Installation and Operation Manual

YMP Series Signal Programmer

american time®

Integrated Solutions

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INSTALLATION AND OPERATION MANUAL

YMP Series Clock/Signal Programmers

YMP YMP02 YMP04 YMP06

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Introduction

The American Time YMP Clock/Signal Programmer Series consists of models YMP, YMP02, YMP04 and YMP06. Each master clock unit provides automatic synchronization of virtually any secondary clock system without complex codes or mode selections. Two output relays are dedicated to control secondary clock correction and two, four or six additional relays are independently programmable for momentary, ON/OFF, or manual operation. Note: Model YMP is a master clock only with no programmable auxiliary outputs, and all programming features are disabled. Events are programmed into non-volatile memory with one-minute increments, which allows
up to 1440 events per schedule. Sixteen (16) independent schedules may be accessed for alternate schedule programming. Each output circuit may be assigned any one of the schedules and programmed for signal type and duration. User selectable features include Automatic Daylight Saving Time adjustment, 12 or 24 hour format and security code enable/disable.

SPECIFICATIONS

Input Voltage	120vac (220vac optional)
Input Frequency	50/60 Hz
Fuse	1/4 amp, 1/4" x 1 1/4"
Relays	10 amps SPDT
Timing Accuracy	± .001%
Signal Duration	1-9 seconds, ON/OFF
Daylight Saving Time Adjustment	Enabled from factory (dip switch disable)
Programmed Events	1440 per schedule - 16 schedules (excluding YMP)
Timekeeping Backup	3.6V lithium battery - 1200mA hours
Outside Dimensions	7.28"h x 8.38"w x 5.43"d
Mounting Dimensions	5.43"h x 7.76"w
Temperature Range	32˚F-140˚F (0˚C-60˚C)
Shipping Weight	4 lbs.

Glossary of Terms

Clock Circuit:	A circuit which drives and provides correction signals to secondary clocks.
Clock System:	A master clock, secondary (slave) clocks and/or signal or utility devices.
Event:	A programmed occurrence, such as class beginning and dismissal bells or the ON/OFF of a utility device.
Hourly Correction:	A correction signal sent to compatible secondary clocks every hour that synchronizes their minute hands, and second hands, if so equipped.
12 Hour Correction:	A correction signal sent to compatible secondary clocks every 12 hours that corrects the clocks that are slow from as much as 11 hours and 57 minutes.
Impulse Clock:	A secondary clock which has no sweep second hand and works by momentary closure of DC voltage. The minute hand steps (moves) each minute.
Master Clock;	The primary timekeeping device. It provides the voltage pulses to operate and correct the secondary clocks and/or signal or utility devices.
Reverse Polarity:	A means by which impulse clocks can be advanced each minute and corrected on the same pair of wires by reversing the polarity of the signal sent out on those wires.
Schedule:	A sequence of events. Example: Daily or weekly bell schedule.
Secondary Clock:	A correctable clock that is part of a master time system.
Signal Circuit:	A circuit which operates bells and/or utility devices in accordance with a programmed schedule of events.
Signal Duration:	The elapsed time that a duration event activates its signals. Example: The length of time that bells ring.
Synchronous Clock:	A secondary clock that receives a constant run voltage (usually line voltage) and hourly and 12 hour correction signals as appropriate.
Utility Device:	A device connected to a signal circuit that is designed to be turned on or off, such as for lighting, environmental control or security. (Duration must be set to “0” to operate these types of devices)

Installation & Setup

Mounting Instructions

Unit has 3-point mounting provisions. Hang enclosure from the upper rear mounting hole and secure to the wall by using the two lower mounting holes located external to the wiring compartment. Remove the compartment cover to access the lower mounting holes which are slotted through-holes (see Page 10).

Electrical Connections

External wiring connections are made at the terminal blocks located inside the wiring compartment. Remove the two screws and cover to the wiring compartment to access a series of removable screw-terminal blocks. (see Page 10). A diagram showing input power connections and the relay output configuration is located inside the wiring compartment cover. $^1/_2$" conduit knockouts are provided for either rear or bottom entry to the wiring compartment. Conduit hubs (not supplied) must be connected to the conduit before being connected to the enclosure.

Power Switch

The ON/OFF power switch is located in the upper right corner of the circuit board (see page 10). The four screws on the front panel must be removed to access the power switch.

Dip-Switch Settings

The unit is shipped with DS-1, DS-2 ON (12 hour time format & Automatic Daylight Saving Time) and DS-3 (Security Code, DS-4 OFF). The power switch must be in the OFF position to change any of the dip-switch settings. To access the dip-switches, remove the four screws from the front panel and locate dip-switches on the circuit board (see page 10).

