Application Note #5520

Connecting a Yaskawa Junma Servo Motor & Drive to a Galil controller

Yaskawa's Junma Motor and Drive combination can be connected to any Galil motion controller in order to get precise multi-axis position control. The Junma series has multiple options for sizing a servo motor and drive system.
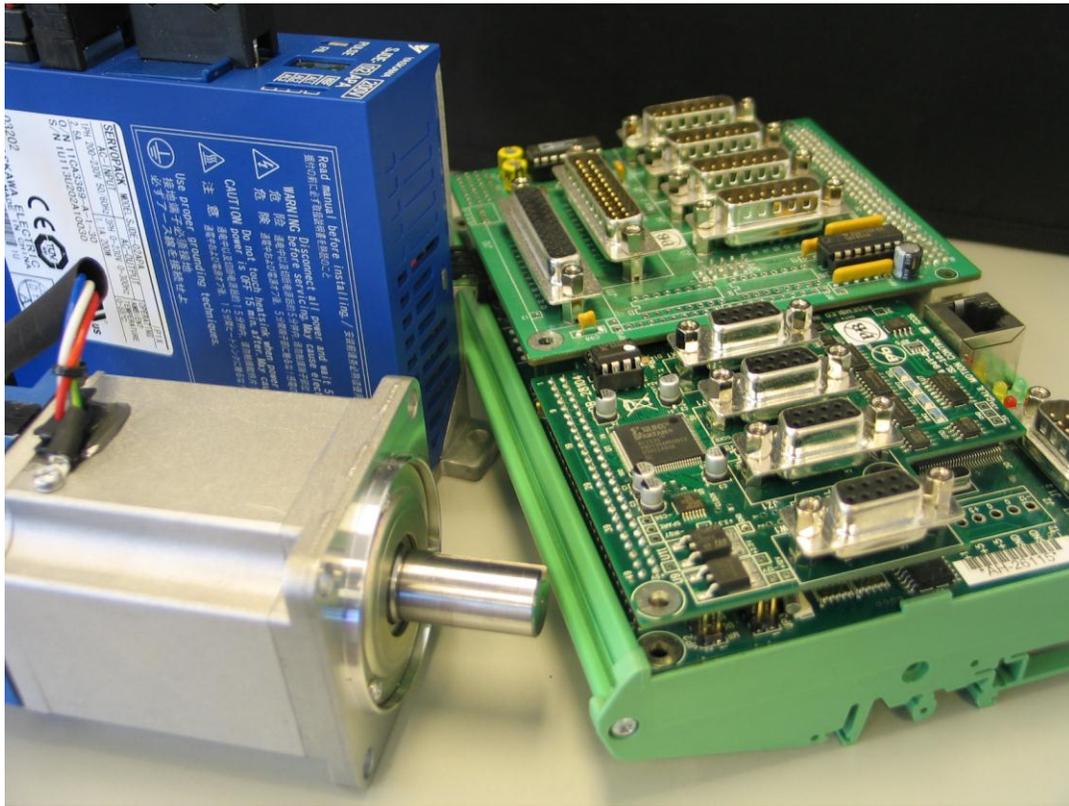

Figure 1: Yaskawa Junma Motor and Drive with Galil DMC-2143-ICM-20105-DB-28104

The motors come standard with a sin/cos encoder that is fed directly back to the Junma drive but can also be hooked up to a Galil sin/cos encoder interpolator board at the same time if needed. For the DMC-21x3 series, the sin/cos encoder board is the DB-28104 and for the DMC-40x0 series, the sin/cos interpolator board is the I100. According to Yaskawa -the Junma series drive/motor combination is meant to have "the standard servo characteristics such as high response, high speed, high torque, and high accuracy" without the need to do servo tuning. For complete details and specs on the Junma series, please visit the Yaskawa website:
http://www.yaskawa.com/site/Products.nsf/products/Rotary%20Servomotors~sjme-junma.html

To connect a Junma motor and drive to a Galil controller – the controller's step & direction signals are used. The motor type on the Galil should be changed to be a "stepper" using the MT*=2 command. Step Smoothing (KS) can be left as the default or can be changed to have higher pulse smoothing capability. For DMC-21x3 and older controllers – the stepper jumpers need to be installed. For new controllers such as the DMC-40x0, stepper jumpers are no longer required.

