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CHAPTER 1 - USER ORIENTATION

INTRODUCTION

The SMART ALARM is a microprocessor-based system designed to monitor virtually all critical parameters of a commercial control system. Its state-of-the-art hardware and software combine to provide advanced control strategies and I/O flexibility. This is accomplished within a non-intimidating, user-friendly environment that is uncommon to other units of similar capability.

About This Manual...

You are encouraged to read this manual prior to operating the SMART ALARM. At the very minimum, please read and understand chapter 2, INSTALLATION INSTRUCTIONS; it contains important safety information and precautions.

IF YOU WANT   THEN READ

To learn about the SMART ALARM'S   Chapter 1 - USER ORIENTATION
capabilities.

To become familiar with the   Chapter 1 - USER ORIENTATION
SMART ALARM user interface.

To install the SMART ALARM.   Chapter 2 - INSTALLATION INSTRUCTIONS

To learn how to enter setpoints   Chapter 3 - PROGRAMMING AND
and assign setpoints   OPERATIONS

To diagnose a problem with   Chapter 4 - TROUBLESHOOTING GUIDE
the SMART ALARM.

To obtain spare parts or learn   Appendix A - WARRANTY AND ORDERING
how to go about returning parts   INFORMATION
to ECI.

IF YOU WANT	THEN READ
To get started quickly after installation.	Appendix B - QUICK REFERENCE
Installation and wiring guidelines	Appendix C - INSTALLATION DRAWINGS

SMART ALARM CAPABILITIES

The SMART ALARM will monitor the communication line to the 1000 or 2000 series controllers in a location. The controllers will be set up such that any alarms will be directed to "LOCAL." When any alarms are generated, the messages are sent on the LOCAL bus and the Smart Alarm intercepts the message and displays it on its LCD screen. Upon receiving an alarm, the Smart Alarm will light a red alarm light and sound a beeper. The beeper will stop sounding for a programmable period of time when the alarm is acknowledged using the ENTER key. Two extra relays provide hook up to additional devices for signaling an alarm. These relays can be used to illuminate a light, sound an additional alarm or connect to an external alarm dialer. When an OK message is sent by the controller, the Smart Alarm will remove the alarm from the screen, all other alarm functions will cease, and operation will return to normal.

In addition to displaying the alarms, the Smart Alarm will also log any alarms it receives and the time when the alarm was acknowledged and the time when the alarm was OK.

It is important to note that the Smart Alarm is a passive device designed to receive alarms. Minor additional programming will be required to any controllers that the user would like to monitor. Refer to chapter 4 for details on setting up these units.

SMART ALARM HARDWARE SYSTEM OVERVIEW

The SMART ALARM system is comprised of a power source, a CPU Base Unit and a combination relay/output board. There are two versions of the Smart Alarm. Both have identical capabilities and operations. One style utilizes the larger CPU with non backlit LCD display and a slightly larger cabinet. The part number for this unit is CC/01699403. The other utilizes the smaller, newer CPU board with a backlit LCD display. The part number of this unit is CC/01699402. Minor installation differences will be pointed out where necessary.

POWER SOURCE

The SMART ALARM requires one 12 VAC, 2A source (24 KVA). The source must be external to the CPU BASE UNIT to comply with UL safety standards. ECI can supply a transformer, model TF-5, pre-wired with marked terminations. The TF-5 can be powered from either 115 VAC or 230 VAC (208V) (see Figures 5 and 5A). Alternatively, ECI has a self contained, fused, power supply in a 6" x 6" enclosure powered from 120 VAC. (refer to spare parts list) However, the user can supply the power source, provided that it meets the above specifications. The primary of the transformer should be wired through a 5 Amp (maximum) circuit breaker. Secondary fusing is taken care of on the microprocessor board.

CPU BASE UNIT

The CPU Base Unit consists of a sturdy steel enclosure that houses the microprocessor board (with firmware), a 4-line by 40-character LCD display, a keypad and a combination relay/output board. Conveniently placed holes in the rear panel provide pilot holes for conduit fittings, wiring and mounting used during installation. Listed below are some of the features of the components contained within the CPU Base Unit:

CPU Board

This compact design features a state-of-the-art V40 microprocessor. The SMART ALARM currently uses RAM (Random Access Memory) and ROM (Read-Only Memory) for data and program storage. A watchdog timer circuit is provided to insure proper recovery from a processor lock-up. The system I/O interface is achieved with an optically coupled, twenty-pin data bus that isolates the processor circuitry from electrical noise present in harsh environments. Both power and communications hookups are made on this board. An 8-position dip switch has several purposes. Switches 1 through 5, 7 and 8 are not used and should remain open. (Refer to figure 1) Dip switch 6 is used to set the remote baud rate setting. For 1200 baud, switch 6 should be open. For 2400 baud, switch 6 should be closed. For 9600 baud, switch 7 should be closed.

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LCD Display and Rubber Keypad - Mounted on the SMART ALARM panel, these two components work together with the software to provide the most intuitive user interface on the market. The user responds to clear-cut menu choices on each well-constructed screen by using the numbers and arrows presented on the keypad (see chapter 3, Programming and Operating the SMART ALARM).
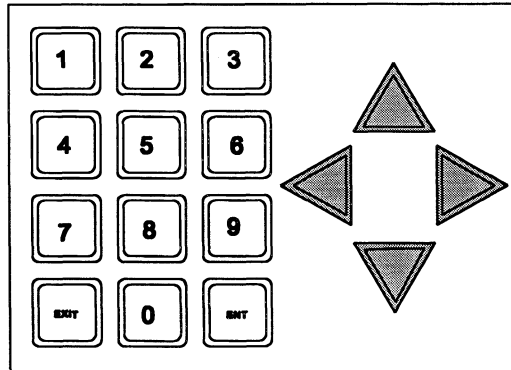
Keypad

Backup Battery - Each SMART ALARM CPU is supplied with a 3 VDC Lithium battery that is UL approved for installation in electronic equipment. The battery is mounted in a holding clip located at the top-middle of the CPU board. The battery is sufficient to retain all data for at least one year (setpoints, etc.) when the SMART ALARM loses main power. The life expectancy of the battery is eight years under normal conditions. **The battery should only be replaced by a qualified technician. Consult the factory for battery replacement instructions.**
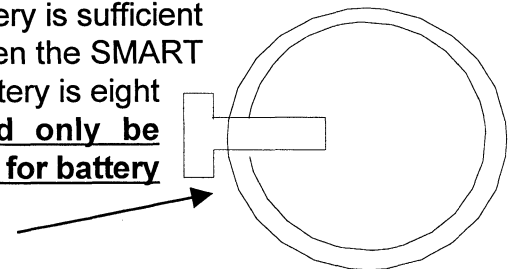
Battery in holding clip

If during the operation of the SMARTALARM the battery falls below normal operating levels, an ▆ icon will be displayed on the upper line of the banner screen and an alarm entry will be generated.

THE WINDOW/PAGE APPROACH TO USER INTERFACE

The SMART Alarm's LCD display is a 4-line view port or "window" to a single page of SMART ALARM control information (status, setpoints, etc.). By using the up and down arrow keys, the user can move the 4-line window vertically over the contents of an entire page.

THE SMART ALARM CHANNEL NUMBERING SYSTEM

Channel 1-1 is the Beeper output.
Channel 1-2 is the Red Alarm Light output.
Channel 1-3 is a dry contact relay (K1) output. (TS-1)
Channel 1-4 is a dry contact relay (K2) output. (TS-2)

Refer to figure 1 for details of the relay/output board.

The status of each output can be visually seen from the rear of the relay/output board:

CR1 - Beeper output
CR2 - Red Alarm Light output
CR3 - Relay K1 output
CR4 - Relay K2 output

The beeper output (B1) can be also be disabled by removing jumper J1. The internal CPU beeper cannot be disabled.

Each channel number contains two digits separated by a dash ("-"). The first digit indicates which module the channel can be found on, and the second digit indicates the actual channel number on that module. As an example, relay number 1-2 can be found on the relay board and is the relay number 2.

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CHAPTER 2 - INSTALLATION INSTRUCTIONS

MOUNTING AND POWER CONNECTION

UNPACKING

1. Remove the SMART ALARM from its shipping container and verify that it has not been physically damaged.

2. You should receive:

   - SMART ALARM Control,
   - This manual,
   - Transformer and power supply box assembly (if ordered).

