E500 Communication Interface and Monitor

Year 2000 Compliant in accordance with BSI document DISC PD2000-I:1998

DESCRIPTION

The E500 Communication Interface performs a number of functions including flame safeguard system supervision, alarm point monitoring, auto dial, gateway operation for a shared phone line, relay output scheduling and power interruption history. It will supervise the operation of up to six Fireye® FLAME-MONITOR™ or MicroM controls and provide dial-out alarm notification concerning a number of user selectable features.
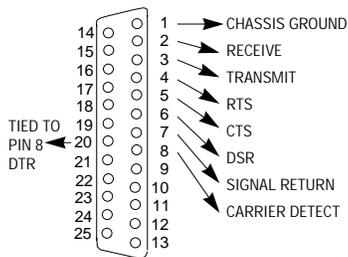
The interface has a built-in 300/1200 BAUD auto-answer, auto-dial modem with RJ11 connector, RS232c port with selectable BAUD RATE (300-9600), two alarm/counter input terminals, and one relay output and up to four Flame-Monitor parallel input ports.

The E500 also provides two methods for communicating with Fireye controls:

1. an RS485 interface to communicate with up to six FLAME-MONITOR or MicroM controls and six E340 Boiler controls, wired in a multi-drop configuration

  or

2. the E500 also has up to four parallel communication input ports to communicate with older style FLAME-MONITOR controls.

The primary function of the E500 is to provide communication capability to the Flame-Monitor flame safeguard system. It allows for historical information retrieval not accessed by the display module of the Flame-Monitor as well as dial out operation on an alarm. Using the E500, a message can be displayed at a remote terminal when a safety shutdown occurs at the burner. The remote terminal may be located in the same building as the E500 or may be remotely located when using telephone communications. The Flame-Monitor or MicroM will safely react to all interlocks and operational functions even while the E500 is transmitting and receiving data.

When another communication system is located in the same area, the E500 Communication Interface can act as a gateway to a single telephone line, allowing the operator to use both systems. A single RS232c connector port is integral to the E500 for this purpose. (A typical example is an HVAC energy management communication system.)

CHASSIS GROUND — 1
RECEIVE — 2
TRANSMIT — 3
RTS — 4
CTS — 5
DSR — 6
SIGNAL RETURN — 7
CARRIER DETECT — 8

Pins 14–25 and 9–13 shown on DB25 connector.

TIED TO PIN 8 — 20 DTR

Supply Voltage: 120 (VAC + 10% - 15%) 50/60 Hz.

Power consumption: 4.0 VA Max.

Operating Temperature Limits: 32°F + 125°F (0°C +52°C).

Humidity: 85% R.H. Maximum (Non-Condensing).

Input Connection: Fireye cable type ED550.

Parity: Selectable, even or none.

Data Bits: 7 w/even parity, 8 w/no parity.

Software: X-On X-OFF Software handshaking used to control data transmission.

User-Inputs 1 & 2: Used as Counter—Max. count rate 250Hz. or used as Alarm.

Dry Contact Inputs: Do not apply voltage to this circuit.
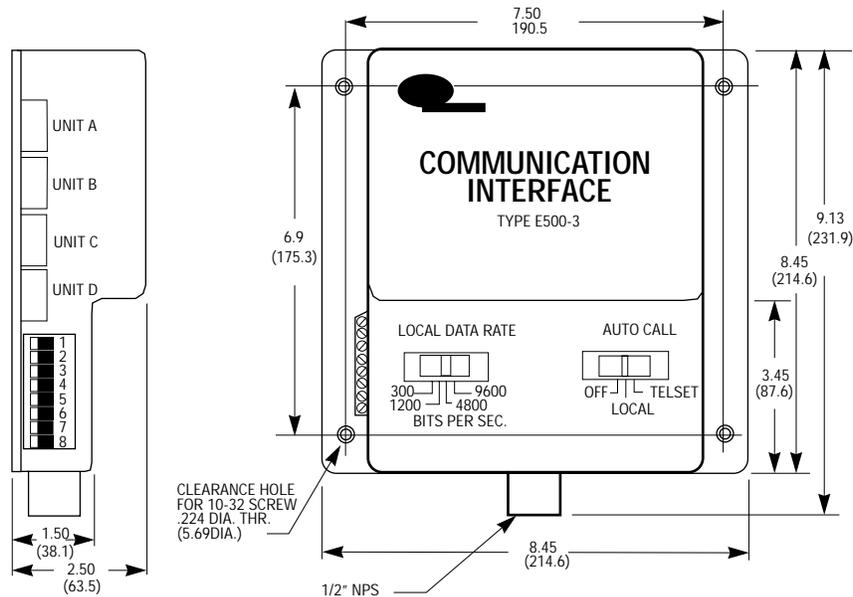
Relay Output: One SPDT elec. Isolated. Relay contacts suitable for 24V Class 2.

Circuits. Minimum Contact Rating 10 ma. - 5 amps.

