DeviceNet Gateway

User Guide



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The manufacturer accepts no liability for any consequences resulting from inappropriate, negligent or incorrect installation.
The contents of this User Guide are believed to be correct at the time of printing. In the interests of a commitment to a policy of continuous improvement, the manufacturer reserves the right to change the specification of the product or its performance or the contents of the User Guide without notice.

SAFETY

This option module is designed specifically to be used with the Optidrive Plus variable speed drive product and is intended for professional incorporation into complete equipment or systems. If installed incorrectly it may present a safety hazard. The Optidrive Plus uses high voltages and currents, carries a high level of stored electrical energy, and is used to control mechanical plant that may cause injury. Close attention is required to system design and electrical installation to avoid hazards in either normal operation or in the event of equipment malfunction.

Personnel who have the necessary training and experience must only carry out system design, installation, commissioning and maintenance. They must read carefully this safety information and the instructions in this Guide and follow all information regarding transport, storage, installation and use of the Option module, including the specified environmental limitations.

Please read the SAFETY NOTICES below, and all Warning and Caution boxes elsewhere.

SAFETY NOTICES

WARNING is given where there is a hazard that could lead to injury or death of personnel.
CAUTION is given where there is a hazard that could lead to damage to equipment.
It is the responsibility of the installer to ensure that the equipment or system into which the product is incorporated complies with the EMC legislation of the country of use. Within the European Union, equipment into which this product is incorporated must comply with 89/336/EEC, Electromagnetic Compatibility.

WARNING
Within the European Union, all machinery in which this product is used must comply with the Directive 89/392/EEC, Safety of Machinery. In particular, the equipment should comply with EN60204-1.

WARRANTY

All Invertek Drives Ltd (IDL) products carry a 2-year warranty, valid from the date of manufacture.

Complete Warranty Terms and Conditions are available upon request from your IDL Authorised Distributor.

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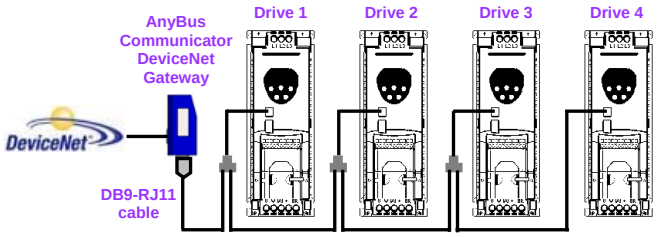
Part No. 82-DEVNET-IN Iss 1.00

WARNING

- Optidrive Plus and the Option Modules should be installed only by qualified electrical persons and in accordance with local and national regulations and codes of practice.
- ***Electric shock hazard!*** Disconnect and **ISOLATE** the Optidrive before attempting any work on it. High voltages are present at the terminals and within the drive for up to 10 minutes after disconnection of the electrical supply.
- Where the electrical supply to the drive is through a plug and socket connector, do not disconnect until 10 minutes have elapsed after turning off the supply.

System connection diagram

Please read "AnyBus Communicator for DeviceNet" user guide before system installation.



Note that the gateway needs an external 24Vdc, 300mA power supply. This is not shown in the above diagram. The gateway is supplied with a RJ11 to D-type connector, which will connect to the first drive. For each additional drive in the network, a RJ11 splitter and a RJ11 data cable are required (available from your Optidrive supplier).

Note that an increase in the number of nodes on the gateway increases the time required for any drive to respond to commands.

QUICK START

Drive setup:

- Set drive to Modbus control mode by setting P1-12 = 4.
- Set drive communication baud rate to 57600bps using P2-26.
- The default configuration supports 4 drives connected with each gateway. Each drive must have its unique address from 1 to 4. Using parameter P2-27 to specify drive address.

Gateway setup:

- Adjust the switches behind the removable cover on the front of the gateway to set the required MacID in the DeviceNet Network. See enclosed Anybus Communicator Installation leaflet for details.
- When delivered from the factory, the gateway is configured for the connection of 4 drives (nodes). In this case, the gateway is ready for use and no further configuration is needed.
- If less than 4 drives are required in the application, the configuration of the gateway must be changed. This requires configuration software which can be downloaded from the HMS website (www.anybus.com) and a RJ11 - DB9 data cable which can be obtained from HMS. The configuration files are available form your Optidrive supplier.

System Integration:

- Build the system connection according to above diagram.
- Program the PLC or other DeviceNet master device according to memory mapping.
- **Complete integration into a new or existing DeviceNet network will require a good knowledge of the DeviceNet system and is best implemented by a DeviceNet Systems Integrator/Engineer.**

A Optidrive Plus fitted with this Option Module complies with the following standards:

- CE-marked for Low Voltage Directive.
- EN61000-4 EMC Generic Emissions Standard, Industrial Level.
- EN61000-2 EMC Generic Immunity Standard, Industrial Level.
- Enclosure ingress protection, EN60529 IP20, NEMA 250.
- Flammability rating according to UL 94.



Dr D M Jones, R&D Director

Memory Mapping

PLC programmer could read/write the PLC memory mapping to gateway memory in order to monitor/control drives in the sub network.

Input memory

This part of the memory contains the drive real time information that can be read by PLC.

