MM251 miniMantis2 Operation Notes

Description.

The miniMantis2 is a sophisticated 2-channel, real-time-programmable microprocessor-controlled digital event timer with sound.

It allows the user to program a sequence of on-off “events” on either channel, or both, for different lengths of time for a period of up to 150 seconds (2.5 minutes). These events are recorded in program memory at 41.7-millisecond intervals or “frames”, giving a recording and playback rate of 24 frames per second. Up to 512 different on-off events can be recorded within the 150-second period.

Sound is recorded, stored, and played back digitally in two audio memory storage areas called “tracks”. One track plays in a continuous loop to provide background or “ambience”; the other track is played when the miniMantis2 senses that a triggering device has been activated. Neither track has a fixed length, but the total duration of the two cannot exceed 150 seconds.

Controls (5, left to right):

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

VOLUME, a rotary control that adjusts the volume of the sounds monitored from the AUDIO IN jack while they are being recorded and when they are played back through the AUDIO OUT jack.

> *NOTE: This control has no effect on the level of a signal being recorded from the AUDIO IN jack. That level must be adjusted on the device providing the audio signal.*

CONTROL, a pushbutton switch to enter and leave “recording” mode, whether for event programming or for audio. For testing connected devices, it can be used to set either channel “on” and hold it that way continuously. It is also used to erase the miniMantis2 program and audio memories (called a “global” erase”).

CHAN[NEL] 1, a pushbutton switch to turn the CHANNEL 1 relay on and off during recording. When the miniMantis2 is not playing back a program (“idle”), this switch activates the relay as a way to test operation without running an entire program. It is also used to record and preview sound that will be played during the continuous loop, called Track 1. It can turn memory protection on or off.

CHAN[NEL] 2, a pushbutton switch to turn the CHANNEL 2 relay on and off during recording. When the miniMantis2 is not playing back a program ("idle"), this switch activates the relay as a way to test operation without running an entire program. It is also used to record and preview sound that will be played to accompany the programmed on-off events, called Track 2. [An additional function is reserved at this time.]

Indicators (9, from left to right and top to bottom) are used in many different combinations during normal operation and for testing. The most common conditions:

CHAN[NEL] 1 (green) is used two ways.

> It "mirrors" the action of the CHANNEL 1 relay. When that relay is on (the normally-open contacts are on), it is on; when the relay is off (the normally-closed contacts are on), it is off.
>
> It also indicates when sound Track 1 has been selected for recording or preview.

CHAN[NEL] 2 (green) is used two ways.

> It "mirrors" the action of the CHANNEL 2 relay. When that relay is on (the normally-open contacts are on), it is on; when the relay is off (the normally-closed contacts are on), it is off.
>
> It also indicates when sound Track 2 has been selected for recording or preview.

TRIGGER (yellow) is on whenever a trigger or sensor is active (closed). It is also on whenever the TEST button is pressed.

> *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 miniMantis2 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 flashing, this means that the miniMantis2 is in the optional (repeating) mode and that there is no program recorded in the memory.*

LADC (green) shows that a Lights Alive sensor or trigger device is connected to the modular (RJ25) jack using Lights Alive Direct Connect (LADC).

STATUS (green) is used several ways.

In normal operation (“idle”, while waiting for a sensor or trigger to start the program), it will be a “heartbeat”, flashing about once a second.

It will flash very fast, about 6 times a second:

For about 3 seconds when power is first applied if the miniMantis2 is in the “optional” (repeating) mode. Then it will begin normal operation (idle);

When the miniMantis2 is ready to record an event program;

If, while recording, there is either no memory or time left; or

When recording is ended;

When erasing, if that function is selected when power is turned on.

It will flash rapidly, about 4 times a second, while 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 miniMantis2 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).

NOTE: When the TEST pushbutton is pressed, if STATUS is off and TRIGGER is on at the same time, this means either that there is no program in the miniMantis2 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 STATUS is flashing and TRIGGER is on, this means that the miniMantis2 is in the optional (repeating) mode and that there is no program recorded in the memory.

NOTE: If STATUS and CONTROL always flash together, this means that memory protection has been selected.

CONTROL (yellow) is associated with recording:

When recording an event program, it is on while the events are recorded and off when recording is stopped.

When recording an audio program, it is on when ready to record. It is off and the AUDIO indicator is on when audio is being recorded.

NOTE: If CONTROL and STATUS always flash together, this means that memory protection has been selected.

RECORD OK (green) is mostly on when enough audio is present at the AUDIO IN jack to record well. ***[Technical note: This is presently set at 260mVpp.]***

RECORD HI (red) is mostly on when too much audio is present at the AUDIO IN jack. The recording quality may be poor and sound distorted. ***[Technical note: This is presently set at 900mVpp.]***

AUDIO (yellow) indicates which audio function is performed.

