Document Number: 3504 **Product: 650(V) Data Table**

AC650 Series V/Hz Controller – 220-240 VAC ±10%; 50-60 Hz ±5%							
FRAME SIZE	**1**	**2**	**3**	**C**	**D**	**E**	**F**
Dimensions	142 x 74 x 142 5.6 x 2.9 x 5.6	200 x 74 x 173 7.9 x 2.9 x 6.8	259 x 97 x 200 10.2 x 3.8 x 7.9				
Weight (Kg/Lb.)	0.9 / 1.9	1.4 / 3.1	2.7 / 5.9				
Enclosure Protection	IP20						
Mounting Options	Panel or DIN Rail						
Supply	Single-Phase		Three-Phase				
STANDARD DUTY							
HP	0.3 – 1	2	3 – 5				
kW	0.25 – 0.75	1.5	2.2 – 4				
Current	1.5 – 4	7	9.6 – 16.4				
HEAVY DUTY							
HP	0.3 – 1	2	3 – 5				
kW	0.25 – 0.75	1.5	2.2 – 4				
Current	1.5 – 4	7	9.6 – 16.4				
OPTIONS AND TECHNICAL SPECIFICATIONS							
Keypad Type	6511-TTL – Standard removable but not remote mountable, does not hold configuration 6511-RS232 – Optional remote mountable						
Built-in Choke	None						
Built-in Brake Switch	None		Standard				
Internal EMC Filter[1]	Optional						
Ambient	0-40°C (32-104°F); derate 2% per °C to 50°C (122°F) maximum						
Altitude	1000m (3280 ft.) ASL; derate 1% per 100m (328 ft.) above 1000m (3280 ft.) to 5000m (16400 ft.) max.						
Overload	150% for 30 seconds (heavy duty) 115% for 30 seconds (standard duty)						
Output Frequency	0-240 Hz						
Analog Inputs	One voltage (0 – 10 or 5 VDC) only (SPEED SETPOINT) ; 10 bit at 10ms One voltage (0 – 10 or 5 VDC) or current (4-20mA or 0-20mA) selectable (SPEED FEEDBACK); 10 bit at 10ms						
Analog Outputs	One 0-10 VDC at 10mA maximum (short circuit protected); 10 bit at 15Hz; Configurable for DEMAND / CURRENT / PID ERROR / RAISE-LOWER OUTPUT						
Digital Inputs	Three 24 VDC; 7.5mA at 24 VDC; 10ms; Configurable for START/STOP/DIRECTION/PRE-SET SPEEDS (8)						
Digital Input/Output	One selectable 24 VDC output at 50mA; 33 Ohm impedance or 24 VDC input 7.5mA; 10ms Digital output configurable for AT SPEED / AT ZERO SPEED / RUNNING / HEALTHY / TRIPPED						
Relay Output	One configurable for 250 VAC maximum, 4A resistive load maximum; 10ms						
Encoder Input	Not available						
Thermistor Input	Isolated						
STANDARDS (SEE PRODUCT MANUAL FOR INSTALLATION REQUIREMENTS TO MEET REQUIRED STANDARDS)							
UL and cUL (Canada)	Listed component under UL508C (industrial control equipment)						
EMC Standards	EN50081-1 (1992) EN50082-1 (1997) EN61800-3 (1997) EN61000-6-2 (1999)		EN50081-1 (1992) EN50081-2 (1993) EN50082-1 (1997) EN61800-3 (1997) EN61000-6-2 (1999)				
CE	EN50178 (1998) and EMC standards (when used as stand-alone equipment) EN60204-1 and EMC standards (when used as part of other equipment)						
SOFTWARE AND COMMUNICATIONS							
Setup	Configuration only through the keypad; 5 pre-configured applications (Speed / Auto-Manual / Preset / Raise-Lower / PID)						
Communication	No communication port						
Techbox Options	No Techbox support						

[1] All drives meet the CE Drive Specific Standard, filter required only to meet Class A or B.

