High Performance FieldBus cards

Profibus card VLT 5000/5000 Flux/6000 HVAC/8000 AQUA ..................... 3
Interbus card VLT 5000 ........................................................................ 6
DeviceNet card VLT 5000/5000 Flux/6000 HVAC/8000 AQUA .............. 8
Modbus+ card VLT 5000 ..................................................................... 10
Modbus RTU card ............................................................................. 12
Lonworks card VLT 5000/6000 HVAC/8000 AQUA Free Topology ...... 14
Lonworks cards VLT 5000/6000 HVAC 78 kbps and 1.25 Mbps .......... 16
VLT 2800 Fieldbus cards .................................................................... 18
FCD 300 Fieldbus cards ..................................................................... 20
DMS 300 Profibus card ...................................................................... 23
Adap-Kool Lon card .......................................................................... 23

Miscellaneous, Accessories to Fieldbus
   VLT 3000 to 5000 converter software .............................................. 24
   Profibus SUB D9 connector .............................................................. 25

Fieldbus options ordering number for VLT 5000: ....................... 26
Fieldbus options ordering number for VLT 6000: ......................... 27
Fieldbus options ordering number for VLT 8000: ......................... 27
Previous produce fieldbus cards: ..................................................... 28
Introduction:
This instruction can be used in conjunction with Danfoss Drives High Performance Fieldbus cards. It briefly shows the most important Technical data for each Fieldbus we support. For more information or Technical data please consult the representative Operating Instruction.

The table shows the supported Fieldbusses:

<table>
<thead>
<tr>
<th>Fieldbus</th>
<th>DMS 300</th>
<th>FCD 300</th>
<th>FCM 300</th>
<th>VLT 2800</th>
<th>VLT 5000</th>
<th>VLT 5000 Flux</th>
<th>VLT 6000 HVAC</th>
<th>VLT 8000 Aqua</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profibus DPV0</td>
<td>✔</td>
<td>✏</td>
<td>✏</td>
<td>✏</td>
<td>✏</td>
<td>✏</td>
<td>✏</td>
<td>✏</td>
</tr>
<tr>
<td>Profibus DPV1</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Profibus FMS</td>
<td></td>
<td></td>
<td></td>
<td>✔ ◊</td>
<td>✔ ◊</td>
<td>✔ ◊</td>
<td>✔ ◊</td>
<td>✔ ◊</td>
</tr>
<tr>
<td>Interbus</td>
<td></td>
<td>✔ ◊</td>
<td></td>
<td>✔ ◊</td>
<td>✔ ◊</td>
<td>✔ ◊</td>
<td>✔ ◊</td>
<td>✔ ◊</td>
</tr>
<tr>
<td>DeviceNet</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>AS-i</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modbus+</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modbus RTU</td>
<td>✔ ◊</td>
<td>✔ ◊</td>
<td>✔ ◊</td>
<td>✔ ◊</td>
<td>✔ ◊</td>
<td>✔ ◊</td>
<td>✔ ◊</td>
<td></td>
</tr>
<tr>
<td>LonWorks</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔ ◊</td>
</tr>
<tr>
<td>FC protocol</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Metasys N2</td>
<td>✔</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L&amp;S FLN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>✔</td>
</tr>
</tbody>
</table>

◊ These products still support Profibus DPV0, but have now been replace with Profibus DPV1.

◊ Note that the Profibus FMS card has a new ordering number, see page 26-27.

② Note that the previous Interbus gateway to Profibus is not available anymore.

② The Modbus RTU need to be install in an external box by these products. The box is not included.

④ VLT 8000 Aqua supports only the LonWorks FTP card.

Issued by: John Bargmeyer, DD-OSE
Revision: 3.11
Date: 2003-08-13
Profibus DP V0/V1 card for VLT 5000/6000/8000
This Profibus DP V0/V1 card is only available as a build in, i.e. if the VLT was produce with a Profibus card.
High Performance FieldBus cards

■ **Profibus DP V0/V1 card for VLT 5000/6000/8000**
This Profibus DP V0/V1 card is used in conjunction with a memory card or Sync./Pos card.

■ **Profibus DPV0 card for FMS support**
This Profibus DPV0 card is available to support installations that use the Profibus FMS protocol.
High Performance FieldBus cards

Profibus data

■ Profibus connection

![Diagram of PROFIBUS connection](image)

- 62 = RxD/TxD-P red cable
- 63 = RxD/TxD-N green cable

■ Profibus termination

By ‘ON’ is the bus termination active.

