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The Industry Leader In HazMon Technology



Overview

This application note describes how to communicate to a CMC WS2-HM web server from an RSLogix 5000 based PLC. The intent is to copy multiple data tables from the web server into one composite array in the PLC. The data is copied as received from the web server and no further data manipulation is performed. It is the responsibility of the user to manipulate and map the data into their PLC logic to provide a fully functional Hazmon system.

Prerequisites

This application note assumes the following prerequisite conditions are met:

1. The user has knowledge of the RSLogix 5000 programming environment
2. The PLC is a CompactLogix or ControlLogix with Ethernet capability
3. The web server is fully setup and configured, including:
 - a. Compatible IP Address with the PLC
 - b. Sensors mapped to PLC appropriate locations
4. Bus Converter and sensor networks are fully wired and tested and connected to the web server
5. The web server and the PLC are connected via Ethernet
6. Web server is set to EthernetIP (not Modbus), Configuration-> System. To apply the change from Modbus to EthernetIP and vice versa the Sensor Network needs to be stopped and started again after selecting the desired protocol.

Scanning Time

Optimal scanning time is around **250 mS**. The web server updates the data table in up to 1 second periods so scanning it 4 times a second is more than enough.



Procedure

1. Web Server Addition
 - a. Add a New Ethernet Module to the RSLogix 5000 project

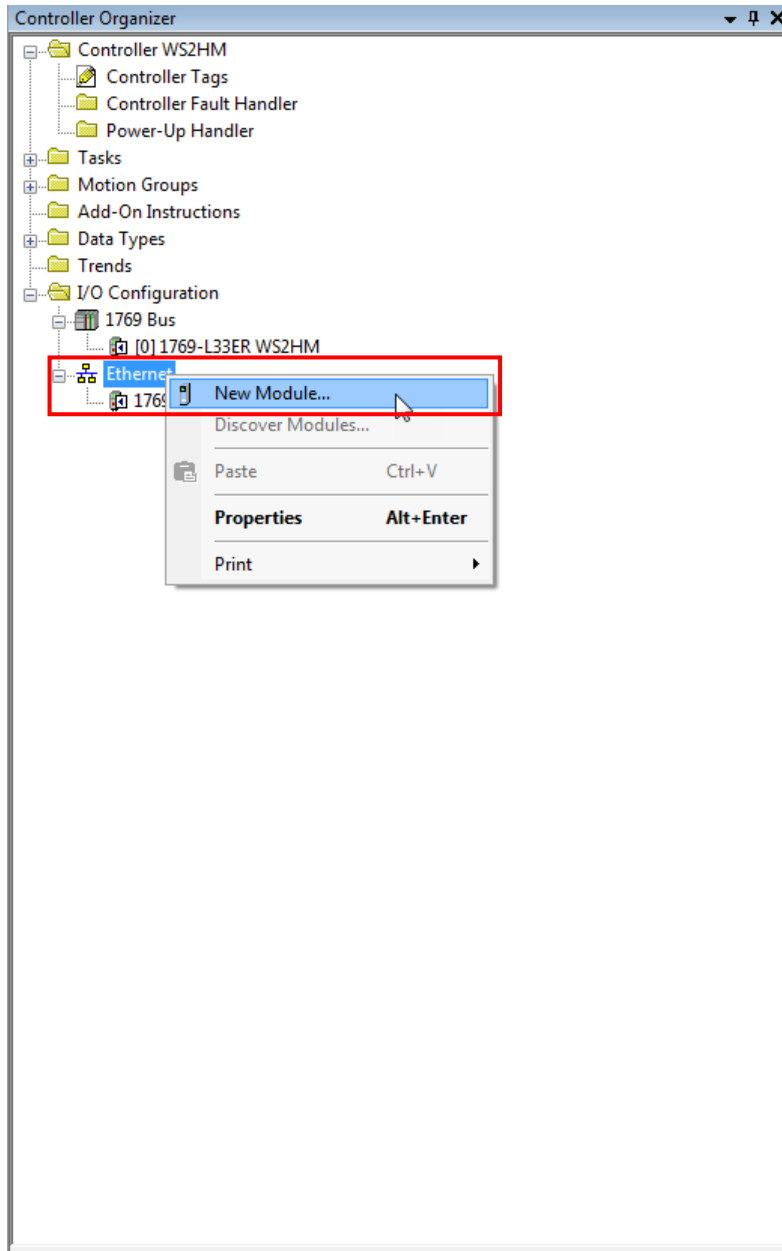


Figure 1: Web Server Addition



- 2. Select Module Type
 - a. Type in “generic” to filter on Generic Modules
 - b. Select the Generic Ethernet Module
 - c. Press the Create button

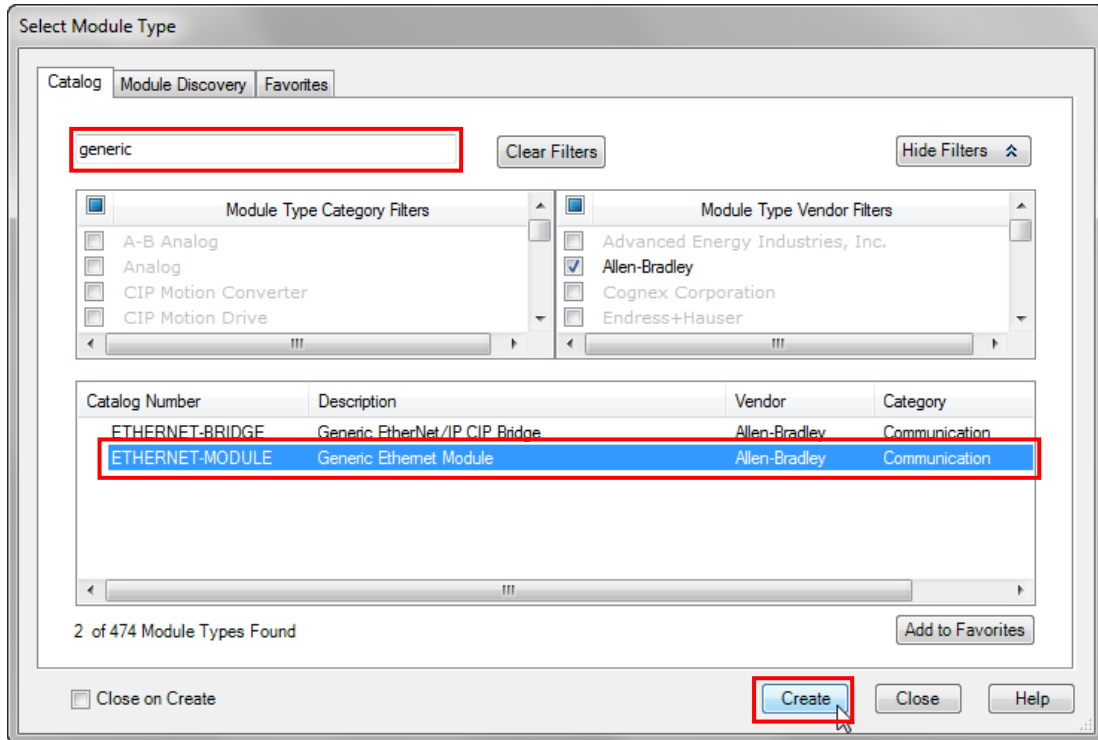


Figure 2: Select Module Type



3. Ethernet Module General Properties
 - a. Enter a name for the module
 - b. Set Comm Format to Data – INT
 - c. Enter the IP address of the WS2HM web server
 - d. Enter the Connection Parameters
 - i. Set Input to Instance 104, Size 202
 - ii. Set Output to Instance 101, Size 16
 - iii. Set Configuration to Instance 102, Size 16
 - e. Press the OK button

