DAV*p*

Digital Alert Viewer with Radio Paging Receiver

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Contents

List of Figures

Overview

The WaveWare DAV is designed to monitor and process RF alert messages, display a list of active alerts on attached digital televisions via an HDMI interface, and audibly notify personnel when a new alert is processed. The DAV requires a digital television with an HDMI interface (not included) to operate properly.

The DAV is available in 2 models:

- **DAV*p*** – DAV with a radio pager input module. Monitors for alert message activation and cancellation signals via radio paging and manages the display of active alerts on an attached digital television.

- **DAVp-R** – A DAVp with a DC relay output module able to activate external DC powered annunciation systems.

- **DAV*m*** – DAV with WaveWare MARS™ communications interface. (refer to separate manual for the DAV*m*)

Note that the DAV*p* is commonly referenced as the DAV in this manual. The DAV monitors for alert messages using an embedded radio paging receiver. The DAV is configured via OTA (Over-the-Air) commands delivered via a radio paging system, or it can be configured via a web browser.

See Figure 1 for an image of the DAV*p* with power interface harness. See Appendix A for additional views of the DAV*p*.

Figure 1 – DAV*p-R* with Power/DC Output Module Interface Harness and HDMI Cable

Specifications

The DAV*p* includes the following components in a single enclosure:

- Raspberry Pi 3 computer with Linux operating system
- Daviscomms TMR telemetry messaging receiver with external antenna and status LED
- (Optional) - DC output module with flying leads that allows switching of a DC load on priority message detection*
- 5VDC AC/DC universal switching power adapter
- Ethernet connection
- HDMI connection for digital television control (HDMI cable not included)
- DAV*p* enclosure dimensions are 6" tall x 4.5" wide x 2" deep, not counting antenna, flanges or attachments
  * - Optional Relay Interface, Order Part # **DAVp-R**

Ordering Requirements

To order a DAV*p*, you need to specify POCSAG or FLEX paging protocol, operating frequency, and capcodes. For the POCSAG version, you need to also specify the RF data rate. For international usage, specify the AC/DC power adapter blade configuration. **To add an Optional Relay Interface, order Part # DAVp-R.**

Accessories

Note that the Daviscomms TMR telemetry messaging receiver module in the DAV*p* requires a special interface harness and programming kit if you want to modify operating radio pager frequency, capcodes, or RF data rate. The DAV*p* programming kit needs to be ordered separately, but it's not required if you specify the radio paging configuration requirements when you order your DAV*p*.

Installation

To install the DAV, you may need the following:

- A radio paging system, operating on the same operating frequency as the DAV
- A digital television and HDMI interface cable, connected to the HDMI port on the DAV*p*
- An AC power outlet for the 5VDC AC/DC power adapter
- 1/8" Nylon zip ties for securing loose cables
- An Ethernet cable and Ethernet outlet: in case you want to log received messages to a remote server, or if you want to configure the DAV from a web browser

The DAV should be installed using the following procedure:

- Before powering up the DAV, make sure it's all connected including:
  - Ethernet (optional)
  - HDMI to the digital television
- Power up the DAV. Wait approximately one minute for the DAV to boot up. The DAV is designed to boot up automatically when power is applied.

- Observe the power up sequence on the attached television. The DAV uses DHCP to obtain an IP address from the network that it is connected to. The IP address of the DAV is displayed on the attached television for 5 seconds at the end of the power up sequence. Note the IP address if you want to use a web browser to configure the DAV.

Configuration

The DAV is configured via radio paging OTA (over-the-air) commands or OTA commands delivered via web browser. Please refer to the OTA programming command reference in the appendices for the command structure. The DAV configuration web page also references the OTA commands.

Radio Paging Configuration

Radio paging configuration requires the delivery of specially formatted radio paging messages to the DAV, using the frequency, RF data rate, and capcodes programmed into the TMR module of the DAV*p*.

Web Browser Configuration

As described above in the installation section, the DAV momentarily displays its assigned IP address at the end of the power up sequence.

For security reasons, the DAV stops allowing web-based configuration 5 minutes after powering up. Within those 5 minutes, enter the observed DAV IP address into a web browser on the same network as the DAV. You should be able to observe the DAV OTA command interface screen as shown below. If the DAV web configuration function has timed out, you will observe this message: "Configurator only available for 5 minutes after DAV reboot".

