

M221 RTC synchronization with HMI

What is the purpose

To synchronize the Time between PLC and HMI

What units are effected

1. M221
2. HMI magelis

Details

This application is divided into several parts

Section	Title
1	Parts List
2	Architecture System
3	Step by Step
3	Online Testing
4	Remarks

Section 1: Parts list

Parts List table

Items used in the test

Items	Part numbers	Description
PLC M221	TM221ME16T	PLC Hardware
Magelis HMI	XBTGT series	Touch Screen Hardware
Software	VJDSNDTGSVxxM	Vijeo Designer software

Section 2: Architecture System



Section 2: Architecture Systemstep by step

Step by step configuration software on Vijeo Designer :

Hardware Configuration:

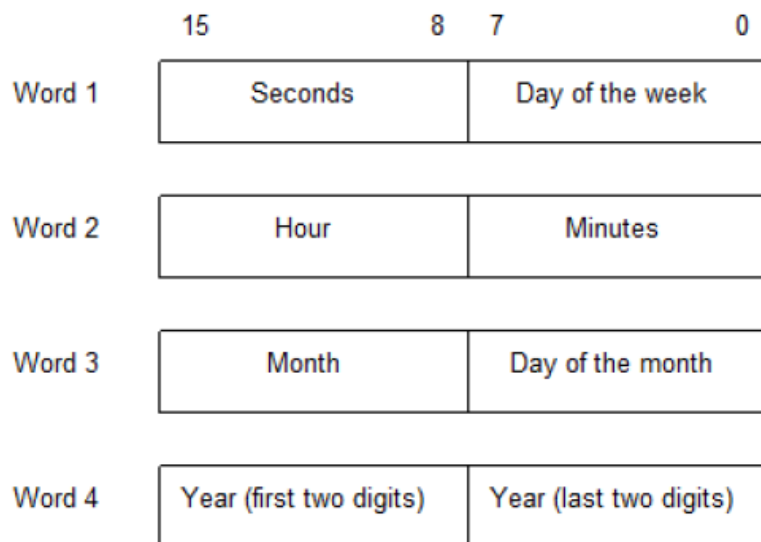
PLC setting

1. In M221 current time and date are stored in 5 system words in BCD format:

RTC functions: words containing current date and time values (in BCD):	
%SW49	xN Day of the week (N=1 for Monday)
%SW50	00SS Seconds
%SW51	HHMM: hour and minute
%SW52	MMDD: month and day
%SW53	CCYY: century and year

HMI setting

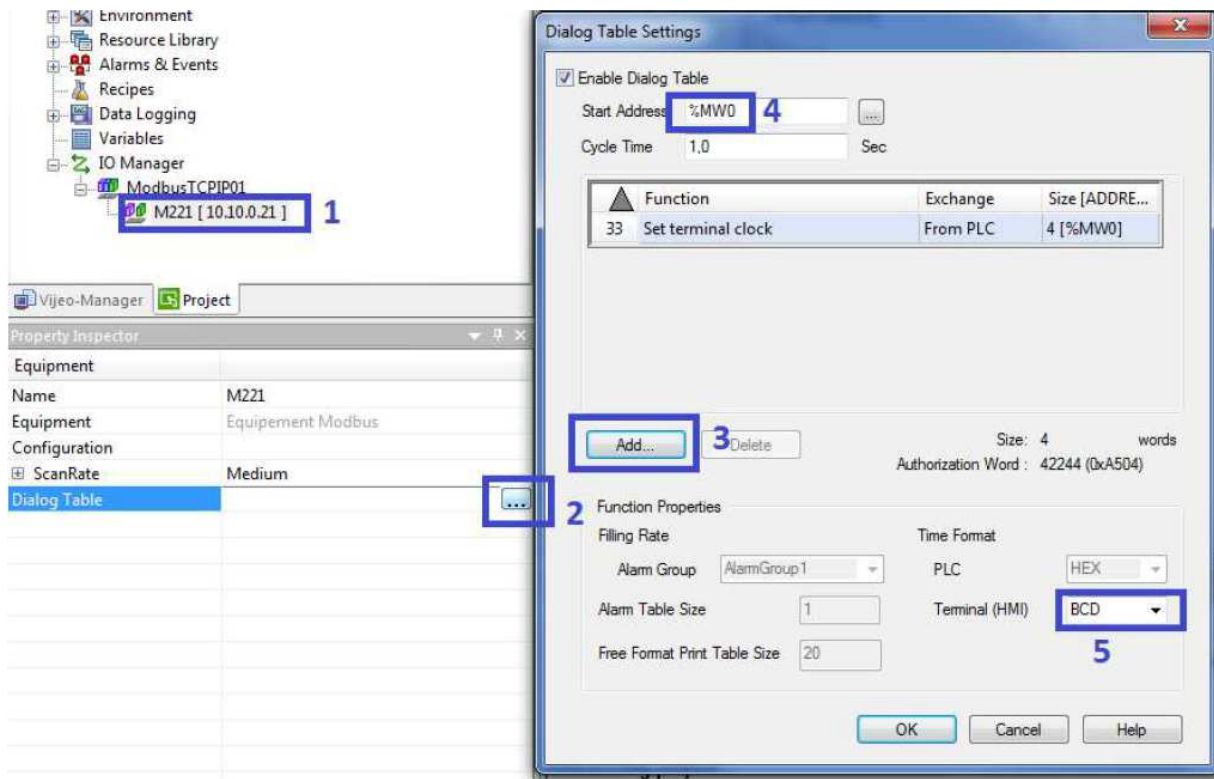
This function is a block of four 16 bit words that stores the target machine time and date. The following illustration shows the structure :



