SEL DeviceNet Communications Card

User's Guide

20180629

SCHWEITZER ENGINEERING LABORATORIES, INC.

PM1950-01

⚠ CAUTION
Equipment components are sensitive to electrostatic discharge (ESD). Undetectable permanent damage can result if you do not use proper ESD procedures. Ground yourself, your work surface, and this equipment before removing any cover from this equipment. If your facility is not equipped to work with these components, contact SEL about returning this device and related SEL equipment for service.

⚠ DANGER
Disconnect or de-energize all external connections before opening this device. Contact with hazardous voltages and currents inside this device can cause electrical shock resulting in injury or death.

⚠ DANGER
Contact with instrument terminals can cause electrical shock that can result in injury or death.

⚠ WARNING
Have only qualified personnel service this equipment. If you are not qualified to service this equipment, you can injure yourself or others, or cause equipment damage.

⚠ WARNING
Use of this equipment in a manner other than specified in this manual can impair operator safety safeguards provided by this equipment.

⚠ ATTENTION
Les composants de cet équipement sont sensibles aux décharges électrostatiques (DES). Des dommages permanents non-décelables peuvent résulter de l'absence de précautions contre les DES. Raccordez-vous correctement à la terre, ainsi que la surface de travail et l'appareil avant d'en retirer un panneau. Si vous n'êtes pas équipés pour travailler avec ce type de composants, contacter SEL afin de retourner l'appareil pour un service en usine.

⚠ DANGER
Mettre hors tension ou débrancher tous les raccordements externes avant d'ouvrir cet appareil. Tout contact avec des tensions ou courants internes à l'appareil peut causer un choc électrique pouvant entraîner des blessuers ou la mort.

⚠ DANGER
Tout contact avec les bornes de l'appareil peut causer un choc électrique pouvant entraîner des blessuers ou la mort.

⚠ AVERTISSMENT
Seules des personnes qualifiées peuvent travailler sur cet appareil. Si vous n'êtes pas qualifiés pour ce travail, vous pourriez vous blesser avec d'autres personnes ou endommager l'équipement.

⚠ AVERTISSMENT
L'utilisation de cet appareil suivant des procédures différentes de celles indiquées dans ce manuel peut désarmer les dispositifs de protection d'opérateur normalement actifs sur cet équipement.

PM1950-01

Contents

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Important User Information

This manual provides information and instructions for installing and operating the DeviceNet Card. This material is for use by integration engineers and others experienced in communications and protective relay applications. These personnel must satisfy themselves that all necessary steps have been taken to ensure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes, and standards.

Included are detailed technical descriptions and application examples. While this manual gives reasonable examples and illustrations, you must exercise sound judgment at all times when applying the DeviceNet card in a power system. Schweitzer Engineering Laboratories does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Throughout this manual we use notes to make you aware of safety considerations:

⚠ CAUTION
Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss.

Caution statements alert you in the following ways:

- Identify a hazard
- Avoid a hazard
- Recognize the consequences

IMPORTANT: Identifies information that is critical for successful application and understanding of the product.

Trademark List

DeviceNet™ and the DeviceNet logo are trademarks of the Open DeviceNet Vendor Association (ODVA). Microsoft® Windows is a registered trademark of the Microsoft Corporation.

European Communities (EC) Directive Compliance

If this product has the CE mark it is approved for installation within the European Union and EEA regions. It has been designed and tested to meet the following directives.

EMC Directive

IMPORTANT: This product has been designed for environment A. Use of this product in environment B can cause unwanted electromagnetic disturbances in which case the user could be required to take adequate mitigation measures.

This product is tested to meet the Council Directive 89/336/EEC Electromagnetic Compatibility (EMC) by applying the following standards, in whole:

- EN 60947-4-1—Low-Voltage Switchgear and Controlgear: Part 4: Contactors and Motor Starters–Section 1: Electromechanical Contactors and Motor Starters
- EN 60947-5-1—Low-Voltage Switchgear and Controlgear: Part 5: Control Circuit Devices and Switching Elements–Section 1: Electromechanical Control Circuit Devices

This product is intended for use in an industrial environment.

Low Voltage Directive

This product is tested to meet Council Directive 73/23/EEC Low Voltage as amended by 93/68/EEC by applying the safety requirements of EN 60947-4-1 and EN 60947-5-1. For specific information required by EN 60947-4-1 and EN 60947-5-1, see the appropriate sections in this publication.

Getting Started

IMPORTANT: Be sure to carefully align the option card with the relay chassis during reassembly. If the option card is not well aligned with the chassis, you might bend connector pins, causing the relay to fail.

The DeviceNet Card is an optional accessory that connects the SEL Relay to the DeviceNet automation network. The card occupies the communications card expansion Slot C in the relay. *Figure 1* shows the location of Slot C in an SEL-749M relay.

This section covers the following information:

- Features
- Required equipment
- Safety precautions

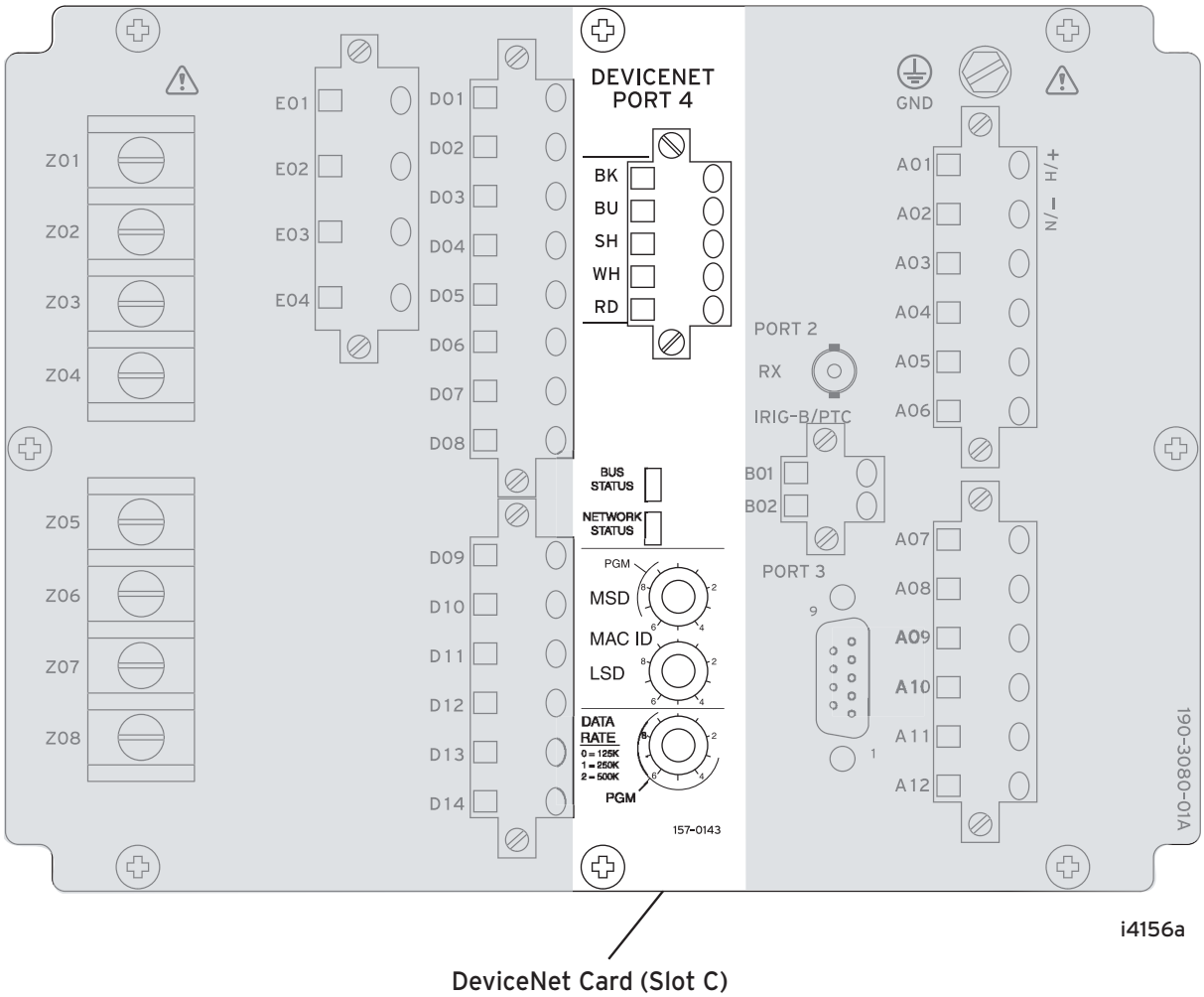

Figure 1 Location of DeviceNet Card on an SEL-749M Rear-Panel View

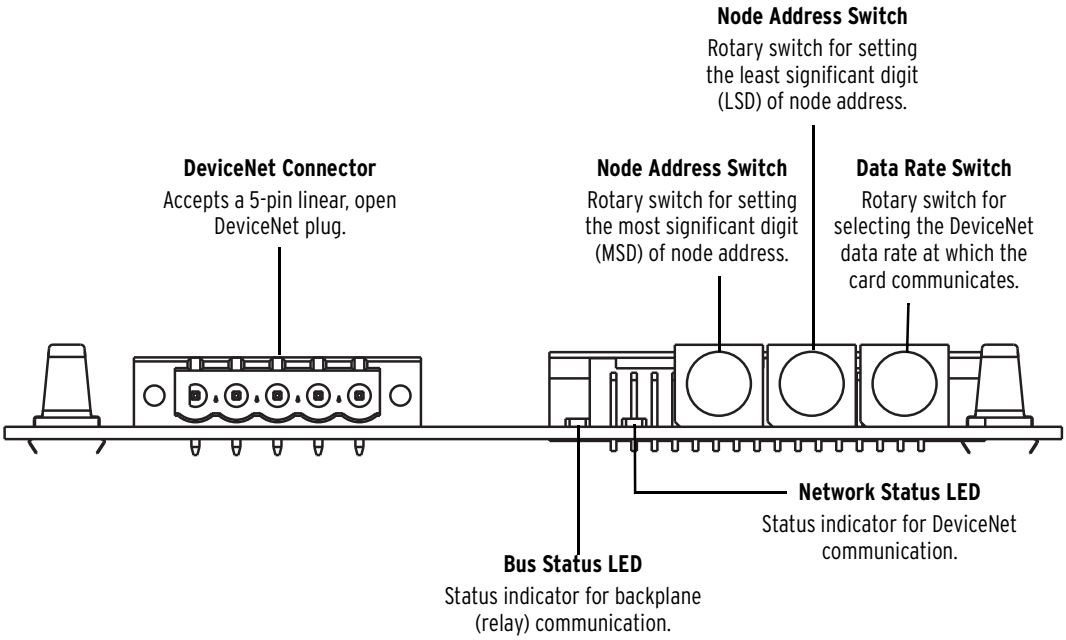

Figure 2 DeviceNet Card Component Overview

Features

The DeviceNet Card features the following:

- The card receives power from the DeviceNet network.
- Rotary switches let you set the node address and network data rate prior to mounting in the SEL relay and applying power. Alternatively, the switches can be set to positions that allow for configuring these settings over the DeviceNet network using a configuration tool software.
- Status indicators report the status of the device bus and network communications. These indicators are visible from the rear panel of the SEL relay as installed.
- UCMM (Unconnected Message Manager) messages are supported with the ability to allocate up to three explicit message connections concurrently.
- DeviceNet Group 2 slave functionality including:
  - Explicit connection
  - Polled connection
  - 1 COS (Change of State)/Cyclic connection
  - Full DeviceNet Parameter Object support for extracting EDS files from all units.
  - Programmable auxiliary relays for Comm Fault and Comm Idle conditions.
- Group 4 faulted node recovery is supported. You can configure a device even when it is faulted on the network if the configuration tool software supports faulted node recovery.