Document Number: 3504 **Product: 650(V) Data Table**

AC650 Series V/Hz Controller – 380-460 VAC ±10%; 50-60 Hz ±5%

FRAME SIZE	1	2	3	C	D	E	F
Dimensions		200 x 74 x 173 7.9 x 2.9 x 6.8	259 x 97 x 200 10.2 x 3.8 x 7.9				
Weight		1.4 / 3.1	2.7 / 5.9				
Enclosure Protection		IP20					
Mounting Options		Panel or DIN Rail					
Supply		Three-Phase					
STANDARD DUTY							
HP		0.5 – 3	5 – 10				
kW		0.3 – 2.2	3.7 – 7.5				
Current		1.5 – 5.5	9 – 14				
HEAVY DUTY							
Max HP		0.5 – 3	5 – 10				
Max kW		0.3 – 2.2	3.7 – 7.5				
Current		1.5 – 5.5	9 – 14				
OPTIONS AND TECHNICAL SPECIFICATIONS							
Keypad Type	6511-TTL – Standard removable but not remote mountable, does not hold configuration 6511-RS232 – Optional remote mountable						
Built-in Choke		None					
Built-in Brake Switch		Standard					
Internal EMC Filter[2]		Optional					
Ambient	0-40°C (32-104°F); derate 2% per °C to 50°C (122°F) maximum						
Altitude	1000m (3280 ft.) ASL; derate 1% per 100m (328 ft.) above 1000m (3280 ft.) to 5000m (16400 ft.) max.						
Overload	150% for 30 seconds (heavy duty) 115% for 30 seconds (standard duty)						
Output Frequency	0-240 Hz						
Analog Inputs	One voltage (0 – 10 or 5 VDC) only (SPEED SETPOINT) ; 10 bit at 10ms One voltage (0 – 10 or 5 VDC) or current (4-20mA or 0-20mA) selectable (SPEED FEEDBACK); 10 bit at 10ms						
Analog Outputs	One 0-10 VDC at 10mA maximum (short circuit protected); 10 bit at 15Hz; Configurable for DEMAND / CURRENT / PID ERROR / RAISE-LOWER OUTPUT						
Digital Inputs	Three 24 VDC; 7.5mA at 24 VDC; 10ms; Configurable for START/STOP/DIRECTION/PRE-SET SPEEDS (8)						
Digital Input/Output	One selectable 24 VDC output at 50mA; 33 Ohm impedance or 24 VDC input 7.5mA; 10ms Digital output configurable for AT SPEED / AT ZERO SPEED / RUNNING / HEALTHY / TRIPPED						
Relay Output	One configurable for 250 VAC maximum, 4A resistive load maximum; 10ms						
Encoder Input	Not available						
Thermistor Input	Isolated						
STANDARDS (SEE PRODUCT MANUAL FOR INSTALLATION REQUIREMENTS TO MEET REQUIRED STANDARDS)							
UL and cUL (Canada)	Listed component under UL508C (industrial control equipment)						
EMC Standards	EN50081-1 (1992) EN50082-1 (1997) EN61800-3 (1997) EN61000-6-2 (1999)		EN50081-1 (1992) EN50081-2 (1993) EN50082-1 (1997) EN61800-3 (1997) EN61000-6-2 (1999)				
CE	EN50178 (1998) and EMC standards (when used as stand-alone equipment) EN60204-1 and EMC standards (when used as part of other equipment)						
SOFTWARE AND COMMUNICATIONS							
Setup	Configuration only through the keypad; 5 pre-configured applications (Speed / Auto-Manual / Preset / Raise-Lower / PID)						
Communication	No communication port						
Techbox Options	No Techbox support						

[2] All drives meet the CE Drive Specific Standard, filter required only to meet Class A or B.

