Installation and Operation Manual

AllSync® Wired Master Clock/ Signal Programmer

american time®
Integrated Solutions

Part # PS000001
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Safety Precautions

All electrical power and signal wiring connected to the AllSync Master, secondary clocks, signaling devices and antennas must be installed by qualified persons in conformance with applicable national and local electrical codes. Improper installation of this equipment can result in lethal electrical shock and fire.

Disconnect and lock out electrical power to the unit before removing the wiring compartment cover or front panel.

The AllSync master operates from 115vac electrical power.

Voltage applied to clock and signal relay contacts must not exceed 115vac.

To protect against shorts between power and signal circuits, all wires connected to the power, clock, and signal circuit terminals must be insulated to 300vac.

The only serviceable parts behind the front panel are a battery and a fuse.

The AllSync Master should be installed in a secure location protected from:

- Physical damage
- Water, including condensation
- Direct sunlight
- Operation by untrained personnel

Keep the hinged cover closed except when using the keypad.

The AllSync master signal programmer provides synchronized control of secondary system clocks and electrical circuits such as those for controlling signaling devices and lights.

Standard features of the AllSync master include:

- Built-in keypad and LCD for setup and operation
- Internal clock accuracy of ±2 minutes per year
- User selectable clock codes for controlling a wide range of clock types
- Two level password security
- Manual advance of impulse clock types
- Automatic Daylight Saving Time and Leap Year correction
- Programmable Custom and Automatic Daylight Saving Time

Optional features include:

- Automatic time synchronization with one or more external time references, including GPS and Ethernet
- Remote setup and operation with PC software via Ethernet
- Programming and viewing of multiple events with PC software (via Ethernet)
- Flexible control of 2, 4, or 6 signal circuits
- Manual control of signal circuits

The following table shows the options included with each model number. The **X** in the model number indicates the number of signal circuits (0, 2, 4 or 6) that can be controlled by that model. Example: ASMA04ES includes 4 signal circuits.

Model No.	GPS	Ethernet
ASMA0**X**BS	NO	NO
ASMA0**X**GS	YES	NO
ASMA0**X**ES	NO	YES
ASMA0**X**MS	YES	YES

Figure 1 - Options Included With Each Model Number

Mounting Master Clock

The AllSync master clock should be:

- Located indoors in a dry location
- Mounted upright on a vertical surface
- Protected from physical damage
- Protected from water, including condensation
- Out of direct sunlight
- Operated by trained personnel

An area at least 34" wide and 20" high should be reserved to allow a clearance of at least 12" below and on each side of the AllSync master. Wiring for power, clock and signal circuits must enter through conduit knockouts along the bottom of the enclosure. Connectors for Ethernet and other cables are located on the left side, and a reset button is accessed through a small opening on the right side of the enclosure.

The AllSync Master is designed to be wall-mounted by a keyhole hanger and screws. Appendix F shows a template for locating wall hangers to mate with these openings.

User Notes

Mounting Optional GPS Antenna

The optional GPS Smart Antenna with integrated receiver is designed for outdoor installation, in a location with a full view of the sky. For best results attach the antenna to an outside wall or a mast extending above a roof. It is best to pick a location unobstructed by trees, branches, power lines, other buildings, or other objects. Refer to the GPS Option User Manual (Part No. P000009) for complete installation and operation information.

The antenna must be installed by a qualified person in conformance with applicable national and local electrical codes.

In addition to the antenna, the GPS kit includes a mounting bracket and a 15-meter (approx. 50 ft) cable. Additional extension cables (15 meters) are available - reference American Time & Signal Co. part #H000818.

Figure 2 shows the parts used for mounting the optional GPS antenna on a mast.

Electrical Connections

115vac Supply Connections

WARNING
To prevent electrical shock, do not apply electrical power to the master, clock relays or signal relays before completing all wiring connections.

Connect the ungrounded (hot) wire to the H screw terminal and the neutral wire to the N terminal. A grounding wire is not required because the enclosure is made of non-conducting polycarbonate material.

Fuse

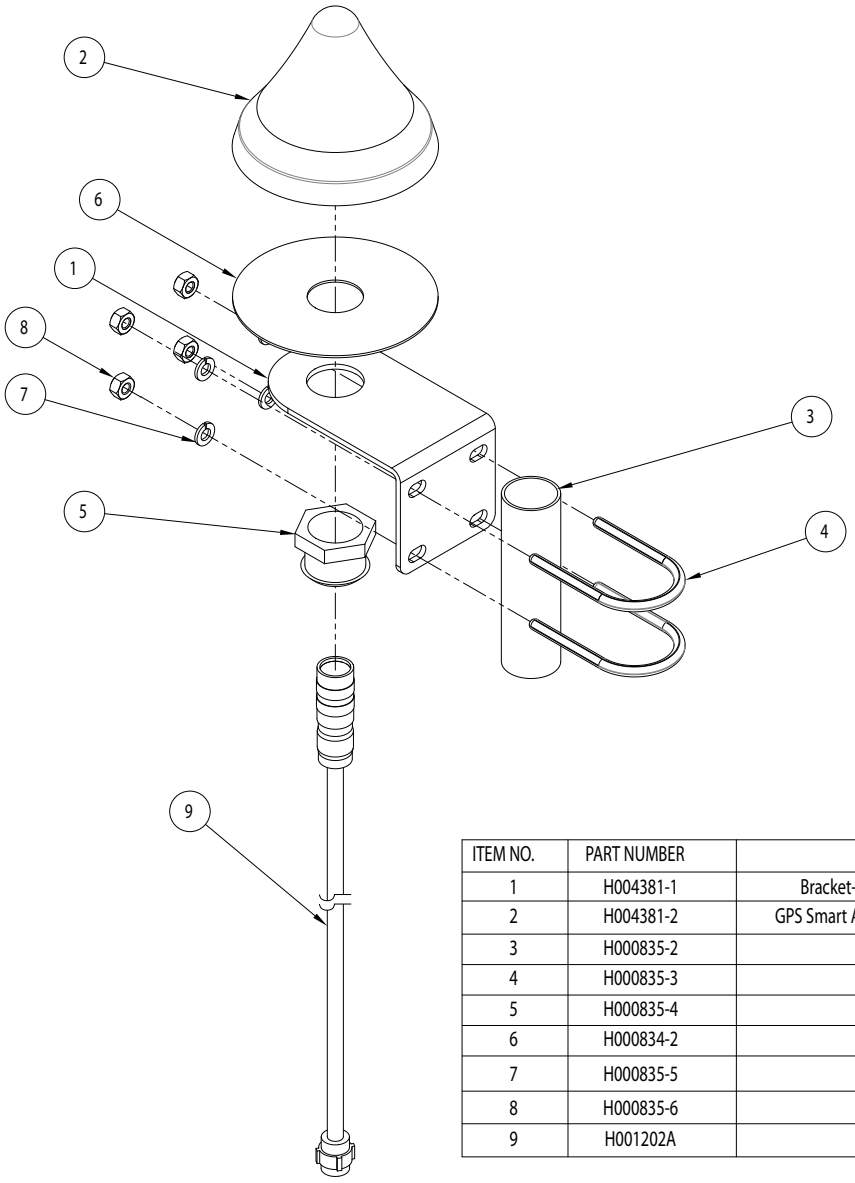
A 1A - 250vac subminiature (Wickman part #3741100041 recommended) protects the power input circuit. Each clock and signal relay circuit must be current limited to 10A or less by an external circuit breaker or fuse.

Clock Connections

CAUTION
To prevent damage to relays, relay contact voltage must not exceed 115vac.

WARNING
To protect against shorts between power and signal circuits, all wires connected to the power, clock, and signal circuit terminals must be insulated to 300vac.

Appendix A shows wiring connections to the master clock and the secondary clocks for all clock types controlled by the AllSync master.



ITEM NO.	PART NUMBER	Description	QTY.
1	H004381-1	Bracket-GPS Antenna Mount 28 mm hole	1
2	H004381-2	GPS Smart Antenna-Synergy Systems 10001510	1
3	H000835-2	Pipe, not supplied with kit	1
4	H000835-3	U-bolt, 1/4-20 supplied in kit	2
5	H000835-4	Nut, GPS-supplied in kit	1
6	H000834-2	Washer, Rubber spacer	1
7	H000835-5	Lock Washer, 1/4	4
8	H000835-6	Hex Nut, 1/4-20	4
9	H001202A	50 ft. cable	1

Figure 2 - GPS Antenna Installation

Signal Circuit Connections

CAUTION

To prevent damage to relays, relay contact voltage must not exceed 115vac.

WARNING

To protect against shorts between power and signal circuits, all wires connected to the power, clock, and signal circuit terminals must be insulated to 300vac.

Terminals for connecting to the normally open and common contacts of the optional signal circuit relays are located in the wiring compartment at the bottom of the enclosure.

Ethernet

If the Ethernet option is included, connect an Ethernet data cable to the RJ-45 jack (bottom port) on the left side of the AllSync Master.

GPS Kit

If the optional GPS kit is included, connect the cable supplied with it to the matching 12-pin circular connector (middle port) on the left side of the AllSync Master. Refer to the GPS kit installation instructions on page 10.

Figure 3 - Keypad and LCD User Interface

The AllSync master is configured and operated using the 16-button keypad and LCD display shown in Figure 3. If an optional Ethernet connection is available, a networked PC can be used to configure and operate the master remotely. Software included with the Ethernet option emulates the user interface panel on the PC screen. Refer to the Ethernet Option User Manual (Part No. P000007)

Keypad Button Functions

SUN 1 **1**/Sunday

MON 2 **2**/Monday

TUE 3 **3**/Tuesday

WED 4 **4**/Wednesday

THU 5 **5**/Thursday

FRI 6 **6**/Friday

SAT 7 **7**/Saturday

AUTO 8 **8**/Sunday

ADJ 9 **9**/Enable automatic control of relay signal

OFF 0 **0**/Resynchronize master clock to external time source or synchronize secondary clocks to master

PREV < Scroll backward through menu choices or backspace within displayed screen.

NEXT > Scroll forward through menu choices within displayed screen.

BACK Return to previous menu screen.

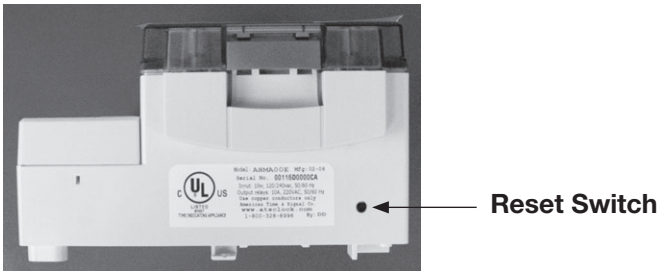
PROG Display Program Menu or return to Program Menu

MAN Manually control signal relays.

OK Accept displayed settings.

Reset Switch

In addition to the keypad buttons a reset switch is accessible through a small hole in the right side of the master enclosure. This switch is used during certain setup procedures.



Configuration and Operation

Figure 4 shows the initial entry points that lead from the main (time display) screen to the menus for configuring and operating the AllSync master. Access to menus for changing configuration or controlling signal circuits requires either the User Lock or the Service Lock. The User Lock and the Service Lock are set to 1234 at the factory. Both codes can be set or changed in the Configuration portion of the Program menu.

The steps involved in each of these operations are detailed in the Programming and Adjust Time Menu sections of this manual.

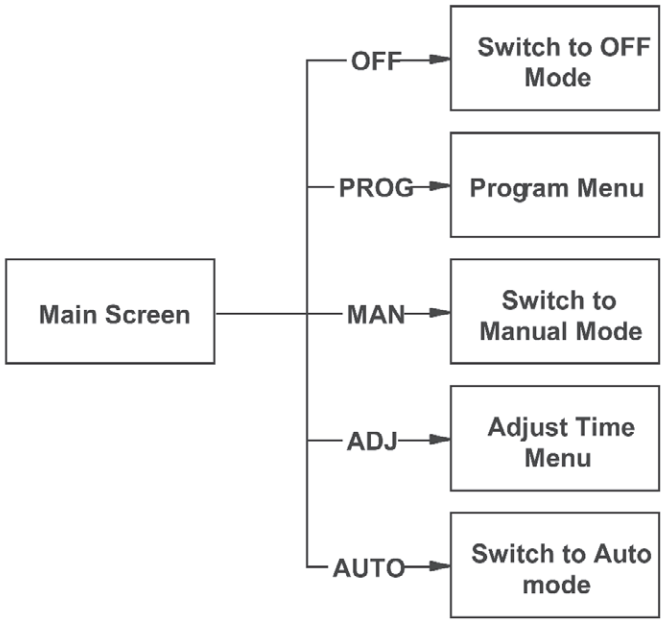


Figure 4 - Menu Entry Points

Program Menu

Pressing the **PROG** key at the main screen brings up the Program menu shown in Figure 5. This menu includes 8 submenus for performing the following:

- Configuring the master clock and setting it to the correct time.
- Programming events for controlling signal circuits.
- Checking the status of connections to GPS and Ethernet time reference sources.
- Selecting the primary time signal source if multiple sources are available.
- Selecting security passwords.
- Checking and revising Ethernet communication settings.
- Selecting a different clock control signal code.
- Advancing clocks manually (applicable clock codes only).
- Customizing the time display screen.