A: Step, Direction, Amp Enable, GND
B: Sin/Cos Encoder signals (A+,A-,B+,B-, GND)
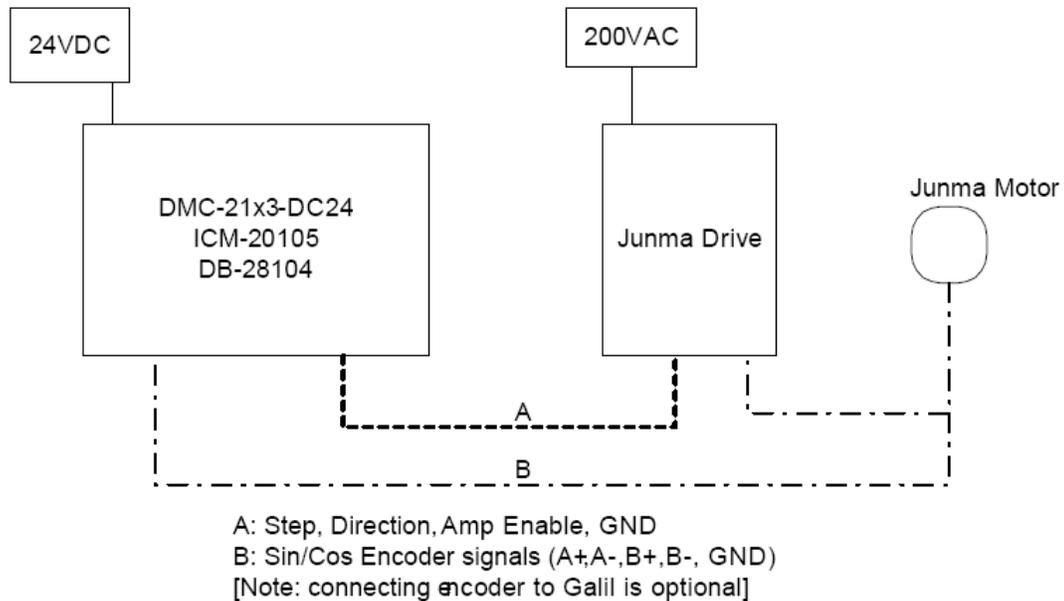[Note: connecting encoder to Galil is optional]

Figure 2: Connection Diagram

The front of the Junma drive has a 16position rotary switch that can be changed to reflect the desired resolution. For instance a Pulse setting of "C" is 1000 pulses per rev resolution with a Sign + pulse sequence having negative logic (open collector or line driver).

If using a Galil sin/cos interpolator board as well, the GND, A+, A-, B+, and B- encoder signals will need to be run in parallel to both the Junma drive and the Galil. Note: Do *not* connect 5V from the Galil controller as the encoder will already have 5V power coming from the drive. Use the AF command to set the level of analog interpolation on the Galil controller. An AF8 setting gives a resolution of 65536 cts/revolution for the motor shown above.

Pinout:

Junma SJDE-xxAPA CN1 (cable # JZSP-CHI003-01)					ICM-20105(15pin D)		External 24V Supply
pin	I/O	function	wire color		pin	function	
1	Input	Pulse	Orange (-black)	⟷	15	STEP	
2	Input	/Pulse	Orange (-red)	⟷	10	GND	
3	Input	Sign	Grey (-black)	⟷	8	DIR	
4	Input	/Sign	Grey (-red)	⟷	10	GND	
5	Input	+24 vdc	White (-black)	⟷	1	AECOM1	← +24VDC
6	Input	Servo On	White (-red)	⟷	2	AEN	
7	Output	Output GND	Yellow (-black)		9	AECOM2	← GND
8	Input	Pos Clear	Yellow (-red)				
9	Input	/PosClear	Pink (-black)				
10	Output	Index	Pink (-red)				
11	Output	Index GND	Orange (--black)				
12	Output	Alarm	Orange (--red)				
13	Output	Brake	Grey(--black)				
14	Output	COIN	Grey (--red)				

*Note: ICM-20105 should be configured as Sinking, Isolated 24V HAEN
JP1: AECOM1-AEC1
JP2:AECOM2-AEC2
Dot on R-pack next to RPAE1 label
See 21x3 Accessories manual for details