

# INSTALLATION MANUAL



PC4600 / PC4650  
GRAPHIC ANNUNCIATOR  
FOR THE PC4000 ALARM CONTROL SYSTEM

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## 1 INTRODUCTION

The PC4600 and PC4650 Graphic Annunciators are designed to make it easy and economical to add graphic display of system status and operation to your PC4000 system. Combined with the LCD4500G Message keypad, the PC4600 and PC4650 become versatile information and operation centres for your PC4000 installation.

The PC4600 can display as many as 32 indications on its display screen: zone openings and closings, trouble conditions, device operation, and many other operations can all be represented on the PC4600. The LCD4500G Message Keypad provides easy-to-understand plain-language prompts and messages to guide system operation and explain system conditions. Together, the keypad and the graphic display can show and explain at a glance the condition and status of the system.

The display area of the PC4600 is designed to accept artwork 8½" × 11" (216 mm × 279 mm) in size, making production of indicator panels easy. The PC4600 is well suited for offices, manufacturing plants and residential applications.

The PC4650 Graphic Annunciator features a larger display screen than the PC4600. With a display screen measuring 11" × 17" (279 mm × 432 mm), the PC4650 is capable of displaying up to 64 indications. The PC4650 is especially suited for larger PC4000 installations, such as manufacturing plants, warehouses, large offices and residential apartments.

Set-up, installation and programming of the PC4600 and PC4650 are all similar, and both Graphic Annunciator models are described in this manual. Where a procedure differs from the PC4600 to the PC4650, the difference will be clearly noted with the following symbols:

**PC4600**

will be used to refer to steps and procedures unique to the PC4600.

**PC4650**

will be used to refer to steps and procedures unique to the PC4650.

## MODELS

The Graphic Annunciator for the PC4000 is available in two models and in different package configurations:

<b>PC4600</b>	8½" × 11" (216 mm × 279 mm) display area Can display up to 32 indications Includes 1 PC4216 Output Module; expandable to 2 PC4216 Output Modules Includes 1 LCD4500G Message Keypad
<b>PC4650</b>	11" × 17" (279 mm × 432 mm) display area Can display up to 64 indications Includes 2 PC4216 Output Modules; expandable to 4 PC4216 Output Modules Includes 1 LCD4500G Message Keypad

## PARTS AND ACCESSORIES

Various parts and accessories are available to expand the display capabilities of the PC4600 or PC4650. Parts are also available for maintenance and replacement should the need arise.

- PC4600LA** 16 LED indicator assemblies - use with an additional PC4216 Output Module (available separately) to add another 16 indications to a PC4600 or PC4650.
- PC4600LG** Set of 4 plastic grids used to hold LED indicators in place behind the display screen. Grid mounting hardware included.
- PC4600GP** Display screen materials for the PC4600 Graphic Annunciator. All materials measure 8½" x 11" (216 mm x 279 mm):
- 2 film transparencies
  - 1 white plastic diffuser
  - 1 translucent Lexan display cover
- PC4650GP** Display screen materials for the PC4650 Graphic Annunciator. All materials measure 11" x 17" (279 mm x 432 mm):
- 2 film transparencies
  - 1 white plastic diffuser
  - 1 translucent Lexan display cover

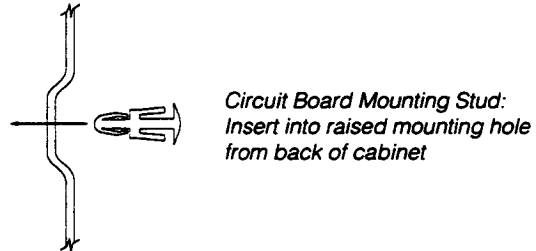
## 2 INSTALLING THE GRAPHIC ANNUNCIATOR

### ASSEMBLY

Assemble the components of the Graphic Annunciator before mounting the cabinet to the wall.