When the miniMantis2 is first turned on, if it flashes twice and then stays off, there are no audio tracks recorded.

It will flash rapidly, about 6 times a second, while audio is being played.

It is on continuously while audio is being recorded.

If both tracks are being erased, it will flash twice, pause, then flash seven more times.

If only Track 2 is being erased, it will flash three times.

When it changes tracks, it will flash twice.

When beginning to play or record, if it flashes seven times and stops, an audio failure has occurred and the miniMantis2 may need to be serviced.

Modes.

The miniMantis2 has two modes of operation:

1. Non-repeating, the default mode. When the device is triggered, it play 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 miniMantis2 is delivered to the customer in the 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 the default (non-repeating) mode.

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

The modes may be changed.

Changing modes is “toggled”. If the miniMantis2 is in the default mode, this will change to the optional mode; if it is in the 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 CONTROL and CHAN1 lights will be on.

3. Release the TEST pushbutton. The CONTROL and CHAN1 lights will go off.

If the STATUS light continues 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 miniMantis2 will always “remember” what mode has been set, even when power is turned off.

The miniMantis2 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.

If the miniMantis2 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.

Other Functions.

Sometimes it is useful to test the relay channels or the devices to which they are connected without running an entire program. Two different functions are provided to do this:

When the miniMantis2 is in an "idle" state, not playing back a program, the relay for each channel can be turned on and off by pressing and releasing the appropriate CHAN pushbutton.

If a relay needs to be turned on ("locked on") for a long period of time, press and hold down its CHAN pushbutton, then press and release CONTROL. The corresponding CHAN light will stay on and the STATUS light will flash very fast.

To release either relay from this condition, press both the CONTROL and CHAN1 pushbuttons at the same time, then release them. The STATUS light will show a heartbeat.

NOTE: These functions are not possible when memory is protected.

The miniMantis2 has two additional functions that are used only when power is turned on.

Erase. *WARNING! This is a global erase! It erases the entire program memory and the audio memory! There is <u>no</u> way to recover them!*

1. Disconnect the power.

2. While holding the CONTROL pushbutton down, connect the power. The program and audio memories will be erased in about 3 seconds. Release the CONTROL pushbutton.

The CHAN1 and CHAN2 lights will turn on. During the erase, the STATUS light flashes very fast and the AUDIO light will flash twice, pause, and flash seven more times.

3. When the erase is finished, the CHAN1 and CHAN2 lights turn off and the STATUS light resumes its normal heartbeat.

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

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

1. Disconnect the power.

2. While holding the CHAN1 pushbutton down, connect the power.

For as long as the CHAN1 pushbutton is held down, the CHAN2 and CONTROL lights will be on.

3. Release the CHAN1 pushbutton.

If memory protection has been turned on, the CONTROL light will flash together with the STATUS light for all functions.

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

NOTE: The repeat/non-repeat mode cannot be changed when memory is protected.

NOTE: Even if memory is protected, the miniMantis2 will still automatically detect a shorted ("strapped") trigger input.

The miniMantis2 will always "remember" if memory is protected, even when power is turned off.

Recording an Audio Program.

The miniMantis2 is delivered to the customer with the audio memory already erased. No sounds have been recorded.

Two audio "tracks" are provided in the audio memory:

Track 1 plays in a continuous loop to provide background or "ambience". No events will be replayed while Track 1 is running.

NOTE: The longer the audio recording for Track 1 is, the less noticeable the "looping" effect will be.

Track 2 plays only when the miniMantis2 has been activated by a sensor or trigger. When Track 2 is running, programmed events will be replayed.

NOTE: The total time available for recording Tracks 1 and 2 is 150 seconds.

Preparing to record an audio program requires:

a. Headphone-level audio source,
b. Stereo speaker pair or amplified stereo speaker pair, and
c. Appropriate cables and connectors.

The AUDIO IN and AUDIO OUT jacks on the miniMantis2 are intended to accept 1/8-inch (3.5mm) stereo plugs.

NOTE: Using mono plugs will not damage the miniMantis2 input or output, but the audio quality and level will be seriously compromised and possibly unsatisfactory.

1. Connect the speakers to the AUDIO OUT jack.

2. Connect the audio source to the AUDIO IN jack. The STATUS and CONTROL lights will flash very fast.

NOTE: If memory is protected, the STATUS and CONTROL lights will flash at the normal "heartbeat" rate. Sound cannot be previewed or recorded when memory is protected.

3. The sound for the track to be recorded should be previewed by monitoring it as it is played through the miniMantis2 while observing the level indicators RECORD OK and RECORD HI.

