

Serial Number _____
Options _____

**OPERATOR'S MANUAL
MODEL LS15E+**

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All requests for repairs should be directed to the factory.

This instrument is warranted against defective workmanship and materials for a period of six
months. There will be no warranty when the instrument is misused, or when the factory seal on
the instrument is broken.

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Specification and price change privileges are reserved.

SECTION 1

INTRODUCTION

Introduction of alarm-receiver function

Traditionally, when alarm panels are tested in the manufacturing or demonstrated in the sales offices, alarm receiver with two public telephone lines are required in addition to a computer. The Micro Seven model LS15E+ eliminates an alarm receiver and two telephone lines by combining both of telephone line simulator and alarm receiver functions for the application. Here, an alarm panel is connected to the line 1 of LS15E+. The RS232C port of a PC is connected to the rear panel connector of LS15E+ with special cable and connector that are provided with LS15E+. Micro Seven's LS15E+ control software provides a tool to display incoming alarm messages. First, the alarm panel goes off-hook at line 1. The loop current is flowing at the line 1. Then, the alarm panel dials either primary telephone number "2" (single digit) or secondary telephone-number that is assigned for line 2(programmable one) depending on which telephone number scheme is selected. When the dialed number is correct, the LS15E+ provides ring-back tone for two seconds. Then, there is no sound for four seconds. And ring-back tone is generated for two seconds. After 0.6 seconds, the LS15E+ transmits handshake tones of 1400 and 2300Hz for 100 ms each separated with 100 ms silence period. When the alarm panel receives the handshake tones, the alarm panel transmits a string of alarm message in DTMF tones with a check-sum at the end. When the alarm message with correct check-sum is received by LS15E+, it transmits the kiss-off tone to the alarm panel. LS15E+ also transmits the ASCII equivalent of the alarm message at the RS232C interface to the PC. Then, the alarm panel either transmits a new alarm message after a short delay or hangs up with the telephone line to terminate the call. If the alarm panel did not receive the kiss-off tone, the alarm panel may repeat transmitting the same alarm message four times. When LS15E+ sees the on-hook-state, it turns off the loop current for a few hundred milliseconds as a disconnect signal. Then, LS15E+ is now ready for a new call from the alarm panel. LS15E+ is compatible with the Ademco ® Contact ID Protocol for Alarm System Communications. Programmed parameters are restored upon powering off and on unless noted.

The line 2 of LS15E+ contains CPE (customer provided equipment) circuit to interface PBX inside line. If there is ring signal input at line 2, an off-hook relay is turned on to represent off-hook condition. After short time delay, LS15E+ transmits handshake tones of 1400 and 2300Hz in 100 ms each separated with 100 ms silence period. The rest of alarm receiver sequence is the same as for line 1 as follows: when the alarm panel receives the handshake tones, the alarm panel transmits a string of alarm message in DTMF tones with a check-sum at the end. When the alarm message with correct check-sum is received by LS15E+, it transmits the kiss-off tone to the alarm panel. LS15E+ also transmits the ASCII equivalent of the alarm message at the RS232C interface to the PC. Then, the alarm panel either transmits a new alarm message after a short delay or hangs up with the telephone line to terminate the call. If the alarm panel did not receive the kiss-off tone, the alarm panel may repeat transmitting the same alarm message four times. When the alarm panel hangs up the call, it produces disconnect signal that interrupts loop current at line 2. Then, LS15E+ turns off the off-hook relay. Then, LS15E+ is now ready for a new call from the alarm panel. LS15E+ is compatible with the Ademco ® Contact ID Protocol for Alarm System Communications. Programmed parameters are restored upon powering off and on unless noted. The alarm message length is programmable (May 22, 2006 change). The generation of kiss-off tone may be hold until receiving acknowledge from PC (September 15, 2006 change).

SECTION2

SPECIFICATIONS

Specifications of alarm receiver function:

Dialing: (same as the telephone line simulator function)

Telephone numbers:

1. Primary telephone number
2. Secondary telephone number

DTMF dialing signal power: -13dBm to +5dBm per a frequency with maximum 4dB difference between frequencies.

Pulse dialing: Break period: 45 to 75 ms (60 ms nominal), make period: 30 to 60 ms (40 ms nominal)

DTMF detecting signal power for alarm messages: -23dBm to +5dBm per a frequency with maximum 4dB difference between frequencies

Alarm message DTMF signal on time (Burst ON time): 50 ms minimum

Alarm message DTMF signal off time (Burst OFF time): 50 ms minimum 400 ms maximum
Note: Contact ID protocol requires Burst ON and OFF times to be 50 ms minimum and 60 ms maximum.

Handshake tones:

1400: 1400+/- 1Hz, duration of 100 ms +/- 1.5 ms, silence period of 100 ms +/- 1.5 ms, and
2300Hz: 2300+/-2 Hz duration of 100 ms +/- 1.5 ms

Kiss-off tones:

1400 +/- 1 Hz with duration of 750 ms

Kiss-off and handshake tones amplitude: selectable among -14 dBm, -20 dBm, and -30 dBm by control software

Line characteristics: (same as the telephone line simulator function)

Battery-feed voltage at line 1: (loop voltage): -20 volts

Off-hook impedance requirement at line 1: 400 ohms maximum DC, 600 ohms nominal AC(same as the telephone line simulator function)

Call Progress Tones at line 1: single frequency or dual frequency type selected by control software

Stutter dial tone at line 1: selected by control software

Line Input Jacks at line 1 and line 2: USOC-RJ11-C, standard modular phone jack

Programmable disconnect-signal at line 1: by control software

CPE port at line 2:

High voltage isolation: 1500VRMS between lines and RS232C connector.
Ring signal detector: opto-coupler
Signal isolation: telephone coupling transformer
Off-hook impedance: 50 ohms typical
High o-hook impedance is obtained by off-hook mechanical relay.
Handshake tone is produced after 1.8 seconds when the off-hook relay is turned on.

