

ERROR CODES AND SYSTEM LOCATIONS



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Do-more! Designer Errors and System Locations

Errors in Do-more! Designer are typically found in the Output Window. To get to the Output Window, Go to Windows -> Output Window and a new pane will open. Typically the Output window will open automatically when an error is found when accepting rungs or when downloading to the PLC.

For errors that are not program check errors, there may be an error reporting field in the Device Structure that can provide information on the error and what it means. For these sorts of errors, the best place to find more information is in the Software Help file for the operation that you are attempting.

System memory locations can also help with finding errors. There is a chart later in this appendix for reference. For more information see Do-more! Designer help topic DMD0323.

| Program Check Rules | | |
|---------------------|--------|---|
| Class | Number | Description |
| Message | M090 | Disconnected Module is being downloaded as part of the System Configuration. |
| Error | E091 | Support for feature added in Do-more! Technology Version, but this PLC is currently running older Do-more! Technology Version |
| Warning | W092 | Support for feature added in Do-more! Technology Version, but this PLC is currently running older Do-more! Technology Version |
| Warning | W101 | Rung is missing input logic, power flow state will be based on previous rung's power flow state |
| Error | E102 | Multiple instructions exist; only one is allowed |
| Error | E103 | Do-more! Technology Version in CPU does not support the new instruction; remove the instruction or upgrade firmware |
| Error | E121 | Instruction validation error |
| Message | M122 | Program contains Unassigned Nicknames |
| Error | E123 | Program contains Unassigned Nicknames |
| Error | E124 | Disconnected Module Device used by instruction |
| Warning | W125 | DirectLOGIC Stub instruction needs attention before downloading to PLC |
| Error | E126 | DirectLOGIC Stub instruction needs attention before downloading to PLC |
| Error | E128 | Array reference found within differential/delta contact inside a loop |
| Warning | W129 | Writing to Raw Analog Output WY or to Scaled Analog Input RX when that analog channel has a pre-defined scale in the System Configuration |
| Warning | W130 | Writing to High Speed Y that is bound to High Speed Output Function (instruction has no effect) |
| Warning | W131 | Accessing a 16 bit unipolar analog without the Unsigned cast :U |
| Warning | W201 | <Primary-instruction> <element> in <secondary-instruction> does not exist |
| Warning | W202 | <Resource-parameter> in instruction used multiple times |
| Error | E203 | <Resource-parameter> in instruction used multiple times |
| Message | M204 | Code-block exists without any invocation-instruction to execute it |
| Warning | W221 | OUT <element> coil duplicated multiple times |
| Message | M222 | OUT <element> coil duplicated multiple times |
| Message | M240 | Common Modbus/TCP Client Device used for multiple Servers |
| Error | E301 | Duplicate LABEL at address |
| Error | E302 | GOTO missing corresponding LABEL |
| Error | E303 | Cannot GOTO a LABEL in a different Stage |
| Message | M304 | LABEL missing corresponding GOTO |
| Error | E305 | Cannot GOTO a LABEL in a different code-block |
| Error | E311 | End-of-loop instruction is missing start-of-loop or is paired with incorrect start-of-loop instruction |
| Error | E312 | Start-of-loop missing corresponding end-of-loop |