DS-1 – Enables (ON) or disables (OFF) the Automatic Daylight Saving Time (DST) adjustment. DST is programmed to start the first SUN in April at 2:00 AM and end on the last SUN in October at 2:00 AM.

DS-2 – Sets the time format. ON is 12 hour format and OFF is 24 hour format.

DS-3 – Enables (ON) or disables (OFF) the security code required to access **SET**, **PRGM** and **MAN** modes of operation.

DS-4 – Is not used.

Operating Procedures

Keypad Description

The 8-button keypad consists of two rows of four keys. The keys in the top row are used for mode selection (**RUN**, **SET**, **PRGM**, **MAN**). The keys in the bottom row are used to edit and enter data (**FWD**, **ENT**, **STO**, **DEL**).

RUN mode is the normal operating mode and may be pressed at any time to exit the other modes and return to normal operation.

SET mode is accessed to change time and/or date information.

PRGM (program) mode is a multiple mode key used to access four (4) programming modes. The **PRGM** key is pressed to alternate between 1)program events, 2) program circuit schedules, 3) program signal duration and 4) program review.

MAN (manual) mode is used to manually signal events.

FWD (forward) advances or edits the data displayed at the cursor.

ENT (enter) confirms the data displayed at the cursor and advances the cursor to the next data location on the LCD display.

STO (store) is used to store an event or group of events into program memory.

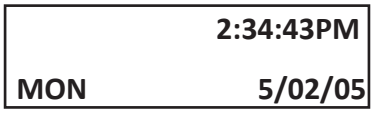
DEL (delete) is used to delete an event or group of events from program memory.

Security Code

Security Code may be enabled (DS-3 ON) to prevent unauthorized access to the **SET**, **PRGM** and **MAN** modes of operation. An attempt to access these modes will result in a prompt for the security code. The code is pre-programmed at the factory as a sequence of three keystrokes—press **SET**, **DEL** then **STO**.

The Run Mode

The Run mode is the normal operating mode of the programmer and the time, day, date and active relays are shown on the display. When power is applied to the unit, it will be in the **RUN** mode. When not programming or setting the time/date, your unit should be in this mode.



The **RUN** button is pressed to exit other modes and return to normal operation.

The Cursor

While in **SET**, **PRGM** and **MAN** modes, the small black (non-blinking) cursor indicates the item which can be changed. The cursor is moved forward by pushing the **ENT** button.

SET MODE—SET TIME & DATE To set the time of day:

- Push **SET**
- Notice the small black (non-blinking) cursor beneath the minute digit.

	2:34 PM
MON	**5/02/05**

- Push and hold **FWD** and the minutes will start advancing…slowly at first, then faster after a couple of seconds. Release the button when you get close to the time you wish to enter. Then advance the minutes slowly by pressing **FWD** until the correct time is indicated. Note: You will not be able to back up when setting the time, so if you go past the time you need to enter, you will need to advance through nearly 24 hours to get back to the desired time.
- At this point, if you only want to adjust the time, you can push **RUN** to get out of **SET** mode. You do not need to push **ENT**. The time will be entered automatically when you push **RUN**.

Set or change day of week:

- If not already in **SET** mode, push **SET**
- Push **ENT** to move the cursor until it is beneath the first character of the day of week.

	2:34 PM
MON	**5/02/05**

- Advance day of week by pushing **FWD** until the current day of the week is shown. At this point, if you only want to adjust the day of week, you can push **RUN** to get out of **SET** mode. You do not need to push **ENT**. The day of week will be entered automatically when you push **RUN**.

Set or change month:

- If not already in **SET** mode, push **SET**
- Push **ENT** to move cursor until it is beneath the month digit.

	2:34 PM
MON	**5/02/05**

- Advance month by pushing **FWD** until the correct month is shown. At this point, if you only want to adjust the month, you can push **RUN** to get out of **SET** mode. You do not need to push **ENT**. The month will be entered automatically when you push **RUN**.

Set or change day of month:

- If not already in **SET** mode, push **SET**.
- Push **ENT** to move the cursor until it is beneath the digit of the date.

	2:34 PM
MON	**5/02/05**

- Advance the date by pushing **FWD** until the correct date is shown. At this point, if you only want to adjust the date, you can push **RUN** to get out of **SET** mode. You do not need to push **ENT**. The date will be entered automatically when you push **RUN**.

Set or change the year:

- If not already in **SET** mode, push **SET**.
- Push **ENT** to move the cursor until it is beneath the digit of the year.