![Image of PROFIBUS termination](image)

■ LEDs

There are 4 LEDs on the PROFIBUS option card:
- LD1 and LD4: Flash when the card is communicating.
- LD2 and LD3: Lights up when the card is initialized and ready to communicate. They will flash while auto baudrate detection is attempting to detect the actual baudrate.

■ Cable specification

- Impedance: 135 to 165 ohm at a measuring frequency from 3 to 20 MHz
- Resistance: < 110 ohm/km
- Capacitance: < 30 pF/m
- Damping: max. 9 dB over the whole wire length
- Cross section: max. 0.34 mm², corresponding to AWG 22
- Cable type: twisted in pairs, 1 x 2, or 2 x 2, or 1 x 4 wires
- Screening: Copper-braided screen or braided screen and foil screen

It is recommended to use the same cable type in the entire network to avoid impedance mismatch.

■ Technical data

- Baudrate: 9.6 - 12000 kBaud
- Address area: 0 - 125

■ Profibus literature

- Operating Instruction: MG.90.G1.02
- DPV1 Design Guide: MG.90.E2.02
- Siemens S7 PLC: MC.50.A2.02
- Siemens S5 IM 308C: MC.50.C1.02
- SST-PFB-PLC5 Profibus master: MN.51.U1.02
- GE Fanuc Series 90-30: MI.50.X1.02

■ GSD files

GSD files are available on the internet at: http://www.danfoss.com/drives

![Diagram of PROFIBUS termination and LEDs](image)
■ Interbus card VLT 5000

Interbus connection for Bookstyle

IBS IN                IBS OUT

TR     CC/CR     UL     RD     BA

DC/DC converter

SUPI component for Interbus communication

Interbus connection for Compact

IBS OUT                IBS IN

UL     RD     BA     CC/CR     TR
High Performance FieldBus cards

Interbus data

- **Interbus connection**
  - VLT 5000 to VLT 5000
  - DB9 (male) to VLT 5000
  - VLT 5000 to DB9 (female)

- **Cable length**
  - Max. total cable length ..................... 12.8 km (Cu)
  - Max. length between nodes ..................... 400 m

- **Cable specification**
  - Impedance: 135 to 165 ohm at a measuring frequency from 3 to 20 MHz
  - Resistance: < 110 ohm/km
  - Capacitance: < 30 pF/m
  - Damping: max. 9 dB over the whole wire length
  - Cross section: max. 0.34 mm², corresponding to AWG 22
  - Cable type: twisted in pairs, 3 x 2 wires
  - Screening: Copper-braided screen or braided screen and foil screen

  It is recommended to use the same cable type in the entire network to avoid impedance mismatch.

- **Technical data**
  - Baudrate ........................................ 500 kBaud

- **LEDs**

<table>
<thead>
<tr>
<th>Name</th>
<th>Indicates</th>
<th>Color</th>
<th>On</th>
<th>OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC/CR:</td>
<td>Cable Check.</td>
<td>Green</td>
<td>Incomming bus active</td>
<td>Incomming bus switched off</td>
</tr>
<tr>
<td>BA</td>
<td>Bus Active.</td>
<td>Green</td>
<td>Bus active</td>
<td>Bus stopped</td>
</tr>
<tr>
<td>RD:</td>
<td>Status of outgoing bus.</td>
<td>Red</td>
<td>Outgoing bus stopped</td>
<td>Outgoing bus active</td>
</tr>
<tr>
<td>TR:</td>
<td>Transmit/Receive.</td>
<td>Green</td>
<td>PCP Communication running</td>
<td>NO PCP Communication running</td>
</tr>
<tr>
<td>UL:</td>
<td>Power OK.</td>
<td>Green</td>
<td>Voltage within permissable range</td>
<td>No Voltage</td>
</tr>
</tbody>
</table>

- **Interbus literature**
  - Operating Instruction .................. MG.10.O2.02
  - Interbus CMD ............................. MN.50.U1.02

MI.90.11.02 - VLT is a registered Danfoss trademark
DeviceNet card for VLT 5000/6000/8000

DeviceNet connection
for Bookstyle

DeviceNet connection
for Compact

Device status LED
Network status LED

Address switch and baud rate setting

\[
\begin{align*}
\text{ON} &= 0 \\
\text{OFF} &= 1
\end{align*}
\]
High Performance FieldBus cards

