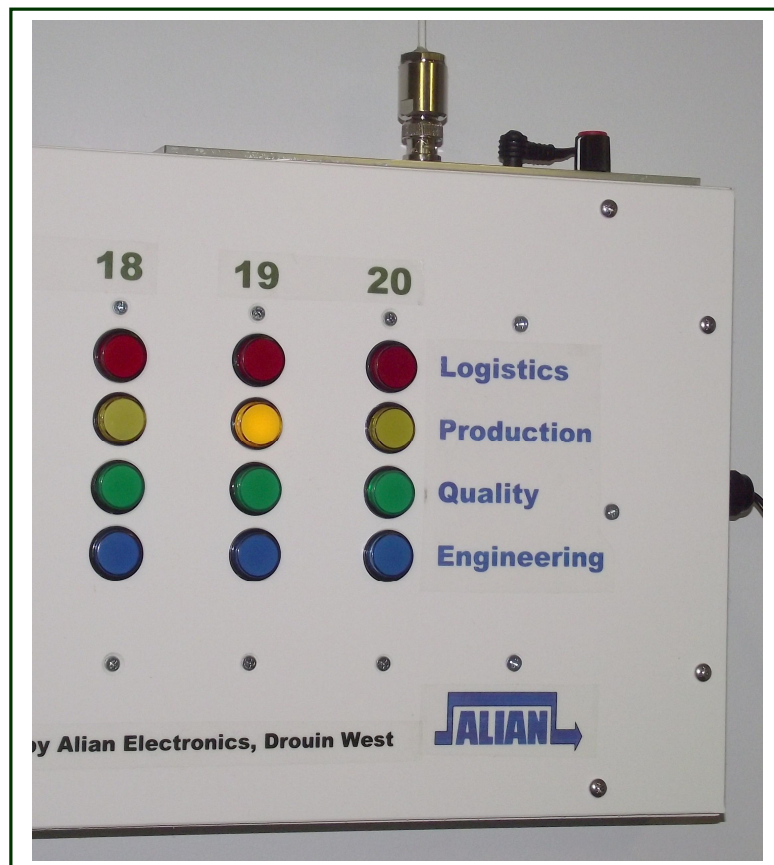


ANDON SYSTEM OPERATION MANUAL

Model SM329 (wireless station)

Model SM330 (wireless display panel)

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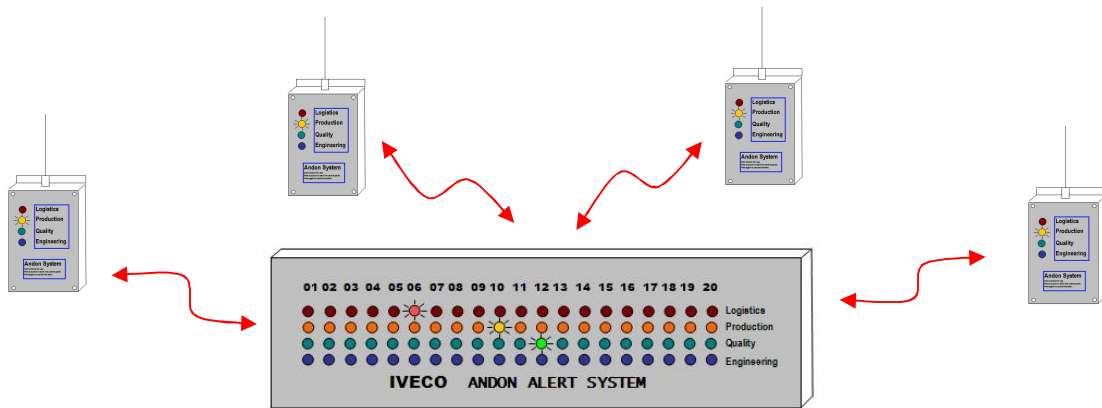


The SM329 Station unit

GENERAL INFORMATION

The Andon alert system is a signalling system that allows production line staff to signal for assistance without having to leave their work station. Any of four departments may be selected at a terminal station, which will in turn trigger a visual and audible indication at the Display Panel. Up to 20 stations can communicate with the Display panel. The Display Panel can also send an acknowledgement signal back to the originating station to let the operator know that assistance is on its way. These functions are achieved wirelessly, via a low-power VHF radio signal, removing the need for installing cables over a wide area within an assembly plant.

Communications takes place in both directions between Stations and the Main Panel



Unlike Bluetooth and Wifi that use microwave frequencies which suffer badly in highly reflective metallic areas, the wireless communications of this system uses VHF frequencies at a slow data rate to give the best possible chance of working in difficult factory environments.

Options include the addition of high-visibility column lamps at station locations and the ability to record time & date information to a PC for all operator activity. All equipment is powered via intrinsically safe DC plug-pack adapters that plug into a mains supply near each station.

STATION OPERATION (model SM329)

Each station has an identifying Station Number. This number appears on the top of each station and corresponds with a matching column of buttons on the main display panel.