RS232C Interface:

Speed: 1200 baud, with one stop bit, no parity bit
The interface signals: Receive Data, Transmit Data, Data Set Ready, Clear-to-send, and ground. The Data Terminal Ready signal is forced high at LS15E+ meaning that a PC is always ready to receive data from LS15E+.
Connector: 9-pin D-sub on LS15E+ the rear panel
Cable(9-pin M/9-pin F) is provided.
Received alarm messages are computed for the checksum.

AC/DC Adapter(provided with LS15E+): 117VAC +/- 5%, or 230VAC +/- 5%(for optional 230V AC/DC Adapter)

AC/DC Adapter or Car Battery Adapter input: 12VDC unregulated, 800mA maximum

Line Status Display: red LED for each line to indicate off-hook status (continuous on)

Calibration: not required because digitally synthesized tones

Power-On Indicator: green LED display

Dimensions: 19 cm (4") W x 4.5 cm (1.75") H x 10 cm (7.5") L

Weight: 400g (0.8 LBS.)

Environmental: Operating temperature: 0 to 35 degree C, Humidity: 85% RH at 35 degree C

Warranty/Service: 6 months limited warranty. No warranty if any factory seal is broken. Service is performed at the factory, usually within 5 working days.

Options and Accessories:

Car Battery Adapter

230V input AC/DC Adapter (117V input unit is a standard.)

Reference: Digital Communication Standard-SIA DC-05-1999.09, Ademco Contact ID Protocol for Alarm System Communications

SECTION3

PROGRAMMING

3.1 Programming of email parameters and communication port

Programming of email parameters is done by the software “centralprogram.exe”. The specified wavefile may be played for specified length as shown. If email transmission is not required, Unmark the button shown below. RS232 communication port needs to be input into the window shown. Auto comport detection may be provided by this software for selecting communication port automatically among port 1 and port 9. Leave it in “COM1” if your Control Panel in Windows systems in PC allows changing communication port.

The screenshot shows a window titled 'centralprogram' with the following fields and controls:

- EMAIL PARAMETERS** (Section Header)
- SMTP SERVER**: Empty text box
- TO ADDRESS**: Empty text box
- USER NAME**: Empty text box
- SUBJECT**: Text box containing 'LS15E++-Reporting alarm condition'
- PASSWORD**: Empty text box
- WAVEFILE**: Text box containing './program/popeye.wav'
- SENDER**: Empty text box
- WAVEFILE PLAYING LENGTH IN 100MS**: Text box containing '50'
- FROM ADDRESS**: Empty text box
- ENABLE EMAIL**: Radio button (checked)
- COMMPORT**: Text box containing 'COM1:'
- AUTO COMMPORT DETECTION**: Button

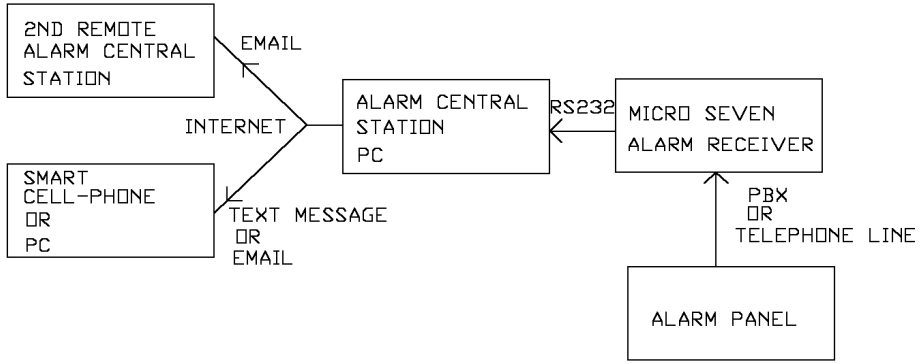
Figure 3-3 RS232 port and email parameters programming

3.2 Building files for customer profile information and email addresses for programming manually

1. In “**program**” directory, edit **servername.txt** by using Notepad editor or other text editor to enter your local SMTP server, i.e. smtp.microseveninc.com. Do not enter carriage return at the end. If you don’t have a local SMTP server or SMTP email account, we can provide you your own email account with low email volume for small monthly fee. The SMTP server needs to be non SLL type.
2. In “**program**” directory, edit **username.txt** by using Notepad editor or other text editor to enter your username to your local SMTP server, i.e. alarmtesting1@microseveninc.com Do not enter carriage return at the end.

3. In “**program**” directory, edit **password.txt** by using Notepad editor or other text editor to enter your password to your local SMTP server. Do not enter carriage return at the end.
4. In “**program**” directory, edit **subject.txt** by using Notepad editor or other text editor to enter subject field in your email, i.e. “CT10-Reporting alarm condition”. Do not enter carriage return at the end.
5. In “**program**” directory, edit **sender.txt** by using Notepad editor or other text editor to enter name of sender and email address in your email, Do not enter carriage return at the end. i.e. “John Kicker< sales@microseveninc.com>”
6. In “**program**” directory, edit **fromaddress.txt** by using Notepad editor or other text editor to enter name of your email address, i.e. “ sales@microseveninc.com”. Do not enter carriage return at the end.
7. In “**program**” directory, edit **toaddress.txt** by using Notepad editor or other text editor to enter the primary email address which is the first email address that an alarm message is sent to. Leave it blank if there is no primary email address. Do not enter carriage return at the end.
8. Each subscriber’s email address is contained under each account number in “**custemail**” directory. For example, file “1234” contains an email address of the subscriber’s account. Leave it blank if you do not want to send alarm messages to subscriber’s email address. Leave it blank if there is no primary email address. Do not enter carriage return at the end.
9. Each subscriber’s profile information that may include name, address, and phone number may be included under each account number in “**customer**” directory. For example, file “1234” may contain name, address and phone number of account holder 1234. The example of profile information is as follows:
Abc corporation
1234 NE Broadway
Anycity, Anystate
Zip code
Phone number555-555-5555
Fax 555-555-5555
Email address
Name John Smith

EMERGENCY CONDITIONS REPORTING



3.3 RS232 interface specifications

This specifications are for reading data directly from Micro Seven's alarm receiver without using Micro Seven's central station software or DLL software components.

