

DYN3 Servo Drive Testing Procedures

Manual Code	DYN3TR_A1_EN
Revision	A1.2
Date	July 2013
Valid Hardware Version	DYN3-H/T

Step 1: Un-boxing and Parts Check

Carefully remove the contents of the servo system from its packaging. Check that all components of the servo system are included.

Minimum components needed for testing:

- DYN3 AC Servo Drive [DYN3-H/T]
- Encoder Feedback Cable
- RS232 Tuning Cable [CA-MRS232-6]
- DHT Series Servo Motor
- Motor Power Cable
- DMMDRV.exe program

Step 2: Servo Motor Connection

Terminal Name	Pin Number	Specification
T2 Motor Control Power	A	0 - 400VAC @ 0 - 20A Peak
	B	
	C	

For the 880-DST-AS1 model 0.75kW capacity servo motor, the Motor Power Cable should be connected as:

Motor Phase	Wire Colour
A	Green
B	Red
C	Black
Protective Earth (Motor Body)	Yellow

Motor Power cable length <= 30m



Figure 1. Servo Motor Power Connection

Step 3: Encoder Feedback Connection

Connect the encoder feedback extension cable into the JP3 Terminal of the DYN3 servo drive.

Encoder Feedback cable length <= 30m



Figure 2. Encoder Feedback



Figure 3. Complete Motor Connection

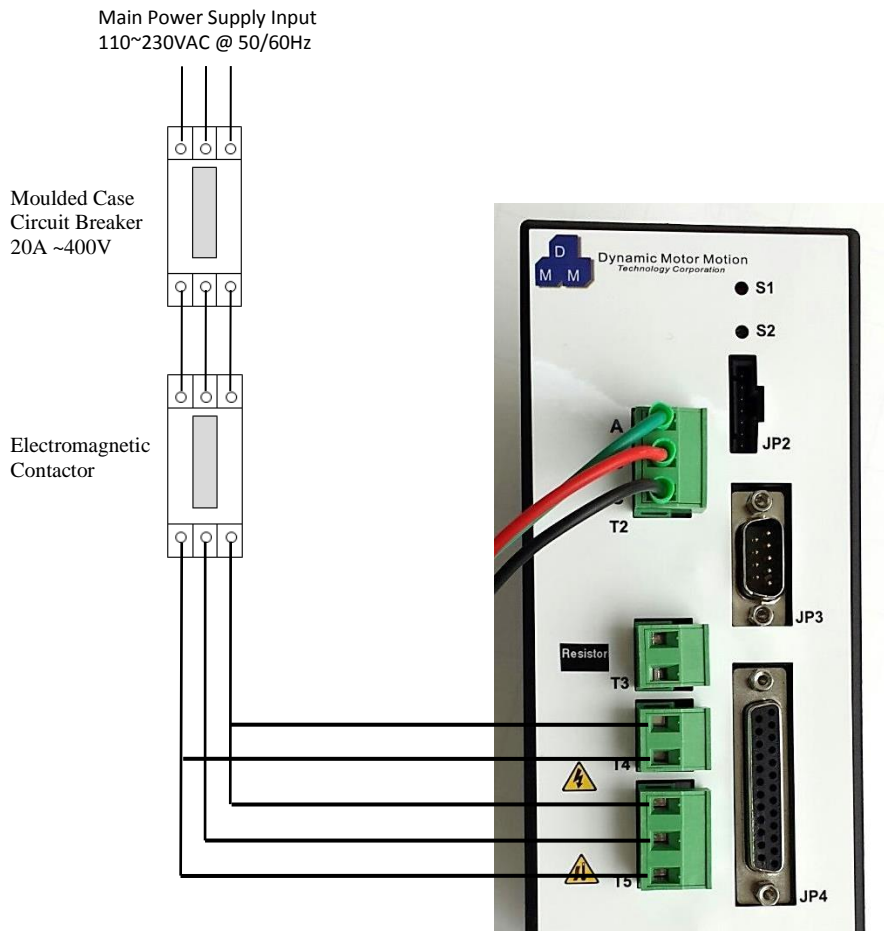
Step 4: Logic and Control Power Connection

Connect the AC input power to the DYN3 servo drive according to the diagram. DO NOT apply power to the input lines until Step 7.

