

AUTOCOM-100

Personal Response System



Visonic

Installation Instructions

1. SYSTEM OVERVIEW

1.1 Introduction

The AUTOCOM-100 is an advanced, programmable emergency system designed primarily to assist elderly and sick people in calling for help in distress situations. The receiver of such a call - the Remote Supervisor - may be someone with a private telephone such as a family relative or a neighbor, or a compatible professional Response Center. The system can be programmed to call up to 9 private telephone numbers and up to 2 Response Center numbers. Suitable for residential, commercial and industrial applications, the AUTOCOM-100 operates interactively with the remote supervisor via regular telephone lines, and performs the following functions:

- **Calls for help** - When triggered by means of its HELP pushbutton, by a wireless pendant transmitter, or by an automatic triggering device such as a detector, the AUTOCOM-100 sends an alarm message to the remote supervisor. An alarm message sent out to a private telephone may take the form of a coded tone sequence or a two-tone siren or a pre-recorded plain speech announcement. An alarm message sent out to a Response Center is composed of DTMF (Dual-Tone Multi-Frequency) code sequences.
- **Sends out inactivity alerts** - If the occupant of the site under surveillance fails to demonstrate normal activity within a predetermined time frame, the AUTOCOM-100 automatically sends out an "INACTIVITY ALERT".
- **Initiates periodic test reports** - The AUTOCOM-100 can be programmed to initiate periodic test reports, to ensure proper function of the equipment and the telephone line.
- **Permits "LISTEN-IN"** - Following an alarm message or an inactivity alert, the remote supervisor can switch a built-in Speakerphone to the LISTEN-IN mode by sending a DTMF code on the line from an ordinary telephone set. This enables him to pick up sounds from the site under surveillance - even while the local telephone set is "on hook".
- **Provides "SPEAK OUT"** - Using another DTMF code, the remote supervisor can switch the built-in Speakerphone to the SPEAK OUT mode. This allows him to speak and be heard in the site under surveillance through the local loudspeaker.
- **Controls auxiliary circuits** - The remote supervisor can send DTMF codes over the telephone line to enable/disable the AUTOCOM-100's two open-collector output circuits. These circuits may be wired to operate electrical door-strikes, to switch on strobe lights or to trigger a siren, as required in each particular installation. The person under surveillance can also control these circuits locally, as explained in Section 2.

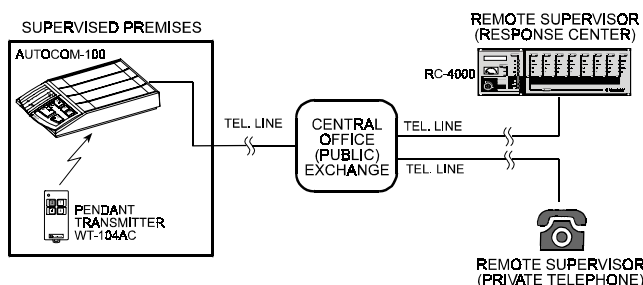


Figure 1. AUTOCOM-100, Typical Application

1.2 Applications

The AUTOCOM-100 system may be used for personal and/or environmental monitoring. Typical applications include:

- **Health care** - AUTOCOM-100 monitors the activity of elderly, disabled or sick persons, and alerts family relatives or a medical service in case of alarm or whenever the person under

surveillance remains inactive for a certain period. Hands-free voice communication, initiated by the remote supervisor, can be used to talk with the person under surveillance and verify the cause for emergency. Decisions can then be made for further action.

- **Industrial control** - Supervision of industrial enterprises such as refrigeration plants and unmanned warehouses; surveillance of industrial processes that are carried out overnight with little or no personnel on the premises.

1.3 System Construction

The housing of the AUTOCOM-100 accommodates all the modular optional building blocks which make up the system. Its top part is designed as a recessed platform suitable for carrying the local telephone set which shares the telephone line with the AUTOCOM-100. The sloping front panel has a styled control keypad on the right, with control pushbuttons and indicators. These pushbuttons are used by the person under surveillance to operate the system. The left side includes the built-in Speakerphone unit which permits two-way exchange of speech. Additional remote Speakerphone units (optional) can be mounted in various rooms within the area under surveillance.

Since programming and reprogramming are carried out infrequently, the programmer's keypad is located on the bottom plate of the system housing, out of reach in normal use. When programming the system, the housing has to be turned over to permit access to this keypad. All cable connectors are grouped at the rear of the housing.

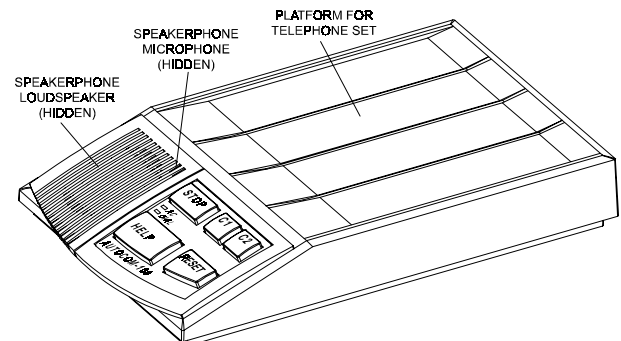


Figure 2. AUTOCOM-100, General View

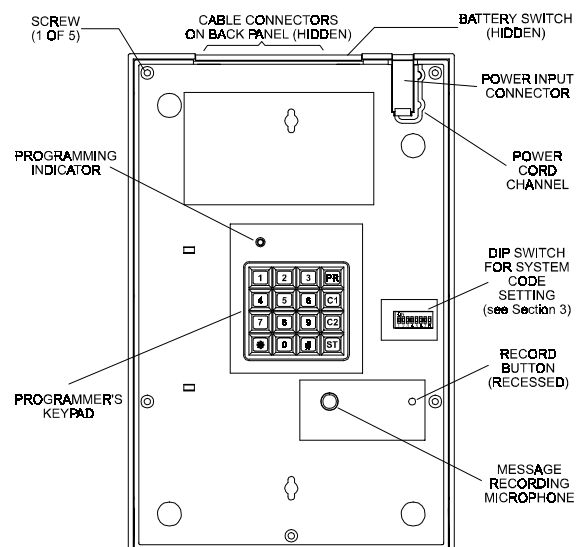


Figure 3. Bottom View of the AUTOCOM-100

The System includes the following internal modules:

- **Digital Communicator SA-100 (see Section 2).** This programmable microprocessor-controlled module supervises and coordinates the function of the entire system.
- **4-Channel Wireless Receiver SA-200 (see Section 3).** This is a wireless receiver module which allows the person under surveillance to use a pendant transmitter (WT-104AC) for controlling the various system functions from wherever he may be (within reception range). In addition, wireless motion detectors located on the premises can be used to detect movement and to trigger the AUTOCOM-100's RESET input via the built-in SA-200 wireless receiver.
- **Speech Processor SA-300 (see Section 4).** This module permits the installer to pre-record a 20-second verbal message for automatic transmission to the remote supervisor when the SA-100 communicator is triggered into action. The module uses a built-in microphone and record button, accessible from the bottom of the AUTOCOM-100 housing.
- **Speakerphone SA-420 (see Section 5).** This highly sensitive module is used to establish a two-way, hands-free voice communication link between the person under surveillance and the remote supervisor.

Operating power for the AUTOCOM-100 system is 16-18 VAC, obtained from the mains supply through an external step-down

transformer. A 18-20 VDC power pack can also be used. A 12-Volt rechargeable, sealed nickel-cadmium battery pack is included in the AUTOCOM-100 housing, to serve as the backup power source during power failures. The battery is recharged through the internal circuitry. To prevent the battery from being completely discharged before actual installation, the system is switched off in the factory prior to shipment. A battery ON/OFF slide switch at the rear (see Figure 4) must be set to ON by the installer once the installation is completed.

