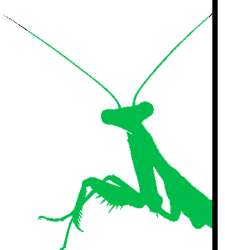
miniMANTIS

Operation Manual



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Mantis brand prop/scene controllers and sensors are designed for entertainment purposes only and should NEVER be used for mission critical or medical applications. NEVER apply high voltages to equipment specified as low voltage only. ALWAYS follow local codes. Extreme care should be taken when working with power line voltages. If in doubt, consult with Lights Alive or your local electrician. Lights Alive is not responsible for improper use of this equipment.

miniMANTIS MM-101 Operation

General Description

The miniMANTIS is a sophisticated, real-time-programmable (trainable) microprocessor-controlled digital event timer. It allows the user to program a sequence of on-off events for different lengths of time for a period of up to 30 seconds. These on-off events are recorded during 125-millisecond intervals.

The miniMANTIS is available fully assembled in a custom case, as an assembled board without case for OEM use and as a kit for the do it yourselfer who wants the ultimate product at the lowest possible price. All versions include an unprecedented conditional 5-year warranty against defective materials and workmanship.

Controls (3, left to right)

TEST, a pushbutton switch that begins the programmed event. This is equivalent to operating the sensor or TRIGGER. TEST is also used to change modes.

CONTROL, a pushbutton switch to enter and leave "recording". It is also used to erase the miniMANTIS memory.

CHANNEL, a pushbutton switch to turn the relay on and off during recording. When the miniMANTIS is idle (not playing back a program), this switch activates the relay as a way to test operation of the controller and attached device(s) without running an entire program. It is also used to turn memory protection on and off.

Power source

A suitable power source is required for the miniMANTIS, but is not included. While the MM-101 is designed for 12vdc, it may successfully be operated at anywhere from 9vdc to 14vdc. Because of the extreme flexibility of the miniMANTIS, power requirements are dependent upon what other devices will be powered from the same supply.

Power may be applied through the coaxial power jack (2.1mm x 5.5mm, center positive), via the screw terminals or through the Mantis universal adapter. A single power adapter may drive many controllers by daisy chaining via the screw terminals. MANTIS INTELLIGENT CONTROLLERS receive their power from the miniMANTIS and the MM-101 can be configured to supply power directly to solenoid or air valves, up to a maximum of 1 amp, thus eliminating the need for more adapters. Suitable power supplies are available from Lights Alive and many other sources.

Indicators (4, bottom to top)

LADC (green) shows that a MANTIS INTELLIGENT SENSOR or TRIGGER device is connected to the **L**ights **A**live **D**irect **C**onnect modular jack.

STATUS (green) is used several ways.

In normal operation ("idle", waiting for a sensor or trigger to start the program), it will be a "heart beat", flashing about once a second. This indicates that the microprocessor is operating normally.

It will flash very rapidly, about 8 times a second, in any of the five following cases:

1) For about 3 seconds when power is first applied if the miniMANTIS is in the “optional” (repeating) mode. Then it will begin normal operation (idle);

2) When the miniMANTIS is ready to record a program;

3) When recording is ended;

4) If, while recording, there is no memory left record time has been exceeded; or,

5) When doing a global erase, if that function is selected when power is applied.

It will flash rapidly, about 4 times a second, while actually recording a program.

It will flash more slowly, about 2 times a second, slower than for recording but faster than for the normal idle, while playing back a program.

If the miniMANTIS is in the “default” (non-repeating) mode, it will go off after the program has finished playing back unless the trigger or sensor is released (open).

TRIGGER (yellow) is on whenever a MANTIS INTELLIGENT SENSOR, TRIGGER or third-party sensor is active (closed).

ACTIVITY (green) is used two ways.

1) It “mirrors” the action of the relay. When the relay is on (the normally-open contacts are closed), it is on; when the relay is off (the normally-closed contacts are open), it is off.

2) If it flashes together with the STATUS light for about three seconds when the miniMANTIS is first turned on, the memory is protected.

