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5011649300-DLE0

DVP DNET-SL DeviceNet Network Scanner

Instruction Sheet

Warning

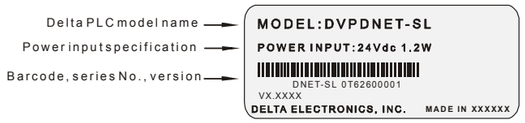
- ✓ *This Instruction Sheet only provides descriptions for electrical specifications, general specifications, installation and wiring.*
- ✓ *DVPDNET-SL is an OPEN-TYPE device and therefore should be installed in an enclosure free of airborne dust, humidity, electric shock and vibration. The enclosure should prevent non-maintenance staff from operating the device (e.g. key or specific tools are required for opening the enclosure) in case danger and damage on the device may occur. Do NOT tough any terminal when the power is switched on.*

❶ Introduction

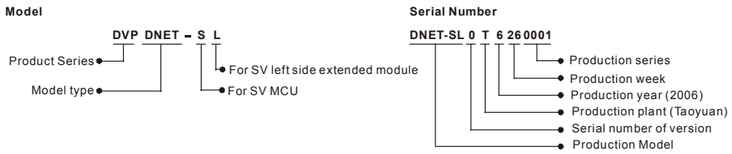
Functions:

- ❖ Support Group 2 server device and Group 2 only server device.
- ❖ Support DeviceNet Master mode and Slave mode.
- ❖ Support EDS file configure in ElinkConfigurator software.
- ❖ Support explicit connection via Predefined Master/Slave Connection Set. (Explicit message)
- ❖ Connection size is flexible from 1 to 390 bytes in input and output area.

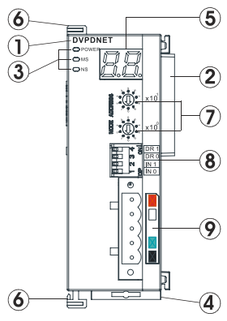
Nameplate Explanation



Model Name and Serial Number Explanations



Product Profile



Unit: mm

①	Model name
②	Extension port
③	Power, MS, NS LED
④	DIN rail clip
⑤	Message display
⑥	Extension clip
⑦	Address switch
⑧	Function switch
⑨	DeviceNet connection port

❷ Specifications

DeviceNet Connection

Interface	Removable connector (5.08mm)
Transmission method	CAN
Transmission cable	2-wire twisted shielded cable with 2-wire bus power cable and drain
Electrical isolation	500V DC

Communication

Message type	I/O polled, bit-strobe, change of state/cyclic
Baud rates	125 Kbps; 250 Kbps; 500 Kbps
Product code	64
Product type	12
Vendor ID	799 (Delta Electronics Inc.)

Electrical Specification

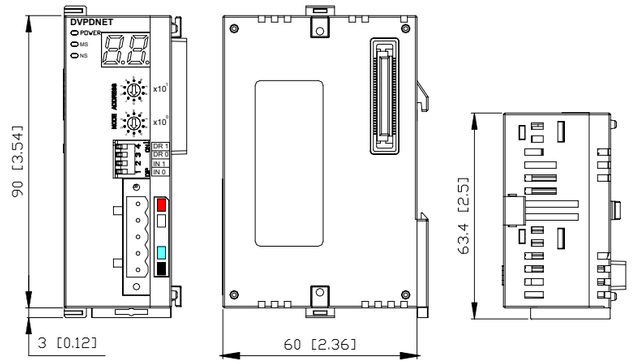
DeviceNet	Module power voltage: All other power derived from PLC controller power supply
	Network power input: 11 ~ 25V DC; Current: less than 50mA (25V DC)

Environment Specifications

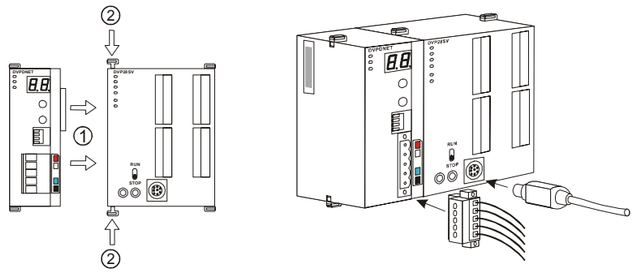
Noise immunity	ESD (IEC 61131-2, IEC 61000-4-2): 8KV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2KV, Digital I/O: 1KV, Analog & communication I/O: 1KV Damped-Oscillatory Wave: Power Line: 1KV, Digital I/O: 1KV RS (IEC 61131-2, IEC 61000-4-3): 26MHz ~ 1GHz, 10V/m
Environment	Operation: 0ºC ~ 55ºC (temperature); 50 ~ 95% (humidity); pollution degree 2 Storage: -40 ºC ~ 70ºC (temperature); 5 ~ 95% (humidity)
Vibration/shock resistance	Standard: IEC1131-2、IEC 68-2-6 (TEST Fc)/IEC1131-2 & IEC 68-2-27 (TEST Ea)
Approvals	CE cULus

