

DELTA DVP-F232 PLC Extension Card



# DELTA DVP-F232 PLC Extension Card Instructions

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**DELTA DVP-F232 PLC Extension Card**



## Product Specifications

- **Model Name:** DVP-EH Series
- **Function:** PLC extension card
- **Types:** Analog input/output card (AI/AO), digital input/output card (DI/DO), communication port extension card, memory card

## Product Usage Instructions

### Installation Precautions

When installing the function extension card:

- Turn off the MPU.
- Use static electricity protection measures like wearing antistatic gloves to prevent component damage.

### Model Identification

Identify the model of the function extension card you have ordered for correct usage.

#### DVP-F232 (RS-232 card)

This card allows communication via RS-232 and RS-485 interfaces. It supports Master and Slave modes. Note that using RS-232 will occupy COM2, rendering the built-in RS-485 function of COM2 invalid.

#### System Connection

Refer to the following diagram for connecting the RS-232 card

#### DVP-F422 (RS-422 card)

This card enables long-distance connections using RS-422. Similar to RS-232, using RS-422 will occupy COM2, disabling the built-in RS-485 function of COM2.

#### System Connection

Follow the wiring example below for connecting the RS-422 card

## Frequently Asked Questions (FAQ)

- What precautions should I take during installation?

Turn off the MPU and use static electricity protection measures like antistatic gloves.

- **Can I use both RS-232 and RS-422 simultaneously?**

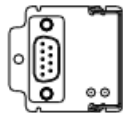
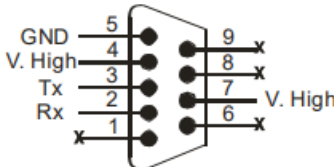
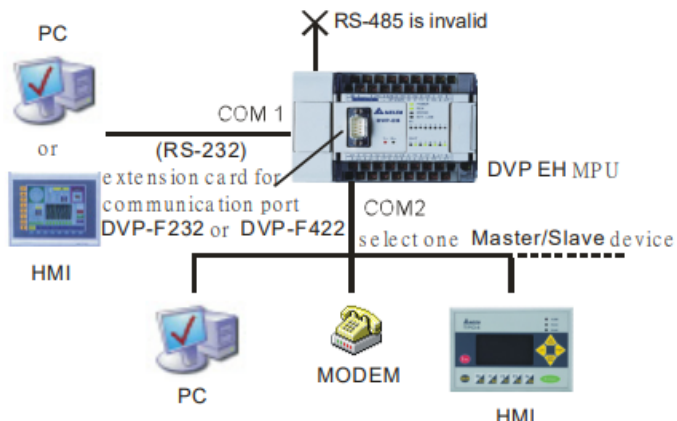
No, using either RS-232 or RS-422 will occupy COM2, making the built-in RS-485 function of COM2 invalid.

## **Warning**

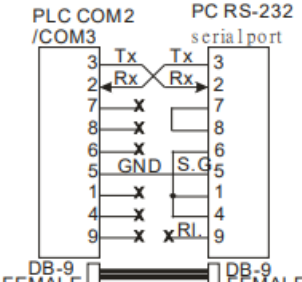
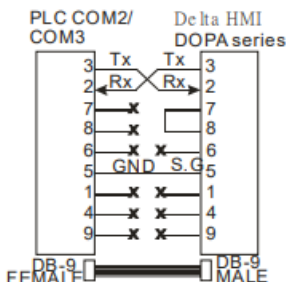
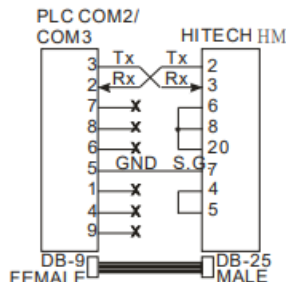
- This instruction provides electrical specifications, functional specifications, wiring and basic program design. For detailed program design and explanation of instructions, please refer to DVP-PLC Application Manual (programming).
- This is an OPEN-TYPE function extension card. When installing it, you should turn off the MPU and have static electricity protection (such as wearing antistatic gloves) to prevent those components on the function extension card from being damaged by static.
- This instruction is for DVP series function extension cards. Please find out the model you order in the following for correct usage.