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| Program Check Rules (continued) | | |
|---------------------------------|--------|---|
| Class | Number | Description |
| Error | E313 | Instruction not allowed within a loop |
| Message | M314 | Instruction found within loop |
| Message | M315 | Clocked/edged instruction used within loop |
| Error | E316 | Cannot GOTO a LABEL into or out of a loop |
| Warning | W317 | Asynchronous instruction found within loop |
| Error | E318 | Instruction must exist within a loop |
| Message | M331 | Asynchronous instruction used in code-block with yielding instructions |
| Warning | W401 | SUSPEND not recommended within its own code-block (no easy way to un-SUSPEND self) |
| Warning | W402 | Found <code-block-invoking-instruction> within its own code-block |
| Warning | W403 | Using HALT on a code-block that utilizes fully-asynchronous instruction(s) |
| Error | E411 | Instruction can only exist in \$Main code-block |
| Error | E412 | <Instruction> found in <non-program> code-block; can only exist in a PROGRAM code-block |
| Error | E413 | Instruction not permitted in \$Main code-block |
| Error | E421 | Stage bit cannot be modified by logic in a different PROGRAM code-block |
| Error | E422 | Instruction cannot be in a Stage |
| Error | E423 | Instruction must be within a Stage |
| Warning | W424 | Using retentive element in coil within a non-retentive stage |
| Warning | W451 | Time-based instruction used in edge-enabled task |
| Warning | W452 | Time-based instruction used in a continuously-enabled task with a non-zero interval |
| Warning | W453 | Fully-asynchronous instruction used in edge-enabled task |
| Warning | W454 | Fully-asynchronous instruction used in a continuously-enabled task with a non-zero interval |
| Message | M455 | Partial-asynchronous instruction used in edge-enabled task |
| Message | M456 | Partial-asynchronous instruction used in a continuously-enabled task with a non-zero interval |
| Message | M457 | Clocked/edged instruction used in edge-enabled task |
| Message | M458 | Clocked/edged instruction used in a continuously-enabled task with a non-zero interval |
| Warning | W459 | Edge-Enabled ENTASK instructions exist with Interval-Enabled ENTASK instructions |
| Warning | W460 | Other continuous / interval ENTASK instructions exist |
| Warning | W461 | Full OFF-to-ON Transition Input Leg counting instruction used in edge-enabled task |
| Error | E501 | Subroutine missing unconditional RET at end of code-block |
| Message | M521 | High Speed Discrete Output set within non-Immediate instruction in Interrupt-Service-Routine |
| Message | M522 | Immediate I/O instruction inside NON-Interrupt-Service-Routine |
| Error | E701 | Do-more! Technology Version in CPU only supports Edge-Triggered Input-Leg (not Power-Flow-Enabled) in instruction; modify instruction or upgrade firmware |
| Error | E702 | Do-more! Technology Version in CPU does not support ONLY Swap Bytes or ONLY Swap Words on DWord sized memory in PUBLISH/SUBSCRIB instruction; modify instruction, or upgrade firmware |
| Error | E703 | Do-more! Technology Version in CPU does not support clearing bit-sized elements in MEMCLEAR instruction; modify instruction, use RSTR, or upgrade firmware |
| Error | E704 | Do-more! Technology Version in CPU does not support variable Modbus parameter in MRX/MWX instruction; use only constant, or upgrade firmware |
| Error | E705 | Do-more! Technology Version in CPU does not support variable parameter in NETTIME instruction; use only a constant value, or upgrade firmware |
| Error | E706 | Do-more! Technology Version in CPU does not support a variable networking parameter in DLRX/DLWX instruction; use only constant, or upgrade firmware |
| Error | E707 | Do-more! Technology Version in CPU does not support "ipaddr" format in "FmtInt()" print script command in instruction; modify instruction or upgrade firmware |
| Warning | W708 | Do-more! Technology Version in CPU does not support register in DEVREAD/DEVWRITE instruction; modify instruction or upgrade firmware |
| Error | E890 | CTRIO's file system does not contain a file at file number compatible with the instruction |

Memory Locations with System-Assigned Nicknames

The Do-more! CPUs are pre-configured with several bit and numeric locations that have system-assigned Nicknames. Some of these locations are outputs that report Status information, some of them are inputs used to provide configuration selections to the CPU, and some of them are input & output locations. This list can be found in Help topic DMD0208.

| Bit Locations with System-Assigned Nicknames | | | |
|--|------------------|--------|--|
| Bit Location | Nickname | Type | Description |
| ST0 | \$FirstScan | Status | Will be ON for the duration of the first CPU scan after a STOP mode -to- RUN mode transition. |
| ST1 | \$On | Status | Always ON. |
| ST2 | \$Off | Status | Always OFF. |
| ST3 | \$1Minute | Status | While the CPU is in RUN mode this bit location will be set ON once a minute with a 50% duty cycle, that is, it will be ON for 30 seconds then OFF for 30 seconds. |
| ST4 | \$1Second | Status | While the CPU is in RUN mode this bit location will be set ON once a second with a 50% duty cycle, that is, it will be ON for 1/2 second then OFF for 1/2 second. |
| ST5 | \$100ms | Status | While the CPU is in RUN mode this bit location will be set ON once every 100ms with a 50% duty cycle, that is, it will be ON for 50 milliseconds then OFF for 50 milliseconds. |
| ST6 | \$50ms | Status | While the CPU is in RUN mode this bit location will be set ON once every 50ms with a 50% duty cycle, that is, it will be ON for 25 milliseconds then OFF for 25 milliseconds. |
| ST7 | \$ScanToggle | Status | Will be ON for alternate scans. |
| ST8 | \$LastScan | Status | Will be ON for the duration of the last CPU scan before a RUN mode -to- STOP mode transition. |
| ST10 | \$HasErrors | Status | Will be ON any time the CPU is reporting any runtime errors. |
| ST11 | \$HasWarnings | Status | Will be ON any time the CPU is reporting any runtime warnings. |
| ST12 | \$HasInfo | Status | Will be ON any time the CPU is reporting any runtime informational messages. |
| ST13 | \$WatchdogReboot | Status | Will be ON after a Hardware Watchdog Reboot has occurred. |
| ST14 | \$ModuleFailed | Status | Will be ON when any installed module fails validation, which generally means that its module ID doesn't match the module ID discovered at power up. |