Required Equipment

Equipment Shipping With the Card

When you unpack the card, verify that the package includes the following:

- One DeviceNet Card
- One 5-pin linear DeviceNet plug
- Two labels that the installer affixes to the SEL relay; one to the top or side and one to the rear panel
- SEL DeviceNet Communications Card User's Guide

User-Supplied Equipment

- Small slotted screwdriver (0.6 mm x 3.5 mm)
- DeviceNet cable (a thin cable with an outside diameter of 6.9 mm (0.27 in.), is recommended)
- Configuration tool software (e.g., RSNetWorx for DeviceNet)
- Computer with an installed DeviceNet communications adapter
- DeviceNet User's Guide

Safety Precautions

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⚠ WARNING
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⚠ DANGER
Disconnect or de-energize all external connections before opening this device. Contact with hazardous voltages and currents inside this device can cause electrical shock resulting in injury or death.

Installation

Refer to the Open DeviceNet Vendor Association (ODVA) website (ODVA.org) for information on DeviceNet network basics, selecting components, and configuring the network. Verify that you have all of the required equipment (see *Getting Started*).

Follow the steps listed below to wire the DeviceNet Card into the SEL device.

Step 1. Refer to the *Safety Precautions* listed in *Getting Started*.

Step 2. Remove power from the DeviceNet network and the SEL relay.

Step 3. Use static control precautions.

Step 4. Connect a DeviceNet cable to the network.

Step 5. Terminate the bare leads of the DeviceNet cable to the 5-pin linear plug as illustrated in *Figure 3*.

Step 6. Connect the wired 5-pin linear plug to the DeviceNet Card, securing with the two screws.

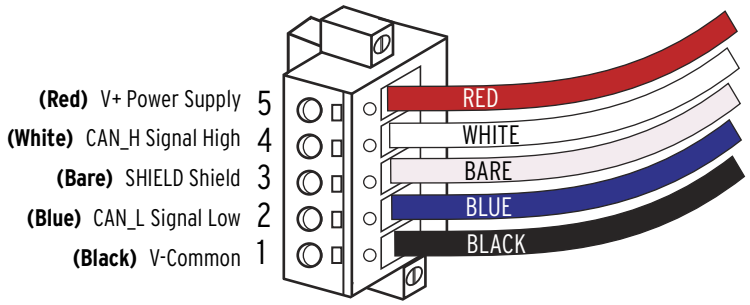

Figure 3 Connecting 5-Pin Linear Plug to DeviceNet Cable

Commissioning

This section covers the following information about commissioning the DeviceNet Card:

- Node commissioning
  - Setting the hardware switches
  - Using configuration tool software

Commissioning the protection settings is described in the instruction manual of the relay.

Node Commissioning

The DeviceNet Card is shipped with a default software node address (MAC ID) setting of 63 and the data rate set to autobaud. Each device on a DeviceNet network must have a unique node address set to a value from 0 through 63.

Keep in mind that most DeviceNet systems use address 0 for the master device (Scanner) and node address 63 should be left vacant for introduction of new slave devices.

The node address and data rate for the DeviceNet Card can be changed using software or by setting the hardware switches that reside on the card. While both methods yield the same result, it is good practice to choose one method and deploy it throughout the system.

Setting the Hardware Switches

Use the following steps to commission the card:

Step 1. Set the node address switches.

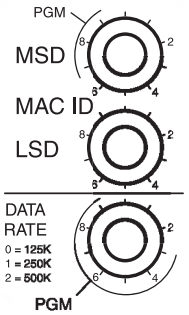

Figure 4 Node Address and Data Rate Setting Switches

Table 1: Node Address MAC ID Setting

Switch Settings	Description
0–63	Node address setting determined by switch values when set in this range. MSD = most significant digit LSD = least significant digit
64–99	For switch settings in this range, node address setting is determined by the software setting using the configuration tool software.
99	Factory default setting.

Step 2. Set the data rate switches.

Table 2: Data Rate Setting

Switch Settings	Description
0	125 K
1	250 K
2	500 K
3–9	For a switch setting in this range, data rate setting is determined by the software setting using the configuration tool software. **Note:** The card is factory default set to autobaud to the network data rate.
9	Factory default setting.

Step 3. Cycle power to the card to initialize the new settings.

Node Commissioning From Software Tools

To add this device to a system, follow instructions provided with the configuration tool software.

Building and Registering an EDS File

The EDS file defines the way that the configuration tool software communicates with the SEL relay. Follow the directions provided with the configuration tool software for using the EDS file. There are three methods for obtaining an EDS file:

- Create the EDS file over the DeviceNet network
- Copy the EDS file from the Product Literature CD for the SEL relay
- Download the EDS file from selinc.com

The EDS file (SEL-*xxx*R*yyy*.eds) and icon file (SEL-*xxx*.ico) are archived together as SEL-*xxx*R*yyy*.exe. The EDS file uses the icon file for creating the network graphical representation. If the icon file is missing, the configuration tool software uses a default icon.

SEL recommends using the EDS file from the SEL Product Literature CD or from the SEL website (selinc.com). The EDS file that you upload from the relay will operate correctly but will have a number of incorrect descriptions and bit positions; see *Electronic Data Sheets on page B.1* for more information. You will have to match the proper bit descriptions to the DeviceNet address (listed in *Parameter Information on page A.1*).

Specifications

Table 3: Electrical, Communication, and Compliance Standards for DeviceNet

Electrical (DeviceNet)	
Supply Voltage	11–25 Vdc
Input Current	0.085 A maximum / 0.035 A typical
Power Consumption	2.04 W maximum / 0.84 W typical
Environmental	
Ambient Temperature	
Operating	–20 to +60°C
Storage	–40 to +85°C (–40 to +185°F)
Humidity (operating)	5%–95% noncondensing
Vibration (per IEC 68-2-6)	5G
Shock (per IEC 68-2-27)	30G
Communication	
Baud Rates	125, 250, 500 kbps
Distance (max)	
@ 125 kbps	500 m (1640 ft.)
@ 250 kbps	200 m (656 ft.)
@ 500 kbps	100 m (328 ft.)
Compliance Standards	
UL 508, CSA 22.2 No. 14, EN 60947-4-1, EN 60947-5-1	

Troubleshooting

⚠ CAUTION
Follow your company's standard procedures to remove the relay from service and to return the relay to service.

The information in the following sections is provided as a diagnostic tool for troubleshooting the DeviceNet interface to the SEL relay.

The assumption has been made that the SEL relay had been properly installed and operating prior to the occurrence of a fault.

Table 4: DeviceNet Troubleshooting Procedures

Network Status LED	Definition	Possible Cause
Off	The device has not completed the initialization, is not on an active network, or might not be powered.	Check to ensure that the product is wired correctly and configured on the network.
Solid Green	The device is operating in a normal condition, and is communicating to another device on the network.	No action required.
Flashing Green	The device is operating in a normal condition, is online, but with no connection to another device. This is the typical state for new devices.	The device could need to be mapped to a master scanner, placed in a scanlist, or have another device communicate to it.
Flashing Red	Recoverable fault has occurred.	Ensure that the PLC and scanner are operating correctly and that there are no media or cabling issues. Check to see if other networked devices are in a similar state.
Solid Red	The device has detected a major error that has rendered it incapable of communicating on the network (Duplicate MAC ID, bus off, media issue).	Troubleshooting should be done to ensure that the network is correct (terminators, lengths, etc.) and there is not a duplicate node problem. If other devices on the network appear to be operating fine and power cycling the device does not work, contact SEL.
Flashing Red and Green	The device is in a communications faulted state.	Power cycling the device could resolve the problem; however, if the problem continues contact SEL.

Troubleshooting Device Backplane Communication

Table 5: Device Backplane Communication Troubleshooting Procedure

Bus Status LED	Definition	Possible Cause
Off	The device is in power-up mode.	Check to ensure that the product is wired correctly. Confirm that the product has appropriate DeviceNet and control power. Verify that the DeviceNet Card is inserted correctly.
Green	The device is operating in a normal condition.	No action required.
Red	The DeviceNet Card has lost backplane communication with the SEL relay.	Confirm product has appropriate DeviceNet and control power.

Technical Support

We appreciate your interest in SEL products and services. If you have any questions or comments, please contact us at:

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Email: info@selinc.com

Appendix A: Parameter Information

Each DeviceNet interface has a common set of parameters followed by a set of parameters that pertain to each particular SEL relay.

IMPORTANT: Resetting the factory default value Parameter 46 (Set to Defaults) resets all parameters to the factory default values. It also resets the MAC ID to the factory default value after cycling DNet power when node address switches are set greater than 63.

IMPORTANT: Parameter setting changes downloaded to the device take effect immediately, even during a Running state.

IMPORTANT: Parameter setting changes made in configuration tool software (such as RSNetWorx for DeviceNet) do not take effect in the device until you apply or download the new settings to the device.

Parameter Groups

The DeviceNet Card contains four parameter groups. This appendix discusses the parameter groups summarized in the table below.

Status Parameters	DeviceNet Parameters	Aux. Output Parameters	Misc. Parameters
Hdw Inputs	Autobaud Enable	GrpA Pr FltState	Set To Defaults
Hdw Outputs	Consumed IO Assy	GrpA Pr FltValue	
Trip Status 1	Produced IO Assy	GrpA DN FltState	
Trip Status 2	Prod Assy Word 0	GrpA DN FltValue	
Warn Status 1	Prod Assy Word 1	GrpA DN IdlState	
Warn Status 2	Prod Assy Word 2	GrpA DN IdlValue	
DNet Status	Prod Assy Word 3	GrpB Pr FltState	
	Prod Assy Word 4	GrpB Pr FltValue	
	Prod Assy Word 5	GrpB DN FltState	
	Prod Assy Word 6	GrpB DN FltValue	
	Prod Assy Word 7	GrpB DN IdlState	
	Consumed IO Size	GrpB DN IdlValue	
	Produced IO Size	GrpC Pr FltState	
	Status COS Mask 1	GrpC Pr FltValue	
	Status COS Mask 2	GrpC DN FltState	
	Trip COS Mask 1	GrpC DN FltValue	
	Trip COS Mask 2	GrpC DN IdlState	
	Warning COS Mask 1	GrpC DN IdlValue	
	Warning COS Mask 2		
	DNet Voltage		

Status Parameters

HDW INPUTS		
This parameter provides status indication of the hardware inputs. 1 = Active 0 = Inactive	**Parameter Number**	**1**
	Access Rule	**Get**
	Data Type	**WORD**
	Group	**Status Params**
	Units	**–**
	Minimum Value	**–**
	Maximum Value	**–**
	Default Value	**None**

Bit																Description
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
															X	**Input IN101**
														X		**Input IN102**
													X			**Input IN401**
												X				**Input IN402**
											X					**Input IN403**
										X						**Input IN6[a]**
									X							**Input IN7[a]**
								X								**Input IN8[a]**
X	X	X	X	X	X	X	X									**Reserved**

[a] Not supported.