	2:34 PM
MON	**5/02/05**

- Advance the year by pushing **FWD** until the correct year is shown. At this point, if you only want to adjust the year, you can push **RUN** to get out of **SET** mode. You do not need to push **ENT**. The year will be entered automatically when you push **RUN**.

PROGRAM MODE

Entering circuit events:

- Push **PRGM** to enter the PROGRAM mode.
- Move to the desired schedule (1 through G) you wish to add or change by pushing **FWD**.

SCH 1	**2:34PM**
MON	

- Move the cursor to the event time (in the upper right hand corner) by pushing **ENT**.

SCH 1	**2:34PM**
MON	

- Advance the event time to the desired time at which you want an event to occur by slowlypushing **FWD**.
- Push **ENT** until the cursor is beneath the event days indicator.

SCH 1	**2:34PM**
WDY	

- Change the event day(s) to the desired day(s) by pushing **FWD**. Event day choices are: EDY: Event will occur every day of the week.
  WDY: Event will occur every week day, Monday through Friday (most common). MON: Event will occur only every Monday.
  TUE: Event will occur only every Tuesday.
  WED: Event will occur only every Wednesday.
  THR: Event will occur only every Thursday.
  FRI: Event will occur only every Friday.
  SAT: Event will occur only every Saturday.
  SUN: Event will occur only every Sunday.
- Push **STO** to store the displayed event day and time in the displayed schedule. At this time the day(s) you have selected will display in the lower right hand corner.

SCH 1	**2:34PM**
WDY	**MTWTF**

- Push **RUN** to go back to normal operating mode.
- Repeat steps for as many events as needed.

DELETING CIRCUIT EVENT(S)

Within a schedule:

Push **PRGM** (if not already in this mode). Move to the desired schedule by pushing **FWD**. Push **ENT** to move cursor to time and advance to the event time you want to delete. Push **ENT** to move cursor to the day of week indicator in the lower left corner and push **FWD** to advance to the day of the week to be deleted and press **DEL** (if you want to delete the event completely **FWD** the day of week indicator to EDY). The deleted day(s) will no longer appear in the lower right hand corner. Push **RUN** to go back to normal operating mode.

ASSIGNING SCHEDULES TO OUTPUT CIRCUITS

Once events have been programmed into a schedule, the schedule must be directed to an available circuit or circuits (enabled). If this is not done, the event operation will not occur.

- From **RUN** mode push **PRGM** twice to enter the schedule-circuit assignment mode.

CIRCUIT	**123456**
SCHEDULE	**111111**

- Move the cursor to the desired circuit by pushing **ENT**. (Display will vary depending on the number of circuits included with your model). To direct a schedule to that circuit, push **FWD** until the desired schedule number appears. Do the same for the remaining circuits if necessary. When done, push **RUN** to enter your selections and return to normal operating mode.

SETTING CIRCUIT-EVENT DURATION

- From **RUN** mode, push **PRGM** three (3) times. All circuits and their associated event durations (in seconds) will be displayed.

CIRCUIT	**123456**
DURATION	**000000**

- To set or change the duration of a circuit, push **ENT** until the cursor is beneath the circuit duration that you want to change.

CIRCUIT	**123456**
DURATION	**060000**

- Push **FWD** to advance the circuit duration (0-9 seconds). A duration of zero (0) programs the circuit for ON/OFF operation (the circuit will toggle ON/OFF state each time an event occurs). Make appropriate modifications to remaining circuit durations. Push **RUN** to enter settings and return to normal operating mode.

REVIEWING PROGRAM EVENTS (Programmed Event Review Mode)

- From the **RUN** mode, push **PRGM** four (4) times to enter programmed event review mode. Schedule 1 will be shown in the upper left hand corner and event time will appear in the upper right hand corner.

SCH 1	**2:34PM**
MON	

- Push **FWD** to the schedule to be reviewed (1-G).
- Push **ENT** to move the cursor to the time.
- Push **FWD** to advance to the next programmed event within the schedule. Event days will appear beneath the time as a string of characters representing the day of the week when the event will occur. Continue pushing time as a string of characters representing the day of the week when the event will occur. Continue pushing **FWD** to advance through the entire schedule. Note: As the current time is displayed, event review will begin with the next scheduled event after that time and continue through the entire schedule from there.

SCH	**13:00PM**
WED	**SMTWTFS**

SCH	**13:50PM**
WED	**MWF**

Example: The character string SMTWTFS indicates that the event will occur every day Sunday-Saturday at the time shown.

Example: The character string MWF indicates that the event will occur Monday, Wednesday and Friday at the time shown.