Document Number: 3504 **Product: 650(V) Data Table**

AC650V Series Sensorless Vector Controller – 220-240 VAC ±10%; 50-60 Hz ±5%							
FRAME SIZE	**1**	**2**	**3**	**C**	**D**	**E**	**F**
Dimensions	142 x 74 x 142 5.6 x 2.9 x 5.6	200 x 74 x 173 7.9 x 2.9 x 6.8	259 x 97 x 200 10.2 x 3.8 x 7.9	348 x 201 x 208 13.7 x 7.9 x 8.1	453 x 252 x 245 17.8 x 9.9 x 9.6	668 x 257 x 312 26.3 x 10.1 x 12.1	720 x 257 x 349 28.9 x 10.1 x 27.5
Weight (Kg/Lb.)	0.9 / 1.9	1.4 / 3.1	2.7 / 5.9	9.3 / 20	17.4 / 38	22.5 / 50	29 / 64
Enclosure Protection	IP20			NEMA 1			IP20
Mounting Options	Panel or DIN Rail			Panel or Through-panel with mounting kit			Panel
Supply	Single-Phase		Three-Phase				
STANDARD DUTY							
HP	0.3 – 1	2	3 – 5	10 – 15	20 – 25	40	50 – 75
kW	0.25 – 0.75	1.5	2.2 – 4	7.5 – 11	15 – 18	30	37 – 55
Current	1.5 – 4	7	9.6 – 16.4	28 – 42	54 – 68	104	130 – 192
HEAVY DUTY							
HP	0.3 – 1	2	3 – 5	7.5 – 10	15 – 25	30	40 – 60
kW	0.25 – 0.75	1.5	2.2 – 4	5.5 – 7.5	11 – 18	22	30 – 45
Current	1.5 – 4	7	9.6 – 16.4	22 – 28	42 – 68	80	104 – 154
OPTIONS AND TECHNICAL SPECIFICATIONS							
Keypad Type	6511-RS232 – Remote mountable			6521 – Remote mountable 6901 – Remote mountable and clone-able			
Built-in Choke	None			DC		AC	
Built-in Brake Switch	None		Standard		Optional		
Internal EMC Filter[3]	Optional			None (External option only)			
Ambient (IP20)	0-40°C (32-104°F); derate 2% per °C to 50°C (122°F) maximum						
Ambient (NEMA 1)	None			0-35°C (32-95°F); derate 2% per °C to 50°C (122°F) maximum			None
Altitude	1000m (3280 ft.) ASL; derate 1% per 100m (328 ft.) above 1000m (3280 ft.) to 5000m (16400 ft.) max.						
Overload	150% for 30 seconds (heavy duty) 115% for 30 seconds (standard duty)						
Output Frequency	0-240 Hz						
Analog Inputs	One voltage (0 – 10 or 5 VDC) only (SPEED SETPOINT) ; 10 bit at 10ms One voltage (0 – 10 or 5 VDC) or current (4-20mA or 0-20mA) selectable (SPEED FEEDBACK); 10 bit at 10ms						
Analog Outputs	One 0-10 VDC at 10mA maximum (short circuit protected); 10 bit at 15Hz; Configurable for DEMAND / CURRENT / PID ERROR / RAISE-LOWER OUTPUT						
Digital Inputs	Three 24 VDC; 7.5mA at 24 VDC; 10ms; Configurable for START/STOP/DIRECTION/PRE-SET SPEEDS (8)						
Digital Input/Output	One selectable 24 VDC output at 50mA; 33 Ohm impedance or 24 VDC input 7.5mA; 10ms Digital output configurable for AT SPEED / AT ZERO SPEED / RUNNING / HEALTHY / TRIPPED						
Relay Output	One configurable for 250 VAC maximum, 4A resistive load maximum; 10ms						
Encoder Input	Single-ended input with minimum ON state of 4 VDC (24 VDC maximum); 10ms						
Thermistor Input	Isolated						
STANDARDS (SEE PRODUCT MANUAL FOR INSTALLATION REQUIREMENTS TO MEET REQUIRED STANDARDS)							
UL and cUL (Canada)	Listed component under UL508C (industrial control equipment)						
EMC Standards	EN50081-1 (1992) EN50082-1 (1997) EN61800-3 (1997) EN61000-6-2 (1999)		EN50081-1 (1992) EN50081-2 (1993) EN50082-1 (1997) EN61800-3 (1997) EN61000-6-2 (1999)	EN50081-1 (1992) EN50081-2 (1994) EN50082-1 (1998) EN50082-2 (1995) EN61800-3 (1997) EN61000-3-2			
CE	EN50178 (1998) and EMC standards (when used as stand-alone equipment) EN60204-1 and EMC standards (when used as part of other equipment)						
SOFTWARE AND COMMUNICATIONS							
Setup	Using keypad (5 pre-configured applications Speed / Auto-Manual / Preset / Raise-Lower / PID) or software (DSELite)						
Communication	P3 port standard allows RS-232 (EIBISYNCH) communications						
Techbox Options	Modbus (includes P3 port for remote mounted keypad)						
Other Features	Autotune, Slip Compensation						

[3] All drives meet the CE Drive Specific Standard, filter required only to meet Class A or B.