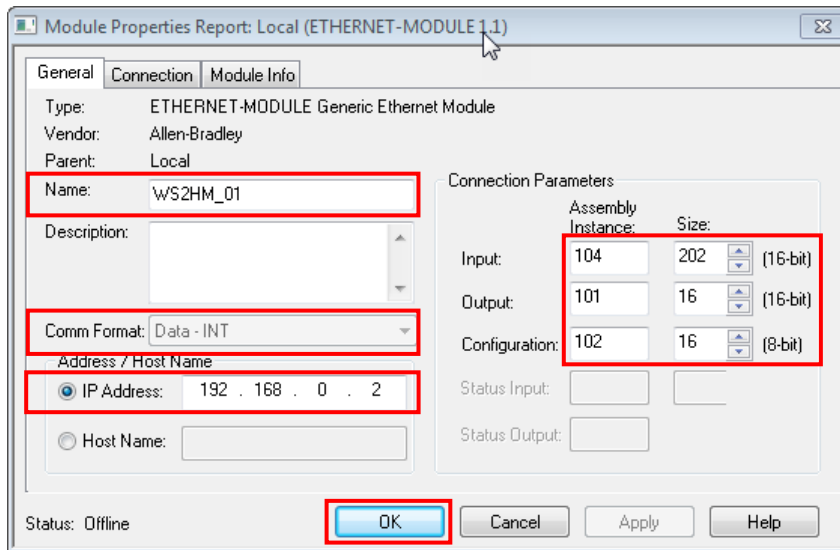


Figure 3: Ethernet Module General Properties



- 4. Ethernet Module Verification
 - a. Verify the module appears in the Controller Organizer tree
 - b. Double-click the Controller Tags to review the newly created tags

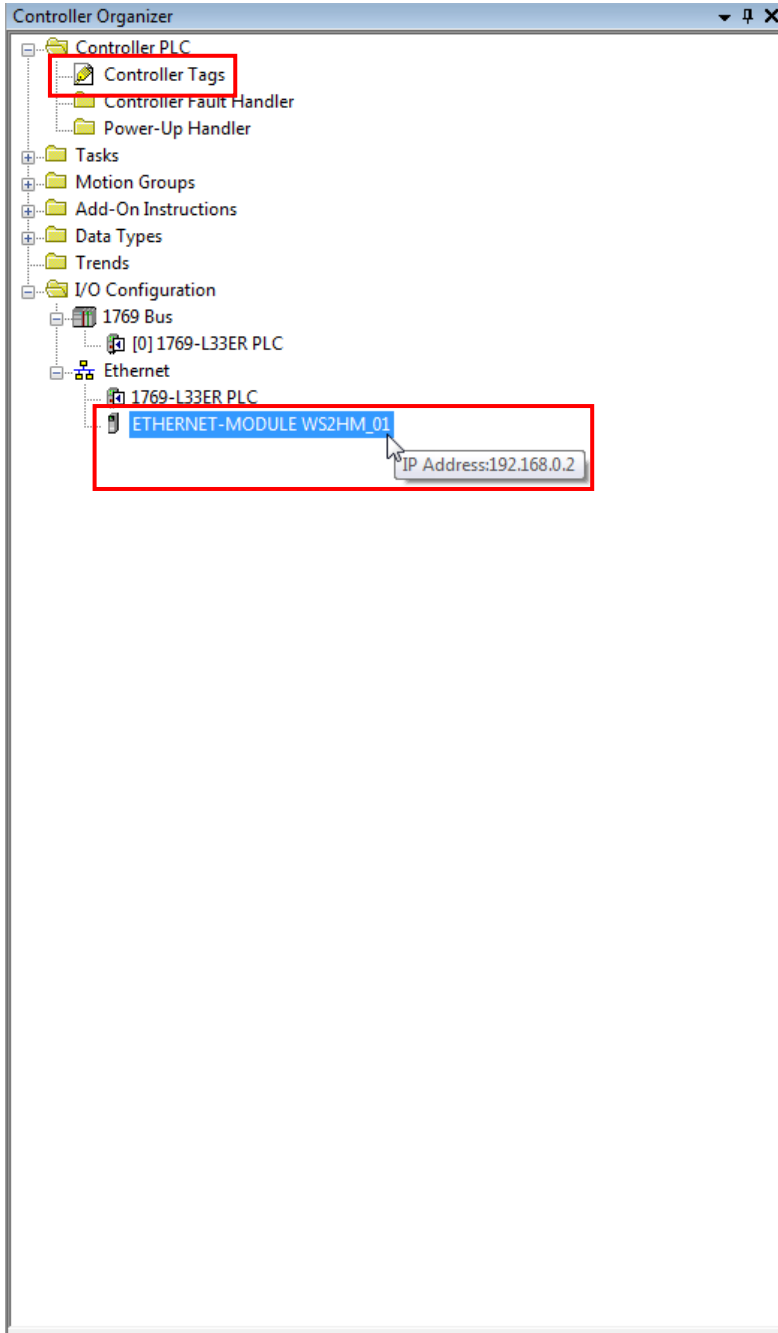


Figure 4: Ethernet Module Verification



5. Module Tags Verification

- a. The Input Assembly tags prefixed with WS2HM_01:I in this example are used to receive responses from the WS2HM web server
- b. The Output Assembly tags prefixed with WS2HM_01:O in this example are used to send commands to the web server
- c. Input Assembly details
 - i. The Input Assembly is 202 words (404 bytes) and the WS2HM web server must send more data than will fit in this assembly
 - ii. The WS2HM web server has three (3) different blocks of data that must be received to have complete information on the web server, bus converters, and sensors
 - iii. Creation of an RSLogix 5000 Routine is required to programmatically cycle through each of the three data blocks and build a composite destination array for all of the data

Name	Alias For	Base Tag	Data Type
+ WS2HM_01:C			AB:ETHERNET_MODULE:C:0
+ WS2HM_01:I			AB:ETHERNET_MODULE_INT_404Bytes:I:0
+ WS2HM_01:O			AB:ETHERNET_MODULE_INT_32Bytes:O:0

