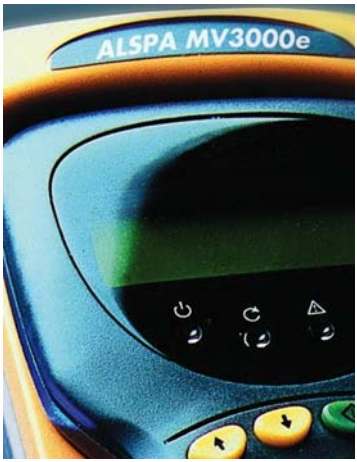


ALSPA MV3000e

Publication No. T1968EN Rev. 0003 (07/06)

2nd CAN Port

CANopen & DeviceNet

CONVERTEAM

THE POWER CONVERSION COMPANY

Acknowledgements

Issue Information

Publication T1968EN
Issue 1 (03/2003)
Issue 2 Minor Modifications (06/2003)
Issue 3 Company name change (07/2006)

SAFETY INSTRUCTIONS

Care has been taken with the design of this product to ensure that it is safe. However, in common with all products of this type, misuse can result in injury or death. Therefore, it is very important that the instructions in this manual and on the product are observed during transportation, commissioning, operation, maintenance and disposal.

This technical manual must be regarded as part of the product. It should be stored with the product and must be passed on to any subsequent owner or user.

Local safety laws and regulations must always be observed.

Persons working on the product must be suitably skilled and should have been trained in that work for these products.

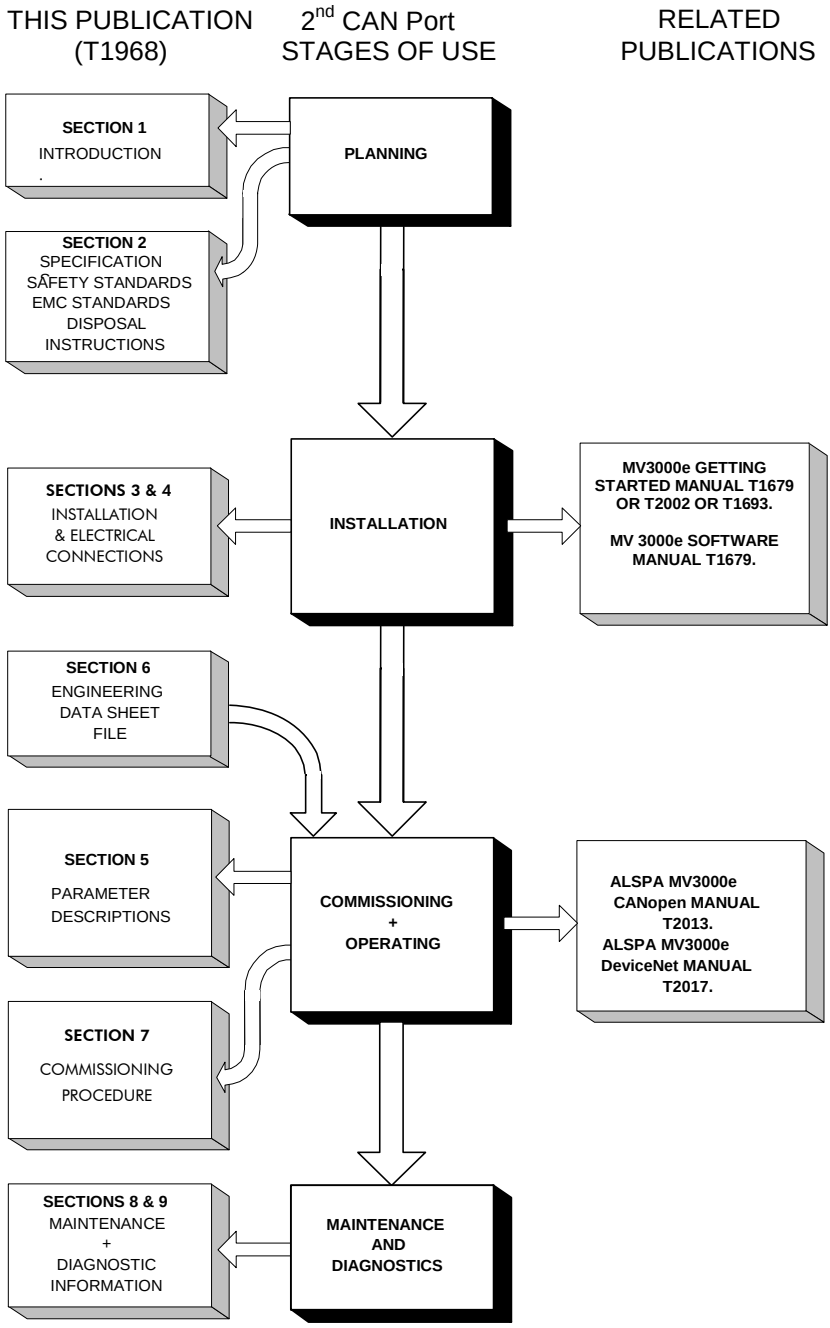
The product is a component designed for incorporation in installations, apparatus and machines.

The product must not be used as a single item safety system. In applications where maloperation of the product could cause danger, additional means must be used to prevent danger to persons.

Product approvals and certifications will be invalidated if the product is transported, used or stored outside its ratings or if the instructions in this manual are not observed.

In the European Union:

- Products within the scope of the Low Voltage Directive, 73/23/EEC as amended are CE marked.
- The product complies with the essential protection requirements of the EMC directive 89/336/EEC as amended, when installed and used as described in this manual. The requirements of the EMC Directive should be established before any installation, apparatus or machine which incorporates the product is taken into service.
- A machine must not be taken into service until the machine has been declared in conformity with the provisions of the Machinery (Safety) Directive, 98/37/EEC.


THIS PUBLICATION (T1968)
2nd CAN Port STAGES OF USE
RELATED PUBLICATIONS
SECTION 1
INTRODUCTION
.
SECTION 2
SPECIFICATION
SAFETY STANDARDS
EMC STANDARDS
DISPOSAL
INSTRUCTIONS
PLANNING
SECTIONS 3 & 4
INSTALLATION
& ELECTRICAL
CONNECTIONS
INSTALLATION
MV3000e GETTING STARTED MANUAL T1679 OR T2002 OR T1693.
MV 3000e SOFTWARE MANUAL T1679.
SECTION 6
ENGINEERING
DATA SHEET
FILE
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PARAMETER
DESCRIPTIONS
COMMISSIONING
+
OPERATING
ALSPA MV3000e CANopen MANUAL T2013.
ALSPA MV3000e DeviceNet MANUAL T2017.
SECTION 7
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MAINTENANCE
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INFORMATION
MAINTENANCE
AND
DIAGNOSTICS

SCOPE

This manual describes the CANbus facilities supported by the ALSPA MV3000e Drive and provides detailed descriptions of the related drive parameters used to configure, monitor and operate the CANbus Interface.

OVERVIEW

Section **Page**

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Section **Page**

1. Introduction

1.1 Introduction to the use of the second CAN port

Current models of the ALSPA MV3000e provide the Extended I/O, CANopen and DeviceNet protocols from the CAN port provided on the CDC control board.

The latest models of ALSPA MV3000e drives can support a second CAN port, offering all the facilities provided on the CDC CAN port.

This manual describes the installation and use of second CAN port with the later models of drives that are able to support it.

This manual assumes that the user has access to the CANopen and DeviceNet manuals listed below. These manuals provide a detailed description of the CAN menu parameters and an overview of the protocols provided, together with set up examples.

T2013	ALSPA MV3000e CANopen user manual
T2017	ALSPA MV3000e DeviceNet user manual

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2. Specification

2.1 CANbus Specification

The second CAN port supports the CANopen, Extended I/O and DeviceNet protocols as described in the ALSPA MV3000e CANopen user manual and the ALSPA MV3000e DeviceNet user manual.

This software facility is incorporated as standard in drives fitted with Version 9.00 or later:

CDC required: 20X4311 issue E or later
OR 20X4341 issue C or later

The following sub-sections supersede the equivalent sub-sections found in the above manuals.

2.1.1 Supported Baud Rates

In common with the primary CAN port on the CAN 2 capable CDCs, the second CAN port can be configured to communicate at the standard CANopen rates between 20 k Baud and 1M Baud.

The Baud rate selection is from the following list:

- 20 k Baud
- 50 k Baud
- 100 k Baud
- 125 k Baud
- 250 k Baud
- 500 k Baud.
- 1M Baud

DeviceNet is limited to a subset of the above Baud rates, i.e.

- 125 k Baud
- 250 k Baud
- 500 k Baud.

2.1.2 Opto-Isolation

In common with the primary CAN port on the CAN 2 capable CDCs, full opto-isolation is provided. The opto-isolated CAN transceiver is powered by an on-board DC to DC converter. There is no requirement to provide CAN-side external power.

2.2 Connector Specification

2.2.1 Connectors and Connections

The CANbus connection is achieved via the CAN_HI and CAN_LO and COMMS_GND terminals provided on Terminal Block TB7/TB7B as detailed in Table 4-1.

The connections at TB7/TB7B are made by screw-type terminations for each separate flexible cable.

All cables should have strain relief to prevent damage to the CANbus connection at TB7/TB7B.

3. Installation of 2nd CAN port

It is only possible to fit the second CAN port board to the later issue of the drive control board. For full details of compatible ALSPA MV3000e AC Drives, please refer to Appendix C ALSPA MV3000e AC Drives & 2nd CAN Port.

The earlier issue control board is incapable of utilising the second CAN port board, even though it is physically possible to fit the CAN board in the drive-to-drive connector site.

CAUTION

Do not install the second CAN port board into MicroCubicle™ issue C CDCs or Delta Controllers MVC3001-4001 as damage may occur.

3.1 PCB Handling Information

An earthed anti-static wristband must be worn when handling the optional second CAN port board.

3.1.1 Receipt of Equipment on Site

Where the second CAN port board is shipped separately to the general drive assembly; the equipment should be carefully unpacked and inspected for any signs of damage. Check the complete consignment against the packing slip for any loss in transit. If any damage or loss has occurred, contact your local supplier immediately giving the following details:

- A list of damaged or missing items.
- A description of the damage.
- The order number or packing slip details.

3.1.2 Storage

If the equipment delivered to site is not to be installed immediately:

- Re-pack it in its original packing material.
- Store it in a clean dry atmosphere, preferably at room temperature.

3.2 Installation Procedure for MicroCubicle™ Drives

1. Switch off the mains supply to the drive and ensure that the drive is fully isolated.

WARNINGS

This equipment may be connected to more than one live circuit. Disconnect all supplies before working on the equipment.

Wait at least 5 minutes after isolating supplies and check that voltage between DC+ and DC- has reduced to a safe level before working on this equipment.

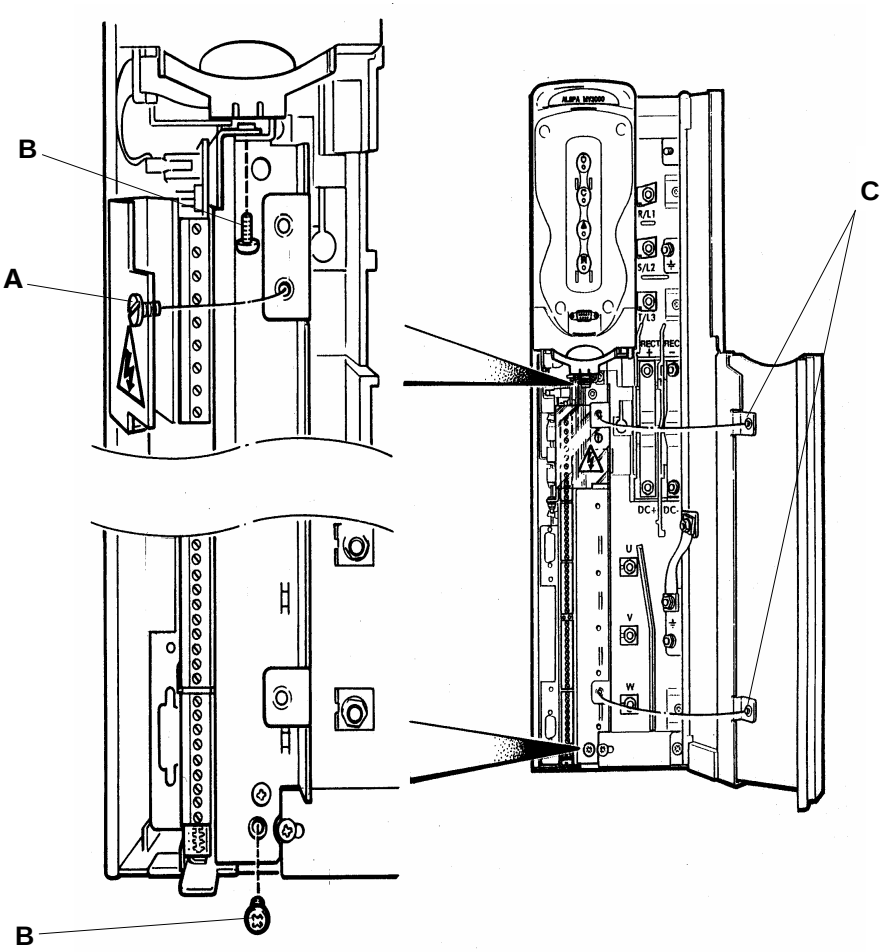
2. Refer to Figure 3-1 and fully open the drive doors as follows:

   i. Open the left hand yellow plastic door beneath the Keypad harbour by carefully pulling the bottom of the door and/or the depression at the top.

   ii. Open the right hand door by releasing the two screws (C).

