

# Special Relays

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In This Appendix. . . .  
— DL350 CPU Special Relays

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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>SP2</b>	Always OFF	provides a contact that is always off.
<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 anytime the CPU switch is in the RUN position.
<b>SP12</b>	Terminal run mode	on when the CPU switch is in the TERM position and the CPU is in the RUN mode.
<b>SP13</b>	Test run mode	on when the CPU switch is in the TERM position and the CPU is in the test RUN mode.
<b>SP14</b>	Test hold mode	on when the CPU switch is in the TERM position and the CPU is in the TEST HOLD mode
<b>SP15</b>	Test program mode	on when the CPU is in the TERM position and the CPU is in the TEST PROGRAM MODE.
<b>SP16</b>	Terminal program mode	on when the CPU switch is in the TERM position and the CPU is in the PROGRAM MODE.
<b>SP17</b>	Forced stop mode relay	on anytime the CPU mode switch is in the STOP position.
<b>SP20</b>	Forced stop mode	on when the STOP instruction is executed.
<b>SP21</b>	Break Relay 2	on when the BREAK instructions is executed. It is OFF when the CPU mode is changed to RUN.
<b>SP22</b>	Interrupt enabled	on when interrupts have been enabled using the ENI instruction.
<b>SP25</b>	CPU battery disabled relay	on when the CPU battery is disabled by special V-memory.

**System Monitoring Relays**

<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 such as a low battery has occurred.
<b>SP43</b>	Battery low	on when the CPU battery voltage is low.
<b>SP44</b>	Reserved	
<b>SP45</b>	Reserved	
<b>SP46</b>	Communications error	on when a communications error has occurred on any of the CPU ports.
<b>SP47</b>	I/O configuration error	on if an I/O configuration error has occurred. The CPU power-up I/O configuration check must be enabled before this relay will be functional.
<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 check is run. V7755 contains the exact error code.
<b>SP53</b>	Solve logic error	on if CPU cannot solve the logic.
<b>SP54</b>	Intelligent I/O error	on when communications with an intelligent module has occurred.

**Accumulator Status Relays**

<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	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>	Invalid octal number	on when an Invalid octal number was entered. This also occurs when the V-memory specified by a pointer (P) is not valid.
<b>SP72</b>	Invalid Real Number	On when an invalid real number is in the accumulator
<b>SP73</b>	Overflow	on if overflow occurs in the accumulator when a signed addition or subtraction results in a incorrect sign bit.
<b>SP74</b>	Underflow	On if real number underflow occurs in the accumulator (numbers are too close to 0.0)
<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.

## Communications Monitoring Relays

<b>SP116</b>	DL350 CPU communication	on when port 2 is communicating with another device
<b>SP117</b>	Comm error port 2	on when Port 2 has encountered a communication error.
<b>SP120</b>	Module busy Slot 0	on when the communication module in slot 0 is busy transmitting or receiving. You must use this relay with the RX or WX instructions to prevent attempting to execute a RX or WX while the module is busy .
<b>SP121</b>	Com. error Slot 0	on when the communication module in slot 0 of the local base has encountered a communication error.
<b>SP122</b>	Module busy Slot 1	on when the communication module in slot 1 of the local base is busy transmitting or receiving. You must use this relay with the RX or WX instructions to prevent attempting to execute a RX or WX while the module is busy.
<b>SP123</b>	Com. error Slot 1	on when the communication module in slot 1 of the local base has encountered a communication error.
<b>SP124</b>	Module busy Slot 2	on when the communication module in slot 2 of the local base is busy transmitting or receiving. You must use this relay with the RX or WX instructions to prevent attempting to execute a RX or WX while the module is busy.
<b>SP125</b>	Com. error Slot 2	on when the communication module in slot 2 of the local base has encountered a communication error.
<b>SP126</b>	Module busy Slot 3	on when the communication module in slot 3 of the local base is busy transmitting or receiving. You must use this relay with the RX or WX instructions to prevent attempting to execute a RX or WX while the module is busy.
<b>SP127</b>	Com. error Slot 3	on when the communication module in slot 3 of the local base has encountered a communication error.
<b>SP130</b>	Module busy Slot 4	on when the communication module in slot 4 of the local base is busy transmitting or receiving. You must use this relay with the RX or WX instructions to prevent attempting to execute a RX or WX while the module is busy.
<b>SP131</b>	Com. error Slot 4	on when the communication module in slot 4 of the local base has encountered a communication error.
<b>SP132</b>	Module busy Slot 5	on when the communication module in slot 5 of the local base is busy transmitting or receiving. You must use this relay with the RX or WX instructions to prevent attempting to execute a RX or WX while the module is busy.
<b>SP133</b>	Com. error Slot 5	on when the communication module in slot 5 of the local base has encountered a communication error.
<b>SP134</b>	Module busy Slot 6	on when the communication module in slot 6 of the local base is busy transmitting or receiving. You must use this relay with the RX or WX instructions to prevent attempting to execute a RX or WX while the module is busy.
<b>SP135</b>	Com. error Slot 6	on when the communication module in slot 6 of the local base has encountered a communication error.
<b>SP136</b>	Module busy Slot 7	on when the communication module in slot 7 of the local base is busy transmitting or receiving. You must use this relay with the RX or WX instructions to prevent attempting to execute a RX or WX while the module is busy.
<b>SP137</b>	Com. error Slot 7	on when the communication module in slot 7 of the local base has encountered a communication error.