

SMV Series Wiring Lab

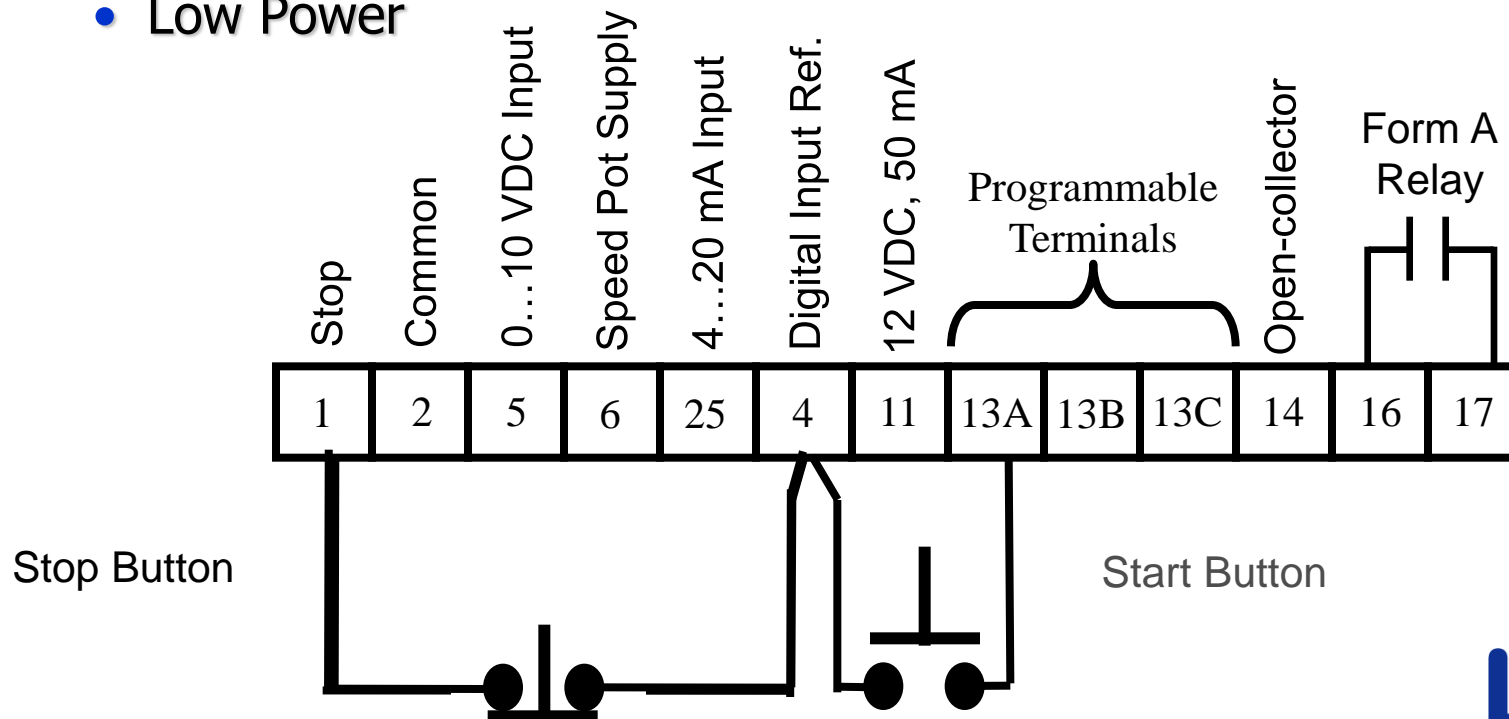
- **3-Wire Start / Stop**
- 2-Wire Start / Stop
- 2-Wire Start / Stop W Preset Speed
- 2-Wire Start / Stop W/ Speed Pot
- 2-Wire W/ Forward, Reverse & Pot
- 2-Wire W/ Forward, Reverse and Jog Fwd
- 3-Wire W/ MOP Speed Reference




3 Wire Start / Stop

➤ Three Wire Control

- Push-buttons wire directly to drive
- Low Power



Code		Possible Settings		IMPORTANT
No.	Name	Default	Selection	
P 100	Start Control Source	0	0 Local Keypad	Use RUN button on front of drive to start
			1 Terminal Strip	Use start/stop circuit wired into the terminal strip. See Section 3.2.3
			2 Remote Keypad Only	Use RUN button on optional Remote Keypad to start
			3 Network Only	<ul style="list-style-type: none">Start command must come from network (Modbus, CANopen, etc)
<div><h3><u>3 Wire Start/Stop</u></h3><p>We want to set the drive up to use external inputs to start and stop the motor.</p><p>To do this we need to set Parameter P100 – “Start Control Source” to</p><p>1 - “Use start/stop circuit wired into the terminal strip”.</p></div>				
			Keypad	between terminal strip and optional remote keypad using one of the TB-13 inputs. See note below.
<div>WARNING!<p>P100 = 0 disables TB-1 as a STOP input! STOP circuitry may be disabled if parameters are reset back to defaults (see P199)</p></div>				

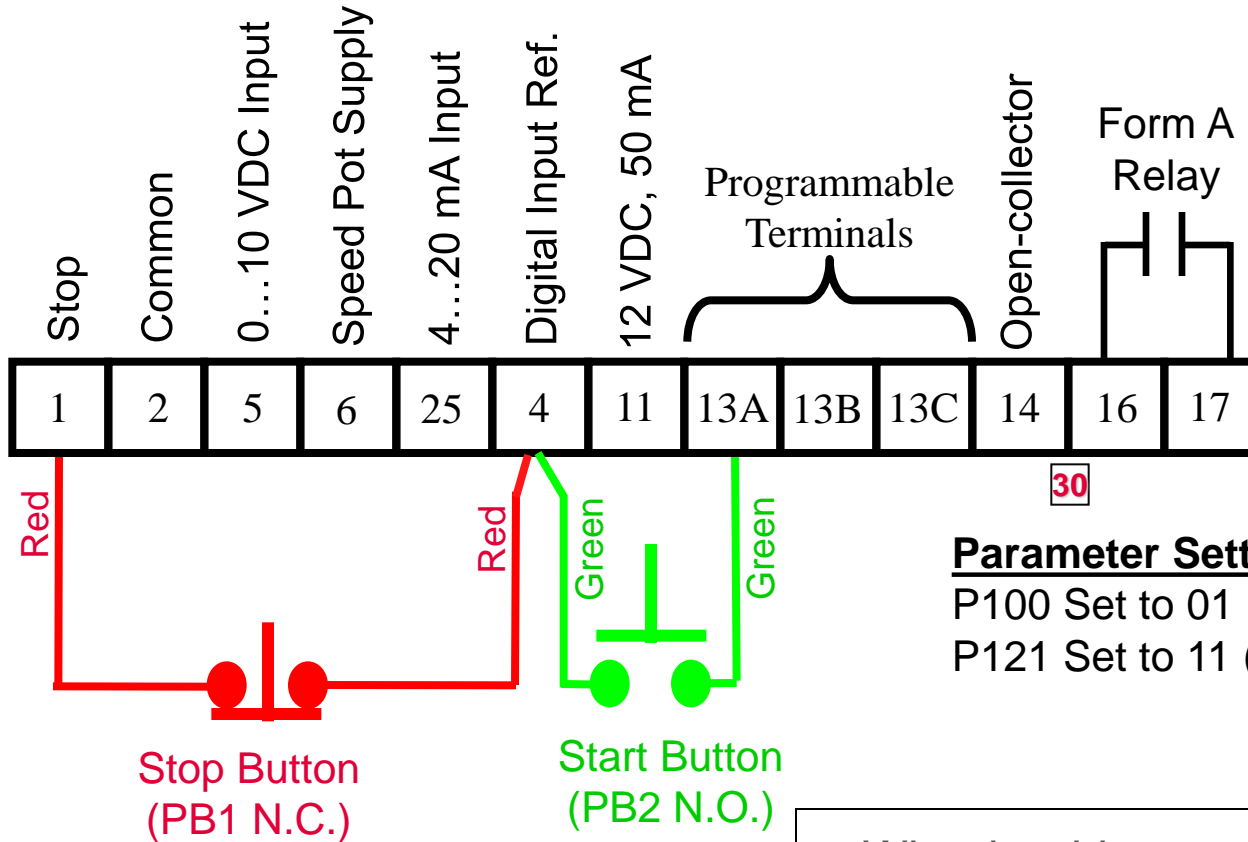
P 121	TB-13A Input Function	0	0 None	Disables input
P 122	TB-13B Input Function		1 AUTO Reference: 0-10 VDC	For frequency mode, see P160...P161, For PID mode, see P204...P205, For vector torque mode, see P330
P 123	TB-13C Input Function		2 AUTO Reference: 4-20 mA	
			3 AUTO Reference: Preset	For frequency mode see P131...P137, For PID mode, see P231...P233, For torque mode see, P331...P333
			4 AUTO Reference: MOP Up	• Normally open: Close input to increase or decrease speed, PID setpoint or torque setpoint.
			5 AUTO Reference: MOP Down	• MOP Up is not active while in STOP
			6 AUTO Reference: Keypad	
			7 AUTO Reference: Network	
			8 Control Select	Use when P100 = 4, 5 to switch between terminal strip control and local or remote keypad control.
			9 Network Enable	Required to start the drive through the network.
			10 Reverse Rotation	Open = Forward Closed = Reverse
			11 Start Forward	See note for typical circuit
			12 Start Reverse	
			13 Run Forward	See note for typical circuit
			14 Run Reverse	

3 Wire Start/Stop

We want to set the drive up to use the TB-13A Input as the start switch to start the motor in the forward direction.