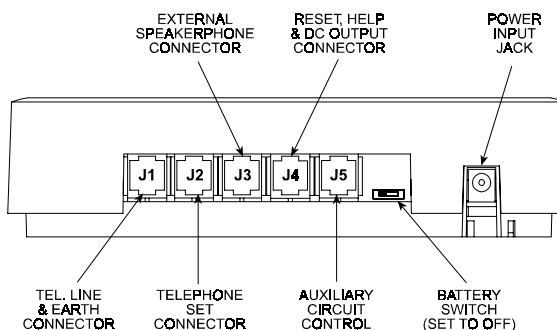


Figure 4. Back Panel of the AUTOCOM-100

2. DIGITAL COMMUNICATOR SA-100

2.1 Description

The SA-100 is a programmable automatic digital communicator, which, by virtue of its microprocessor, coordinates the operation of all system modules. Its first important task is to send alarms and status reports over telephone lines to a Response Center or to pre-programmed private telephones. The programmer's keypad, through which all programming is easily implemented, is mounted on the bottom plate of the AUTOCOM-100 system housing. Programmed data is retained in an EEPROM, unaffected by power failures. The second important task of the SA-100 is to be responsive to specific DTMF handshaking and control codes received from the remote supervisor over the telephone line.

Certain DTMF codes sent by the remote supervisor to the SA-100 are used to control the Speakerphone module SA-420, which can either monitor the AUTOCOM-100 installation site for sound and speech, or broadcast the remote supervisor's voice through the system loudspeaker(s).

The SA-100 has two auxiliary open collector outputs, enabled locally from the AUTOCOM-100 front panel (pushbuttons **C1** and **C2**), or by DTMF codes sent by the remote supervisor, or by pressing the buttons on the short range hand-held transmitter WT-104AC. In a typical application, one of these outputs would be used to gain emergency access through an electrically locked door, and the second would control a strobe light or a siren.

A communication session during which the SA-100 communicates with the remote supervisor may be initiated by external triggering, or takes place automatically at regular programmable intervals (periodic test reporting – see 2.2 below). In the course of such a communication session, the person in the area under surveillance can follow the automatic dialing and reporting processes through various verification and alerting tones heard through the front-panel loudspeaker.

When the well being of the person under surveillance is of prime importance, a lack of activity might indicate trouble. To monitor activity, a special **RESET** function can be enabled by the installer. When enabled, the RESET input must be triggered by the person under surveillance at least once between regular reporting sessions. Failure to trigger the RESET input will cause the system to send out an "inactivity alert" in the next communication session. Resetting may be accomplished either by pressing the RESET button on the AUTOCOM-100 front panel, or by pressing the RESET button on the 4-button wireless pendant transmitter WT-104AC carried by the person under surveillance. The RESET input may also be triggered automatically by:

- hard-wired or wireless motion detectors installed on the premises for detecting occasional movement of the person under surveillance.

- hard-wired or wireless magnetic door switches installed where the person under surveillance moves while carrying out his daily activities (the kitchen door, the bathroom or the toilet).

2.2 SA-100 Control Capabilities

- The AUTOCOM-100 communicator is activated by:
 - pressing the HELP pushbutton, on the front panel or on a pendant transmitter such as the WT-201 or WT-104AC.
 - pressing any one of the auxiliary HELP pushbuttons installed anywhere on the premises.
 - automatic triggering at regular intervals, as programmed.
- Dials up to 2 response center numbers and up to 9 private subscriber numbers, as programmed by the installer (see Para. 2.3 for further clarification).
- Supports DTMF as well as pulse dialing.
- Accepts programming from the 16-key keypad located at the bottom of the housing.
- May be programmed to transmit the following message formats to Response Centers:
 - a report composed of a 4-digit ID number and a two-digit event code.
 - a 27-character pre-programmed text message
 - a regular periodic test message, or a test message with an "INACTIVITY ALERT" code or melody, depending on programming and circumstances.
- May be programmed to transmit the following audible **alarm** signals to private telephones:
 - a continuous two-tone siren
 - an ID code pulse train (1 to 16 pulses)
 - a 20-second verbal message (pre-recorded on the system's speech processor). Since transmission duration is 60 seconds, a 20-second message would be repeated 3 times.
- Reacts to **DTMF** control codes received from the remote supervisor (in the Response Center or at a private telephone). The following DTMF codes are used:
 - **88** (listen-in code): Switches the Speakerphone to the LISTEN IN mode for 60 seconds. The installation site is thereby "bugged for sound".
 - **99** (Speak-out code): Switches the Speakerphone to the SPEAK OUT mode for 60 seconds. Anything said into the remote telephone's mouthpiece is heard via the system's or remote loudspeakers.
 - **31/32** (output enable codes): Permit the remote responder to enable the auxiliary outputs C1 and C2 respectively (may

be used to allow access through a door protected by an electrical door strike or to activate a local alarm).

- **61/62** (output disable codes): Permit the remote responder to disable the auxiliary outputs C1 and C2 respectively, provided that this function is allowed by the programmed operating mode (see PROGRAMMING CHART in Para. 7-6, Location 23).
- **77** (kissoff code): message transmission to the currently contacted telephone number is aborted, the system goes "on hook" and the subscriber's number is written off the dialing list for the rest of the ongoing communication session, or dialing is entirely aborted (as programmed in Location 22 - see PROGRAMMING CHART in Para. 7.6).

Note: If no code is received from the far end of the line, the communication session is terminated after 60 seconds, and the SA-100 will continue to call the telephone number that didn't respond. Any code received from the remote supervisor before the 60 second term is up prolongs the communication session by another 60 seconds. The only exception is 77, the "kissoff" code, which terminates the communication session. The communicator will not redial a number that has already responded in any form.

- Permits programming of different operating modes for each auxiliary open-collector output. Either of these outputs may be programmed to operate in the following modes:
 - momentary enable (programmable duration) upon reception of enable code 31 or 32.
 - latch upon reception of enable codes 31 or 32; unlatch by the disable codes 61 or 62, or when the communication session ends.
 - latch upon reception of enable codes 31 or 32; unlatch by the disable codes 61 or 62, or by pressing the local STOP pushbutton.
 - automatic latch when the communicator is triggered, unlatch by pressing the local STOP pushbutton.
 - automatic latch when the communicator is triggered, unlatch when the communication session ends.

2.3 Communication Routine

A. Alerting Signals Generated by the SA-100

The user can easily monitor the progress of the communication routine from within the supervised area by listening to special informative and alerting tones heard over the front-panel or remote loudspeaker (see section 5.2).

Whenever the system is triggered into action, a PREDIALING DELAY goes into effect (if allowed by preprogramming location 21 - see Para. 7.6). Two kinds of audible warnings may be heard on the loudspeaker during the predialing delay:

- Predialing warning - a repetitive monotone sequence comprising 3 short tones followed by a long tone (see Fig. 5).

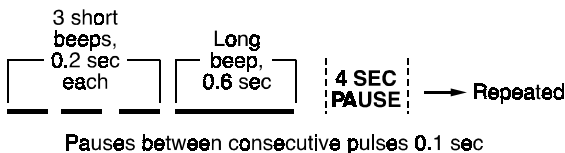


Figure 5. Predialing Warning

Note: The predialing warning does not sound when the imminent communication is a periodic test report.

- Predialing warning informing that an "INACTIVITY ALERT" is about to be transmitted. This warning is an ascending 3-tone melody heard through the Speakerphone (see Fig. 6).

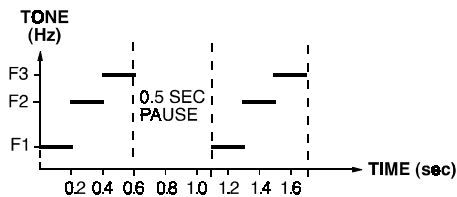


Figure 6. Pre-dialing Warning prior to Inactivity Alert

The person under surveillance is thus warned of the impending communication session, and is granted a programmable interval (up to 255 seconds) to cancel the communication by pressing the DE7401

STOP pushbutton on the AUTOCOM-100 front panel, or just to prevent the "inactivity alert" from being sent out by pressing the RESET button on the AUTOCOM-100 front panel, or by pressing an auxiliary RESET button installed elsewhere on the premises, or pressing RESET on the pendant transmitter WT-104AC.

Note: If the STOP pushbutton is pressed while a communication session is already in progress, the system aborts the session, goes "on hook" and disengages the telephone line.

B. Programmable Communication Parameters

"Location" numbers mentioned in the following text are programming references (see Para. 7.6).

