prepared.

UN Global Compact

Danfoss has signed the UN Global Compact on social and environmental responsibility and our companies act responsibly towards local societies.

Impact on energy savings

One year's energy savings from our annual production of VLT[®] drives will save the energy equivalent to the energy production from a major power plant. Better process control at the same time improves product quality and reduces waste and wear on equipment.

Dedicated to drives

Dedication has been a key word since 1968, when Danfoss introduced the world's first mass produced variable speed drive for AC motors – and named it VLT[®].

Twenty five hundred employees develop, manufacture, sell and service drives and soft starters in more than one hundred countries, focused only on drives and soft starters.

Intelligent and innovative

Developers at Danfoss VLT Drives have fully adopted modular principles in development as well as design, production and configuration.

Tomorrow's features are developed in parallel using dedicated technology platforms. This allows the development of all elements to take place in parallel, at the same time reducing time to market and ensuring that customers always enjoy the benefits of the latest features.

Rely on the experts

We take responsibility for every element of our products. The fact that we develop and produce our own features, hardware, software, power modules, printed circuit boards, and accessories is your guarantee of reliable products.

Local backup – globally

VLT[®] motor controllers are operating in applications all over the world and Danfoss VLT Drives' experts located in more than 100 countries are ready to support our customers with application advice and service wherever they may be.

Danfoss VLT Drives experts don't stop until the customer's drive challenges are solved.



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- Logistics systems for the shipment of materials almost anywhere in the world.
- Purchasing management, order record and tracking of shipments.

To access the product, [click on the green button.](#)

Product	Code	Reference	Product link
VLT® Profibus DP V1 MCA 101	130B1100		Buy on EAN
VLT® DeviceNet MCA 104, uncoated	130B1102		Buy on EAN
VLT® LonWorks MCA 108, uncoated	130B1106		Buy on EAN
VLT® EtherNet/IP MCA 121, uncoated	130B1119		Buy on EAN
VLT® PROFINET MCA 120, uncoated	130B1135		Buy on EAN
VLT® BACnet MCA 109, uncoated	130B1144		Buy on EAN
VLT® LonWorks MCA 108, coated	130B1206		Buy on EAN
VLT® Profibus DP V1 MCA 101, coated	130B1200		Buy on EAN
VLT® EtherNet IP MCA 121, coated	130B1219		Buy on EAN
VLT® BACnet MCA 109, coated	130B1244		Buy on EAN