DeviceNet data

■ DeviceNet connection

5 V+ red
4 CAN_H white
3 drain bare
2 CAN_L blue
1 V– black

■ DeviceNet termination
Termination resistors should be installed at each end of the bus line.
The resistors shall be mount between terminal 2 CAN_L and terminal 4 CAN_H and should have the following specification:

121 Ohm, 1 % Metal film and 1/4 Watt

■ LEDs
For the device status LED:
1. when the LED is off, the device is off
2. when the LED is green, the device is operational
3. When the LED is flashing green, the device is in standby
4. when the LED is flashing red, the device detects a minor fault
5. when the LED is red, the device detects an unrecoverable fault
6. when the LED is flashing red/green, the device is self testing

For the network status LED:
1. when the LED is off, the network is non-powered/not online
2. when the LED is flashing green, the network is online but not connected
3. when the LED is green, the network is online and connected
4. when the LED is flashing red, the network has a connection time-out
5. when the LED is red, the network has a critical link failure.

■ Cable length

<table>
<thead>
<tr>
<th>Transmission speed</th>
<th>Max. total cable length [m]</th>
</tr>
</thead>
<tbody>
<tr>
<td>125 kBaud</td>
<td>500</td>
</tr>
<tr>
<td>250 kBaud</td>
<td>250</td>
</tr>
<tr>
<td>500 kBaud</td>
<td>100</td>
</tr>
</tbody>
</table>

■ Cable specification
- Cross section: max. 0.78 mm², corresponding to AWG 18
- Cable type: twisted in pairs, 2 x 2 wires with drain wire in center
- Screening: Copper-braided screen or braided screen and foil screen

It is recommended to use the same cable type in the entire network to avoid impedance mismatch.

■ Address and baud rate setting
Dip switch 1-6 set the VLT frequency converters address and 7-8 the baud rate.
If the address shall be set to 3 the dip switches should be set as follow:

ON
1 2 3 4 5 6 7 8
OFF = 1

Switch Settings for DeviceNet Module Baud Rate:

<table>
<thead>
<tr>
<th>Baud Rate</th>
<th>Switch Setting</th>
<th>Switch Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>125 kBPS</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>250 kBPS</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>500 kBPS</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>125 kBPS</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

■ DeviceNet literature
Operating Instruction ......................... MG.50.H4.22
Allen-Bradley SLC 500 .......................... MC.50.D1.02
Allen-Bradley Control logix .................... MN.51.T1.02

■ EDS files
EDS files for each product series are available on the internet at:
http://www.danfoss.com/drives
High Performance FieldBus cards

- **Modbus+ card VLT 5000 Bookstyle**
  - Top connector
  - Network LED

- **Modbus+ card VLT 5000 Compact**
  - Network LED
  - Side connector
  - Address switch
Modbus Plus data

■ Modbus connection

![Modbus connection diagram]

3 Blue
2 Drain
1 White

NOTE: Drain wire and shield should be insulated.

■ Modbus termination

It is essential that the bus line be terminated properly. A mismatch of impedance may result in reflections on the line that will corrupt data transmission.

The Modbus Plus Option card is provide with a pluggable screw connector for 176F1551 (Compact units) and a DB9 connector for 176F1550 (Book-style units).

An adaptor cable number 190703 is required for use with 176F1551.

Mating network connectors should be ordered from MODICON:
P/N AS-MBKT-085, (1) in-line connector
P/N AS-MBKT-185, (2) terminating connectors

■ LEDs

Modbus Plus status is shown by flashing a repetitive pattern on the network indicator (green LED). The patterns are:

- Six flashes per second;
  The node’s normal operating state. The node is successfully receiving and passing the token. All nodes on the network should be flashing this pattern.

- One flash per second;
  The node is off-line after just being powered up, or after exiting the four flashes per second mode.

- Two flashes, then OFF for two seconds;
  The node is hearing the token being passed among other nodes, but is never receiving the token. Check the network for an open circuit or defective termination.

- Three flashes, then OFF for 1.7 seconds;
  The node is not hearing any other nodes. It is periodically claiming the token, but finding no other node to which to pass it. Check the network for an open circuit or defective termination.

- Four flashes, then OFF for 1.4 seconds;
  The node has heard a valid message from another node that is using the same address as this node. The node remains in this state as long as it continues to hear the duplicate address. If the duplicate address is not heard for five seconds, the node then changes to the pattern of one flash every second.

