



**EUROTHERM  
DRIVES**

---

# **LonWorks Communications Interface**

Technical Manual  
HA468031U001 Issue 1

Compatible with Version 1.x Firmware

© Copyright Eurotherm Drives Limited 2003

All rights strictly reserved. No part of this document may be stored in a retrieval system, or transmitted in any form or by any means to persons not employed by a Eurotherm Drives company without written permission from Eurotherm Drives Ltd.

Although every effort has been taken to ensure the accuracy of this document it may be necessary, without notice, to make amendments or correct omissions. Eurotherm Drives cannot accept responsibility for damage, injury, or expenses resulting therefrom.

# Safety Information



Please read this information **BEFORE** installing the equipment.

## Intended Users

This manual is to be made available to all persons who are required to install, configure or service equipment described herein, or any other associated operation.

The information given is intended to highlight safety issues, and to enable the user to obtain maximum benefit from the equipment.

## Application Area

The equipment described is intended for industrial motor speed control utilising AC induction or AC synchronous machines.

## Personnel

Installation, operation and maintenance of the equipment should be carried out by qualified personnel. A qualified person is someone who is technically competent and familiar with all safety information and established safety practices; with the installation process, operation and maintenance of this equipment; and with all the hazards involved.

**REFER TO YOUR MAIN PRODUCT MANUAL FOR SPECIFIC SAFETY INFORMATION ABOUT THE DEVICE YOU ARE CONTROLLING**

## Acknowledgements

ConfigEd Lite, CE Lite is a registered trademark of Eurotherm Drives, Inc.

LonMaker is a registered trademark of Echelon.

### IMPORTANT

Users are required to have CE LITE and LonMaker (or similar) installed on a computer and have a working knowledge of these software packages.

### WARRANTY

Eurotherm Drives warrants the goods against defects in design, materials and workmanship for the period of 12 months from the date of delivery on the terms detailed in Eurotherm Drives Standard Conditions of Sale IA058393C.

Eurotherm Drives reserves the right to change the content and product specification without notice.

# Contents

Contents

Page

## LONWORKS TECHNOLOGY OPTION

1

<b>System Overview .....</b>	<b>1</b>
Product Features.....	1
Product Code .....	1
CE Lite Requirements.....	1
<b>Hardware Installation .....</b>	<b>1</b>
Installing and Connecting the LonWorks Technology Option.....	1
Connection Diagram.....	3
• Cable Specifications .....	3
<b>Understanding the LED Indications.....</b>	<b>4</b>
Initial Power-on Checks .....	4
<b>Configuring the Drive .....</b>	<b>5</b>
• The LonWorks MMI View.....	5
• The Non-specific ConfigEd-Lite & MMI View .....	5
• Parameter Descriptions.....	6
<b>Commissioning the Lonworks Technology Option.....</b>	<b>7</b>
Configuring with LonMaker .....	7
The Network Interface .....	9
• The Node Object.....	10
• The VSD Object (Variable Speed Drive) .....	12
<b>Troubleshooting.....</b>	<b>17</b>
• 6053/6055 LonWorks Technology Option Status LED.....	17



# LONWORKS TECHNOLOGY OPTION

## System Overview

### Product Features

- Suitable for use with all 690+ drives using firmware version 5.1 onwards
- Free topology, twisted pair connections for simple wiring to the network (FTT-10A transceiver)
- Plug-in installation to drive
- On-board Service Button
- LED's indicate board, communications status and Wink
- Supplied with a drive Resource File for use with LonMaker (or similar) software

### Product Code

Technology Option Part Number: 6053/LON/00 (for 690+ Frame B)  
6055/LON/00 (for Frames C, D, E, F, G, H & J)

### CE Lite Requirements

Software version: 5.14 or higher.

## Hardware Installation

### Installing and Connecting the LonWorks Technology Option

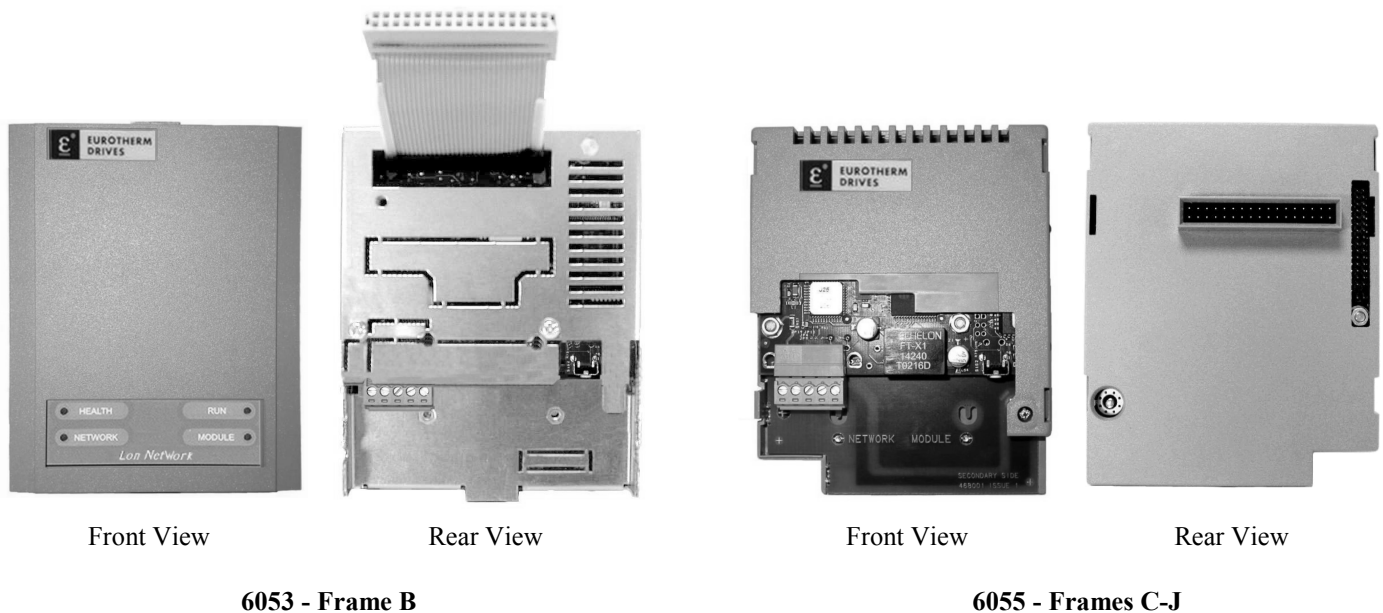


Figure 1. The LonWorks Technology Option

**WARNING!**  
Prior to starting work ensure all sources of power are isolated.

The LonWorks Technology Option plugs into the drive in the slot provided.

**Frame B**

Fit the Technology Option in place of the Keypad. Connect the supplied yellow/green wire between the Technology Option's metal case and one of the chassis earth pillars. Fit a 6052 Remote Mounting Kit to use the keypad with the drive while the Technology Option is installed. Refer to Figure 2.