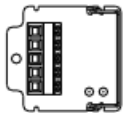
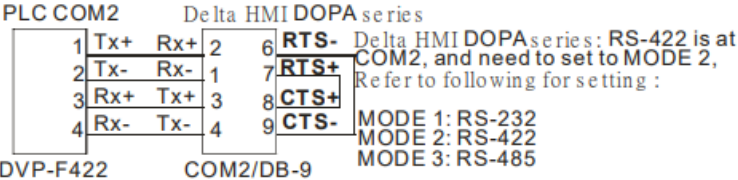
## **Introduction**

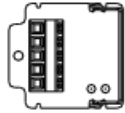
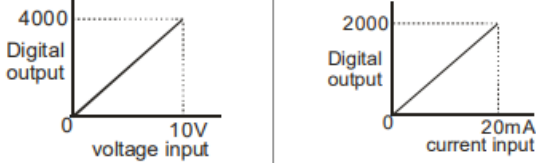
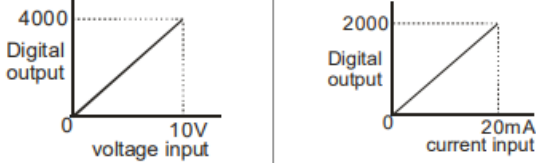
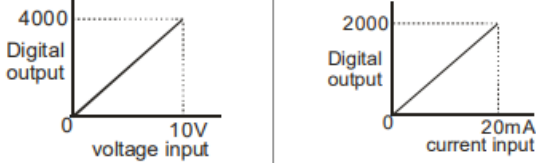
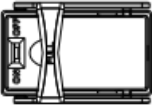
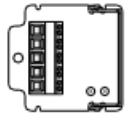
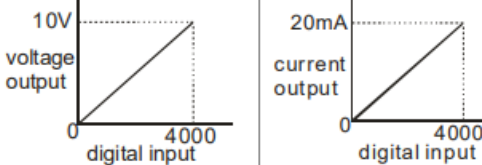
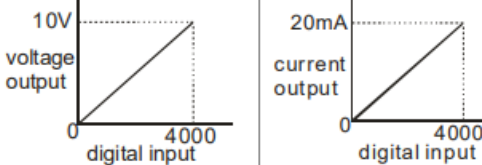
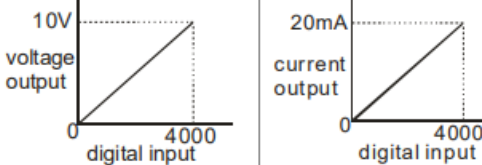
Thank you for choosing Delta's PLC extension card of DVP-EH Series. There are analog input/output card (AI/AO), digital input/output card (DI/DO), extension card for communication port and memory card. Refer to following table for detail.

| Model Name                | Outline  | Function Explanation  |
|---------------------------|--|---|
| DVP-F232<br>(RS-232 card) |  <p>■ Terminal Layout (DB-9 male)</p>  <p>V. High: high potential, i.e. logic 1</p> <p>Note:</p> <p>Please pay attention for pin 2 and pin 3 when connecting this communication port to PC or HMI.</p> | <p>EH2 MPU built in COM1 (RS-232) and COM2 (RS-485). When connecting RS-232 to PC or other peripheral, such as MODEM, by using COM2, you can use this extension card. The communication function is the same as COM2 except communication interface, i.e. there are Slave mode and Master mode for you to choose. Note: PLC will set that COM2 is occupied by RS-232 card and built-in COM2 (RS-485) function will be invalid after inserting this card. Refer to following for system connection.</p>  <p>For EH3 MPU, it will be COM3 card and either slave or master mode can be used.</p> |