3. Release the screw (A) securing the plastic terminal shroud. Remove and retain the two screws and washers (B) securing the control board to the drive chassis.

Figure 3-1 Drive module – access and release the control board



4. Slide the control board completely forward out of the drive, disconnecting any ribbon connectors located at the top of the board, (see Figure 3-2), and noting their positions for ease of re-connecting.

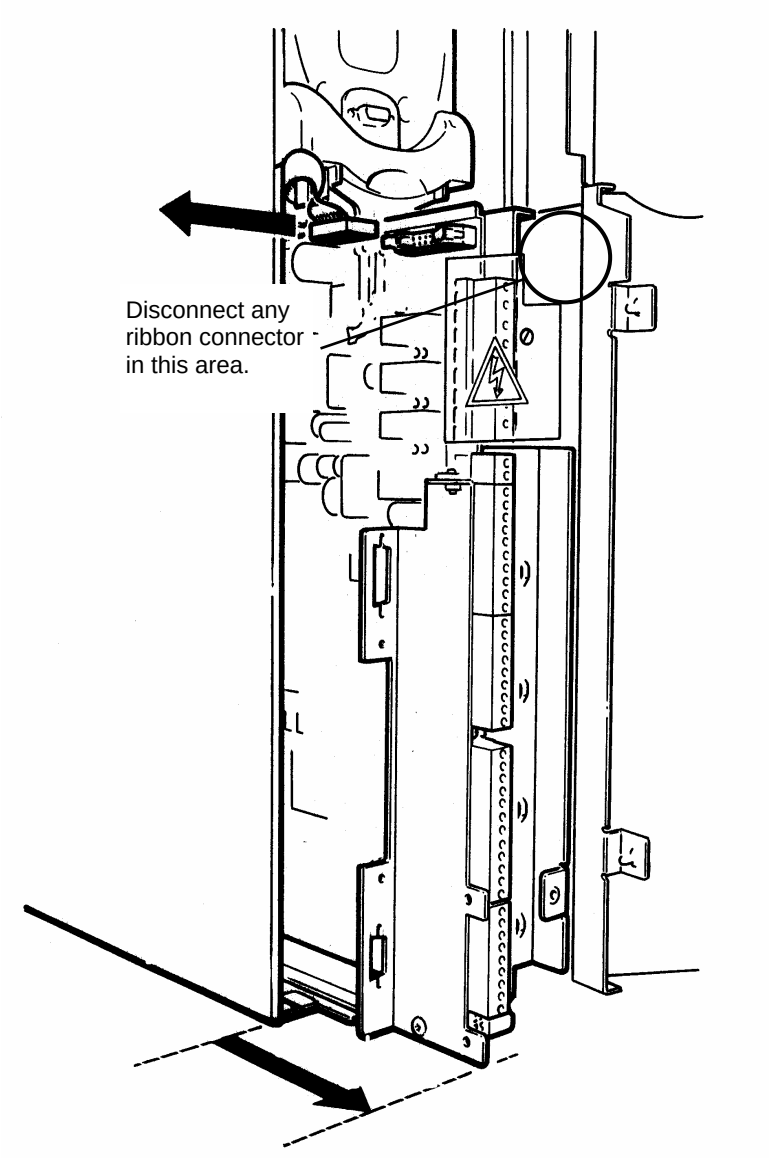


Figure 3-2 Drive module – removing the control board

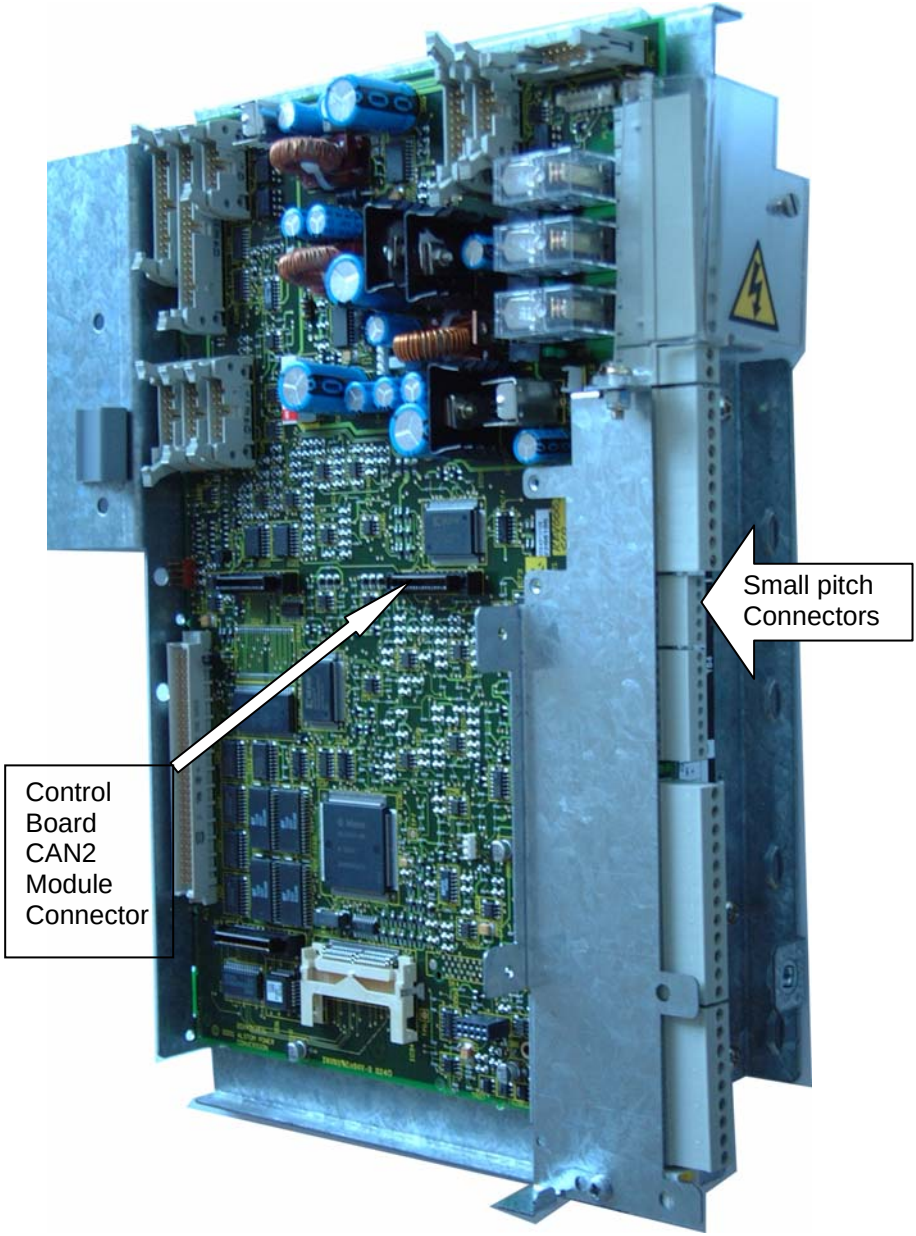


Figure 3-3 Location of CAN2 connector and small pitch connectors.

CAUTION

This equipment contains solid state devices which may be affected by electrostatic discharge. Observe static handling precautions.

5. Fit the CAN board into the drive-to-drive-way socket (see Figure 3-3) at the front of the control board, as shown in Figure 3-4.
6. Secure it to the steel front plate with the two screws provided.
7. Attach the label if supplied.

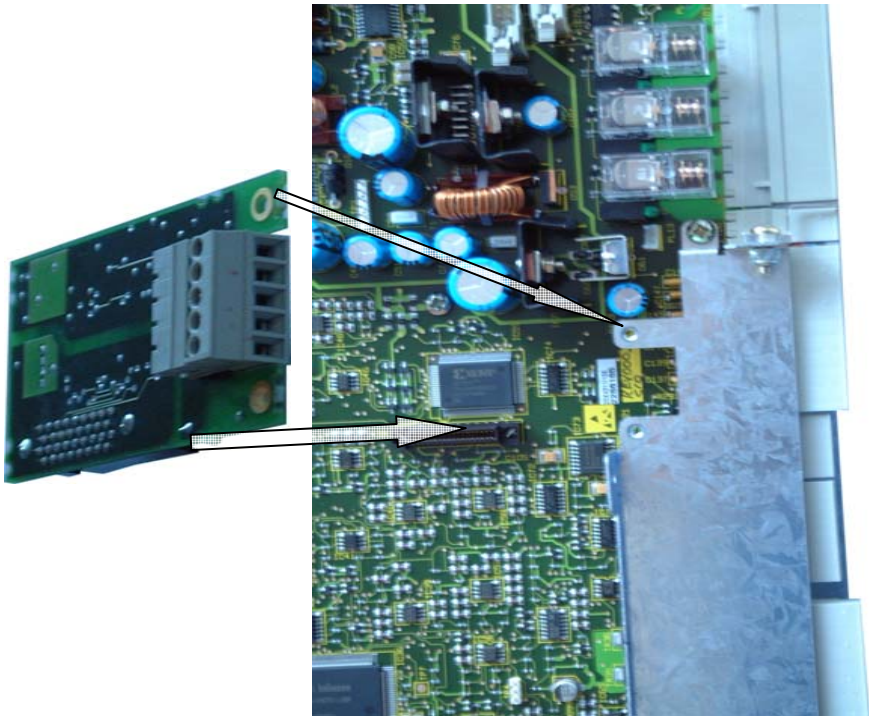


Figure 3-4 Drive module – fitting the CAN board

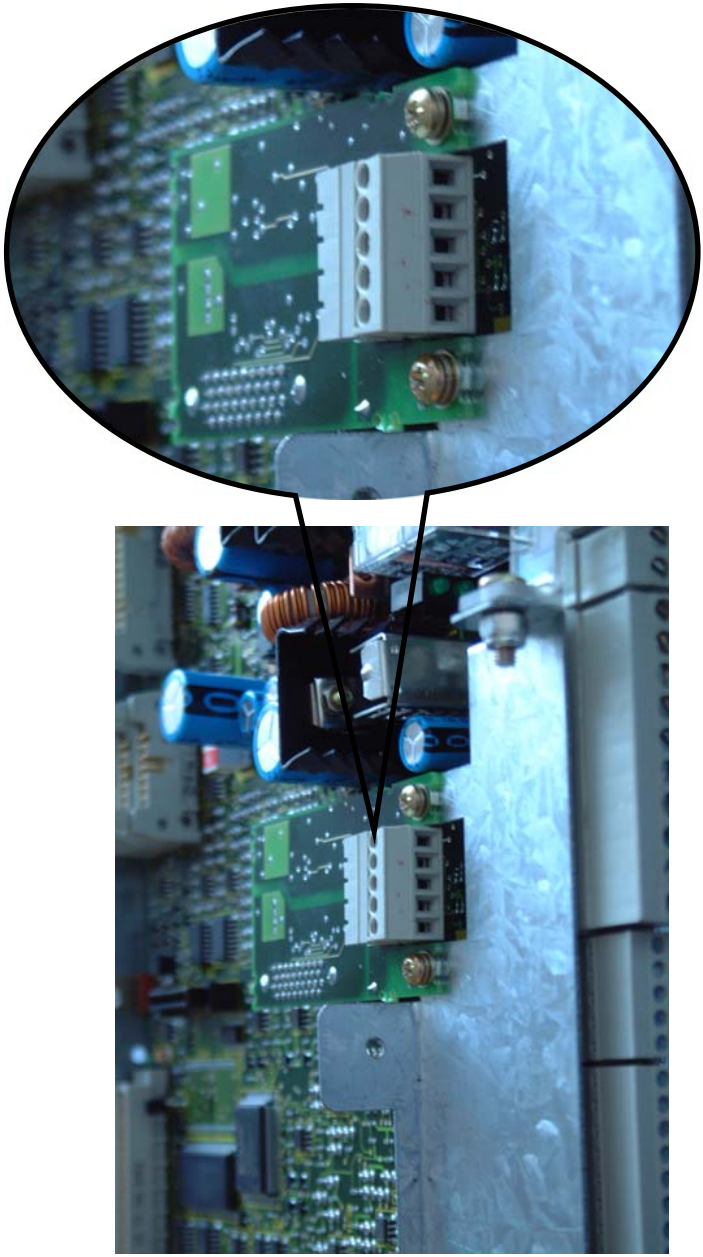


Figure 3-5 Location of fitted CAN board

8. Slide the control board back into the drive and re-connect the ribbon connectors that were disconnected at step 4.

9. Secure the control board to the drive chassis using the two screws and washers removed at step 3. Close the plastic terminal shroud and secure with the retained screw, then close and secure the drive doors.