NOTE: LED patterns other than those shown above indicate a possible hardware problem.

■ Cable specification and length

The recommended Modbus Plus cable is Belden 9841, shielded twisted pair.

Minimum length between nodes ......................... 3 m
Maximum length without repeaters ................... 450 m

■ Address and baud rate setting

Dip switch 1-6 set the VLT frequency converters address. Dip switch are not 7-8 used.

![Dip switch settings]

ON = 0
OFF = 1

The address of the VLT frequency converter will be one higher than the binary value. With the above settings of the dip switches the address will be 4.

NOTE: Changes in switch settings are only active after power up.

■ Modbus Plus literature

Operating Instruction ......................... MG.10.M1.22
Modbus ................................. Modbus Plus Tech note
**Modbus RTU card**

The Modbus RTU option card is a gateway that translates Modbus RTU telegrams to Danfoss FC protocol. As the FC protocol is integrated in all VLT frequency converts as standard, the Modbus RTU can interface to all our drives except for the DMS 300.

The Modbus RTU can be built into the control cassette of the following products:

- VLT 5000
- VLT 6000 HVAC
- VLT 8000 AQUA

With VLT 5000 Flux, VLT 2800, FCM 300 the Modbus RTU card must be mounted into an external box.

The code number for the Modbus RTU option card is 175Z3362.
Modbus RTU data

- **Modbus RTU connection**

<table>
<thead>
<tr>
<th>RTxD' (-)</th>
<th>Com</th>
<th>RTxD (+)</th>
</tr>
</thead>
</table>

- **Connector from Modbus RTU to VLT**

<table>
<thead>
<tr>
<th>24V in</th>
<th>to terminal 12 or 13</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTxD</td>
<td>to terminal 69 (+)</td>
</tr>
<tr>
<td>Com</td>
<td>to terminal 39</td>
</tr>
<tr>
<td>RTxD'</td>
<td>to terminal 68 (-)</td>
</tr>
<tr>
<td>(spare)</td>
<td>(spare)</td>
</tr>
</tbody>
</table>

- **LEDs**

  There are 2 LEDs on the Modbus RTU option card. Both LEDs use the same communication pattern:

  - Flashing Green (1 Hz): Communication online (VLT LED) or receiving data (Modbus LED).
  - Flashing Red (1 Hz): Communication time out
  - Solid Red: Major fault, communication stopped

- **Baud rate and parity Dip switch**

  This Dip switch sets the baud rate and the parity on the Modbus network.

  - The baud rate can be set to 4800, 9600 (default) or 19200 baud by switches 1-3.
  - The parity bit can be set to None, Odd or Even (default) by switches 4-5.

  See the Modbus manual for the Dip switch settings.

  ![](9600 Baud Rate and No Parity Switch Settings)

- **Address and termination Dip switch**

  This Dip switch sets the Modbus address and the termination.

  - The address can be set by switches 1-8. Default address is 1.
  - The termination can be set by switch 9. Default termination is ON.

  See the Modbus manual for the Dip switch settings.

  ![](OM)

- **VLT parameter settings**

  As the Modbus RTU card interface to the built-in RS-485 FC profile the following parameters must be set in the VLT:

  **VLT 5000/VLT 2800/FCD 300/FCM 300:**

  - Parameter 500 Address: 001
  - Parameter 501 Baud rate: 9600 baud
  - Parameter 512 Profile: FC protocol

  **VLT 6000/VLT 8000**

  - Parameter 500 Profile: FC protocol
  - Parameter 501 Address: 001
  - Parameter 502 Baud rate: 9600 baud
■ Lonworks cards VLT 5000/6000/8000 Free Topology

Termination of LonWorks

Status and Service LED

LonWorks connection for Bookstyle

Service Pin

Status and Service LED

LonWorks connection for Compact

Service Pin
LonWorks data for FTP

■ LonWorks connection

Connect signal wires to terminal 79 and to 80 of the terminal connector. In free topology model, connections can be reversed.

■ Lonworks termination
The option card has a termination resistor built-in which is activated by a terminator switch. Use of the terminator is optional, depending upon the network configuration. If termination is provided elsewhere in the network, the termination function should be OFF. Terminator switch position functions are provided in the table below.