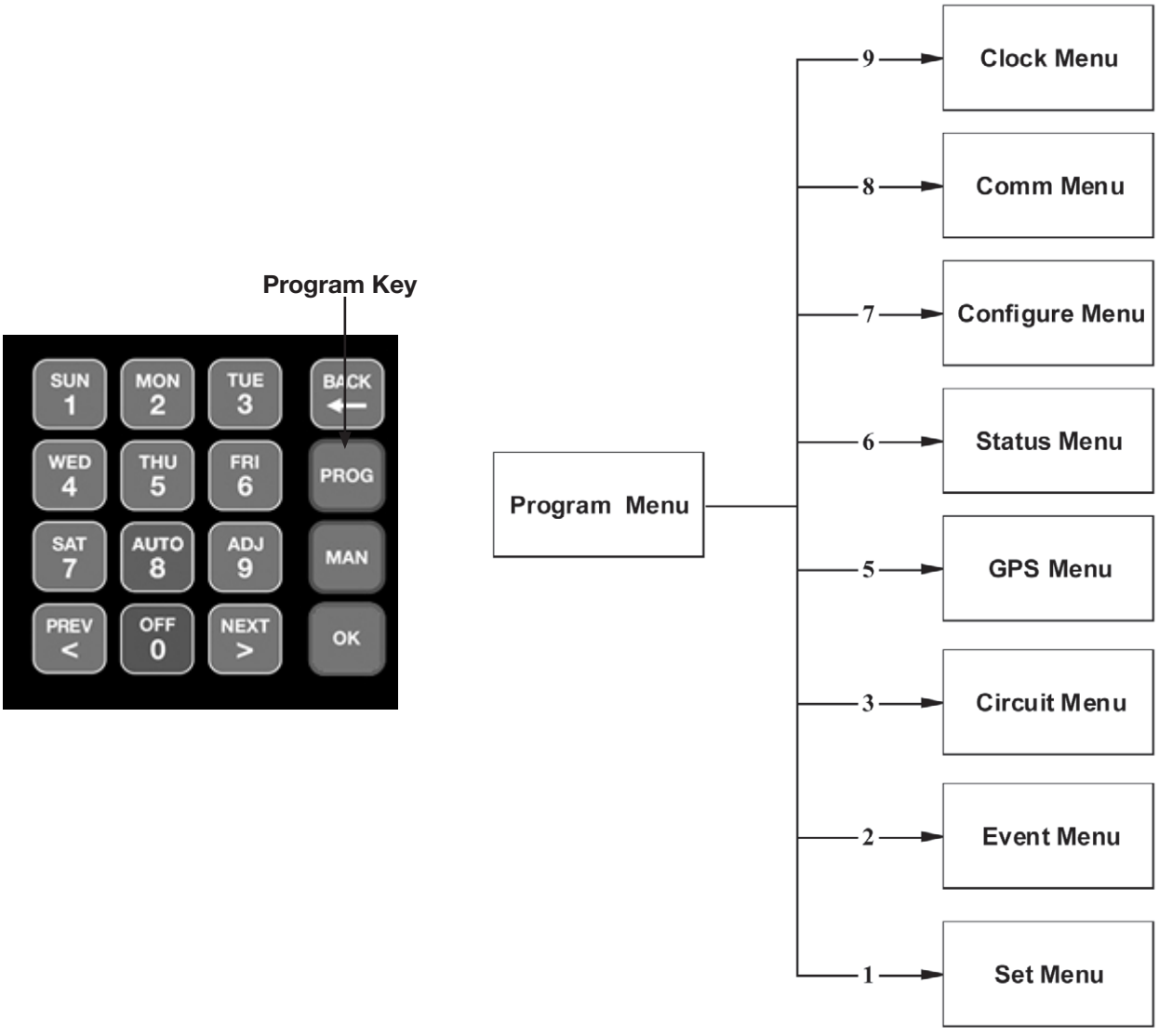


Figure 5 - Program Menu

Set Menu

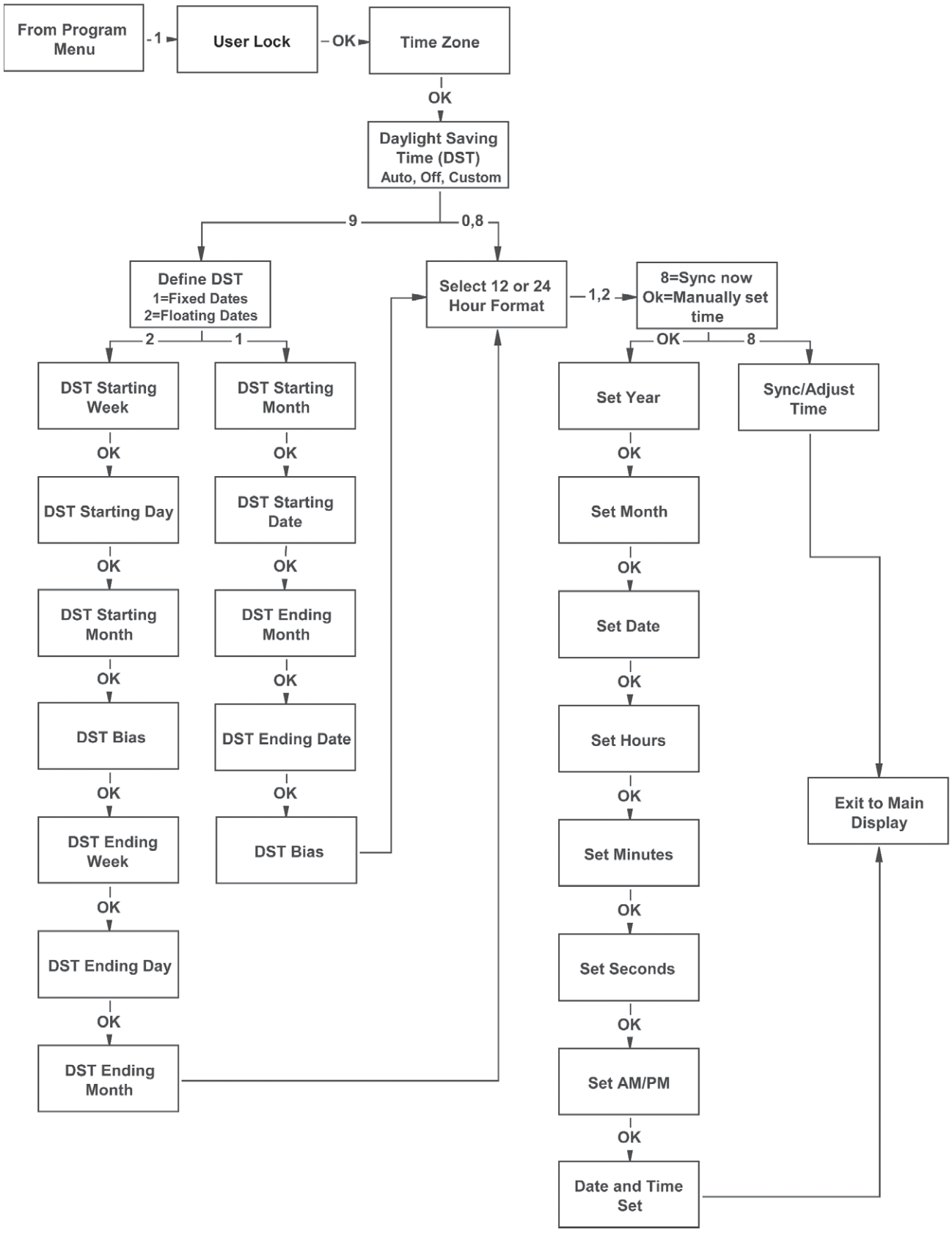


Figure 6 - Set Time Menu

Setting the Master Clock

Figure 6 shows the menu structure for setting the time.

The master clock can be set in the SET Menu with the following keystrokes:

1. **PROG**
2. **1**
3. Enter User Lock (Unless User Lock is disabled)
4. **OK.** (Unless User Lock is disabled)

The Time Zone screen appears:

```
Set menu TZone
Select time zone: 005
040=Custom USCST
<>=Scroll OK=Accept
```

At this point scroll to the correct time zone using **< and >** (or key in the desired time zone number). Enter **040** if a custom time zone is needed. Press **OK** to accept the selection. Refer to appendix C for Time Zone abbreviations and UTC offsets.

Selecting Custom in the above screen brings up the Enter Time Zone screen:

```
Set menu TZone
Enter Time Zone
offset from UTC
+ 02:00   OK=Accept
```

Enter the custom time zone as an offset from Universal Time. The offset is expressed in hours and minutes ahead of (+) or behind (-) Universal Time. For example, -05:55 maintains master time at 5 minutes ahead of Central Standard Time. Press **OK** to accept the offset.

After the time zone is accepted the Set Daylight Saving screen appears:

```
Set Menu DST
Set DST   (Auto)
8=Auto    9=Custom
0=Off     OK=Accept
```

Pressing **8** causes automatic time changes to and from daylight saving time under the rules in effect through the year 2006.
Press **8** to enable or **0** to disable these automatic time changes. For the years 2007 and beyond, follow instructions in the Configuration menu, option **9**, "Set Auto DST" to set Auto DST settings to the appropriate floating dates.

```
Set Menu DST
Set DST   (Custom)
8=Auto    9=Custom
0=Off     OK=Accept
```

Pressing **9** selects Custom DST and brings up the Define DST screen:

```
Set Menu DST
Define DST By:
1=Fixed Dates
2=Floating Dates
```

At this screen press **1** to designate fixed dates and times for the beginning and end of daylight saving time, or press **2** to designate the months, weeks, weekdays and times for the beginning and end of daylight saving time.

Pressing **1** at the Define DST screen displays the DST Start screen for fixed dates:

```
Set Menu DST
DST Start:  APR 30
DST End     OCT 15
Bias +02:00 OK=Acpt
```

1. Use the **< >** keys to change the start month.
2. Press **OK** to accept the displayed start month. A start date appears.
3. Use the **< >** keys to change the start date.

4. Press **OK** to accept the displayed start date. An end month appears.
5. Use the **< >** keys to change the end month.
6. Press **OK** to accept the displayed end month. An end date appears.
7. Use the **< >** keys to change the end date.
8. Press **OK** to accept the displayed end date.
9. A bias value appears. This indicates the hours and minutes to advance the time on the DST start date when the time change occurs. For example, a bias of +01:00 causes the time change to advance 1 hour (and no minutes) on the start date.
10. Enter the bias hour and minute.
11. Press **>** for **+**.
12. Press **OK** to accept the displayed bias.

Pressing **2** at the Define DST screen displays the Start of DST screen:

```
Set Menu DST
Start of DST:
 1st        OF
Bias        OK=Acpt
```

1. Use the **< >** keys to change the start week.
2. Press **OK** to accept the displayed start week. A start day appears.
3. Use the **< >** keys to change the start day.
4. Press **OK** to accept the displayed start day. A start month appears.
5. Use the **< >** keys to change the start month.

```
Set Menu DST
Start of DST:
 2nd SUN  OF MAR
Bias +01:00 OK=Acpt
```

6. Press **OK** to accept the displayed start month. A bias value appears. This indicates the hours and minutes to advance the time on the DST start date when the time change occurs. For example, a bias of +02:00 causes the time change to advance 2 hours (and no minutes) on the start date.
7. Enter the bias hour and minute.
8. Press **>** for **+**.
9. Press **OK** to accept the displayed bias. The End of DST screen appears.

```
Set Menu DST
End of DST:
 1st SUN  OF NOV
          OK=Accept
```

10. Use the **< >** keys to change the end week.
11. Press **OK** to accept the displayed end week. An end day appears.
12. Use the **< >** keys to change the end day.
13. Press **OK** to accept the displayed end day. An end month appears.
14. Use the **< >** keys to change the end month.
15. Press **OK** to accept the displayed end month.

After daylight saving time is defined the Choose Mode screen appears:

```
Set Menu Mode
Choose Mode: 1
1=12 HR (AM/PM)
2=24 HR (Military)
```

Select the time display format by pressing **1** for 12-hour or **2** for 24-hour time display.

Example: Master Clock Setup

To setup the master clock for operation in the Eastern time zone with automatic daylight saving time adjustment and 12 hour time display press:

1. **PROG**
2. **1**
3. Enter User Lock (unless User Lock is disabled)
4. **OK** (unless User Lock is disabled)
5. **007** for Eastern time zone
6. **8** for automatic daylight saving time adjust
7. **1** for time display in 12 hour format

After the time display format is selected the time Sync Option screen appears.

Setting Time Manually

At the Sync Option screen press OK to set the clock manually. The steps are as follows:

```
Set Menu
Time Sync Option is
Available:   Ethernet
8=Sync now  OK=Set
```

1. At the Set Year screen key in 4 digits to correct the year if necessary.
2. Press **OK**.
3. At the Month screen key in 2 digits to correct the month if necessary.
4. Press **OK**.
5. At the Date screen key in 2 digits to correct the date if necessary.
6. Press **OK**.
7. At the Hour screen key in 2 digits to correct the hour if necessary.
8. Press **OK**.
9. At the Minute screen key in 2 digits to correct the minute if necessary.
10. Press **OK**.
11. At the Second screen key in 2 digits to correct the second if necessary.
12. Set it 10 seconds ahead to allow syncing to the correct time.
13. Press **OK**.
14. At the next screen press **< or >** to change between AM and PM if necessary.
15. When the actual time matches the displayed time press **OK**.

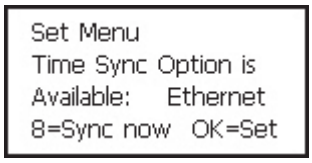
Example: Setting Time Manually

Starting at the Time Sync Option screen, setting the master clock manually to 10:44:50 AM, March 15, 2006 requires the following keystrokes:

1. **OK**
2. **2006** for year 2006
3. **OK**
4. **03** for March
5. **OK**
6. **15** for date
7. **OK**
8. **10** for hour
9. **OK**
10. **44** for minute
11. **OK**
12. **50** for second
13. **OK**
14. **<** for AM
15. **OK** set clock to the new time

Synchronizing to a Time Reference

If the master clock has access to one or more external time references, the master clock will attempt to sync its internal clock to a time reference at four minutes past each hour. To initiate an external sync of the master clock at any other time, proceed through the steps for setting the time manually until the Time Sync Option screen appears:



At the Sync Option screen, the time references available (GPS or Ethernet, depending upon the AllSync model) can be viewed using the **<** and **>** keys. Pressing **8** causes the unit to attempt synchronization with external time sources in the order of priority (refer to the Time Sync Priority section of the Configuration menu for setting priority).

The master clock can also be synchronized to an external time reference by pressing **ADJ**, then **2** (from the main time screen). This causes the unit to attempt synchronization with external time sources in order of priority. See the Setting Time Sync Priority section in the Configuration menu for information on setting time sync priority.

Event Menu

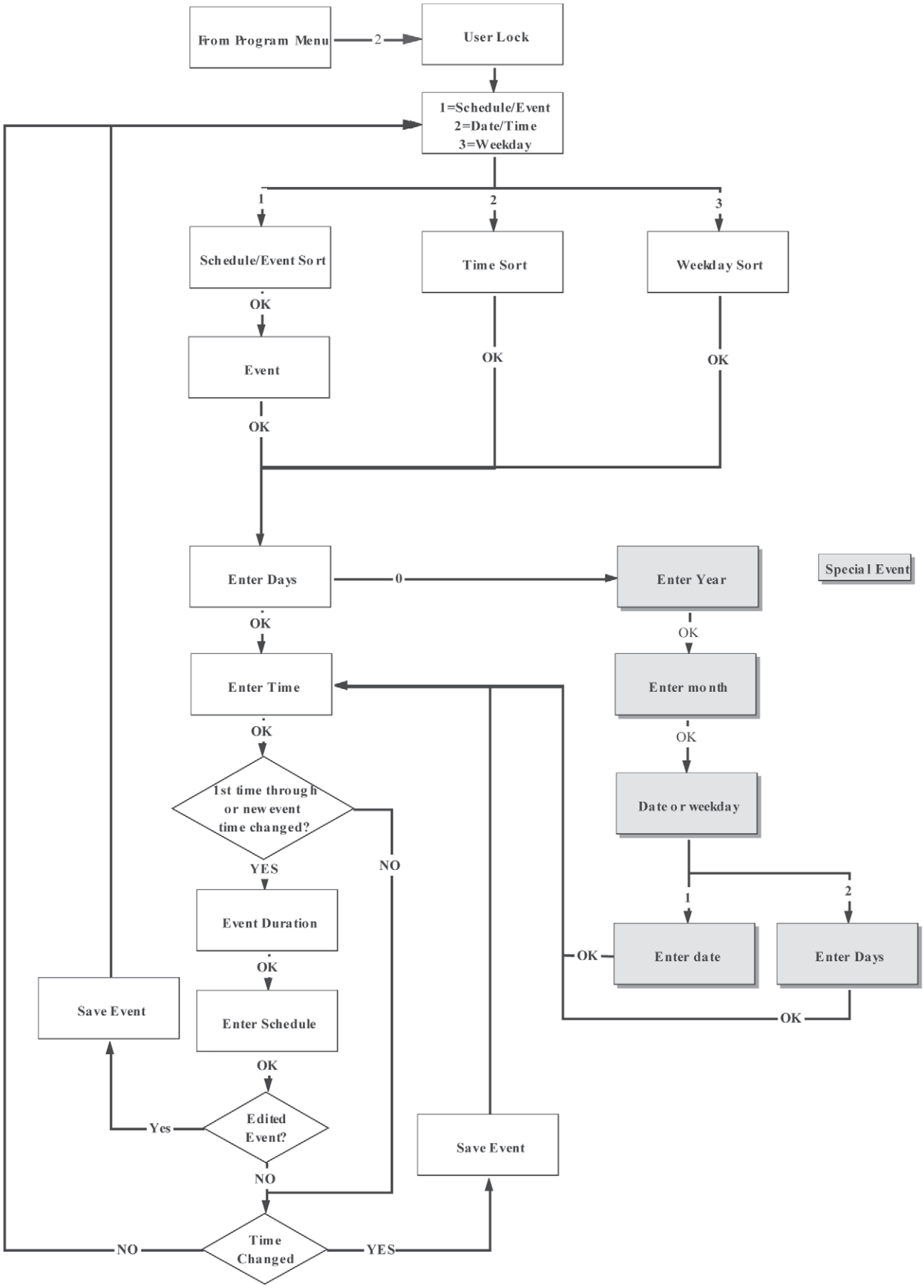


Figure 7 - Event Menu

Programming Events

Optional signal relays for controlling signal or lighting circuits are programmed by specifying the start time and duration of each signaling or lighting event. Recurring events are programmed by specifying their recurring days (usually selected weekdays), start time, and duration. Duration can be a fixed time period (1-9 seconds), the default duration assigned independently to each signal circuit (described in the Signal Circuits section), or defined by a start time and a stop time (using two separate events). Events can also be programmed to occur on specific dates.

A schedule is a group of events that occur for the same signal circuit(s). Each programmed event, and the signal circuit(s) controlled by that event, must be assigned to the same schedule. Schedules that are programmed to control one or more signal circuits for extended periods of time are identified by numbers 1 - 99. Schedule 0 is reserved for temporary control of signal circuits. After assignment to Schedule 0, a signal circuit will run the event(s) assigned to Schedule 0 for up to 24 hours or until all events are completed, whichever occurs first. At the end of this period the signal circuit resumes its previously assigned schedule.

Note: American Time and Signal recommends sorting events after each edited, added or deleted event. When exiting the event menu, sorting automatically occurs by the master if needed. However, the AllSync Master has a time out feature (90 seconds) for security. If the AllSync Master times out after event(s) have been added, edited or deleted, Events should be sorted via entry of Dte/Time selection of the view events by screen (refer to Reviewing and Editing Events By Date/Time section).

Programming New Events

Figure 7 shows the Events Menu structure. To reach the Event Menu press

1. **PROG**
2. **2**
3. Enter User Lock
4. **OK**.

The View Events screen appears:

```
Event Menu
View Events by
1=Schedule/Event
2=Dte/Tme    3=WKD
```

At this point, press **1** to add an event. This leads to the Choose Schedule screen:

```
Event Menu
Choose Schedule
Sch=01 Select 1-99
          OK=Accept
```

At this screen, if necessary, change the number of the schedule for the new event and press **OK**. The Event Day/Start Time screen appears:

```
Event menu
Sch=01 Event=0000
2006-02-12  12:04 AM
<Scl> M=Del OK=Edt
```

If any events have already been assigned to the selected schedule, the days and start time for the first event are displayed. Use the **<** key to move directly to the New Event screen.

Pressing **OK** displays the Select Weekdays Screen:

```
Select Weekdays:
8=M-F       MTWTF
9=S+S Key 1234567
0=Special OK=Accept
```

To program event days, press:

- S**UN - SAT** keys to add or remove days individually, or
- **8** to add weekdays, **9** to add weekends, or
- **0** for special events. This allows events to be defined by date(s).
- Press **OK** to accept the assigned days.

Programming Recurring Events by Weekday

For a non-special event, this brings up the Event Time screen:

```
Event menu
Select event time:
Evt Time:   12:00 AM
 MTWTF   OK=Acpt
```

To program start time:

1. Use the number keys to enter hour and minute.
2. Press < for AM or > for PM.
3. Press **OK** to accept the event start time.