The following parameters and attributes are set by the installer:

1. Dialing method, PULSE or DTMF (Location 16).
2. The PREDIALING DELAY length (Location 21).
3. The maximum number of DIALING ATTEMPTS made to each telephone number (Location 20).
4. The COMMUNICATION PLAN for calling private subscribers. 4 different plans may be selected (Location 22).
5. The AUDIBLE MESSAGE TYPE for private subscribers (Location 10).
6. Various EVENT CODES for reporting to the response center (Locations 34, 35 and 36).
7. The TIME INTERVAL between periodic test reports (Location 12).
8. PERIODIC TEST REPORTING enable/disable (Location 33).
9. The OPERATING MODE and OPERATION DURATION of the auxiliary, open-collector control outputs C1 and C2 (Locations 23, 24 and 25).
10. INACTIVITY ALERT enable/disable (Location 11).

Note: When the INACTIVITY ALERT function is enabled, the person under surveillance has to press the RESET button or activate any detector connected to the RESET input at least once within the periodic test report time interval (Location 12). This will assure the supervisor that the person under surveillance is active. Failure to do so will cause the system to send an INACTIVITY ALERT code to the Response Center and an INACTIVITY MELODY to private telephones.

The RESET input may be triggered by:

- Pressing the RESET button on the AUTOCOM-100 front panel.
- Pressing extra RESET buttons installed near the bed or someplace else.
- Detection of movement by a PIR detector installed in the room, bathroom or toilet.
- Signaling from the RESET button on the wireless pendant transmitter WT-104AC worn by the person under surveillance, or from a wireless detector set to the correct channel (see Para. 3.2).

C. Communication with Response Centers

1. When triggered into action, the system will pause for the duration of the PRE-DIALING DELAY, and if not reset, will dial the first Response Center number (provided that such a number has been programmed).
2. The system engages the line and pauses up to 5 seconds or until a dialing tone is detected - whichever comes first. Dialing is initiated after detection of a dialing tone for at least 2 seconds.
3. When finished dialing, the system waits for a GO-AHEAD signal (DTMF code "12") from the response center's digital receiver - RC-4000 or other compatible terminal. Upon reception of this signal, the SA-100 transmits its ID number and the event code, followed by the pre-programmed text message, which may include 27 tone-coded ASCII characters. The message can be printed by a printer connected to the Response Center's computer.
4. Between message transmissions, the SA-100 is constantly responsive to the following DTMF control codes sent from the response center:
 - "77" - "kissoff" and go on-hook.
 - "88" - serves as a "handshake" and turns on the Speakerphone in the LISTEN-IN mode for 60 seconds or until "77" is received, whichever comes first.

- "99" – serves as a "handshake" and turns on the Speakerphone in the SPEAK OUT mode for 60 seconds or until "77" is received, whichever comes first.

Once the 60-second term is up, the system transmits a reminder – two short notes followed by a long note – waits 10 seconds and goes "on hook" unless it receives a new DTMF command.

Notes:

- The called party may send the "88" or "99" code again just before the 60-second term is up, to prolong the term by another 60 seconds.
- During operation in the LISTEN-IN mode, a "99" code will switch the Speakerphone to the SPEAK OUT mode; conversely, a "88" code will switch the Speakerphone from the SPEAK OUT mode back to the LISTEN-IN mode. Two-way conversation can thus be conducted.
- 5. While communication is maintained, control codes may be sent to the system to enable or disable control outputs C1 and C2:
 - "31": serves as a "handshake" and enables C1.
 - "61": serves as a "handshake" and disables C1.
 - "32": serves as a "handshake" and enables C2.
 - "62": serves as a "handshake" and disables C2.

Note: Upon reception of kissoff or handshake codes, the system transmits a rapid 3-tone descending ACKNOWLEDGE MELODY over the telephone line (see Fig. 7), and then stops redialing the Response Center's telephone numbers for the current event.

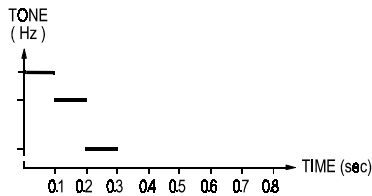


Figure 7. Acknowledge Melody

Important! If the SA-100 is triggered for ALARM while engaged in a periodic test report, it will first finish reporting and will then start a new communication session.

D. Communication with Private Telephones

The way the "Communication Plan" logic flag was set by the installer (Location 22) determines whether or not the SA-100 would call the programmed private telephone numbers after having established successful communication with the Response Center. However, if allowed by the "communication plan", the preprogrammed private telephone numbers are called in the following manner:

1. The system engages the line and pauses up to 5 seconds or until a dialing tone is detected – whichever comes first. Dialing is initiated after detection of a dial tone for at least 2 seconds.
2. After having dialed the last digit, the SA-100 waits 3 seconds and then resumes its routine by transmitting its message, which may be programmed to take one of the following forms:
 - A sequence of equal-duration, equally spaced 988 Hz tone pulses. 1 to 16 pulses may be sent, as programmed by the installer (Location 10). Pulse width is 0.5 seconds and the spacing between pulses is also 0.5 seconds. When

the sequence ends, there is a 3-second pause and the entire sequence is repeated. When a remote supervisor is in charge of several AUTOCOM-100 installations, each AUTOCOM-100 may be programmed to send a different number of pulses. When the supervisor receives a call from one of these units, counting the pulses in 1 whole message sequence will enable him to identify the calling unit.

- A two-tone siren signal, composed of alternating 1046 Hz and 659 Hz tone bursts. The duration of each tone burst is a 1/5 of a second. The siren sounds continuously for 5 seconds, pauses for 3 seconds and then sounds again.
 - A pre-recorded verbal message. This plain speech message is sent by the built-in speech processor.
3. If the INACTIVITY ALERT function has been enabled by the installer (Location 11), and the person under surveillance has indeed failed to demonstrate activity, an INACTIVITY MELODY will be transmitted over the telephone line, together with any other message. Refer to Figure 6 for a graphic representation of this melody.
 4. While message transmission is in progress, the system is constantly responsive to DTMF "kiss-off", "handshake" and command codes sent by the remote supervisor. When such codes are received (at the interval between message repetitions), the SA-100 stops transmitting and carries out the received command. See Paragraph C above, steps 4 and 5.

Note: If no DTMF control code is received (no "kiss-off" or "handshake"), the system goes "on hook" after 60 seconds, calls all other private telephone numbers, each in its turn, and returns to the "bad" number after completing a full cycle of communication attempts. This is carried on until the preprogrammed number of attempts is exhausted or until a response is received from all relevant remote telephones. Each remote telephone from which a response code has been received is taken off the "task list", until all activity relating to the particular event ceases.

5. If the system has been programmed to transmit the verbal message stored in the built-in speech processor, the speech processor will be turned on for 60 seconds, after successful completion of a dialing attempt. Since the maximum message length is 20 seconds, the message will be repeated at least 3 times before the communicator signs off.

E. Programming

The AUTOCOM-100 system is highly versatile and flexible, since it may be programmed by each installer to meet the customer's specific requirements. The program data is retained in a non-volatile memory (EEPROM) even during a total power failure.

For your convenience, a set of default parameters is programmed at the factory and saved in the EEPROM. Naturally, this default set does not include telephone numbers, which may be entered at any time, together with any other programming changes you may wish to introduce. Just follow the procedures given in Chapter 7. A special column in the PROGRAMMING CHART (Para. 7.6) contains factory default information, and another column has been left blank for noting down your own particular set of telephone numbers and operating parameters.

3. WIRELESS RECEIVER SA-200

3.1 Description

The SA-200 receiver module is designed to receive coded wireless transmissions on a preset RF channel. In order to be effective, the transmitted RF signal must be modulated with a specific SYSTEM CODE (an 8-bit digital word) and with a "function command" (CHANNEL CODE). The SA-200 receiver responds to 4 distinct function commands, each of which causes a change in the state of one of the receiver's outputs. Each output is wired to enable a particular function of the AUTOCOM-100 system. In simple words, the SA-200 receiver serves as a wireless command interpreter, which responds to recognizable codes sent by system transmitters and ignores transmissions from other sources.

The SA-200 therefore permits the person under surveillance to control four distinct functions of the AUTOCOM-100 system by pressing any one of 4 pushbuttons on the Visonic Ltd. miniature pendant transmitter WT-104AC (supplied separately).