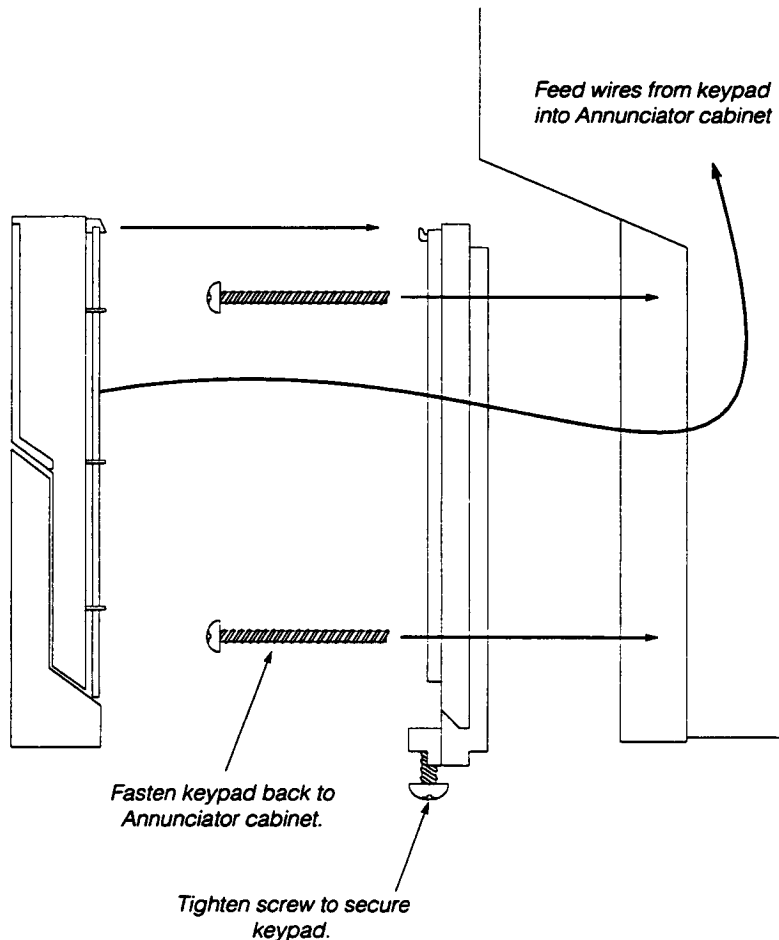
### CIRCUIT BOARD MOUNTS

Press the white nylon circuit board mounting studs into the raised mounting holes from the back of the panel. **Install all of the nylon studs at this time. Doing it now will save you from having to remove the cabinet from the wall to mount new studs if another circuit board is added later.**



### LCD4500G KEYPAD

Loosen the screws at the bottom of the LCD4500G keypad and remove the back cover. Secure the back of the keypad to the Graphic Annunciator cabinet as shown below. Feed the four wires from the LCD4500G keypad through the hole in the keypad back and into the Annunciator cabinet. Replace the keypad on its back and secure the two screws at the bottom.



## CIRCUIT BOARDS

Align the mounting holes in a PC4216 Output Module with the 4 white nylon mounting studs closest to the LCD4500G keypad. Press the module onto the mounting studs.

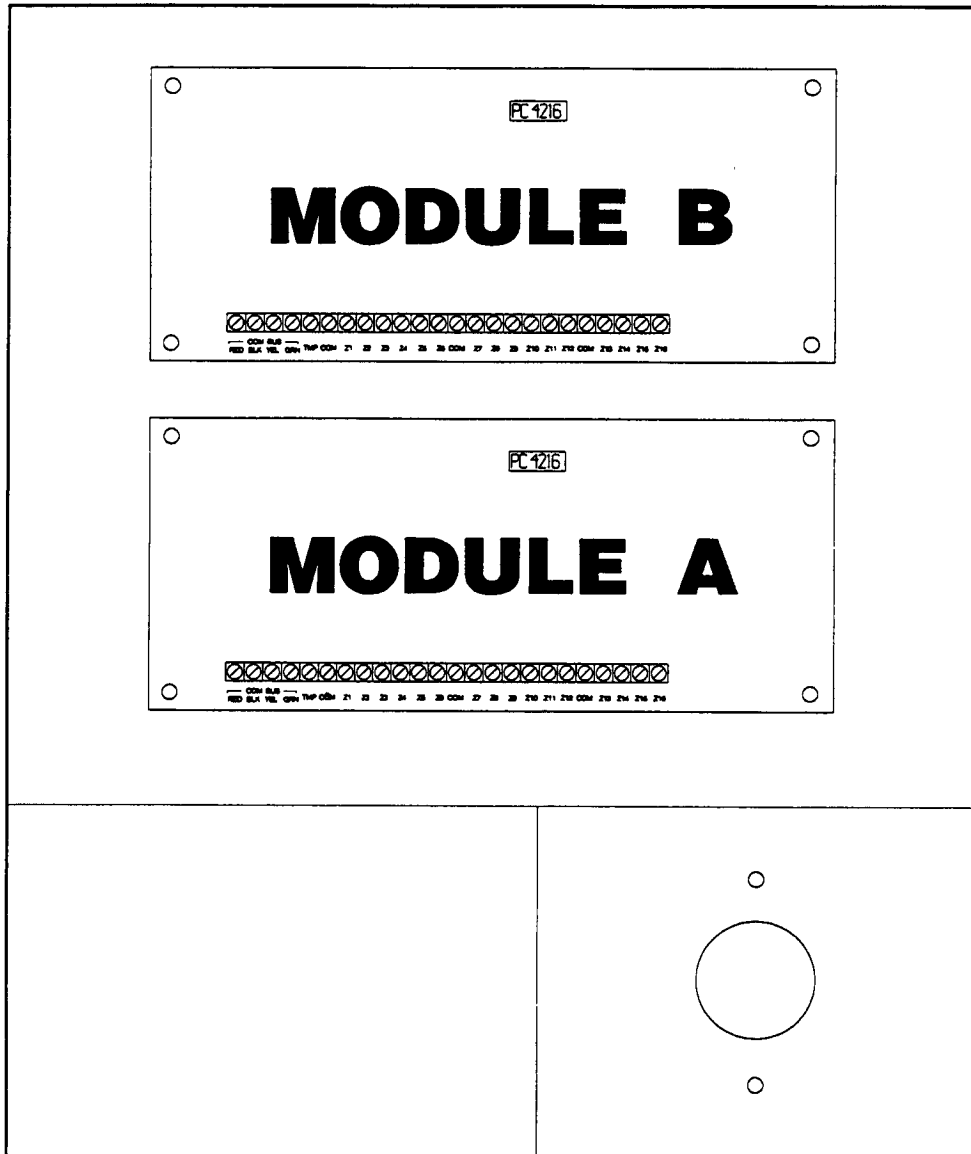
For the PC4600, one PC4216 module is provided; there is room in the cabinet for mounting an additional module.