<table>
<thead>
<tr>
<th>Termination</th>
<th>Pos 1</th>
<th>Pos 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>No termination</td>
<td>Net Term Off</td>
<td>Don’t Care</td>
</tr>
<tr>
<td>Single termination</td>
<td>Net Term On</td>
<td>Net Term Off</td>
</tr>
<tr>
<td>Double termination</td>
<td>Net Term On</td>
<td>Net Term On</td>
</tr>
</tbody>
</table>

■ LEDs
There are 2 LEDs on the LonWorks option card:
Green LED: Status LED
Red LED: Service LED, see LonWorks manual.

The Status LED patterns are:
ON
There is power on the board but there has not been any communication to an input network variable in the last 2 seconds.

Flashing 10 times per second
There is regular network communication to the VLT's input network variables.

Flashing intermittently
There is network communication to the VLT's input network variables but input network variables are received at a period greater than 2 seconds.

Flashing 5 times per second
The response to the network management “Wink” command. The VLT LonWorks node must be reset to leave the wink state.

OFF
No power on board or hardware fault.

■ Cable length
Free Topology Specifications

<table>
<thead>
<tr>
<th></th>
<th>Maximum node-to-node distance</th>
<th>Maximum total wire length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belden 85102</td>
<td>500 m</td>
<td>500 m</td>
</tr>
<tr>
<td>Belden 8471</td>
<td>400 m</td>
<td>500 m</td>
</tr>
<tr>
<td>Level IV, 22AWG</td>
<td>400 m</td>
<td>500 m</td>
</tr>
<tr>
<td>JY (St) Y 2x2x0.8</td>
<td>320 m</td>
<td>500 m</td>
</tr>
</tbody>
</table>

Maximum bus length for segments with FTT-10 transceivers and with both FTT-10 and LPT-10 transceivers.

<table>
<thead>
<tr>
<th></th>
<th>FTT-10</th>
<th>FTT-10 and LPT-10 transceivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belden 85102</td>
<td>2700 m</td>
<td>2200 m</td>
</tr>
<tr>
<td>Belden 8471</td>
<td>2700 m</td>
<td>2200 m</td>
</tr>
<tr>
<td>Level IV, 22AWG</td>
<td>1400 m</td>
<td>1150 m</td>
</tr>
<tr>
<td>JY (St) Y 2x2x0.8</td>
<td>900 m</td>
<td>750 m</td>
</tr>
</tbody>
</table>

Danfoss recommends the use of shielded LonWorks communication cable for instance Belden 8719.

■ LonWorks literature
Operating Instruction ......................... MG.60.N1.02
LonMaker .............................................. MI.60.L1.02

■ Xif files
Xif files are available on the internet at:
http://www.danfoss.com/drives
Lonworks cards VLT 5000/6000 78 kbps and 1.25 Mbps
LonWorks data for 78 kbps and 1.25 Mbps

- **LonWorks connection**

  61
  80 Net B 80
  79 Net A 79

  Connect signal wires NET A to terminal 79 and NET B to 80 of terminal connector.

- **Lonworks termination**

  The option card has a termination resistor built-in which is activated by a terminator switch. Use of the terminator is optional, depending upon the network configuration. If termination is provided elsewhere in the network, the termination function should be OFF. Terminator switch position functions are provided in the table below.

  **Switch 1:**
  - **Network Termination ON**
    The VLT LonWorks node is terminated.
  - **Network Termination OFF**
    The VLT LonWorks node is not terminated.

- **LEDs**

  There are 2 LEDs on the LonWorks option card:
  - Green LED: Status LED
  - Red LED: Service LED, see LonWorks manual.

  The Status LED patterns are:
  - **ON**
    There is power on the board but there has not been any communication to an input network variable in the last 2 seconds.
  - **Flashing 10 times per second**
    There is regular network communication to the VLT’s input network variables.
  - **Flashing intermittently**
    There is network communication to the VLT’s input network variables but input network variables are received at a period greater than 2 seconds.

- **Cable length**

  78 kbps and 1.25 Mbps Specifications

  - **78 kbps**
    - Network bus length, Typical: 2000 m
    - Network bus length, Worst case: 1330 m
  - **1.25 Mbps**
    - Network bus length, Typical: 500 m
    - Network bus length, Worst case: 125 m

- **Network bus wiring**

  - UL Level IV, 22 AWG (0.65 mm) twisted pair
  - UL Level IV, 22 or 24 AWG (0.5 mm) twisted pair

  Danfoss recommends the use of shielded LonWorks communication cable for instance Belden 8719.

