EtherNet/IP Level 2.06 Calendar Conditions

This test concentrates on sending several settings to the printer and then reading all settings back to see what changed. For the general case of trying to upload a message, it would be nice if all values read reflected an initialized calendar block. Otherwise, it would be necessary to decode all the text to decide what needed to be retrieved.

There are many parts to this test. The plan was to build a single item using a single calendar block.

"{{MMM}/{DD}/{YY} {hh}:{mm}:{ss} {TTT} {WW} {777} {EE} {FF}}"

However, the printer would not accept this as text in a single item using a single calendar block. I broke it into three calendar blocks.

"{{MMM}/{DD}/{YY} {hh}:{mm}:{ss}} {{TTT} {WW} {777}} {{EE} {FF}}"

The printer again would not accept the message. The “EE” (Shift code) and “FF” (Time Count) caused the message to be rejected. The only indication was the message contained no text. Splitting the message into two items also failed. There should now two tests instead of one. However, setting the shift code causes the printer to start rejecting requests and requiring cycling of power on the printer to recover.

"{{MMM}/{DD}/{YY} {hh}:{mm}:{ss}} {{TTT} {WW} {777}}"

" {{FF}}"

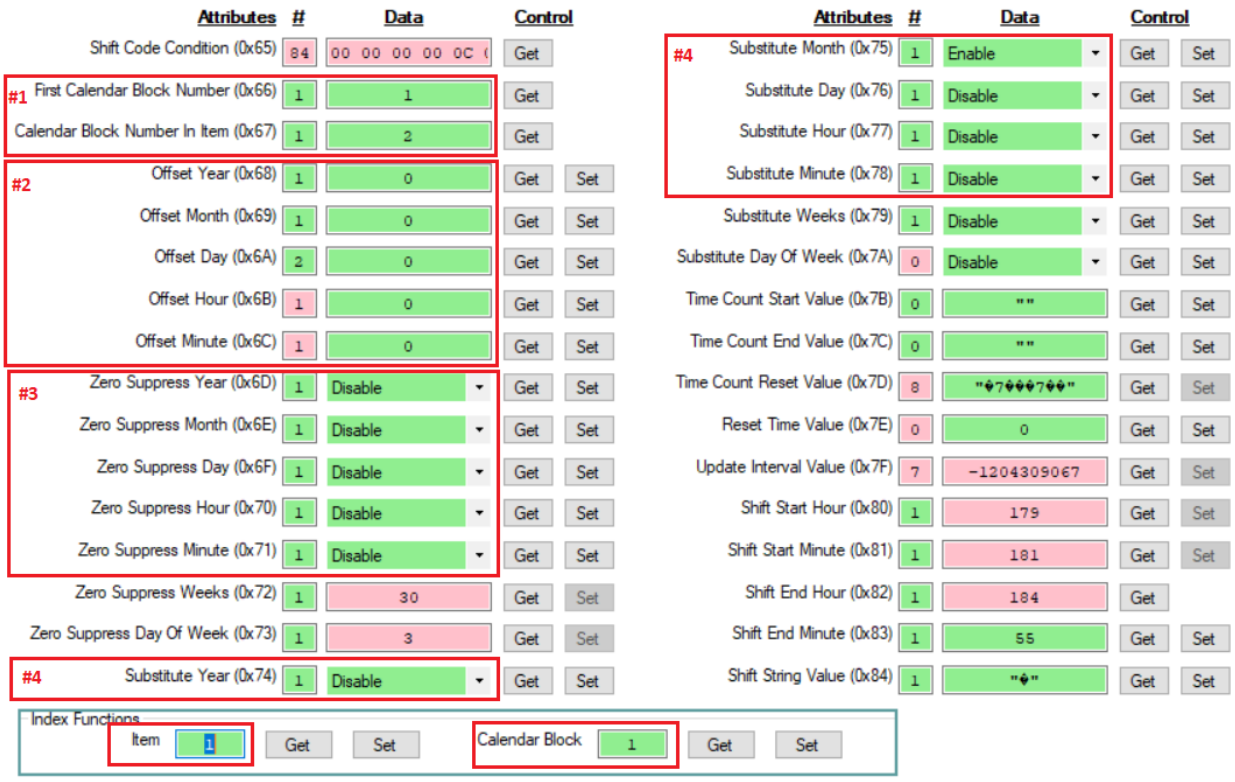
" {{EE}}"

Test 1.