Other Visonic Ltd. miniature transmitters, including wireless magnetic contact transmitters and wireless PIR detectors, are also compatible with the SA-200 receiver. These include the WT-201A, WT-100A, WT-301, GL-1W, WST-400 and SRN-2000W/PCN. All information regarding programming, maintenance and use of these transmitters is included in their respective Installation Manuals, supplied together with each unit in the original cardboard packing box.

Various operations can be carried out by means of wireless transmission from anywhere within the local reception range. These operations are:

- Sending out an alarm - pressing the top right button (Channel 1) on the WT-104AC transmitter (equivalent to pressing HELP on the AUTOCOM-100 front panel).
- Inhibiting transmission of an "Inactivity Alert" - pressing the top left button (Channel 2) on the WT-104AC transmitter (equivalent to pressing RESET on the AUTOCOM-100 front panel). It is recommended to install wireless PIR detectors in

places moved through often: the kitchen, the toilet, the bathroom etc. Detection of movement will reset the AUTOCOM-100 automatically without having to press a button.

- **Enabling auxiliary output C1** - pressing the **bottom right** button (Channel 3) on the WT-104AC transmitter (equivalent to pressing C1 on the AUTOCOM-100 front panel).
- **Enabling auxiliary output C2** - pressing the **top left** button (Channel 4) on the WT-104AC transmitter (equivalent to pressing C2 on the AUTOCOM-100 front panel).

The SA-200 receiver and the companion transmitter must, of course, be programmed by the installer with an identical system code combination. For this purpose, both receiver and transmitter are equipped with an 8-key DIP switch, permitting selection any one of 256 different digital codes. In the SA-200 receiver module, this 8-key DIP switch is mounted on the printed circuit board and

is accessible through an opening in the bottom plate of the AUTOCOM-100 housing (see Fig. 3).

3.2 System Code Selection

To select the digital system code, switch every key to either ON or OFF. This combination must match the code selected on the companion transmitters. All wireless PIR detectors and pendant transmitters used in the system as well as the SA-200 receiver module must be set to the same digital code.

Caution: The code combination 2,4,5,6,7 ON / 1,3,8 OFF is a factory test code which must be avoided. Also avoid codes which are often used: all keys ON, all keys OFF or alternating ON-OFF settings.

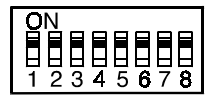


Fig. 8. DIP Switch

4. SPEECH PROCESSOR SA-300

4.1 Description

The SA-300 speech processor is a versatile, small electronic record/playback module for short verbal messages. It is highly reliable due to its advanced electronic design, has no moving parts, and is unaffected by power failures thanks to its EEPROM non-volatile memory.

The SA-300 has been designed to form part of the AUTOCOM-100 system and to operate in conjunction with digital communicator SA-100. It can store a 20-second voice message and, whenever triggered, transmits the voice message over the telephone line and through the front-panel loudspeaker. The recorded message will be played back repeatedly 3 times (60 seconds).

A miniature recording microphone and a RECORD switch are included in the SA-300 (as in a common answering machine), easily accessible through openings in the bottom plate of the AUTOCOM-100 housing (see Fig. 3).

4.2 Recording and Playback

A. Recording

1. Turn the AUTOCOM-100 housing upside down to obtain access to the RECORD switch and the built-in microphone (Fig. 3).
2. Use a ball point pen or another sharp object to depress and hold down the RECORD switch. Wait 3 seconds and start speaking at normal voice level about 50 cm from the unit. When through, release the switch. The 3-second silence is important when the message is played back automatically several times, to introduce an interval between repetitions.
Remember! the message duration is limited to 20 seconds. If you exceed 20 seconds, recording operation will stop and

message playback will start by itself. Use a stopwatch and finish recording shortly before the 20-second mark.

Note: It is advisable to make the recording in a quiet environment. Turn off nearby radio receivers and noisy machines, and ask people in your immediate vicinity to remain silent while you record. If the background noise is too high, speak closer to the microphone.

B. Playback

To initiate playback for testing purposes, you will have to cause the SA-100 communicator to dial any one of the already programmed telephone numbers. This will work, provided that the system has been programmed to send out a verbal message upon alarm (the value 18 has been entered in Location 10 – see Para. 7.6).

1. Disconnect the telephone line from the AUTOCOM-100 system by pulling out the telephone line plug from J1 (Fig. 4).
2. Press the **PR** key on the programmer's keypad (see Figure 3). The LED will flash 3 times and then will light steadily.
3. Key a number of a **memory location** which stores a private phone number (any number from 1 to 9, provided that a phone number has indeed been programmed into that location).
Note: Do not select a telephone number that includes the letter D (see Para. 7.2)
4. Press the Asterisk [*] key. The communicator will dial the selected telephone number and will then trigger the SA-300 module into playback. The recorded message will be heard repeatedly through the front panel loudspeaker.
5. If satisfied that the recording meets your requirement, press the STOP pushbutton on the AUTOCOM-100 front panel. If you don't, the playback will stop by itself after 60 seconds.

5. SPEAKERPHONE SA-420

5.1 Description

The SA-420 Speakerphone is a "hands free" voice communication module that forms part of the AUTOCOM-100 and operates in conjunction with the SA-100 digital communicator. It is switched by the SA-100 between "LISTEN-IN" and "SPEAK OUT" modes in accordance with DTMF codes received from a remote telephone or from a remote Response Center. This switching permits hands-free, half duplex voice communication between the remote supervisor and people at the supervised site.

Since the Speakerphone is highly sensitive to sound, it incorporates an ALC (Automatic Level Control) circuit that matches the LISTEN-IN amplification level to the actual sound level in the room in which the AUTOCOM-100 system operates. The audio level heard through the loudspeaker is adjustable by means of a potentiometer located on the printed circuit board. Access to this potentiometer is possible only by removing the bottom cover of the AUTOCOM-100 housing.

As soon as the AUTOCOM-100 system is placed into service, the Speakerphone will function as follows:

- DTMF code "88" will switch it to the LISTEN IN mode.
 - DTMF code "99" will switch it to the SPEAK OUT mode.
- It is recommended to conduct a test run of the Speakerphone, during which the speaker volume may be adjusted as required.

5.2 Auxiliary Speakerphone (Option)

An auxiliary external speakerphone unit is available for installation in remote locations such as the basement, the front porch or the garden. The auxiliary speakerphone extends the reach of the AUTOCOM-100 system, by allowing the remote responder to LISTEN-IN and SPEAK OUT wherever the person under surveillance may wander within the monitored site. Up to two external speakerphones may be added to the system, and all three function identically and simultaneously.

The auxiliary speakerphone draws its operating power from the AUTOCOM-100 system. It is packaged in a rectangular plastic box, suitable for surface installation.

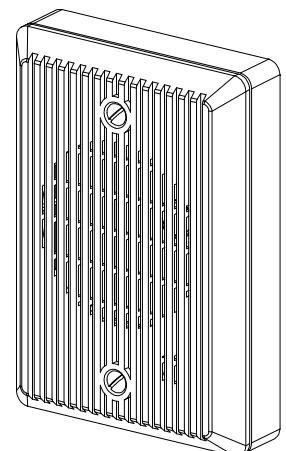


Figure 9. The External Speakerphone

The front cover, complete with the loudspeaker and microphone, may be removed for installation purposes, for gaining access to the 6-position internal terminal block and for adjusting the loudspeaker level. Wiring instructions for auxiliary speakerphones are given in Section 6.

CAUTION: The auxiliary speakerphone is designed for indoor use only, or outdoors in places protected from water and rain.

5.3 The Speakerphone as a Monitor

Audible monitoring of the communication process is required to ensure peace of mind for the person under surveillance. Having pressed his HELP button, he needs reassurance that the AUTOCOM-100 has really gone into action.

