Terminal Interface Manual for LV and MV Panels

Document Number: 926-11-01
Document Revision: 1.2



© 2018 Kidde Australia

About this manual

Kidde Australia Pty Ltd ("Kidde") assumes no responsibility for the application of any systems other than those addressed in this manual. The technical data contained herein is limited strictly for informational purposes only.

All information contained in this manual is based on the latest product information available at the time of preparation and Kidde reserves the right to make changes at any time without notice.

Kidde believes this data to be accurate, but it is published and presented without any guarantee or warranty. Kidde disclaims any liability for any use that may be made by the data and information contained herein by any party.

Important *Stat-X® vehicle and marine systems must only be designed, installed, and commissioned by technicians accredited by Kidde.*

No part of this manual may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, or otherwise without the prior written approval of Kidde Australia Pty Ltd.

For further information, contact Kidde Australia Pty Ltd. ACN 006 252 428:

- Telephone on: **1800 672 171**
- Internet at: **www.kidde.com.au**

Stat-X® is a registered trademark. Manufactured in the USA and sold worldwide exclusively by Fireaway LLC under licence from Techno-TM, LLC.

© 2018 Kidde Australia

Revision History

Revision	Notes
1.2	- Added two new configuration options (ID: 54 & 55) to Table 7 & Table 8. - Added 'Short-to-Chassis' fault to Table 11 & Table 15.
1.1	- Changed Terminal software requirement from 'VS Software Package V5' to 'VS Terminal V1.10'. - Removed inapplicable shutdown output settings (supervisions & overload) from Table 7. - Updated Table 7 to include new settings available on LV firmware V1.0-3
1.0	Initial release

© 2018 Kidde Australia

Contents

Overview ---- 5

Requirements ---- 6

Software Installation ---- 7

Installing USB to RS232 Converter Driver ---- 7
Installing VS Terminal Software ---- 7

Establishing Connection ---- 11

Terminal Commands ---- 14

Command Structure ---- 14
Supported Commands ---- 15
Quick Access Functions ---- 16

Interacting with the Panel ---- 17

Example A Using Command without Parameters ---- 18
Example B Using Command with Parameter ---- 20

System Configuration ---- 22

Example C Changing AUX Output Trigger Event ---- 25

System Report ---- 28

History Log ---- 30

Trend Log ---- 33

Example D Interpreting a Status Byte of a Trend Log Record ---- 36

Appendix A Terminal Commands ---- 40

Appendix B LV Panel 'Soft' Configuration Table ---- 44

Appendix C MV Panel 'Soft' Configuration Table ---- 49

Appendix D LV Panel's Status Byte Lookup Tables ---- 51

Appendix E MV Panel's Status Byte Lookup Tables ---- 53

Feedback form ---- 55

© 2018 Kidde Australia

Overview

LV and MV panels have a RS232 serial port to allow technicians to perform the following tasks:

- Viewing system information (such as, voltages, temperature and panel status).
- Viewing and uploading logs (such as, historical event and trend logs).
- Viewing and setting system configurations.
- Viewing and setting the real time clock (RTC).
- Uploading firmware updates

© 2018 Kidde Australia

Requirements

To communicate with the panel, at minimum, the following tools are required,

- VS Serial cable (P/N: 255-982)
- VS Terminal V1.10 or later
- A computer running Windows XP™ or later
- A commFront® USB to RS232 Converter (P/N: USB-232-1)

The USB to RS232 converter is only required if the PC/Laptop to be used for this task doesn't come equipped with a RS232 serial port.



The commFront® USB to RS232 Converter is recommended, as it has been thoroughly tested for compatibility. Other brands will NOT be supported.

© 2018 Kidde Australia

Software Installation

Software installation is only required to be performed once and depending individual cases, there may be up to two software components - converter driver and VS Terminal application - that required installation.

Note *Administrator Rights to the computer is required to perform the installation.*

Installing USB to RS232 Converter Driver

This task is required if the computer to be used doesn't have a RS232 serial port. For installation and setup instructions, please refer to the instructions come with the converter's driver CD.

Installing VS Terminal Software

VS Terminal is a customized version of the open-source TeraTerm terminal program, purposely for use with VS Panels. This program allows the operator to interact with the panel through a computer.

1. To install VS Terminal, double-click on the **VS Software Package.exe** file and wait for the setup wizard to appear.



Figure 1 - Welcome Screen

2. Click **NEXT** to install the software package.

© 2018 Kidde Australia

3. Read the license and if agreed, click on **'I accept the agreement'** and click **NEXT** to continue.

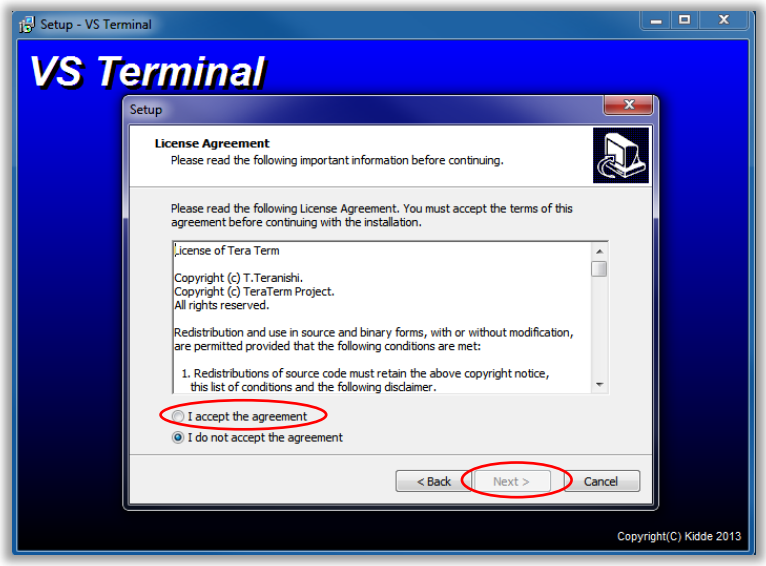


Figure 2 - License Agreement

*The **NEXT** button is only enabled if license is accepted*

4. Click **NEXT** to install the software to the default location or choose an alternative destination folder.

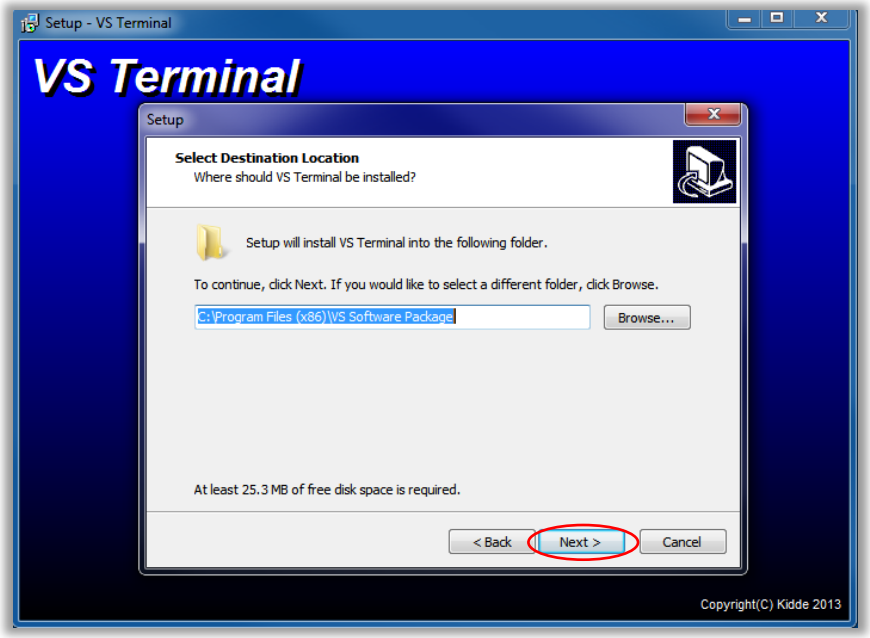


Figure 3 – Destination Location

© 2018 Kidde Australia

5. Click **NEXT** to create the program default shortcuts in Start Menu

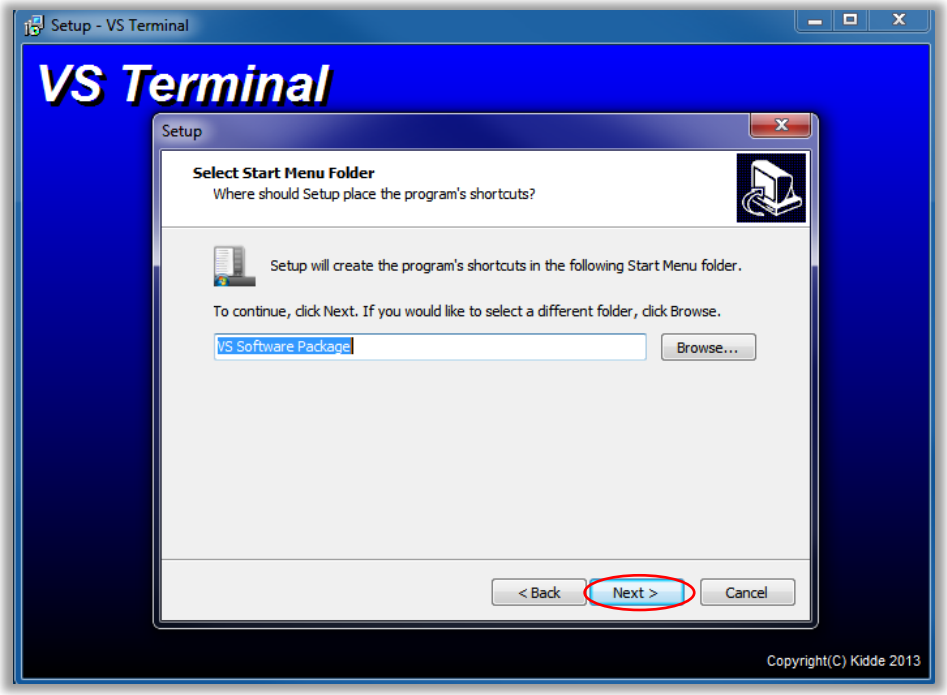


Figure 4 – Select Start Menu Folder

6. Click **INSTALL** to start the installation

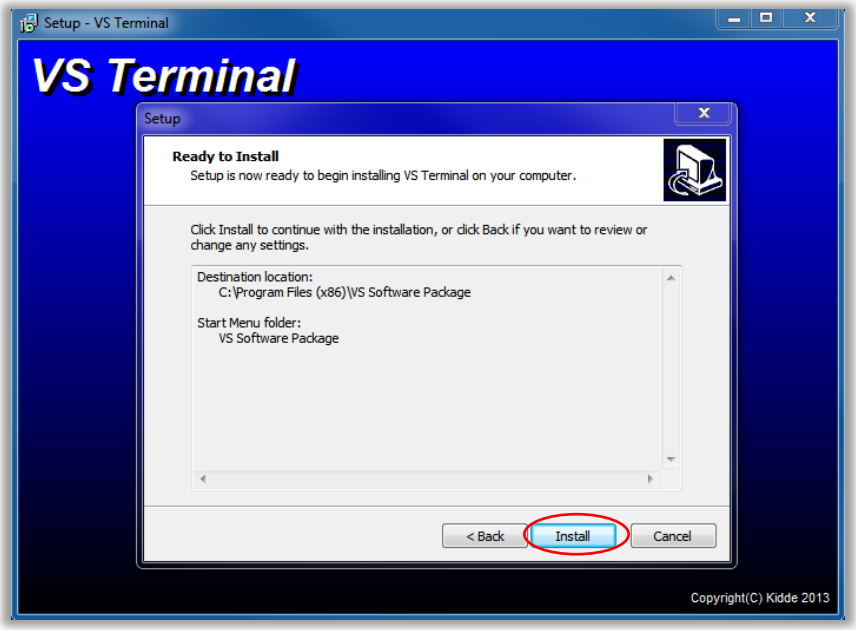


Figure 5 - Starting the Installation

© 2018 Kidde Australia

7. Wait for the installation to complete and click **FINISH** to complete the installation and close the setup wizard



Figure 6 - Completing the Installation

© 2018 Kidde Australia

Establishing Connection

To communicate with the panel, the computer must be connected to the panel's RS232 serial port prior to starting the VS Terminal program.