Starting with test 1, building the message involved:

Status/Path	Access	Class	Attribute	#Out	Data Out	Raw Out
Load Month and Day Substitutions Data						
32 6C 01 66	Set	Substitution_rules	Start_Year	2	2010	07 DA
32 6C 01 68	Set	Substitution_rules	Month	5	1,JAN	01 4A 41 4E 00
32 6C 01 68	Set	Substitution_rules	Month	5	2,FEB	02 46 45 42 00
32 6C 01 68	Set	Substitution_rules	Month	5	3,MAR	03 4D 41 52 00
32 6C 01 68	Set	Substitution_rules	Month	5	4,APR	04 41 50 52 00
32 6C 01 68	Set	Substitution_rules	Month	5	5,MAY	05 4D 41 59 00
32 6C 01 68	Set	Substitution_rules	Month	5	6,JUN	06 4A 55 4E 00
32 6C 01 68	Set	Substitution_rules	Month	5	7,JUL	07 4A 55 4C 00
32 6C 01 68	Set	Substitution_rules	Month	5	8,AUG	08 41 55 47 00
32 6C 01 68	Set	Substitution_rules	Month	5	9,SEP	09 53 45 50 00
32 6C 01 68	Set	Substitution_rules	Month	5	10,OCT	0A 4F 43 54 00
32 6C 01 68	Set	Substitution_rules	Month	5	11,NOV	0B 4E 4F 56 00
32 6C 01 68	Set	Substitution_rules	Month	5	12,DEC	0C 44 45 43 00
32 6C 01 6D	Set	Substitution_rules	Day_Of_Week	5	1,MON	01 4D 4F 4E 00
32 6C 01 6D	Set	Substitution_rules	Day_Of_Week	5	2,TUE	02 54 55 45 00
32 6C 01 6D	Set	Substitution_rules	Day_Of_Week	5	3,WED	03 57 45 44 00
32 6C 01 6D	Set	Substitution_rules	Day_Of_Week	5	4,THU	04 54 48 55 00
32 6C 01 6D	Set	Substitution_rules	Day_Of_Week	5	5,FRI	05 46 52 49 00
32 6C 01 6D	Set	Substitution_rules	Day_Of_Week	5	6,SAT	06 53 41 54 00
32 6C 01 6D	Set	Substitution_rules	Day_Of_Week	5	7,SUN	07 53 55 4E 00
Build the Message						
32 7A 01 65	Set	Index	Automatic_reflection	1	1	01
32 7A 01 66	Set	Index	Item	2	1	00 01
32 67 01 74	Set	Print_format	Dot_Matrix	1	5x8(5x7)	03
32 67 01 77	Set	Print_format	Barcode_Type	1	None	00
32 67 01 75	Set	Print_format	InterCharacter_Space	1	1	01
32 67 01 71	Set	Print_format	Print_Character_String	64	{{MMM}/{DD}/{YY} {hh}:{mm}:{ss}} {{TTT} {WW} {777}}	7B 7B 4D 4D 4D …
Enable the Desired Substitutions						
32 7A 01 6F	Set	Index	Calendar_Block	1	1	01
32 69 01 75	Set	Calendar	Substitute_Month	1	Enable	01
32 69 01 7A	Set	Calendar	Substitute_Day_Of_Week	1	Enable	01
32 7A 01 65	Set	Index	Automatic_reflection	1	0	00
32 7A 01 64	Set	Index	Start_Stop_Management_Flag	1	2	02

