

HC900 Hybrid Controller

When you need more than just discrete control

Calendar Function Block – Product Note

Sun	Mon	Tue	Wed	Thu	Fri	Sat
25	26	27	28	29	30	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	1	2	3	4	5

Overview

Turning equipment on or off according to a real time clock schedule is a common requirement in building automation and a number of commercial and industrial applications. Included in this requirement is the ability to alter the time setpoints from a user interface while the controller is in operation. The HC900 Calendar Event function block provides a versatile and flexible algorithm to satisfy these requirements.

The operation of the Calendar Event function block has the following attributes:

1. The Event outputs turn ON for one Analog Scan Time when the controller's real time clock (RTC) value is equal to the user's time setpoint.
2. Up to 8 time-triggered Events may be configured in one function block.
3. Typical control action is to activate an external Latch function block with one output to turn an external device ON, and use a second event output to unlatch the Latch function block to turn the external device OFF.
4. Time setpoint resolution is one minute minimum.
5. The block Event Output is activated immediately when the RTC value is equal to the time setpoint and will not reoccur until at least one minute has passed, except for override input actions (see below).
6. Event actions are configured to re-occur periodically based on a user's schedule.
7. Recurring Event actions may be configured for the follow schedules:

- a. Daily at specified time of day (Selection of 5 day and 7 day weeks provided.)
 - b. Day of week at specified day (Sun-Sat) and time.
 - c. Day of month at specified day (1-31) and time.
 - d. Yearly at specified month (Jan-Dec), day (1-31), and time
8. The controller must be on-line in operation, the RTC must be set and the Enable Input to the block must be ON at the time the event is scheduled for the control action to occur. If power was off or if the block was disabled when the event time passed the controller will not take late control actions.
 9. The Calendar block outputs will be held off if the controller clock is not set or if a time error is detected.
 10. Override Event inputs – Each Event output of the function block has an associated Override Event input. An OFF to ON transition of an Override input causes its associated output to turn ON for one Analog Scan Time. (Useful in testing external logic without waiting for time setpoints and for unlatching outputs during abnormal periods.) The input must turn OFF before a second action can be initiated.

Special Days - The Calendar function block supports up to 16 special days. The user can set the following attributes of Special Days.

1. Specify the date for the Special Days and assign them a name.
2. Specify the desired output actions. The selection applies to all Special Days during the year:
 - a. Keep all selected events OFF for the 24 hours of the special day.
 - b. Use alternate times for selected events during the Special Days. Event outputs that are configured to have timed actions and are not selected to use alternate times will follow their normal day schedules.

Setpoint Groups (1 – 5) The calendar Event function block provides up to 5 groups of 8 setpoints for a total of 40 time setpoints. This feature is useful in selecting a different sets of setpoints for all 8 outputs of the function block based on time of year (Summer, Fall, Winter, Spring) or other external event or operation.

If no group is selected the default group will be group #1. The block provides SP_GRP# and SET input pins to select alternate groups of setpoints. If an Analog Variable is connected to the SP_GRP# input pin to select a group, the SET pin is not needed. Any change to the Analog Variable will be handled as a group change request and be acted upon. Connecting the SP_GRP# input pin to any other data source will require an OFF to ON transition of the Set pin to cause the group selection to take effect.

A SP_GRP# output pin is provided to indicate which of the 5 setpoint groups have been selected.

Multiple Calendar Function Blocks may be configured in a HC900 controller configuration. The number of blocks is not limited in the controller, however if operated by a 1042 or 559 Honeywell operator interface, the maximum number supported is 4.

1042/559 Operator Interface

A dedicated Calendar display is available for selection when using model 559 or 1042 operator interfaces (see OTHER display formats in Hybrid Control Designer). To support these displays, in the Calendar Event function block configuration, a label may be assigned to each event output and a parameter may be selected to provide a feedback signal for each output event. The feedback signal can be any analog or digital signal in the controller's configuration, but typically is a signal representing the results of the Calendar block's output. The block operation can be monitored by viewing the event (by name) and its associated feedback signal.

The 1042 and 559 operator interfaces provide up to four (4) user interface displays for calendar function blocks. This limit is imposed in the operator interface. There is no quantity limit on the number of Calendar function blocks that can be configured in a HC900 controller.

