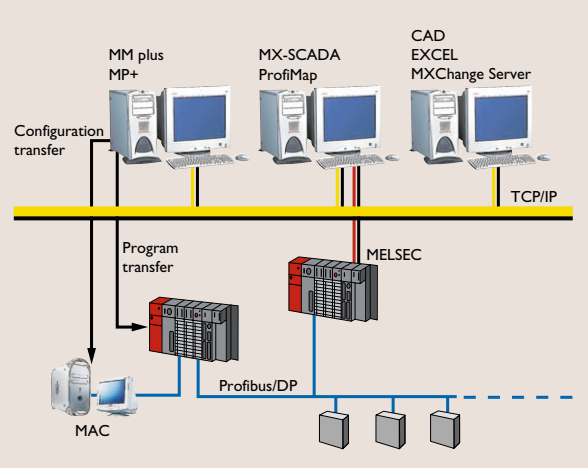
Studer S3 Surveillance System

System Description

The Studer Surveillance System S3 is based on Programmable Logic Controller (PLC) technology and consists of a microprocessor, i/o modules and a graphical user interface. It can be integrated into a network or be operated standalone.



The architecture allows to receive and analyse data and to activate control outputs according to a custom build program. Inputs and outputs can be of parallel, serial, digital or analogue type.

Graphical User Interfaces (GUI) can be personal computers or touch screen pannels with network interface in order to communicate to the PLC processor and their i/o's.

These GUI interfaces are programed with a custom build software to deliver the display and functionality needed by the customer/user.

Broadcast Application

Initially PLC technology has been developped mainly for the manufacturing industry (e.g. car, machinery, electronics, robotics, etc.) but also for critical quality control and survey in factories like nuclear plants, water dams etc. The common goal being to minimize human errors and decrease response times when a problem appears.

S3 is the application of PLC in the broadcasting environment in order to minimize on-air down time and assist users in maintenance and fault finding.

A broadcast environment, whether it is television or radio orientated, may consist of production studios, editing suites, libraries systems, on-air studios, news systems, OB vehicles, master control rooms and transmission / link areas.

Between all these sites, data is being transmitted through networks (audio, video or control data). Statistically, such complexity will produce errors at one stage or another. Human or electronic faults should be eliminated as much as possible in order to decrease and eradicate on-air downtime and protect income revenues.

For this purpose, Studer's System Department has developed together with end users the **S3** surveillance system. Independent of and outside all above mentioned areas and functions, the PLC may receive information regarding audio silence detectors, video, temperature sensors, power supplies, UPS changeover or security sensors, analyse them and react in consequence for example by re-connecting signals, sending e-mails, paging people, setting alarms and displaying where the fault comes from for a quick and fast localisation of the fault or cause. The PLC system might even be redundant itself to correct own possible faults and increase reliability even more.

In case of a problem, the PLC activates a predetermined emergency path or solution plan. For example, it can start an emergency play out system to avoid on air break down and activate an alarm display in the control room or automatically re-route the signals.

The Programmable Logic Controller

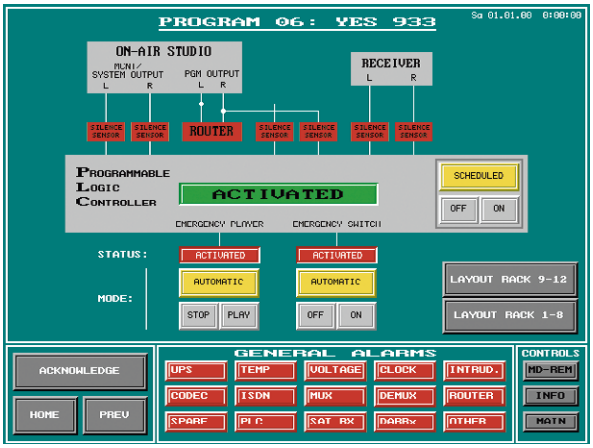
In contrast to traditional set-up's with relais' and control lamps, PLC systems are freely programmable and can therefore combine complex conditions, delays or even entire emergency sequences with case dependent actions.

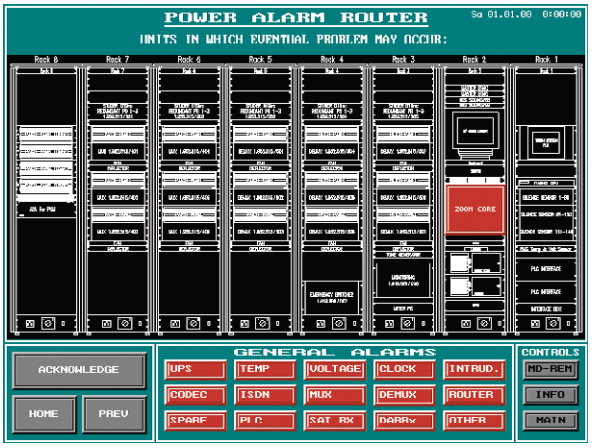
Moreover, the PLC includes a graphical user interface with touch screens located for example in the control room or maintenance room showing the entire chain of the studio network and its statuses. Actions can be taken by the user directly on the touch screen when an error appears. The location of the fault is shown graphically by means of a display change on the screen allowing for a speedy reaction of the maintenance team.

The PLC system has virtually no limitations on number of inputs or outputs (200 i/o's should be sufficient for medium systems).

Many of the interfaces between the i/o modules and the exterior world like audio silence detector, video miss, power failure sensor or fire and security detectors are designed or customized and manufactured by Studer Professional Audio AG.

Studer also provides the control software needed to monitor the process in the system and initiate actions according to the customer's requirement.





Alarm Principle

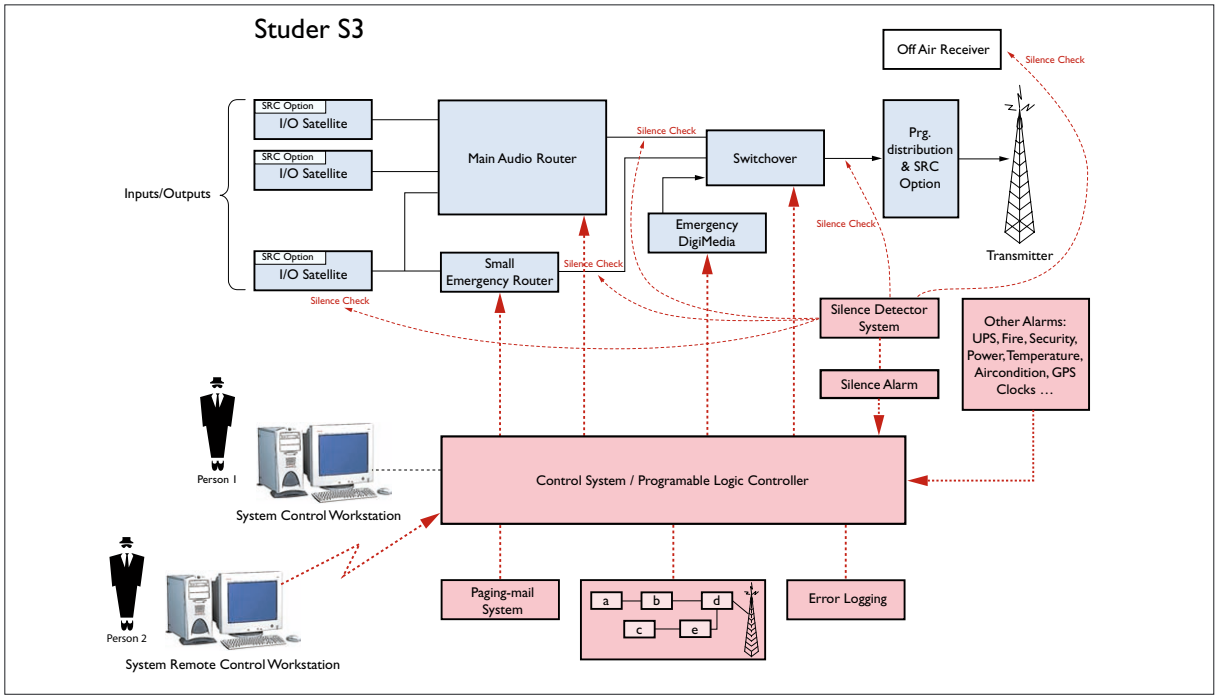
When a problem arises in the system, two types of alarms have to be considered:

- Information Display Alarm: will start an alert information message on the screens, pagers, e-mail or GSM. The maintenance team will then be able to check if the alarm was neglectable and disable the alarm sensor or if it is real and proper action has to be taken.

- HOT Alarm: will mainly be connected to the on air program output of the system and emerge when an error (silence) has been detected for a pre-defined period of time. In this case the PLC may e.g. start emergency signal lamps and/or an acoustic alarm. The maintenance team can then locate the fault on the PLC screen and act appropriately (e.g. emergency router channel or patch).

  Should the maintenance team be unavailable, the PLC may automatically activate an emergency path via an external emergency router and audio switches, and if still no signal is perceived by the sensor, activate an emergency play machine.
  At all times, during this kind of alarms, the PLC system may send predefined messages of the fault evolution and actions being taken to predefined destinations (e.g. touch screens, pagers, e-mail or GSM).

An example for an S3 applications is schematically shown below for an audio broadcast application.



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