



ADJUSTABLE FREQUENCY DRIVES

**SV9000 AF DRIVES
DEVICENET
OPTION BOARD**

Instruction Leaflet

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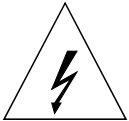
1. INTRODUCTION

SV9000 drives can be connected to DeviceNet using the SV9NCDN fieldbus board. The drive can then be controlled, monitored and programmed from the Host system.

SV9NCDN meets the requirements of the ODVA 2.0 specifications for the AC/DC Drives profile.

The DeviceNet board shall be installed in the space reserved for it inside the SV9000 adjustable frequency drive.

This instruction leaflet must be thoroughly read and understood before using the DeviceNet option board. Please keep this instruction leaflet in a safe place for future reference.

WARNING !

Internal components and circuit boards are at high potential when the drive is connected to the power source. This voltage is extremely dangerous and may cause death or severe injury if you come in contact with it.

2. SPECIFICATIONS

Table 1. SV9NCDN DeviceNet Specification

DeviceNet Connections	Interface	Pluggable connector (5.08mm)
	Transfer method	CAN
	Transfer cable	2 wire twisted shielded cable with 2 wire bus power cable and drain
	Electrical isolation	500 V DC
Communications	ODVA 2.0 Compliant	
	Message types	IO Polling Explicit
	Baud rates	125 Kbaud 250 Kbaud 500 Kbaud
	Product Code	90
	Product Type	2 (AC Drive)
	Vendor ID	68 (Cutler-Hammer)
Electrical	DeviceNet	Network supply voltage: 11 to 25 V DC Network input current: 28 mA typical, 125 mA inrush (24 V DC)
	Other	All other power derived from SV9000 inverter power supply
Environment	Ambient operating temperature	-10 to 55 °C
	Storage temperature	-40 to 60 °C
	Humidity	< 95%, no condensation allowed
	Altitude	Max. 1000 meters
	Vibration	0.5G 9-200 Hz
Safety		Fulfils EN50178 standard
Certification	CE, UL.	CE Mark and UL Listed/Approve

3. INSTALLATION

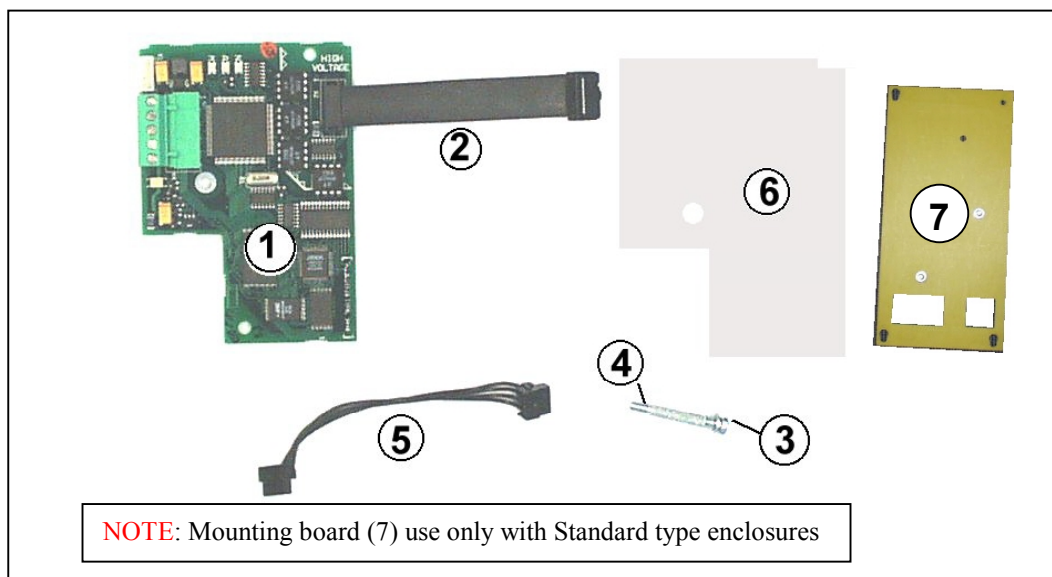
3.1 Installation of the SV9NCDN in Compact Nema 1 type Enclosure Adjustable Frequency Drive

The DeviceNet board must be installed according to the instructions below (see table 3-1).

NOTE! These instructions apply only to field installations. Otherwise, the board has already been installed at the factory.

Before doing any commissioning, carefully read the safety instructions in the "SV9000 AF drive, User Manual" Chapter "SAFETY".


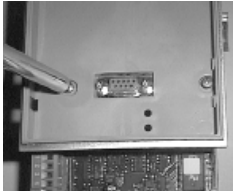
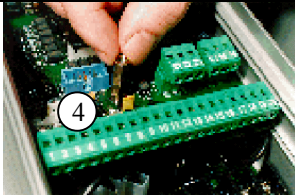
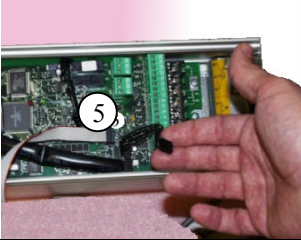
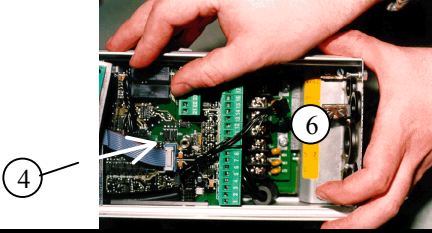
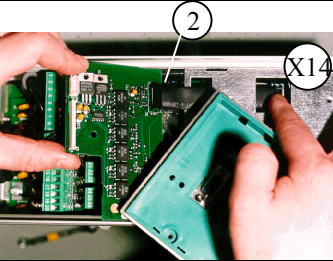
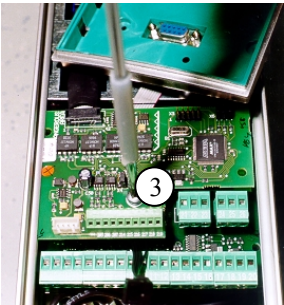
Verify receipt of all the DeviceNet board parts: **DeviceNet board (1)**, **data cable (blue terminal) (2)**, **fixing screw (3)**, **stand sleeve (4)**, **power cable (black terminal) (5)**, **protective plastic board (6)**, and **mounting board (7)**. See Figure below.

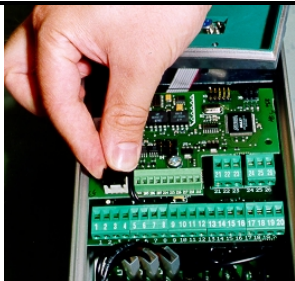



If the delivery does not correspond to your order, please contact the supplier immediately. Only qualified persons should carry out the electrical installation

Disconnect the SV9000 AF Drive from the power source. Wait 5 minutes before opening the cover of the Drive

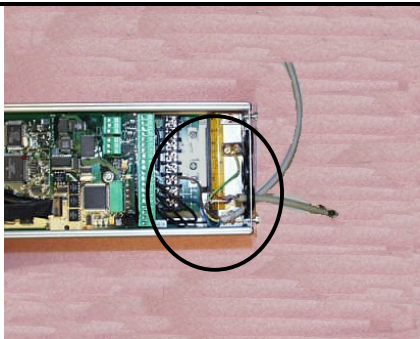
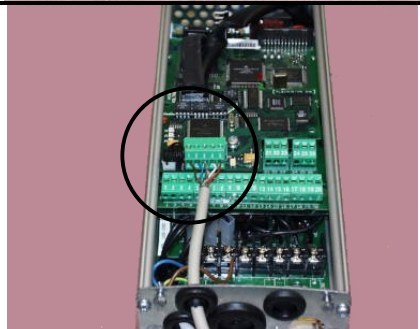
Table 3-1

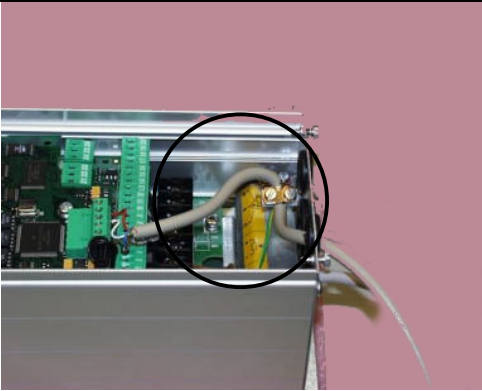
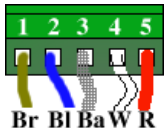
A	<p>Remove the control panel and the panel base.</p>  
B	<p>Remove the fixing screw from the control board and replace it with a stand sleeve (4).</p> 
C	<p>Connect the power cable (5) to terminal X5 of the control board. The power cable can also be connected to terminal X6 if terminal X5 is already in used by the power cable from the power board.</p> 
D	<p>Remove the protective foil from the control board and place the protective plastic board (6) above the control board. Be sure to place the plastic board correctly so that the stand sleeve (4) comes out through the hole on the board.</p> 
E	<p>Place the DeviceNet board (1) on the protective plastic board (6) and connect the data cable (2) to terminal X14 of the control board. The data cable (2) must be routed under metal shroud through the holes provided. The stand sleeve should come out through the metal-edged hole.</p> 
F	<p>Secure the DeviceNet board on the stand sleeve with the screw (3) attached.</p> 

G	Connect the power cable (5) to terminal X1 on the SV9NCDN.	
H	Attach the control panel base with the four screws.	
I	Check the connections. Remove all foreign objects inside the AF drive. Continue with the instructions for connecting the DeviceNet drop-line cable.	

3.1.1 Connection of DeviceNet drop-line cable [Compact NEMA 1 Enclosure]

The following instructions guide you through the connection of the SV9NCDN to the DeviceNet system, the power-up of the board and the grounding.

A	Feed the DeviceNet drop-line cable through the upper left rubber-covered hole on the bottom of the SV9000 drive.	
B	Connect the 4 colored wires into connector X4 in the following order from left: black, blue, NONE, white, red . Bend the bare cable in the middle backwards along the drop-line cable. See point C below.	

C	<p>DeviceNet shield must not be grounded to the drive chassis. The shield should be connected to terminal 3 on the DeviceNet connector. It is allowed to leave the shield unconnected at the connector.</p>	 
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3.2 Installation of the SV9NCDN in Standard type Enclosure Adjustable Frequency Drives

The DeviceNet fieldbus board must be installed according to the instructions below (see table 3-2).

NOTE! These instructions apply only to field installations. Otherwise, the board has already been installed at the factory.

Before doing any commissioning, carefully read the safety instructions in the “SV9000 AF drive, User Manual” Chapter “SAFETY”.

Verify receipt of all the DeviceNet board parts: **DeviceNet board (1)**, **data cable (blue terminal) (2)**, **fixing screw (3)**, **stand sleeve (4)**, **power cable (black terminal) (5)**, **protective plastic board (6)**, and **mounting board (7)**. See Figure below.

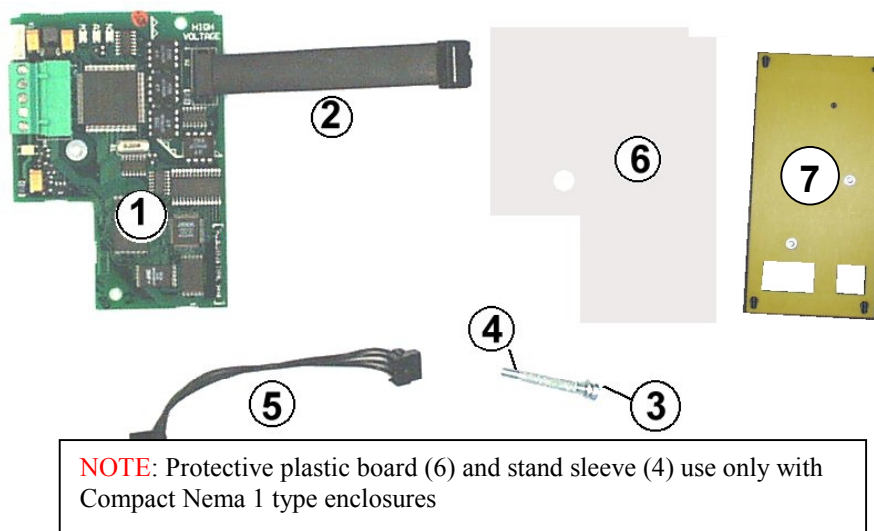


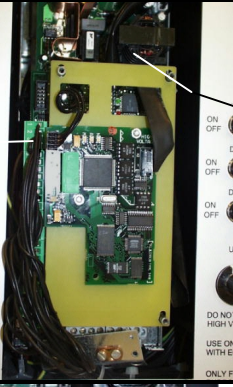


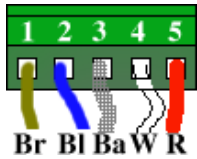
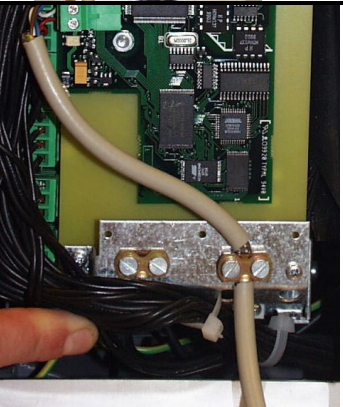


Table 3-2

A	Attach the DeviceNet fieldbus board (1) on the mounting board (7) with the two screws attached. Make sure that the installation is stable	
B	Connect the other end of the power cable (5) to terminal X5 of the control board. The power cable can also be connected to terminal X6 if terminal X5 is already in use by the power cable from the power board	
C	Feed the power cable (5) through the smaller opening and connect it to terminal X1 on the SV9NCDN. Put also the data cable (2) through the larger opening and connect it to terminal X14 of the control board. Place the mounting board (7) with the SV9NCDN above the control board by the three stand-offs.	
D	Push the mounting board (7) downwards so that the narrow parts of the holes in the board hit the slots on the stand-offs. Secure the mounting board (7) with a screw at the lower left corner.	
E	Check the connections. Remove all foreign objects inside the AF drive. Continue with the instructions for connecting the DeviceNet drop-line cable.	

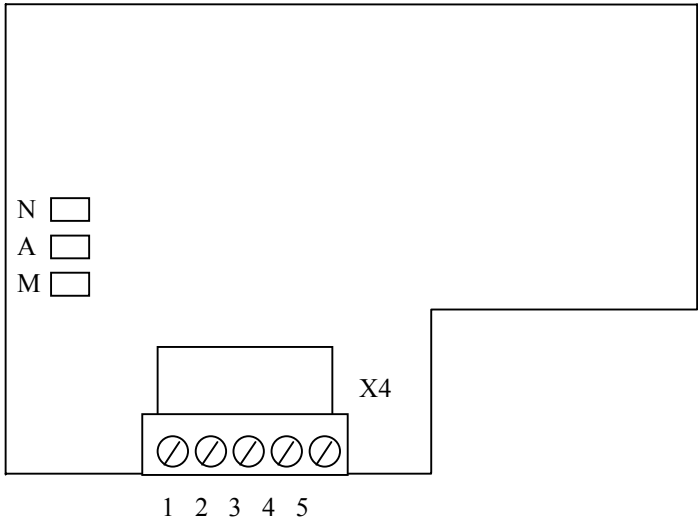
3.2.1 Connection of DeviceNet drop-line cable [Standard Enclosure]

The following instructions guide you through the connection of the SV9NCDN to the DeviceNet system, the power-up of the board and the grounding.

A	Feed the DeviceNet drop-line cable through the upper left rubber-covered hole on the bottom of the SV9000 drive.	
B	Connect the 4 coloured wires into connector X4 in the following order from left: black, blue, NONE, white, red . Bend the bare cable in the middle backwards along the drop-line cable. See point C below	
C	DeviceNet shield must not be grounded to the drive chassis. The shield should be connected to terminal 3 on the DeviceNet connector. It is allowed to leave the shield unconnected at the connector.	

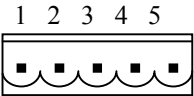
4. CONNECTIONS

4.1 Board layout



DeviceNetConnector (X4):

1	V-	Black
2	CAN_L	Blue
3	Drain	Bare
4	CAN_H	White
5	V+	Red



Diagnostic LED:

N	Network Status, bi-color (red/green)
A	Node Address, bi-color (red/green)
M	Module Status, bi-color (red/green)

LED Definitions see chapter 6.1

5. CONFIGURATION

NOTE: PLEASE SKIP THIS SECTION IF YOUR DEVICENET INTERFACE IS FACTORY INSTALLED

FIRST READ HOW TO COMMISSION THE DRIVE IN THE SV9000 DRIVE USER'S MANUAL (STARTUP)

Required Software Installation and Loading:

Install the SVLOAD program on your computer if not already installed on your computer.

- Insert the 3.5" diskette into the 'A drive' of your computer
- From a Windows operating system, click on the start button and select "Run" from the pop-up menu
- In the 'Open field space' type "A:\svload\setup" and click the 'OK' button
- Follow the installation instruction to complete the installation of the SVLOAD program.

Load the 'Fieldbus Control Application Software' onto the SV9000 drive if not already loaded.

- Use the 'SVDRIVE CABLE' to connect your PC's serial port to the RS-232 interface on the front panel of SV9000 drive after removing the panel keypad. Make sure that the drive is powered but not running.
- Launch the SVLOAD program on your computer and select the 'Application Button'
- Locate the application software file "smf073cg.hex" by using the browse button
- Power-up the SV9000 drive
- Click on the 'Start Button' to begin the loading of the application software
- You will be notified on completion of the loading process.
- Remove the 'SVDRIVE CABLE' from the SV9000 drive and replace the panel keypad.

Commissioning of the DeviceNet board:

Check that visibility for all parameter groups is selected. [Refer to SV9000 User's manual (control panel)]

- Parameter Conceal P1.15 = 0

Check that Fieldbus Control Application is selected. [Refer to SV9000 User's manual (control panel)]

- Application Selection P0.1 = 0

For further information about the description of parameters, see FieldBus Control Application Manual. More information on the loading and saving of system parameters can be found in the SV9000 Drive User's Manual, "System Parameter Group 0".

Set active control source to DeciveNet:

1. Check that the control panel is not the active control source.
(See SV9000 Drive User's manual, Control Panel.)
2. Check that parameter 10.1 "Fieldbus control select" is set to value 1(On).

DeviceNet Configuration Tool

Before using the SV9NCDN option board, you must configure the device baud rate and node address to the desired values. This can be accomplished by using a DeviceNet configuration tool (Cutler-Hammer "Netview", Allen Bradley "DeviceNet Manager", etc.). The default baud rate and node address is 125 Kbaud and 63, respectively. All devices must have the same baud rate.

Since all new devices are factory set to node address 63, it is usually not a good idea to leave the address set to 63.

You must also check or set the following attributes before use:

Basic and Motor Control Class (160) - Instance Attributes (1)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
26 0x1A	Polled Input Assembly Type	Get_Attribute_Single, Set_Attribute_Single	71 70 73	C7	Input assembly used by the polled connection
27 0x1B	Polled Output Assembly Type	Get_Attribute_Single, Set_Attribute_Single	21 20 23	C7	Output assembly used by the polled connection

Protection Class (166) - Instance Attributes (1)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
151 0x97	SafeStateType	Get_Attribute_Single, Set_Attribute_Single	0 0 2	C6	Selects Safe State response to errors which specify safe state operation. Currently only a loss of connection other than by de-allocation is a safe state error. Warning: Review the application for safe operation before specifying a value for this attribute. 0 = DriveFault (fault and stop) 1 = No Action (hold last speed) 2 = Preset Speed/Direction
152 0x98	PresetDir	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C1	Sets safe state direction of rotation if the Safe State Behavior attribute specifies "Preset Speed/Direction". Warning: Review the application for safe operation before specifying a value for this attribute. Inverter will require external stop. 0 = Forward 1 = Reverse
153 0x99	PresetRPM	Get_Attribute_Single, Set_Attribute_Single	0 0 30000	C7	Sets safe state speed reference (RPM) if the Safe State Behavior attribute specifies "Preset Speed/Direction". Warning: Review the application for safe operation before specifying a value for this attribute. Inverter will require external stop.
154 0x9A	PresetTq	Get_Attribute_Single, Set_Attribute_Single	0 0 10000	C7	Sets safe state torque reference (0.00%) if the Safe State Behavior attribute specifies "Preset Speed/Direction". Warning: Review the application for safe operation before specifying a value for this attribute. Inverter will require external stop.

6. SV9000 DEVICENET INTERFACE

Features of the SV9000 DeviceNet Interface:

- Direct control of SV9000 (e.g. Run, Stop, Direction, Speed reference, Fault reset)
- Full access to all SV9000 parameters
- Monitor SV9000 status (e.g. Output frequency, Output current, Fault code)

6.1 LED definitions and diagnostic

The SV9NCDN includes three LED status indicators: Module status, Node address and Network status. Module Status (**M**) provides information about the DeviceNet module. Network Status (**N**) provides information about the status of the network connection.

Module Status LED

LED	Meaning
Off	There is no power applied to the SV9NCDN.
Green	The SV9NCDN is operating normally.
Flashing Green	The SV9NCDN is in the Standby state, or the device needs commissioning due to configuration missing, incomplete or incorrect.
Flashing Red	The SV9NCDN has detected a Recoverable Fault
Red	The SV9NCDN has detected an Unrecoverable Fault.

Network Status LED

LED	Meaning
Off	SV9NCDN is not on-line. - The device has not completed the Dup_MAC_ID test yet. - If the Module Status LED is off, the device is not powered.
Green	The SV9NCDN is on-line and allocated to a Master.
Flashing Green	The SV9NCDN has passed the Dup_MAC_ID test, is on-line, but is not allocated to a master.
Flashing Red	One or more I/O Connections are in the Timed-Out state.
Red	The SV9NCDN cannot communicate on the network (Duplicate MAC ID, or Bus-off).

The Node Address (**A**) LED blinks the MAC ID of the unit while it is powered. The unit displays the tens digit with red blinks, and the ones digits with green blinks. The unit plays the tens, then ones, and finally delays about 2 second before repeating the sequence.

An LED test is performed at power-up. The following sequence performed:

1. All LED's off
2. All LED's green (0.25 s)
3. All LED's red (0.25 s)
4. All LED's off
5. Start of normal operation

6.2 Reset Service

The following table lists the different types of resets supported by the Identity Object. Reset services are all supported for connection and control supervisor instances.

Resetting the SV9NCDN interface to its out-of-box configuration will set ALL attributes to their Cutler-Hammer default values and change the response of the drive to a loss of communications with the SV9NCDN. The device will have to be re-configured for your application before resuming normal operation.

Resetting the SV9000 inverter to its out-of-box configuration will set ALL inverter parameters to their Cutler-Hammer default values. Before restarting the inverter, you must verify that it is properly configured for your application.

Value	Type of Reset
0	Emulate as closely as possible the cycling of power to the SV9NCDN DeviceNet Interface. This value is the default if this parameter is omitted. The SV9000 drive shall be stopped if it is running.
1	Return the SV9NCDN DeviceNet Interface AND the SV9000 Drive as closely as possible to the out-of-box (C-H factory default) configuration, then emulate cycling of power as closely as possible. The SV9000 Drive shall be stopped if it is running.

6.3 Message Types

The SV9NCDN allows an SV9000 AF Drive to operate as a slave device on a DeviceNet network. The SV9NCDN supports Explicit Messages and Polled I/O Messages of the predefined master/slave connection set. It *does not* support the Explicit Unconnected Message Manager (UCMM).

As a group 2 slave device, the SV9NCDN supports the following message types.

CAN Identifier Field	Group 2 Message Type
10xxxxxx111	Duplicate MAC ID Check Messages
10xxxxxx110	Unconnected Explicit Request Messages
10xxxxxx101	Master I/O Poll Command Messages
10xxxxxx100	Master Explicit Request Messages
10xxxxxx011	Slave Explicit Response Messages
01111xxxxx	Slave Poll Response Messages

xxxxxx = Communication Interface Node Address

6.4 List of Object Classes

The Communication Interface supports the following object classes.

Class	Object
0x01	Identity
0x02	Message Router
0x03	DeviceNet
0x04	Assembly
0x05	DeviceNet Connection
0x28	Motor Data
0x29	Control Supervisor
0x2A	AC/DC Drive
0xA0	Basic and Motor Control
0xA1	Input and Fieldbus Control
0xA2	Output and Supervision
0xA3	Drive and Torque Control
0xA6	Protections
0xAA	Monitoring Data

6.5 List of Services

The Services supported by these object classes are shown below.

Service Code (in hex)	Service Name	Identity		Message Router		DeviceNet		Assembly		Connection		Motor Data		Control Supervisor		AC/DC Drive		SV9000 Objects	
		Class	Inst	Class	Inst	Class	Inst	Class	Inst	Class	Inst	Class	Inst	Class	Inst	Class	Inst	Class	Inst
05	Reset (Type 0, 1)		Y																
0E	Get_Attribute_Single	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
10	Set_Attribute_Single		Y		Y		Y		Y		Y		Y		Y		Y		Y
14	Error Response	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
18	Get Member	Y		Y		Y		Y		Y		Y		Y		Y		Y	
4B	Allocate Master/Slave Connection Set						Y												
4C	Release Master/Slave Connection Set						Y												
Vendor Specific Services																			
47	Cutler-Hammer Get Member	Y		Y		Y		Y		Y		Y		Y		Y		Y	

6.6 List of Data Types

The attribute list that follows includes information on the Data Type of each attribute. The following tables explain the Data, Structure, and Array Type codes used in the Data Type column. For further information see Appendix J of the ODVA DeviceNet specification 2.0

Elementary Data Types

Data Type Name	Data Type Code (in hex)	Data Type Description
BOOL	C1	Logical Boolean with values TRUE and FALSE
SINT	C2	Signed 8-bit integer value
INT	C3	Signed 16-bit integer value
USINT	C6	Unsigned 8-bit integer value
UINT	C7	Unsigned 16-bit integer value
UDINT	C8	Unsigned 32-bit integer value
BYTE	D1	bit string - 8-bits
WORD	D2	bit string - 16-bits
SHORT_STRING	DA	character sting (1 byte per character, 1 byte length indicator)

Constructed Data Types

Type Code	Description
A1	Abbreviated array type encoding
A2	Formal structure type encoding

7. Fault Tracking

When a fault occurs while communicating via DeviceNet, the keypad flashes the drive's fault code and the DeviceNet communication fault code is logged in one of the eight Eventlists under the Monitoring Data Object Class [Class 170, Instance 1, Attributes 51-58].

The most recent DeviceNet fault code is logged in E1 [Class 170, Instance 1, Attribute 51] and the oldest of the eight recent faults is logged in E8 [Class 170, Instance 1, Attribute 58]

The fault can be cleared with the reset button on the keypad, an I/O terminal (if so programmed), and the fault reset bit via DeviceNet in the Control Supervisor Object Class [Class 41, Instance 1, Attribute 12]

For the DeviceNet faults, please see Appendix 1 **“SV9000 DEVICENET INTERFACE ERRORS”**

For the drive's faults, please consult the SV9000 User Manual under the heading **“FAULT TRACKING”**

If you encounter problems communicating with the drive, please make sure that the network control bit [NetCtrl] is set to “1” in the output assembly.

Appendix 1

SV9000 DeviceNet Interface Errors

The SV9NCDN DeviceNet interface records the following events in the Event List FIFO:

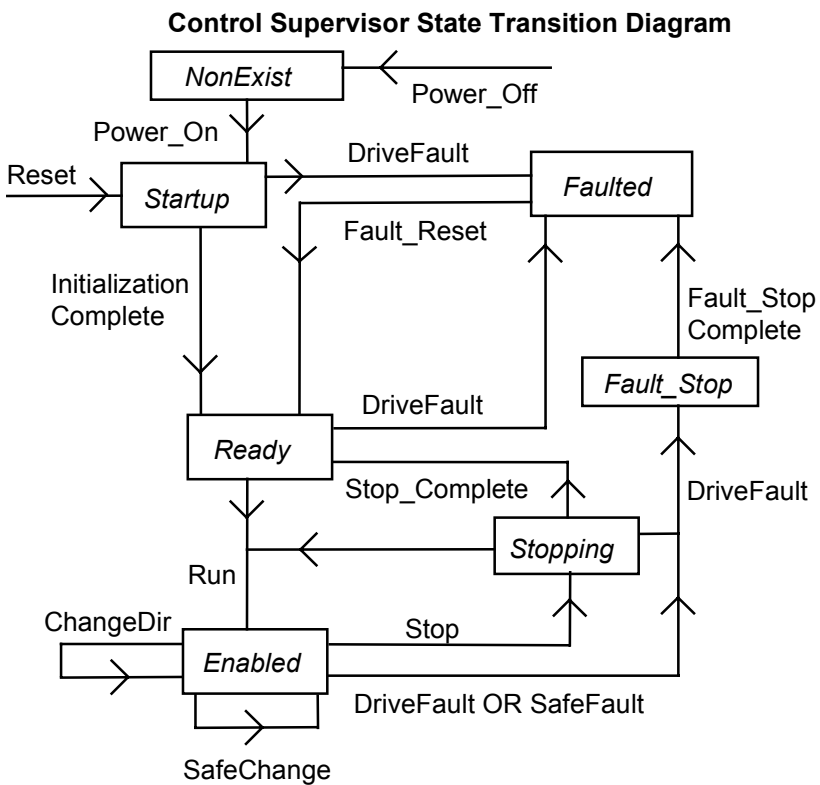
SV9000DNA Event Name	Event Code	Event Description
No event	0x00	Default value in EventList entries.
Drive Communication Error	0x01	Inverter interface communication error with the drive.
I/O Connection Timeout – Fault Stop	0x02	Control Supervisor transitions to Fault Stop.
I/O Connection Timeout – No Action	0x03	Control Supervisor remains in Enabled State. Hold last speed
I/O Connection Timeout – Preset Direction and Speed	0x04	Control Supervisor remains in Enabled State. Run at preset direction and speed.
Explicit Connection Timeout – Fault Stop	0x05	Control Supervisor transitions to Fault Stop.
Explicit Connection Timeout – No Action	0x06	Control Supervisor remains in Enabled State. Hold last speed
Explicit Connection Timeout – Preset Direction and Speed	0x07	Control Supervisor remains in Enabled State. Run at preset direction and speed.
Low DeviceNet Voltage	0x08	Connection timeout may occur next.
Bus Off	0x09	Connection timeout may occur next.
CAN Overrun	0x0C	Connection timeout may occur next.
Configuration Consistency Value (CRC) mismatch	0x0E	The device's configuration is incorrect or incomplete. Major Recoverable Fault. An Identity Reset type 1 is needed for recovery.
Microprocessor watchdog timeout	0x0F	The device detected a serious problem with itself. Major Unrecoverable Fault.
Received explicit message is too big	0x10	Message is ignored.
Received IO message is too big	0x11	Message is ignored.
Parameter Range Error	0x12	An out-of-range parameter value exists in the drive.
I/O Connection Released – Fault Stop	0x14	Control Supervisor transitions to Fault Stop.
I/O Connection Released – No Action	0x15	Control Supervisor remains in Enabled State. Hold last speed
I/O Connection Released – Preset Direction and Speed	0x16	Control Supervisor remains in Enabled State. Run at preset direction and speed.
Receive Idle – Fault Stop	0x17	Control Supervisor transitions to Fault Stop.
Receive Idle – No Action	0x18	Control Supervisor remains in Enabled State. Hold last speed
Receive Idle – Preset Direction and Speed	0x19	Control Supervisor remains in Enabled State. Run at preset direction and speed.
Explicit Connection Released – Fault Stop	0x1A	Control Supervisor transitions to Fault Stop.
Explicit Connection Released – No Action	0x1B	Control Supervisor remains in Enabled State. Hold last speed
Explicit Connection Released – Preset Direction and Speed	0x1C	Control Supervisor remains in Enabled State. Run at preset direction and speed.
Connection unable to read message	0x21	Error detected by connection object code
Connection unable to send message	0x22	Error detected by connection object code
Consumer unable to read message	0x23	Error detected by connection object code
Producer unable to send message	0x24	Error detected by connection object code
Producer unable to send buffer	0x25	Error detected by connection object code
Producer unable to send acknowledgment	0x26	Error detected by SV9NCDN connection object code
Unexpected notification that message was sent	0x27	Error detected by connection object code
Explicit reply is too big	0x31	Error detected by connection object code
First fragment of an IO message is too big	0x34	Error detected by connection object code
Reassembled IO message is too big	0x35	Error detected by connection object code
IO message is too big for producer	0x36	Error detected by connection object code
IO/Explicit message is too big for producer	0x37	Error detected by connection object code

Appendix 2

Control Supervisor Behavior

Control Supervisor State Transition Diagram

The State Transition Diagram provides a graphical description of the states and corresponding state transitions for the control supervisor.



Control Supervisor State Transition Diagram Explanation

Input Conditions							Results	
Old State	CtrlFromNet	Run1Var	Run2Var	IdleMode	FwdMode	RevMode	Event	Action
x	x	x	x	x	x	x	Power_Off	NonExist
x (except NonExist)	x	x	x	x	x	x	Reset	Startup Faulted := 0; Ready := 0 FwdMode := 0; RevMode := 0 Run1Var := 0; Run2Var := 0
NonExist	x	x	x	x	x	x	Power_On	Startup Faulted := 0; Ready := 0 FwdMode := 0; RevMode := 0 Run1Var := 0; Run2Var := 0
Startup	x	x	x	x	x	x	DriveFault	Faulted Faulted := 1; FaultCode := x
Startup	x	x	x	x	x	x	Initialization Complete	Ready Ready := 1
Ready	x	x	x	x	x	x	DriveFault	Faulted Faulted := 1; FaultCode := x; Ready := 0
Ready	1	1	0	0	x	x	Run (Fwd)	Enabled FwdMode := 1 (Start Forward)
Ready	1	0	1	0	x	x	Run (Rev)	Enabled RevMode := 1 (Start Reverse)
Enabled	x	x	x	x	x	x	DriveFault	Fault_Stop Faulted := 1; FaultCode := x (Initiate Faulted Stop) FwdMode := 0; RevMode := 0; Ready := 0
Enabled	1	0	0	x	x	x	Stop	Stopping (Initiate Stop)
Enabled	1	1	0	0	0	1	ChangeDir (Fwd)	Enabled FwdMode := 1; RevMode := 0 (Change to Forward)
Enabled	1	0	1	0	1	0	ChangeDir (Rev)	Enabled FwdMode := 0; RevMode := 1 (Change to Reverse)
Enabled	1	x	x	x	x	x	SafeFault	Fault_Stop Faulted := 1; FaultCode := x (Initiate Faulted Stop) FwdMode := 0; RevMode := 0; Ready := 0 Run1Var := 0; Run2Var := 0
Enabled	1	x	x	x	x	x	SafeChange	Enabled FwdMode := Run1Var := NOT PresetDir RevMode := Run2Var := PresetDir SpeedRef := PresetSpeed TorqueRef := PresetTorque
Stopping	x	x	x	x	x	x	DriveFault	Fault_Stop Faulted := 1; FaultCode := x (Initiate Faulted Stop) Ready := 0
Stopping	1	1	0	0	x	x	Run (Fwd)	Enabled FwdMode := 1 (Start Forward)
Stopping	1	0	1	0	x	x	Run (Rev)	Enabled RevMode := 1 (Start Reverse)
Stopping	x	0	0	x	x	x	Stop Complete	Ready
Fault_Stop	x	x	x	x	x	x	Fault_Stop Complete	Faulted
Faulted	x	x	x	x	x	x	Fault_Reset	Ready Faulted := 0; Ready := 1

Start Forward, Start Reverse, Change to Forward, Change to Reverse, and Stop (not Faulted Stop) are static outputs of the Control Supervisor state machine. They are commands to the drive when CtrlFromNet=1. When CtrlFromNet=0, control commands are from another source.

Other logic equations:

RefFromNet = (NetRef) AND (EnableFieldbus);

IF (RefFromNet)

```
{
  (Write reference frequency or torque to the drive whenever SpeedRef or TorqueRef are written.)
}
```

(1) Run/Stop/Direction can be changed because CtrlFromNet must equal 1 when in the Enabled state.

(2) Reference in the drive can be changed to PresetSpeed or PresetTorque only if (RefFromNet = 1).

Appendix 3

Input and Output Assemblies

Output 20

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0						FaultReset		RunFwd
Byte 1								
Byte 2	Speed Reference (Low Byte)							
Byte 3	Speed Reference (High Byte)							

Output 21 (Default)

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0		NetRef	NetCtrl			FaultReset	RunRev	RunFwd
Byte 1								
Byte 2	Speed Reference (Low Byte)							
Byte 3	Speed Reference (High Byte)							

Output 23

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0		NetRef	NetCtrl			FaultReset	RunRev	RunFwd
Byte 1								
Byte 2	Speed Reference (Low Byte)							
Byte 3	Speed Reference (High Byte)							
Byte 4	Torque Reference (Low Byte)							
Byte 5	Torque Reference (High Byte)							

Input 70

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0						Running1		Faulted
Byte 1								
Byte 2	Speed Actual (Low Byte)							
Byte 3	Speed Actual (High Byte)							

Input 71 (Default)

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	AtReference	RefFromNet	CtrlFromNet	Ready	Running2	Running1	Warning	Faulted
Byte 1	Drive State							
Byte 2	Speed Actual (Low Byte)							
Byte 3	Speed Actual (High Byte)							

Input 73

	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Byte 0	AtReference	RefFromNet	CtrlFromNet	Ready	Running2	Running1	Warning	Faulted
Byte 1	Drive State							
Byte 2	Speed Actual (Low Byte)							
Byte 3	Speed Actual (High Byte)							
Byte 4	Torque Actual (Low Byte)							
Byte 5	Torque Actual (High Byte)							

Appendix 4

SV9NCDN Communication Interface Object Profiles

In the following list, attributes shown in **bold** are stored in the non-volatile memory of the SV9NCDN or SV9000 drive and maintain their values after a power loss. All other settable attributes will power up at their default values.