Output: Telephone—RJ11 standard receptacle. Modem transmission rate 300 or 1200 BAUD. LOCAL—RS232C Connector (6 Conductor Minimum)). Selectable data transmission rate (BAUD rate) 300, 1200, 4800, 9600).

RS485 Inputs: Used for RS485 communications to FIREYE FLAME-MONITOR controls and E340 Boiler Room Control System.

DIMENSIONS

COMMUNICATION INTERFACE

TYPE E500-3

UNIT A
UNIT B
UNIT C
UNIT D

LOCAL DATA RATE
300 — 9600
1200 — 4800
BITS PER SEC.

AUTO CALL
OFF — TELSET
LOCAL

7.50
190.5

6.9
(175.3)

9.13
(231.9)

8.45
(214.6)

3.45
(87.6)

1.50
(38.1)

2.50
(63.5)

CLEARANCE HOLE FOR 10-32 SCREW .224 DIA. THR. (5.69DIA.)

1/2" NPS

8.45
(214.6)

APPROVALS

UL — File MP1537 **CSA**—CERTIFIED
FM — APPROVED **FCC** — CERTIFIED
CDC — Certified (Canadian Department of Communication)

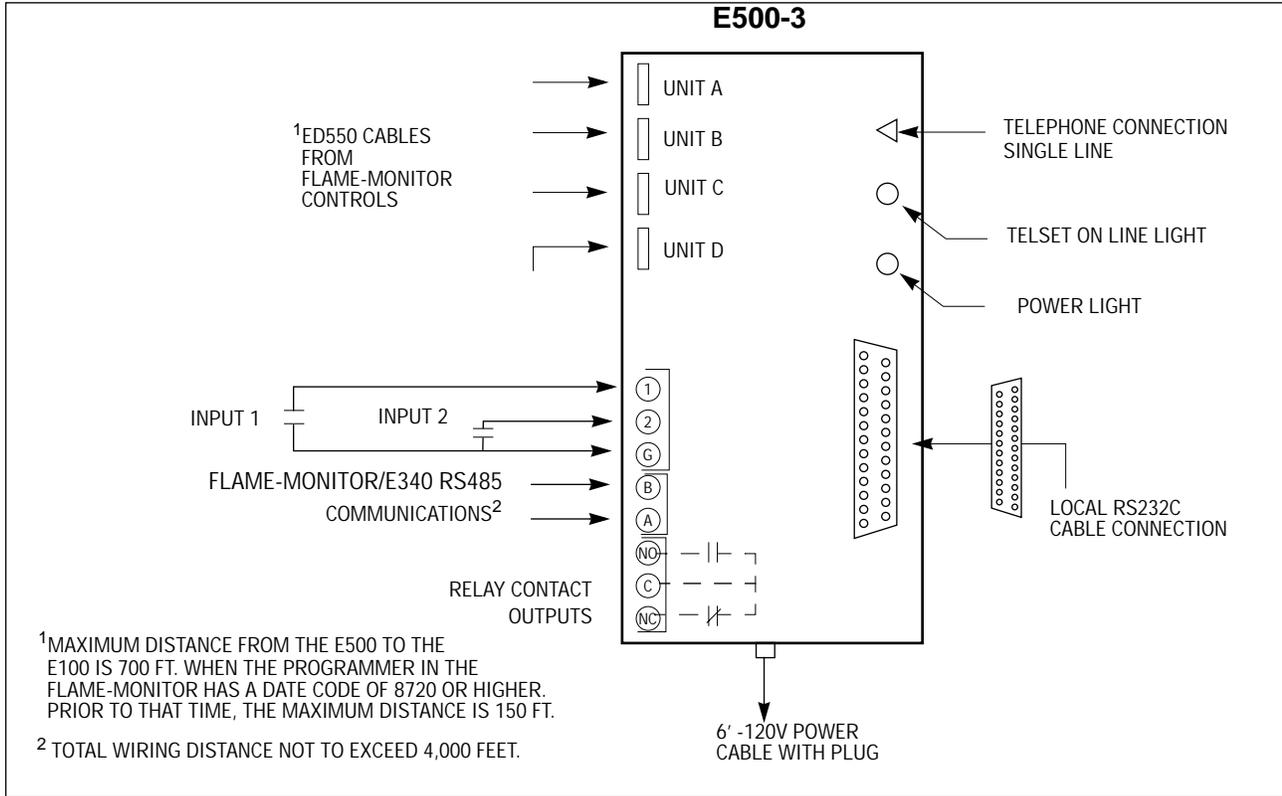**Year 2000 Compliant in accordance with BSI document DISC PD2000-I:1998**

E500 ORDERING INFORMATION

PART NUMBER	DESCRIPTION
E500-1	Communicate with one Flame-Monitor control via communication input port, or six Flame-Monitor or MicroM controls via RS485.
E500-3	Communicate with four Flame-Monitor controls via communication input ports, or six Flame-Monitor or MicroM controls via RS485.

