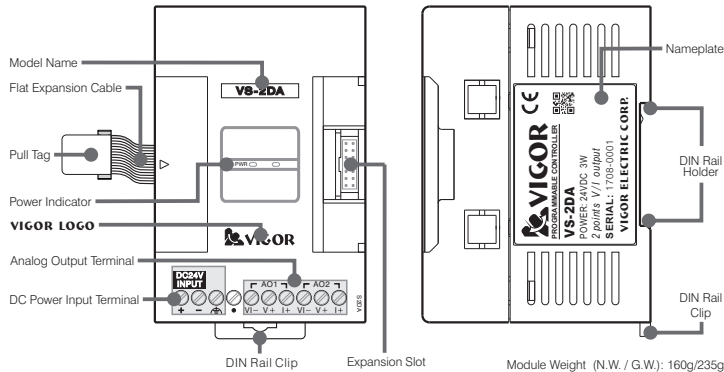# VIGOR

VS-2DA
Analog Output Module

Forward

The VS-2DA Analog Output Module has 2 analog output channels.

The module can use 16-bit digital set values to generate 2 channels of external voltage or current signal outputs. When the TO instruction is executed, the VS Main Unit copies DA source data to the respective memory at the VS-2DA then the module's DA circuit converts the data to analog outputs for external loads.

The VS-2DA Analog Output Module requires a DC 24V external power input for the isolated DC to DC regulated power to provide its DA converters. Also, between the PLC inner circuit and the analog outputs are isolated by the Magnetic-coupler thus the module can get a stable digital to analog conversion. Please read following instructions before use.

Component Designation

Module Weight (N.W. / G.W.): 160g/235g

Specification

Analog Input Specification

Item	Voltage Output Spec.	Current Output Spec.	
Analog Output Range	−10V~+10V	4~20mA	−20mA~+20mA
Digital Set Range	−32000~+32000 / −10000~+10000	0~32000	−32000~+32000 / −20000~+20000
Load Resistance	500Ω~1MΩ	500Ω	500Ω
Max. Resolution	0.3125mV	0.625μA	0.625μA
Overall Accuracy	● Ambient temp. 25 ±5℃ is ±0.3% full scale (±60mV) ● Ambient temp. 0~55℃ is ±0.5% full scale (±100mV)	● Ambient temp. 25 ±5℃ is ±120μA ● Ambient temp. 0~55℃ is ±200μA	● Ambient temp. 25 ±5℃ is ±0.3% full scale (±120μA) ● Ambient temp. 0~55℃ is ±0.5% full scale (±200μA)
Conversion Curve Diagram	Mode 0 / Mode 1 −10V~+10V voltage output	Mode 2 4mA~20mA current output	Mode 3 / Mode 4 −20mA~+20mA current output

Basic Specification

Item	Specification
Response Time	0.1ms
Isolation Method	The external DC 24V input through an isolated DC/DC power to provide DA convert circuit; Magnetic-coupler isolation between PLC and analog circuit; no isolation between output channels
Power Consumption	DC 24V ± 20%, 90mA (Max.) from external + DC 5V 15mA from PLC's inner power

Definition of Buffer Memory BFM in the VS-2DA Module

The VS-2DA module uses the BFM to communicate with the VS Main Unit for the parameter setting and set value access.

BFM No.	Component Description	
#20	To assign the analog output modes of AO1~AO2. When the power is turned from OFF to ON, the default value is H00.	
#21	The digital set value of AO1.	When the power is turned from OFF to ON, the default value is 0.
#22	The digital set value of AO2.	
#23	To assign the holding modes of AO1~AO2. When the power is turned from OFF to ON, the default value is H00.	
#30	Identification code: VS-2DA = K202 (can use the FROM instruction to check whether the place is this module or not)	
#31	The version number of this module. (the content value XX indicates Ver. X.X)	

BFM#20 To appoint the modes of analog outputs:

Value of Nibble	Analog Output Mode	
0	−10V~+10V voltage output	Digital set value: −32000~+32000
1		Digital set value: −10000~+10000
2	4mA~20mA current output	Digital set value: 0~+32000
3	−20mA~+20mA current output	Digital set value: −32000~+32000
4		Digital set value: −20000~+20000
Other	Disabled	

Example: If the BFM #20 of a VS-2DA is set to be H20, then

AO1: For −10V~+10V voltage output, that will use the digital set value −32,000~+32,000 at this mode.
AO2: For 4mA~20mA current output, that will use the digital set value 0~+32,000 at this mode.

BFM#23 To appoint the output holding mode: (for the PLC status turns from RUN to STOP)

If the value in the nibble = 0, the channel will keep the last output, even PLC is STOP.
If the value in the nibble ≠ 0, the channel will change its digital set value = 0 at STOP.

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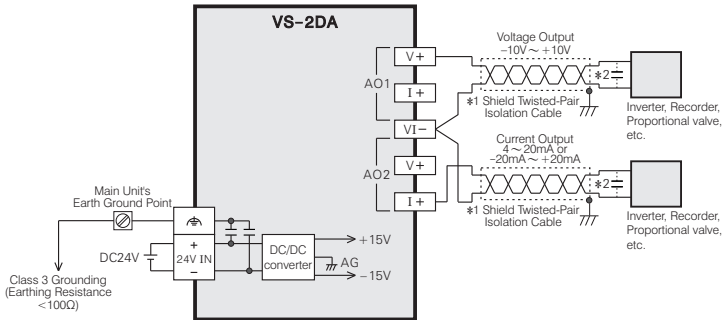
*1: Please use the Shield Twisted-Pair isolation cable for every analog output channel, and keep the signal cable away from power lines to minimize external interference. Besides, ground the shield of the cable. (class 3 grounding, grounding resistance < 100Ω)

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

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

Example Program

The VS-2DA is installed next to the Main Unit and became the 1st. special module.
Its AO1 is used for −10V~+10V output, AO2 is used for 4~20mA output. Output digital set values of AO1~AO2 are sequentially stored at D7000~D7001.

FROM K1 K30 D0 K1 — Read the 1st. special module's identification code at the beginning

MOVP H20 U1G20 — Assign AO operating modes for the VS-2DA

TO K1 K21 D7000 K2 — Transfer the output AO1~AO2 digital set values from D7000~D7001 to the VS-2DA