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| Bit Locations with System-Assigned Nicknames (continued) | | | |
|--|-------------------|---------------|--|
| Bit Location | Nickname | Type | Description |
| ST15 | \$PgmModeRestart | Configuration | <p>Will be ON after a Program mode -to- Run mode transition (because of a Do-more! Designer mode change operation or because the front panel mode switch was used). Non-retentive memory has been cleared, retentive memory has not been changed, but the state information of all Programs (including their Stage bits) and Tasks have been reset even if the Program or Task has been configured as retentive.</p> <p>Will be OFF in Run mode after a power-up, or a restart after a Watchdog Timer event, or after a REBOOT instruction is executed. Non-retentive memory has been cleared, retentive memory has been preserved. The state information for Programs and Tasks marked as retentive has been preserved, those NOT marked as retentive has been cleared.</p> <p>By default, user created Programs are Tasks are non-retentive, but they can be made retentive if required through the Code-block Configuration dialog. All System (built-in) Programs and Tasks are retentive and that cannot be changed. The one exception is that all Stages in \$Main will be disabled and the Initial Stage will be enabled if the CPU powers up in Run mode, or on a Program -to- Run transition.</p> <p>Note: the Difference Between Two Date / Times (DTDIFF) instruction with SDT1 (\$SysShutdown) and SDT2 (\$SysStartup) can be used to determine how long a CPU has NOT been in Run mode. The result of this calculation can be used to help decide what (if anything) needs to be manually reset based on the amount of time the PLC was not in control of the machine or process.</p> |
| ST16 | \$TermRunMode | Status | <p>Will be ON if the CPU is in RUN mode and the switch is in TERM position.</p> <p>Will be OFF if the CPU is in STOP (PGM) mode and the switch is in TERM position, or if the if the mode switch is NOT in TERM position (regardless of the CPU mode).</p> |
| ST17 | \$SerFifoOverflow | Configuration | Will be ON if the input buffer for the on-board serial port contains 1023 bytes of data. |
| ST18 | \$RetErrOnBadReq | Configuration | Will be ON if there is a bad array reference in a Data View. |
| ST21 | \$InhPgmUpdate | Configuration | Set to ON to prevent program from being updated. |
| ST23 | \$TimeSynced | Status | Will be ON if the TimeSync operation is successful. |
| ST24 | \$HwWatchdogMode | Configuration | Specifies the action to take in the event of a Hardware Watchdog Timeout. |
| ST25 | \$DisableHwWdog | Configuration | Set ON to disable the Hardware Watchdog Timer. |
| ST33 | \$EnableDebug | Configuration | Set ON by the Debug View to put the CPU in debug mode. |
| ST34 | \$EnablePowerFlow | Configuration | Reserved. |
| ST35 | \$EnableNScan | Configuration | Set ON by the Debug View to put the CPU into N-Scan Mode. |
| ST36 | \$EnableMsgDump | Configuration | Set ON to send all ERR and MSG values to Do-more! Logger, see the Send Email (EMAIL) Instruction. |
| ST37 | \$DisableSwWdog | Configuration | Set ON to disable the software watchdog timer. |
| ST128 | \$WatchdogTimeout | Status | Will be ON when a software watchdog occurs. |
| ST129 | \$IndexError | Status | Will be ON when an array reference is out of range. |
| ST131 | \$InvalidInstr | Status | Will be ON if an invalid instruction was downloaded to the CPU. User generally should never see this. |

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Bit Locations with System-Assigned Nicknames (continued)

| Bit Location | Nickname | Type | Description |
|--------------|--------------------|--------|--|
| ST132 | \$OutOfRange | Status | <p>Will be ON when a parameter that isn't an index error, or an overflow, or a divide-by-zero is out of range. The Status tab of System Info will also display "A comm client attempted to read a data address that was out of range. Zero data was returned." in the ERR field.</p> <p>Two common examples (assume the normal range of C is C0–C2047):</p> <p>If V0 = 9999, then trying to reference C[V0] = C9999 would fail because 9999 is outside the range of configured C locations.</p> <p>If an external communication client creates a tag that references C9999. Again, 9999 is outside the range of configured C locations. To correct this, the external communication client should import the memory configuration from the Do-more! Designer project so that the only the correct ranges are available for its tags.</p> |
| ST133 | \$Overflow | Status | Will be ON when certain math operators (POW, INC, DEC, etc.) overflow their calculation. |
| ST134 | \$InstIOChanged | Status | Do-more! CPUs keep a copy of the last known good I/O Configuration data stored in their battery-backed memory. While the system is powered down, if an I/O module is removed, or an I/O module is added, or an existing I/O module is moved to a different slot, or an existing I/O module is replaced with a different one, the collection of I/O modules will not match the collection that is in the battery-backed memory when the system is powered back on. Will be ON at power-up any time the collection of installed I/O modules has changed from the last time the PLC was powered on. |
| ST135 | \$IOConfigError | Status | Will be ON when there is an error in the manual I/O configuration. |
| ST136 | \$IOMapError | Status | Will be ON when there is an error in the manual I/O map. |
| ST137 | \$LoopTuning | Status | Will be ON while a PID loop is being Auto-tuned. |
| ST138 | \$MathStackOverflw | Status | Will be ON when a math operation has caused a stack overflow. |
| ST139 | \$FileSystemError | Status | Reserved. |
| ST140 | \$BufferOverflow | Status | Will be ON if the result of a string operation is larger than the string element can hold. |
| ST141 | \$DivideByZero | Status | Will be ON when a math operation has a divide by zero operation. |
| ST142 | \$DriverLoadError | Status | Will be ON if any device driver failed to load. |
| ST143 | \$DriverError | Status | Will be ON if any device is reporting a runtime error, use the Device List to see the specific device in error. |
| ST144 | \$SystemStopped | Status | Will be ON when a Switch to Program Mode (STOP) instruction has executed and put the CPU in Stop mode. |
| ST145 | \$QueuesFlushed | Status | Will be ON when Ethernet queues were forcibly cleared, possibly due to an open Ethernet device which isn't being serviced. |
| ST146 | \$CommStackOverrn | Status | Will be ON when the Ethernet stack was unable to allocate a packet buffer for an incoming packet. |
| ST147 | \$InstrTerminated | Status | Will be ON when a Device instruction was terminated before normal completion. |
| ST148 | \$CriticalIOError | Status | Will be ON when one or more modules failed to verify for longer than the verify filter time, and the system is in a permanent I/O shutdown. Power cycle or Re-Initialize I/O required to return to RUN mode. |
| ST149 | \$BatteryLow | Status | Will be ON if the battery voltage is below the minimum threshold, see the help section on Battery Backup for more information. |
| ST150 | \$LoginLockedOut | Status | Will be ON when PLC isn't accepting session passwords due to excessive password failures. See the help topic for Failed Login Attempts. |