ACCESSORIES

PART NUMBER	DESCRIPTION	PART NUMBER	DESCRIPTION
ED610	Telephone jack adapter board for use when connecting a FLAME-MONITOR control and/or E340 Boiler control to an E500 communication Interface. (See Bulletin E-8002.)	ED600	Ribbon cable adapter board for use when running long lengths of shielded cable from the Flame-Monitor control to the Communication Interface. (See Bulletin E-8001.)
ED512-2	2-foot cable with RJ12 connectors to connect a FLAME-MONITOR control to E500. Used with ED610. (See Bulletin E-8002.)	ED550-2	18-inch cable to connect FLAME-MONITOR controls (with EP programmer Eng. code 26 or lower) to E500. Used with ED600. (See Bulletin E-8001.)
ED512-4	4-foot cable with RJ12 connectors to connect FLAME-MONITOR controls to E500. Used with ED610. (See Bulletin E-8002.)	ED550-3	3′ cable to connect FLAME-MONITOR control (with EP programmer Eng. code 26 or lower) to E500. Used with ED600. (See Bulletin E-8001.)
ED512-8	8-foot cable with RJ12 connectors to connect FLAME MONITOR control to E500. Used with ED610. (See Bulletin E-8002.)	ED550-6	6′ cable to connect FLAME-MONITOR (with EP programmer Eng. code 26 or lower) to E500. Used with ED600. (See Bulletin E-8001.)

NOTE: Flame-Monitor may include EP or EPD style programmers

E500-3

UNIT A

UNIT B → TELEPHONE CONNECTION SINGLE LINE

UNIT C

UNIT D

[1]ED550 CABLES FROM FLAME-MONITOR CONTROLS

TELSET ON LINE LIGHT

POWER LIGHT

INPUT 1   INPUT 2
①
②
Ⓖ

FLAME-MONITOR/E340 RS485
COMMUNICATIONS[2]
Ⓑ
Ⓐ

LOCAL RS232C CABLE CONNECTION

NO
RELAY CONTACT OUTPUTS   C
NC

[1]MAXIMUM DISTANCE FROM THE E500 TO THE E100 IS 700 FT. WHEN THE PROGRAMMER IN THE FLAME-MONITOR HAS A DATE CODE OF 8720 OR HIGHER. PRIOR TO THAT TIME, THE MAXIMUM DISTANCE IS 150 FT.

[2] TOTAL WIRING DISTANCE NOT TO EXCEED 4,000 FEET.

6' -120V POWER CABLE WITH PLUG

RS232C-style connections and cables are available at many computer stores. Minimum pin requirements for this cable are #'s 1, 2, 3, 7, 8, 20. Maximum Distance for Local RS232 C Cable:

BAUD RATE	DISTANCE (FT))
300	1,000
1,200	500
4,800	250
9,600	125

OPERATION

Two models of the E500 are available. The only difference is the number of parallel communication input ports to communicate with older style Flame-Monitor controls. The E500-1 has one parallel communication port, the E500-3 has four. Both models have an RS485 interface to communicate with up to six Flame-Monitor[1] or MicroM controls and six E340 boiler controls. All functions are identical in each unit except for certain four-channel messages appear as single channel answers when using the E500-1.

All functions found in the E500 are shown on an index list which provide the user with a code and brief description. The user can review each function by typing the code onto a terminal which is connected (either hard wired or via modem) to the E500. You must press the return key following the code. The message presented on the terminal screen will then provide the desired information and prompt the user for additional entries, if required.

The E500 can be used with any dumb terminal or personal computer with communication software. The E500 is designed to respond to ASCII character sequences from any compatible terminal. By following the cable connection specification found on Page 2 and the proper setting parameters between the modem, computer and E500, the system will operate as described below.

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[1]. Flame-Monitor controls require an EP programmer or an EPD-style programmer.

The local (RS232c) connection and TELSET (RJ11) Connection may be connected simultaneously. Local transmission will always be active when the power is brought on the E500. TELSET mode will override LOCAL communications when the E500 receives a call or when the E500 initiates an "auto-call." Following the telephone communications, the E500 will revert to LOCAL mode automatically. **The E500 will not communicate simultaneously on both the LOCAL and TELSET modes.**

The **amber** light on the right side of the E500 will glow when the E500 is powered, and blink if the AUTO CALL switch is in either the LOCAL or TELSET position. The **green** light marked TELSET ON LINE will glow when a telephone carrier signal is acknowledged and the control is communicating in the TELSET mode.

When initially brought on line, the terminal monitoring the E500 will display the preamble message shown in Figure 1.

FIGURE 1.

```
E500 COMMUNICATION INTERFACE
Copyright
FIREYE
1992 All Rights Reserved
UNIT # MEMORIAL HOSPITAL
TIME: 13:04      SATURDAY 07/27/91
Type INDEX or CNTL G
```

CTRL G COMMAND

Typing **CTRL G** on your terminal will display:

SELECT UNIT A, B, C, D, or Ep(d)

The **CTRL** key must be held down while simultaneously pressing the **G** key.