Document Number: 3504 **Product: 650(V) Data Table**

AC650V Series Sensorless Vector Controller – 380-460 VAC ±10%; 50-60 Hz ±5%							
FRAME SIZE	**1**	**2**	**3**	**C**	**D**	**E**	**F**
Dimensions		200 x 74 x 173 7.9 x 2.9 x 6.8	259 x 97 x 200 10.2 x 3.8 x 7.9	348 x 201 x 208 13.7 x 7.9 x 8.1	453 x 252 x 245 17.8 x 9.9 x 9.6	668 x 257 x 312 26.3 x 10.1 x 12.1	720 x 257 x 349 28.9 x 10.1 x 27.5
Weight		1.4 / 3.1	2.7 / 5.9	9.3 / 20	17.4 / 38	22.5 / 50	29 / 64
Enclosure Protection		IP20		NEMA 1			IP20
Mounting Options		Panel or DIN Rail		Panel or Through-panel with mounting kit			Panel
Supply		Three-Phase					
STANDARD DUTY							
HP		0.5 – 3	5 – 10	15 – 25	30 – 50	60 – 75	100 – 150
kW		0.3 – 2.2	3.7 – 7.5	11 – 18	22 – 37	45 – 55	75 – 91
Current		1.5 – 5.5	9 – 14	27 – 34	45 – 65	87 – 105	125 – 180
HEAVY DUTY							
Max HP		0.5 – 3	5 – 10	10 – 20	25 – 40	50 – 60	75 – 150
Max kW		0.3 – 2.2	3.7 – 7.5	7.5 – 15	18 – 30	37 – 45	55 – 91
Current		1.5 – 5.5	9 – 14	21 – 27	38 – 52	73 – 87	105 – 180
OPTIONS AND TECHNICAL SPECIFICATIONS							
Keypad Type		6511-RS232 – Remote mountable		6521 – Remote mountable 6901 – Remote mountable and clone-able			
Built-in Choke		None		DC		AC	
Built-in Brake Switch		Standard			Optional		
Internal EMC Filter[4]		Optional		None (External option only)			
Ambient (IP20)		0-40°C (32-104°F); derate 2% per °C to 50°C (122°F) maximum					
Ambient (NEMA 1)		None		0-35°C (32-95°F); derate 2% per °C to 50°C (122°F) maximum			None
Altitude	1000m (3280 ft.) ASL; derate 1% per 100m (328 ft.) above 1000m (3280 ft.) to 5000m (16400 ft.) max.						
Overload	150% for 30 seconds (heavy duty) 115% for 30 seconds (standard duty)						
Output Frequency	0-240 Hz						
Analog Inputs	One voltage (0 – 10 or 5 VDC) only (SPEED SETPOINT) ; 10 bit at 10ms One voltage (0 – 10 or 5 VDC) or current (4-20mA or 0-20mA) selectable (SPEED FEEDBACK); 10 bit at 10ms						
Analog Outputs	One 0-10 VDC at 10mA maximum (short circuit protected); 10 bit at 15Hz; Configurable for DEMAND / CURRENT / PID ERROR / RAISE-LOWER OUTPUT						
Digital Inputs	Three 24 VDC; 7.5mA at 24 VDC; 10ms; Configurable for START/STOP/DIRECTION/PRE-SET SPEEDS (8)						
Digital Input/Output	One selectable 24 VDC output at 50mA; 33 Ohm impedance or 24 VDC input 7.5mA; 10ms Digital output configurable for AT SPEED / AT ZERO SPEED / RUNNING / HEALTHY / TRIPPED						
Relay Output	One configurable for 250 VAC maximum, 4A resistive load maximum; 10ms						
Encoder Input	Single-ended input with minimum ON state of 4 VDC (24 VDC maximum); 10ms						
Thermistor Input	Isolated						
STANDARDS (SEE PRODUCT MANUAL FOR INSTALLATION REQUIREMENTS TO MEET REQUIRED STANDARDS)							
UL and cUL (Canada)	Listed component under UL508C (industrial control equipment)						
EMC Standards	EN50081-1 (1992) EN50082-1 (1997) EN61800-3 (1997) EN61000-6-2 (1999)	EN50081-1 (1992) EN50081-2 (1993) EN50082-1 (1997) EN61800-3 (1997) EN61000-6-2 (1999)		EN50081-1 (1992) EN50081-2 (1994) EN50082-1 (1998) EN50082-2 (1995) EN61800-3 (1997) EN61000-3-2			
CE	EN50178 (1998) and EMC standards (when used as stand-alone equipment) EN60204-1 and EMC standards (when used as part of other equipment)						
SOFTWARE AND COMMUNICATIONS							
Setup	Using keypad (5 pre-configured applications Speed / Auto-Manual / Preset / Raise-Lower / PID) or software (DSELite)						
Communication	P3 port standard allows RS-232 (EIBISYNCH) communications						
Techbox Options	Modbus (includes P3 port for remote mounted keypad)						
Other Features	Autotune, Slip Compensation						