**Frames C - J**

Fit the Technology Option in the right-hand "Comms Option" position. Refer to Figure 3.

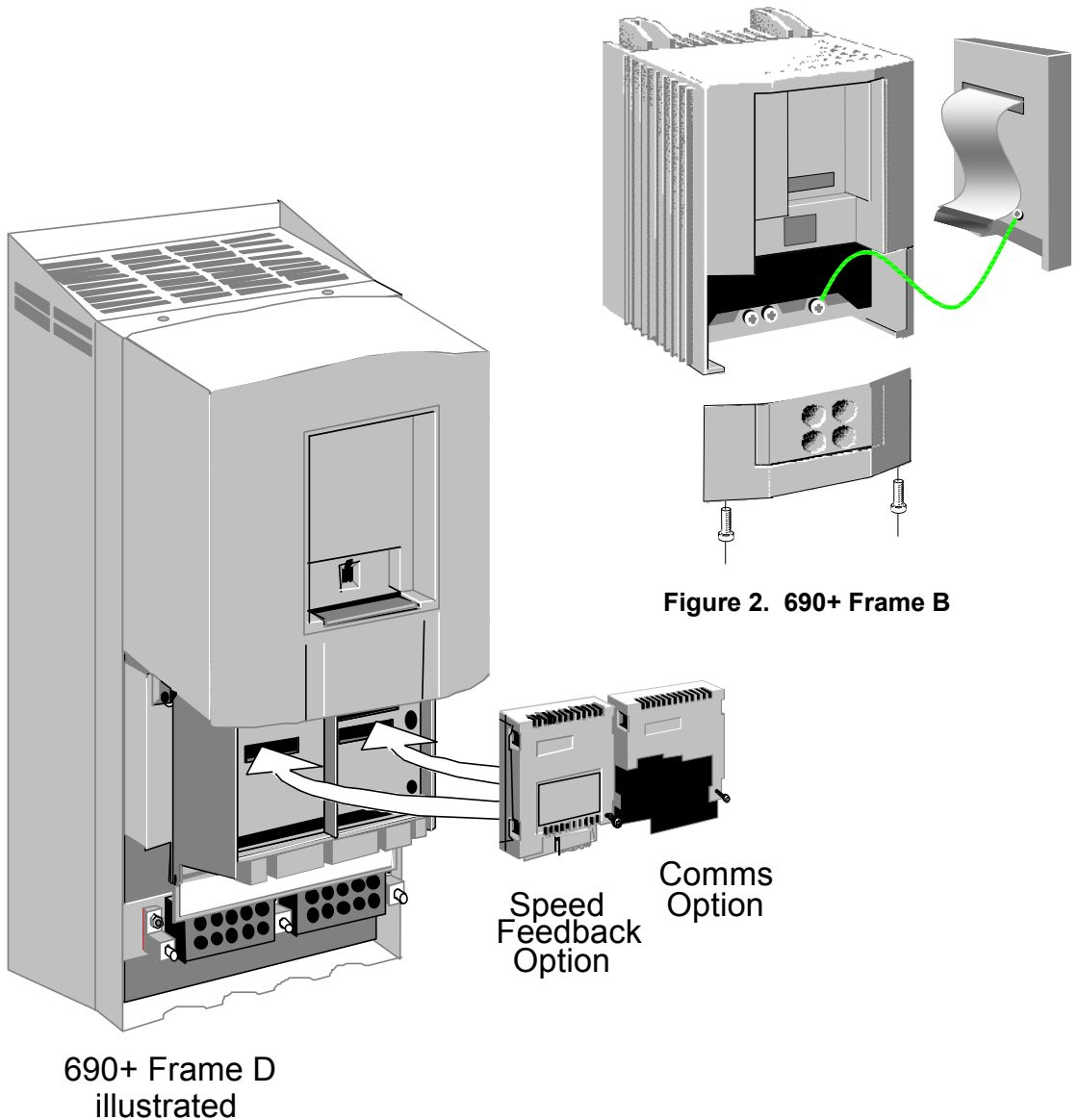


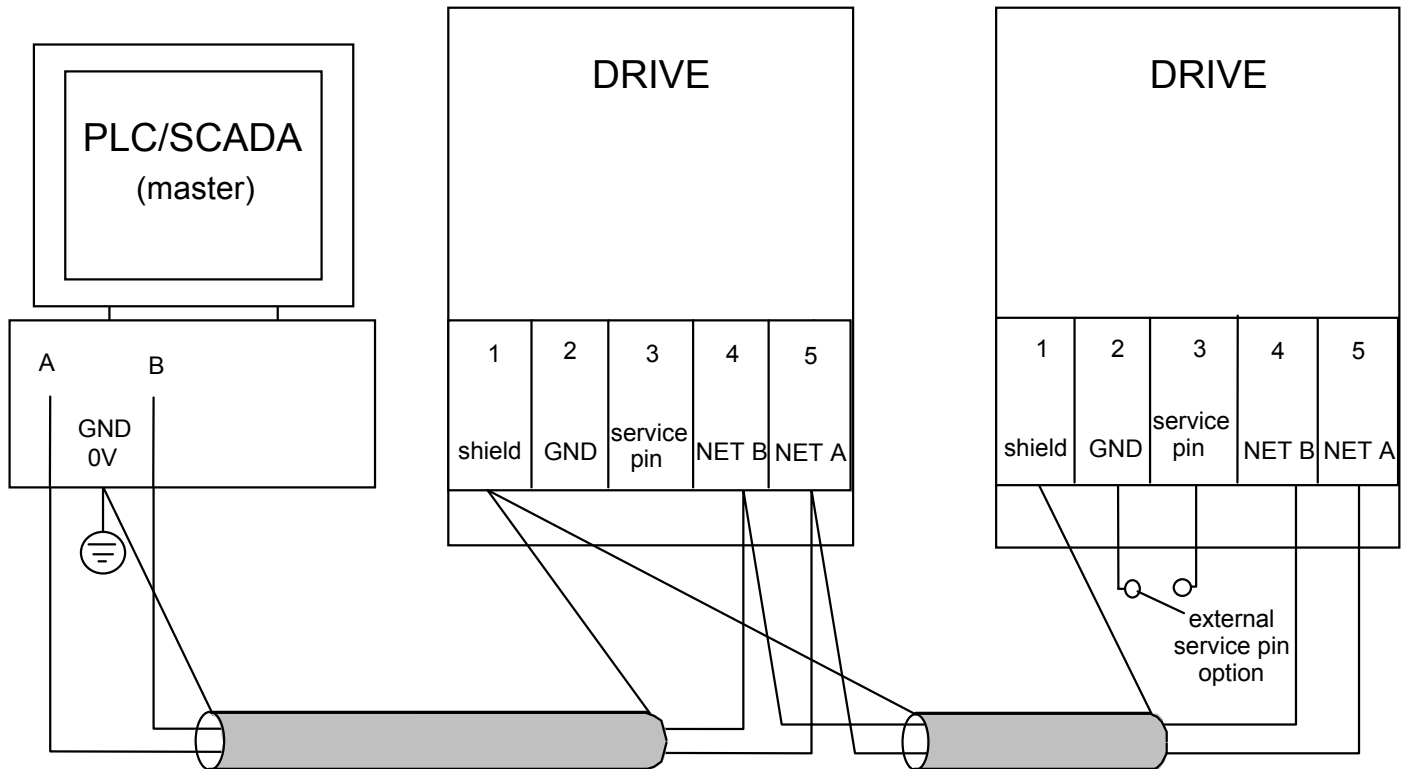
Figure 2. 690+ Frame B

Figure 3. 690+ frames C - J

## Connection Diagram

**WARNING!**

Before installing, ensure that the drive wiring is electrically isolated and cannot be made "live" unintentionally by other personnel.  
Wait 5 minutes after disconnecting power before working on any part of the system or removing the covers from the drives.