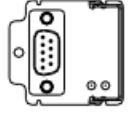
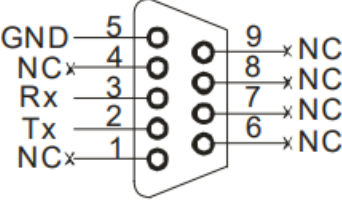
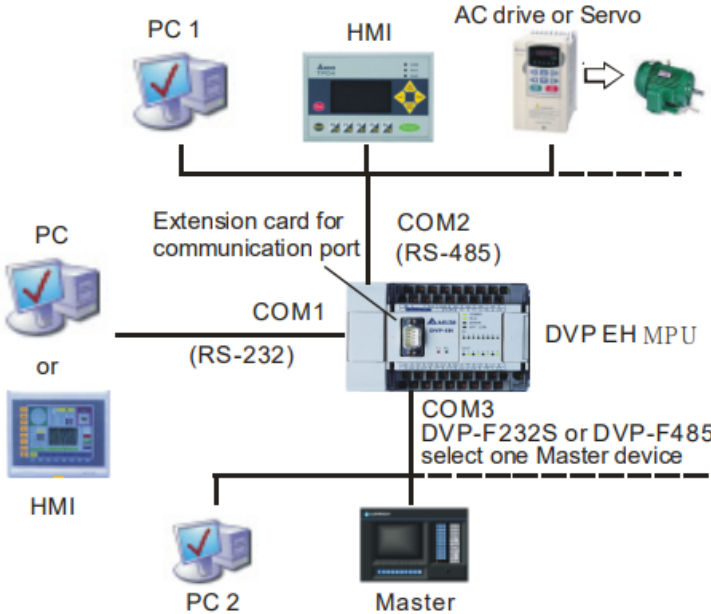
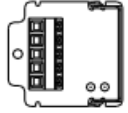
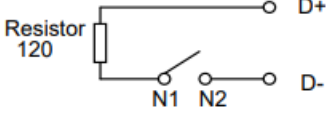
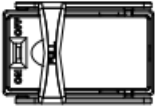
#### ■ Application example for connection in Slave mode

|   |   |   |
|---|---|---|
| <p>PLC COM2 /COM3</p>  | <p>PLC COM2/ COM3</p>  | <p>PLC COM2/ COM3</p>  |
|---|---|---|

|                           |   |   |
|---------------------------|---|---|
| DVP-F422<br>(RS-422 card) |  <p>■ Terminal Layout</p> <p>Tx+: transmission (+)</p> <p>Tx-: transmission (-)</p> <p>Rx+: receive (+)</p> <p>Rx-: receive (-)</p> <p>GND</p> | <p>For EH2 series: User can use COM2 to connect RS-422 and HMI or other peripheral for long distance connection. The communication function is the same as COM2 except communication interface. Note: PLC will set that COM2 is occupied by RS-422 card and built-in COM2 (RS-485) function will be invalid after inserting this card. Refer to following for system connection.</p> <p>■ Wiring example</p>  <p>For EH3 MPU, it will be COM3 card and either slave or master mode can be used.</p> |
|---------------------------|---|---|

