



Application Note

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Product Family: GS10/20(X)/30 Drives

Number: AN-GS-022

Subject: Common External Wiring Setups

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Note: This document is intended as a supplement to the GS10/20(X)/30 Drive User Manuals and Quick Start Guides.

Some common control parameters to review for most applications:

See "Parameter Details" in chapter 4 in of the User Manual for more details on any parameter as needed.

Param:	Description / Explanation:
00.20	Choose which option you want to control the speed/frequency of the drive
00.21	Choose which option you want to start/stop the drive
00.22	Set = 1 for <u>ramp</u> stop with a set decel time; set = 2 for <u>coast</u> to stop
01.00	Maximum desired frequency in Hertz (hz) for your application. Most motors are 60 hz so typically a value of "60" gives 100% speed as the max speed for the motor
01.12	Acceleration time – This is the desired time (in seconds) for the motor to ramp from stopped up to full speed.
01.13	Deceleration time – This is the desired time (in seconds) for the motor to ramp down to stop <u>from</u> full speed. This parameter is used for <u>ramp</u> type stops where the drive controls the deceleration time of the motor.
01.22	Jog Frequency in Hz – when a jog request is entered from a digital input or communications
02.00	2-wire & 3-wire control wiring options for Run/Stop, Forward/Reverse (see next page in App Note)
02.13	Multi-function Output 1 (Relay type with normally open and normally closed contacts)
02.35	Enables 'auto-run on power-up' (if a digital run input is already present when the drive powers up)
03.00	Configuration for Analog Input, AI1, (If used, supports 0-10vdc or -10 to +10vdc signal)
03.01	Configuration for Analog Input, AI2, (If used, supports 0/4-20mA or 0-10vdc signal)
03.28	AI1 terminal input selection (If used, 0:0-10v, 3:-10-10v)
03.29	AI2 terminal input selection (If used, 0:4-20mA, 1:0-10v, 2:0-20mA)
05.01	Motor Full Load Amps (FLA)
05.03	Motor Rated RPM
05.04	Motor, Number of Poles (~1800rpm = 4 poles, ~3600 = 2 poles)
06.01	Over-Voltage Stall Prevention (Set to 0:Disable when using external dynamic braking unit or resistor)
06.13	Motor, Electronic Thermal Overload Protection (Set to 0 or 1 to enable OL protection)
07.06	Restart after momentary power loss (Set to 1 or 2 to enable)
07.07	Allowed momentary power loss duration in seconds
=== Less common parameters ===	
00.17	Carrier Frequency
07.12	Speed tracking during start-up (Set to 1, 2 or 3 to allow "Flying Restart" for a shaft that is turning)
07.19	Cooling Fan control (control how the drive cooling fan operates)
00.02	This parameter can be used to set the drive back to factory defaults

The following sections will cover:

- Common Wiring Scenarios for Start/Stop and Forward/Reverse
- Common Wiring for external analog Speed/Frequency Reference

Common Wiring Scenarios for Start/Stop and Forward/Reverse:

2-wire start/stop with a selector switch or relay contacts:

- 00.21 = 1 (Enable control from digital input terminals)
- 02.00 = 1 (DI1: FWD/STOP, DI2: REV/STOP)
 - Defines terminal, DI1/FWD, as the Run Forward input
 - Defines terminal, DI2/REV, as the Run Reverse input (optional, if needed)

2-wire start/stop (selector switch or relay contacts) with a separate input to choose Reverse direction:

- 00.21 = 1 (Enable control from digital input terminals)
- 02.00 = 2 (DI1: FWD/STOP, DI2: REV/FWD)
 - Defines DI1/FWD as the start input
 - Defines DI2/REV to select reverse direction (optional, if needed)

3-wire Start/Stop with momentary Start and Stop pushbuttons:

- 00.21 = 1 (Enable control from digital input terminals)
- 02.00 = 3 (Defines DI1/FWD as Start Input, DI3 as Stop input, DI2 as optional direction input)
- Note: Requires normally-open Start contacts and normally-closed Stop contacts

Wiring diagrams from the User Manual and Quick Start Guide:

Note: These wiring diagrams assume the drive switch is set to NPN position. If you wish to use the PNP setting on the drive, then instead of wiring each circuit back to DCM, you will supply internal or external 24vdc to each DI terminal and connect the 0v of any external 24vdc power source to the DCM terminal. See the “Control Circuit Wiring Diagrams” in the table of contents in chapter 2 of the user manual for “Source Mode” wiring examples.

