

# DVP-SLIM

## Instruction Sheet

### 安裝說明 安 裝 說 明

Digital I/O Extension Unit

數位I/O擴充機

数字I/O扩展机



| Model name  | Power supply   | Input  |             | Output |                     | Dimension (mm) | Outline |
|-------------|--|--------|-------------|--------|---------------------|----------------|---------|
|             |  | Points | Type        | Points | Type                |                |         |
| DVP08SM11N  | 24VDC (-15%~20%) (with DC input polarity reverse protection) | 8      | DC Type     | 0      | Relay               | 25.2           | 90      |
| DVP16SM11N  |  | 16     | Sink/Source | 0      |                     |                |         |
| DVP06SN11R  |  | 0      | N/A         | 6      |                     |                |         |
| DVP08SN11R  |  | 0      |             | 8      |                     |                |         |
| DVP08SN11T  |  | 0      |             | 8      | Transistor (Sink)   |                |         |
| DVP16SN11T  |  | 0      |             | 16     | Transistor (Source) |                |         |
| DVP08SN11TS |  | 0      |             | 8      |                     |                |         |
| DVP16SN11TS |  | 0      |             | 16     |                     |                |         |

## Specifications

### Electrical Specifications

| Item                            | Model | 08SM11N<br>08SM10N   | 16SM11N | 08SN11R/T<br>/TS | 08SP11R/T<br>/TS | 16SP11R/T | 16SP11TS | 06SN11R | 16SN11T<br>/TS |  |
|---------------------------------|-------|--|---------|------------------|------------------|-----------|----------|---------|----------------|--|
| Power supply voltage            |       | 24VDC (-15%~20%) (with DC input polarity reverse protection)   |         |                  |                  |           |          |         |                |  |
| Motion specification            |       | Within 5ms of the momentary power loss, the device will keep on operating  |         |                  |                  |           |          |         |                |  |
| Power consumption               |       | 1W   | 2W      | 1.5W             | 1.5W             | 2W        | 2W       | 1.5W    | 1W             |  |
| Insulation resistance           |       | > 5MΩ (all I/O point-to-ground: 500VDC)  |         |                  |                  |           |          |         |                |  |
| Noise immunity                  |       | ESD (IEC 61131-2, IEC 61000-4-2): 8KV Air Discharge<br>EFT (IEC 61131-2, IEC 61000-4-4): Power Line: 2KV, Digital I/O: 1KV,<br>Analog & Communication I/O: 1KV<br>Damped-Oscillatory Wave: Power Line: 1KV, Digital I/O: 1KV<br>RS (IEC 61131-2, IEC 61000-4-3): 26MHz ~ 1GHz, 10V/m |         |                  |                  |           |          |         |                |  |
| Earth                           |       | The diameter of grounding wire shall not be less than that of L, N terminal of the power. When many PLCs are in use at the same time, please make sure every PLC is properly grounded.   |         |                  |                  |           |          |         |                |  |
| Operation / storage environment |       | Operation: 0°C ~ 55°C (temperature), 5% ~ 95% (humidity), pollution degree 2<br>Storage: -25°C ~ 70°C (temperature), 5% ~ 95% (humidity)   |         |                  |                  |           |          |         |                |  |
| Shock / vibration immunity      |       | International standards: IEC61131-2, IEC 68-2-6 (TEST Fc) / IEC61131-2 & IEC 68-2-27 (TEST Ea)   |         |                  |                  |           |          |         |                |  |
| Weight (g)                      |       | 162 / 141  | 146     | 154 / 146        | 141 / 136        | 162 / 154 | 151      | 200     | 70             |  |

### I/O Point Specifications

| Input point type                          | Input Point                 |  |
|---|-----------------------------|--|
|   | DC                          | AC   |
| Input type                                | DC Type (Sink or Source)    | -  |
| Input resistance                          | -                           | 19Kohm/50Hz 16Kohm/60Hz                      |
| Input current/voltage                     | 24VDC 5mA                   | 85 ~ 132VAC, 50 ~ 60Hz<br>9.2mA, 110VAC/60Hz |
| Active level                              | Off → On: more than 16.5VDC | More than 79VAC                              |
|   | On → Off: less than 8VDC    | Less than 30VAC                              |
| Response time                             | Approx. 10ms                | Off → On < 15ms<br>On → Off < 20ms           |
| Circuit isolation / operation instruction | By photocoupler / LED On    |  |



## Warning

EN **Warning** DVP-SLIM is an OPEN-TYPE device. It should be installed in a control cabinet free of airborne dust, humidity, electric shock and vibration. To prevent non-maintenance staff from operating DVP-SLIM, or to prevent an accident from damaging DVP-SLIM, the control cabinet in which DVP-SLIM is installed should be equipped with a safeguard. For example, the control cabinet in which DVP-SLIM is installed can be unlocked with a special tool or key.

