Special Relays

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In This Appendix. . . .

— DL350 CPU Special Relays

DL350 CPU Special Relays

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

System Monitoring Relays

SP40	Critical error	on when a critical error such as I/O communication loss has occurred.
SP41	Warning	on when a non-critical error such as a low battery has occurred.
SP43	Battery low	on when the CPU battery voltage is low.
SP44	Reserved	
SP45	Reserved	
SP46	Communications error	on when a communications error has occurred on any of the CPU ports.
SP47	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.
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 contains the exact error code.
SP53	Solve logic error	on if CPU cannot solve the logic.
SP54	Intelligent I/O error	on when communications with an intelligent module has occurred.

Accumulator Status Relays

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	when the 32 bit addition instruction results in a carry.
SP70	Sign	on anytime the value in the accumulator is negative.
SP71	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.
SP72	Invalid Real Number	On when an invalid real number is in the accumulator
SP73	Overflow	on if overflow occurs in the accumulator when a signed addition or subtraction results in a incorrect sign bit.
SP74	Underflow	On if real number underflow occurs in the accumulator (numbers are too close to 0.0)
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.

Appendix D
Special Relays

Communications Monitoring Relays

SP116	DL350 CPU communication	on when port 2 is communicating with another device
SP117	Comm error port 2	on when Port 2 has encountered a communication error.
SP120	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 .
SP121	Com. error Slot 0	on when the communication module in slot 0 of the local base has encountered a communication error.
SP122	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.
SP123	Com. error Slot 1	on when the communication module in slot 1 of the local base has encountered a communication error.
SP124	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.
SP125	Com. error Slot 2	on when the communication module in slot 2 of the local base has encountered a communication error.
SP126	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.
SP127	Com. error Slot 3	on when the communication module in slot 3 of the local base has encountered a communication error.
SP130	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.
SP131	Com. error Slot 4	on when the communication module in slot 4 of the local base has encountered a communication error.
SP132	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.
SP133	Com. error Slot 5	on when the communication module in slot 5 of the local base has encountered a communication error.
SP134	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.
SP135	Com. error Slot 6	on when the communication module in slot 6 of the local base has encountered a communication error.
SP136	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.
SP137	Com. error Slot 7	on when the communication module in slot 7 of the local base has encountered a communication error.