*Note:* Cable and shield terminations are provided by the Technology Box in accordance with the "Lonworks FTT-10A Free Topology Transceiver User's Guide", available at [www.echelon.com](http://www.echelon.com).

## Cable Specifications

Cable Type	Maximum Node-to-Node Distance (m)	Maximum Total Wire Length (m)
Belden 85102	500	500
Belden 8471	400	500
Level IV, 22AWG	400	500
JY(St) Y 2x2x0.8	320	500
TIA Category 5	250	450

## Understanding the LED Indications











Network LED			Module LED		
Indicates the state of the connected network. The states indicated are those produced by the NODE STATE and WINK parameter of the TEC OPTION function block.			Indicates the set-up state of the Technology Option. The states indicated are those produced by the FAULT parameter of the TEC OPTION function block.		
Network LED Indication		NODE STATE & WINK Parameter	Module LED Indication		FAULT Parameter
ON 	0	INSTALLED	ON 	0	NONE
LONG FLASH 	1	-	LONG FLASH 	1	PARAMETER
FLASH 	2	WINK (wink parameter)	FLASH 	2	TYPE MISMATCH
SHORT FLASH 	3	DRIVE VERSION	SHORT FLASH 	3	SELF TEST
OFF 	4	INITIALISING	OFF 	4	HARDWARE
	5	DISABLED		5	MISSING

Figure 4. LED Status Indication

*Note:* The NETWORK LED is always in the OFF State when the MODULE LED is **not** ON continuously, indicating that the Technology Option is not receiving external communications or the PLC is off.

### Initial Power-on Checks

With the correct connections to the active PLC/SCADA supervisor, the NETWORK and MODULE LEDs will be on continuously to indicate the INSTALLED state with no faults.



# Configuring the Drive

**Note:** At each power-up of the drive, the LonWorks Technology Option is re-configured according to the TYPE and PROFILE parameters. This process can take up to 10 seconds.

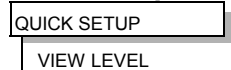
Begin by configuring the drive to accept the Technology Option. Use the keypad (MMI), or ConfigEd Lite to configure the TEC OPTION function block parameters inside the drive before commissioning the LonWorks technology option.

The parameter names and functions in this function block are inter-dependent and will change with different parameter values and various Options that can be fitted.

Fit the LonWorks option to the drive:

- Navigate to the VIEW LEVEL parameter and select ADVANCED. This allows you to view the SETUP PARAMETERS menu.
- In the SETUP PARAMETERS menu, navigate to the TEC OPTION menu and set the TYPE parameter to "LONWORKS", and the PROFILE parameter to "6010 VSD".

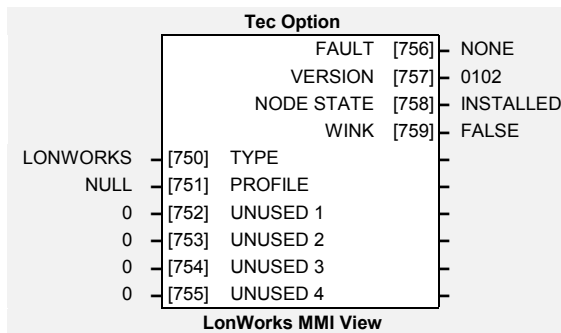
### 690+MMI Menu Map



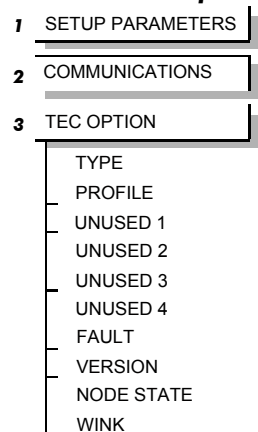
**Note:** When using the MMI, remember to save the set-up via the Parameter Save or Config Save menu.

## The LonWorks MMI View

With the LonWorks option correctly installed, the TEC OPTION function block will contain the following parameter names when viewed using the MMI.



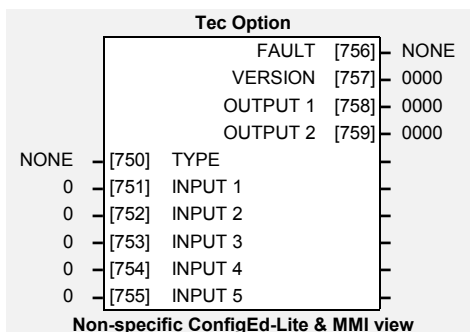
### 690+ MMI Menu Map



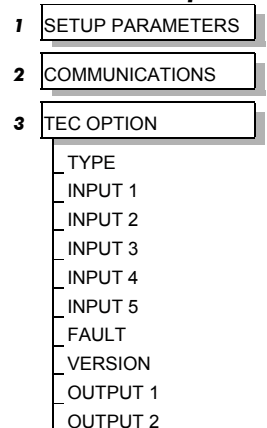
## The Non-specific ConfigEd-Lite & MMI View

This is how the TEC OPTION function block looks when viewed using ConfigEd-Lite.

The MMI also displays these non-specific parameter names when the LonWorks option is not yet installed into the drive, or an incorrect TYPE is selected for the fitted Option.



### 690+ MMI Menu Map



## Parameter Descriptions

### TYPE

Range: Enumerated - see below

Selects the type of Technology Option. Select LONWORKS for this parameter.

Enumerated Value : Technology Option

- 0 : NONE
- 1 : RS485
- 2 : PROFIBUS DP
- 3 : LINK
- 4 : DEVICENET
- 5 : CANOPEN
- 6 : LONWORKS
- 7 : CONTROLNET
- 8 : MODBUS PLUS
- 9 : ETHERNET

### PROFILE

Range: See below

Used to select which profile is presented to the network. The NULL profile contains no parameters. Select "6010 VSD" for this parameter. Note that when changing profile, the MMI may take several seconds to respond to the change.

- NULL
- 6010 VSD (Variable Speed Drive)

### UNUSED 1-4

Reserved for future use.

### FAULT

Range: Enumerated - see below

The fault state of the Technology Option.