- **LonWorks literature**

  - Operating Instruction: MG.60.E4.02
  - LonMaker: MI.60.L1.02

- **Xif files**

  Xif files are available on the internet at:
  http://www.danfoss.com/drives
■ VLT 2800 fieldbus cards.
High Performance FieldBus cards

VLT 2800 Profibus card

- VLT 2800 Profibus connection

68 = RxD/TxD-P red cable
69 = RxD/TxD-N green cable

- Technical data
  Baudrate: 9.6 - 3000 kbaud
  Adress area: 0 - 125

- 12 M baud Profibus card
  VLT 2800 can also be delivered with a 12 M baud Profibus control card.
  Order number: 195N0603

  The order number is only for the control card with 12 M baud Profibus. The power part should be order separately.

For other technical data on Profibus, see page 5 Profibus Data.

VLT 2800 DeviceNet card

- VLT 2800 DeviceNet connection

Drop cable

An alternative to splicing two trunk lines in the connector on the control card, is using a DeviceNet connection box or a T-connector. For this kind of installation a drop cable is available as an option.

Drop cable ordering number: 195N3113

For other technical data on DeviceNet, see page 9 DeviceNet Data.
High Performance FieldBus cards

- **FCD 300 Profibus card**

- **FCD 300 Profibus connection**

  195NA259.10

  68 = RxD/TxD-P red cable
  69 = RxD/TxD-N green cable

- **FCD 300 DIP switches**
**High Performance FieldBus cards**

**FCD 300 DeviceNet card**

**FCD 300 DeviceNet connection**

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Colour</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>67</td>
<td>Red</td>
<td>24 Volt</td>
</tr>
<tr>
<td>68</td>
<td>White</td>
<td>Can_high</td>
</tr>
<tr>
<td>69</td>
<td>Blue</td>
<td>Can_low</td>
</tr>
<tr>
<td>70</td>
<td>Black</td>
<td>GND</td>
</tr>
<tr>
<td>D</td>
<td>Bar</td>
<td>Drain</td>
</tr>
</tbody>
</table>

**FCD 300 Plug 175N2279**

The DeviceNet bus connection can be performed through a plug, that is to be mounted in the FCD 300 housing (M16 gland hole) and wired to the inside terminal strip.
FCD 300 AS-i bus card

FCD 300 AS-i connection
The AS-i bus lines are to be connected to terminals 68 and 69 of the internal terminal strip. A round drop cable can be wired directly into the terminals by using a cable gland. A sealed M12 connector can be mounted into one of the M16 gland holes in the FCD enclosure. The M12 connector is to be wired to the terminals 68, 69 on the control terminal block. The connection is in the following way:
AS-i + to 68
AS-i - to 69.

FCD 300 AS-i Plug 175N2281
The AS-i bus connection can be performed through a plug, that is to be mounted in the FCD 300 housing (M16 gland hole) and wired to the inside terminal strip.
Pin 1 (Brown) to AS-i + (68)
Pin 3 (Blue) to AS-i - (69)
■ DMS 300 Profibus card

Profibus connection

Profibus termination

■ AKD Lon card

The AKD Lon card can only be used together with AKD 2800 and AKD 5000.
Miscellaneous, Accessories to Fieldbus

VLT 3000 to 5000 converter software (17.1x):
The VLT 3000 to 5000 converter is a special software version which is intended to convert a VLT 3000 to a VLT 5000, which replaces the VLT 3000. The converter software is typical used to replace a VLT 3000 with a Profibus interface, but it can also replace a VLT 3000 in a RS-485 network.

With the converter software we only support Profibus DP Norm, so a replaced VLT 3000 should have a software version 3.00 or higher. The software version number can be read out in parameter 603, choice 3.

To purchase (obligatory):
- VLT 5000 ................................................ 175XXXXX
- Converter software 17.1x ....................... 175z3389

Optional:
- Profibus option excl. memory option ...... 175z0402
- Backplate for 5001-5005 Compact IP 20 ordering no. ................................................ 175Z2349
- Separate relay card ................................. 175Z1814

If two high voltage relays are needed in VLT 5000 a separate relay card must be purchased.
- Ordering number ................................. 176F1814

See also the VLT 3000 to 5000 converter manual MG.50.Q1.02.
High Performance FieldBus cards

Miscellaneous, Accessories to Fieldbus

Profibus kit for SUB D9 connection:
This kit can be mounted together with a VLT 5000/6000/8000 Profibus card and the standard SUB D9 Profibus connector can be used.