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| Bit Locations with System-Assigned Nicknames (continued) | | | |
|--|-------------------|---------------|---|
| Bit Location | Nickname | Type | Description |
| ST151 | \$IndexRealigned | Status | Will be ON if the CPU adjusted a misaligned array index. Occurs when incorrectly indexing memory cast to a larger size...as in X[V0]:B, where V0 isn't 0, 8, 16, etc. |
| ST152 | \$IOError | Status | Will be ON an I/O Master is in a warning state, this can go from ON to OFF as module issues arise and are resolved. |
| ST153 | \$EthMasterError | Status | Will be ON when the Ethernet I/O Master detects an error with one of its Ethernet I/O Slaves - most likely an Ethernet I/O Slave is offline. |
| ST154 | \$EthSlaveOffline | Status | Will be ON when the Ethernet I/O Master detects one of its Ethernet I/O Slaves that is marked as Not Required to Go TO Run Mode is offline. |
| ST192 | \$PgmSwitchActive | Status | Will be ON when system is swapping program buffers during run mode program update. |
| ST193 | \$CurPgmBuffer | Status | Indicates active program buffer. Toggles when new program is downloaded. |
| ST194 | \$SysConfigUpdate | Status | Will be ON when system is updating system configuration. |
| ST200 | \$PgmROMUpdate | Status | Will be ON when system is writing program to ROM. |
| ST201 | \$SysCfgROMUpdate | Status | Will be ON when system is writing system configuration to ROM. |
| ST202 | \$DocROMUpdate | Status | Will be ON when system is writing project documentation to ROM. |
| ST203 | \$SysSetROMUpdate | Status | Will be ON when system is writing system setup to ROM. |
| ST204 | \$UserROMUpdate | Status | Will be ON when system is writing to user ROM |
| All bit locations starting at ST768 are retentive; they will hold their value through a power cycle. | | | |
| ST768 | \$SummerTime | Configuration | Set this bit ON to add one hour to \$LocalTime calculation to account for Daylight Savings Time. |

| Numeric Locations with System-Assigned Nicknames | | | |
|---|-----------------|-------------|--|
| Numeric Location | Nickname | Type | Description |
| DST0 | \$ScanCounter | Status | Contains the number of scans since the last STOP mode to RUN mode transition. |
| DST1 | \$ScanTime | Status | Contains a filtered average of the \$ElapsedTicks. |
| DST2 | \$MinScanTime | Status | Contains the length of time (in microseconds) of the shortest scan since the last STOP mode to RUN mode transition. |
| DST3 | \$MaxScanTime | Status | Contains the length of time (in microseconds) of the longest scan since the last STOP mode to RUN mode transition. |
| DST4 | \$ElapsedTicks | Status | Contains the number of microseconds for the last scan. |
| DST5 | \$Errors | Status | Compilation of bit flags from (ST128 ... ST159) which are considered to be errors. Currently contains the following: WATCHDOGTIMEOUT MEMORYERROR IOCONFIGERROR IOMAPERROR MATHSTACKOVERFLOW STOPPED COMM_STACK_OVERRUN PERMIOFAILURE |
| <i>Table continued on next page</i> | | | |