Attributes listed in the shaded area in the following list must be set during the configuration of the SV9NCDN while it is connected to an SV9000 drive. These attributes must be stored in non-volatile memory to maintain their values after power loss.

Before operating over DeviceNet, NetCtrl (SV9NCDN Control Supervisor Object Class 41, Instance 1, Attribute 5) must be set to 1, "Network Control". Setting the speed of the drive over DeviceNet requires that NetRef (SV9NCDN AC/DC Drive Object Class 42, Instance 1, Attribute 4) be set to 1, "Reference is From Network".

Identity Object

Class Code 0x01

Identity Class (1) – Class attributes (0)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	Revision	Get_Attribute_Single	1 1 1	C7	Revision of this object
2 0x02	Max Instance	Get_Attribute_Single	1 1 1	C7	
3 0x03	Number of Instances	Get_Attribute_Single	1 1 1	C7	
4 0x04	Optional attribute list	Get_Attribute_Single	{3,8,9,176} {3,8,9,176} {3,8,9,176}	A2 04 C7 A1 01 C7	
5 0x05	Optional service list	Get_Attribute_Single	{1,16} {1,16} {1,16}	A2 04 C7 A1 01 C7	
6 0x06	Max Class Attribute ID	Get_Attribute_Single	190 190 190	C7	
7 0x07	Max Instance Attribute ID	Get_Attribute_Single	176 176 176	C7	
176 0xB0	Object Name	Get_Attribute_Single	"Identity" "Identity" "Identity"	DA	ASCII Name for the object Class
180 0xB4	Class Attribute List	Get Member, CH_Get_Member	N/A N/A N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes a class attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
186 0xBA	Instance Attribute List	Get Member, CH_Get_Member	N/A N/A N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes an instance attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
190 0xBE	Instance ID List	Get Member, CH_Get_Member	1 1 1	A1 01 C7	Array of instance IDs supported by this class

Identity Class (1) - Instance Attributes (1)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	Vendor Id	Get_Attribute_Single	68 68 68	C7	Identification of each vendor by number
2 0x02	Device Type	Get_Attribute_Single	2 2 2	C7	Indication of the general type of product
3 0x03	Product Code	Get_Attribute_Single	90 90 90	C7	This is a code assigned by the vendor to describe the device. Product code determined by interrogating the connected drive.
4 0x04	Revision	Get_Attribute_Single	{1,26} {1,26} {1,26}	A2 02 C6 C6	Revision of the item the Identity Object represents
5 0x05	Status	Get_Attribute_Single	N/A 0 4095	D2	Summary Status of the Device. Defined in ODVA DeviceNet spec. Bit 5 = User fault Bit 6 = Node fault Bit 7 = System fault

6 0x06	Serial Number	Get_Attribute_Single	N/A 0x30940000 0x37FFFFFF	C8	Serial Number of the device
7 0x07	Product Name	Get_Attribute_Single	"SV9000" "SV9000" "SV9000"	DA	Human readable identification
8 0x08	State	Get_Attribute_Single	N/A 0 5	C6	Present state of the device as represented by the state transition diagram. 0 = Nonexistent 1 = Device Self Testing 2 = Standby 3 = Operational 4 = Major Recoverable Fault 5 = Major Unrecoverable Fault
9 0x09	Configuration Consistency Value	Get_Attribute_Single	N/A 0 65535	C7	Contents identify configuration of device
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A N/A N/A	DA	User Supplied name for the Instance. Maximum of 8 characters

Message Router Object

Class Code 0x02

Message Router Class (2) - Class Attributes (0)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	Revision	Get_Attribute_Single	1 1 1	C7	Revision of this object
2 0x02	Max Instance	Get_Attribute_Single	1 1 1	C7	
3 0x03	Number of Instances	Get_Attribute_Single	1 1 1	C7	
4 0x04	Optional attribute list	Get_Attribute_Single	{2,1,176} {2,1,176} {2,1,176}	A2 04 C7 A1 01 C7	
5 0x05	Optional service list	Get_Attribute_Single	{1,16} {1,16} {1,16}	A2 04 C7 A1 01 C7	
6 0x06	Max Class Attribute ID	Get_Attribute_Single	190 190 190	C7	
7 0x07	Max Instance Attribute ID	Get_Attribute_Single	176 176 176	C7	
176 0xB0	Object Name	Get_Attribute_Single	"Message Router" "Message Router" "Message Router"	DA	ASCII Name for the object Class
180 0xB4	Class Attribute List	Get Member, CH_Get_Member	N/A N/A N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes a class attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
186 0xBA	Instance Attribute List	Get Member, CH_Get_Member	N/A N/A N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes an instance attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.F97
190 0xBE	Instance ID List	Get Member, CH_Get_Member	1 1 1	A1 01 C7	Array of instance IDs supported by this class

Message Router Class (2) - Instance Attributes (1)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	Object List	Get_Attribute_Single	N/A N/A N/A	A2 04 C7 A1 01 C7	
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A N/A N/A	DA	User Supplied name for the Instance. Maximum of 8 characters

DeviceNet Object

Class Code 0x03

DeviceNet Class (3) - Class Attributes (0)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	Revision	Get_Attribute_Single	2 2 2	C7	Revision of this object
2 0x02	Max Instance	Get_Attribute_Single	1 1 1	C7	
3 0x03	Number of Instances	Get_Attribute_Single	1 1 1	C7	
4 0x04	Optional attribute list	Get_Attribute_Single	{5,2,3,4,100,176} {5,2,3,4,100,176} {5,2,3,4,100,176}	A2 04 C7 A1 01 C7	
5 0x05	Optional service list	Get_Attribute_Single	{4,14,16,75,76} {4,14,16,75,76} {4,14,16,75,76}	A2 04 C7 A1 01 C7	
6 0x06	Max Class Attribute ID	Get_Attribute_Single	190 190 190	C7	
7 0x07	Max Instance Attribute ID	Get_Attribute_Single	176 176 176	C7	
176 0xB0	Object Name	Get_Attribute_Single	"DeviceNet" "DeviceNet" "DeviceNet"	DA	ASCII Name for the object Class
180 0xB4	Class Attribute List	Get Member, CH_Get_Member	N/A N/A N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes a class attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
186 0xBA	Instance Attribute List	Get Member, CH_Get_Member	N/A N/A N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes an instance attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
190 0xBE	Instance ID List	Get Member, CH_Get_Member	1 1 1	A1 01 C7	Array of instance IDs supported by this class

DeviceNet Class (3) - Instance Attributes (1)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	MAC ID	Get_Attribute_Single, Set_Attribute_Single	63 0 63	C6	Node Address.
2 0x02	Baud Rate	Get_Attribute_Single, Set_Attribute_Single	0 0 2	C6	The baud rate of the device. 00 = 125K 01 = 250K 02 = 500K
3 0x03	BOI [Bus Off Interrupt]	Get_Attribute_Single, Set_Attribute_Single	1 0 1	C1	0 = Hold CAN Chip in its bus-off state 1 = Reset CAN Chip and continue communication
4 0x04	Bus-off Counter	Get_Attribute_Single, Set_Attribute_Single	0 0 255	C6	Counts the number of Bus-Off Interrupts

5 0x05	Allocation Information	Get_Attribute_Single	N/A N/A N/A	A2 02 D1 C6	Allocation Choice Master's Mac ID Struct of: BYTE: = Allocation Choice byte Bit 0: = explicit messaging Bit 1: = Polled I/O USINT: = Master's Mac ID (0-63 valid, 255 = unallocated)
100 0x64	Bus-off Separation	Get_Attribute_Single, Set_Attribute_Single	50 0 255	C6	
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A N/A N/A	DA	User Supplied name for the Instance. Maximum of 8 characters

Assembly Object

Class Code 0x04

Assembly Class (4) - Class Attributes (0)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	Revision	Get_Attribute_Single	2 2 2	C7	Revision of this object
2 0x02	Max Instance	Get_Attribute_Single	73 73 73	C7	
3 0x03	Number of Instances	Get_Attribute_Single	6 6 6	C7	
4 0x04	Optional attribute list	Get_Attribute_Single	{1,176} {1,176} {1,176}	A2 04 C7 A1 01 C7	
5 0x05	Optional service list	Get_Attribute_Single	{1,16} {1,16} {1,16}	A2 04 C7 A1 01 C7	
6 0x06	Max Class Attribute ID	Get_Attribute_Single	190 190 190	C7	
7 0x07	Max Instance Attribute ID	Get_Attribute_Single	176 176 176	C7	
176 0xB0	Object Name	Get_Attribute_Single	"Assembly" "Assembly" "Assembly"	DA	ASCII Name for the object Class
180 0xB4	Class Attribute List	Get Member, CH_Get_Member	N/A N/A N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes a class attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
186 0xBA	Instance Attribute List	Get Member, CH_Get_Member	N/A N/A N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes an instance attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
190 0xBE	Instance ID List	Get Member, CH_Get_Member	{20,21,23,70,71,73} {20,21,23,70,71,73} {20,21,23,70,71,73}	A1 01 C7	Array of instance IDs supported by this class

Assembly Class (4) – Basic Control (20)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
3 0x03	Data	Get_Attribute_Single	N/A N/A N/A	A2 05 A1 01 C1 D1 C3	
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A N/A N/A	DA	User Supplied name for the Instance. Maximum of 8 characters

Assembly Class (4) – Speed Control (21)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
3 0x03	Data	Get_Attribute_Single	N/A N/A N/A	A2 05 A1 01 C1 D1 C3	
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A, N/A, N/A	DA	User Supplied name for the Instance. Maximum of 8 characters

Cutler-Hammer

Assembly Class (4) – Torque Control (23)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
3 0x03	Data	Get_Attribute_Single	N/A N/A N/A	A2 06 A1 01 C1 D1 C3	
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A N/A N/A	DA	User Supplied name for the Instance. Maximum of 8 characters

Assembly Class (4) - Basic Status (70)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
3 0x03	Data	Get_Attribute_Single	N/A N/A N/A	A2 05 A1 01 C1 D1 C3	
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A N/A N/A	DA	User Supplied name for the Instance. Maximum of 8 characters

Assembly Class (4) - Speed Status (71)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
3 0x03	Data	Get_Attribute_Single	N/A N/A N/A	A2 05 A1 01 C1 D1 C3	
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A N/A N/A	DA	User Supplied name for the Instance. Maximum of 8 characters

Assembly Class (4) - Torque Status (73)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
3 0x03	Data	Get_Attribute_Single	N/A N/A N/A	A2 06 A1 01 C1 D1 C3	
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A N/A N/A	DA	User Supplied name for the Instance. Maximum of 8 characters

DeviceNet Connection Object

Class Code 0x05

DeviceNet Connection Class (5) - Class Attributes (0)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	Revision	Get_Attribute_Single	1 1 1	C7	Revision of this object
2 0x02	Max Instance	Get_Attribute_Single	2 2 2	C7	
3 0x03	Number of Instances	Get_Attribute_Single	2 2 2	C7	
4 0x04	Optional attribute list	Get_Attribute_Single	{1,176} {1,176} {1,176}	A2 04 C7 A1 01 C7	
5 0x05	Optional service list	Get_Attribute_Single	{2,5,16} {2,5,16} {2,5,16}	A2 04 C7 A1 01 C7	
6 0x06	Max Class Attribute ID	Get_Attribute_Single	190 190 190	C7	
7 0x07	Max Instance Attribute ID	Get_Attribute_Single	176 176 176	C7	
176 0xB0	Object Name	Get_Attribute_Single	"DeviceNet Connection" "DeviceNet Connection" "DeviceNet Connection"	DA	ASCII Name for the object Class
180 0xB4	Class Attribute List	Get Member, CH_Get_Member	N/A N/A N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes a class attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
186 0xBA	Instance Attribute List	Get Member, CH_Get_Member	N/A N/A N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes an instance attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
190 0xBE	Instance ID List	Get Member, CH_Get_Member	1 1 {1,2}	A1 01 C7	Array of instance IDs supported by this class