HDW OUTPUTS		
This parameter provides status indication of the hardware outputs. 1 = Energized 2 = De-energized	**Parameter Number**	**2**
	Access Rule	**Get**
	Data Type	**WORD**
	Group	**Status Params**
	Units	**–**
	Minimum Value	**–**
	Maximum Value	**–**
	Default Value	**None**

Bit																Description
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
															X	**Output OUT101**
														X		**Output OUT102**
													X			**Output OUT401**
												X				**Output OUT402**
											X					**Output OUT403**
										X						**Output OUT404**
									X							**Output AUX7[a]**
								X								**Output AUX8[a]**
							X									**Output AUX9[a]**
						X										**Output AUX10[a]**
X	X	X	X	X	X											**Reserved**

[a] Not supported.

TRIP STATUS 1 This parameter provides trip identification. 1 = Trip 0 = No Trip		
	Parameter Number	**3**
	Access Rule	**Get**
	Data Type	**WORD**
	Group	**Status Params**
	Units	**–**
	Minimum Value	**–**
	Maximum Value	**–**
	Default Value	**None**

Bit	Description					
	(for SEL-700G)	(for SEL-710 & SEL-749M)	(for SEL-710-5)	(for SEL-751 & SEL-751A)	(for SEL-787)	(for SEL-787-3, -4)
0	50 Phase	Overload	Overload	Phase A1 50	Wdg1 50 Phase	Wdg1+Wdg2 50 Ph
1	50 Ground	Undercurrent	Undercurrent	Phase B1 50	Wdg1 50 Ground	Wdg1+Wdg2 50 Gnd
2	50 Neg-Seq	Jam	Jam	Phase C1 50	Wdg1 50 Neg-Seq	Wdg1+Wdg2 50 Neq
3	51 Phase	Curr. Imbalance	Curr. Imbalance	Phase 50P1	Wdg1 51 Phase	Wdg1+Wdg2 51 Ph
4	51 Ground	Overcurrent	Inst Overcurrent	Ground 50G1	Wdg1 51 Ground	Wdg1+Wdg2 51 Gnd
5	51 Neg-Seq	RTD-Wind/Bear	RTD	Neutral 50N1	Wdg1 51 Neg-Seq	Wdg1+Wdg2 51 Neq
6	Neutral 50	PTC	PTC	Neg-Seq 50Q1	Wdg2 50 Phase	Wdg3+Wdg4 50 Ph
7	Neutral 51	Ground Curr	Ground Curr	Phase A 51	Wdg2 50 Ground	Wdg3+Wdg4 50 Gnd
8	67 Phase	VAR	VAR	Phase B 51	Wdg2 50 Neg-Seq	Wdg3+Wdg4 50 Neq
9	67 Ground	Underpower	Underpower	Phase C 51	Wdg2 51 Phase	Wdg3+Wdg4 51 Ph
10	67 Neg-Seq	Undervoltage	Undervoltage	Phase 51P1	Wdg2 51 Ground	Wdg3+Wdg4 51 Gnd
11	46 Neg-Seq	Overvoltage	Overvoltage	Ground 51G1	Wdg2 51 Neg-Seq	Wdg3+Wdg4 51 Neq
12	49T Thermal	Phase Reversal	Phase Reversal	Neutral 51N1	Neutral 50	Neutral 50
13	Gnd Diff 87N	Power Factor	Power Factor	Neg-Seq 51Q	Neutral 51	Neutral 51
14	Restr Diff 87R	Speed Switch	Speed Switch	Undervoltage 27P1	Restr Diff 87R	Restr Diff 87R
15	Unrstr Diff 87U	Neutral Curr	87M Differential	Overvoltage 59P1	Unrestr Diff 87U	Unrestr Diff 87U

TRIP STATUS 2 This parameter provides trip identification. 1 = Trip 0 = No Trip		
	Parameter Number	4
	Access Rule	Get
	Data Type	WORD
	Group	Status Params
	Units	–
	Minimum Value	–
	Maximum Value	–
	Default Value	None

Bit	Description					
	(for SEL-700G)	(for SEL-710 & SEL-749M)	(for SEL-710-5)	(for SEL-751 & SEL-751A)	(for SEL-787)	(for SEL-787-3, -4)
0	Undervolt 27P	Start Time	Start Time	Power Factor 55	Undervolt 27P	Undervolt 27P
1	Overvolt 59P	Frequency 1	Frequency	Frequency 81D1	Overvolt 59P	Overvolt 59P
2	Reserved	Frequency 2	TOC Overcurrent	Frequency 81D2	Nseqvolt 59Q	Nseqvolt 59Q
3	Power Elements	RTD–Other	Arc-Flash Trip	RTD–Other	Power Elements	Power Elements
4	Frequency 81	RTD–Ambient	Field Trip	RTD–Ambient	Frequency 81	Frequency 81
5	Volts/Hertz	PTC Error	Out of Step	RTD–Wind/Bear	Volts/Hertz	Volts/Hertz
6	Restrctd Earth	RTD Error	Breaker Fail	RTD Error	Restrctd Earth	Restrctd Earth
7	RTD Trip	Reserved	Remote Trip	Power Elements	RTD Trip	RTD Trip
8	Breaker Fail	Comm Idle	Dnet Comm	Comm Idle	Breaker Fail	Breaker Fail
9	Remote Trip	Comm Loss	Reserved	Comm Loss	Remote Trip	Remote Trip
10	Backup	Remote Trip	Reserved	Remote Trip	Reserved	Reserved
11	40 Fld Loss	Comm Fault	Reserved	Comm Fault	Reserved	Reserved
12	64G/64F Gnd	Config Fault	Reserved	Config Fault	Reserved	Reserved
13	Inadvertent Enrg	87M Differential	Reserved	Reserved	Reserved	Reserved
14	Out of Step	Reserved	Reserved	Reserved	Reserved	Reserved
15	Trip	Breaker Fail	Reserved	Breaker Fail	Trip	Trip

WARN STATUS 1		
This parameter provides warning identification. **1 = Warn** **0 = No Warn**	**Parameter Number**	**5**
	Access Rule	**Get**
	Data Type	**WORD**
	Group	**Status Params**
	Units	**–**
	Minimum Value	**–**
	Maximum Value	**–**
	Default Value	**None**

Bit	Description					
	(for SEL-700G)	(for SEL-710 & SEL-749M)	(for SEL-710-5)	(for SEL-751 & SEL-751A)	(for SEL-787)	(for SEL-787-3, -4)
0	Breaker Monitor	Overload	Overload	Phase 50P2	THR Fault Alarm	Thr Fault Alarm
1	Demand Alarm	Undercurrent	Undercurrent	Phase 50P3	Demand Alarm	Demand Alarm
2	RTD Fault	Jam	Inst Undercurrent	Phase 50P4	RTD Fault	RTD Fault
3	Config Fault	Curr Imbalance	Jam	Ground 50G2	Config Fault	Config Fault
4	Comm Fault	RTD–Wind/Bear	Curr Imbalance	Ground 50G3	Comm Fault	Comm Fault
5	Comm Idle	Power Factor	RTD	Ground 50G4	Comm Idle	Comm Idle
6	Comm Loss	Neutral Curr	Power Factor	Neutral 50N2	Comm Loss	Comm Loss
7	Diff Alarm 87A	Ground Curr	Ground Fault	Neutral 50N3	Diff Alarm 87A	Diff Alarm 87A
8	5th Harmonic Alm	VAR	Broken Rotor Bar	Neutral 50N4	5th Harmonic Alm	5th Harmonic Alm
9	RTD Alarm	Underpower	VAR	Neg-Seq 50Q2	RTD Alarm	RTD Alarm
10	Loss Of Potntial	Undervoltage	Underpower	Neg-Seq 50Q3	Loss Of Potntial	Loss of Potntial
11	AI Hi/Lo Alarm	Overvoltage	Undervoltage	Neg-Seq 50Q4	AI Hi/Lo Alarm	AI Hi/Lo Alarm
12	49A Thermal Alm	Speed Switch	Overvoltage	Phase 51P2	Reserved	Reserved
13	HALARM	Frequency 3[a]	Speed Switch	Ground 51G2	HALARM	HALARM
14	SALARM	Frequency 4[b]	Arc Flash	Neutral 51N2	SALARM	SALARM
15	Warning	RTD–Other	PTC	Reserved	Warning	Warning

[a] Frequency 3 for SEL-710; Frequency 1 for SEL-749M.
[b] Frequency 4 for SEL-710; Frequency 2 for SEL-749M.

WARN STATUS 2		
This parameter provides warning identification. 1 = Warn 0 = No Warn	**Parameter Number**	**6**
	Access Rule	**Get**
	Data Type	**WORD**
	Group	**Status Params**
	Units	**–**
	Minimum Value	**–**
	Maximum Value	**–**
	Default Value	**None**

Bit	Description					
	(for SEL-700G)	(for SEL-710 & SEL-749M)	(for SEL-710-5)	(for SEL-751 & SEL-751A)	(for SEL-787)	(for SEL-787-3, -4)
0	**Undervolt 27P**	**RTD–Ambient**	**Field Warning**	**Power Factor 55**	**Reserved**	**Reserved**
1	**Overvolt 59P**	**SALARM**	**Dnet Comm**	**SALARM**	**Reserved**	**Reserved**
2	**46 Neg-Seq**	**Warning**	**Salarm**	**Warning**	**Reserved**	**Reserved**
3	**Volts/Hertz**	**Reserved**	**Warning**	**RTD–Wind/Bear**	**Reserved**	**Reserved**
4	**Reserved**	**Reserved**	**Reserved**	**RTD–Other**	**Reserved**	**Reserved**
5	**Reserved**	**Reserved**	**Reserved**	**RTD–Ambient**	**Reserved**	**Reserved**
6	**Reserved**	**Reserved**	**Reserved**	**Undervoltage 27P2**	**Reserved**	**Reserved**
7	**Reserved**	**Overcurrent**	**Reserved**	**Overvoltage 59P2**	**Reserved**	**Reserved**
8	**Reserved**	**Reserved**	**Reserved**	**Frequency 81D3**	**Reserved**	**Reserved**
9	**Reserved**	**Reserved**	**Reserved**	**Frequency 81D4**	**Reserved**	**Reserved**
10	**Reserved**	**Reserved**	**Reserved**	**Reserved**	**Reserved**	**Reserved**
11	**Reserved**	**Reserved**	**Reserved**	**Reserved**	**Reserved**	**Reserved**
12	**Reserved**	**Reserved**	**Reserved**	**Reserved**	**Reserved**	**Reserved**
13	**Reserved**	**Reserved**	**Reserved**	**Reserved**	**Reserved**	**Reserved**
14	**Reserved**	**Reserved**	**Reserved**	**Reserved**	**Reserved**	**Reserved**
15	**Reserved**	**Reserved**	**Reserved**	**Reserved**	**Reserved**	**Reserved**

MODULE STATUS **This parameter provides communications card status indication.** **1 = Active** **0 = Non-Active**		
	Parameter Number	**7**
	Access Rule	**Get**
	Data Type	**WORD**
	Group	**Status Params**
	Units	**–**
	Minimum Value	**–**
	Maximum Value	**–**
	Default Value	**None**

Bit																Description
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
															X	**Explicit Conn**
														X		**I/O Conn**
													X			**Explicit Fault**
												X				**I/O Fault**
											X					**I/O Idle**
										X						**Reserved**
									X							**Reserved**
								X								**Reserved**
							X									**Fault**
						X										**Warning**
					X											**Starting[a]**
				X												**Running[a]**
			X													**Stopped[a]**
		X														**Reserved**
	X															**Reserved**
X																**Reserved**

[a] Supported only in SEL-749M, SEL-710, and SEL-710-5.