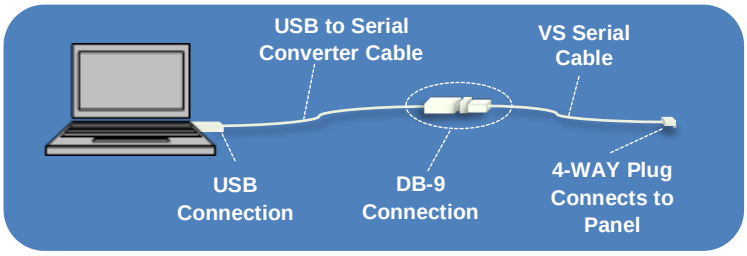


Figure 7 – Serial Cable Connections

1. Prepare and connect the cables as shown in Figure 7 and confirm that the **RED_POWER** indicator on the DB-9 end of the **USB to RS232 converter** is on.

Note *If the computer has a RS232 serial port, the USB to Serial Convertor cable is not required and the VS Serial cable can be connected directly to the computers serial port*

2. Open the panel enclosure to access the panel's serial port

3. Connect the 4-WAY plug of the VS Serial cable to the panel's serial port (**CON7** next to the internal battery connector) as shown in Figure 8 below,



Figure 8 – Panel's Serial Connection

4. Power up the panel (if not already powered up) and ensure that the panel's **GREEN POWER LED** is on.

© 2018 Kidde Australia

5. On the computer's desktop, double-click on the '**VS Terminal'** shortcut to start the program.

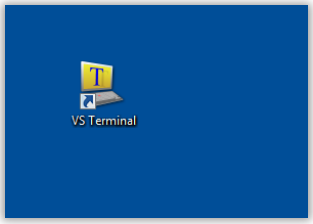


Figure 9 - VS Terminal Shortcut on Desktop

Tip *VS Terminal program can also be accessed through the START menu, under 'VS Software Package' folder.*

6. On start-up, the program will automatically search for any known VS devices connected to the computer and establish connection with the first device found.

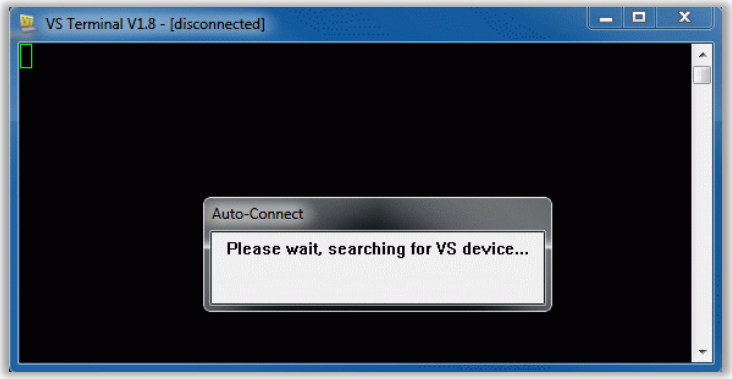


Figure 10 - Searching for VS Device

7. The search could take up to 30 seconds to complete. Once completed, the user will be informed with the status of the search. If unsuccessful, check your connections, device settings and driver installation, once ready click on **YES** to try again.



Figure 11 - Unsuccessful Attempt

© 2018 Kidde Australia

8. Once a VS device is found and communication link has been established, a message dialog similar to Figure 12 will be shown and will automatically close after a few seconds.

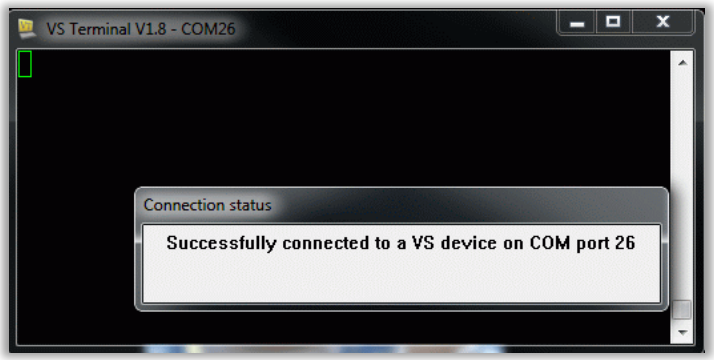


Figure 12 - Connection Established

9. After the message dialog has disappeared, the command prompt will appear on the Terminal's main screen as shown in Figure 13, indicating that the panel is ready to accept command.

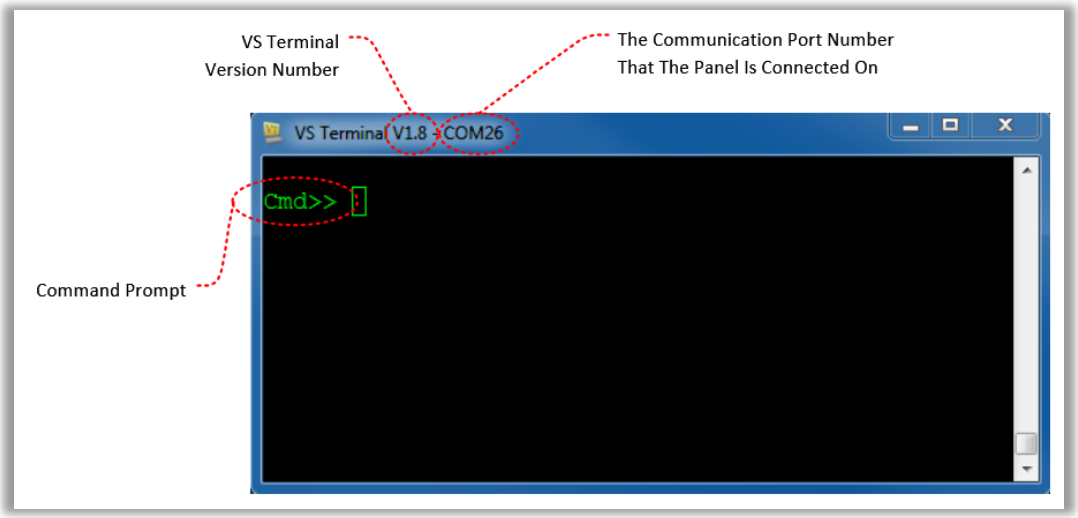


Figure 13 – Terminal's Main Screen

© 2018 Kidde Australia

Terminal Commands

Once connected, the panel doesn't perform any task unless instructed by the user, using one of the available commands. There are a number of different commands available that can be used to perform various tasks. To make the most of this interface, it's important to have a good understanding of the basic command structure.

This section details,

- The terminal command structure.
- The available commands and their function.
- The available shortcuts (also referred to as Quick Access Functions) for commonly used commands.

Command Structure

A command may consist of one or more fields, the first field is the command mnemonic[1] and is mandatory, subsequence fields are parameters. Some commands require one or more parameters; however, most commands do not require parameters or are optional. Where parameters are required, a space character is required to separate the fields.

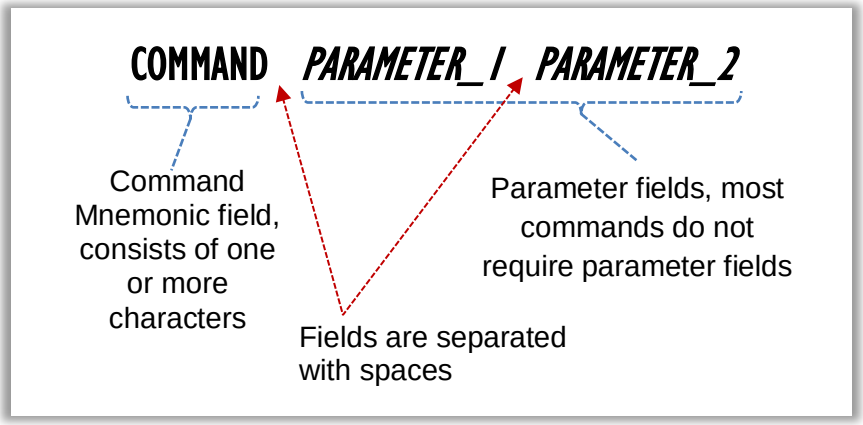


Figure 14 - Command Format

Commands and parameters are case insensitive and must be entered in the order depicted in Figure 14, starting with the command Mnemonic.

[1] *In computer language, a **mnemonic** is an abbreviation for an operation.*

© 2018 Kidde Australia

Supported Commands

Table 1 lists some of the commonly used commands, for a full list of available commands, refer to Table 6 on page 43. The '**Format**' column of the table lists all the available parameters for a command, optional parameter are specified enclosed in spare brackets.



*Optional parameters are specified enclosed in square brackets (i.e. **['an_optional_parameter']**) and can be omitted if not required.*

When issuing commands manually (not using Quick Access Functions as detailed on page 16) through Terminal, each command needs to be terminated with **ENTER/RETURN** key. The panel will only process a command once it has been terminated with **ENTER/RETURN** key. More practical information is available in 'Interacting with the Panel' section on page 17.

Command Mnemonic	Function Description	Format	Remarks
HELP	Displays a list of all available commands with brief description.	HELP	
T	Displays the panel's current time & date	T	See 'Quick Access Functions' section on page 16.
I	Displays system report	I	See 'Quick Access Functions' section on page 16.
H	Displays historical event log	H ['filter'] 'filter' – Refer to Table 6 on page 43 for detail.	See 'Quick Access Functions' section on page 16.
C	Displays system configuration	C	See 'Quick Access Functions' section on page 16.
F	Displays a list of all the current faults in the system	F	See 'Quick Access Functions' section on page 16.

Table 1 - Commonly Used Commands

© 2018 Kidde Australia

Quick Access Functions

To assist with complex tasks and quicker access to frequently used commands, function keys **F1** to **F12** on the computer keyboard (just above the numeric keys) have been assigned with special function as outlined in Table 2 below.

Note *Terminal Interface must be in focus to use the function keys.*
***ENTER or RETURN** key is not required when using shortcut keys.*

Function Key	Function Description
F1	Displays system report (Same as 'I' command).
F2	Displays history log (Same as 'H' command without any parameters).
F3	Displays error log (Same as 'E' command).
F4	Displays active faults (Same as 'F' command).
F5	Displays current time and date (Same as 'T' command).
F6	Displays analogue readings of all monitored points in the system. This is an advance function and should only be used as direct by technical support team.
F7	Displays current system configuration (Same as 'C' command)
F11	Executes an automated task to set the panel's time and date. This is an automated task to set the panel's time and date using the computer's clock. When executed, it will capture the current time & date of the computer and ask for confirmation before completing the task.
F12	Executes an automated task to capture all relevant system information and save to a text file on the user's desktop. This task can take several minutes to complete. On VS Terminal V1.8 and later, confirmation from the user is required before this task is executed.

Table 2 - Command Shortcut Keys

© 2018 Kidde Australia

Interacting with the Panel

To interact with the panel, the user is required to issue a command, either requesting for information or to perform an action. Once the command has been terminated with the **ENTER/RETURN** key, the panel will process the command and reply with the requested information or the status of the action.

Note *Information returned in Terminal is static and is not automatically refreshed or updated. To obtain the latest information, the user is required to repeat the command.*

To issue a command, at the command prompt, type the command mnemonic and its parameters (if required by the command, refer to Table 6 on page 43 for list of available commands and their structure) separated by space character, then follow by the **ENTER/RETURN** key.

Tip *Commands and parameters are case insensitive.*

Shown in Figure 15 below is an example of using the 'T' command to retrieve the panel's time and date. First the user typed 'T' (without the quotes) and followed by the **ENTER** key, the panel responded with the panel's current time and date on the next line and ended with the new command prompt to indicate that it's ready to accept new command. More detailed examples provided later in this section.

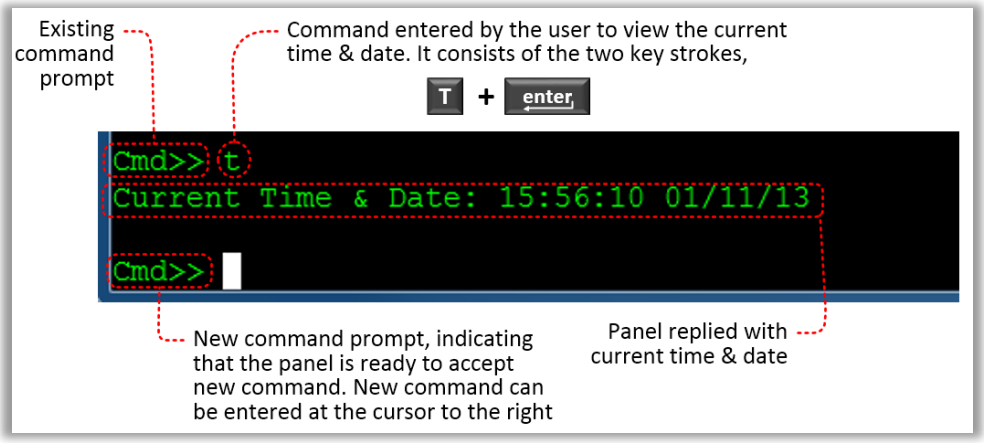


Figure 15 - Issuing Command

BACKSPACE or **DELETE** keys can be used to correct any mistyped characters. **DELETE** key behaves in the same way as the **BACKSPACE** key.

The panel will validate the entered command once it has been terminated with **ENTER/RETURN** key, if the command entered is not supported, the panel will respond with an 'Invalid Command' error message similar to Figure 16.

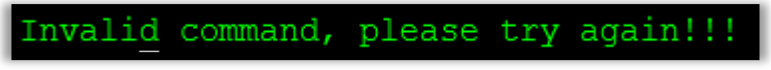


Figure 16 - Error Message - Invalid Command

© 2018 Kidde Australia

Likewise, if the command mnemonic is valid but parameter(s) are not fully supplied or are not in valid range, the panel will reply with a format error message as shown in Figure 17.

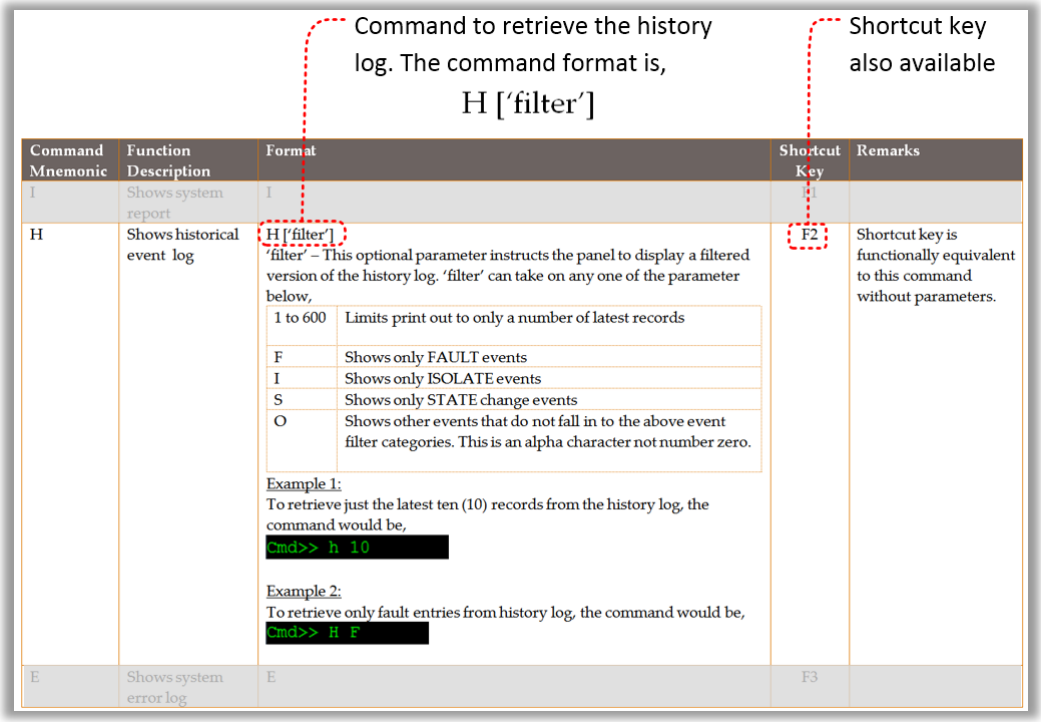


Figure 17 - Error Message - Incorrect Format

Example A Using Command without Parameters

This example uses the 'H' command to retrieve the complete history log to demonstrate the use of a command without parameter. It provides comprehensive details of the steps involved; later examples will be more simplified with only specific details provided.

Step 1: Consult Table 6 on page 43 to determine the command to use and its format,



Command Mnemonic	Function Description	Format	Shortcut Key	Remarks
I	Shows system report	I	F1	
H	Shows historical event log	H ['filter'] 'filter' – This optional parameter instructs the panel to display a filtered version of the history log. 'filter' can take on any one of the parameter below, 1 to 600 – Limits print out to only a number of latest records F – Shows only FAULT events I – Shows only ISOLATE events S – Shows only STATE change events O – Shows other events that do not fall in to the above event filter categories. This is an alpha character not number zero. Example 1: To retrieve just the latest ten (10) records from the history log, the command would be, Cmd>> h 10 Example 2: To retrieve only fault entries from history log, the command would be, Cmd>> H F	F2	Shortcut key is functionally equivalent to this command without parameters.
E	Shows system error log	E	F3	

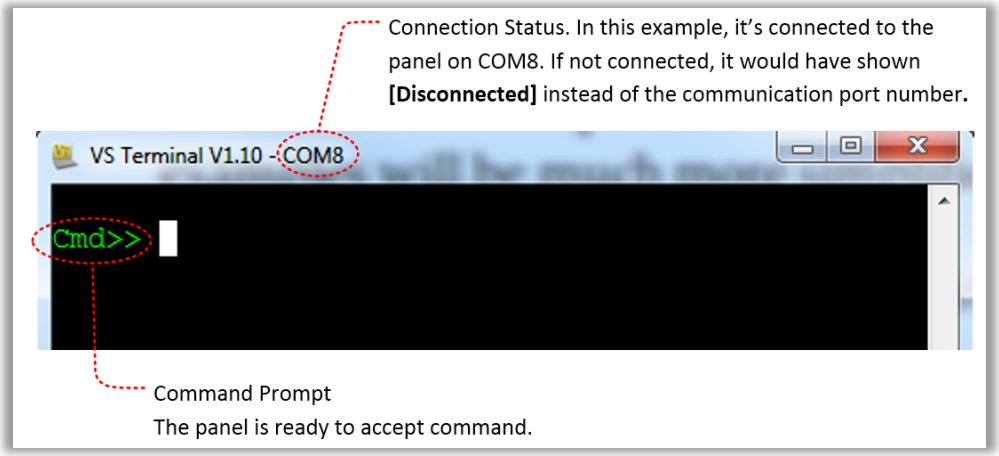
From the table, it shows that the 'H' command is used to retrieve the history log and it has a '***filter***' parameter - that is optional as its specified enclosed in square brackets – that can be used to retrieve a filtered version of the history log. Since we want to get the full version of the log, the parameter is omitted.

Note *Notice that '**F2**' shortcut key could also be used to achieve the same result but to demonstrate the principle, manual method is used in this example.*

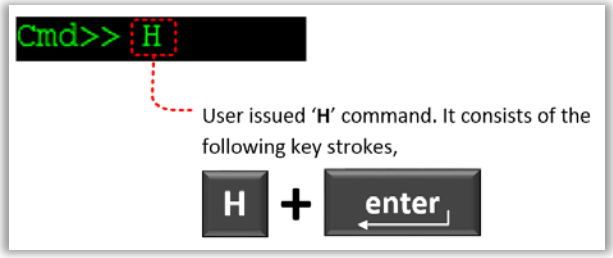
© 2018 Kidde Australia

Example A Using Command without Parameters

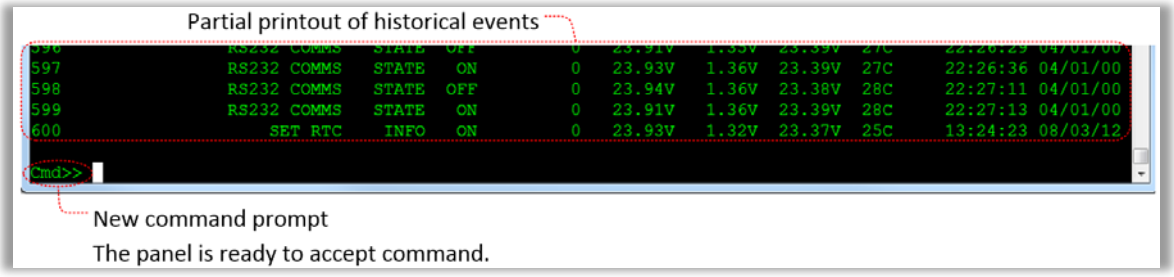
Step 2: Confirm that connection with panel has been established and the panel is ready to accept command,



Step 3: At the prompt, type the command mnemonic **H** then follow by the **ENTER** key to terminate the command.



Step 4: The panel responded with complete history log printout, starting from the oldest record. Once completed, a new command prompt will be shown, indicating it's ready to accept another command.



Tip *Scroll up to view older entries*

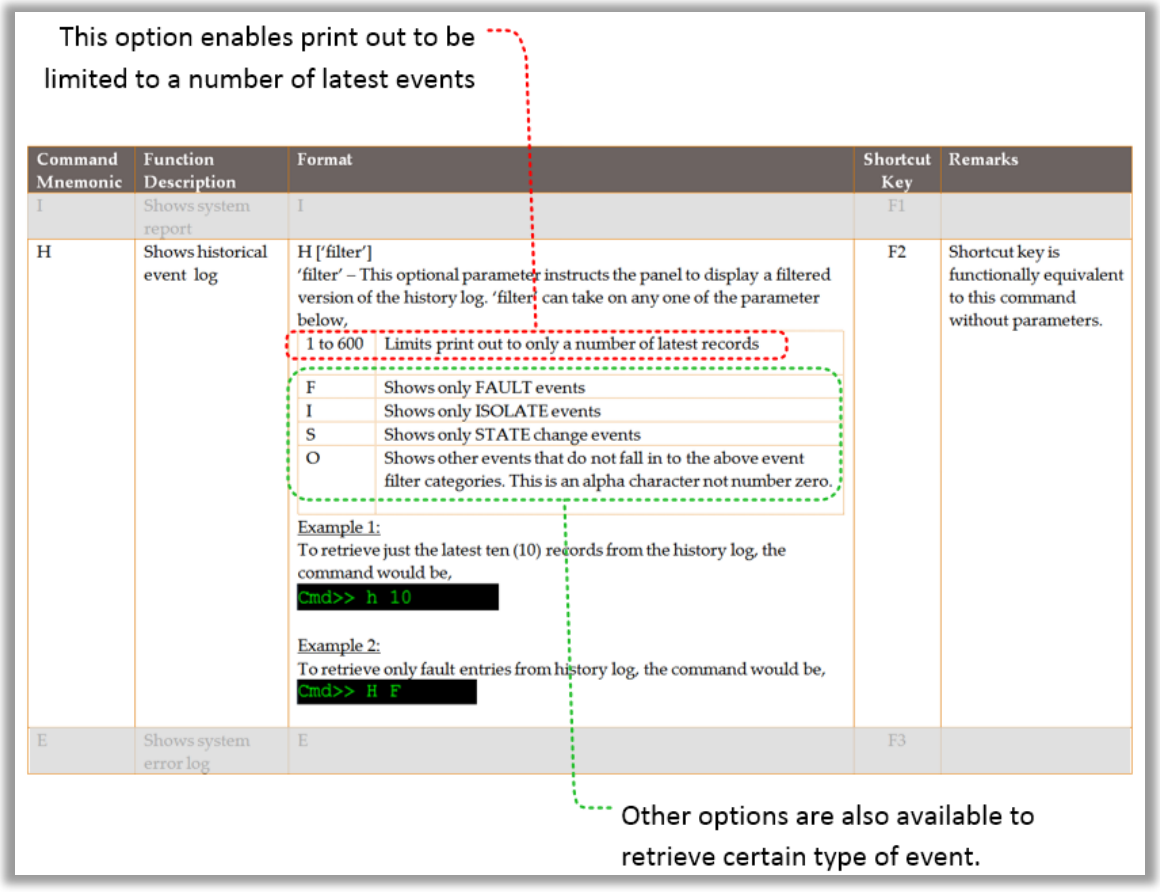
For information on interpreting the history log, refer to History Log section on page 30.