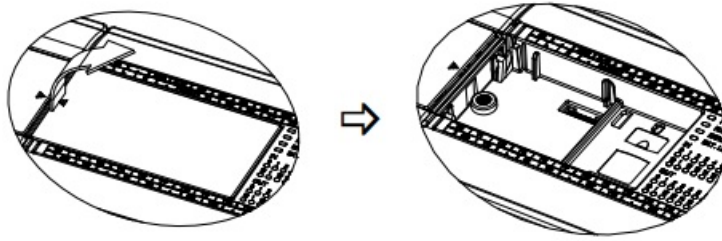
| <p>DVP-F2AD</p>    |  | <p>There are 2 analog input points supported by F2AD card and their characteristics are shown in the following:</p>   |      |                |                |               |           |           |                    |                  |                 |                    |                 |               |                            |  |  |                      |  |             |                      |  |                            |               |                            |
|--|--|---|------|----------------|----------------|---------------|-----------|-----------|--------------------|------------------|-----------------|--------------------|-----------------|---------------|----------------------------|--|--|----------------------|--|-------------|----------------------|--|----------------------------|---------------|----------------------------|
| <p>■ <b>Terminal layout</b></p> <p>0~10V — V0+ } CH0<br/>I0+ }<br/>0~10V — V1+ } CH1<br/>I1+ }<br/>Voltage input COM</p> <p>0~20mA — V0+ } CH0<br/>I0+ }<br/>0~20mA — V1+ } CH1<br/>I1+ }<br/>Current input COM</p> <p>Voltage input signal limit:<br/>less than 12VDC (Inputting negative voltage is banned)</p> <p>Current input signal limit:<br/>less than 30mA (Inputting negative current is banned)</p> |  | <table border="1"> <thead> <tr> <th>Item</th><th>Voltage input</th><th>Current input</th></tr> </thead> <tbody> <tr> <td>Analog signal</td><td>DC 0~+10V</td><td>DC 0~20mA</td></tr> <tr> <td>Resolution (12bit)</td><td>2.5mV (10/4000)</td><td>10uA (20/2000)</td></tr> <tr> <td>Input impedance</td><td>40KΩ</td><td>250Ω</td></tr> <tr> <td>Update time for conversion</td><td colspan="2">D1118 setting (<math>\geq</math> K150, unit: ms)</td></tr> <tr> <td>Characteristic curve</td><td colspan="2">  </td></tr> <tr> <td rowspan="2">Digital value output</td><td>Current value</td><td>D1056 (CH0)    D1057 (CH1)</td></tr> <tr> <td>Average value</td><td>D1110 (CH0)    D1111 (CH1)</td></tr> </tbody> </table> <p>User can get A/D conversion value saved in special D by reading special D that corresponds to current value or average value. D1118 setting is every update time of current value of digital value output.</p> | Item | Voltage input  | Current input  | Analog signal | DC 0~+10V | DC 0~20mA | Resolution (12bit) | 2.5mV (10/4000)  | 10uA (20/2000)  | Input impedance    | 40KΩ            | 250Ω          | Update time for conversion | D1118 setting ( $\geq$ K150, unit: ms) |  | Characteristic curve |  |             | Digital value output | Current value  | D1056 (CH0)    D1057 (CH1) | Average value | D1110 (CH0)    D1111 (CH1) |
| Item   | Voltage input  | Current input   |      |                |                |               |           |           |                    |                  |                 |                    |                 |               |                            |  |  |                      |  |             |                      |  |                            |               |                            |
| Analog signal  | DC 0~+10V  | DC 0~20mA   |      |                |                |               |           |           |                    |                  |                 |                    |                 |               |                            |  |  |                      |  |             |                      |  |                            |               |                            |
| Resolution (12bit)   | 2.5mV (10/4000)  | 10uA (20/2000)  |      |                |                |               |           |           |                    |                  |                 |                    |                 |               |                            |  |  |                      |  |             |                      |  |                            |               |                            |
| Input impedance  | 40KΩ   | 250Ω  |      |                |                |               |           |           |                    |                  |                 |                    |                 |               |                            |  |  |                      |  |             |                      |  |                            |               |                            |
| Update time for conversion   | D1118 setting ( $\geq$ K150, unit: ms)   |   |      |                |                |               |           |           |                    |                  |                 |                    |                 |               |                            |  |  |                      |  |             |                      |  |                            |               |                            |
| Characteristic curve   |    |   |      |                |                |               |           |           |                    |                  |                 |                    |                 |               |                            |  |  |                      |  |             |                      |  |                            |               |                            |
| Digital value output   | Current value  | D1056 (CH0)    D1057 (CH1)  |      |                |                |               |           |           |                    |                  |                 |                    |                 |               |                            |  |  |                      |  |             |                      |  |                            |               |                            |
|  | Average value  | D1110 (CH0)    D1111 (CH1)  |      |                |                |               |           |           |                    |                  |                 |                    |                 |               |                            |  |  |                      |  |             |                      |  |                            |               |                            |
| <p>DVP-256FM/<br/>DVP-512FM</p>    |  | <p>DVP-256FM(for EH2 series)/DVP-512FM(for EH3 series) is a data backup memory card. There is a switch on it and PLC will check the state of this switch when PLC is power on. If this switch is Off, memory card will be invalid. And it is invalid to change the switch when PLC is power on. All memory data read/write action will be valid when switch is On.</p> <p>NOTE: DVP-512FM is black cover and DVP-256FM is white cover.</p>  |      |                |                |               |           |           |                    |                  |                 |                    |                 |               |                            |  |  |                      |  |             |                      |  |                            |               |                            |
| <p>DVP-F2DA</p>   |  | <p>There are 2 analog output points supported by F2DA card and their characteristics are shown in the following:</p>  |      |                |                |               |           |           |                    |                  |                 |                    |                 |               |                            |  |  |                      |  |             |                      |  |                            |               |                            |
| <p>■ <b>Terminal layout</b></p> <p>CH0 { V0+ — 0~+10V<br/>I0+ }<br/>CH1 { V1+ — 0~+10V<br/>I1+ }<br/>COM Voltage output</p> <p>Load Impedance:<br/>Output voltage <math>\geq</math> 1KΩ<br/>Output current <math>\leq</math> 500Ω</p> <p>CH0 { V0+ }<br/>I0+ — 0~20mA<br/>CH1 { V1+ }<br/>I1+ — 0~20mA<br/>COM Current output</p> <p>output load: 0~500Ω</p>   |  | <table border="1"> <thead> <tr> <th>Item</th><th>Voltage output</th><th>Current output</th></tr> </thead> <tbody> <tr> <td>Analog signal</td><td>DC 0~+10V</td><td>DC 0~20mA</td></tr> <tr> <td>Output impedance</td><td><math>\leq 0.5\Omega</math></td><td><math>\geq 1M\Omega</math></td></tr> <tr> <td>Resolution (12bit)</td><td>2.5mV (10/4000)</td><td>5uA (20/4000)</td></tr> <tr> <td>Update time for conversion</td><td colspan="2">D1118 setting (<math>\geq</math> K5, unit: ms)</td></tr> <tr> <td>Digital value input</td><td>D1116 (CH0)</td><td>D1117 (CH1)</td></tr> <tr> <td>Characteristic curve</td><td colspan="2">  </td></tr> </tbody> </table> <p>User can move value to D1116 (CH0) or D1117 (CH1) to get correspondent output voltage by using instruction MOV.</p>   | Item | Voltage output | Current output | Analog signal | DC 0~+10V | DC 0~20mA | Output impedance   | $\leq 0.5\Omega$ | $\geq 1M\Omega$ | Resolution (12bit) | 2.5mV (10/4000) | 5uA (20/4000) | Update time for conversion | D1118 setting ( $\geq$ K5, unit: ms)   |  | Digital value input  | D1116 (CH0)  | D1117 (CH1) | Characteristic curve |  |                            |               |                            |
| Item   | Voltage output   | Current output  |      |                |                |               |           |           |                    |                  |                 |                    |                 |               |                            |  |  |                      |  |             |                      |  |                            |               |                            |
| Analog signal  | DC 0~+10V  | DC 0~20mA   |      |                |                |               |           |           |                    |                  |                 |                    |                 |               |                            |  |  |                      |  |             |                      |  |                            |               |                            |
| Output impedance   | $\leq 0.5\Omega$   | $\geq 1M\Omega$   |      |                |                |               |           |           |                    |                  |                 |                    |                 |               |                            |  |  |                      |  |             |                      |  |                            |               |                            |
| Resolution (12bit)   | 2.5mV (10/4000)  | 5uA (20/4000)   |      |                |                |               |           |           |                    |                  |                 |                    |                 |               |                            |  |  |                      |  |             |                      |  |                            |               |                            |
| Update time for conversion   | D1118 setting ( $\geq$ K5, unit: ms)   |   |      |                |                |               |           |           |                    |                  |                 |                    |                 |               |                            |  |  |                      |  |             |                      |  |                            |               |                            |
| Digital value input  | D1116 (CH0)  | D1117 (CH1)   |      |                |                |               |           |           |                    |                  |                 |                    |                 |               |                            |  |  |                      |  |             |                      |  |                            |               |                            |
| Characteristic curve   |  |   |      |                |                |               |           |           |                    |                  |                 |                    |                 |               |                            |  |  |                      |  |             |                      |  |                            |               |                            |