3. Select a mounting location that would place the SMART ALARM at eye-level for easy viewing of the LCD display.

4. Remove the door from the hinges to mount the backing plate. There are two mounting holes on the back plate. Mount the unit securely with two 1/4" mounting screws. (Refer to figure 2)

RELAY/OUTPUT BOARD

5. The SMART ALARM output/relay board is mounted inside the Control Panel, behind the display. (Refer to figure 1)

6. Connect any external alarm dialer or other circuits to the relay outputs in accordance with the manufacturer's specifications. Make connections to the terminal block to the right of each relay. Note that each relay provides both normally open (NO) and normally closed (NC) connections along with a common which is rated at 5 amps/120 vac. (not fused)

SYSTEM POWER CONNECTION

7. The power switch, fuses, and input terminal block are located in the lower right-hand corner of the CPU board. (Refer to figure one)

8. The SMART ALARM requires one external 12 VAC, 2 Amp (minimum) source which is connected to the CPU board's terminal block (see figures 5 and 5A). This input is fused on the CPU board. A 12 VAC transformer (TF-5) with a dual-voltage primary is available from the factory. The TF-5 can be powered from either 115 VAC or 230 VAC (208V) and provides one isolated secondary output (see figures 5 and 5A). It is preferred that the SMART ALARM have its own circuit, either breakered or fused.

9. Turn on the SMART ALARM CPU by pushing up the slide switch located on the lower right-hand corner of the CPU board (see figures 5 and 5A). The display should activate. The power and status indicator LEDs should light (new style CPU only).

10. Connect the phone cable coming from any one of the Series 1000 control units on the communications loop to the CPU board.

11. Re-mount the SMART ALARM on its hinges to the back plate.

Once installation is complete, the SMART ALARM is ready to be programmed. See Chapters 3 - Configuring and Interrogating the SMART ALARM.

IMPORTANT NOTE:

For optimal performance and ease of use of the SMART ALARM, it is most important that all remote Series 1000/2000 controllers have good descriptions for all systems and sensors. This will allow for quick pinpointing of problems by the SMART ALARM users, and easier servicing once problems have been reported. Please take the time to verify that all systems and sensors have the correct descriptions before installation is complete.

MAKING CABLES

Many of the required field connections are made using 6-conductor cables with modular, quick-connects (RJ-11 style) on each end. They are easily recognizable as 'telephone' cables. The main difference between these cables and those found on the standard house telephone is that the SMART ALARM cables have six conductors, while regular telephone cables have only four. This style was chosen for the same reasons used by the telephone industry--they offer a high quality connection, are easy to use, are durable, and are inexpensive. In most cases, the installation will be completed using cables supplied by ECI. For custom cable lengths or repair, a Cable Termination Kit is available from the factory that contains a crimping tool and simple instructions for making these connections in the field. The standard cable assembly used by ECI is shown in Figure 4. A cable tester is also available to check the integrity of cable assemblies, Part # CC/60028400.

Six Conductor Communication Cable

RJ-11 Jack
(Tab Down)

RJ-11 Jack
(Tab Up)

BLUE
YELLOW
GREEN
RED
BLACK
WHITE

Cable Orientation
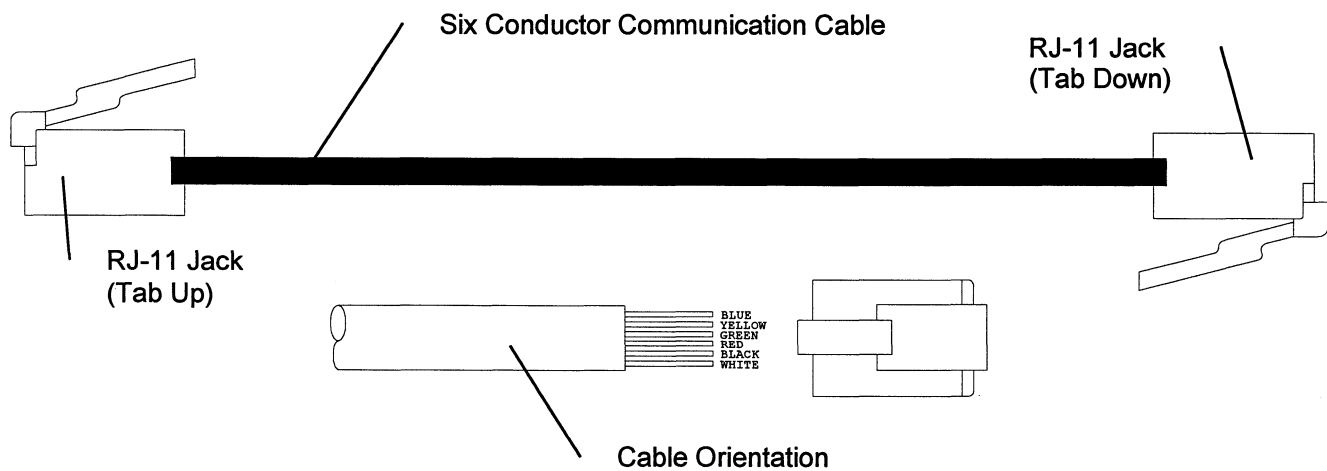
Cable Assembly

CHAPTER 3 -PROGRAMMING AND OPERATING THE SMART ALARM

INTRODUCTION

The configuration of the SMART ALARM is rather simple and involves only one menu of setpoints. All programming can be performed via the SMART ALARM keypad. In addition, logs can be accessed to view alarm history.

Each menu or screen generally consists of a title line and one or more lines of text and data. If the screen consists of more then three data lines, all subsequent lines can be scrolled into view by pressing the up arrow or down arrow on the keypad. Any screen that can be scrolled is terminated by two rows of double asterisks to separate the first and last data lines.

In general, the position of the cursor, which indicates the current page, menu selection, or data field, is denoted by a '>'.

SMART ALARM DATA ACCESS AND DATA ENTRY

Although the user interface of the SMART ALARM was designed to be both easy to understand and simple to use, a quick reading of the following paragraphs is recommended to all new users of the SMART ALARM.

- To change menu selections or data fields, use the appropriate arrow keys to move the cursor around the menu or screen.

- To change menus, press the numeric key that corresponds to the number of the desired menu selection, or press the 'ENTER' key when the cursor is to the left of the number of the desired menu selection.

- To enter the data portion of a programmable screen from the title line, press the 'ENTER' key; the cursor will appear to the left of the first programmable data field on the screen.

- To begin data entry for any selected field, press the 'ENTER' key; the arrow cursor will change to an underline, indicating that new data will be accepted.

- To enter data for numeric fields, press either the appropriate numeric keys or use the up and down arrow keys to scroll each digit in the field to the desired value.

- To enter data for alphanumeric fields, press either the appropriate numeric keys or use the up and down arrow keys to scroll each character in the field to one of the following:

        0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
        . , : # * ! / &

- To enter data for multiple-choice fields, use the up and down arrow keys to scroll the available choices.

- To complete your data entry for any field, press the 'ENTER' key; the cursor will reappear either at the next field or to the left of the current field.
- To leave a field without changing its value, press the 'EXIT' key.

- To cause a feature or setpoint to be unused, simply set the function designation to channel number 0-0.

SMART ALARM MENUS, SCREENS, AND RELATED DATA FIELDS

Presented in the following pages are examples of all the SMART ALARM menus and screens, complete with explanations of their contents and application.

SMART ALARM BANNER SCREEN

```
┌─────────────────────────────────────────────┐
│  ┌───────────────────────────────────────┐  │
│  │    Monday   06-15-99   13:29:52 DT     │  │
│  │           NO NEW ALARMS                │  │
│  │                                        │  │
│  │                                        │  │
│  └───────────────────────────────────────┘  │
└─────────────────────────────────────────────┘
```
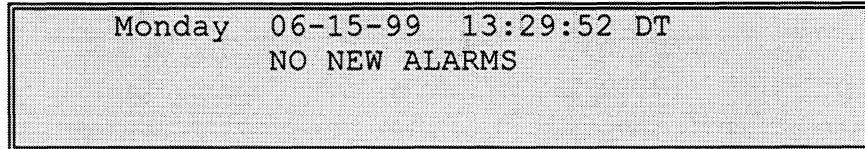
Required Access Level: None.

The SMART ALARM Banner Screen appears when keypad input to the unit has ceased for more than two minutes or when the SMART ALARM has recovered from a temporary loss of line power. This screen will display 'NO NEW ALARMS' if there are no active alarms on the control units. If an alarm is received, it will be displayed on the screen as it would appear in the alarm of the controller sending the alarm. When the alarm clears, it will be removed from the screen and the 'NO NEW ALARMS' message will be displayed (if no other alarms are active) the most current alarms will be displayed at the top of the list. If the SMART ALARM is left in any screen for more than 15 minutes, this banner screen will appear.