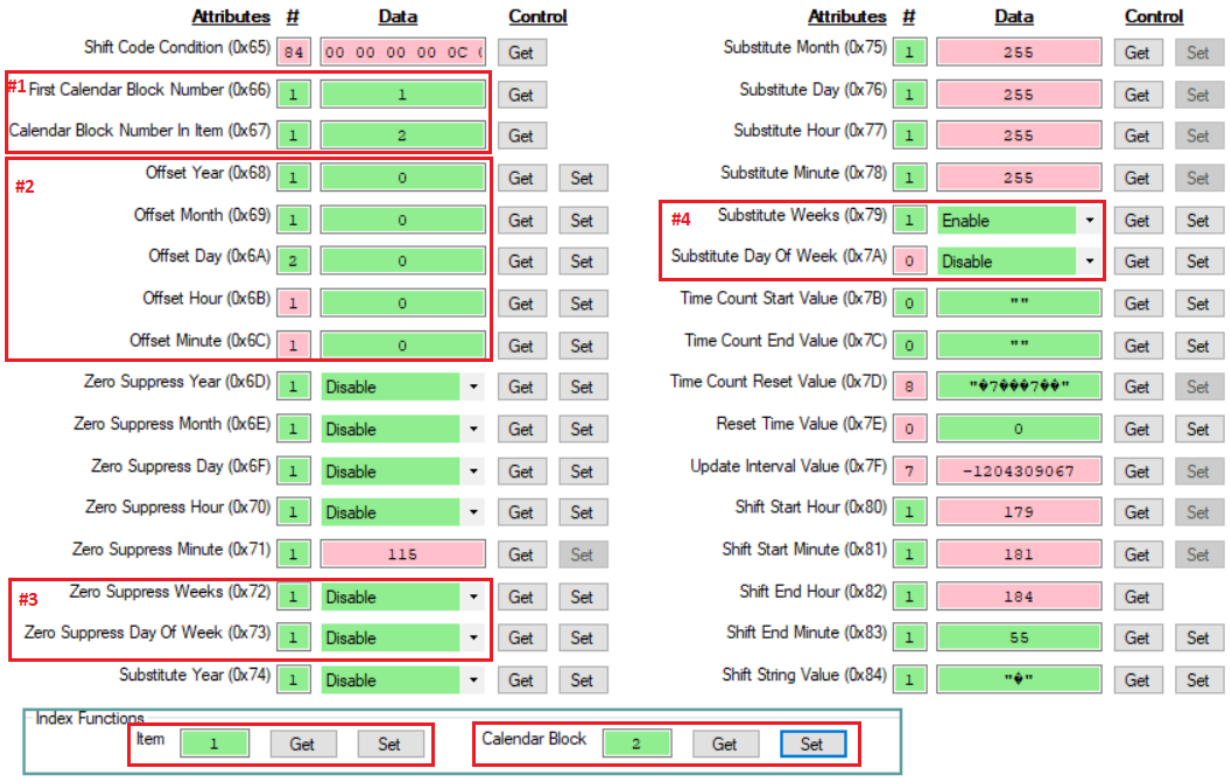
Browser screen == Item 1, Calendar block 1.:



Observations (only areas outlined in red are pertinent to this test):

1. Item 1 hase two calendar blocks starting a calandar block 1.
2. Offset Hour and Offset Minute only returned 1 byte. I tried sending out a -20 (0xFF 0xEC) and the value returned was 0.
3. Worked.
4. Worked.

Browser screen == Item 1, Calendar block 2.:



Observations (only areas outlined in red are pertinent to this test):

1. Item 1 hase two calendar blocks starting a calandar block 1.
2. Offset Hour and Offset Minute only returned 1 byte. . I tried sending out a -20 (0xFF 0xEC) and the value returned was 0.
3. Worked.
4. Substitute day of week returned 0 bytes.
5. Substitute Day of Week was set. On the screen, it was Substitute Weeks that was enabled. It was also set without Substitute rule number set to 2.
6. After a recovery of the printer and a reload of 2.06, the enables for Month and Day of Week substitution are ignored. After manually setting them in the printer, they are honored. But, not setting the enables, the substitutions remain on the printer screen.

Browser substitution screen.

Issues:

- .The date start was sent as 2010 (0x07 0xDA). The date code returned as 1 byte (0xDA).

All other controls on the form worked.

Test 1 Continued.

A more comprehensive look at test 1.

Test results:

- All worked except hour and minute offsets.

Traffic out

Status/Path	Access	Class	Attribute	#Out	Data Out	Raw Out
32 69 01 68	Set	Calendar	Offset_Year	1	1	01
32 69 01 69	Set	Calendar	Offset_Month	1	2	02
32 69 01 6A	Set	Calendar	Offset_Day	2	3	00 03
32 69 01 6B	Set	Calendar	Offset_Hour	2	4	00 04
32 69 01 6C	Set	Calendar	Offset_Minute	2	-5	FF FB
32 69 01 6D	Set	Calendar	Zero_Suppress_Year	1	Disable	00
32 69 01 6E	Set	Calendar	Zero_Suppress_Month	1	Disable	00
32 69 01 6F	Set	Calendar	Zero_Suppress_Day	1	Disable	00
32 69 01 70	Set	Calendar	Zero_Suppress_Hour	1	Space Fill	01
32 69 01 71	Set	Calendar	Zero_Suppress_Minute	1	Character Fill	02
32 69 01 74	Set	Calendar	Substitute_Year	1	Disable	00
32 69 01 75	Set	Calendar	Substitute_Month	1	Enable	01
32 69 01 76	Set	Calendar	Substitute_Day	1	Disable	00
32 69 01 77	Set	Calendar	Substitute_Hour	1	Disable	00
32 69 01 78	Set	Calendar	Substitute_Minute	1	Disable	00