The Event Duration screen appears:

```
Event Menu
Duration 0=Default
2  Sec (1-9 , < or >)
Off=< On=> OK=Set
```

An event can activate one or more signal circuits for a fixed period (1 - 9 seconds) or for the default duration assigned independently to each signal circuit (see the Programming Signal Circuit Menu). An event can also turn on one or more circuits, leaving them on until a later event turns them off. To program event duration:

- Key in any number **1-9** to specify duration in seconds,

or

- Press **0** to use the default duration(s) for the circuit(s) assigned to this schedule,

or

- Press > to latch assigned circuits on until a later event turns them off,

or

- Press < to turn off assigned circuits that were previously turned on.
- Press **OK** to accept event duration.

```
Event Menu
Choose Schedule
Sch=01 Select 1-99
          OK=Accept
```

The Choose Schedule screen reappears:

Press **OK** to accept the schedule number.

```
Event Menu
Y=All   M=All
 MTWTF   05:03 AM
 Event 0000 Saved
```

The Event Saved screen appears momentarily followed by the Select Event Time screen:

```
Event menu
Select event time:
Evt Time:   12:00 AM
 MTWTF   OK=Acpt
```

At this point, if a new event is to be programmed with the same assigned schedule, days and duration as the previous event, enter only the start time of the new event and press **OK**. This sequence can be repeated to program a series of events that share the same schedule, days and duration.

To exit this loop, press the **BACK** key or press **OK** without changing start time. This returns to the View Events screen at the top of the Event Menu.

Example: Programming Recurring Events

To program a new event in Schedule 2 that turns on signal circuits for 5 seconds starting at 8:55 AM every weekday Monday-Friday, press:

1. **PROG**
2. **2**
3. Enter User Lock (unless User Lock is disabled)
4. **OK** (unless User Lock is disabled)
5. **1** for Schedule/Event
6. **02** for Schedule 2
7. **OK**
8. **<** if necessary to display New Event
9. **8** to select Mon. - Fri.
10. **OK** to accept day selection
11. 0855 for time
12. **<** if necessary to select AM
13. **OK** to accept time
14. **5** for event duration
15. **OK** to accept duration
16. **OK** to save event

At this point, to program a new event for the same schedule, days and duration simply enter the new start time and press **OK**. To stop programming similar events press **OK** a second time.

To exit Event menu press **BACK**.

To exit Program menu press **BACK** again.

Programming Special Events

Note: American Time and Signal recommends against programming any 12:00am *special* events because, during this minute of each day, the AllSync Master refreshes its event routines. As a result, special events programmed for 12:00am (midnight) may not run properly. Regular 12:00am events are not affected by this daily activity.

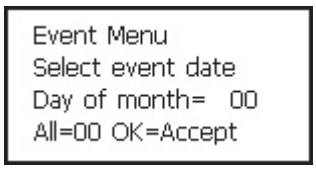
Pressing **0** in the Select Weekdays screen brings up the Enter Event Year screen:

Change year if necessary or enter **0000** to indicate all years. Press **OK**. The Enter Event Month screen appears:

To change the month, enter the number of the month as 2 digits. Enter **00** to select all months.

Pressing **OK** brings up the Choose screen:

Pressing **1** to select a day of the month brings up the Select Event Date screen:



Enter a 2-digit day of the month or **00** for all days. Press **OK**.

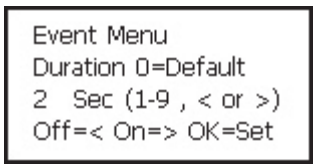
Pressing **2** in the Choose screen to set weekdays brings up the Select Day screen. At this screen press:

- **SUN-SAT** keys to add or remove days individually, or
- **8** to add weekdays, **9** to add weekends.
- Press **OK** to accept the assigned days. The Select Event Time screen appears:

To program start time:

1. Use the number keys to enter hour and minute.
2. Press < for AM or > for PM.
3. Press **OK** to accept the event start time.

The Event Duration screen appears:



An event can activate one or more signal circuits for a fixed period (1-9 seconds) or for the default duration assigned independently to each signal circuit (see the Programming Signal Circuit Menu). An event can also turn on one or more circuits, leaving them on until a later event turns them off. To program event duration:

- Key in any number **1-9** to specify duration in seconds, or
- Press **0** to use the default duration(s) for the circuit(s) assigned to this schedule, or
- Press **>** to latch assigned circuits on until a later event turns them off, or
- Press **<** to turn off assigned circuits that were previously turned on.
- Press **OK** to accept event duration.

The Choose Schedule screen reappears:

Press **OK** to accept the schedule number.

The Event Saved screen appears momentarily followed by a return to the View Events screen at the top of the Event Menu:

Example: Programming Special Events

To program a new special event in Schedule 2 that turns on signal circuits for 8 seconds starting at 3:45 PM on October 31, 2006 press:

1. **PROG**
2. **2**
3. Enter User Lock (unless User Lock is disabled)
4. **OK** (unless User Lock is disabled)
5. **1** for Schedule/Event
6. **02** for Schedule 2
7. **OK**
8. **<** if necessary to display New Event
9. **OK**
10. **0** to select Special
11. **2006** to change year to 2006
12. **OK** to accept year
13. **10** to change month to October
14. **OK** to accept month
15. **1** to select Set Date
16. **31** to set date
17. **OK**
18. **0345** to set start time
19. **>** to select PM
20. **OK**
21. **8** to set duration
22. **OK**
23. **OK** to save event

To exit Event menu press **BACK**.

To exit Program menu press **BACK** again.

Reviewing and Editing Events

To reach the Events Menu press:

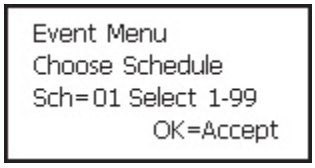
1. **PROG**
2. **2**
3. Enter User Lock (unless User Lock is disabled)
4. **OK** (unless User Lock is disabled)

The View Event screen appears:

At this point press:

- **1** to add, view, edit, or delete events sequentially by event number in a particular schedule, or
- **2** to view, edit, or delete events in all schedules, beginning with the first event scheduled to start on or after a specified hour.
- **3** to view, edit, or delete events by weekday.

Reviewing and Editing Events by Schedule



Pressing **1** leads to the Choose Schedule screen:

Key in a schedule number and press **OK**. If any events have already been assigned to the selected schedule, the days and start time for the lowest numbered event are displayed:

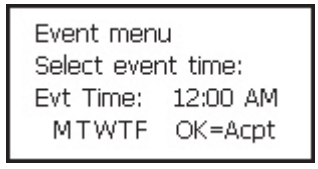
Use the < and > keys to scroll through similar screens for all existing events, or enter an event number to move immediately to that event. Press **BACK** to exit the Event menu. Press **MAN** to delete the event. Press **OK** to view or edit the days, start time and duration of the displayed event.

Pressing **OK** leads to the Event Weekdays screen:

This screen shows the days previously assigned to the event. To change event days press:

- **SUN-SAT** keys to add or remove days individually, or
- **8** to add weekdays or
- **9** to add weekends, or
- **0** to edit a special event. This will lead to the series of screens for defining special events.

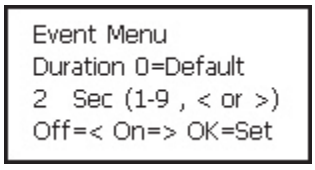
Press **OK** to accept the assigned days. For recurring events this brings up the Event Time screen:



This screen shows the start time of the event. To change start time:

1. Use the number keys to enter hour and minute.
2. Press < for AM or > for PM.
3. Press **OK** to accept the event start time.

The Event Duration screen appears:



An event can activate one or more signal circuits for a fixed period (1-9 seconds) or for the default duration assigned independently to each signal circuit (see Circuit Menu). An event can also turn on one or more circuits, leaving them on until a later event turns them off. To change event duration:

- Key in any number **1-9** to specify duration in seconds, or
- Press **0** to use the default duration(s) for the circuit(s) assigned to this schedule, or
- Press **>** to latch assigned circuits on until a later event turns them off, or
- Press **<** to turn off assigned circuits that were previously turned on.
- Press **OK** to accept event duration.
- Press **OK** to save event changes.

Example: Reviewing and Editing Events by Schedule

To change only the duration of Event 24 in Schedule 2 to 6 seconds press:

1. **PROG**
2. **2**
3. Enter User Lock (unless User Lock is disabled)
4. **OK** (unless User Lock is disabled)
5. **1** for Schedule/Event
6. **02** for Schedule 2
7. **OK**
8. **0024** for event number
9. **OK** to jump to Event 24
10. **OK** to show event weekdays
11. **OK** to accept day selection
12. **OK** to accept time
13. **6** for event duration
14. **OK** to accept duration
15. **OK** to save event

To exit Event menu press **BACK**.

To exit Program menu press **BACK** again.

Reviewing and Editing Events By Date/Time

To reach the Events Menu press:

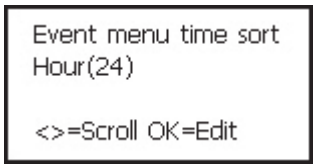
1. **PROG**
2. **2**
3. Enter User Lock (unless User Lock is disabled)
4. **OK** (unless User Lock is disabled)

The Event Menu screen appears:

Pressing **2** at this screen leads to the Chronological Sort Screen:

At the Chronological Sort screen the option is given to Sort or Cancel Sort. Either selection (1or0) will lead to the Hour Screen:

Note: American Time and Signal recommends always selecting the Sort option (1). The Cancel feature (0) should only be used if more than 200 events have been entered (to save time required to sort) and it is known that this sorting feature has been performed after the last event edit, add or deletion.



At the Hour screen, indicate the hour to start displaying events in chronological order. Enter the hour as 2 digits in 24 hour format. For example if the earliest programmed event is scheduled for 5:00 AM, entering **05** (or an earlier) hour and pressing **OK** leads to the following screen:

Use the **<** and **>** keys to scroll backward or forward through all programmed events. At this point the steps for reviewing and editing selected events are identical to those listed above for viewing and editing events by schedule, with one exception: event number cannot be used to jump directly to an event.

Reviewing and Editing Events By Weekday

To reach the Events Menu press:

1. **PROG**
2. **2**
3. Enter User Lock (unless User Lock is disabled)
4. **OK** (unless User Lock is disabled)

   The Event Menu screen appears:

Pressing **3** at this screen leads to the View Weekday Screen:

Select the weekday of interest by pressing

- One of the **SUN-SAT** keys
- Use the **<** and **>** keys to scroll through screens showing events scheduled for that day.

At this point the steps for reviewing and editing selected events are identical to those listed above for viewing and editing events by schedule, with one exception: event number cannot be used to jump directly to an event.

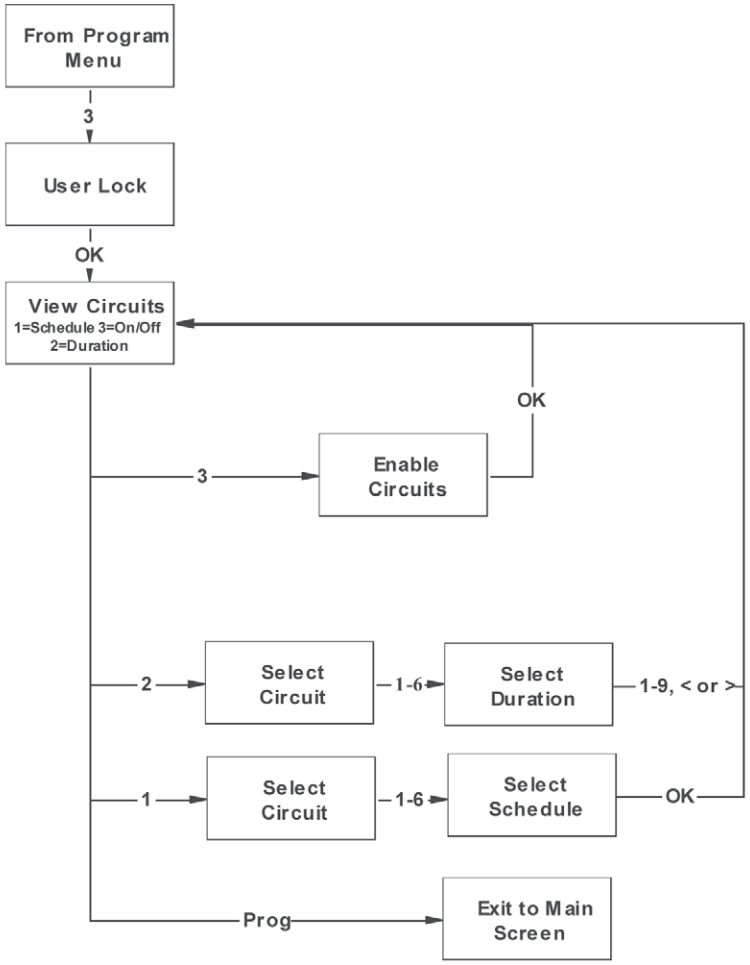


Figure 8 - Signal Circuit Menu

Programming Signal Circuits

Optional signal relays for controlling signal or lighting circuits must be assigned to schedules of events for automatic control. Multiple circuits can be assigned to one schedule, but each signal circuit can be assigned to only one schedule.

Each signal circuit is also programmed with a default event duration. This allows signal circuits assigned to the same schedule to be activated for different lengths of time for the same event. This default duration can be overridden by the duration specified for an event (described in the Programming Events section).

Setting Signal Circuit Schedule and Duration

Figure 8 shows the Signal Circuit menu structure. To reach the Circuit menu press:

1. **PROG**
2. **3**
3. Enter User Lock (unless User Lock is disabled)
4. **OK** (unless User Lock is disabled)

   The View Circuits screen appears:

```
Circuit Menu
View Circuits for:
1=Schedule 3=On/Off
2=Duration  Prog=Exit
```

Press 1 to select the Signal Circuit screen:

```
Circuit Menu
Select Circuit:
Cir  1  2  3  4  5  6
Sch 01 01 02 02 03 03
```

This screen shows the current schedule assignments for all signal circuits. To change the schedule assignment for a signal circuit, press the number of the signal circuit.

The Choose Schedule screen appears:

```
Circuit Menu
Cir: 01     Choose Sch
Sch: 01     00=Special
            OK=Accept
```

Assign this signal circuit to a schedule by pressing the two digit schedule number. Press **OK** to accept the schedule assignment. This returns to the View Circuits screen. Press **2** to bring up the Duration screen:

```
Circuit Menu
Select Circuit:
Cir  1  2
Dur <  1
```

This screen shows the current default duration for all signal circuits. Where **<** indicates an off default and **>** indicates an on default. To change the default duration for a signal circuit, press the number of the signal circuit. The Select circuit duration screen appears:

```
Circuit Menu
Select Cir 1 Duration
5 Sec (1-9, < or >)
Latchin  Off=<  On=>
```

This screen shows the current default duration for the selected signal circuit. This duration applies only for events that are programmed with a duration of 0. Circuit duration can be for a definite period (1-9 seconds) or for a time defined by two successive events. The first event turns the circuit on, the second event turns it off. To change circuit default duration:

- Key in any number **1-9** to specify duration in seconds, or
- Press **>** to latch the circuit on, or
- Press **<** to turn the circuit off.
- Pressing any one of these keys saves the circuit duration and returns to the View Circuits screen.

Example: Programming Signal Circuits

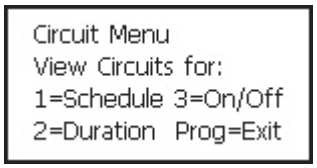
To assign Signal Circuit 1 to Schedule 12 with a default duration of 5 seconds and Signal Circuit 4 to Schedule 6 with a default duration of 8 seconds, press:

1. **PROG**
2. **3**
3. Enter User Lock (unless User Lock is disabled)
4. **OK** (unless User Lock is disabled)
5. **1** to select Schedule
6. **1** to select Circuit 1
7. **12** to assign Circuit 1 to Schedule 12
8. **OK**
9. **2** to select Duration
10. **5** to set Circuit 1 default duration to 5 seconds
11. **1** to select Schedule
12. **4** to select Circuit 4
13. **06** to assign Circuit 4 to Schedule 6
14. **OK**
15. **2** to select Duration
16. **8** to set Circuit 4 default duration to 8 seconds

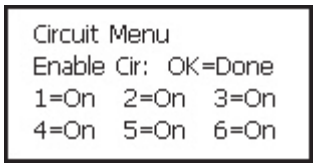
To exit Signal Circuit menu press **PROG**.

To exit Program menu press **BACK**.

Enabling and Disabling Signal Circuits



In the View Circuits screen press **3** to view or change the control status of individual signal circuits. The Enable Circuits screen appears:



This screen allows individual signal circuits to be enabled (On) or disabled (Off).

Note: For a signal circuit to be controlled by programmed events, it must be enabled and the status of the master clock must be set to AUTO. Master clock status is set to AUTO by:

1. Pressing the **AUTO** key
2. Entering the User Lock
3. Pressing **OK**

Setting the master status to OFF disables all signal circuits. Master clock status is set to OFF by:

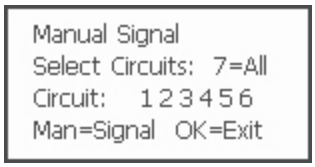
1. Pressing the **OFF** key
2. Entering the User Lock (unless User Lock is disabled)
3. Pressing **OK** (unless User Lock is disabled)

Controlling Signal Circuits Manually

Signal circuits can be controlled manually with the MAN key acting as a momentary push-button switch. To initiate manual control:

1. Press the **MAN** key
2. Enter User Lock (unless User Lock is disabled)
3. Press **OK** (unless User Lock is disabled)

This brings up the Select Circuits screen:



At this screen:

1. Press any combination of number keys **1-6** to select or deselect the signal circuits to be turned on with the **MAN** key
2. Press and hold the **MAN** key to activate the selected circuits for the desired length of time
3. Release the **MAN** key

The **MAN** key can be pressed as many times as needed. Control of the signal circuits reverts to its previous state (AUTO or OFF) 90 seconds after the last press of the **MAN** key.