Figure 5: Module Tags Verification



- 6. RSLogix 5000 Routine Creation
 - a. Create a New Routine under MainProgram

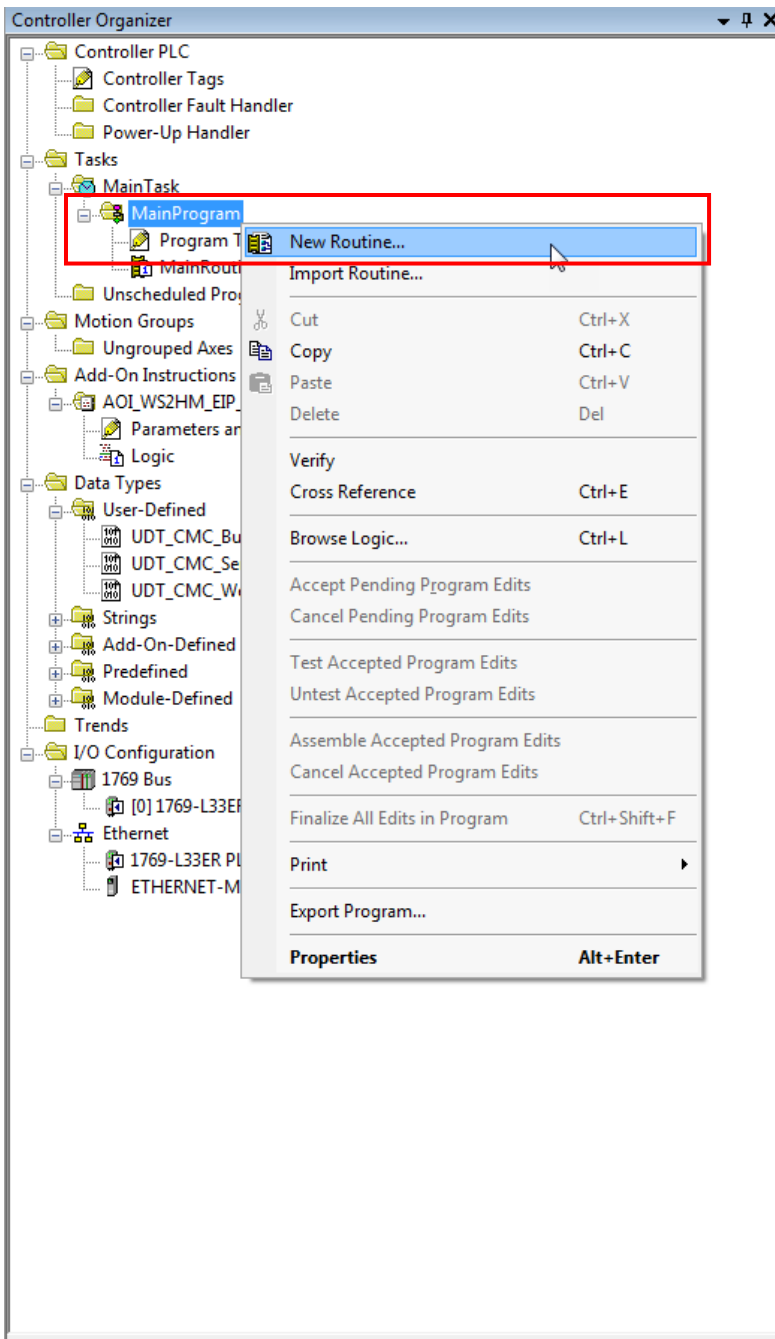


Figure 6: RSLogix 5000 Routine Creation



7. New Routine Details
 - a. Enter a New Routine Name
 - b. Select Ladder Diagram Type
 - c. Select MainProgram
 - d. Press the OK button