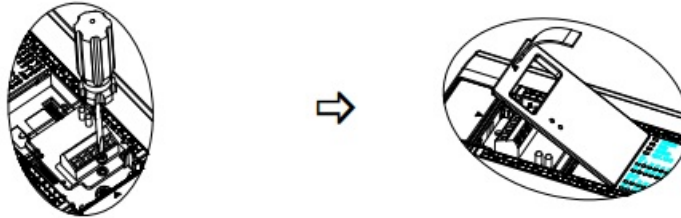
|   |   |   |
|---|---|---|
| DVP-F232S<br>(RS-232 card)  |     | <p>When two built-in COM1 (RS-232) and COM2 (RS-485) are not enough for use, you can add one COM by this card (number is 3 and is called COM3). There are two interfaces, RS-232 and RS-485, for you to use. Its general function is the same as COM1 but communication baud rate is 9600/19200/38400 bps. PLC scan time will be added at least 0.8ms ~ 2ms due to COM3.</p>                    |
| <p>■ Terminal Layout (DB-9 female)</p>  <p>Note:<br/>Please pay attention to signal of pin2 and pin3 when this communication port is connected to PC or HMI. <u>Especially that this definition is different from DVP-F232 card.</u></p>   |   | <p>Usage limit: PC1 and PC2 can't execute ladder diagram monitor function simultaneously when COM2 is slave mode and connect to PC1 with executing WPLSoft/ISPSoft and COM3 also connects to PC2 with executing WPLSoft/ISPSoft. But other communication function is normal. COM1 is out of this limit.</p>  |
| DVP-F485S<br>(RS-485 card)  |   |   |
| <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">D+</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;">D-</div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;"></div> <div style="border: 1px solid black; padding: 2px; margin-right: 5px;"></div> </div> D+: signal (+)<br>D-: signal (-) |   | <p>DVP-F485 only supports DVP-EH3 series MPUs. Its communication port can communicate independently without occupying COM2 on a MPU. DVP-F485 can function as a slave or a master. After N1 is connected to N2, D+ and D- will be connected to the 120Ω terminal resistor in parallel.</p>                  |
| DVP-512FM   |  | <p>DVP-512FM(for EH3 series) is a data backup memory card. There is a switch on it and PLC will check the state of this switch when PLC is power on. If this switch is Off, memory card will be invalid. And it is invalid to change the switch when PLC is power on. All memory data read/write action will be valid when switch is On.</p> <p>NOTE: DVP-512FM is black cover</p>              |