Note: If the *default* duration for a circuit being activated with the MAN function is currently configured to ON or OFF (in the Circuit Durations menu) the circuit will toggle states when pressing the **MAN** key. This feature can be used to turn on lights after a power outage. For example, Front Parking Lot lighting is set up on Circuit 6 with a continuous ON event at 10:00pm, and an OFF event at 6:00am. The power goes out due to a thunderstorm at 2:00am and comes back on at 3:00am. These Parking Lot lights will be off, since the unit was reset. To turn them back on after 3:00am, you can activate Circuit 6 via the MAN button, as described above. The lights will then stay on until the next OFF event at 6:00am.

Note: To verify active relays when using Remote Control, set master to small screen format (see Display Settings for instructions on setting to small screen format) and observe the active relays at the bottom of the main time screen.

GPS Menu

GPS refers to the time reference signal from the Global Positioning System satellites. An optional GPS receiver is required to access this time reference. Figure 9 shows the GPS menu structure. To reach the GPS Time menu press **PROG**, **5**.

```
GPS Time Menu
Choose:
1=Signal Status
2=Enable/Disable
```

At this screen:

To check GPS signal status:

1. Press **1**. The screen shows the most recent time that the signal was received.
2. Press **OK** to view the number of satellites within range.
3. Press **OK** to return to the GPS Time menu.

To enable or disable the GPS signal as a time reference:

1. Press **2**
2. Enter User Lock

The Choose screen appears:

Press **1** to enable or **2** to disable the GPS receiver.

To exit the GPS menu press **BACK**.

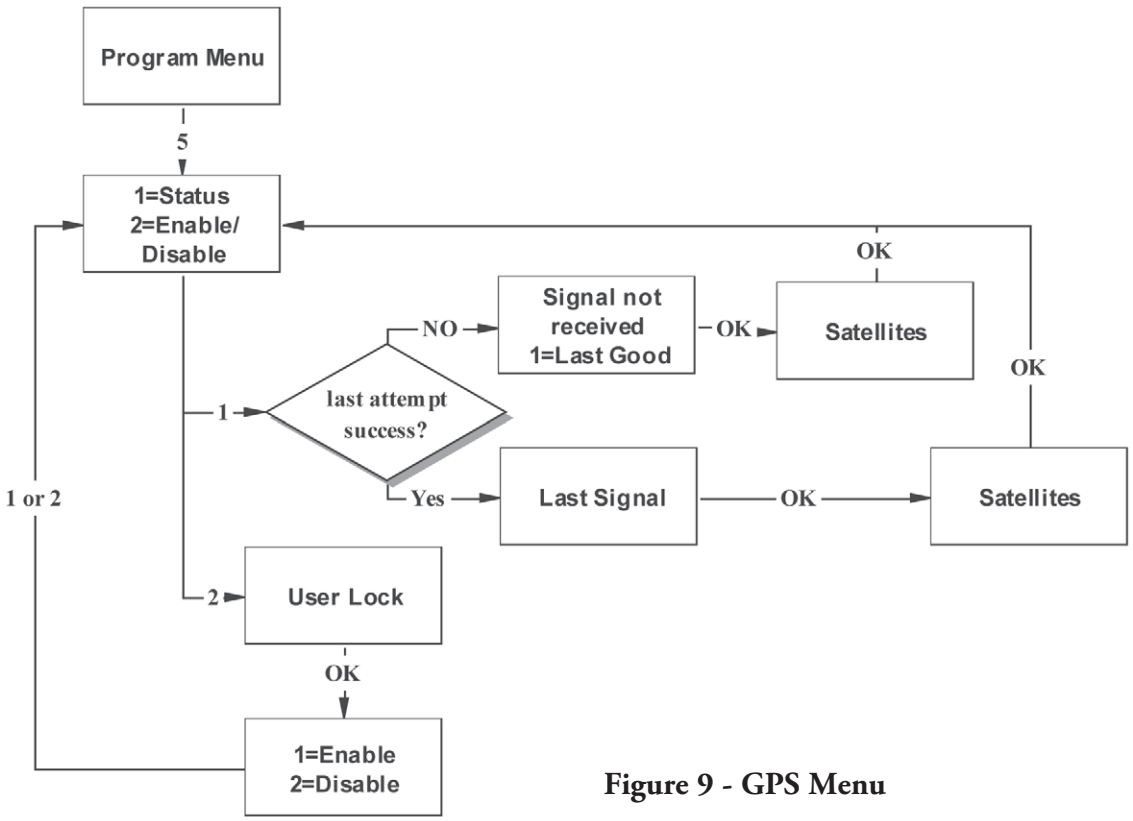


Figure 9 - GPS Menu

Checking Status

The Status of the external time source, Ethernet and other functions can be checked in the Status menu. Figure 10 shows the Status Menu structure, which is entered by pressing **PROG 6**.

```
Status Menu
Time Last Set
2005-04-05 05:12:17P
          OK=Done
```

The first status screen displays the last time that the master clock was synchronized to an external time reference or set manually.

```
Status Menu
Next Signal: 1 2 3 4 5 6
Event 0000: 02:05 AM
  MTWTF    OK=Dne
```

Pressing **OK** brings up the next screen, showing the time of the next programmed event and the circuits it will activate:

```
Status Menu
Communication Status
Ethernet = Link OK
          OK=Done
```

Pressing **OK** advances to the Communication Status screen, which shows the state of the Ethernet link:

Note: Other events may be viewed by pressing > or <.

```
Status Menu
Configured Clock
Code = 12
          OK=Done
```

Pressing **OK** brings up the Configured Clock screen displaying the selected clock code:

Pressing **OK** at this screen returns to the main menu.

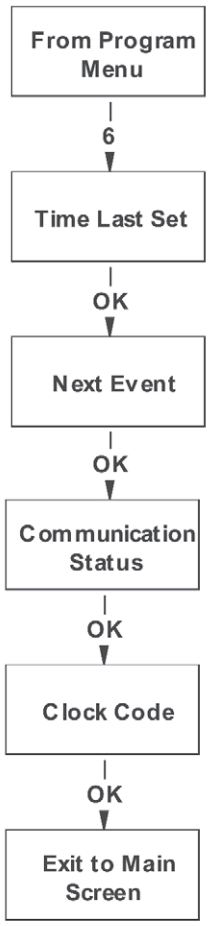


Figure 10 - Status Menu

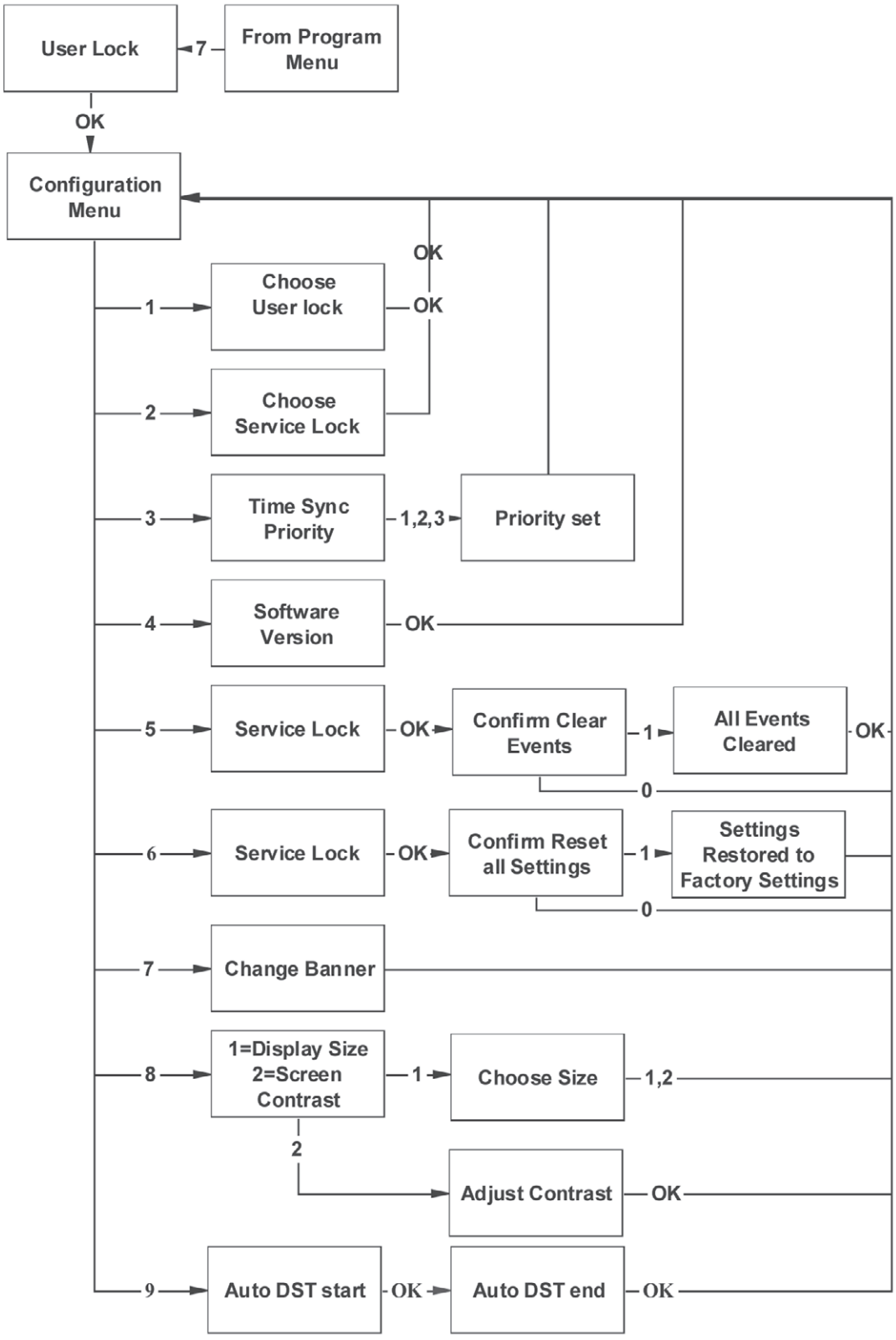


Figure 11 - Configuration Menu

Configuration Menu

Figure 11 shows the Configuration menu structure. This menu enables viewing or changing the following configuration settings:

1. User Lock - Change or disable.
2. Service Lock - Change or disable.
3. Time sync priority - Set to GPS, Ethernet, or internal clock.
4. Software version - View version and revision level of installed control code.
5. Clear all events - Clear all programmed events from memory.
6. Reset all settings - Return all configuration parameters to factory settings.
7. Change banner text - Create or change a line of text in the time screen.
8. Display settings - Change time display size or LCD display contrast.

1. Selecting User Lock

The default User Lock is **1234**. To reach the screen for changing the User Lock:

1. Press **PROG**
2. Press **7**
3. Enter User Lock (unless User Lock is disabled)
4. Press **OK** (unless User Lock is disabled)
5. Press **1**

At this point key in the new four-digit User Lock and press **OK**. Record the new User Lock for future reference. Changing the User Lock to **0000** disables this security feature, allowing configuration changes to be made without entering the User Lock.

2. Selecting Service Lock

The Service Lock is factory set to **1234**. The Service Lock can be changed with the following keystrokes:

1. **PROG**
2. **7**
3. Enter User Lock (unless User Lock is disabled)
4. **OK** (unless User Lock is disabled)
5. **2**

At this point key in the selected four digit Service Lock and press **OK**. Record the Service Lock for future reference. Changing the Service Lock to **0000** disables this security feature, allowing the clock code to be changed and all programmed events to be cleared without entering the Service Lock.

3. Setting Time Sync Priority

Time sync priority indicates the preferred external time reference (GPS or Ethernet, depending upon the AllSync model) if more than one is available. When synchronizing the internal clock to an external time reference, the AllSync master will attempt to receive a time signal from the preferred time reference. If unsuccessful, the unit will attempt to access other available time references. The Time Sync Priority menu can be reached by keying:

1. **PROG**
2. **7**
3. User Lock (unless User Lock is disabled)
4. **OK** (unless User Lock is disabled)
5. **3**

At this screen, select the preferred time reference among those available.

4. Viewing Software Version

The version, revision level & release date for the control software operating the master clock can be viewed by:

1. Pressing **PROG**
2. Pressing **7**
3. Entering User Lock (unless User Lock is disabled)
4. Pressing **OK** (unless User Lock is disabled)
5. Pressing **4**

5. Clearing All Events

Individual events can be cleared in the Events menu (see Viewing and Editing Events). To clear all events:

1. Press **PROG**
2. Press **7**
3. Entering User Lock (unless User Lock is disabled)
4. Press **OK** (unless User Lock is disabled)
5. Press **5**
6. Enter Service Lock (unless User Lock is disabled)
7. Press **1** (unless User Lock is disabled)
8. Press **OK**

6. Restoring All Settings

To return all configuration parameters to factory settings:

```
Config Menu
Clear all settings
1=Confirm
0=Cancel
```

1. Press **PROG**
2. Press **7**
3. Entering User Lock (unless User Lock is disabled)
4. Press **OK** (unless User Lock is disabled)
5. Press **6**
6. Enter Service Lock (unless User Lock is disabled)
7. Press **1** (unless User Lock is disabled)
8. Press **OK**

7. Changing Banner

When time is displayed in small text, the banner is the third line in the Time display screen. To view or change the banner:

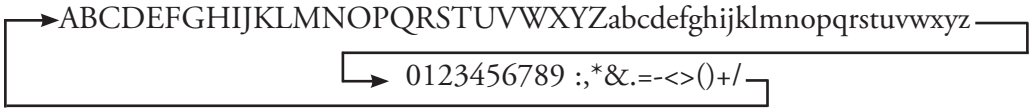
```
Config Menu
Change Position  1
American Time & Sig.
<>=Change OK=Acpt
```

1. Press **PROG**
2. Press **7**
3. Entering User Lock (unless User Lock is disabled)
4. Press **OK** (unless User Lock is disabled)
5. Press **7**
6. The Banner Text screen appears:

At this point, use the **BACK** key to exit the Banner Text screen without changing it.

The banner can be changed to any message up to approximately 20 characters in length. To change the banner:

1. Use **<** and **>** to scroll backward or forward through the list of available characters. Note that the character in the leftmost position of the banner changes.
2. Continue scrolling until the desired character is in the first position. The available characters appear in the following order when scrolling with the **>** key:



3. The starting position within the loop is at the character currently displayed. Note that the blank space is found between **9** and **: (colon)**.
4. After placing the desired character in the first position, press **OK**. This steps to the next position.

Repeat these steps to add each character to the banner:

1. Use **<** and **>** until reaching the character to be placed
2. Press **OK**

After completing the new banner press **OK twice** to save it and delete any text to the right of the last character entered. This will also exit the Banner Text screen.

8. Display Settings

Changes in LCD contrast and format of the Time Display screen are available at the Display Settings menu.

The Time Display screen can display information in large or small text. Large text allows the time to be read at a greater distance, while small text allows the banner text and relay status to be displayed along with the time. To change text size press:

1. **PROG**
2. **7**
3. Enter User Lock (unless User Lock is disabled)
4. **OK** (unless User Lock is disabled)
5. **8**
6. **1**

The Choose Display Size screen appears:

At this screen press

1 for large text or

2 for small text.

Screen contrast can be adjusted for optimum viewing in the surrounding light. To change screen contrast:

1.Press **PROG**

2.Press **7**

3.Enter User Lock (unless User Lock is disabled)

4.Press **OK** (unless User Lock is disabled)

5.Press **8**

6.Press **2**

At the Adjust Contrast screen use the < and > keys to adjust screen contrast.

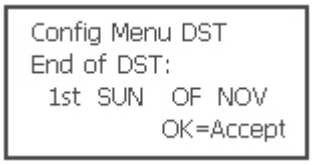
9. Set Auto DST

The AUTO DST (Automatic Daylight Saving Time) settings of the AllSync Master can be revised with the Set Auto DST function. This feature can be used to permanently change the DST settings of the AllSync Master. This should only be done to make permanent changes in the DST settings necessitated by a change in the DST calendar or due to a different DST calendar in your country of installation (outside USA).

Note: In Aug. 2005, the US Congress passed an energy bill that included extending Daylight Saving Time by about a month. Beginning in 2007, DST will start the second Sunday of March and end on the first Sunday of November. American Time & Signal recommends changing the AUTO DST settings of the unit sometime after the Fall DST change on October 29, 2006 and prior to the new Springtime DST change on March 11, 2007. The example below describes the procedure and shows the screen settings required for this change.