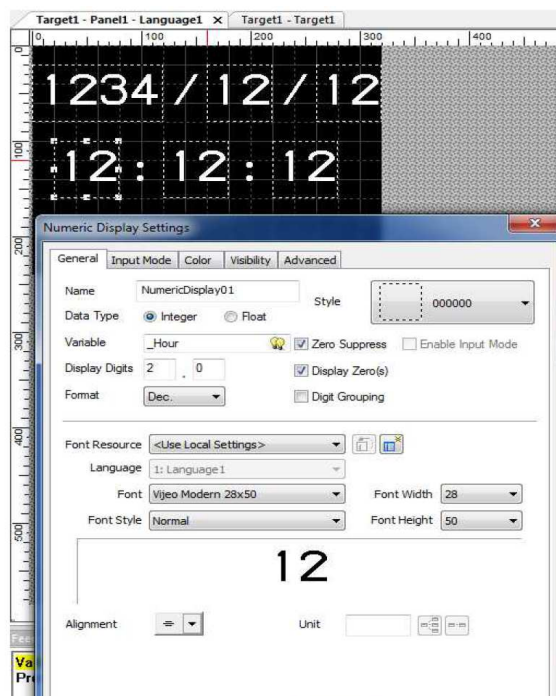
And also here for the day

Value	Day
1	Monday
2	Tuesday
3	Wednesday
4	Thursday
5	Friday
6	Saturday
7	Sunday

Here the configuration of the vimeo designer



and the setting of display panel is explained below



M221 configuration setting :

The 4 system words setting

System Word properties				
	Used	Address	Symbol	Comment
	☒	%SW50	RTC_SECS	Real time clock seconds
	☒	%SW51	RTC_HHMM	Real time clock hours and minutes
	☒	%SW52	RTC_MMDD	Real time clock month and day
	☒	%SW53	RTC_CCYY	Real time clock century and year

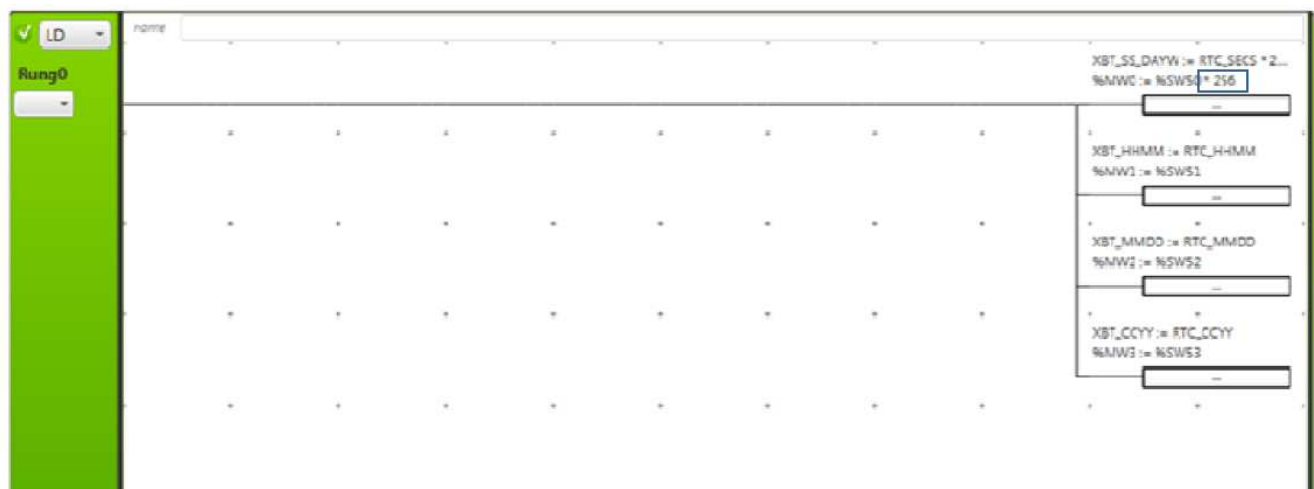
The 4 words to be read by HMI

Memory word properties

Used	Equ Used	Address	Symbol	Comment
☒	☐	%MW0	XBT_SS_DAYW	HMI seconds and day of the week
☒	☐	%MW1	XBT_HHMM	HMI hours and minutes
☒	☐	%MW2	XBT_MMDD	HMI minutes and days
☒	☐	%MW3	XBT_CCYY	HMI century and year

The Main task is to transfer the 4 RTC related words (system words) to the 4 memory words to be read by HMI.

Only %SW50 has to be shifted to fit HMI format. The 8 right shift is done by multiplying by 256, here the sample program



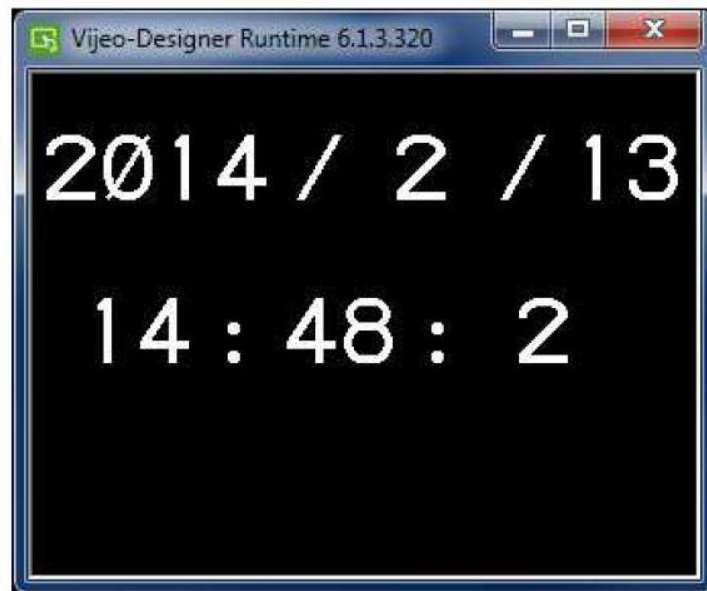
The 3 other words remain unchanged and are just copied

The HMI will calculate the day of the week by the current date it self and doesn't use the PLC day format

Section 4: Online Testing

Online testing :

1. Download the PLC program to the M221 hardware
2. Configured the Vijeo Designer software and download to HMI
3. Test the program
4. If connection success, the display will appear like this



Section 5: Remark

This features to meet customer expectations regarding to scheduler Project such as motor pump run, generator load shading, etc

After using synchronize feature the operator will have same understanding level with the machine's clock, so he can easily adjust their schedule control of all the machine in one command