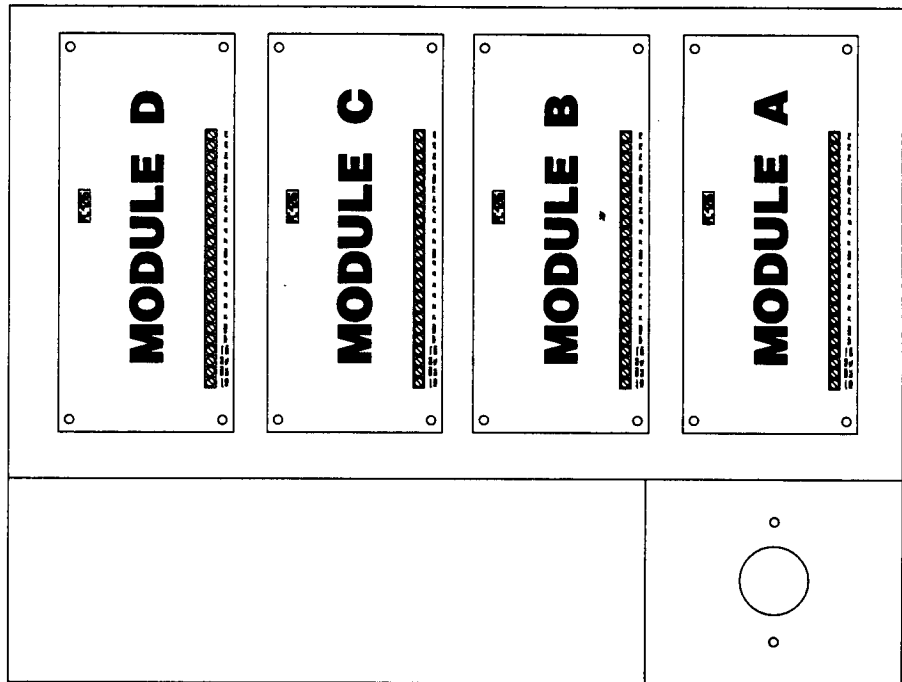
For the PC4650, two PC4216 modules are provided; there is room in the cabinet for mounting two additional modules.

To assist with wiring and programming, this manual will refer to the PC4216 Output Modules in the Graphic Annunciator as Module A, Module B, Module C and Module D.

### PC4600

In the PC4600, the Modules are numbered as shown below:





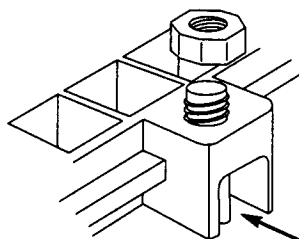
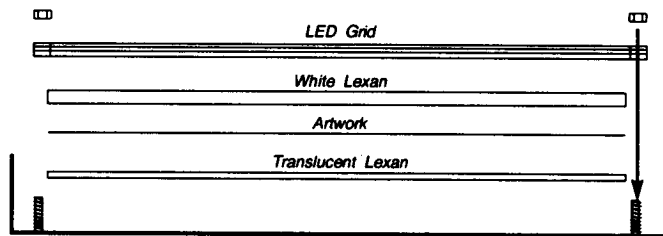
In both cases, Module A is the closest to the LCD4500G keypad (to make keypad wiring easier). Module A is also the module connected *directly* to the COMBUS; the remaining modules are connected with jumper wires to Module A.

**SCREEN**

Installation can be made faster if you have the artwork for your graphic display prepared at this time. Section 6 of this manual discusses how to design and create the artwork for your display.

If the artwork is ready, install it now as you assemble the screen. If the artwork is not yet ready, assemble the screen as described below, but do not completely tighten the nuts that hold the Indicator Grids to the door.

Sandwich your artwork (if prepared now) between the translucent lexan sheet and the white lexan sheet so that the artwork is readable through the translucent sheet.



Place LED Grids so that notch rests against door.

Place the lexan sheets in the display area in the door so that the translucent sheet faces outwards. Ensure that your artwork will be visible and right-side up when the door is closed. Place one of the black plastic Indicator Grids onto the mounting studs surrounding the display area. Place the grid in the centre of the display area to hold the lexan sheets in place while the other grids are installed. With the nuts supplied, secure the grid.

Install the remaining grids and secure with the nuts supplied. When the grids are installed, make sure that your artwork is straight in the screen area. When you are satisfied with the placement, tighten the nuts to secure the grids. If you have yet to install your artwork, do not completely tighten the nuts.

## **MOUNTING THE CABINET**

When selecting a location for the Graphic Annunciator, keep in mind the same factors that dictate the position of keypads. Remember that the Annunciator is designed to provide at-a-glance indication of system status and operation, so it must be mounted so that it is clearly visible and easily accessible.