© 2018 Kidde Australia

Example B Using Command with Parameter

This example uses the same command as the previous example to retrieve the history log but instead of retrieving the full log; we will be using the optional ***'filter'*** parameter of the '**H**' command to retrieve just the latest 20 events. This is particularly useful during trouble-shooting, when only latest events required attention.

Step 1: Referring to Table 6 on page 43, the 'filter' parameter of the 'H' command can be used to limit the printout to a number of latest events by specifying a numerical value ranging from 1 to 600 as its parameter.

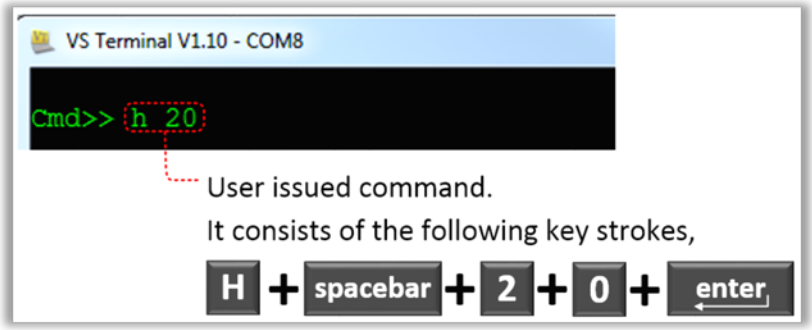


Command Mnemonic	Function Description	Format	Shortcut Key	Remarks
I	Shows system report	I	F1	
H	Shows historical event log	H ['filter'] 'filter' – This optional parameter instructs the panel to display a filtered version of the history log. 'filter' can take on any one of the parameter below, 1 to 600 – Limits print out to only a number of latest records F – Shows only FAULT events I – Shows only ISOLATE events S – Shows only STATE change events O – Shows other events that do not fall in to the above event filter categories. This is an alpha character not number zero. Example 1: To retrieve just the latest ten (10) records from the history log, the command would be, Cmd>> h 10 Example 2: To retrieve only fault entries from history log, the command would be, Cmd>> H F	F2	Shortcut key is functionally equivalent to this command without parameters.
E	Shows system error log	E	F3	

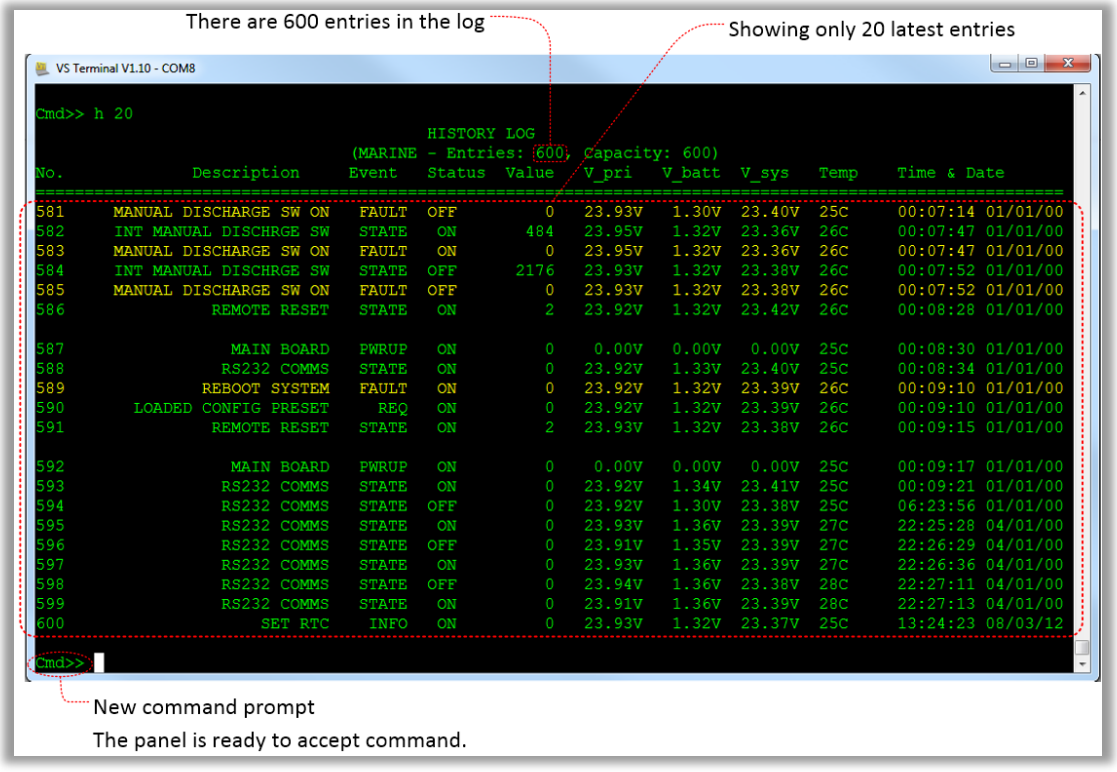
© 2018 Kidde Australia

Example B Using Command with Parameter

Step 2: At the command prompt, type the command mnemonic **H**, followed by a space (using the spacebar on the keyboard) to separate the parameter from the command, then enter **2** and **0** and finally terminate the command with the **ENTER** key.



Step 3: The panel responds with a print out of just the latest 20 entries of the history log.



© 2018 Kidde Australia

System Configuration

The system configuration on LV and MV panels is made up of various configurable items. Each configurable item has a unique ID and a predefined set of options that are available to it.

The mean in which a configuration item can be modified can be categorized into two types, 'hard' and 'soft' configurations. 'Hard' configuration refers to configurable items reside on the DIP switches (Designated as SW2) on the Printed Circuit Board (PCB) of the panel and 'Soft' configuration refers to configurable items that can only be modified by using Terminal interface software.

This section addresses making changes to 'soft' configuration part, though, some information is also relevant to both types. For information on 'hard' configuration part, refer to 'Panel configuration settings' section of the relevant Installation and maintenance manual.

Warning *Changing the configuration of a live system can potentially cause it to discharge the system. Before changing the system configuration, ensure the system is isolated using the system isolate switch (refer to the LV or MV panel installation and maintenance manual, as appropriate).*

Before attempting to make changes to the configuration, it is recommended to back up the current configuration settings. The simplest method is to use the **F12** key (refer to Table 2 on page 16 for more information on **F12** key) which will capture relevant system information – including system configuration - to a file saved on the connected computer.

Tip *To view the current system configuration, use '**F7**' shortcut key or the equivalent '**C**' command.*

Changing the 'soft' configuration is achieved – one item at a time – using the '**SSC'** command. This command requires two parameters, the first parameter is the configuration item unique identification number (*CFG_ITEM_ID*) and the second parameter is the option value for the configuration item. The general form of the command is shown in Figure 18,

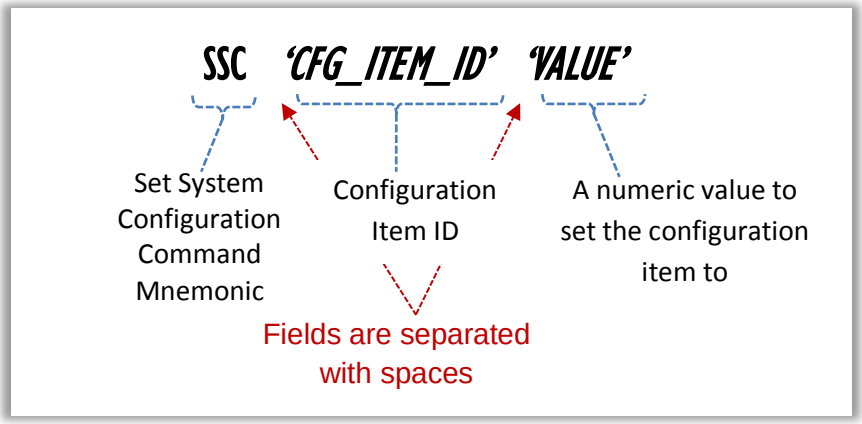


Figure 18 - SSC Command Format

© 2018 Kidde Australia

Available configurable items for LV and MV panels are provided in Appendix B and Appendix C respectively. The 'ID' and 'Value' columns correspond to the command's parameter fields (*CFG_ITEM_ID* and *VALUE*) as shown in Figure 19.

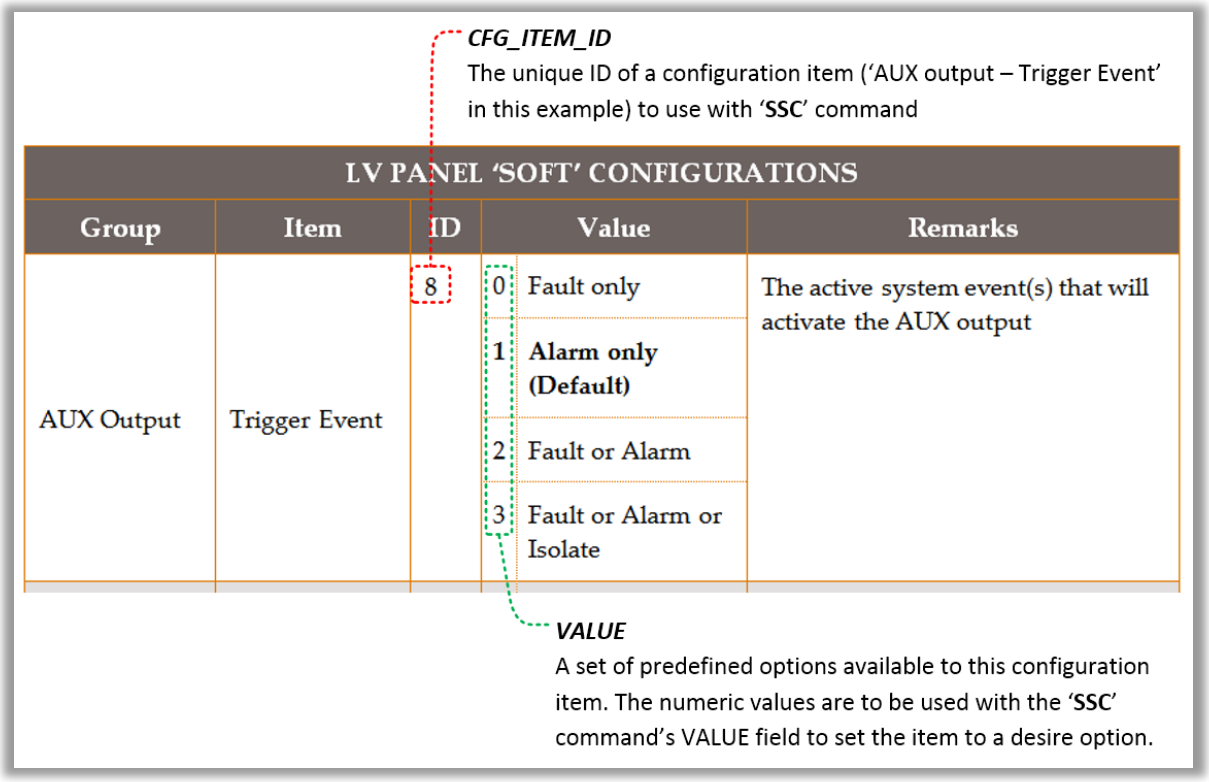


Figure 19 Looking up configuration ID and Value

Changes made to the configuration will not be effective until the system is rebooted and as a reminder, a system 'Reboot' fault will be asserted when any change to the system configuration is detected, irrespective of whether the change was made via the DIP switches or through Terminal interface.