3.3 Installation Procedure for DELTA Systems

1. Switch off the mains supply to the drive and ensure that the drive is fully isolated.

WARNINGS

This equipment may be connected to more than one live circuit. Disconnect all supplies before working on the equipment.

Wait at least 5 minutes after isolating supplies and check that voltage between DC+ and DC- has reduced to a safe level before working on this equipment.

2. Referring to Figure 3-6, remove the five M4 screws (E), and the M5 nut and washers (D) (next to the M5 earth stud), that secure the steel cover plate (G) covering the control board.

   Note: If this is difficult due to restricted access, remove the MV3000e controller as described in T1689 (air-cooled) or T1693 (liquid cooled).

3. Remove the two M4 screws securing the steel front panel (C) to the chassis.

CAUTION

This equipment contains solid state devices which may be affected by electrostatic discharge. Observe static handling precautions.

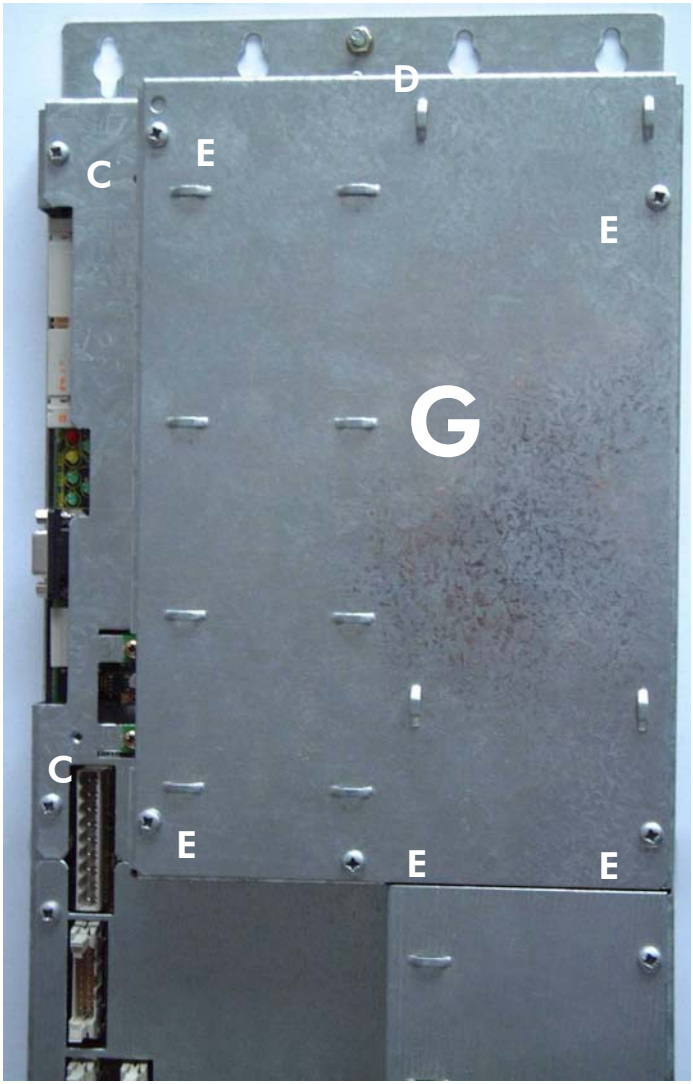


Figure 3-6 DELTA system – fitting the CAN board

4. Fit the CAN board to the front panel with the two screws provided.

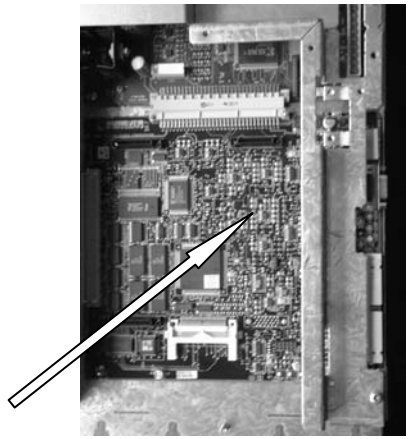


Figure 3-7 DELTA System – positioning the CAN 2 Board

5. Locate the connector on the CAN board into the drive-to-drive socket at the front of the control board, as shown in Figure 3-7
6. Secure the CAN board to the chassis using the two M4 screws removed at step 3.

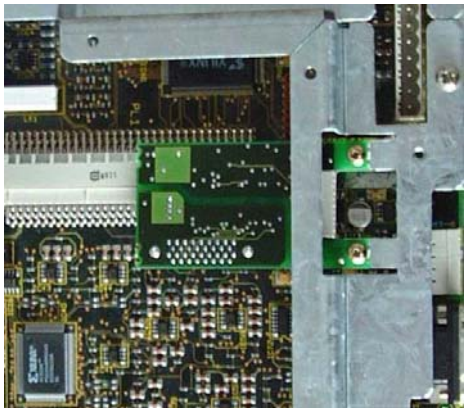


Figure 3-8 DELTA System - final position of the CAN 2 Board

7. Attach the label supplied.
8. Re-fit the cover plate over the control board, using the five screws and the M5 nut and washers removed at step 2.

3.4 Connections

3.4.1 External Wiring

It is wise to strain relieve the CANbus cable before it is connected to the drive. Strain relief helps to prevent damage to the CANbus connection or the cable becoming unexpectedly unplugged.

Electrical noise and electromagnetic interference can be introduced into a microelectronics system via the cables and wires connected to it. To avoid this, wiring which could carry noise, that is 'dirty' cables, should be kept away from cables that are to be kept free from electrical noise or 'clean'. Wiring that falls into the same group can be run together, while wiring from different groups should be kept apart, though paths may cross at right angles. All connections to the CANbus board are considered to be clean.

4. CANbus Network Connection

WARNINGS

- **Multiple Circuits**

  This equipment may be connected to more than one live circuit. Disconnect all supplies before working on the equipment.

- **Energy Discharge**

  Wait at least 5 minutes after isolating supplies and check that voltage between DC+ and DC- has reduced to a safe level before working on this equipment.

4.1 External Wiring

A CANopen cable is required for connections between drives. It should be connected to the ALSPA MV3000e Drive CDC (Common Drive Controller) at TB7 and TB7B on the CAN 2 module. The position of the terminal block, the method of routing, restraining and segregating the wiring for the CANopen connection are shown in the T1676 ALSPA MV3000e Getting Started Manual.

It is important to strain relieve the CANopen cable before it is connected to the drive. Strain relief helps to prevent damage to the CANopen connection and restricts the cable from being accidentally unplugged.

If the CANopen connections are to be made to an ALSPA MV DELTA Drive the connection should be made at TB7 on the ALSPA MVC3002-4001 User I/O Termination Panel. The type of cable is specified at 4.4.

4.2 Cable Segregation

Electrical noise and electromagnetic interference can be introduced into a microelectronics system via the cables and wires connected to it. Segregation requirements for the wiring and cables connected to a drive, including those for CANbus, should be implemented to minimise any possibility of interference being introduced into the drive system.

Implementation of segregation requirements involves separating that wiring which could carry electrical noise, referred to as 'dirty' wiring, from that which is free from electrical noise, referred to as 'clean' wiring. Wiring that falls into the same group (i.e. 'dirty' or 'clean') can be run together, while wiring from different groups should be kept apart, though paths may cross at right angles. All connections for CANbus are considered to be clean.

4.3 CANbus Connectors

The CANbus connection is achieved via the CAN_HI and CAN_LO and COMMS_GND terminals provided on Terminal Block TB7/TB7B as detailed at Table 4-1.

The connections at TB7/TB7B are made by screw-type terminations for each separate flexible cable of the type specified at 4.4.

All cables should have strain relief to prevent damage to the CANbus connection at TB7/TB7B.

Table 4-1 ALSPA MV3000e TB7/TB7B CANbus Connections

TB Number	Pin Number	Designation	CAN Cable
TB7/TB7B	1	Comms Ground	CAN_GND
	2	CAN_LO	CAN_LO
	3	Screen	Screen
	4	CAN_HI	CAN_HI
	5	NC	

Note: The making of a 'T' in the CANbus network is not allowed, the cable must always be daisy chained.

4.4 CANbus Cable

The connection between an ALSPA MV3000e Drive and other devices using CANbus is made via a 3-wire screened cable. It is recommended that a two-pair twisted cable with overall screen be used. The cable electrical specification is as detailed in the ALSPA MV3000e CANopen and DeviceNet user manuals.

4.5 CANbus Earthing

To ensure an EMC (Electromagnetic Compatibility) compliant installation, the network cable screens must be continuous and

connected to a d.c. earth at each ALSPA MV3000e Drive and at all other nodes in accordance with the recommendations of the node equipment manufacturer.

Full details of drive earthing are included in the appropriate manuals T1676 or T1693).

4.5.1 Bus Cable Termination

Figure 4-1 to Figure 4-3 illustrate typical connection diagrams for CANbus network cabling between drives. The diagrams also show connections for terminating resistors.

Each end of a CANbus network must have a 120 Ω ± 10%, ¼ W resistor fitted between the CAN_HI and CAN_LO wires. It is therefore necessary for the resistors to be supplied and fitted when the network is being installed.

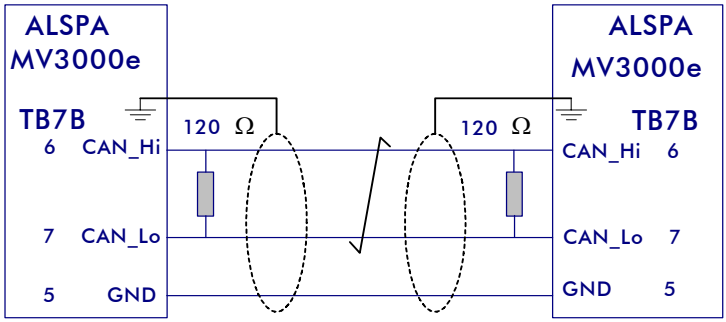


Figure 4-1 Network Cabling between 2 Nodes

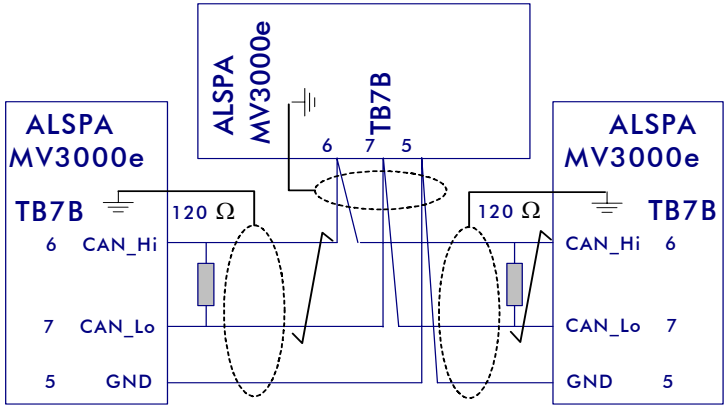


Figure 4-2 Network Cabling between 3 Nodes

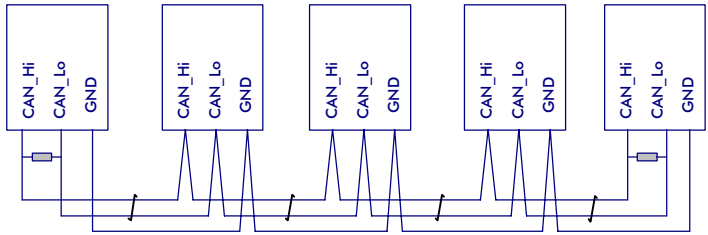


Figure 4-3 Network Cabling between more than three Nodes

5. CAN 2 Parameters

5.1 Introduction

This section includes a list of all the CAN parameters that are provided within the CAN 2 specific parameter menus. Each CAN 2 parameter has a directly equivalent CAN 1 parameter; the detailed description of the CAN 1 parameter is contained within the appropriate CANopen or DeviceNet manual.