To do this we need to set
Parameter P121 – “TB-13A Input Function”
to
11 – “Start Forward”

3 Wire Start/Stop



Parameter Settings:

P100 Set to 01 (terminal strip control)

P121 Set to 11 (terminal 13A as start forward)

Wire the drive up according to the drawing.
Use the **GREEN** PB2 button to Start the motor.
Use the **RED** PB1 button to Stop the motor.

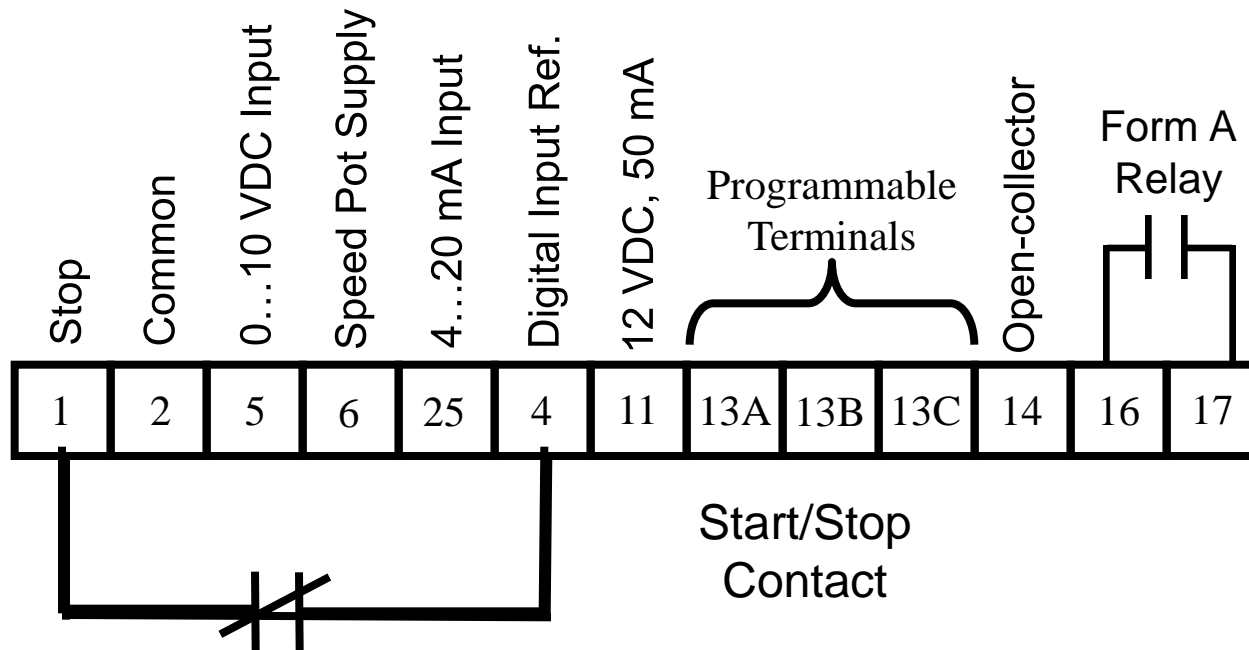
SMV Series Wiring Lab



- 3-Wire Start / Stop
- **2-Wire Start / Stop**
- 2-Wire Start / Stop W/ Preset Speed
- 2-Wire Start / Stop W/ Speed Pot
- 2-Wire W/ Forward, Reverse & Pot
- 2-Wire W/ Forward, Reverse and Jog Fwd
- 3-Wire W/ MOP Speed Reference



2 Wire Start / Stop

- Two-wire Control
 - Signal from start relay
 - Signal from PLC



Code		Possible Settings		IMPORTANT
No.	Name	Default	Selection	
P 100	Start Control Source	0	0 Local Keypad	Use RUN button on front of drive to start
			1 Terminal Strip	Use start/stop circuit wired into the terminal strip. See Section 3.2.3
			2 Remote Keypad Only	Use RUN button on optional Remote Keypad to start
			3 Network Only	<ul style="list-style-type: none"> Start command must come from network (Modbus, CANopen, etc)
				al communication the network module
				ne of the TB-13 work Enable); see
				l to be switched strip and local of the TB-13 inputs.
				l to be switched between terminal strip and optional remote keypad using one of the TB-13 inputs. See note below.
		 <div> <h2>2 Wire Start/Stop</h2> <p>We want to set the drive up to use external inputs to start and stop the motor.</p> <p>To do this we need to set Parameter P100 – “Start Control Source” to</p> <p>1 - “Use start/stop circuit wired into the terminal strip”.</p> </div>		
		 WARNING! P100 = 0 disables TB-1 as a STOP input! STOP circuitry may be disabled if parameters are reset back to defaults (see P199)		

P 121	TB-13A Input Function	0	0 None	Disables input
P 122	TB-13B Input Function		1 AUTO Reference: 0-10 VDC	For frequency mode, see P160...P161, For PID mode, see P204...P205, For vector torque mode, see P330
P 123	TB-13C Input Function		2 AUTO Reference: 4-20 mA	
			3 AUTO Reference: Preset	For frequency mode see P131...P137, For PID mode, see P231...P233, For torque mode see, P331...P333
			4 AUTO Reference: MOP Up	• Normally open: Close input to increase or decrease speed, PID setpoint or torque setpoint.
			5 AUTO Reference: MOP Down	• MOP Up is not active while in STOP
			6 AUTO Reference: Keypad	
			7 AUTO Reference: Network	
			8 Control Select	Use when P100 = 4, 5 to switch between terminal strip control and local or remote keypad control.
			9 Network Enable	Required to start the drive through the network.
			10 Reverse Rotation	Open = Forward Closed = Reverse
			11 Start Forward	See note for typical circuit
			12 Start Reverse	See note for typical circuit
			13 Run Forward	See note for typical circuit
			14 Run Reverse	See note for typical circuit

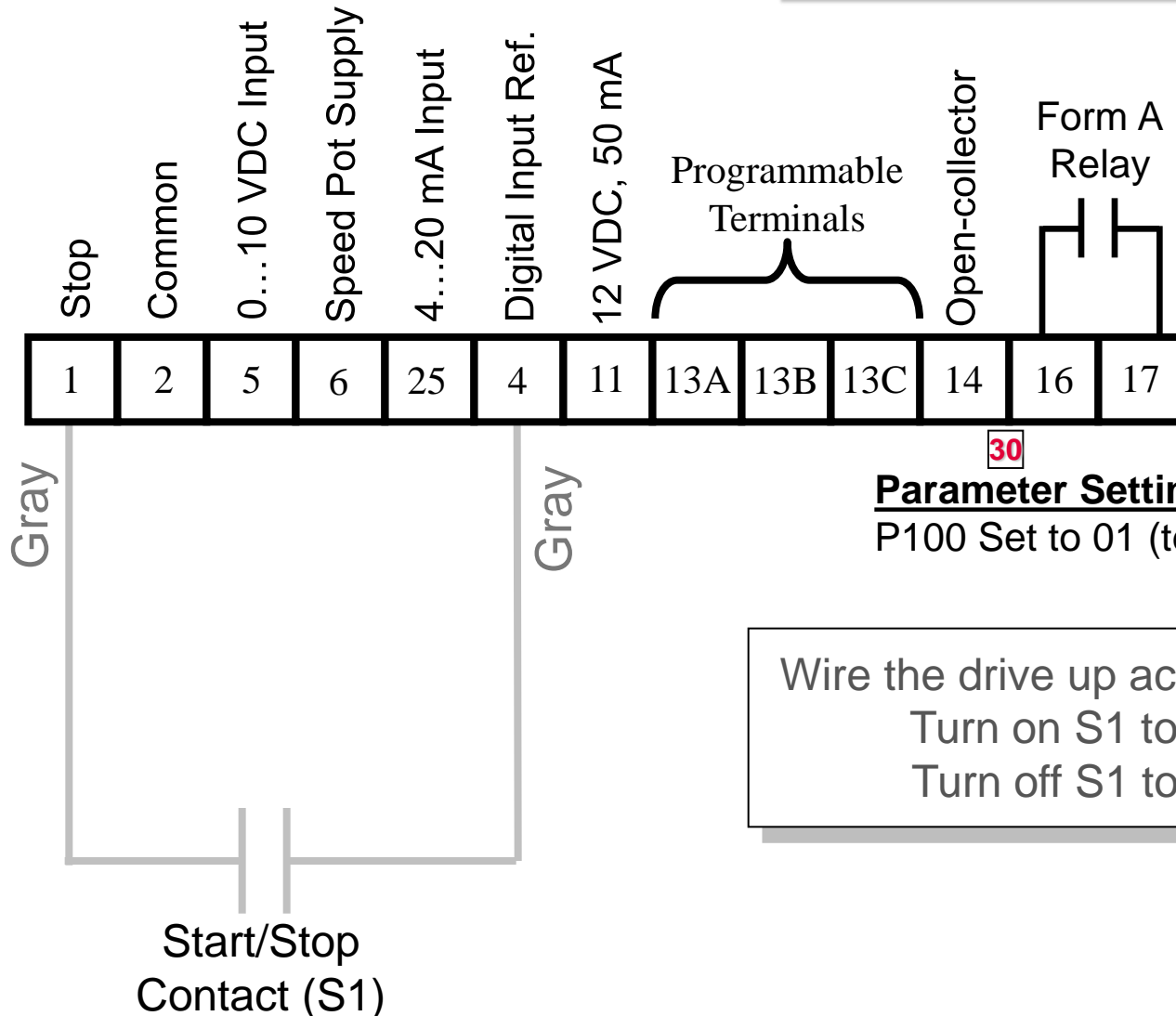
2 Wire Start/Stop

We want to reset the TB-13A Input Function to have no effect on the drive.