DeviceNet Connection Class (5) - Explicit Connection Instance (1)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	State	Get_Attribute_Single	0 0 5	C6	State of the object
2 0x02	Instance Type	Get_Attribute_Single	0 0 0	C6	Indicates either I/O or messaging connection 0=Explicit
3 0x03	Transport Class Trigger	Get_Attribute_Single	0x83 0x83 0x83	C6	Defines Behavior of the connection
4 0x04	Produced Connection Id	Get_Attribute_Single	N/A 0x403 0x5FB	C7	Placed in CAN Identifier Field when the Connection Transmits

5 0x05	Consumed Connection Id	Get_Attribute_Single	N/A 0x404 0x5FC	C7	CAN Identifier Field value that denotes message to be received
6 0x06	Initial Comm Characteristics	Get_Attribute_Single	0x21 0x21 0x21	C6	Defines the Message Group(s) across which productions and consumptions associated with this
7 0x07	Produced Connection Size	Get_Attribute_Single	41 41 41	C7	Maximum number of bytes transmitted across this Connection
8 0x08	Consumed Connection Size	Get_Attribute_Single	41 41 41	C7	Maximum number of bytes received across this Connection
9 0x09	Expected Packet Rate	Get_Attribute_Single, Set_Attribute_Single	2500 0 65535	C7	Defines timing associated with this Connection
12 0x0C	Watchdog Timeout Action	Get_Attribute_Single, Set_Attribute_Single	1 1 3	C6	Defines how to handle Inactivity/Watchdog timeouts. 1-Auto Delete 3-Deferred Delete An attempt to set this attribute to the value 2 will result in an Invalid Attribute Value error.
13 0x0D	Produced Connection Path Length	Get_Attribute_Single	0 0 0	C7	Number of bytes in the produced_connection_path length attribute
14 0x0E	Produced Connection Path	Get_Attribute_Single	N/A N/A N/A	A1 01 C6	Application Obj. producing data on this connection
15 0x0F	Consumed Connection Path Length	Get_Attribute_Single	0 0 0	C7	Number of bytes in the consumed_connection_path length attribute
16 0x10	Consumed Connection Path	Get_Attribute_Single	N/A N/A N/A	A1 01 C6	Specifies the Application Object(s) that are to receive the data consumed by this Connection Object
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A N/A N/A	DA	User Supplied name for the Instance. Maximum of 8 characters

DeviceNet Connection Class (5) - Polled IO Connection Instance (2)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	State	Get_Attribute_Single	0 0 4	C6	State of the object
2 0x02	Instance Type	Get_Attribute_Single	1 1 1	C6	Indicates either I/O or messaging connection 1 = I/O
3 0x03	Transport Class Trigger	Get_Attribute_Single	0x83 0x83 0x83	C6	Defines Behavior of the connection
4 0x04	Produced Connection Id	Get_Attribute_Single	N/A 0x3C0 0x3FF	C7	Placed in CAN Identifier Field when the Connection Transmits
5 0x05	Consumed Connection Id	Get_Attribute_Single	N/A 0x405 0x5FD	C7	CAN Identifier Field value that denotes message to be received
6 0x06	Initial Comm Characteristics	Get_Attribute_Single	1 1 1	C6	Defines the Message Group(s) across which productions and consumptions associated with this
7 0x07	Produced Connection Size	Get_Attribute_Single	4 0 6	C7	Maximum number of bytes transmitted across this Connection

8 0x08	Consumed Connection Size	Get_Attribute_Single	4 0 6	C7	Maximum number of bytes received across this Connection
9 0x09	Expected Packet Rate	Get_Attribute_Single, Set_Attribute_Single	0 0 65535	C7	Defines timing associated with this Connection
12 0x0C	Watchdog Timeout Action	Get_Attribute_Single, Set_Attribute_Single	0 0 2	C6	Defines how to handle Inactivity/Watchdog timeouts. 1-Auto Delete 3-Deferred Delete An attempt to set this attribute to the value 2 will result in an Invalid Attribute Value error.
13 0x0D	Produced Connection Path Length	Get_Attribute_Single	6 6 6	C7	Number of bytes in the produced_connection_path length attribute
14 0x0E	Produced Connection Path	Get_Attribute_Single	N/A N/A N/A	A1 01 C6	Application Obj. producing data on this connection
15 0x0F	Consumed Connection Path Length	Get_Attribute_Single	6 6 6	C7	Number of bytes in the consumed_connection_path length attribute
16 0x10	Consumed Connection Path	Get_Attribute_Single	N/A N/A N/A	A1 01 C6	Specifies the Application Object(s) that are to receive the data consumed by this Connection Object
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A N/A N/A	DA	User Supplied name for the Instance. Maximum of 8 characters

Motor Data Object

Class Code 0x28

Motor Data Object Class (40) - Class Attributes (0)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	Revision	Get_Attribute_Single	1 1 1	C7	Revision of this object
2 0x02	Max Instance	Get_Attribute_Single	1 1 1	C7	
3 0x03	Number of Instances	Get_Attribute_Single	1 1 1	C7	
4 0x04	Optional attribute list	Get_Attribute_Single	{4,9,12,15,176} {4,9,12,15,176} {4,9,12,15,176}	A2 04 C7 A1 01 C7	
5 0x05	Optional service list	Get_Attribute_Single	0 0 0	A2 04 C7 A1 01 C7	
6 0x06	Max Class Attribute ID	Get_Attribute_Single	190 190 190	C7	
7 0x07	Max Instance Attribute ID	Get_Attribute_Single	176 176 176	C7	
176 0xB0	Object Name	Get_Attribute_Single	"Motor Data" "Motor Data" "Motor Data"	DA	ASCII Name for the object Class
180 0xB4	Class Attribute List	Get Member, CH_Get_Member	N/A N/A N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes a class attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
186 0xBA	Instance Attribute List	Get Member, CH_Get_Member	N/A N/A N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes an instance attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
190 0xBE	Instance ID List	Get Member, CH_Get_Member	1 1 1	A1 01 C7	Array of instance IDs supported by this class

Motor Data Object Class (40) - Instance Attributes (1)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
3 0x03	Motor Type	Get_Attribute_Single	7 7 7	C6	Type of Motor Represented by This Instance 0 - Non-standard motor 1 - PM DC Motor 2 - FC DC Motor 3 - PM Synchronous Motor 4 - FC Synchronous Motor 5 - Switched Reluctance Motor 6 - Wound Rotor Induction Motor 7 - Squirrel Cage Induction Motor 8 - Stepper Motor 9 - Sinusoidal PM BL Motor 10 - Trapezoidal PM BL Motor
6 0x06	RatedCurrent[100mA]	Get_Attribute_Single	70 0 16000	C7	Rated Stator Current Units: [100mA]

7 0x07	RatedVoltage[V]	Get_Attribute_Single	230 180 690	C7	Rated Base Voltage Units: [V]
9 0x09	RatedFrequency[Hz]	Get_Attribute_Single	60 30 500	C7	Rated Electrical Frequency Units: [Hz]
12 0x0C	PoleCount[pair*2]	Get_Attribute_Single	4 2 16	C7	Number of poles in the motor
15 0x0F	BaseSpeed[RPM]	Get_Attribute_Single	1710 1 30000	C7	Nominal speed at rated frequency from nameplate Units: [RPM]
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A N/A N/A	DA	User Supplied name for the Instance. Maximum of 8 characters

Control Supervisor Object

Class Code 0x29

Control Supervisor Object Class (41) – Class Attributes (0)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	Revision	Get_Attribute_Single	1 1 1	C7	Revision of this object
2 0x02	Max Instance	Get_Attribute_Single	1 1 1	C7	
3 0x03	Number of Instances	Get_Attribute_Single	1 1 1	C7	
4 0x04	Optional attribute list	Get_Attribute_Single	{11,4,5,6,8,9,11,13,14,15,16,176} {11,4,5,6,8,9,11,13,14,15,16,176} {11,4,5,6,8,9,11,13,14,15,16,176}	A2 04 C7 A1 01 C7	
5 0x05	Optional service list	Get_Attribute_Single	0 0 0	A2 04 C7 A1 01 C7	
6 0x06	Max Class Attribute ID	Get_Attribute_Single	190 190 190	C7	
7 0x07	Max Instance Attribute ID	Get_Attribute_Single	176 176 176	C7	
176 0xB0	Object Name	Get_Attribute_Single	“Control Supervisor” “Control Supervisor” “Control Supervisor”	DA	ASCII Name for the object Class
180 0xB4	Class Attribute List	Get Member, CH_Get_Member	N/A N/A N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes a class attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
186 0xBA	Instance Attribute List	Get Member, CH_Get_Member	N/A N/A N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes an instance attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
190 0xBE	Instance ID List	Get Member, CH_Get_Member	1 1 1	A1 01 C7	Array of instance Ids supported by this class

Control Supervisor Object Class (41) - Instance Attributes (1)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
3 0x03	Run1	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C1	Run Forward Request
4 0x04	Run2	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C1	Run Reverse Request
5 0x05	NetCtrl	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C1	Requests Run/Stop control to be local or from network

6 0x06	State	Get_Attribute_Single	N/A, 0 7	C6	State of Control Supervisor Instance 1 = Startup 2 = Not_Ready 3 = Ready 4 = Enabled 5 = Stopping 6 = Fault_Stop 7 = Faulted
7 0x07	Running1	Get_Attribute_Single	N/A, 0 1	C1	Running Forward Status 0 = Other state 1 = Running Forward
8 0x08	Running2	Get_Attribute_Single	N/A, 0 1	C1	Running Reverse Status 0 = Other state 1 = Running reverse
9 0x09	Ready	Get_Attribute_Single	N/A, 0 1	C1	Ready to Accept a Run Event 0 = Other state 1 = Ready to accept a Run Event
10 0x0A	Faulted	Get_Attribute_Single	N/A, 0 1	C1	Fault Occurred 0 = No faults present 1 = Fault occurred (latched)
11 0x0B	Warning	Get_Attribute_Single	N/A, 0 1	C1	Warning Present 0 = No warnings present 1 = Warning present (not latched)
12 0x0C	FaultRst	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C1	Fault Reset Request 0 = No action 0 -> 1 = Fault reset request 1 = No action
13 0x0D	FaultCode	Get_Attribute_Single	N/A, 0, 65535	C7	If in Faulted state, FaultCode indicates the fault that caused the transition to Faulted state. If not in Faulted state, FaultCode indicates the fault that caused the last transition to Faulted state. Fault codes are listed in DeviceNet Volume II, section 6-29.6
14 0x0E	WarnCode	Get_Attribute_Single	N/A, 0, 65535	C7	If in Enabled state, WarnCode indicates the lowest valued warning that caused the Warning bit to be TRUE. Warning codes are listed in DeviceNet Volume II, section 6-29.6
15 0x0F	CtrlFromNet	Get_Attribute_Single	N/A, 0 1	C1	Status of Run/Stop control source 0 = Control is local 1 = Control is from network
16 0x10	DNFaultMode	Get_Attribute_Single, Set_Attribute_Single	0 0 2	C6	Action on loss of DeviceNet 0 = Fault and Stop 1 = Ignore 2 = Use preset speed and direction ATTENTION: Ignoring communication faults may result in equipment damage, personal injury, or death. Ensure that you understand how ignoring a communication fault may affect the operation of your system.
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A N/A N/A	DA	User Supplied name for the Instance. Maximum of 8 characters

AC/DC Drive Object

Class Code 0x2A

AC/DC Drive Object Class (42) - Class Attributes (0)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	Revision	Get_Attribute_Single	1 1 1	C7	Revision of this object
2 0x02	Max Instance	Get_Attribute_Single	1 1 1	C7	
3 0x03	Number of Instances	Get_Attribute_Single	1 1 1	C7	
4 0x04	Optional attribute list	Get_Attribute_Single	{12,3,9,10,11,12,15,16,17,20,21,29,176} {12,3,9,10,11,12,15,16,17,20,21,29,176} {12,3,9,10,11,12,15,16,17,20,21,29,176}	A2 04 C7 A1 01 C7	
5 0x05	Optional service list	Get_Attribute_Single	0 0 0	A2 04 C7 A1 01 C7	
6 0x06	Max Class Attribute ID	Get_Attribute_Single	190 190 190	C7	
7 0x07	Max Instance Attribute ID	Get_Attribute_Single	176 176 176	C7	
176 0xB0	Object Name	Get_Attribute_Single	"AC\DC Drive" "AC\DC Drive" "AC\DC Drive"	DA	ASCII Name for the object Class
180 0xB4	Class Attribute List	Get Member, CH_Get_Member	N/A N/A N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes a class attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
186 0xBA	Instance Attribute List	Get Member, CH_Get_Member	N/A N/A N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes an instance attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
190 0xBE	Instance ID List	Get Member, CH_Get_Member	1 1 1	A1 01 C7	Array of instance IDs supported by this class