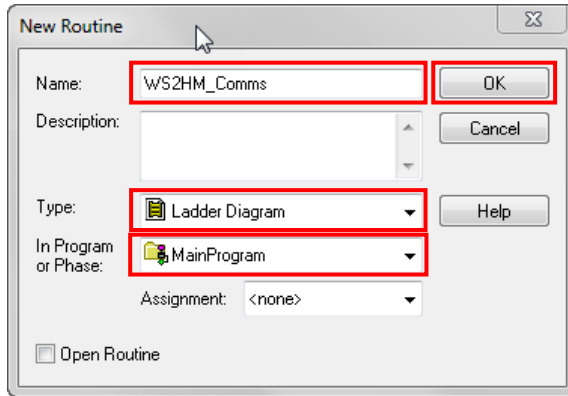


Figure 7: New Routine Details



- 8. Program Tags
 - a. Add tags to the Program as shown below

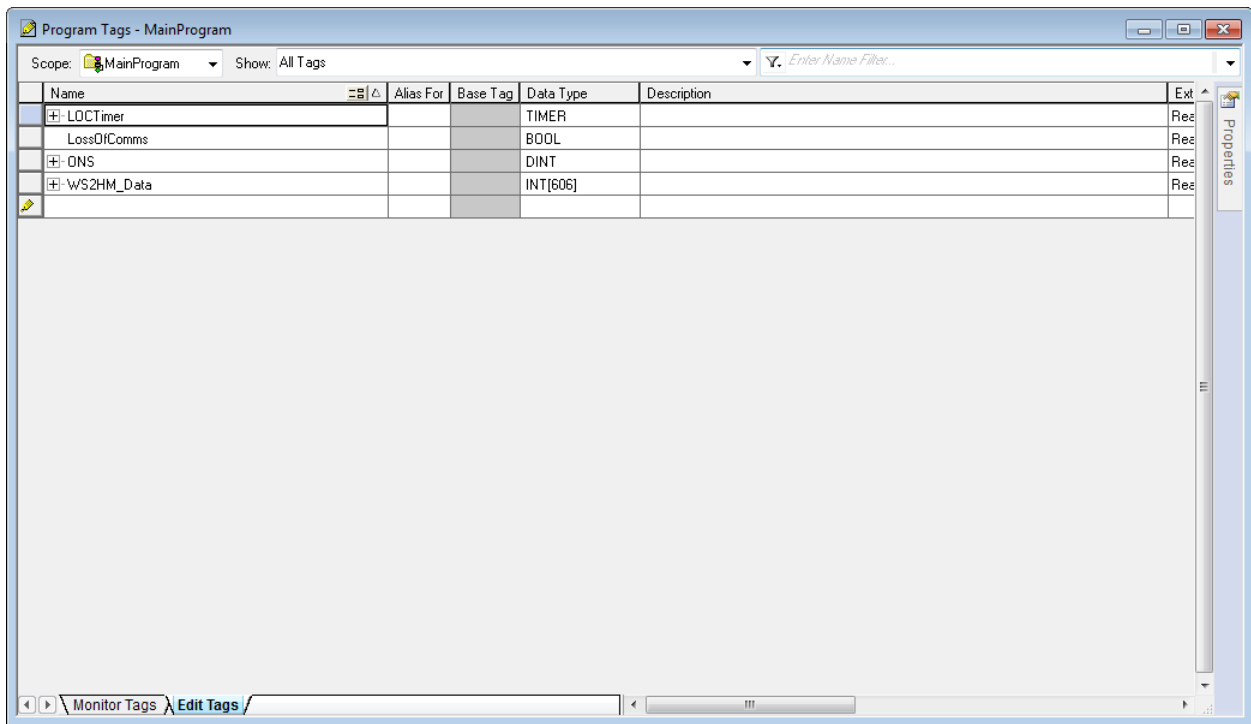


Figure 8: Program Tags



- 9. Routine Logic
 - a. Add logic to the Routine as shown below

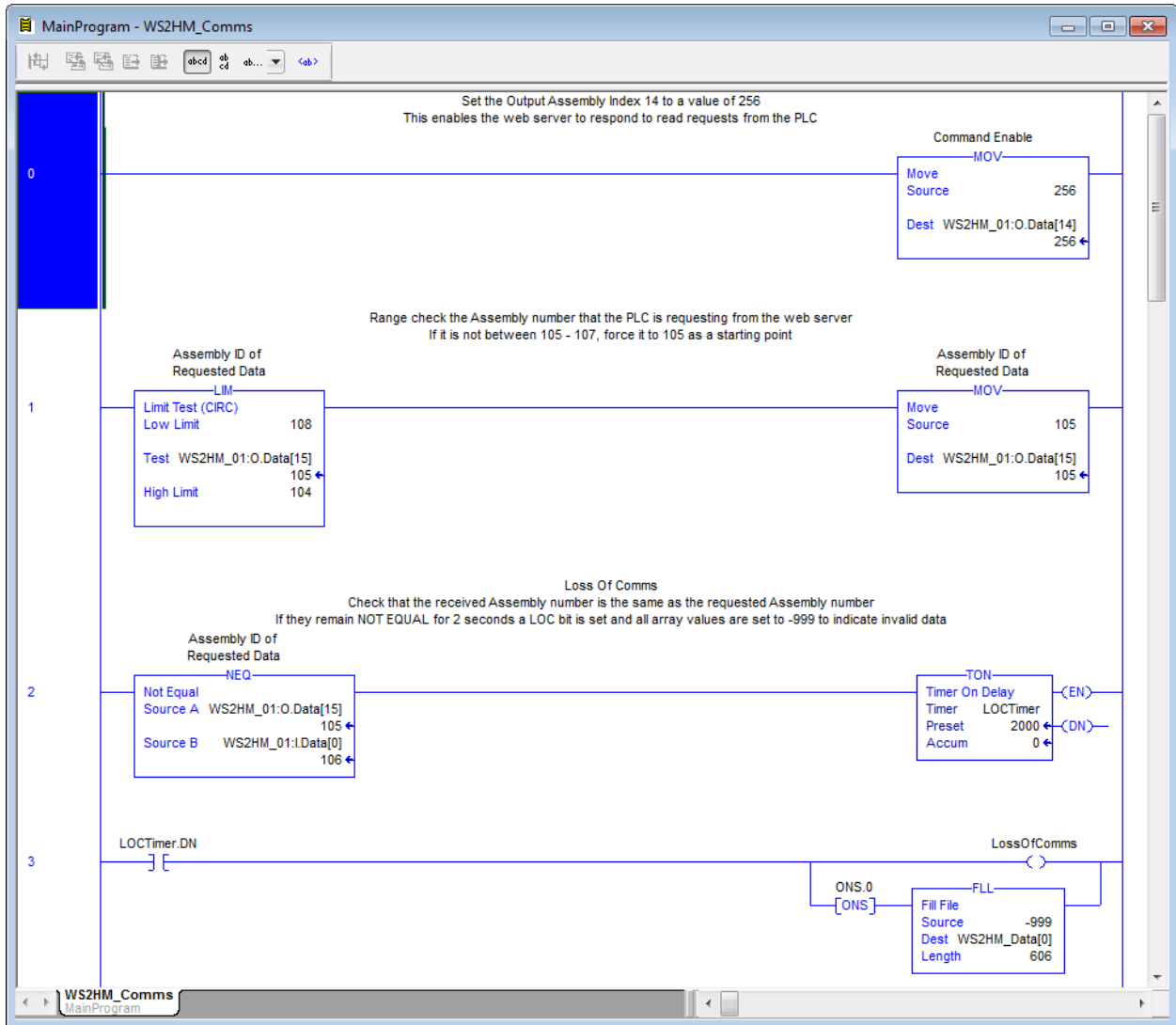


Figure 9: Routine Logic



10. Routine Logic (cont'd)

a. Continue to add the logic below to the Routine

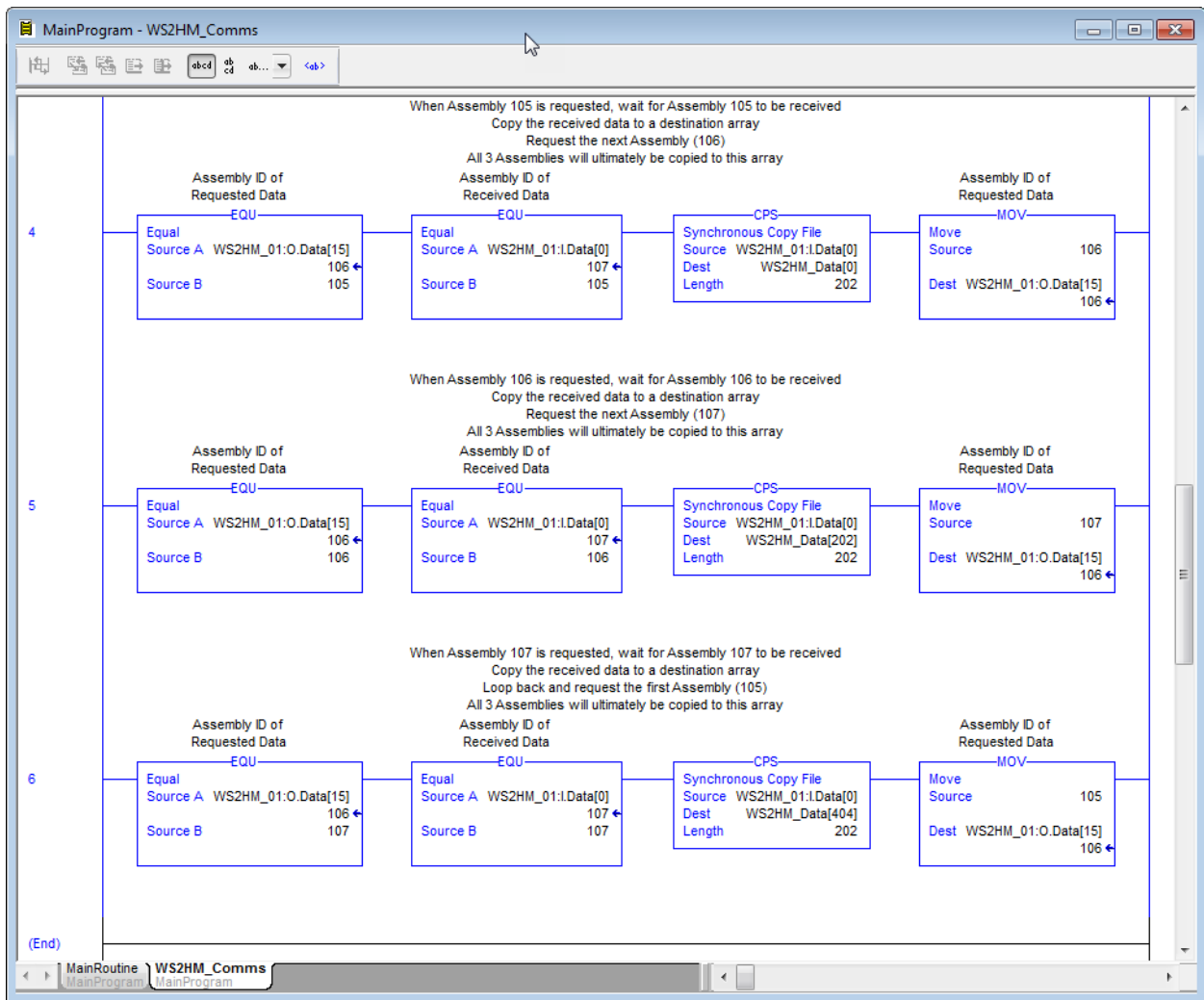


Figure 10: Routine Logic (cont'd)



11. Test Communications

- a. Download the Project to the PLC and set to Run Mode
- b. Verify the I/O status LED in RSLogix 5000 is steady green
- c. Verify no errors on the Ethernet Module entry in the RSLogix 5000 I/O tree
- d. Verify no LossOfComms bit in the RSLogix 5000 Routine
- e. Monitor the PLC array tags and verify sensors are mapped as expected

WS2-HM Data Table Details

- 1. Watchdog
 - a. The watchdog value in Assembly 107 increments by a value of 1 approximately every 1 second
- 2. Server State B
 - a. The Server State B value is currently not used
 - b. It currently contains the same value as the watchdog
- 3. Refer to the Modbus Appendix in the WS2-HM manual for a breakdown of status bits

Color Legend	
Not Used	
Assembly ID	
Sensor Data	
Converter Data	
Not Used	



WS2HM Data Tables (Assembly 105 – 107)