To do this we need to reset
Parameter P121 – “TB-13A Input Function”

Back to
0 – “Disables Input”

2 Wire Start/Stop Control



Parameter Settings:
P100 Set to 01 (terminal strip control)

Wire the drive up according to the drawing.
Turn on S1 to **Start** the motor.
Turn off S1 to **Stop** the motor.

SMV Series Wiring Lab

- 3-Wire Start / Stop
- 2-Wire Start / Stop
- **2-Wire Start / Stop W/ Preset Speed**
- 2-Wire Start / Stop W/ Speed Pot
- 2-Wire W/ Forward, Reverse & Pot
- 2-Wire W/ Forward, Reverse and Jog Fwd
- 3-Wire W/ MOP Speed Reference

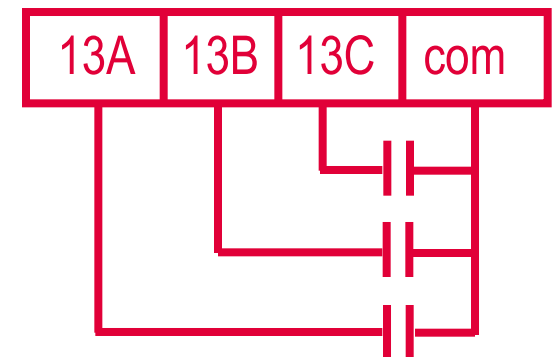




2 Wire Start/Stop W/Preset Speeds

Up to 8 preset speeds

- 1st preset speed is "Minimum speed setting"
- One input - 2 preset speeds
- Two inputs – 4 preset speeds
- Three inputs – 8 preset speeds

- Binary Counting
 - Speed 1 = 13A
 - Speed 2 = 13B
 - Speed 3 = 13C
 - Speed 4 = 13A & 13B
 - Speed 5 = 13A & 13C
 - Speed 6 = 13B & 13C
 - Speed 7 = 13A & 13B & 13C



Code		Possible Settings		IMPORTANT
No.	Name	Default	Selection	
P 100	Start Control Source	0	0 Local Keypad	Use RUN button on front of drive to start
			1 Terminal Strip	Use start/stop circuit wired into the terminal strip. See Section 3.2.3
			2 Remote Keypad Only	Use RUN button on optional Remote Keypad to start
			3 Network Only	<ul style="list-style-type: none">Start command must come from network (Modbus, CANopen, etc)
<div><div><h2><u>2 Wire Start/Stop w/Preset Speed</u></h2><p>We want to set the drive up to use external inputs to start and stop the motor.</p><p>To do this we need to set Parameter P100 – “Start Control Source” to</p><p>1 - “Use start/stop circuit wired into the terminal strip”.</p></div></div>				
<div><p>WARNING! P100 = 0 disables TB-1 as a STOP input! STOP circuitry may be disabled if parameters are reset back to defaults (see P199)</p></div>				

P 121	TB-13A Input Function	0	0 None	Disables input
			1 AUTO Reference: 0-10 VDC	For frequency mode, see P160...P161,
			2 AUTO Reference: 4-20 mA	For PID mode, see P204...P205,
			3 AUTO Reference: Preset	For frequency mode see P131...P137,
				For PID mode, see P231...P233,
				For torque mode see, P331...P333
			4 AUTO Reference: MOP Up	• Normally open: Close input to increase or decrease speed, PID setpoint or torque setpoint.
			5 AUTO Reference: MOP Down	• MOP Up is not active while in STOP
			6 AUTO Reference: Keypad	
			7 AUTO Reference: Network	
			8 Control Select	Use when P100 = 4, 5 to switch between terminal strip control and local or remote keypad control.
			9 Network Enable	Required to start the drive through the network.

2 Wire Start/Stop w/Preset Speed

We want to set the drive up to use the TB-13A as a preset speed selector switch.

To do this we need to set
Parameter P121 – “TB-13A Input Function”
to
3 – “AUTO Reference: Preset”

			20 Clear Fault	even if P111 is set to Coast (0 or 1). Close to reset fault
			21 External Fault F.EF	Normally closed circuit; open to trip
			22 Inverse External Fault F.EF	Normally open circuit; close to trip

P 121	TB-13A Input Function	0	0 None	Disables input
			1 AUTO Reference: 0-10 VDC	For frequency mode, see P160...P161,
			2 AUTO Reference: 4-20 mA	For PID mode, see P204...P205,
				For vector torque mode, see P330
P 122	TB-13B Input Function		3 AUTO Reference: Preset	For frequency mode see P131...P137,
				For PID mode, see P231...P233,
				For torque mode see, P331...P333
			4 AUTO Reference: MOP Up	• Normally open: Close input to increase or decrease speed, PID setpoint or torque setpoint.
			5 AUTO Reference: MOP Down	• MOP Up is not active while in STOP
			6 AUTO Reference: Keypad	
			7 AUTO Reference: Network	
			8 Control Select	Use when P100 = 4, 5 to switch between terminal strip control and local or remote keypad control.
			9 Network Enable	Required to start the drive through the network.

2 Wire Start/Stop w/Preset Speed

We want to set the drive up to use the TB-13B as the second preset speed selector switch.

To do this we need to set
Parameter P122 – “TB-13B Input Function”
to
3 – “AUTO Reference: Preset”

				even if P111 is set to Coast (0 or 1).
			20 Clear Fault	Close to reset fault
			21 External Fault F.EF	Normally closed circuit; open to trip
			22 Inverse External Fault F.EF	Normally open circuit; close to trip

Run / Stop
with Direction
P121 = 10

1	4	13A
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Start Forward /
Start Reverse
P121 = 11, P122 = 12

1	4	13A	13B
---	---	-----	-----

Run Forward /
Run Reverse
P121 = 13, P122 = 14

1	4	13A	13B
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2 Wire Start/Stop w/Preset Speed

Set the appropriate parameters to get all of your preset speeds.

How many preset speeds do we have?

	Time 2				
P 127	Deceleration Time for Auxiliary Ramp to Stop	0.0	0.0	{s}	3600
P 131	Preset Speed #1	0.0	0.0	{Hz}	500
P 132	Preset Speed #2	0.0	0.0	{Hz}	500
P 133	Preset Speed #3	0.0	0.0	{Hz}	500
P 134	Preset Speed #4	0.0	0.0	{Hz}	500
P 135	Preset Speed #5	0.0	0.0	{Hz}	500
P 136	Preset Speed #6	0.0	0.0	{Hz}	500
P 137	Preset Speed #7	0.0	0.0	{Hz}	500

- For S-ramp accel/decel, adjust P106
- Selected using TB-13A...TB-13C (P121...P123 = 19).
- For S-ramp accel/decel, adjust P106
- Once executed, this ramp time has priority over P105 and P126.

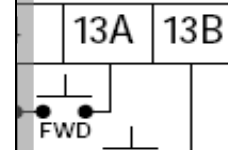
PRESET SPEED	13A	13B	13C
1	X	--	--
2	--	X	--
3	--	--	X
4	X	X	--
5	X	--	X
6	--	X	X
7	X	X	X

2 Wire Start/Stop w/Preset Speed

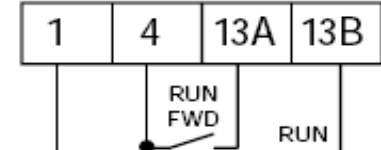
We want to set up the Preset Speed when input TB-13A is made

To do this we need to set Parameter P131 – “Preset Speed #1” to 60 – “Sets speed to 60 Hz”

Forward /
Reverse
P11, P122 = 12



Run Forward /
Run Reverse
P121 = 13, P122 = 14



Note

The table below shows which preset speed is selected when the various inputs are made.

P	Time 2				
P 127	Deceleration Time for Auxiliary Ramp to Stop	0.0	0.0	{s}	3600
P 131	Preset Speed #1	60	0.0	{Hz}	500
P 132	Preset Speed #2	0.0	0.0	{Hz}	500
P 133	Preset Speed #3	0.0	0.0	{Hz}	500
P 134	Preset Speed #4	0.0	0.0	{Hz}	500
P 135	Preset Speed #5	0.0	0.0	{Hz}	500
P 136	Preset Speed #6	0.0	0.0	{Hz}	500
P 137	Preset Speed #7	0.0	0.0	{Hz}	500

- Selected using TB-13A...TB-13C (P121...P123 = 9).
- For S-ramp accel/decel, adjust P106
- Once executed, this ramp time has priority over P105 and P126.

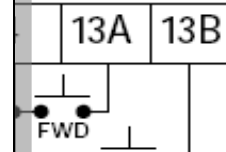
PRESET SPEED	13A	13B	13C
1	X	--	--
2	--	X	--
3	--	--	X
4	X	X	--
5	X	--	X
6	--	X	X
7	X	X	X

2 Wire Start/Stop w/Preset Speed

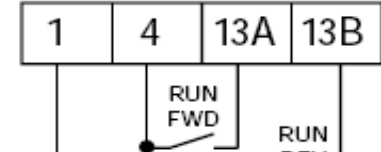
We want to set up the Preset Speed when input TB-13B is made

To do this we need to set Parameter P132 – “Preset Speed #2” to 10 – “Sets speed to 10 Hz”

Forward /
Reverse
P11, P122 = 12



Run Forward /
Run Reverse
P121 = 13, P122 = 14



Note

The table below shows which preset speed is selected when the various inputs are made.