| Numeric Locations w/System-Assigned Nicknames (continued) | | | |
|---|--------------------|--------|--|
| Numeric Location | Nickname | Type | Description |
| DST6 | \$Warnings | Status | Compilation of bit flags from (ST128...159) which are considered to be warnings. Currently contains the following: INDEXERROR OUTOFRANGE INVALIDINSTRUCTION OVERFLOW FILESYSERROR BUFFEROVERFLOW DIVIDEBYZERO DRIVERLOADERROR DRIVERERROR QUEUES_FLUSHED BATTERYLOW |
| DST7 | \$Info | Status | Compilation of bit flags from (ST128...159) which are considered to be info. Currently contains the following: INSTALLEDIOCHANGED, LOOPTUNING, and LOGINLOCKEDOUT |
| DST8 | \$InvalidInstrAddr | Status | Contains address of invalid instruction on failed program validation: -1 = no invalid instruction address |
| DST10 | \$PLCMode | Status | Contains a value that reflects the current operational mode of the PLC: 2 = STOP mode 3 = RUN mode. |
| DST11 | \$PLCStatus | Status | Contains the PSTAT_XXX bits from ST192-223. |
| DST12 | \$FirmwareRev | Status | The revision number of the CPU's firmware in the form MMmmbbbb. |
| DST13 | \$DmRev | Status | The revision number of the CPU's Do-more! library in the form MMmmbbbb. |
| DST14 | \$HardwareRev | Status | The revision number of the CPU's PWB n the form 0000MMaa. |
| DST15 | \$BooterRev | Status | The revision number of the CPU's boot loader in the form MMmmbbbb. |
| DST16 | \$FPGARev | Status | The revision number of the CPU's FPGA code in the form MMMMmmmm. |
| DST17 | \$NodeNumber | Status | The Node Number assigned to the PLC. |
| DST18 | \$IPAddress | Status | The IP Address assigned to the PLC. Use the IP Address format of the Data View to see the value in the traditional dotted-decimal form. |
| DST19 | \$NetMask | Status | The Subnet Mask assigned to the PLC. Use the IP Address format of the Data View to see the value in the traditional dotted-decimal form. |
| DST20 | \$Gateway | Status | The Gateway IP Address assigned to the PLC. Use the IP Address format of the Data View to see the value in the traditional dotted-decimal form. |
| DST21 | \$UTC | Status | Contains the current UTC value (the number of seconds that have elapsed since Jan, 1 1970). |
| DST22 | \$LocalTime | Status | The current time calculated from the UTC value after adjustments for Time Zone and Daylight Savings. |
| DST23 | \$WatchdogTimeVal | Status | Contains the maximum number of milliseconds to allow for a single scan. |
| DST24 | \$DefaultBlockVer | Status | Used by C-More panels to enforce protocol compatibility. |
| DST25 | \$DefaultHeapVer | Status | Used by C-More panels to enforce protocol compatibility. |
| DST26 | \$IOVerifyTimeout | Status | Contains the minimum amount of time for a module to fail verification before a permanent IO failure shutdown. |
| DST27 | \$IOVerifyLastTO | Status | Contains the amount of time accrued during the last failure verification. |
| DST28 | \$IOMasterErrors | Status | Contains one bit per I/O Master, that bit will be ON if that I/O Master is reporting a Module Error, can go from ON to OFF as module errors arise and are resolved. |
| DST29 | \$PLCType | Status | Values that indicate the PLC type: 0: Unknown 1: DM-SIM (Do-more! Simulator) 2: H2-DM1 (DirectLOGIC 205 Series) 3: H2-DM1E (DirectLOGIC 205 Series with on-board Ethernet) 4: T1H-DM1 (Terminator I/O Series) 5: T1H-DM1E (Terminator I/O Series with on-board Ethernet) 6: BRX-DM1 (BRX series) 7: BRX-DM1E (BRX Series with on-board Ethernet) see DST53 for BRX Series PLC Sub-types |