Special access codes are required to program and interrogate your SMART ALARM. The factory settings for these access codes are 1234 (level-1) and 9876 (level-2). Once the SMART ALARM has been installed and completely programmed, you may want to change the level-1 and level-2 access codes and give them only to people who are qualified to program and interrogate your SMART ALARM.

To get into the programming or logs portions of the SMART ALARM, press the 'EXIT' key twice. The screen in the following section will be displayed.

SMART ALARM ACCESS CODE SCREEN

```
┌─────────────────────────────────────────┐
│ ┌───────────────────────────────────┐   │
│ │         SMART ALARM X.XX           │   │
│ │       Enter Access Code: _         │   │
│ │                                    │   │
│ │                                    │   │
│ └───────────────────────────────────┘   │
└─────────────────────────────────────────┘
```

Level two access code (9876) is used for configuring the SMART ALARM.
Level one access code (1234) is used for overriding alarm outputs.
No access code is required to interrogate the alarm logs.

A special access code is required to program your SMART ALARM. The factory setting for this access code is 9876. Once the SMART ALARM has been installed and completely set up, you may want to change the code and give it to people who are qualified to program the unit.

Note the version number of the installed software and be sure to reference it when discussing any questions or problems that concern your SMART ALARM unit with an E.I.L. sales or applications engineer.

Once your SMART ALARM has been programmed, it will be more often accessed to review system status and performance information than to be reprogrammed. No access code is required for these functions. However, during maintenance or repair work on your control system - you may need access to certain programmable data fields. Remember to enter the access code that is appropriate for your programming needs.

SMART ALARM MAIN MENU

```
            SMART ALARM MAIN MENU
1-Setup                   4-System Menu
2-Unit Alarms
3-Alarm Outputs
```

Required Access Level: None

The Main Menu is the first choice when setting up the SMART ALARM system. It allows access to further setpoint and configuration screens. This area is used to initialize or alter basic operating parameters of the SMART ALARM.

Setup Screen

```
                    SETUP
Beeper Silence Period . 015 m (Min 15 m)
  Ext Rly #1 ........... None
  Ext Rly #2 ........... None

   AUX Alarm Delay ...... 05
   Dialer On Time (mins).. 1
   Dialer Cycle Time(mins) 005
                **
                **
```

Required Access Levels: 2.

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The first line is the 'Beeper Silence Period' interval. This is the period that the beeper will silence when an alarm is acknowledged. When this time expires and an alarm is still active, the beeper will sound again.

The next two lines are for the 'External relay' #1 and #2 assignments This assigns the function of the aux relays to the respective outputs. To change the functions, move the cursor to the appropriate line, press ENTER, use the up and down arrows to select the desired function and press ENTER.

'None' : Relays will not react to incoming alarms.

'Beeper' : Relay will close on an alarm condition, then open for the beeper silence period if the alarm is acknowledged (relay operation is the same as the beeper)

'Main Alarm' : Relay will close on alarm and remain closed as long as there is an active alarm.

'Aux Alarm' : Relay will close after the Aux Time Delay and remain closed as long as there is an active alarm. This output is designed to connect to an external dialer.

'Dialer' : Relay will close on alarm and remain closed as long as there is an active alarm. This output is designed to connect to an external dialer. This output will remain on for the 'Dialer on Time' then turn off. It will stay stay off for the 'Dialer Cycle Time' then turn back on again. This cycle repeats for as long as the alarm is active.

The fourth line assigns the Aux Alarm Delay. If this delay is set to 00m, the response will be immediately. If this delay is set to some time (i.e.: 05m), the relay will delay 5 minutes before energizing after the Smart Alarm receives an alarm.

The lines are for the 'Dialer On Time' and 'Dialer Cycle Time'. The 'Dialer Output' will remain on for the 'Dialer On Time' then turn off. It will stay off for the 'Dialer Cycle Time' then turns back on again. This cycle repeats for as long as the alarm is active.

Unit Alarms Log Screen

```
                  Unit Alarms
01-08 18:33 3 Deck Fish Case    Hi Temp
            Not acknowledged
01-08 19:50 3 Deck Fish Case    Hi Temp ok
```

Required Access Level: 2.

The Unit Alarm Log screen shows a list of the unit alarms. These logs are pertinent to the remote Series 1000/2000 units and provides a record of when the alarms were sent, acknowledged (ENTER key pressed to silence the beeper) and OK'ed by the remote units (an OK sent from the unit). A 'Not OK' and 'Not Acknowledged' message will be displayed until the alarm clears or is acknowledged.

A special indication will be posted in the log is the alarm is cleared from the Clear Option screen. This indication is posted as:

'***** ALARM CLEARED *****'.

When moving through this screen, the display will move 3 lines at a time to group the alarm comments together.

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Alarm Outputs Screen

```
                    ALARM OUTPUTS
                 Ovrd Act                  Ovrd Act
Light            None Off  Beeper          None Off
Ext Rly #1       None Off  Ext Rly #2      None Off
```

Required Access Level: 2

This screen shows all outputs used by the Smart Alarm. The user can override the outputs by selecting 'ON' or 'OFF'. To return the outputs to normal operation, the selection should be set to 'None'. These overrides are in effect indefinitely until they are manually changed.

For each output, there is an 'Ovrd' and 'Act' indication. The 'Ovrd' shows the override state desired. The 'Act' indication displays the actual operating condition of the output.

System Menu Screen

```
┌─────────────────────────────────────────┐
│              SYSTEM MENU                 │
│ 1-Date / Time      4-Access Codes        │
│ 2-Clear Options    5-System Parameters   │
│ 3-Local Alarms                           │
└─────────────────────────────────────────┘
```

Required Access Level: 2

The System menu allows access to system related parameters. These are typically set only at initial system setup.

Date/Time Screen

```
┌─────────────────────────────────────────┐
│                Date/Time                 │
│ Date 06-15-92 Mon      Time 10:18:27 DT  │
│ Spring forward on first Sun after 04-01  │
│       Fall back on first Sun after 10-25 │
└─────────────────────────────────────────┘
```

Required Access Level: 2

This screen allows the user to set the date, time and daylight savings operations. The day of the week is automatically determined by the SMART ALARM. The defaults for daylight savings are usually sufficient for most areas. DT indicates daylight savings time is in effect while ST indicates standard savings time is in effect.

Clear Options Screen

```
┌─────────────────────────────────────────────┐
│              CLEAR OPTIONS                    │
│      Select a clear option: No Action         │
│                                               │
│                                               │
└─────────────────────────────────────────────┘
```
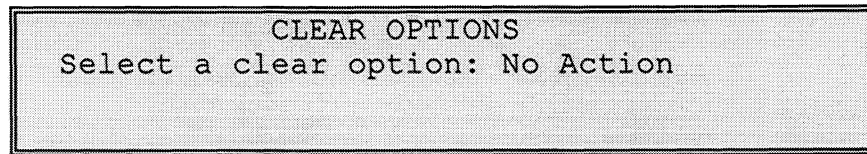
Required Access Level: 2

This screen allows either a soft reset or master from the keypad. There is also an option to clear any active alarms from the banner screen called 'Clr Act Alarms'. This selection will allow the user to remove any alarms that will not clear from the SMART ALARM. To use the functions, press ENTER and use the up and down arrows to select 'Reset CPU', 'Master Clear', 'Clr Act Alarms' or 'No Action', then press ENTER. When this screen is exited, the desired action will occur within a few seconds. The reset is the same as if the power was turned off and back on again. A master clear will clear ALL the memory and restore default parameters.

If the 'Clr Act Alarms' function was used, the Unit Alarm Log will indicate this with the message:

'**** ALARM CLEARED ****'.

**CAUTION: A MASTER CLEAR WILL DESTROY ALL DATA.
USE THIS FEATURE AS A LAST RESORT.**

Local Alarms Screen

```
          LOCAL ALARMS
12-01 11:50 System        Mst Clear
05-15 05:00 System        Power Up
05-15 04:45 System        Power Fail
```

Required Access Level: 2

This screen shows all alarms logged that pertain to the SMART ALARM. Power failures and low battery are two of the alarms that may be displayed here.

Access Codes Screen

```
┌──────────────────────────────────────────────┐
│             Access Codes                       │
│                                                │
│           Level 1   1234                       │
│           Level 2   9876                        │
└──────────────────────────────────────────────┘
```

Required Access Level: 2

The access codes screen allows you to redefine the level-1 and level-2 access codes of the SMART ALARM. Level 2 access code is required to view or change these fields.

The level one access code will allow viewing of any of the SMART ALARM screens but no changes can be made.

The security of the SMART ALARM system depends on the proper use and discretionary distribution of its alarm codes; if at any time you think that the security of your system has been compromised and is at risk of malicious tampering, immediately change these codes.