To change the AUTO DST Settings:

1. Press **PROG**
2. Press **7**
3. Enter User Lock (unless User Lock is disabled)
4. Press **OK** (unless User Lock is disabled)
5. Press **9**
6. At the Start of DST screen use the < and > keys to select the appropriate week to start DST, and then press **OK**.
7. Use the < and > keys to select the appropriate day of the week for DST start, then press **OK**.
8. Use the < and > keys to select the appropriate Month for start of DST, and then press **OK**.
9. The Bias value indicates the hours and minutes to advance the time on the DST start date when the time change occurs. For example, a bias of +02:00 causes the time change to advance 2 hours (and no minutes) on the start date. Use < and > to toggle between + and – and the number keys to enter the appropriate bias, and then press **OK**.



10. At the End of DST screen use the < and > keys to select the appropriate week to end DST, and then press **OK**.
11. Use the < and > keys to select the appropriate day of the week, and then press **OK**.
12. Use the < and > keys to select the appropriate Month. Press **OK** when finished.

Changing Communications Settings

Setting up the master for Ethernet communication on a local or wide area network involves careful selection of addresses and other parameters to assure compatibility with the network. This usually requires assistance from the local network systems administrator. Refer to the Ethernet Option User Manual (Part No. P000007) for more information.

Setting up the master for Ethernet communication is performed through the Communications menu, and involves assigning values to the following:

Unit IP address - A unique address assigned to the master for network communications.

Master IP address - The IP address, on a network or the internet, of the time server to be accessed by the master for time synchronization.

Subnet Mask - A required LAN setup parameter.

Gateway IP - A required LAN setup parameter.

Figure 12 shows the Communication menu structure. To reach the Communication menu from the main screen press:

PROG

User Lock (unless User Lock is disabled)

OK (unless User Lock is disabled)

8

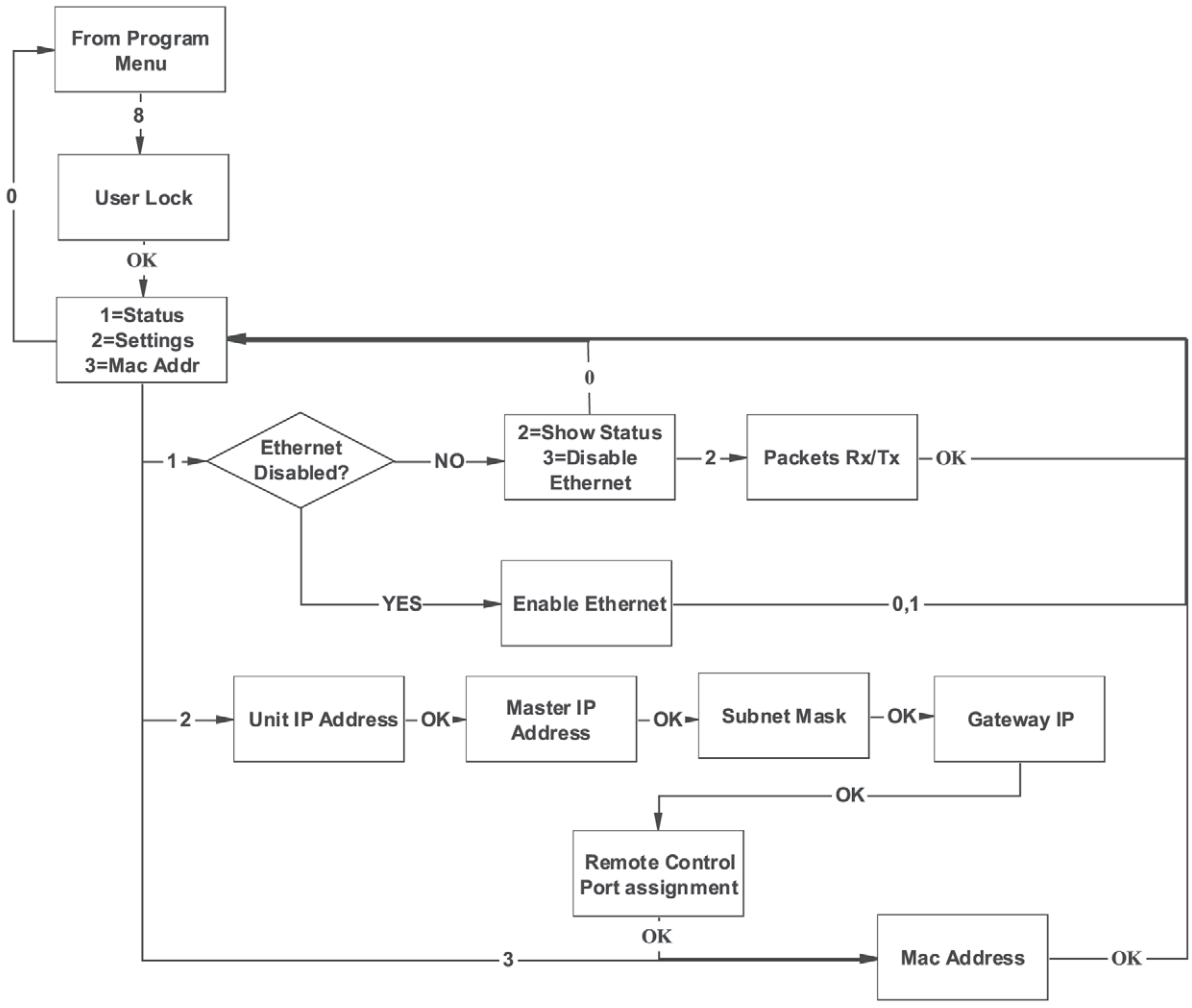
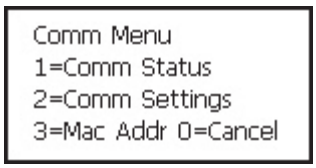
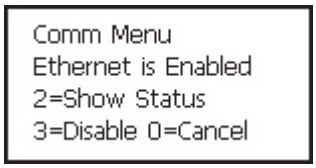


Figure 12 - Communications Menu



Pressing **1** at the Comm menu screen brings up the Comm Status screen, which shows whether Ethernet communication is enabled or disabled. If it is enabled the following screen appears:



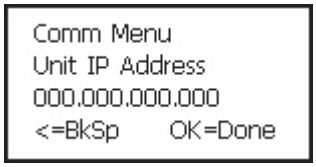
Pressing **2** at this screen displays the number of communication packets sent (Tx) and received (Rx) by the master.

Pressing **3** at this screen disables Ethernet communication.

Pressing **1** at the Comm menu screen when Ethernet communication is disabled brings up the following screen:

Pressing **1** at this screen enables Ethernet communication. Pressing **0** leaves Ethernet disabled and returns to the Comm menu screen.

Pressing **2** at the Comm menu screen causes the Unit IP Address screen to appear:



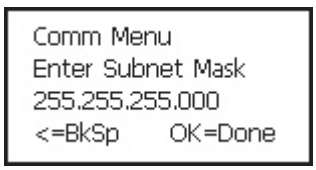
To change the Unit IP Address:

- Enter the 12 digits of the new address, or
- Change only the last few digits of the address by pressing **<** as many times as necessary to backspace through the digits to be replaced.
- Key in new digits to complete the 12 digit address.
- Press **** to accept the Unit IP Address. The Master IP Address screen appears:

The Master IP Address is factory set to that of a NIST time server. Addresses for other time servers are listed in Appendix D.

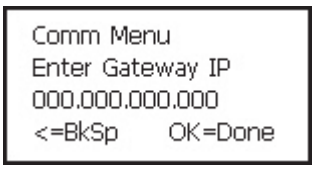
To change the Master IP Address follow the procedure for changing the Unit IP Address.

Pressing **OK** to accept the Master IP Address brings up the Subnet mask screen:



To change the Subnet Mask follow the procedure for changing the Unit IP Address.

Pressing **OK** to accept the Subnet Mask brings up the Gateway IP Address screen:



To change the Gateway IP Address follow the procedure for changing the Unit IP Address.

Pressing **OK** to accept the Gateway IP Address brings up the MAC Address screen:

The MAC Address is a unique identification number (factory assigned) for the master. It also serves as the unit serial number. The MAC Address cannot be changed. Pressing **OK** to acknowledge the MAC Address returns to the Comm menu.

The MAC Address can also be viewed by pressing **3** at the Comm menu screen.

Use the **BACK** key to exit the Comm menu.

Changing Clock Type

Appendix A includes wiring diagrams and clock codes for the 30 types of clocks supported by the AllSync Master. Figure 13 shows the Clock menu structure. To view the current clock code setting:

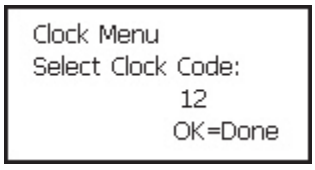
Press **PROG**

Press **9**

Enter Service Lock (unless User Lock is disabled)

Press **OK** (unless User Lock is disabled)

The Select Clock Code screen appears, showing the current clock code:



To begin controlling a different type of clock:

1. Locate the two-digit clock code listed in Appendix A for the new clock type
2. Key in the new code at this screen
3. Press **OK** to accept the new clock code

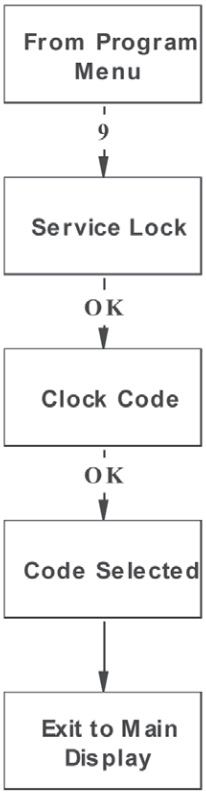


Figure 13 Clock Menu

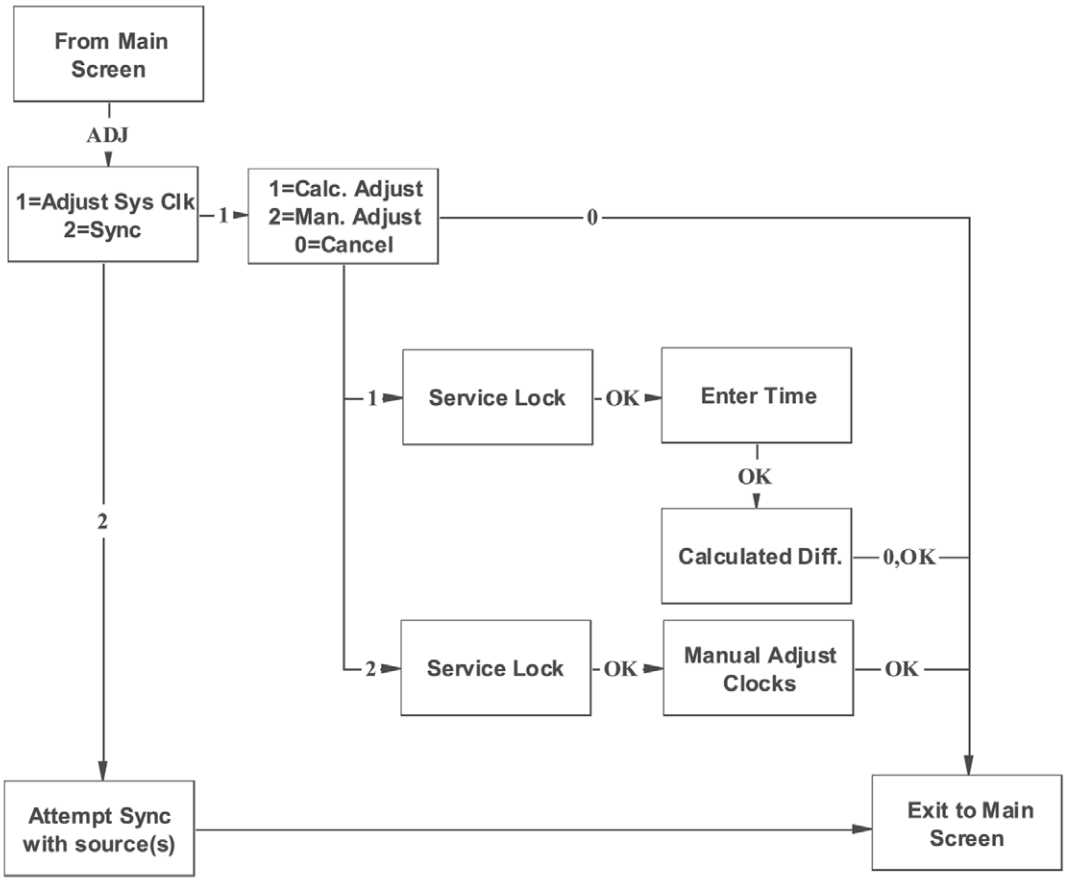


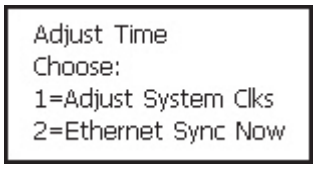
Figure 14 - Adjust Time Menu

Adjust Time Menu

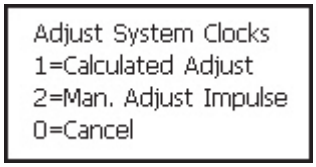
The Adjust Time menu serves two functions:

- Manual correction of certain secondary clocks, and
- Simple synchronization of the master clock to an external time source.

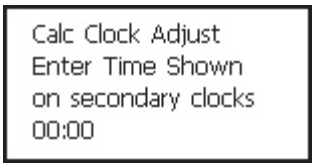
Figure 14 shows the Adjust Time menu structure, which is reached by pressing the **ADJ** key:



Pressing **1** at this screen displays the Adjust System Clocks menu:



Pressing **1** at this screen brings up the Calc Clock Adjust screen:

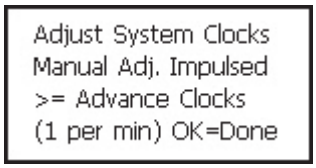


At this screen:

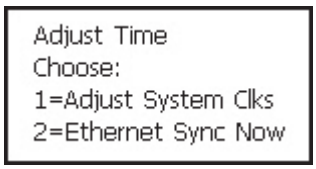
1. Enter the time shown on the secondary clocks (to the nearest minute)
2. Press **OK**. The time difference between the secondary clocks and the master is displayed.
3. Press **OK** to initiate automatic correction of the secondary clocks.

The Time Display screen appears.

Pressing **2** at the Adjust System Clocks menu brings up the Manual Adjust screen:



At this screen press **>** repeatedly to correct impulse clocks manually. Press **OK** when finished. The Time Display screen appears.



Pressing **2** at the Adjust Time screen causes the unit to attempt synchronization with external time sources in order of priority. If successful, a message confirming this flashes before the Time Display screen appears.

Note: If timed events (1-9 seconds duration) are currently running during the attempted synchronization, the synchronization will not occur. The master will simply exit to the main time screen immediately without attempting to synchronize to an external time source.

Master Appears OFF (LCD Dark) When Power is Connected

- Disconnect power to master and remove junction box cover. Restore power and carefully check for 120vac between terminals H and N.
- Disconnect power and remove front panel. Check fuse and replace if necessary.

Secondary Clocks Not Synchronized With Master Clock

- Make certain the master is running correct clock code (See Checking Status and Changing Clock Type sections).
- If master time was recently changed, allow up to 24 hours for secondary clocks to resynchronize to master.
- Make sure there is sufficient voltage across each secondary clock.
- If fewer than 25 AllSync secondary clocks are connected to the Master, the secondary clocks might not recognize the correction from the master. Connect all intended clocks and allow time for normal master correction. If secondary clocks still have not corrected, you may need additional hardware. Contact American Time & Signal Technical Support (1-800-328-8996) for information on adding a Resitor Pack (Part #H001941) to your system.

Signal Circuits Not Responding to Programmed Events

- Make certain that master status is set to AUTO and signal circuits are enabled (see Enabling and Disabling Signal Circuits section).
- Confirm that signal circuits and events programmed to control them are assigned to the same schedule.
- Check for correct voltage at signal relay contacts.
- Activate the sorting Algorithm by entering view by Dte/Time (see Reviewing and Editing Events by Date/Time). If the AllSync Master timed out after editing, adding or deleting event(s), it needs to perform this sorting algorithm to operate correctly.

Incorrect Time is Displayed by Master Clock After Loss of Power

- Backup battery may be dead. Check for “Low Battery Voltage” message when time is displayed in small text (see Display Settings section). If this message is displayed replace battery with new CR2354 or equivalent 3 Volt lithium battery. Install battery with + side up.

Power Outage During Daylight Saving Time Correction

- If there is a power outage during the correction period for daylight saving time, the secondary clocks might not correct. In this event wait for the next 12 hour correction or instruct the master to correct secondary impulse clocks (see Adjust Time Menu section).

Unable to Synchronize With Ethernet Time Source

- Check Ethernet cable connection to master.
- Check for communication between master and PC running ATS Remote software. If no communication, check communication settings for compatibility with local area network (see Changing Communication Settings section).
- Confirm that a PC on the LAN is able to access the Web.
- Change Master IP address to a different time server among those listed in Appendix D (see Changing Communication Settings section).
- Verify Static IP address used for the master is not a duplicate on local area network.

Unable to Synchronize With GPS Time Source

- If GPS antenna has been connected to the master for less than 20 minutes, GPS time signal may be inaccurate. Allow more time.
- Check GPS cable connections between master and GPS antenna.
- Check GPS last signal received and number of satellites (see GPS section). If no signal has been received, move GPS antenna to a better location (see Mounting Optional GPS Antenna section).
- Enable GPS update (see GPS section).