AC/DC Drive Object Class (42) - Instance Attributes (1)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
3 0x03	AtReference	Get_Attribute_Single	N/A 0 1	C1	1 = Drive actual at reference (speed or torque reference) based on mode
4 0x04	NetRef	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C1	Requests torque or speed reference to be local or from the network 0 = Set Reference not DN Control 1 = Set Reference at DN Control Note that the actual status of torque or speed reference is reflected in attribute 29, RefFromNet

6 0x06	DriveMode	Get_Attribute_Single, Set_Attribute_Single	1 1 3	C6	1 = Open loop speed (Frequency) 3 = Torque control
7 0x07	SpeedActual[RPM]	Get_Attribute_Single	N/A, 0 30000	C3	Actual drive speed (best approximation) Units: RPM
8 0x08	SpeedRef[RPM]	Get_Attribute_Single, Set_Attribute_Single	0 0 30000	C3	Speed reference Units: RPM
9 0x09	CurrentActual[100mA]	Get_Attribute_Single	N/A, 0 32767	C3	Actual motor phase current Units: 100mA
10 0x0A	CurrentLimit[100mA]	Get_Attribute_Single	N/A, 0 32767	C3	Motor phase current limit Units: 100mA
11 0x0B	TorqueActual[Nm]	Get_Attribute_Single	N/A, 0 32767	C3	Actual torque Units: Nm
12 0x0C	TorqueRef[Nm]	Get_Attribute_Single, Set_Attribute_Single	0 0 10000	C3	Torque reference Units: Nm
15 0x0F	PowerActual[W]	Get_Attribute_Single	N/A, 0 32767	C3	Actual output power Units: Watts
16 0x10	InputVoltage[V]	Get_Attribute_Single	N/A 180 690	C3	Input Voltage Units: Volts
17 0x11	OutputVoltage[V]	Get_Attribute_Single	N/A 0 690	C3	Output Voltage Units: Volts
20 0x14	LowSpdLimit[RPM]	Get_Attribute_Single	0 0 30000	C7	Minimum speed limit Units: RPM
21 0x15	HighSpdLimit[RPM]	Get_Attribute_Single	1800 0 30000	C7	Maximum speed limit Units: RPM
29 0x1D	RefFromNet	Get_Attribute_Single	N/A 0 1	C1	Status of torque/speed reference 0 = Local torque/speed reference 1 = DeviceNet torque/speed reference
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A N/A N/A	DA	User Supplied name for the Instance. Maximum of 8 characters

Basic and Motor Control Object

Class Code 0xA0

Basic and Motor Control Class (160) - Class Attributes (0)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	Revision	Get_Attribute_Single	1 1 1	C7	Revision of this object
2 0x02	Max Instance	Get_Attribute_Single	1 1 1	C7	
3 0x03	Number of Instances	Get_Attribute_Single	1 1 1	C7	
4 0x04	Optional attribute list	Get_Attribute_Single	{1,176} {1,176} {1,176}	A2 04 C7 A1 01 C7	
5 0x05	Optional service list	Get_Attribute_Single	{1,16} {1,16} {1,16}	A2 04 C7 A1 01 C7	
6 0x06	Max Class Attribute ID	Get_Attribute_Single	190 190 190	C7	
7 0x07	Max Instance Attribute ID	Get_Attribute_Single	176 176 176	C7	
176 0xB0	Object Name	Get_Attribute_Single	"Basic and Motor Control", "Basic and Motor Control", "Basic and Motor Control"	DA	ASCII Name for the object Class
180 0xB4	Class Attribute List	Get Member, CH_Get_Member	N/A, N/A, N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes a class attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
186 0xBA	Instance Attribute List	Get Member, CH_Get_Member	N/A, N/A, N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes an instance attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
190 0xBE	Instance ID List	Get Member, CH_Get_Member	1, 1, 1	A1 01 C7	Array of instance IDs supported by this class

Basic and Motor Control Class (160) - Class Attributes (1)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	MinFreq[Hz]	Get_Attribute_Single, Set_Attribute_Single	0 0 500	C7	
2 0x02	MaxFreq[Hz]	Get_Attribute_Single, Set_Attribute_Single	60 1 500	C7	
3 0x03	AccTime1[100ms]	Get_Attribute_Single, Set_Attribute_Single	30 1 30000	C7	Time from fmin (Minimum Frequency) to fmax (Maximum Frequency)
4 0x04	DecTime1[100ms]	Get_Attribute_Single, Set_Attribute_Single	30 1 30000	C7	Time from fmax (Maximum Frequency) to fmin (Minimum Frequency)

5 0x05	RefSelection	Get_Attribute_Single, Set_Attribute_Single	0 0 13	C7	0 = Vin 3 = Vin - I _{in} 1 = I _{in} 4 = I _{in} - V _{in} 2 = Vin + I _{in} 5 = V _{in} * I _{in} 6 = V _{in} joystick control 7 = I _{in} joystick control 8 = Signal from internal motor pot. 9 = Signal from internal motor pot. Reset if SV9000 unit is stopped 10 = Signal from internal motor pot. (stored in memory over mains break) 11 = Signal from internal motor pot. (stored in memory over mains break)
6 0x06	JogFrequencyRef	Get_Attribute_Single, Set_Attribute_Single	50 0 5000	C7	
7 0x07	CurentLimit[100mA]	Get_Attribute_Single, Set_Attribute_Single	105 1 175	C7	Output current limit [A] of the unit
8 0x08	V/HzSelection	Get_Attribute_Single, Set_Attribute_Single	0 0 2	C7	0 = Linear 1 = Squared 2 = Programmable U/f ratio
9 0x09	V/HzOptimize	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C7	0 = None 1 = Automatic torque boost
10 0x0A	MotorVolt[V]	Get_Attribute_Single, Set_Attribute_Single	230 180 690	C7	230 V SV9000 range STD CHASSIS/STD NEMA1 400 V SV9000 range STD CHASSIS/STD NEMA1/COMPACT NEMA1 500 V SV9000 range STD CHASSIS/STD NEMA1/COMPACT NEMA1 690 V SV9000 range STD CHASSIS/STD NEMA1/COMPACT NEMA1
11 0x0B	MotorFreq[Hz]	Get_Attribute_Single, Set_Attribute_Single	60 30 500	C7	Frequency on the rating plate of the motor
12 0x0C	MotorSpeed[RPM]	Get_Attribute_Single, Set_Attribute_Single	1710 300 30000	C7	Speed (rpm) on the rating plate of the motor
13 0x0D	MotorAmps[100mA]	Get_Attribute_Single, Set_Attribute_Single	65 1 160	C7	Amps on the rating plate of the motor
14 0x0E	SupplyVolt[V]	Get_Attribute_Single, Set_Attribute_Single	x 6 22	C7	230 V SV9000 range STD CHASSIS/STD NEMA1 400 V SV9000 range STD CHASSIS/STD NEMA1/COMPACT NEMA1 500 V SV9000 range STD CHASSIS/STD NEMA1/COMPACT NEMA1 690 V SV9000 range STD CHASSIS/STD NEMA1/COMPACT NEMA1
15 0x0F	GroupVisibility	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C7	Visibility of the parameters: 0 = All parameter groups visible 1 = Only group 1 is visible
16 0x10	ProgramLock	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C7	Disables parameter changes: 0 = Changes enabled 1 = Changes disabled
26 0x1A	PolledInputAssemblyType	Get_Attribute_Single, Set_Attribute_Single	71 70 73	C7	Input assembly used by the polled connection
27 0x1B	PolledOutputAssemblyType	Get_Attribute_Single, Set_Attribute_Single	21 20 23	C7	Output assembly used by the polled connection

61 0x3D	ControlMode	Get_Attribute_Single, Set_Attribute_Single	0 0 2	C7	0 = Frequency control 1 = Speed control (open loop) 2 = Torque control (open loop)
62 0x3E	SwitchingFreq[100Hz]	Get_Attribute_Single, Set_Attribute_Single	100 10 160	C7	Dependant on kW
63 0x3F	Max VoltFreq[Hz]	Get_Attribute_Single, Set_Attribute_Single	60 30 500	C7	
64 0x40	MaxVolt[%]	Get_Attribute_Single, Set_Attribute_Single	100 15 200	C7	
65 0x41	Mid V/Hz Freq[Hz*10]	Get_Attribute_Single, Set_Attribute_Single	0 0 5000	C7	
66 0x42	Mid V/Hz Volt[%*100]	Get_Attribute_Single, Set_Attribute_Single	0 0 10000	C7	
67 0x43	Zero FreqVolt[%*100]	Get_Attribute_Single, Set_Attribute_Single	0 0 4000	C7	
68 0x44	OvervoltController	Get_Attribute_Single, Set_Attribute_Single	1 0 1	C7	0 = Controller is not operating 1 = Controller is operating
69 0x45	UndervoltController	Get_Attribute_Single, Set_Attribute_Single	1 0 1	C7	0 = Controller is not operating 1 = Controller is operating
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A, N/A, N/A	DA	Array of instance IDs supported by this class

Input and Fieldbus Object

Class Code 0xA1

Input and Fieldbus Control Class (161) - Class Attributes (0)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	Revision	Get_Attribute_Single	1 1 1	C7	Revision of this object
2 0x02	Max Instance	Get_Attribute_Single	1 1 1	C7	
3 0x03	Number of Instances	Get_Attribute_Single	1 1 1	C7	
4 0x04	Optional attribute list	Get_Attribute_Single	{1,176} {1,176} {1,176}	A2 04 C7 A1 01 C7	
5 0x05	Optional service list	Get_Attribute_Single	{1,16} {1,16} {1,16}	A2 04 C7 A1 01 C7	
6 0x06	Max Class Attribute ID	Get_Attribute_Single	190 190 190	C7	
7 0x07	Max Instance Attribute ID	Get_Attribute_Single	176 176 176	C7	
176 0xB0	Object Name	Get_Attribute_Single	"Input and Fieldbus Control", " Input and Fieldbus Control", " Input and Fieldbus Control "	DA	ASCII Name for the object Class
180 0xB4	Class Attribute List	Get Member, CH_Get_Member	N/A, N/A, N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes a class attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
186 0xBA	Instance Attribute List	Get Member, CH_Get_Member	N/A, N/A, N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes an instance attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
190 0xBE	Instance ID List	Get Member, CH_Get_Member	1, 1, 1	A1 01 C7	Array of instance IDs supported by this class

Input and Fieldbus Control Class (161) - Class Attributes (1)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	Start/Stop Select	Get_Attribute_Single, Set_Attribute_Single	0 0 4	C7	<div>DIA1</div> <div>0 = Start forward</div> <div>1 = Start/Stop</div> <div>2 = Start/Stop</div> <div>3 = Start pulse</div> <div>4 = Start/stop pulse</div> <div>DIA2</div> <div>Start reverse</div> <div>Reverse</div> <div>Run enable</div> <div>Stop pulse</div> <div>Run enable</div>

2 0x02	DIA3Function	Get_Attribute_Single, Set_Attribute_Single	7 0 11	C7	0 = Not used 1 = Ext. fault, closing contact 2 = External fault, opening contact 3 = Run enable 4 = Acc./dec. time selection 5 = Reverse 6 = Jogging speed 7 = Fault reset 8 = Acc./dec. operation prohibit 9 = DC-braking command 10 = Torque control
3 0x03	DIB4Function	Get_Attribute_Single, Set_Attribute_Single	6 0 11	C7	0 = Not used 1 = Ext. fault, closing contact 2 = External fault, opening contact 3 = Run enable 4 = Acc./dec. time selection 5 = Reverse 6 = Jogging speed 7 = Fault reset 8 = Acc./dec. operation prohibit 9 = DC-braking command 10 = Multi-Step speed select 1
4 0x04	DIB5Function	Get_Attribute_Single, Set_Attribute_Single	1 0 11	C7	0 = Not 1 = Ext. fault, closing contact 2 = External fault, opening contact 3 = Run enable 4 = Acc./dec. time selection 5 = Reverse 6 = Jogging speed 7 = Fault reset 8 = Acc./dec. operation prohibit 9 = DC-braking command 10 = Multi-Step speed select 2
5 0x05	DIB6Function	Get_Attribute_Single, Set_Attribute_Single	4 0 12	C7	0 = Not used 1 = Ext. fault, closing contact 2 = External fault, opening contact 3 = Run enable 4 = Acc./dec. time selection 5 = Reverse 6 = Jogging speed 7 = Fault reset 8 = Acc./dec. operation prohibit 9 = DC-braking command 10 = Multi-Step speed select 3 11 = Motorised pot. speed down 12 = Auto
6 0x06	Vin TypeSelect	Get_Attribute_Single, Set_Attribute_Single	0 0 2	C7	0 = 0 to 10 V 1 = Custom setting range 2 = -10 to +10 V (can be used only with Joystick control)
7 0x07	CustomVinMin[%*100]	Get_Attribute_Single, Set_Attribute_Single	0 0 10000	C7	
8 0x08	CustomVinMax[%*100]	Get_Attribute_Single, Set_Attribute_Single	10000 0 10000	C7	
9 0x09	VinInversion	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C7	0 = Not inverted 1 = Inverted
10 0x0A	VinFilterTime[10ms]	Get_Attribute_Single, Set_Attribute_Single	10 0 1000	C7	0 = No filtering

