



GALaxy IV – DSD DC Drive QUICKSTART



WARNING

Elevator control products must be installed by elevator personnel who have been trained in the construction, maintenance, repair, inspection, and testing of elevator equipment. The elevator personnel must comply with all applicable safety codes and standards.



NOTE

Every precaution, whether or not specifically stated in this document, should be taken when installing, adjusting or servicing any elevator. All safety precautions should be followed to make sure life and limb of the service person and public is not endangered.

Power Requirement and Voltages

Check the power requirement and voltages according to the job schematics.

- 1) Wire Motor and Main Line Power as shown in job schematics.
- 2) Install and wire Governor.
- 3) Add temporary connections and set toggle switches on Main I/O Board GALX-1102 as shown below.
- 4) Wire the DBR temperature sensor to the temperature sensor board, if controller is equipped with dynamic breaking resistors.
- 5) Check/set parameters in controller LCD user interface. See "GALaxy IV Controller Settings" page of this guide.
- 6) Check/set parameters in drive. See "Drive Settings" page of this guide.
- 7) Wire encoder cable to the drive and check Encoder PPR.
- 8) Check PIC and PAL fault LEDs.
 - If LCD displays "Open" – check door lock/gate bypass switches.
 - If LCD displays "INS ERR" – make sure that the **INS** input is high and the **ACC**, **MRI**, **ICI**, and **AUTO** inputs are off.
- 9) Check speed and direction of motor rotation.
 - If platform runs slow, overcurrent fault on drive, or motor rotation or encoder channels are set wrong, check LE03 parameter on drive.

To configure the controller to operate a running platform for construction use, set toggle switches and install temporary connections as shown below.

Left Side of Board	Right Side of Board	Toggle Switches
S10 – GOV GOV – TF TF – BF BF – PS PS – HSS RG7 – RG5	HSS – FFS FFS – CST CST – UN UN – DN DN – INS	Door Lock Bypass – Down (Bypassed) Gate Bypass – Down (Bypassed) Independent – Down Auto Door – Down Stop Switch – Up (Run) Inspection – Down
Run Bug		1106/1107 I/O Board
Inspection Common – INS Inspection Up – IU Inspection Down – ID Inspection Enable – IEN (Cannot be held high)		FEP (on 1102 Board) – FEP (on 1106/1107 Board) FEP – MES MES – ALT ALT – MRS MRS- HWS HSW – HWS2
Main I/O Board Jumpers		
EQS1 – EQST (if earthquake mode is enabled)		

GALaxy IV Controller Settings

Preset the following parameters from the LCD User Interface “Adjustable Variables” menu.