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| Numeric Locations w/System-Assigned Nicknames (continued) | | | |
|---|------------------|--------|--|
| Numeric Location | Nickname | Type | Description |
| <p>The following 8 locations serve as a 4 x 2 stack that contains the last 4 error codes and the address of the instruction that reported that error.</p> <p>To locate the instruction that reported the error, Open Search -> Goto -> Goto Address or Rung Number (or press Ctrl+G), then enter the value in the associated LastErrorAddr location in the Address / Rung Number field and make sure to select Absolute Address then click OK. This will move the edit cursor to the code-block that contains the rung that has the instruction that reported the error code.</p> | | | |
| DST30 | \$LastError1 | Status | Contains the code of the most recently reported error. |
| DST31 | \$LastErrorAddr1 | Status | Contains the address of the most recently reported error. |
| DST32 | \$LastError2 | Status | Contains the code of the 2nd most recently reported error. |
| DST33 | \$LastErrorAddr2 | Status | Contains the address of the 2nd most recently reported error. |
| DST34 | \$LastError3 | Status | Contains the code of the 3rd most recently reported error. |
| DST35 | \$LastErrorAddr3 | Status | Contains the address of the 3rd most recently reported error. |
| DST36 | \$LastError4 | Status | Contains the code of the 4th most recently reported error. |
| DST37 | \$LastErrorAddr4 | Status | Contains the address of the 4th most recently reported error. |
| | | | <p>The following is a list of the possible error codes that appear in the \$LastError locations (DST30, DST32, DST34, DST36).</p> <ul style="list-style-type: none"> -2 - UNKNOWN_ERROR ----- An unexpected error occurred. This can be an attempted operation on a POM that is not installed or a POM that does not support that operation. -1 - RESERVED ----- Reserved. 00 - NO_ERROR ----- No error. 10 - TIMEOUT ----- Operation timed out. 11 - RXWX_NAK ----- The target device NAKed a DLRX or DLWX request. 12 - UNKNOWN_RESPONSE ----- Unknown response. 13 - MODULE_NOT_INSTALLED ----- An Attempt was made to access an I/O module that isn't installed. 14 - MODULE_ACCESS_FAILED ----- Unable to access I/O module. 15 - DEVICE_ALREADY_OPEN ----- An attempt was made to open a Device that is already open. 16 - DEVICE_NOT_OPEN ----- An attempt was made to use a Device that hasn't been opened. 17 - INVALID_DATA ----- Invalid data in response. 18 - EXCEPTION_RESPONSE ----- Exception response from MRX or MWX request. 19 - INVALID_CRC ----- Invalid CRC in MRX or MWX request. 20 - CONNECTION_FAILED ----- Couldn't open TCP connection with specified device. 21 - UNEXPECTED_SMTP_RESP ----- Unexpected response from SMTP server. 22 - POP3_ERROR_RESP ----- Error response from POP3 server. 23 - MODULE_ERROR_RESP ----- I/O module returned and error response. 24 - MODULE_TIMEOUT ----- Timed out while waiting for an I/O module to respond. 25 - ILLEGAL_OPERATION ----- An operation was attempted that is illegal in the current mode or configuration. 26 - DEVICE_NOT_CONNECTED ----- An attempt was made to use a Device that is not connected. 27 - INDEXERROR ----- Array index was out of bounds. 28 - DIVEDEBYZERO ----- Divide by Zero. 29 - OTOFRANGE ----- Parameter out of range. 30 - OVERFLOW ----- Numeric value overflow. 31 - WATHCDOGTIMEOUT ----- Watchdog timeout. 32 - STOPPED ----- PLC Stopped. 33 - BUFFEROVERFLOW ----- Result of an attempted string operation was longer than the target string and was truncated. 34 - INSTRUCTION_TERMINATED --- Multi-scan device instruction was forcibly terminated before completion. 35 - EIPMSG_RESP_TOO_LONG ----- Received a response that exceeded the maximum length. <p>Cell continued on next page</p> |
| Table continued on next page | | | |

| Numeric Locations w/System-Assigned Nicknames (continued) | | | |
|---|-------------------|---------------|--|
| Numeric Location | Nickname | Type | Description |
| | | | <p><i>Cell continued from previous page</i></p> <p>36 - EIPMSG_ERROR_RESPONSE ---- Received an error response from adapter. 37 - DMPP_ERROR_RESPONSE ----- An error was returned to a peer to peer request in an RX or WX instruction. 38 - FILESYS_ERROR ----- File system returned an error. 39 - FILESYS_NOMEDIA ----- File operation failed because there is no media card installed or the media card didn't mount properly. 40 - FILESYS_NODIRSTART ----- The file system's .StartFolderScan structure member must be set to start a scan with FILEQUERY instruction. 41 - AXIS_UNCONFIGURED ----- Axis unconfigured. Must be configured with AXCONFIG prior to use. 42 - AXIS_INVALID_MODE ----- Requested an unsupported Axis mode. 43 - AXIS_UNKNOWN_ERROR ----- Axis controller received unknown command. 44 - AXIS_COMMAND_PENDING ---- Attempted to send command to axis controller with a command pending. 45 - AXIS_INVALID_PARM ----- Axis command contained an invalid parameter. 46 - AXIS_ESTOP ----- Attempted operation on an Axis that is disabled through the .MasterEnable structure member. 47 - AXIS_DISABLED ----- Axis instruction was terminated prior to normal completion. 48 - AXIS_SCRIPT_BUSY ----- Attempted new script operation while script is running. 49 - AXIS_LINROT_MISMATCH ---- Linear / Rotary mismatch between current Axis configuration and request. 50 - AXIS_FAULT ----- Axis has faulted. 51 - TABLE_INVALID_PARM ----- Invalid parameter in table driven output function.</p> |
| DST38 | \$LastProtoError | Status | Contains the error response value from last protocol-based instruction (RX, WX, MRX, MWX, EIPMSG, DLRX, DLWX, etc.). |
| DST39 | \$InhibitErrors | Configuration | Specifies which errors should not result in fatal shutdown of the CPU. |
| DST40 | \$EthDroppedPckts | Status | Contains the number of Ethernet packets that have been lost since the last power-cycle. |
| DST41 | \$EthStoppedIntr | Status | Contains the number of times the Ethernet interrupt was shut off due to excessive network traffic. |
| DST42 | \$EthSendErrors | Status | Contains the number of Ethernet send errors that have occurred since the last power-cycle. |
| DST43 | \$EthPktsReceived | Status | Contains the total number of Ethernet packets that have been received since the last power-cycle |
| DST44 | \$EthPktsSent | Status | Contains the total number of Ethernet packets that have been sent since the last power-cycle. |
| DST45 | \$TuneDeadBand | Configuration | Deadband value used the by the PID Autotune process. |
| DST46 | \$TuneSampleTime | Configuration | Sample time value used the by the PID Autotune process. |
| DST47 | \$TuneMinPVChange | Configuration | The Minimum PV Change value used the by the PID Autotune process. |
| DST48 | \$TuneOutputBump | Configuration | The Output bump value used the by the PID Autotune process. |
| DST49 | \$EthMissedFrames | Status | Contains the total number of packets since the last power-cycle that the Ethernet hardware did not process because the packets were incorrectly formed. |
| DST50 | \$Installed POM | Status | 255 - No POM installed 0 - Unknown POM installed 1 - BX-P-USB-B ----- (USB POM with USB-B connector) 2 - BX-P-ECOMLT ----- (Ethernet POM with RJ-45 connector) 3 - BX-P-SER2-TERM --- (Serial RS-232 with 3-pin header) 4 - BX-P-SER4-TERM --- (Serial RS-485 with 3-pin header) 5 - BX-P-SER2-RJ12 --- (Serial RS-232 with RJ-12 connector) |
| <i>Table continued on next page</i> | | | |