Index, words	0		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15					
index, bytes	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
0	105				Value 1		State 1		Value 2		State 2		Value 3		State 3		Value 4		State 4		Value 5		State 5		Value 6		State 6		Value 7		State 7					
1	Value 8		State 8		Value 9		State 9		Value 10		State 10		Value 11		State 11		Value 12		State 12		Value 13		State 13		Value 14		State 14		Value 15		State 15					
2	Value 16		State 16		Value 17		State 17		Value 18		State 18		Value 19		State 19		Value 20		State 20		Value 21		State 21		Value 22		State 22		Value 23		State 23					
3	Value 24		State 24		Value 25		State 25		Value 26		State 26		Value 27		State 27		Value 28		State 28		Value 29		State 29		Value 30		State 30		Value 31		State 31					
4	Value 32		State 32		Value 33		State 33		Value 34		State 34		Value 35		State 35		Value 36		State 36		Value 37		State 37		Value 38		State 38		Value 39		State 39					
5	Value 40		State 40		Value 41		State 41		Value 42		State 42		Value 43		State 43		Value 44		State 44		Value 45		State 45		Value 46		State 46		Value 47		State 47					
6	Value 48		State 48		Value 49		State 49		Value 50		State 50		Value 51		State 51		Value 52		State 52		Value 53		State 53		Value 54		State 54		Value 55		State 55					
7	Value 56		State 56		Value 57		State 57		Value 58		State 58		Value 59		State 59		Value 60		State 60		Value 61		State 61		Value 62		State 62		Value 63		State 63					
8	Value 64		State 64		Value 65		State 65		Value 66		State 66		Value 67		State 67		Value 68		State 68		Value 69		State 69		Value 70		State 70		Value 71		State 71					
9	Value 72		State 72		Value 73		State 73		Value 74		State 74		Value 75		State 75		Value 76		State 76		Value 77		State 77		Value 78		State 78		Value 79		State 79					
10	Value 80		State 80		Value 81		State 81		Value 82		State 82		Value 83		State 83		Value 84		State 84		Value 85		State 85		Value 86		State 86		Value 87		State 87					
11	Value 88		State 88		Value 89		State 89		Value 90		State 90		Value 91		State 91		Value 92		State 92		Value 93		State 93		Value 94		State 94		Value 95		State 95					
12	Value 96		State 96		Value 97		State 97		Value 98		State 98		Value 99		State 99		Value 100		State 100																	

Index, words	0		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15					
index, bytes	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
0	106				Value 101		State 101		Value 102		State 102		Value 103		State 103		Value 104		State 104		Value 105		State 105		Value 106		State 106		Value 107		State 107					
1	Value 108		State 108		Value 109		State 109		Value 110		State 110		Value 111		State 111		Value 112		State 112		Value 113		State 113		Value 114		State 114		Value 115		State 115					
2	Value 116		State 116		Value 117		State 117		Value 118		State 118		Value 119		State 119		Value 120		State 120		Value 121		State 121		Value 122		State 122		Value 123		State 123					
3	Value 124		State 124		Value 125		State 125		Value 126		State 126		Value 127		State 127		Value 128		State 128		Value 129		State 129		Value 130		State 130		Value 131		State 131					
4	Value 132		State 132		Value 133		State 133		Value 134		State 134		Value 135		State 135		Value 136		State 136		Value 137		State 137		Value 138		State 138		Value 139		State 139					
5	Value 140		State 140		Value 141		State 141		Value 142		State 142		Value 143		State 143		Value 144		State 144		Value 145		State 145		Value 146		State 146		Value 147		State 147					
6	Value 148		State 148		Value 149		State 149		Value 150		State 150		Value 151		State 151		Value 152		State 152		Value 153		State 153		Value 154		State 154		Value 155		State 155					
7	Value 156		State 156		Value 157		State 157		Value 158		State 158		Value 159		State 159		Value 160		State 160		Value 161		State 161		Value 162		State 162		Value 163		State 163					
8	Value 164		State 164		Value 165		State 165		Value 166		State 166		Value 167		State 167		Value 168		State 168		Value 169		State 169		Value 170		State 170		Value 171		State 171					
9	Value 172		State 172		Value 173		State 173		Value 174		State 174		Value 175		State 175		Value 176		State 176		Value 177		State 177		Value 178		State 178		Value 179		State 179					
10	Value 180		State 180		Value 181		State 181		Value 182		State 182		Value 183		State 183		Value 184		State 184		Value 185		State 185		Value 186		State 186		Value 187		State 187					
11	Value 188		State 188		Value 189		State 189		Value 190		State 190		Value 191		State 191		Value 192		State 192		Value 193		State 193		Value 194		State 194		Value 195		State 195					
12	Value 196		State 196		Value 197		State 197		Value 198		State 198		Value 199		State 199		Value 200		State 200																	

Index, words	0		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15	
index, bytes	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
0	107				Value 201		State 201		Value 202		State 202		Value 203		State 203		Value 204		State 204		Value 205		State 205		Value 206		State 206		Value 207		State 207	
1	Value 208		State 208		Value 209		State 209		Value 210		State 210		Value 211		State 211		Value 212		State 212		Value 213		State 213		Value 214		State 214		Value 215		State 215	
2	Value 216		State 216		Value 217		State 217		Value 218		State 218		Value 219		State 219		Value 220		State 220		Value 221		State 221		Value 222		State 222		Value 223		State 223	
3	Value 224		State 224		Value 225		State 225		Value 226		State 226		Value 227		State 227		Value 228		State 228		Value 229		State 229		Value 230		State 230		Value 231		State 231	
4	Value 232		State 232		Value 233		State 233		Value 234		State 234		Value 235		State 235		Value 236		State 236		Value 237		State 237		Value 238		State 238		Value 239		State 239	
5	Value 240		State 240		Value 241		State 241		Value 242		State 242		Value 243		State 243		Value 244		State 244		Value 245		State 245		Value 246		State 246		Value 247		State 247	
6	Value 248		State 248		Value 249		State 249		Value 250		State 250		Value 251		State 251		Value 252		State 252		Value 253		State 253		Value 254		State 254		Value 255		State 255	
7	Value 256		State 256		srv state A		srv state B		Bus State 1		Bus State 2		Bus State 3		Bus State 4		Bus State 5		Bus State 6		Bus State 7		Bus State 8		Bus Sns State 1		Bus Sns State 2					
8	Bus Sns State 3			Bus Sns State 4			Bus Sns State 5			Bus Sns State 6			Bus Sns State 7			Bus Sns State 8			watchdog	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	
9	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	
10	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	
11	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	
12	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	reserved	



PLC Array Mapping

Array	Assembly	Index	Word	Contents
Array[0]	105	0	0	105
Array[1]	105	0	1	Not Used
Array[2]	105	0	2	Value 1
Array[3]	105	0	3	State 1
Array[4]	105	0	4	Value 2
Array[5]	105	0	5	State 2
Array[6]	105	0	6	Value 3
Array[7]	105	0	7	State 3
Array[8]	105	0	8	Value 4
Array[9]	105	0	9	State 4
Array[10]	105	0	10	Value 5
Array[11]	105	0	11	State 5
Array[12]	105	0	12	Value 6
Array[13]	105	0	13	State 6
Array[14]	105	0	14	Value 7
Array[15]	105	0	15	State 7
Array[16]	105	1	0	Value 8
Array[17]	105	1	1	State 8
Array[18]	105	1	2	Value 9
Array[19]	105	1	3	State 9
Array[20]	105	1	4	Value 10
Array[21]	105	1	5	State 10
Array[22]	105	1	6	Value 11
Array[23]	105	1	7	State 11
Array[24]	105	1	8	Value 12
Array[25]	105	1	9	State 12
Array[26]	105	1	10	Value 13
Array[27]	105	1	11	State 13
Array[28]	105	1	12	Value 14
Array[29]	105	1	13	State 14
Array[30]	105	1	14	Value 15
Array[31]	105	1	15	State 15
Array[32]	105	2	0	Value 16
Array[33]	105	2	1	State 16
Array[34]	105	2	2	Value 17
Array[35]	105	2	3	State 17
Array[36]	105	2	4	Value 18
Array[37]	105	2	5	State 18
Array[38]	105	2	6	Value 19