Enter OTA command(s) for processing, separated by a pipe '|' character:

[   ] [Submit]

[Clear DAV Screen]

Example of Multiple Commands:

Demo Settings:
DAVOTA:fullreset|DAVOTA:name=TV Demo|DAVOTA:maxfontsize=45|DAVOTA:defaultmessage=No Alerts|DAVOTA:maxmessages=100|DAVOTA:maxduration=300|DAVOTA:plevel=3:FF0000:3|DAVOTA:plevel=2:0000FF:2|DAVOTA:plevel=1:00FF00:1

Demo Alerts:
Demonstration Alert 0|Demonstration Alert 1|Demonstration Alert 2|Demonstration Alert 3

-Available OTA Commands-

Name:
The name that is displayed at the top of the TV display. Used to provide reference on which alert zone is being monitored by the DAV.
DAVOTA:NAME = [Name displayed at top of TV]
Example: DAVOTA:NAME = West Wing 7

Default Message:
The message that is displayed on the TV display when the message list is empty. The default message can be programmed to be blank.
DAVOTA:DEFAULTMESSAGE = [Message displayed when no alerts active.]
Example: DAVOTA:DEFAULTMESSAGE = No Alerts

Priority Level:
The key strings required to trigger a particular priority message at a particular level. Priority level values can range from 1 to 9. Color code is a 6 character hex color value.
To disable a particular priority level, output a blank list of key strings for that priority level.
DAVOTA:PLEVEL = [Priority Level Number]:[COLOR CODE]:[Comma separated key strings]
Example: DAVOTA:PLEVEL = 1:FF0000:Code Red, Fall, Emergency
Example: DAVOTA:PLEVEL = 2:00FF00:Code Blue
Disable Example: DAVOTA:PLEVEL = 1:000000:

Message Cancellation Keyword:
The key word that causes message cancellation. To disable message cancellation detection, output a blank cancellation keyword
DAVOTA:CANCELWORD = [Key word that causes message cancellation]
Example: DAVOTA:CANCELWORD = reset
Disable Example: DAVOTA: CANCELWORD =

Max Messages:
The maximum quantity of messages that can be displayed on the alert list at once. If the alert list message quantity equals the MAXMESSAGES value when a new message arrives, the oldest message will be removed from the list by the newly arriving message.
DAVOTA:MAXMESSAGES = [How many messages can be displayed at once, ranging from 1 to 25]

Figure 2 - DAV Web Configuration Interface

The DAV OTA commands can be concatenated using pipe characters for more an efficient configuration. The Multiple Commands Example section of the DAV web configuration page provides an excellent starting point for efficiently configuring the DAV.

Troubleshooting

Troubleshooting DAV Communications Status

You can observe the attached digital television or the DAV status LED for troubleshooting purposes.

If the default message appears for a lengthy period of time, it is likely that there is a problem with the radio paging receiver module or with the facility's radio paging system.

If the alert list is not displaying all paging messages or is displaying garbled text in the message list, you can assume that there is a problem with the radio receiver positioning, or with the facility's radio paging system signal strength.

The DAV status LED provides the following information:

LED Indication	Status	Condition
Continuously on for up to one minute or until paging message is received	Proper startup or received paging message within last 1 minute	After power on and after paging message received
Blinking every ½ second	EEPROM failure	After power on
Blinking every 2 seconds until paging system transmission is detected	Out-of-range indication	No paging system transmission detected for at least one minute
Blinking every 1/3 second for up to 3 seconds	Receiving a new paging message	After power on

Appendices

Appendix A - DAV Views

Figure 3 – DAVp-R Front View with Power/Output Control Harness and HDMI Cable

Figure 4 - DAV Bottom View with Power/Programming/Output Control Connector and Ethernet Jack

Figure 5 - DAV Left Side View with HDMI Connector and Tie Down

Figure 6 - DAVp with Optional TMR Module Programming Kit

All DAV dynamic text is displayed in white on a black background with an associated message priority icon. The alert priority level for a given alert is represented by the color of each message priority icon. The highest priority active alert on the list is also represented by the color of the screen border. Each new alert that is received will also trigger an audio tone dependent on its priority level.

