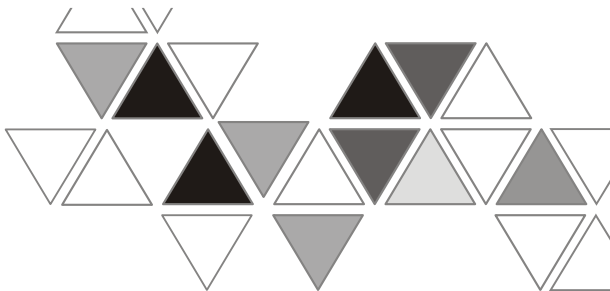


2010-11-22



5012606600-MC00



DVP-MC

INSTRUCTION SHEET

▲ *Multi-Axis Motion Controller*

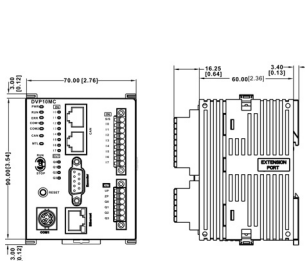


<http://www.delta.com.tw/industrialautomation>

Thank you for choosing Delta DVP-MC series motion controller. DVP-MCseries is a multi-axis motion controller based on CANopen fieldbus and can be applied in packaging machines, printing machines, taping machines, cutting machines, digital control lathes and automated storage systems.

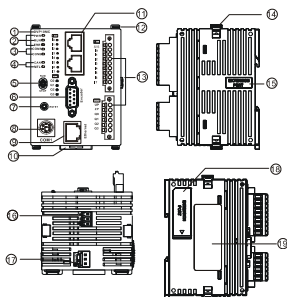
- ✦ Please read this instruction sheet carefully using DVP10MC11T and follow the instructions to avoid damages on the product or injuries on staff.
- ✦ Switch off the power supply before wiring.
- ✦ This instruction sheet offers information on electrical specifications, functions, installation, wiring and trouble-shooting for DVP-MC series. For more details, see the operation manual for DVP10MC11T.
- ✦ DVP10MC11T 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 to open the enclosure) in case danger and damage on the device may occur.
- ✦ DVP-MC series is for controlling the machines or equipment in operation. To avoid damaging it, only qualified staff who knows it well is allowed to install, operate, wiring and maintain it.
- ✦ DO NOT connect the input AC power supply to any of the I/O terminals; otherwise series damages may occur. Check all the wirings again before switching on the power.

■ Product Profile & Dimensions



Unit: mm [inch]

[Figure 1]



[Figure 2]

① Model name	⑪ CANopen communication port
② POWER, RUN, ERR indicators	⑫ Extension module fixing clip
③ COM1, COM2 indicators	⑬ I/O terminals
④ CAN, MTL indicators	⑭ Direct mounting hole
⑤ RUN/STOP switch	⑮ Right-side extension port
⑥ Encoder interface	⑯ COM2 port
⑦ RESET button	⑰ 24V power supply port
⑧ COM1 port	⑱ Left-side extension port
⑨ Ethernet port	⑲ Nameplate
⑩ DIN rail clip	

■ Electrical Specifications

◆ Power Supply

Power supply voltage	24 VDC (-15 to +20%)
Power supply fuse	3 A/30 VDC, Polyswitch
Insulation voltage	500 VDC (Secondary-PE)
Power consumption	8 W Max.
Shock/vibration immunity	Standards: IEC61131-2, IEC 68-2-6 (TEST Fc)/IEC61131-2 & IEC 68-2-27 (TEST Ea)
Noise immunity	ESD (IEC 61131-2, IEC 61000-4-2): 8 kV Air Discharge EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2 kV, Digital I/O: 1 kV, Analog & Communication I/O: 1 kV Damped-Oscillatory Wave: Power Line: 1 kV, Digital I/O: 1 kV RS (IEC 61131-2, IEC 61000-4-3): 26 MHz ~ 1GHz, 10 V/m
Ambiance	Operation: 0 to 55°C (temperature), 50 to 95% (humidity), pollution degree 2 Storage: -25 to 70°C (temperature), 5 to 95% (humidity)
Weight	Approx. 240g

◆ I/O Specifications

I/O channels	8 input channels, 4 output channels
I/O channel types	8 high-speed digital input channels, 4 high-speed digital output channels
I/O terminals	Input terminals: I0, I1, I2, I3, I4, I5, I6, I7 Output terminals: Q0, Q1, Q2, Q3
Common terminal for input points	Wiring terminal S/S (for connecting to the positive or negative pole of the power supply)
Input types	Sink or Source
I/O delay time	Input: 2.5 μ s (OFF→ON), 5 μ s (ON→OFF) Output: 2 μ s (OFF→ON), 3 μ s (ON→OFF)
Input signal current	24 VDC, 5 mA
Max. I/O cable length	Shielded: 500m; Not shielded: 300m
Power supply for output points	24 VDC (-15 to +20%) #1
Max. load	Resistive load: 0.5 A/1 point (2A/ZP) Conductive load: 13 W (30 VDC) Light bulb load: 2.5 W (30 VDC)

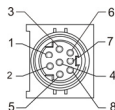
#1: UP and ZP must use external auxiliary 24 VDC power supply (-15 to 20%).

■ COM Ports

◆ COM1 (RS-232)

DVP10MC11T offers one RS-232 port. See the table below for the PIN definitions.

PIN	Signal	Definition
1, 2	+5V	5V power supply (positive pole)
3	GND	Earth
4	Rx	Receiving data
5	Tx	Sending data
6	GND	Earth
7	NC	Reserved
8	GND	Earth



◆ COM2 (RS-485)

DVP10MC11T offers one RS-485 port. See the table below for the PIN definitions.