This section lists the CAN 2 parameters, but the reader is referred to the above manuals for a detailed description.

5.2 Parameter Listing

5.2.1 Menus Listed

This section includes a listing of all the parameters, grouped in menus, for ease of reference. The listing includes:

Menu 58	Extended I/O 2	- see Table 5-1
Menu 65	CDC CAN 2 Port	- see Table 5-2
Menu 66	CAN 2 CANopen	- see Table 5-3
Menu 67	CAN 2 DeviceNet	- see Table 5-4
Menu 89	Data Spy	- see Table 5-5

5.2.2 Attributes

All parameters have attributes that specify how they may be accessed. The types of attributes used in this manual are:

R = Read only
E = Engineer Accessible
O = Operator Accessible
L = List parameter
N = Enter parameter
S = Stop to edit.

5.2.3 Extended I/O Menu 58

Table 5-1 Extended I/O 2 Menu 58

Parameter	Name	Default	Range	Attrib.	Comment
P58	Extended I/O 2 Menu				
P58.00	Digital i/p Node ID	0	0 to 127	E	
P58.01	Analog i/p Node ID	0	0 to 127	E	
P58.02	Analog o/p Node ID	0	0 to 127	E	
P58.03	Digital o/p Node ID	0	0 to 127	E	
P58.04	No. of Digital i/ps	0	0 to 64	E	
P58.05	No. of Digital o/ps	0	0 to 64	E	
P58.06	Digital i/ps 0..15		0000h to FFFFh	R	
P58.07	Digital i/ps 16..31		0000h to FFFFh	R	
P58.08	Digital i/ps 32..47		0000h to FFFFh	R	
P58.09	Digital i/ps 48..63		0000h to FFFFh	R	
P58.10	Ext Analog i/p 1 binary	0		R	
P58.11	Ext Analog i/p 1 Full Scale	32767	±32,767	E	
P58.12	Ext. Analog i/p 1 Offset	0	±10,000	E	
P58.13	Ext Analog i/p. 1 Drive FS pu	10000	±30,000	E	
P58.14	Ext Analog i/p 1 pu Scaled	0		R	
P58.15	Ext Analog i/p 2 binary	0		R	
P58.16	Ext Analog i/p 2 Full Scale	32767	±32,767	E	
P58.17	Ext. Analog i/p 2 Offset	0	±10,000	E	
P58.18	Ext Analog i/p. 2 Drive FS pu	10000	±30,000	E	
P58.19	Ext Analog i/p 2 pu Scaled	0		R	
P58.20	Ext Analog i/p 3 binary	0		R	
P58.21	Ext Analog i/p 3 Full Scale	32767	±32,767	E	
P58.22	Ext. Analog i/p 3 Offset	0	±10,000	E	
P58.23	Ext Analog i/p. 3 Drive FS pu	10000	±30,000	E	
P58.24	Ext Analog i/p 3 pu Scaled	0		R	
P58.25	Ext Analog i/p 4 binary	0		R	
P58.26	Ext Analog i/p 4 Full Scale	32767	±32,767	E	
P58.27	Ext. Analog i/p 4 Offset	0	±10,000	E	
P58.28	Ext Analog i/p. 4 Drive FS pu	10000	±30,000	E	
P58.29	Ext Analog i/p 4 pu Scaled	0		R	
P58.30	Ext Analog o/p 1 Src	00.00	00.00 to 99.99	E.N	
P58.31	Ext Analog o/p. 1 Drive FS pu	10000	±30,000	E	

Table 5-1 Extended I/O 2 Menu 58

Parameter	Name	Default	Range	Attrib.	Comment
P58.32	Ext Analog o/p 1 Full Scale	32767	±32,767	E	
P58.33	Ext. Analog o/p 1 Offset	0	±10,000	E	
P58.34	Ext Analog o/p 1 pu	0		R	
P58.35	Ext Analog o/p 2 Src	00.00	00.00 to 99.99	E.N	
P58.36	Ext Analog o/p. 2 Drive FS pu	10000	±30,000	E	
P58.37	Ext Analog o/p 2 Full Scale	32767	±32,767	E	
P58.38	Ext. Analog o/p 2 Offset	0	±10,000	E	
P58.39	Ext Analog o/p 2 pu	0		R	
P58.40	Ext Analog o/p 3 Src	00.00	00.00 to 99.99	E.N	
P58.41	Ext Analog o/p. 3 Drive FS pu	10000	±30,000	E	
P58.42	Ext Analog o/p 3 Full Scale	32767	±32,767	E	
P58.43	Ext. Analog o/p 3 Offset	0	±10,000	E	
P58.44	Ext Analog o/p 3 pu	0		R	
P58.45	Ext Analog o/p 4 Src	00.00	00.00 to 99.99	E.N	
P58.46	Ext Analog o/p. 4 Drive FS pu		±30,000	E	
P58.47	Ext Analog o/p 4 Full Scale	32767	±32,767	E	
P58.48	Ext. Analog o/p 4 Offset	0	±10,000	E	
P58.49	Ext Analog o/p 4 pu	0		R	
P58.50	Ext Dig o/p 0 Src	0.000	±CFSRC range	E.N	
P58.51 :	Ext Dig o/p 1 Src	0.000	±CFSRC range	E.N	
P58.81	Ext Dig o/p 31 Src	0.000	±CFSRC Range	E.N	
P58.82	Ext Dig o/p 0..15		0000 to FFFF	R	
P58.83	Ext Dig o/p 16..31		0000 to FFFF	R	
P58.84	Ext IO Loss Action	1	0 = No Action 1 = Warning 2 = Trip	E.L.N	

5.2.4 CAN Port 2 Menu 65

Table 5-2 CAN Port 2 Menu 65

Par No	Name	Default	Range	Attrib.	Comment
P65.00	CAN2 Protocol	0	0=None 1=Standard CANopen 2=DeviceNet 3=MV1000 CANopen	E.L	
P65.01	CAN2 Baud Rate	2	0=1M Baud 1=800k Baud 2=500k Baud 3=250k Baud 4=125k Baud 5=100k Baud 6=50k Baud 7=20k Baud 8=10k Baud*	E.L	*Not supported
P65.02	CAN2 Node ID	0	0 to 127 for CANopen 0 to 63 for DeviceNet	E	
P65.03	Config CAN Port 2	0	0 or 1	E.L.N	
P65.04	Config. on Power Up.	0	0 or 1	E.L.N	
P65.05	Use Received Data.	1	0 or 1	E.L	
P65.06	CAN Comms. State		0=Off-line 1=Bus Off 2=Tx/Rx Errors Limit 3=On-line 4=Initialising 5=Pre-operational 6=Prepared 7=Operational 8=Disconnected 9=Connected 10=Preparing 11=Ext I/O only	R	
P65.07	TX Per Second		Packets/sec	R	
P65.08	RX Per Second		Packets/sec	R	
P65.09	CAN Error Word		0000 to FFFFh	R.	
P65.10	CAN Error Count	0	0-65535	R	
P65.11	Bus Off Action.	1	0=Hold 1=Reset Port	E.N.L	
P65.12	CAN2 Loss Action	1	0=Ignore 1=Set Warning Bit 2=Trip Drive	E.L	
P65.13	Freeze/Fallback on loss of	0	0= Freeze	E.L.S	

Table 5-2 CAN Port 2 Menu 65

Par No	Name	Default	Range	Attrib.	Comment
	CAN		1= Fallback		
P65.14	CAN2 Reference 1	0	±200.00 %	E	
P65.15	CAN2 Ref. 1 Fallback	0	±200.00 %	E	
P65.16	CAN2 Reference 2	0	±200.00 %	E	
P65.17	CAN2 Ref. 2 Fallback	0	±200.00 %	E	
P65.18	CAN2 Reference 3	0	±200.00 %	E	
P65.19	CAN2 Ref. 3 Fallback	0	±200.00 %	E	
P65.20	CAN2 Reference 4	0	±200.00 %	E	
P65.21	CAN2 Ref. 4 Fallback	0	±200.00 %	E	
P65.22	CAN2 Reference 5	0	±200.00 %	E	
P65.23	CAN2 Ref. 5 Fallback	0	±200.00 %	E	
P65.24	CAN2 Reference 6	0	±200.00 %	E	
P65.25	CAN2 Ref. 6 Fallback	0	±200.00 %	E	
P65.26	CAN2 Reference 7	0	±200.00 %	E	
P65.27	CAN2 Ref. 7 Fallback	0	±200.00 %	E	
P65.28	CAN2 Reference 8	0	±200.00 %	E	
P65.29	CAN2 Ref. 8 Fallback	0	±200.00 %	E	
P65.30	CAN2 Control Word 1	0	0000 to FFFFh	E	
P65.31	Control Fallback 1.	0	0000 to FFFFh	E	
P65.32	CAN Control Word 2	0	0000 to FFFFh	E	
P65.33	Control Fallback 2.	0	0000 to FFFFh	E	
P65.34	CANopen Version.	3.0	3.0 – 4.0	E	
P65.35	CANopen Master Func.	2	0=disable 1=NMT Master 2=IO Master	E.N.L	
P65.36	CANopen Sync Master.	0	0=disable 1=enable	E.N.L	
P65.37	Sync Master Period.	0	0 to 1000ms	E	
P65.38	Node Guard Method.	1	0=None 1=PDO presence 2=Node Guarding 3=Heartbeat	E.L	Fixed=1
P65.39	Node Guard Period.	0	0 to 1000 ms	E	
P65.40	Life Time Factor.	1	0 to 60	E	
P65.41	PDO Inhibit Time.	0	0 to 1000 ms	E.N	
P65.42	Standard Slave.	0	0=disable 1=enable	E.N.L	

Table 5-2 CAN Port 2 Menu 65

Par No	Name	Default	Range	Attrib.	Comment
P65.43	Warn/Trip Source.	None	0=None 1=PDO 1 2=PDO 2 3=PDO 3 4=PDO 4 5=PDO 5 6=PDO 6 7=PDO 7 8=PDO 8 9=PDO 9 10=PDO 10 11=Digital O/P 12=Analogue O/P 13=Digital i/p 14=Analogue i/p 15=Network Fault 16=No Process Data 17=Tx Poll loss 18=Rx Poll loss 19=Tx Strobe loss 20=Rx Strobe loss 21=Tx Cyclic/COS loss 22=Rx Cyclic/COS loss	R	
P65.44	Unmonitored PDO Mask	0000h	0000 to FFFFh	E	
P65.45	Bad CAN-ID Source.	None	0 = None 1 = PDO 1 Bad CAN-ID 2 = PDO 2 Bad CAN-ID 3 = PDO 3 Bad CAN-ID 4 = PDO 4 Bad CAN-ID 5 = PDO 5 Bad CAN-ID 6 = PDO 6 Bad CAN-ID 7 = PDO 7 Bad CAN-ID 8 = PDO 8 Bad CAN-ID 9 = PDO 9 Bad CAN-ID	R	