Note: Readers are assumed to be familiar with Digital Communication Standard-SIA DC-05-1999.09, Ademco Contact ID Protocol for Alarm System Communications.

3.3.1 RS232 signals

1200baud

1 stop bit and no parity for all communications

CTS hardware handshake signal

RTS and DTR signals that hold PC transmission to alarm receiver are not monitored, and they are assumed for asserted at the interface.

3.3.2 Received data

Sixteen character ASCII data including a checksum character is output to PC as shown below:

1234181131010158<CR>

First four characters "1234" are account number, "18" for Contact-ID message, "1" for new message, "131" for the event "Perimeter Burglary", "01" for the partition, "015" for the zone, "8" for the checksum and carriage return (hex 0DH).

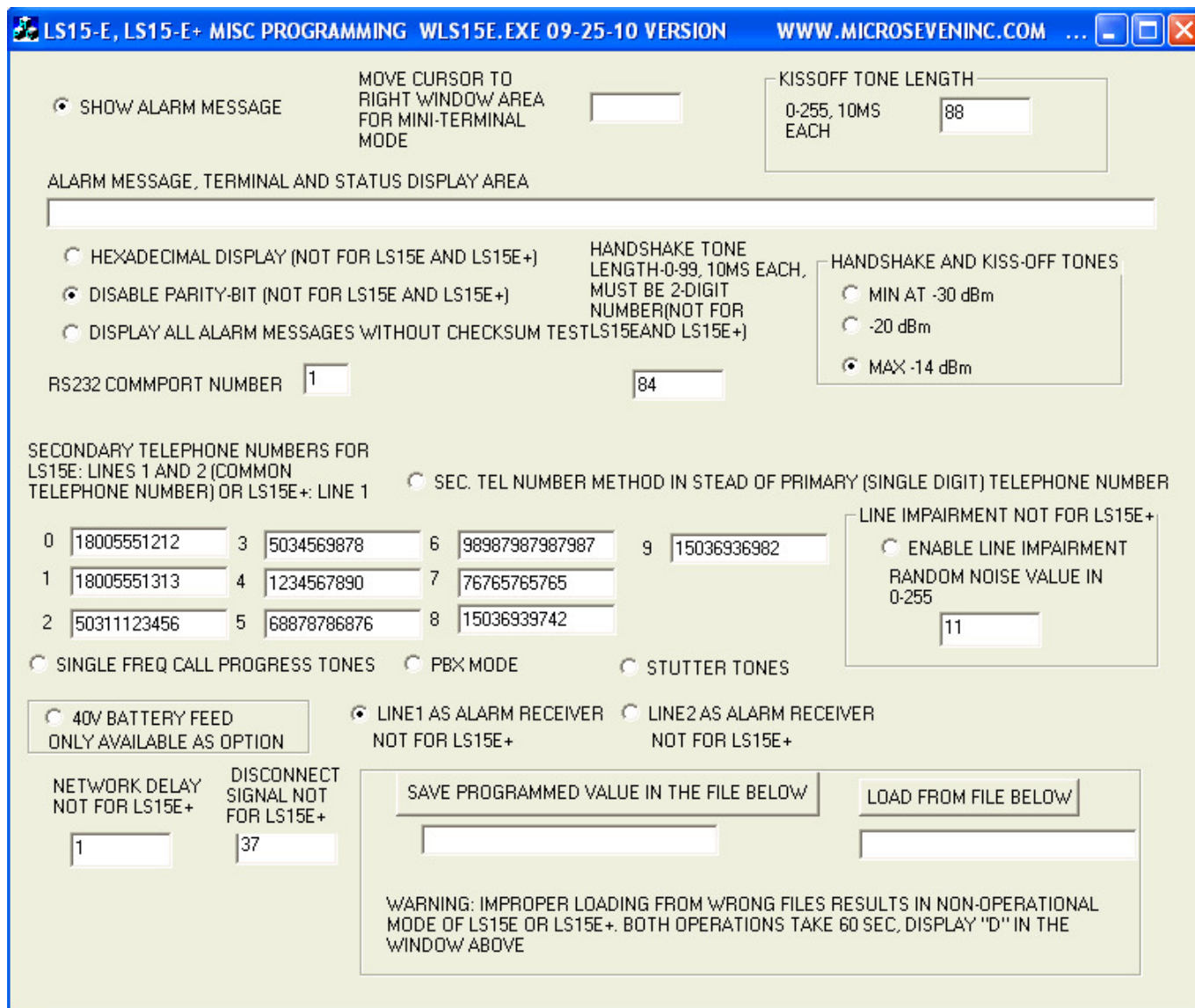
3.4 LS15E+ CONTROL SOFTWARE, WLS15E.EXE

Installation procedure

The following files are required in your disk file to operate WLS15E.EXE.

WLS15E.EXE

commport



SHOW ALARM MESSAGE

Showing received Contact-ID alarm messages in the display window area below.