| Numeric Locations w/System-Assigned Nicknames (continued) | | | |
|---|---------------------------|--------|--|
| Numeric Location | Nickname | Type | Description |
| DST51 | \$FatalTermCode | Status | <p>When a fatal error occurs, the ERR LED will be on and this register will contain a value that explains what caused the fatal error.</p> <p>0 : No Fatal Error Code</p> <p>1 : any of the following conditions: watchdog timeout, memory error, I/O Error - configuration or mapping - typically happens if the I/O layout changed, Ethernet I/O Master detected an error (usually a missing slave or the I/O layout in a slave has changed).</p> <p>2 : An I/O module in the local base is not responding to backplane requests</p> <p>3 : An Ethernet I/O Slave that is marked as required is not responding.</p> <p>4 : An instruction that was downloaded to the PLC is not valid for the firmware version in the CPU. This will typically only happen if the firmware is downgraded without clearing the Program section of the PLC first.</p> <p>5 : A Force Watchdog Error (WATCHDOG) instruction was executed.</p> <p>6 : An error occurred in the program, typically an issue in the MATH stack (overflow / underflow).</p> <p>7 : The limit on the number of local expansion modules that are allowed in the BRX system has been exceeded.</p> |
| DST52 | \$ActiveSessions | Status | <p>The number of active communications sessions using Do-more! protocol - DmDesigner, HMI (if it's using DM driver), RX/WX connections to other DM CPUs, or any 3rd party device that's using DM protocol.</p> <p>This is for all ports, ethernet or serial or usb. Maximum of 32 sessions</p> |
| DST53 | \$PLCSubType (for BRX) | Status | <p>For the BRX Series PLCs these are the valid Sub-types:</p> <p>128: BX-DM1E-M 129: BX-DM1E-M-D 144: BX-DM1-10ED1-D 145: BX-DM1-10ED2-D 146: BX-DM1-10ER-D 147: BX-DM1-10AR-D 148: BX-DM1E-10ED13-D 149: BX-DM1E-10ED23-D 150: BX-DM1E-10ER3-D 151: BX-DM1E-10AR3-D 4256: BX-DM1-18ED1 4257: BX-DM1-18ED2 4258: BX-DM1-18ER 4259: BX-DM1-18ED1-D 4260: BX-DM1-18ED2-D 4261: BX-DM1-18ER-D 4514: BX-DM1-18AR 4768: BX-DM1E-18ED13 4769: BX-DM1E-18ED23 4770: BX-DM1E-18ER3 4771: BX-DM1E-18ED13-D 4772: BX-DM1E-18ED23-D 4773: BX-DM1E-18ER3-D 5026: BX-DM1E-18AR3 8368: BX-DM1-36ED1 8369: BX-DM1-36ED2 8370: BX-DM1-36ER 8371: BX-DM1-36ED1-D 8372: BX-DM1-36ED2-D 8373: BX-DM1-36ER-D 8626: BX-DM1-36AR 8886: BX-DM1E-36ED13 8887: BX-DM1E-36ED23</p> <p><i>Cell continued on next page</i></p> |