The DAV has multiple output display modes, including:

- No active alerts

- One or more normal alerts

- One or more priority alerts in the list

The DAV output display has the following elements:

- Header (Name), displayed at top of screen, programmable

- Message List, displayed in one of the three output display modes defined above

- Message Priority Icon, displayed in the assigned priority color for the associated alert. Normal alerts use a default priority icon color of white

- Display Border, displayed in the color of the highest priority active alert

New messages have a timestamp value of *Now*. When a message ages to one minute, the timestamp value will be *1m*. The timestamp values will roll up to *59m*, then switch to **H:MM** format, e.g. *1:02*, through *9:59* and on up.

No Active Alerts

The figure below shows how the DAV output can appear when there are no active alerts. The top element is the DAV unit's Name, which is programmable using the Name OTA command. The center element is the default message, which is programmable using the Default Name OTA command.

When all messages in the message list have expired or have been cancelled, and there are no messages in the message list, the default message appears. The default message can be programmed to be blank.
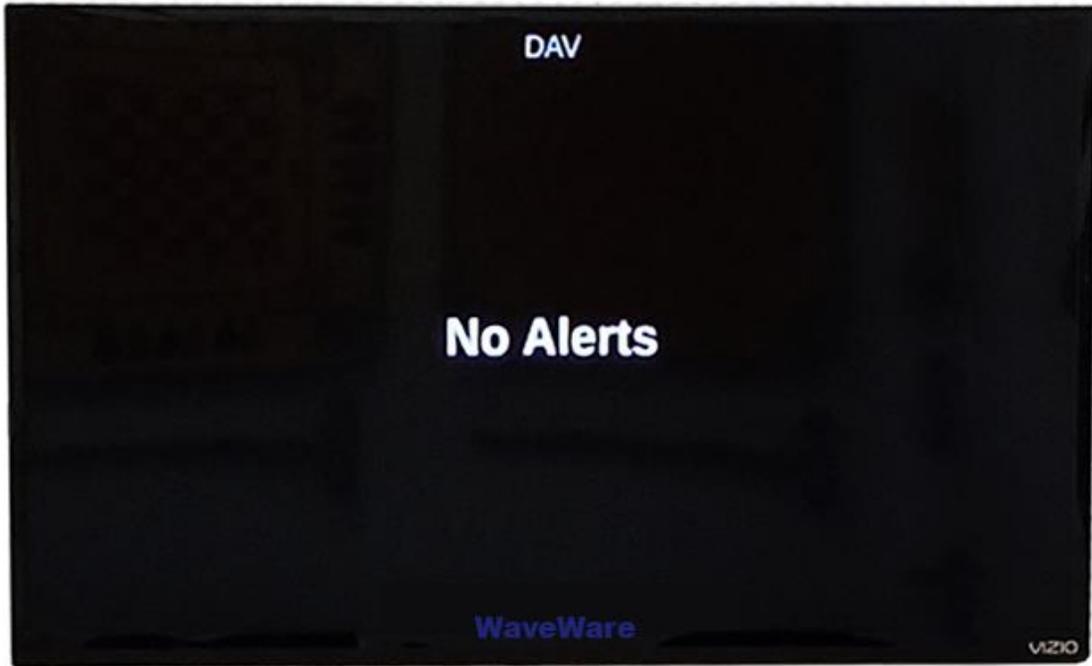
Figure 7 - No Alerts