The VOLUME control can be adjusted for a comfortable listening level and, later, for an optimum playback level.

NOTE: The VOLUME control has no effect on the level of a signal being recorded from the AUDIO IN jack. The recording level must be adjusted at the audio source.

Adjust the level (volume) of the audio source until the RECORD OK light is on most of the time and the RECORD HI light flashes only on the loudest sound peaks.

NOTE: If the RECORD OK light isn't on enough of the time, the audio source isn't loud enough. The recording quality may be weak and noisy.

NOTE: If the RECORD HI light is on too much of the time, the audio source is too loud. The recording quality may be poor and sound distorted.

Recording audio Track 1:

4. Press and release the CONTROL pushbutton. The CONTROL light and both CHAN lights will turn on. STATUS will continue to flash rapidly.

5. Press and release the CHAN1 pushbutton. The CONTROL light remains on and STATUS flashes rapidly, but the CHAN2 light is off. The CHAN1 light is a reminder that Track 1 will be recorded. The AUDIO light will flash twice, pause, then flash seven more times.

NOTE: Before Track 1 is recorded, both Tracks 1 and 2 are erased. This is to make sure that there is enough room for Track 1. If a new Track 1 is recorded, a new Track 2 must also be recorded.

6. At the desired beginning sound cue, press and release CHAN1. The CHAN1 light remains on, but the CONTROL light is off. STATUS flashes less fast and the AUDIO light indicates that the audio is being recorded.

7. At the desired ending sound cue, press and release CHAN1 again. The CHAN1 light will flash three times to indicate that recording is ended and STATUS will flash rapidly. The CONTROL light and both CHAN lights will turn on.

At this point, Track 1 may be re-recorded (step 5), reviewed (step 8), or Track 2 may be recorded (step 13). If no more recording is to be performed at this time, exit the audio function completely (step 22).

8. To review the Track 1 recording, first press and release CONTROL to exit the audio recording state. The STATUS and CONTROL lights will flash very fast.

NOTE: Before reviewing the recorded track, be sure the audio source is turned off but not unplugged from AUDIO IN.

9. Press and release the TEST pushbutton. Both CHAN lights will turn on. STATUS will continue to flash rapidly.

10. Press and release CHAN1. The CHAN1 light will remain on but the CHAN2 light will be off. STATUS will flash more slowly and AUDIO will flash very fast while audio is being played.

NOTE: If the lights remain as they were in step 9, no Track 1 has been recorded.

11. To stop playing the track before it ends, press and release CHAN1 again. Both CHAN lights will be on and STATUS will flash very fast.

12. Press and release TEST to exit the audio playback state. The STATUS and CONTROL lights will flash very fast.

Recording audio Track 2:

13. Press and release the CONTROL pushbutton. The CONTROL light and both CHAN lights will turn on. STATUS will continue to flash rapidly.

14. Press and release the CHAN2 pushbutton. The CONTROL light remains on and STATUS flashes rapidly, but the CHAN1 light is off. The CHAN2 light is a reminder that Track 2 will be recorded. The AUDIO light will flash three times if there is already a recorded Track 2.

NOTE: If the lights remain as they were in step 13, no Track 1 has been recorded. Track 2 cannot be recorded if there is not already a Track 1.

15. At the desired beginning sound cue, press and release CHAN2. The CHAN2 light remains on, but the CONTROL light is off. STATUS flashes less fast and the AUDIO light indicates that the audio is being recorded.

16. At the desired ending sound cue, press and release CHAN2 again. The CHAN2 light will flash three times to indicate that recording is ended and STATUS will flash rapidly. The CONTROL light and both CHAN lights will turn on.

At this point, Track 2 may be re-recorded (step 14) or reviewed (step 17). If no more recording is to be performed at this time, exit the audio function completely (step 22).

17. To review the Track 2 recording, first press and release CONTROL to exit the audio recording state. The STATUS and CONTROL lights will flash very fast.

NOTE: Before reviewing the recorded track, be sure the audio source is turned off but <u>not</u> unplugged from AUDIO IN.

18. Press and release the TEST pushbutton. Both CHAN lights will turn on. STATUS will continue to flash rapidly.

19. Press and release CHAN2. The CHAN2 light will remain on but the CHAN1 light will be off. STATUS will flash more slowly and AUDIO will flash very fast while audio is being played.

NOTE: If the lights remain as they were in step 18, no Track 2 has been recorded.

20. To stop playing the track before it ends, press and release CHAN2 again. Both CHAN lights will be on and STATUS will flash very fast.

21. Press and release TEST to exit the audio playback state. The STATUS and CONTROL lights will flash very fast.

Exit:

22. Be sure that no lights are on except STATUS and CONTROL, and that they are both flashing very fast. If other lights are on press and release either CONTROL or TEST until only STATUS and CONTROL remain and are flashing very fast.