Table continued on next page

| Numeric Locations w/System-Assigned Nicknames (continued) | | | |
|---|--|---------------|--|
| Numeric Location | Nickname | Type | Description |
| | | | <p><i>Cell continued from previous page</i></p> <p>8888: BX-DM1E-36ER3 8889: BX-DM1E-36ED13-D 8890: BX-DM1E-36ED23-D 8891: BX-DM1E-36ER3-D 9144: BX-DM1E-36AR3</p> |
| | | | <p>The BX-P-ECOMLT POM requires functional IP Addressing information to operate on an Ethernet network. Because the ECOMLT can be hot-swapped into an operating BRX CPU, you have the option of specifying where the IP Addressing for the ECOMLT resides:</p> <ul style="list-style-type: none"> • Use the IP Addressing information that was statically assigned by NetEdit. In this mode the ECOMLT operates like a traditional ECOM. • Any ECOMLT that is installed will temporarily use the IP Addressing information that has been provided in the System Configuration. If the ECOMLT already has a statically assigned IP address that information will not be used. This will allow any external network connection - like Do-more! Designer - to operate with any ECOMLT that is installed in this BRX PLC, because the BRX CPU will assign the IP address. • Overwrite the existing IP Addressing information in ROM of the ECOMLT with the values from DST55, DST56, and DST57, then use the newly written values. |
| DST54 | \$POMIpSetupSrc | Configuration | <p>Specifies the source for the TCP/IP configuration for the ECOMLT POM (value in the least significant byte):</p> <p>0: uses the IP Address information in the BX-P-ECOMLT POM; also stores a copy of that information in the DST55, DST56, and DST57.</p> <p>1: ignore values from DST55, DST56, DST57; do not write values from DST55, DST56, and DST57 to the ECOMLT.</p> <p>2: ignores any existing IP addressing information in the ECOMLT and uses the values currently stored in DST55, DST56, and DST57.</p> <p>3: overwrite the IP Addressing information in ROM of the ECOMLT with the values from DST55, DST56, and DST57. DST54 will change to 0 after the ROM update is complete. The steps to manually change from the default mode of 0 in DST54 to using a given IP configuration are as follows:</p> <ul style="list-style-type: none"> • Write a value of 1 to DST54 to get the ECOMLT to ignore values from the ECOMLT. • After delaying for a few milliseconds (in case the ECOMLT was already in the process of writing the values) write the new IP Addressing information to DST55, DST56, and DST57. • Then write a value of 2 to DST54 to instruct the ECOMLT to update its ROM with the new values. • DST54 will return to a value of 0 when the process is complete. <p>4 - 254: Reserved.</p> <p>255: ECOMLT reporting an error in high Word of DST54</p> |
| DST55 | \$POMIpAddress | Configuration | The IP Address of the BX-P-ECOMLT POM that is installed. |
| DST56 | \$POMIpNetmask | Configuration | The Netmask of the BX-P-ECOMLT POM that is installed. |
| DST57 | \$POMIpGateway | Configuration | The Gateway Address of the BX-P-ECOMLT POM that is installed. |
| DST58 | \$ProgramChecksum | | A 32-bit value that is the checksum of the current program data. |
| DST384 | \$TimeZone (signed integer in minutes) | Configuration | Contains the number of minutes to apply to the UTC value for the current location of the PLC. |
| DST385 | \$WatchdogReboots | Status | The number of hardware and / or software watchdog reboots that have occurred since the last power-cycle. Each time the CPU watchdog fires it will increment the value. When this value reaches 10 it will drop the PLC into Program mode on the next restart. This is to prevent the CPU from getting stuck in an unrecoverable crash loop. |
| DST386 | \$FailedLoginCnt | Status | The number of login attempts that have failed. |

Table continued on next page

| Numeric Locations w/System-Assigned Nicknames (continued) | | | |
|---|------------------|---------------|---|
| Numeric Location | Nickname | Type | Description |
| DST387 | \$ProductID | Configuration | An 8-digit Hex value that is used by Generate DMLoader Image and DMLoader to validate the target CPU before downloading the contents of the image file. |
| DST388 | \$ProductVersion | Configuration | An 8-digit Hex value (MMmmBBBB - where MM is the major version, mm is minor version and BBBB is the build number) that is used by Generate DMLoader Image and DMLoader to validate the target CPU before downloading the contents of the image file. |
| DST410 | \$ModeChngFailed | Status | <p>If an attempt to transition between PLC modes is successful this register will contain 0.</p> <p>If an attempt to transition between PLC modes fails, this location will contain one of the following failure codes:</p> <ul style="list-style-type: none"> 100 - low level hardware initialization failed 101 - one or more modules failed to verify for longer than the verify filter time, and the system is in a permanent I/O shutdown. Power cycle or Re-Initialize I/O required to return to RUN mode 102 - there is an error in the manual I/O map 103 - there is an error in the manual I/O configuration 104 - the attempt to initialize the local I/O failed 105 - one or more Ethernet I/O Slaves is offline 106 - the Ethernet I/O Master failed to initialize 107 - an invalid instruction was downloaded to the CPU |

Notes: