MILLER INGENUITY

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Radio DTMF Activator

Model No. 14-99005V2-AC1

Installation, Operation & Service Manual

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Foreword

The Radio DTMF Activator is designed to provide reliable remote-control-by-radio in an easy to install and compact package. The AC-Powered version of the Radio DTMF Activator is powered directly from standard 117VAC and provides an output power of 24 VDC @ .8 Amp. It is built into a steel enclosure with a latching door. The circuit board is physically different to accommodate the AC – DC converters and to fit into the new enclosure. However, its functionality is the same as the 14-99005V2.

The AC-Powered Radio DTMF Activator is based on Version 2 of the radio DTMF Activator (14-99005V2), released in January 2006, which incorporates several operational modes into each unit. Previously, each Activator was programmed with a single operational mode, as specified by the customer. With "V2", multiple modes are programmed into each Activator. Inform the factory of the mode you wish to have activated. The user can also change the mode in the field.

Once the operational mode is set (normally done at the factory), setting up the unit for use is accomplished by setting rotary switches on the circuit board and LEDs enable quick and easy status verification.

Multiple operational modes programmed into each Activator enable it to be used for many applications. However, if your installation requires an operational mode different from what is normally provided, please contact the factory for availability.

Please feel free to send us your comments on your experience with the Radio DTMF Activator.

MANUAL SECTIONS

I. INTRODUCTION: DESCRIPTION & APPLICATIONS

The LMG 14-99005V2-AC1 Radio DTMF Activator provides radio-controlled relay contacts for control of gates, switches and other equipment. It is available in a steel box with a hinged door. Multiple operational modes are built into the unit and are user-selectable.

A. Description

The Radio DTMF Activator includes a radio receiver, circuit board and connecting cables enclosed in a steel case. Mounting flanges are provided for wall mounting. The radio receiver is programmable and synthesized. Any of the eight frequencies programmed into the radio may be selected with the rotary switch on the circuit board. The circuit board includes AC-DC power modules and a 1-6 digit DTMF decoder. The DTMF digits are programmed with rotary switches on the front of the unit. The Activator provides 24 VDC as an output to power external equipment.

The following operational modes are available:

0) Code toggles relay. I.E. enter code to turn relay on, enter code again to turn relay off. Timer setting irrelevant.
1) Code alone trips relay. Timer = 1 second per increment.
2) Code alone trips relay. Timer = 10 seconds per increment.
3) Code alone trips relay. Timer = 1 minute per increment.
4) Code then " * " to turn relay on, or Code then" # " to turn relay off. There is no timer setting.
5) Code then " * " to turn relay on, or Code then " # " to turn relay off. Timer = 1 sec per increment.
6) Code then " * " to turn relay on, or Code then " # " to turn relay off. Timer = 10 sec per increment.
7) Code then " * " to turn relay on, or Code then " # " to turn relay off. Timer = 1 minute per increment.
8) Code then " * " enables relay 1. Code then " # " enables relay 2. Timer = 1 sec per increment.
9) Code then " * " enables relay 1. Code then " # " enables relay 2. Timer = 10 sec per increment.
10) Code then " * " enables relay 1. Code then " # " enables relay 2. Timer = 1 minute per increment.
11) Code then " * " then "xxx" (enter time in seconds) I.E. to enable the relay for 19 seconds you would enter "123*019" assuming the code of the unit was "123".
12) Code then " * " then "xxx" (enter time in minutes) I.E. to enable the relay for 27 minutes you would enter "123*027" assuming the code of the unit was "123".

When the Activator is in a mode utilizing timed relay operation (modes 1,2,3,5,6,7,8,9,10), the "TIME SET" switch on the front panel determines the amount of time the relay will remain energized once the proper DTMF code has been detected (if the "relay off" command has not been sent in modes 5, 6, and 7). Switch positions 1-15 correspond to 1 – 15 time increments, respectively. If the DTMF code is detected again during this time, the timing cycle will re-initialize.