Lost or Forgotten User Lock

- Contact American Time & Signal Technical Support at 1-800-328-8996.

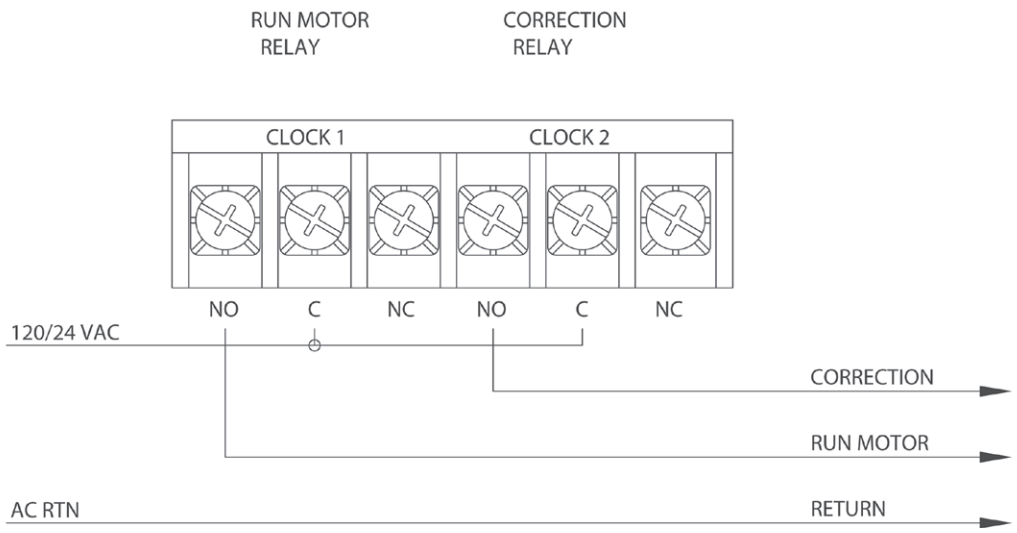
Missing or Unscheduled Events with Ethernet Option

- Clear all events (option 5, Configuration menu) and reload events
- Run chronological sort (2 Date/time sort of Event menu)

Appendix A - Clock Circuit Wiring Diagrams

Clock Code 01 - 3 wire Synchronous
Clock Code 03 - Standard Electric Time Dual Motor
Clock Code 06 - Synchronous Wired 2
Clock Code 09 - Simplex 59th minute Dual Motor
Clock Code 10 - Simplex 45th minute Dual Motor
Clock Code 11 - National Synchronous Wired (25 Sec Hour, 25 Pulses 12 Hour)
Clock Code 13 - National Synchronous Wired (25 Sec Hour, 25 Min 12 Hour)
Clock Code 14 - Honeywell
Clock Code 18 - National Synchronous Wired
Clock Code 19 - Stromberg Synchronous Wired (56th Minute)
Clock Code 20 - National Synchronous Wired (NO 12 HR Correction)
Clock Code 23 - Standard Electric Time Dual Motor (Hourly Correction Only)
Clock Code 36 - Synchronous Wired 2 with Noon and Midnight Sync

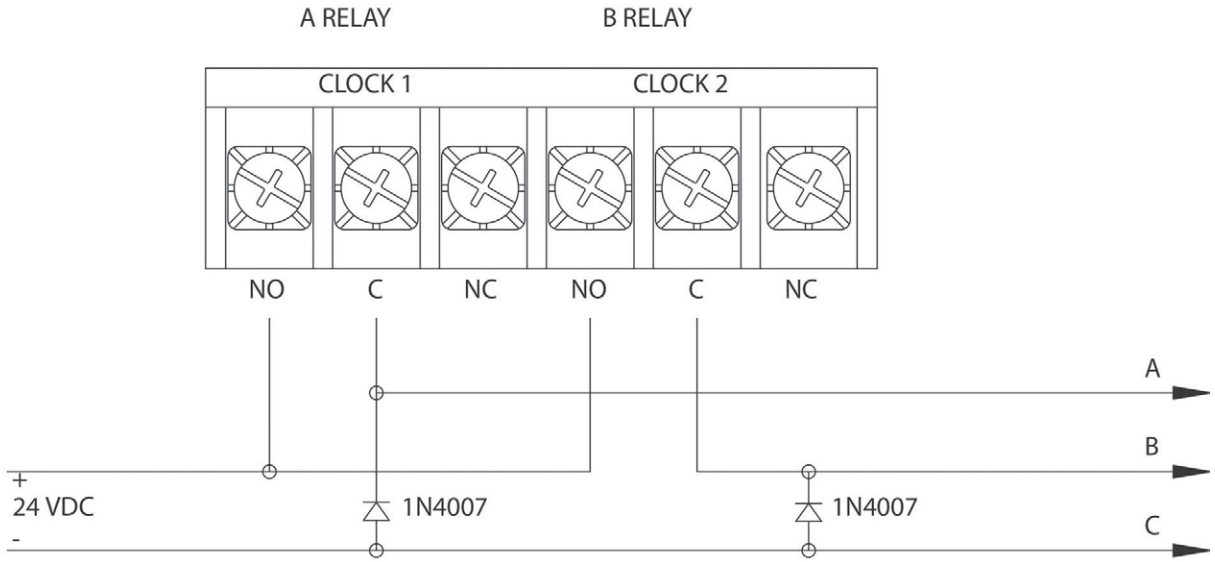
CLOCK CODE: 01, 03, 09, 10, 11, 13, 14, 18, 19, 20, 23, 36



Appendix A - Clock Circuit Wiring Diagrams

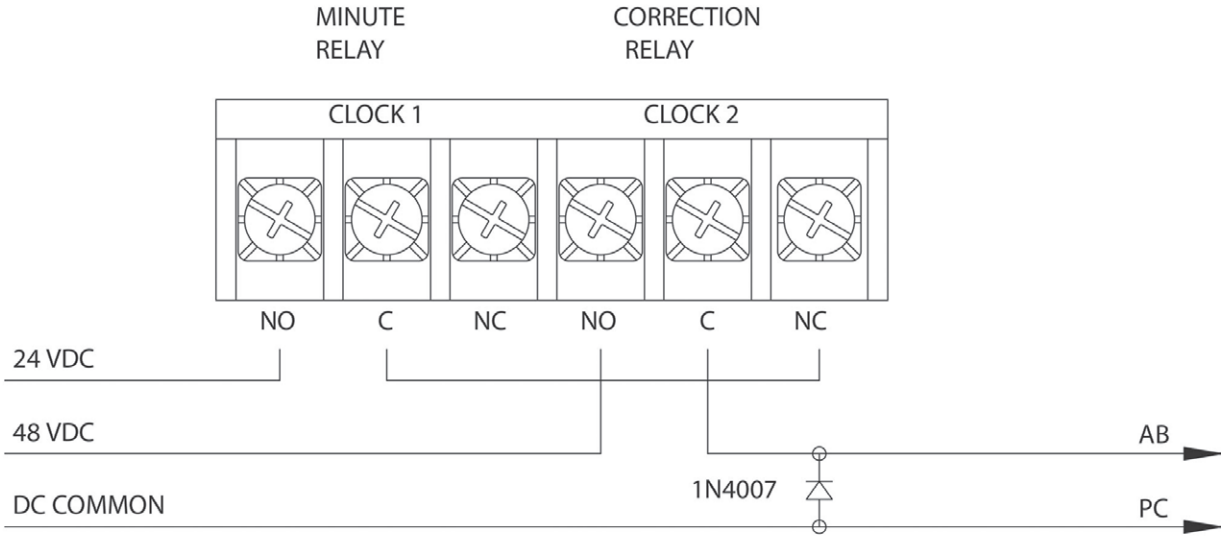
Clock Code 02 - 3 Wire Minute Impulse
Clock Code 05 - 3 Wire Minute Impulse (58th Minute)
Clock Code 16 - 3 Wire Minute Impulse (59th Minute) w/ 12hr Correction
Clock Code 17A - Standard Electric Time AR-3 (3 Wire Impulse)

CLOCK CODE: 02, 05, 16, 17A



Clock Code 04 - Standard electric Time AR-2A Two Wire Dual Voltage
Clock Code 17 - Standard electric Time AR-2 Two Wire Dual Voltage

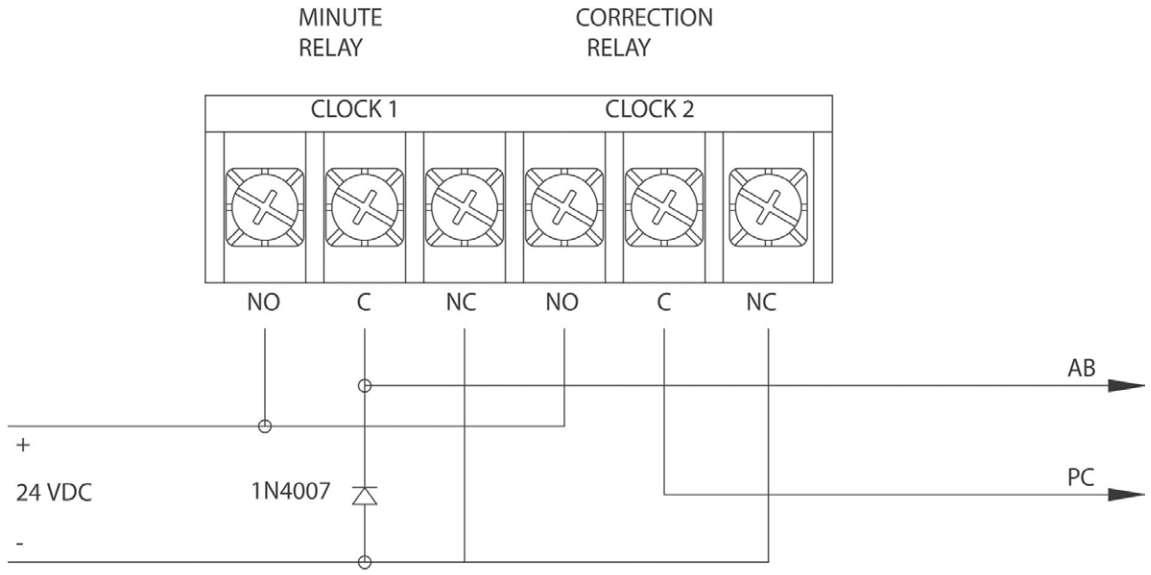
CODE: 04, 17



Appendix A - Clock Circuit Wiring Diagrams

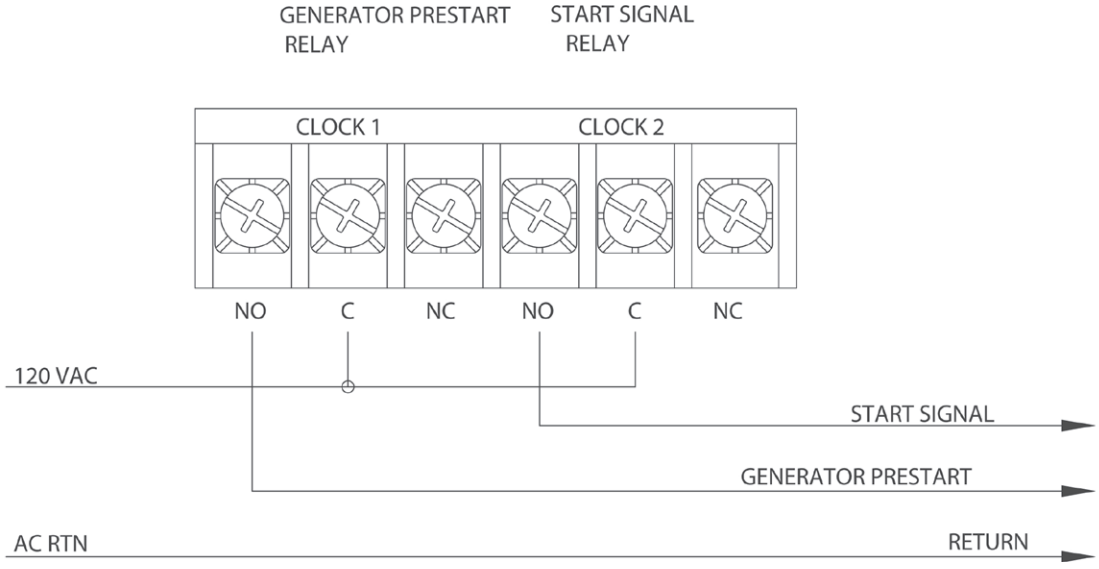
Clock Code 07 - Two Wire Reverse Polarity Minute Impulse (59th minute)
Clock Code 08 -Two Wire Reverse Polarity Minute Impulse (59th minute) With 12 HR Correction
Clock Code 12 -Cincinnati D6 - 2 wire Reverse Polarity Min Impulse (59th minute) With 12 HR Correction
Clock Code 26 - Stromberg 2 Wire Minute Impulse (58th Minute, Hourly Correction Only)

CLOCK CODE: 07, 08, 12, 26



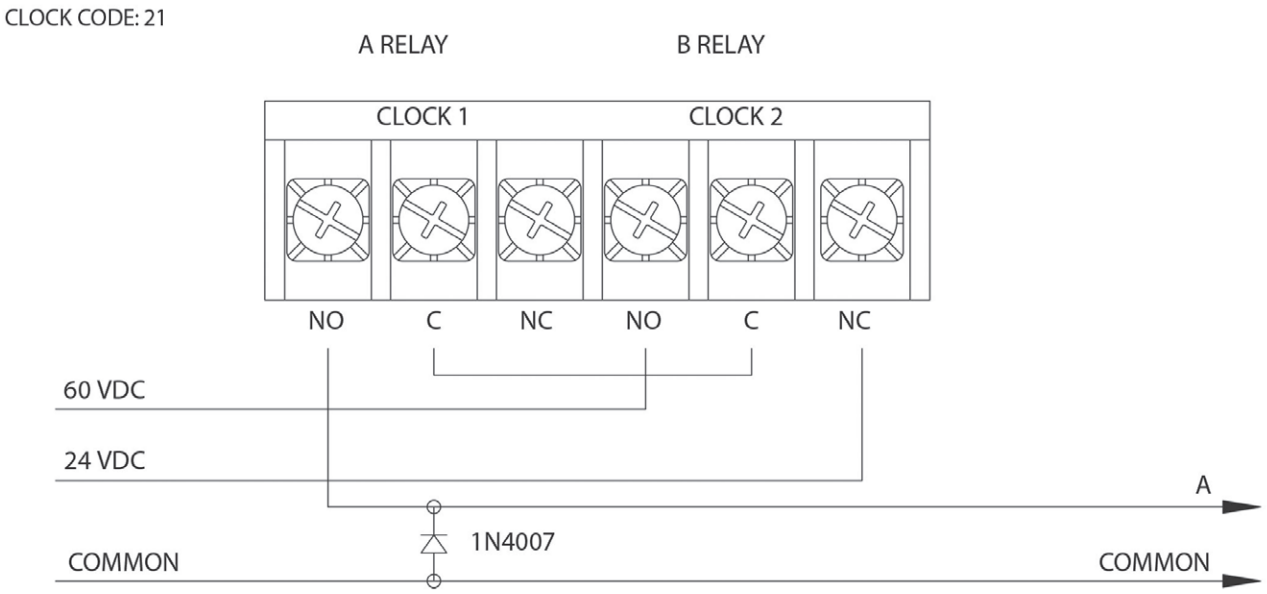
Clock Code 15 - Straight Frequency Electronic Clock