Table 5-2 CAN Port 2 Menu 65

Par No	Name	Default	Range	Attrib.	Comment
			10 = PDO 10 Bad CAN-ID 11 = PDO 1 Duplicate 12 = PDO 2 Duplicate 13 = PDO 3 Duplicate 14 = PDO 4 Duplicate 15 = PDO 5 Duplicate 16= PDO 6 Duplicate 17 = PDO 7 Duplicate 18 = PDO 8 Duplicate 19 = PDO 9 Duplicate 20 = PDO 10 Duplicate 21 = Dig O/P Duplicate 22 = An O/P Duplicate 23 = Dig i/p Duplicate 24 = An i/p Duplicate		
P65.50	Bus off Count.	0	0-65536	R	

5.2.5 CAN 2 CANopen Menu 66

Table 5-3 CAN 2 CANopen Menu 66

P66.00	PDO.1 Mode *	0	0=Unused 1=RX (100 ms) 2=TX (100 ms) 3=RX (10 ms) 4=TX (10 ms) 5=RX (5 ms) 6=TX (5 ms) 7=RX (1.25 ms) 8=TX (1.25 ms)	E.L	
P66.01	PDO.1 Channel.ID *	0.000	±8.127	E.N	
P66.02	PDO.1 Word 1 Pointer *	00.00	0-99.99	E.N	
P66.03	PDO.1 Word 1 Scale *	0	0=Unity 1=Speed(%) 2=Speed(rpm) 3=Torque(%) 4=Torque(Nm) 5=Frequency 6=Percent 7=Speed Ramp Rate 8=Torque Slew Rate 9=Current 10=Volts 11=Resistance 12=Inductance 13=Scaler 1 14=Scaler 2 15= Scaler 3	E.L	
P66.04	PDO.1 Word 2 Pointer *	00.00	0-99.99	E.N	
P66.05	PDO.1 Word 2 Scale *	0	0-15	E.L	See P66.03
P66.06	PDO.1 Word 3 Pointer *	00.00	0-99.99	E.N	
P66.07	PDO.1 Word 3 Scale *	0	0-15	E.L	See P66.03
P66.08	PDO.1 Word 4 Pointer *	00.00	0-99.99	E.N	
P66.09	PDO.1 Word 4 Scale *	0	0-15	E.L	See P66.03
P66.10 to P66.99	Definition of PDOs 2 to 10 *				

* This parameter requires a CANopen reconfiguration before changes can take effect i.e. set P65.03 = 1.

5.3 DeviceNet Parameters

5.3.1 CAN 2 DeviceNet Menu 67

Table 5-4 CAN 2 DeviceNet Menu 67

Par No	Description	Default	Range	Attrib.	Comment
P67.00	Unused	0			
P67.01	Tx.1 Instance *	0	0-200	E.N	
P67.02	Tx.1 Word 1 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.03	Tx.1 Word 1 Scale*	0	0=Unity 1=Speed (%) 2=Speed (rpm) 3=Torque (%) 4=Torque (Nm) 5=Frequency 6=Percent 7=Speed Ramp Rate 8=Torque Slew Rate 9=Current 10=Volts 11=Resistance 12=Inductance 13=Scalar 1 14=Scalar 2 15=Scalar 3	E.L	
P67.04	Tx.1 Word 2 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.05	Tx.1 Word 2 Scale*	0	See P67.03	E.L	
P67.06	Tx.1 Word 3 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.07	Tx.1 Word 3 Scale*	0	See P67.03	E.L	
P67.08	Tx.1 Word 4 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.09	Tx.1 Word 4 Scale*	0	See P67.03	E.L	
P67.10	Unused				
P67.11	Tx.2 Instance	0	0-200	E.N	
P67.12	Tx.2 Word 1 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.13	Tx.2 Word 1 Scale *	0	See P67.03	E.L	
P67.14	Tx.2 Word 2 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.15	Tx.2 Word 2 Scale *	0	See P67.03	E.L	
P67.16	Tx.2 Word 3 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.17	Tx.2 Word 3 Scale *		See P67.03	E.L	
P67.18	Tx.2 Word 4 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.19	Tx.2 Word 4 Scale *		See P67.03	E.L	
P67.20	Unused				

Table 5-4 CAN 2 DeviceNet Menu 67

Par No	Description	Default	Range	Attrib.	Comment
P67.21	Tx.3 Instance	0	0-200	E.N	
P67.22	Tx.3 Word 1 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.23	Tx.3 Word 1 Scale *		See P67.03	E.L	
P67.24	Tx.3 Word 2 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.25	Tx.3 Word 2 Scale *	0	See P67.03	E.L	
P67.26	Tx.3 Word 3 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.27	Tx.3 Word 3 Scale *	0	See P67.03	E.L	
P67.28	Tx.3 Word 4 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.29	Tx.3 Word 4 Scale *	0	See P67.03	E.L	
P67.30	Unused				
P67.31	Tx.4 Instance	0	0-200	E.N	
P67.32	Tx.4 Word 1 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.33	Tx.4 Word 1 Scale *	0	See P67.03	E.L	
P67.34	Tx.4 Word 2 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.35	Tx.4 Word 2 Scale *	0	See P67.03	E.L	
P67.36	Tx.4 Word 3 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.37	Tx.4 Word 3 Scale *		See P67.03	E.L	
P67.38	Tx.4 Word 4 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.39	Tx.4 Word 4 Scale *	0	See P67.03	E.L	
P67.40	Unused				
P67.41	Tx.5 Instance	0	0-200	E.N	
P67.42	Tx.5 Word 1 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.43	Tx.5 Word 1 Scale *	0	See P67.03	E.L	
P67.44	Tx.5 Word 2 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.45	Tx.5 Word 2 Scale *	0	See P67.03	E.L	
P67.46	Tx.5 Word 3 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.47	Tx.5 Word 3 Scale *	0	See P67.03	E.L	
P67.48	Tx.5 Word 4 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.49	Tx.5 Word 4 Scale *	0	See P67.03	E.L	
P67.50	Unused	0			
P67.51	Rx.1 Instance *	0	0-200	E.N	
P67.52	Rx.1 Word 1 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.53	Rx.1 Word 1 Scale*	0	See P67.03	E.L	
P67.54	Rx.1 Word 2 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.55	Rx.1 Word 2 Scale*	0	See P67.03	E.L	
P67.56	Rx.1 Word 3 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.57	Rx.1 Word 3 Scale*	0	See P67.03	E.L	
P67.58	Rx.1 Word 4 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.59	Rx.1 Word 4 Scale*	0	See P67.03	E.L	
P67.60	Unused	0			
P67.61	Rx.2 Instance *	0	0-200	E.N	

Table 5-4 CAN 2 DeviceNet Menu 67

Par No	Description	Default	Range	Attrib.	Comment
P67.62	Rx.2 Word 1 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.63	Rx.2 Word 1 Scale*	0	See P67.03	E.L	
P67.64	Rx.2 Word 2 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.65	Rx.2 Word 2 Scale*	0	See P67.03	E.L	
P67.66	Rx.2 Word 3 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.67	Rx.2 Word 3 Scale*	0	See P67.03	E.L	
P67.68	Rx.2 Word 4 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.69	Rx.2 Word 4 Scale*	0	See P67.03	E.L	
P67.70	Unused				
P67.71	Rx.3 Instance *	0	0-200	E.N	
P67.72	Rx.3 Word 1 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.73	Rx.3 Word 1 Scale*	0	See P67.03	E.L	
P67.74	Rx.3 Word 2 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.75	Rx.3 Word 2 Scale*	0	See P67.03	E.L	
P67.76	Rx.3 Word 3 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.77	Rx.3 Word 3 Scale*	0	See P67.03	E.L	
P67.78	Rx.3 Word 4 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.79	Rx.3 Word 4 Scale*	0	See P67.03	E.L	
P67.80	Unused				
P67.81	Rx.4 Instance	0	0-200	E.N	
P67.82	Rx.4 Word 1 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.83	Rx.4 Word 1 Scale*	0	See P67.03	E.L	
P67.84	Rx.4 Word 2 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.85	Rx.4 Word 2 Scale*	0	See P67.03	E.L	
P67.86	Rx.4 Word 3 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.87	Rx.4 Word 3 Scale*	0	See P67.03	E.L	
P67.88	Rx.4 Word 4 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.89	Rx.4 Word 4 Scale*	0	See P67.03	E.L	
P67.90	Unused				
P67.91	Rx.5 Instance *	0	0-200	E.N	
P67.92	Rx.5 Word 1 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.93	Rx.5 Word 1 Scale*	0	See P67.03	E.L	
P67.94	Rx.5 Word 2 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.95	Rx.5 Word 2 Scale*	0	See P67.03	E.L	
P67.96	Rx.5 Word 3 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.97	Rx.5 Word 3 Scale*	0	See P67.03	E.L	
P67.98	Rx.5 Word 4 Pointer *	P0.00	P0.00 to P99.99	E.N	
P67.99	Rx.5 Word 4 Scale*	0	See P67.03	E.L	

* This parameter requires a DeviceNet reconfiguration before changes can take effect

5.3.2 Data Spy Menu 89

5.4 Data Spy Parameters P89.00 to P89.06

This menu can be used to help debug and commission the CANbus network as well as monitoring data transactions during normal operation. In addition to the CDC CAN port, the second CAN port data transactions can now be monitored. The values are displayed in decimal with no scaling and should be exactly what is appearing on the CANbus network.

To select a PDO (on a CANopen network) or Assembly object (on a DeviceNet network) to be spied upon, enter the parameter menu number in P89.00, e.g. P89.00 = 66.00 for PDO1, 66.10 for PDO 2, etc.

The P89.00 spy selections are listed in Table 5-5

Table 5-5 Data Spy P89.00 Settings

Value	Meaning
P58.00	Spy Ext digital I/P data on CAN 2
P58.01	Spy Ext analog I/P data on CAN 2
P58.02	Spy Ext analog O/P data on CAN 2
P58.03	Spy Ext digital O/P data on CAN 2
P66.x0	Spy selected CANopen PDO (1+x) on CAN 2
P67.x0	Spy selected DeviceNet Assembly object on CAN 2
P59.00	Spy Ext digital I/P data on CDC CAN
P59.01	Spy Ext analog I/P data on CDC CAN
P59.02	Spy Ext analog O/P data on CDC CAN
P59.03	Spy Ext digital O/P data on CDC CAN
P62.x0	Spy selected CANopen PDO (1+x) on CDC CAN
P63.x0	Spy selected DeviceNet Assembly object on CDC CAN

6. Electronic Data Sheet File

6.1 Introduction

In order for a CANopen or DeviceNet Master device to communicate with other CANopen or DeviceNet compliant units on a network it needs to know, from a CANopen or DeviceNet point of view, the capabilities of those units. These capabilities are described in a file provided by the unit's manufacturer known as an EDS (**E**lectronic **D**ata **S**heet) file, and is in a simple text format and has file name extension of ".eds".

Refer to the appropriate CANopen (T2013) or DeviceNet (T2017) manual for further EDS details.

CAUTION

Both CANopen and DeviceNet use EDS files with the file extension of ".eds". Ensure the correct EDS file is used for the appropriate protocol.

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7. Commissioning

WARNINGS

- **Multiple Circuits**

  This equipment may be connected to more than one live circuit. Disconnect all supplies before working on the equipment.

- **Energy Discharge**

  Wait at least 5 minutes after isolating supplies and check that voltage between DC+ and DC- has reduced to a safe level before working on this equipment.

7.1 Protocol Set-up Procedure

Commissioning of the second CAN port is the same as commissioning the primary CAN port. Refer to the appropriate CANopen/DeviceNet manuals' commissioning chapter.

7.2 Verifying data contents

Once the CANbus protocol has been commissioned, the next step may be to verify the data being sent to or from the CANbus protocol master.

For simple applications, viewing the data item on the drive (e.g. a reference) or the master (e.g. a monitor point) may be sufficient to confirm correct data.

For more complex applications, the use of the data spy (see 5.3.2) is a way of confirming the data values at the point of entry or exit to or from the drive. These should correspond to the producer or consumer at the source or destination end of the CANbus network. Once the un-scaled value of each data element is confirmed, the scaled (if appropriate) data can be examined at the appropriate drive destination or source parameter.

Note: As the data spy values are displayed in decimal, it may be useful to have a decimal to hex, decimal to binary conversion utility, such as a scientific calculator.