	Time 2				
P 127	Deceleration Time for Auxiliary Ramp to Stop	0.0	0.0	{s}	3600
P 131	Preset Speed #1	60	0.0	{Hz}	500
P 132	Preset Speed #2	10	0.0	{Hz}	500
P 133	Preset Speed #3	0.0	0.0	{Hz}	500
P 134	Preset Speed #4	0.0	0.0	{Hz}	500
P 135	Preset Speed #5	0.0	0.0	{Hz}	500
P 136	Preset Speed #6	0.0	0.0	{Hz}	500
P 137	Preset Speed #7	0.0	0.0	{Hz}	500

- Selected using TB-13A...TB-13C (P121...P123 = 9).
- For S-ramp accel/decel, adjust P106
 - Once executed, this ramp time has priority over P105 and P126.

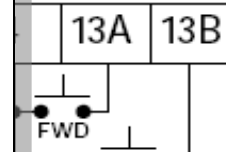
PRESET SPEED	13A	13B	13C
1	X	--	--
2	--	X	--
3	--	--	X
4	X	X	--
5	X	--	X
6	--	X	X
7	X	X	X

2 Wire Start/Stop w/Preset Speed

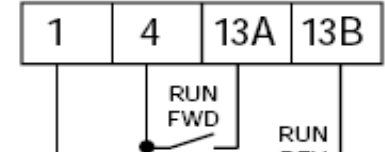
We want to set up the Preset Speed when input TB-13A and TB-13B are made

To do this we need to set Parameter P134 – “Preset Speed #4” to 30 – “Sets speed to 30 Hz”

Forward /
Reverse
P11, P122 = 12



Run Forward /
Run Reverse
P121 = 13, P122 = 14



Note

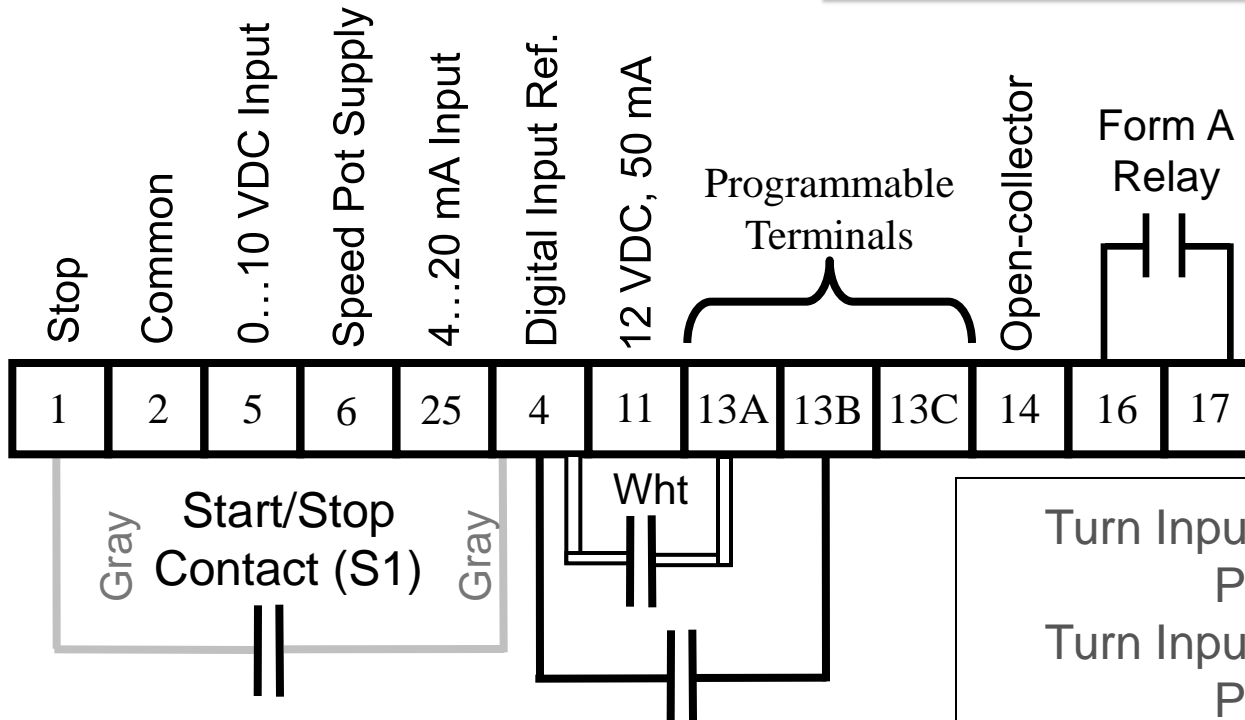
The table below shows which preset speed is selected when the various inputs are made.

P	Time 2				
P 127	Deceleration Time for Auxiliary Ramp to Stop	0.0	0.0	{s}	3600
P 131	Preset Speed #1	60	0.0	{Hz}	500
P 132	Preset Speed #2	10	0.0	{Hz}	500
P 133	Preset Speed #3	0.0	0.0	{Hz}	500
P 134	Preset Speed #4	30	0.0	{Hz}	500
P 135	Preset Speed #5	0.0	0.0	{Hz}	500
P 136	Preset Speed #6	0.0	0.0	{Hz}	500
P 137	Preset Speed #7	0.0	0.0	{Hz}	500

- Selected using TB-13A...TB-13C (P121...P123 = 9).
- For S-ramp accel/decel, adjust P106
- Once executed, this ramp time has priority over P105 and P126.

PRESET SPEED	13A	13B	13C
1	X	--	--
2	--	X	--
3	--	--	X
4	X	X	--
5	X	--	X
6	--	X	X
7	X	X	X

2 Wire Start/Stop Control



Turn Input 13A on and 13B off for Preset speed "1".
Turn Input 13A off and 13B on for Preset speed "2".

Wire the drive up according to the drawing.
Turn on S1 to **Start** the motor.
Turn off S1 to **Stop** the motor.



Parameter Settings:

P100 Set to 01 (terminal strip control)
P121 Set to 03 (auto ref preset speed)
P122 Set to 03 (auto ref preset speed)
P131 Set to 60(auto preset speed "1")
P132 Set to 10 (auto preset speed "2")

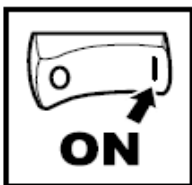
SMV Series Wiring Lab

- 3-Wire Start / Stop
- 2-Wire Start / Stop
- 2-Wire Start / Stop W/ Preset Speed
- **2-Wire Start / Stop W/ Speed Pot**
- 2-Wire W/ Forward, Reverse & Pot
- 2-Wire W/ Forward, Reverse and Jog Fwd
- 3-Wire W/ MOP Speed Reference



Code		Possible Settings		IMPORTANT
No.	Name	Default	Selection	
P 100	Start Control Source	0	0 Local Keypad	Use RUN button on front of drive to start
			1 Terminal Strip	Use start/stop circuit wired into the terminal strip. See Section 3.2.3
			2 Remote Keypad Only	Use RUN button on optional Remote Keypad to start
			3 Network Only	<ul style="list-style-type: none">Start command must come from network (Modbus, CANopen, etc)
<div><div><h2><u>2 Wire Start/Stop w/Speed Pot</u></h2><p>We want to set the drive up to use external inputs to start and stop the motor.</p><p>To do this we need to set Parameter P100 – “Start Control Source” to</p><p>1 - “Use start/stop circuit wired into the terminal strip”.</p></div></div>				
		Keypad	between terminal strip and optional remote keypad using one of the TB-13 inputs. See note below.	
		<div>WARNING! P100 = 0 disables TB-1 as a STOP input! STOP circuitry may be disabled if parameters are reset back to defaults (see P199)</div>		


P 101	Standard Reference Source	0	0 Keypad (Local or Remote)	Selects the default speed or torque reference when no Auto Reference is selected using the TB-13 inputs
			1 0-10 VDC	
			2 4-20 mA	
			3 Preset #1	
			4 Preset #2	
			5 Preset #3	
			6 Network	