Enumerated Value : FAULT state

- |                   |                                    |
|-------------------|------------------------------------|
| 0 : NONE          | no faults                          |
| 1 : PARAMETER     | parameter out-of-range             |
| 2 : TYPE MISMATCH | TYPE parameter not set to LONWORKS |
| 3 : SELF TEST     | hardware fault - internal          |
| 4 : HARDWARE      | hardware fault - external          |
| 5 : MISSING       | no option fitted                   |

### VERSION

Range: 0000 to FFFF

The version of the Technology Option card. If no option is fitted then the version is reset to zero. For example, 0102 is version 1.2.

### NODE STATE

Range: Enumerated - see below

State of the LonWorks network connection.

Enumerated Value : NODE STATE

- 0 : INSTALLED
- 1 : CONFIGURED
- 2 : NOT CONFIGURED
- 3 : INITIALISING
- 4 : DISABLED
- 5 : DRIVE VERSION

### WINK

Range: FALSE / TRUE

If TRUE indicates that a network management "Wink" command has been received, or the Service Button on the Technology Option has been pressed. When TRUE, the "Network" LED on the Technology Option flashes.

# Commissioning the Lonworks Technology Option

## Configuring with LonMaker

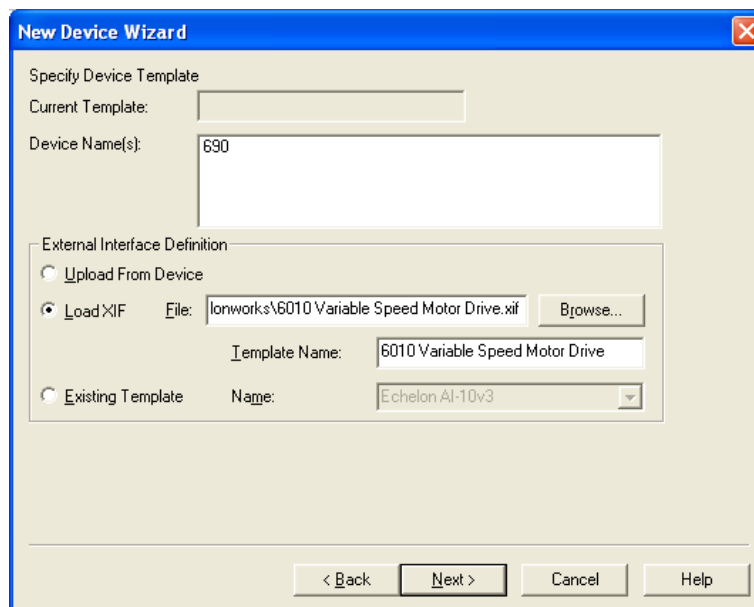
To add the 690+ drive to an existing network or create a new network first power-up the drive with the LonWorks Technology Option installed and connected to the network/PLC/SCADA.

### Adding a Device

Select "Commission Device" to add the 690+ to the network.

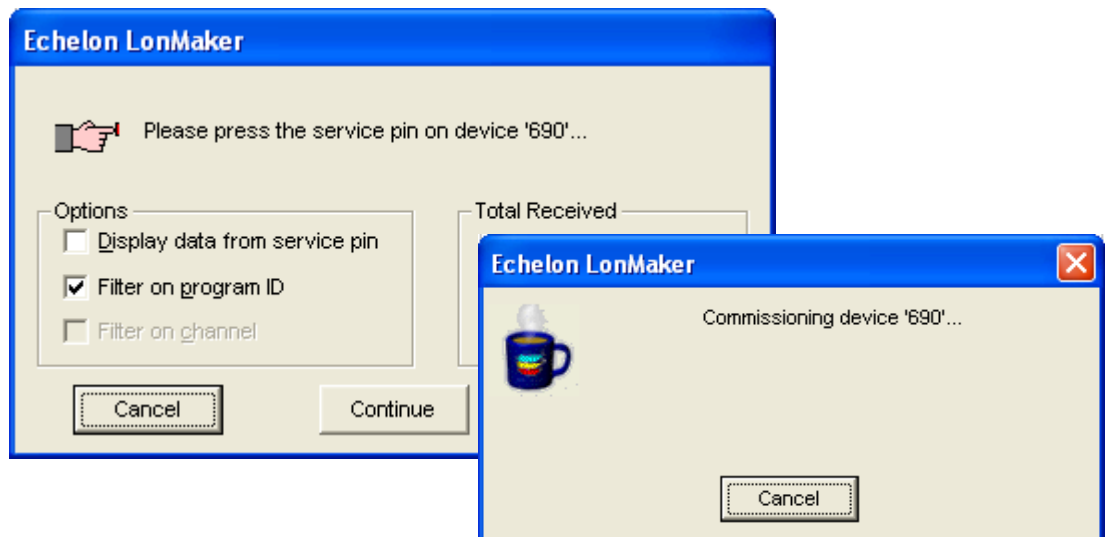
A Resource File (XIF) can be used when installing the drive onto the network. These files contain information about the drive and the profile it uses. The Resource File is supplied separately, but may also be extracted from the Lonworks Technology Option by the management tool.

You can choose to load the XIF file. This will allow you to display data from the device and check it against the data stored in the XIF file. Click "Load XIF" and browse to the file.

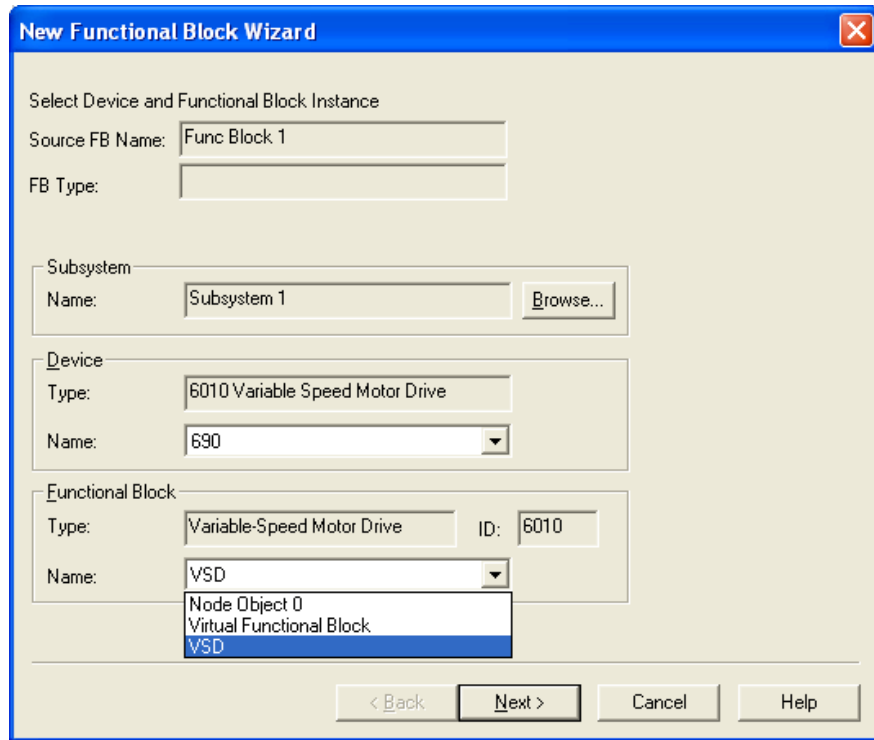


Or you can choose to "Upload from Device" (and accept the information displayed).