One or More Normal Alerts

The figure below shows how the DAV output can look when there are one or more active alerts with none of the alerts being priority alerts.   All normal messages appear with white text and a white message priority icon.
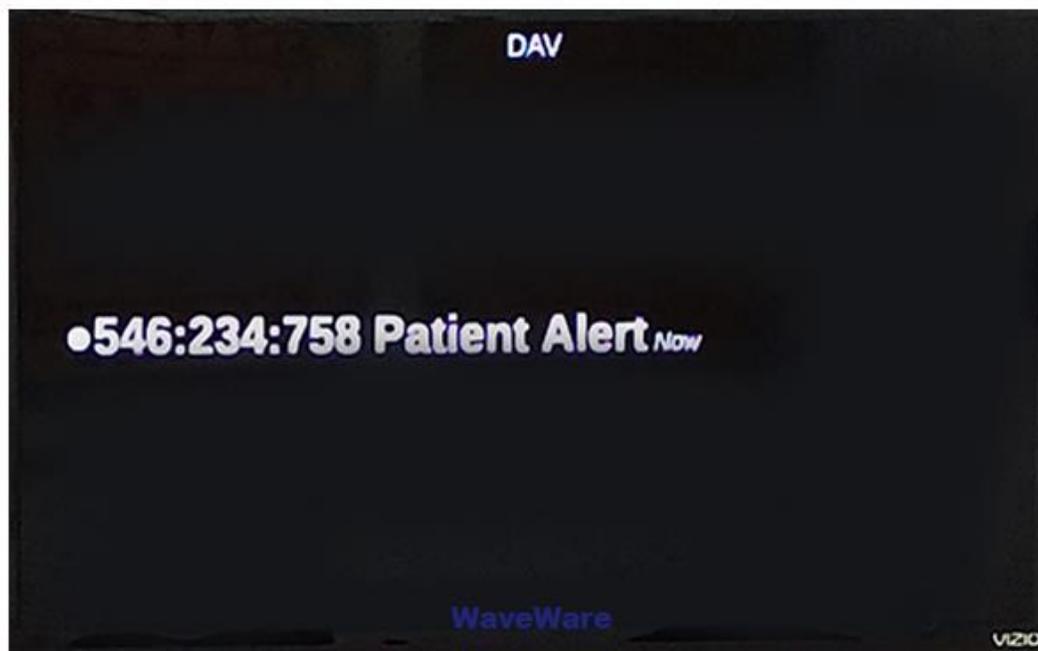
Figure 8 - Active Alert Normal Priority

One or More Priority Alerts in the List

The following figures show how the DAV output can look when there are one or more priority alerts in the list.   Priority alerts have a colored icon associated with the message's priority level, and this color can be assigned by the PLEVEL OTA command.

Priority processing is configured using the Priority Level (PLEVEL) OTA command. When an incoming message contains a keystring defined in the PLEVEL OTA command, then that message will be displayed as per the requirements defined in that PLEVEL command.

As shown in the third figure below, when the message list contains one or more competing priority messages, the highest priority message in the list will have its icon color displayed on the border.
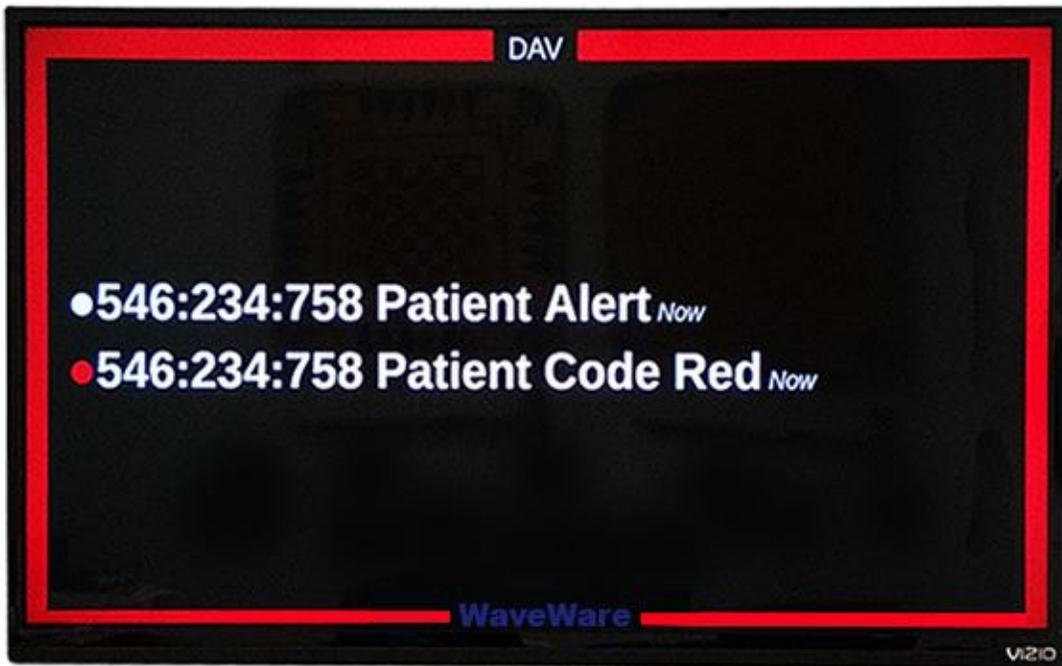
Figure 9 - Priority Message(s) in Message List, Red Example
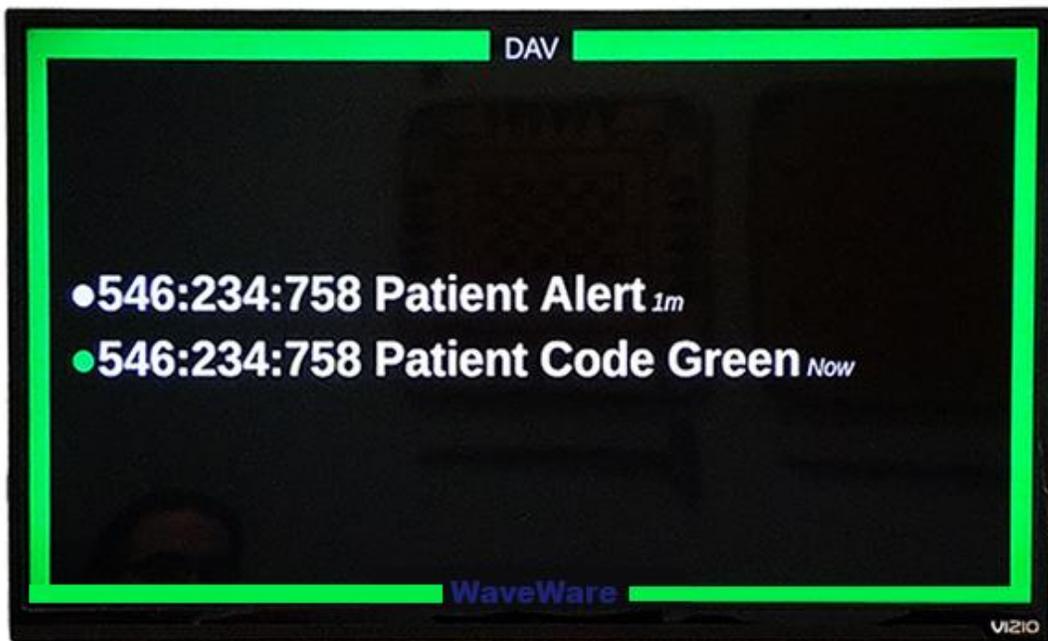