Array[39]	105	2	7	State 19
Array[40]	105	2	8	Value 20
Array[41]	105	2	9	State 20
Array[42]	105	2	10	Value 21
Array[43]	105	2	11	State 21
Array[44]	105	2	12	Value 22
Array[45]	105	2	13	State 22
Array[46]	105	2	14	Value 23
Array[47]	105	2	15	State 23
Array[48]	105	3	0	Value 24
Array[49]	105	3	1	State 24
Array[50]	105	3	2	Value 25
Array[51]	105	3	3	State 25
Array[52]	105	3	4	Value 26
Array[53]	105	3	5	State 26
Array[54]	105	3	6	Value 27
Array[55]	105	3	7	State 27
Array[56]	105	3	8	Value 28
Array[57]	105	3	9	State 28
Array[58]	105	3	10	Value 29
Array[59]	105	3	11	State 29
Array[60]	105	3	12	Value 30
Array[61]	105	3	13	State 30
Array[62]	105	3	14	Value 31
Array[63]	105	3	15	State 31
Array[64]	105	4	0	Value 32
Array[65]	105	4	1	State 32
Array[66]	105	4	2	Value 33
Array[67]	105	4	3	State 33
Array[68]	105	4	4	Value 34
Array[69]	105	4	5	State 34
Array[70]	105	4	6	Value 35
Array[71]	105	4	7	State 35
Array[72]	105	4	8	Value 36
Array[73]	105	4	9	State 36
Array[74]	105	4	10	Value 37
Array[75]	105	4	11	State 37
Array[76]	105	4	12	Value 38
Array[77]	105	4	13	State 38
Array[78]	105	4	14	Value 39
Array[79]	105	4	15	State 39



Array[80]	105	5	0	Value 40
Array[81]	105	5	1	State 40
Array[82]	105	5	2	Value 41
Array[83]	105	5	3	State 41
Array[84]	105	5	4	Value 42
Array[85]	105	5	5	State 42
Array[86]	105	5	6	Value 43
Array[87]	105	5	7	State 43
Array[88]	105	5	8	Value 44
Array[89]	105	5	9	State 44
Array[90]	105	5	10	Value 45
Array[91]	105	5	11	State 45
Array[92]	105	5	12	Value 46
Array[93]	105	5	13	State 46
Array[94]	105	5	14	Value 47
Array[95]	105	5	15	State 47
Array[96]	105	6	0	Value 48
Array[97]	105	6	1	State 48
Array[98]	105	6	2	Value 49
Array[99]	105	6	3	State 49
Array[100]	105	6	4	Value 50
Array[101]	105	6	5	State 50
Array[102]	105	6	6	Value 51
Array[103]	105	6	7	State 51
Array[104]	105	6	8	Value 52
Array[105]	105	6	9	State 52
Array[106]	105	6	10	Value 53
Array[107]	105	6	11	State 53
Array[108]	105	6	12	Value 54
Array[109]	105	6	13	State 54
Array[110]	105	6	14	Value 55
Array[111]	105	6	15	State 55
Array[112]	105	7	0	Value 56
Array[113]	105	7	1	State 56
Array[114]	105	7	2	Value 57
Array[115]	105	7	3	State 57
Array[116]	105	7	4	Value 58
Array[117]	105	7	5	State 58
Array[118]	105	7	6	Value 59
Array[119]	105	7	7	State 59
Array[120]	105	7	8	Value 60



Array[121]	105	7	9	State 60
Array[122]	105	7	10	Value 61
Array[123]	105	7	11	State 61
Array[124]	105	7	12	Value 62
Array[125]	105	7	13	State 62
Array[126]	105	7	14	Value 63
Array[127]	105	7	15	State 63
Array[128]	105	8	0	Value 64
Array[129]	105	8	1	State 64
Array[130]	105	8	2	Value 65
Array[131]	105	8	3	State 65
Array[132]	105	8	4	Value 66
Array[133]	105	8	5	State 66
Array[134]	105	8	6	Value 67
Array[135]	105	8	7	State 67
Array[136]	105	8	8	Value 68
Array[137]	105	8	9	State 68
Array[138]	105	8	10	Value 69
Array[139]	105	8	11	State 69
Array[140]	105	8	12	Value 70
Array[141]	105	8	13	State 70
Array[142]	105	8	14	Value 71
Array[143]	105	8	15	State 71
Array[144]	105	9	0	Value 72
Array[145]	105	9	1	State 72
Array[146]	105	9	2	Value 73
Array[147]	105	9	3	State 73
Array[148]	105	9	4	Value 74
Array[149]	105	9	5	State 74
Array[150]	105	9	6	Value 75
Array[151]	105	9	7	State 75
Array[152]	105	9	8	Value 76
Array[153]	105	9	9	State 76
Array[154]	105	9	10	Value 77
Array[155]	105	9	11	State 77
Array[156]	105	9	12	Value 78
Array[157]	105	9	13	State 78
Array[158]	105	9	14	Value 79
Array[159]	105	9	15	State 79
Array[160]	105	10	0	Value 80
Array[161]	105	10	1	State 80



Array[162]	105	10	2	Value 81
Array[163]	105	10	3	State 81
Array[164]	105	10	4	Value 82
Array[165]	105	10	5	State 82
Array[166]	105	10	6	Value 83
Array[167]	105	10	7	State 83
Array[168]	105	10	8	Value 84
Array[169]	105	10	9	State 84
Array[170]	105	10	10	Value 85
Array[171]	105	10	11	State 85
Array[172]	105	10	12	Value 86
Array[173]	105	10	13	State 86
Array[174]	105	10	14	Value 87
Array[175]	105	10	15	State 87
Array[176]	105	11	0	Value 88
Array[177]	105	11	1	State 88
Array[178]	105	11	2	Value 89
Array[179]	105	11	3	State 89
Array[180]	105	11	4	Value 90
Array[181]	105	11	5	State 90
Array[182]	105	11	6	Value 91
Array[183]	105	11	7	State 91
Array[184]	105	11	8	Value 92
Array[185]	105	11	9	State 92
Array[186]	105	11	10	Value 93
Array[187]	105	11	11	State 93
Array[188]	105	11	12	Value 94
Array[189]	105	11	13	State 94
Array[190]	105	11	14	Value 95
Array[191]	105	11	15	State 95
Array[192]	105	12	0	Value 96
Array[193]	105	12	1	State 96
Array[194]	105	12	2	Value 97
Array[195]	105	12	3	State 97
Array[196]	105	12	4	Value 98
Array[197]	105	12	5	State 98
Array[198]	105	12	6	Value 99
Array[199]	105	12	7	State 99
Array[200]	105	12	8	Value 100
Array[201]	105	12	9	State 100
Array[202]	106	0	0	Value 106



Array[203]	106	0	1	Not Used
Array[204]	106	0	2	101
Array[205]	106	0	3	State 101
Array[206]	106	0	4	Value 102
Array[207]	106	0	5	State 102
Array[208]	106	0	6	Value 103
Array[209]	106	0	7	State 103
Array[210]	106	0	8	Value 104
Array[211]	106	0	9	State 104
Array[212]	106	0	10	Value 105
Array[213]	106	0	11	State 105
Array[214]	106	0	12	Value 106
Array[215]	106	0	13	State 106
Array[216]	106	0	14	Value 107
Array[217]	106	0	15	State 107
Array[218]	106	1	0	Value 108
Array[219]	106	1	1	State 108
Array[220]	106	1	2	Value 109
Array[221]	106	1	3	State 109
Array[222]	106	1	4	Value 110
Array[223]	106	1	5	State 110
Array[224]	106	1	6	Value 111
Array[225]	106	1	7	State 111
Array[226]	106	1	8	Value 112
Array[227]	106	1	9	State 112
Array[228]	106	1	10	Value 113
Array[229]	106	1	11	State 113
Array[230]	106	1	12	Value 114
Array[231]	106	1	13	State 114
Array[232]	106	1	14	Value 115
Array[233]	106	1	15	State 115
Array[234]	106	2	0	Value 116
Array[235]	106	2	1	State 116
Array[236]	106	2	2	Value 117
Array[237]	106	2	3	State 117
Array[238]	106	2	4	Value 118
Array[239]	106	2	5	State 118
Array[240]	106	2	6	Value 119
Array[241]	106	2	7	State 119
Array[242]	106	2	8	Value 120
Array[243]	106	2	9	State 120