DeviceNet Parameters

AUTOBAUD ENABLE **When this parameter is enabled, the device attempts to determine the network data rate and set its rate to the same, provided network traffic exists.** **At least one node with an established data rate must exist on the network for autobaud to function.**	**Parameter Number**	**8**
	Access Rule	**Get/Set**
	Data Type	**BOOL**
	DeviceNet Params	
	Units	**–**
	Minimum Value	**0 = Disabled**
	Maximum Value	**1 = Enabled**
	Default Value	**1 = Enabled**
CONSUMED IO ASSY **This parameter is used to select the Consumed IO Assembly that you want. See** Appendix.B: DeviceNet Information **for a listing.**	**Parameter Number**	**9**
	Access Rule	**Get/Set**
	Data Type	**USINT**
	DeviceNet Params	
	Units	**–**
	Minimum Value	**0**
	Maximum Value	**188**
	Default Value	**150**
PRODUCED IO ASSY **This parameter is used to select the Produced IO Assembly that you want. See** Appendix.B: DeviceNet Information **for a listing.**	**Parameter Number**	**10**
	Access Rule	**Get/Set**
	Data Type	**USINT**
	DeviceNet Params	
	Units	**–**
	Minimum Value	**0**
	Maximum Value	**189**
	Default Value	**103**
PROD ASSY WORD 0 **This parameter assigns the parameter value to be placed in Word 0 of Produced Assembly Instance 100.**	**Parameter Number**	**11**
	Access Rule	**Get/Set**
	Data Type	**USINT**
	DeviceNet Params	
	Units	**–**
	Minimum Value	**0**
	Maximum Value	**SEL-700G: 1544 SEL-751: 2035** **SEL-710: 2200 SEL-751A: 2170** **SEL-710-5: 2093 SEL-787: 1610** **SEL-749M: 550 SEL-787-3, -4: 1523**
	Default Value	**1**

PROD ASSY WORD 1 **This parameter assigns the parameter value to be placed in Word 1 of Produced Assembly Instance 100.**	**Parameter Number**	**12**
	Access Rule	**Get/Set**
	Data Type	**USINT**
	DeviceNet Params	
	Units	**–**
	Minimum Value	**0**
	Maximum Value	**SEL-700G: 1544 SEL-751: 2035** **SEL-710: 2200 SEL-751A: 2170** **SEL-710-5: 2093 SEL-787: 1610** **SEL-749M: 550 SEL-787-3, -4: 1523**
	Default Value	**3**
PROD ASSY WORD 2 **This parameter assigns the parameter value to be placed in Word 2 of Produced Assembly Instance 100.**	**Parameter Number**	**13**
	Access Rule	**Get/Set**
	Data Type	**USINT**
	DeviceNet Params	
	Units	**–**
	Minimum Value	**0**
	Maximum Value	**SEL-700G: 1544 SEL-751: 2035** **SEL-710: 2200 SEL-751A: 2170** **SEL-710-5: 2093 SEL-787: 1610** **SEL-749M: 550 SEL-787-3, -4: 1523**
	Default Value	**4**
PROD ASSY WORD 3 **This parameter assigns the parameter value to be placed in Word 3 of Produced Assembly Instance 100.**	**Parameter Number**	**14**
	Access Rule	**Get/Set**
	Data Type	**USINT**
	DeviceNet Params	
	Units	**–**
	Minimum Value	**0**
	Maximum Value	**SEL-700G: 1544 SEL-751: 2035** **SEL-710: 2200 SEL-751A: 2170** **SEL-710-5: 2093 SEL-787: 1610** **SEL-749M: 550 SEL-787-3, -4: 1523**
	Default Value	**5**
PROD ASSY WORD 4 **This parameter assigns the parameter value to be placed in Word 4 of Produced Assembly Instance 100.**	**Parameter Number**	**15**
	Access Rule	**Get/Set**
	Data Type	**USINT**
	DeviceNet Params	
	Units	**–**
	Minimum Value	**0**
	Maximum Value	**SEL-700G: 1544 SEL-751: 2035** **SEL-710: 2200 SEL-751A: 2170** **SEL-710-5: 2093 SEL-787: 1610** **SEL-749M: 550 SEL-787-3, -4: 1523**
	Default Value	**6**

PROD ASSY WORD 5 **This parameter assigns the parameter value to be placed in Word 5 of Produced Assembly Instance 100.**	**Parameter Number**	**16**
	Access Rule	**Get/Set**
	Data Type	**USINT**
	DeviceNet Params	
	Units	**–**
	Minimum Value	**0**
	Maximum Value	**SEL-700G: 1544 SEL-751: 2035 SEL-710: 2200 SEL-751A: 2170 SEL-710-5: 2093 SEL-787: 1610 SEL-749M: 550 SEL-787-3, -4: 1523**
	Default Value	**7**
PROD ASSY WORD 6 **This parameter assigns the parameter value to be placed in Word 6 of Produced Assembly Instance 100.**	**Parameter Number**	**17**
	Access Rule	**Get/Set**
	Data Type	**USINT**
	DeviceNet Params	
	Units	**–**
	Minimum Value	**0**
	Maximum Value	**SEL-700G: 1544 SEL-751: 2035 SEL-710: 2200 SEL-751A: 2170 SEL-710-5: 2093 SEL-787: 1610 SEL-749M: 550 SEL-787-3, -4: 1523**
	Default Value	**0**
PROD ASSY WORD 7 **This parameter assigns the parameter value to be placed in Word 7 of Produced Assembly Instance 100.**	**Parameter Number**	**18**
	Access Rule	**Get/Set**
	Data Type	**USINT**
	DeviceNet Params	
	Units	**–**
	Minimum Value	**0**
	Maximum Value	**SEL-700G: 1544 SEL-751: 2035 SEL-710: 2200 SEL-751A: 2170 SEL-710-5: 2093 SEL-787: 1610 SEL-749M: 550 SEL-787-3, -4: 1523**
	Default Value	**0**
CONSUMED IO SIZE **This parameter identifies the size (in bytes) of the selected Consumed IO Assembly.**	**Parameter Number**	**19**
	Access Rule	**Get**
	Data Type	**USINT**
	DeviceNet Params	
	Units	**–**
	Minimum Value	**0**
	Maximum Value	**6**
	Default Value	**2**

PRODUCED IO SIZE This parameter identifies the size (in bytes) of the selected Produced IO Assembly.		
	Parameter Number	20
	Access Rule	Get
	Data Type	USINT
	DeviceNet Params	
	Units	–
	Minimum Value	0
	Maximum Value	16
	Default Value	5

STATUS COS MASK 1 This parameter allows the installer to select the events for which a Change-of-State (COS) message is produced. 1 = Enabled 0 = Disabled		
	Parameter Number	21
	Access Rule	Get/Set
	Data Type	WORD
	DeviceNet Params	
	Units	–
	Minimum Value	0000000000000000
	Maximum Value	1111111111111111
	Default Value	0000000000000000

Bit																Description
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
															X	Fault
														X		Warning
													X			IN101 Status
												X				IN102 Status
											X					IN401 Status
										X						IN402 Status
									X							IN403 Status
								X								Starting[a]
							X									OUT101 Status
						X										OUT102 Status
					X											OUT401 Status
				X												OUT402 Status
			X													OUT403 Status
		X														OUT404 Status
	X															Running[a]
X																Stopped[a]

[a] Supported only in SEL-749M, SEL-710, and SEL-710-5. These bits are Reserved in other products.

STATUS COS MASK 2		
This parameter allows the installer to select the events for which a Change-of-State (COS) message is produced. **1 = Enabled** **0 = Disabled**	**Parameter Number**	**22**
	Access Rule	**Get/Set**
	Data Type	**WORD**
	DeviceNet Params	
	Units	**–**
	Minimum Value	**0000000000000000**
	Maximum Value	**1111111111111111**
	Default Value	**0000000000000000**

Bit																Description
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
															X	**Reserved**
														X		**Reserved**
													X			**IN6 Status[a]**
												X				**IN7 Status[a]**
											X					**IN8 Status[a]**
										X						**Reserved**
									X							**Reserved**
								X								**Reserved**
							X									**AUX7 Status[a]**
						X										**AUX8 Status[a]**
					X											**AUX9 Status[a]**
				X												**AUX10 Status[a]**
			X													**Reserved**
		X														**Reserved**
	X															**Reserved**
X																**Reserved**

[a] Not supported.

FAULT1 COS MASK		
This parameter allows the installer to select the events for which a Change-of-State (COS) message is produced. **1 = Enabled** **0 = Disabled**	**Parameter Number**	**23**
	Access Rule	**Get/Set**
	Data Type	**WORD**
	DeviceNet Params	
	Units	**–**
	Minimum Value	**0000000000000000**
	Maximum Value	**1111111111111111**
	Default Value	**0000000000000000**

Bit	Description					
	(for SEL-700G)	(for SEL-710 & SEL-749M)	(for SEL-710-5)	(for SEL-751 & SEL-751A)	(for SEL-787)	(for SEL-787-3, -4)
0	50 Phase	Overload	Overload	Phase A1 50	Wdg1 50 Phase	Wdg1+Wdg2 50 Ph
1	50 Ground	Undercurrent	Undercurrent	Phase B1 50	Wdg1 50 Ground	Wdg1+Wdg2 50 Gnd
2	50 Neg-Seq	Jam	Jam	Phase C1 50	Wdg1 50 Neg-Seq	Wdg1+Wdg2 50 Neq
3	51 Phase	Curr Imbalance	Curr Imbalance	Phase 50P1	Wdg1 51 Phase	Wdg1+Wdg2 51 Ph
4	51 Ground	Overcurrent	Inst Overcurrent	Ground 50G1	Wdg1 51 Ground	Wdg1+Wdg2 51 Gnd
5	51 Neg-Seq	RTD–Wind/Bear	RTD	Neutral 50N1	Wdg1 51 Neg-Seq	Wdg1+Wdg2 51 Neq
6	Neutral 50	PTC	PTC	Neg-Seq 50Q1	Wdg2 50 Phase	Wdg3+Wdg4 50 Ph
7	Neutral 51	Ground Curr	Ground Curr	Phase A 51	Wdg2 50 Ground	Wdg3+Wdg4 50 Gnd
8	67 Phase	VAR	VAR	Phase B 51	Wdg2 50 Neg-Seq	Wdg3+Wdg4 50 Neq
9	67 Ground	Underpower	Underpower	Phase C 51	Wdg2 51 Phase	Wdg3+Wdg4 51 Ph
10	67 Neg-Seq	Undervoltage	Undervoltage	Phase 51P1	Wdg2 51 Ground	Wdg3+Wdg4 51 Gnd
11	46 Neg-Seq	Overvoltage	Overvoltage	Ground 51G1	Wdg2 51 Neg-Seq	Wdg3+Wdg4 51 Neq
12	49T Thermal	Phase Reversal	Phase Reversal	Neutral 51N1	Neutral 50	Neutral 50
13	Gnd Diff 87N	Power Factor	Power Factor	Neg-Seq 51Q	Neutral 51	Neutral 51
14	Restr Diff 87R	Speed Switch	Speed Switch	Undervoltage 27P1	Restr Diff 87R	Restr Diff 87R
15	Unrstr Diff 87U	Neutral Curr	87M Differential	Overvoltage 59P1	Unrestr Diff 87U	Unrestr Diff 87U

FAULT2 COS MASK		
This parameter allows the installer to select the events for which a Change-of-State (COS) message is produced. **1 = Enabled** **0 = Disabled**	**Parameter Number**	**24**
	Access Rule	**Get/Set**
	Data Type	**WORD**
	DeviceNet Params	
	Units	**–**
	Minimum Value	**0000000000000000**
	Maximum Value	**1111111111111111**
	Default Value	**0000000000000000**

Bit	Description					
	(for SEL-700G)	(for SEL-710 & SEL-749M)	(for SEL-710-5)	(for SEL-751 & SEL-751A)	(for SEL-787)	(SEL-787-3, -4)
0	Undervolt 27P	Start Time	Start Time	Power Factor 55	Undervolt 27P	Undervolt 27P
1	Overvolt 59P	Frequency 1	Frequency 1	Frequency 81D1	Overvolt 59P	Overvolt 59P
2	Reserved	Frequency 2	TOC Overcurrent	Frequency 81D2	NSeqVolt 59Q	Nseqvolt 59Q
3	Power Elements	RTD–Other	Arc Flash Trip	RTD–Other	Power Elements	Power Elements
4	Frequency 81	RTD–Ambient	Field Trip	RTD–Ambient	Frequency 81	Frequency 81
5	Volts/Hertz	PTC Error	Out of Step	RTD–Wind/Bear	Volts/Hertz	Volts/Hertz
6	Restrctd Earth	RTD Error	Breaker Fail	RTD Error	Restrctd Earth	Restrctd Earth
7	RTD Trip	Reserved	Remote Trip	Power Elements	RTD Trip	RTD Trip
8	Breaker Fail	Comm Idle	Dnet Comm	Comm Idle	Breaker Fail	Breaker Fail
9	Remote Trip	Comm Loss	Reserved	Comm Loss	Remote Trip	Remote Trip
10	Backup	Remote Trip	Reserved	Remote Trip	Reserved	Reserved
11	40 FLD Loss	Comm Fault	Reserved	Comm Fault	Reserved	Reserved
12	64G/64F Gnd	Config Fault	Reserved	Config Fault	Reserved	Reserved
13	Inadvertent Enrg	87M Differential	Reserved	Reserved	Reserved	Reserved
14	Out Of Step	Reserved	Reserved	Reserved	Reserved	Reserved
15	Trip	Breaker Fail	Reserved	Breaker Fail	Trip	Trip

WARN1 COS MASK		
This parameter allows the installer to select the events for which a Change-of-State (COS) message is produced. **1 = Enabled** **0 = Disabled**	**Parameter Number**	**25**
	Access Rule	**Get/Set**
	Data Type	**WORD**
	DeviceNet Params	
	Units	**–**
	Minimum Value	**0000000000000000**
	Maximum Value	**1111111111111111**
	Default Value	**0000000000000000**

Bit	Description					
	(for SEL-710 & SEL-749M)	(for SEL-751 & SEL-751A)	(for SEL-710-5)	(for SEL-787)	(for SEL-700G)	(SEL-787-3, -4)
0	Overload	Phase 50P2	Overload	Thr Fault Alarm	Breaker Monitor	Thr Fault Alarm
1	Undercurrent	Phase 50P3	Undercurrent	Demand Alarm	Demand Alarm	Demand Alarm
2	Jam	Phase 50P4	Inst Overcurrent	RTD Fault	RTD Fault	RTD Fault
3	Curr Imbalance	Ground 50G2	Jam	Config Fault	Config Fault	Config Fault
4	RTD–Wind/Bear	Ground 50G3	Curr. Imbalance	Comm Fault	Comm Fault	Comm Fault
5	Power Factor	Ground 50G4	RTD	Comm Idle	Comm Idle	Comm Idle
6	Neutral Curr	Neutral 50N2	Power Factor	Comm Loss	Comm Loss	Comm Loss
7	Ground Curr	Neutral 50N3	Ground Fault	Diff Alarm 87A	Diff Alarm 87A	Diff Alarm 87A
8	VAR	Neutral 50N4	Broken Rotor Bar	5th Harmonic Alm	5th Harmonic Alm	5th Harmonic Alm
9	Underpower	Neg-Seq 50Q2	VAR	RTD Alarm	RTD Alarm	RTD Alarm
10	Undervoltage	Neg-Seq 50Q3	Underpower	Loss Of Potntial	Loss Of Potntial	Loss of Potntial
11	Overvoltage	Neg-Seq 50Q4	Undervoltage	AI Hi/Lo Alarm	AI Hi/Lo Alarm	AI Lo/Hi Alarm
12	Speed Switch	Phase 51P2	Overvoltage	Reserved	49A Thermal Alm	Reserved
13	Frequency 1[a]	Ground 51G2	Speed Switch	HALARM	HALARM	HALARM
14	Frequency 2[b]	Neutral 51N2	Arc Flash	SALARM	SALARM	SALARM
15	RTD–Other	Reserved	PTC	Warning	Warning	Warning

[a] Frequency 1 for SEL-749M; Frequency 3 for SEL-710.
[b] Frequency 2 for SEL-749M; Frequency 4 for SEL-710.

WARN COS MASK 2		
This parameter allows the installer to select the events for which a Change-of-State (COS) message is produced. **1 = Enabled** **0 = Disabled**	**Parameter Number**	**26**
	Access Rule	**Get/Set**
	Data Type	**WORD**
	DeviceNet Params	
	Units	**–**
	Minimum Value	**0000000000000000**
	Maximum Value	**1111111111111111**
	Default Value	**0000000000000000**

Bit	Description					
	(for SEL-700G)	(for SEL-710 & SEL-749M)	(for SEL-710-5)	(for SEL-751 & SEL-751A)	(for SEL-787)	(for SEL-787-3, -4)
0	Undervolt 27P	RTD–Ambient	Field Warning	Power Factor 55	Reserved	Reserved
1	Overvolt 59P	SALARM	Dnet Comm	SALARM	Reserved	Reserved
2	46 Neg-Seq	Warning	Salarm	Warning	Reserved	Reserved
3	Volts/Hertz	Reserved	Warning	RTD–Wind/Bear	Reserved	Reserved
4	Reserved	Reserved	Reserved	RTD–Other	Reserved	Reserved
5	Reserved	Reserved	Reserved	RTD–Ambient	Reserved	Reserved
6	Reserved	Reserved	Reserved	Undervoltage 27P2	Reserved	Reserved
7	Reserved	Overcurrent	Reserved	Overvoltage 59P2	Reserved	Reserved
8	Reserved	Reserved	Reserved	Frequency 81D3	Reserved	Reserved
9	Reserved	Reserved	Reserved	Frequency 81D4	Reserved	Reserved
10	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
11	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
12	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
13	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
14	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved
15	Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

DEVICENET VOLTAGE		
This parameter reports the measured DeviceNet supply voltage to the card.	**Parameter Number**	**27**
	Access Rule	**Get/Set**
	Data Type	**UINT**
	DeviceNet Params	
	Units	**Volts**
	Minimum Value	**0.00**
	Maximum Value	**65.00**
	Default Value	**–**

Aux. Output Parameters

GRPA PR FLTSTATE **This parameter, in conjunction with Parameter 29, defines how Aux1 (OUT101) and Aux2 (OUT102) respond when a protection trip occurs. When set to "1," the relays continue to respond as commanded. When set to "0," the relays open or close as determined by the setting of Parameter 29.**	**Parameter Number**	**28**
	Access Rule	**Get/Set**
	Data Type	**BOOL**
	Aux. Outputs	
	Units	**–**
	Minimum Value	**0 = Go to FltValue (#29)**
	Maximum Value	**1 = Ignore Trip**
	Default Value	**0**
GRPA PR FLTVALUE **This parameter determines the state that Aux1 (OUT102) and Aux2 (OUT101) assume when a protection trip occurs and Parameter 28 is set to "0."**	**Parameter Number**	**29**
	Access Rule	**Get/Set**
	Data Type	**BOOL**
	Aux. Outputs	
	Units	**–**
	Minimum Value	**0 = Open**
	Maximum Value	**1 = Closed**
	Default Value	**0**
GRPA DN FLTSTATE **This parameter, in conjunction with Parameter 31, defines how Aux1 (OUT101) and Aux2 (OUT102) respond when a DeviceNet network fault occurs. When set to "1," the relays holds the state commanded prior to the network fault. When set to "0," the relays open or close as determined by the setting of Parameter 31.**	**Parameter Number**	**30**
	Access Rule	**Get/Set**
	Data Type	**BOOL**
	Aux. Outputs	
	Units	**–**
	Minimum Value	**0 = Go to FltValue (#31)**
	Maximum Value	**1 = Hold Last State**
	Default Value	**0**
GRPA DN FLTVALUE **This parameter determines the state that Aux1 (OUT102) and Aux2 (OUT101) assume when a DeviceNet network fault occurs and Parameter 30 is set to "0."**	**Parameter Number**	**31**
	Access Rule	**Get/Set**
	Data Type	**BOOL**
	Aux. Outputs	
	Units	**–**
	Minimum Value	**0 = Open**
	Maximum Value	**1 = Closed**
	Default Value	**0**
GRPA DN IDLSTATE **This parameter, in conjunction with Parameter 33, defines how Aux1 (OUT101) and Aux2 (OUT102) respond when the DeviceNet network is idle. When set to "1," the relays holds the state commanded prior to the network idle condition. When set to "0," the relays open or close as determined by the setting of Parameter 33.**	**Parameter Number**	**32**
	Access Rule	**Get/Set**
	Data Type	**BOOL**
	Aux. Outputs	
	Units	**–**
	Minimum Value	**0 = Go to FltValue (#33)**
	Maximum Value	**1 = Hold Last State**
	Default Value	**0**

GRPA DN IDLVALUE This parameter determines the state that Aux1 (OUT102) and Aux2 (OUT101) assume when the DeviceNet network is idle and Parameter 32 is set to "0."	Parameter Number	33
	Access Rule	Get/Set
	Data Type	BOOL
	Aux. Outputs	
	Units	–
	Minimum Value	0 = Open
	Maximum Value	1 = Closed
	Default Value	0
GRPB PR FLTSTATE This parameter, in conjunction with Parameter 35, defines how Aux3 (OUT401) through Aux6 (OUT404) respond when a protection trip occurs. When set to "1," the relays continue to respond as commanded. When set to "0," the relays open or close as determined by the setting of Parameter 35.	Parameter Number	34
	Access Rule	Get/Set
	Data Type	BOOL
	Aux. Outputs	
	Units	–
	Minimum Value	0 = Go to FltValue (#35)
	Maximum Value	1 = Ignore Trip
	Default Value	0
GRPB PR FLTVALUE This parameter determines the state that Aux3 (OUT401) through Aux6 (OUT404) assume when a protection trip occurs and Parameter 34 is set to "0."	Parameter Number	35
	Access Rule	Get/Set
	Data Type	BOOL
	Aux. Outputs	
	Units	–
	Minimum Value	0 = Open
	Maximum Value	1 = Closed
	Default Value	0
GRPB DN FLTSTATE This parameter, in conjunction with Parameter 37, defines how Aux3 (OUT401) through Aux6 (OUT404) respond when a DeviceNet network fault occurs. When set to "1," the relays holds the state commanded prior to the network fault. When set to "0," the relays open or close as determined by the setting of Parameter 37.	Parameter Number	36
	Access Rule	Get/Set
	Data Type	BOOL
	Aux. Outputs	
	Units	–
	Minimum Value	0 = Go to FltValue (#37)
	Maximum Value	1 = Hold Last State
	Default Value	0
GRPB DN FLTVALUE This parameter determines the state that Aux3 (OUT401) through Aux6 (OUT404) assume when a DeviceNet network fault occurs and Parameter 36 is set to "0."	Parameter Number	37
	Access Rule	Get/Set
	Data Type	BOOL
	Aux. Outputs	
	Units	–
	Minimum Value	0 = Open
	Maximum Value	1 = Closed
	Default Value	0