Figure 10 - Priority Message(s) in Message List, Green Example

Figure 11 - Competing Priority Messages

Configuration Readout

The figure below shows how the DAV output can look when a Readout OTA command is received by the DAV. The Readout command is useful when troubleshooting DAV configuration.
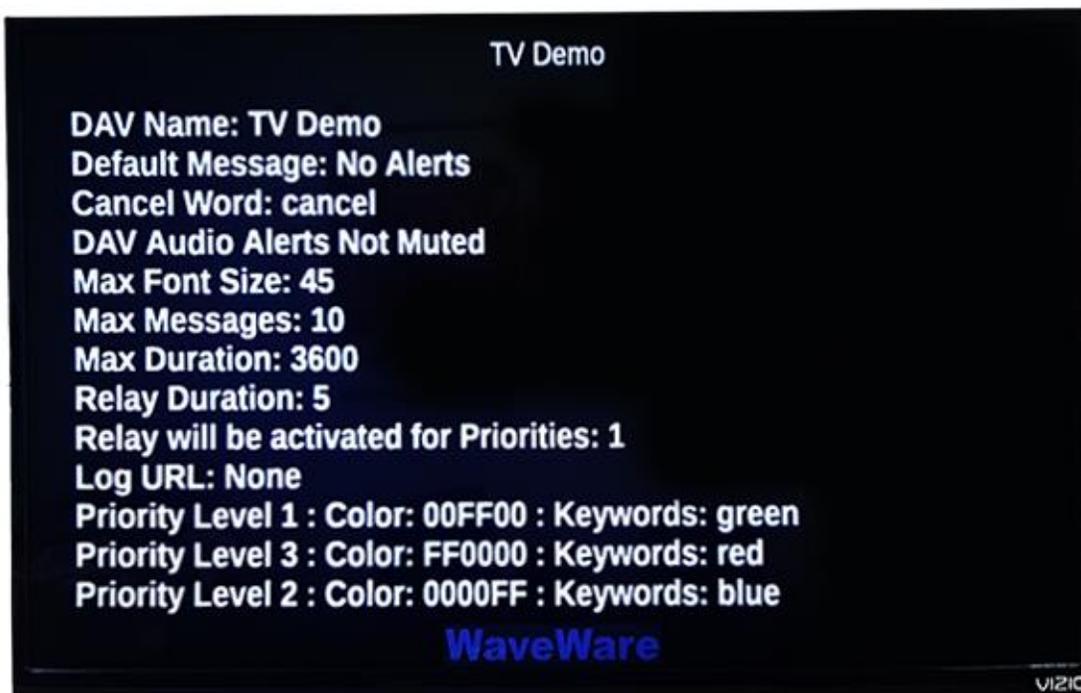
Figure 12 - DAV Configuration Readout Display