Product | Ordering number
--- | ---
VLT 5001-5027 230 V | 175Z3568
VLT 5032-5052 230 V | 176F1822
VLT 5001-5102 400 V | 175Z3568
VLT 5125-5500 400 V | 176F1822
VLT 6002-6032 230 V | 175Z3568
VLT 6042-6072 230 V | 176F1822
VLT 6002-6122 400 V | 175Z3568
VLT 6150-6550 400 V | 176F1822
VLT 8002-8032 230 V | 175Z3568
VLT 8042-8072 230 V | 176F1822
VLT 8002-8122 400 V | 175Z3568
VLT 8150-8550 400 V | 176F1822

By VLT 5072-5102, 6102-6122 and 8102-8122 can the kit first by install from week 36 2003 (G363).

Top connection of Fieldbus by IP 20 Unit:
It is now possible to make a top connection of the Fieldbus cable by all IP 20 units by VLT 5000/6000/8000. The connection will be similar to a book style connection.

The top connection can be done on all VLT 5000/6000/8000 IP 20 unit that are produce from the week 15 2003 (G363) except VLT 5032-5052 230 V, VLT 5125-5500 400 V, VLT 6042-6072 230 V, VLT 6150-6550 400 V, VLT 8042-8072 230 V and VLT 8150-8550 400 V.

Top connection on VLT 5072-5102, 6102-6122 and 8102-8122 is available from week 36 2003.

It is also possible to retrofit VLT 5000/6000/8000 IP 20 unit with a clamp (175Z3477), so that a top connection can be done.
In this case the Drive need to be produce after week 23 2002 (G232)

Ordering number 175Z3477
### High Performance FieldBus cards

#### Fieldbus options ordering number for VLT 5000:

**Profibus DPV1:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Ordering no.</th>
<th>Ordering no. with conformal coating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profibus option DPV1</td>
<td>Incl. memory option</td>
<td>175Z0404</td>
<td>175Z2625</td>
</tr>
<tr>
<td>Profibus option DPV1</td>
<td>excl. memory option</td>
<td>175Z0402</td>
<td>175Z4363</td>
</tr>
</tbody>
</table>

**Profibus FMS:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Ordering no.</th>
<th>Ordering no. with conformal coating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profibus option FMS</td>
<td>Incl. memory option</td>
<td>175Z3722</td>
<td>175Z3723</td>
</tr>
</tbody>
</table>

**Interbus:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Ordering no.</th>
<th>Ordering no. with conformal coating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interbus option</td>
<td>Incl. memory option</td>
<td>175Z3122</td>
<td>175Z3191</td>
</tr>
<tr>
<td>Interbus option</td>
<td>excl. memory option</td>
<td>175Z2900</td>
<td></td>
</tr>
</tbody>
</table>

**DeviceNet:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Ordering no.</th>
<th>Ordering no. with conformal coating</th>
</tr>
</thead>
<tbody>
<tr>
<td>DeviceNet option</td>
<td>Incl. memory option</td>
<td>176F1580</td>
<td>176F1581</td>
</tr>
<tr>
<td>DeviceNet option</td>
<td>excl. memory option</td>
<td>176F1584</td>
<td></td>
</tr>
</tbody>
</table>

**Modbus Plus:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Ordering no.</th>
<th>Ordering no. with conformal coating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modbus Plus for Compact units</td>
<td>Incl. memory option</td>
<td>176F1551</td>
<td>176F1553</td>
</tr>
<tr>
<td>Modbus Plus for Compact units</td>
<td>Excl. memory option</td>
<td>176F1559</td>
<td></td>
</tr>
<tr>
<td>Modbus Plus for Bookstyle units</td>
<td>Incl. memory option</td>
<td>176F1550</td>
<td>176F1552</td>
</tr>
<tr>
<td>Modbus Plus for Bookstyle units</td>
<td>Excl. memory option</td>
<td>176F1558</td>
<td></td>
</tr>
</tbody>
</table>