GRPB DN IDLSTATE **This parameter, in conjunction with Parameter 39, defines how Aux3 (OUT401) through Aux6 (OUT404) respond when the DeviceNet network is idle. When set to "1," the relays holds the state commanded prior to the network idle condition. When set to "0," the relays open or close as determined by the setting of Parameter 39.**	**Parameter Number**	**38**
	Access Rule	**Get/Set**
	Data Type	**BOOL**
	Aux. Outputs	
	Units	**–**
	Minimum Value	**0 = Go to FltValue (#39)**
	Maximum Value	**1 = Hold Last State**
	Default Value	**0**
GRPB DN IDLVALUE **This parameter determines the state that Aux3 (OUT401) through Aux6 (OUT404) assume when the DeviceNet network is idle and Parameter 38 is set to "0."**	**Parameter Number**	**39**
	Access Rule	**Get/Set**
	Data Type	**BOOL**
	Aux. Outputs	
	Units	**–**
	Minimum Value	**0 = Open**
	Maximum Value	**1 = Closed**
	Default Value	**0**
GRPC PR FLTSTATE **This parameter, in conjunction with Parameter 41, defines how Aux7 through Aux10 respond when a protection trip occurs. When set to "1," the relays continue to respond as commanded. When set to "0," the relays open or close as determined by the setting of Parameter 41.**	**Parameter Number**	**40**
	Access Rule	**Get/Set**
	Data Type	**BOOL**
	Aux. Outputs	
	Units	**–**
	Minimum Value	**0 = Go to FltValue (#41)**
	Maximum Value	**1 = Ignore Trip**
	Default Value	**0**
GRPC PR FLTVALUE **This parameter determines the state that Aux7 through Aux10 assume when a protection trip occurs and Parameter 40 is set to "0."**	**Parameter Number**	**41**
	Access Rule	**Get/Set**
	Data Type	**BOOL**
	Aux. Outputs	
	Units	**–**
	Minimum Value	**0 = Open**
	Maximum Value	**1 = Closed**
	Default Value	**0**
GRPC DN FLTSTATE **This parameter, in conjunction with Parameter 43, defines how Aux7 through Aux10 respond when a DeviceNet network fault occurs. When set to "1," the relays holds the state commanded prior to the network fault. When set to "0," the relays open or close as determined by the setting of Parameter 43.**	**Parameter Number**	**42**
	Access Rule	**Get/Set**
	Data Type	**BOOL**
	Aux. Outputs	
	Units	**–**
	Minimum Value	**0 = Go to FltValue (#43)**
	Maximum Value	**1 = Hold Last State**
	Default Value	**0**

GRPC DN FLTVALUE This parameter determines the state that Aux7 through Aux10 assume when a DeviceNet network fault occurs and Parameter 42 is set to "0."	Parameter Number	43
	Access Rule	Get/Set
	Data Type	BOOL
	Aux. Outputs	
	Units	–
	Minimum Value	0 = Open
	Maximum Value	1 = Closed
	Default Value	0
GRPC DN IDLSTATE This parameter, in conjunction with Parameter 45, defines how Aux7 through Aux10 respond when the DeviceNet network is idle. When set to "1," the relays holds the state commanded prior to the network idle condition. When set to "0," the relays open or close as determined by the setting of Parameter 45.	Parameter Number	44
	Access Rule	Get/Set
	Data Type	BOOL
	Aux. Outputs	
	Units	–
	Minimum Value	0 = Go to FltValue (#45)
	Maximum Value	1 = Hold Last State
	Default Value	0
GRPC DN IDLVALUE This parameter determines the state that Aux7 through Aux10 assume when the DeviceNet network is idle and Parameter 44 is set to "0."	Parameter Number	45
	Access Rule	Get/Set
	Data Type	BOOL
	Aux. Outputs	
	Units	–
	Minimum Value	0 = Open
	Maximum Value	1 = Closed
	Default Value	0

Miscellaneous Parameters

SET TO DEFAULTS This parameter provides a method for resetting the SEL relay, DeviceNet Card, or both. 0 = No action 1 = Set all defaults 2 = Set DeviceNet defaults 3 = Set SEL relay defaults	Parameter Number	46
	Access Rule	Get/Set
	Data Type	BYTE
	Misc. Outputs	
	Units	–
	Minimum Value	0
	Maximum Value	3
	Default Value	0

Appendix B: DeviceNet Information

This appendix contains information about specific DeviceNet topics listed below:

- Electronic data sheets
- Product codes
- DeviceNet object classes

Electronic Data Sheets

Electronic Data Sheet (EDS) files are specially formatted ASCII files that provide all of the information necessary for configuration tool software (e.g., RSNetWorx for DeviceNet) to access and alter the device parameters. The EDS file contains all the parameter information for a device: number of parameters; groupings; parameter name; minimum, maximum, and default values; units; and data format and scaling.

Some configuration tool software can build EDS files automatically because the SEL relay contains all of the information necessary for an EDS file. The first 100 parameters of the extracted EDS file will have errors in some of the legends, whereas the EDS files distributed on the SEL relay product literature CD and provided on the website have the correct legends, as documented in *Appendix A: Parameter Information*.

Product Codes

Configuration tool software uses product codes to identify the EDS file to use for a given device. The SEL relay has a product code of 100 (64 hex).

DeviceNet Objects

The SEL relay supports the following DeviceNet object classes:

Class	Object
0x0001	Identity
0x0002	Message Router
0x0003	DeviceNet
0x0004	Assembly
0x0005	Connection
0x0008	Discrete Input Point
0x0009	Discrete Output Point
0x000F	Parameter Object
0x0010	Parameter Group Object
0x001E	Discrete Output Group
0x0029	Control Supervisor
0x002B	Acknowledge Handler
0x002C	Overload Object
0x00B4	DN Interface Object

Identity Object–CLASS CODE 0x0001

The following class attributes are supported for the Identity Object:

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	Revision	UINT	1

The table below shows Instance 1 attributes of the Identity Object. Each instance of the Identity Object contains the following attributes:

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	Vendor	UINT	1
2	Get	Device Type	UINT	3
3	Get	Product Code	UINT	100 (64 hex)
4	Get	Revision Major Revision Minor Revision	Structure of: USINT USINT	0RRRMMMM 0 = reserved by DeviceNet RRR = Revision of Motor Relay MMMM = Revision of DNet card
5	Get	Status	WORD	Bit 0 0 = not owned 1 = owned by master Bit 2 0 = Factory Defaulted 1 = Configured Bit 8 Minor Recoverable fault Bit 9 Minor Unrecoverable fault Bit 10 Major Recoverable fault Bit 11 Major Unrecoverable fault
6	Get	Serial Number	UDINT	Unique number for each device
7*	Get	Product Name String Length ASCII String	Structure of: USINT STRING	SEL relay
9	Get	Configuration Consistency Value	UINT	Unique value depending on output of the parameter checksum algorithm.

The following common services are implemented for the Identity Object:

Service Code	Implemented for:		Service Name
	Class	Instance	
0x0E	No	Yes	Get_Attribute_Single
0x05	No	Yes	Reset

Message Router–CLASS CODE 0x0002

No class or instance attributes are supported. The message router object exists CODE only to route explicit messages to other objects.

DeviceNet Object–CLASS CODE 0x0003

The following class attributes are supported for the DeviceNet Object:

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	Revision	UINT	2

Only Instance 1 of the DeviceNet Object is supported. The following instance attributes are supported:

Attribute ID	Access Rule	Name	Data Type	Value
1	Get/Set	Node Address	USINT	0–63
2	Get/Set	Baud Rate	USINT	0 = 125 K 1 = 250 K 2 = 500 K
5	Get	Allocation Info Allocation Choice Master Node Addr	Structure of: BYTE USINT	Allocation_byte[a] 0–63 = address 255 = unallocated
8	Get	MAC ID Switch Value	USINT	0–63

[a] Allocation_byte Bit 0 Explicit messaging
Bit 1 Polled I/O
Bit 4 COS I/O
Bit 5 Cyclic I/O
Bit 6 Acknowledge Suppression

The following services are implemented for the DeviceNet Object:

Service Code	Implemented for:		Service Name
	Class	Instance	
0x0E	Yes	Yes	Get_Attribute_Single
0x10	No	Yes	Set_Attribute_Single
0x4B	No	Yes	Allocate_Master/Slave _Connection_Set
0x4C	No	Yes	Release_Master/Slave _Connection_Set

Assembly Object–CLASS CODE 0x000 4

The following class attributes are supported for the Assembly Object:

Attribute ID	Access Rule	Name	Data Type	Value
2	Get	Max Instance	UINT	189

All of the various instances of the assembly object support Attribute 3, Data. Details about the specific content of the data attribute for each of the instances are described after the following summary Assembly Object Instance table:

Instance	Type	Description
2	Consumed	Required ODVA Consumed Instance
50	Produced	Required ODVA Produced Instance
51	Produced	ODVA Starter
100	Produced	Custom Parameter Based Word Wise Assembly
101	Produced	SEL relay Average Current Overload
102	Produced	SEL relay Phase Current Overload
103	Produced	SEL relay Current Overload
104	Produced	SEL relay Misc. Information Overload
150	Consumed	Standard Overload
180	Produced	Auxiliary Inputs
181	Consumed	Auxiliary Outputs
185	Produced	Trip Status 1
186	Produced	Trip Status 2
187	Produced	Warn Status 1
188	Produced	Warn Status 2
189	Produced	Module Status Bits

Custom Parameter Based Input (Produced) Assembly Instance 100

Instance 100									
Word	Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	0	Value of the parameter pointed to by “Produced Word 0 Param” (low byte)							
	1	Value of the parameter pointed to by “Produced Word 0 Param” (high byte)							
1	2	Value of the parameter pointed to by “Produced Word 1 Param” (low byte)							
	3	Value of the parameter pointed to by “Produced Word 1 Param” (high byte)							
2	4	Value of the parameter pointed to by “Produced Word 2 Param” (low byte)							
	5	Value of the parameter pointed to by “Produced Word 2 Param” (high byte)							
3	6	Value of the parameter pointed to by “Produced Word 3 Param” (low byte)							
	7	Value of the parameter pointed to by “Produced Word 3 Param” (high byte)							
4	8	Value of the parameter pointed to by “Produced Word 4 Param” (low byte)							
	9	Value of the parameter pointed to by “Produced Word 4 Param” (high byte)							
5	10	Value of the parameter pointed to by “Produced Word 5 Param” (low byte)							
	11	Value of the parameter pointed to by “Produced Word 5 Param” (high byte)							
6	12	Value of the parameter pointed to by “Produced Word 6 Param” (low byte)							
	13	Value of the parameter pointed to by “Produced Word 6 Param” (high byte)							
7	14	Value of the parameter pointed to by “Produced Word 7 Param” (low byte)							
	15	Value of the parameter pointed to by “Produced Word 7 Param” (high byte)							

Standard Input (Produced) Assemblies

Instance 50 is the required input (produced) assembly defined in the DeviceNet Motor Overload Profile.

Instance 50 ODVA Overload								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0								Fault

Instance 51 is the required input (produced) assembly defined in the DeviceNet Motor Starter Profile.