Drive	Data	Start Add	Data Length	Data range	Unit	Description
1	Trip code	0x0000	8 bits	0 to 11		See error code list for further information
	Drive status	0x0001	8bits	0, 1, 2,		0: Drive stopped 1: Drive running 2: Drive tripped
	Motor speed in HZ	0x0002	16 bits	-P1-01 to P1-01	Hz	One decimal place (500 = 50.0Hz)
	Motor current	0x0004	16 bits	0 to 10000	A	One decimal place (76 = 7.6A)
	Motor output torque	0x0006	16 bits	0 -2000	%	Percentage of rating torque, One decimal place
2	Trip code	0x0008	8 bits	0 to 11		See error code list for further information
	Drive status	0x0009	8bits	0, 1, 2,		0: Drive stopped 1: Drive running 2: Drive tripped
	Motor speed in HZ	0x000A	16 bits	-P1-01 to P1-01	Hz	One decimal place (500 = 50.0Hz)
	Motor current	0x000C	16 bits	0 to 10000	A	One decimal place (76 = 7.6A)
	Motor output torque	0x000E	16 bits	0 -2000	%	Percentage of rating torque, One decimal place
3	Trip code	0x0010	8 bits	0 to 11		See error code list for further information
	Drive status	0x0011	8bits	0, 1, 2,		0: Drive stopped 1: Drive running 2: Drive tripped
	Motor speed in HZ	0x0012	16 bits	-P1-01 to P1-01	Hz	One decimal place (500 = 50.0Hz)
	Motor current	0x0014	16 bits	0 to 10000	A	One decimal place (76 = 7.6A)
	Motor output torque	0x0016	16 bits	0 -2000	%	Percentage of rating torque, One decimal place
4	Trip code	0x0018	8 bits	0 to 11		See error code list for further information
	Drive status	0x0019	8bits	0, 1, 2,		0: Drive stopped 1: Drive running 2: Drive tripped
	Motor speed in HZ	0x001A	16 bits	-P1-01 to P1-01	Hz	One decimal place (500 = 50.0Hz)
	Motor current	0x001C	16 bits	0 to 10000	A	One decimal place (76 = 7.6A)
	Motor output torque	0x001E	16 bits	0 -2000	%	Percentage of rating torque, One decimal place

Error Code List:

0x01: Break resistor short circuit
0x02: Over current
0x03: External trip
0x04: Over voltage trip
0x05: Under voltage trip
0x06: Over temperature
0x07: Under temperature
0x08: Data checksum wrong
0x09: Parameter default
0x0A: Overload trip (I * t)
0x0B: Phase imbalance
0x0C: Break resistor overload
0x0D: Power stage trip
0x0E: Bus comms link loss
0x0F: Phase loss trip
0x10: Thermistor fault
0x11: Auto-tune failure

Output memory

This part of the memory contains the command information where the PLC should write the control command to.

Drive	Data	Start Add	Data Length	Data range	Unit	Description
1	Control command	0x0200	16 bits	-		Bit 0: start (1)/stop(0) Bit 1: reset Bit 2: 2nd deceleration ramp select flag
	Speed reference in HZ	0x0202	16 bits	-P1-01 to P1-01	Hz	Drive digital speed reference. Including one decimal place. (500 = 50.0Hz)
	Torque reference	0x0204	16 bits	0 - 2000	%	Percentage of rating torque, One decimal place. (230 = 23.0%)
	Accelerate time	0x0206	8 bits	0 - 255	s	Acceleration ramp time in second (25 = 25s)
	Decelerate time	0x0207	8 bits	0 - 255	s	Deceleration ramp time in second (25 = 25s)
2	Control command	0x0208	16 bits	-		Bit 0: start (1)/stop(0) Bit 1: reset Bit 2: 2nd deceleration ramp select flag
	Speed reference in HZ	0x020A	16 bits	-P1-01 to P1-01	Hz	Drive digital speed reference. Including one decimal place. (500 = 50.0Hz)
	Torque reference	0x020C	16 bits	0 - 2000	%	Percentage of rating torque, One decimal place. (230 = 23.0%)
	Accelerate time	0x020E	8 bits	0 - 255	s	No decimal place
	Decelerate time	0x020F	8 bits	0 - 255	s	No decimal place
3	Control command	0x0210	16 bits	-		Bit 0: start (1)/stop(0) Bit 1: reset Bit 2: 2nd deceleration ramp select flag
	Speed reference in HZ	0x0212	16 bits	-P1-01 to P1-01	Hz	Drive digital speed reference. Including one decimal place. (500 = 50.0Hz)
	Torque reference	0x0214	16 bits	0 - 2000	%	Percentage of rating torque, One decimal place. (230 = 23.0%)
	Accelerate time	0x0216	8 bits	0 - 255	s	No decimal place
	Decelerate time	0x0217	8 bits	0 - 255	s	No decimal place
4	Control command	0x0210	16 bits	-		Bit 0: start (1)/stop(0) Bit 1: reset Bit 2: 2nd deceleration ramp select flag
	Speed reference in HZ	0x0212	16 bits	-P1-01 to P1-01	Hz	Drive digital speed reference. Including one decimal place. (500 = 50.0Hz)
	Torque reference	0x0214	16 bits	0 - 2000	%	Percentage of rating torque, One decimal place. (230 = 23.0%)
	Accelerate time	0x0216	8 bits	0 - 255	s	No decimal place
	Decelerate time	0x0217	8 bits	0 - 255	s	No decimal place