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Technical Bulletin No. 081804 JM

I/O Wiring for the Insight IC and PD

Purpose:
This defines each of the Inputs and Outputs (I/O) available on the Insight IC and PD controllers. Examples are shown for some common types of I/O connections. Timing Charts are shown for starting a tool and selecting Configurations using Handheld and Machine Mount tools. All I/O is 24VDC ONLY.

INSIGHT IC Inputs

CONFIG 1 and **2**	Tell the Insight IC which configurations to run
CONFIG 3 thru **8***	Additional Configuration inputs
SPINDLE DISABLE	Disables the selected spindle (in 2-Line Enable/ Disable Mode only)
SPINDLE RE-ENABLE	Re-enables the selected spindle (must be held HIGH for 1-Line Enable/ Disable, but may be pulsed for 2-Line Enable/ Disable)
GANG RESET*	Resets the GANG COUNT to 0
CONFIG RESET*	Resets the Configuration # to the lowest configuration number
SAFETY LATCH*	This is the other "Free Speed" input when the Start Mode is set to "Dual". When both of these inputs are used, it works as a "2-Hand No-Tie-Down" circuit.
LIMIT SWITCH IN*	This works the same as the "Spindle Re-Enable" input and is for use with safety equipment such as a guard or a light curtain.
LIMIT SWITCH OUT*	This works the same as the "Spindle Disable" input and is for use with safety equipment such as a guard or a light curtain.
BYPASS SPINDLE*	Sets the indicated spindle to bypass in a POWERHEAD configuration
FREE SPEED	Allows the spindle to turn at the set FREE SPEED
SOFT START	Allows the spindle to turn at the set SOFT START speed
FORWARD	Sets the spindle to turn in the FORWARD direction
REVERSE	Sets the spindle to turn in the REVERSE direction
RESET OUTPUTS*	Resets all OUTPUTS to the non-active condition

* Extra I/O Systems Only

Red denotes version 1.2.x software forward

Insight Binary Configuration Selection

In the Insight Graphics and the Insight IC, it is necessary to use the
Binary External Configuration Selection in order to use configurations higher than 8.

0 = OFF 1 = ON

Insight IC with Extra I/O and Insight PFS Only

Insight IC with Extra I/O Only

Configurations	Inputs					
		Config 1	Config 2	Config 3	Config 4	Config 5
	1	0	0	0	0	0
	2	1	0	0	0	0
	3	0	1	0	0	0
	4	1	1	0	0	0
	5	0	0	1	0	0
	6	1	0	1	0	0
	7	0	1	1	0	0
	8	1	1	1	0	0
	9	0	0	0	1	0
	10	1	0	0	1	0
	11	0	1	0	1	0
	12	1	1	0	1	0
	13	0	0	1	1	0
	14	1	0	1	1	0
	15	0	1	1	1	0
	16	1	1	1	1	0
	17	0	0	0	0	1
	18	1	0	0	0	1
	19	0	1	0	0	1
	20	1	1	0	0	1
	21	0	0	1	0	1
	22	1	0	1	0	1
	23	0	1	1	0	1
	24	1	1	1	0	1
	25	0	0	0	1	1
	26	1	0	0	1	1
	27	0	1	0	1	1
	28	1	1	0	1	1
	29	0	0	1	1	1
	30	1	0	1	1	1
	31	0	1	1	1	1
	32	1	1	1	1	1

INSIGHT IC Outputs

ACCEPT	HIGH when tightening sequence is “OK”
REJECT BUZZER*	HIGH, for 0.0-9.9sec when tightening sequence is not “OK”
HIGH TORQUE	HIGH when Torque value is above the HIGH TORQUE LIMIT
HIGH ANGLE	HIGH when Angle value is above the HIGH ANGLE LIMIT
LOW TORQUE	HIGH when Torque value is below the LOW TORQUE LIMIT
LOW ANGLE	HIGH when Angle value is below the LOW ANGLE LIMIT
GANG COMPLETE*	HIGH when # of “OK” tightenings=GANG COUNT,within a CYCLE
CYCLE COMPLETE	HIGH when either a “OK” or not “OK” tightening is completed
REJECT	HIGH when tightening sequence is not “OK”
STATS ALARM *	HIGH when one or more STATS ALARMS are outside limits
PROGRAMMABLE **	(as defined by user) The following are programmable outputs:

Not Active	No output
Accept	As above
Reject	As above
Cycle Complete	As above
High Torque	As above
Low Torque	As above
High Angle	As above
Low Angle	As above
Gang Complete	As above
Spindle in Bypass	Selected spindle is set to not run (bypassed) in POWERHEAD mode
Reject Buzzer	HIGH, for 0.0-9.9sec when tightening sequence is not “OK”
Paint Marker	HIGH, for 0.0-9.9sec when tightening sequence is “OK”
In Cycle	HIGH when tightening sequence has started, but not completed
Stats Alarm	HIGH when one or more STATS ALARMS are outside limits
Powerhead Accept	HIGH when Powerhead tightening sequence is “OK”

Powerhead Reject	HIGH when Powerhead tightening sequence is not "OK"
Powerhead Cycle Complete	HIGH when Powerhead sequence is complete
Powerhead In Cycle	HIGH when Powerhead sequence has started, but not completed
Powerhead Paint Marker	HIGH, for 0.0-9.9sec when Powerhead sequence is "OK"
Powerhead Reject Buzzer	HIGH, for 0.0-9.9 sec when Powerhead sequence is not "OK"
System Ready	The System Ready output is active when all of the following conditions are true: ▪ The RISC processor has successfully booted and downloaded all programmed parameters to the MCE ▪ A tool is connected to the MCE and the MCE power board is powered ▪ There are no system faults (See Below) ▪ System not in cycle ▪ System is ready to start next cycle OR ▪ Spindle is in Bypass (Powerhead mode only)
Config Out 1 thru **8**	When the controller receives a configuration input from either a bar code reader or internal selection, it shall send out the selected configuration via the "Config Out X" outputs. The 16-position socket tray (PFS-SOCKET-16F) can be used to compare this selected configuration with the configuration selected by the user via the socket selection. If they match the "Correct Out" line from the socket tray is set high (this will be sent to the ENABLE input of the controller).
Prog. Tool Switch	When the momentary switch on a QE-Series tool is activated, this output will turn ON. This output can be used with any of the Programmable Tool Switch functions.
Tool Trigger	Turns ON when tool trigger is pulled (after 3.6.0 only)
Tool Reverse	Turns ON when tool switch in Reverse (after 3.6.0 only)

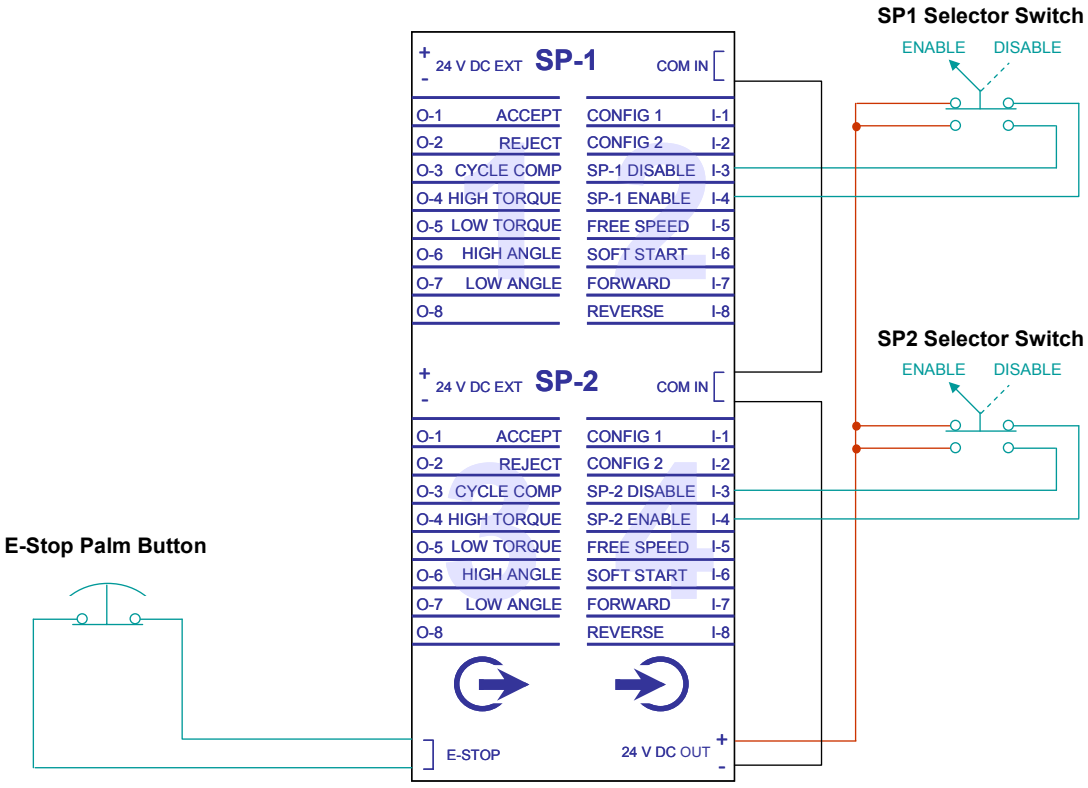
Red denotes version 1.2.x software forward
Blue denotes QE-Series tools only