## Installation and Maintenance

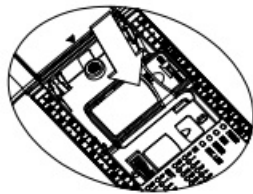
Please make sure that PLC is power off and open extension slot cover before installing or removing function card or memory card. The installed position of function card and memory card are shown at the right side. Please attach terminal label shipped with package on correct terminal to avoid error wiring.



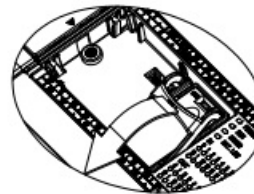
- **Function card installation** – Please put function card into slot vertically and tighten accessory screws into correct position.



- Backup memory card installation (change switch to On or Off by requirement) and removal



Installation

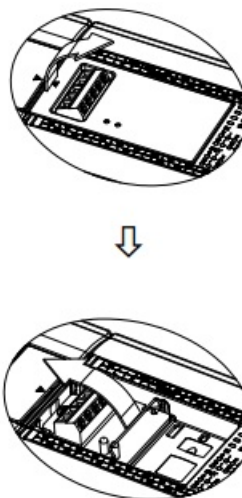


Removal

- **Check for finishing installation**

After PLC is power on, connect PLC to WPLSoft/ISPSoft at PC side. In WPLSoft/ISPSoft, select view -> workspace and then select connected model to connect. At this time, WPLSoft/ISPSoft will detect configuration of PLC MPU system and show the result, including categories of function card and state of memory card (On or Off), in working area. Refer to WPLSoft/ISPSoft user manual for detail.

## Remove function card



## Wiring

Please use single or multi-core cables with 14-30 AWG (0.25~1.6 mm). PLC terminal screws should be tightened

to 9.50 kg-cm (8.25 in-lbs) and please use only 60/75°C copper conductor.

## Application

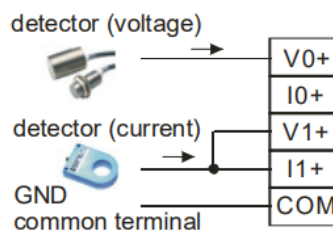
All kinds of function card provided by DVP series solve the problem that happened in PLC application. For example:

| Usage timing and application requirement                                       | solution (correspond to function card model name) |
|--|---|
| There is space limit for installing and need to deal with analog signal.       | Use DVP-F2AD or DVP-F2DA                          |
| You need 1~2 analog output points to control AC drive speed.                   | Use DVP-F2DA                                      |
| Small control system and need 1~2 analog input points.                         | Use DVP-F2AD                                      |
| For EH2: You need to connect PLC to PC and HMI and also control AC drive.      | Use DVP-F232S or DVP-F485S                        |
| There are many PLCs and need to download program quickly. (copy PLC)           | Use DVP-256FM or DVP-512FM                        |
| For EH2: When built-in COM 2 is RS-485, but what you need is RS-232 or RS-422. | Use DVP-F232 or DVP-F422                          |
| For EH2: When remote control PLC is by MODEM.(NOT for EH3)                     | Use DVP-F232                                      |