In firmware version 1.0-2 or later, in addition to the 'Reboot' fault, a warning message will also be shown on the configuration report when a change has been made but the system hasn't been rebooted. Figure 20 shows a sample configuration report on LV panel with explanation of the various components of the report.

© 2018 Kidde Australia

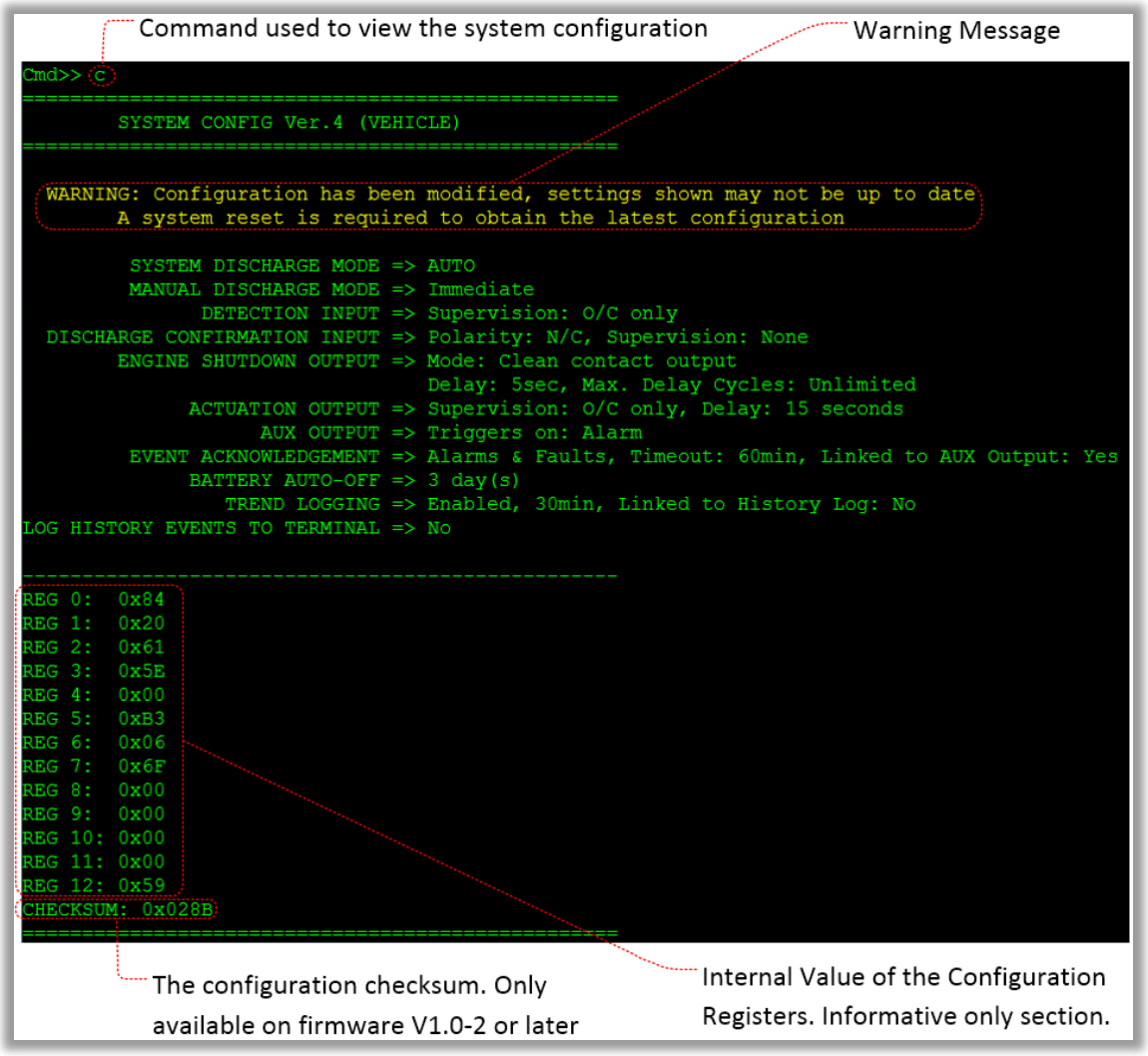


Figure 20 – LV System Configuration Report

Tip *Multiple changes to the system configuration can be made before resetting the system.*

© 2018 Kidde Australia

Example C Changing AUX Output Trigger Event

An example of using the '**SSC'** command on LV panel to set the AUX output to trigger on fault event. The principle is the same and applies to other configurable items that are available on LV and MV panels.

Step 1: Refer to the LV Panel 'Soft' Configurations table on page 48 to look up the configuration ID and option value. According to the table the configuration ID is '**8**' and the option value required to set it to trigger on fault event is '**0**'.

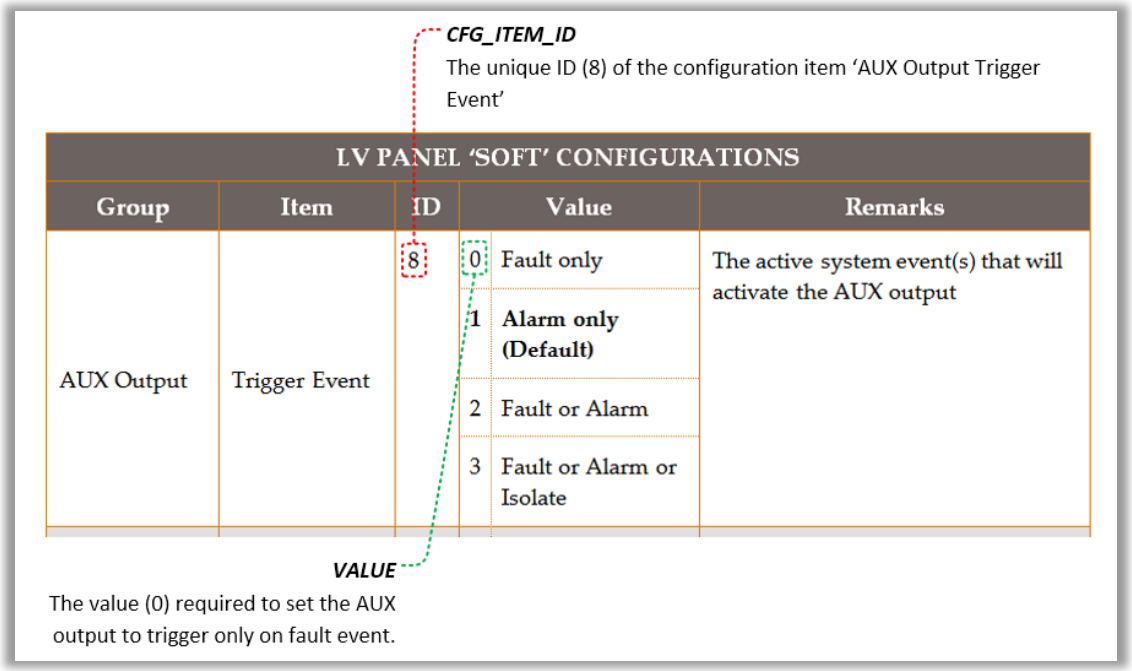


Figure 21 - Looking up configuration values

Step 2: At the command prompt, enter the full command '**SSS 8 0'** (without the quotes) as shown in Figure 22 below and then press '**ENTER'** to terminate the command.

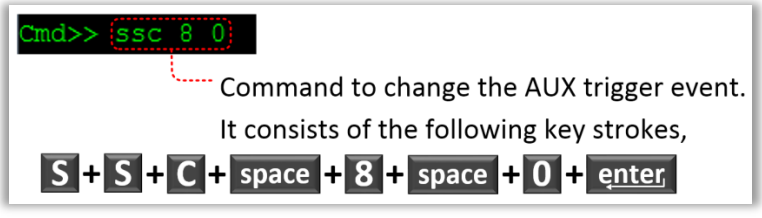


Figure 22 Reconfiguring AUX Output Trigger Event

© 2018 Kidde Australia

Example C Changing AUX Output Trigger Event

Step 3: Press '**F7'** to view the system configuration report and confirm that the AUX output trigger event has been changed to 'FAULT only'.

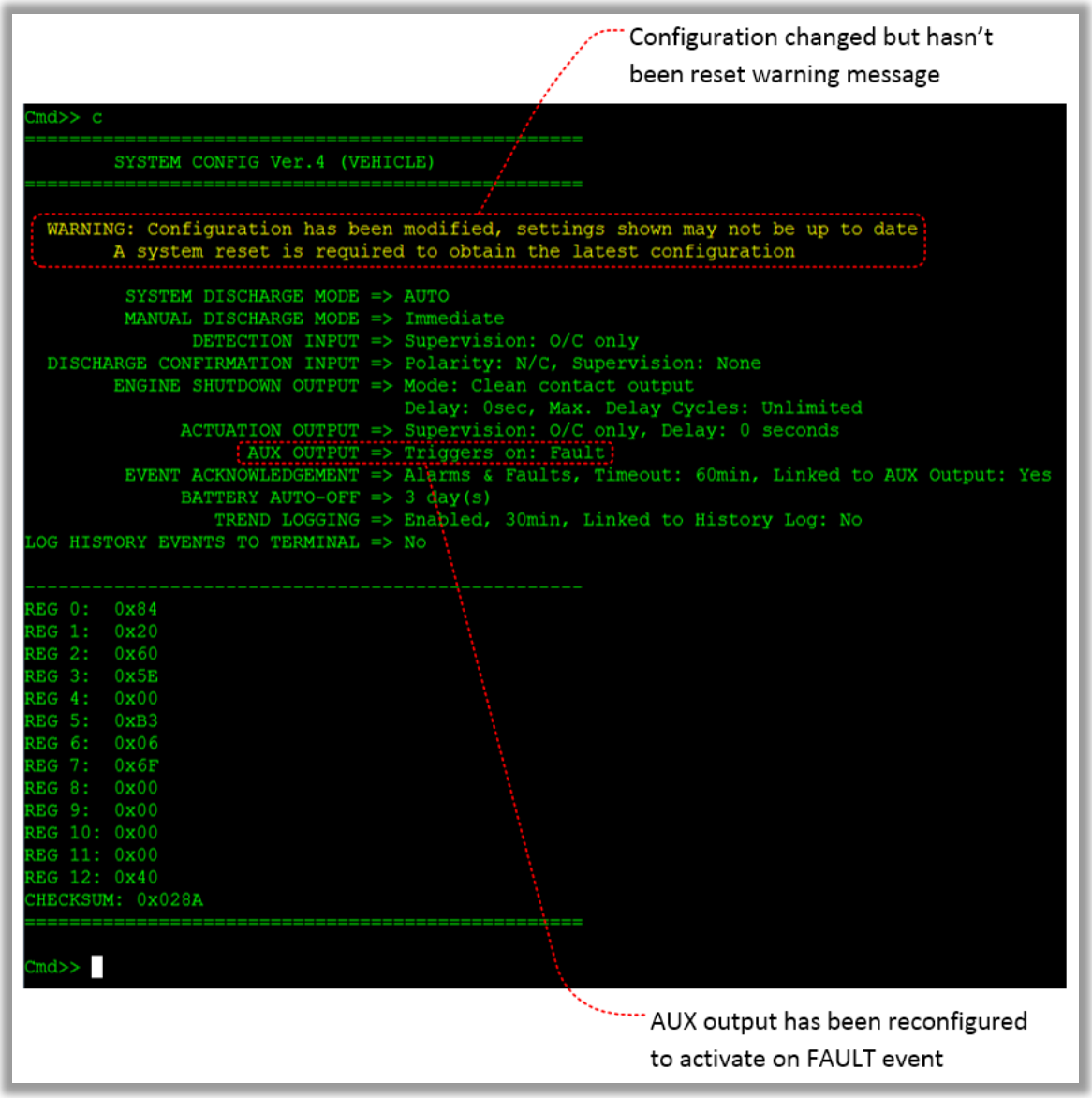


Figure 23 Verifying the Configuration

© 2018 Kidde Australia

Example C Changing AUX Output Trigger Event

Step 4: At the command prompt, type '**RST'** and press **ENTER** to reset the panel to apply the change made to the system configuration.