[4] All drives meet the CE Drive Specific Standard, filter required only to meet Class A or B.

Objective

To Upload / Download a ConfigEd Lite configuration to or from your PC.

Equipment

A computer with ConfigEd Lite software installed and communications cable (CM351909).

Procedure

Upload a Configuration from the Drive into the computer

1. Launch ConfigEd Lite on the computer. Refer to ConfigEd Lite manual RG352747.
2. Connect the communications cable from the comm port on the computer to the P3 port on the drive.
   Note: In the CE Lite software verify the baud rate is 19200 under Command::Comms
3. Verify communications to the drive by going under COMMAND::GET INFO. After clicking on GET INFO The drive you are connected should be shown on the scratch pad.
   Note: If an error message appeared when you clicked on GET INFO, verify comm port and settings.
4. Under FILE::NEW, open the default configuration for the drive that appeared in the scratch pad. (Example: 65V Version 4.x (not running) - choose DEFAULT4.65V.)
5. Under the Command menu click on "update."
6. After the program has finished updating, Save the file.
   Note: Do not change the extension of the file.

Download a Configuration to the drive

1. Launch ConfigEd Lite on the computer. Refer to ConfigEd Lite manual RG352747.
2. Under FILE::OPEN, open the desired configuration to install.
   (Example: Winder1.65V)
   Note:In the CE Lite software verify the baud rate is 19200 under Command::Comms.
3. Under the Command menu click on "full install."

Note: ConfigEd Lite is no longer supported. Please update to DSE Lite, available as a free download on the website.

If you have questions, please call the Product Support Group at (704) 588-3246.

Objective

To configure the 650V drive for the Encoder feedback feature.