TIP: *When the TEST pushbutton is pressed, if TRIGGER is on and STATUS is off at the same time, this means either that there is no program in the miniMANTIS memory or that it is in the default (non-repeating) mode and the sensor or TRIGGER is still active (closed).*

TIP: *When the TEST pushbutton is pressed, if TRIGGER is on and STATUS is on but not flashing, this means that the miniMANTIS is in the optional (repeating) mode and that there is no program recorded in the memory.*

Modes

The miniMANTIS has two modes of operation:

1. Non-repeating, the default mode. When the device is TRIGGERed, it plays the program in memory. If the TRIGGER is not clear (still on or closed), it will stop at the end of the program. Once the TRIGGER is cleared (off or open), it will continue.

2. Repeating, the optional mode. When the device is TRIGGERed, it will play the program in memory. If the TRIGGER is not clear (still on or closed), it will play the program again.

The miniMANTIS is delivered to the customer in default mode, which is non-repeating.
When power is first applied:

If the STATUS light begins immediately to show a heartbeat, about one flash per second, it is in default (non-repeating) mode.

If the STATUS light flashes very fast for about 3 seconds, it is in optional (repeating) mode. The modes may be changed.

Changing modes is “toggled”. If the microMantis is in default mode, this will change to the optional mode; if it is in optional mode, this will change it to the default mode.

1. Disconnect the power.

2. While holding the TEST pushbutton down, connect the power.

   For as long as the TEST pushbutton is held down, the STATUS light will be on.

3. Release the TEST pushbutton

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   If the STATUS light begins immediately to show a heartbeat, it has changed to “default” (non-repeating) mode.

   If the STATUS light flashes very fast for about 3 seconds, it has changed to optional (repeating) mode.

The miniMANTIS will always “remember” what mode has been set, even after power has been turned off.

The miniMANTIS also offers an “automatic” repeating mode. If the TRIGGER input is shorted closed (“strapped”) when power is turned on, the device will detect this condition in 5 seconds and automatically begin to operate in the optional (repeating) mode even if it has been set to the “default” (non-repeating) mode.

DC Power

Screw terminal connections for 12 VDC power out for props or valves, or power in to the controller.

Trigger/Sensor Connectors

Screw terminal connections for non-Lights Alive triggers.

Test Switch

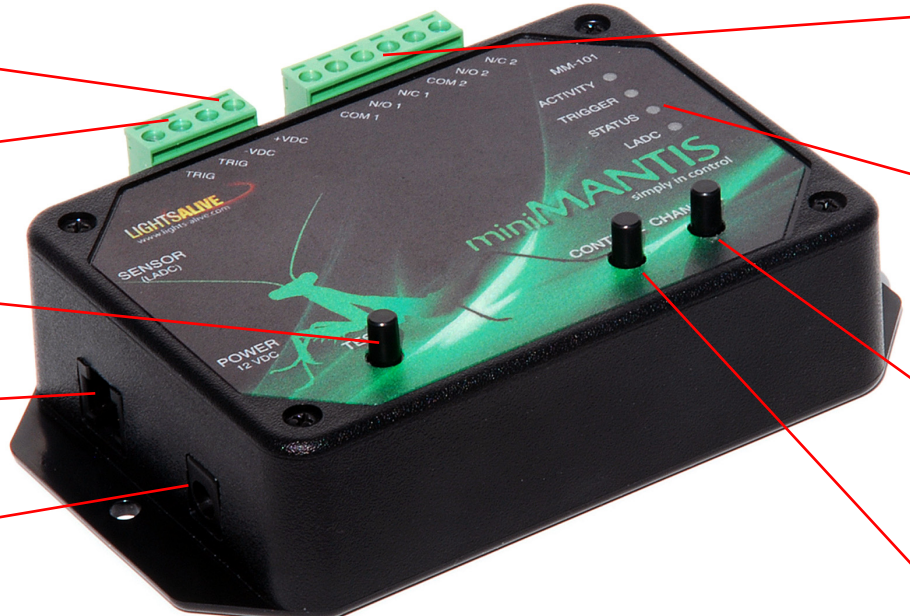
A pushbutton switch that begins the programmed event. This is equivalent to operating the sensor or TRIGGER. TEST is also used to change modes.

LADC Connector

The Lights Alive Direct Connect jack gives a positive, one-click connection with Lights Alive triggers and intelligent sensors.