The wizard will continue until you reach the screen below which prompts you to press the Service Button on the Lonworks Technology Option. Press the button to commission the device.



You can also add a Functional Block to display the inputs and outputs for wiring the network.



The function block provides a useful list of parameters.

The LonMaker Browser displays the following table of parameters for the VSD functional block:

Subsystem	Device	Functional Block	Network Variable	Config Prop	Mon	Value
Subsystem 1	690	VSD		SCPTlocation	N	
Subsystem 1	690	VSD		SCPTmaxSetpoint	N	100.000
Subsystem 1	690	VSD		SCPTminSetpoint	N	-100.000
Subsystem 1	690	VSD		SCPTnomFreq	N	50.0
Subsystem 1	690	VSD		SCPTnomRPM	N	1500
Subsystem 1	690	VSD		SCPTrampDownTm	N	10.0
Subsystem 1	690	VSD		SCPTrampUpTm	N	10.0
Subsystem 1	690	VSD	nviDrvSpeedScale		H	100.000
Subsystem 1	690	VSD	nviDrvSpeedScale	SCPTdefScale	N	100.000
Subsystem 1	690	VSD	nviDrvSpeedScale	SCPTmaxRcvTime	N	0.0

The network diagram below shows the VSD functional block connected to a network interface. The VSD block has several output variables:

- nviDrvSpeedScale
- nviDrvSpeedSpt
- nvoDrvCurnt
- nvoDrvPwr
- nvoDrvRunHours
- nvoDrvSpeed
- nvoDrvVolt

The diagram also shows a green box labeled 'LNS Network Interface' and another green box labeled '690' connected to 'Channel 1'.

The parameter list for the 690+ Lonworks interface with the 6010 VSD profile selected:

Subsystem	Device	Functional Block	Network Variable	Config Prop	Mon	Value
Subsystem 1	690	Node Object 0	nviObjRequest		H	0,RQ_NORMAL
Subsystem 1	690	Node Object 0	nvoObjStatus		H	1 0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,0,0,0,0,0,1
Subsystem 1	690	Virtual Functional Block	nciDrvSpeedScale		H	100.000
Subsystem 1	690	Virtual Functional Block	nciLocation		H	
Subsystem 1	690	Virtual Functional Block	nciMaxSpeed		H	100.000
Subsystem 1	690	Virtual Functional Block	nciMinOutTm		H	0.0
Subsystem 1	690	Virtual Functional Block	nciMinSpeed		H	-100.000
Subsystem 1	690	Virtual Functional Block	nciImlFreq		H	50.0
Subsystem 1	690	Virtual Functional Block	nciImlSpeed		H	1500
Subsystem 1	690	Virtual Functional Block	nciRampDownTm		H	10.0
Subsystem 1	690	Virtual Functional Block	nciRampUpTm		H	10.0
Subsystem 1	690	Virtual Functional Block	nciRcvHrtBt		H	0.0
Subsystem 1	690	Virtual Functional Block	nciSndHrtBt		H	0.0
Subsystem 1	690	VSD		SCPTlocation	N	
Subsystem 1	690	VSD		SCPTmaxSetpoint	N	100.000
Subsystem 1	690	VSD		SCPTminSetpoint	N	-100.000
Subsystem 1	690	VSD		SCPTnomFreq	N	50.0
Subsystem 1	690	VSD		SCPTnomRPM	N	1500
Subsystem 1	690	VSD		SCPTrampDownTm	N	10.0
Subsystem 1	690	VSD		SCPTrampUpTm	N	10.0
Subsystem 1	690	VSD	nviDrvSpeedScale		H	100.000
Subsystem 1	690	VSD	nviDrvSpeedScale	SCPTdefScale	N	100.000
Subsystem 1	690	VSD	nviDrvSpeedScale	SCPTmaxRcvTime	N	0.0
Subsystem 1	690	VSD	nviDrvSpeedStpt		H	0.0 0
Subsystem 1	690	VSD	nviDrvSpeedStpt	SCPTmaxRcvTime	N	0.0
Subsystem 1	690	VSD	nvoDrvCurnt		H	0.0
Subsystem 1	690	VSD	nvoDrvCurnt	SCPTmaxSendTime	N	0.0
Subsystem 1	690	VSD	nvoDrvCurnt	SCPTminSendTime	N	0.0
Subsystem 1	690	VSD	nvoDrvPwr		H	0.0
Subsystem 1	690	VSD	nvoDrvPwr	SCPTmaxSendTime	N	0.0
Subsystem 1	690	VSD	nvoDrvPwr	SCPTminSendTime	N	0.0
Subsystem 1	690	VSD	nvoDrvRunHours		H	0
Subsystem 1	690	VSD	nvoDrvRunHours	SCPTminSendTime	N	0.0
Subsystem 1	690	VSD	nvoDrvSpeed		H	0.000
Subsystem 1	690	VSD	nvoDrvSpeed	SCPTmaxSendTime	N	0.0
Subsystem 1	690	VSD	nvoDrvSpeed	SCPTminSendTime	N	0.0
Subsystem 1	690	VSD	nvoDrvVolt		H	0.0
Subsystem 1	690	VSD	nvoDrvVolt	SCPTmaxSendTime	N	0.0
Subsystem 1	690	VSD	nvoDrvVolt	SCPTminSendTime	N	0.0

## The Network Interface

The "6010 VSD" profile selected for use with the 690+ drive consists of a mandatory Node Object and a Variable Speed Drive Object (VSD).

Each object is a collection of Standard Network Variable Types (SNVT's), in addition to various Configuration Properties:

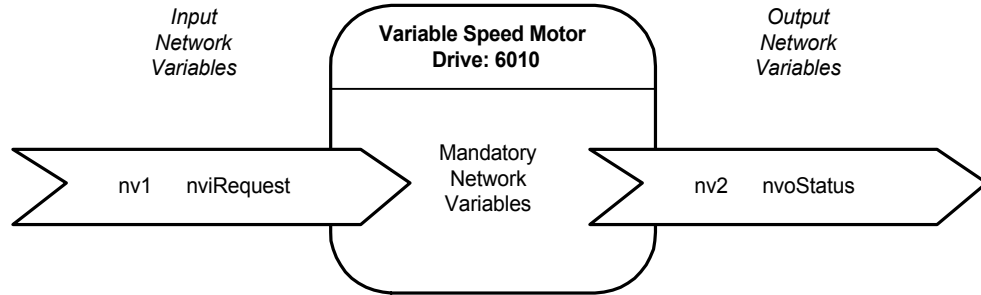
- Input Network Variables (nvi's)
- Output Network Variables (nvo's)
- Configuration Properties (nci's)

The 690+ drive is installed in a LonWorks network using a network management tool, which also binds the SNVT's to other devices on the network. The 690+ drive thus becomes a Node on the network.