CLOCK CODE: 15

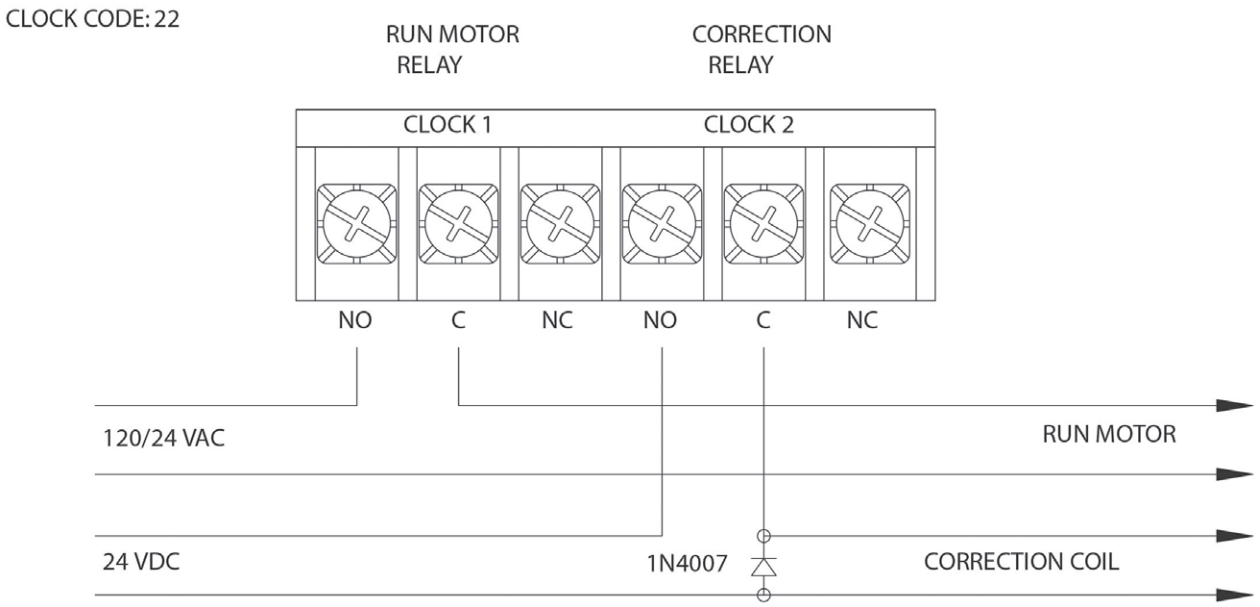


Appendix A - Clock Circuit Wiring Diagrams

Clock Code 21 - Cincinnati D1

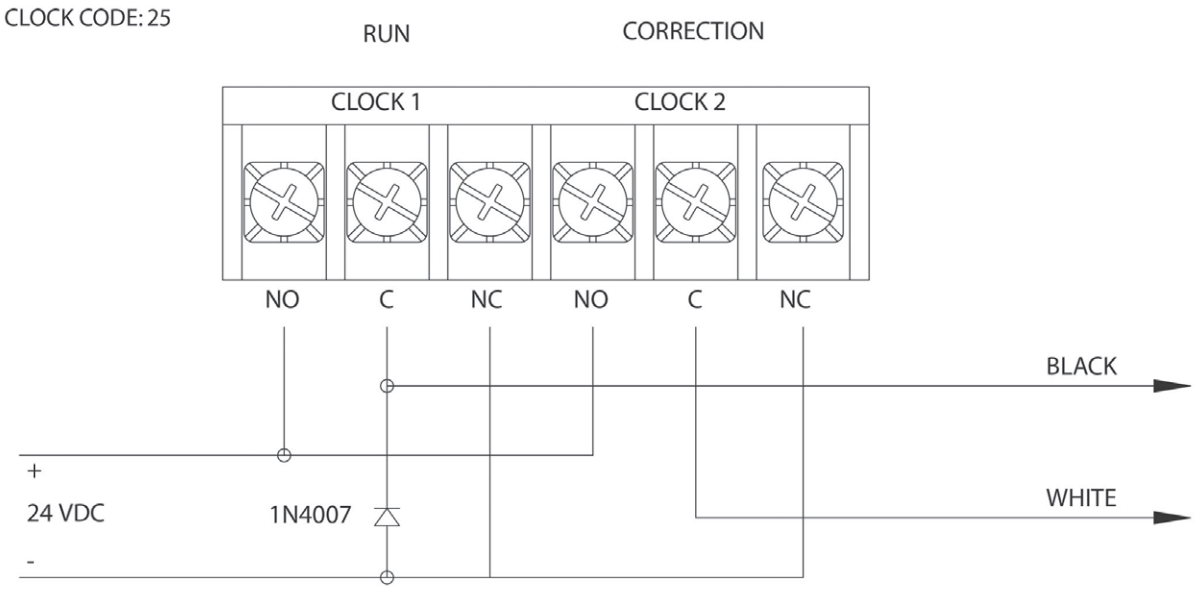


Clock Code 22 - Dukane Synchronous Wired



Appendix A - Clock Circuit Wiring Diagrams

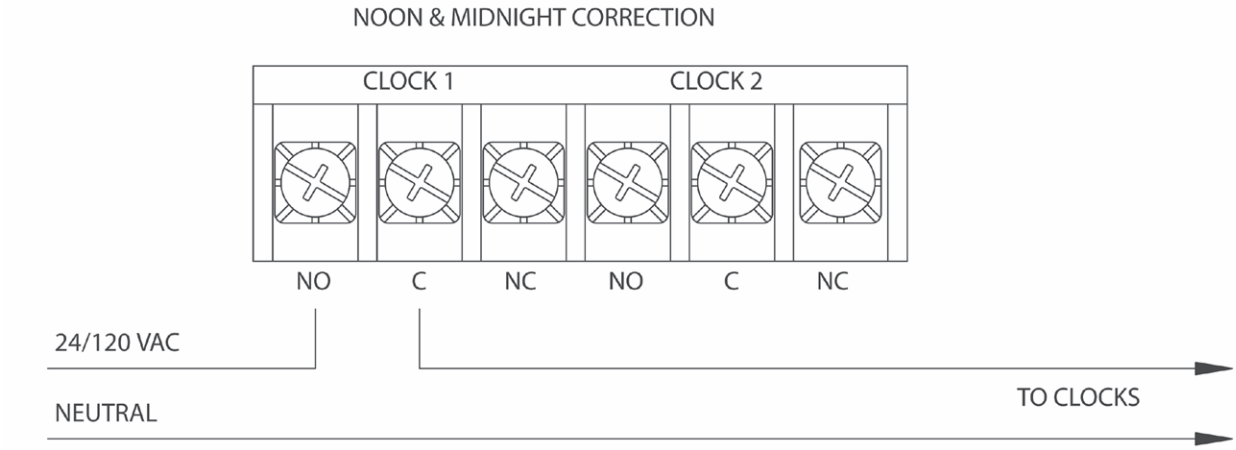
Clock Code 25 - Industrial Electronic Service Master clock (Digital Clocks)

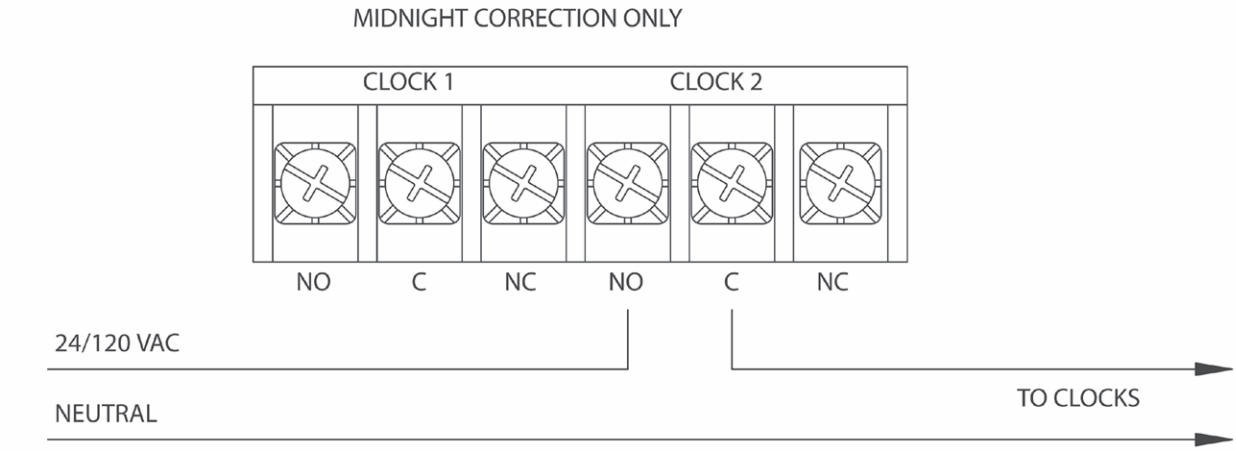


Appendix A - Clock Circuit Wiring Diagrams

Clock Code 27 - Digital Clock Reset - 12:00 AM/PM

CLOCK CODE 27

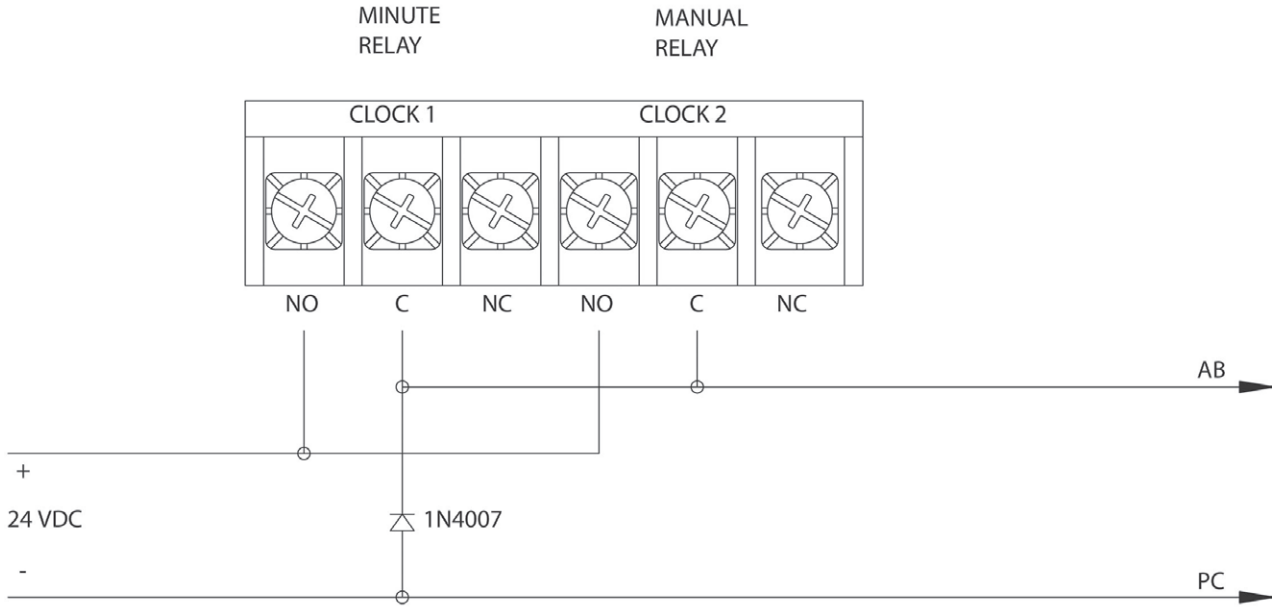




Appendix A - Clock Circuit Wiring Diagrams

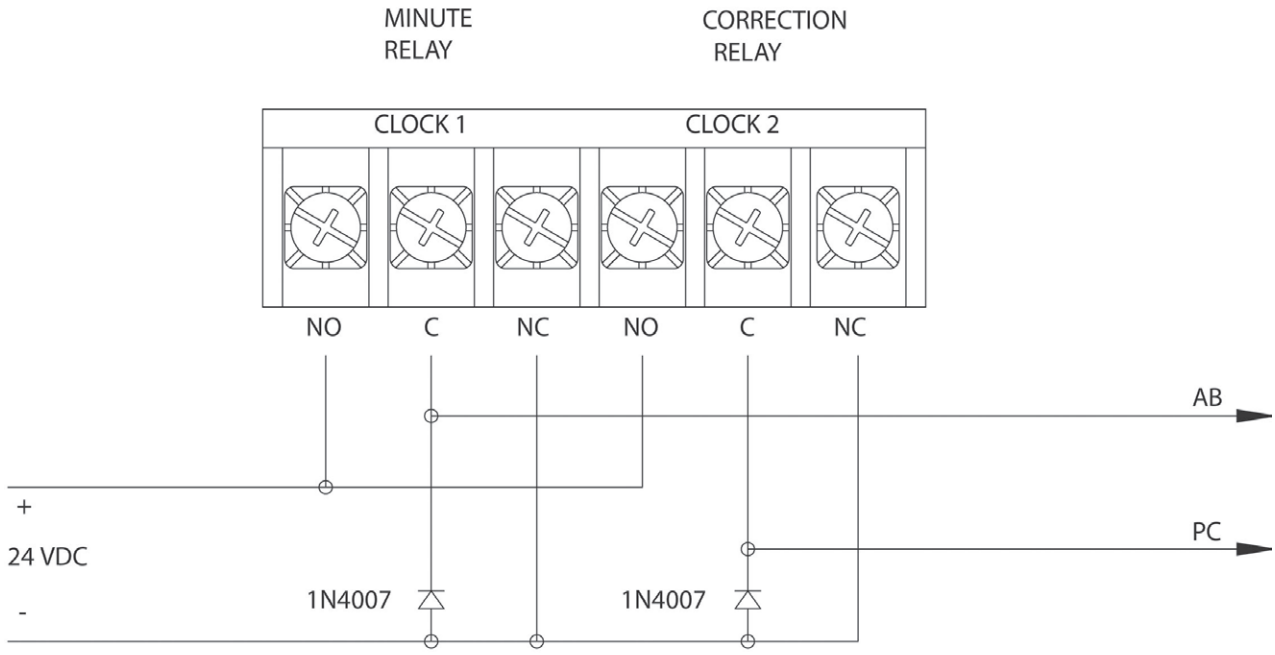
Clock Code 37 - Two Wire Reverse Polarity Minute Impulse 59th Min

CLOCK CODE 37



Clock Code 38 - Two Wire Reverse Polarity Minute Impulse (59th Min) with 12 HR Correction

CLOCK CODE 38



Appendix B - Specifications

Input Voltage:..... 115vac, 50/60 Hz
Input Power:..... 10 Watts
Standby Power:..... 25 µWatts
Fuse:..... 1 A, 250vac, Subminiature
Standby Time Keeping:... 7 years in the event of AC power Loss
Memory/Time Backup:... CR2354 Lithium Battery, 560 mAh Capacity
Timekeeping Accuracy:... ± 2 minutes per year without correction from GPS
..... or Ethernet time reference.
Program Retention:..... Unlimited
Programmable Events:.... 9999 events total
Schedules:..... 99 maximum
Signal Duration:..... Programmable 1-9 seconds or continuous ON
Clock Circuits:..... Dry contacts rated at 115vac ,10A
Signal Circuits:..... Dry contacts rated at 115vac, 10A
Physical Dimensions:..... 7.23"h x 8.38"w x 4.3"d
Temperature Range:..... 32° - 140° F (0°- 60° C)
Mounting:..... Surface mount
Communication:..... Ethernet, RS-485, RS-422 (GPS)
Shipping Weight:..... 4 lbs.
Clock Circuits/Codes:..... 1 circuit, up to 30 configurable clock protocols
Signal Circuits:..... 0, 2, 4 or 6 (optional)
Display:..... 128 x 64 graphics LCD
Keypad:..... 16 button tactile feedback membrane switch

Appendix C - Supported Time Zones

Time Zone Code	Description	Hours Difference from UTC (Winter)	Hours Difference from UTC (Summer)	Automatic Daylight Saving Time Adjustment?
000	LMT (Local Mean Time) - based on longitude	CALCULATED	CALCULATED	CONFIG
001	USA Alaska	-9	-8	YES
002	USA Aleutian (HAST/HADT)	-10	-9	YES
003	USA Arizona	-7	-7	NO
004	USA Atlantic / Puerto Rico (AST)	-4	-4	NO
005	USA Central (CST/CDT)	-6	-5	YES
006	USA Chammoro (chST)	+10	+10	NO
007	USA Eastern (EST/EDT)	-5	-4	YES
008	USA Hawaii (HST)	-10	-10	NO
009	USA Indiana East	-5	-5	NO
010	USA Mountain (MST/MDT)	-7	-6	YES
011	USA Pacific (PST/PDT)	-8	-7	YES
012	USA Midway Island / Samoa (SST)	-11	-11	NO
013	USA Wake Islands (WAKT)	+11	+11	NO
014	UTC+0	+0	+0	CONFIG
015	UTC+1	+1	+1	CONFIG
016	UTC+2	+2	+2	CONFIG
017	UTC+3	+3	+3	CONFIG
018	UTC+4	+4	+4	CONFIG
019	UTC+5	+5	+5	CONFIG
020	UTC+6	+6	+6	CONFIG
021	UTC+7	+7	+7	CONFIG
022	UTC+8	+8	+8	CONFIG
023	UTC+9	+9	+9	CONFIG
024	UTC+10	+10	+10	CONFIG
025	UTC+11	+11	+11	CONFIG
026	UTC+12	+12	+12	CONFIG
027	UTC+13	+13	+13	CONFIG
028	UTC-1	-1	-1	CONFIG
029	UTC-2	-2	-2	CONFIG
030	UTC-3	-3	-3	CONFIG
031	UTC-4	-4	-4	CONFIG
032	UTC-5	-5	-5	CONFIG
033	UTC-6	-6	-6	CONFIG
034	UTC-7	-7	-7	CONFIG
035	UTC-8	-8	-8	CONFIG
036	UTC-9	-9	-9	CONFIG
037	UTC-10	-10	-10	CONFIG
038	UTC-11	-11	-11	CONFIG
039	UTC-12	-12	-12	CONFIG
040	Custom Time Zone	CONFIG	CONFIG	CONFIG

Appendix D - IP Addresses of Selected NIST Time Servers

URL	IP address	Location
nist1-ny.ustiming.org	064.090.182.055	New York City, New York
nist1-nj.ustiming.org	096.047.067.105	Bridgewater, New Jersey
nist1-pa.ustiming.org	206.246.122.250	Hatfield, Pennsylvania
nist1.aol-va.symmetricom.com	064.236.096.053	Reston, Virginia
nist1-chi.ustiming.org	208.066.175.036	Chicago, Illinois
nist1.expertsmi.com	173.014.055.009	Monroe, Michigan
nist.netservicesgroup.com	064.113.032.005	Southfield, Michigan
nisttime.carsoncity.k12.mi.us	066.219.116.140	Carson City, Michigan
www.nist.gov	024.056.178.140	WWV, Fort Collins, Colorado
utcnist.colorado.edu	128.138.140.044	University of Colorado, Boulder
utcnist2.colorado.edu	128.138.188.172	University of Colorado, Boulder
ntp-nist.ldsbc.edu	198.060.073.008	LDSBC, Salt Lake City, Utah
nist1-lv.ustiming.org	064.250.229.100	Las Vegas, Nevada
nist1.aol-ca.symmetricom.com	207.200.081.113	Mountain View, California
nist1.symmetricom.com	069.025.096.013	San Jose, California
nist1-sj.ustiming.org	216.171.124.036	San Jose, California
nist1-la.ustiming.org	064.147.116.229	Los Angeles, California

■**Note:** Please reference http:/tf.nist.gov/tf-cgi/servrs.cgi for the latest NIST Internet Time servers list, which includes the status of each server.