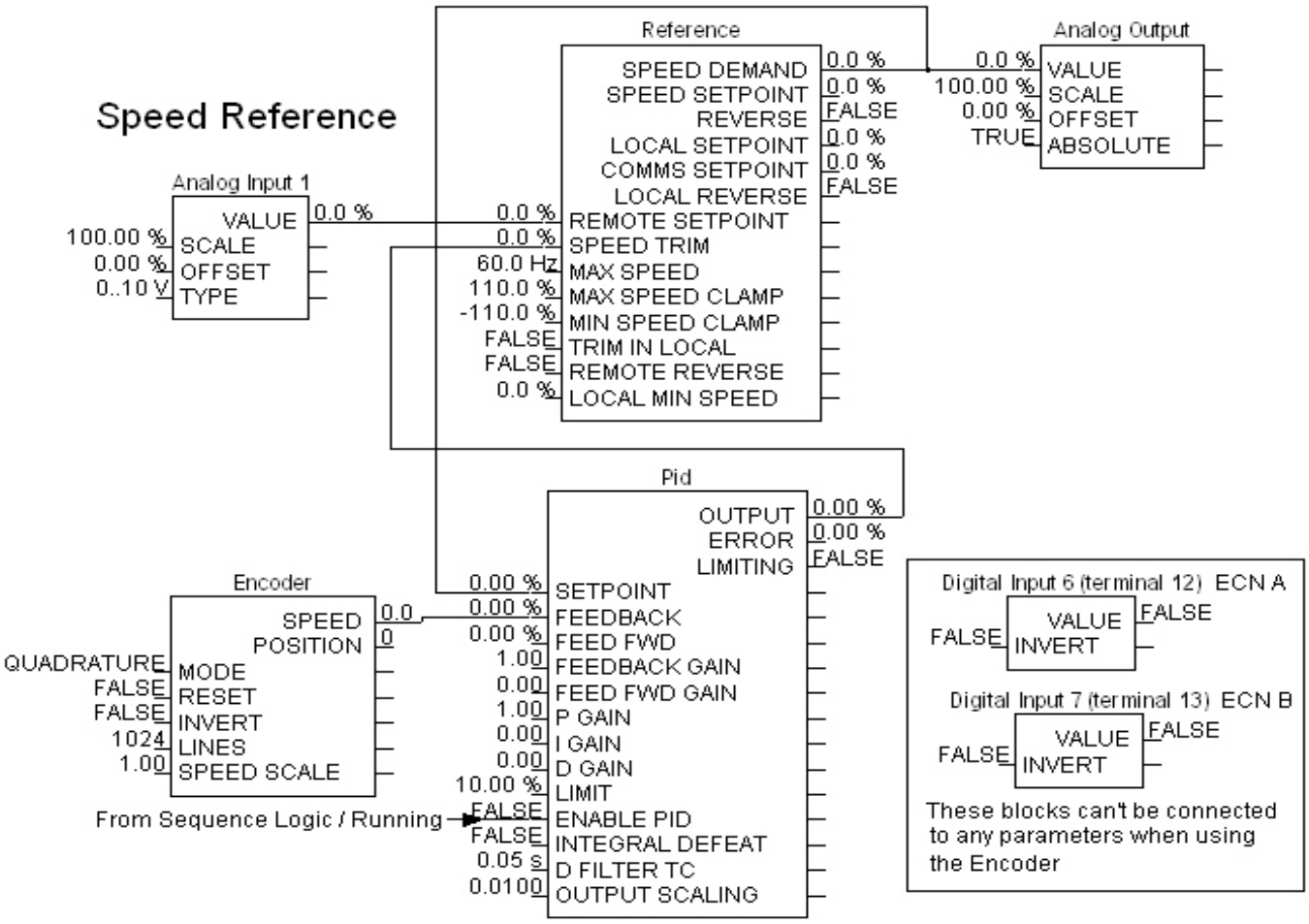
Equipment

650V AC drive, Encoder (Single Ended Quadrature) and the software DSELite.

Procedure

The 650V drive has an *Encoder* function block. The encoder block can be configured as a 'trim feedback' which will help improve the steady state speed regulation, when an encoder is mounted to the motor.

1. Connect a single ended encoder Channel A to terminal 12 (Digital Input 6 / ENC A) on the 650V drive and connect Channel B to terminal 13 (Digital Input 7 / ENC B) on the 650V drive. The drive does not have provisions for an encoder supply.
2. Using DSELite, open a 'default.65V' template and configure the drive as shown below.
3. Also if a connection is made to Digital Input 6 and to Digital Input 7 in the DSELite template, delete it. There should not be any connections made to these two blocks.
4. In the *Encoder* block, enter in the *Lines* of the encoder ppr.
5. Adjust the *PID* parameters for best performance.



If you have questions, please call the Product Support Group at (704) 588-3246.

Objective

Provide details to convert the wiring changes from the 584S, 584SV, and 605 to a 650V.

Equipment

650V drive, wiring diagram, drive product manuals, computer with DSELite installed.

Procedure

1. Launch DSELite on the computer.
2. Under **File::New**, open the default configuration of the drive you have, (example: default4.65V). Ensure that the name on the lower left corner matches the drive you are working on.
3. Configure the DSELite file to mask the previous drive application.
4. Reference the chart below for assistance to convert the wiring changes.

   Note: This document only provides information to convert the wiring changes from the previous drive to a 650V based on default templates.

If you have questions, please call the Product Support Group at (704) 588-3246.