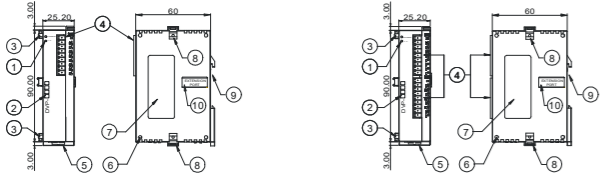
EN **DO NOT** connect AC power to any of I/O terminals, otherwise serious damage may occur. Please check all wiring again before DVP-SLIM is powered up. After DVP-SLIM is disconnected, DO NOT touch any terminals in a minute. Make sure that the ground terminal is correctly grounded in order to prevent electromagnetic interference.

FR **Ne pas** appliquer la tension secteur sur les bornes d'entrées/Sorties, ou l'appareil DVP-SLIM pourra être endommagé. Merci de vérifier encore une fois le câblage avant la mise sous tension du DVP-SLIM. Lors de la déconnection de l'appareil, ne pas toucher les connecteurs dans la minute suivante. Vérifier que la terre est bien reliée au connecteur de terre afin d'éviter toute interférence électromagnétique.

## Introduction

Thank you for choosing Delta DVP-Slim series programmable logic controller. DVP-Slim digital I/O extension unit offers ~ 16 points, and the maximum digital I/O extension points (including the MPU) can reach 256 points. In addition, maximum 8 additional special modules (AD/DA/PT/TC/XA/PU) can be extended to DVP-Slim series extension unit.

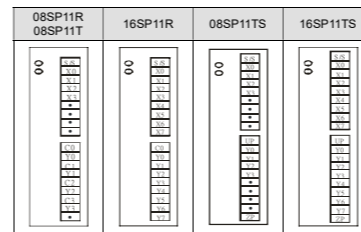
### Product Profile & Outline



- ① POWER, L.V (low voltage) indicator
- ② Model name
- ③ Extension unit fixing clip
- ④ I/O terminals
- ⑤ DIN rail clip
- ⑥ Extension unit positioning hole
- ⑦ Nameplate
- ⑧ Extension unit fixing clip
- ⑨ DIN rail (35mm)
- ⑩ Connection port for extension unit

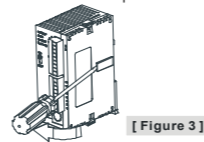
### Model Information

| Model name  | Power supply | Input  |                     | Output              |              | Dimension (mm) | Outline |   |     |
|-------------|--------------|--------|---------------------|---------------------|--------------|----------------|---------|---|-----|
|             |              | Points | Type                | Points              | Type         |                |         |   |     |
| DVP08SP11R  | 24VDC        | 4      | DC Type Sink/Source | 4                   | Relay        | 25.2           | 90      |   |     |
| DVP16SP11R  |              | 8      |                     | 8                   |              |                |         |   |     |
| DVP08SP11T  |              | 4      |                     | Transistor (Sink)   |              |                |         |   |     |
| DVP16SP11T  |              | 8      |                     |                     |              |                |         |   |     |
| DVP08SP11TS |              | 4      |                     | Transistor (Source) |              |                |         |   |     |
| DVP16SP11TS |              | 8      |                     |                     | 8            |                |         |   |     |
| DVP08SM10N  |              | 8      |                     |                     | 100 ~ 120VAC |                |         | 0 | N/A |



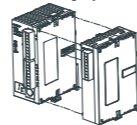
### Connection

Step 1 Screw open the side cover of the extension unit, and you will see the connection port.



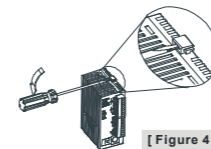
[ Figure 3 ]

Step 3 Adjust the positioning hole of the MPU and the extension unit, Meet the connection port on the MPU with the extension unit to tightly connect the two.



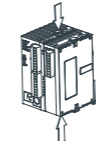
[ Figure 5 ]

Step 2 Lift the fixing clip by the screwdriver.



[ Figure 4 ]

Step 4 Fasten the fixing clip on the extension unit to complete the connection.

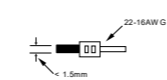


[ Figure 6 ]

### Installation & Wiring

Install the PLC in an enclosure with sufficient space around it to allow heat dissipation (as shown in the figure below).

**How to install DIN rail**  
DVP-PLC can be secured to a cabinet by using the DIN rail of 35mm in height and 7.5mm in depth. When mounting PLC to the DIN rail, be sure to use the end bracket to stop any side-to-side movement of the PLC and reduce the chance of wires being loosen. A small retaining clip is at the bottom of the PLC. To secure PLC to the DIN rail, place the clip onto the rail and gently push it up. To remove it, pull the retaining clip down and gently remove the PLC from the DIN rail.