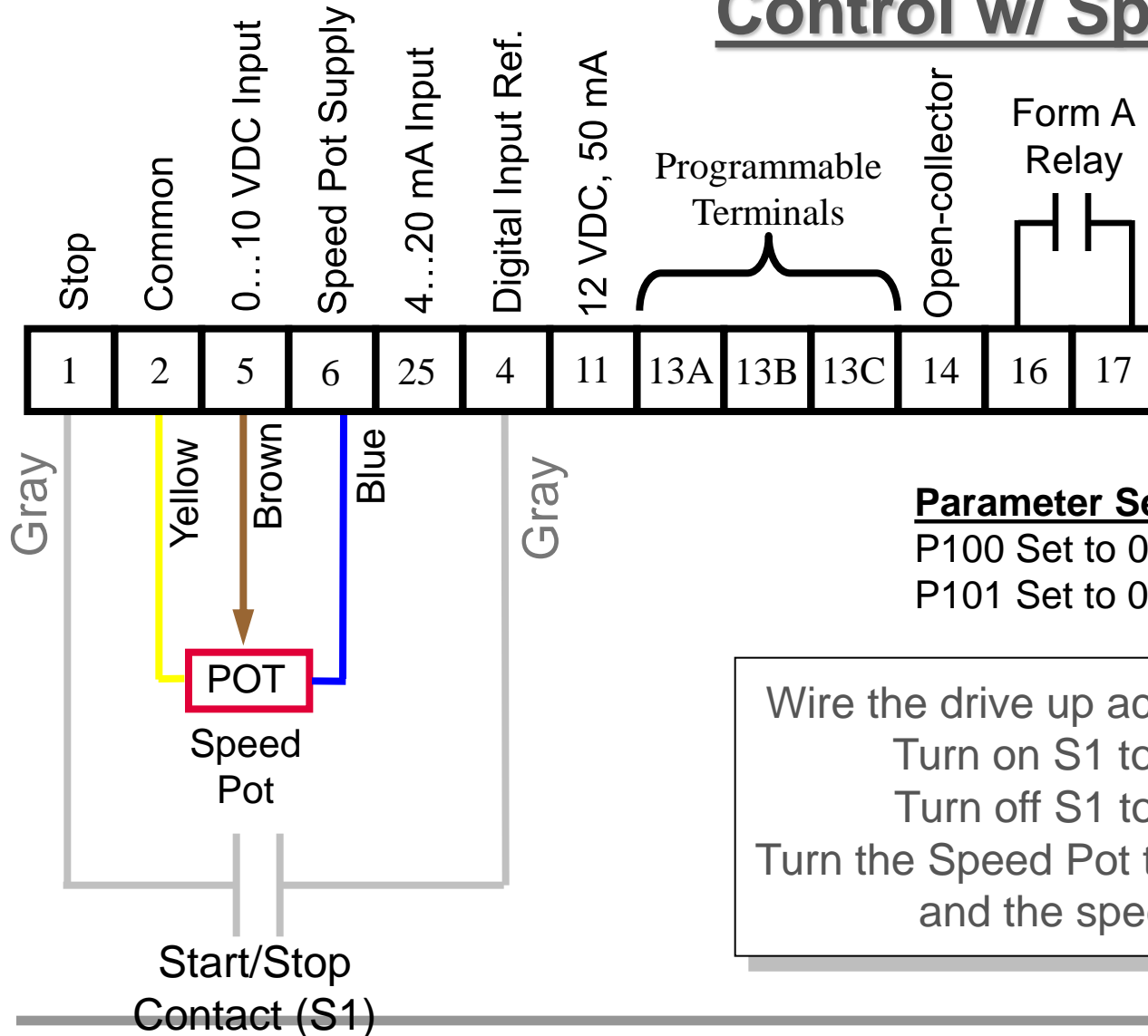
2 Wire Start/Stop w/Speed Pot

We want to reset the input reference source to the drive to be 0 – 10 VDC.

To do this we need to set
Parameter P101 – “Standard Reference Source”
to
1 – “0 – 10 VDC”

Code		1 – “0 – 10 VDC”				
No.	Name					
P 102	Minimum Frequency	0.0	0.0	{Hz}	P103	<ul style="list-style-type: none">• P102, P103 are active for all speed references• When using an analog speed reference, also see P160, P161
P 103	Maximum Frequency	60.0	7.5	{Hz}	500	
		<div>Note<ul style="list-style-type: none">• P103 cannot be set below Minimum Frequency (P102)• To set P103 above 120 Hz:<ul style="list-style-type: none">- Scroll up to 120 Hz: display shows H₁Fr (flashing).</div>				

2 Wire Start/Stop Control w/ Speed Pot



Parameter Settings:

P100 Set to 01 (terminal strip control)



P101 Set to 01 (0-10 VDC speed reference)

Wire the drive up according to the drawing.
Turn on S1 to **Start** the motor.
Turn off S1 to **Stop** the motor.
Turn the Speed Pot to change analog signal
and the speed of the motor

SMV Series Wiring Lab

- 3-Wire Start / Stop
- 2-Wire Start / Stop
- 2-Wire Start / Stop W/ Preset Speed
- 2-Wire Start / Stop W/ Speed Pot
- **2-Wire W/ Forward, Reverse & Pot**
- 2-Wire W/ Forward, Reverse and Jog Fwd
- 3-Wire W/ MOP Speed Reference



Code		Possible Settings		IMPORTANT
No.	Name	Default	Selection	
P 100	Start Control Source	0	0 Local Keypad	Use RUN button on front of drive to start
			1 Terminal Strip	Use start/stop circuit wired into the terminal strip. See Section 3.2.3
			2 Remote Keypad Only	Use RUN button on optional Remote Keypad to start
			3 Network Only	• Start command must come from network (Modbus, CANopen, etc)
				al communication the network module
<div><div><h2><u>2 Wire w/ Forward & Reverse</u></h2><p>We want to set the drive up to use external inputs to start and stop the motor.</p><p>To do this we need to set Parameter P100 – “Start Control Source” to</p><p>1 - “Use start/stop circuit wired into the terminal strip”.</p></div></div>				ne of the TB-13 work Enable); see
				l to be switched strip and local of the TB-13 inputs.
				l to be switched between terminal strip and optional remote keypad using one of the TB-13 inputs. See note below.
		<div>WARNING!<p>P100 = 0 disables TB-1 as a STOP input! STOP circuitry may be disabled if parameters are reset back to defaults (see P199)</p></div>		



P 101	Standard Reference Source	0	0 Keypad (Local or Remote)	Selects the default speed or torque reference when no Auto Reference is selected using the TB-13 inputs
			1 0-10 VDC	
			2 4-20 mA	
			3 Preset #1	
			4 Preset #2	
			5 Preset #3	
			6 Network	

2 Wire w/ Forward & Reverse

We want to reset the input reference source to the drive to be 0 – 10 VDC.

To do this we need to set

Parameter P101 – “Standard Reference Source”
to
1 – “0 – 10 VDC”



Code					
No.	Name				
P 102	Minimum Frequency	0.0	0.0	{Hz}	P 102, P 103 are active for all speed references
P 103	Maximum Frequency	60.0	7.5	{Hz}	500

Note

- P103 cannot be set below Minimum Frequency (P102)
- To set P103 above 120 Hz:
- Scroll up to 120 Hz; display shows H iFr (flashing).

P111	Stop Method	0	0	Coast	Drive's output will shut off immediately upon a stop command, allowing the motor to coast to a stop
			1	Coast with DC Brake	The drive's output will shut off and then the DC Brake will activate (see P174, P175)
			2	Ramp	The drive will ramp the motor to a stop according to P105 or P126.
			3	Ramp with DC Brake	The drive will ramp the motor to 0 Hz and then the DC Brake will activate (see P174, P175)
P112	Rotation	0	0	Forward Only	If PID mode is enabled, reverse direction is disabled (except for Jog).
			1	Forward and Reverse	

2 Wire w/ Forward & Reverse

We want to enable the Forward and Reverse Rotation Parameter.

To do this we need to set
Parameter P112 – “Rotation”
to

1 – “Forward and Reverse”

IMPORTANT



4.5.

Code

No.

P120	Assertion Level	2	1 Low	P120 and the Assertion Level switch
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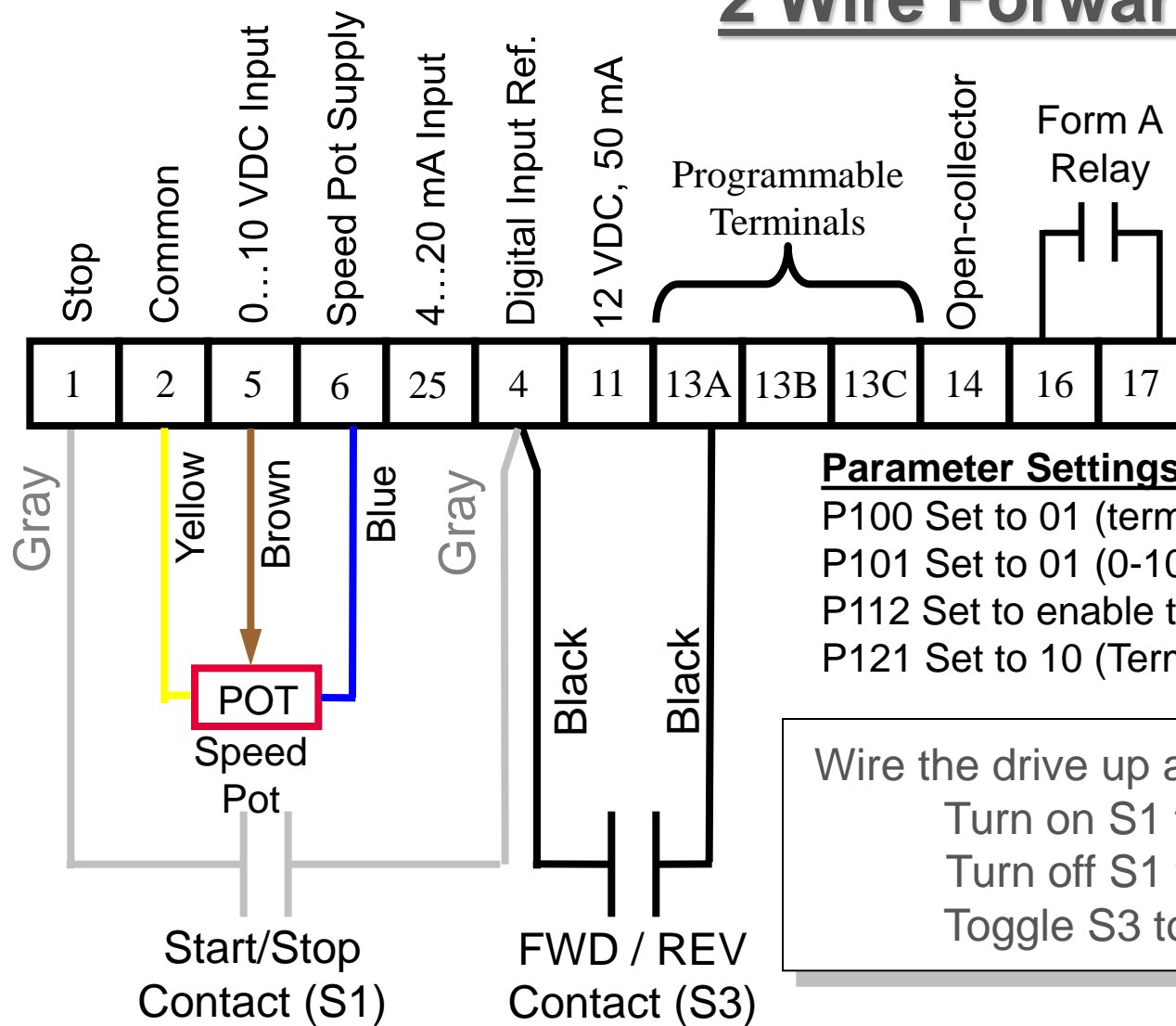
P 121	TB-13A Input Function	0	0 None	Disables input
P 122	TB-13B Input Function		1 AUTO Reference: 0-10 VDC	For frequency mode, see P160...P161, For PID mode, see P204...P205, For vector torque mode, see P330
P 123	TB-13C Input Function		2 AUTO Reference: 4-20 mA	
			3 AUTO Reference: Preset	For frequency mode see P131...P137, For PID mode, see P231...P233, For torque mode see, P331...P333
			4 AUTO Reference: MOP Up	• Normally open: Close input to increase or decrease speed, PID setpoint or torque setpoint.
			5 AUTO Reference: MOP Down	• MOP Up is not active while in STOP
			6 AUTO Reference: Keypad	
			7 AUTO Reference: Network	
			8 Control Select	Use when P100 = 4, 5 to switch between terminal strip control and local or remote keypad control.
			9 Network Enable	Required to start the drive through the network
			10 Reverse Rotation	Open = Forward Closed = Reverse
			11 Start Forward	
			12 Start Reverse	See note for typical circuit
			13 Run Forward	
			14 Run Reverse	See note for typical circuit

