How to use New Clock, Schedule & Calendar Features

Effects: ASIC/1-8040C, ASIC/1-7040C
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Note No. TE005

Object 12 - Clock Object (7040C/8040C)

This is an important change to controller operation - please read carefully!

We have made changes to the relationship between the hardware clock and the software clock. In all controllers the software clock has always been the keeper of time in the controller, the hardware clock (if enabled) only synchronized the software clock every minute at the minute change. Since many operations also happen at the minute, such as schedules etc it is a very busy transition time.

We have modified this relationship in the following way.

- Hardware Clock Enable is redefined as Time Keeper Enable.
- The internal operation of the controller is based on the software clock.
- The Time Keeper will read the hardware clock once an hour at a time which represents an odd number of minutes that does not conflict with any controller events.
- If the controller is not a Time Keeper the hardware clock is only read at power up as a back up. This is a significant change. Now when a controller in software clock mode is reset it will synchronize itself from its own clock chip.

With this version the Timekeeper's Hardware Clock is always updated whenever there is a 3FH, M1=1 message. The Timekeeper ignores the update enable and is always synchronized. Only the Time Keeper may Broadcast Time, 3Fh,M1-1 or 38h on the system bus. Broadcast of Time will work in both token and non-token mode. (Non-Token Enable is not needed.)

For others the Update Enable should always be set so that the hardware clock can be updated. (In older versions Update Enable should always be set so that the Time Keeper can be updated.)

The recommended set up for a network of controllers incorporating the new release firmware is to have one Timekeeper enabled. Other controllers should be set to software clock (Timekeeper or Hardware Clock not enabled.) These controllers will receive time broadcasts on the system bus for synchronization. If they lose power their own local hardware clock will synch the time.

You may set all ASIC/2 to Timekeeper (Hardware Clock) Enable if the communication system cannot be relied on to ensure system synchronization. However, the best performance of clock, communications, and time related functions occurs when the Time Keeper Function is not enabled since the time-intensive function of synching software clock to hardware clock is removed from the microprocessor.

If multiple TimeKeeper/ Hardware Clocks are enabled, Make sure that only one device is the synchronizing device broadcasting the time. If more than one device sends time synchronizations, unexpected results will occur.

The Calendar must reside in the device that synchronizes the time since the Special Days are broadcast as part of the time message.

Object 4 - Schedule Changes

At the release of the ASIC/2-7040C (1/97) we modified the operation of the Time Schedules:

Originally a setting of zero hours meant not used. This was changed to the following

- IF On-time=0 and Off-time <> 0; then schedule is Always Off.
- IF On-time=0 and Off-time = 0; then schedule is Always Off.
- IF On-time = Off-time ; then schedule is Always Off.
- IF On-time<>0 and Off-time 0; then schedule is Always On.

If both the Off-time and On-time are non-zero,
then the schedule is active and its output depends On comparing the
On and Off-times with the current time in the controller.

The latest versions of both ASIC/2-7040 and ASIC/2-8040 include a new flag **Use Old Schedule** option to Schedule object, SCH,Attr-11,LO bit 7 .If Use Old Schedule is set it works as it did in earlier product providing backward compatibility with earlier models. Download a new Setsys to obtain scripts displaying this parameter.

Object 36 Calendar Object

At all versions of 7040C and 8040C the **Calendar Object** is available. The Calendar provides the capability to set special events, holidays, periods, semesters, sales or other special time periods when the facility is expected to operate differently.

The Calendar greatly extends the function of Holiday by allowing extended periods to be entered explicitly by a full date including a four digit year. This means that it is possible to explicitly select a time period years in advance. The Calendar also allows repetitive functions to be added such as “on the first Monday of the month during the period” or “weekends only during the period”.

The Calendar only indicates that a special event is currently active. This information is relayed to the local schedules in the controller and by time broadcast to other ASIC/2 controllers. Each Schedule in an ASIC/2 has up to 7 **Special Days** that can be set to reflect different behaviors for the equipment or feature that it schedules . For example Special Day 1 may be OFF. Special 2 May be run all day. Special Three may be half day, Special 4 late start etc. The profile that each special day represents is selected based on the calendar information.

The Calendar should be set up in the controller responsible for time synchronization (see above). Use of multiple Calendar Objects is potentially dangerous and will cause erratic behavior.