Safety Processor Adjustable Variables Submenu (Motor Encoder Speed Feedback):	
<ul style="list-style-type: none"> TOP SPEED (contract speed FPM) ENCODER RPM (set to motor RPM) ENCODER PPR (set to motor encoder PPR) ENCODER TYPE (set to 4 = incremental) CONTROL TYPE (set to 2 = Tract DF) 2 STOP (0 = Mult – Stop; 1 = 2 Stop) REAR DOORS (0 = Front Only; 1 = Rear) UTS VELOCITY (set to TOP SPEED) DTS VELOCITY (set to TOP SPEED) 	<ul style="list-style-type: none"> INSP VELOCITY (set to 140) LEVELING VEL. (set to 140) ETS UP VEL. (set to TOP SPEED – only used for reduced stroke buffer) ETS DOWN VEL. (set to TOP SPEED – only used for reduced stroke buffer) SOFT STOP TIME (set to 3) PAL ETS UP VEL. (set to TOP SPEED) PAL ETS DN VEL. (set to TOP SPEED)
NTS Processor Adjustable Variables Submenu	
<ul style="list-style-type: none"> TOP SPEED (contract speed FPM) ENCODER RPM (set to motor RPM) ENCODER PPR (set to motor encoder PPR) ENCODER TYPE (set to 0 if using tape selector; set to 1 if using tapeless selector) UT VELOCITY (set to TOP SPEED) 	<ul style="list-style-type: none"> DT VELOCITY (set to TOP SPEED) UT1 VELOCITY (set to TOP SPEED) DT1 VELOCITY (set to TOP SPEED) UTn VELOCITY (set to TOP SPEED) DTn VELOCITY (set to TOP SPEED)
Car Motion Submenu	
When Using Tape Selector:	When Using Tapeless Selector:
<ul style="list-style-type: none"> TOP SPEED (set to Contract Speed) INSPECT SPEED (set to 25 FPM) ENCODER PPR (set to 64 PPR) ENCODER RPM (FPM value of Contract Speed and set) ENCODER TYPE (set to 4) MOTOR RPM (set to value of Function #601 in DSD Drive) 	<ul style="list-style-type: none"> TOP SPEED (set to Contract Speed) INSPECT SPEED (set to 25 FPM) ENCODER PPR (set to 10,000 PPR) ENCODER RPM (set to governor RPM) MOTOR RPM (set to value of Function #601 in DSD Drive)
	When Using APS Selector:
	<ul style="list-style-type: none"> TOP SPEED (set to Contract Speed) INSPECT SPEED (set to 25 FPM) ENCODER PPR (not used) ENCODER RPM (not used) MOTOR RPM (set to value of Function #601 in DSD Drive)
System Options Submenu	
Encoder Type:	Encoder Node:
<ul style="list-style-type: none"> 0 = Based on CONS.DAT file 1 = Turck Encoder 2 = Dynapar Encoder 3 = Wachendorff Encoder 4 = Tape Selector Feedback 	<ul style="list-style-type: none"> Not used for tape selector. If tapeless, then set node as follows: Turck = 63 Dynapar = 1 Wachendorff = 127 Note: This parameter gets set automatically when encoder type is changed.
	Encoder Baud Rate:
	<ul style="list-style-type: none"> 0 = 250K (default) 1 = 125k (used if communication errors)



NOTE

For governor mounted encoders, to calculate the RPM, divide the contract speed of the car by the distance traveled in one revolution with the governor as shown below: $RPM = Speed\ fpm / (diameter\ GOV\ (in\ feet) * pi)$

- For a 1 ft. Dia. Governor: $RPM = 350 / (1 * pi) = 350 / 3.1415 = 111.4\ Feet$
- For a 16 in Dia. Governor: $RPM = 350 / (1.33 * 3.1415) = 350 / 4.188 = 83.5\ Feet$ [NOTE: (16"/12" = 1.33ft)]

Drive Settings DSD DC Drive

Preset the following parameters from the DSD drive keypad.

Funct #	Description	Unit	Range	Setting
1	CURRENT LIMIT	%	0 – 300	250
2	USE SELF-TUNE VALUES	LOGIC	0 – 1	0 = OFF
3	RTD. ARMATURE AMPS	ADC	2.0 – 1250.0	MOTOR NAMEPLATE
4	ARMATURE OHMS	OHMS	0.001 – 5.000	FROM SELF TUNE
6	ARMATURE INDUCTANCE	HENRY	0.0010 – 1.000	FROM SELF TUNE
7	RTD. ARMATURE VOLTS	VDC	150 – 550	MOTOR NAMEPLATE
8	I REG. CROSSOVER	RAD	100 – 1000	500
9	NOMINAL AC INPUT	VAC	150 – 525	A/C LINE TO LINE VOLTAGE @ DRIVE
10	ENCODER PPR	PPR	600 – 19999	ENCODER NAMEPLATE
11	RATED MOTOR RPM	RPM	50.0 – 1999.0	MOTOR NAMEPLATE
12	OVERSPEED %	%	0.0 – 150.0	110
14	V SENSE %	%	0.0 – 100.0	25
15	T SENSE %	%	0.0 – 100.0	5
16	ENCODER / MOTOR RATIO	--	1.000 – 19.000	1
17	RATED CAR SPEED	FPM	1.0 – 1900.0	CONTRACT SPEED
21	EXT. ACCEL. LIMIT	M/S ²	2.00 – 10.00	4.2
22	ERROR LIST RESET	LOGIC	0 – 1	0 = OFF
32	FULL FIELD DETECT	%	30 – 90	45
38	ARM. VLT. RESPONSE	RAD	1.0 – 4.0	2
39	HI SPEED BANDWIDTH	RAD	1 – 15	6
40	LO SPEED BANDWIDTH	RAD	1 – 15	6
41	PER-UNIT INERTIA	SEC	0.10 – 9.99	2
42	STIFFNESS	--	0.2 – 9.9	1
49	WEAK FIELD CURRENT	ADC	0.2 – 40.00	40
50	FULL FIELD CURRENT	ADC	0.2 – 40.00	MOTOR NAMEPLATE
51	MOTOR FIELD L/R	SEC	0.10 – 10.00	FROM SELF TUNE
52	RTD. FIELD VOLTS DC	VDC	50 – 525	MOTOR NAMEPLATE
53	STANDBY FIELD AMPS	%	10 – 100	25
54	FIELD RESPONSE	RAD	1.0 – 10.0	5
55	FIELD CONTROL AC SOURCE VOLTS	VAC	0 – 525	0
110	REFERENCE MODE SELECT	NUM	1 – 4	3
182	INVERT ALARM RELAY	LOGIC	0 – 1	1 = ON
183	K3 LGC OUT SELECT	NUM	1 – 4	3

