

DT-55 Telephone Remote Control



Operating Manual

CONEX 
ELECTRO - SYSTEMS, INC

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Specifications:

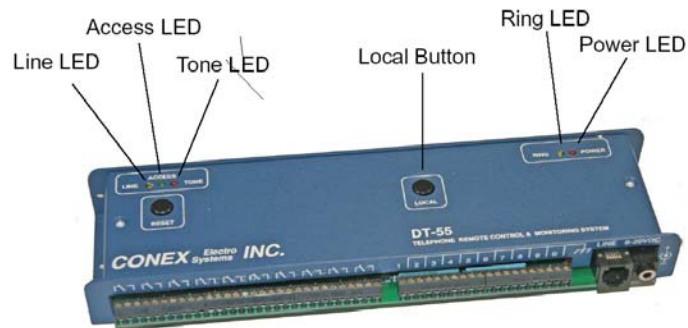
Size:	9 .43" x 2.9" x 1.13"
Mounting:	#6 mounting holes on wide and narrow flanges
Power requirements:	+8 to 20 VDC @ 80 mA nominal 110VAC wall adapter supplied
Relay Contacts:	Single Pole Double Throw
Relay Contact Ratings:	1A 30 VDC
Max Input Logic Voltage Range:	0 to +12 V max. (1.6 mA in @ 12V)
Max Input Voltage to Sense Logic Low:	+1V
Input Current (using external switch):	50 μ A
Ringer Equivalence:	0.2
Access Codes:	1023 four-digit codes
Access Code Tries Before Hang-Up:	3
FCC Registration Number:	3H1USA-20367-OT-N



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DT-55

Telephone Access Remote Control and Status Monitoring System



The Conex DT-55 answers a phone line, accepts a user access code, then allows remote control of ten SPDT relays and remote monitoring of ten external switch contacts or logic levels. The DT-55 is simple to understand, simple to install, secure, and effective.

- Compact 9.43" x 1.13" x 2.9"
- Magnetic latching relays. On power loss and restoration, the relays can retain their prior states or return to the de-activated state. Each relay can be set, cleared or activated momentarily (for the duration of the push-button actuation on the calling telephone).
- Relay interlock mode allows easy use as a remote-controlled audio selector.
- All IC's and relays plug in for easy maintenance.
- Miniature screw-clamp terminal strips for easy connection to your external circuits -- no crimp pins, spade lugs or special tools required.
- Switch-selectable four-digit access code (can be disabled if desired).
- Easily distinguishable tones indicate the high-low or open-closed status of the ten external inputs. Each input is individually polled by the user.
- Status lights indicate ringing signal, power, DTMF tone detection, line-connected status, and access granted.

BASIC OPERATION

The DT-55 allows the remote control of 10 SPDT relays from any Touch-Tone telephone standard telephone network. It also allows the user to check the status of 10 logic-level or switch contact inputs, through easily distinguishable audio tones.

The DT-55 is connected to a phone line with a standard 6 position modular cable. When the DT-55 is called, it will answer after the 3rd ring. If the access code feature is enabled, the caller will hear the access code prompt, a "beep-boop". When the correct access code is entered, the caller will hear the 3 tone "command prompt".

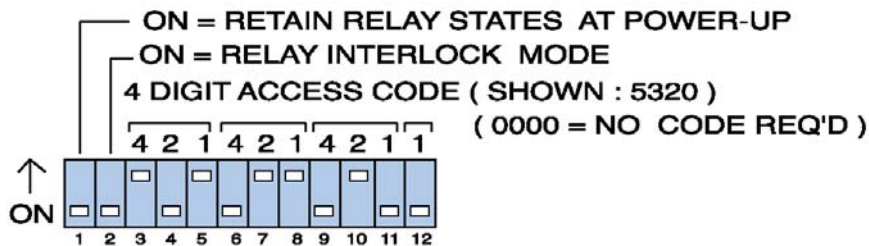
At this time the caller may turn any of the relays on or off using the Touch- Tone keys on the telephone, request the status of any relay, or request the status of any of the 10 logic inputs. The

status is indicated by either a single low-pitched tone for "off", or two short high-pitched tones for "on". An error by the caller is indicated by a low-pitched pulsing tone.

SETTING THE ACCESS CODE

The access code is a four-digit number that the user must enter before the DT-55 will allow any further functions to be used. This code is set into the DT-55 by a switch under the top cover. This cover is removed by removing two small screws. If the access code is set to 0000, the unit will allow all functions without the caller first entering an access code.'

The access code is determined as shown:



Only switches 3 - 12 (the 10 right hand positions) are used for the access code. Each switch has a digit value as shown in the diagram. In the example shown, the first digit, 5, is determined by the 1 and 4 switches being set to the "on" position and 2 to "off". the next digit, a 3, consists of the 4 being off and the 1 and 2 being on. The last digit has only one switch; therefore the **last digit of the access code must be a 1 or a zero.**

This scheme may be familiar to you as the octal number system. If the code is set to 0000 (all switches in the OFF position) no access code will be needed to use the DT-55. There are 1023 usable 4 digit codes, with the highest number being 7771. Not that none of the digits can be 8 or 9.

INSTALLING THE DT55

To install the DT-55, connect it to the phone line with a standard 6 position modular cable, as you would any extension phone. Connect the wall power adapter. The red POWER LED should light.