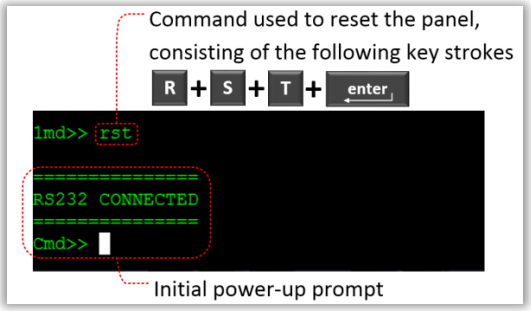


Figure 24 Resetting to apply the new setting.

Step 5: After the system rebooted, press '**F7'** again and confirm that the AUX output trigger event is set to 'FAULT' and the warning message is no longer shown.

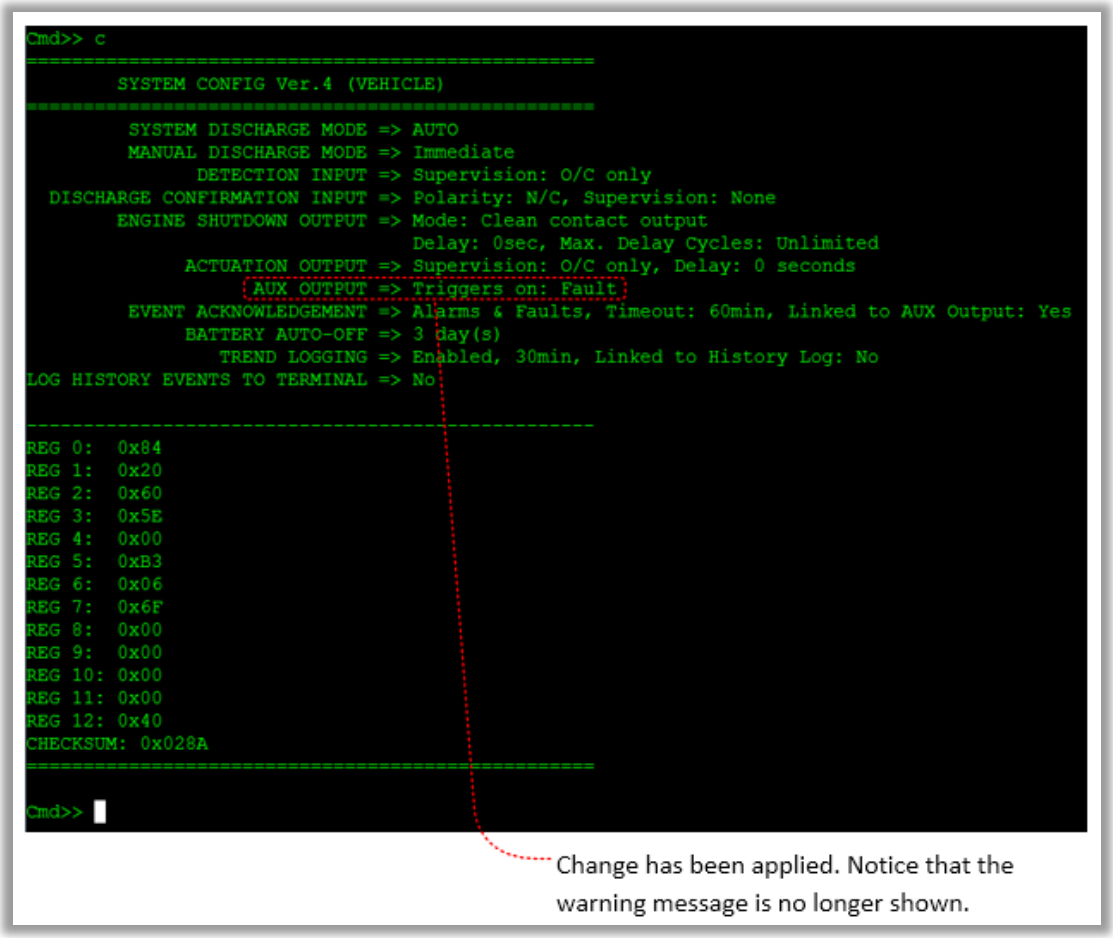


Figure 25 Verifying configuration

© 2018 Kidde Australia

System Report

The system report provides a summary of the system status and serves a very important role in trouble-shooting.

The system report can be retrieved using **'I'** command or its shortcut key **'F1'**. The report is divided into four sections, system status, panel firmware and hardware information, power supply status and various useful counters. Most fields are self-explanatory; however, some are not so obvious and are explained below,

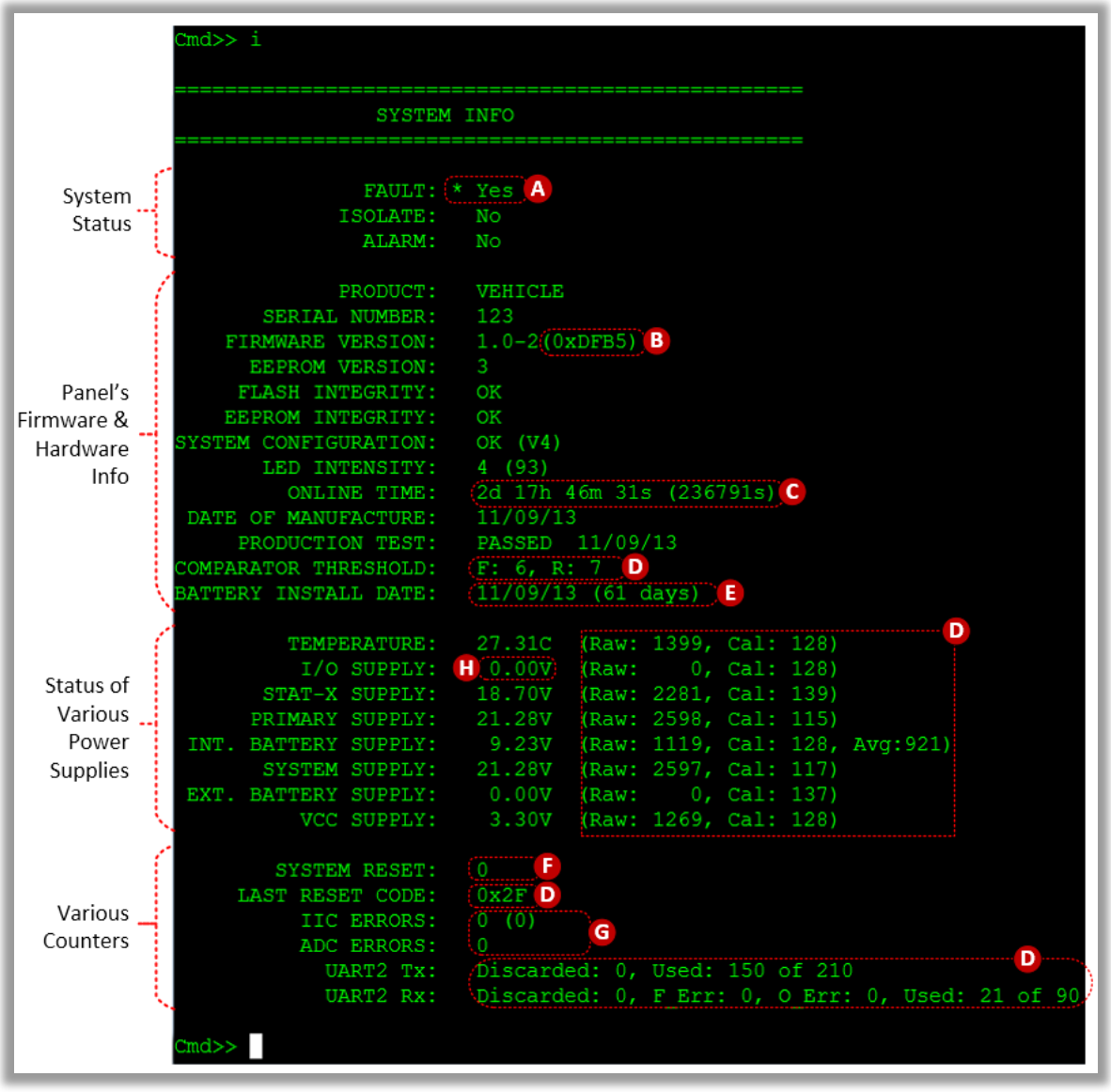


Figure 26 – LV System Report

© 2018 Kidde Australia

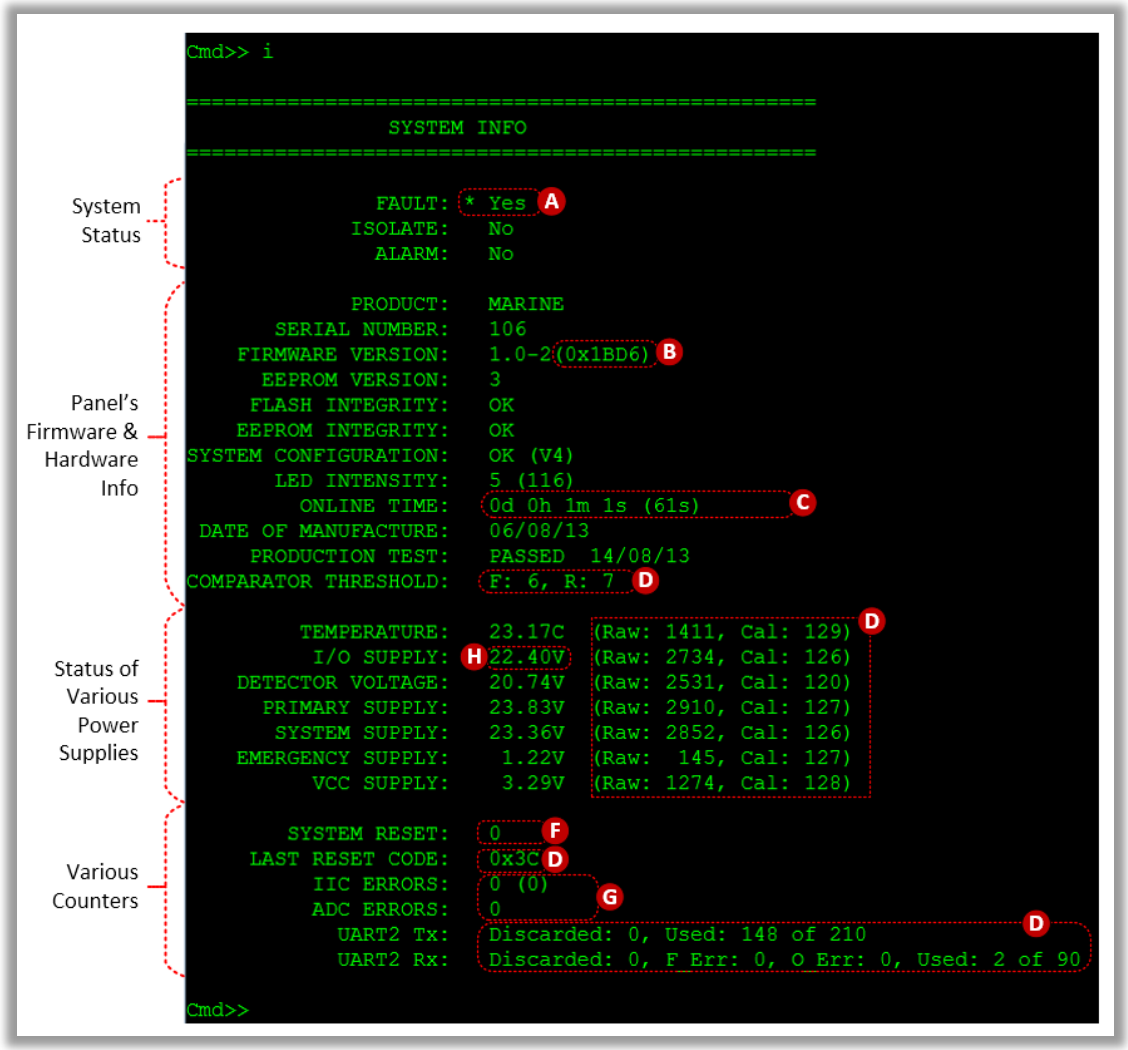


Figure 27 – MV System Report

A Indicating there is one or more active fault in the system. The asterisk signifies an abnormal condition for that field.