Traffic in

Status/Path	Access	Class	Attribute	#In	Data In	Raw In
33 69 01 68	Get	Calendar	Offset_Year	1	1	01
33 69 01 69	Get	Calendar	Offset_Month	1	2	02
33 69 01 6A	Get	Calendar	Offset_Day	2	3	00 03
33 69 01 6B	Get	Calendar	Offset_Hour	1	0	00
33 69 01 6C	Get	Calendar	Offset_Minute	1	0	00
33 69 01 6D	Get	Calendar	Zero_Suppress_Year	1	Disable	00
33 69 01 6E	Get	Calendar	Zero_Suppress_Month	1	Disable	00
33 69 01 6F	Get	Calendar	Zero_Suppress_Day	1	Disable	00
33 69 01 70	Get	Calendar	Zero_Suppress_Hour	1	Space Fill	01
33 69 01 71	Get	Calendar	Zero_Suppress_Minute	1	Character Fill	02
33 69 01 74	Get	Calendar	Substitute_Year	1	Disable	00
33 69 01 75	Get	Calendar	Substitute_Month	1	Enable	01
33 69 01 76	Get	Calendar	Substitute_Day	1	Disable	00
33 69 01 77	Get	Calendar	Substitute_Hour	1	Disable	00
33 69 01 78	Get	Calendar	Substitute_Minute	1	Disable	00

Test 2 Time/Count function:

This is a simple test of the time count function

Traffic Out

Status/Path	Access	Class	Attribute	#Out	Data Out	Raw Out
32 67 01 71	Set	Print_format	Print_Character_String	11	"=>{{FF}}<="	3D 3E 7B 7B 46 …
32 69 01 7B	Set	Calendar	Time_Count_Start_Value	3	"AA"	41 41 00
32 69 01 7C	Set	Calendar	Time_Count_End_Value	3	"KK"	4B 4B 00
32 69 01 7D	Set	Calendar	Time_Count_Reset_Value	3	"AA"	41 41 00
32 69 01 7E	Set	Calendar	Reset_Time_Value	1	6	06
32 69 01 7F	Set	Calendar	Update_Interval_Value	1	30 Minutes	06

Traffic In

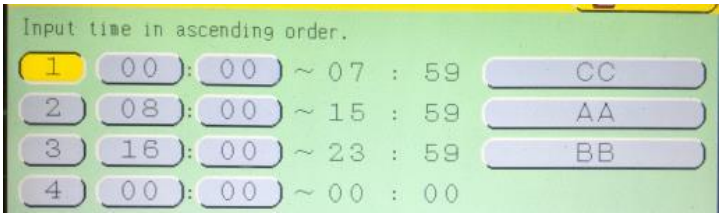
Status/Path	Access	Class	Attribute	#In	Data In	Raw In
33 69 01 7B	Get	Calendar	Time_Count_Start_Value	2	"00"	30 30
33 69 01 7C	Get	Calendar	Time_Count_End_Value	2	"KK"	4B 4B
33 69 01 7D	Get	Calendar	Time_Count_Reset_Value	2	"AA"	41 41
33 69 01 7E	Get	Calendar	Reset_Time_Value	1	30 Minutes	06

Test 3 Shift Code

Traffic Out

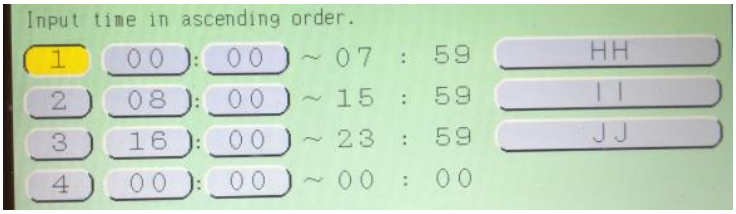
Status/Path	Access	Class	Attribute	#Out	Data Out	Raw Out
00 -- O.K. -- 32 67 01 71	Set	Print_format	Print_Character_String	11	"=>{{EE}}<="	3D 3E 7B 7B …
00 -- O.K. -- 32 7A 01 6F	Set	Index	Calendar_Block	1	1	01
00 -- O.K. -- 32 69 01 80	Set	Calendar	Shift_Start_Hour	1	0	00
00 -- O.K. -- 32 69 01 81	Set	Calendar	Shift_Start_Minute	1	0	00
00 -- O.K. -- 32 69 01 84	Set	Calendar	Shift_String_Value	3	"CC"	43 43 00
00 -- O.K. -- 32 7A 01 6F	Set	Index	Calendar_Block	1	2	02
00 -- O.K. -- 32 69 01 80	Set	Calendar	Shift_Start_Hour	1	8	08
00 -- O.K. -- 32 69 01 81	Set	Calendar	Shift_Start_Minute	1	0	00
00 -- O.K. -- 32 69 01 84	Set	Calendar	Shift_String_Value	3	"AA"	41 41 00
00 -- O.K. -- 32 7A 01 6F	Set	Index	Calendar_Block	1	3	03
00 -- O.K. -- 32 69 01 80	Set	Calendar	Shift_Start_Hour	1	16	10
00 -- O.K. -- 32 69 01 81	Set	Calendar	Shift_Start_Minute	1	0	00
00 -- O.K. -- 32 69 01 84	Set	Calendar	Shift_String_Value	3	"BB"	42 42 00

In printer



Input traffic could not be shown. Any attempt to read from the printer calendar settings results in a printer hang. Cycling power is required to recover. Other functions can be displayed. Just not the Calendar Function.

