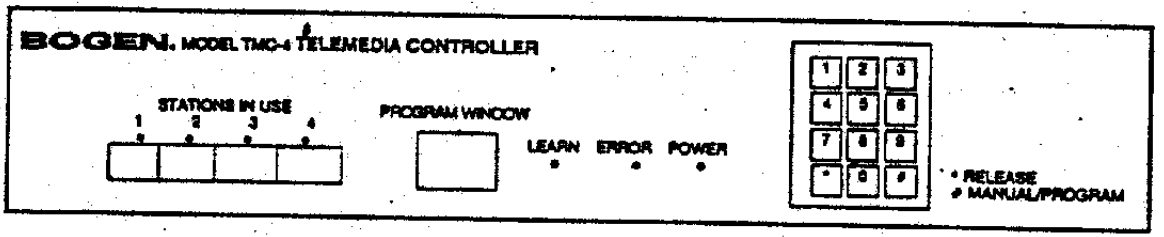
TELEMEDIA CONTROLLER

Model TMC-4

Installation and Operation Instructions



Introduction

The Bogen TMC-4 is a programmable universal media-source controller capable of learning and reproducing the infrared commands for consumer audio-visual products. It is designed for operation with various telephone switches (requires use of Bogen Model TAM-B access modules), or from Multicom 2000® System telephones. When used with Multicom 2000 systems, the TMC-4 provides additional features such as: reserving media source, quick reconnect code, menu driven access, and current user identification.

Each TMC-4 panel has four media 'stations' and can simultaneously control up to four different media-source devices from standard touch tone telephones.

The TMC-4 decodes the DTMF tones from the telephone keypad. The controller then transmits an infrared control signal to the media-source via a small transmitter which is mounted over the media-source's infrared receiver. Any function that is available through the media-source's remote control can be learned and assigned to a key sequence on a telephone keypad (up to 20 commands). In addition, the unit permits manual control directly from the keypad on the TMC-4.

Installation

The TMC-4 is designed for rack mounting and requires 3-1/2" of rack panel space. The equipment to be controlled should be mounted in the same rack directly above or below the TMC-4. Power requirements are 120VAC, 60Hz, 0.1A.

When installed in a Multicom 2000 system, each station on the TMC-4 is connected directly to the annunciator (A) and ground (G) terminals of a station on the relay module. See Figure 1A below.

When used with other telephone systems, one Bogen Model TAM-B Telephone Access Module is required for each media station. (Diodes CR27 and CR28 must be removed from the TAM-B for proper DTMF communications.) Refer to Figure 1B below. Follow the instructions included with the TAM-B for proper connection to the telephone system. Connect output terminals PT and PR on the TAM-B to the A and G terminals of a station on the TMC-4. Connect the contact closure N.O. and COM terminals on the TAM-B to the respective station's EXTERNAL INPUT and G terminals on the TMC-4.

To connect the TMC-4 to a media source, plug the IR transmitter into the INFRARED SIGNAL OUTPUT. The IR transmitter is then mounted over the infrared detector on the media source device. Make sure the detector window is clean and free of any oils before removing the self adhesive backing and mounting the transmitter.

Note

The location of the media-source's infrared detector varies between manufacturers. You can use the remote control at close range to locate the detector.

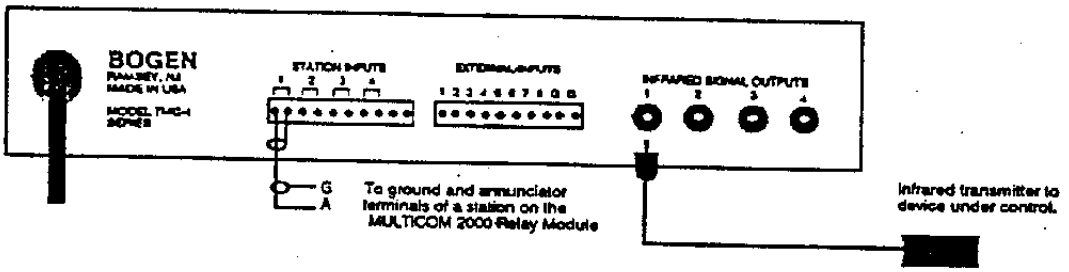


Figure 1A — Connection of TMC-4 to MULTICOM 2000 System (1 Station Shown)