* Extra I/O systems only

** One (1) Programmable Output on basic I/O systems, fourteen (14) Programmable Outputs per spindle on extra I/O systems

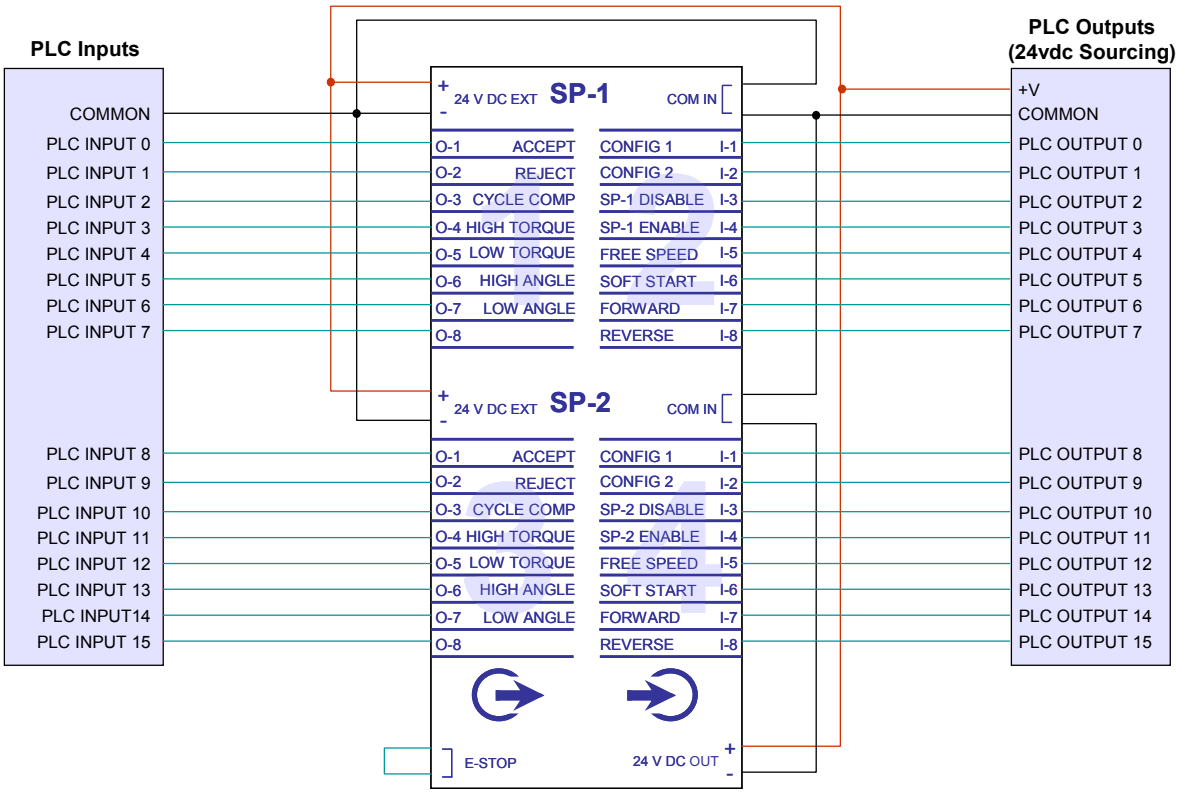
Examples

Wiring the E-Stop to an External Palm Button
And Enable/ Disable to an External Switch