System Parameters Screen

```
┌────────────────────────────────────────────┐
│            SYSTEM PARAMETERS                 │
│        Communication ID 010                  │
│        Line Freq 060    Baud Rate 1200       │
│                                              │
└────────────────────────────────────────────┘
```

Required Access Level: 2

This screen allows you to set the communications ID of the SMART ALARM (default of 010); the line frequency of the incoming power (50H or 60H) and indicates the remote communications baud rate (1200 or 2400). The baud rate of the large CPU can be changed by toggling the baud rate from 1200 to 2400 to 9600. On the new CPU board, the baud rate is set by dip switch 6 or 7.

CHAPTER 4 - 1000/2000 SERIES CONTROLLER SETUP

INTRODUCTION

Alarms are sent to the SMART ALARM via the Local communications function of the 1000/2000 series controllers. This option is found in the Dial Out Setup menu of the controllers. When the local option is changed to 'YES', the controller will broadcast the alarm messages on to the RS232 communications bus and the SMART ALARM will display them. All devices that are to be monitored must have local alarming turned on in order for the SMART ALARM to monitor them correctly.

IMPORTANT NOTE:

For optimal performance and ease of use, it is most important that all remote 1000 and 2000 series controllers have good descriptions for all systems. This will allow for quick pinpointing of problems by the SMART ALARM users and easier servicing once problems have been reported. Please take time to verify that all systems have the correct descriptions before the installation is complete.

TYPICAL RC-1000/2000 ALARM SETUP MENU

```
                        Alarm Setup
1-Circuit                4-Leak Sensor
 2-CSC                   5-Logic Statement
 3-Rack                  6-System
```

Required Access Level: 2.

This menu allows access to selection of the types of alarms that will initiate an alarm dial out sequence. Enter the desired field and proceed to set up each system on the unit.

TYPICAL RC-1000/2000 CIRCUIT ALARM SETUP

```
01 CIRCUIT 01
     Alarm Type        Local  Grp1  Grp2  Delay
  ----------------     -----  ----  ----  ----
  High Temperature      NO    YES   NO     001


  Low Temperature       NO    YES   NO     001
  Valve Verify          NO    YES   NO     001
  Bad Sensor            NO    YES   NO     001
  OK (cleared)          NO    YES   NO
```

Required Access Levels: 2.

This screen allows set up of the dial out parameters by each individual circuit. The first line shows the circuit name as described in the circuit names screen. There are as many of these setup pages as there are configured circuits. To go to other circuits, use the right and left arrows. The categories for dial out are 'Local', which enables a locally connected SMART ALARM. The 'Delay' field does not affect the Local alarms.

'High Temperature' enables the circuit high temp alarms.
'Low Temperature' enables the circuit low temp alarms.
'Valve Verify' enables the circuit valve verification alarms.
'OK (Cleared)' enables the OK indication that an alarm has cleared. This MUST be set to Yes if using the SMART ALARM.

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TYPICAL RC-2000 CSC ALARM SETUP

```
01 CSC 01
   Alarm Type        Local Grp1 Grp2 Delay
---------------------- ------ ---- ---- -----
High Temperature       NO   YES  NO    001


   Low Temperature     NO   YES  NO    001
   Offline             NO   YES  NO    001
   Intlk Open          NO   YES  NO    001
   Evap Sensor         NO   YES  NO    001
   Dmd Defr Inpt       NO   YES  NO    001
   OK (cleared)        NO   YES  NO
```

Required Access Code : 2

This screen allows set up of the dial out parameters by each individual CSC. The first line shows the CSC name as described in the CSC names screen. There are as many of these setup pages as there are configured CSCs. To go to other CSCs, use the right and left arrows. The categories for dial out are 'Local', which enables a locally connected SMART ALARM. The 'Delay' field does not affect the Local alarms.

'High Temperature' enables the CSC high temp alarms.
'Low Temperature' enables the CSC low temp alarms.
'Intlk Open' enables the CSC interlock alarms.
'Evap Sensor' enables the evap sensor alarms.
'Dmd Defr Input' enables the demand defrost input alarms.
'OK (Cleared)' enables the OK indication that an alarm has cleared. This MUST be set to Yes if using the SMART ALARM.

TYPICAL RC-1000/2000 RACK ALARM SETUP

```
┌──────────────────────────────────────────────┐
│ ┌────────────────────────────────────────────┐ │
│ │ 01 RACK A                                  │ │
│ │    Alarm Type        Local Grp1 Grp2 Delay │ │
│ │ ------------------   ----- ---- ---- ----- │ │
│ │ High Pressure          NO   YES  NO   001  │ │
│ └────────────────────────────────────────────┘ │
│                                                │
│      Low Pressure          NO   YES  NO   001  │
│      Run Verify            NO   YES  NO   001  │
│      Miscellaneous         NO   YES  NO   001  │
│      OK (cleared)          NO   YES  NO        │
│                                                │
└──────────────────────────────────────────────┘
```

Required Access Levels: 2.

This screen allows set up of the dial out parameters by each individual rack. The first line shows the rack name as described in the rack names screen. There are as many of these setup pages as there are configured racks. To go to other racks, use the right and left arrows. The categories for dial out are 'Local', which enables a locally connected SMART ALARM. The 'Delay' field does not affect the Local alarms.

'High Pressure' enables the rack high-pressure alarms.
'Low Pressure' enables the rack low pressure alarms.
'Run Verify' enables the rack compressor and condenser fan run verification alarms.
'Miscellaneous' enables rack phase loss, low liquid level and oil pressure alarms.
'OK (Cleared)' enables the OK indication that an alarm has cleared. This MUST be set to Yes if using the SMART ALARM.

TYPICAL RC-2000 LEAK DETECT ALARM SETUP

```
                        Leak Detect
            Name            Local Grp1 Grp2 Delay
         -------------------  -----  ----  ----  -----
         Comp Room            NO     YES   NO     001


            Comp Room            NO     YES   NO     001
            HVAC House           NO     YES   NO     001
            Airflow Duct         NO     YES   NO     001
                                 -  -   -  -  -  -
            OK (cleared)         NO     YES   NO
```

Required Access Levels: 2.

This screen allows set up of the dial out parameters by each individual leak detect group. The first line shows the leak detect group name as described in the leak detect names screen. There are as many of these setup pages as there are configured leak detect groups. There is only one page for these alarms. The categories for dial out are 'Local', which enables a locally connected SMART ALARM. The 'Delay' field does not affect the Local alarms.

Since there is only one type of alarm generated by the leak detect group, each group is only configurable for the local and phone number groups.

'OK (Cleared)' enables the OK indication that an alarm has cleared: This MUST be set to Yes if using the SMART ALARM.

TYPICAL RC-1000/2000 LOGIC STATEMENT ALARM SETUP

```
┌─────────────────────────────────────────────────┐
│  ┌───────────────────────────────────────────┐  │
│  │           Logic Statements                │  │
│  │        Name         Local Grp1 Grp2 Delay │  │
│  │ ──────────────────  ───── ──── ──── ───── │  │
│  │ High Temp Shutdn    NO  YES  NO     001    │  │
│  └───────────────────────────────────────────┘  │
│                                                 │
│      Hot Water Htr       NO    YES  NO    001   │
│      Oil Cooler          NO    YES  NO    001   │
│      Door Interlock      NO    YES  NO    001   │
│      Phase Monitor       NO    YES  NO    001   │
│                          - - - - - - -          │
│      OK (cleared)        NO    YES  NO          │
│                                                 │
└─────────────────────────────────────────────────┘
```

Required Access Levels: 2.

This screen allows set up of the dial out parameters by each individual logic statement. The first line shows the logic statement name as described in the logic statement names screen. There are as many of these setup pages as there are configured logic statements. There is only one page of this dial out screen. The categories for dial out are 'Local', which enables a locally connected SMART ALARM. The 'Delay' field does not affect the Local alarms.

'OK (Cleared)' enables the OK indication that an alarm has cleared. This MUST be set to Yes if using the SMART ALARM.

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TYPICAL RC-1000/2000 SYSTEM ALARM SETUP

```
                    Select System Alarms
        Alarm Type Local    Grp1   Grp2
        ------------------   -----  ----  ----
        Override              NO    YES    NO


           Miscellaneous      NO     YES    NO
           OK (cleared)       NO     YES    NO
```

Required Access Levels: 2.

This screen allows set up of system related alarms for dial out. Each category can be set up for local if using a SMART ALARM. The SMART ALARM was not designed to receive override alarms. This option should be set to 'No' if using a SMART ALARM.

