



# GALaxy IV – Quattro AC PM 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
<b>Run Bug</b>		<b>1106/1107 I/O Board</b>
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
<b>Main I/O Board Jumpers</b>		
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"> <li>TOP SPEED (contract speed FPM)</li> <li>ENCODER RPM (set to motor RPM)</li> <li>ENCODER PPR (set to motor encoder PPR)</li> <li>ENCODER TYPE (set to 4 = incremental)</li> <li>CONTROL TYPE (set to 2 = Tract DF)</li> <li>2 STOP (0 = Mult – Stop; 1 = 2 Stop)</li> <li>REAR DOORS (0 = Front Only; 1 = Rear)</li> <li>UTS VELOCITY (set to TOP SPEED)</li> <li>DTS VELOCITY (set to TOP SPEED)</li> </ul>	<ul style="list-style-type: none"> <li>INSP VELOCITY (set to 140)</li> <li>LEVELING VEL. (set to 140)</li> <li>ETS UP VEL. (set to TOP SPEED – only used for reduced stroke buffer)</li> <li>ETS DOWN VEL. (set to TOP SPEED – only used for reduced stroke buffer)</li> <li>SOFT STOP TIME (set to 3)</li> <li>PAL ETS UP VEL. (set to TOP SPEED)</li> <li>PAL ETS DN VEL. (set to TOP SPEED)</li> </ul>
NTS Processor Adjustable Variables Submenu	
<ul style="list-style-type: none"> <li>TOP SPEED (contract speed FPM)</li> <li>ENCODER RPM (set to motor RPM)</li> <li>ENCODER PPR (set to motor encoder PPR)</li> <li>ENCODER TYPE (set to 0 if using tape selector; set to 1 if using tapeless selector)</li> <li>UT VELOCITY (set to TOP SPEED)</li> </ul>	<ul style="list-style-type: none"> <li>DT VELOCITY (set to TOP SPEED)</li> <li>UT1 VELOCITY (set to TOP SPEED)</li> <li>DT1 VELOCITY (set to TOP SPEED)</li> <li>UTn VELOCITY (set to TOP SPEED)</li> <li>DTn VELOCITY (set to TOP SPEED)</li> </ul>
Car Motion Submenu	
When Using Tape Selector:	When Using Tapeless Selector:
<ul style="list-style-type: none"> <li>TOP SPEED (set to Contract Speed)</li> <li>INSPECT SPEED (set to 25 FPM)</li> <li>ENCODER PPR (set to 64 PPR)</li> <li>ENCODER RPM (FPM value of Contract Speed and set)</li> <li>ENCODER TYPE (set to 4)</li> <li>MOTOR RPM (set to value of A1 =&gt; CONTRACT MTR SPD in QUATTRO Drive)</li> </ul>	<ul style="list-style-type: none"> <li>TOP SPEED (set to Contract Speed)</li> <li>INSPECT SPEED (set to 25 FPM)</li> <li>ENCODER PPR (set to 10,000 PPR)</li> <li>ENCODER RPM (set to governor RPM)</li> <li>MOTOR RPM (set to value of A1 =&gt; CONTRACT MTR SPD in QUATTRO Drive)</li> </ul>
	When Using APS Selector:
	<ul style="list-style-type: none"> <li>TOP SPEED (set to Contract Speed)</li> <li>INSPECT SPEED (set to 25 FPM)</li> <li>ENCODER PPR (not used)</li> <li>ENCODER RPM (not used)</li> <li>MOTOR RPM (set to value of A1 =&gt; CONTRACT MTR SPD in QUATTRO Drive)</li> </ul>
System Options Submenu	
Encoder Type:	Encoder Node:
<ul style="list-style-type: none"> <li>0 = Based on CONS.DAT file</li> <li>1 = Turck Encoder</li> <li>2 = Dynapar Encoder</li> <li>3 = Wachendorff Encoder</li> <li>4 = Tape Selector Feedback</li> </ul>	<ul style="list-style-type: none"> <li>Not used for tape selector.</li> <li>If tapeless, then set node as follows: Turck = 63 Dynapar = 1 Wachendorff = 127</li> <li><b>Note:</b> This parameter gets set automatically when encoder type is changed.</li> </ul>
	Encoder Baud Rate:
	<ul style="list-style-type: none"> <li>0 = 250K (default)</li> <li>1 = 125k (used if communication errors)</li> </ul>



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:  $RPM = \text{Speed fpm} / (\text{diameter GOV (in feet)} * \pi)$

## NOTE

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

## Drive Settings Quattro AC PM Drive

Preset the following parameters from the Quattro drive keypad.