❸ Installation

Profile (Dimensions are in millimeter and [inch])



Installing DVPDNET-SL With PLC MPU

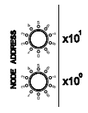


Pin Definition Of DevicetNet Connection Port

Pin	Signal	Color	Content
1	V-	Black	0 VDC
2	CAN_L	Blue	Signal-
3	Drain	-	Shield
4	CAN_H	White	Signal+
5	V+	Red	24 VDC

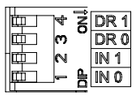
MAC ID Setting

Switch setting	Content
0…63	Valid DeviceNet MAC ID setting
Others	Invalid DeviceNet MAC ID setting



Function Switch Setting

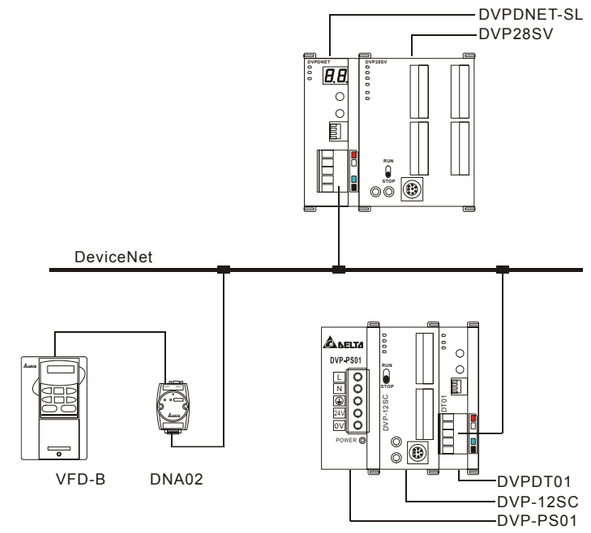
DR1	DR0	Baud rate
OFF	OFF	125K bps
OFF	ON	250K bps
ON	OFF	500K bps



IN0	Reserved
IN1	Reserved

Connecting DVPDNET-SL Scanner With Slave Devices

Connection Example:



Cable Length and Baud Rates

The maximum cable length in a segment depends on the transmission speed. DeviceNet communicates at speeds from 125K bps to 500K bps over distances from 100 to 500 meters.

Baud rates (bps)	125K	250K	500K
Length (m)	500	250	100

❹ Configuration

Access DNET Scanner With PLC

When DNET scanner is connected to PLC, it will get a data area that maps to DNET scanner in PLC.

Index of DNET scanner	Mapped D registers	
	Output image table	Input image table
1	D6250 – D6497	D6000 – D6247
2	D6750 – D6997	D6500 – D6747
3	D7250 – D7497	D7000 – D7247
4	D7750 – D7997	D7500 – D7747
5	D8250 – D8497	D8000 – D8247
6	D8750 – D8997	D8500 – D8747
7	D9250 – D9497	D9000 – D9247
8	D9750 – D9997	D9500 – D9747

The index of DNET scanner is the sequence number of scanner. The 1st scanner is near to SV MPU and the index number is1. The 2nd scanner is near to the 1st scanner in the left side and to be numbered as 2. The others are numbered as 3, 4, …and so on.

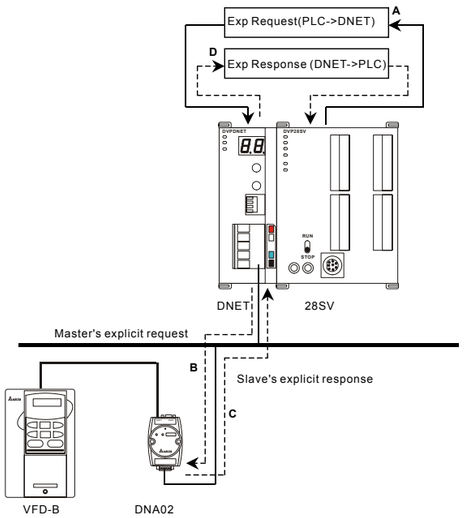
Input and Output Image Tables

The mapping of the scanner input and output image (the 1st scanner):

Output image			Input image		
D register	Image mapping	Length	D register	Image mapping	Length
D6250 – D6281	Explicit message program request	32 words	D6000 – D6031	Explicit message program response	32 words
D6282 - D6476	DeviceNet output data	195 words	D6032 – D6226	DeviceNet input data	195 words
D6477 – D6497	Reserved for other function (do not use these devices in user program)	21 words	D6227 – D6247	Reserved for other function (do not use these devices in user program)	21 words

Using Explicit Message in Application Program

DNET scanner can use PLC application program to send the explicit message request and receive explicit message response.



Step A: PLC transfers the explicit message data to DNET scanner.

Step B: DNET scanner sends the explicit request to target devices.

Step C: The target devices process the request and send the response to DNET scanner.

Step D: PLC receives the explicit response data.

Explicit Message Structure

The explicit message is controlled by explicit message program request area and explicit message program response area. The two areas are mapped to D registers in PLC.