If audible monitoring is selected in Location 13 (see Para. 7.6), anyone present in the room where an AUTOCOM-100 system is operating can follow the communication routine by listening to informative and alerting tones heard through the front panel loudspeaker. Whenever the system is triggered into action, audible signals help identify the process in progress:

- The "predialing alert" is heard prior to actual dialing, as explained in Section 2.3 A and demonstrated in Figs. 5 and 6.
- Dialing the supervisor's number has the following audible effects:

- Pulse dialing is heard as sequences of clicks over the loudspeaker.
- DTMF dialing is heard as DUAL-TONE MULTI-FREQUENCY signal bursts.
- Data exchange with response centers utilizes DTMF tone combinations which will be heard over the loudspeaker.
- An "Acknowledge melody" (Fig. 7) is sent from the AUTOCOM-100 to the response center when a command is received and carried out. This melody can be easily identified when heard through the speakerphone.
- Signals sent to private telephones - any form of message transmitted by the SA-100 communicator to private telephone numbers is heard over the loudspeaker:
 - Pulse train sequences sent to private telephones can be easily identified, and the pulses counted to verify that the outgoing message is correct.
 - Two-tone siren signals sound like a conventional siren.
 - Speech messages are heard in ordinary human voice.
 - "Inactivity melody" is a signal which accompanies any type of message when there is no assurance that the person under surveillance is active (see Para 2.3 D and Figure 6).

6. INSTALLATION

6.1 Mounting

The AUTOCOM-100 is designed to be placed on a desk, at a height permitting convenient access to the front panel controls. Wall or shelf mounting are also possible, provided that the mounting site be easily accessible for regular use, programming and maintenance. Please make sure that all connecting cables are either secured to the wall or passed through special protective conduit.

6.2 Wiring

All connections to the AUTOCOM-100 system can be made via the 6-position, telephone-type side-entry female connectors located at the rear panel of the unit. The 6-pin mating plug for these receptacles is designated RJ-11 and shown in Figure 10.

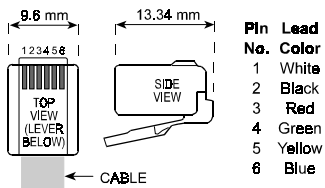


Figure 10. 6-pin RJ-11 Plug

A standard DC IN receptacle, as found in many consumer appliances, permits the input power to be supplied separately. The tubular mating plug for this receptacle is shown in Figure 11.

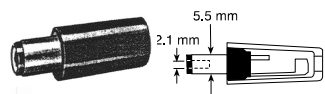


Figure 11. DC IN Tubular Plug

To complete the wiring, you will need the following items:

- An unspecified length of 6-lead, color coded modular cable (depending on the distance from the AUTOCOM-100 to the various peripheral devices and to the telephone line terminals). To prevent confusion, it should be crimped onto the RJ-11 plug with the white lead at position 1 and the blue lead at position 6 (see Figure 10).
- At least four 6-position RJ-11 type male connectors, to terminate the cables at the AUTOCOM-100 end.
- A crimping tool for RJ-11 type 6-position plugs.

With all these in your possession, refer to Figure 12 and then:

1. Disconnect the modular cable connector from the telephone set closest to the AUTOCOM-100. Make sure the modular cable has 6 leads. If so, plug it into the female connector J1 at the rear of the AUTOCOM-100. If the cable has less than 6 leads, prepare a new cable assembly with 6 leads.

Caution! Lightning protection is obtained by connecting lead No. 6 (the blue lead) of this cable to the nearest electrical earth, preferably a ground rod. Use a 14 gauge wire between the junction box on the wall and the grounding point.

2. Connect the local telephone set to plug P2, using the cable assembly supplied with the AUTOCOM-100.
3. If you do not intend to use an auxiliary external Speakerphone, disregard plug P3. For external Speakerphone connection instructions – see Para. 6.3.
4. If an external HELP (alarm) pushbutton is required near the bed of the person under surveillance or anywhere else, use a Normally Open (N.O.) momentary switch and connect it across the yellow and white leads of plug P4.
5. An external RESET (activity assurance) momentary-action switch or a PIR detector which serves as an RESET switch may be installed anywhere within the premises.
 - If you are using a Normally Closed (N.C.) RESET device such as a PIR detector, connect its alarm contacts across the green and blue leads of Plug P4. Connect the PIR's DC input contacts across the white (+) and blue (–) wires of Plug P4. When several detectors are to be wired in the system, connect their N.C. contacts in series.
6. The remote supervisor or the person under surveillance can be allowed to operate an electrical door strike (or any other external device such as a siren). For this purpose, you may wire up open-collector outputs C1 or C2.
 - Connect one terminal of the external device to be operated by C1 to the green lead of plug P5. Connect the device's other terminal to the white lead (+12 VDC).
 - Connect one terminal of the external device to be operated by C2 to the yellow lead of plug P5. Connect the device's other terminal to the white lead (+12 VDC).

Caution! Remember that the maximum permissible current for each open collector output is 100 mA (resistive load).

7. To allow the person under surveillance to enable the C1 and C2 outputs from a convenient spot within the premises (without having to approach the AUTOCOM-100 front panel), install external momentary action, Normally Open (N.O.) switches as follows:
 - Connect the C1 activation switch across the black and white leads of plug P5.
 - Connect the C2 activation switch across the red and white leads of plug P5.

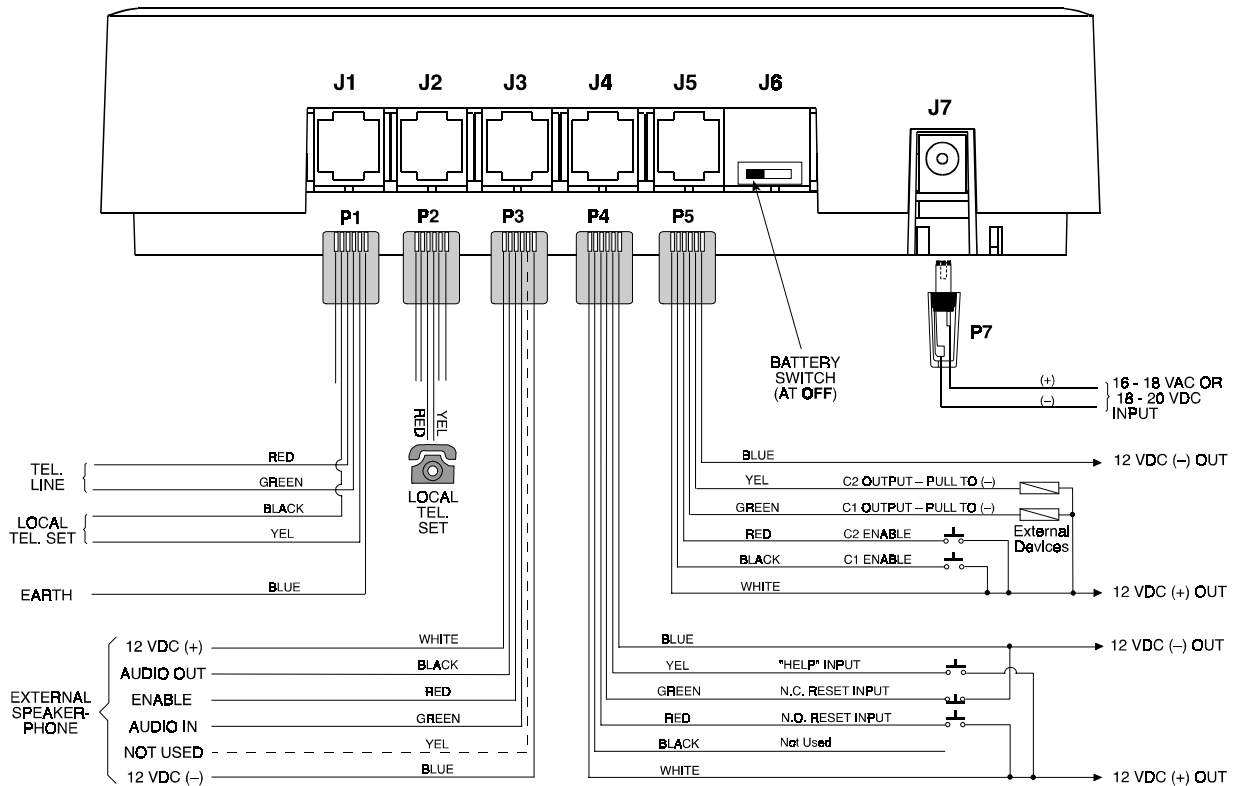


Figure 12. System Wiring

- Connect the wires of the external power transformer (16-18 VAC) or DC power supply (18-20VDC) to the power input plug P7. With AC input, polarity is insignificant. With DC input, make sure the positive lead is connected to the inner sleeve, and the negative lead to the outer sleeve. Insert plug P7 into the power receptacle J7.
- Note:** Secure the power cord against being accidentally pulled out by routing it through the power cord channel provided on the bottom of the AUTOCOM-100 (see Figure 3).
- Connect the external power supply's AC input to an AC mains wall receptacle and verify that the AC indicator illuminates on the AUTOCOM-100 front panel.
- Set the battery switch to the ON position (see Figure 12).