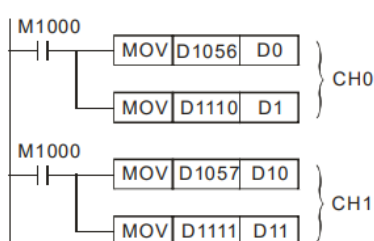
Following is application for DI/DO card and AI/AO card:

### • DVP-F2AD application:

#### Terminal Layout



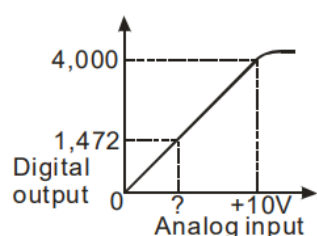
#### Program



#### Explanation

- ① CH0 AD is variable. Current value is D0 and average value is D1.
- ② CH1 AD is variable. Current value is D10 and average value is D11.

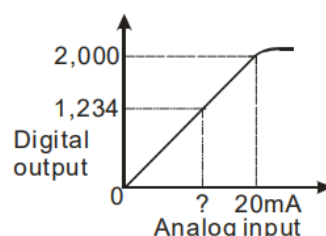
#### Conversion calculation of CH0 AD:



Detector (voltage) produces an input voltage CH0. If the value D1 reads is K1472, it means input voltage is

$$= 1472 \times \frac{10V}{4000} = 3.68V$$

#### Conversion calculation of CH1 AD:



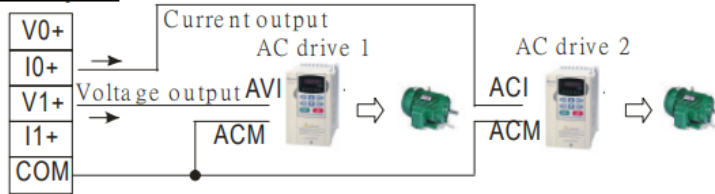
Detector (current) produces an input current CH1. If the value D11 reads is K1234, it means input current is

$$= 1234 \times \frac{20mA}{2000} = 12.34mA$$

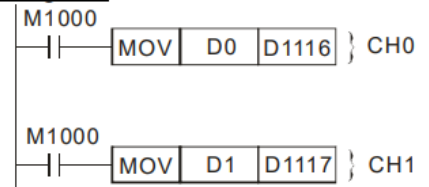
### • DVP-F2DA application:



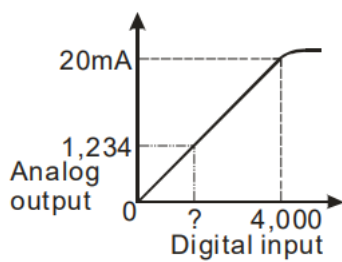
## Terminal layout



## Program



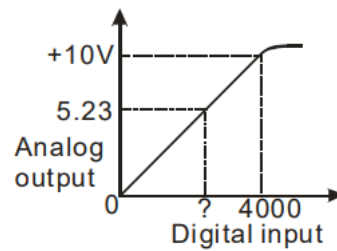
### Conversion calculation of CH0 DA:



The current is outputted to ACI of AC drive to be speed control. If you need current 12.34mA, you should give D0:

$$= 12.34mA \times \frac{4000}{20mA} = 2468$$

### Conversion calculation of CH1 DA:



The voltage is outputted to AVI of AC drive to be speed control. If you need voltage 5.23V, you should give D1:

$$= 5.23V \times \frac{4000}{10V} = 2092$$

## Documents / Resources

|  |  |
|--|--|
|  | <p><a href="#">DELTA DVP-F232 PLC Extension Card</a> [pdf] Instructions</p> <p>DVP-F232 PLC Extension Card, DVP-F232, PLC Extension Card, Extension Card, Card</p> |
|--|--|

## References

- [User Manual](#)

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