Within program event review mode, new event times may not be entered. The user must return to **RUN** mode and then go to Program mode (push **PRGM** once) to enter new events.

***Within program event review mode, the user is allowed to modify event days (add or delete) at an existing event time or delete an event time completely. This can be done using the same steps in the program mode section located on page 7.**

MANUAL OPERATION OF CIRCUITS

- From **RUN** mode, push **MAN**. The display will show all circuits on the top row with a 1 or 0 below the circuit. A "0" indicates the circuit is not selected for manual operation. A "1" indicates the circuit has been selected for manual operation.

CIRCUIT	123456
MANUAL	110111

CIRCUIT	123456
MANUAL	100000

- To change the select or deselect status of a circuit, push **ENT** to move the cursor to the circuit to be changed. Push **FWD** to show either 1 (enabled) or 0 (disabled).
- Once the circuits have been selected, push **MAN** to activate the selected circuits. The **MAN** button can be pushed repeatedly to operate the selected circuits while still in **MAN** mode.
- When manual operation is complete, deselect circuits (see above), then push **RUN** to return to normal operation.

QUICK TIPS:

PRGM (PROGRAM) KEY ACCESS NAVIGATION:

- Push **PRGM** (1) time to enter program mode
- Push **PRGM** (2) times to direct schedules to output circuits
- Push **PRGM** (3) times to set circuit event duration time
- Push **PRGM** (4) times to enter programmed event review mode

USING FWD AND ENT BUTTONS WITHIN ABOVE MODES:

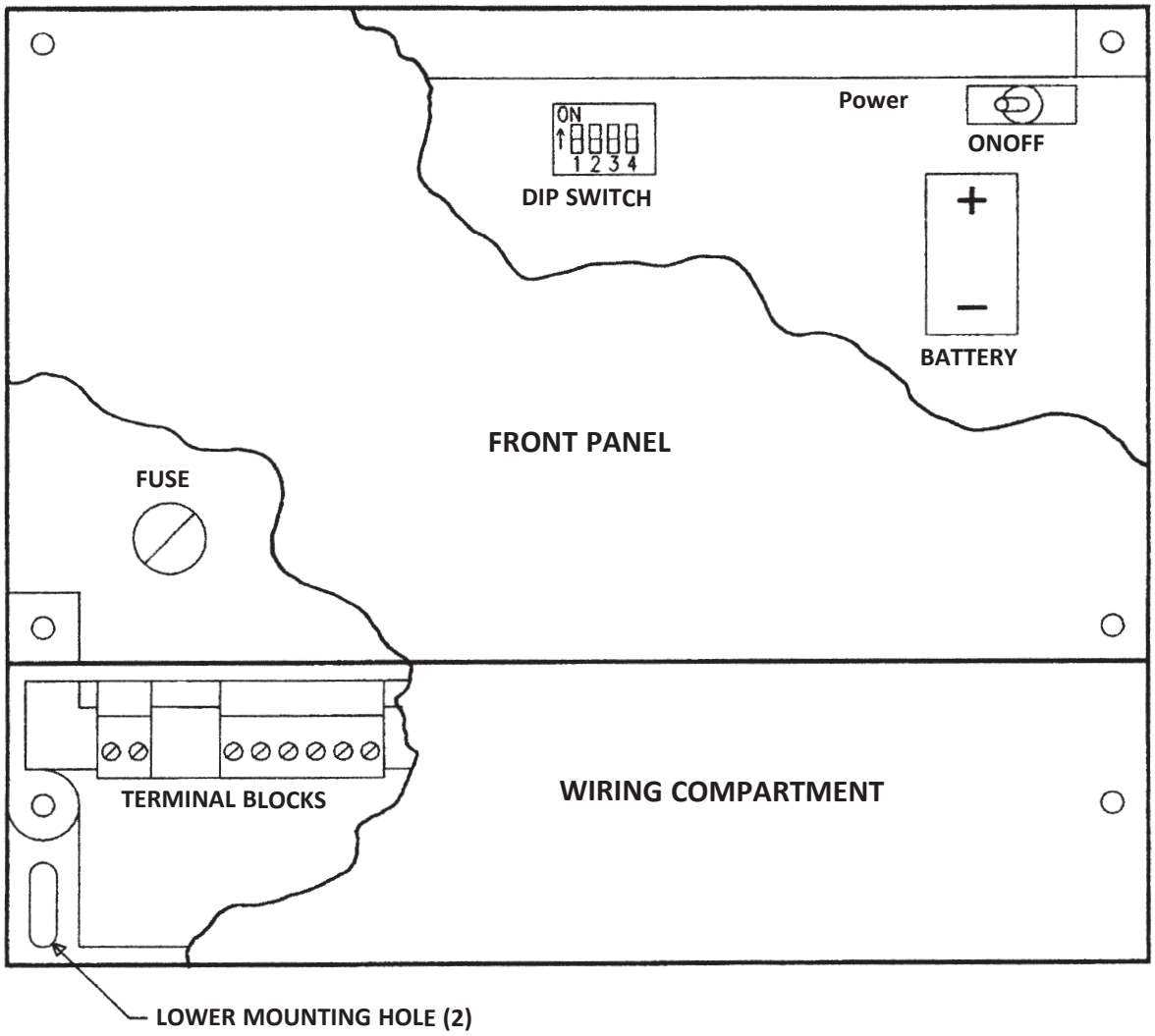
- The **FWD** button edits (advances) the data at the cursor: i.e. In this example **FWD** would advance the month.