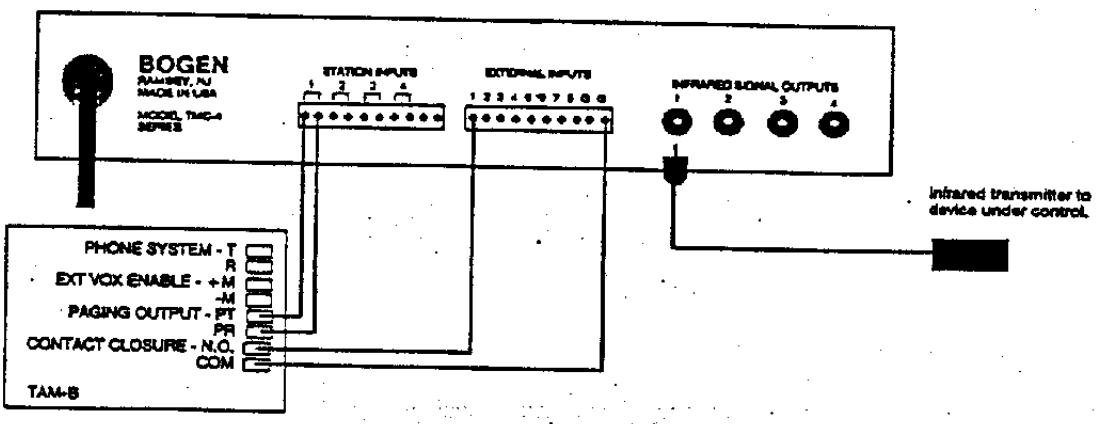


Figure 1B — Connection of TMC-4 to Telephone System using TAM-B (1 Station Shown)

Power Up

The TMC-4 is shipped fully tested and with all functions cleared. When power is first applied, LEDs illuminate and/or flash and the unit runs a self test of nonvolatile memory. If the unit encounters an error during the self test, the error LED will flash for one second. Following the self test, the unit enters its ready mode.

Programming

The TMC-4 operates as four independent controllers in one package. Each station can learn up to 20 commands from the media-source's remote control unit. These commands can then be activated from the telephone keypad or the TMC-4 front panel keypad. Any infrared command can be assigned to any telephone key combination, however, it is recommended that you follow the sequence provided in Table 1. This will ensure compatibility with telephone overlays and future product enhancements.

Note

The front panel keypad is used during programming and manual operation. In these instructions, numbers or symbols appearing in brackets ([0] through [9] and [#] and [*]) refer to the individual keys on the telephone or TMC-4 keypad which must be pressed.

During operation from a telephone keypad, the first 10 commands are activated with a single keypress – [0] through [9] – see Table 1. The second ten commands are activated by pressing [#] followed by [0] through [9].

When programming the TMC-4, or when using the front panel keypad for manual operation, the command numbers are entered as [0] [0] through [1] [9]; these correspond to the telephone keypad numbers as shown in Table 1.

Determine Programming Distance

Before programming, determine the optimum distance that the media-source's remote control unit must be from the TMC-4 controller.

1. Press and hold down the MANUAL/PROGRAM key ([#]) for at least 5 seconds. All STATIONS IN USE LEDs will begin flashing. After 5 seconds, all LEDs will light solid (station select mode).
2. Enter a station number: [1] [2] [3] or [4]. All other station LEDs will go out.
   A. Aim the media-source's remote control at the TMC-4 PROGRAM WINDOW (the remote control should point directly at the center of the PROGRAM WINDOW).
   B. Press and hold any of the remote's function buttons. The LEARN LED will flicker.
   C. Slowly pull the remote control straight back from the PROGRAM WINDOW while holding the button down. Note the distance at which the LEARN LED stops flickering. Use 1/3 of this distance when programming commands.

Note

The range of the remote has to be determined only once for each brand or remote control used, but is critical for proper command learning. Remote control units vary widely in signal output – too close to the TMC-4 may overload the receiver, too far will not provide proper signal.

3. To return to the station select mode, press [#]. To return to the ready mode, press [#] [#].

Program Commands

1. Press and hold down the MANUAL/PROGRAM key ([#]) for at least 5 seconds. All STATIONS IN USE LEDs will begin flashing. After 5 seconds, all LEDs will light solid (station select mode).
2. Enter a station number: [1] [2] [3] or [4]. All other station LEDs will go out.
3. To teach the TMC-4 a command, enter a command number on the TMC-4 keypad ([0] [0] to [1] [9], see Table 1). At this point the LEARN LED will begin flashing.
4. Aim the remote control at the PROGRAM WINDOW. Press and hold down the button on the remote for the function to be assigned to that command number. Once the function is successfully learned, the LEARN

Table 1

Controller Keypad	Telephone Keypad	Function Command
[0] [0]	[0]	Power
[0] [1]	[1]	Play
[0] [2]	[2]	Pause
[0] [3]	[3]	Stop
[0] [4]	[4]	Rewind
[0] [5]	[5]	Fast Forward
[0] [6]	[6]	Channel Up
[0] [7]	[7]	TV/VCR
[0] [8]	[8]	Display
[0] [9]	[9]	Channel Down
[1] [0]	[#] [0]	Power Off
[1] [1]	[#] [1]	User Definable
[1] [2]	[#] [2]	User Definable
[1] [3]	[#] [3]	User Definable
[1] [4]	[#] [4]	Step Forward
[1] [5]	[#] [5]	Step Back
[1] [6]	[#] [6]	User Definable
[1] [7]	[#] [7]	User Definable
[1] [8]	[#] [8]	User Definable
[1] [9]	[#] [9]	User Definable

LED will go out and the code will be stored in memory. If there was a learn error, the ERROR LED will flash briefly and the LEARN LED will again light. At this point you can repeat this step.