8. Maintenance

8.1 General Guidance

When CANopen/DeviceNet is enabled in an ALSPA MV3000e Drive, its maintenance requirements are included with maintenance of the drive, described in the T1676 ALSPA MV3000e Getting Started Manual. The drive maintenance consists generally of checking for ingress of dust and moisture, and checking for security of electrical connections. The latter checks should include all the cables and connectors used for CANopen/DeviceNet connections.

8.2 Firmware Revisions

Firmware revisions for the CANopen/DeviceNet software used in the ALSPA MV3000e Drive are available from **Converteam**. Contact **Converteam** for details at the Customer Support telephone number listed at the end of this manual.

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9. Diagnostics

9.1 Faults

If a link, that was previously working, stops working then one of the two error codes may be displayed depending upon the setting of P65.12.

9.2 CAN Warning Fault Code

Table 9-1 shows the warning fault codes displayed in the drive warnings table, if the CAN link is not healthy, and P65.12, action on loss of CAN control source has been set to "warning".

Table 9-1 Warning Fault Codes

Fault Code	Name	Description
111	CAN 2 Loss	CAN 2 is not communicating correctly – refers to P65.43 for cause
117	CAN2 PDO/sec too high	PDOs allocated to a scan are exceeding recommended quantity
118	Bad CAN2 ID	Bad or duplicated CAN ID - refers to P65.45 for their identification
119	CAN 2 PDO/IO clash	PDO and IO have IDs clashing

9.3 CAN Trip Fault Code

Table 9-2 shows the trip fault code displayed in the drive trip tables when the CAN link is not healthy, and P65.12, action on loss of CAN control source, has been set to "trip".

Table 9-2 Trip Fault Code

Fault Code	Name	Class	Description
203	CAN 2 Loss	R	CAN 2 Loss see P65.43

A= Auto resetable trip

R = Manually resetable trip

S = System trip

N = Non resetable trip

When the warning or trip is active, menu P65.43 or P65.45 will give further information as to the cause of the trip or warning.

9.4 CAN Status P65.06

Parameter P65.06 displays the state of the communications; see Table 5-2

9.5 Spares and Re-order Information

The interface does not contain any user replaceable parts and must be returned to the manufacturer for repair. Whole units should be kept for spares.

Please contact customer support, or your local agent for details.

The order number for the 2nd CAN Port Module is:

MVS3011-4001

Appendix A. CANopen Configuration Tables

A.1. Introduction

This appendix includes a set of tables (Table A-1 to Table A-19) which enable a CANopen network on the second CAN port to be configured. Each table includes an example of a typical configuration shown in the shaded rows of the table.

It is suggested that a user copies all the pages from this appendix and uses them to configure the required network.

It is also recommended that the completed tables are copied and retained safely as records of the network configuration.

Table A-1 CAN References

No.	Param.	Mapped From	Fallback Value	Description
Example				
1	P65.14	66.14	0	PDO 2 Word 2 Speed ref.
1	P65.14			
2	P65.16			
3	P65.18			
4	P65.20			
5	P65.22			
6	P65.24			
7	P65.26			
8	P65.28			

Table A-2 CAN Control Words

No.	Param.	Mapped From	Fallback Value	Description
Example				
1	P65.30	66.12	0	PDO 2 Word 1
1	P65.30			
2	P65.32			

Table A-3 Control Word 1, P65.30

Bit	Control Flag Number	Fallback Value	Description
Example			
0	7.032	0	Bit 0 mapped to Stop flag
0	7.032		
1	7.033		
2	7.034		
3	7.035		
4	7.036		
5	7.037		
6	7.038		
7	7.039		
8	7.040		
9	7.041		
10	7.042		
11	7.043		
12	7.044		
13	7.045		
14	7.046		
15	7.047		

Table A-4 Control Word 2, P65.32

Bit	Control Flag Number	Fallback Value	Description
Example			
0	7.048	0	Bit 0 mapped to Stop flag
0	7.048		
1	7.049		
2	7.050		
3	7.051		
4	7.052		
5	7.053		
6	7.054		
7	7.055		
8	7.056		
9	7.057		
10	7.058		
11	7.059		
12	7.060		
13	7.061		
14	7.062		
15	7.063		

Table A-6 Example of CANopen PDO 1 Allocation

Example				
	Dir[n]	Rate	Channel.ID	COB-ID
	RX	10ms	1.010	894
No.	Param.	Destination Parameter	Scale Type	Description
1	P66.02	65.30	Unity	Control word
2	P66.04	65.14	Speed(%)	Speed Reference
3	P66.06	5.17	Speed(rpm)	Min. speed fwd
4	P66.08	0.00	Unity	Unused

Table A-5 CANopen PDO 1 Allocation

	Dir[n]	Rate	Channel.ID	COB-ID
No.	**Param.**	**Destination Parameter**	**Scale Type**	**Description**
1	P66.02			
2	P66.04			
3	P66.06			
4	P66.08			

Table A-7 CANopen PDO 2 Allocation

	Dir[n]	Rate	Channel.ID	COB-ID
No.	**Param.**	**Destination Parameter**	**Scale Type**	**Description**
1	P66.12			
2	P66.14			
3	P66.16			
4	P66.18			

Table A-8 CANopen PDO 3 Allocation

	Dir[n]	Rate	Channel.ID	COB-ID
No.	**Param.**	**Destination Parameter**	**Scale Type**	**Description**
1	P66.22			
2	P66.24			
3	P66.26			
4	P66.28			

Table A-9 CANopen PDO 4 Allocation

	Dir[n]	Rate	Channel.ID	COB-ID
No.	**Param.**	**Destination Parameter**	**Scale Type**	**Description**
1	P66.32			
2	P66.34			
3	P66.36			
4	P66.38			

Table A-10 CANopen PDO 5 Allocation

	Dir[n]	Rate	Channel.ID	COB-ID
No.	**Param.**	**Destination Parameter**	**Scale Type**	**Description**
1	P66.42			
2	P66.44			
3	P66.46			
4	P66.48			

Table A-11 CANopen PDO 6 Allocation

	Dir[n]	Rate	Channel.ID	COB-ID
No.	**Param.**	**Destination Parameter**	**Scale Type**	**Description**
1	P66.52			
2	P66.54			
3	P66.56			
4	P66.58			

Table A-12 CANopen PDO 7 Allocation

	Dir[n]	Rate	Channel.ID	COB-ID
No.	**Param.**	**Destination Parameter**	**Scale Type**	**Description**
1	P66.62			
2	P66.64			
3	P66.66			
4	P66.68			

Table A-13 CANopen PDO 8 Allocation

	Dir[n]	Rate	Channel.ID	COB-ID
No.	**Param.**	**Destination Parameter**	**Scale Type**	**Description**
1	P66.72			
2	P66.74			
3	P66.76			
4	P66.78			

Table A-14 CANopen PDO 9 Allocation

	Dir[n]	Rate	Channel.ID	COB-ID
No.	**Param.**	**Destination Parameter**	**Scale Type**	**Description**
1	P66.82			
2	P66.84			
3	P66.86			
4	P66.88			

Table A-15 CANopen PDO 10 Allocation

	Dir[n]	Rate	Channel.ID	COB-ID
No.	**Param.**	**Destination Parameter**	**Scale Type**	**Description**
1	P66.92			
2	P66.94			
3	P66.96			
4	P66.98			

Table A-16 Scaler Allocation Menu 60

No.	Scaler	Drive Scale	External Scale	Description
Example				
1	Speed(%)	10000	16383	
1	Speed(%)			
2	Speed(rpm)			
3	Torque(%)			
4	Torque(Nm)			
5	Frequency			
6	Percent			
7	Speed Ramp Rate			
8	Torque Slew Rate			
9	Current			
10	Volts			
11	Resistance			
12	Inductance			
13	Scaler 1			
14	Scaler 2			
15	Scaler 3			

Table A-17 Programmable Status Word 0

Bit	Param. No.	Control Flag No.	Description
Example			
0	P41.00	2.001	Bit 0 mapped to Stopped flag
0	P41.00		
1	P41.01		
2	P41.02		
3	P41.03		
4	P41.04		
5	P41.05		
6	P41.06		
7	P41.07		
8	P41.08		
9	P41.09		
10	P41.10		
11	P41.11		
12	P41.12		
13	P41.13		
14	P41.14		
15	P41.15		

Table A-18 Programmable Status Word 1

Bit	Param. No.	Control Flag No.	Description
Example			
0	P41.16	2.001	Bit 0 mapped to Stopped flag
0	P41.16		
1	P41.17		
2	P41.18		
3	P41.19		
4	P41.20		
5	P41.21		
6	P41.22		
7	P41.23		
8	P41.24		
9	P41.25		
10	P41.26		
11	P41.27		
12	P41.28		
13	P41.29		
14	P41.30		
15	P41.31		

Table A-19 Menu 42 - Reference Pointers

No.	Param.	Points To Param.	Scale	Function
Example				
1	P42.00	65.14	10000	Speed Reference
1	P42.00			Speed Reference
2	P42.02			Speed Reference
3	P42.04			Reference Sequencer
4	P42.06			PID Set-point
5	P42.08			PID Feedback
6	P42.10			Trim Reference
7	P42.12			Speed Trim Reference
8	P42.14			Torque Reference
9	P42.16			Torque Limits
10	P42.18			Torque Limits
11	P42.20			Temperature Compensation Scale
12	P42.22			Flux Limit
13	P42.24			Current Limit
14	P42.26			Torque/Magnet. Current
15	P42.28			Torque/Magnet. Current
16	P42.30			Position Reference
17	P42.32			Position Reference
18	P42.34			Tacho Feedback
19	P42.36			Variable Voltage Boost
20	P42.38			Reference Shaper
21	P42.40			SFE Vdc Reference
22	P42.42			SFE Active Current Reference
23	P42.44			SFE Active Current Negative Limit
24	P42.46			SFE Active Current Positive Limit
25	P42.48			SFE Reactive Current Reference
26	P42.50			SFE Reactive Current Positive Limit
27	P42.52			SFE Reactive Current Negative Limit
28	P42.54			Dynamic Braking

Appendix B. DeviceNet Configuration Tables

B.1 Introduction

This appendix includes a set of tables (Table B-1 to Table B-19) which enable a DeviceNet network on the second CAN port to be configured. Each table includes an example of a typical configuration shown in the shaded rows of the table.

It is suggested that a user copies all the pages from this appendix and uses them to configure the required network.

It is also recommended that the completed tables are copied and retained safely as records of the network configuration.

Table B-1 CAN References

No.	Param.	Mapped From	Fallback Value	Description
Example				
1	P65.14	67.64	0	Rx 2 Word 2 Speed ref.
1	P65.14			
2	P65.16			
3	P65.18			
4	P65.20			
5	P65.22			
6	P65.24			
7	P65.26			
8	P65.28			

Table B-2 CAN Control Words

No.	Param.	Mapped From	Fallback Value	Description
Example				
1	P65.30	67.62	0	Rx 2 Word 1
1	P65.30			
2	P65.32			

Table B-3 Control Word 1, P65.30

Bit	Control Flag Number	Fallback Value	Description
Example			
0	7.032	0	Bit 0 mapped to Stop flag
0	7.032		
1	7.033		
2	7.034		
3	7.035		
4	7.036		
5	7.037		
6	7.038		
7	7.039		
8	7.040		
9	7.041		
10	7.042		
11	7.043		
12	7.044		
13	7.045		
14	7.046		
15	7.047		

Table B-4 Control Word 2, P65.32

Bit	Control Flag Number	Fallback Value	Description
Example			
0	7.048	0	Bit 0 mapped to Stop flag
0	7.048		
1	7.049		
2	7.050		
3	7.051		
4	7.052		
5	7.053		
6	7.054		
7	7.055		
8	7.056		
9	7.057		
10	7.058		
11	7.059		
12	7.060		
13	7.061		
14	7.062		
15	7.063		

Table B-5 DeviceNet Rx 1 Allocation

No.	Param.	Destination Parameter	Scale Type	Description
1	P67.52			
2	P67.54			
3	P67.56			
4	P67.58			

Table B-6 Example of DeviceNet Rx 1 Allocation

Example				
No.	**Param.**	**Destination Parameter**	**Scale Type**	**Description**
1	P67.52	65.30	Unity	Control word
2	P67.54	65.14	Speed(%)	Speed Reference
3	P67.56	0.00	Unity	Unused
4	P67.58	0.00	Unity	Unused

Table B-7 DeviceNet Rx 2 Allocation

No.	Param.	Destination Parameter	Scale Type	Description
1	P67.62			
2	P67.64			
3	P67.66			
4	P67.68			