Connecting the inputs and outputs of Nodes allows the network to perform specific tasks. A Node sends a message across the network in response to messages it receives, or to events.

## The Node Object

The Node Object allows you to monitor the status of the drive and the LonWorks Technology Option. When you send an *nviRequest* to the drive (VSD object) an updated *nvoStatus* report will be returned.



### nviRequest

This input contains an object ID and a request.

- An object ID of 1 refers to the VSD object (valid - only requests to the VSD object ID are valid)
- An object ID of 0 refers to the Node Object (invalid)

The supported request values are:

Identifier	Notes
RQ_NORMAL	Enable drive - used to cancel a Disable state
RQ_DISABLED	Disable drive - output network variables (nvo's) belonging to the drive are not propagated onto the network in the Disabled state. You can however poll nvo's while in the Disabled state. The drive will not respond to updates to its network variable inputs (nvi's), but it does support reading and writing of any configuration properties.  If the drive is running under control from the LonWorks network when it receives RQ_DISABLED request, the drive will be stopped (ramp-to-stop).
RQ_UPDATE_STATUS	Report drive status to the network via updated <i>nvoStatus</i>
RQ_REPORT_MASK	Report status bit mask - the status bits that are supported by the drive are set in <i>nvoStatus</i> . This option sets the mask 0xE000D1, indicating that the following status bits are supported: invalid_id, invalid_request, disabled, manual_control, in-alarm, report_mask, reset_complete.
RQ_ENABLE	Enable drive - used to cancel a Disable state (In this implementation, RQ_ENABLE has the same effect as RQ_NORMAL).
RQ_CLEAR_STATUS	Clear drive status - clears all status bits in <i>nvoStatus</i> and outputs this to the network.
RQ_CLEAR_ALARM	Clear drive alarm - attempts to reset any trips in the drive.
RQ_CLEAR_RESET	Clear reset-complete flag in <i>nvoStatus</i> .

An example code to be entered into the management tool is:

```
1 (space) RQ_CLEAR_ALARM
```

In this case, pressing the [RETURN] key will send the instruction to attempt to reset any trips in the drive. An *nvoStatus* will be returned with updated information.

## nvoStatus

The drive status output field consists of a drive ID and 32 status bits.

The supported output values are:

Bit	Name	Notes
32	Invalid_id	The drive ID sent in <i>nviRequest</i> is not recognised
31	Invalid_request	The request sent in <i>nviRequest</i> is not supported
30	Disabled	The drive is disabled
29	Out_of_limits	-
28	Open_circuit	-
27	Out_of_service	-
26	Mechanical_fault	-
24	Feedback_failure	-
23	Over_range	-
22	Under_range	-
21	Electrical_fault	-
20	Unable_to_measure	-
19	Comm_failure	-
18	Fail_self_test	-
17	Self_test_in_progress	-
16	Locked_out	-
15	Manual_control	Indicates that the drive will not respond to start and stop commands from the LonWorks network
14	in_alarm	Indicates that the drive has tripped
13	in_override	-
12	Report_mask	Set when responding to the RQ_REPORT_MASK request
11	Programming_mode	-
10	Programming_fail	-
9	Alarm_notify_disable	-
8	Reset_complete	Set on completion of a reset sequence Cleared on RQ_CLEAR_RESET and RQ_CLEAR_STATUS
7 - 0	Reserved	-

Note: Bits shown with "-" are not supported in this implementation

The management tool will display the returned *nviStatus* as:

1 (space) 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 1 0 0 0 1
---

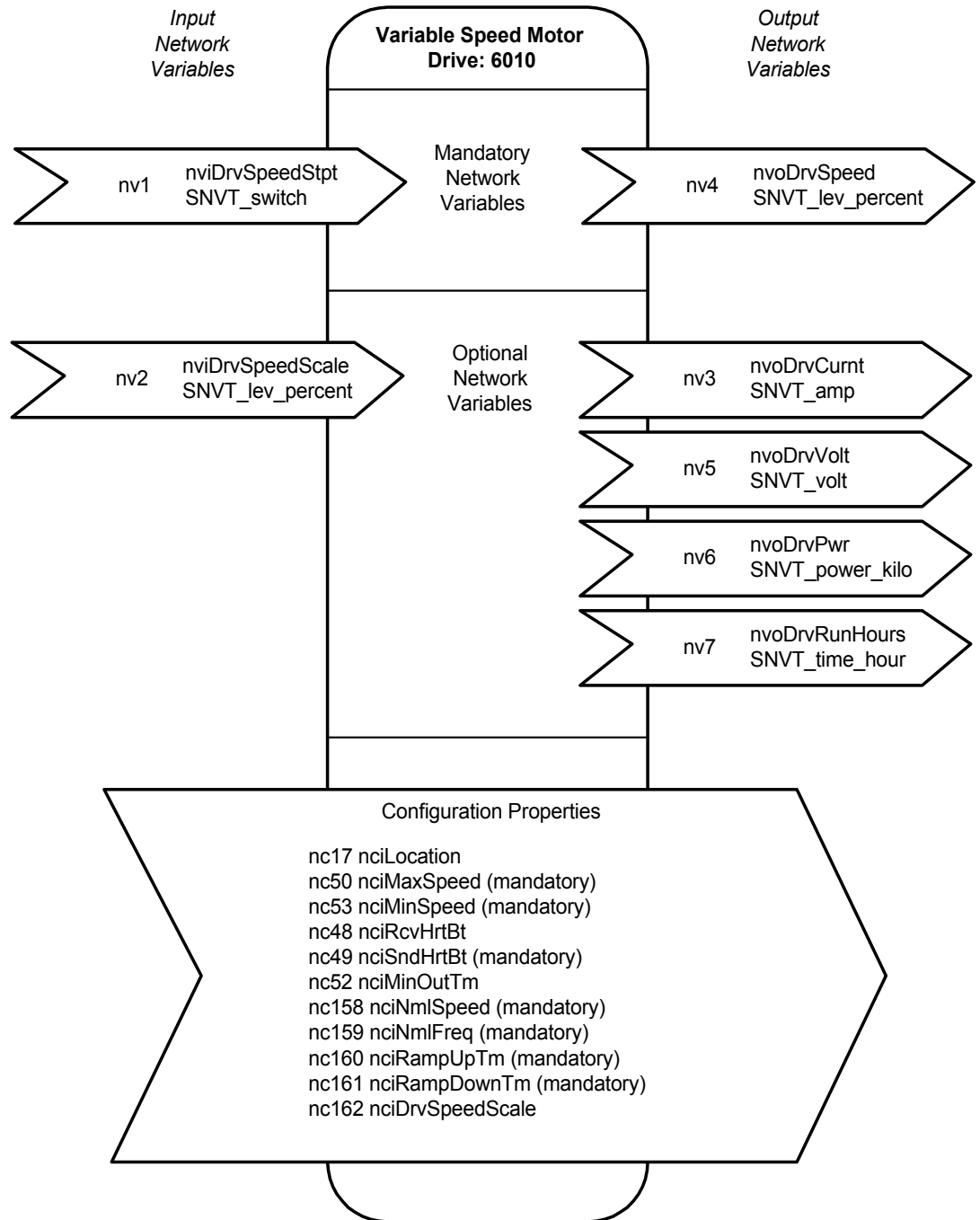
Bit: 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8

In this case, *nvoStatus* shows the mask of supported status bits.

## The VSD Object (Variable Speed Drive)

An object ID of 1 refers to the VSD object. This represents the drive on the LonWorks network.

The supported inputs, outputs and configuration properties are:



For example, highlight a variable in the LonMaker Browser, say *nciDrvSpeedScale*, enter a suitable value:

<b>100.000</b>
----------------

In this case, pressing the [RETURN] key will set the default value for *nviDrvSpeedScale*.



SCPT Reference	The VSD Object																								
<b>Drive Inputs</b>																									
(nv2)	<p><b>nviDrvSpeedScale</b> <span style="float: right;">SNVT_lev_percent</span></p> <p>Writes to Tag 269, REFERENCE::COMMS SETPOINT</p> <p>This input provides scaling for <i>nviDrvSpeedStpt</i>. Negative values indicate a motor direction in reverse. A default value for <i>nviDrvSpeedScale</i> is provided by <i>nciDrvSpeedScale</i>.</p> <p>For example, you might send the input</p> <p style="text-align: center;">"-150.000"</p> <p>If the <i>nviDrvSpeedStpt</i> value is 50% and <i>nviDrvSpeedScale</i> is -150%, then the actual speed setpoint is <math>50\% \times -150 = -75\%</math>, or 0.75 times the nominal speed in reverse direction.</p> <p>Leaving <i>nviDrvSpeedStpt</i> at a Value of 100 allows you a fine setting for the speed setpoint where a value for <i>nviDrvSpeedScale</i> of say 33.3% provides a speed setpoint of 33.3% of nominal speed in forward direction (<math>100\% \times 33.300 = 33.3\%</math>).</p> <p>The valid range for <i>nviDrvSpeedScale</i> is -163.840% to 163.830 (0.005% increments).</p> <p>Remember that the final speed setpoint is clamped in the drive by the Speed Loop parameters SPEED POS LIM and SPEED NEG LIM, Tags 1200 and 1201 respectively.</p>																								
(nv1)	<p><b>nviDrvSpeedStpt</b> <span style="float: right;">SNVT_switch</span></p> <p>Writes to Tag 271, COMMS COMMAND (reserved parameter)</p> <p>This input provides start/stop control and a low resolution speed setpoint which is dependent upon the values for <i>nviDrvSpeedScale</i> and <i>nciDrvSpeedScale</i>.</p> <p>For example, you might send the input</p> <p style="text-align: center;">"100(space)1"</p> <p>This is made up of the Value and State bits. This will run the drive at some setpoint (dependent upon the value for <i>nviSpeedScale</i>). Changing State from 0 to 1 clears any trips and starts the drive. Changing the State to 0 stops the drive (ramp-to-stop).</p> <p>In practice, you might want to leave the Value at 100, use the State to start/stop the drive, and change the drive's speed setpoint using <i>nviDrvSpeedScale</i> which provides a higher resolution speed setpoint and choice of direction.</p> <table border="1" data-bbox="440 1539 1518 1793"> <thead> <tr> <th>Value</th> <th>State</th> <th>Equivalent Percent Value</th> <th>Requested Speed</th> </tr> </thead> <tbody> <tr> <td>N/A</td> <td>0</td> <td>N/A</td> <td>STOPPED</td> </tr> <tr> <td>0</td> <td>1</td> <td>0%</td> <td>0%</td> </tr> <tr> <td>1 to 200</td> <td>1</td> <td>0.5 to 100.0%</td> <td>0.5 to 100.0%</td> </tr> <tr> <td>201 to 255</td> <td>1</td> <td>100.0%</td> <td>100.0%</td> </tr> <tr> <td>N/A</td> <td>0xFF</td> <td>N/A</td> <td>AUTO (invalid)</td> </tr> </tbody> </table>	Value	State	Equivalent Percent Value	Requested Speed	N/A	0	N/A	STOPPED	0	1	0%	0%	1 to 200	1	0.5 to 100.0%	0.5 to 100.0%	201 to 255	1	100.0%	100.0%	N/A	0xFF	N/A	AUTO (invalid)
Value	State	Equivalent Percent Value	Requested Speed																						
N/A	0	N/A	STOPPED																						
0	1	0%	0%																						
1 to 200	1	0.5 to 100.0%	0.5 to 100.0%																						
201 to 255	1	100.0%	100.0%																						
N/A	0xFF	N/A	AUTO (invalid)																						



















SCPT Reference	The VSD Object
<b>Drive Outputs</b>	
(nv3)	<p><b>nvoDrvCurnt</b> <span style="float: right;">SNVT_amp</span></p> <p>Reads from Tag 67, FEEDBACKS::MOTOR CURRENT A</p> <p>This output reports the drive output current in Amps. The value is transmitted immediately the value changes significantly, no more frequently than the time set in <i>nciMinOutTm</i>.</p> <p>The value is also transmitted as a heartbeat output at a rate set by <i>nciSndHrtBt</i>.</p>
(nv6)	<p><b>nvoDrvPwr</b> <span style="float: right;">SNVT_power_kilo</span></p> <p>Reads from Tag 1604, ENERGY METER::POWER</p> <p>This output reports the drive output power in Kilowatts.</p> <p>The value is transmitted immediately the value changes significantly, no more frequently than the time set in <i>nciMinOutTm</i>.</p> <p>The value is also transmitted as a heartbeat output at a rate set by <i>nciSndHrtBt</i>.</p>
(nv7)	<p><b>nvoDrvRunHours</b> <span style="float: right;">SNVT_time_hour</span></p> <p>Reads from Tag 1827, TIMER 2::TOTAL HOURS</p> <p>This output reports the total operation time for the motor in running hours.</p> <p>The value is transmitted immediately the value changes significantly, no more frequently than the time set in <i>nciMinOutTm</i>.</p> <p>The TIMER 2 function block must be operational in the drive's configuration.</p>
(nv4)	<p><b>nvoDrvSpeed</b> <span style="float: right;">SNVT_lev_percent</span></p> <p>Reads from Tag 749, FEEDBACKS::SPEED FBK %</p> <p>This output reports the speed of the drive as a percentage of the nominal speed. The value is transmitted immediately the value changes significantly no more frequently than the time set in <i>nciMinOutTm</i>.</p> <p>The value is also transmitted as a heartbeat output at a rate set by <i>nciSndHrtBt</i>.</p>
(nv5)	<p><b>nvoDrvVolt</b> <span style="float: right;">SNVT_volt</span></p> <p>Reads from Tag 1020, FEEDBACKS::TERMINAL VOLTS</p> <p>This output reports the drive output voltage in Volts.</p> <p>The value is transmitted immediately the value changes significantly no more frequently than the time set in <i>nciMinOutTm</i>.</p> <p>The value is also transmitted as a heartbeat output at a rate set by <i>nciSndHrtBt</i>.</p>