When a location has been determined, mark the location of the mounting holes on the wall and drill pilot holes in the wall. If the Annunciator is being mounted on a solid wooden surface, the use of wall plugs is not required. If the cabinet is being mounted on a brick, cinder block, drywall or plaster wall, be sure to use plastic wall plugs. Drill holes for the plugs to ensure a tight fit and install the plugs. Secure the cabinet to the wall with the mounting screws provided.



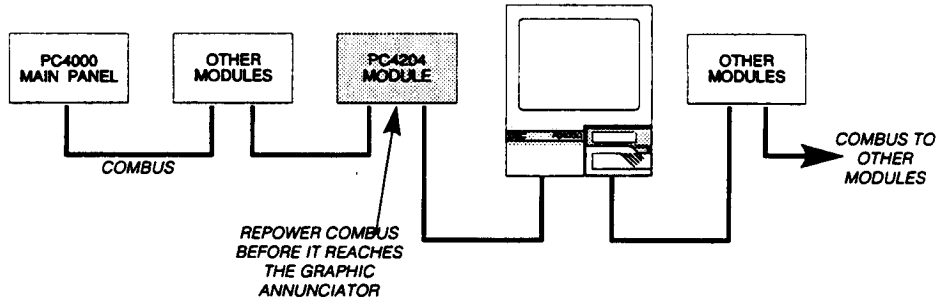
### 3 REPOWERING THE COMBUS

It is recommended that the COMBUS be "repowered" when a PC4600 or PC4650 Graphic Annunciator is installed.

While the PC4000 Main Control Panel supplies 500mA to power modules and keypads, the demand for current may exceed the supply when the Graphic Annunciator is indicating events. When indicating events, as many as 32 LEDs may be illuminated at once in the PC4600, and up to 64 LEDs may be illuminated at once in the PC4650. To prevent the demand for current from adversely affecting the operation of the system, it is strongly recommended that the COMBUS be repowered with a PC4204 4-Zone Relay Output Module as described below.

#### LOCATING THE PC4204 ON THE COMBUS

Install the PC4204 4-Zone Relay Output Module at a point between the PC4000 Main Control Panel and the PC4216 Output Modules installed in the Graphic Annunciator. The COMBUS must be repowered before it reaches the Graphic Annunciator, as shown below.



The PC4204 Module, its power supply and back-up battery may be installed in the PC4600 or PC4650 cabinet **only if**:

- **only one** PC4216 Module is used in the PC4600
- **three or fewer** PC4216 Modules are used in the PC4650.

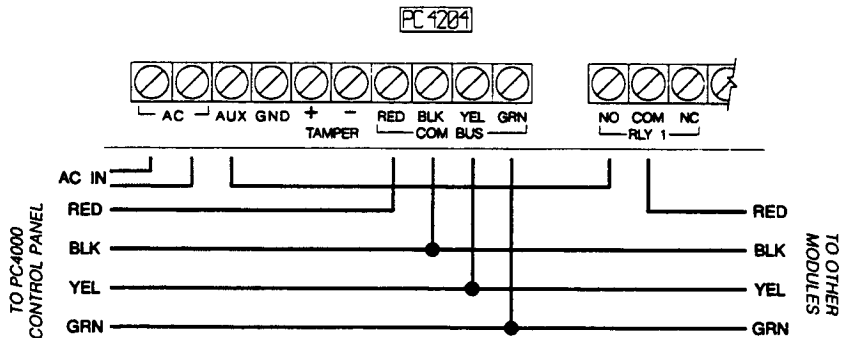
If two PC4216 Modules are used in the PC4600, or four modules are used in the PC4650, the PC4204 Module **must** be mounted separately in its own cabinet. It is suggested that, in any case, the PC4204 Module be mounted in its own cabinet. This will save having to remove and relocate the PC4204 if additional PC4216 Output Modules are added to the Graphic Annunciator at a later date.

#### INSTALLING AND WIRING THE PC4204

Shut off all power to the COMBUS before making any connections.

Install the PC4204 Module in a PC4002C cabinet or in the Graphic Annunciator cabinet by pressing it onto the nylon mounting studs fixed in the back of the cabinet. Make the battery and AC transformer connections as described in the Wiring Diagram included with the PC4204 Module.

Make the "COMBUS Repower" connections as shown below.



After the PC4204 Module has been installed and wired, be sure to enroll the PC4204 Module as described in the PC4000 Programming Manual.

## IMPORTANT POINTS TO REMEMBER

When using the PC4204 4-Zone Relay Output Module to repower the COMBUS, be sure to observe the following:

- A PC4204 used to repower the COMBUS **must not** be used to supply power to any load other than the COMBUS.
- Relay 1 should not be used for BELL output. Use only Relays 2, 3, or 4 for BELL output.
- Do not use any power supply other than the PC4204 to repower the COMBUS. ***Improper operation or damage to components could result if a power supply other than the PC4204 is used.***

For more information on repowering the COMBUS, refer to the section "COMBUS Power and Operation" in the PC4000 System Manual.