B Firmware checksum value.

C The time the panel has been online/running since last powered up.

D These fields are for engineering and factory use only.

E The date stamp of when the internal 9V battery was installed. The value in the brackets indicates the number of days elapsed calculated based on the panel's clock. If this value is negative, the most likely cause is the panel's clock not set correctly.

F Abnormal system reset counter, contact technical support if this value is higher than 1.

G Hardware error counters, contact technical support if any of the counters is more than 0.

H The I/O supply is the power supply for some of the inputs or outputs.
On LV panel, this supply is normally off and only switches on occasionally.
On MV panel, this supply is normally on and will typically be approximately 2 volts above the detector voltage (By default, the detection circuit voltage is 20V).

© 2018 Kidde Australia

History Log

History log is an event logger; it contains a record of important events that took place in the system. It is a useful tool in assisting with fault diagnostics and fire incident investigations.

The panels are capable of recording up to 600 events in its non-volatile memory[2]. Every event logged to memory is date and time stamped, along with other useful information. Events are stored in the order they occurred and once the log is filled, the oldest record will be overwritten with a new record.

The history log can be retrieved using the '**H'** command or the **'F2'** shortcut key (Refer to Example A and Example B on page 18 for examples of retrieving the history log). Log records are arranged in chronological order, with event number 1 being the oldest and displayed first.

In firmware version 1.0-2 or later, fault and alarm events are colour coded in yellow and red for ease of identification. Shown in Figure 28 & Figure 29 are sample logs from LV and MV panels respectively.

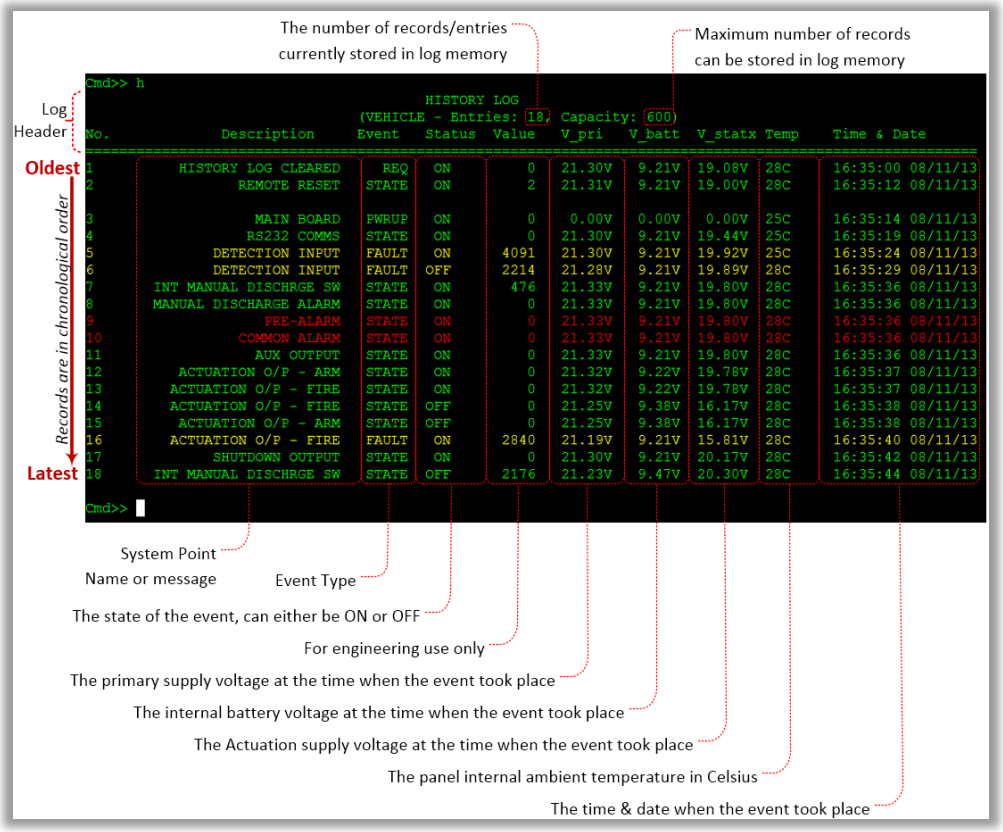


Figure 28 – Sample History Log from an LV panel

[2] *Non-volatile memory is a type of memory that doesn't lose its memory when not powered*

© 2018 Kidde Australia

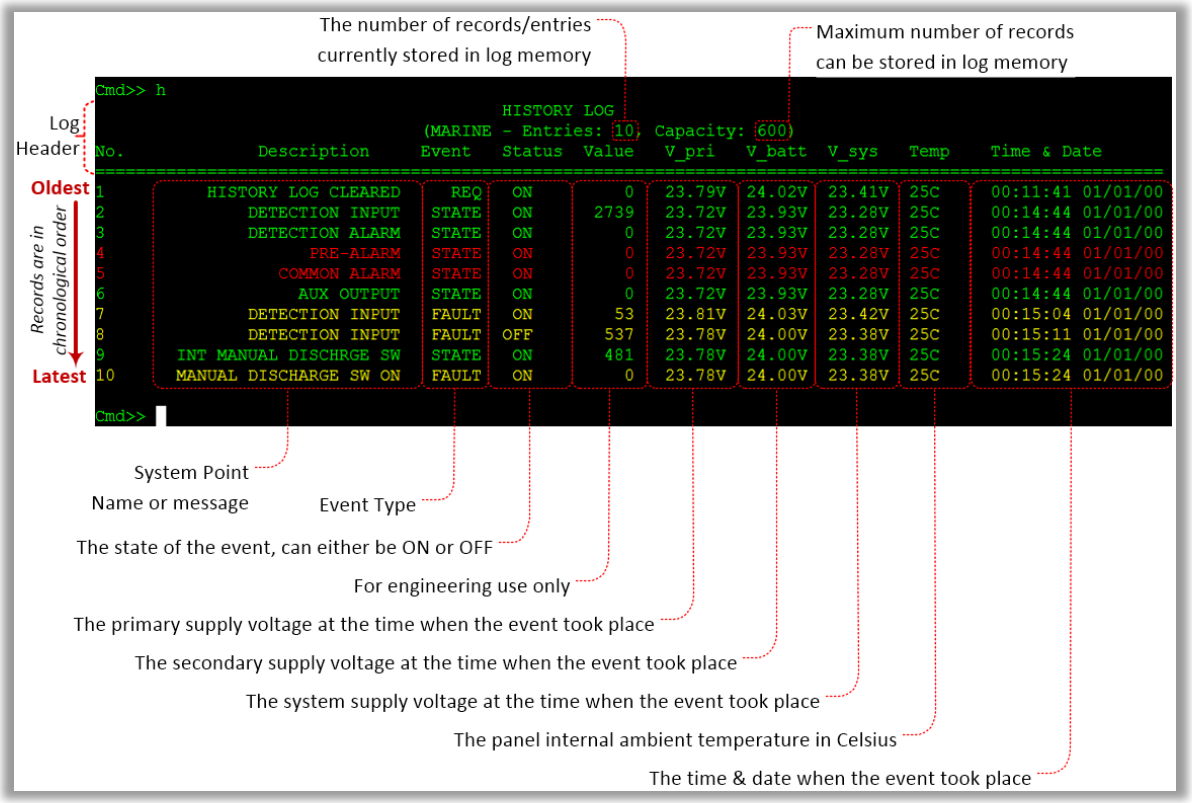


Figure 29 – Sample History Log from an MV Panel

There are different events that can occur in the system, Table 3 lists all possible event types that are used by the system,

Event Type	Definition
FAULT	FAULT event, an abnormal event occurred on the system point
ISO	ISOLATE event refers to a system point being isolated from normal operation
STATE	STATE change event or also known as ON/OFF event means a system point is being switched on or off as part of normal operation
PWRUP	POWER UP event, this event indicates that the system is being powered up
REQ	A REQUEST made by an operator
INFO	INFORMATIVE only event, an event that was logged by the system to inform of an operation that was detected/performed by the system

Table 3 - History Event Type

© 2018 Kidde Australia

Due to memory constraint, some texts in history log are shortened and are explained below,

Abbreviation	Definition
ACK	Acknowledge
ACT	Actuation
ADC	Analogue to Digital Converter
AUX	Auxiliary or Ancillary
BATT	Battery
CFG or CONFIG	Configuration, most often used to refer to the system configuration
COMMS	Communication
DIS or DISCHRGE	Discharge
ENG.	Engine
EXT	External
FB	Feedback
FLT	Fault
GND	Ground, most often use to refer to the low potential side of a circuit.
GRN	Green
I/O	Input or Output
I/P	Input
I2C	Inter-Integrated Circuit, is an internal serial bus used by the processor to communicate with on-board devices.
INFO	Information
INT	Internal
ISO	Isolate
LED	Light Emitting Diode
O/P	Output
PB	Push Button
PRE-ALARM	Refers to an alarm condition prior to the actual system alarm condition. On LV panel, this condition will always follow by the system alarm condition “COMMON ALARM”. On MV panel, it indicates that the system has been armed.
PSU	Power Supply Unit
PWR	Power
RTC	Real-Time Clock
SD or S/D	Shutdown
SW	Switch
YLW	Yellow

Table 4 - Abbreviations used in History Log

© 2018 Kidde Australia

Trend Log

Trend log is a tool that captures various system data at a pre-set interval to non-volatile memory for post analysis. This supporting data can be very helpful in diagnosing faults that are influenced by external factors, such as ambient temperature or supply voltages.

The trend log module capable of recording up to 1440 records in its memory; with each record containing the following information,

- Time and date of when it was captured
- Status of various system points packed into 4 bytes (Stat_0 to Stat_3)
- Internal ambient temperature (Temp)
- Primary supply voltage (V_pri)
- Internal battery voltage (V_batt)
- Discharge output voltage (V_statx)

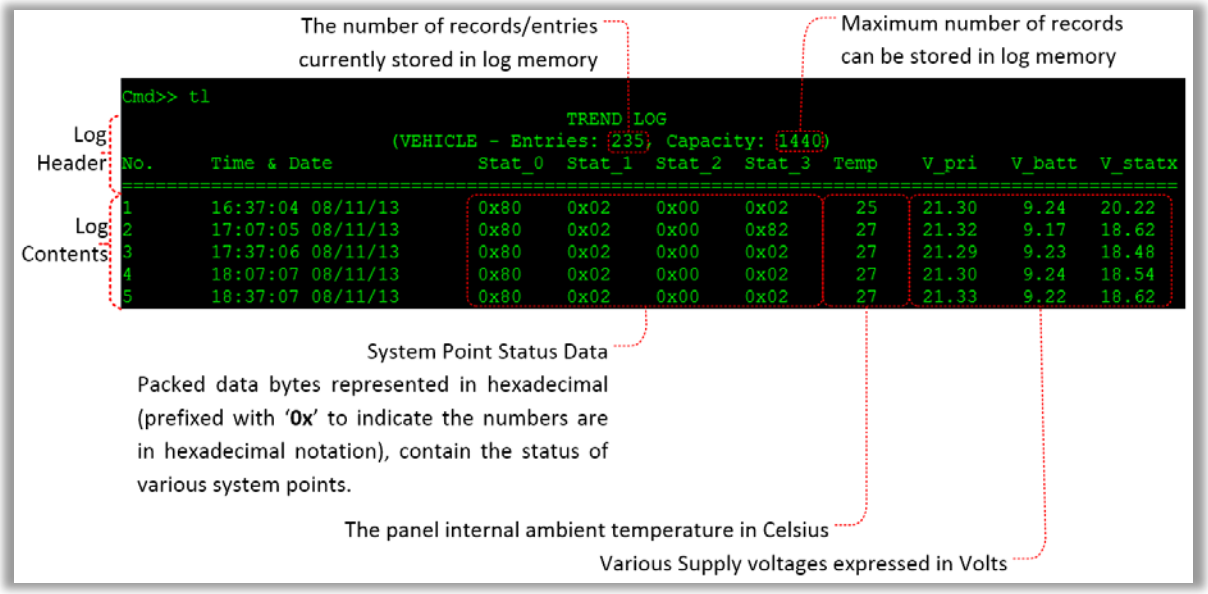


Figure 30 - Trend Log Report

Each row in the trend log report represents a record; the records are arranged in chronological order, starting with the oldest record (Record No. 1).