MOVE CURSOR TO RIGHT WINDOW AREA FOR MINI-TERMINAL MODE

Reading and writing data memory between PC and LS15E+ may be done by moving the cursor to the edit window on the right and type for example "R55", and the data memory content is shown in the large display window below.

KISSOFF TONE LENGTH

Enter a new number in the edit window on its right. Each count is 10 ms long.

HEXADECIMAL DISPLAY-It is not for LS15E+.

DISABLE PARITY-BIT-It is not for LS15E+.

HANDSHAKE TONE LENGTH-It is not for LS15E+.

HANDSHAKE AND KISSOFF TONES (AMPLITUDE) PROGRAMMING: selectable among – 14, -20, and –30 dBm amplitude

RS232 COMMPORT NUMBER-enter RS232 communication port number in the edit window area. If it is invalid number “?” is shown in the large display area.

SECONDARY TELEPHONE NUMBER METHOD IN STEAD OF PRIMARY (SINGLE DIGIT) TELEPHONE NUMBER:

The secondary telephone number is selected, ten different telephone numbers are provided as shown in the ten edit windows. Each telephone number is compatible for dialing at both line 1 and line 2. Programmed telephone numbers are stored in EEROM.

LINE IMPAIRMENT (not for LS15E+)

When it is selected, insertion losses is 20 dB between line 1 and line 2 for telephone line simulator mode and random noise (only for LS15E-X1) with programmable amplitude. Enter new value for random noise amplitude in the edit window.

SINGLE FREQUENCY CALL PROGRESS TONES

When it is not selected, the dual frequency call progress tones are enable.

PBX MODE

Dialing “9” would produce dial tone again.

STUTTER TONES

When it is enabled, the dial tone is interrupted several times.

40V BATTERY FEED

If it is not selected, the battery feed voltage is 21 volts. 40V battery feed is only available for 40V battery feed option for both LS15E and LS15E+.

LINE1 AS ALARM RECEIVER and LINE2 AS ALARM RECEIVER(not for LS15E+)

If it is not selected, telephone line simulator function is enabled. The factory default of LS15E is that line 1 as alarm receiver and line 2 as telephone line simulator.

NETWORK DELAY(not for LS15E+)

Delay between 0 and 2.55 seconds may be programmed to simulate network delay which is time delay between end of dialing and beginning of ring signal generation at called line.

DISCONNECT SIGNAL(not for LS15E+)

Disconnect signal is sent at the other line when the line becomes on-hook. During the disconnect signal period, loop current is turned off. It is programmable between 0 and 2.55 seconds with 10 ms increment.

SAVE PROGRAMMED VALUE IN THE FILE BELOW

Click the button for storing programmed value in EEROM for 256 bytes in selected file name below. It takes about 60 seconds, and a character “D” is shown in the large display area.

LOAD FROM FILE BELOW

Click the button for loading programmed value into EEROM from file which is shown in the edit window area. . It takes about 60 seconds, and a character “D” is shown in the large display area. The factory default file is “DEF1207.09”, which is provided in a CD.

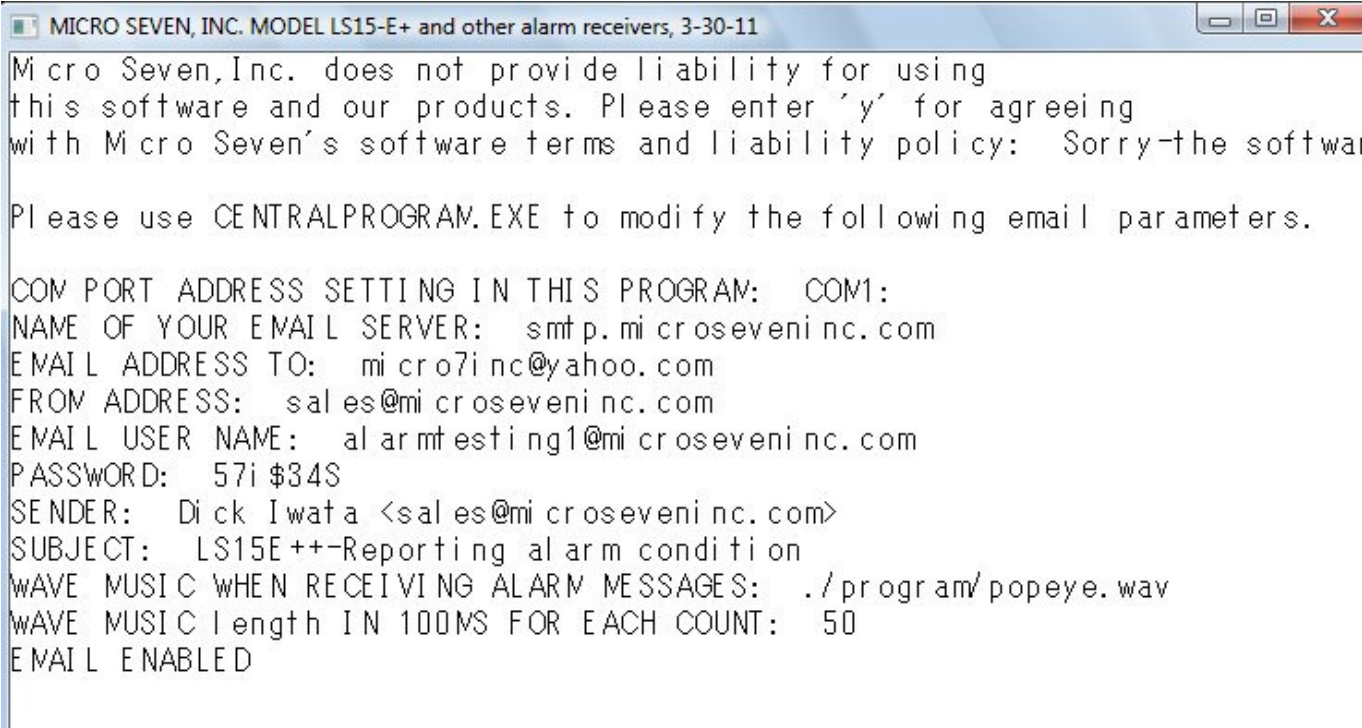
SECTION 4

OPERATION

4.1 First-time operation without alarm panel

The following procedure requires a telephone set with memory dial for dialing sixteen digits of telephone number. Please follow the procedures below:

1. Connect AC/DC adapter to correct AC power. Connect the power cable to LS15E+. Turn on the power switch on LS15E+ front panel.
2. Connect provided interface cable with 9-pin D-sub connectors to PC and LS15E+.
3. Run "centralE+.exe"



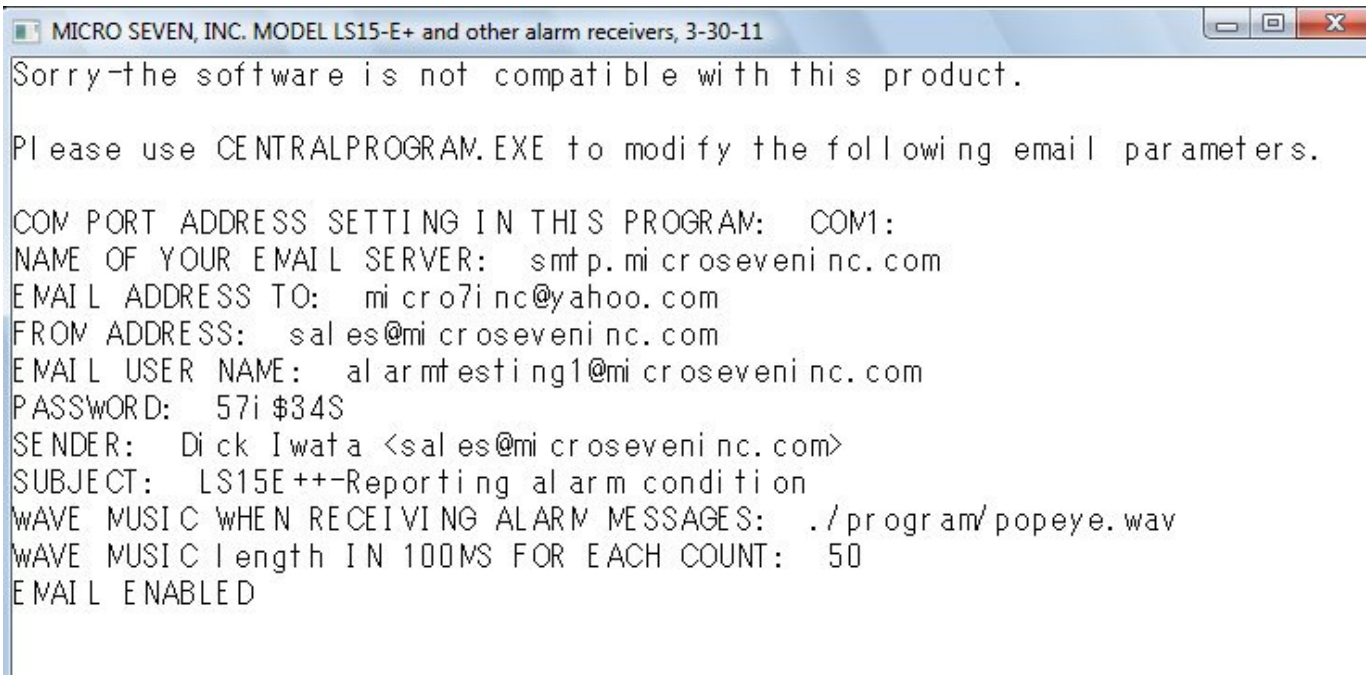
```

MICRO SEVEN, INC. MODEL LS15-E+ and other alarm receivers, 3-30-11
Micro Seven, Inc. does not provide liability for using
this software and our products. Please enter 'y' for agreeing
with Micro Seven's software terms and liability policy: Sorry-the softwar

Please use CENTRALPROGRAM.EXE to modify the following email parameters.

COM PORT ADDRESS SETTING IN THIS PROGRAM: COM1:
NAME OF YOUR EMAIL SERVER: smtp.microseveninc.com
EMAIL ADDRESS TO: micro7inc@yahoo.com
FROM ADDRESS: sales@microseveninc.com
EMAIL USER NAME: alarmtesting1@microseveninc.com
PASSWORD: 57i$34S
SENDER: Dick Iwata <sales@microseveninc.com>
SUBJECT: LS15E++-Reporting alarm condition
WAVE MUSIC WHEN RECEIVING ALARM MESSAGES: ./program/popeye.wav
WAVE MUSIC length IN 100MS FOR EACH COUNT: 50
EMAIL ENABLED
  