Each station has a mains approved DC Plug Pack that needs to be powered by a nearby 240v power outlet.

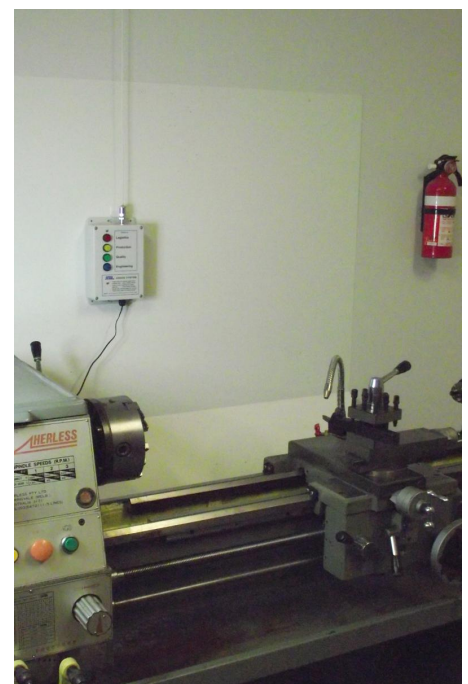


Stations also have a thin vertical rod antenna that it uses to send & receive wireless signals.

This is capable of communicating over a wide area within a factory complex.

Stations have four coloured buttons, **Blue**, **Green**, **Yellow** and **Red**, which represent four different departments within the plant. When any button is pressed, it will flash slowly to indicate a need for attention by the corresponding department. This action sends an alert signal to the main Panel where the matching button will also flash slowly.

Pressing the same button a second time will cancel the alert both at the station and the main Panel, and the lamp will turn off. It is possible to signal for attention from more than one department simultaneously



A wall mounted station

Where a lamp has changed to a steady glow, it is an indication that a support person has pressed the corresponding flashing button at the central Display Panel. This steady-glow is an acknowledgement signal to confirm that a support group is responding to the request.

URGENCY SIGNAL

Where a second level of urgency may be required at stations, the user can press **and hold** a button for two seconds. This will change the slow flash to a rapid flash at both the station and the central Display Panel. The voice announcement will have the words “**Urgent Alert**” added to the standard announcement message. All other responses are the same as for a regular alert.

BEACON LAMP OPTION

An optional four-colour LED Column Lamp may be fitted to each station. Each lamp will operate in synchronisation with the matching illuminated button on the station. This lamp allows the station alert to be identified from some distance away where the smaller illuminated buttons are not readily seen by an approaching alert respondent.

The lamps are 60 cm tall and plug into a 6-wire socket inside the station via a two metre long flat cable. The lamps are an intrinsically safe 24V DC that are powered through the cable connection to the station.



Beacon lamp option

THE CENTRAL DISPLAY PANEL (model SM330)

The Central Panel unit is wall mounted, 110 cm wide and 22 cm high. It has twenty columns of illuminated buttons that can correspond with up to 20 stations located in production areas.

When one of the operator buttons at a station are pressed, a corresponding lamp will flash on this panel. An announcing system built within the panel will sound a chime and say the name of the department that should respond to the request for attention. The volume of the voice announcement can be controlled via a volume control knob on top of the Central Panel.

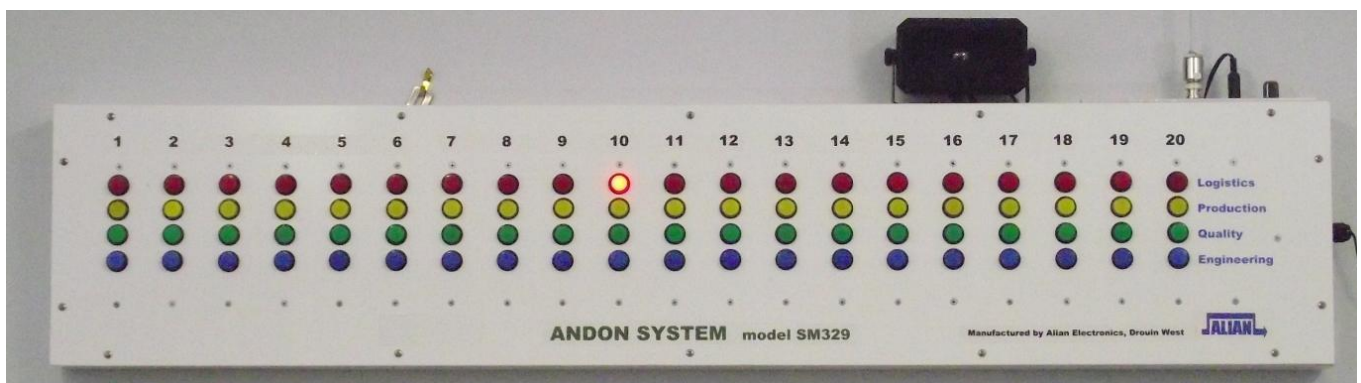
Pressing one of the flashing buttons will trigger the verbal response “Confirmed” from the voice announcement system and change the lamp to a steady glow.