	2:34 PM
MON	5/02/05

- The **ENT** button moves the cursor to the next data field: i.e In this example pressing **ENT** would move the cursor from the date to the year.

	2:34 PM
MON	5/02/05

Cut Out View of the Programmer



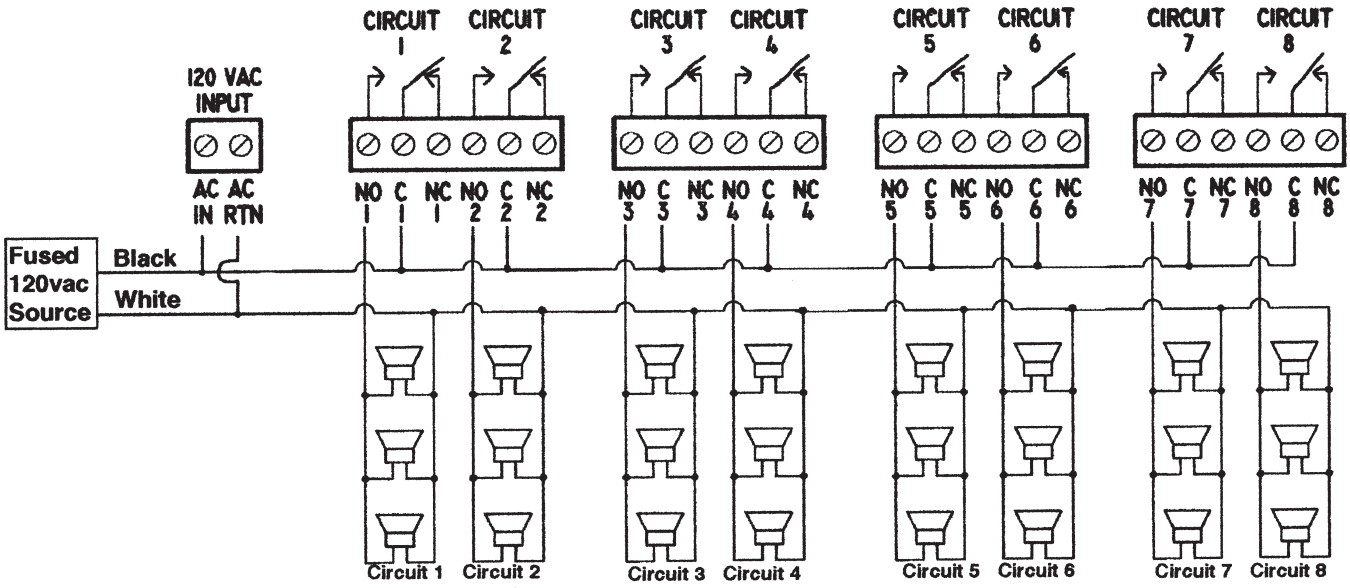
3-Wire Synchrounous (59th min.) Clock Correction Protocol & Wiring

120/24vac is continuously applied to the secondary clock **RUN** motor. An eight (8) second signal is transmitted on the correction line each hour from HH:57:54 to HH:58:02 for hourly correction. A 14 second signal is transmitted on the correction line from 5:57:54 to 5:58:08 for 12 hour correction.

Secondary clocks are connected to the rightmost 6-position terminal block according to the wiring diagram below. Relays dedicated for secondary clock control are as follows:

Model	Relays
YMP	1, 2
YMP02	3, 4
YMP04	5, 6
YMP06	7, 8

Wiring Diagram



This diagram is using 120vac bells (user supplied step-down transformer required for low voltage (24vac) signals).

Relays shown in disabled position.