Examples

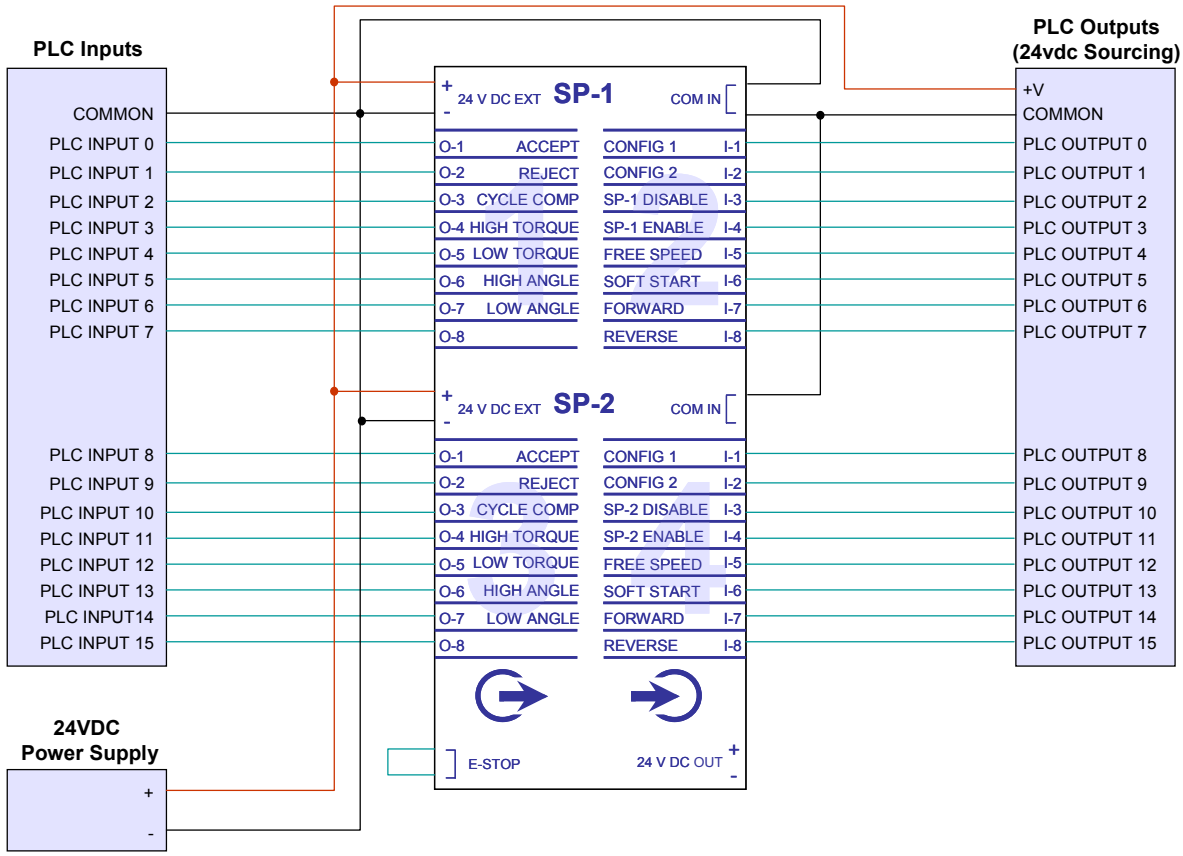
Internal Power, Standard I/O, PLC Wiring