Back at the station that originated the request, the flashing lamp there will also be updated to a steady glow, indicating that someone has responded to their call at the Display Panel.

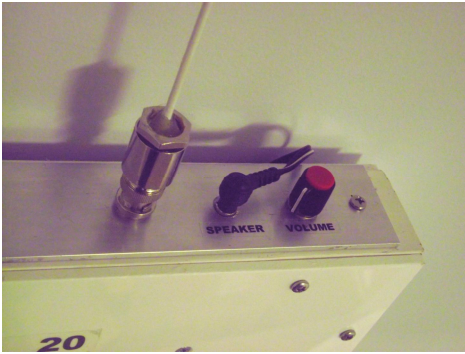
Ideally, this panel should be mounted in a highly visible location, approximately head-height. This allows reasonable access to buttons by the operators, while providing some reasonable signal quality from distant stations.



The wall mounted Central Panel



VOICE ANOUNCEMENT PLAYBACK



Volume controls and antenna socket

When a button is pressed at a Station unit, this activates a flashing lamp at the display panel and triggers a pre-recorded message appropriate to the department requested. Each message is held digitally within an audio recording chip that can store up to 3 seconds of audio for each sound event.

The recording is played back via a 3.5Watt audio amplifier built into the Display Panel. The volume of the announcements can be adjusted with a volume setting knob. Pressing any button on the Display Panel will manually trip an alert so that volume may be set to a suitable level. The Display Panel has no internal speaker, so an external speaker should be connected to the 3.5mm SPEAKER socket adjacent to the antenna socket.

VOICE ANOUNCEMENT RECORDING

Fresh messages may be recorded by feeding line-level audio into the side of the Display Panel via a 3.5mm mono socket located behind a round adhesive label, above the power cable inlet point. Note that the 'Chime' sound present in the default recording is part of the actual message, so recording a fresh message will also erase the alert chime.



On the rear of the Display Panel there are three holes that line up with controls within the unit. The bottom hole is above a small blue rotary switch that may be turned to 1 of 10 positions using a small flat-bladed screwdriver in the central part of the switch.



Record Set Buttons

Positions 1 to 4 correspond to recording areas for each department. The 6th position contains the voice message '**Confirmed**' that is played whenever a flashing button is pressed.

Pressing the centre **SELECT** button on its own will play back the message selected by the rotary switch without affecting the memory.

Pressing the **RECORD** and **SELECT** buttons simultaneously will allow a fresh recording to be laid down in the selected memory position. Audio needs to be applied to the audio input socket at this time for the recording to work. Maximum record time is 3 seconds, but this duration may be reduced if the buttons are released earlier.

Note: The RECORD button should never be pressed unless there is an intention to overwrite the existing recorded message.

OPTIMISING WIRELESS RANGE

The Station Units and the Display Panel come equipped with a basic 'quarter-wave' style antenna, which should be capable of servicing a large area.

On a level, unobstructed path with stations and panel mounted 1.5 metres above the ground reliable operation should be attainable up to **700 metres** from the Main Panel.

Industrial, production areas are generally more complex, with large areas of metal walls, moving machinery and inventory affecting the operating range of a station. This may affect the working range of a station. Where a station has problems in updating the man Display Panel, moving the station unit by even a few metres in a different direction may improve the link quality.

When mounting a Station Unit in a production area more than a few hundred metres from the Display Panel, avoid mounting it directly onto a metal wall or column, as this would place the antenna very close to a metal area and affect its performance.

Other possibilities for extending the working range include attaching a short extension cable to the antenna so that it may be mounted a few metres higher, or fitting a higher gain antenna to the Display Panel.

DATA CAPTURE FEATURE

Above the power cable entry point in the side of the Display Panel, there is a DB9 connection configured as a standard RS232 output. This socket may be connected to a PC serial port using a common 'wire-for-wire' DB9 extension cable.

Whenever data traffic arrives at the Display Panel, a raw form of this data will appear at the serial port at 1200 baud as a packet of ten bytes.

Note that this data requires some decoding and error checking by a matching data recovery program to correctly interpret this information.

SPECIFICATIONS

SM329 Station Unit

Dimensions	120mm x 200mm x 65mm
Supply	24V D.C.
Transmitter	100mw, 151.300 MHz
Data transmission	1200 baud AFSK
Antenna connection	50 Ohm, BNC socket

SM330 Display Panel

Dimensions	1100mm x 225mm x 65mm
Supply	12V D.C.
Transmitter	100mw, 151.300 MHz
Data Transmission	1200 baud AFSK
Antenna connection	50 Ohm, BNC socket
Audio announcer	3.5 Watt

Note the 151.300 MHz is a designated LIPD (Low Interference Potential Device) frequency and no communications licence is required to operate this equipment.