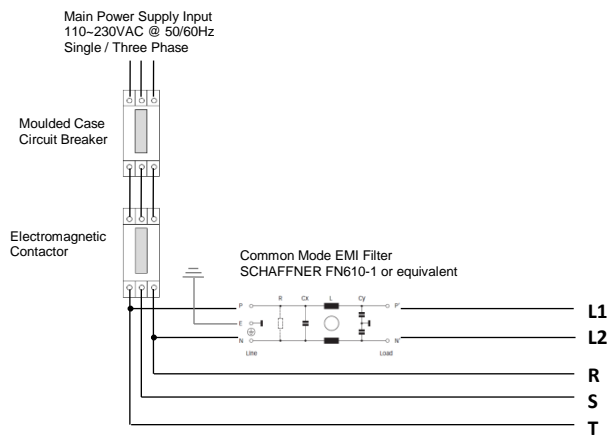
Terminal Name	Pin Number	Specification
T4 Logic Control Power	L1	Single Phase 110~230VAC +/-5%, 50/60Hz +/-5%
	L2	
T5 Main Control Power	R	Three Phase 110~230Vac +/-5%, 50/60Hz +/-5% Voltage between any two terminals < 230VAC
	S	
	T	
	R	Single Phase 110~230Vac +/-5%, 50/60Hz +/-5%
	T	



Install appropriate protective circuitry for the servo drive. Minimum wiring requires a 20A ~ 400V fuse or moulded case circuit breaker before the power is fed into the servo drive.



Recommended: An EMI noise filter should be connected between the AC Input power and Logic Power Terminal. This will eliminate external electrical noise disturbances.



Step 5: Grounding

Ensure that the power supply ground terminal and the servo motor ground terminal are securely connected to the DYN3 servo drive's grounding terminals.

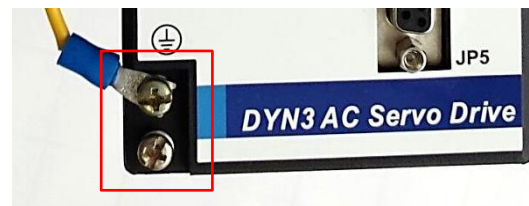


Figure 4. Servo Drive Grounding Terminals

Step 6: Connect I/O

The DYN3 servo drive accepts standard differential PULSE/SIGN pulse train commands, or analogue +/-10VDC Speed / Torque reference commands. Terminal JP4 should be used to make appropriate connections with external host controllers. Refer to DYN3 servo drive manual for detailed descriptions of each I/O.

Terminal JP4 mapping:

Pin	Description	Pin	Description
1	DIG	15	DI2
2	DI3	16	Ext. +24VDC Input
3	DI1	17	Int. +14VDC Output
4	Ext. +14VDC Input	18	DO4 +
5	DO4 -	19	DO3 +
6	DO3 -	20	DO2 +
7	DO2 -	21	DO1 +
8	DO1 -	22	SIGN +
9	A-REF Ground	23	PULS -
10	SIGN -	24	Int. +5VDC Output
11	PULS +	25	NC
12	A-REF Ground		
13	A-REF		
14	DI4		

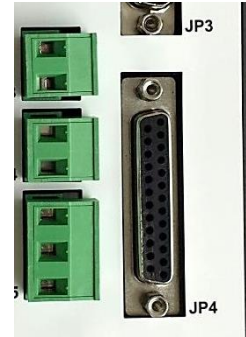


Figure 5. JP4 External I/O Terminal

Step 7: Power Up

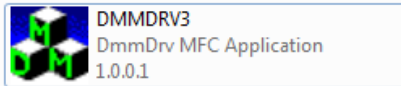
Apply power to the Logic Control Power and Main Control Power of the servo drive. The S1 status indicator lamp should be lit GREEN and the S2 status indicator lamp should be OFF.