See AS 081604 JM for Timing Diagrams for PLC Controlled Tools

Examples

External Power, Standard I/O, PLC Wiring



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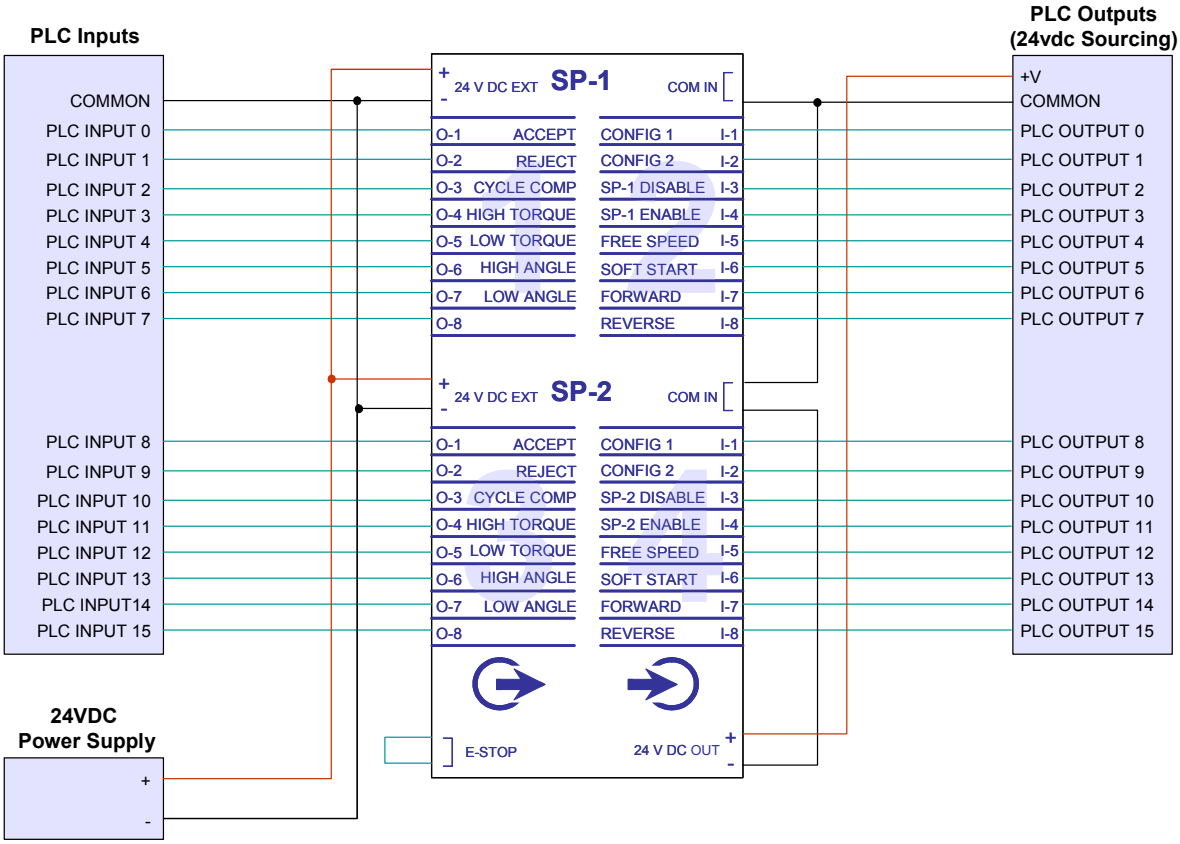
Examples

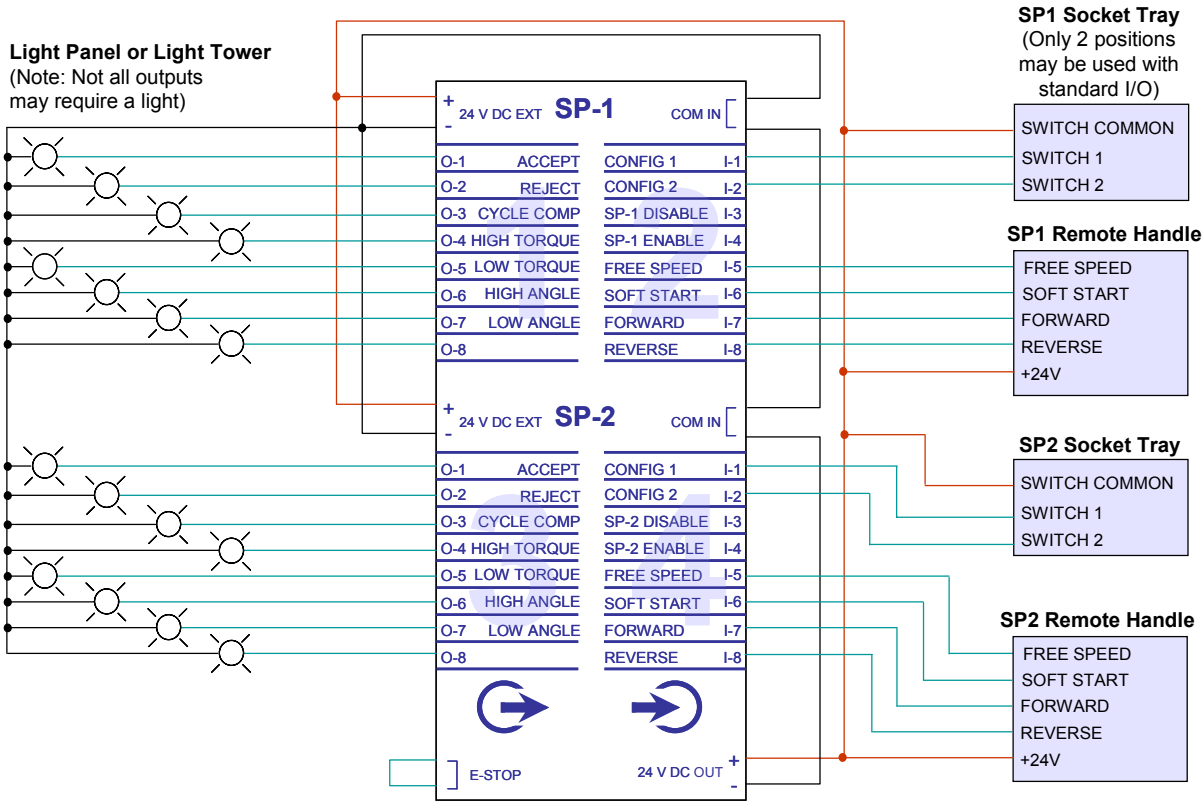
Mixed Power (Recommended), Standard I/O, PLC Wiring