6.3 Connecting an Auxiliary Speakerphone

Auxiliary speakerphones may be connected via receptacle J3 on the rear panel of the AUTOCOM-100. A 6-lead color coded modular telephone cable is required, same as for most other system connections.

To install an auxiliary speakerphone refer to Figure 13 and proceed as follows:

- Select the mounting location for the speakerphone. Take off the front cover by removing the two white headed screws at the front and pulling the cover off.
- Swing the cover aside and disconnect the microphone and loudspeaker connectors from their respective headers on the printed circuit board. Put the cover aside.
- Punch out two of the mounting knockouts in the speakerphone's base and install the base at the chosen location.
- Punch out the wiring knockout and insert the 6-lead cable end through the opening into the base.
- Remove the two screws which hold the printed circuit board in place.
- Strip the ends of all 6 wires and connect them to the terminal block as follows:

| | |
|-----------------------------------|-----------------------|
| – White to terminal 1 | – Black to terminal 2 |
| – Red to terminal 3 | – Green to terminal 4 |
| – Yellow to terminal 5 (not used) | – Blue to terminal 6 |

Note: You will have to lift the PCB off the base to gain easy access to the terminals.

- Return the PCB to its place and secure it to the base with the two screws. Hold the front cover with one hand and reconnect the microphone and loudspeaker connectors.
- Fit the cover over the base, and secure it in place with the two white-headed screws.
- Route the cable all the way from the auxiliary speakerphone to the AUTOCOM-100.
- At the AUTOCOM-100 end, crimp the cable end onto an RJ-11 type connector with the white lead at position 1 and the blue lead at position 6 (see Figure 10).
- Plug the RJ-11 connector into receptacle J3 on the rear panel of the AUTOCOM-100.

If you wish to connect a second auxiliary speakerphone, connect its cable leads in parallel with the cable leads of the first speakerphone. The parallel distribution connection may be made at the first speakerphone's terminals.

Another method is to mount a 6-terminal telephone junction box at a convenient spot, equi-distant from both speakerphones. Use a properly-terminated modular cable between the junction box and receptacle J3 on the AUTOCOM-100. Connect the cable leads from both speakerphones to the junction box screw terminals, matching colors with numbers as explained in step (6) above.

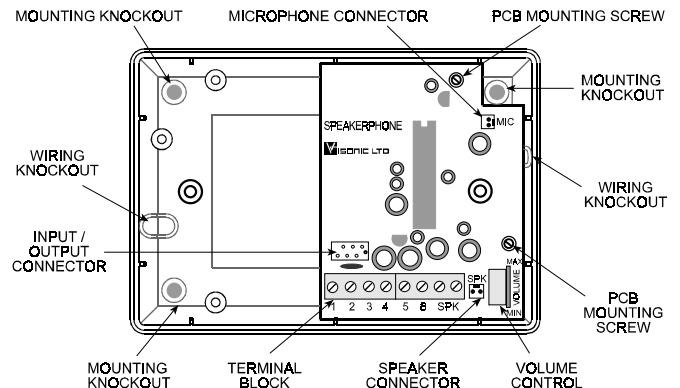


Figure 13. Auxiliary Speakerphone - Component Layout

7. PROGRAMMING

7.1 Programming Fundamentals

The AUTOCOM-100 employs a non-volatile EEPROM, which stores programmed data and keeps it intact even during power failures. Programming is carried out from the programmer's keypad located at the bottom of the housing (see Figure 3), by entering the desired variables or by setting logic flags. Every variable is programmed into a special location in the SA-100 module's memory, and each location is identified by a LOCATION NUMBER. The programming format consists of the following successive entries:

[PR] <LOC> [#] <VAL> [#]

<LOC> is the location number, in which a leading zero may be ignored, so that location 06 may be entered as a single digit – <6>.

<VAL> is the parameter value or code entered into that location.

Refer to the PROGRAMMING CHART (Para. 7-6) for a full list of locations, permissible entries and explanation of each function.

IMPORTANT! Before starting to program an operational AUTOCOM-100, disconnect Plug P4 from the console's rear panel. At the end of programming, reconnect P4.

Note: You will sometimes have to key hexadecimal numbers which may include the letters A through F. These letters are marked on certain digit keys in Figure 14. Press the [*] key first to enter the hexadecimal mode, and then press the key on which the desired letter is marked. The LED near the keyboard will flash rapidly during this operation. After keying a letter, the keypad will automatically return to its normal numerical function, and the LED will stop flashing. The [*] key has to be pressed again in order to key another letter.

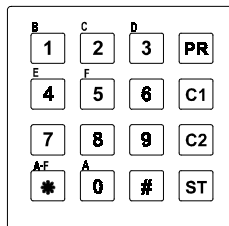


Figure 14. Keying Hexadecimal Numbers

After programming, you may wish to restart the internal clock. This is accomplished by briefly disconnecting the power from the AUTOCOM-100 and then reconnecting it.

If you feel that this introduction will be sufficient for going ahead, skip Para. 7.2 through 7.4 and proceed directly to Para. 7.5.

7.2 Programming Telephone Numbers

Private telephone numbers are entered in locations 1 thru 9, and response center telephone numbers are entered in locations 30 - 31 (see Table in Para. 7.6). The programming format is:

[PR] <Loc> [#] <Num> [#]

To program a number, proceed as follows:

1. Enter the programming mode by pressing the PR key. The LED indicator will flash 3 times and will then light steadily.
2. Select the location for the telephone number you wish to program by keying its (Loc) number. The LED indicator will flash once for each keystroke.
3. Press [#] to confirm the location number.
4. Key the telephone number (Num), digit by digit. The LED will flash once for each digit. There is a 20-digit limit, including inter-digit pauses (see the following note).

Note: To program pauses between dialed digits, as sometimes required when PABX systems are used, the following entries are available:

[*][B] – wait 5 seconds or wait for a dial tone, whichever comes first, and continue dialing.

[*][C] – wait 10 seconds or wait for a dial tone, whichever comes first, and continue dialing.

[*][D] – wait 5 seconds for a dial tone and disengage the line if none is received.

After pressing [*], the LED indicator flashes until a letter is keyed.

5. Finish off by pressing [#] after having entered the last digit. The LED indicator will extinguish.

6. To program another telephone number, repeat the procedure outlined in steps 1 to 5 above.

7.3 Deleting Telephone Numbers

A telephone number location is considered not programmed if no number has been entered. The format required to delete a telephone number programmed in a specific location (<Loc>) is:

[PR] <Loc> [#] [#]

Note: The telephone number already programmed into any location between 1 and 9 or between 30 and 31 may be verified by using the following format:

[PR] <Loc> [*]

This initiates a communication session with the particular telephone, and gives the installer a chance to monitor the session and verify correctness of the programmed telephone number.

7.4 Selecting the Outgoing Message to Private Telephones

The type of message sent out by the SA-100 communicator is programmed into Location 10. The format required to define the type of message is as follows:

[PR] [1] [0] [#] [Code] [#]

[Code] may have different values as shown in the following table:

| Code | Type of Message |
|------|---|
| 1-16 | A pulse train will be sent out. The number of pulses transmitted depends on the number entered. The called party must count the pulses to identify the specific AUTOCOM-100 unit sending the message. |
| 17 | A two-tone alarm will be transmitted over the line (an alarm for 3 seconds, a 3 second pause, a 3-second alarm again and so on). |
| 18 | The speech processor module SA-300 will be activated for transmitting the recorded voice message (if installed). |

Note: An "INACTIVITY" melody, if transmitted, always accompanies the regular message.