You must now select which unit you wish to communicate with. Press the letter of the appropriate unit and then press RETURN. All commands will now be answered with a response preceded by the unit letter you have chosen. When you wish to select another unit, press **CNTL G** and follow this sequence again.

The selections **A, B, C**, or **D** address the Flame-Monitor controls connected to the communication ports located on the side of the E500. The selection **Ep(d)** addresses the Flame-Monitor controls connected to the E500 via the RS485 interface.

Communicating with Flame-Monitor controls on Communication Ports - A, B, C, D

Press the letter of the appropriate unit and press **Return**. All commands will now be answered with a response preceded by the unit letter you have chosen. When you wish to select another unit, press **CTRL G** and follow this sequence.

Communicating with Flame-Monitor controls on RS485 Communication Port - Ep(d)

The Flame-Monitor and/or MicroM controls are connected to the RS485 communication port (terminals B and A - refer to Bulletin E-8002). The baud rate of the Flame-Monitor and MicroM controls is fixed at 4800 Baud. The E500 (version 7 or greater) is designed to automatically communicate with the Flame-Monitor and/or MicroM controls. The Local Data Rate Selector switch of the E500 must be set to match the data rate of any E340 controls connected to the RS485 port (refer to Bulletin E-3401) and any terminal or IBM PC connected in a local or direct mode (to the RS232 connector). It is possible to have different baud rates for devices connected with the Flame-Monitor and/or MicroM controls.

Before communicating with the Flame-Monitor controls for the first time, it is necessary to type in the command:

LEPD and press **Return**

The E500 will respond with:

01, 02, 03, 04 (or the appropriate addresses)

The command **LEPD** allows the E500 to learn the unit addresses of the EP and EPD programmers
The command **LEPD** allows the E500 to learn the unit addresses of the EP and EPD programmers
connected on the RS485 communication line (addresses 1, 2, 3, and 4 in the above example). The
command **LEPD** only needs to be entered one time unless additional controls are added to the E500.
The E500 then stores these addresses for use with the **CTRL G** command.

> ⚠ **CAUTION: The unit addresses must be different for each control, including E340 controls.
> Refer to Bulletins EP-1601, EPD-1601, or E-3401 to program the unit addresses of the
> FLAME-MONITOR or E340 controls.**

In response to the **SELECT UNIT A, B, C, D, or Ep(d**), type **E** and the E500 will respond with:

SELECT UNIT 01, 02, 03, 04 (addresses learned via the command LEPD).

Type in the numerical address of the appropriate Flame-Monitor control and press **RETURN**. All
commands will now be answered with a response preceded by the unit letter you have chosen. When
you wish to select another unit, press **CTRL G** and follow the above sequence.

If the E500 does not receive data from a Flame-Monitor control, the messages on the terminal will be
Flame-Monitor OFF LINE.

The E500-1 only monitors one Flame-Monitor control via the parallel communication port, and up to
six Flame-Monitor or MicroM controls via the RS485 port. In response to the **CTRL G** command,
the E500-1 will reply with **SELECT UNIT A or E(pd)**.

*NOTE: Because of line transmission problems, you may occasionally see incorrect characters in
words. If they are excessive hang up and redial to obtain a new connection.*

The E500 has a built-in lifetime battery which keeps all the historical memory and clock active even
during power interruptions.

300/1200 Baud Modem

The E500 has the ability to communicate over the public phone lines at either 300 or 1200 baud. It
can also answer the phone and establish communication automatically at either 300 or 1200 baud.
When using the internal modem of the E500 to communicate with Flame-Monitor controls
connected to the E500 via the RS485 port, the E500 will automatically convert the incoming
message from 300 (or 1200) baud to 4800 baud (set via Local Data Rate Selector Switch) to commu-
nicate with the EP and EPD style programmers. **When the E500 originates a phone call (in the
event of a LOCKOUT or ALARM condition), the baud rate is selected via the command
MODEM (See SOFTWARE).**

RS485 Communication Interface

The RS485 Interface located on the sub-miniature terminal provides communication with up to six
Flame-Monitor or MicroM controls and six E340 controls wired in a multi-drop wiring configuration
(refer to bulletin E-8002). The baud rate on the EP and EPD style programmers are fixed at 4800
baud to match the baud rate of the Local Data Rate Selector switch on the E500. The baud rate on the
E340 must be programmed via the Setpoints key (refer to bulletin E-3401). The baud rate of the IBM
PC or dumb terminal must also be set to match this speed (Direct Connect) or 300/ 1200 baud (when
communicating over phone lines).

INDEX OF MENU COMMANDS

INDEX: Typing the word INDEX on your terminal and pressing the ENTER key will display a complete menu list of commands and a brief description.

