

SPECIAL RELAYS



In This Appendix...

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DL06 PLC Special Relays

Special Relays are just contacts that 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.

Startup and Real-Time Relays

SP0	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.
SP1	Always ON	Provides a contact to ensure an instruction is executed every scan.
SP2	Always OFF	Provides a contact that is always off.
SP3	1 minute clock	On for 30 seconds and off for 30 seconds.
SP4	1 second clock	On for 0.5 second and off for 0.5 second.
SP5	100 ms clock	On for 50 ms. and off for 50 ms.
SP6	50 ms clock	On for 25 ms. and off for 25 ms.
SP7	Alternate scan	On every other scan.

CPU Status Relays

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

System Monitoring

SP36	Override setup relay	On when the override function is used.
SP37	Scan controller	On when the actual scan time runs over the prescribed scan time.
SP40	Critical error	On when a critical error such as I/O communication loss has occurred.
SP41	Warning	On when a non critical error has occurred.
SP42	Diagnostics error	On when a diagnostics error or a system error occurs.
SP43	Low battery error	On when the CPU battery voltage is low (only if bit 12 of V7633 is set).
SP44	Program memory error	On when a memory error such as a memory parity error has occurred.
SP45	I/O error	On when an I/O error such as a blown fuse occurs.
SP46	Communications error	On when a communication error occurs on any of the CPU ports.
SP50	Fault instruction	On when a Fault Instruction is executed.
SP51	Watch Dog timeout	On if the CPU Watch Dog timer times out.
SP52	Grammatical error	On if a grammatical error has occurred either while the CPU is running or if the syntax check is run. V7755 will hold the exact error code.
SP53	Solve logic error	On if CPU cannot solve the logic.
SP54	Communication error	On when RX, WX, instructions are executed with the wrong parameters.
SP56	Table instruction overrun	On if a table instruction with a pointer is executed and the pointer value is outside the table boundary.

Accumulator Status

SP60	Value less than	On when the accumulator value is less than the instruction value.
SP61	Value equal to	On when the accumulator value is equal to the instruction value.
SP62	Greater than	On when the accumulator value is greater than the instruction value.
SP63	Zero	On when the result of the instruction is zero (in the accumulator).
SP64	Half borrow	On when the 16 bit subtraction instruction results in a borrow.
SP65	Borrow	On when the 32 bit subtraction instruction results in a borrow.
SP66	Half carry	On when the 16 bit addition instruction results in a carry.
SP67	Carry	On when the 32 bit addition instruction results in a carry.
SP70	Sign	On anytime the value in the accumulator is negative.
SP71	Pointer reference error	On when the V-memory specified by a pointer (P) is not valid.
SP72	Floating point number	On anytime the value in the accumulator is a valid floating point number.
SP73	Overflow	On if overflow occurs in the accumulator when a signed addition or subtraction results in an incorrect sign bit.
SP74	Underflow	On anytime a floating point math operation results in an underflow error.
SP75	Data error	On if a BCD number is expected and a non-BCD number is encountered.
SP76	Load zero	On when any instruction loads a value of zero into the accumulator.

HSIO Input Status

SP100	X0 status	On when X0 is on
SP101	X1 status	On when X1 is on
SP102	X2 status	On when X2 is on
SP103	X3 status	On when X3 is on

HSIO Pulse Output Relay

SP104	Profile Complete	On when the pulse output profile is completed. (Mode 30)
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Communication Monitoring Relay

SP116	CPU port busy Port 2	On when port 2 is the master and sending data.
SP117	Communications error Port 2	On when port 2 is the master and has a communication error.