Instance 51 ODVA Starter								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0							Warning	Fault

Instance 101 is the SEL Relay Average Current Overload Input (produced) assembly.

Instance 101 SEL Relay Average Current Overload								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0							Warning	Tripped
1	Reserved							
2	Average 3 Phase Current (low)							
3	Average 3 Phase Current (high)							

Instance 102 is the SEL Relay Phase Current Input (produced) assembly.

Instance 102 SEL Relay Phase Current								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0							Warning	Tripped
1	Reserved							
2	Current Phase A (low)							
3	Current Phase A (high)							
4	Current Phase B (low)							
5	Current Phase B (high)							
6	Current Phase C (low)							
7	Current Phase C (high)							

Instance 103 is the SEL Relay Current Input (produced) assembly.

Instance 103 SEL Relay Current								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0							Warning	Tripped
1	% Thermal Capacity Used							
2	Average 3 Phase Current (low)							
3	Average 3 Phase Current (high)							
4	% Current Imbalance							

Instance 104 is the SEL Relay Misc. Input (produced) assembly.

Instance 104 SEL Relay Misc.								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0							Warning	Tripped
1	% Thermal Capacity Used							
2	Average 3 Phase Current (low)							
3	Average 3 Phase Current (high)							
4	% Current Imbalance							
5	Max value of all Temperature sensors							
6	Neutral Current (low)							
7	Neutral Current (high)							

This is a “Read Only” status assembly.

Instance 180 Hardware Inputs 1–8								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Input IN8[a]	Input IN7[a]	Input IN6[a]	Input IN403	Input IN402	Input IN401	Input IN102	Input IN101
1								

[a] Not supported.

This is a “Read Only” status assembly. The bit descriptions are the same as those for parameter #3. The following descriptions apply to the SEL-710 and SEL-749 relays; for bit descriptions in other relays, refer to *page A.3*.

Instance 185 Trip Status 1								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Ground Curr	PTC	RTD Wind	Overcurrent	Cur Imbal	Jam	Undercurrent	Overload
1	Neutral Curr	Sp Switch	P Factor	Ph Rev	Over V	Under V	Under power	VAR

This is a “Read Only” status assembly. The bit descriptions are the same as those for parameter #4. The following descriptions apply to the SEL-710 and SEL-749 relays; for bit descriptions in other relays, refer to *page A.4*.

Instance 186 Trip Status 2								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0		RTD Err	PTC Err	RTD Amb	RTD Other	Freq 2	Freq 1	Stall
1	Bkr Fail		87M Differential	Config Flt	Comm Flt	Remote	Comm Idle	Comm Loss

This is a “Read Only” status assembly. The bit descriptions are the same as those for parameter #5. The following descriptions apply to the SEL-710 and SEL-749 relays; for bit descriptions in other relays, refer to *page A.5*.

Instance 187 Warning Status 1								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Ground Curr	Neutral Curr	P Factor	RTD Wind	Cur Imbal	Jam	Undercurrent	Overload
1	RTD-Other	Freq 2	Freq 1	Sp Switch	Over V	Under V	Under power	VAR

This is a "Read Only" status assembly. The bit descriptions are the same as those for parameter #6. The following descriptions apply to the SEL-710 and SEL-749 relays; for bit descriptions in other relays, refer to *page A.6*.

Instance 188 Warning Status 2								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Overcurrent					Warning	SALARM	RTD-Amb
1								

This is a "Read Only" status assembly.

Instance 189 Module Status								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0				I/O Idle	I/O Flt	Exp Flt	I/O Cnxn	Exp Cnxn
1						OUT103	Warning	Trip

Standard Output Assemblies

Instance 2 is the required output (consumed) assembly defined in the Motor (Consumed) Overload Profile.

Instance 3 ODVA Overload								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0						Flt Reset		

Instance 150 is the standard output (consumed) assembly with Network Inputs.

Instance 150 Standard Consumed Starter								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Aux 8	Aux 7	DNAUX6	DNAUX5	DNAUX4	DNAUX3	DNAUX2	DNAUX1
1	Flt Reset						Aux 10	Aux 9

This is a "Read/Write" control assembly.

Instance 181 Hardware Outputs 1–6								
Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Aux 8[a]	Aux 7[a]	OUT404	OUT403	OUT402	OUT401	OUT102	OUT101
1							Aux 10[a]	Aux 9[a]

[a] Not supported.

Connection Object–CLASS CODE 0x0005

No class attributes are supported for the Connection Object. Multiple instances of the Connection Object are supported, Instances 1, 2, and 4 from the Group 2 predefined master/slave connection set, and Instances 5–7 are available explicit UCMM connections.

Instance 1 is the Predefined Group 2 Connection Set Explicit Message Connection. The following Instance 1 attributes are supported:

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	State	USINT	0 = nonexistent 3 = established 1 = configuring 4 = timed out
2	Get	Instance Type	USINT	0 = Explicit Message
3	Get	Transport Class Trigger	USINT	0x83–Server, Transport Class 3
4	Get	Produced Connection ID	UINT	10xxxxxx011 (xxxxxx = node address)
5	Get	Consumed Connection ID	UINT	10xxxxxx100 (xxxxxx = node address)
6	Get	Initial Comm Characteristics	USINT	0x22
7	Get	Produced Connection Size	UINT	0x61
8	Get	Consumed Connection Size	UINT	0x61
9	Get/Set	Expected Packet Rate	UINT	in milliseconds
12	Get	Watchdog Action	USINT	01 = auto delete 03 = deferred delete
13	Get	Produced Connection Path Length	UINT	0
14	Get	Produced Connection Path		Empty
15	Get	Consumed Connection Path Length	UINT	0
16	Get	Consumed Connection Path		Empty

Instance 2 is the Predefined Group 2 Connection Set Polled IO Message Connection. The following Instance 2 attributes are supported:

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	State	USINT	0 = nonexistent 3 = established 1 = configuring 4 = timed out
2	Get	Instance Type	USINT	1 = I/O Connection
3	Get	Transport Class Trigger	USINT	0x82 - Server, Transport Class 2 (If alloc_choice ! = polled and ack suppression is enabled then value = 0x80)
4	Get	Produced Connection ID	UINT	01111xxxxxx x (xxxxx = node address)
5	Get	Consumed Connection ID	UINT	10xxxxxx101 (xxxxxx = node address)
6	Get	Initial Comm Characteristics	USINT	0x21
7	Get	Produced Connection Size	UINT	0 to 8
8	Get	Consumed Connection Size	UINT	0 to 8
9	Get/Set	Expected Packet Rate	UINT	in milliseconds
12	Get/Set	Watchdog Action	USINT	0 = transition to timed out 1 = auto delete 2 = auto reset
13	Get	Produced Connection Path Length	UINT	8
14	Get/Set	Produced Connection Path		21 04 00 25 (assy inst #) 00 30 03
15	Get	Consumed Connection Path Length	UINT	8
16	Get/Set	Consumed Connection Path		21 04 00 25 (assy inst #) 00 30 03

Instance 4 is the Predefined Group 2 Connection Set Change of State / Cyclic IO Message Connection. The following Instance 4 attributes are supported:

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	State	USINT	0 = nonexistent 3 = established 1 = configuring 4 = timed out
2	Get	Instance Type	USINT	1 = I/O Connection
3	Get	Transport Class Trigger	USINT	0x00 (Cyclic, unacknowledged) 0x03 Cyclic, acknowledged) 0x10 (COS, unacknowledged) 0x13 (COS, acknowledged)
4	Get	Produced Connection ID	UINT	01101xxxxxx (xxxxxx = node address)
5	Get	Consumed Connection ID	UINT	10xxxxxx101 (xxxxxx = node address)
6	Get	Initial Comm Characteristics	USINT	0x02 (acknowledged) 0x0F (unacknowledged)
7	Get	Produced Connection Size	UINT	0 to 8
8	Get	Consumed Connection Size	UINT	0 to 8
9	Get/Set	Expected Packet Rate	UINT	in milliseconds
12	Get	Watchdog Action	USINT	0 = transition to timed out 1 = auto delete 2 = auto reset
13	Get	Produced Connection Path Length	UINT	8
14	Get	Produced Connection Path		21 04 00 25 (assy inst #) 00 30 03
15	Get	Consumed Connection Path Length	UINT	8
16	Get/Set	Consumed Connection Path		21 04 00 25 (assy inst #) 00 30 03

Instances 5–7 are available Group 3 explicit message connections that are allocated through the UCMM. The following attributes are supported:

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	State	USINT	0 = nonexistent 3 = established 1 = configuring 4 = timed out
2	Get	Instance Type	USINT	0 = Explicit Message
3	Get	Transport Class Trigger	USINT	0x83–Server, Transport Class 3
4	Get	Produced Connection ID	UINT	Depends on message group and Message ID
5	Get	Consumed Connection ID	UINT	Depends on message group and Message ID
6	Get	Initial Comm Characteristics	USINT	0x33 (Group 3)
7	Get	Produced Connection Size	UINT	0
8	Get	Consumed Connection Size	UINT	
9	Get/Set	Expected Packet Rate	UINT	in milliseconds
12	Get	Watchdog Action	USINT	01 = auto delete 03 = deferred delete
13	Get	Produced Connection Path Length	UINT	0
14	Get	Produced Connection Path		Empty
15	Get	Consumed Connection Path Length	UINT	0
16	Get	Consumed Connection Path		Empty

The following services are implemented for the Connection Object:

Service Code	Implemented for:		Service Name
	Class	Instance	
0x05	No	Yes	Reset
0x0E	No	Yes	Get_Attribute_Single
0x10	No	Yes	Set_Attribute_Single

Discrete Input Point Object—CLASS CODE 0x0008

The following class attributes are supported for the Discrete Input Point Object:

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	Revision	UINT	2
2	Get	Max Instance	UINT	2, 5, or 8

Five Instances of the Discrete Input Point Object are supported. All instances contain the following attributes:

Attribute ID	Access Rule	Name	Data Type	Value
3	Get	Value	BOOL	0 = OFF, 1 = ON

The following common services are implemented for the Discrete Input Point Object:

Service Code	Implemented for:		Service Name
	Class	Instance	
0x0E	Yes	Yes	Get_Attribute_Single
0x10	No	Yes	Set_Attribute_Single

Discrete Output Point Object—CLASS CODE 0x0009

The following class attributes are supported for the Discrete Output Point Object:

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	Revision	UINT	1
2	Get	Max Instance	UINT	10

Six Instances of the Discrete Output Point Object are supported. All instances contain the following attributes:

Attribute ID	Access Rule	Name	Data Type	Value
3	Get	Value	BOOL	0 = OFF, 1 = ON

The following common services are implemented for the Discrete Output Point Object:

Service Code	Implemented for:		Service Name
	Class	Instance	
0x0E	Yes	Yes	Get_Attribute_Single
0x10	No	Yes	Set_Attribute_Single

Discrete Output Point Object Special Requirements

Many sources can control a relay output when assigned for "Network" use: an I/O message, an explicit message, network fault and idle conditions, and protection fault conditions. You must assign the data source that drives an output point value attribute. Refer to the appropriate SEL relay instruction manual for setting relay output contacts.

Control SEL relay contact outputs from the DeviceNet network. Assign network bits DNAux1 through DNAux6 to Outputs OUT101 and OUT102, and Outputs OUT401 through OUT404 as needed. Outputs follow the rules described in *Figure B.1*.