BNRHR	TOTAL MAIN BURNER HOURS	ENDIT	END TRANSMISSION
BNRCY	TOTAL BURNER CYCLES	NOTES	ESTABLISH A NOTE
SYSHR	TOTAL HOURS INSTALLED	CLOCK	SET THE TIME AND DAY
STATS	PRESENT BURNER STATUS	PHONE	ESTABLISH A PHONE NUMBER
STAT1	PRESENT STATUS UPDATED EVERY 8 SEC.	TOPS	SELECT TONE OR PULSE DIALING
STAT4	PRESENT STATUS ALL FOUR CONTROLS PARALLEL PORTS	RINGS	SET NUMBER OF RINGS FOR INCOMING CALL PICKUP
STAT41	CONTINUOUS STATUS ALL FOUR CONTROLS PARALLEL PORTS	BUSY	INHIBIT PHONE CALL PICKUP
LCKHT	LAST SIX LOCKOUTS	POLL	SET POLLING INTERVAL
LCKTT	TOTAL NUMBER OF LOCKOUTS	HIST	LAST 23 LOCKOUTS OF SELECTED UNIT
SHORT	TOTAL NUMBER OF SHORT CIRCUIT EVENTS	HIST4	HISTORICAL SUMMARY ALL FOUR CONTROLS
FSPTI	AVERAGE FLAME SIGNAL PTFI	CLR	CLEAR HISTORY OF SELECTED UNIT
FSAVG	AVERAGE FLAME SIGNAL MAIN	RELAY	USER CONTROLLED GENERAL PURPOSE RELAY
FSPRE	PRESENT FLAME SIGNAL	EMS	DIRECT CONNECT TO RS-232 PORT
TYPEP	PROGRAMMER INSTALLED	INPUT	CONFIGURE USER INPUT TERMINALS
TYPEA	AMPLIFIER INSTALLED	RATE	SHOW PRESENT INPUT COUNT RATE
UNIT #	SERIALIZE THE E500	PORTS	SHOW E500 CONFIGURATION
INDEX	MENU LIST	LHVAC	LEARN DEVICES ON RS-485 PORT
MDUMP	BNRHR BNRCY LCKTT SYSHR	PASSW	ESTABLISH A SECURITY PASSWORD
		PWRON	LAST 9 APPLICATIONS OF POWER
		CYCLE	LAST 23 CYCLES OF SELECTED UNIT
		CYCLE 4	CYCLE SUMMARY ALL FOUR CONTROLS
		HISTEPD	HISTORICAL INFORMATION FOR ALL CONTROLS ON RS485
		STATALL	PRESENT STATUS OF ALL CONTROLS PARALLEL PORTS AND RS485

The "INDEX" list is self-explanatory. However, a few require special note.

SYSHR   Provides the operator with the total number of hours the Flame-Monitor control has been powered. This is independent of the burner operation and is rounded to the nearest hour. Information is stored in the EP programmer.

STAT1   This command will give the operator a display of the present burner status every 8 seconds. It will operate continuously until the terminal operator presses CNTRL G. This function may be very helpful in recording burner operation when the terminal is unattended.

UNIT #   To individually serialize each E500 use this command. You may use up to 64 characters for this message. It will appear on the preamble each time a communication is initiated so that the terminal operator can easily identify the location on the E500.

NOTES   The terminal operator can use this command to leave a message of up to 200 characters on the E500. The message is held in the E500 even on a power failure.

ENDIT   Whenever the terminal operator is finished with the E500 phone transmission, he must end the communications by typing this message and striking "enter." The E500 will respond by GOODBYE CALL AGAIN. The communications interface is now ready to receive another call.

The "INDEX" list is self-explanatory. However, a few require special note.

STAT41   Similar to the STAT1 command, except you will see the status of all four controls connected on the Parallel connection port.

LCKHT   This command will give the operator a list of the last six LOCKOUT causes in order as read directly from the programmer. The first LOCKOUT listed is the most recent cause. Occasionally, the cause "LOCKOUT UNKNOWN" may be listed. This may be due to electrical noise at the location of the Flame-Monitor control or to the use of a newer style programmer in the E100 which has new messages not consistent with the E500. (i.e.: "LOCKOUT SCANNER NOISE")

SHORT   This is the number of short circuits seen on the terminals 5, 6 and 7 of the Flame-Monitor control. It is not the actual number of LOCKOUTS. The short (or high current) must be seen twice consecutively for a LOCKOUT to occur.

CLOCK   This function will allow you to view and reset the internal clock. The clock has a 24-hour military time readout. In addition, you can set the date with this command.

STATALL   Similar to the STATS command except you see the status of all of the controls connected both to the parallel ports and RS485 port.

PASSW

This function allows creation of security passwords. When shipped new, this function is not activated. This means that all INDEX functions are available to view and alter. If you wish to establish a password, type PASSW. Follow the simple instructions to proceed. In the example below, the user has chosen option #1 to SET PASSWORD and has chosen the word PASS as the password. The password can be up to 10 characters in length.

From now on, when the E500 is called, the user must type in PASS before being able to change any parameters in the system. When entering the password, the E500 will display a # for every character entered.