2 Wire w/ Forward & Reverse

We want to set the drive up to use the TB-13A Input as a toggle switch to change the direction of the motor.

To do this we need to set
Parameter P121 – “TB-13A Input Function”
to
10 – “Reverse Rotation”

2 Wire Forward / Reverse



Parameter Settings:

P100 Set to 01 (terminal strip control)
 P101 Set to 01 (0-10 VDC speed reference)
 P112 Set to enable the FWD / REV parameter
 P121 Set to 10 (Term 13A FWD / REV selection)

Wire the drive up according to the drawing.
 Turn on S1 to **Start** the motor.
 Turn off S1 to **Stop** the motor.
 Toggle S3 to change direction



SMV Series Wiring Lab

- 3-Wire Start / Stop
- 2-Wire Start / Stop
- 2-Wire Start / Stop W/ Preset Speed
- 2-Wire Start / Stop W/ Speed Pot
- 2-Wire W/ Forward, Reverse & Pot
- **2-Wire W/ Forward, Reverse and Jog Fwd**
- 3-Wire W/ MOP Speed Reference



Jog

- Typically used for machine set up
 - Push-button
 - Starts when pushed
 - Stops when released
 - Set to run at low speed
- Drive's stop circuit is disabled.
Motor should be at stop when jogging
- Runs at preset speed #2

Code		Possible Settings		IMPORTANT
No.	Name	Default	Selection	
P 100	Start Control Source	0	0 Local Keypad	Use RUN button on front of drive to start
			1 Terminal Strip	Use start/stop circuit wired into the terminal strip. See Section 3.2.3
			2 Remote Keypad Only	Use RUN button on optional Remote Keypad to start
			3 Network Only	• Start command must come from network (Modbus, CANopen, etc)
				al communication the network module
<div></div>				ne of the TB-13 work Enable); see
<div><h2><u>2 Wire w/ Forward & Reverse</u></h2><p>We want to set the drive up to use external inputs to start and stop the motor.</p><p>To do this we need to set Parameter P100 – “Start Control Source” to</p><p>1 - “Use start/stop circuit wired into the terminal strip”.</p></div>				l to be switched strip and local of the TB-13 inputs.
				l to be switched between terminal strip and optional remote keypad using one of the TB-13 inputs. See note below.
<div>WARNING!<p>P100 = 0 disables TB-1 as a STOP input! STOP circuitry may be disabled if parameters are reset back to defaults (see P199)</p></div>				



P 101	Standard Reference Source	0	0 Keypad (Local or Remote)	Selects the default speed or torque reference when no Auto Reference is selected using the TB-13 inputs
			1 0-10 VDC	
			2 4-20 mA	
			3 Preset #1	
			4 Preset #2	
			5 Preset #3	
			6 Network	



2 Wire w/ FWD & REV and Jog

We want to reset the input reference source to the drive to be 0 – 10 VDC.

To do this we need to set
Parameter P101 – “Standard Reference Source”
to
1 – “0 – 10 VDC”

Code					
No.	Name				
P 102	Minimum Frequency				
P 103	Maximum Frequency	60.0	7.5	{Hz}	500
		<p>Note</p> <ul style="list-style-type: none"> • P103 cannot be set below Minimum Frequency (P102) • To set P103 above 120 Hz: - Scroll up to 120 Hz; display shows H iFr (flashing). 			

- When using an analog speed reference, also see P160, P161

P111	Stop Method	0	0	Coast	Drive's output will shut off immediately upon a stop command, allowing the motor to coast to a stop
			1	Coast with DC Brake	The drive's output will shut off and then the DC Brake will activate (see P174, P175)
			2	Ramp	The drive will ramp the motor to a stop according to P105 or P126.
			3	Ramp with DC Brake	The drive will ramp the motor to 0 Hz and then the DC Brake will activate (see P174, P175)
P112	Rotation	0	0	Forward Only	If PID mode is enabled, reverse direction is disabled (except for Jog).
			1	Forward and Reverse	



2 Wire w/ FWD & REV and Jog

We want to enable the Forward and Reverse Rotation Parameter.

To do this we need to set
Parameter P112 – “Rotation”
to

1 – “Forward and Reverse”

IMPORTANT

4.5.

Cod

No.

P120	Assertion Level	2	1 Low	P120 and the Assertion Level switch
------	-----------------	---	-------	-------------------------------------

P 121	TB-13A Input Function	0	0 None	Disables input
P 122	TB-13B Input Function		1 AUTO Reference: 0-10 VDC	For frequency mode, see P160...P161, For PID mode, see P204...P205, For vector torque mode, see P330
P 123	TB-13C Input Function		2 AUTO Reference: 4-20 mA	
			3 AUTO Reference: Preset	For frequency mode see P131...P137, For PID mode, see P231...P233, For torque mode see, P331...P333
			4 AUTO Reference: MOP Up	• Normally open: Close input to increase or decrease speed, PID setpoint or torque setpoint.
			5 AUTO Reference: MOP Down	• MOP Up is not active while in STOP
			6 AUTO Reference: Keypad	
			7 AUTO Reference: Network	
			8 Control Select	Use when P100 = 4, 5 to switch between terminal strip control and local or remote keypad control.
			9 Network Enable	Required to start the drive through the network
			10 Reverse Rotation	Open = Forward Closed = Reverse
			11 Start Forward	
			12 Start Reverse	See note for typical circuit
			13 Run Forward	
			14 Run Reverse	See note for typical circuit

2 Wire w/FWD & REV and Jog

We want to set the drive up to use the TB-13A Input as a toggle switch to change the direction of the motor.

To do this we need to set
Parameter P121 – “TB-13A Input Function”
to
10 – “Reverse Rotation”

P 121	TB-13A Input Function	0	0 None	Disables input
P 122	TB-13B Input Function			
P 123	TB-13C Input Function			

9	Network Enable	Required to start the drive through the network.
10	Reverse Rotation	Open = Forward Closed = Reverse
11	Start Forward	See note for typical circuit
12	Start Reverse	See note for typical circuit
13	Run Forward	See note for typical circuit
14	Run Reverse	See note for typical circuit
15	Jog Forward	Jog Forward speed = P134
16	Jog Reverse	Jog Reverse speed = P135 ⚠ Active even if P112 = 0
17	Accel/Decel #2	See P125, P126
18	DC Brake	See P174; close input to override P175
19	Auxiliary Ramp to Stop	Normally closed: Opening input will ramp drive to STOP according to P127, if P127 = 1 to Coast (0 or 1).

2 Wire w/ FWD & REV and Jog

We want to set the drive up to use the TB-13B Input as the Jog Forward switch.