Output image			Input image		
D register	Image mapping	Length	D register	Image mapping	Length
D6250 – D6281	Explicit message program request	32 words	D6000 – D6031	Explicit message program response	32 words

The user can move the data of explicit request message to D6250 – D6281 and DNET scanner will fill the response data into D6000 – D6031. The explicit message request format is shown in the table below.

	D register	Output explicit request	
Message Header	D6250	ReqID	Command
	D6251	Port	Size
	D6252	Service code	MAC ID
Message Data	D6253	Class id	
	D6254	Instance id	
	D6256 – D6281	Service data (optional)	

- ReqID: When sending every explicit message, the user has to assign a Request ID for this explicit message. DNET scanner identifies the response message by this ID. Therefore, the user has to change the ID value when completing an explicit message communication for the next transmission.
- Command code: Fixed to 01 for every message transmission.
- Port: Reserved as 0 for every message transmission.
- Size: The size of message data (starting from D6253); Unit: byte.
- Service code: The service code of this explicit message.
- MAC ID: The node address of target devices.

The format of explicit message response:

	Words	Input explicit response	
Message Header	D6000	ReqID	Status
	D6001	Port	Size
	D6002	Service code	MAC ID
Message Data	D6003-D6031	Service response data	

- Status code:

Status code	Description
0	No request transmission
1	Explicit message communication is successful
2	Explicit message communication is in progress
3	Error: Cannot get response from target device
4	Error: Command code is invalid
5	Error: The request data size is invalid
6	Error: The response data size is invalid
7	Error: Cannot connect to target device
8-255	Reserved

❺ Troubleshooting

NS LED

NS LED status	Indication	How to correct
OFF	No power or duplicate ID check has not completed	1. Make sure the scanner is powered. 2. Make sure at least 1 node or more are communicating in the network.
Flashing GREEN	No communication	No correction is needed, or refer to digit-indicator.
GREEN	Normal operation	No correction is needed.
Flashing RED	Error in communication	Refer to digit-indicator.
RED	Network error; cannot check duplicate ID; Bus-off (please refer to digit-indicator)	1. Make sure all the devices have their unique address. 2. Check the network for correcting media installation and baud rate.

MS LED

MS LED status	Indication	How to correct
OFF	No power	Make sure the scanner is powered.
Flashing GREEN	The master is not configured.	Configure the scan list and re-download it to the scanner.
GREEN	Normal operation	No correction is needed.
Flashing RED	Some slaves encounter communication error.	Refer to digit-indicator and check the scanner setup.
RED	Internal fault in the scanner module (please refer to digit-indicator)	Check if the configuration is valid. If the internal error still exists, replace the scanner with a new one.

NS & MS LED

NS LED	MS LED	Indication	How to correct
OFF	OFF	No power	Make sure the scanner is powered.
OFF	GREEN	Duplicate ID check has not completed	Make sure at least 1 node or more are communicating in the network and the baud rate is the same as the setting in DVPDENT.
RED	Flashing RED	No 24V DC power from DeviceNet network	Check if the network cable is correctly connected to DVPDNET. Check the 24V DC network power.
RED	RED	Hardware error and no network power	Go to your manufacturer or distributor for problem-solving.
RED	GREEN	MAC ID detection failure or Bus-off	Change the MAC ID setting and re-power DVPDNET.

Digit-Indicator LED

Code	Indication	How to correct
0-63	Node address of scanner, normal operation	None
F0	Duplicate MAC ID check failure	Change the address and re-power DNET scanner.
F1	No scan list is active in the module	No slave device in the scan list. Configure the scanner and download it to the scanner.
F2	Low voltage is detected	Check if the power of the scanner and PLC MPU is normal.
F3	Entering Test Mode	Switch IN1 from ON to OFF and re-power the scanner.
F4	Bus-off detected	Re-power the scanner.
F5	No network power	Make sure the cable is correctly connected and check if the network power is normal.
F6	Internal error; Flash or Ram check error	If the error still exists after re-power, replace the scanner with a new one.
F7	Internal error; GPIO check error	If the error still exists after re-power, replace the scanner with a new one.
F8	Error in factory manufacturing	If the error still exists after re-power, replace the scanner with a new one.
F9	Internal error; EEPROM access failure	If the error still exists after re-power, replace the scanner with a new one.
E0	Device key parameter does not match scan list table.	Make sure that the device parameter in scan list matches the desired key parameter, including vendor ID, product code, device type and version.
E1	Data size returned does not match scan list.	Re-configure scan list using correct data size.
E2	Salve device in scan list does not exist.	The desired slave device does not exist in the network. Add device to the network.
E3	Module fails to transmit a message	Make sure that the connection is valid and check if the baud rate is correct.
E4	Error detected in sequence of fragmented I/O messages from device.	Fragmented I/O data is invalid from slave device.
E5	Slave device returns error response when the scanner attempts to communicate with it.	None
E6	Data size returned is bigger than expected.	Check slave device configuration and scan list configuration.
E7	Device is checking MAC ID.	None