Communications & Documentation Technologies

ANNUNCIATION & DISPLAY DESIGN GUIDE

GRAPHIC DISPLAY ANNUNCIATORS

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Introduction

This design guide will help you develop the design and installation of a graphic display annunciation system. It is recommended that you review this entire manual before designing an annunciator system. Special pricing forms are available to help you obtain current pricing on any custom annunciator. If you need help, please contact the factory.

Overview

Control Room Display

Control Room Displays inform the operator of status and warn of problems that have occurred. Typically the displays are large and located in a place that will immediately inform the operator of the problem regardless of the operator's location in the control room.

Each display normally contains a visual annunciation of the type and location of alarm and an audible alarm that notifies the operator that a problem has occurred. Audible alarms may be presented in different tones for different priorities of alarm.

Control room displays are generally divided into two types: Linear and Graphic.

Linear Displays

Linear displays consist of an array of lamps presented with labels for each lamp function. Lamps are normally situated in rows and columns. The label should be sufficient for the operator to rapidly identify the nature of the problem.

The advantages of linear displays are their smaller size and economy. The disadvantage is that the lack of precise location information requires the operator to have knowledge of the facility to precisely identify the problem for the responding personnel.

Graphic Displays

Graphic displays consist of lamps arranged over a graphic representation of the monitored area. Lamps are normally colored and situated to show the location and nature of the alarm. Labels can be added for clarity.

The advantages of graphic displays are the clear presentation of the nature and location of the alarm in relation to the area being monitored. Multiple alarms can be quickly associated because the graphic display shows their relationship. Responding personnel can usually be directed more accurately. The disadvantages are the typically larger size and higher cost.

Examples of Use

General

The following examples are provided as ideas for the use of the *Graphic Display Annunciator* systems. Each example is drawn from practical experience but bears no specific resemblance to any project or installation.

Each example is only briefly explained. If you wish additional details, please contact our factory.

Control Room Display

CORRECTIONAL OR OTHER FACILITY PERIMETER ALARM

The perimeter of a correctional facility is long and difficult to monitor. A graphic display panel shows each alarmed section of the perimeter alarm system and the status of the alarm conditions. If an alarm occurs, the alarm is shown in relation to the facility and response is easily directed.

The status of each alarm zone is shown by different colored lamps. If an alarm zone has been accessed for maintenance or has been damaged, the status is presented in front of the control room operator until the problem is repaired.

Multiple alarms in adjacent zones are immediately apparent. The graphically presented alarm situations are more apparent to an operator who may not have a complete knowledge of the facility.

CORRECTIONAL FACILITY INTERNAL BUILDING ALARMS

A correctional facility housing unit is a complex structure with monitoring usually required for door position, fire alarm, personal security, intercommunications and others.

A graphic display panel utilizing different colored lamps for each function provides a convenient method of keeping track of all systems. A change of status or an alarm condition is indicated by a flashing lamp and audible signal.

The graphic display panel can be integrated with the control panel allowing monitoring door position and allowing door control from the same panel.

INDUSTRIAL PROCESS CONTROL CENTER

A manufacturing process is often automatically controlled. Each function in the process depends on the preceding and succeeding functions to produce a smooth flow of manufactured products.

A graphic display panel located in the process control center informs the operator of the status of each operation relative to all other operations. Erratic operation of one or more functions will be identified to the operator who can make required adjustments or stop the process while repairs are made.

Discussion

Graphic annunciation can be connected to one or several systems. It is best to determine which systems should be connected to the annunciator at the beginning so that the locations and types of lighting can be coordinated between all systems.

The size and location of the graphic annunciator can help determine the systems appearing on the display. It is best not to overload a graphic with too many functions that will confuse the operator. A larger graphic with space between lamps is often easier to read, especially in an emergency.

Several graphic annunciators, each dealing with certain operations is often best for a control room. Place similar systems on annunciators. Be careful to make sure that there are no conflicts in lighting or graphic colors. Certain colors should be used for alarms while other colors can be used for advisory type messages.

Flashing lamps usually mean a higher priority than solid lamps. Lamp illumination should always be accompanied by an audible indicator that alerts the operator to a change in condition. Audible alarms should be capable of reset by the operator; however, the operator should not be able to reset the annunciator unless the alarm condition is cleared and reset.

Equipment Placement

Graphic displays should be placed where they can be easily read by the operator. Displays that are too far away from the operator's normal position may be hard to read and therefore ignored. Legends and other wording should always be presented in what we call “over 40” type. Displays at a distance should use larger type.