11 0x0B	IinTypeSelect	Get_Attribute_Single, Set_Attribute_Single	0 0 2	C7	0 = 0 to 20 mA 1 = 4 to 20 mA 2 = Custom setting range
12 0x0C	CustomIinMin[%*100]	Get_Attribute_Single, Set_Attribute_Single	0 0 10000	C7	
13 0x0D	CustomIinMax[%*100]	Get_Attribute_Single, Set_Attribute_Single	10000 0 10000	C7	
14 0x0E	IinInversion	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C7	0 = Not inverted 1 = Inverted
15 0x0F	IinFilterTime[10ms]	Get_Attribute_Single, Set_Attribute_Single	10 0 1000	C7	0 = No filtering
16 0x10	Vin MinScale[%]	Get_Attribute_Single, Set_Attribute_Single	0 -32000 32000	C3	0% = no minimum scaling
17 0x11	Vin MaxScale[100%]	Get_Attribute_Single, Set_Attribute_Single	10000 -32000 32000	C3	100% = no maximum scaling
18 0x12	IinMinScale[%]	Get_Attribute_Single, Set_Attribute_Single	0 -32000 32000	C3	0% = no minimum scaling
19 0x13	IinMaxScale[100%]	Get_Attribute_Single, Set_Attribute_Single	10000 -32000 32000	C3	100% = no maximum scaling
20 0x14	Analog InSelect	Get_Attribute_Single, Set_Attribute_Single	0 0 4	C7	0 = Not use 1 = Vin (analog voltage input) 2 = Iin (analog current input) 3 = Ain1 (option board) 4 = Ain2 (option board)
21 0x15	Analog InFunc	Get_Attribute_Single, Set_Attribute_Single	0 0 4	C7	0 = No function 1 = Reduces current limit (par. 1.7) 2 = Reduces DC-braking current 3 = Reduces acc. and decel. times 4 = Reduces torque supervis. limit
51 0x33	FieldbusSelect	Get_Attribute_Single, Set_Attribute_Single	1 0 1	C7	0 = Control via I/O terminals 1 = Control via Fieldbus board
52 0x34	DIC1Function	Get_Attribute_Single, Set_Attribute_Single	1 0 1	C7	0 = Fieldbus control 1 = External fault
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A, N/A, N/A	DA	Array of instance IDs supported by this class

Output and Supervision Object

Class Code 0xA2

Output and Supervision Class (162) - Class Attributes (0)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	Revision	Get_Attribute_Single	1 1 1	C7	Revision of this object
2 0x02	Max Instance	Get_Attribute_Single	1 1 1	C7	
3 0x03	Number of Instances	Get_Attribute_Single	1 1 1	C7	
4 0x04	Optional attribute list	Get_Attribute_Single	{1,176} {1,176} {1,176}	A2 04 C7 A1 01 C7	
5 0x05	Optional service list	Get_Attribute_Single	{1,16} {1,16} {1,16}	A2 04 C7 A1 01 C7	
6 0x06	Max Class Attribute ID	Get_Attribute_Single	190 190 190	C7	
7 0x07	Max Instance Attribute ID	Get_Attribute_Single	176 176 176	C7	
176 0xB0	Object Name	Get_Attribute_Single	"Output and Supervision", "Output and Supervision", "Output and Supervision"	DA	ASCII Name for the object Class
180 0xB4	Class Attribute List	Get Member, CH_Get_Member	N/A, N/A, N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes a class attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
186 0xBA	Instance Attribute List	Get Member, CH_Get_Member	N/A, N/A, N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes an instance attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
190 0xBE	Instance ID List	Get Member, CH_Get_Member	1, 1, 1	A1 01 C7	Array of instance IDs supported by this class

Output and Supervision Class (162) - Class Attributes (1)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	AoutFunction	Get_Attribute_Single, Set_Attribute_Single	1 0 11	C7	0 = Not used 1 = O/P frequency (0 to fmax) 2 = Motor speed (0 to max. speed) 3 = O/P current (0 to 2.0 x InCX) 4 = Motor torque (0 to 2 x TnCX) 5 = Motor power (0 to 2 x PnCX) 6 = Motor voltage (0 to 100% x UnM) 7 = DC-link volt. 8 = Input signal Vin 9 = Input signal lin 10 = Reference frequency 11 = Reference torque
2 0x02	Aout FilterTime[10ms]	Get_Attribute_Single, Set_Attribute_Single	100 1 1000	C7	
3 0x03	AoutInversion	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C7	0 = Not inverted 1 = Inverted
4 0x04	AoutMinimum	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C7	0 = 0 mA 1 = 4 mA
5 0x05	AoutScale[%]	Get_Attribute_Single, Set_Attribute_Single	100 10 1000	C7	
6 0x06	DoutFunction	Get_Attribute_Single, Set_Attribute_Single	1 0 22	C7	0 = Not used 1 = Ready 2 = Run 3 = Fault 4 = Fault inverted 5 = SV9000 overheat warning 6 = External fault or warning 7 = Reference fault or warning 8 = Warning 9 = Reversed 10 = Jogging speed selected 11 = At speed 12 = Motor regulator activated 13 = Output freq. limit superv. 1 14 = Output freq. limit superv. 2 15 = Torque limit supervision 16 = Reference limit supervision 17 = External brake control 18 = Control from I/O terminals 19 = Frequency converter temperature limit supervision 20 = Unrequested rotation direction 21 = External brake control inverted 22 = Termistor fault or warning
7 0x07	Rout1Function	Get_Attribute_Single, Set_Attribute_Single	2 0 21	C7	As attribute 6
8 0x08	Rout2Function	Get_Attribute_Single, Set_Attribute_Single	3 0 21	C7	As attribute 6
9 0x09	Freq1SuperFunc	Get_Attribute_Single, Set_Attribute_Single	0 0 2	C7	0 = No 1 = Low limit 2 = High limit

10 0x0A	Freq1SuperValue[Hz*10]	Get_Attribute_Single, Set_Attribute_Single	0 0 5000	C7	
11 0x0B	Freq2SuperFunc	Get_Attribute_Single, Set_Attribute_Single	0 0 2	C7	0 = No 1 = Low limit 2 = High limit
12 0x0C	Freq2SuperValue[Hz*10]	Get_Attribute_Single, Set_Attribute_Single	0 0 5000	C7	
13 0x0D	TorqueSuperFunc	Get_Attribute_Single, Set_Attribute_Single	0 0 2	C7	0 = No 1 = Low limit 2 = High limit
14 0x0E	TorqueSuperValue[%]	Get_Attribute_Single, Set_Attribute_Single	1000 -2000 2000	C7	
15 0x0F	RefSuperFunc	Get_Attribute_Single, Set_Attribute_Single	0 0 2	C7	0 = No 1 = Low limit 2 = High limit
16 0x10	RefSuperValue[Hz*10]	Get_Attribute_Single, Set_Attribute_Single	0 0 5000	C7	
17 0x11	EB Off-delay[100ms]	Get_Attribute_Single, Set_Attribute_Single	5 0 1000	C7	
18 0x12	EB On-delay[100ms]	Get_Attribute_Single, Set_Attribute_Single	15 0 1000	C7	
19 0x13	TempSuperFunc	Get_Attribute_Single, Set_Attribute_Single	0 0 2	C7	0 = No 1 = Low limit 2 = High limit
20 0x14	TempSuperValue[oC]	Get_Attribute_Single, Set_Attribute_Single	40 -10 75	C3	Unit is Degree Centigrade
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A, N/A, N/A	DA	Array of instance IDs supported by this class

Drive and Torque Control Object

Class Code 0xA3

Drive and Torque Control Class (163) - Class Attributes (0)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	Revision	Get_Attribute_Single	1 1 1	C7	Revision of this object
2 0x02	Max Instance	Get_Attribute_Single	1 1 1	C7	
3 0x03	Number of Instances	Get_Attribute_Single	1 1 1	C7	
4 0x04	Optional attribute list	Get_Attribute_Single	{1,176} {1,176} {1,176}	A2 04 C7 A1 01 C7	
5 0x05	Optional service list	Get_Attribute_Single	{1,16} {1,16} {1,16}	A2 04 C7 A1 01 C7	
6 0x06	Max Class Attribute ID	Get_Attribute_Single	190 190 190	C7	
7 0x07	Max Instance Attribute ID	Get_Attribute_Single	176 176 176	C7	
176 0xB0	Object Name	Get_Attribute_Single	"Drive and Torque Control", "Drive and Torque Control", "Drive and Torque Control"	DA	ASCII Name for the object Class
180 0xB4	Class Attribute List	Get Member, CH_Get_Member	N/A, N/A, N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes a class attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
186 0xBA	Instance Attribute List	Get Member, CH_Get_Member	N/A, N/A, N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes an instance attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
190 0xBE	Instance ID List	Get Member, CH_Get_Member	1, 1, 1	A1 01 C7	Array of instance IDs supported by this class

Drive and Torque Control Class (163) - Class Attributes (1)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	Ramp1	Get_Attribute_Single, Set_Attribute_Single	0 0 100	C7	0 = Linear >0 = S-curve acc./dec. time
2 0x02	Ramp2	Get_Attribute_Single, Set_Attribute_Single	0 0 100	C7	0 = Linear >0 = S-curve acc./dec. time
3 0x03	AccTime2	Get_Attribute_Single, Set_Attribute_Single	100 1 30000	C7	
4 0x04	DecTime2	Get_Attribute_Single, Set_Attribute_Single	100 1 30000	C7	

5 0x05	BrkChop	Get_Attribute_Single, Set_Attribute_Single	0 0 2	C7	0 = Brake chopper not in use 1 = Brake chopper in use 2 = External brake chopper
6 0x06	StartFn	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C7	0 = Ramp 1 = Flying start
7 0x07	StopFn	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C7	0 = Coasting 1 = Ramp
8 0x08	DCBAmps	Get_Attribute_Single, Set_Attribute_Single	32, 9, 97	C7	
9 0x09	DCBStopT	Get_Attribute_Single, Set_Attribute_Single	0 0 2500	C7	0 = DC-brake is off at Stop
10 0x0A	DCBStopFn	Get_Attribute_Single, Set_Attribute_Single	15 1 100	C7	
11 0x0B	DCBStartT	Get_Attribute_Single, Set_Attribute_Single	0 0 2500	C7	0 = DC-brake is off at Start
12 0x0C	P1	Get_Attribute_Single, Set_Attribute_Single	100 0 5000	C7	
13 0x0D	P2	Get_Attribute_Single, Set_Attribute_Single	150 0 5000	C7	
14 0x0E	P3	Get_Attribute_Single, Set_Attribute_Single	200 0 5000	C7	
15 0x0F	P4	Get_Attribute_Single, Set_Attribute_Single	250 0 5000	C7	
16 0x10	P5	Get_Attribute_Single, Set_Attribute_Single	300 0 5000	C7	
17 0x12	P6	Get_Attribute_Single, Set_Attribute_Single	400 0 5000	C7	
18 0x13	P7	Get_Attribute_Single, Set_Attribute_Single	500 0 5000	C7	
51 0x33	TqRefSel	Get_Attribute_Single, Set_Attribute_Single	0 0 3	C7	0 = None 1 = Vin 2 = Iin 3 = Panel Reference
52 0x34	TqBias	Get_Attribute_Single, Set_Attribute_Single	0 -100 100	C3	0 = not in use
53 0x35	TqGain	Get_Attribute_Single, Set_Attribute_Single	100 -320 320	C3	100 = no scaling
54 0x36	TqTC	Get_Attribute_Single, Set_Attribute_Single	128 1 1000	C7	
55 0x37	TqMin	Get_Attribute_Single, Set_Attribute_Single	300 1 1000	C7	
101 0x65	Trail#	Get_Attribute_Single, Set_Attribute_Single	0 0 10	C7	0 = not in use