```

4. After liability statement, the screen shows if the RS232 communication port on the screen does not match with programmed value. Go back to section 3, and program it with correct communication port number that is shown in the "Device Manager" of the Windows systems. Some Windows allow selecting any communication port number through the Control Panel. Changing port is done as shown in Figure 3-3 for RS232 port and email parameters programming in centralprogram.exe. There may be software button on the screen to search comport number in your computer and automatically selects it for LS15E+ for you.



```

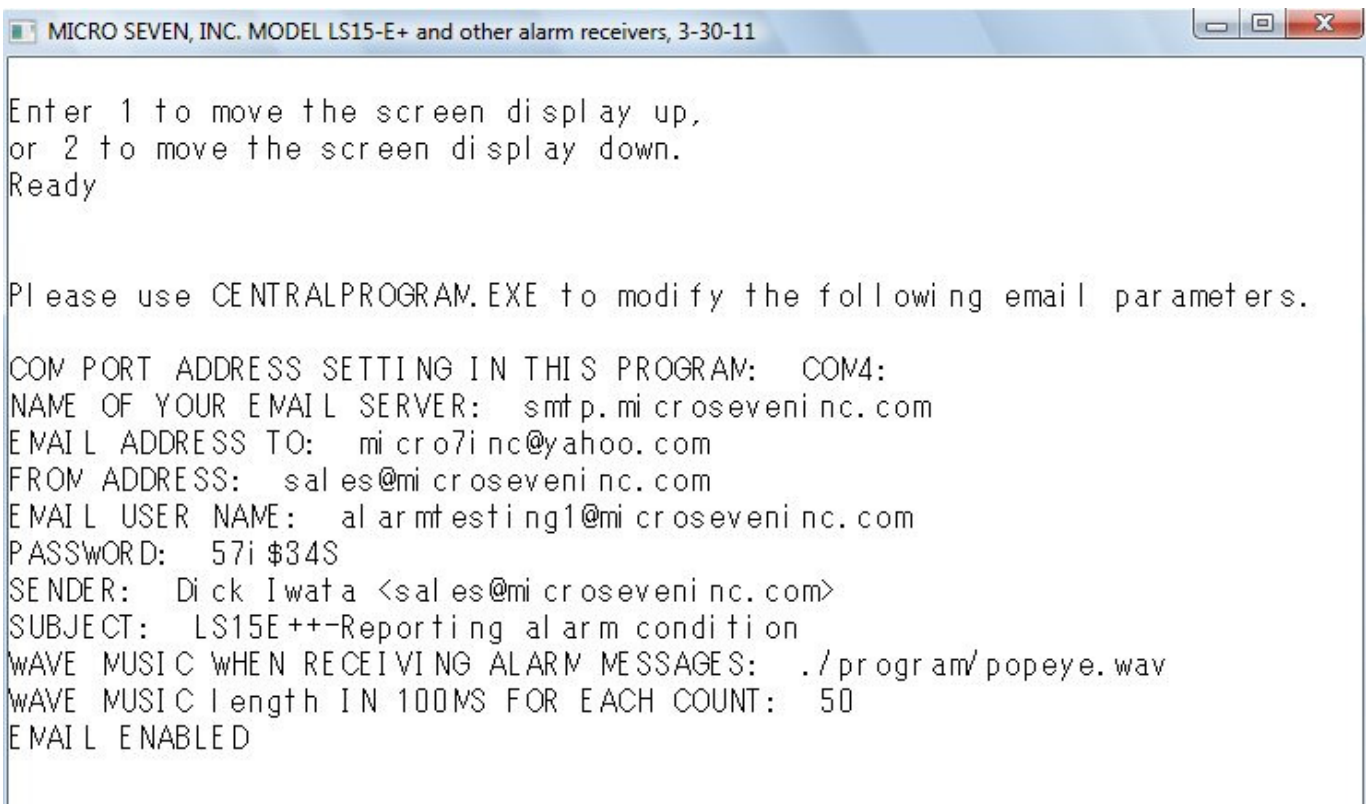
MICRO SEVEN, INC. MODEL LS15-E+ and other alarm receivers, 3-30-11
Sorry-the software is not compatible with this product.

Please use CENTRALPROGRAM.EXE to modify the following email parameters.

COM PORT ADDRESS SETTING IN THIS PROGRAM:  COM1:
NAME OF YOUR EMAIL SERVER:  smtp.microseveninc.com
EMAIL ADDRESS TO:  micro7inc@yahoo.com
FROM ADDRESS:  sales@microseveninc.com
EMAIL USER NAME:  alarmtesting1@microseveninc.com
PASSWORD:  57i $34S
SENDER:  Dick Iwata <sales@microseveninc.com>
SUBJECT:  LS15E++-Reporting alarm condition
WAVE MUSIC WHEN RECEIVING ALARM MESSAGES:  ./program/popeye.wav
WAVE MUSIC length IN 100MS FOR EACH COUNT:  50
EMAIL ENABLED

```

5. After correcting port number, LS15E+ is ready to receive alarm message. Then the display would show as below:



```

MICRO SEVEN, INC. MODEL LS15-E+ and other alarm receivers, 3-30-11
Enter 1 to move the screen display up,
or 2 to move the screen display down.
Ready

Please use CENTRALPROGRAM.EXE to modify the following email parameters.

COM PORT ADDRESS SETTING IN THIS PROGRAM:  COM4:
NAME OF YOUR EMAIL SERVER:  smtp.microseveninc.com
EMAIL ADDRESS TO:  micro7inc@yahoo.com
FROM ADDRESS:  sales@microseveninc.com
EMAIL USER NAME:  alarmtesting1@microseveninc.com
PASSWORD:  57i $34S
SENDER:  Dick Iwata <sales@microseveninc.com>
SUBJECT:  LS15E++-Reporting alarm condition
WAVE MUSIC WHEN RECEIVING ALARM MESSAGES:  ./program/popeye.wav
WAVE MUSIC length IN 100MS FOR EACH COUNT:  50
EMAIL ENABLED

```

6. program your alarm panel to dial single digit telephone number "2".
7. Connect your alarm panel at line 1 of LS15E+. Make your alarm panel to start an event.

8. An alarm message is delivered to LS15E+, the received message is converted to IP-type message and delivered to the alarm receiver server at PC #2.