See AS 081604 JM for Timing Diagrams for PLC Controlled Tools

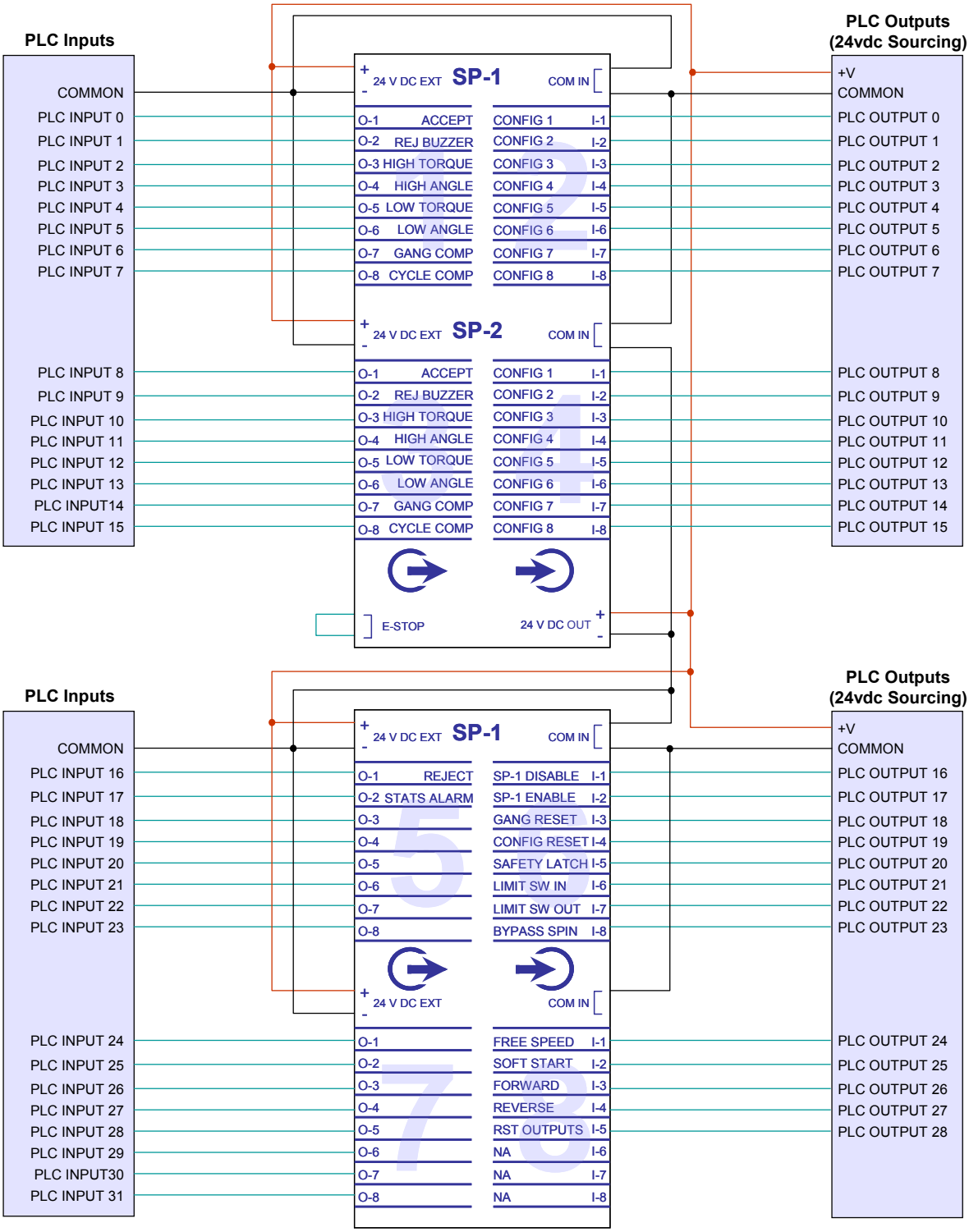
Examples

Internal Power, Standard I/O, Accessory Wiring



Examples

Internal Power, Additional I/O, PLC Wiring
(Spindle 1 shown only – Spindle 2 is wired the same way)