7.5 Programming Summary

The programming procedure for the AUTOCOM-100 can be carried out equally well in the installer's office or at the installation site. The only requirement is that the system be powered during the entire operation. Follow the PROGRAMMING CHART on the next page row by row, and enter the appropriate variables. The programming code options are explained in the third column, and the full programming sequence for each variable is given in the fourth column. Each programming step is enclosed in square brackets, and may include more than one keystroke. The fifth column includes default values, and the last column (Prog) is left blank so that you can note down your own programmed values.

To quit programming, press the ST (Stop) pushbutton.

Caution: If no key is pressed for 30 seconds while in the programming mode, programming will be aborted and the selected location will revert to the previously programmed value. However, when the programming process of a telephone number or a text messages is interrupted, the partial data entered will be saved in memory.

7.6 Programming Chart

| Loc. No. | Entry Limits | Description of Parameter & Code Options | Programming Format | Default Value | prog |
|----------|--------------|---|-----------------------|---------------|------|
| 1 | 20 digits | 1st private-subscriber telephone number | [PR][1][#][Num][#] | None | |
| 2 | 20 digits | 2nd private-subscriber telephone number | [PR][2][#][Num][#] | None | |
| 3 | 20 digits | 3rd private-subscriber telephone number | [PR][3][#][Num][#] | None | |
| 4 | 20 digits | 4th private-subscriber telephone number | [PR][4][#][Num][#] | None | |
| 5 | 20 digits | 5th private-subscriber telephone number | [PR][5][#][Num][#] | None | |
| 6 | 20 digits | 6th private-subscriber telephone number | [PR][6][#][Num][#] | None | |
| 7 | 20 digits | 7th private-subscriber telephone number | [PR][7][#][Num][#] | None | |
| 8 | 20 digits | 8th private-subscriber telephone number | [PR][8][#][Num][#] | None | |
| 9 | 20 digits | 9th private-subscriber telephone number | [PR][9][#][Num][#] | None | |
| 10 | 1-18 | Type of message sent to private telephones: 1-16: pulse tone messages; 17: two-tone siren 18: pre-recorded verbal message | [PR][10][#][Code][#] | 17 | |
| 11 | 0-1 | INACTIVITY alert function: 1: enabled 0: disabled | [PR][11][#][Code][#] | 0 | |
| 12 | 0-255 | Interval between periodic test reports (hours) | [PR][12][#][hours][#] | 2 4 | |
| 13 | 0-1 | Audible monitoring of the progress of the communication session by Speakerphone: 1: enabled 0: disabled | [PR][13][#][Code][#] | 1 | |
| 14 | | Reserved for future use | | | |
| 15 | 0-1 | Speakerphone installation (do not change!) 1: installed 0: not installed | [PR][15][#][Code][#] | 1 | |
| 16 | 0-1 | Dialing method. 0: DTMF 1: pulse | [PR][16][#][Code][#] | 0 | |
| 17 | - | Space (BREAK) time for dialing pulses 0C: 60 ms; 0D: 66 ms; 08: 40 ms; 06: 33 ms | [PR][17][#][Code][#] | 0 D | |
| 18 | - | Mark (MAKE) time for dialing pulses 0C: 60 ms; 0D: 66 ms; 08: 40 ms; 06: 33 ms | [PR][18][#][Code][#] | 0 6 | |
| 19 | | Reserved for future use | | | |
| 20 | 1-16 | Number of dialing attempts for each Tel. No. | [PR][20][#][Num][#] | | |
| 21 | 0-255 | Predialing delay to permit manual reset: 0: no delay 1-255: delay in seconds | [PR][21][#][Code][#] | 10 | |
| 22 | 0-3 | "communication plan" for private telephones: 0: Private telephones are called, irrespective of acknowledgement by the response center. 1: Private subscribers are not called if the response center acknowledged. 2: If acknowledged by one private telephone, remaining private telephones are not called. 3: End session after first acknowledgement, no matter by whom. | [PR][22][#][Code][#] | 0 | |
| 23 | 1-5 | Operating modes of control output C1: 1: Momentarily enabled upon reception of enable code (enable duration programmable in location 25 below). While enabled, may be disabled by pressing the STOP pushbutton. 2: Latched upon reception of enable code, unlatched by disable code or when the communication session ends. 3: Latched upon reception of enable code, unlatched by the disable code or by pressing the STOP pushbutton. 4: Automatically enabled when the communicator is triggered, disabled by pressing the local STOP pushbutton. 5: Automatically enabled when the communicator is triggered, disabled when the communication session ends. | [PR][23][#][Code][#] | 1 | |
| 24 | 1-5 | Operating modes of control output C2: Codes are the same as in location 23 above. | [PR][24][#][Code][#] | 3 | |
| 25 | 0-255 | C1 and C2 control circuit enabling duration (in seconds) | [PR][25][#][sec][#] | 10 | |
| 26 | 0-255 | Delay for first periodic test report (in hours) | [PR][26][#][hours][#] | 0 | |
| 27-29 | - | Reserved for future use | - | - | |
| 30 | 20 digits | First Response Center telephone number | [PR][30][#][Num][#] | None | |
| 31 | 20 digits | Second Response Center telephone number | [PR][31][#][Num][#] | None | |
| 32 | 4 digits | Dialer's account number which identifies it to the response center. Important! For account numbers with less than 4 digits, "0" prefixes must be added. For example: to register 27, enter 0027. | [PR][32][#][Num][#] | None | |
| 33 | 0-1 | Periodic test report. 0: disabled 1: enabled | [PR][33][#][Code][#] | 0 | |
| 34 | 2 digits | Alarm code | [PR][34][#][Code][#] | 11 | |
| 35 | 2 digits | Code for "all OK" periodic test report | [PR][35][#][Code][#] | 33 | |
| 36 | 2 digits | Code for "Inactivity report" | [PR][36][#][Code][#] | 22 | |
| 37 | 27 char. | Text message to be sent to the response center - up to 27 characters (see note below for keying instructions). | [PR][37][#][Text][#] | No Message | |

Note: Each alphabetical, numerical and punctuation character of the text message is sent to the telephone line as a pair of DTMF signals transmitted in succession. The text message is programmed and saved in memory by keying in the ASCII hexadecimal code for each character in the message, from beginning to end. For your convenience, Appendix A to this manual is a list of characters and their corresponding hexadecimal representations.

8. SPECIFICATIONS

GENERAL DATA

Construction: Modular construction including the following modules:

Building Block Details:

SA-100 – automatic digital communicator and system controller.

SA-200 – wireless receiver unit (option).

SA-300 – speech processor - record/playback unit (optional).

SA-420 – speakerphone (hands-free telephone) unit.

Various pendant/key-ring transmitters – carried by the person under surveillance.

Communication with the Remote Supervisor: Via the public telephone network.

Call Destinations: Up to 9 private telephones and up to two response centers.

Telephone Number Limits: Up to 20 digits in each.

Event Types:

call for help – initiated by user,

"Inactivity Alert" – initiated automatically (if there is no proof of activity within a programmable time frame).

periodic test – initiated automatically once in 24 hours.

Outgoing Message Format

to response centers: 4-digit ID Code + 2-Digit event Code + 27-character text message (optional).

to private telephones: Pre-programmed tone pulse sequence, or two-tone siren or pre-recorded 20-second verbal message (optional).

Dialog: Half-duplex hands-free conversation, controlled by the remote responder.

Auxiliary Control Options: Two circuits (C1 and C2), controlled locally by person under surveillance or remotely by the responder.

Local Site Control Means: Front panel pushbuttons, hard-wired switches, hard-wired or wireless motion detectors and pendant transmitters.

Remote Site Control Method: DTMF codes sent over the telephone line.

Equipment Required at the Remote Site: The Motocom Ltd. SAR-5000 response center terminal (with or without an IBM-PC™ computer), or just a regular DTMF telephone set.

Programming: Carried out using the programmer's keypad on the bottom panel.

Memory Type: EEPROM - unaffected by power failures.

DTMF CONTROL CODES

Note: Each code comprises 2 DTMF digits transmitted in succession

Handshake (go ahead signal from response center): [1][2]

Switch Speakerphone to "listen in": [8][8]

Switch Speakerphone to "speak out": [9][9]

Kissoff (end of communication session): [7][7]

Enable Control Circuit C1: [3][1]

Disable Control Circuit C1: [6][1]

Enable Control Circuit C2: [3][2]

Disable Control Circuit C2: [6][2]

DTMF EVENT CODES (for Response Centers)

Note: Each code comprises 2 DTMF digits transmitted in succession

• **Alarm:** [1][1]

• **Inactivity Alert:** [2][2]

• **Periodic Test:** [3][3]

• TONE PULSE MESSAGES (for private-telephone responders)

Alarm: A sequence of equal-duration, equally spaced 988 Hz tone pulses.