Audio Tones

In addition to the different display modes, the DAV has 2 different tones it outputs through the HDMI connection to the connected television. This includes the **Normal Tone** and the **Priority Tone.** The Normal Tone applies to all non-priority alerts and the Priority Tone covers all priority levels. These tones can be deactivated anytime using the MUTE OTA command. Currently however, these tones are deactivated together using the MUTE command and cannot be deactivated separately.

Appendix C - Over-The-Air (OTA) Programming for DAV*p*

You can use the DAV OTA Program to program the DAV*p* product. The OTA programming allows programming of DAV behavior.

Note that many OTA commands cause the DAV*p* to add a status message to the message list, indicating that an OTA command was properly received and processed. Those status messages, along with all other messages, are naturally cleared if the Max Message Duration feature is enabled. Another method of removing the status messages is to use the Clear command.

OTA commands are case insensitive, but the displayable parameters, such as Name value, will be displayed as delivered.

Readout

The Readout command causes a listing of the DAV primary configuration items to appear on the TV display.

DAVOTA:READOUT [Primary configuration values displayed on TV]

Example: **DAVOTA:READOUT**

Name

The name that is displayed at the top of the TV display. Used to provide reference on which alert zone is being monitored by the DAV.

DAVOTA:NAME = [Name displayed at top of TV]

Example: **DAVOTA:NAME = West Wing 7**

Default Message

The message that is displayed on the TV display when the message list is empty. The default message can be programmed to be blank.

DAVOTA:DEFAULTMESSAGE = [Message displayed when no alerts active.]

Example: **DAVOTA:DEFAULTMESSAGE = No Alerts**

Priority Level

The key strings required to trigger a particular priority message at a particular level. Priority level values can range from 1 to 9. Color code is a 6 character hex color value. To disable a particular priority level, output a blank list of key strings for that priority level.

DAVOTA:PLEVEL = [Priority Level Number]:[COLOR CODE]:[Comma separated key strings]

Example: **DAVOTA:PLEVEL = 1:FF0000:Code Red, Fall, Emergency**

Example: **DAVOTA:PLEVEL = 2:00FF00:Code Blue**

Disable Example: DAVOTA:PLEVEL = 1:000000:

Message Cancellation Keyword

The key word that causes message cancellation. To disable message cancellation detection, output a blank cancellation keyword.

DAVOTA:CANCELWORD = [Key word that causes message cancellation]

Example: **DAVOTA:CANCELWORD = reset**

Disable Example: **DAVOTA: CANCELWORD =**

Max Messages

The maximum quantity of messages that can be displayed on the alert list at once. If the alert list message quantity equals the MAXMESSAGES value when a new message arrives, the oldest message will be removed from the list by the newly arriving message.

DAVOTA:MAXMESSAGES = [How many messages can be displayed at once, ranging from 1 to 25]

Example: **DAVOTA:MAXMESSAGES = 10**

Max Font Size

The maximum font size to be used on the TV display. This helps prevent unduly large text rendering and excessive text wrapping. The maximum font size applies to all messages in the message list as well as to the default message. The MAXFONTSIZE value can range from 20 to 300. A typical MAXFONTSIZE value is 45.

DAVOTA:MAXFONTSIZE = [Maximum font size in pt]

Example: **DAVOTA:MAXFONTSIZE = 45**

Max Message Duration

The maximum time, in seconds, that an alert message will be allowed to be displayed in the message list, ranging from 0 to 999. A zero (0) value disables the MAXDURATION feature.