Note about relay contact terminology: The following terminology applies to the relay contacts of the Radio DTMF Activator –

Front Contact = Normally Open Contact (open unless the relay is energized)
Contact Heel = Contact Arm
Back Contact = Normally Closed Contact (closed unless the relay is energized)

B. Applications

The Radio DTMF Activator provides radio-controlled relay contacts for convenient control of gates, switches and other equipment. Note that it does not provide an “answer-back”, so it is recommended that it be used in situations where the user has visual or other feedback to determine that the desired actions have been initiated.

FIGURE 1
Front of AC-Powered Radio DTMF Activator

FIGURE 2
Inside of AC-Powered Radio DTMF Activator

II. SPECIFICATIONS

Specifications:

Input Power	117VAC nominal, provided with U.S.-style AC cord for 117VAC. AC-DC converters on circuit board are capable of using voltage in the range of 85 – 264VAC, 47 – 440 Hz (Mean Well PM-20-24)
Output Power	24 VDC, .9 Amp, available at terminal strip at bottom of unit
Radio	Programmable VHF, 8 synthesized channels
Temperature Range	Operational: -20C (-4F) to +60C (+140F)
Storage:	-40C (-40F) to +80C (+176F).
Size	Steel enclosure, overall dimensions are 11 ½" H x 8 ¾" W x 4 ½" D. Wall-mounting mounting brackets on a pattern 10 ¾" H x 6" W, 5/16" diameter.
Weight	12 pounds.
Surge Protection	1500 Watt, 36 Volt TVS between Power and Ground.
Relay Contacts	Relay contact rated 1 amp @ 30 VDC. One "Form C" contact available. ("Front contact", "Back Contact" and "Contact Heel").
Terminals	Thermoplastic terminal strip with barriers at bottom of enclosure.
DTMF Code	1-6 digit, selected with rotary switches on front panel. The DTMF detector resets after app. 2 seconds without decoding a digit.

Operational Modes

The Activator has 13 modes built-in and accessible to the user. These are:

0) Code toggles relay. I.E. enter code to turn relay on, enter code again to turn relay off. Timer setting irrelevant.
1) Code alone trips relay. Timer = 1 second per increment.
2) Code alone trips relay. Timer = 10 seconds per increment.
3) Code alone trips relay. Timer = 1 minute per increment.
4) Code then " * " to turn relay on, or Code then " # " to turn relay off. There is no timer setting.
5) Code then " * " to turn relay on, or Code then " # " to turn relay off. Timer = 1 sec per increment.
6) Code then " * " to turn relay on, or Code then " # " to turn relay off. Timer = 10 sec per increment.
7) Code then " * " to turn relay on, or Code then " # " to turn relay off. Timer = 1 minute per increment.
8) Code then " * " enables relay 1. Code then " # " enables relay 2. Timer = 1 sec per increment.
9) Code then " * " enables relay 1. Code then " # " enables relay 2. Timer = 10 sec per increment.
10) Code then " * " enables relay 1. Code then " # " enables relay 2. Timer = 1 minute per increment.
11) Code then " * " then "xxx" (enter time in seconds) I.E. to enable the relay for 19 seconds you would enter "123*019" assuming the code of the unit was "123".
12) Code then " * " then "xxx" (enter time in minutes) I.E. to enable the relay for 27 minutes you would enter "123*027" assuming the code of the unit was "123".

When the Activator is in a mode utilizing timed relay operation (modes 1,2,3,5,6,7,8,9,10), the "TIME SET" switch on the front panel determines the amount of time the relay will remain energized once the proper DTMF code has been detected (if the "relay off" command has not been sent in modes 5, 6, and 7). Switch positions 1-15 correspond to 1 – 15 time increments, respectively. If the DTMF code is detected again during this time, the timing cycle will re-initialize.

Radio Receiver — The Radio Receiver used is a Ritron DTX Plus transceiver. Only the receiver section of the radio is used in this device. Larry McGee Company reserves the right to substitute a receiver (transceiver) of similar specifications.

III. INSTALLATION, SET-UP & ADJUSTMENTS

Physical Installation

The AC Powered Radio DTMF Activator is enclosed in a steel case with mounting flanges. The case is 11 ½" tall x 8 ¾" wide x 4 ½" deep. The bolt pattern of the mounting holes is nominally 10 ¾" tall x 6" wide. The mounting holes in the flanges are 5/16" diameter. It is good practice to verify exact mounting hole location before drilling mounting holes.