9. typical PC display of a received alarm message at PC#1 is shown below:

Alarm message number: 12354
Fri Mar 23 10:47:10 2007
Alarm message: 1234181131010158
Account number: 1234
Event qualifier: New Event
Event code: 131 Perimeter-Burglar Alarm
User/Zone Number: Zone 015
Partition number: 01

Date and time and consecutive alarm message number, and stores decoded messages are stored in a text file, "al".

10. Above data is transmitted to email address in the "TO ADDRESS" and also email address for each account file in the "custemail".

SECTION5

ADDITIONAL FEATURES

Note: the following programming is normally not required for most of operations, and its programming is done by using commercially available Hyperterminal software or by using the alarm monitor mode (MOVE CURSOR TO RIGHT WINDOW AREA FOR MINI-TERMINAL MODE)as described in the section 3.4.

5.1 Kissoff tone duration

The Contact ID protocol specification requires the length of kissoff tone that is transmitted by the receiver to be 750 ms mimimum 1 sec maximum. LS15E+ allows programming of kissoff tone by the following key typed during alarm monitor mode: MFB(n1)(n2), where n1 n2 forms two hexadecimal value multiplied by 9.1 ms., i.e. MFB6D for 1 sec and MFB52 for 750 ms. Programmed value stays in EEROM in LS15E+.

5.2 Handshake signal programming-caution: this operation affects section 4.6 below.

By entering the following key strokes, handshake signals may be generated continuously:
Note: this condition will not be restored upon powering off and on.

WEC11 for continuous generation of 1400 Hz tone

WEC14 for continuous on and off of 1400 Hz tone

WEC12 for continuous on and off of 2300 Hz tone

WEC18 for continuous on and off of 2300 Hz tone

5.3 Alarm message length programming (May 22, 2006 change)

The standard alarm message-length of Contact ID protocol is sixteen digits including the checksum; however, non-standard alarm messages that are shorter than sixteen digits are accepted by sending the following commands:

MFD n1 n2, where n1 and n2 in hexadecimal notation forms one byte. MFD10 programs the factory-default sixteen digits. For example, command "MFD0F" is needed for fifteen-digit long message.

5.4 Number of ring programming (July 20, 2006 change)

The number of ring period before the off-hook relay at line 2 is turned on for an incoming call is programmed by:

MF9 n1 n2, where n1 and n2 in hexadecimal notation forms one byte. MF901 programs the factory-default single ring-period. Note that one ring period consists of ring-on period and ring-off period, and the off-hook relay is turned on the beginning of next ring period.

5.5 kiss-off tone hold (September 15, 2006 change)

When a command MAE08 is output once, kiss-off tone generation is hold until receiving acknowledge ASCII "a" from PC within 1.25 seconds. This set-up is stored in EEROM until a command MAE00 is output to enable kiss-off tone generation again. The alarm receiving software on or after 9-10-06 version is compatible with this change.

5.6 LS15E+ control register (March 30 change)

Bit 7: When LS15E+ is powered up, unique RS232 communication handshake mode is employed to interface with slower PCs. In this mode, if you are using Hyperterminal, only first character of received alarm message from LS15E+ is displayed until LS15E+ receives a carriage return character (hex D) from PC. To disable the handshake mode between PC and LS15E+, bit 7 of LS15E+ control register needs to be cleared. Then all characters from LS15E+ are displayed at PC. The input buffer size at PC requires to be set for minimum sixteen bytes.

Bit 6: When bit 6 of LS15E+ control register is on, incoming calls at line1 and line 2 are aborted after elapsing time value of two time-out registers. The LSB time-out register is programmed by MF0(n1)(n2), and the MSB time-out register is programmed by MF1(n1)(n2). The factory default values of time-out registers can be obtained by MF04A and MF102 for three seconds. The abort time-out is reset by receiving single DTMF tone. (August 23, 2006 change)

To write LS15E+ Control register, non-volatile memory operation, MEC(n1)(n2) is needed. For example, a command MEC40 disables communication handshake mode and enables time-out. Non-volatile memory operation commands should not be used continuously because of limited operations.

5.7 LS15E+ Control Register 2 (July 16, 2007 addition)

The content of the LS15E+ Control Register 2, address E0 in non-volatile memory, requires LS15E+ to be powered down to be effected. ME020 would set for a factory default condition.

The bit 5 10-dB-amplifies DTMF signal inputs for alarm signal inputs when it is set. It is intended to read alarm signals at line 2, FXO input, from long-distance or poor telephone line with bit 5 on. The DTMF dialing input or reading alarm signals at line 1 is not affected. The factory default is the bit 5 on.

5.8 LS15E+ programming silence period after ring signal is detected (May 26, 2009 addition)

The LSB silence period after LS15E+ turns on the off-hook relay is programmable by the following format:

MADn1n2, i.e. MAD01 programs 10ms delay after the relay is turn on before generating handshake signal.

As a special case, MAD00 would programs two seconds delay. The factory default is MAD00 and two-second delay.

5.9 LS15E+ programming silence period after ring signal is detected (May 26, 2009 addition)

The MSB silence period after LS15E+ turns on the off-hook relay is programmable by the following format:

MFFn1n2, i.e. MFF01 adds 2.2 seconds silence time before generating handshake signals.

5.10 Hang-up timer enabled/disabled by alarm command (Sep. 29, 2009 change)

When LS15E+ receives an alarm message with alarm code “606-listen-in feature”, hang-up timer is disabled to keep telephone line open so that central station operators can listen in.

When LS15E+ receives other commands, the hang-up timer is restored. The enabled/disabled function by using LS15E+ control register with the bit 6 of LS15E+ control register is disabled.

5.11 LS15E+ Control Register 3 (Dec. 4, 2009 addition, firmware EP1209.09)

The LS15E+ control register3 is address A1 in EEROM. The LS15E+ control register 3 is written by MA1 n1 n2 where n1 and n2 forms two hexadecimal-notation. Command “MA104” writes the factory default.

