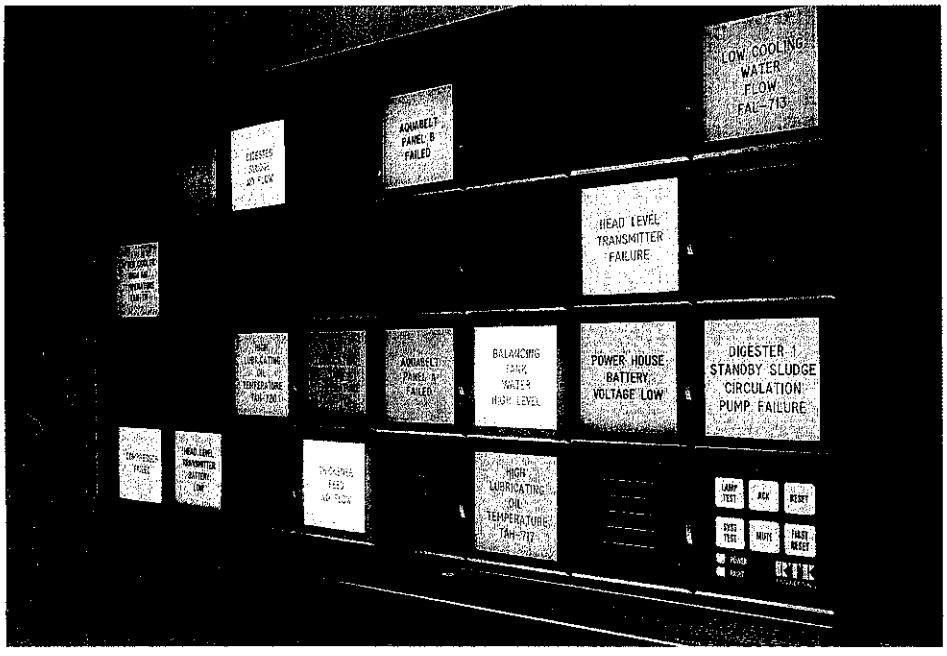
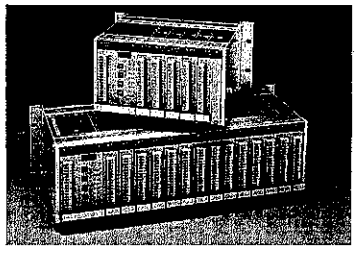
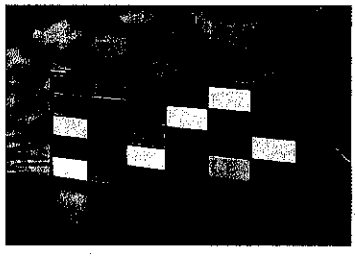


Alarm Annunciators More than just flashing lights!

ASIC Technology not only gives reliability and flexibility but is also forcing prices down

Alarm annunciators are found in every process industry and, although often percieved as no more than warning lights, the amount of design technology behind them is quite surprising. What is even less well known is how much alarm technology has moved on in the last few years, resulting in very large performance differences between similar looking products on the market. Having a long and distinguished past, alarm annunciators have become an integral part of control and instrumentation systems. There is no process industry which does not use alarm annunciators, in some form or other, to assist in plant operation and safety. The traditional users are generally power stations, oil and gas, chemical and water industries, but any control system monitoring plant conditions could well use an annunciator of some form.





THE PAST

Alarm annunciators have developed and improved in line with all electronic equipment. Relay logic was used in the earliest systems and it is still sold today for extremely harsh operating conditions or applications where there is very limited technical back-up. The transistor gave rise to the first solid state systems, closely followed by integrated circuits and CMOS technology. These changes continually produced more reliable systems at lower prices, but it was the advent of the microprocessor, heralded as a panacea for all electronic engineers' problems, which changed annunciators most dramatically. The microprocessor was promoted as 'The answer waiting for the problem' and the alarm annunciator was indeed one of the problems addressed using this method. Because of the flexibility of microprocessors, annunciators were then produced with an ever expanding range of options, including field programmability, without sacrificing the inherent reliability.

ASIC TECHNOLOGY

One of the most recent major advances in IC technology has been the 'Application Specific Integrated Circuit' (ASIC) which allows the designer the possibility of cramming the equivalent of thousands of gates onto an IC smaller than a postage stamp. In the latest generation of alarm annunciators, ASIC technology gives some major advantages over conventional systems. Firstly, there is now no need for an annunciator to have a master module, containing the microprocessor or control circuitry, as each ASIC within the system is capable of controlling the whole system. This philosophy gives the ultimate in redundancy, as each alarm board contains one of these powerful ASIC's. If one ASIC goes faulty or is removed, control is automatically transferred to another board, unlike a microprocessor system which is totally reliant on the central CPU and associated components. With the ASIC approach, the worst system fault that can occur is the loss of two alarm ways. As the price of ASICs has dropped, it is now possible to include other features within the IC such as full field programmability, so that the customer can configure the system to suit his own requirements and match the appropriate alarm sequence, as outlined in the ISA manual 'Annunciator Sequences and Specifications', S18, 1 - 1979.

The most interesting feature of the ASIC approach is the fact that it also costs less than other technologies! Within the limits of the ASICs capacity, additional features can be added without any increase in component costs. This is particularly true for small systems up to approximately 50-60 alarm points, where the very fact that a central master-module is not required makes the system price lower. A second advantage of the ASIC technology is the speed of delivery that can be offered. As there is only one common alarm board, systems of almost any size can be built and configured (using the on-board DIL switches) to exact customer requirements in a few hours. End users only require minimal spares, as only one type of alarm board is used for all systems.

PANEL MOUNT OR REMOTE LOGIC?

Two main types of annunciators are still commonly used - the panel mounted version or the remote logic version. Panel mounted versions, where all the elctronics are integral to the display facia, are generally cheaper and suitable for the majority of common alarm monitoring applications. The remote logic method, where all the electronics are mounted in a 19in racking system, would be used to drive mimic diagrams or custom displays and also on larger alarm systems where control room space is limited.

LAMPS OR LEDS

In the past the continual replacement of incandescent bulbs on annunciators has been a cause for complaint. However, with the improvements in LED technology, it is now possible to have a back-lit LED display which is comparable in brightness to conventional bulbs. This is at present more expensive, but it does give a truly maintenance-free annunciator.

THE FUTURE

As computer control and complex SCADA systems are used more extensively for plant control and monitoring, then communications become an important part of the annunciator system. Systems can be supplied to communicate with PCs, DCS systems and computers to provide a secondary level of alarm annunciation at the central control room. This would normally be displayed on VDUs. As process plant becomes more and more complex, the need for alarm monitoring still continues to be an important aspect of system design. The simplicity and visual impact of standard annunciator display facias, combined with its inherent reliability and communications abilities, provides an ideal method of clearly indicating any abnormal plant condition.

Tim McLeman