FIGURE 3
Rear View of Activator (shown on its side)

Electrical Installation

NOTICE: THIS RADIO DTMF ACTIVATOR HAS NOT BEEN DESIGNED FOR USE IN APPLICATIONS REQUIRING 2,000 VAC ELECTRICAL ISOLATION BETWEEN THE POWER TERMINALS AND THE CASE. IT IS PROVIDED WITH A 3-PRONG POWER CORD AND THE CASE IS CONNECTED TO THE GROUND OF THE POWER CORD.

Power to operate the Activator is provided by the AC power cord. The Activator provides a 24 VDC output, available at the terminal strip at the bottom of the case. Output relay connections are also made at the terminal strip.

FIGURE 4
Bottom of Activator

Changing the Operational Mode

Before using your Activator, ensure it is in the appropriate Operational Mode (see Mode list in Specifications section (above)). To change the operational mode of the DTMF activator, follow these steps:

#1) Remove power to unit.
#2) Remove the front cover to gain access to the circuit board. Locate J5 and place the shorting jumper on position " B ". See Figure 3.
#3) Rotate ALL the rotary switches on the front of the unit to the " 0 " position.
#4) Apply power to unit, you should now see the Power LED flashing. If not check the above steps.
#5) Locate the MODE CHART in the manual. Once you have determined what mode you would like, rotate the "TIME SET" rotary switch to the mode position you desire. Then remove the shorting jumper on J5 from position B and place it on position A. The Power LED should now be on solid. The unit has saved this new mode setting in its non-volatile storage memory, and will return to that mode in the event of a loss & restore of power.

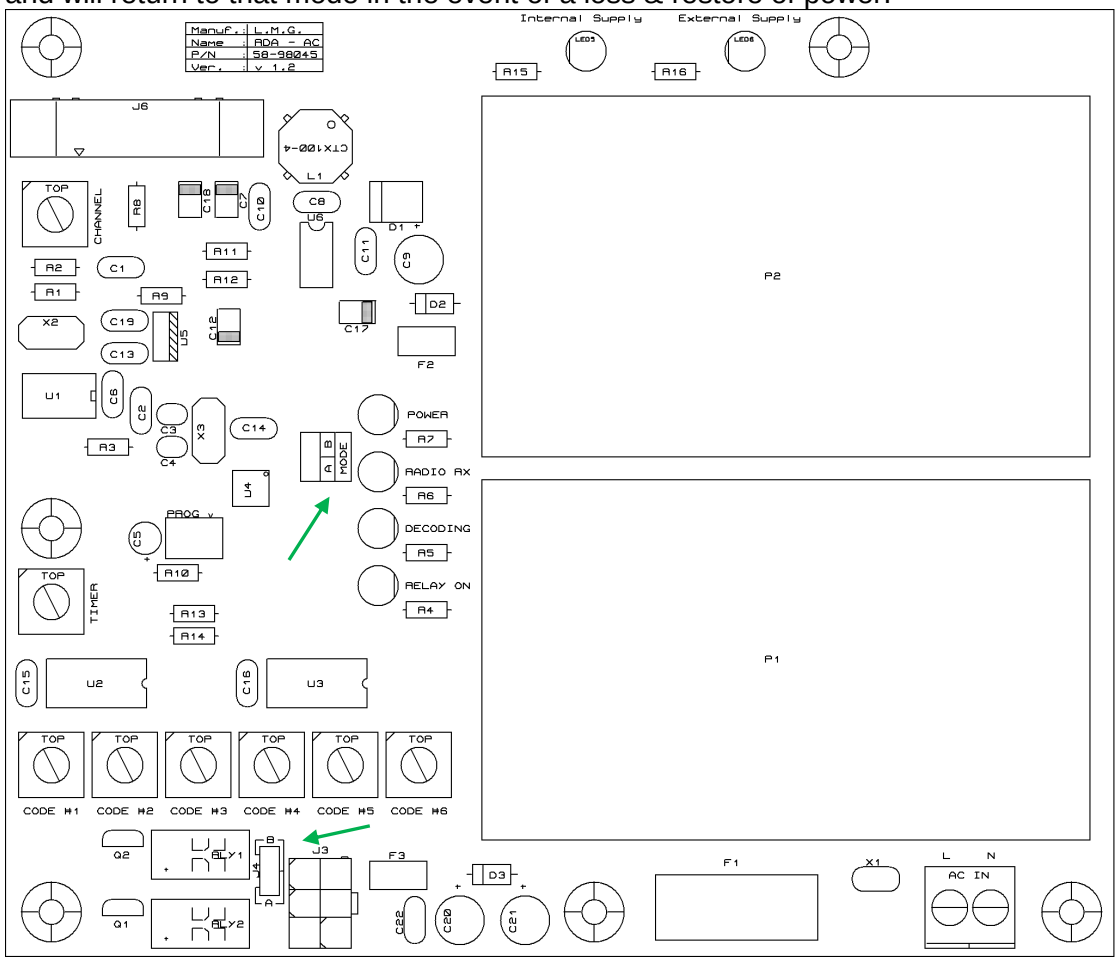

Figure 5 Jumper Locations

Changing the Relay Jumper (J4)

Jumper J4 is only used when the user wants to use the unit in dual relay modes.
If the unit is used in any of the single relay modes, the jumper should be in position " A ". When in any of the dual relay modes, it should be placed into position " B ". The following modes are used when in position " A ": 0,1,2,3,4,5,6,7,11,12. While in the other modes: 8,9,10, you should move the shorting jumper to position " B ".

Setting switches for DTMF code, Radio Channel Select and Timer -
Setting DTMF code:
To set the DTMF code, start at the leftmost of the “DTMF Digit Set” switches and adjust each switch to the corresponding position. The code may be up to six digits in length. If the code is to be shorter, set the switch after the last digit to “D”. For setting the code, switch positions 0-9 correspond the DTMF 0-9, switch positions A, B & C correspond to DTMF A, B & C, switch position D signifies “end-of-code” and switch positions E & F correspond to “*” & “#”.
Examples – To set the code to “1-5-3”, set the switches to “1-5-3-D”. The positions of the 5th & 6th switches are irrelevant in this example.

Selecting radio channel:
The list of channels programmed into the radio is normally affixed to the front of the unit, near the Radio Channel Select switch. Find the frequency you need in the list and turn the Select switch to the corresponding position.

Timer:
The 14-99005V2-AC1 Model has several modes that use a timer adjustable in 1-second, 10-second or 1-minute intervals. The time is selected using the “Time Set” rotary switch on the front panel. Switch positions 1 – 15 each correspond to one time increment. For modes with 1-second increments, positioning the “Time Set” switch to 5 will result in a relay active time of 5 seconds, for modes with a 10-second interval, 50 seconds and for modes with a 1-minute interval, 5 minutes. Putting the switch to the “0” position disables the unit. When in modes that do not use the timer, the position of the “Time Set” switch has no effect on the operation of the Activator, except that the “0” position disables the unit.

Antenna:
The Radio DTMF Activator is equipped with an SO-239 antenna connector on the bottom of the enclosure, which mates with a PL-259 connector

Radio Programming:
The radio has been programmed at the factory and the frequencies are listed on the label on the inside of the door of the Activator. If the radio is to be re-programmed, contact Miller Ingenuity.