Table B-8 DeviceNet Rx 3 Allocation

No.	Param.	Destination Parameter	Scale Type	Description
1	P67.72			
2	P67.74			
3	P67.76			
4	P67.78			

Table B-9 DeviceNet Rx 4 allocation

No.	Param.	Destination Parameter	Scale Type	Description
1	P67.82			
2	P67.84			
3	P67.86			
4	P67.88			

Table B-10 DeviceNet Rx 5 allocation

No.	Param.	Destination Parameter	Scale Type	Description
1	P67.92			
2	P67.94			
3	P67.96			
4	P67.98			

Table B-11 DeviceNet Tx 1 Allocation

No.	Param.	Destination Parameter	Scale Type	Description
1	P67.02			
2	P67.04			
3	P67.06			
4	P67.08			

Table B-12 DeviceNet Tx 1 Allocation

No.	Param.	Destination Parameter	Scale Type	Description
1	P67.02			
2	P67.04			
3	P67.06			
4	P67.08			

Table B-13 DeviceNet Tx 2 Allocation

No.	Param.	Destination Parameter	Scale Type	Description
1	P67.12			
2	P67.14			
3	P67.16			
4	P67.18			

Table B-14 DeviceNet Tx 3 Allocation

No.	Param.	Destination Parameter	Scale Type	Description
1	P67.22			
2	P67.24			
3	P67.26			
4	P67.28			

Table B-15 DeviceNet Tx 4 Allocation

No.	Param.	Destination Parameter	Scale Type	Description
1	P67.32			
2	P67.34			
3	P67.36			
4	P67.38			

Table B-16 DeviceNet Tx 5 Allocation

No.	Param.	Destination Parameter	Scale Type	Description
1	P67.42			
2	P67.44			
3	P67.46			
4	P67.48			

Table B-17 Scaler Allocation Menu 60

No.	Scaler	Drive Scale	External Scale	Description
Example				
1	Speed(%)	10000	16383	
1	Speed(%)			
2	Speed(rpm)			
3	Torque(%)			
4	Torque(Nm)			
5	Frequency			
6	Percent			
7	Speed Ramp Rate			
8	Torque Slew Rate			
9	Current			
10	Volts			
11	Resistance			
12	Inductance			
13	Scaler 1			
14	Scaler 2			
15	Scaler 3			

Table B-18 Programmable Status Word 0

Bit	Param. No.	Control Flag No.	Description
Example			
0	P41.00	2.001	Bit 0 mapped to Stopped flag
0	P41.00		
1	P41.01		
2	P41.02		
3	P41.03		
4	P41.04		
5	P41.05		
6	P41.06		
7	P41.07		
8	P41.08		
9	P41.09		
10	P41.10		
11	P41.11		
12	P41.12		
13	P41.13		
14	P41.14		
15	P41.15		

Table B-19 Programmable Status Word 1

Bit	Param. No.	Control Flag No.	Description
Example			
0	P41.16	2.001	Bit 0 mapped to Stopped flag
0	P41.16		
1	P41.17		
2	P41.18		
3	P41.19		
4	P41.20		
5	P41.21		
6	P41.22		
7	P41.23		
8	P41.24		
9	P41.25		
10	P41.26		
11	P41.27		
12	P41.28		
13	P41.29		
14	P41.30		
15	P41.31		

Table B-20 Menu 42 - Reference Pointers

No.	Param.	Points To Param.	Scale	Function
Example				
1	P42.00	61.14	10000	Speed Reference
1	P42.00			Speed Reference
2	P42.02			Speed Reference
3	P42.04			Reference Sequencer
4	P42.06			PID Set-point
5	P42.08			PID Feedback
6	P42.10			Trim Reference
7	P42.12			Speed Trim Reference
8	P42.14			Torque Reference
9	P42.16			Torque Limits
10	P42.18			Torque Limits
11	P42.20			Temperature Compensation Scale
12	P42.22			Flux Limit
13	P42.24			Current Limit
14	P42.26			Torque/Magnet. Current
15	P42.28			Torque/Magnet. Current
16	P42.30			Position Reference
17	P42.32			Position Reference
18	P42.34			Tacho Feedback

Appendix C. ALSPA MV3000e AC Drives & 2nd CAN Port

C.1 Introduction.

Not all ALSPA MV3000e AC Drives can accept the 2nd CAN Port Module MVS3011-4011. The following lists the requirements for fitting the module.

C.2 ALSPA MV3000e DELTA Based AC Drives

All ALSPA MV3000e DELTA based AC Drives fitted with DELTA Controller MVS3001-4002 will accept the 2nd CAN Port Module. They will, however, need to be at firmware revision 9.00 or later.

CAUTION
Do not install the 2nd CAN Port Module on DELTA Controller MVS3001-4001 as damage may occur.

C.3 ALSPA MV3000e MicroCubicle™ AC Drives

To install the 2nd CAN Port Module on an ALSPA MV3000e MicroCubicle™ AC Drive requires the drive to have

1. The Common Drive Controller pcb 20X4311 to be at issue D or Issue E artwork, distinguished by having small pitch connectors, see Figure 4-3.
2. The Serial link Support Steelwork 029212981 to be at revision 8 or later.
3. The drive firmware to be a release 9.00 or later.

For all practicable purposes this means that drive should have a serial number of 2273721 or higher. This serial number limit also applies to the spare for the Common Drive Controller - S41Y7784/40.

CAUTION
Do not install the 2nd CAN Port Module on earlier versions of the Common Drive Controller as damage may occur.

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Terminology

The following definitions, acronyms and terms are used within this manual:

Acronyms and Definitions

CAN	Controller Area Network.
CANbus	CAN Fieldbus.
CANopen	A networking system based on the CAN serial bus; the network protocol defined by CiA.
CDC	Common Drive Controller the control board for the ALSPA MV3000e range of drives.
CFSRC	A Control Flag Source
CiA	CAN in Automation (an international users and manufacturers group).
COB	A Communication Object - a unit of transportation in a CAN Network; data must be sent across a Network inside a COB.
COB-ID	A COB identifier. It identifies a COB uniquely in a Network. It is the CANopen name for a node address.
CRC	Cyclic Redundancy Check.
CW	Control Word
DBT	A Distributor within the CANopen Distribution Protocol services.
DeviceNet	CAN Protocol defined initially by Allen Bradley and now controlled by the ODVA (Open DeviceNet Vendor Association). Direction
Dir^{n}	Direction
EDS	Electronic data sheet. The EDS file is used to provide a profile of the slave device e.g. the

	ALSPA MV3000e Drive, to the CANbus Master. The file is supplied in PC readable format.
EPR	Expected Packet Rate attribute
Explicit Data	The data telegram defined by DeviceNet to transfer service data between DeviceNet Nodes.
FS	Full scale.
GND	Ground.
h	Used in this manual to indicate a number is hexadecimal.
I/O Data	The data telegram defined by DeviceNet to transfer process data between DeviceNet Nodes.
MAC-ID	Media Access Controller Identifier. This is the DeviceNet term for a node address.
NMT	Network Management.
ODVA	Open DeviceNet Vendor Association.
PIB	Power Interface Board, the control board which interfaces the CDC to the output switching devices.
PDO	Process Data Object, the data telegram defined by CANopen to transfer data between CANopen nodes.
SDO	Service Data Object, a data telegram used to transfer configuration data between CANopen master and slave nodes.
Src	Source.
VSD	Variable Speed Drive.

CANopen Terms and Definitions

Combined Node	an Extended I/O Node which has more than one type of I/O fitted e.g. digital/analogue and/or input/output on the same node.
Consumer	a device that receives data sent by a producing device.
Emergency Object	an optional communication object of a stored event type with the notifying device acting as a server of the event. If a device supports the emergency object it has to support at least two error codes 00xx and 10xx.
Master Node	a node that, as a minimum, can send a 'Start' and 'Stop' command to other nodes.
Node	in a communications network it is a device connected to the network capable of communicating with other network devices. In a more generic sense, it is a connection point on a bus or a network.
Node Guard Object	an optional object that guards a node against communication errors which may occur between the node and a master device.
Peer-to-peer	devices at the same level that can talk to each other.
Producer	a device that is a source and transmitter of data on a network.
Producer/consumer Network	a network that is a combination of producers and consumers and in which there is no control of data transfer across the network, all devices having an equal

	or hierarchical access to the network, other than mechanisms inherently in-built into the network.
Slave Node	a node that awaits ‘Start’ and ‘Stop’ instructions from a Master Node

DeviceNet Terms and Definitions

Assembly Object	Used to collect various pieces of data together for transfer at the same time.
Class Descriptor	A DeviceNet node comprises a number of objects. Objects of the same type belong to a class of objects. Examples of classes of objects are the Parameter, Assembly and Connection objects. Each object can exist more than once with an associated instance number. It is usual that instance zero of each object is the class descriptor.
Class of Objects	Objects of the same type belong to a class of objects. Examples of classes of objects are the Parameter, Assembly and Connection objects.
Connection Object	This object is used to manage the characteristics of a communication connection.
Consumer	A device that receives data sent by a producing device
DeviceNet Master	The device that gathers and distributes I/O data for the process controller.
DeviceNet Node	A DeviceNet node comprises a number of objects.
DeviceNet Object	The DeviceNet Object provides the configuration and status of a DeviceNet port. Each DeviceNet product must support one (and only one) DeviceNet object per physical connection to the DeviceNet communication link.

Explicit Messaging	Allows any Assembly Object data set to be read or written to by an Explicit Message to the data attribute of the Assembly Object Instance.
Fragmentation	DeviceNet allows data of more than 8 bytes (8 bytes is the maximum number of data bytes that can fit in a single CAN message) to be transmitted by using fragmentation.
Instance	A specific and real (physical) occurrence of an object.
I/O Message	An I/O Message consists of a Connection ID and associated I/O data. The meaning of the data within an I/O Message is implied by the associated Connection ID.
Master Node	A node that, as a minimum, can send a 'Start' and 'Stop' command to other nodes.
Node	In a communications network it is a device connected to the network capable of communicating with other network devices. In a more generic sense, it is a connection point on a bus or a network.
Polled I/O	Allows the transfer of real time process data, via poll commands – a message is directed towards a single, specific slave – point-to-point. The master transmits a separate poll command for each of its slaves to be polled and poll responses (the polled slave returns its data if it is an input device).
Producer	A device that is a source and transmitter of data on a network

Index

Introduction

This subject index applies to the English Edition of the T1968 Technical Manual for the ALSPA MV3000e 2nd CAN Port Facility for ALSPA MV3000e Drives.

The indexes are prepared with word-by-word alphabetisation and are presented with page numbers for subject location. Page numbers for appendices are prefixed with the appendix letter e.g. A-1 in the index is Appendix A page 1. Page numbers for the Terminology and Block Diagrams are prefixed with letter(s) and no hyphen e.g. T1 in the index is Terminology page 1 and BD1 for Block Diagram page 1.