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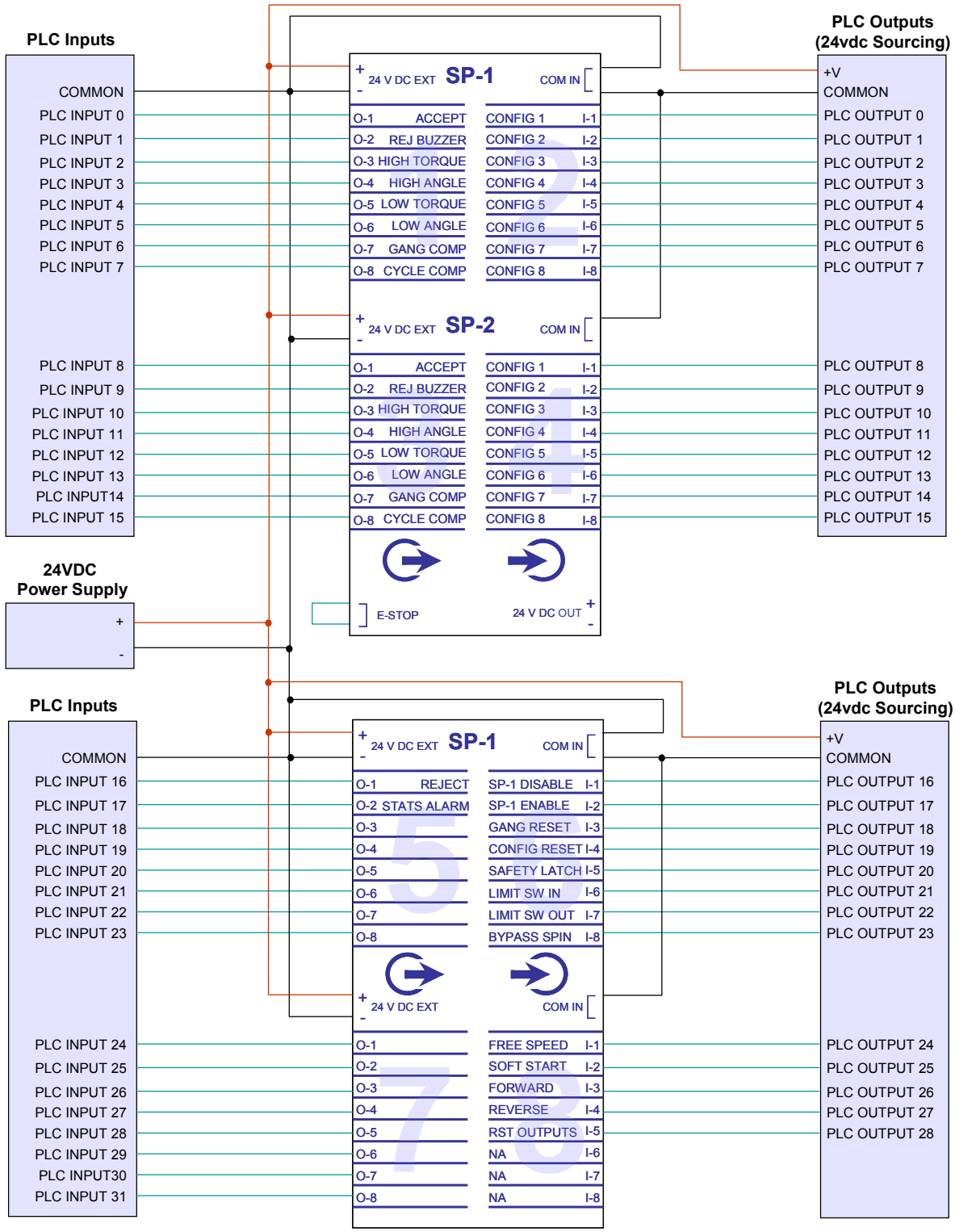
Examples