⚠️   **CAUTION: If you forget the password you put in the system, you cannot de-activate or change it. If this happens, consult the factory.**

FIGURE 2.

```
PASSW

SELECT PASSWORD OPTION

1. SET PASSWORD
2. RETAIN PASSWORD
3. CANCEL PASSWORD
SELECT OPTION: 1
ENTER PASSWORD PASS
```

NOTE: An additional command not listed in the INDEX is CALLME. This command is helpful during the initial setup procedure to check and see if the unit will perform a callout. When CALLME is typed followed by ENTER, the E500 will immediately hang up and dial the phone number in its PHONE memory.

PHONE

This command will allow you to select up to two phone numbers (primary and secondary) for the "AUTO CALL" function. These are numbers the E500 will call if it recognizes an alarm lockout on any of the Flame-Monitor controls. Up to 40 character positions are available for the number. A comma (,) will pause the dialing sequence for 2 seconds while calling a number. Other than the comma, only numerals will be accepted.

The E500 will call the primary number and look for a carrier signal. If found, it will dump its message and hang up. Another call will only be initiated if another lockout is sensed. If a carrier signal is not sensed on the primary number, the E500 will hang up and dial the secondary number

immediately (if enabled). Sensing a carrier signal on this number will end the "AUTO CALL" sequence also until another lockout alarm is sensed. Should no carrier signal be sensed on either number dialed, the E500 will wait for the selected polling internal time (POLL) to go through the dial-out sequence again.

The E500 will perform up to 15 dial-out sequences until recognizing a carrier signal. If a carrier signal still has not been sensed after 15 attempts, the Flame-Monitor must be reset before the E500 will initiate another AUTO CALL ON A LOCKOUT.

```
PRIMARY PHONE NUMBER 555757575575
ENTER PHONE NUMBER 3456789

SECONDARY PHONE NUMBER 7575—DISABLED
ENTER PHONE NUMBER 324567

 DISABLE SECONDARY PHONE NUMBER Y/N N
 OK
```

POLL

This function allows the user to select the time interval which the E500 polls the Flame-Monitor controls and looks for a lockout condition. Minimum time is 1 minute. Maximum time is 9 minutes. This is also the dial-out interval timing when using the AUTO-CALL TELSET position.

NOTE: While polling, the display on the Flame-Monitor control will go blank. Polling takes approximately two seconds for each Flame-Monitor.

HIST

A complete list of the last 23 lockout messages and reset times as recorded by the E500 for each Flame-Monitor unit connected to the parallel communication port is available from this request. In addition, a date and time stamp is shown on each screen. This history is NOT read directly from the programmer in the Flame-Monitor control. Therefore if the programmer is changed, this history will be retained in the E500. The lockout information is read each time the E500 polls the status of the Flame-Monitor. If the selection of the **POLL** command is set too high, the E500 may miss a lockout condition. See **POLL** command.

A typical summary is shown below. If you wish to request the history of all the units connected to the E500, use the command **HIST4**. You may clear the LOCKOUT HISTORY by using the command **CLR**.

```
HIST
UNIT A LOCKOUT HISTORY
09/16/88   09:28          LOCKOUT FLAME FAIL PTFI
RESET      09/16/88       10:02
09/16/88   09:23          LOCKOUT 3-P RUN INTLK
                          OPEN PURGE
RESET      09/16/88       09:26
```

HISTEPD

Similar to the **HIST** command except it provides the last 23 lockouts of the Flame-Monitor controls connected to the RS485 communication port.

RELAY

The E500 has a built-in relay which can be energized or de-energized via the communications ports. It can be manually operated through the terminal or automatically operated by selecting the scheduled function.

The scheduled function allows the SPDT relay to be automatically energized and de-energized up to twice a day with full seven day individual selection. You may also select up to 20 days during the year to SCHEDULE a special "Holiday" program.

In addition, you may choose to energize the relay based on the configuration of the two input terminals.

After typing RELAY, choose the function you wish and follow the self-prompting steps. When you finish, hit the ENTER key and you will see a summary of what has been selected.

⚠ **WARNING: This relay should not be used to reset the flame safeguard control or to bypass any safety circuit in the control. Severe personal injury or property damage could result from improper use.**

RINGS

Occasionally, the user of an E500 may want to put an extension phone on the same line as the E500. This may be inconvenient if the E500 picks up the line automatically when the phone rings. The RINGS function will allow you to choose the number of rings the E500 will wait before picking up the line (up to 9).
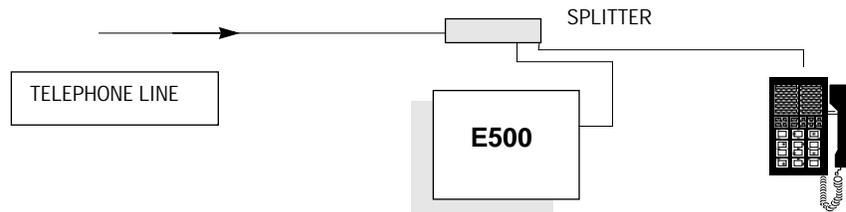
EMS