102 0x66	TrialT	Get_Attribute_Single, Set_Attribute_Single	30 1 6000	C7	
103 0x67	StartFn	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C7	0 = Ramp 1 = Flying start
104 0x68	UVRestart	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C7	0 = No 1 = Yes
105 0x69	OVRRestart	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C7	0 = No 1 = Yes
106 0x6A	OCRestart	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C7	0 = No 1 = Yes
107 0x6B	RefRestart	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C7	0 = No 1 = Yes
108 0x6C	TempRestart	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C7	0 = No 1 = Yes
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A, N/A, N/A	DA	Array of instance IDs supported by this class

Protections Object

Class Code 0xA6

Protections Class (166) - Class Attributes (0)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	Revision	Get_Attribute_Single	1 1 1	C7	Revision of this object
2 0x02	Max Instance	Get_Attribute_Single	1 1 1	C7	
3 0x03	Number of Instances	Get_Attribute_Single	1 1 1	C7	
4 0x04	Optional attribute list	Get_Attribute_Single	{1,176} {1,176} {1,176}	A2 04 C7 A1 01 C7	
5 0x05	Optional service list	Get_Attribute_Single	{1,16} {1,16} {1,16}	A2 04 C7 A1 01 C7	
6 0x06	Max Class Attribute ID	Get_Attribute_Single	190 190 190	C7	
7 0x07	Max Instance Attribute ID	Get_Attribute_Single	176 176 176	C7	
176 0xB0	Object Name	Get_Attribute_Single	"Protections", "Protections", "Protections"	DA	ASCII Name for the object Class
180 0xB4	Class Attribute List	Get Member, CH_Get_Member	N/A, N/A, N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes a class attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
186 0xBA	Instance Attribute List	Get Member, CH_Get_Member	N/A, N/A, N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes an instance attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
190 0xBE	Instance ID List	Get Member, CH_Get_Member	1, 1, 1	A1 01 C7	Array of instance IDs supported by this class

Protections Class (166) - Class Attributes (1)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	RefFlt	Get_Attribute_Single, Set_Attribute_Single	0 0 3	C7	0 = No action 1 = Warning 2 = Fault, stop according to par 4.7 3 = Fault, stop always by coasting
2 0x02	ExtFlt	Get_Attribute_Single, Set_Attribute_Single	2 0 3	C7	0 = No action 1 = Warning 2 = Fault, stop according to par 4.7 3 = Fault, stop always by coasting
3 0x03	PhaseSuper	Get_Attribute_Single, Set_Attribute_Single	2 0 2	C7	0 = No action 2 = Fault
4 0x04	EarthFlt	Get_Attribute_Single, Set_Attribute_Single	2 0 2	C7	0 = No action 2 = Fault

5 0x05	TempProtect	Get_Attribute_Single, Set_Attribute_Single	2 0 2	C7	0 = No action 1 = Warning 2 = Fault
6 0x06	TempBreakPtA	Get_Attribute_Single, Set_Attribute_Single	1000 500 1500	C7	2
7 0x07	TempZeroHzA	Get_Attribute_Single, Set_Attribute_Single	450 50 1500	C7	2
8 0x08	TempTC	Get_Attribute_Single, Set_Attribute_Single	150 5 3000	C7	Default value is set according to motor nominal current
9 0x09	TempBreakPtHz	Get_Attribute_Single, Set_Attribute_Single	35 10 500	C7	
10 0x0A	StallProtect	Get_Attribute_Single, Set_Attribute_Single	1 0 2	C7	0 = No action 1 = Warning 2 = Fault
11 0x0B	StallA	Get_Attribute_Single, Set_Attribute_Single	1300 50 2000	C7	
12 0x0C	StallT	Get_Attribute_Single, Set_Attribute_Single	150 20 1200	C7	
13 0x0D	MaxStallHz	Get_Attribute_Single, Set_Attribute_Single	25 1 500	C7	
14 0x0E	ULProtect	Get_Attribute_Single, Set_Attribute_Single	0 0 2	C7	0 = No action 1 = Warning 2 = Fault
15 0x0F	ULFWTq	Get_Attribute_Single, Set_Attribute_Single	500 100 1500	C7	
16 0x10	ULZeroHzTq	Get_Attribute_Single, Set_Attribute_Single	100 50 1500	C7	
17 0x11	ULTime	Get_Attribute_Single, Set_Attribute_Single	200 20 6000	C7	
18 0x12	SupplySuper	Get_Attribute_Single, Set_Attribute_Single	2 0 2	C7	
19 0x13	ThermSuper	Get_Attribute_Single, Set_Attribute_Single	2 0 2	C7	0 = No action 1 = Warning 2 = Fault
20 0x14	FBusFlt	Get_Attribute_Single, Set_Attribute_Single	2 0 2	C7	0 = No action 1 = Warning 2 = Fault
51 0x33	SkipHzL1	Get_Attribute_Single, Set_Attribute_Single	0 0 5000	C7	
52 0x34	SkipHzH1	Get_Attribute_Single, Set_Attribute_Single	0 0 5000	C7	0 = Skip Frequency range 1 is off
53 0x35	SkipHzL2	Get_Attribute_Single, Set_Attribute_Single	0 0 5000	C7	
54 0x36	SkipHzH2	Get_Attribute_Single, Set_Attribute_Single	0 0 5000	C7	0 = Skip Frequency range 2 is off

55 0x37	SkipHzL3	Get_Attribute_Single, Set_Attribute_Single	0 0 5000	C7	
56 0x38	SkipHzH3	Get_Attribute_Single, Set_Attribute_Single	0 0 5000	C7	0 = Skip Frequency range 3 is off
151 0x97	SafeStateType	Get_Attribute_Single, Set_Attribute_Single	0 0 2	C7	<p>Selects Safe State response to errors which specify safe state operation. Currently only a loss of connection other than by de-allocation is a safe state error.</p> <p>Warning: Review the application for safe operation before specifying a value for this attribute.</p> <p>0 = DriveFault (fault and stop) 1 = No Action (hold last speed) 2 = Preset Speed/Direction</p>
152 0x98	PresetDir	Get_Attribute_Single, Set_Attribute_Single	0 0 1	C7	<p>Sets safe state direction of rotation if the Safe State Behavior attribute specifies "Preset Speed/Direction".</p> <p>Warning: Review the application for safe operation before specifying a value for this attribute.</p> <p>Inverter will require external stop. 0 = Forward 1 = Reverse</p>
153 0x99	PresetRPM	Get_Attribute_Single, Set_Attribute_Single	0 0 30000	C7	<p>Sets safe state speed reference (RPM) if the Safe State Behavior attribute specifies "Preset Speed/Direction".</p> <p>Warning: Review the application for safe operation before specifying a value for this attribute.</p> <p>Inverter will require external stop.</p>
154 0x9A	PresetTq	Get_Attribute_Single, Set_Attribute_Single	0 0 10000	C7	<p>Sets safe state torque reference (0,00%) if the Safe State Behavior attribute specifies "Preset Speed/Direction".</p> <p>Warning: Review the application for safe operation before specifying a value for this attribute.</p> <p>Inverter will require external stop.</p>
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A, N/A, N/A	DA	Array of instance IDs supported by this class

Monitoring Data Object

Class Code 0xAA

Monitoring Data Class (170) - Class Attributes (0)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	Revision	Get_Attribute_Single	1 1 1	C7	Revision of this object
2 0x02	Max Instance	Get_Attribute_Single	1 1 1	C7	
3 0x03	Number of Instances	Get_Attribute_Single	1 1 1	C7	
4 0x04	Optional attribute list	Get_Attribute_Single	{1,176} {1,176} {1,176}	A2 04 C7 A1 01 C7	
5 0x05	Optional service list	Get_Attribute_Single	{1,16} {1,16} {1,16}	A2 04 C7 A1 01 C7	
6 0x06	Max Class Attribute ID	Get_Attribute_Single	190 190 190	C7	
7 0x07	Max Instance Attribute ID	Get_Attribute_Single	176 176 176	C7	
176 0xB0	Object Name	Get_Attribute_Single	"Monitoring Data" "Monitoring Data" "Monitoring Data"	DA	ASCII Name for the object Class
180 0xB4	Class Attribute List	Get Member, CH_Get_Member	N/A, N/A, N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes a class attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
186 0xBA	Instance Attribute List	Get Member, CH_Get_Member	N/A, N/A, N/A	A1 08 A2 06 C7 DA DA A1 01 C6	Each Element describes an instance attribute. The Array's elements are structs as described in the semantics section. Individual elements are accessed using the Get Member service.
190 0xBE	Instance ID List	Get Member, CH_Get_Member	1, 1, 1	A1 01 C7	Array of instance IDs supported by this class

Monitoring Data Object Class (170) - Class Attributes (1)

#	Attribute Name	Services	Default, Minimum, Maximum	Data Type	Description
1 0x01	OutputHz	Get_Attribute_Single	N/A, 0, 500	C7	Frequency to the motor
2 0x02	MotorRPM	Get_Attribute_Single	N/A, 0, 30000	C7	Calculated motor speed
3 0x03	MotorAmps	Get_Attribute_Single	N/A, 0, 160	C7	Measured motor current
4 0x04	MotorTorque[%]	Get_Attribute_Single	N/A, 0, N/A	C7	Calculated actual torque/nominal torque of the unit
5 0x05	MotorPower[%]	Get_Attribute_Single	N/A, 0, N/A	C7	Calculated actual power/nominal power of the unit power of the unit

6 0x06	MotorVolts	Get_Attribute_Single	N/A, 0, 690	C7	Calculated motor voltage
7 0x07	DC-LinkVolts	Get_Attribute_Single	N/A, 0, N/A	C7	Measured DC-link voltage
8 0x08	TempC	Get_Attribute_Single	N/A, N/A, N/A	C7	Temperature of the heat sink
9 0x09	OpDayCount	Get_Attribute_Single	N/A, 0, 65535	C7	Operating days 1), not resettable
10 0x0A	OpHrCount	Get_Attribute_Single	N/A, 0, 65535	C7	Operating hours 2), can be reset with program-button #3
11 0x0B	MWhCount	Get_Attribute_Single	N/A, 0, 65535	C7	Total MW-hours, not resettable
12 0x0C	MWhTripCount	Get_Attribute_Single	N/A, 0, 65535	C7	MW-hours, can be reset with programmable button #4
13 0x0D	VinVolts	Get_Attribute_Single	N/A, 0, 1000	C7	Voltage of the terminal Vin+ (control board)
14 0x0E	IinmA	Get_Attribute_Single	N/A, 0, 20	C7	Current of terminals lin+ and lin- (control board)
15 0x0F	DIAStatus	Get_Attribute_Single	N/A, 0, 7	C7	0 = Open Input, 1 = Closed Input (Active)
16 0x10	DIBStatus	Get_Attribute_Single	N/A, 0, 7	C7	0 = Open Input, 1 = Closed Input (Active)
17 0x11	OutStatus	Get_Attribute_Single	N/A, 0, 7	C7	0 = Open Input, 1 = Closed Input (Active)
18 0x12	ControlProg	Get_Attribute_Single	N/A, 0, 65535	C7	Version number of the control software
19 0x13	NomPower	Get_Attribute_Single	N/A, 1, 1000	C7	Shows the power size of the unit
20 0x14	MotorTemp[%]	Get_Attribute_Single	N/A, 0, N/A	C7	100%= temperature of motor has risen to nominal value
21 0x15	HzRef	Get_Attribute_Single	N/A, 0, 500	C7	Frequency reference
22 0x16	TorqueRef	Get_Attribute_Single	N/A, 0, N/A	C7	Torque reference when torque control in use
51 0x33	E1	Get_Attribute_Single	N/A, 0, 65535	C7	
52 0x34	E2	Get_Attribute_Single	N/A, 0, 65535	C7	
53 0x35	E3	Get_Attribute_Single	N/A, 0, 65535	C7	

54 0x36	E4	Get_Attribute_Single	N/A, 0, 65535	C7	
55 0x37	E5	Get_Attribute_Single	N/A, 0, 65535	C7	
56 0x38	E6	Get_Attribute_Single	N/A, 0, 65535	C7	
57 0x39	E7	Get_Attribute_Single	N/A, 0, 65535	C7	
58 0x3A	E8	Get_Attribute_Single	N/A, 0, 65535	C7	
59 0x3B	EC	Get_Attribute_Single	N/A, 0, 65535	C7	
176 0xB0	User Label	Get_Attribute_Single, Set_Attribute_Single	N/A, N/A, N/A	DA	Array of instance IDs supported by this class