Drive A1 Submenu			
Contract Car Speed	= CONTRACT CAR SPEED FT / MIN (OR FPM)		
Contract Motor Speed	= NAMEPLATE MOTOR RPM		
Encoder Pulses	= RATED PULSES (PPR)		
NTSD Target Speed	= 6 FT / MIN (OR FPM)		
Contact Flt Time	= 5 SEC		
A2 Parameters Submenu			
Acceleration Rate 0	= 7.99 FT / SEC <sup>2</sup> (OR FPS <sup>2</sup> )		
Deceleration Rate 0	= 7.99 FT / SEC <sup>2</sup> (OR FPS <sup>2</sup> )		
Jerk & Acceleration In	= 0.00 FT / SEC <sup>2</sup> (OR FPS <sup>2</sup> )		
Jerk & Acceleration Out	= 0.00 FT / SEC <sup>2</sup> (OR FPS <sup>2</sup> )		
Jerk & Deceleration In	= 0.00 FT / SEC <sup>2</sup> (OR FPS <sup>2</sup> )		
Jerk & Deceleration Out	= 0.00 FT / SEC <sup>2</sup> (OR FPS <sup>2</sup> )		
Deceleration Rate 4 = NTSD Decel.	= 7.99 FT / SEC <sup>2</sup> (OR FPS <sup>2</sup> )		
Decel. Jerk In 4 = NTSD Jerk	= 7.99 FT / SEC <sup>2</sup> (OR FPS <sup>2</sup> )		
Decel. Jerk Out 4 = NTSD Jerk	= 7.99 FT / SEC <sup>2</sup> (OR FPS <sup>2</sup> )		
Motor Side Power Convert A4			
UV Alarm Level	= 80%		
Line Side Power Convert A5			
Input L-L Volts	RMS L-L Applied to Drive		
Motor A6 Submenu			
Rated Motor Power	= NAMEPLATE (HP)		
Rated Motor Current	= NAMEPLATE (AMPS)		
Armature Voltage	= NAMEPLATE (VOLTS)		
Full Field Current	= NAMEPLATE (AMPS)		
Weak Field Current	= NAMEPLATE (AMPS)		
Standby Field Current	= NAMEPLATE (AMPS)		
Motor Poles	= NUMBER OF POLES (SEE BELOW)		
Rated Motor Speed	= RPM		
User Switches C1 Submenu			
Speed Command Source	= SERIAL		
Run Command Source	= SERIAL + EXTERNAL		
Field ENA Source	= EXTERNAL TB		
Contact Confirm Source	= EXTERNAL TB		
Fault Reset SRC	= SERIAL		
Ramped Stop SEL	= RAMP ON STOP		
Ramped Down EN SRC	= RUN LOGIC		
NTSD Source	= EXTERNAL		
Logic Inputs C2 Submenu		Logic Outputs C3 Submenu	
Logic Input 1	= CONTACT CONFIRM	Logic Output 1	= NOT FAULT
Logic Input 2	= CTR POWER SENSE	Logic Output 2	= NO FUNCTION
Logic Input 3	= NO FUNCTION	Logic Output 3	= MTR OVERLOAD
Logic Input 4	= DRIVE ENABLE	Logic Output 4	= NO FUNCTION
Logic Input 5	= RUN	Logic Output 5	= NO FUNCTION
Logic Input 6	= RUN 2	Logic Output 6	= NO FUNCTION
Logic Input 7	= NTSD INPUT 1	Logic Output 7	= NO FUNCTION
Logic Input 8	= NO FUNCTION	Solid State RLY1	= SPEED REG RLS
Logic Input 9	= FAULT RESET	Solid State RLY2	= NO FUNCTION
		Relay Coils 1	= FAULT
		Relay Coils 2	= NO FUNCTION

The Number of Poles if You are Using One of the Following PM Motors:			
MAG05	= 66 Poles	Imperial 474	= 20 Poles
MAG10	= 66 Poles	Imperial 475	= 24 Poles
MAG15	= 66 Poles	Imperial 522	= 20 Poles
		Imperial 525	= 20 Poles
		Imperial 805	= 44 Poles
Leroy Somer Z2	= 16 Poles	Hollister – Whitney GL-100	= 28 Poles
Leroy Somer Z3	= 16 Poles	Hollister – Whitney GL-115	= 28 Poles
Leroy Somer Z4	= 16 Poles	Hollister – Whitney GL-130	= 28 Poles
Leroy Somer Z6	= 32 Poles	Hollister – Whitney GL-170	= 28 Poles
Leroy Somer Z10	= 32 Poles	Hollister – Whitney GL-171	= 28 Poles
Leroy Somer Z20	= 32 Poles	Hollister – Whitney GL-130A	= 40 Poles
		Hollister – Whitney GL-185	= 40 Poles
		Hollister – Whitney GL-260	= 40 Poles

**ENCODER LEARN PROCEDURE PM MACHINE (Sections 3.3.4 and 3.3.5 in GALaxy IV Manual):**

- Set inspection speed to 0.
- Lift one wire on Main Brake.
- Select/Press: **Rotor Align U10 => Alignment Method => Auto Align.**
- Select/Press: **Begin Alignment => On Run.**
- Inspection UP or DOWN Run.

**MOTOR AUTO TUNE PROCEDURE (Section 3.3.7 in GALaxy IV Manual):**

- Inspection Speed to 0.
- Lift one wire on Main Brake.
- Select/Press **Autotune Sel U12 => Autotune Select => On Run.**
- Inspection UP or DOWN Run.

***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 Formulas:**

- **Torque in lb./ft. = HP x 5250 /RPM**
- **HP = Torque x PM /5250**
- **RPM = 120 x Frequency / # of Poles**
- **RPM = 5250 x HP /Torque**
- **Freq = # of Poles x RPM /120**
- **Poles = 120 x Freq /RPM**