When a communication system is already installed in the building and the owners want to install an E500 on the same phone line, this is possible using the EMS function. Simply wire the RS232c output port of E500 to the present communication system as shown below:
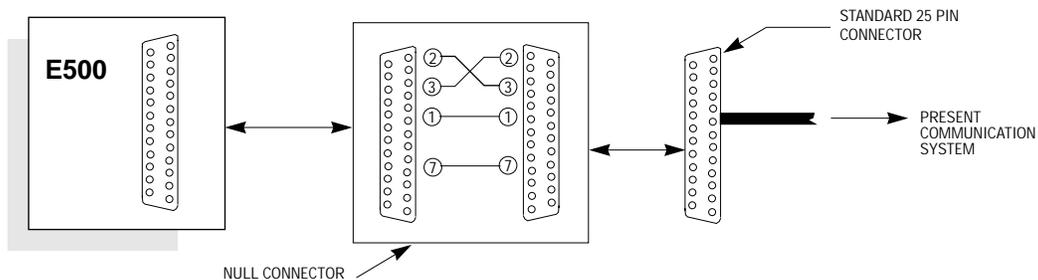
The E500 will act as a communication gateway whenever the command EMS [RETURN] is given. The user can then communicate directly with the other communication system. When you want to return to the E500 menu and operation, enter the command CTRL G.

Note that all phone communications used in this mode are at 300/1200 BAUD. The second communication system must accept and send information at 300/1200 BAUD. When in this mode, the LOCAL DATA RATE switch is not functional.

INPUT

The INPUT function may be used as an alarm indicator or as a counter. The E500 can be used as an ALARM indicator for up to two separate inputs. When these inputs are activated, they will initiate a phone callout anytime the input contacts are closed.

A primary and secondary phone number can be chosen independently for each input and the interval between callouts is selectable. If a carrier signal is detected when calling out to report an input

closure, The E500 will provide a unit descriptor and alarm message. The user can set independent alarm messages up to 64 characters in length. When a carrier signal is detected on a callout, the E500 will not report again until its senses the input open and then closed again to indicate another alarm. The E500 will attempt up to 15 calls to report the alarm condition.

Also provided by the E500 is a historic summary of input closures. The last 23 detected closures for each input are stored in chronological order with the date and time. The contact open time is also recorded. The option to clear the summary is also provided.

When the counter function is chosen, the E500 will count input pulses at a rate of up to 250 per second. The input counters work with paddle wheel type or pulse output type transducers for the measurement of fuel or water meters.

Setup and review for the counter function is easy. Just follow the user friendly prompts. The RATE command allows you to review the present count rate.

> ⚠ **WARNING: These are dry contact inputs. DO NOT apply voltage to terminals 1,2, G. Use a relay contact closure to activate appropriate input.**

BUSY

Using this command will allow you to use more than one E500 on a single phone line. Connect the E500s like this:
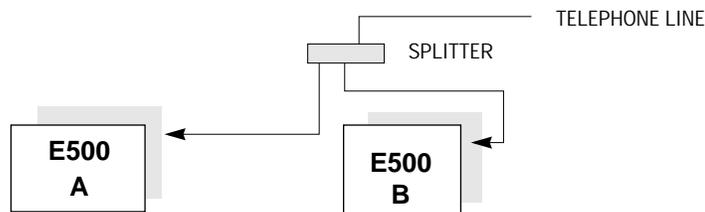
Set the RINGS command on the A unit to pick up after 2 RINGS and set the B unit to pick up after 3 rings. Anytime you call, A will always pick up the line first. If you want to call B, before you end the conversation with A, energize the BUSY command. This will tell A not to pick up any incoming calls for 3 minutes. Therefore, when you call the number back within 3 minutes, unit B will answer.

Also, if a user is communicating via the RS232 port and does not want to be interrupted by an incoming phone call, activating the BUSY command will inhibit the telephone pickup until 3 minutes after the last keyboard entry.

PORTS

This command shows the user the present configuration of the line E500 switches as well as parity, relay position, status of the inputs, total number of phone calls received, total number of phone calls attempted and number of power interruptions. An example is shown on the next page.

```
 PORTS
 E500 CONFIGURATION
 LOCAL BAUD RATE = 1200 BITS PER SECOND

 PARITY SELECTED IS EVEN
 AUTO-CALL SWITCH = OFF

 RELAY IS NOW DE-ENERGIZED

 INPUT 1 = OPEN
 INPUT 2 = OPEN

 TOTAL PHONE RECEIVED =000001    10/20/98
 TOTAL PHONE ATTEMPTS =000001    10/20/98
 TOTAL POWER RESETS =000001    10/20/98

 ENTER PARITY TO CHANGE PARITY
 ENTER RESET TO CLEAR REGISTERS OK
 PORTS
 E500 CONFIGURATION
 LOCAL BAUD RATE = 1200 BITS PER SECOND

 PARITY SELECTED IS EVEN
 AUTO-CALL SWITCH = OFF
 RELAY IS NOW DE-ENERGIZED

 INPUT 1 = OPEN
 INPUT 2 = OPEN

 TOTAL PHONE RECEIVED = 000001    10/20/98
 TOTAL PHONE ATTEMPTS = 000004    10/20/98
 ENTER PARITY TO CHANGE PARITY

 ENTER RESET TO CLEAR REGISTERS
```