Appendix E - Events Programming Table

Programmer _____ Date _____ Page _____ of _____

Schedule No.

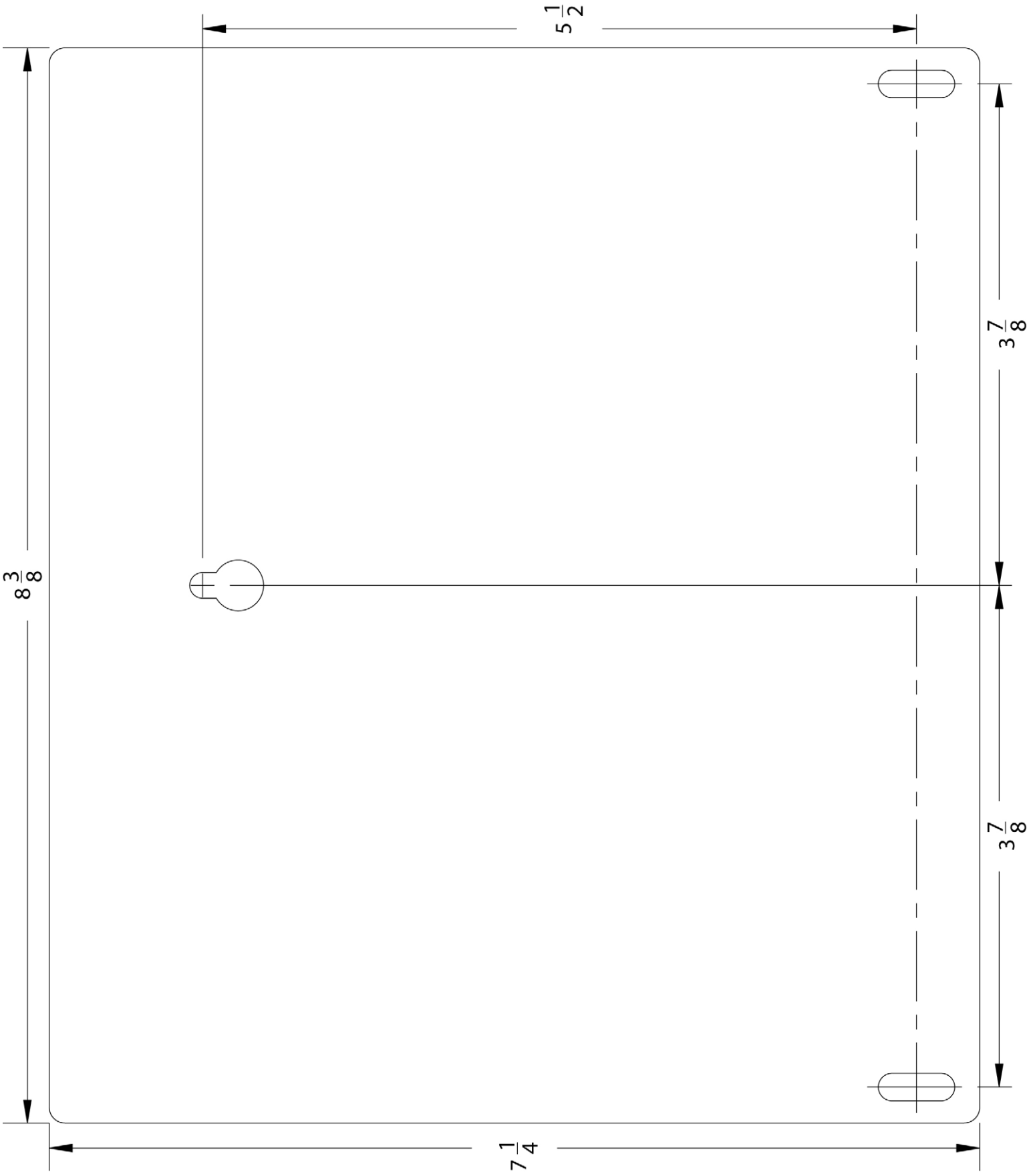
Description _____

Signal Circuits Assigned to Schedule

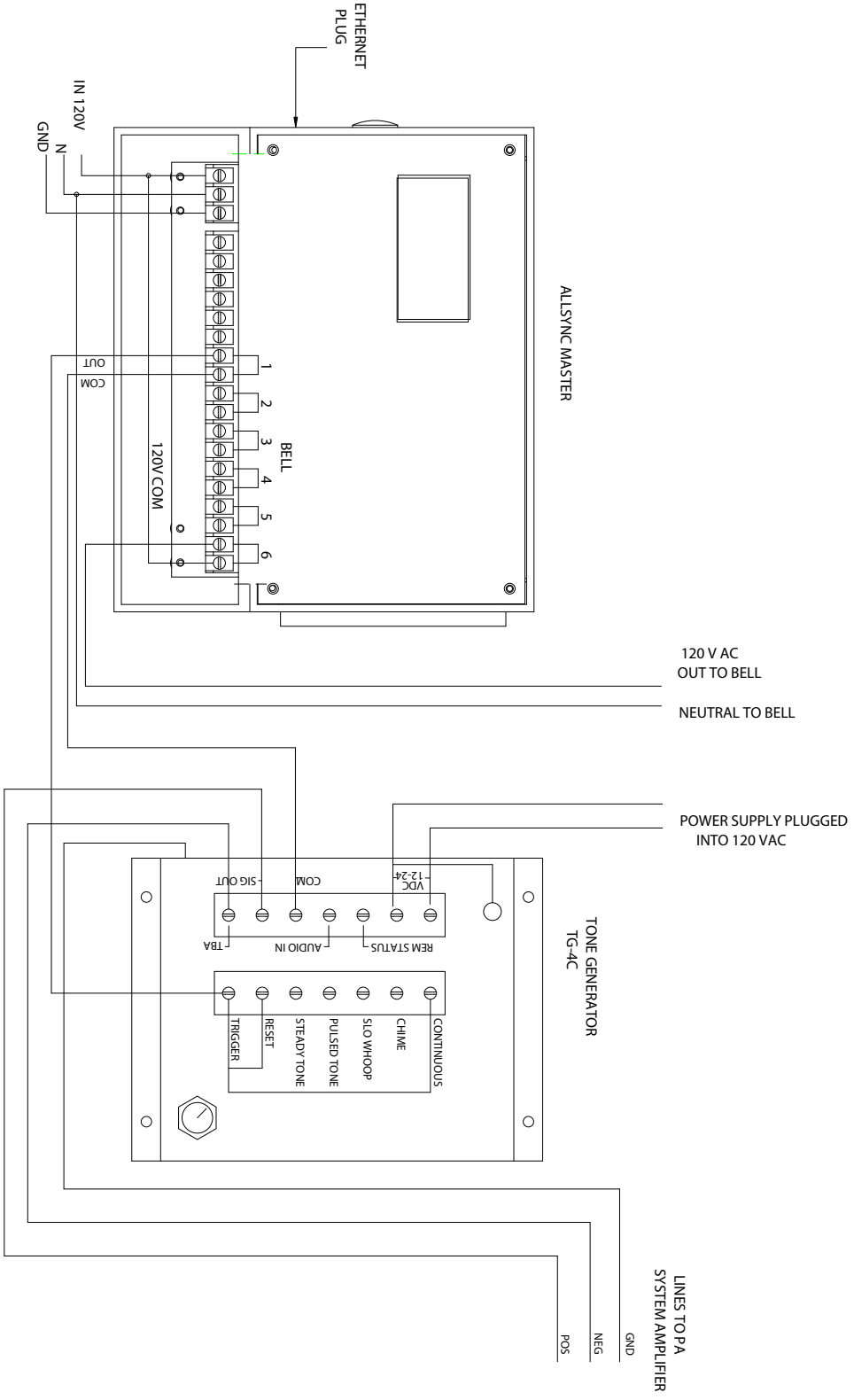
No.	Description	Default Duration
1		
2		
3		
4		
5		
6		

Events Assigned to Schedule				Control Action				
No.	Time	AM/ PM	Day(s) or Date(s)	On	Off	Pulse (Seconds)	Circuit Default	Note

Appendix F - Mounting Template



Appendix G - Typical Tone Generator Wiring Diagram



Glossary of Terms

Banner - A line of text that is displayed on the LCD screen for promotional or informational purposes. The AllSync Master supports 1 line of approximately 20 characters that can be modified to display an organization's name, for example. This banner text is only displayed when the unit's display size is set to small text mode.

Circuit - A complete or partial path followed by a flow of electric current. In the case of the AllSync Master, electrical circuits are connected for the purposes of controlling devices (clocks, bells, etc). These devices can be switched on and off and/or provided signals (ON and OFF sequences) from the AllSync Master.

Client - A computer or other networked device, or a software application, that connects to and requests information from a server.

Clock Code - A code that is assigned to a unique collection of electrical signals used to control a clock system. These signals are sent from a Master Clock to each Secondary Clock for the purposes of time synchronization. Different types of clock systems require different, often proprietary signals, which are specified with a unique clock code. The AllSync Master is capable of operating a wide variety of clock systems, with a selectable clock code feature.

Contrast - The amount of difference between the lightest and the darkest areas of the LCD screen.

Daylight Saving Time (DST) - A time used during the summer months, in some localities, in which clocks are advanced 1 hour from the usual standard time. The official time is adjusted forward during the spring and summer months, so that the active hours of work and school will better match the hours of daylight. Daylight Saving Time begins for most of the United States at 2 a.m. on the first Sunday of April. Time reverts to standard time at 2 a.m. on the last Sunday of October. Starting in 2007, it will be observed from the second Sunday in March to the first Sunday in November, adding about a month to daylight saving time. The AllSync Master accommodates both sets of DST dates allowing user selectable AUTO DST settings.

Daytime Protocol (RFC-867) - A standard, Internet-based timekeeping specification that calls for a timestamp to be sent from a timeserver as an ASCII character string containing the current date and time. This message is sent from the timeserver as a response to any input on port 13. The timeserver closes the connection as soon as the timestamp is sent. The AllSync Master is capable of sending and receiving timestamps via UDP port 13 using this protocol.

Ethernet - A very popular technology for networking computers and other devices. This communication method is used for transmitting and receiving timing signals and/or remote programming with the AllSync Master (with Ethernet Option).

Event - An occurrence specified with a unique time of day. For the AllSync Master, an Event is specified to be either a continuous ON, continuous OFF, or a timed signal of 1-9 seconds. An event can also be specified with date or weekday information (for recurring or one-time events). Events are collected into groups, called Schedules and used to determine the timing of circuit switching. Example: Event 0004 is programmed to occur at 1:41pm Monday through Friday for 3 seconds duration.

Firewall - A network configuration, usually both hardware and software, that forms a fortress between networked computers within an organization and those outside the organization. It is commonly used to protect information such as a network's e-mail and data files within a physical building or organization site.

Gateway - A network device or network point that acts as an entrance to another network, such as the server through which computers on a local area network access the Internet.

Gateway IP Address - The address value for the Gateway device on the network (see "Gateway").

Glossary of Terms

GPS - Global Positioning System, a constellation of satellites operated by the United States Military (US Naval Observatory) that broadcast precisely timed signals from space. These signals are used for extremely accurate global navigation as well as the distribution of precise time.

Internet - A worldwide system of computer networks in which any one computer can get information from/or talk to any other connected computer using the TCP/IP protocols.

Leap Second - A second of time as measured by an atomic clock, added to or omitted from official timekeeping systems annually to compensate for changes in the rotation of the earth.

Leap Year - A calendar year that contains 366 days instead of the normal 365. During Leap Years, the extra day falls on February 29th. In the Gregorian calendar, a leap year is any year which number can be divided by 4 without a remainder, and years ending in hundreds are not leap years unless they are divisible by 400.

LMT - Local Mean Time, the Mean Solar Time for any given longitude around the earth. It differs at every longitude (1 hour change for every 15 degrees longitude). LMT may or may not correspond with the local time in a given time zone.

Low-E Glass - Low Emissivity Glass - this type of glass features a unique surface coating that reduces the heat transfer through the window. Such a coating can reflect anywhere from 40% to 70% of the normally transmitted heat, while not inhibiting the amount of light that passes through the window. However, the metal oxide coating of Low-E glass does not allow the GPS signals to pass through. Thus, mounting the GPS antenna inside a window with Low-E glass is not recommended.

Master Clock - In a timekeeping or clock system, a device that acts as the source of time. The Master clock transmits the time to any number of secondary (or slave) clocks.

Master IP Address - The value of an address for a timekeeping server on the local computer network or Public Internet.

Navigation Message - a message, transmitted by each GPS satellite, containing its orbital elements, clock behavior, system time and status messages.

Network - A group of interconnected computers or other electronic devices, capable of transferring data signals with each other.

NIST - National Institute of Standards and Technology - The Time and Frequency Division, part of NIST's Physics Laboratory, maintains the standard for frequency and time interval for the United States and provides official time to the United States. NIST also maintains timeservers on the Internet, some of which are listed in Table 1.

Banner - A line of text that is displayed on the LCD screen for promotional or informational purposes. The AllSync Master supports 1 line of approximately 20 characters that can be modified to display an organization's name, for example. This banner text is only displayed when the unit's display size is set to small text mode.

Circuit - A complete or partial path followed by a flow of electric current. In the case of the AllSync Master, electrical circuits are connected for the purposes of controlling devices (clocks, bells, etc). These devices can be switched on and off and/or provided signals (ON and OFF sequences) from the AllSync Master.

Client - A computer or other networked device, or a software application, that connects to and requests information from a server.

Clock Code - A code that is assigned to a unique collection of electrical signals used to control a clock system. These signals are sent from a Master Clock to each Secondary Clock for the purposes of time synchronization. Different types of clock systems require different, often proprietary signals, which are specified with a unique clock code. The AllSync Master is capable of operating a wide variety of clock systems, with a selectable clock code feature.

Glossary of Terms

Patch Cable - A cable with plugs or terminals on each end of the conductor or conductors used to connect circuits of equipment together. Patch cables are used to connect an individual computer or other device to a network. The AllSync Master can be connected to an RJ-45 jack with an Ethernet Patch Cable.

RJ-45 Jack - Short for Registered Jack-45, this is an 8-pin (or 8-wire) modular connector used to attach data transmission devices to standard telephone wiring. Commonly used in Ethernet data connections and installed in the AllSync Master for physical connection of the Ethernet port.

RS-422 - Standard communications interface approved by the Electronic Industries Alliance (EIA) for connecting serial devices and supporting multi-point connections. This interface supports higher data rates and a higher immunity from interference than RS-232 and is used for the communication between the AllSync Master and the GPS receiver.

Schedule - A collection of programmed events that the AllSync Master runs in chronological order. In the case of the AllSync Master, events and the circuit(s) they control are assigned to the same schedule. Example: Events 0001, 0002, and 0005 and circuits 1 and 4 are assigned to Schedule 04.

Secondary Clock - Also known as a Slave Clock, this is a clock that synchronizes its timekeeping to that of a connected Master Clock.

Service Lock - A secret 4 digit password that can be set to limit access to special programming and configuration of the AllSync Master (such as deleting all events, changing the clock code, etc.) This code can be disabled by setting it to 0000. The default Service Lock from the factory is 1234.

Shrink Tubing - Tubing which has been extruded, cross linked, and mechanically expanded which, when reheated, will return to its original diameter. For this GPS kit, it is used to protect the electrical and communications connections from water, etc. It can be easily installed over the connectors and will shrink tightly over them after being heated.

Server - A host computer or host device on a network, which shares resources and "serves" data to client computers or other servers.

Static IP Address - An Internet Protocol (network) address permanently assigned to an individual machine, account, or user.

Subnet Mask - A number that helps to define the relationship between the host (computers, routers, switches, etc.) and the rest of the network.

Synchronization - The process of bringing two clocks or time sources into phase so their difference is zero. In the case of a timekeeping system, time synchronization takes place between the master clock and all secondary clocks.

Timeserver - A system or device that acquires the correct time from a local reference clock and/or remote timeservers and will answer time requests from other systems. See "Server".

Timestamp - A time mark or notation that indicates the date and the time.

User Lock - A secret 4 digit password that can be set to limit access to general programming and operation of the AllSync Master. This code can be disabled by setting it to 0000. The default User Lock from the factory is 1234.

User Interface - The point of communication and interaction between a device and human. In the case of the AllSync Master, the User Interface consists of hardware (LCD screen and 16 button keypad) with associated software algorithms to accept input from the user and provide information to the user.

USNO - The U.S. Naval Observatory - an organization within the United States Navy which determines precise time and maintains the Master Clock for the United States. The USNO monitors the timing of the Global Positioning System (GPS) to provide a reliable and stable coordinated time reference for the GPS satellite navigation system.

UTC - Universal Coordinated Time - A time-scale that forms the basis of a coordinated distribution of standard frequencies and time signals throughout the world. It is often referred to as Greenwich Mean Time (GMT) or Zulu Time (military and aviation).

User Notes