To do this we need to set
Parameter P122 – “TB-13B Input Function”
to
15 – “Jog Forward”

Note

Parameter P134 is used to set the Jog Forward speed

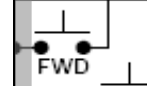
2 Wire w/ FWD & REV and Jog

We want to set up the Jog Speed when input TB-13B is made

To do this we need to set
Parameter P134 – “Preset Speed #4”
to
10 – “Sets speed to 10 Hz”

Forward /
Reverse
P11, P122 = 12

13A 13B



Run Forward /
Run Reverse

P121 = 13, P122 = 14

1 4 13A 13B



Note

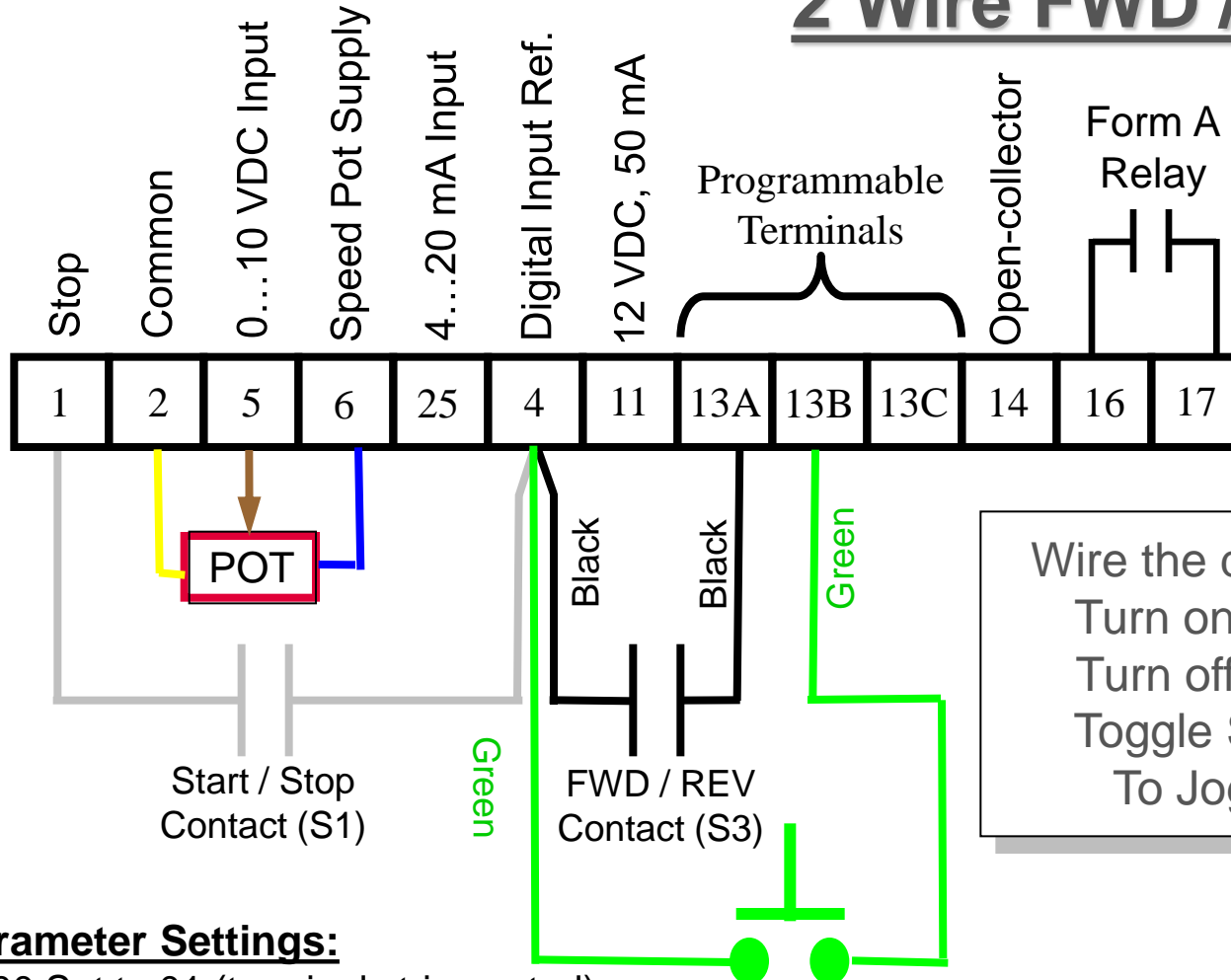
Because Parameter P134 is the default Jog Forward speed the table below is not applicable

P 125	Deceleration Time 2	20.0	0.0	{s}	36
P 127	Deceleration Time for Auxiliary Ramp to Stop	20.0	0.0	{s}	3600
P 131	Preset Speed #1	0.0	0.0	{Hz}	500
P 132	Preset Speed #2	0.0	0.0	{Hz}	500
P 133	Preset Speed #3	0.0	0.0	{Hz}	500
P 134	Preset Speed #4	10	0.0	{Hz}	500
P 135	Preset Speed #5	0.0	0.0	{Hz}	500
P 136	Preset Speed #6	0.0	0.0	{Hz}	500
P 137	Preset Speed #7	0.0	0.0	{Hz}	500

- Selected using TB-13A...TB-13C (P121...P123 = 9).
- For S-ramp accel/decel, adjust P106
 - Once executed, this ramp time has priority over P105 and P126.

PRESET SPEED	13A	13B	13C
1	X	--	--
2	--	X	--
3	--	--	X
4	X	X	--
5	X	--	X
6	--	X	X
7	X	X	X

2 Wire FWD / REV & Jog



Wire the drive up per the drawing.
Turn on S1 to **Start** the motor.
Turn off S1 to **Stop** the motor.
Toggle S3 to change direction
To Jog the motor use PB2

Parameter Settings:

- P100 Set to 01 (terminal strip control)
- P101 Set to 01 (0-10 VDC speed reference)
- P121 Set to 10 (Term 13A FWD / REV selection)
- P122 Set to 15 (Term 13B = JOG FWD)
- P134 Set to 10.0 (10 Hz JOG speed)

SMV Series Wiring Lab


- 3-Wire Start / Stop
- 2-Wire Start / Stop
- 2-Wire Start / Stop W/ Preset Speed
- 2-Wire Start / Stop W/ Speed Pot
- 2-Wire W/ Forward, Reverse & Pot
- 2-Wire W/ Forward, Reverse and Jog Fwd
- **3-Wire W/ MOP Speed Reference**



M - O - P

“Motor Operated Pot”

- Increase & Decrease speed by input
 - Work just like buttons on front of drive
 - Sometimes referred as “Floating Point control”
- Standard on all MC and SC Series drives
- Use where speed needs to be set from more than one location
- Use for some basic set-point control applications

Code		Possible Settings		IMPORTANT
No.	Name	Default	Selection	
P 100	Start Control Source	0	0 Local Keypad	Use RUN button on front of drive to start
			1 Terminal Strip	Use start/stop circuit wired into the terminal strip. See Section 3.2.3
			2 Remote Keypad Only	Use RUN button on optional Remote Keypad to start
			3 Network Only	<ul style="list-style-type: none"> Start command must come from network (Modbus, CANopen, etc)
<div> <h3><u>3 Wire Start / Stop Control w/ MOP Speed Reference</u></h3> <p>We want to set the drive up to use external inputs to start and stop the motor.</p> <p>To do this we need to set Parameter P100 – “Start Control Source” to 1 - “Use start/stop circuit wired into the terminal strip”.</p> </div>				
<div>  <p>WARNING! P100 = 0 disables TB-1 as a STOP input! STOP circuitry may be disabled if parameters are reset back to defaults (see P199)</p> </div>				

P 121	TB-13A Input Function	0	0 None	Disables input
P 122	TB-13B Input Function		1 AUTO Reference: 0-10 VDC	For frequency mode, see P160...P161, For PID mode, see P204...P205, For vector torque mode, see P330
P 123	TB-13C Input Function		2 AUTO Reference: 4-20 mA	
			3 AUTO Reference: Preset	For frequency mode see P131...P137, For PID mode, see P231...P233, For torque mode see, P331...P333
			4 AUTO Reference: MOP Up	• Normally open: Close input to increase or decrease speed, PID setpoint or torque setpoint.
			5 AUTO Reference: MOP Down	• MOP Up is not active while in STOP
			6 AUTO Reference: Keypad	
			7 AUTO Reference: Network	
			8 Control Select	Use when P100 = 4, 5 to switch between terminal strip control and local or remote keypad control.
			9 Network Enable	Required to start the drive through the network.
			10 Reverse Rotation	Open = Forward Closed = Reverse
			11 Start Forward	See note for typical circuit
			12 Start Reverse	
			13 Run Forward	See note for typical circuit

3 Wire Start / Stop Control w/ MOP Speed Reference

We want to set the drive up to use the TB-13A Input as a Start Forward switch.

To do this we need to set
Parameter P121 – “TB-13A Input Function”
to
11 – “Start Forward”

P 121	TB-13A Input Function	0	0 None	Disables input
P 122	TB-13B Input Function		1 AUTO Reference: 0-10 VDC	For frequency mode, see P160...P161, For PID mode, see P204...P205, For vector torque mode, see P330
			2 AUTO Reference: 4-20 mA	
P 123	TB-13C Input Function		3 AUTO Reference: Preset	For frequency mode see P131...P137, For PID mode, see P231...P233, For torque mode see P331...P333
			4 AUTO Reference: MOP Up	• Normally open: Close input to increase or decrease speed, PID setpoint or torque setpoint. • MOP Up is not active while in STOP
			5 AUTO Reference: MOP Down	
			6 AUTO Reference: Keypad	
			7 AUTO Reference: Network	
			8 Control Select	Use when P100 = 4, 5 to switch

3 Wire Start / Stop Control w/ MOP Speed Reference

We want to set the drive up to use the TB-13B Input as a MOP Up switch.