Alternative Alarm: Two-tone signal - alternating 1046 Hz and 659 Hz. Each tone burst is 200 ms long. The two-tone signal sounds continuously for 5 seconds, pauses for 3 seconds and then sounds again.

Inactivity Melody: A rapid staccato of 3 ascending tones (tone duration 200 ms), a 0.5 s pause, three ascending tones again and so on.

Acknowledge Melody (AUTOCOM-100 response to DTMF commands): A rapid staccato of 3 descending tones (tone duration 200 ms).

LINE CHARACTERISTICS

Protection: 2 varistors between each line terminal and the earth.

Insulation Resistance between Line Terminals: $\geq 10 \text{ M}\Omega$ at 200 Vdc.

Return Loss (across 600 Ω): $\geq 16 \text{ dB @ } 300 - 3400 \text{ Hz}$.

Loop Impedance: 600 - 800 Ω @ 300 - 3400 Hz.

Signal Levels Transmitted to the Line (speech processor and speakerphone): $\leq 9 \text{ dBm}$ averaged over 10 sec.

Dialing Methods: DTMF or Pulse

DTMF Dialing Tone Levels:

High frequency group level: $-9 \pm 2 \text{ dBm}$.

Low frequency group level: $-11 \pm 2 \text{ dBm}$.

Pulse Dialing Data:

Dialing Rate: 10 pps.

Make / break ratio: 34/66, 40/60, 66/34, 60/40 msec.

Inter-digit pause: 1000 \pm 100 msec.

WIRELESS RECEPTION CHARACTERISTICS

Operating Frequency: 315, 404, 418 and 433.92 MHz, or other frequencies, according to local requirements.

System Code: 8-bit digital word, 256 combinations - pulse width modulation.

Coded Output Channels: 4

ELECTRICAL REQUIREMENTS

Power Supply: 16 -18 VAC, by external mains-fed step-down transformer.

C1 and C2 Outputs Current Sinking Capability: 100 mA max.

Current Consumption:

At standby: 40 mA average

In operation: up to 500 mA overall, including outputs C1 and C2

Backup Battery: Internal 12 VDC, 500 mA/h rechargeable nickel-cadmium pack.

Backup Capability (with a fully charged battery): After 9-hour standby without AC power, the unit will be able to complete at least one 5-minute operational cycle.

PHYSICAL PROPERTIES

Operating Temperatures: 0°C to 50°C (32°F to 122°F).

Size (H x W x D): 298 x 187 x 48 mm (11-3/4 x 7-3/8 x 1-7/8 in.).

Weight (including power supply): 1.625 kg (3.6 lb).

APPENDIX A. ASCII TABLE

| Char. | Hex. Code |
|-------|-----------|
| A | 41 |
| a | 61 |
| B | 42 |
| b | 62 |
| C | 43 |
| c | 63 |
| D | 44 |
| d | 64 |
| E | 45 |
| e | 65 |
| F | 46 |
| f | 66 |
| G | 47 |
| g | 67 |
| H | 48 |
| h | 68 |
| I | 49 |
| i | 69 |
| J | 4A |
| j | 6A |
| K | 4B |
| k | 6B |
| L | 4C |
| l | 6C |
| M | 4D |
| m | 6D |
| N | 4E |
| n | 6E |
| O | 4F |
| o | 6F |
| P | 50 |
| p | 70 |
| Q | 51 |
| q | 71 |
| R | 52 |
| r | 72 |
| S | 53 |

| Char. | Hex. Code |
|-------|-----------|
| s | 73 |
| T | 54 |
| t | 74 |
| U | 55 |
| u | 75 |
| V | 56 |
| v | 76 |
| W | 57 |
| w | 77 |
| X | 58 |
| x | 78 |
| Y | 59 |
| y | 79 |
| Z | 5A |
| z | 7A |
| Space | 20 |
| . | 2E |
| , | 2C |
| ; | 3B |
| - | 2D |
| (| 28 |
|) | 29 |
| ' | 27 |
| " | 22 |
| ! | 21 |
| ? | 3F |
| + | 2B |
| / | 2F |
| 0 | 30 |
| 1 | 31 |
| 2 | 32 |
| 3 | 33 |
| 4 | 34 |
| 5 | 35 |
| 6 | 36 |
| 7 | 37 |

| Char. | Hex. Code |
|-------|-----------|
| 8 | 38 |
| 9 | 39 |
| * | 2A |
| # | 23 |
| @ | 40 |
| ^ | 5E |
| % | 25 |
| < | 3C |
| > | 3E |
| ~ | 7E |
| Ç | 80 |
| ç | 87 |
| è | 8A |
| é | 82 |
| ê | 88 |
| ë | 89 |
| ì | 8D |
| í | A1 |
| î | 8C |
| ï | 8B |
| Ñ | A5 |
| ñ | A4 |
| ò | 95 |
| ó | A2 |
| ô | 93 |
| ö | 94 |
| ù | 97 |
| ú | A3 |
| û | 96 |
| ü | 81 |
| ÿ | 98 |
| ı | AD |
| ¿ | A8 |
| ° | F8 |
| : | 3A |

WARRANTY

Visonic Ltd. and/or its subsidiaries and its affiliates ("the Manufacturer") warrants its products hereinafter referred to as "the Product" or "Products" to be in conformance with its own plans and specifications and to be free of defects in materials and workmanship under normal use and service for a period of twelve months from the date of shipment by the Manufacturer. The Manufacturer's obligations shall be limited within the warranty period, at its option, to repair or replace the product or any part thereof. The Manufacturer shall not be responsible for dismantling and/or reinstallation charges. To exercise the warranty the product must be returned to the Manufacturer freight prepaid and insured.

This warranty does not apply in the following cases: improper installation, misuse, failure to follow installation and operating instructions, alteration, abuse, accident or tampering, and repair by anyone other than the Manufacturer.

This warranty is exclusive and expressly in lieu of all other warranties, obligations or liabilities, whether written, oral, express or implied, including any warranty of merchantability or fitness for a particular purpose, or otherwise. In no case shall the Manufacturer be liable to anyone for any consequential or incidental damages for breach of this warranty or any other warranties whatsoever, as aforesaid.

This warranty shall not be modified, varied or extended, and the Manufacturer does not authorize any person to act on its behalf in the modification, variation or extension of this warranty. This warranty shall apply to the Product only. All products, accessories or attachments of others used in conjunction with the Product, including batteries, shall be covered solely by their own warranty, if any. The Manufacturer shall not be liable for any damage or loss whatsoever, whether directly, indirectly, incidentally, consequentially or otherwise, caused by the malfunction of the Product due to products, accessories, or attachments of others, including batteries, used in conjunction with the Products.

The Manufacturer does not represent that its Product may not be compromised and/or circumvented, or that the Product will prevent any death, personal and/or bodily injury and/or damage to property resulting from burglary, robbery, fire or otherwise, or that the Product will in all cases provide adequate warning or protection. User understands that a properly installed and maintained alarm may only reduce the risk of events such as burglary, robbery, and fire without warning, but it is not insurance or a guarantee that such will not occur or that there will be no death, personal damage and/or damage to property as a result.

The Manufacturer shall have no liability for any death, personal and/or bodily injury and/or damage to property or other loss whether direct, indirect, incidental, consequential or otherwise, based on a claim that the Product failed to function. However, if the Manufacturer is held liable, whether directly or indirectly, for any loss or damage arising under this limited warranty or otherwise, regardless of cause or origin, the Manufacturer's maximum liability shall not in any case exceed the purchase price of the Product, which shall be fixed as liquidated damages and not as a penalty, and shall be the complete and exclusive remedy against the Manufacturer.

Warning: The user should follow the installation and operation instructions and among other things test the Product and the whole system at least once a week. For various reasons, including, but not limited to, changes in environmental conditions, electric or electronic disruptions and tampering, the Product may not perform as expected. The user is advised to take all necessary precautions for his/her safety and the protection of his/her property.

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