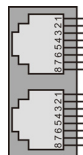
PIN	Signal	Definition
1	+	Signal+
2	-	Signal-
3	SG	--



◆ CANopen Communication Port

DVP10MC11T offers two RJ45 connectors as the interface for motion control. When establishing a network, use standard CAN cables for the CAN bus, e.g. Delta TAP-CB03 or TAP-CB04. You will need termination resistances at the two ends of the bus, e.g. Delta TAP-TR01.

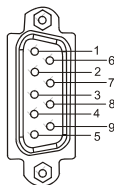
PIN	Signal	Definition
1	CAN_H	Signal+
2	CAN_L	Signal-
3	CAN_GND	0 VDC
4	RESE_1	Reserved
5	RESE_2	Reserved
6	CAN_SHLD	Shielded cable
7	CAN_GND	0 VDC
8	RESE_3	Reserved



◆ Encoder Interface

DVP10MC11T offers one 9-PIN D-SUB encoder interface. See the table belows for the terminal definitions.

Terminal	Signal	Definition
1	A+	Incremental encoder
2	B+	
3	Z+	
6	A-	
7	B-	
8	Z-	
4	+24VEXT	24V encoder
5	GNDEXT	
9	+5VEXT	+5V encoder



◆ Ethernet Port

DVP10MC11T offers one Ethernet port, supporting Modbus/TCP protocol. See the table below for the terminal definitions.

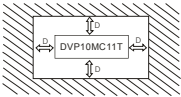
Terminal	Signal	Definition
1	Tx+	Sending data (positive)
2	Tx-	Sending data (negative)
3	Rx+	Receiving data (positive)
4	--	N/C
5	--	N/C
6	Rx-	Receiving data (negative)
7	--	N/C
8	--	N/C



■ Installation & Wiring

◆ Installation

Install DVP10MC11T in an enclosure with sufficient space around it to allow heat dissipation. $D > 50\text{mm}$ (See the figure).

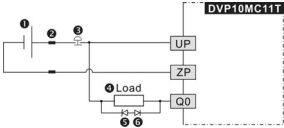


◆ Input Point Wiring

Mode	Simplified model	Wiring loop
Sink		
Source		

◆ Output Point Wiring

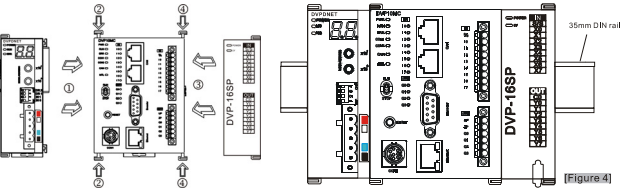
All transistor outputs in DVP10MC11T include zener diode, which is sufficient enough for small-power conductive load and infrequent On/Off applications. However, in big-power or frequent On/Off occasions, follow the method below to connect to suppression circuit to reduce interferences and avoid the transistor output circuit from being damaged due to over-voltage or overheating.



[Figure 3]

① 24 VDC power supply	② Fuse
③ Emergency stop button	④ Load: Switch, conductive load
⑤ 9V Zener diode, 5W (Use ⑤ and ⑥ when in big-power and frequent On/Off occasions)	
⑥ Diode or equivalent components for suppression (Use ⑥ only when in small-power loads)	

■ Connecting to DVP-S Series Extension Modules



[Figure 4]

■ LED Indicators & Trouble-Shooting

◆ ERR LED

LED status	Indication	How to correct
Off	PLC in normal operation	--
Red light flashing	Syntax errors in the PLC program; devices or commands exceed the allowed range	Find out the cause of error from register D1004 in the PLC and the location of error from D1137. For details, see "DVP-PLC Application Manual: Programming".
Red light quickly flashing	Insufficient power supply for DVP10MC11T	Check if the power supply load for DVP10MC11T is normal.

◆ CAN LED

LED status	Indication	How to correct
Green light single flashing	CANopen network in STOP status	The host controller is downloading the program and waiting for the download to be completed.
Green light flashing	CANopen network in pre-operational status	■ Check if the CANopen network is connected correctly. ■ Check if the slave configured on the network exists. ■ Check if the slave is offline.
Green light constantly on	CANopen network in operational status	--
Red light single flashing	Bus error, exceeding the alarm level	■ Check if the connecting cable for the CANopen bus is standard cable. ■ Check if there are termination resistances at both ends of the CANopen bus. ■ Check if the interferences around the CANopen bus are too big.
Red light constantly on	Bus-off	■ Check if the cable connection in the CANopen network is correct. ■ Check if the baudrate of DVP10MC11T is consistent with its slaves.

◆ MTL LED

LED status	Indication	How to correct
Off	DVP10MC11T is not configured with slaves.	Configure slaves for DVP10MC11T in the CANopen Builder software and download the configuration.
Green light on	DVP10MC11T in operational status; motion control program in executing status.	--
Green light flashing	DVP10MC11T has not been connected with the slave.	■ Check if the CANopen network is connected correctly. ■ Check if the slave configured on the network exists.
Red light constantly on	Hardware error in DVP10MC11T	Send DVP10MC11T back to factory for repair.
Red light flashing	DVP10MC11T is operating in abnormal status.	■ Check if the set synchronous scan period is too short. ■ Check if there is slave offline from the CANopen network. ■ Press the RESET button on DVP10MC11T (Re-enter STOP status after the program is executed.)

◆ Ethernet LED

LED	LED status	Indication
Orange light	On	The baudrate for Ethernet communication is 100 Mbps.
	Off	The baudrate for Ethernet communication is 10 Mbps, or DVP10MC11T has not been connected to the Ethernet.
Green light	Flashing	The Ethernet port on DVP10MC11T is sending or receiving data.
	Off	The Ethernet port on DVP10MC11T is not sending or receiving data.