## 4 WIRING THE GRAPHIC ANNUNCIATOR

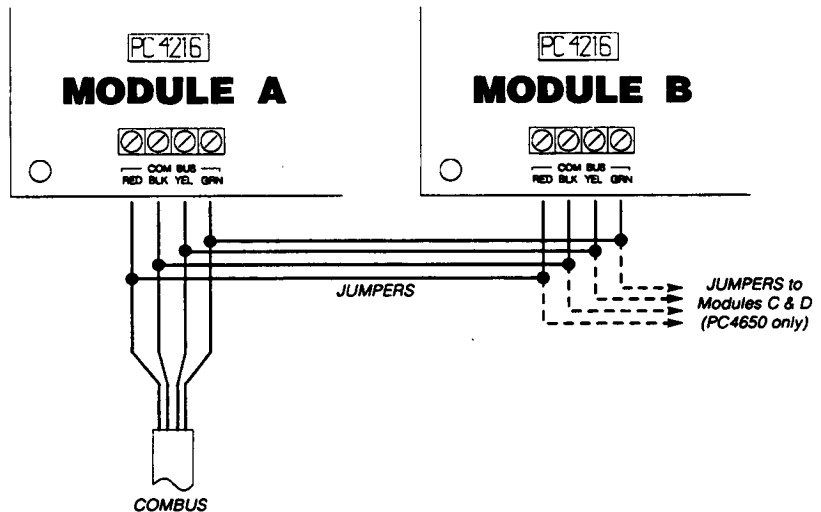
### COMBUS

Shut off the power to the PC4000 System. Always be sure that the power is off when connecting modules to the COMBUS.

Pull the COMBUS into the cabinet and prepare each of the four conductors for connection.

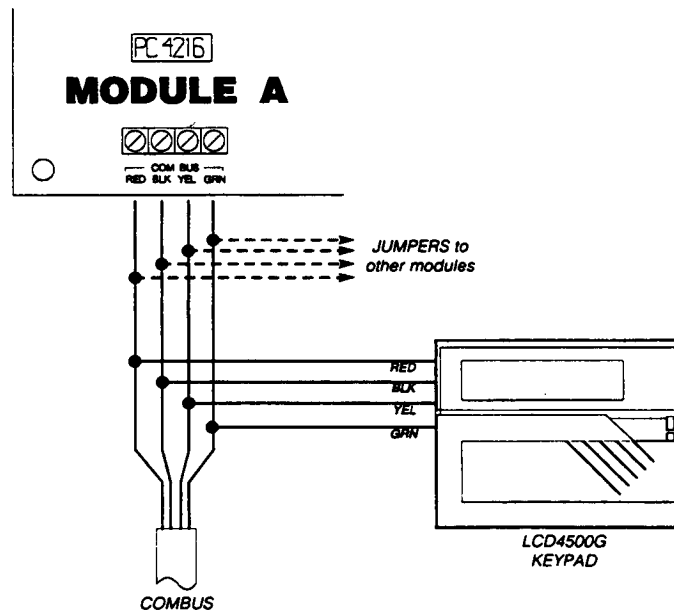
Connect the red, black, yellow and green conductors of the COMBUS to the corresponding RED, BLK, YEL and GRN terminals on Module A.

If more than one PC4216 module is to be installed in the Annunciator, prepare red, black, yellow and green jumper wires for connection. Connect the jumpers to the COMBUS terminals of Module A and then to the COMBUS terminals of Module B. Note that all of the PC4216 modules installed in the Graphic Annunciator - a maximum of 2 in the PC4600, a maximum of 4 in the PC4650 - must be connected to the COMBUS. Refer to diagram below.



### KEYPAD

Connect the red, black, yellow and green conductors from the LCD4500G keypad to the corresponding RED, BLK, YEL and GRN terminals on Module A. Refer to diagram below.



## TAMPER SWITCH

Install the tamper switch (not supplied) according to manufacturer's directions. Connect one lead of the switch to the TMP terminal on Module A. Connect the second lead from the tamper contact to a COM terminal on Module A.

It is not necessary to install tamper switches for all of the PC4216 modules installed in a Graphic Annunciator. If you have more than one PC4216 module installed, connect the tamper switch to Module A (the module connected directly to the COMBUS). Install a jumper between the TMP and COM terminals of the other PC4216 modules.

If you do not wish to use a tamper contact with your Graphic Annunciator, install a jumper between the TMP and COM terminal on all of the PC4216 modules in your Graphic Annunciator.

## LED INDICATORS

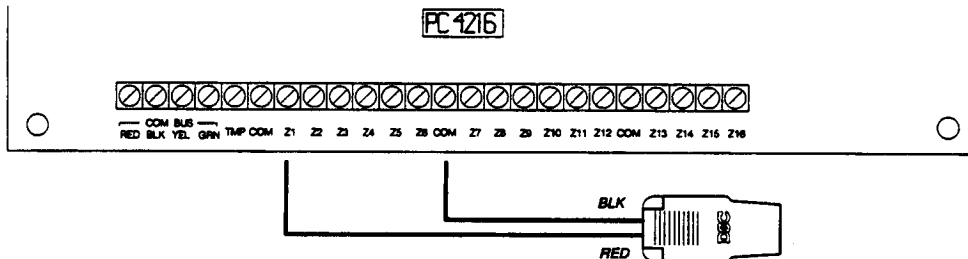
LED indicators are supplied with your Graphic Annunciator:

- PC4600 supplied with 16 LED indicators
- PC4650 supplied with 32 LED indicators

Extra LED indicators are available from your distributor should you decide to expand the display capabilities of your Graphic Annunciator.