Update: I found the problem. The reading of the "Shift cont condition (0x65) was causing the issue. New table added.



Issues:

- Shift code comes back as 1 character, was set to 2
- How to read shifts 2 and 3.

Update: There is an issue with shift codes. Question: Is a shift code associated with a calendar block or is the shift code printer wide (applies to all calendar blocks)?

- To write the shift code values, you need to set calendar block number to the shift number (I tried setting index but it only updated shift 1).
- To read the shift codes back, you need to set index to the shift number (I tried using calendar block number, but it always read shift 1).

So, how do you build a shift code for Calendar Block #2.

Calendat blocks seem to be assigned by the printer. The application has no control over which calendar bloock is used for a specific item.

If a calendar function is used in text (say "{{EE}}") and then more text is added using using "Add to end of string (0x67/0x6A), the printer does not assign two calendar blocks to the item.

New traffic display follows:

Traffic (New):

Status/Path	Access	Class	Attribute	#In	Data In	Raw In	#Out	Data Out	Raw Out
Write shift 1 using Calendar Block									
32 67 01 71	Set	Print_format	Print_Character_String				11	"=>{{EE}}<="	3D 3E 7B …
32 7A 01 6F	Set	Index	Calendar_Block				1	1	01
32 69 01 80	Set	Calendar	Shift_Start_Hour				1	0	00
32 69 01 81	Set	Calendar	Shift_Start_Minute				1	0	00
32 69 01 84	Set	Calendar	Shift_String_Value				3	"HH"	48 48 00
Write shift 2 using Calendar Block									
32 7A 01 6F	Set	Index	Calendar_Block				1	2	02
32 69 01 80	Set	Calendar	Shift_Start_Hour				1	8	08
32 69 01 81	Set	Calendar	Shift_Start_Minute				1	0	00
32 69 01 84	Set	Calendar	Shift_String_Value				3	"II"	49 49 00
Write shift 3 using Calendar Block									
32 7A 01 6F	Set	Index	Calendar_Block				1	3	03
32 69 01 80	Set	Calendar	Shift_Start_Hour				1	16	10
32 69 01 81	Set	Calendar	Shift_Start_Minute				1	0	00
32 69 01 84	Set	Calendar	Shift_String_Value				3	"JJ"	4A 4A 00
Switch back to Calendar Block 1									
32 7A 01 6F	Set	Index	Calendar_Block				1	1	01
Read shift 1 using Index									
32 7A 01 66	Set	Index	Item				2	1	00 01
33 69 01 80	Get	Calendar	Shift_Start_Hour	1	0	00			
33 69 01 81	Get	Calendar	Shift_Start_Minute	1	0	00			
33 69 01 82	Get	Calendar	Shift_End_Hour	1	7	07			
33 69 01 83	Get	Calendar	Shift_End_Minute	1	59	3B			
33 69 01 84	Get	Calendar	Shift_String_Value	1	"H"	48			
Read shift 2 using Index									
32 7A 01 66	Set	Index	Item				2	2	00 02
33 69 01 80	Get	Calendar	Shift_Start_Hour	1	8	08			
33 69 01 81	Get	Calendar	Shift_Start_Minute	1	0	00			
33 69 01 82	Get	Calendar	Shift_End_Hour	1	15	0F			
33 69 01 83	Get	Calendar	Shift_End_Minute	1	59	3B			
33 69 01 84	Get	Calendar	Shift_String_Value	1	"I"	49			

Read shift 3 using Index									
32 7A 01 66	Set	Index	Item				2	3	00 03
33 69 01 80	Get	Calendar	Shift_Start_Hour	1	16	10			
33 69 01 81	Get	Calendar	Shift_Start_Minute	1	0	00			
33 69 01 82	Get	Calendar	Shift_End_Hour	1	23	17			
33 69 01 83	Get	Calendar	Shift_End_Minute	1	59	3B			
33 69 01 84	Get	Calendar	Shift_String_Value	1	"J"	4A			