The servo motor should be clamped (locked) and ready for command from the host controller.

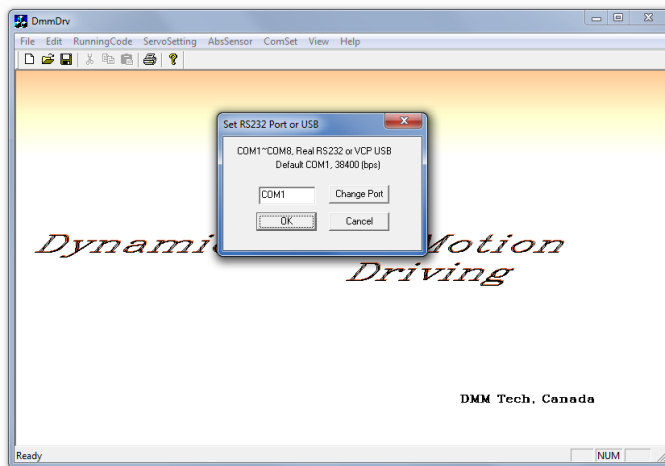
Step 8: PC Communication

Connect the CA-MRS232-6 tuning cable from servo drive JP2 terminal to the controller PC. The DMMDRV program can also support RS232-USB converters if necessary.

Open and launch the DMMDRV3.exe program:

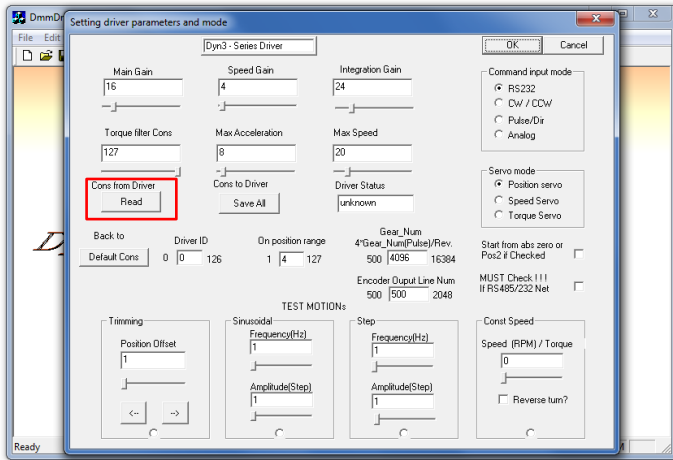


Select **ComSet > ComPort** from the main program dialog box function bar:



Select the appropriate Communications Port (COM). Check your PC's Device Manager to find the communication power number of the RS232 cable. Press **Change Port** until the correct port is selected. Then press **OK** to confirm and save selection.

Select **ServoSetting > DYN3-Driver**. The main servo drive tuning and testing screen will open:



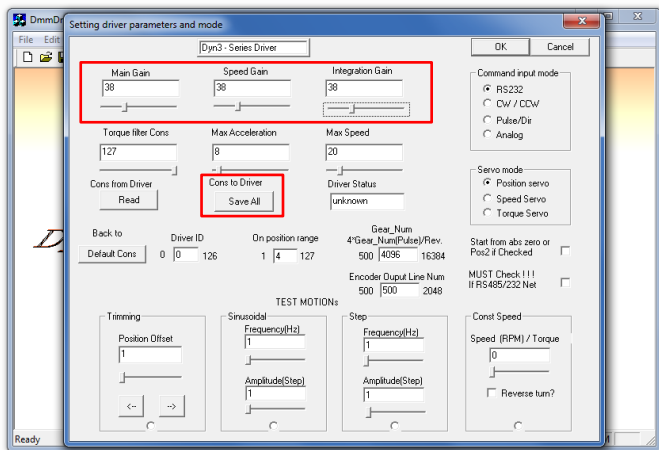
Press **Read** on the Setting driver parameters and mode dialogue box. After approximately 1~2 seconds, the on-screen parameters will change according to the current internal parameter settings of the connected servo drive. Ensure that the **Driver Status** indicates **ServoOnPos** to indicate that the drive has closed the position loop with the motor and is fully operational. The Servo drive is now fully communicating with the host PC.