Please refer to GALaxy IV Manual, Section 3.3, “DC Start-Up Procedure”

Drive Self-Tune

- 1) Place the NVRAM protect switch in the OFF position. (Note: The unprotect LED will now be lit.)
- 2) After the test is complete, the SCDU should flash *Pass*.
- 3) Press the UP arrow on the drive to display the parameter 997.
- 4) Write down values in drive parameters 613, 614, and 615.
- 5) Press *DATA/FCTN* Key. (Note: The SCDU will now display *Test*.)
- 6) Take values recorded in Step 4 and enter them into parameters 4, 6, and 51 respectively.
- 7) Press *ENT* Key on the SCDU. (Note: The Motor Contactor (MC) will pull in and drop briefly, then pull in again as it tests the motor.)
- 8) Follow procedures in drive’s manual to save the parameters using function 994.
- 9) If the test fails, then take down the error code, and refer to DSD – 412 Drive Manual for troubleshooting.
- 10) Place the NVRAM switch back to the ON position. (Note: The unprotect LED will turn off.)

Self-Diagnostics Test

- 1) Place the NVRAM protect switch in the OFF position. (Note: The unprotect LED will now be lit.)
- 2) Press the UP arrow on the drive to display the parameter 998
- 3) . Press *DATA/FCTN* Key. (Note: The SCDU will now display *Test*.)
- 4) Press *ENT* Key on the SCDU.
- 5) If the test fails with error code 917, then swap the armature feedback wires. If the test fails with other codes, then refer to drive manual for troubleshooting.
- 6) After the test is complete, the SCDU should flash *Pass*.
- 7) Place the NVRAM switch back to the ON position. (Note: The unprotect LED will turn OFF.)

All temporary connections must be removed before allowing the elevator to run on automatic operation. Refer to the GALaxy IV Manual for complete adjustment procedures.

Useful DSD Diagnostic Functions

Funct #	Description	Funct #	Description
22	Clear Errors List	613	Measured Resistance – Ohms
000	View Fault List	614	Measured Inductance – Henry
800	View Error List	615	Measured Field L/R Constant – Sec
600	Car Speed – FPM	616	Measured Speed Error – %
601	Motor RPM – RPM	617	Line Frequency – Hz
602	Speed Reference – FPM	618	Heat Sink Temp. – Deg. C
603	Pre-Torque Signal – %	619	Measure AC Line Volts – VAC
609	CEMF Volts – VDC	620	Field Tracking – PU
610	Motor Armature Volts – VDC	621	Serial Comm. On – Logic
611	Motor Armature Current – ADC	688	Cube I. D.
612	Motor Field Current – ADC	689	Filed Range

Useful Formulas:

- Torque in lb./ft. = $HP \times 5250 / RPM$
- $HP = Torque \times PM / 5250$
- $RPM = 120 \times Frequency / \# \text{ of Poles}$
- $RPM = 5250 \times HP / Torque$
- $Freq = \# \text{ of Poles} \times RPM / 120$
- $Poles = 120 \times Freq / RPM$