Bit 0: not used

Bit 1: When this bit is set, generates ASCII “A” for receiving DTMF “A” in received alarm messages. It also generates ASCII “0” for receiving DTMF “0” with 941Hz and 1633Hz frequency components. Note that the DTMF “0” is undefined signal component in Digital Communication Standard-SIA DC-05-1999.09, Ademco Contact ID Protocol for Alarm System Communications.

The factory default of the bit is off.

Bit 2: When the bit 2 is set, DTMF “0” with 941Hz and 1633Hz frequency components is recognized as decimal 10 for checksum calculation in any part of alarm messages. Please notice that there is different meaning when the bit of the control register 3 is on. The factory default of the bit is on. Either bit 2 or bit 3 may be set or both bit 2 and bit3 may be off simultaneously. The factory default of the bit is on.

Bit 3: When the bit 2 is set, DTMF “0” with 941Hz and 1633Hz frequency components is recognized as decimal 10 for checksum calculation in only checksum part of alarm messages. Please notice that there is different meaning when the bit of the control register 2 is on. The factory default of the bit is off. Either bit 2 or bit 3 may be set or both bit 2 and bit3 may be off simultaneously. The factory default of the bit is off.

Bit 4: When the bit 4 is set, no checksum test is conducted, and kiss-off tones are not generated until it received ASCII “a” from PC. Commands “WEC10” is required to transmit to PC whenever power is turned on to enable transmission of alarm messages to PC. The factory default of the bit is off.

Examples:

Mode 1: No special check-sum calculation for DTMF “0”. In this mode 1, normal checksum test is conducted. This mode is enabled by “MA100”. . In this mode, there is no data transmission when checksum is incorrect even with a command “WEC10”.

Kiss-off tone hold is also available as follows: When a command MAE08 is output once, kiss-off tone generation is hold until receiving acknowledge ASCII "a" from PC within 1.25 seconds. This set-up is stored in EEROM until a command MAE00 is output to enable kiss-off tone generation again

Mode 2A: convert all received DTMF “0” in any position of alarm signals for adding decimal 10 for checksum calculation. This mode is entered by “MA104”. Command “MA106” is required for seeing ASCII “A” and “0”.

Mode 2B: convert received DTMF “0” in only checksum position of alarm signals for adding decimal 10 for checksum calculation. This mode is entered by “MA108”. Command “MA10A” is required for seeing ASCII “A” and “0”.

Mode 3: There is no checksum-calculation and no normal kiss-off tone generation in this mode. Kiss-off tone is generated when it receives ASCII “a” from PC within time frame of 1.25 seconds. The difference between the kiss-off tone hold in the above mode 1 and mode 3 is that it transmits all receiving messages to PC no matter checksum is correct or not. This mode is entered by “MA10” to set bit 4 of the control register 3 and “WEC10” to transmit ASCII equivalent of received signals to PC. Note that command “WEC00” is required when power is recycled. For this mode 3, command “MA12” which also sets bit 1 of the control register 3 enables transmission of ASCII “A” for DTMF “A” and ASCII “0” for DTMF “0” to PC.

5.12 Normal mode with checksum calculation by alarm receivers (factory default mode)

Micro Seven’s alarm receiver calculates checksum internally in hardware. If the checksum is correct, it transmits sixteen ASCII characters corresponding with incoming alarm signals including a checksum and a carriage return with hexadecimal value of 0DH. If checksum are incorrect, no data are transmitted to PC. No interface status characters from alarm receivers are transmitted to PC other than responses after memory write and read commands.

The checksum calculation and automatic kiss-off generation by alarm receivers are the factory-default features, and this mode is set with a command with a command MAE00 and “MA104”. There is a confirmation ASCII “C” from alarm receiver after each EEROM writing command. The content of the registers are read by “QAE” and “QA1” with “00” and “04”.

Note: do not include the command “MAE00” and “MA104” in your software because of number of write operation to EEROM is limited.

5.13 Normal mode with checksum calculation by alarm receivers with kiss-off hold

Micro Seven’s alarm receiver calculates checksum internally in hardware. If the checksum is correct, it transmit sixteen ASCII characters corresponding with incoming alarm signals including a checksum and a carriage return with hexadecimal value of 0DH. If checksum are incorrect, no data are transmitted to PC. No interface status characters from alarm receivers are transmitted to PC other than responses after memory write and read commands.

The kiss-off tone generation is hold until receiving acknowledge ASCII "a" from PC within 1.25 seconds after the end of transmission of data to PC with a carriage return character.

This mode is set with a command with a command MAE08 and “MA104”. There is a confirmation ASCII “C” from alarm receiver after each EEROM writing command. The content of the registers are read by “QAE” and “QA1” with “08” and “04”.

Note: do not include the command “MAE08” and “MA104” in your software because of number of write operation to EEROM is limited.

5.14 no checksum calculation by alarm receivers

This mode allows PC calculating checksum of incoming data and sending command to alarm receivers for generation of kiss-off tone. There is no checksum-calculation and no normal kiss-

off tone generation in this mode. Kiss-off tone is generated when it receives ASCII "a" from PC within time frame of 1.25 seconds of the end of data with a carriage return character. The difference between the kiss-off tone hold in the above 8.3 and this mode is that it transmits all receiving messages to PC no matter checksum is correct or not.

This mode is entered by "MA114" for EEROM(flash memory) and "WEC10" at data memory (which loses after powering off at alarm receivers) to transmit ASCII equivalent of received signals to PC. Include "WEC10" always in initialization section of your software.

Note: do not include the command "MA114" in your software because of number of write operation to EEROM is limited.