23. Unplug the audio source from the AUDIO IN jack of the miniMantis2. The STATUS and CONTROL lights will continue to flash very fast.

24. Press and release either TEST or CONTROL. The CONTROL light will turn off and the STATUS light will flash at the normal heartbeat rate.

<u>Recording an Event Program</u>.

The miniMantis2 is delivered to the customer with the program memory already 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 destroyed.

Recording an event program:

<u>IMPORTANT NOTE</u>! To synchronize an event program with the sounds recorded on audio Track 2, a stereo speaker pair or amplified stereo speaker pair <u>must</u> be connected to the AUDIO OUT jack.

1. Press and release the CTRL pushbutton. The STATUS light will flash very fast. This means the miniMantis2 is ready to record but recording has not actually started.

NOTE: If the memory is protected, the STATUS and CONTROL lights will not flash fast. They will continue to show a heartbeat.

To exit now without making a recording, press both the CONTROL and CHAN1 pushbuttons at the same time, then release them. The STATUS light will show a heartbeat.

2. Press and release the TEST pushbutton. Both CHAN lights will flash briefly and the CONTROL light will turn on. The sound recorded on audio Track 2 will play. The STATUS light will flash about 4 times a second while the program is being recorded. The AUDIO light will flash about 6 times a second as long as the audio track is playing.

NOTE: Recording actually begins when the TEST pushbutton is pressed. 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 least possible delay.

2a. Press and hold the CHAN[NEL] pushbutton before pressing and releasing the TEST pushbutton.

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

3. Press and release the CHAN1 and CHAN2 pushbuttons to turn the relays on and off. When a relay is on (the normally-open contacts are on), its CHAN light is on; when a relay is off (the normally-closed contacts are on), its CHAN light is off.

The CHAN pushbuttons may be pressed and released to create up to 512 on-off events during the recording time. The total recording time cannot exceed 150 seconds.

After 150 seconds of recording (3600 "frames"), there is no more time available for the program. When this happens, recording will stop and the CONTROL light will remain on. The CHAN2 light will be on and the STATUS light will flash very fast.

NOTE: The miniMantis2 will automatically turn off any relays that were on and record them as off at 149.96 seconds.

To exit from the “out of time” condition, press and release CONTROL. The STATUS light will resume a normal heartbeat.

After 512 on-off events, the memory is full; there is no more available for the program. When this happens, recording will stop and the CONTROL light will remain on. The CHAN1 light will be on and the STATUS light will flash very fast.

NOTE: The miniMantis2 will automatically turn off any relays that were on and record them as off in the last available memory location.

To exit from the “memory full” condition, press and release CONTROL. The STATUS light will resume a normal heartbeat.

4. To end the program recording, press and release the CONTROL pushbutton. The CONTROL light will turn off and 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.

NOTE: If event program recording is ended while the Track 2 sounds are still playing, the track will end at the point event recording was stopped when the program is played back. If the entire audio track is desired, recording should not be stopped until the audio ends.

5. Press and release the TEST pushbutton. The STATUS light will show a heartbeat. This means the miniMantis2 is ready to play back the program.

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

The miniMantis2 will always “remember” the event program, even when power is turned off.

Playing back the program.

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

The STAT[US] light will flash more slowly (but faster than the heartbeat) while the miniMantis2 is playing back a program.

To exit when the program has not finished playing, press both the CTRL and CHAN[NEL] pushbuttons at the same time, then release them. The STAT[US] light will show a heartbeat.

NOTE: 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 miniMantis2 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 flashing, this means that the miniMantis2 is in the optional (repeating) mode and that there is no program recorded in the memory.

Automatic repeat.

The miniMantis2 offers an "automatic" repeating mode. If the TRIG[GER] 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.

If the miniMantis2 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.

Special Circumstances

There may be occasions where it is desired to have the miniMantis2 function as a programmed event player without audio. There are three ways to do this:

1. Erase the program and audio memories completely. Then program only the events.

2. Program desired events ignoring the recorded audio, and do not connect speakers.

3. Disable the audio without erasing the audio memory. ***[Technical note: This feature has not yet been implemented.]***

In some situations it might be preferred that there be no Track 1 sound, only sound from Track 2 when the event program is played. This can be done by recording a few or several seconds of null audio (“dead air”) for Track 1 before recording Track 2. In similar fashion, if Track 1 sound is desired but no sound is desired when the event program is played, record Track 1 normally. Then record a few seconds of null audio (“dead air”) for Track 2.

The best way to get nearly perfect null audio is to use a stereo plug in which both channels have been shorted to ground.