Note that the LED indicators supplied are ready to install and *do not require* a resistor to be installed between the LED and the terminal.

To install an LED indicator, connect the red lead to one of the Z terminals on the PC4216 module. Connect the black lead to one of the COM terminals on the same module. Each COM terminal is able to accept as many as 5 leads.



When the wire connections are made, press the plastic LED indicator into the appropriate location on the LED retaining grid. The LED Indicators may be easily removed from the Retaining Grid by firmly pulling the LED Indicator straight from the grid: *do not* twist or bend the LED indicators when inserting or removing them from the grid.

Install the remaining LED indicators, connecting only one red lead to each of the PC4216 module's Z terminals. Connect the black lead from each LED indicator to a COM terminal on the same PC4216 module.

When wiring is complete and the LEDs have been placed in the retaining grid, open and close the door of the Annunciator to ensure that the wiring in the cabinet does not interfere with the motion of the door.

## 5 PROGRAMMING THE GRAPHIC ANNUNCIATOR

During programming, you may find it helpful to refer to the manuals supplied with your PC4000 Control Panel:

- Programming Flow Charts (Book 1), pages 16-17, and page 22
- Programming Manual (Book 3) pages 26-27 and page 37

### ENROLLING THE PC4216 MODULES IN YOUR GRAPHIC ANNUNCIATOR

Each of the PC4216 Output Modules installed in your Graphic Annunciator is to be enrolled individually onto the PC4000 system.

Restore power to the PC4000 system and clear any trouble conditions indicated.

Enter [\*][8][Installer's Code]. "System Area" will appear on the screen. Scroll to the "Module Hardware" section and press [\*].

The screen will display the message: "Enroll Module". Press [\*].

Scroll through the options using the [<] and [>] keys until "PC4216 16 O/P" is displayed on the screen. Press [\*].

The screen will display the message: "Create Tamper On Desired Unit". When this message is displayed, create a tamper condition on Module A in the Graphic Annunciator. This can be done by opening the tamper switch, if one is installed, or by momentarily disconnecting the jumper between the TMP and COM terminals.

The screen will display the message "PC4216 Module (n) Enrolled". *n* may be any number from 1 to 9, 9 being the maximum number of PC4216 modules allowed on a PC4000 system. This number will depend on how many other PC4216 Output Modules were enrolled on the system when you began enrolling those in the Graphic Annunciator. Be sure to record on your programming Worksheets which number (*n*) the system assigns to the module.

Repeat the enrollment process described above for each of the modules in the Graphic Annunciator. It is suggested that you enroll the modules in order - Module A then Module B in a PC4600 installation; Modules A through D in a PC4650 installation. Be sure to record the number (*n*) the system assigns to each module on the Programming Worksheets provided with the PC4216 Output Modules.

### ASSIGNING ZONES TO THE PC4216 MODULES

The Graphic Annunciator can be used to indicate alarm memory. An LED on the Annunciator's display screen will illuminate when an alarm in an armed zone is created. The LED will remain illuminated until the next time the partition is re-armed. To program the PC4216 modules in your Annunciator to indicate zone alarms, follow the procedure described below.

Enter [\*][8][Installer's Code]. The message "System Area" will appear on the screen.

Scroll through the displayed options using the [<] and [>] keys until "PGM Outputs" is displayed on the screen. Press [\*].

The screen will display the message: "Main PGM Output". Scroll through the displayed options to find the message "4216 Options". Press [\*].

The screen will display the message: "Which 4216". Enter the number the PC4000 assigned to Module A when the module was enrolled.

The screen will display the message: "Custom PGM Array". Scroll through the displayed options until "Alarms 1-16" is displayed. Press [\*].

Alarms on zones 1 to 16 will now be followed by the PC4216 module. For example, when an alarm occurs on zone 5, output 5 on the PC4216 module will activate, and the LED indicator connected to it will illuminate.

Repeat the process described above to assign zones to the remaining modules in the Graphic Annunciator. For clarity, it is suggested that you assign groups of zones to the modules in order; that is, assign zones 1 to 16 to the first PC4216 module, zones 17 to 32 to the second PC4216 module, and so on.

## INDICATING PGM EVENTS

Special functions and events can be indicated on the Graphic Annunciator by programming a PC4216 module to follow PGM events. For example, fire alarms, burglar alarms, communication failures and so on can be followed by the PC4216 and indicated with an illuminated LED on the Graphic Annunciator.

To program a PC4216 to follow PGM events, a "PGM Array" is created. The array determines which events in a partition are to be followed, and which output they are to be indicated on. The following is a list of PGM events that can be followed by the PC4216. The word "Partition" beside the event means the PC4216 output will only activate when the event occurs in the specific partition you program; "System" means the PC4216 output will activate when the event occurs anywhere on the system.