Array[244]	106	2	10	Value 121
Array[245]	106	2	11	State 121
Array[246]	106	2	12	Value 122
Array[247]	106	2	13	State 122
Array[248]	106	2	14	Value 123
Array[249]	106	2	15	State 123
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Array[251]	106	3	1	State 124
Array[252]	106	3	2	Value 125
Array[253]	106	3	3	State 125
Array[254]	106	3	4	Value 126
Array[255]	106	3	5	State 126
Array[256]	106	3	6	Value 127
Array[257]	106	3	7	State 127
Array[258]	106	3	8	Value 128
Array[259]	106	3	9	State 128
Array[260]	106	3	10	Value 129
Array[261]	106	3	11	State 129
Array[262]	106	3	12	Value 130
Array[263]	106	3	13	State 130
Array[264]	106	3	14	Value 131
Array[265]	106	3	15	State 131
Array[266]	106	4	0	Value 132
Array[267]	106	4	1	State 132
Array[268]	106	4	2	Value 133
Array[269]	106	4	3	State 133
Array[270]	106	4	4	Value 134
Array[271]	106	4	5	State 134
Array[272]	106	4	6	Value 135
Array[273]	106	4	7	State 135
Array[274]	106	4	8	Value 136
Array[275]	106	4	9	State 136
Array[276]	106	4	10	Value 137
Array[277]	106	4	11	State 137
Array[278]	106	4	12	Value 138
Array[279]	106	4	13	State 138
Array[280]	106	4	14	Value 139
Array[281]	106	4	15	State 139
Array[282]	106	5	0	Value 140
Array[283]	106	5	1	State 140
Array[284]	106	5	2	Value 141



Array[285]	106	5	3	State 141
Array[286]	106	5	4	Value 142
Array[287]	106	5	5	State 142
Array[288]	106	5	6	Value 143
Array[289]	106	5	7	State 143
Array[290]	106	5	8	Value 144
Array[291]	106	5	9	State 144
Array[292]	106	5	10	Value 145
Array[293]	106	5	11	State 145
Array[294]	106	5	12	Value 146
Array[295]	106	5	13	State 146
Array[296]	106	5	14	Value 147
Array[297]	106	5	15	State 147
Array[298]	106	6	0	Value 148
Array[299]	106	6	1	State 148
Array[300]	106	6	2	Value 149
Array[301]	106	6	3	State 149
Array[302]	106	6	4	Value 150
Array[303]	106	6	5	State 150
Array[304]	106	6	6	Value 151
Array[305]	106	6	7	State 151
Array[306]	106	6	8	Value 152
Array[307]	106	6	9	State 152
Array[308]	106	6	10	Value 153
Array[309]	106	6	11	State 153
Array[310]	106	6	12	Value 154
Array[311]	106	6	13	State 154
Array[312]	106	6	14	Value 155
Array[313]	106	6	15	State 155
Array[314]	106	7	0	Value 156
Array[315]	106	7	1	State 156
Array[316]	106	7	2	Value 157
Array[317]	106	7	3	State 157
Array[318]	106	7	4	Value 158
Array[319]	106	7	5	State 158
Array[320]	106	7	6	Value 159
Array[321]	106	7	7	State 159
Array[322]	106	7	8	Value 160
Array[323]	106	7	9	State 160
Array[324]	106	7	10	Value 161
Array[325]	106	7	11	State 161



Array[326]	106	7	12	Value 162
Array[327]	106	7	13	State 162
Array[328]	106	7	14	Value 163
Array[329]	106	7	15	State 163
Array[330]	106	8	0	Value 164
Array[331]	106	8	1	State 164
Array[332]	106	8	2	Value 165
Array[333]	106	8	3	State 165
Array[334]	106	8	4	Value 166
Array[335]	106	8	5	State 166
Array[336]	106	8	6	Value 167
Array[337]	106	8	7	State 167
Array[338]	106	8	8	Value 168
Array[339]	106	8	9	State 168
Array[340]	106	8	10	Value 169
Array[341]	106	8	11	State 169
Array[342]	106	8	12	Value 170
Array[343]	106	8	13	State 170
Array[344]	106	8	14	Value 171
Array[345]	106	8	15	State 171
Array[346]	106	9	0	Value 172
Array[347]	106	9	1	State 172
Array[348]	106	9	2	Value 173
Array[349]	106	9	3	State 173
Array[350]	106	9	4	Value 174
Array[351]	106	9	5	State 174
Array[352]	106	9	6	Value 175
Array[353]	106	9	7	State 175
Array[354]	106	9	8	Value 176
Array[355]	106	9	9	State 176
Array[356]	106	9	10	Value 177
Array[357]	106	9	11	State 177
Array[358]	106	9	12	Value 178
Array[359]	106	9	13	State 178
Array[360]	106	9	14	Value 179
Array[361]	106	9	15	State 179
Array[362]	106	10	0	Value 180
Array[363]	106	10	1	State 180
Array[364]	106	10	2	Value 181
Array[365]	106	10	3	State 181
Array[366]	106	10	4	Value 182



Array[367]	106	10	5	State 182
Array[368]	106	10	6	Value 183
Array[369]	106	10	7	State 183
Array[370]	106	10	8	Value 184
Array[371]	106	10	9	State 184
Array[372]	106	10	10	Value 185
Array[373]	106	10	11	State 185
Array[374]	106	10	12	Value 186
Array[375]	106	10	13	State 186
Array[376]	106	10	14	Value 187
Array[377]	106	10	15	State 187
Array[378]	106	11	0	Value 188
Array[379]	106	11	1	State 188
Array[380]	106	11	2	Value 189
Array[381]	106	11	3	State 189
Array[382]	106	11	4	Value 190
Array[383]	106	11	5	State 190
Array[384]	106	11	6	Value 191
Array[385]	106	11	7	State 191
Array[386]	106	11	8	Value 192
Array[387]	106	11	9	State 192
Array[388]	106	11	10	Value 193
Array[389]	106	11	11	State 193
Array[390]	106	11	12	Value 194
Array[391]	106	11	13	State 194
Array[392]	106	11	14	Value 195
Array[393]	106	11	15	State 195
Array[394]	106	12	0	Value 196
Array[395]	106	12	1	State 196
Array[396]	106	12	2	Value 197
Array[397]	106	12	3	State 197
Array[398]	106	12	4	Value 198
Array[399]	106	12	5	State 198
Array[400]	106	12	6	Value 199
Array[401]	106	12	7	State 199
Array[402]	106	12	8	Value 200
Array[403]	106	12	9	State 200
Array[404]	107	0	0	107
Array[405]	107	0	1	Not Used
Array[406]	107	0	2	Value 201
Array[407]	107	0	3	State 201