SCPT Reference	The VSD Object
<b>Configuration Properties</b>	
SCPTdefScale (nc162)	<p><b>nciDrvSpeedScale</b> <span style="float: right;">SNVT_lev_percent</span></p> <p>This configuration property contains the default value for <i>nviDrvSpeedScale</i>.</p> <p>The valid range for <i>nciDrvSpeedScale</i> is -163.840% to 163.830 (0.005% increments).</p> <p>The default value is 0 (%).</p>
SCPTminSendTime (nc52)	<p><b>nciMinOutTm</b> <span style="float: right;">SNVT_time_sec</span></p> <p>This configuration property sets the minimum period of time allowed between automatic network variable transmissions.</p> <p>The valid range for <i>nciMinOutTm</i> is 0.0 to 6,553.4 seconds (0.1 second increments).</p> <p>The default value is 0.5 seconds.</p>
SCPTmaxSendTime (nc49)	<p><b>nciSndHrtBt</b> <span style="float: right;">SNVT_time_sec</span></p> <p>This configuration property sets the maximum period of time that expires before the network variables specified for heartbeat will automatically be updated.</p> <p>The valid range for <i>nciSndHrtBt</i> is 0.0 to 6,553.4 seconds (0.1 second increments).</p> <p>The default value is 0 seconds (no automatic update).</p>
SCPT_location (nc17)	<p><b>nciLocation</b> <span style="float: right;">SNVT_str_asc</span></p> <p>This configuration property may be used to give additional description of the physical location of the drive (if entered). The default ASCII string contains all zeros. The maximum string length is 31 characters.</p>
SCPTmaxSetpoint (nc50)	<p><b>nciMaxSpeed</b> <span style="float: right;">SNVT_lev_percent</span></p> <p>This configuration property defines the maximum speed of the motor. Enter the value as a percent of nominal speed in RPM, as defined by <i>nciNmISpeed</i>.</p> <p>The value of the maximum speed must be validated against the value of the minimum speed as follows:</p> <p><math>-163.840 \leq \text{minimum speed} \leq \text{maximum speed} \leq 163.830</math></p> <p>The typical range for the value is 100.000 to 150.000%. The default value is 100.000%.</p>
SCPTminSetpoint (nc53)	<p><b>nciMinSpeed</b> <span style="float: right;">SNVT_lev_percent</span></p> <p>Writes to Tag 337, MINIMUM SPEED::MINIMUM</p> <p>This configuration property defines the minimum speed of the motor. Enter the value as a percent of nominal speed in RPM, as defined by <i>nciNmISpeed</i>.</p> <p>The value of the maximum speed must be validated against the value of the minimum speed as follows:</p> <p><math>-163.840 \leq \text{minimum speed} \leq \text{maximum speed} \leq 163.830</math></p> <p>The typical range for the value is 0 to 40.000%. The default value is 0%.</p>
SCPTnomFreq (nc159)	<p><b>nciNmIFreq</b> <span style="float: right;">SNVT_freq_hz</span></p> <p>Writes to Tag 1159, MOTOR DATA::BASE FREQUENCY</p> <p>This configuration property is used to enter the nominal frequency of the motor.</p> <p>The valid range is 0 to 100 Hz (1 Hz increments). The default value is 50 or 60Hz.</p>

SCPT Reference	The VSD Object
<b>Configuration Properties cont.</b>	
SCPTnomRPM (nc158)	<p><b>nciNmISpeed</b> <span style="float: right;">SNVT_rpm</span></p> <p>Writes to Tag 1032, SETPOINT SCALE::MAX SPEED</p> <p>This configuration property is used to enter the nominal speed of the motor in RPM. This value is necessary to determine the minimum and maximum speeds for the motor based on the configuration properties of <i>nciMinSpeed</i> and <i>nciMaxSpeed</i> (entered as percent of nominal speed).</p> <p>The valid range is 0 to 65,534 rpm (1 rpm increments). The default is 1500 rpm.</p>
SCPTrampDownTm (nc161)	<p><b>nciRampDownTm</b> <span style="float: right;">SNVT_time_sec</span></p> <p>Writes to Tag 259, REFERENCE RAMP::DECEL TIME</p> <p>This configuration property is used to enter the ramp down time of the motor.</p> <p>The valid range is 0.0 to 6,553.4 seconds (0.1 second increments). The default value is 10.0 seconds.</p>
SCPTrampUpTm (nc160)	<p><b>nciRampUpTm</b> <span style="float: right;">SNVT_time_sec</span></p> <p>Writes to Tag 258, REFERENCE RAMP::ACCEL TIME</p> <p>This configuration property is used to enter the ramp up time of the motor.</p> <p>The valid range is 0.0 to 6,553.4 seconds (0.1 second increments). The default value is 10.0 seconds.</p>
SCPTmaxRcvTime (nc48)	<p><b>nciRcvHrtBt</b> <span style="float: right;">SNVT_time_sec</span></p> <p>This configuration property sets the maximum period of time that elapses after the last update to variables specified for heartbeat before the drive starts to use its default values.</p> <p>The valid range for <i>nciRcvHrtBt</i> is 0.0 to 6,553.4 seconds (0.1 second increments). A value of 0 (zero) disables the Receive Heartbeat mechanism.</p> <p>The default value is 0 seconds (no failure detect).</p>

# Troubleshooting

## 6053/6055 LonWorks Technology Option Status LED

LED Indications		Cause/Symptom	Remedy
NETWORK	MODULE		
 (OFF)		No power at the drive.	Check and apply power to the drive.
		Technology Option not installed correctly.	Check connections between Technology Option and drive. On 690B, check the ribbon cable.
		Hardware fault. <b>690B WARNING:</b> Remove the terminal cover and the Technology Option whilst connected to see the drive's HEALTH and RUN LEDs. <b>BEWARE OF ELECTRIC SHOCK.</b>	If HEALTH and RUN LEDs are OFF, replace the drive, or replace the Technology Option.
		Incorrect Technology Option fitted or selected.	Fit the correct Technology Option or select the matching value for the TYPE parameter in the TEC OPTION function block. (TYPE = LONWORKS).
		Set-up fault. A TEC OPTION parameter is out-of-range.	Select the correct value for the parameter in the TEC OPTION function block.
		No network connection. Disabled or initialising.	-
		No network connection; Software version of drive is incorrect.	The drive must be operating with software version 5.1 onwards to use the Technology Option.
		Network connection; "Wink" command has been received, or the Service Button on the Technology Option has been pressed.	-
		Network Connection; no faults	Normal operating state.

ISS.	MODIFICATION	ECN No.	DATE	DRAWN	CHK'D
1	First release of HA468031U001	16551	29/04/03	CM	JA
FIRST USED ON		MODIFICATION RECORD LonWorks Communications Interface			
 <b>EUROTHERM DRIVES</b>		DRAWING NUMBER ZZ468031			SHT. 1 OF 1