Conversion Table for 584S, 584SV, 605, to 650V				
Terminal Description	584S Connection	584SV Connection	605 Connection	650V Connection
Analog Input (Speed)	1	1	2	2
Analog Input (Trim)	2	2	4	3
Analog Input (Current)	3	3	--	--
0V Reference	4	4	1	1
Analog Input (Torque Limit)	5	5	--	--
Thermistor	6, 10	6, 10	--	Th1A, Th1B
Analog Output (Ramp Output)	7	7	5	5
Analog Output (Load)	8	--	--	--
+10V Reference	9	9	3	4
0V Reference (Analog)	10	10	1	1
-10V Reference	11	11	--	--
Health Relay (Contacts)	12	12	12 (+24Vdc only)	RL1A
Health Relay (Contacts)	13	13	13	RL1B
Relay 1 (Contacts)	14	14	14 (+24Vdc only)	--
Relay 1 (Contacts)	15	15	13	--
Relay 2 (Contacts)	16	16	--	--
Relay 2 (Contacts)	17	17	--	--
+24Vdc Supply	18	18	18	6
0V Reference (Digital)	19	19	12	1
Digital Input (Run)	20	20	7	7
Digital Input	21	21	Configurable	Configurable
Digital Input (Direction)	22	22	9	8
Digital Input (External Trip)	18, 23	18, 23	6, 10	--
Digital Input (Jog)	24	24	11	9
Digital Input	25	Configurable	Configurable	Configurable
Digital Input	26	Configurable	16 Configurable **(ENCA)	12 Configurable **(ENCA)
Digital Input	27	Configurable	17 Configurable **(ENCB)	13 Configurable **(ENCB)

**(ENCA) Encoder Channel A

**(ENCB) Encoder Channel B

If you have questions, please call the Product Support Group at (704) 588-3246.

Objective

Provide details to configure the 650V for maximum speed with a zero value on the Analog Input.

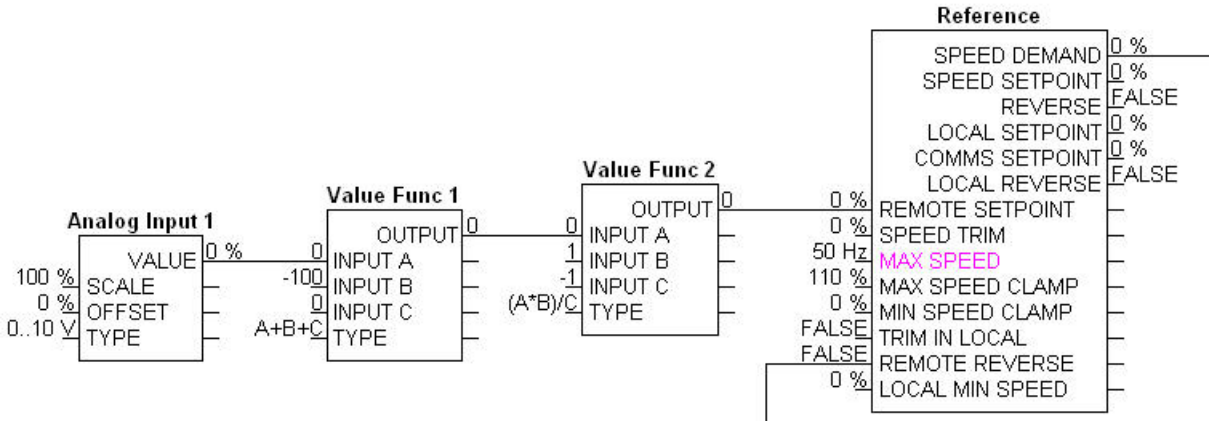
Equipment

650V drive, computer with DSELite installed.

Procedure

1. Launch DSELite on the computer.
2. Under **File::New**, open the default configuration of the drive you have, (example: default4.65V). Ensure that the name on the lower left corner matches the drive you are working on.
3. Using DSELite configure the template as shown below.
4. In the template, make sure the *App Config / Application* is set to display *Custom*.
5. Change the value of *Value Function 1/ Input B* to –100.00%
6. Change the *Value Function 1/Type to (A+B+C).*
7. Change the value of *Value Function 2 / Input B to 1.00.*
8. Change the value of *Value Function 2 / Input C to –1.00.*
9. Change the *Value Function 2/ Type to (A*B/C).*
10. Change the *Reference / Min Speed Clamp* to 0.00%.

Note: The values of Value Function 1::Input B, Value Function 2::Input B and C can be adjusted to provide opposite speed control.



If you have questions, please call the Product Support Group at (704) 588-3246.