P02.00	External Terminal Control Circuits
<p>Setting value: 1 Two-wire operation control FWD / STOP REV / STOP</p>	
<p>Setting value: 2 Two-wire operation control RUN / STOP FWD / REV</p>	
<p>Setting value: 3 Three-wire operation control</p>	

Common Wiring for external analog Speed/Frequency Reference:

P00.20 is used to choose the source that you want the drive to look at to know how fast to run the motor.

- For an external analog input, set P00.20 = 2:External analog input

P03.00 & P03.01 are used to configure the function of the analog input terminals that you are using.

- For a 0-10v source, use terminal **AI1** and set P03.28=0, and P03.00=1:Frequency Command
- For a 4-20mA source, use terminal **AI2** and set P03.01=1:Frequency Command
 - Note: If using AI2, you will first need to configure AI1 via P03.00= 0:No function, because the drive will not allow you to have both AI1 & AI2 configured for the Frequency Command.
 - AI2 supports a voltage or mA current input, so you need to set the physical switch for AI2 to the mA setting. (See P03.29 if your analog source is a 0-20mA signal.)

See wiring examples below showing a 0-10v signal from a Click C0-04DA-2 and a 4-20mA signal from a C0-04DA-1. At bottom right is a wiring example for a 3-wire potentiometer (speed knob) using the +10vdc, AI1 and ACM terminals. Note: Both 0-10v and 4-20mA wiring examples are shown but you can choose which, if either, that you need.

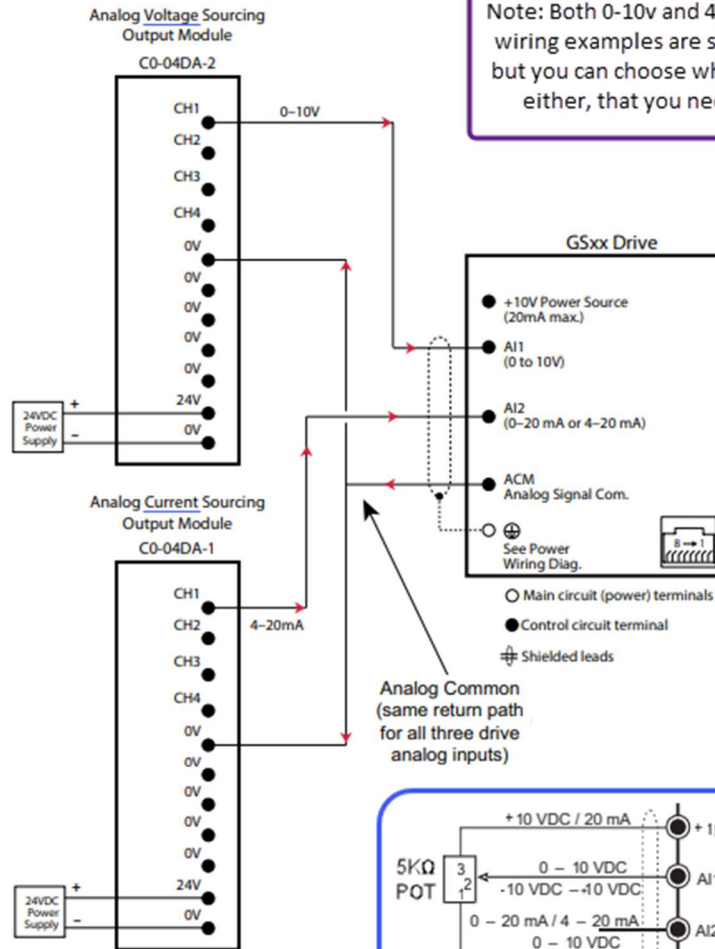
ANALOG INPUT WIRED FOR VOLTAGE AND CURRENT

In this example, AI1 is configured for 0~10V (P03.28). AI2 is configured for 4~20 mA (DIP switch and P03.29).

CLICK Expansion Module C0-04DA-2



CLICK Expansion Module C0-04DA-1



Note: Both 0-10v and 4-20mA wiring examples are shown but you can choose which, if either, that you need.

