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# ControlMatrix

## Generic Signage Protocol Definition

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## 1. General Description

ControlMatrix has the ability to send information regarding paging activity to any RS232 serially-connected device. This information is sent via the protocol described in this document.

## 2. Connection Details

To communicate with a generic signage interface, connect via RS232 (using the port defined in Setup) with the following parameters:

- 115200 bps
- 8 data bits
- 1 stop bit
- no parity

Only a three-wire cable is required (RX data, TX data and 0V).

## 3. Basic Protocol Format

The interaction with the generic signage interface is via an ASCII-based packetised protocol. The format of each packet is as follows:

Field	Description
<SOH>	ASCII Start-of-header character (Hex 01)
<Event Number>	3 ASCII Decimal digits representing the paging event number
<Opcode>	3 ASCII characters. Possible opcodes are
	ON
	OFF
	ACK
<Data>	Command dependent (optional)
<ETX>	ASCII End of text character (Hex 03)
<Checksum>	4 ASCII Decimal digits

Each transmission must be acknowledged. On receipt of a data packet, the client should respond with an acknowledgement packet.

## 4. Protocol Details

Each paging event will be identified by a rolling code. Codes are reused cyclically, so once an Event number has been identified in an OFF opcode packet, the use of that code in a subsequent ON opcode refers to a new paging event.

Each time a relevant change to the paging state of the system is made, a new ON, or OFF message will be sent.

Each ON, or OFF opcode packet sent from the host should be acknowledged within 500msec by an <ACK> opcode packet with matching Event Number sent from the client. Should that acknowledgement not be received, the packet will be resent

once only, before the transmission is discarded. Should an acknowledgement not be received, the Generic Signage client will be marked as OFFLINE in the ControlMatrix alarms panel. Messages will continue to be sent, even if the client is marked as offline.

A packet with an OFF, or ACK opcode does not contain a data field. A packet with an ON opcode has a data field with the following format:

<Priority>	Single ASCII decimal digit representing the ControlMatrix paging priority of the event(Typically 1-4)
<Zonelist>	Comma-delimited list of zones in ascii decimal digits
<Space>	ASCII space character
<Attributes>	2 ASCII characters (R=Red, G=Green, A=Amber, F=Fixed, S=Scrolling)
<Space>	ASCII space character
<Text>	Free format ASCII Text, probably less than 1000 characters. It may contain control characters such as newlines and tabs, but not <SOH> or <ETX>.

The cksum field is calculated by summing the ASCII characters received after the <SOH> as byte values into an integer accumulator, and then written as a modulo-10000 value as 4 ASCII decimal digits.

The receiver should resync on every received <SOH> character. Fragments should be discarded.

The priority may be used to set background colours or similar if desired. It is possible that a given zone may receive a message at low priority, and before the off packet is received for that message, an additional packet showing a page at a higher priority may be received for that zone. Any client written must be capable of coping with such a transaction, and not retain invalid messages on the display. As such it will need to resolve what is actually the highest priority message playing in the zone at any given time.

Generic signage is licensed per zone. Only zones which have been configured in Setup as licensed for signage will appear in a zonelist. Any page which does not contain any zones licensed for signage will have its ON messages suppressed. The off messages may still appear. This is not an error.

## 5. Typical sequence

A standard page may proceed as follows:

From Host

<SOH>101 ON120,21,22,23 RF This is the text for the page<ETX>3788

From client

<SOH>101ACK<ETX>0712

delay for paging activity

<SOH>101OFF<ETX>0724

From client

<SOH>101ACK<ETX>0712

This indicates page with sequence number 101 starting (ON opcode), at priority 1, going to zones 20, 21, 22 and 23. The text has attributes Red, and flashing. The text is "This is the text for the page". The checksum calculates out at 3788.

The client then acknowledges the transmission.

During the page there is no further activity. At the conclusion of the page, the host says that page with sequence number 101 has concluded. The client acknowledges that transmission as well.