**LonWorks:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Ordering no.</th>
<th>Ordering no. with conformal coating</th>
</tr>
</thead>
<tbody>
<tr>
<td>LonWorks option, Free topology</td>
<td>Incl. memory option</td>
<td>176F1500</td>
<td>176F1503</td>
</tr>
<tr>
<td>LonWorks option, Free topology</td>
<td>Excl. memory option</td>
<td>176F1512</td>
<td></td>
</tr>
<tr>
<td>LonWorks option, 78 KBPS</td>
<td>Incl. memory option</td>
<td>176F1501</td>
<td>176F1504</td>
</tr>
<tr>
<td>LonWorks option, 78 KBPS</td>
<td>Excl. memory option</td>
<td>176F1513</td>
<td></td>
</tr>
<tr>
<td>LonWorks option, 1.25 MBPS</td>
<td>Incl. memory option</td>
<td>176F1502</td>
<td>176F1505</td>
</tr>
<tr>
<td>LonWorks option, 1.25 MBPS</td>
<td>Excl. memory option</td>
<td>176F1514</td>
<td></td>
</tr>
</tbody>
</table>
High Performance FieldBus cards

- **Fieldbus options ordering number for VLT 6000 HVAC:**

  **Profibus DPV1:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Ordering no.</th>
<th>Ordering no. with conformal coating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profibus option DPV1</td>
<td>Incl. memory option</td>
<td>175Z7800</td>
<td>175Z2905</td>
</tr>
<tr>
<td>Profibus option DPV1</td>
<td>excl. memory option</td>
<td>175Z0402</td>
<td>175Z4363</td>
</tr>
</tbody>
</table>

  **Profibus FMS:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Ordering no.</th>
<th>Ordering no. with conformal coating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profibus option FMS</td>
<td>Incl. memory option</td>
<td>175Z4207</td>
<td>175Z4208</td>
</tr>
</tbody>
</table>

  **LonWorks:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Ordering no.</th>
<th>Ordering no. with conformal coating</th>
</tr>
</thead>
<tbody>
<tr>
<td>LonWorks option, Free topology</td>
<td>176F1515</td>
<td>176F1521</td>
</tr>
<tr>
<td>LonWorks option, Free topology</td>
<td>176F1512</td>
<td>176F1522</td>
</tr>
<tr>
<td>LonWorks option, 78 KBPS</td>
<td>176F1516</td>
<td>176F1522</td>
</tr>
<tr>
<td>LonWorks option, 78 KBPS</td>
<td>176F1513</td>
<td></td>
</tr>
<tr>
<td>LonWorks option, 1.25 MBPS</td>
<td>176F1517</td>
<td>176F1523</td>
</tr>
<tr>
<td>LonWorks option, 1.25 MBPS</td>
<td>176F1514</td>
<td></td>
</tr>
</tbody>
</table>

  **DeviceNet:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Ordering no.</th>
<th>Ordering no. with conformal coating</th>
</tr>
</thead>
<tbody>
<tr>
<td>DeviceNet option</td>
<td>176F1586</td>
<td>176F1587</td>
</tr>
<tr>
<td>DeviceNet option</td>
<td>176F1584</td>
<td></td>
</tr>
</tbody>
</table>

- **Fieldbus options ordering number for VLT 8000 Aqua:**

  **Profibus DPV1:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Ordering no.</th>
<th>Ordering no. with conformal coating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profibus option DPV1</td>
<td>Incl. memory option</td>
<td>175Z3685</td>
<td>175Z3686</td>
</tr>
<tr>
<td>Profibus option DPV1</td>
<td>excl. memory option</td>
<td>175Z0402</td>
<td>175Z4363</td>
</tr>
</tbody>
</table>

  **LonWorks:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Ordering no.</th>
<th>Ordering no. with conformal coating</th>
</tr>
</thead>
<tbody>
<tr>
<td>LonWorks option, Free topology</td>
<td>176F0225</td>
<td></td>
</tr>
<tr>
<td>LonWorks option, Free topology</td>
<td>176F1512</td>
<td></td>
</tr>
</tbody>
</table>

  **DeviceNet:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Ordering no.</th>
<th>Ordering no. with conformal coating</th>
</tr>
</thead>
<tbody>
<tr>
<td>DeviceNet option</td>
<td>176F0224</td>
<td></td>
</tr>
<tr>
<td>DeviceNet option</td>
<td>176F1584</td>
<td></td>
</tr>
</tbody>
</table>
Previous produce Profibus cards
■ Previous produce DeviceNet cards

Revisions number
18115A

Revisions number
18115D
Previous produce LonWorks cards

- This ferrite coil is only mounted on revision C.
- Revision number 18110C

- This capacitor is only mounted on revision B.
- The capacitor can also be mounted on revision A card.

Revision number 18110A

Revision number 18110B

Revision number 18110C
Previous produce Modbus RTU cards