Graphic displays should be placed out of the way of direct sunlight or other strong lighting. The annunciation lighting is prone to becoming “washed out” and hard or impossible to read from certain angles. Wall mounted displays are popular.

A particularly good location is just below the ceiling level and angled down to the operator's position. This location uses space that would normally be unusable. The down angle provides good visibility, does not interfere with the control room lighting and is out of the way of direct sunlight.

Interconnection

In most cases, a *Graphic Display Annunciator* must interface with several different and usually dissimilar systems. In this regard, the graphic display is a system unto itself and must contain the equipment that will interface with each of the other systems and produce a consistent display.

The interconnection of the graphic display is often a complicated matter that is overlooked by the designer and installer. There are a number of common annunciator functions, such as lamp testing and audible alarms that should be addressed inside the display system.

The interconnection of each system should be addressed individually. The safest and most conservative interface is the utilization of isolated closed contacts. While not a very sophisticated approach, isolated relay contacts provide complete separation between the display system, each system connected to it and between the systems themselves.

Equipment Required

Begin your equipment list by listing the systems that will be connected to each graphic display. A plot or floor plan showing the area of to be covered by the display is very helpful. Overlay the drawing with tracing paper and “dot-in” each display lamp as you proceed through the systems.

Next decide which graphics should appear on the display. It is important to show sufficient detail for the operator to locate each indication without studying the display. However, too much detail will become confusing. Once again the tracing can show the detail.

The lamp colors and styles can be chosen. The operator may have a preference as to the type of lamp used.

- Surface mounted lamps can be seen through a wider area but are prone to damage.
- Lamps mounted behind a non-glare surface provide a consistent pattern that is rugged and easy to keep clean.
- Incandescent lamps provide a brighter display than solid state LEDs but will burn out and require replacement sooner.
- Although not as bright as incandescent lamps and more limited in color selection, Light-Emitting-Diodes (LEDs) last for a very long time and are considered to last forever.
- In summary, the most popular displays utilize LEDs mounted behind a non-glare polycarbonate sheet.

The colors of the lamps should be consistent throughout the display. While the LEDs are more popular the color choice is limited. LEDs are generally available in red, green, yellow, and orange only. Slow and rapid flashing lamps can differentiate certain conditions.

- Normally Red is used for alarm conditions, such as zone alarm, fire alarm, etc. The red lamp can be changed to flashing for certain alarm types.
- Green is used to indicate normal operating conditions although some displays use a “deadfront” method where a normal condition is shown by NO lighted indicators.
- Yellow and Orange lamps are used to annunciate different systems such as, personal security alarms, patrol tour, pressure alarms, door conditions, etc.

The interfaces to the systems being monitored will depend on the type of system connected. Most systems have a specific type of output for driving lamp-type annunciators, although there is no consistency between manufacturers. **CDT** manufactures interface circuit boards for most alarm system manufacturers.

The graphic display enclosure design will depend on the mounting. Several surface wall-mounted and console-mounted displays are standard. Other mountings are custom manufactured to fit the application. Typical custom enclosures have sloped display panel surfaces and hinged panels for ease of service.

Budgetary Pricing

The amount of variation in graphic display panels makes a simple pricing plan difficult. When you need pricing information on a display panel, please contact our engineering department. A pricing schedule is available that will help you develop the criteria for pricing a *Graphic Display Annunciator* system. Or, you may provide us the size, mounting, type, and quantity of lamps and we will be able to furnish budgetary pricing.

Specifications

Graphic Display Annunciator system sample specifications are included in this manual. These specifications are also available on diskette in either IBM-compatible or Macintosh formats. Please contact the factory.

CUSTOM GRAPHIC DISPLAY ANNUNCIATOR SYSTEMS

GENERAL

CDT manufactures custom graphic display annunciators suitable for wall, console, or rack mounting. **CDT** manufactures several standard-size annunciators and stocks the enclosures and faceplates for these sizes. However, many annunciators are required in special sizes and configurations. For these units, a special quotation must be prepared by the factory. The information below is required to request a quotation for a customized system. To price out a standard-size annunciator system, use the form on the reverse side.

QUOTATION INFORMATION

The following information is required to obtain a custom quotation from the factory. If you request a quotation by phone or fax, your firm quotation will be returned with 24 hours in most cases.

1. Annunciator Mounting Type: _____
2. Enclosure Size:_____W, _____ H, _____ D (inches)
3. Lamp Type and Style: _____
4. Lamp Colors and Quantities: _____
5. Special Requirements: _____
   (Examples are: lamp test, audible alarm, special circuits, etc.)
   _____
6. Provide a sketch (attach a drawing if possible) or define special requirements here:

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