Array[408]	107	0	4	Value 202
Array[409]	107	0	5	State 202
Array[410]	107	0	6	Value 203
Array[411]	107	0	7	State 203
Array[412]	107	0	8	Value 204
Array[413]	107	0	9	State 204
Array[414]	107	0	10	Value 205
Array[415]	107	0	11	State 205
Array[416]	107	0	12	Value 206
Array[417]	107	0	13	State 206
Array[418]	107	0	14	Value 207
Array[419]	107	0	15	State 207
Array[420]	107	1	0	Value 208
Array[421]	107	1	1	State 208
Array[422]	107	1	2	Value 209
Array[423]	107	1	3	State 209
Array[424]	107	1	4	Value 210
Array[425]	107	1	5	State 210
Array[426]	107	1	6	Value 211
Array[427]	107	1	7	State 211
Array[428]	107	1	8	Value 212
Array[429]	107	1	9	State 212
Array[430]	107	1	10	Value 213
Array[431]	107	1	11	State 213
Array[432]	107	1	12	Value 214
Array[433]	107	1	13	State 214
Array[434]	107	1	14	Value 215
Array[435]	107	1	15	State 215
Array[436]	107	2	0	Value 216
Array[437]	107	2	1	State 216
Array[438]	107	2	2	Value 217
Array[439]	107	2	3	State 217
Array[440]	107	2	4	Value 218
Array[441]	107	2	5	State 218
Array[442]	107	2	6	Value 219
Array[443]	107	2	7	State 219
Array[444]	107	2	8	Value 220
Array[445]	107	2	9	State 220
Array[446]	107	2	10	Value 221
Array[447]	107	2	11	State 221
Array[448]	107	2	12	Value 222



Array[449]	107	2	13	State 222
Array[450]	107	2	14	Value 223
Array[451]	107	2	15	State 223
Array[452]	107	3	0	Value 224
Array[453]	107	3	1	State 224
Array[454]	107	3	2	Value 225
Array[455]	107	3	3	State 225
Array[456]	107	3	4	Value 226
Array[457]	107	3	5	State 226
Array[458]	107	3	6	Value 227
Array[459]	107	3	7	State 227
Array[460]	107	3	8	Value 228
Array[461]	107	3	9	State 228
Array[462]	107	3	10	Value 229
Array[463]	107	3	11	State 229
Array[464]	107	3	12	Value 230
Array[465]	107	3	13	State 230
Array[466]	107	3	14	Value 231
Array[467]	107	3	15	State 231
Array[468]	107	4	0	Value 232
Array[469]	107	4	1	State 232
Array[470]	107	4	2	Value 233
Array[471]	107	4	3	State 233
Array[472]	107	4	4	Value 234
Array[473]	107	4	5	State 234
Array[474]	107	4	6	Value 235
Array[475]	107	4	7	State 235
Array[476]	107	4	8	Value 236
Array[477]	107	4	9	State 236
Array[478]	107	4	10	Value 237
Array[479]	107	4	11	State 237
Array[480]	107	4	12	Value 238
Array[481]	107	4	13	State 238
Array[482]	107	4	14	Value 239
Array[483]	107	4	15	State 239
Array[484]	107	5	0	Value 240
Array[485]	107	5	1	State 240
Array[486]	107	5	2	Value 241
Array[487]	107	5	3	State 241
Array[488]	107	5	4	Value 242
Array[489]	107	5	5	State 242



Array[490]	107	5	6	Value 243
Array[491]	107	5	7	State 243
Array[492]	107	5	8	Value 244
Array[493]	107	5	9	State 244
Array[494]	107	5	10	Value 245
Array[495]	107	5	11	State 245
Array[496]	107	5	12	Value 246
Array[497]	107	5	13	State 246
Array[498]	107	5	14	Value 247
Array[499]	107	5	15	State 247
Array[500]	107	6	0	Value 248
Array[501]	107	6	1	State 248
Array[502]	107	6	2	Value 249
Array[503]	107	6	3	State 249
Array[504]	107	6	4	Value 250
Array[505]	107	6	5	State 250
Array[506]	107	6	6	Value 251
Array[507]	107	6	7	State 251
Array[508]	107	6	8	Value 252
Array[509]	107	6	9	State 252
Array[510]	107	6	10	Value 253
Array[511]	107	6	11	State 253
Array[512]	107	6	12	Value 254
Array[513]	107	6	13	State 254
Array[514]	107	6	14	Value 255
Array[515]	107	6	15	State 255
Array[516]	107	7	0	Value 256
Array[517]	107	7	1	State 256
Array[518]	107	7	2	WS State A
Array[519]	107	7	3	WS State B
Array[520]	107	7	4	BC State 1
Array[521]	107	7	5	BC State 2
Array[522]	107	7	6	BC State 3
Array[523]	107	7	7	BC State 4
Array[524]	107	7	8	BC State 5
Array[525]	107	7	9	BC State 6
Array[526]	107	7	10	BC State 7
Array[527]	107	7	11	BC State 8
Array[528]	107	7	12	BC Sensor State 1a
Array[529]	107	7	13	BC Sensor State 1b
Array[530]	107	7	14	BC Sensor State 2a



Array[531]	107	7	15	BC Sensor State 2b
Array[532]	107	8	0	BC Sensor State 3a
Array[533]	107	8	1	BC Sensor State 3b
Array[534]	107	8	2	BC Sensor State 4a
Array[535]	107	8	3	BC Sensor State 4b
Array[536]	107	8	4	BC Sensor State 5a
Array[537]	107	8	5	BC Sensor State 5b
Array[538]	107	8	6	BC Sensor State 6a
Array[539]	107	8	7	BC Sensor State 6b
Array[540]	107	8	8	BC Sensor State 7a
Array[541]	107	8	9	BC Sensor State 7b
Array[542]	107	8	10	BC Sensor State 8a
Array[543]	107	8	11	BC Sensor State 8b
Array[544]	107	8	12	Watchdog
Array[545]	107	8	13	Not Used
Array[546]	107	8	14	Not Used
Array[547]	107	8	15	Not Used
Array[548]	107	9	0	Not Used
Array[549]	107	9	1	Not Used
Array[550]	107	9	2	Not Used
Array[551]	107	9	3	Not Used
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Array[553]	107	9	5	Not Used
Array[554]	107	9	6	Not Used
Array[555]	107	9	7	Not Used
Array[556]	107	9	8	Not Used
Array[557]	107	9	9	Not Used
Array[558]	107	9	10	Not Used
Array[559]	107	9	11	Not Used
Array[560]	107	9	12	Not Used
Array[561]	107	9	13	Not Used
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Array[564]	107	10	0	Not Used
Array[565]	107	10	1	Not Used
Array[566]	107	10	2	Not Used
Array[567]	107	10	3	Not Used
Array[568]	107	10	4	Not Used
Array[569]	107	10	5	Not Used
Array[570]	107	10	6	Not Used
Array[571]	107	10	7	Not Used



Array[572]	107	10	8	Not Used
Array[573]	107	10	9	Not Used
Array[574]	107	10	10	Not Used
Array[575]	107	10	11	Not Used
Array[576]	107	10	12	Not Used
Array[577]	107	10	13	Not Used
Array[578]	107	10	14	Not Used
Array[579]	107	10	15	Not Used
Array[580]	107	11	0	Not Used
Array[581]	107	11	1	Not Used
Array[582]	107	11	2	Not Used
Array[583]	107	11	3	Not Used
Array[584]	107	11	4	Not Used
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Array[586]	107	11	6	Not Used
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Array[589]	107	11	9	Not Used
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Array[600]	107	12	4	Not Used
Array[601]	107	12	5	Not Used
Array[602]	107	12	6	Not Used
Array[603]	107	12	7	Not Used
Array[604]	107	12	8	Not Used
Array[605]	107	12	9	Not Used