**Wiring**

- Use 22-16AWG (1.5mm) single or multiple core wire on I/O wiring terminals. The specification of the terminal is shown in the figure on the left hand side. The PLC terminal screws shall be tightened to 1.95kg-cm (1.7 in-lbs). Use 65/75°C copper wires only.
- DO NOT place the I/O signal wires and power supply wire in the same wiring duct.

### Notes

- DO NOT** install PLC in an environment with
  - Dust, smoke, metallic debris, corrosive or flammable gas
  - High temperature, humidity
  - Direct shock and vibration

- During the engineering
  - DO NOT drop tiny metallic conductor into the PLC when screwing and wiring.
  - There should be a margin of more than 50mm between the PLC and other control devices, and the PLC should be placed away from high voltage wire and power equipment.

### Arrangement of I/O Points

No matter the MPU with how many points you are using, the input point No. of the first connected extension unit has to start from X20 and output point No. from Y20. The MPU is able to connect to maximum 14 digital extension units. The connection of MPU and extension units is demonstrated in the figure below.

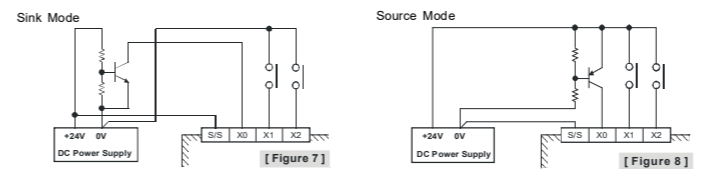
| PLC  | Model       | Input points | Output points | Input point No.   | Output point No.  |
|------|-------------|--------------|---------------|-------------------|-------------------|
| MPU  | SS/SA/SX/SC | 8            | 4/6           | X0 ~ X7, X10, X11 | Y0 ~ Y5, X10, X11 |
| EXT1 | 16SP11T     | 8            | 8             | X20 ~ X27         | Y20 ~ Y27         |
| EXT2 | 08SM11N     | 8            | 0             | X30 ~ X37         | -                 |
| EXT3 | 06SN11R     | 0            | 6             | -                 | Y30 ~ Y35         |
| EXT4 | 08SP11T     | 4            | 4             | X40 ~ X43         | Y40 ~ Y43         |

The 3<sup>rd</sup> extension module 06SN11R will be regarded as 8-point output. The 2 output points of bigger No. will have no actual corresponding output points.

The 4<sup>th</sup> extension module 08SP11R will be regarded as 8-point input/8-point output. The 4 input points and 4 output points of bigger No. will have no actual corresponding input/output points. Therefore, it is suggested that they placed in the end of the series connection to make the No. of I/O points continuous.

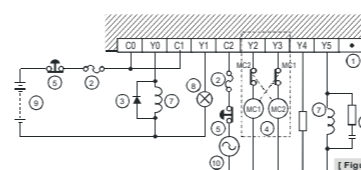
### Input Point Wiring & Specification

There are two types of signals at input points, DC and AC, and there are two types of DC inputs, Sink and Source. The wiring is as follows.



| Wiring Loop       | 110VAC Input Specification  |
|-------------------|---|
| 85~132VAC 50/60Hz | Input voltage: 85 ~ 132VAC, 50 ~ 60Hz                             |
| Prox. Sensor      | Input resistance: 19Kohm/50Hz, 16Kohm/60Hz                        |
| DVP08SM10N        | Input current: 9.2mA 110VAC/60Hz                                  |
|                   | On/Off voltage level: 79V 3.8mA/30V 2.5mA                         |
|                   | Response time: 15ms   |
|                   | Circuit isolation/operation instruction: By photocoupler / LED On |

### Relay Output Wiring Circuit (Sink):



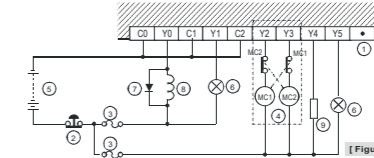
- ① DO NOT wire empty terminal
- ② Fuse
- ③ Reverse current protection diode\*1
- ④ Manual exclusive output\*2
- ⑤ Emergency stop: by external switch
- ⑥ Surge absorber\*3
- ⑦ Inductive load
- ⑧ Incandescent light (resistive load)
- ⑨ DC power supply
- ⑩ AC power supply

- \*1: There is no internal protection circuit in the output relay of the PLC; therefore when activating an inductive load, we suggest you parallelly connect a reverse current protection diode to extend the life of the contact.
- The diode has to be able to endure max. 5 ~ 10 times of load current.
- The positive current of the diode has to be bigger than load current.

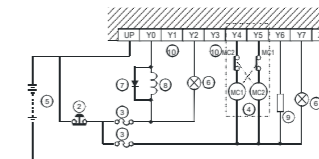
\*2: Manual exclusive output uses external circuit and forms an interlock, together with the PLC internal program, to ensure safety protection in case of any unexpected errors.