'Override' enables any override condition (either hard or soft). Set this to 'No'
'Miscellaneous' enables the powerup, power fail, low battery and master clear alarms.
'OK (Cleared)' enables the OK indication that an alarm has cleared. This MUST be set to Yes if using the SMART ALARM.

CHAPTER 5 - TROUBLESHOOTING

MASTER CLEAR PROCEDURES

IMPORTANT: Invoking the Master Clear function **destroys all existing data.** Therefore, Master Clear should be used as a last resort.

1. Open the door of the SMART ALARM.

2. Place non-conductive material between battery and retaining clip on top of the battery.

3. Turn switch **OFF** (see figure 1).

4. Leave unit de-powered for a minimum of three minutes.

5. Turn switch **ON** and remove material from under the battery clip.

6. The above screen should then appear in the display.

7. Close the SMART ALARM door.

Software Method:

1. Go to the master clear screen.

2. Toggle the field to 'Master Clear'.

3. Exit from this screen.

4. Within seconds, the SMART ALARM will master clear.

SMART ALARM POWER

Transformer connection terminals, fuses, and ON/OFF switch are located on the CPU Board, which is behind the metal plate on the door of the unit (see figure 1).

Checkpoints:
The two terminals - 12 VAC supply for the CPU Board and
is fused with a 2 AMP slow-blow fuse.

Procedure:
1. Make sure that the power switch on CPU Board is turned on.
2. Check voltage through the fuses:

a) Set meter for AC voltage.
b) Read power terminals, the voltage should read 12 VAC.

CLEARING SMART ALARM - ALARMS

If it appears that the Smart Alarm is "stuck" in alarm and it has been verified that no Series 1000/2000 unit has an active alarm, the following procedure can be done to clear all alarms in the Smart Alarm - Alarm Queue:

1. Press EXIT twice.
2. Enter your access code.
3. Select choice 4, "System Menu."
4. Select choice 2, "Clear Options.
5. Select the choice for "Clr Act Alarms.
6. Exit from this screen to the banner screen.

All active alarms in the Smart Alarm will be cleared. This should be done only in those rare cases where an alarm message does not have a matching "OK" message. This could be due to a communications error probably from noise on the communications line. If this continues to be a problem, the communications wiring should be examined. The wires should not be routed near high voltage or lighting ballasts.

APPENDIX A: WARRANTY AND REPLACEMENT PARTS

WARRANTY

Energy Controls International, will for one year after date of purchase of any ECI product, correct any defect in workmanship or material. Such corrective measures will be limited to repairing or replacing the unit, at ECI's option. This limited warranty shall not apply to equipment that has been subjected to negligence, accident, or damage by operation, maintenance or storage, or to other than normal use or service. This limited warranty does not cover reimbursements for transportation, removal, installation, or repair or replacement, except as may otherwise be specifically agreed to in writing by Energy Controls International.

THE FOREGOING IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, AND ALL OTHER OBLIGATIONS OR LIABILITIES WHETHER ARISING UNDER CONTRACT, NEGLIGENCE OR OTHERWISE, ON THE PART OF ECI. IN NO EVENT SHALL ECI BE LIABLE FOR CONSEQUENTIAL OR SPECIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOSS OF USE, LOSS OF INCOME, LOSS OF PROFIT OR COST OF REPLACEMENT.

SMART ALARM REPLACEMENT PARTS LIST

PART NUMBER	DESCRIPTION
5401695400	Display Assembly (backlit)
5101612400	Display Assembly (non backlit)
5401623400	Keypad Assembly
5101611400	CPU Board (new style)
5101690400	CPU Board (old style)
1761706800	2 amp fuse, CPU Board
4464401800	Instruction Manual
5401701400	Relay/Output Board
CC/PCONN	Phone Connector
CC/CRIMP-1	Phone Connector Crimper
CC/60028400	Phone Cable Tester
CC/TF-5	Transformer (TF-5)
CC/01679400	TF-5 in (6" x 6") enclosure
4464401900	Laminated Quick Reference Guide

ADVANCE SHIPMENT AND REPAIR PROCEDURE

REPAIR PROCEDURE

If any part of your system requires repair, please use the following procedure:

1. Call ECI at 410-403-4000, ext. 3289 between 8:30 A.M. and 4:30 P.M. Eastern time for a Repair Order (R.O.) Number.

2. Have the following information ready:
   a) Purchase Order # for each unit to be repaired.
   b) As much information as possible regarding the nature of the equipment problem
   c) Serial number of unit/Date of purchase
   d) Previous repair history, if applicable

3. Send impaired item to:
   ECI (Energy Controls International)
   10946 Golden West Drive, Suite 130
   Hunt Valley MD 21031

4. The R.O. Number should be clearly marked on the outside of the shipping carton. Include all applicable paperwork with the shipment **INSIDE** the carton.

5. The warranty on repaired units will be 90 days from the date of shipment from ECI.

ADVANCE SHIPMENT

1. a) If necessary, ECI will "**ADVANCE SHIP**" the replacement component or parts, under certain circumstances, provided that a Purchase Order # is issued for such. The **customer** will bear **responsibility** for **excess freight charges** and agrees to return the defective component or parts **WITHIN 15 DAYS** upon receipt of the "Advance Shipment."

   b) After ECI receives the defective component/system/parts, they will be repaired and upgraded to current operational standards (i.e., ECI will restore them to "**LIKE NEW**" condition). The customer will be billed for this restoration work at the Standard Repair Charge rate.

APPENDIX B – SMART ALARM QUICK REFERENCE

ALARM SOUNDING:

1. Press any key to temporarily silence alarm.
2. Read alarm messages on the display. Use the up and down arrows if several alarm messages are displayed.
3. Investigate the problem personally.
4. Call service, if necessary.

TYPICAL ALARM TYPES:

RC-1000/2000:
- Oil Fail…Oil Failure on Compressor
- Lo Pres…Low Pressure on Compressor or Condenser
- Hi Pres…High Pressure on Compressor or Condenser
- Lo Temp…Low Temperature on a Circuit
- Hi Temp…High Temperature on a Circuit
- Run Verify…Run Verify Failure
- Refr Leak…Refrigerant Leak
- Logic…Logic Statement in Alarm

EC-1000:
Lo Temp…Low Temperature on an HVAC Unit
Hi Temp…Hi Temperature on an HVAC Unit
Logic…Logic Statement

APPENDIX C: INSTALLATION DRAWINGS

REAR VIEW OF SMART ALARM ENCLOSURE
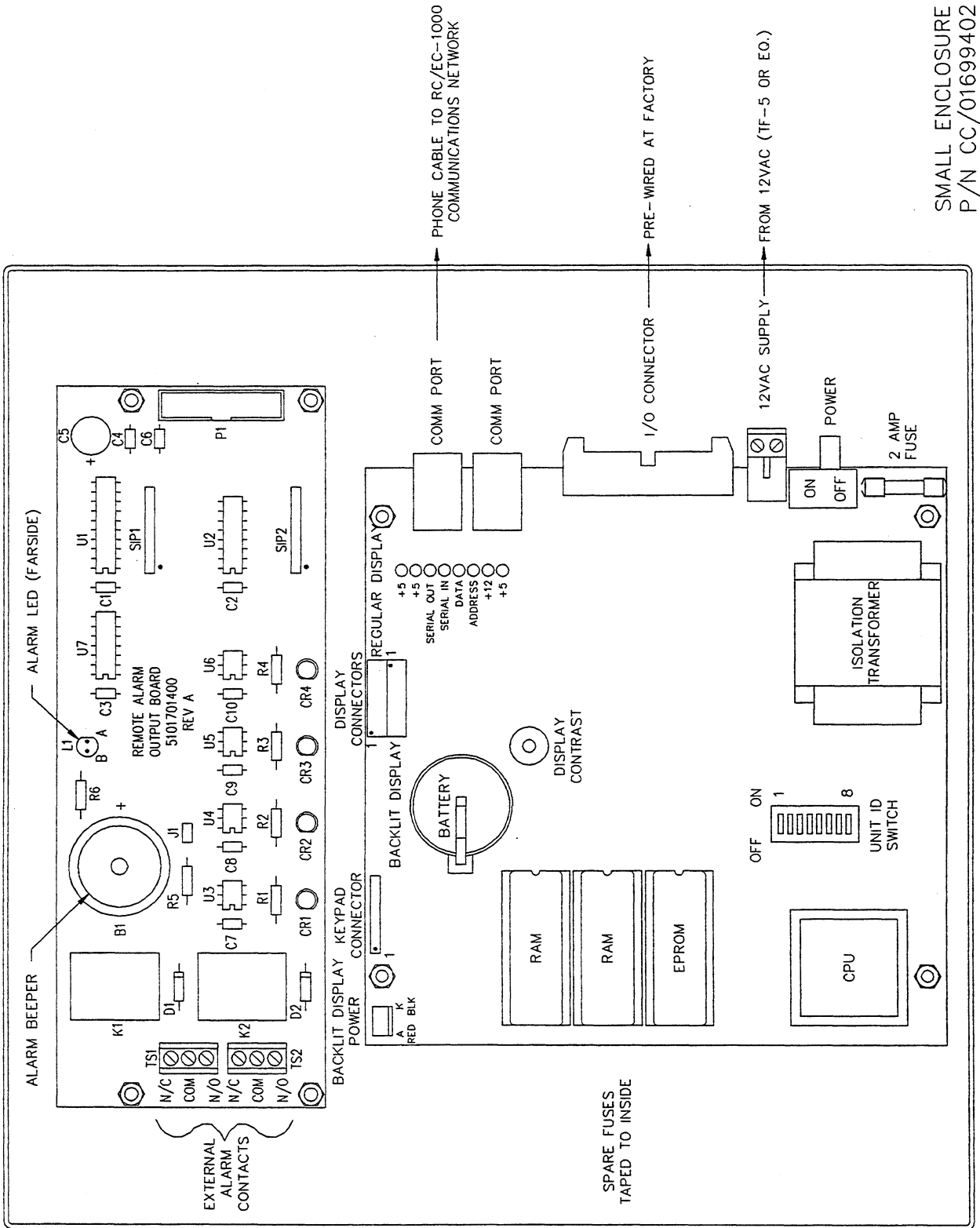
SMALL ENCLOSURE
P/N CC/01699402