Calendar Editing from 1042 and 559 OIs.:

The following items can be altered from a 1042 or 559 operator interface:

- Time Setpoints
- Setpoint group
- Special day dates

The following items can only be edited during block configuration using Hybrid Control Designer:

- Setpoint Event Type – (5 day week, 7 day week, weekly, monthly, calendar)
- Block tag and event labels
- Special day actions
- Special day labels

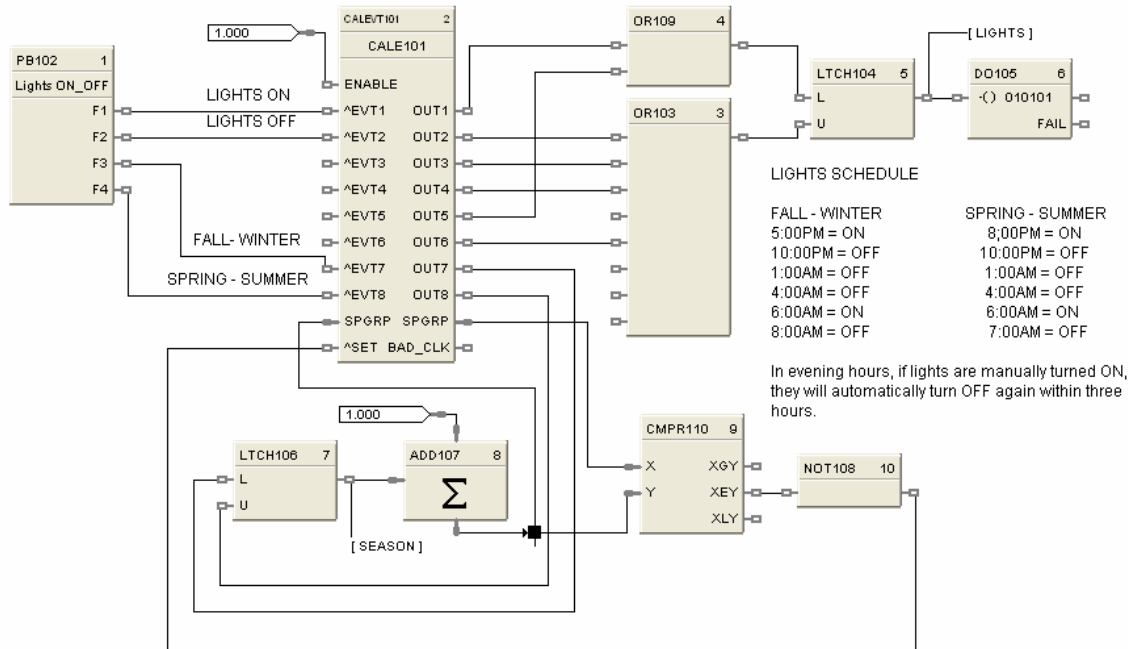
Calendar editing from other interfaces via Modbus Communications:

The following Calendar items may be edited via communications:

- Group time setpoints
- Special Days
- Special Day Mode
- Special Day setpoint times

To select setpoint groups and to monitor the selected group, apply variables and signal tags to the appropriate input and output pins of the function block and use these to support interface operation.

Sample Configuration:



This configuration uses the Calendar function block to control a digital output to turn the lights of a building ON and OFF on a time schedule. Two setpoint schedules (groups) are stored in the block to change the light activation times for a Spring/Summer schedule and a Fall/Winter schedule. The outputs 1 and 5 of the Calendar block trigger Latch 104 to turn the lights ON. Outputs 2 through 4 and 6 are used to unlatch Latch 104 to turn the lights OFF. Outputs 7 and 8 plus interface logic are used to select alternate setpoint groups once a year for the seasonal time changes.

The Pushbutton block 102 provides a manual interface to override the time setpoints and turn lights ON or OFF or change seasonal setpoints on demand from a user interface.

Summary

The calendar function block of the HC900 controller provides a powerful tool for configuring event actions based on the real time clock of the HC900 controller. The multiple setpoint groups (up to 5) allow the function block to maintain multiple control scenarios in its memory that may be manually selected through a local interface or programmatically selected through a control strategy. The use of Special Days minimizes the need for operation action to accommodate schedule changes due to holidays or other planned off-normal periods.