The DanVLT60 Driver

The DanVLT60 driver links Danfoss VLT® 6000 HVAC frequency converters to North. Available for Commander and ObSys.

This document relates to DanVLT60 driver version 2.0

Please read the *Commander Manual* or *ObSys Manual* alongside this document, available from *www.northbt.com*

Contents

Compatibility with the Danfoss System

The DanVLT60 driver allows North to interface with Danfoss VLT® 6000 HVAC frequency converters. Typically used to control fans and pumps that regulate the flow or pressure in a system.

The driver connects, via an RS485 serial connection, to a network of up to 31 Danfoss VLT® 6000 HVAC frequency converters (Fig. 1).

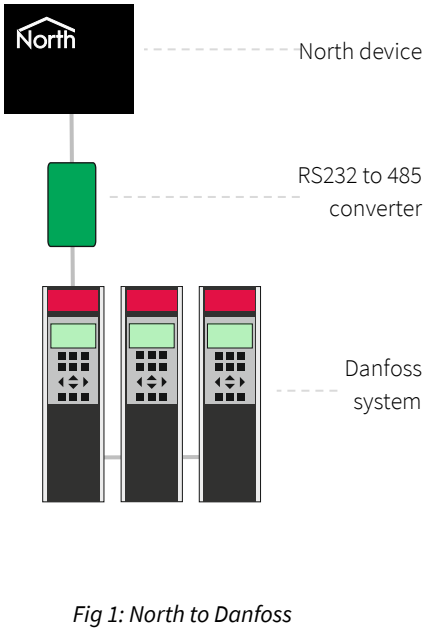

Fig 1: North to Danfoss

Equipment

Danfoss frequency converters that are compatible with the driver include:

- Danfoss VLT® 6000 Series – including the 6002 to the 6275 range.

Values

The driver can typically access the following values:

- Current (A)
- Energy (kWh)
- Hours run
- Thermal load
- Frequency (Hz)
- Power (kW)
- Voltage
- Operation
- Fault code

Prerequisites

Each of the VLT 6000 HVAC units should be set to use the Danfoss 'FC protocol' (parameter 500), a unique address in the range 1…126 (parameter 501), and the same baud rate (parameter 502, default '9600').

An RS232-485 adapter is required and should be set to 11 bits, with a baud rate to match the frequency converters.

Using the Driver

On ObSys, the DanVLT60 driver is pre-installed. On Commander, the driver is available to download in the file 'Bank15 DanVLT60.cdm'. On all of these North devices, you can use the driver to create an interface to Danfoss. Once started, you will need to set up the driver before it can communicate with the DanVLT60 system.

Making the Cable

Connect the North device COM port to an RS232 to RS485 adapter.

Using the RS485 cable specification (Fig. 2), connect the RS485 adapter to the Danfoss VLT 6000 HVAC network.

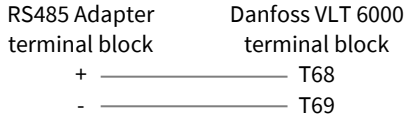

Fig 2 North to DanVLT60 cable

RS485 adapters are available from North, order code MISC/RS232/485.

Starting the Interface

To start an interface using the DanVLT60 driver, follow these steps:

- → **Start Engineering** your North device using ObSys
- → Navigate to **Configuration, Interfaces,** and set a unused **Interface** to 'DanVLT60' to start the particular interface
- → Navigate to the top-level of your North device, then rescan it

The driver setup object (Mc), labelled **DanVLT60 Setup**, should now be available. If this object is not available, check an interface licence is available and the driver is installed.

Setting up the Driver

To set up the driver, follow these steps:

- → Navigate to the **DanVLT60 Setup** object (Mc). For example, if you started interface 1 with the driver earlier, then the object reference will be 'M1'
- → Set the **RS232 Com Port** (RS.COM) to select which serial port on the North Device the Danfoss system is connected
- → Set the **Baud Rate (**RS.BR**)** to match that of the Danfoss VLT 6000s.

Object Specifications

Once an interface is started, one or more extra objects become available within the top-level object of the device. As with all North objects, each of these extra objects may contain sub-objects, (and each of these may contain sub-objects, and so on) - the whole object structure being a multi-layer hierarchy. It is possible to navigate around the objects using the ObSys Engineering Software.

Each object is specified below, along with its sub-objects.

Example Object Reference

An example of a reference to an object in the same device: the DanVLT60 (S1) contains Address 1 (A1), which itself contains a Current value (C). Therefore, the complete object reference is 'S1.A1.C'.

An example of a reference to an object in a different device: the IP network object (IP) contains Default Commander object (CDIP), which contains the object above (S1.A1.C) – therefore the complete object reference is 'IP.CDIP.S1.A1.C'.

Device Top-Level Objects

When an interface is started using the DanVLT60 driver, the objects below become available within the top-level object of the device. For example, if interface 1 is started, then the object references 'M1' and 'S1' become available.

