ERROR CODES AND SYSTEM LOCATIONS

APPENDIX
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In This Appendix...

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
Table continued on next page		

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	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. 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. 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 $Main will be disabled and the Initial Stage will be enabled if the CPU powers up in Run mode, or on a Program -to-Run transition. Note: the Difference Between Two Date / Times (DTDIFF) instruction with SDT1 ($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.
ST16	$TermRunMode	Status	Will be ON if the CPU is in RUN mode and the switch is in TERM position. 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).
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.
Table continued on next page			

Bit Locations with System-Assigned Nicknames (continued)

Bit Location	Nickname	Type	Description
ST132	$OutOfRange	Status	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. Two common examples (assume the normal range of C is C0–C2047): If V0 = 9999, then trying to reference C[V0] = C9999 would fail because 9999 is outside the range of configured C locations. 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.
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
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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
			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. 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.
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.
			The following is a list of the possible error codes that appear in the $LastError locations (DST30, DST32, DST34, DST36). -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 - OUTOFRANGE --------------- 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. ***Cell continued on next page***

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Numeric Locations w/System-Assigned Nicknames (continued)

Numeric Location	Nickname	Type	Description
			Cell continued from previous page 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.
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)
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Numeric Locations w/System-Assigned Nicknames (continued)

Numeric Location	Nickname	Type	Description
DST51	$FatalTermCode	Status	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. 0 : No Fatal Error Code 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). 2 : An I/O module in the local base is not responding to backplane requests 3 : An Ethernet I/O Slave that is marked as required is not responding. 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. 5 : A Force Watchdog Error (WATCHDOG) instruction was executed. 6: An error occurred in the program, typically an issue in the MATH stack (overflow / underflow). 7 : The limit on the number of local expansion modules that are allowed in the BRX system has been exceeded.
DST52	$ActiveSessions	Status	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. This is for all ports, ethernet or serial or usb. Maximum of 32 sessions
DST53	$PLCSubType (for BRX)	Status	For the BRX Series PLCs these are the valid Sub-types: 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 ***Cell continued on next page***

Table continued on next page

Numeric Locations w/System-Assigned Nicknames (continued)

Numeric Location	Nickname	Type	Description
			Cell continued from previous page 8888: BX-DM1E-36ER3 8889: BX-DM1E-36ED13-D 8890: BX-DM1E-36ED23-D 8891: BX-DM1E-36ER3-D 9144: BX-DM1E-36AR3
			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: • 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	Specifies the source for the TCP/IP configuration for the ECOMLT POM (value in the least significant byte): 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. 1: ignore values from DST55, DST56, DST57; do not write values from DST55, DST56, and DST57 to the ECOMLT. 2: ignores any existing IP addressing information in the ECOMLT and uses the values currently stored in DST55, DST56, and DST57. 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: • 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 is 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 it's ROM with the new values. • DST54 will return to a value of 0 when the process is complete. 4 - 254: Reserved. 255: ECOMLT reporting an error in high Word of DST54
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.
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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	If an attempt to transition between PLC modes is successful this register will contain 0. If an attempt to transition between PLC modes fails, this location will contain one of the following failure codes: 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: