

Art Gallery

Art Galleries come in many forms. Virtually all of them having multiple rooms. Therefore there is a need to link them to a Building Management System (BMS) within the building. Operation by staff should be simple and configuration, highly flexible, as there will very likely be a need for varying lighting requirements as different exhibitions are staged. As most Art Galleries do not close down for a “big bang” refurbishment, there is a common process of planned renewal further underlying this need for flexibility.

This application deals with one scenario and is designed to show that the iCANnet™ system is a highly flexible and adaptable one. It also illustrates two separate issues of systems integration.

In this example project it is necessary to provide an integrated control system in eighteen galleries. It is expected that the control system in each gallery will be done in turn. It is therefore a prerequisite that the control system for each gallery must “stand alone”, but at the same time

be capable of interfacing to the BMS system for timed instructions and master over-ride.

The system can also be designed with the protection of the art being displayed, as one of its priorities. UV light damages paintings, so this should be minimised. We can monitor and log the time and intensity of light to which the objects are subjected and thus provide records for management and insurance purposes. In addition, the system can be configured to automatically turn off the artificial lighting and close the louvers when the space is not occupied.

The gallery itself is octagonal in shape, with two entrances diametrically opposed. There is a glazed and domed roof. The building is not over shadowed by any nearby structures.

The proposed lighting scheme consists of a total of fifteen circuits, including a three circuit track and grid system. An interface to eight circuits of louvre blind control is also accommodated (refer to figure 1 below):-

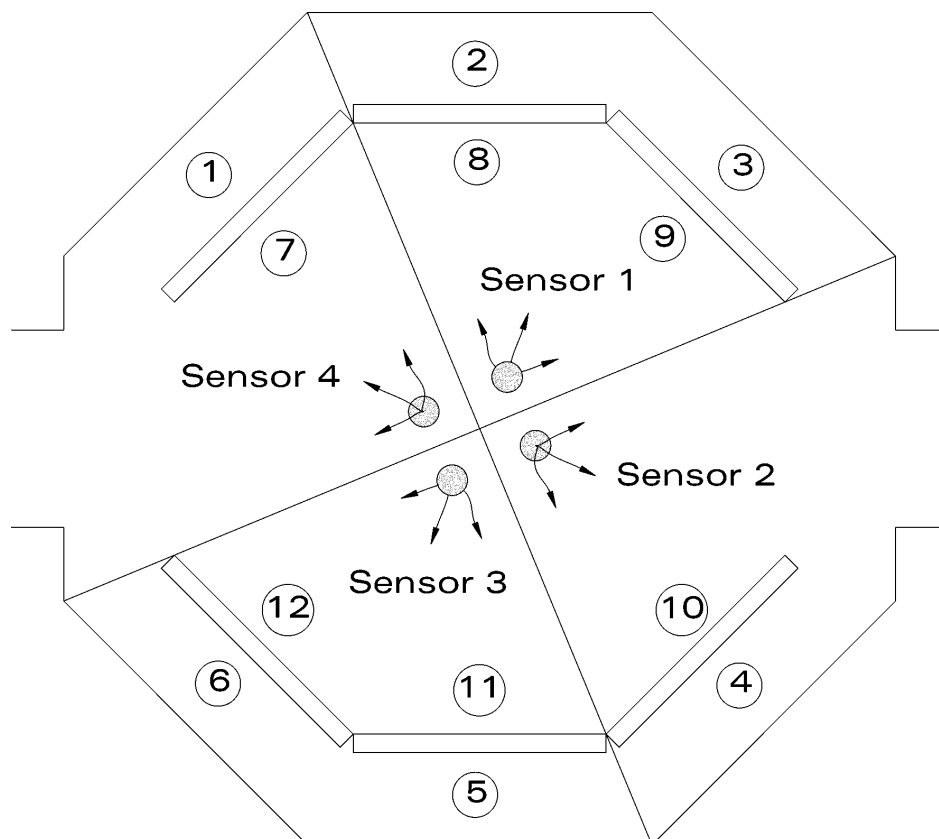


Figure 1: Reflected Ceiling plan of one gallery.

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Circuits 1 to 6 consist of twin 55W TC-L lamp fittings with High Frequency Ballasts, operated on a 0->10 Volt control signal.

Circuits 7 to 12 consist of 36W TC-L lamps, arranged to up-light the dome to give reflected light for circulation.

Two circuits of accent spots to light sculptures which would be displayed in the centre of the gallery floor (not shown).

One additional circuit of non-dimmed Compact Fluorescent lamps for cleaner's lighting and security lighting for use when the other circuits are off in "out of hours" operation (not shown).

Daylight control is achieved by means of eight electrically operable louvre blinds. These would be controlled by high precision stepper motors which in turn would be linked to the PE Cells via the interface unit.

Control System Objectives

The task for the control system is as follows:

To monitor the combined daylight and artificial light falling on the vertical surfaces of the gallery walls using an average illumination level of 200 Lux on each of the four zones (see figure 1 previous page). To then

issue commands to both the dimmers and the Automatic Louvre system in a closed loop basis, to ensure that the system dynamically achieves this goal.

To provide a dimmed scene for two or three circuits of Low Voltage Tungsten Halogen lighting for works of art/sculptures within the centre of the gallery.

To allow a BMS input to fade off or on all of the gallery lighting via means of a BMS input.

To enable the Security/Cleanest Lighting circuit when the main lighting system is off. This circuit would be switched only, and would be triggered by a person entering the space being detected by the PIR within the Universal sensors (units 2 and 4). The circuit would then remain on for a preprogrammed period of between one and twenty minutes.

To provide a local control panel (with integral programming point) to over-ride the automatic control system settings. This control panel would have a key switch or an IR hand held transmitter to enable/disable the unit.

To function on the principle of last action/ instruction takes precedence.

The proposed components

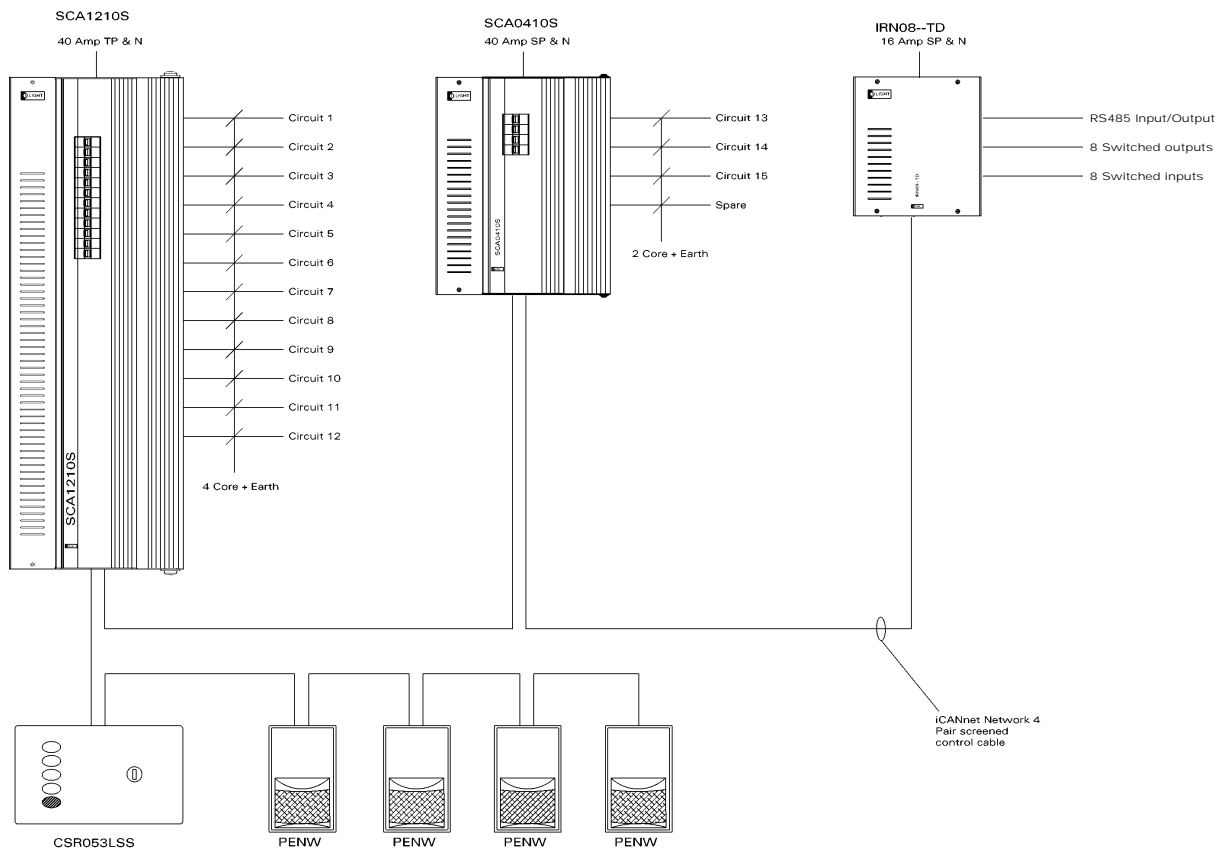


Figure 2: block schematic of proposed system

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System Description

Circuits 1 to 12 would be under the control of a 12 channel HF Ballast controller unit (SCH1210S). This has an integral 128 scene memory.

The control of the three Low Voltage Tungsten Halogen circuits and the Compact Fluorescent Security/Cleaners circuit (non-dimming) would be via a four channel source controller unit also with an integral 128 scene memory. Note that this would be an adaptive dimmer, which would automatically configure itself as a switch for the non-dimmed circuits and would detect what type of dimmable light sources were present and ensure compatibility. This type of control unit is ideal in Galleries, where the lighting is frequently changed.

These units will receive scene commands via the iCANnet™ network from several sources. These will be:

From the matrix of Universal Sensors, focused on the vertical wall surfaces as shown on the diagram above. These units will send out the appropriate preset select commands to the source controllers and to the louvre control system via the General Purpose Interface (GPI).

From the BMS system, via the GPI. These signals can be either RS485 or up to eight relay contact closures and would select time based commands.

From the push button control panel within the Gallery. These would temporarily over-ride the automatic selections from the BMS, allowing lamp check, focus setting and special events.

The general purpose interface will also issue

instructions to the louvre control system, either via the RS485 connection or via volt free contact closures (8).

An alternative option could be to provide a series of 0->10 volt analogue signals to provide positional data for the Louvre Blinds.

It would be a simple matter to provide a Fire Alarm and or Panic input into the system. This would set selected or all circuits to full when triggered. This is a zero cost option, as the source controllers have this terminal input as standard.

Additional Comments

It is assumed that the louvre blind manufacturer would be able to co-operate on a common control system. It is of vital importance that there is only one common control system, which has hysteresis control built in to avoid "hunting" of the lighting and blinds.

We would recommend the use of Osram lamp and ballast combinations as we have found that these offer guaranteed compatibility with the lamp ballast combination and most importantly are able to dim down to less than 1% lumen output. In this environment, it is crucial that the lamps do not flicker when instructed to fade up from off. To help this further we would suggest that the system be programmed such that the circuits do not switch off fully during normal hours of operation, but go down to a minimum level of 1% and hold there. This would guarantee a flicker free fade up from what would visually appear to be an off status. Outside normal hours of operation there would be a true power off state.