5. You can now:

   A. Repeat steps 3 & 4 and enter a new number to program another command.

   B. Overwrite the command by repeating Steps 3 & 4, entering the same number.

   C. Return to the station select mode by pressing [#]. Return to the ready mode by pressing [#] [#].

Cancelling Commands

Commands can be overwritten with new commands by using the procedure above. To cancel a command without overwriting, use the procedure below. (During operation, a "no command" error tone will be sent to the telephone handset if no command has been programmed for a specific sequence.)

1. Press and hold down the MANUAL/PROGRAM key ([#]) for at least 5 seconds. All STATIONS IN USE LEDs will begin flashing. After 5 seconds, all LEDs will light solid (station select mode).
2. Select the desired station number: [1] [2] [3] or [4]. All other station LEDs will then go out.
3. Press [*]. The station LED will begin flashing.
4. Enter the number of the command to be cancelled by pressing [0] [0] to [1] [9] on the TMC-4 key pad. The command is instantly cancelled.
5. At this point, you can:

   A. Press [*] and a different command number to cancel another command.

   B. Enter a command number without previously pressing [*]. This will illuminate the LEARN LED and permit you to program a new function for the command number (same as overwriting in above procedure).

   C. Return to the station select mode by pressing [#]. Return to the ready mode by pressing [#] [#].

Operation

Manual Operation

The TMC-4 can be operated directly from its front panel This feature is useful for verifying commands or controlling equipment that is easier to access remotely. To send remote commands from the TMC-4 key pad:

1. Briefly Press [#]. All STATIONS IN USE LEDs will flash.
2. Enter the desired station number: [1] [2] [3] or [4]. All other station LEDs will go out.
3. Select a command ([0] [0] to [1] [9], see Table 1). If a command has been stored, the controller will issue that command. If no command has been stored for the selected number, the ERROR LED will flash for one second.
4. At this point you can:

   A. Repeat Step 3.

   B. Press [#] to return to Step 2.

   C. Press [#] [#] to return to the ready mode.

Remote Interface (MULTICOM 2000)

Remote access can be through a MULTICOM 2000 system telephone. A valid station connect code is sent by the MULTICOM system when a user calls a media station extension number. (A media station is one programmed as a Level 12 station during MULTICOM 2000 system programming.) If the station has not been reserved the calling party will be connected. If the media station has been already reserved for them, the reconnect code [9] [9] may be used to achieve media control.

After a Multicom connect code is received:

1. The unit connects the respective station and the station's in-use LED illuminates. A ready beep is sent every 2 seconds to the calling station. The station is reserved until released by the Multicom 2000, the user, or the TMC-4.
2. The TMC-4 waits for DTMF tones. If a key pad numbers [0] through [9] or [#] [0] through [#] [9] are pressed, the controller will try to send the corresponding command. If successful, a valid tone will be heard, if unsuccessful, a error tone will be heard.
3. If the key sequence [*] [0] is received, or if the Multicom 2000 sends a disconnect code, the TMC4 will disconnect the station and shut off the station's in use light.

Remote Interface (TAM-B)

The TMC-4 can be accessed remotely by an external contact closure between a station external input and ground. The TAM-B provides this closure after being accessed as an extension of the telephone system. When the external inputs are activated:

1. The unit connects the respective station, the station's in-use LED illuminates. A ready beep is sent every 2 seconds to the calling station. The station is reserved until released by the TAM-B, the user, or the TMC-4.
2. The TMC-4 waits for DTMF tones or a disconnect code. If key pad numbers [0] through [9] or [#] [0] through [#] [9] are pressed, the controller will try to send the corresponding command. If successful, a valid tone will be heard, if unsuccessful, a error tone will be heard.

3. After a preset time, if the user does not hang up or send the disconnect code ([*] [0]), the TAM-B will automatically hang up.

Releasing a station directly from the TMC-4

If at any time it becomes necessary to free the device currently being controlled, it can be released directly from the TMC-4.

To release a station:

1. Press [*]. The in-use LEDs of all stations currently in use will flash.
2. Enter the number of the station to be released. That station will be released and the stations light will go out.

Service

There are no user-serviceable parts within the unit. The warranty may become void if repairs are by other than Bogen Factory Service Department. For information on warranty repair, contact the Factory.

Technical service is available from the Bogen Applications Engineering Department.

Bogen Communications, Inc.
50 Spring Street, Ramsey, NJ 07446
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Specifications

Interface

LEDs
- 4 Yellow STATIONS IN USE
- 1 Red ERROR
- 1 Green LEARN
- 1 Green POWER

Telephone style keypad
STATION INPUTS terminal block
EXTERNAL INPUTS terminal block
INFRARED SIGNAL OUTPUTS RCA jack

Digital Section

CPU - Intel 80C32 12 MHz

Memory - 1 each 27C256 EPROM
2 each 28C64 EEPROMs

Infrared Section

Detectable IR transmission schemes:
1. Envelope Modulation
2. Pulse Modulation

Carrier Modulation Range: 25-92 kHz
Pulse Modulation Width: 15x10-6 sec.

Power Requirements

120 VAC, 60 Hz, 0.1A