Fire and Burglary .....	Partition
Inverted Fire and Burglary .....	Partition
Burglary Only .....	Partition
Inverted Burglary Only .....	Partition
Fire Only .....	Partition
Inverted Fire Only .....	Partition
Utility Output .....	Partition
Sensor Reset .....	Partition
Partition Status .....	Partition
Latched Strobe .....	Partition
Trouble Output .....	Partition
Courtesy Pulse .....	Partition
Chime Follower .....	Partition
TLM Only .....	System
TLM and Alarm .....	Partition
Failure to Communicate .....	System
Communications Active .....	System
Ground Start .....	System
Kissoff Output .....	System
COMBUS Power .....	System
Ready Status .....	Partition

## PROGRAMMING PGM OUTPUTS

Enter [\*][8][Installer's Code], and go to the "PGM Outputs" menu as described above. Press [\*].

Scroll through the displayed options to find the "4216 Custom" message. Press [\*].

The screen will display the message: "Which Output". Enter the number of the output on the PC4216 that is to follow the PGM event. Valid entries are from [01] to [16].

The first of the 21 PGM options listed above will be displayed on the screen. Scroll through the options using the [<] and [>] keys. When the desired option is displayed, enter that option's number (displayed in the lower-right corner of the screen) or press [\*].

The screen will display the message: "Partition...X Y/N". Enter the number of the partition where you want the event to be followed.

Press the [<] and [>] keys to select either "yes" or "no" for the option, then press [\*].

Repeat the process described above for all 16 outputs.

When completed, you can assign the PGM Array to a PC4216 module.

Go to the Main PGM Out menu and scroll to find "4216 Options". Press [\*].

The screen will display the message: "Which 4216". Enter the number of the PC4216 module that is to use the PGM Array. Enter the number that the PC4000 assigned to the module when it was enrolled.

The screen will display the message: "Custom PGM Array". Press [0]. The PGM Array is now assigned to the PC4216 module you have selected.

### **ARRANGING YOUR PROGRAMMING**

It does not matter which zones you assign to each PC4216 output, or which module you use for indicating PGM events. However, for easier record keeping and trouble shooting, the following arrangements are suggested for the PC4600 and PC4650:

#### **PC4600**

Use Module A to indicate Zones 1 to 16 and Module B to indicate Zones 17 to 32 or PGM events.

#### **PC4650**

Use the last module in the PC4650 (the module installed furthest to the left) for PGM events, and use the other modules for zone indications.

For example, if three PC4216 modules are installed in the PC4650, use Module A to indicate Zones 1 to 16; Module B to indicate Zones 17 to 32 and Module C to follow the PGM events.

It has been found that arranging programming in this way helps to keep things organised and easy to follow. Whether you follow these suggestions or not, be sure to record your programming on the provided programming worksheets!





## 6 CREATING ARTWORK FOR THE GRAPHIC ANNUNCIATOR

The PC4600 and PC4650 are designed to accept standard-sized sheets of paper or transparencies. The PC4600 accepts artwork as large as 8½" x 11" (216 mm x 279 mm), while the PC4650 accepts displays as large as 11" x 17" (279 mm x 432 mm). Both sizes can be reproduced easily on most office photocopiers.

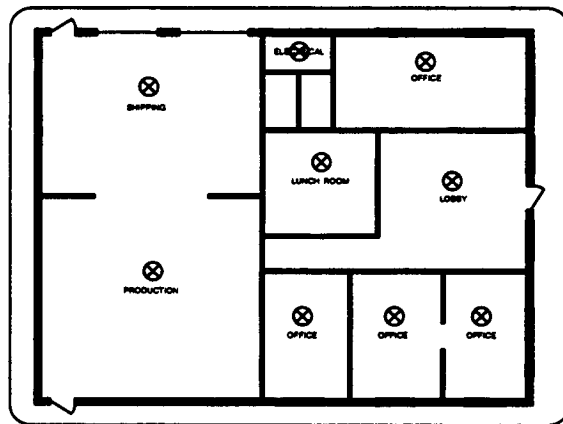
The process for creating artwork involves three steps:

- Designing the Display
- Drawing the Display
- Making Transparencies

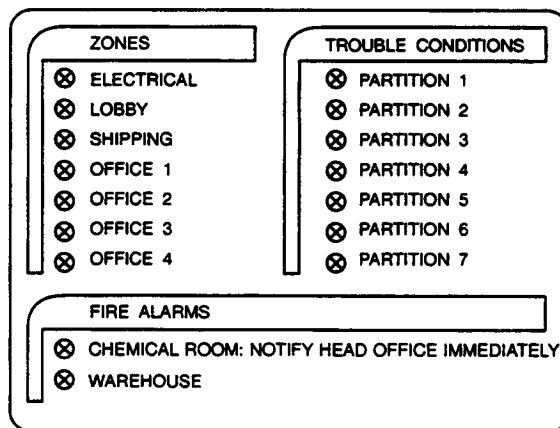
### DESIGNING THE DISPLAY

Decide what it is that you want displayed on the PC4600 or PC4650 Graphic Annunciator. Decide how many and which zones are to be annunciated, as well as any programmable events that are to be indicated.

The illustration below shows a typical Graphic Annunciator display for the PC4600. A floor plan of the premises has been drawn, and the various areas have been labelled. The symbol ⊗ indicates the placement of LED indicators behind the screen. When one of the zones is tripped, the LED will illuminate on the screen above the name of the zone. This sort of display is most useful for showing users precisely where on the premises zones are open.



