

# **SPECIAL RELAYS**

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## DL05 PLC Special Relays

“Special Relays” are contacts which are set by the CPU operating system to indicate a particular system event has occurred. These contacts are available for use in your ladder program. Knowing just the right special relay contact to use for a particular situation can save a lot of programming time. Since the CPU operating system sets and clears special relay contacts, the ladder program only has to use them as inputs in ladder logic.

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Startup and Real Time Relays		
<b>SP0</b>	First scan	On for the first scan after a power cycle or program to run transition only. The relay is reset to off on the second scan. It is useful where a function needs to be performed only on program startup.
<b>SP1</b>	Always ON	Provides a contact to insure an instruction is executed every scan.
<b>SP3</b>	1 minute clock	On for 30 seconds and off for 30 seconds.
<b>SP4</b>	1 second clock	On for 0.5 second and off for 0.5 second.
<b>SP5</b>	100 ms clock	On for 50 ms. and off for 50 ms.
<b>SP6</b>	50 ms clock	On for 25 ms. and off for 25 ms.
<b>SP7</b>	Alternate scan	On every other scan.

CPU Status Relays		
<b>SP11</b>	Forced run mode	On when the mode switch is in the run position and the CPU is running.
<b>SP12</b>	Terminal run mode	On when the CPU is in the run mode.
<b>SP13</b>	Test run mode	On when the CPU is in the test run mode.
<b>SP15</b>	Test stop mode	On when the CPU is in the test stop mode.
<b>SP16</b>	Terminal PGM mode	On when the mode switch is the the TERM position and the CPU is in program mode.
<b>SP17</b>	Forced stop	On when the mode switch is in the STOP position.
<b>SP20</b>	Forced stop mode	On when the STOP instruction is executed.
<b>SP22</b>	Interrupt enabled	On when interrupts have been enabled using the ENI instruction.

System Monitoring		
<b>SP36</b>	Override setup relay	On when the override function is used.
<b>SP37</b>	Scan controller	On when the actual scan time runs over the prescribed scan time.
<b>SP40</b>	Critical error	On when a critical error such as I/O communication loss has occurred.
<b>SP41</b>	Warning	On when a non critical error has occurred.
<b>SP42</b>	Diagnostics error	On when a diagnostics error or a system error occurs.
<b>SP44</b>	Program memory error	On when a memory error such as a memory parity error has occurred.
<b>SP45</b>	I/O error	On when an I/O error such as a blown fuse occurs.
<b>SP46</b>	Communication error	On when a communication error occurs on any of the CPU ports.
<b>SP50</b>	Fault instruction	On when a Fault Instruction is executed.
<b>SP51</b>	Watch Dog timeout	On if the CPU Watch Dog timer times out.
<b>SP52</b>	Grammatical error	On if a grammatical error has occurred either while the CPU is running or if the syntax
<b>SP53</b>	Solve logic error	On if CPU cannot solve the logic.
<b>SP54</b>	Communication error	On when RX, WX, RD, WT instructions are executed with the wrong parameters.
<b>SP56</b>	Table instruction overrun	On if a table instruction with a pointer is executed and the pointer value is outside the table boundary.

Accumulator Status		
<b>SP60</b>	Value less than	On when the accumulator value is less than the instruction value.
<b>SP61</b>	Value equal to	On when the accumulator value is equal to the instruction value.
<b>SP62</b>	Greater than	On when the accumulator value is greater than the instruction value
<b>SP63</b>	Zero	On when the result of the instruction is zero (in the accumulator.)
<b>SP64</b>	Half borrow	On when the 16 bit subtraction instruction results in a borrow.
<b>SP65</b>	Borrow	On when the 32 bit subtraction instruction results in a borrow.
<b>SP66</b>	Half carry	On when the 16 bit addition instruction results in a carry.
<b>SP67</b>	Carry	On when the 32 bit addition instruction results in a carry.
<b>SP70</b>	Sign	On anytime the value in the accumulator is negative.
<b>SP71</b>	Pointer reference error	On when the V-memory specified by a pointer (P) is not valid.
<b>SP73</b>	Overflow	On if overflow occurs in the accumulator when a signed addition or subtraction results in an incorrect sign bit.
<b>SP75</b>	Data error	On if a BCD number is expected and a non-BCD number is encountered.
<b>SP76</b>	Load zero	On when any instruction loads a value of zero into the accumulator.

### HSIO Pulse Output Relay

HSIO Pulse Output Relay		
<b>SP104</b>	Profile Complete	On when the pulse output profile is completed. (Mode 30)

### Communication Monitoring Relay

Communication Monitoring Relay		
<b>SP116</b>	CPU port busy Port 2	On when port 2 is the master and sending data.
<b>SP117</b>	Communication error Port 2	On when port 2 is the master and has a communication error.
<b>SP120</b>	Communication busy	Option card slot
<b>SP121</b>	Communication error	Option card slot

### Equal Relays for HSIO Mode 10 Counter Presets

Equal Relays for HSIO Mode 10 Counter Presets		
<b>SP540</b>	Current = target value	On when the counter current value equals the value in V2320 / V2321.
<b>SP541</b>	Current = target value	On when the counter current value equals the value in V2322 / V2323.
<b>SP542</b>	Current = target value	On when the counter current value equals the value in V2324 / V2325.
<b>SP543</b>	Current = target value	On when the counter current value equals the value in V2326 / V2327.
<b>SP544</b>	Current = target value	On when the counter current value equals the value in V2330 / V2331.
<b>SP545</b>	Current = target value	On when the counter current value equals the value in V2332 / V2333.
<b>SP546</b>	Current = target value	On when the counter current value equals the value in V2334 / V2335.
<b>SP547</b>	Current = target value	On when the counter current value equals the value in V2336 / V2337.
<b>SP550</b>	Current = target value	On when the counter current value equals the value in V2340 / V2341.
<b>SP551</b>	Current = target value	On when the counter current value equals the value in V2342 / V2343.
<b>SP552</b>	Current = target value	On when the counter current value equals the value in V2344 / V2345.
<b>SP553</b>	Current = target value	On when the counter current value equals the value in V2346 / V2347.
<b>SP554</b>	Current = target value	On when the counter current value equals the value in V2350 / V2351.
<b>SP555</b>	Current = target value	On when the counter current value equals the value in V2352 / V2353.
<b>SP556</b>	Current = target value	On when the counter current value equals the value in V2354 / V2355.
<b>SP557</b>	Current = target value	On when the counter current value equals the value in V2356 / V2357.
<b>SP560</b>	Current = target value	On when the counter current value equals the value in V2360 / V2361.
<b>SP561</b>	Current = target value	On when the counter current value equals the value in V2362 / V2363.
<b>SP562</b>	Current = target value	On when the counter current value equals the value in V2364 / V2365.
<b>SP563</b>	Current = target value	On when the counter current value equals the value in V2366 / V2367.
<b>SP564</b>	Current = target value	On when the counter current value equals the value in V2370 / V2371.
<b>SP565</b>	Current = target value	On when the counter current value equals the value in V2372 / V2373.
<b>SP566</b>	Current = target value	On when the counter current value equals the value in V2374 / V2375.
<b>SP567</b>	Current = target value	On when the counter current value equals the value in V2376 / V2377.