\*3: There is no internal protection circuit in the output relay of the PLC; therefore when activating an inductive load, we suggest you parallelly connect a surge absorber (0.1uF + \*100ohm to 120ohm) to reduce the noise on AC load and extend the life of the contact.

### Transistor Output Wiring Circuit (Sink):



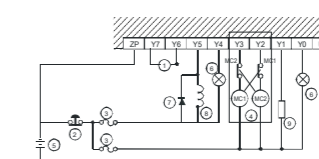
[ Figure 10 ]



[ Figure 11 ]

- \*1: Manual exclusive output uses external circuit and forms an interlock, together with the PLC internal program, to ensure safety protection in case of any unexpected errors.
- \*2: Use a zener diode (39V) in the PLC to protect the transistor output. When activating inductive load, we suggest you parallelly connect a reverse current protection diode.

### Transistor Output Wiring Loop (Source):



[ Figure 12 ]

- \*1: Manual exclusive output uses external circuit and forms an interlock, together with the PLC internal program, to ensure safety protection in case of any unexpected errors.
- \*2: Use a zener diode (39V) in the PLC to protect the transistor output. When activating inductive load, we suggest you parallelly connect a reverse current protection diode.

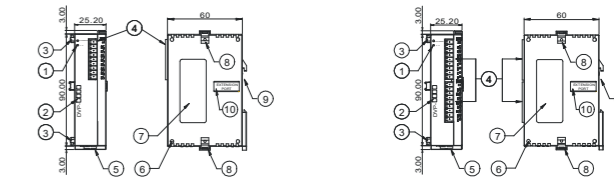
## 注意事項

- ✓ 請在使用之前，詳細閱讀本使用說明書。
- ✓ 本機為開放型 (OPEN TYPE) 機殼，因此使用者使用本機時，必須將之安裝於具防塵、防潮及免於電擊/衝擊意外之外殼配線箱內。另必須具備保護措施 (如：特殊之工具或鑰匙才可打開) 防止非維護人員操作或意外衝擊本體，造成危險及損壞。
- ✓ 交流輸入電源不可連接於直流感應型之輸入/輸出端，否則可能造成嚴重的損壞，因此請在上電之前再次確認電源配線。請勿在上電時觸摸任何端子。

## 產品簡介

謝謝您採用台灣 DVP-SLIM 系列可程式控制器。DVP-SLIM 系列 6 ~ 16 點擴充，含主機最大數位輸入/輸出擴充分別可達 256 點。另備特殊模組 (AD/DA/PT/TC/XA/PU) 擴充功能，最多可擴充 8 台特殊模組。

### 產品外觀及各部介紹



- ① 電源、低電壓指示燈
- ② 機種名稱
- ③ 擴充機固定扣
- ④ 輸出/入端子
- ⑤ DIN 軌固定扣
- ⑥ 擴充機定位孔
- ⑦ 銘牌
- ⑧ 擴充機固定扣
- ⑨ DIN 軌槽 (35mm)
- ⑩ 擴充機連接口

### 機種型號

| 機種          | 電源    | 輸入單元         |                     | 輸出單元                |     | 尺寸 (mm) | 外形參考 |   |
|-------------|-------|--------------|---------------------|---------------------|-----|---------|------|---|
|             |       | 點數           | 形式                  | 點數                  | 形式  |         |      |   |
| DVP08SP11R  | 24VDC | 4            | DC Type Sink/Source | 4                   | 繼電器 | 25.2    | 90   |   |
| DVP16SP11R  |       | 8            |                     | 8                   |     |         |      |   |
| DVP08SP11T  |       | 4            |                     | 電晶體 (Sink)          |     |         |      |   |
| DVP16SP11T  |       | 8            |                     |                     |     |         |      | 8 |
| DVP08SP11TS |       | 4            |                     | 電晶體 (Source)        |     |         |      |   |
| DVP16SP11TS |       | 8            |                     |                     | 8   |         |      |   |
| DVP08SM10N  |       | 8            |                     | 100 ~ 120VAC        | 0   |         |      | 無 |
| DVP08SM11N  |       | 8            |                     | DC Type Sink/Source | 0   |         |      | 無 |
| DVP16SM11N  | 16    | 0            |                     |                     |     |         |      |   |
| DVP06SN11R  | 0     | 無            | 6                   | 繼電器                 |     |         |      |   |
| DVP08SN11R  | 0     |              | 8                   |                     |     |         |      |   |
| DVP08SN11T  | 0     |              | 電晶體 (Sink)          |                     |     |         |      |   |
| DVP16SN11T  | 0     |              |                     | 16                  |     |         |      |   |
| DVP08SN11TS | 0     | 電晶體 (Source) |                     |                     |     |         |      |   |
|             | 0     |              | 8                   |                     |     |         |      |   |