Another design is shown below. Rather than a floor plan, a list of the zones and programmable events to be indicated has been created. Again, the symbol ⊗ indicates the placement of LED indicators. While this display duplicates the zone label feature of the LCD4500G message keypad, the list format can provide additional information for the user: note the message beside the Chemical Room fire alarm indication.



When designing the display, it is best to work with the users of the system to determine what should be indicated, and how it would most clearly be displayed.

## **DRAWING THE DISPLAY**

Included with the screen material for the Graphic Annunciator is a paper template indicating the position of LED Indicators on the display screen. When creating the artwork for your Annunciator, use the template as a guide to position your artwork relative to the LED Indicators in the display.

## **PEN AND PAPER**

A Graphic Annunciator display can be quickly drawn using pen and paper if time does not permit more detailed work. For temporary use, the display can be quickly sketched on plain paper and then photocopied onto a clear acetate transparency. If the display is drawn on translucent paper, such as tracing paper, a transparency is not needed - simply mount the tracing paper in the display.

## **DRY TRANSFERS AND TAPE**

Dry transfer lettering and ruling tape can be used to create neat, professional looking displays for the Graphic Annunciator. Dry transfer lettering is available at any office supply or artists' supply store and is easily used. Many manufacturers, such as Letraset\*, offer a wide variety of symbols and typefaces that can be used in creating a display. Drafting or ruling tape can be used to create lines, borders, floorplans and other designs. This material is also widely available from office and art supply stores.

When creating a display with transfers and tape, it is suggested that you work on a heavy grade of paper or even cardstock that will permit repeated handling - the directions with the products you use will provide complete details regarding the type of material to use. When the artwork is completed, photocopy the design onto clear acetate sheets for mounting in the Graphic Annunciator.

## **COMPUTER ARTWORK**

Many easy-to-use drawing programs are available for home and office computers. These programs will allow you to create professional looking displays in a fraction of the time required for more traditional methods (depending, of course, on your familiarity with the software used). Drawing programs such as CorelDRAW!\* for the PC and MacDraw Pro\* for the Macintosh\*, to name just two of many programs and computer systems, can be used to create almost any sort of display for your Graphic Annunciator.

Artwork from a computer can be printed directly on clear acetate film with most laser printers and some dot-matrix printers. For greater resolution, computer artwork can be printed to clear plastic film on an electronic image setter - most major cities will have service bureaus where computer-generated art can be printed. Also, most cities will have desktop publishing services where, for a fee, artwork can be created to your specifications. Look under "desktop publishing" in the Yellow Pages.

## **MAKING TRANSPARENCIES**

The display design should be printed on a clear material so that the LED indicators in the screen behind the display can be easily seen. If clear material cannot be obtained, translucent tracing paper may be used.

The easiest way to make transparencies is to photocopy the artwork onto clear acetate sheets. When doing this, ensure that the acetate material you are using is safe for photocopiers. The large sheets needed for the PC4650 - 11" x 17" (279 mm x 432 mm) - may be difficult to find, depending on your location. If this is the case, use two 8½" x 11" (216 mm x 279 mm) sheets placed side-by-side.

*\* Letraset is a registered trademark of Letraset Canada Limited; CorelDRAW! is a registered trademark of Corel Systems Inc.; MacDraw Pro is a trademark of Claris Corp.; Macintosh is a trademark of Apple Computer Corp. Digital Security Controls Ltd. does not endorse the use of any brand-name products mentioned in this manual, and cannot guarantee that desirable results will be obtained by using the products mentioned here.*

If your design was created on a computer, you may be able to have your artwork printed directly to clear plastic film. Look under "desktop publishing" in the Yellow Pages to find a service bureau that offers electronic image setting. The service bureau will be able to tell you their requirements for electronic image setting.

When your artwork is completed, install the display as described under Assembly in Section 2 of this manual.

## **LIMITED WARRANTY**

Digital Security Controls Ltd. warrants that for a period of twelve months from the date of purchase, the product shall be free from defects in materials and workmanship under normal use and that in fulfillment of any breach of such warranty, Digital Security Controls Ltd. shall, at its option, repair or replace the defective equipment upon return of the equipment to its repair depot. This warranty applies only to defects in parts and workmanship and not to damage incurred in shipping or handling, or damage due to causes beyond the control of Digital Security Controls Ltd., such as lightning, excessive voltage, mechanical shock, water damage, or damage arising out of abuse, alteration or improper application of the equipment.

The foregoing warranty shall apply only to the original buyer, and is and shall be in lieu of any and all other warranties, whether expressed or implied and of all other obligations or liabilities on the part of Digital Security Controls Ltd. Digital Security Controls Ltd. neither assumes, nor authorizes any other person purporting to act on its behalf to modify or to change this warranty, nor to assume for it any other warranty or liability concerning this product.

In no event shall Digital Security Controls Ltd. be liable for any direct or indirect or consequential damages, loss of anticipated profits, loss of time or any other losses incurred by the buyer in connection with the purchase, installation or operation or failure of this product.

### **WARNING:**

Digital Security Controls Ltd. recommends that the entire system be completely tested on a regular basis. However, despite frequent testing, and due to but not limited to, criminal tampering or electrical disruption, it is possible for this product to fail to perform as expected.