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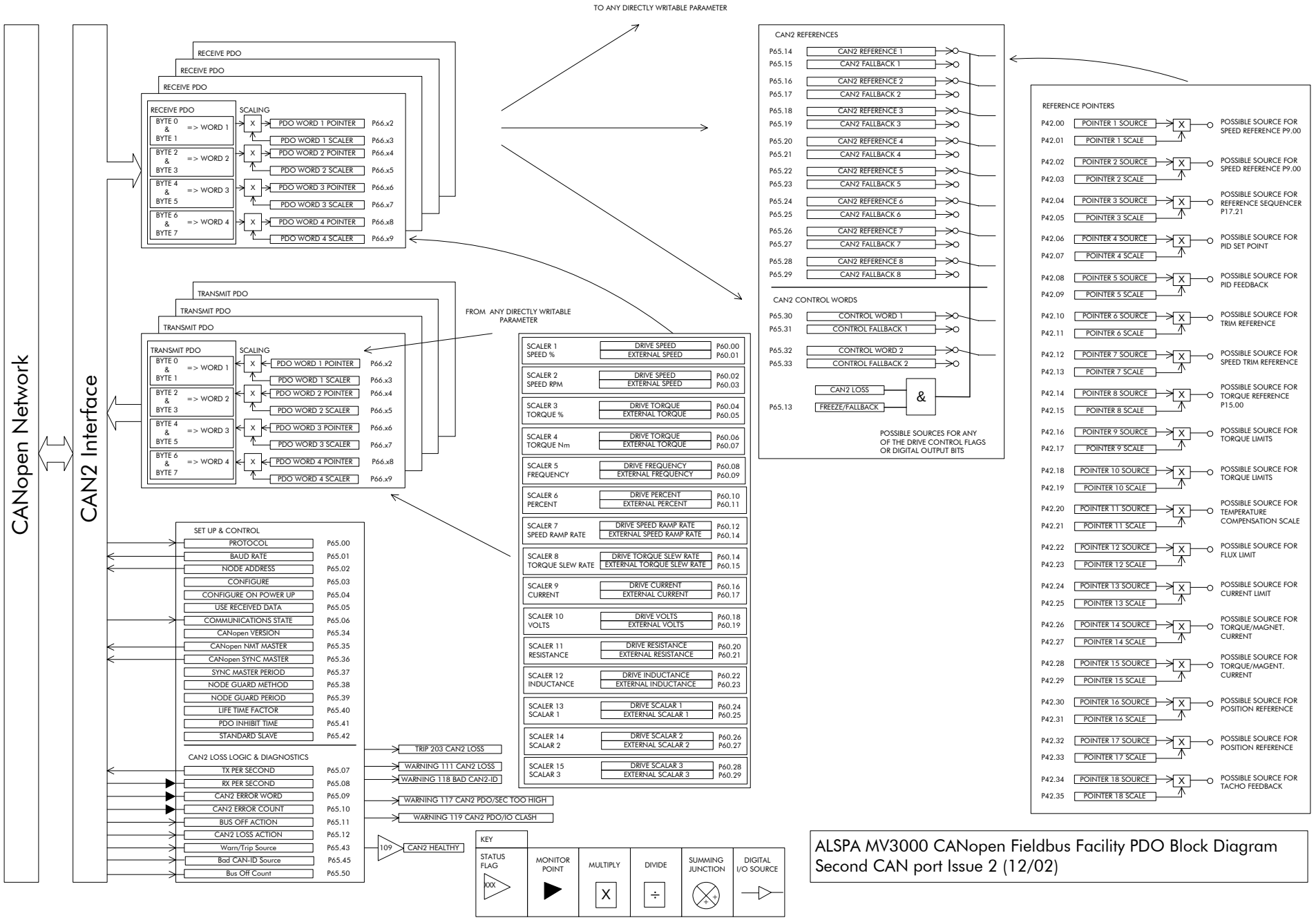

ALSPA MV3000 CANopen Fieldbus Facility PDO Block Diagram
Second CAN port Issue 2 (12/02)

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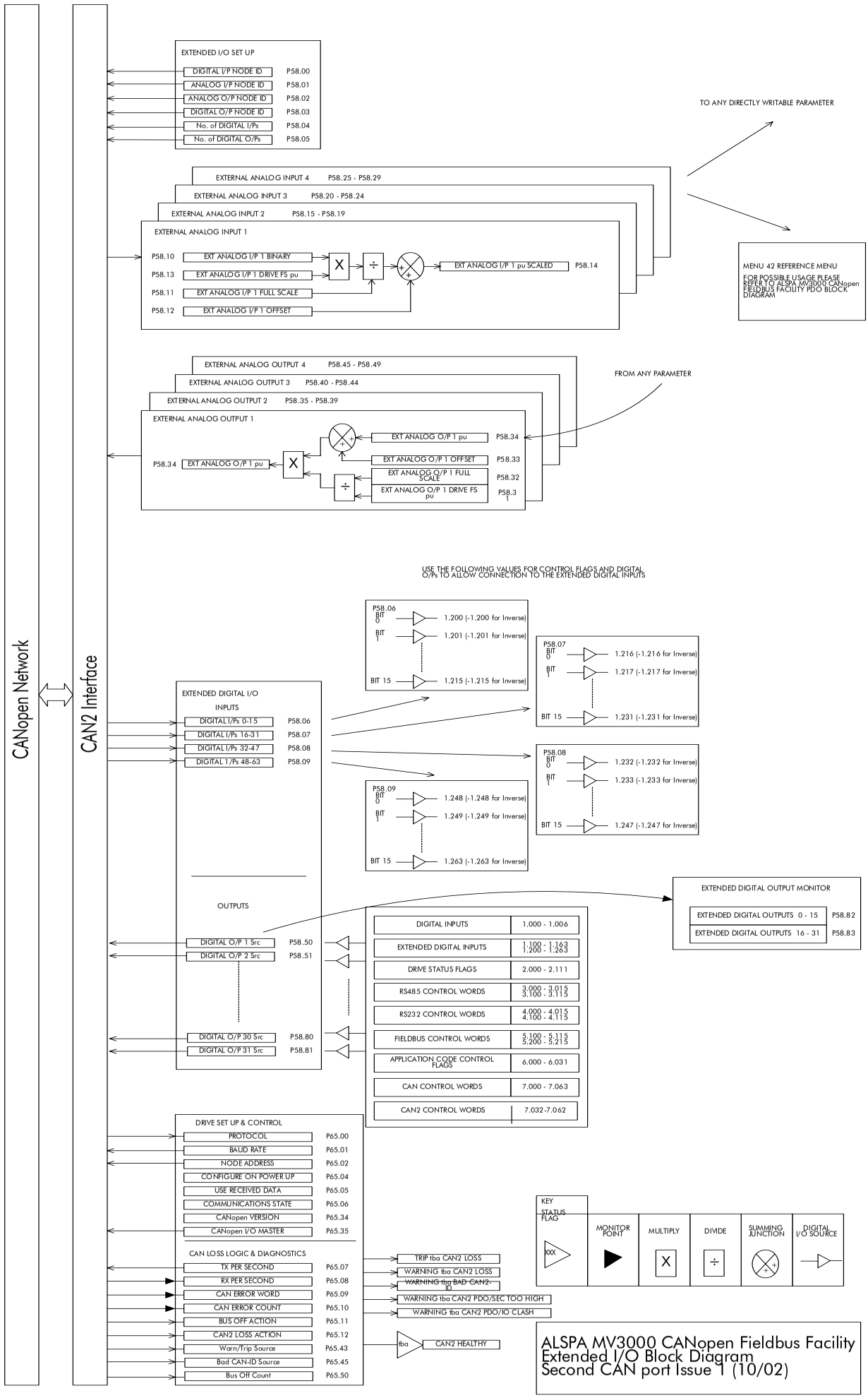
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P58.34 EXT ANALOG O/P 1 pu
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EXT ANALOG O/P 1 OFFSET P58.33
EXT ANALOG O/P 1 FULL SCALE P58.32
EXT ANALOG O/P 1 DRIVE FS pu P58.31
USE THE FOLLOWING VALUES FOR CONTROL FLAGS AND DIGITAL O/Ps TO ALLOW CONNECTION TO THE EXTENDED DIGITAL INPUTS
P58.06 BIT 0 1.200 (-1.200 for Inverse)
BIT 1 1.201 (-1.201 for Inverse)
BIT 15 1.215 (-1.215 for Inverse)
P58.07 BIT 0 1.216 (-1.216 for Inverse)
BIT 1 1.217 (-1.217 for Inverse)
BIT 15 1.231 (-1.231 for Inverse)
P58.08 BIT 0 1.232 (-1.232 for Inverse)
BIT 1 1.233 (-1.233 for Inverse)
BIT 15 1.247 (-1.247 for Inverse)
P58.09 BIT 0 1.248 (-1.248 for Inverse)
BIT 1 1.249 (-1.249 for Inverse)
BIT 15 1.263 (-1.263 for Inverse)
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RX PER SECOND P65.08
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CAN ERROR COUNT P65.10
BUS OFF ACTION P65.11
CAN2 LOSS ACTION P65.12
Warn/Trip Source P65.43
Bad CAN-ID Source P65.45
Bus Off Count P65.50
TRIP tba CAN2 LOSS
WARNING tba CAN2 LOSS
WARNING tba BAD CAN2-ID
WARNING tba CAN2 PDO/SEC TOO HIGH
WARNING tba CAN2 PDO/IO CLASH
tba CAN2 HEALTHY
KEY
STATUS FLAG
MONITOR POINT
MULTIPLY
DIVIDE
SUMMING JUNCTION
DIGITAL I/O SOURCE
ALSPA MV3000 CANopen Fieldbus Facility
Extended I/O Block Diagram
Second CAN port Issue 1 (10/02)

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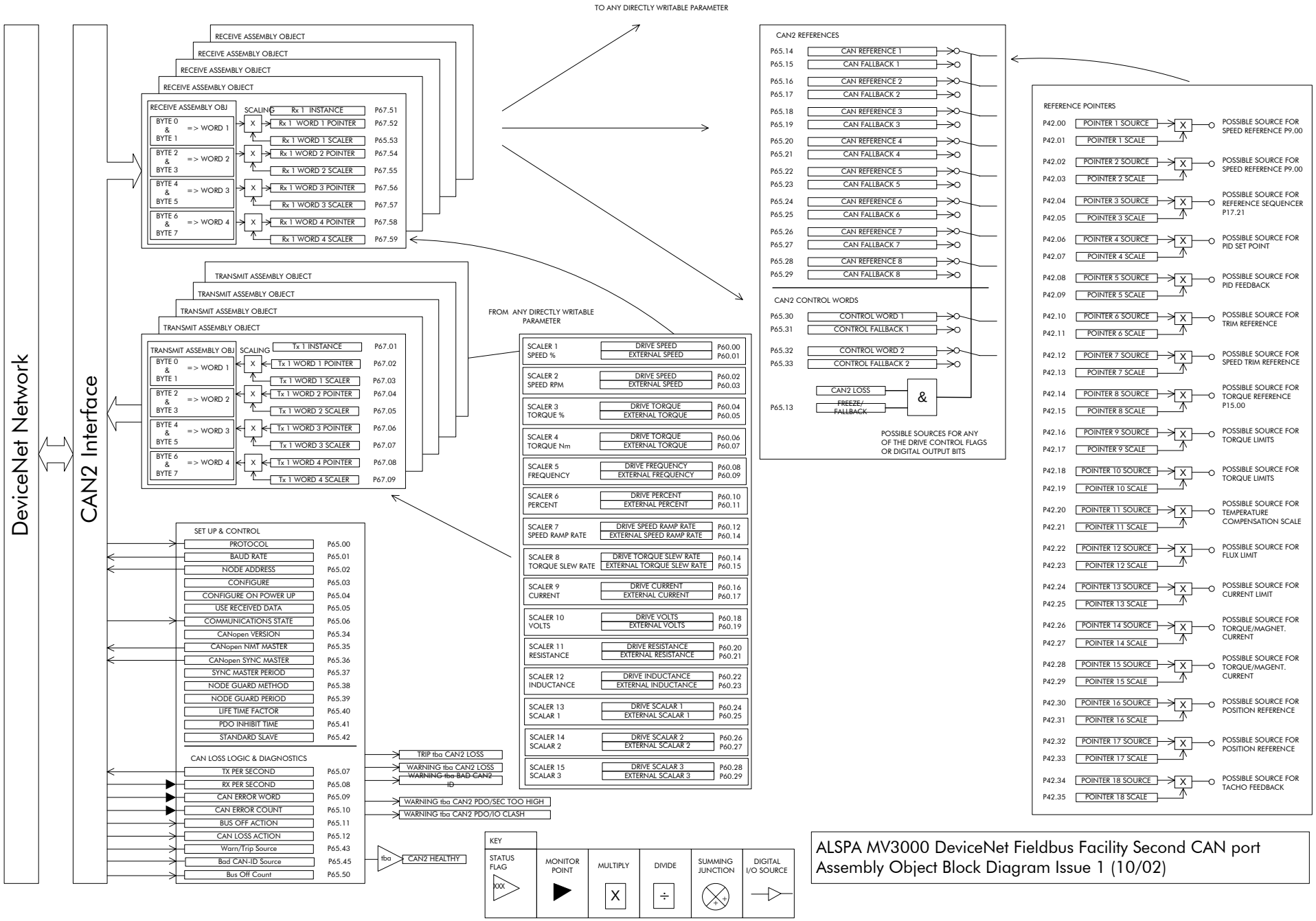

ALSPA MV3000 DeviceNet Fieldbus Facility Second CAN port Assembly Object Block Diagram Issue 1 (10/02)

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