The factory servo drive default PID servo Gain settings should be:

- Main Gain – 38
- Speed Gain – 38
- Integration Gain – 38

If the settings are different, change the parameters to the above. Once testing is complete, these settings can be changed according to the load mass characteristics of the servo motor.

Use the on-screen slider to change each setting to “38”. Then click **Save All** to save these parameters into the EEPROM memory of the servo drive.



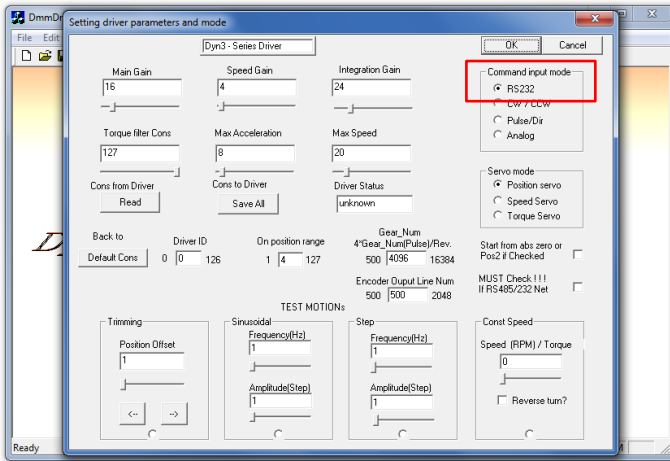
To confirm that these parameters are save into the servo drive, click **Default Cons** to reset the on-screen settings to the default parameters (This does not affect the parameters in the servo drive since it is not saved). Click **Read**, then the previously saved settings should now be displayed on the screen.

Step 9: Test Movements



Warning: During Test movement procedures, the servo motor can rotate very quickly in either direction. Ensure that the servo motor is free to rotate and no dangerous objects are attached to or near the motor shaft.

Select **RS232** under the command input mode option. Select **Position Servo** in the Servo mode option.



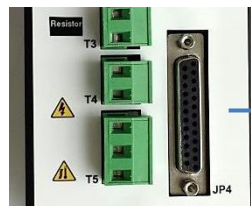
Click **Save All**

Under the Test Motions menu, the user can select one of 4 test motions to jog or move the servo motor. Only one test motion profile can be run at a time, use the radio buttons below each section to select the movement profile.

Trimming		The absolute position of the servo motor can be trimmed from 1 to 4096 reference units. Since the ABS-14-0 absolute encoder has a resolution of 16,384ppr, this corresponds to a maximum of 90° movement when trimming.
Sinusoidal		The motor moves along an oscillated smooth sinusoidal S-curve. The frequency slider controls the frequency of oscillation and the amplitude slider controls the travel amplitude per oscillation period.
Step		The motor moves along an oscillated “stepped” S-curve without acceleration/deceleration profiles. The frequency slider controls the frequency of oscillation and the amplitude slider controls the travel amplitude per oscillation period.
Constant Speed (JOG)		The motor is run at a constant speed set by the slider. The direction of rotation can be changed by the Reverse Turn button and the rate of acceleration/deceleration during direction switching is controlled by the Max Acceleration parameter. Note that the servo drive will throw a “Lost Phase” protective alarm if the motor is commanded to run above its maximum speed.

Step 10: Host Controller Command

The servo drive should be set and saved into the appropriate command input mode according to the command mode of the host controller. For example, a host controller using PULSE/SIGN command mode should have the servo drive saved into the **Pulse/Dir** command input mode and **Position Servo** mode. Use the appropriate communication ports from JP4 to communicate with the host controller.



To Host Controller:
PLC
CNC Control Panel
Pulse Generator