SMART ALARM IDENTIFICATION AND WIRING DIAGRAM

FIGURE 1

REAR VIEW OF SMART ALARM ENCLOSURE

SMART ALARM IDENTIFICATION AND WIRING DIAGRAM

LARGE ENCLOSURE
P/N CC/01699403

PHONE CABLE TO RC/EC-1000
COMMUNICATIONS NETWORK

PRE-WIRED AT FACTORY

FROM 12VAC (TF-5 OR EQ.)

INSTALLATION INSTRUCTIONS:

1. MOUNT 12VAC POWER SOURCE (TF-5 OR EQ.) IN CEILING ABOVE SMART ALARM.

2. REMOVE DOOR FROM CABINET, MOUNT CABINET TO WALL MAKING SURE THAT DISPLAY WILL BE LOCATED AT EYE LEVEL.

3. RUN 12VAC POWER SOURCE WIRES (18 AWG) INSIDE OF WALL CAVITY AND FISH THROUGH ACCESS HOLE IN BACK OF CABINET.

4. RUN 6 CONDUCTOR PHONE CABLE FROM RC/EC-1000 OR RC-2000 COMMUNICATIONS NETWORK DOWN INSIDE OF WALL CAVITY AND FISH OUT THROUGH ACCESS HOLE IN BACK OF CABINET.

5. SLIDE DOOR OVER HINDGE PINS ON SIDE OF CABINET, PROVIDE SERVICE LOOP IN WIRING FOR DOOR SWING.

6. ATTACH POWER AND COMMUNICATIONS TO CPU AS NOTED ON FIGURE 1.

7. POWER-UP UNIT, CLOSE DOOR UNTIL LATCH CATCHES.

NOTE

DIMENSIONS NOT IN BRACKETS ARE FOR PART # CC/01699402
DIMENSIONS IN BRACKETS ARE FOR PART # CC/01699403

SMART ALARM INSTALLATION DRAWING
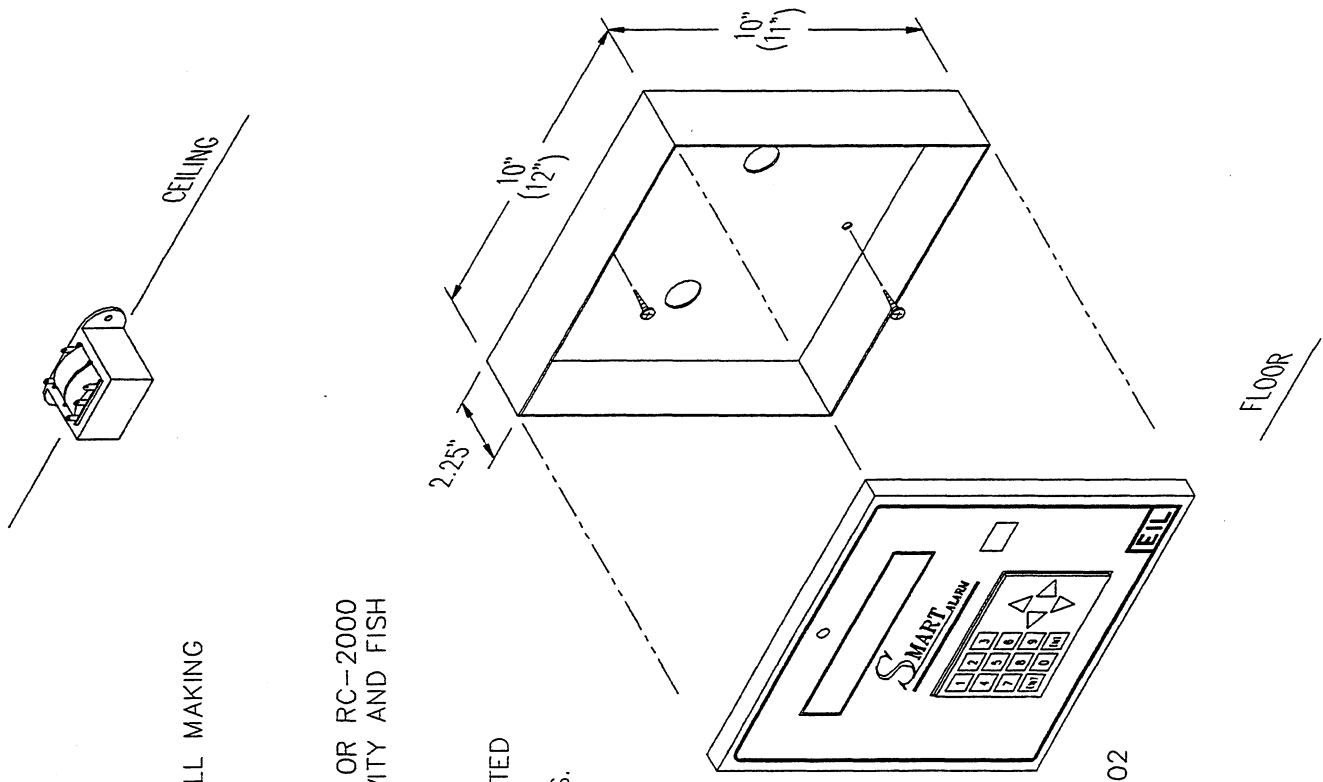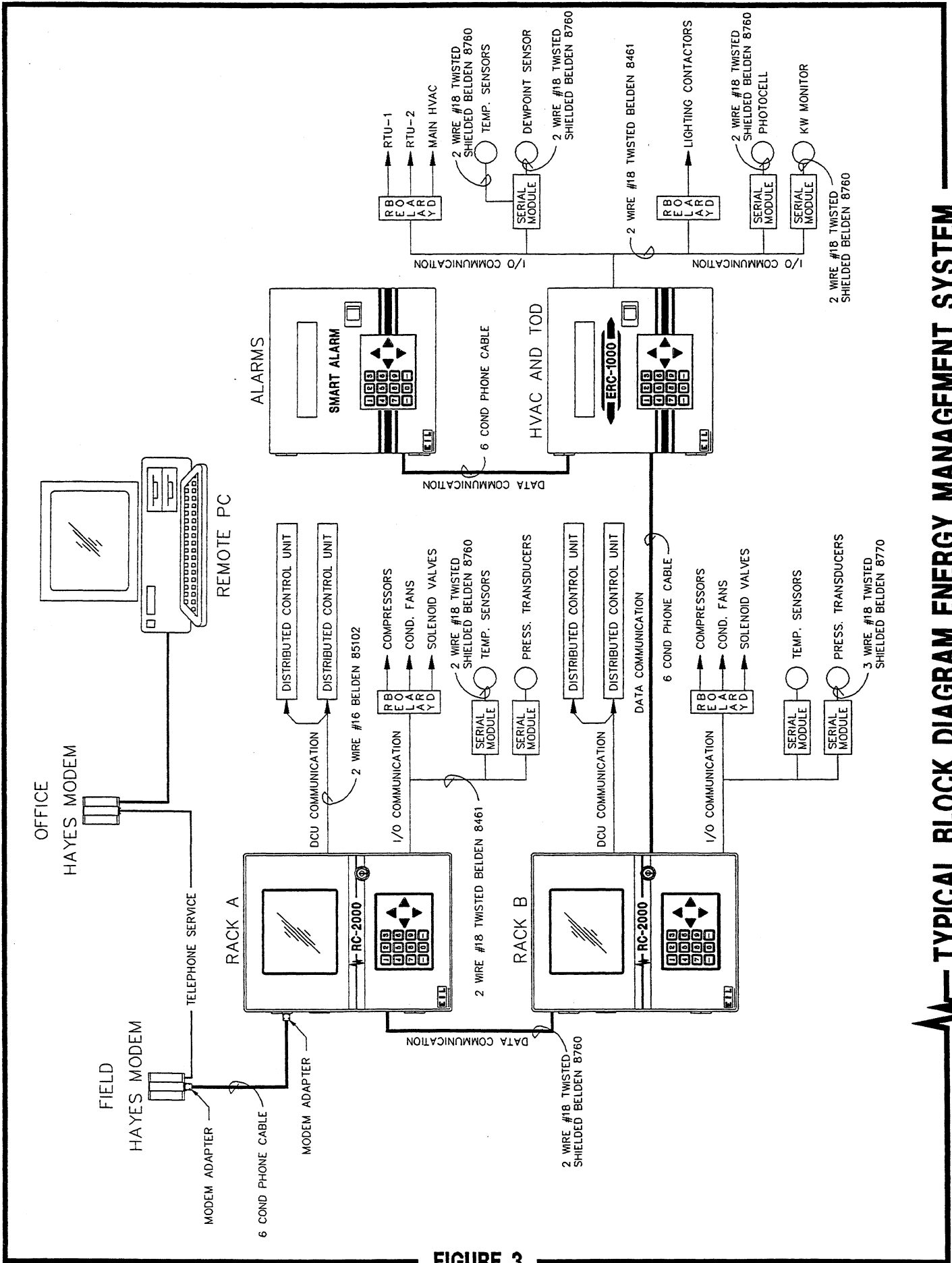
FIGURE 2