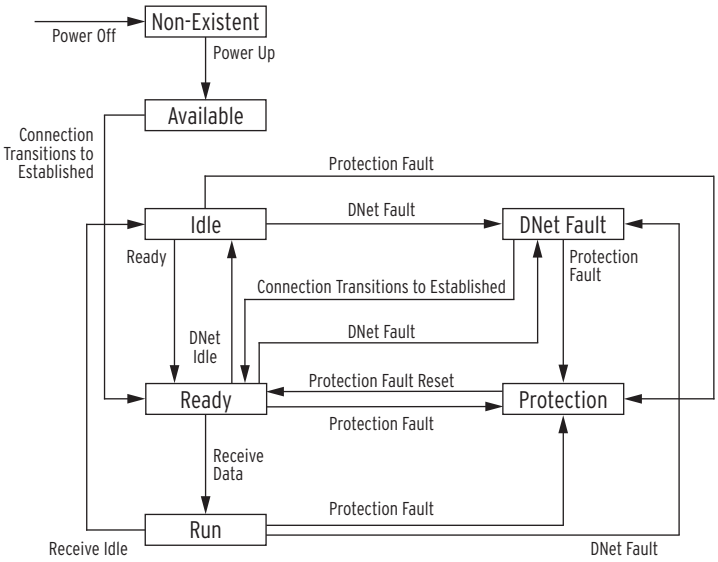

Figure B.1 State Transition Diagram

Parameter Object—CLASS CODE 0x000F

The following class attributes are supported for the Parameter Object:

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	Revision	UINT	
2	Get	Max Instance	UINT	
8	Get	Parameter Class Descriptor	WORD	
9	Get	Configuration Assembly Instance	UINT	0

There is a standard set of instances reserved (1–100) for DeviceNet Card specific parameters. These instances are followed by the motor relay parameters.

See the appropriate SEL relay instruction manual for details about each motor relay parameter instance.

The following common services are implemented for the Parameter Object:

Service Code	Implemented for:		Service Name
	Class	Instance	
0x0E	Yes	Yes	Get_Attribute_Single
0x10	No	Yes	Set_Attribute_Single
0x01	No	Yes	Get_Attributes_All

The following instance attributes are implemented for all parameter attributes:

Attribute ID	Access Rule	Name	Data Type	Value
1	Get/Set	Value	Specified in Descriptor	
2	Get	Link Path Size	USINT	
3	Get	Link Path	Array of: BYTE EPATH	
4	Get	Descriptor	WORD	
5	Get	Data Type	EPATH	
6	Get	Data Size	USINT	
7	Get	Parameter Name String	SHORT_STRING	
8	Get	Units String	SHORT_STRING	
9	Get	Help String	SHORT_STRING	
10	Get	Minimum Value	Specified in Descriptor	
11	Get	Maximum Value	Specified in Descriptor	
12	Get	Default Value	Specified in Descriptor	
13	Get	Scaling Multiplier	UINT	
14	Get	Scaling Divisor	UINT	
15	Get	Scaling Base	UINT	
16	Get	Scaling Offset	INT	
17	Get	Multiplier Link	UINT	
18	Get	Divisor Link	UINT	
19	Get	Base Link	UINT	
20	Get	Offset Link	UINT	
21	Get	Decimal Precision	USINT	

Parameter Group Object–CLASS CODE 0x0010

The following class attributes are supported for the Parameter Object:

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	Revision	UINT	
2	Get	Max Instance	UINT	

The DeviceNet Card provides the following parameter group object instances:

- Instance 1 = Status Parameters
- Instance 2 = DeviceNet Parameters
- Instance 3 = User I/O Parameters
- Instance 4 = Misc.
- Instance 5–*n* = Motor Relay specific parameter groups (refer to Parameter group region of Modbus Map in the appropriate SEL relay instruction manual).

The following instance attributes are supported for all parameter group instances:

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	Group Name String	SHORT_STRING	
2	Get	Number of Members	UINT	
3	Get	1st Parameter	UINT	
4	Get	2nd Parameter	UINT	
n	Get	*n*th Parameter	UINT	

The following common services are implemented for the Parameter Group Object:

Service Code	Implemented for:		Service Name
	Class	Instance	
0x0E	Yes	Yes	Get_Attribute_Single

Discrete Output Group Object–CLASS CODE 0x001E

No class attributes are supported for the Discrete Output Group Object. Supported instances of the Discrete Output Group Object are listed below.

Instance 1 contains the following attributes:

Attribute ID	Access Rule	Name	Data Type	Value
3	Get	Number of Instances	USINT	10
4	Get	Binding	Array of UINT	List of DOP instances
6	Get/Set	Command	BOOL	0 = idle and 1 = run

Instance 2 contains the following attributes:

Attribute ID	Access Rule	Name	Data Type	Value
3	Get	Number of Instances	USINT	2
4	Get	Binding	Array of UINT	1, 2
7	Get/Set	Fault Action	BOOL	0 = Fault Value attribute 1 = Hold Last State
8	Get/Set	Fault Value	BOOL	0 = OFF 1 = ON
9	Get/Set	Idle Action	BOOL	0 = Fault Value attribute 1 = Hold Last State
10	Get/Set	Idle Value	BOOL	0 = OFF 1 = ON
113	Get/Set	Pr Fault Action	BOOL	0 = Pr Fault Value attribute 1 = Ignore
114	Get/Set	Pr Fault Value	BOOL	0 = OFF 1 = ON

Instance 3 contains the following attributes:

Attribute ID	Access Rule	Name	Data Type	Value
3	Get	Number of Instances	USINT	4
4	Get	Binding	Array of UINT	3, 4, 5, 6
7	Get/Set	Fault Action	BOOL	0 = Fault Value attribute 1 = Hold Last State
8	Get/Set	Fault Value	BOOL	0 = OFF 1 = ON
9	Get/Set	Idle Action	BOOL	0 = Fault Value attribute 1 = Hold Last State
10	Get/Set	Idle Value	BOOL	0 = OFF 1 = ON
113	Get/Set	Pr Fault Action	BOOL	0 = Pr Fault Value attribute 1 = Ignore
114	Get/Set	Pr Fault Value	BOOL	0 = OFF 1 = ON

Instance 4 contains the following attributes:

Attribute ID	Access Rule	Name	Data Type	Value
3	Get	Number of Instances	USINT	4
4	Get	Binding	Array of UINT	7, 8, 9, 10
7	Get/Set	Fault Action	BOOL	0 = Fault Value attribute 1 = Hold Last State
8	Get/Set	Fault Value	BOOL	0 = OFF 1 = ON
9	Get/Set	Idle Action	BOOL	0 = Fault Value attribute 1 = Hold Last State
10	Get/Set	Idle Value	BOOL	0 = OFF 1 = ON
113	Get/Set	Pr Fault Action	BOOL	0 = Pr Fault Value attribute 1 = Ignore
114	Get/Set	Pr Fault Value	BOOL	0 = OFF 1 = ON

The following common services are implemented for the Discrete Input Group Object:

Service Code	Implemented for:		Service Name
	Class	Instance	
0x0E	No	Yes	Get_Attribute_Single
0x10	No	Yes	Set_Attribute_Single

Control Supervisor Object–CLASS CODE 0x0029

No class attributes are supported.

Only Instance 1 of the Control Supervisor Object is supported. The following instance attributes are supported:

Attribute ID	Access Rule	Name	Data Type	Value
10	Get	Tripped	BOOL	
11	Get	Warning	BOOL	
12	Get/Set	Fault Reset	BOOL	0->1 = Trip Reset

The following common services are implemented for the Control Supervisor Object:

Service Code	Implemented for:		Service Name
	Class	Instance	
0x0E	No	Yes	Get_Attribute_Single
0x10	No	Yes	Set_Attribute_Single

Acknowledge Handler Object–CLASS CODE 0x002b

No class attributes are supported for the Acknowledge Handler Object.

Only Instance 1 of the Acknowledge Handler Object is supported. The following instance attributes are supported:

Attribute ID	Access Rule	Name	Data Type	Value
1	Get/Set	Acknowledge Timer	UINT	milliseconds
2	Get	Retry Limit	USINT	1
3	Get	COS Producing Connection Instance	UINT	4

The following common services are implemented for the Acknowledge Handler Object:

Service Code	Implemented for:		Service Name
	Class	Instance	
0x0E	No	Yes	Get_Attribute_Single
0x10	No	Yes	Set_Attribute_Single

Overload Object–CLASS CODE 0x002c

No class attributes are supported for the Overload Object. Only Instance 1 of the Overload Object is supported.

Attribute ID	Access Rule	Name	Data Type	Value
5	Get	Average Current	UINT	*xxx.x* amps
6	Get	%Phase Imbalance	USINT	*xxx*% FLA
7	Get	% Thermal Capacity Used	USINT	*xxx*% FLA
8	Get	Current IA	UINT	*xxx.x* amps
9	Get	Current IB	UINT	*xxx.x* amps
10	Get	Current IC	UINT	*xxx.x* amps
11	Get	Ground Current	UINT	*xxx.x* amps

The following common services are implemented for the Overload Object:

Service Code	Implemented for:		Service Name
	Class	Instance	
0x0E	No	Yes	Get_Attribute_Single
0x10	No	No	Set_Attribute_Single

DeviceNet Interface Object–CLASS CODE 0x00B4

The following class attributes are supported for the DeviceNet Interface Object:

Attribute ID	Access Rule	Name	Data Type	Value
1	Get	Revision	UINT	02

Only Instance 1 of the DeviceNet Interface Object is supported:

Attribute ID	Access Rule	Name	Data Type	Min/Max	Default	Description
7	Get/Set	Prod Assy Word 0	UINT		1	Defines Word 0 of Assy 100
8	Get/Set	Prod Assy Word 1	UINT		5	Defines Word 1 of Assy 100
9	Get/Set	Prod Assy Word 2	UINT		6	Defines Word 2 of Assy 100
10	Get/Set	Prod Assy Word 3	UINT		7	Defines Word 3 of Assy 100
15	Get/Set	Autobaud Enable	BOOL	0,1	1	1= enabled 0 = disabled
16	Get/Set	Consumed Assy	USINT	0–185	150	
17	Get/Set	Produced Assy	USINT	0–185	103	
19	Get/Set	Set To Defaults	BOOL	0,1	0	0=No action 1=Reset
23	Get	I/O Produced Size	USINT	0–16		Read only
24	Get	I/O Consumed Size	USINT	0–8		Read only
30	Get	DeviceNet Voltage	UINT			Read only
50	Get/Set	PNB COS Mask	WORD	0–0x00FF	0	Change of state mask for PNBs
55	Get/Set	Prod Assy Word 4	UINT		0	Defines Word 4 of Assy 100
56	Get/Set	Prod Assy Word 5	UINT		0	Defines Word 5 of Assy 100
57	Get/Set	Prod Assy Word 6	UINT		0	Defines Word 6 of Assy 100
58	Get/Set	Prod Assy Word 7	UINT		0	Defines Word 7 of Assy 100
65	Get/Set	Status COS Mask 1	UINT	0–ffff	0	
66	Get/Set	Status COS Mask 2	UINT	0–ffff	0	
67	Get/Set	Trip COS Mask 1	UINT	0–ffff	0	
68	Get/Set	Trip COS Mask 2	UINT	0–ffff	0	
69	Get/Set	Warning COS Mask 1	UINT	0–ffff	0	
70	Get/Set	Warning COS Mask 2	UINT	0–ffff	0	

The following common services are implemented for the DeviceNet Interface Object:

Service Code	Implemented for:		Service Name
	Class	Instance	
0x0E	No	Yes	Get_Attribute_Single
0x10	No	Yes	Set_Attribute_Single

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