To do this we need to set
Parameter P122 – “TB-13B Input Function”
to

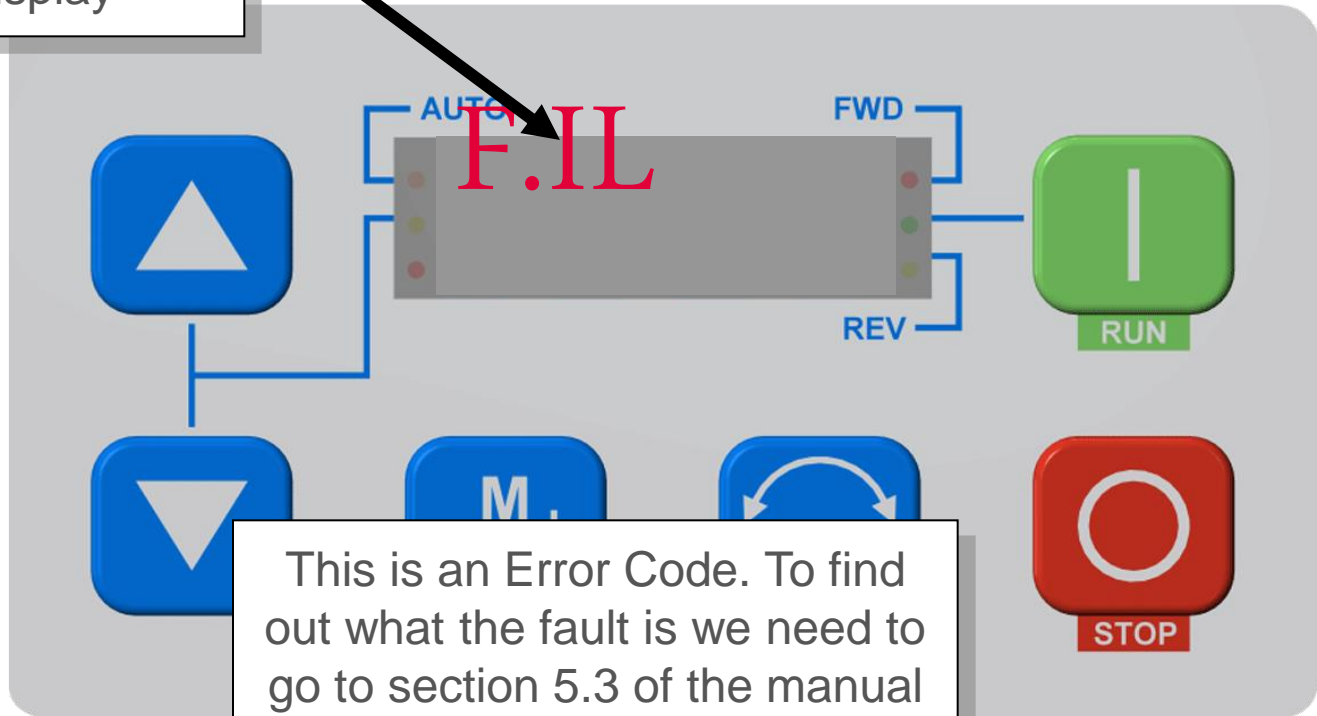
4 – “AUTO Reference : MOP Up”

			19 Auxiliary Ramp to Stop	Normally closed: Opening input will ramp drive to STOP according to P127, even if P111 is set to Coast (0 or 1).
			20 Clear Fault	Close to reset fault
			21 External Fault F.EF	Normally closed circuit; open to trip
			22 Inverse External Fault F.EF	Normally open circuit; close to trip

Customer Interface

At this point you will See
F.I.L

On your display



This is an Error Code. To find out what the fault is we need to go to section 5.3 of the manual "Fault Messages"



Troubleshooting and Diagnostics

Fault		Cause	Remedy ⁽¹⁾
F_ IL	Digital Input Configuration fault (P121...P123)	More than one digital input set for the same function	Each setting can only be used once (except settings 0 and 3)
		Only one digital input configured for MOP function (Up, Down)	One input must be set to MOP Up, another must be set to MOP Down
		PID mode is entered with setpoint reference and feedback source set to the same analog signal	Change PID setpoint reference (P121...P123) or feedback source (P201).
		One of the digital inputs (P121...P123) is set to 10 and another is set to 11...14. One of the digital inputs (P121...P123) is set to 11 or 12 and another is set to 13 or 14.	Reconfigure digital inputs

Note

The issue is that we just set the TB-13B Input as a MOP Up switch. We also need to configure one of the inputs as a MOP Down switch.

PID cannot be used in Vector Torque mode
check remote keypad connections
check mains voltage
see P300...P399 for Drive Mode setup and calibration.

P 121	TB-13A Input Function	0	0 None	Disables input
P 122	TB-13B Input Function		1 AUTO Reference: 0-10 VDC	For frequency mode, see P160...P161, For PID mode, see P204...P205, For vector torque mode, see P330
			2 AUTO Reference: 4-20 mA	
			3 AUTO Reference: Preset	For frequency mode see P131...P137, For PID mode, see P231...P233, For torque mode see P331...P333
P 123	TB-13C Input Function		4 AUTO Reference: MOP Up	<ul style="list-style-type: none"> • Normally open: Close input to increase or decrease speed, PID setpoint or torque setpoint. • MOP Up is not active while in STOP
			5 AUTO Reference: MOP Down	
			6 AUTO Reference: Keypad	
			7 AUTO Reference: Network	
			8 Control Select	Use when P100 = 4, 5 to switch

3 Wire Start / Stop Control w/MOP Speed Reference

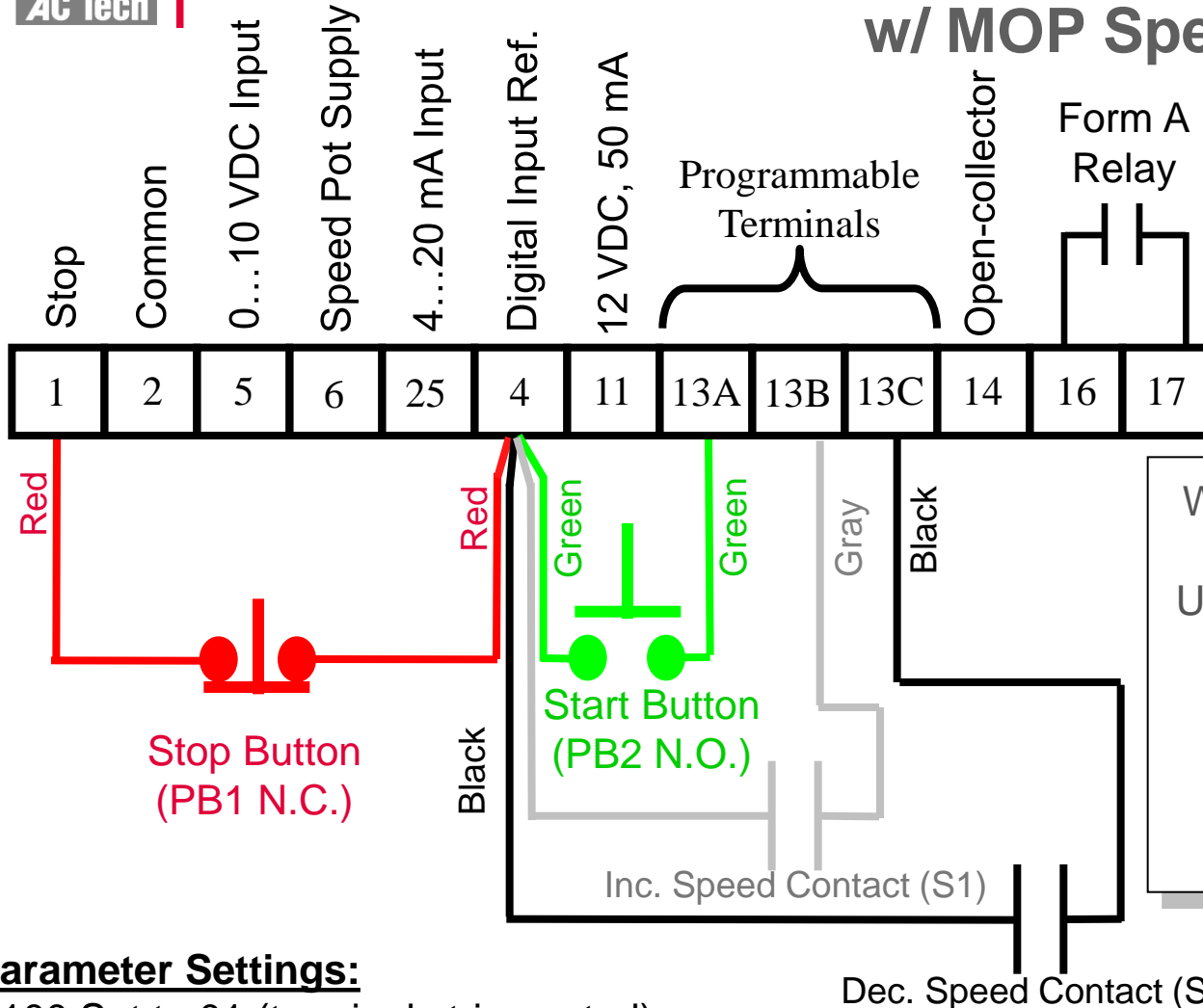
We want to set the drive up to use the TB-13C Input as a MOP Down switch.

To do this we need to set
Parameter P123 – “TB-13C Input Function”
to

5 – “AUTO Reference : MOP Down”

			19 Auxiliary Ramp to Stop	Normally closed: Opening input will ramp drive to STOP according to P127, even if P111 is set to Coast (0 or 1).
			20 Clear Fault	Close to reset fault
			21 External Fault F.EF	Normally closed circuit; open to trip
			22 Inverse External Fault F.EF	Normally open circuit; close to trip

3-Wire Start / Stop Control w/ MOP Speed Reference



Reset P104 & 105 to 20

Disconnect all
external wiring

Wire the drive up according to
the drawing.
Use the **GREEN** PB2 button to
Start the motor.
Use the **RED** PB1 button to
Stop the motor.
Use S1 to increase speed
Use S3 to decrease speed

Parameter Settings:

- P100 Set to 01 (terminal strip control)
- P121 Set to 11 (terminal 13A as start forward)
- P122 Set to 04 (terminal 13B MOP Up)
- P123 Set to 05 (terminal 13C MOP Down)

Questions?



Thank You