TYPICAL BLOCK DIAGRAM ENERGY MANAGEMENT SYSTEM

FIGURE 3
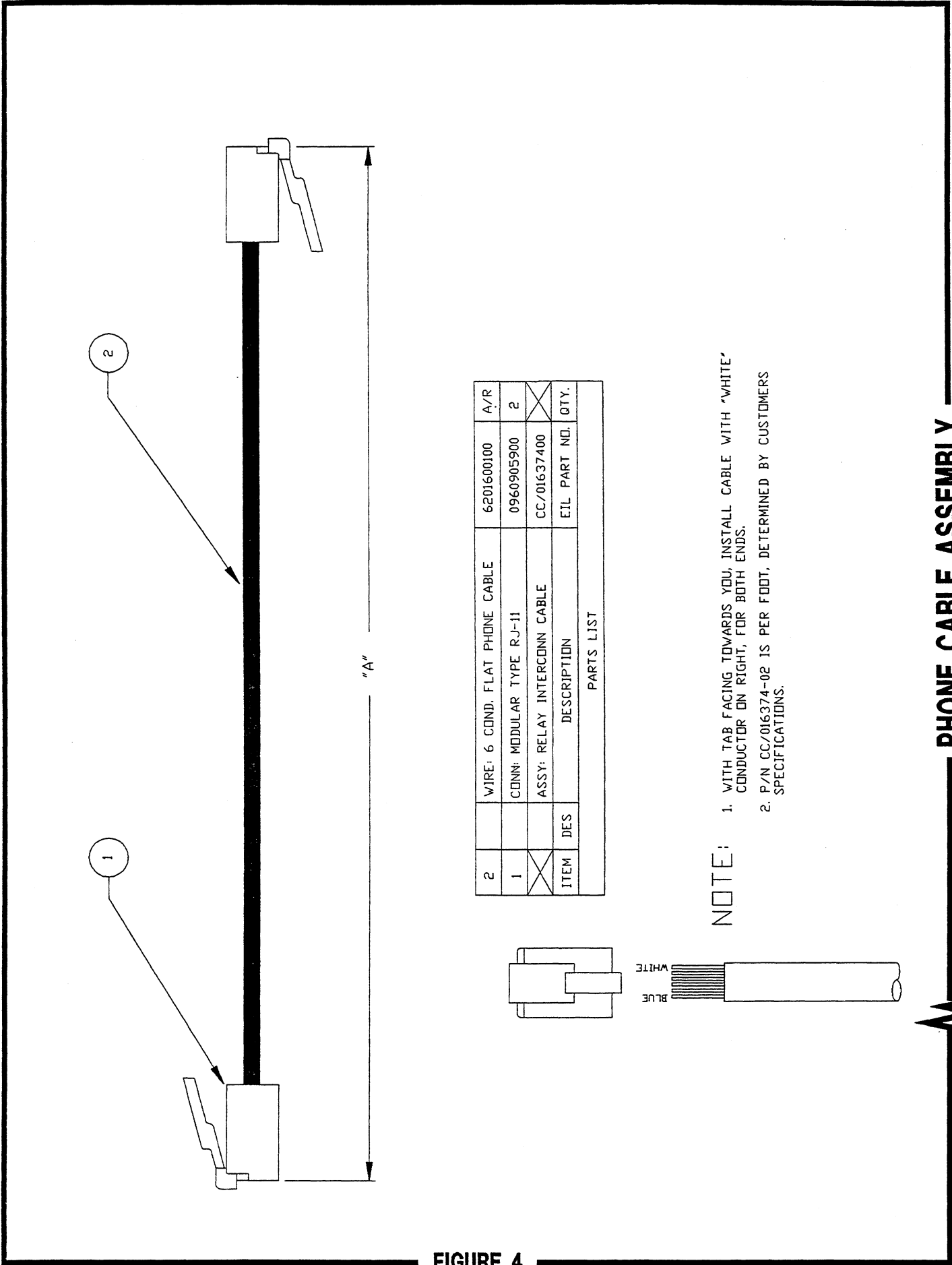
2		WIRE: 6 COND. FLAT PHONE CABLE	6201600100	A/R
1		CONN: MODULAR TYPE RJ-11	0960905900	2
	X	ASSY: RELAY INTERCONN CABLE	CC/01637400	X
ITEM	DES	DESCRIPTION	EIL PART NO.	QTY.

PARTS LIST

NOTE:
1. WITH TAB FACING TOWARDS YOU, INSTALL CABLE WITH 'WHITE' CONDUCTOR ON RIGHT, FOR BOTH ENDS.
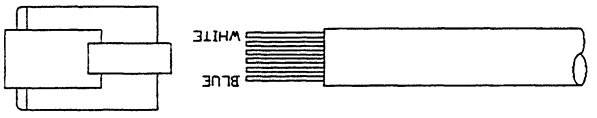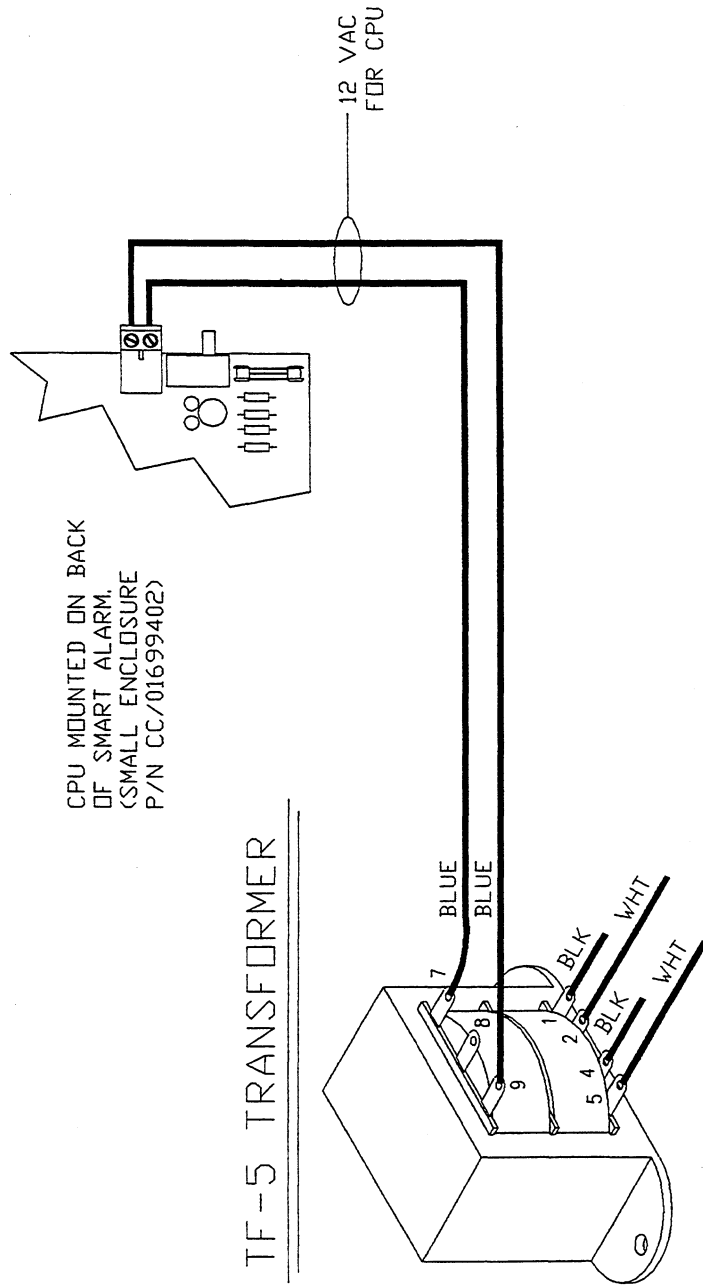
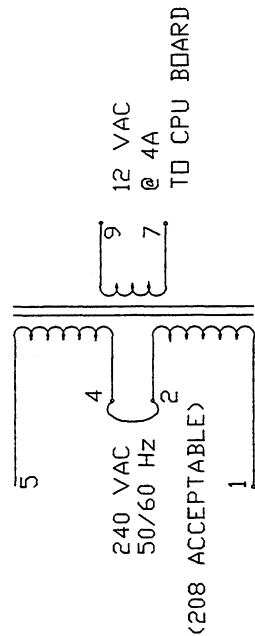2. P/N CC/016374-02 IS PER FOOT, DETERMINED BY CUSTOMERS SPECIFICATIONS.