FUNCTIONS SWITCHES

Local Data Rate

The LOCAL DATA RATE switch is located on the left side of the E500. This switch allows the operator to select the data rate compatible with the terminal used on the LOCAL (RS232c) output. BAUD rates of 300, 1200, 4800 and 9600 are available. This switch only controls the LOCAL output port and RS485 port.

⚠ **The Flame-Monitor and MircoM controls are fixed at 4800 Baud. E500 engineering code 7 and above communicate automatically at the 4800 Baud with the Flame-Monitor and MicroM controls regardless of LOCAL DATA RATE.**

All MODEM communications originate either at 300 or 1200 BAUD as determined by the command MODEM. This switch position does not affect the baud rate when the E500 is communicating in the EMS function, which is always 300 BITS/SEC. The E500 can answer in either baud rate.

Auto Call

In the TELSET position, this switch controls the automatic function of having the E500 initiate a phone call to a predetermined number whenever a LOCKOUT occurs on a Flame-Monitor control connected to the E500. NOTE: PHONE COMMAND

At selectable (1-9 minute) interval times, the E500 checks all the Flame-Monitor controls connected to it, to determine if a safety shutdown has occurred. If a LOCKOUT is found, the E500 will dial a phone number and report the lockout. The E500 will retry if it does not receive a "carrier signal" on the phone line from a compatible device. If a carrier is received, the E500 will not call again until it has found that the Flame-Monitor has been reset and experiences another LOCKOUT. When no

carrier is received, the E500 will try to place up to 15 calls at selectable (1-9 min.) interval times until either a carrier is received or it has completed 15 attempts.

If a lockout is reset before the check occurs, the E500 will not initiate a call. Also, if the E500 has successfully communicated a lockout state and the control is reset and experiences a second lockout before the next check, the communications interface will not realize a reset condition and therefore will not call again. The E500 must see the Flame-Monitor control in a non-lockout mode during its check in order to reset the AUTO CALL function.

If a lockout occurs in the LOCAL mode, the autocall function on the E500 will generate its own information dump on the RS232c output port and display the preamble, along with lockout status messages, to the terminal connected to this port. When the AUTO CALL switch is in the OFF position, the E500 will not initiate an information dump or a call if a lockout occurs.

NOTE: If the E500 is operating and the STAT1 or STAT41 command is selected, the auto call function will not operate until the command is cancelled. STAT1 or STAT41 is cancelled by using the command CNTL G.

This is a typical terminal display which might appear in auto call operation to report a lockout:

```
E500 COMMUNICATION INTERFACE COPYRIGHT
FIREYE
1992 ALL RIGHTS RESERVED
UNIT #   FRED'S UNIT
TIME: 11:05    SATURDAY    02/27/94
UNIT C
PRESENT BURNER STATUS    LOCKOUT 3-P RUN INTLK
OPEN-PURGE
```

FCC REQUIREMENTS

1. The Federal Communications Commission (FCC) has established rules which permit this device to be directly connected to the telephone network. This equipment may not be used on party lines or coin lines.

2. If this device is malfunctioning, it may also cause harm to the telephone network. This device should be disconnected until the source of the problem can be determined and until repair has been made. If this is not done, the telephone company may temporarily disconnect service.

3. The telephone company may make changes in its technical operations and procedures. If such changes affect the compatibility or use of this device, the telephone company is required to give adequate notice of the changes.

4. If the telephone company requests information on what equipment is connected to their lines, inform them of;
    a. The telephone number this unit is connected to.
    b. The ringer equivalence number
    c. The USOC jack required.
    d. The FCC Registration number.

(Items b, c, and d are indicated on the label located on the bottom of the E500 near the power cord.)

5. The Ring Equivalency Number (REN) is useful to determine the quantity of devices you may connect to your telephone line and still have all of those devices ring when your number is called. In most, but not all areas, the sum of REN's of all devices should not exceed five (5). To be certain of the number of devices you may connect to your line, as determined by the REN, you should call your telephone company to determine the maximum REN for your calling area.

6. If the E500 causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice is not practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.

7. In the event of equipment malfunction, inquiries should be directed to your local Fireye Distributor or Fireye, 3 Manchester Road, Derry, NH 03038. Tel: (603) 432-4100.

FCC WARNING

WARNING: This equipment generates, uses, and radiates radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference. If this is the case, the user, at his own expense, will be required to take whatever measures may be required to correct the interference. THIS EQUIPMENT MAY NOT BE USED ON PARTY LINES OR COIN LINES.