Description	Reference	Type
DanVLT60 Setup Set up the DanVLT60 driver, started on interface *c* (*c* is the interface number)	M*c*	Fixed Container: On the Commander platform this will be *[CDM v20\DanVLT60 v20]* On the ObSys platform this will be *[OSM v20\DanVLT60 v20]*
Danfoss Freq Conv Access DanVLT60 system connected to interface *c* (*c* is the interface number)	S*c*	Fixed Container: *[DanVLT60 v20]*

DanVLT60 Driver Setup

Object Type: *[OSM v20\DanVLT60 v20]*
Object Type: *[CDM v20\DanVLT60 v20]*

The DanVLT60 driver contains the following objects:

Description	Reference	Type
RS232 COM Port	RS.COM	Obj\Num:1…8; Adjustable
Baud Rate	RS.BR	Obj\Num; Adjustable Values: 1200, 2400, 4800 and 9600

Danfoss Network

Object Type: *[DanVLT60 v20]*

The Danfoss network contains up to 31 Danfoss VLT 6000 HVAC units:

Description	Reference	Type
VLT 6000 Label The Danfoss VLT 6000 address, *x*, can be in the range 1…126.	A*x*	*Fixed Container:* *[DanVLT60 v20\Address]*

Danfoss VLT 6000

Object Type: [DanVLT60 v20\Address]

A Danfoss VLT 6000 HVAC unit contains the following objects:

Description	Reference	Type
Analogue Input 53 - Value Voltage on terminal 53	AI53.V	Obj\Num
Analogue Input 54 - Value Voltage on terminal 54	AI54.V	Obj\Num
Analogue Input 60 - Value Voltage on terminal 60	AI60.V	Obj\Num
Current (A)	C	Obj\Num
Current Limit Exceed	C.S	Obj\NoYes
Count – Cut In	CT.CI	Obj\ Num: 0…9999
Count - Energy (kWh)	CT.E	Obj\ Num
Count – Hours Run (hrs)	CT.HR	Obj\Float: 0…130000
Count – Hours Total (hrs)	CT.OH	Obj\Float: 0…130000
Count – Over Temperature	CT.OT	Obj\Num: 0…9999
Count – Over Voltage	CT.OV	Obj\Num: 0…9999
Digital Input d – Status The Digital Input number d is a number in the range 0…7	DI*d*.S	Obj\OffOn
External Reference (%)	ER	Obj\Num
Thermal Load (%)	ETR	Obj\Num
Thermal Load – Motor (%)	ETR.M	Obj\Num
Thermal Load – Warning	ETR.S	Obj\NoYes
Fault – Error Code	FLT	Obj\Num: 1…99 See 'Fault Codes' table below
Frequency (Hz)	FQ	Obj\Num
Feedback Unit	FU	Obj\Num
Horse Power (HP)	HP	Obj\Num
Heat Sink – Temperature (°C)	HS.T	Obj\Num
Operation	OP	Obj\ENum: 0…3; Adjustable Values: 0=Stop, 1=Run, 2=Coast stop, 3=Quick Stop
Operation – Bus	OP.B	Obj\ENum: 0…1 Values: 0=Local Control, 1=Bus Control
Operation – Ready to Run	OP.R	Obj\ENum: 0…1 Values: 0=Coasting, 1=Ready to Run
Power (kW)	P	Obj\Num
Pulse Reference (Hz)	PR	Obj\Num
Resulting Reference (%)	RR	Obj\Num
Resulting Reference Unit (Hz, rpm)	RU	Obj\Num

Description	Reference	Type
Reverse	RV	Obj\NoYes; Adjustable
Serial Communications Reference (%)	SR	Obj\Num: 0…100; Adjustable
Speed Reference = Speed	SR.S	Obj\NoYes
Trip	TR	Obj\NoYes; Adjustable
Voltage – DC Link (Vdc)	V.DC	Obj\Num
Voltage – DC Link Warning	V.DC.S	Obj\NoYes
Voltage – Motor (Vac)	V.M	Obj\Num

Fault Codes

The Fault object (FLT) reports the following values:

Fault	Description
1	10 volts low
2	Live zero fault
4	Mains phase fault
5	Voltage warning high
6	Voltage warning low
7	Overvoltage
8	Undervoltage
9	Inverter overloaded
10	Motor overloaded
11	Motor thermistor
12	Current limit
13	Overcurrent
14	Earth fault
15	Switch mode fault
16	Short circuit
17	Serial communication time-out
18	HPFB bus timeout
19	Fault in EEPROM on power card
20	Fault in EEPROM on control card
22	Auto-optimisation not OK
29	Heat-sink temperature too high
30	Motor phase U missing
31	Motor phase V missing
32	Motor phase W missing
34	HPFB communication fault
35	Out of frequency range
37	Inverter fault
39	Check parameters 104 and 106
40	Check parameters 103 and 105
41	Motor too big
42	Motor too small
60	Safety stop
61	Output frequency low
62	Output frequency high
63	Output current low
64	Output current high
65	Feedback low
66	Feedback high
67	Reference low
68	Reference high
99	Unknown fault

Driver Versions

Version	Build Date	Details
1.0	08/10/1999	Driver released
1.0	27/10/1999	Resolved issue with object OP not functioning correctly. Resolved issue with object SR to change speed if VLT in motion.
1.0	17/12/1999	Resolved issue when VLT was repowered.
2.0	02/02/2017	Updated for Commander

Next Steps…

If you require help, contact support on 01273 694422 or visit *www.northbt.com/support*

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