DC Power In

A 2.1mm x 5.5mm center positive coaxial jack to receive 12VDC to power the controller, Mantis sensor, and externasl devices.



Outputs

Provides connections to external devices. Includes common, normally open, and normally closed contacts for each side of the relay. the MM-101 can be configured to supply power directly to solenoid or air valves, up to a maximum of 1 amp

LED Indicators

Activity - Mirrors relay activity
Trigger - Indicates an MANTIS or third-party sensor, or trigger is active (closed.)
Status - The rate of flash provides several indicators of controller functions.
LADC - Indicates proper connection with a MANTIS sensor or trigger

Channel Switch

A pushbutton switch to turn the relay on and off during recording. When the miniMANTIS is idle (not playing back a program), this switch activates the relay as a way to test operation of the controller and attached device(s) without running an entire program. It is also used to turn memory protection on and off.

Control Switch

A pushbutton switch to enter and leave “recording”. It is also used to erase the miniMANTIS memory.

If the miniMANTIS was set to the default (non-repeating) mode and the strap is removed when the power is off, it will still be in the default (non-repeating) mode the next time power is turned on.

Functions

The miniMANTIS has two additional functions that are used only when power is turned on.

Global erase. *WARNING! This erases the entire program memory! There is no way to get it back again! You must reprogram your controller after a global erase.*

1. Disconnect the power.

2. While holding the CONTROL pushbutton down, connect the power. The program memory will be erased in about 1 second.

   NOTE: For as long as the CONTROL pushbutton is held down, the STATUS light will flash very fast.

3. Release the CONTROL pushbutton.

   The STATUS light will immediately show a heartbeat.

Memory protect. This prevents a new program from accidentally being recorded over an existing program. It also prevents the memory from being erased and makes it impossible to exit a program that is being played back.

TIP: Memory protection is toggled. If memory is protected, this will unprotect it; if it is not pro tected, this will protect it.

1. Disconnect the power.

2. While holding the CHANNEL pushbutton down, connect the power.
   NOTE: For as long as the CHANNEL pushbutton is held down, the ACTIVITY light will be on.

3. Release the CHANNEL pushbutton.

   NOTE: If memory protection has been turned on, the ACTIVITY light will f lash together with the STATUS light for about 3 seconds.

   If memory protection has been turned off, the STATUS light will show a heartbeat.

The miniMANTIS will always "remember" if memory is protected, even when power is turned off.

Recording a Program

The miniMANTIS is delivered to the customer with the memory erased. It is not programmed.

NOTE: If there is a program in the memory, the new program is written over it. The old program will be de stroyed.

To record a program

1. Press and release the CONTROL pushbutton. The STATUS light will flash very fast. This means

the miniMANTIS is ready to record but recording has not actually started.

NOTE: If the memory is protected, the STATUS light will not flash very fast. It will continue to show a heartbeat.

TIP: To exit now without making a recording, press both the CONTROL and CHANNEL pushbut tons at the same time, and then release them. The STATUS light will show a heartbeat.

2. Press and release the TEST pushbutton. The STATUS light will flash rapidly while the program is being recorded.

TIP: Recording actually begins when the TEST pushbutton is released. After this, the only way to exit from recording is to go to step 4.

Programming an "instant on". This turns the relay on with no possible delay.

2a. Press and hold the CHANNEL pushbutton before pressing and releasing the TEST pushbutton

NOTE: This can be used only at the very beginning of a program.

3. Press and release the CHANNEL pushbutton to turn the relay on and off. When the relay is on (the normally-open contacts are on/closed), the ACTIVITY light is on; when the relay is off (the normally-closed contacts are on), the ACTIVITY light is off.

NOTE: The CHANNEL pushbutton may be pressed and released as many times as needed during the recording time. The total recording time cannot exceed 30 seconds.

NOTE: After 30 seconds of recording, the memory is full. When this happens, the STATUS light will flash very fast for about 3 seconds. Then the STATUS light will show a heartbeat. This means the miniMANTIS has automatically saved the program, has returned to normal operation (idle), and is ready to play back the program.

4. To end the program recording, press and release the CONTROL pushbutton. The STATUS light will flash very fast. This means that recording has stopped but the program is not ready to play.

