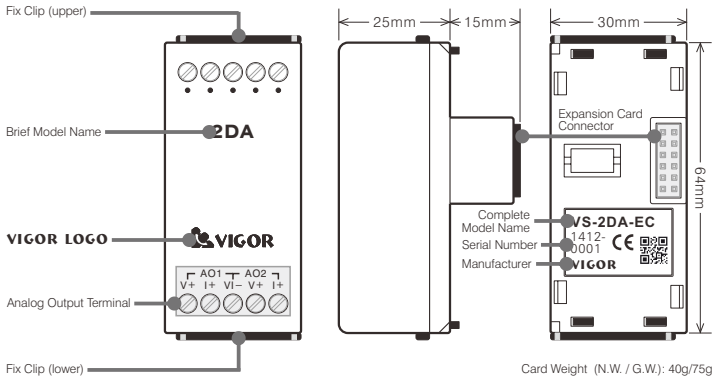
# VS-2DA-EC
## Analog Output Expansion Card

### Forward

The VS-2DA-EC Analog Output Expansion Card can generate 2 channels of external voltage or current signal outputs those are by way of to convert the sources of 12-bit digital set values. When the END instruction is executed, the VS Main Unit sends out source data to the VS-2DA-EC card and stores the values to respective EC card registers then its DA circuit converts the data to analog outputs. Thus, it provides two analog signal outputs from digital set values to control the external loads.

The VS-2DA-EC Analog Output Expansion Card is non-isolated. Please read following instructions before use.

### Component Designation



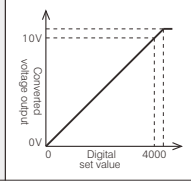
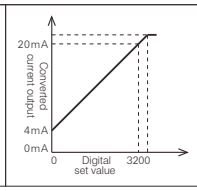
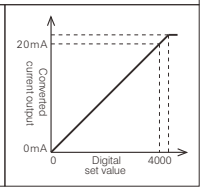

Card Weight (N.W. / G.W.): 40g/75g

### Specification

Basic Specification

| Item | Specification |
|---|---|
| Power Consumption | DC5V 15mA, DC12V 60mA (from PLC Main Unit) |

Analog Output Specification

| Item | Voltage Output Spec. | Current Output Spec. | |
|---|---|---|---|
| | The voltage or current output is selected by the EC card mode register, and those signals output through separate terminals. | | |
| Analog Output Range | 0~10V | 4~20mA | 0~20mA |
| Digital Set Range | 0~4000 | 0~3200 | 0~4000 |
| Load Resistance | 500Ω~1MΩ | 500Ω(Max.) | 500Ω(Max.) |
| Max. Resolution | 2.5mV | 5μA | 5μA |
| Overall Accuracy | ± 1.5% (Overall Max.) | | |
| Response Time | 15 μs × (No. of enabled AO CH.), the AO values will be sent at the END instruction. | | |
| Isolation Method | No isolation between PLC and outputs; no isolation between output channels | | |
| Conversion Curve Diagram |  |  |  |



### EC Card Register (Simple Code) Related to VS-2DA-EC

| EC1 | EC2 | EC3 | Component Description |
|---|---|---|---|
| EC1D10 | EC2D10 | EC3D10 | To assign the analog output modes of AO1~AO2. |
| EC1D11 | EC2D11 | EC3D11 | Digital set value for AO1, 0~4000 or 0~3200. |
| EC1D12 | EC2D12 | EC3D12 | Digital set value for AO2, 0~4000 or 0~3200. |
| EC1D18 | EC2D18 | EC3D18 | Identification code: K102 (If get K240, that means the EC card cannot be connected.) |
| EC1D19 | EC2D19 | EC3D19 | The version number of this card. (the content value XX indicates Ver. X.X) |

To appoint the modes of analog outputs:

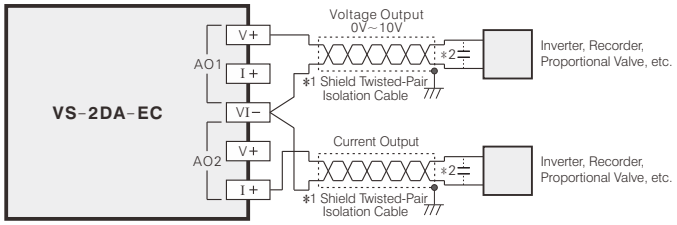
| b15 | | | b0 |
|---|---|---|---|
| Nibble #4 | Nibble #3 | Nibble #2 | Nibble #1 |
| Null | Null | AO2 | AO1 |

To assign output modes

If the nibble = 0, the channel is assigned for (0~10V) voltage output.
If the nibble = 1, the channel is assigned for (4~20mA) current output.
If the nibble = 2, the channel is assigned for (0~20mA) current output.
If the nibble is any number other than 0, 1 or 2, the channel is disabled.

Example: If a VS-2DA-EC is installed at the EC1, and its EC1D10 is set to be H10, then
AO1: voltage output (0~10V)
AO2: current output (4~20mA)

### External Wiring



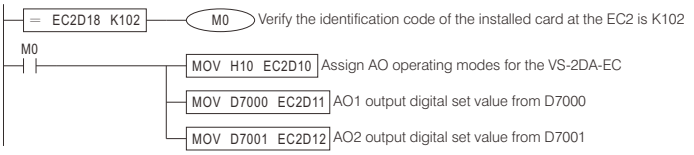

∗1: Please use the Shield Twisted-Pair isolation cable for every analog output channel and keep the signal cable away from power lines to minimize external interference. Besides, ground the shield of the cable. (class 3 grounding, grounding resistance < 100Ω)

∗2: If a voltage/current ripple occurs at the signal input of the load device, please parallel connect a smoothing capacitor (0.1μF~0.47μF, 25V) between the input terminals to reduce induced noise.

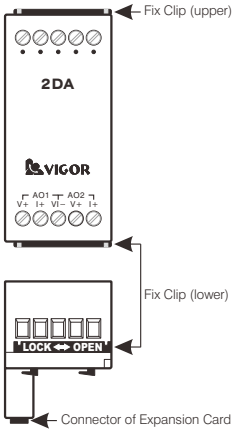
∗3: For every analog output channel, either voltage or current output can be used but not both at the same time.

### Example Program

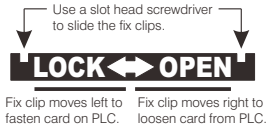
Assume that VS-2DA-EC is installed at the EC2, its AO1 is used for 0~10V output, AO2 is used for 4~20mA output. Output digital set values of AO1~AO2 are sequentially stored at D7000~D7001.




### Expansion Card Installation Guide




- Every VS Series Expansion Card has 2 black fix clips (upper & lower), those have symbols and grooves.




- To install an expansion card, firstly, slide both the fix clips to the right, and insert the card to EC Socket on the Main Unit, then slide the fix clips to the left to fix the card.
- To remove an expansion card from the Main Unit, must slide both the fix clips to the right first, then pull the card from the Main Unit out.