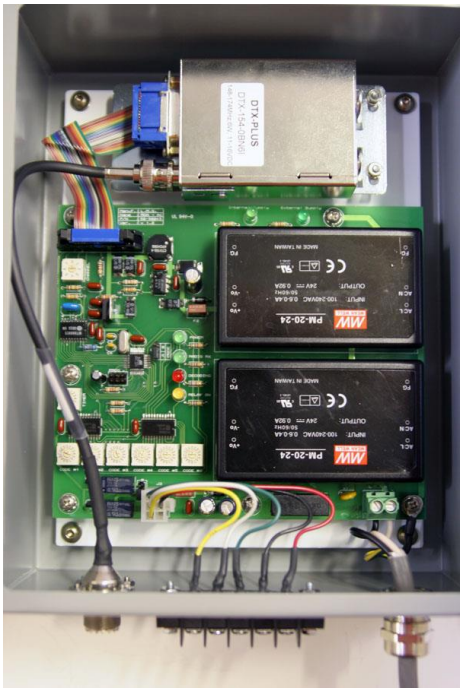

FIGURE 6
Circuit Board of Activator

IV. OPERATION

When the unit is installed, powered-up and sitting idle, the “POWER” LED will be illuminated. When a radio signal on the frequency selected is received by the radio receiver, the “RADIO RECEIVING” LED is also illuminated. Whenever the DTMF decoder detects a DTMF digit (regardless if it is part of the selected code), the “DECODING” LED will be illuminated. Whenever the relay is activated, the “TIMER” LED is illuminated (this applies to models with the timed relay as well as to models with the “*”, “#” relay control).

OPERATING UNITS USING “RELAY-ON”/”RELAY-OFF” (Modes 0, 4)

- In Mode 0, the relay status (on or off) changes every time the proper DTMF code is decoded.
- In Mode 4, the relay is turned ON when the proper DTMF code followed by a “*” is decoded and it is turned off when the proper DTMF code followed by a “#” is detected. This mode corresponds to the “B” operational style in the previous generation of Activators.

OPERATING UNITS USING TIMED ONLY MODES (Modes 1, 2, 3, 8, 9, 10, 11 and 12)

- In Modes 1, 2 and 3, the relay is turned on whenever the proper DTMF code is detected and stays on according to the setting of the Time Set Switch. Mode 2 (10-second increments) corresponds to the “A” operational style in the previous style of Activators.
- In Modes 8, 9 and 10, Relay 1 will energize when the proper DTMF code followed by a “*” is detected (NO contacts closed on energizing). Relay 2 will energize whenever the proper DTMF code followed by a “#” is detected (NC contacts opened on energizing). The relay will remain energized according to the setting of the Time Set Switch. Repeating the DTMF code while the relay is still energized will reset the timer. If the

DTMF code for the unenergized relay is received while the other relay is energized, the energized relay will become deenergized and the 2nd relay will energize. Mode 8 (with 1-second increments) corresponds to the "C" operational mode in the previous style of Activator.

- In Modes 11 and 12, the relay will energize when the proper DTMF code is detected, followed by a "*" and numbers xyz. In Mode 11, xyz indicates the number of seconds the relay will remain activated and in Mode 12, xyz indicates the number of minutes the relay will remain activated.

OPERATING UNITS USING COMBINATION ON/OFF & TIMED MODES (Modes 5, 6 and 7)
In Modes 5, 6 and 7, the relay is activated then the proper DTMF code, followed by a "*" is detected. The relay is deenergized when either of the following conditions is met:

- The timer times out.
- The proper DTMF code followed by a "#" is detected.

Resetting the Timer Before It Times Out
Transmit the DTMF digits with a 2-way radio on the selected frequency. The relay will become energized and will remain energized for the amount of time set by the "TIME SET" switch. To hold the relay energized for a longer amount of time, re-transmit the DTMF digits before the relay times out. Once the digits have been detected, the timer will reset to the full time. If the time is set for 80 seconds and the DTMF digits are resent and detected after 40 seconds, the timer will reset and the relay will remain energized for a total of 120 seconds. This procedure can be repeated as necessary.

V. SERVICE & ORDERING

Warranty
The Radio DTMF Activator comes with a one year parts & labor warranty. If repairs become necessary during this period, call the factory for a Returned Material Authorization (RMA) number. Send the unit to the factory (freight prepaid), with the RMA number on the outside. Include contact information and a description of the problem. Damage due to abuse and misuse are not covered

Post-warranty repairs
If repairs become necessary after the warranty period, phone support is available to assist you in performing repairs. You can also send the unit to the factory for repair. Call first for an RMA number, send the unit (freight prepaid) with the RMA number on the outside and contact information and a description of the problem on the inside. Consult the factory for charges.

Ordering Information:
14-99005V2-AC1 Radio DTMF Activator

Options:

Operational Mode: The Activator has 13 built-in modes and can have additional custom modes programmed to meet specific requirements. When ordering, please mention which operating mode will be used and the Activator will be supplied in that mode. The mode can easily be changed by the user.