Option Slot Communication Monitoring Relay

SP120	Slot 1 busy	H0-ECOM/D0-DCM Port2
SP121	Slot 1 error	H0-ECOM/D0-DCM Port2
SP122	Slot 2 busy	H0-ECOM/D0-DCM Port2
SP123	Slot 2 error	H0-ECOM/D0-DCM Port2
SP124	Slot 3 busy	H0-ECOM/D0-DCM Port2
SP125	Slot 3 error	H0-ECOM/D0-DCM Port2
SP126	Slot 4 busy	H0-ECOM/D0-DCM Port2
SP127	Slot 4 error	H0-ECOM/D0-DCM Port2

Option Slot Special Relay

SP140-237	Slot 1	SP relay for option card
SP240-337	Slot 2	SP relay for option card
SP340-437	Slot 3	SP relay for option card
SP430-537	Slot 4	SP relay for option card

Counter 1 Mode 10 Equal Relays

SP540	Current = target value	On when the counter current value equals the value in V3631/3630
SP541	Current = target value	On when the counter current value equals the value in V3633/3632
SP542	Current = target value	On when the counter current value equals the value in V3635/3634
SP543	Current = target value	On when the counter current value equals the value in V3637/3636
SP544	Current = target value	On when the counter current value equals the value in V3641/3640
SP545	Current = target value	On when the counter current value equals the value in V3643/3642
SP546	Current = target value	On when the counter current value equals the value in V3645/3644
SP547	Current = target value	On when the counter current value equals the value in V3647/3646
SP550	Current = target value	On when the counter current value equals the value in V3651/3650
SP551	Current = target value	On when the counter current value equals the value in V3653/3652
SP552	Current = target value	On when the counter current value equals the value in V3655/3654
SP553	Current = target value	On when the counter current value equals the value in V3657/3656
SP554	Current = target value	On when the counter current value equals the value in V3661/3660
SP555	Current = target value	On when the counter current value equals the value in V3663/3662
SP556	Current = target value	On when the counter current value equals the value in V3665/3664
SP557	Current = target value	On when the counter current value equals the value in V3667/3666
SP560	Current = target value	On when the counter current value equals the value in V3671/3670
SP561	Current = target value	On when the counter current value equals the value in V3673/3672
SP562	Current = target value	On when the counter current value equals the value in V3675/3674
SP563	Current = target value	On when the counter current value equals the value in V3677/3676
SP564	Current = target value	On when the counter current value equals the value in V3771/3770
SP565	Current = target value	On when the counter current value equals the value in V3703/3702
SP566	Current = target value	On when the counter current value equals the value in V3705/3704
SP567	Current = target value	On when the counter current value equals the value in V3707/3706

Counter 2 Mode 10 Equal Relays

SP570	Current = target value	On when the counter current value equals the value in V3711/3710
SP571	Current = target value	On when the counter current value equals the value in V3713/3712
SP572	Current = target value	On when the counter current value equals the value in V3715/3714
SP573	Current = target value	On when the counter current value equals the value in V3717/3716
SP574	Current = target value	On when the counter current value equals the value in V3721/3720
SP575	Current = target value	On when the counter current value equals the value in V3723/3722
SP576	Current = target value	On when the counter current value equals the value in V3725/3724
SP577	Current = target value	On when the counter current value equals the value in V3727/3726
SP600	Current = target value	On when the counter current value equals the value in V3731/3730
SP601	Current = target value	On when the counter current value equals the value in V3733/3732
SP602	Current = target value	On when the counter current value equals the value in V3735/3734
SP603	Current = target value	On when the counter current value equals the value in V3737/3736
SP604	Current = target value	On when the counter current value equals the value in V3741/3740
SP605	Current = target value	On when the counter current value equals the value in V3743/3742
SP606	Current = target value	On when the counter current value equals the value in V3745/3744
SP607	Current = target value	On when the counter current value equals the value in V3747/3746
SP610	Current = target value	On when the counter current value equals the value in V3751/3750
SP611	Current = target value	On when the counter current value equals the value in V3753/3752
SP612	Current = target value	On when the counter current value equals the value in V3755/3754
SP613	Current = target value	On when the counter current value equals the value in V3757/3756
SP614	Current = target value	On when the counter current value equals the value in V3761/3760
SP615	Current = target value	On when the counter current value equals the value in V3763/3762
SP616	Current = target value	On when the counter current value equals the value in V3765/3764
SP617	Current = target value	On when the counter current value equals the value in V3767/3766