DAVOTA:MAXDURATION = [Maximum time in seconds alert can be shown as active]

Example: **DAVOTA:MAXDURATION = 300**

Relay Duration

The maximum time, in seconds, that the output relay will be activated when the relay is triggered by a priority message programmed by the RELAYPRIORITIES OTA command. The RELAYDURATION value can range from 0 to 999. A zero (0) value disables the RELAYDURATION feature.

DAVOTA:RELAYDURATION = [Maximum time in seconds output relay will be activated]

Example: **DAVOTA:RELAYDURATION = 30**

Relay Priorities

The priority levels, that cause relay activation when a new priority message arrives, is defined in the RELAYPRIORITIES command. When a priority message appears on the activity list, the relay will be activated for the duration programmed by the RELAYDURATION OTA command. To disable the RELAYPRIORITIES feature, output a blank list of priority levels.

DAVOTA:RELAYPRIORITIES = [Comma separated list of priority levels that cause relay activation]

Example: **DAVOTA:RELAYPRIORITIES = 1,3,5**

Example: **DAVOTA:RELAYPRIORITIES = 1**

Log URL

The URL used by the DAV*p* to log messaging activity. The DAV*p* passes both a device serial number and the message to the programmed URL. A blank URL value disables the Log URL feature.

DAVOTA:LOGURL = [URL of logging server, passing variable values for serial and msg variables, with serial being DAV device serial number. A blank value disables the LOGURL feature]

Example: **DAVOTA:LOGURL = url.com/log.php?serial=[serial]&msg=[msg]**

Example: **DAVOTA:LOGURL = 192.168.10.142/log.php?serial=[serial]&msg=[msg]**

Disable Example: **DAVOTA: LOGURL =**

Mute

Activate or deactivate the audio output using the MUTE command. The audio output is disabled when the MUTE command equals 1, True, or Yes.

DAVOTA:MUTE = [True-Yes-1/False-No-0]

Example: **DAVOTA:MUTE = True**

Clear

Clears all active messages from the DAV*p.*

DAVOTA:CLEAR Clears all Active Messages

Example: **DAVOTA:CLEAR**

Reset

Resets the DAV*p* to factory default operation.

DAVOTA:FULLRESET Resets Unit to factory defaults

Example: **DAVOTA:FULLRESET**

Appendix D - Concatenating OTA Commands and Messages

The DAV OTA commands can be concatenated using pipe characters, for a more efficient configuration of the DAV. In addition, DAV alert messages can be concatenated using the pipe character. The following are some examples:

Concatenated Settings Example:

DAVOTA:fullreset|DAVOTA:name=TV Demo|DAVOTA:maxfontsize=45|DAVOTA:defaultmessage=No Alerts|DAVOTA:maxmessages=100|DAVOTA:maxduration=300|DAVOTA:plevel=3:FF0000:Code Red|DAVOTA:plevel=2:0000FF:Code Blue|DAVOTA:plevel=1:00FF00:Code Green

Concatenated Alerts Example:

Demonstration Alert 0|Demonstration Alert 1|Demonstration Alert 2|Demonstration Alert 3

Appendix E – Using DC Output Module

The DAVp-R DC output module can be used to switch a DC load each time a priority message is detected by the DAV. The DC output module requires a polarized DC voltage connection to operate properly. The DC output module can switch up to 3A of current at a voltage range of 3 to 60VDC.

For example, to connect a 12VDC audible/visual annunciator to the DC output circuit, you will need a 12VDC external power source and the annunciator. Attach the +12VDC power source output to the red flying lead and attach the black flying lead to the +12VDC input on the audible/visual annunciator.

Appendix F – DAV*p* Power/Programming/Output Control Connector Pinout

The DAV*p* Power/Programming/Output Control Connector is an 8 contact Molex Micro-Fit positive lock jack with the following pinout:
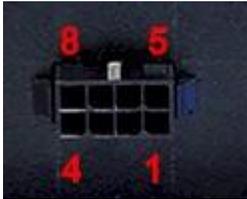

Figure 13 - DAVp Power/Programming/Output Control Connector Pinout

Pin	Function
1	+5VDC for TMR Module
2	GND for TMR Module
3	CLK for TMR Module
4	Neg for DC Output Control
5	+5VDC for Pi Module
6	GND for Pi Module
7	SDATA for TMR Module
8	Pos 3-60 VDC for DC Output Control

Update History

V1.0 – Initial product release

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