NOTE: Recording actually ends when the CONTROL pushbutton is pressed.

Programming an "instant off". This turns the relay off with no possible delay:

4a. While the CHANNEL pushbutton is pressed, press and release the CONTROL pushbutton.

This can be used only at the very end of a program.

5. Press and release the TEST pushbutton. The STATUS light will show a heartbeat. This means the miniMANTIS is ready to play back the program.

TIP: Pressing the TEST pushbutton again will immediately begin playing back the program that has been recorded.

NOTE: The miniMANTIS will always "remember" the program, even when power is turned off.

Playing back a program

The program starts to play back when a sensor or TRIGGER turns it on, or when the TEST pushbutton is pressed.

The STATUS light will flash more slowly (but faster than the heartbeat) while the miniMANTIS is playing back a program.

To exit when the program has not finished playing, press both the CONTROL and CHANNEL pushbuttons at the same time, then release them. The STATUS light will show a heartbeat.

If the memory is protected, it is not possible to exit a program that is being played back.

NOTE: When the TEST pushbutton is pressed, if TRIGGER is on and STATUS is off at the same time, this means either that there is no program in the miniMANTIS memory or that it is in the default (non-repeating) mode and the sensor or TRIGGER is still active (closed).

NOTE: When the TEST pushbutton is pressed, if TRIGGER is on and STATUS is on but not flashing, this means that the miniMANTIS is in the optional (repeating) mode and that there is no program recorded in the memory.

Automatic repeat

The miniMANTIS offers an "automatic" repeating mode. If the TRIGGER input is shorted closed ("strapped") when power is turned on, the device will detect this condition in 5 seconds and automatically begin to operate in the optional (repeating) mode even if it has been set to the default (non-repeating) mode.

NOTE: If the miniMANTIS was set to the default (non-repeating) mode and the strap is removed when the power is off, it will still be in the default (non-repeating) mode the next time power is turned on.

Setup and Configuration

For suggested setups and configurations, see the setups insert (included.)

miniMANTIS MM-101 Specifications

Control Channels	1
Max record time	30 seconds
Relay contacts	2 sets (double pole, double throw)
Relay life	20,000,000 operations
Relay ratings	8 amps per contact, 120 volt (16 amp total)
Power requirement	12vdc nominal (9-14vdc), 250mA typical (see note)
Size	4-1/2" (5-1/2" w/mounting ears) x 3-5/8" x 1-1/2"
Processor speed	1,000,000 instructions per second
Response time	1/100th of a second
Connections	LADC and screw terminals
Trigger method	Switch closure
Indicators	4 (Activity, trigger, status, LADC)
Controls	3 (Test, control, channel)
Features	Repeat mode, optical isolation, prop test, program protect, global erase, LADC, daisy-chainable
Factory options	24volt operation, prop power out from relay

NOTE: Power requirement for the miniMANTIS is only 50mA. The additional power requirement is for Mantis Intelligent Sensors, air valves, other controllers, etc. Up to 1000mA may be passed through mini-MANTIS to power other controllers, sensors, solenoid valves, etc. Actual power supply should be equal to or greater than the sum of all connected devices plus 50mA for miniMANTIS.

MANTIS LIMITED FIVE (5) YEAR WARRANTY

Mantis controllers are conditionally warranted to the original purchaser against defective materials and/or workmanship for a period of five (5) years from the date of purchase. Lights Alive will provide free telephone and/or email technical support for the life of the product.

Lights Alive, at it's sole option, will repair or replace, without charge, any Mantis product found to contain defective materials and/or workmanship within the five year warranty period. The product must be returned, prepaid, to Lights Alive for service.

This warranty does not apply to normal wear and tear or physical damage caused by unreasonable use by the consumer. Consult your manual and/or the Lights Alive website for details on the proper usage and care of Mantis.

Great care is taken in the design and construction of Mantis and related components. However, by using this equipment, you understand and agree that you are doing so at your own risk. Lights Alive will not be liable for any personal injury, property damage or consequential damages of any kind due to the use, misuse, abuse or failure of the product, even if due to our negligence. No other warranty is expressed or implied.

Revised 4/15/09