The DT-55 may be mounted to a wall or to a blank rack panel using the mounting holes provided. All external connections to the relays and logic inputs are made to the miniature terminal strips. Strip about 1/8" of insulation off the wire and insert it into the hole. Now tighten the screw. The relay symbols on the box are shown in the "OFF" position.

For safety, do NOT connect 110 VAC circuits to the relays.

Each logic or switch input is provided with two terminals, a "ground" pin and an input pin. These terminals may be connected to any pair of switch contacts such as external relays, thermostats, magnetic reed door switches, etc. The inputs may also be connected to external open-collector circuits or 5 - 12 V logic signals.

Note that all the inputs have the same common. This common is not connected to power-mains ground since the AC adapter module output is isolated. However, the input common is internally connected to the circuit ground and the metal enclosure of the DT-55.

If a DC power supply other than the supplied wall adapter is used, note that the input common and metal enclosure are connected to the negative side of the DC input jack. Any DC power source supplying a +8 to 20 VDC at 80 mA may be used.

SETTING THE OTHER SWITCHES

The left two switches (switch positions 1 & 2 on the diagram above) enable two DT-55 options:

If switch #1 is on, then after a power interruption, the relays will retain their previous states when power is restored. (The relays are magnetic latching) If switch #1 is off, then all relays will be cleared to their "off" state when power is restored.

Switch #2 puts the DT-55 into the "Interlock Mode". In this mode, only one relay may be on at a time. If any relay is turned on with a momentary touchtone from the caller, all other relays will be turned off. This mode would allow the DT-55 to be used as a simple remote-control audio routing switcher, for instance. In this application, all the relay commons could be tied together and connected to the audio destination, and all the relay normally open contacts would be connected to various audio sources.

If switch #2 is off, the DT-55 is in its normal mode, allowing individual control of all 10 relays.

CALLING THE DT-55

When a call is received by the DT-55, the yellow RING LED will light each time the ringing signal is detected. The call will be answered after the third ring. At this time the LINE LED will light, and the caller will hear a "beeboop", indicating that the DT-55 has answered the line. If an access code is required, the code should be entered at this point. If a correct access code is not entered after three tries, or if more than 48 seconds elapses before a correct code is entered, the DT-55 will hang up.

When access has been granted by the DT-55, the green ACCESS LED will light and the caller will hear a rising sequence of three tones ("DoodleBeep"). This is the command prompt, which signifies that a command may be entered. If the access code feature has been disabled, as described above, the green ACCESS LED will light and the command prompt will be heard as soon as the call is answered.

If no commands are detected for 10 minutes, the DT-55 will hang up. This prevents some unforeseen condition, such as a wrong number, from indefinitely causing an off-hook condition. The DT-55 can be caused to unconditionally hang up with the command * # *.

All the three - tone command prompts may be disabled or re-enabled by pushing the * button four times. This feature allows slightly faster actuation of the relays. The prompts are automatically enabled each time the DT-55 is called. A new command should not be entered before the response tones are over.

CONTROLLING THE RELAYS

After the command prompt, pushing a number key on the phone (0 - 9) will turn the corresponding relay on for as long as the key is held down. If the unit is in the "interlock mode", a momentary key press will latch the selected relay on and turn all others off.

To latch a relay on, simply push the # key followed by the relay number. To turn a relay off, push the # key twice followed by the relay number.

Pressing the # key 3 times will turn all relays off.

If you wish to terminate a relay command before it is completed, press the * key.

POLLING THE RELAY STATUS

To find out, or "poll", the current state of any relay, push the * key three times followed by the relay number. The DT-55 will respond with a single low-pitched tone (booop) if the relay is off, or two short high-pitched tones (beepbeep) if the relay is on. Note that if the power has failed since the DT-55 was last called, the state of the relays may be the same as previously set (see "SETTING THE OTHER SWITCHES", above), but the state of the relays cannot be determined by polling. In this case, instead of the normal tones, the DT-55 will give an error tone, a low-pitched pulsating tone. Once another relay command is received, that relay's state will once again be known and may be polled.

POLLING THE STATUS OF THE INPUTS

To determine the state of the 10 input circuits, press the * key followed by the channel number. Assuming that external switches are connected to the input terminals, the status tone will be a "booop" if the switch is ON, or the beepbeep if the switch is OFF. Note that "ON" would correspond to a low logic level, since one side of the switch circuit is ground.

To find out if the status of any input has changed since the DT-55 was called last, press the * key twice followed by the channel number. If the channel has changed at least once, the tone (beepbeep) will be heard. If not, the tone (booop) will be heard.

POWER-FAIL STATUS

When the DT-55 answers a call, and before access is granted, a rapid series of alternating high and low pitched tones will be heard if the power has failed since the last call was made. This is an indication that the unit is not able to be polled for the relay status, and also that it is not known whether any of the logic inputs have changed state since last polled.

LOCAL OPERATION

With the DT-55 connected to the phone line, you might wish to test the unit without calling it from another phone line. If there is a phone connected to the same line as the DT-55, call any number, preferably one that will be answered by someone who can put your call on hold while you test the unit. Or, if you call your own number, you will receive a busy signal. Then hold the LOCAL button down, on the DT-55, until the line is answered, as indicated by the LINE light. You can then proceed to use the phone to test the functions of the DT-55, even though you will still hear the busy signal in the background.

RESET BUTTON

If a power transient or some other unusual condition causes the DT-55 to lock up or otherwise behave incorrectly, pushing the RESET button will completely clear the unit to its initial power-up state.