External Power, Additional I/O, PLC Wiring
(Spindle 1 shown only – Spindle 2 is wired the same way)



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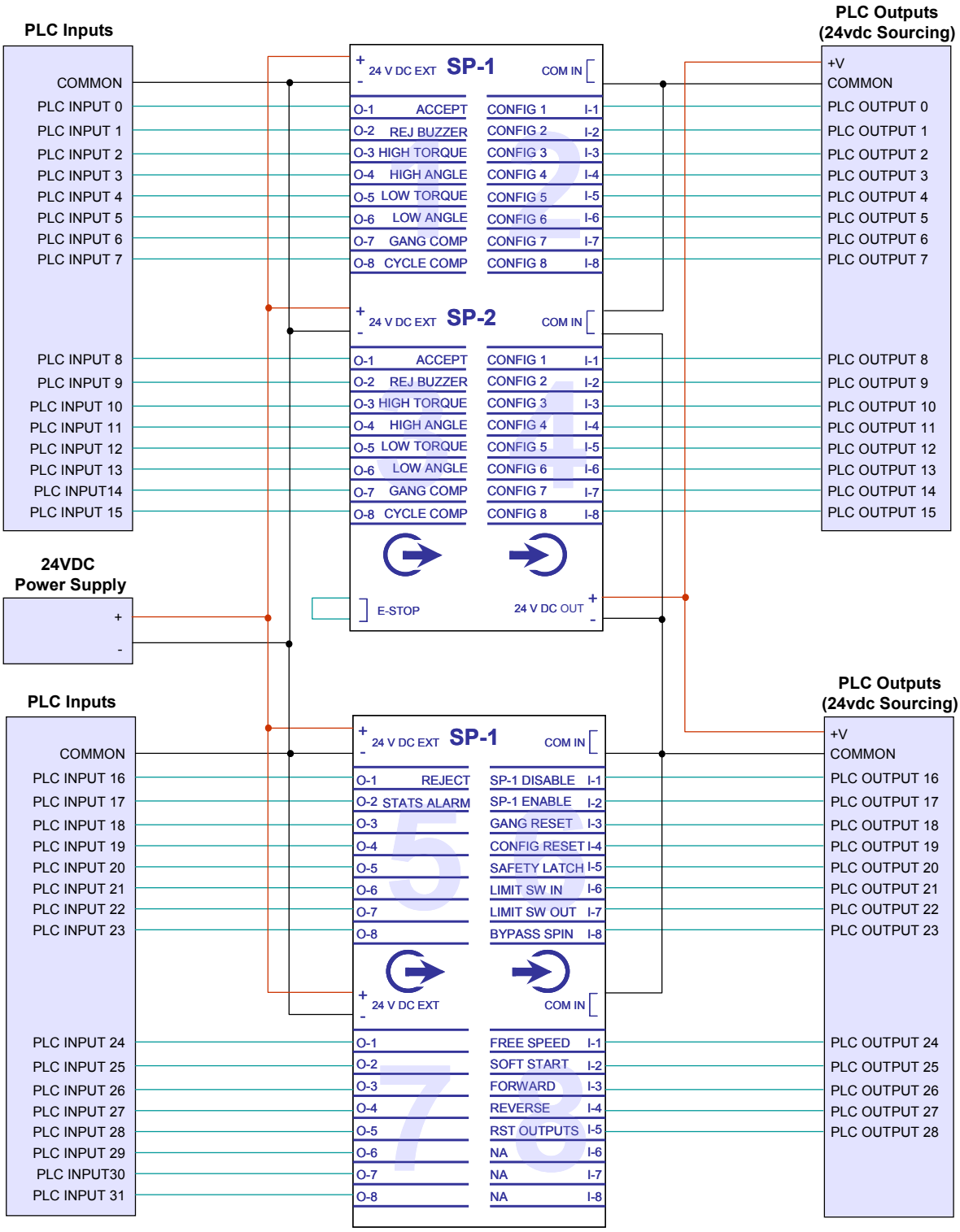
Examples

Mixed (Recommended) Power, Additional I/O, PLC Wiring
(Spindle 1 shown only – Spindle 2 is wired the same way)



See AS 081604 JM for Timing Diagrams for PLC Controlled Tools

Examples

Internal Power, Additional I/O, Accessory Wiring
(Spindle 1 Remote Handle shown only – Spindle 2 is wired the same way)