PHONE CABLE ASSEMBLY

FIGURE 4

SMART ALARM CPU POWER HOOKUP (TF-5)

TF-5 TRANSFORMER

12 VAC FOR CPU

CPU MOUNTED ON BACK
OF SMART ALARM.
(SMALL ENCLOSURE
P/N CC/01699402)

7 BLUE
BLUE

BLK WHT

BLK WHT

NOTE:
1. THE TF-5 TRANSFORMER IS NOW APPROVED FOR CPU POWER WHICH REQUIRES
   ONLY ONE 12VAC POWER SOURCE.
2. FUSE TRANSFORMER PER ELECTRICAL CODE REQUIREMENTS.
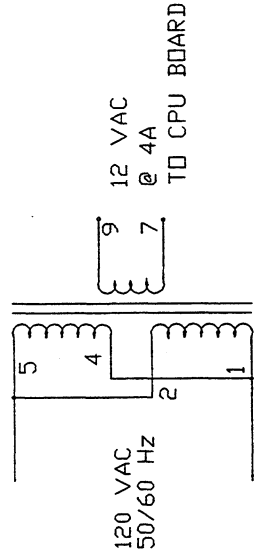
120 VAC CONFIGURATION

12 VAC
@ 4A
TO CPU BOARD
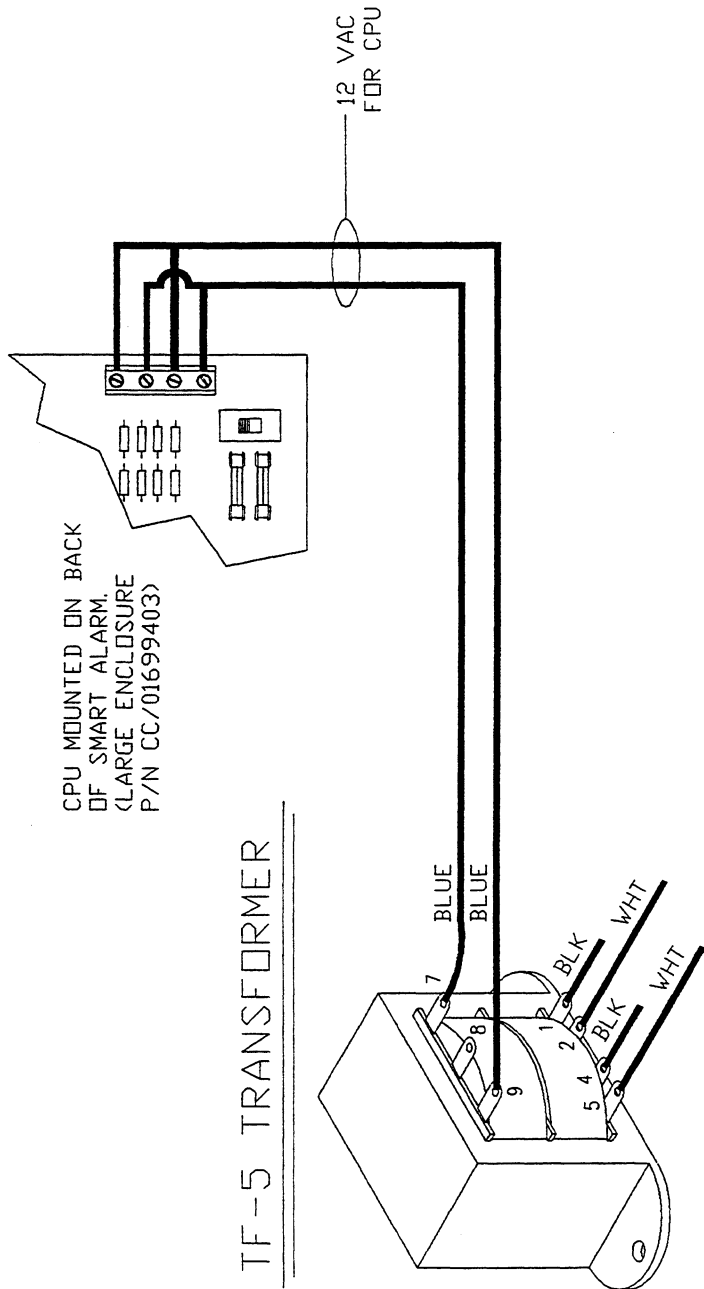
120 VAC
50/60 Hz

240/208 VAC CONFIGURATION:

12 VAC
@ 4A
TO CPU BOARD

240 VAC
50/60 Hz

(208 ACCEPTABLE)

FIGURE 5

CPU MOUNTED ON BACK
OF SMART ALARM.
(LARGE ENCLOSURE
P/N CC/01699403)

12 VAC
FOR CPU

TF-5 TRANSFORMER

7 BLUE
BLUE
BLK WHT
BLK WHT

NOTE:
1. THE TF-5 TRANSFORMER IS NOW APPROVED FOR CPU POWER WHICH REQUIRES ONLY ONE 12VAC POWER SOURCE.
2. FUSE TRANSFORMER PER ELECTRICAL CODE REQUIREMENTS.
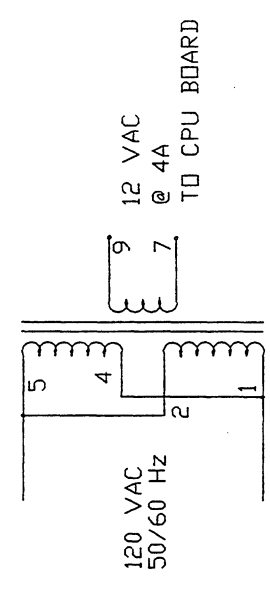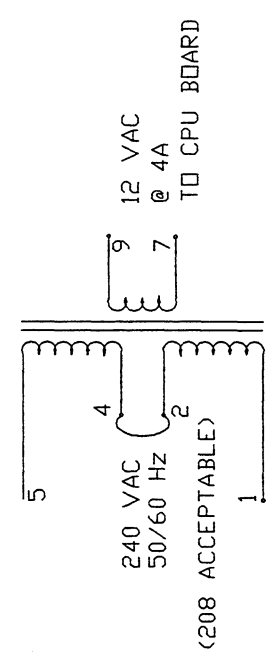
240/208 VAC CONFIGURATION:

5
240 VAC
50/60 Hz
4
(208 ACCEPTABLE)
2
1

9
7
12 VAC
@ 4A
TO CPU BOARD

120 VAC CONFIGURATION

5
4
120 VAC
50/60 Hz
2
1

9
7
12 VAC
@ 4A
TO CPU BOARD

SMART ALARM CPU POWER HOOKUP (TF-5)

FIGURE 5A