The default system configuration is set to capture a record at 30-minute intervals, which allows for up to 30 days of data to be stored in memory. If there is a need to capture at higher frequency (e.g. 1-minute), it should be limited to a short period (1 or 2 months maximum, see warning below) to prevent permanent damage to the memory device.

© 2018 Kidde Australia

Warning

Unless there is a special requirement to capture data at more frequent intervals, it is recommended that the logging interval be set to 30 minutes or longer, to prevent causing permanent damage the memory device.

The memory device fitted on these panels has limited write endurance, if data is captured at 1-minute intervals, the memory device will reach its endurance limit in less than two years, at which point it will need to be replaced.

The 'Log on History Events' configuration allows trend log module to operate in tandem with the history log module. If enabled, every time an event is logged to the history log, it also triggers the trend log module to log a record to its memory. This allows both logs to be correlated in time to get a better insight into the system.

In each trend log record, there are four status bytes (Stat_0 to Stat_3) that are packed with the status of various system points. In each byte, there are eight bits and each bit can take on either of the two values, '0' or '1', where '0' represents 'OFF' and '1' represents 'ON'.

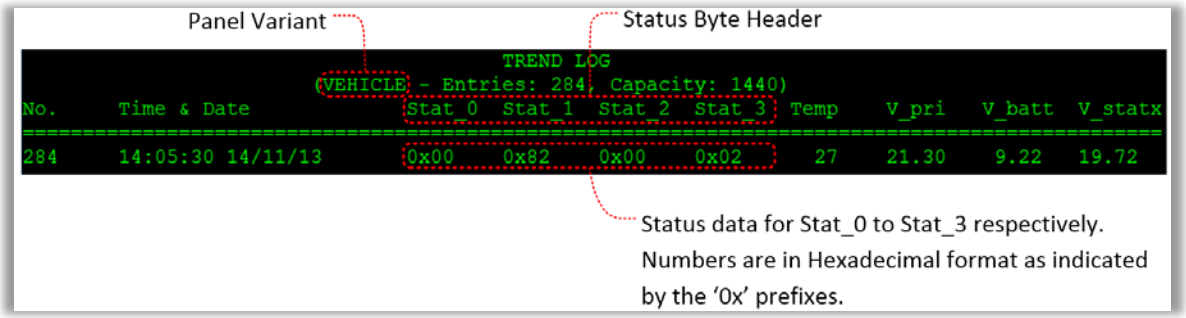


Figure 31 – Trend Log Status Bytes

Each bit of the status bytes has been pre-assigned to represent the status of a system point; most commonly used to indicate the fault status but can also be used to indicate the activation status of a system point.

For each panel variant, there is a set of four specific lookup tables that correspond to the four status bytes and are listed in Appendix D and Appendix E. Note that Stat_3 contains some special system points that are reserved for engineering/factory use only; A technician should not need to interpret these in the field.

In order to determine the status of a system point from a status byte represented in hexadecimal format, the following steps are required,

1. Convert the status byte value in hexadecimal to binary format.
2. Map the binary value to the corresponding status table.
3. Determine the status of the system points.

© 2018 Kidde Australia

There are a few methods that can used to convert hexadecimal number to binary format. In this manual; using lookup table is the preferred method. Table 5 below is the reference lookup table that will be used to perform all hexadecimal to binary conversions.

Hexadecimal	Binary
0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
A	1010
B	1011
C	1100
D	1101
E	1110
F	1111

Table 5 - Hexadecimal to Binary Lookup Table

© 2018 Kidde Australia

Example D Interpreting a Status Byte of a Trend Log Record

This example provides detail of the steps required to interpret the status bytes of a trend log record. The trend log record that will be used for this example is shown below,

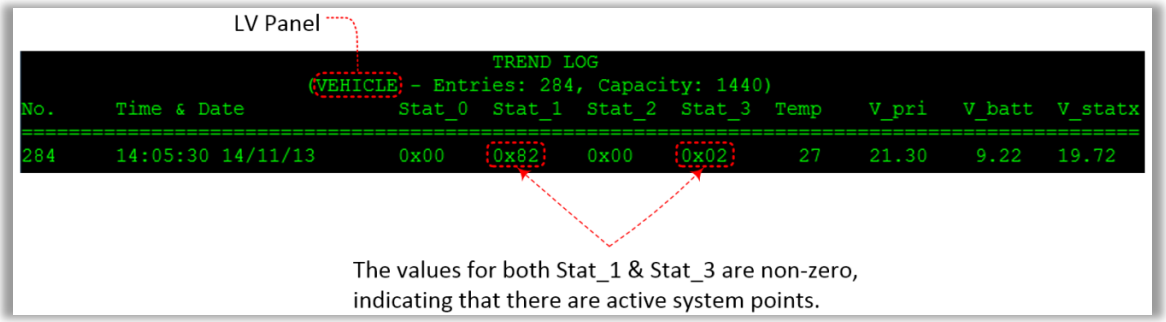


Figure 32 - A Trend Log Record from LV Panel

From the log record in Figure 32, there are two status bytes with non-zero value, Stat_1 and Stat_3, both are in hexadecimal format as indicated by the '0x' prefix and would need to be converted to binary format in order to determine the active system point(s). Also note that the record in Figure 32 belongs to LV panel and so the reference status lookup tables are taken from Appendix D.

© 2018 Kidde Australia

Example D Interpreting a Status Byte of a Trend Log Record

Step 1: Starting with **Stat_1**, its hexadecimal value of 0x82 needs to be converted to binary format. To do the conversion, use the reference hexadecimal to binary lookup table (Table 5 on page 35) to lookup the corresponding 4-bit binary values for both hexadecimal digits, one at a time and then combine the binary values to form 8-bit binary numbers. Figure 33 illustrates the process involved,

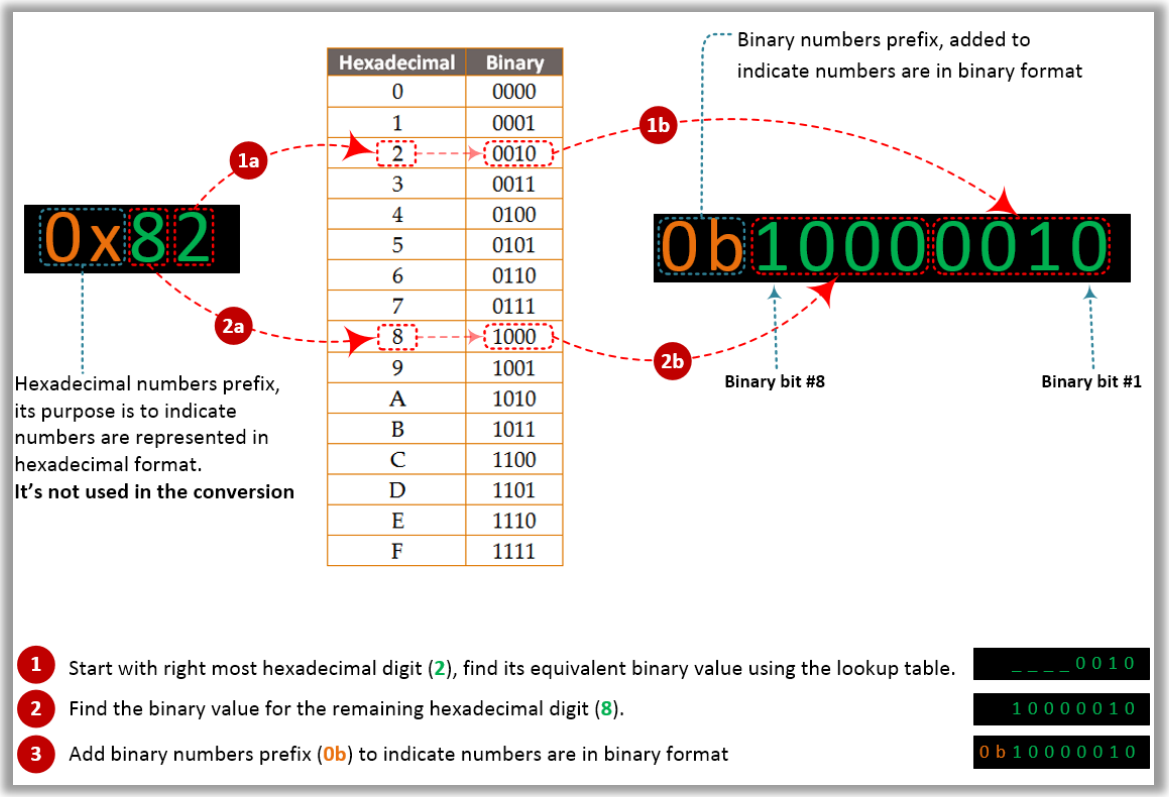
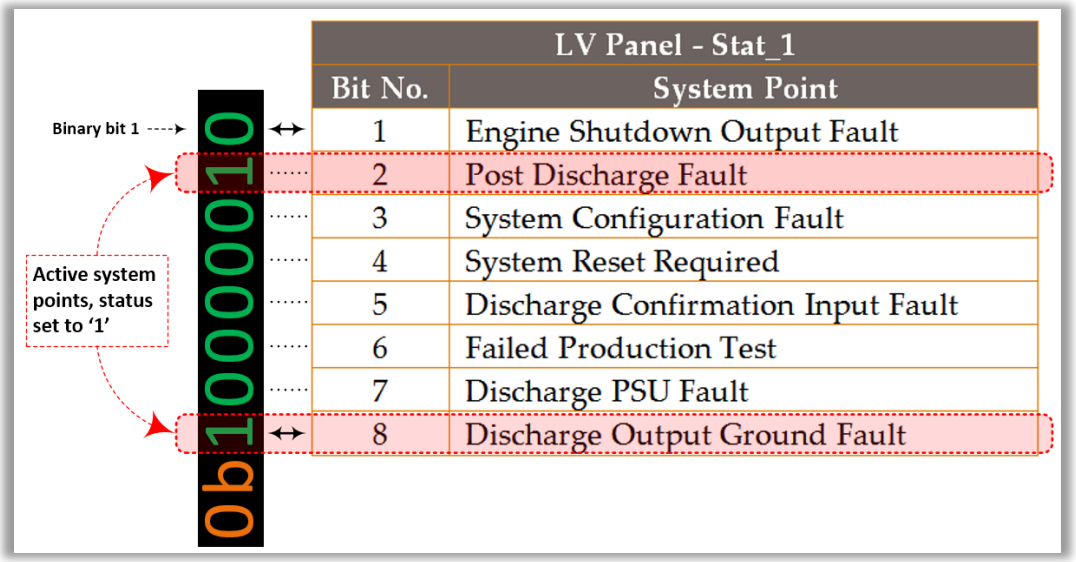


Figure 33 - Hexadecimal to Binary Conversion Process

© 2018 Kidde Australia

Example D Interpreting a Status Byte of a Trend Log Record

Step 2: Once the number has been converted to binary, the next step is to map the binary bits in the correct order to the corresponding status table. In this instance, the data was taken from **Stat_1**, so Table 10 is used. Refer to Figure 34 for details,



LV Panel - Stat_1

Bit No.	System Point
1	Engine Shutdown Output Fault
2	Post Discharge Fault
3	System Configuration Fault
4	System Reset Required
5	Discharge Confirmation Input Fault
6	Failed Production Test
7	Discharge PSU Fault
8	Discharge Output Ground Fault

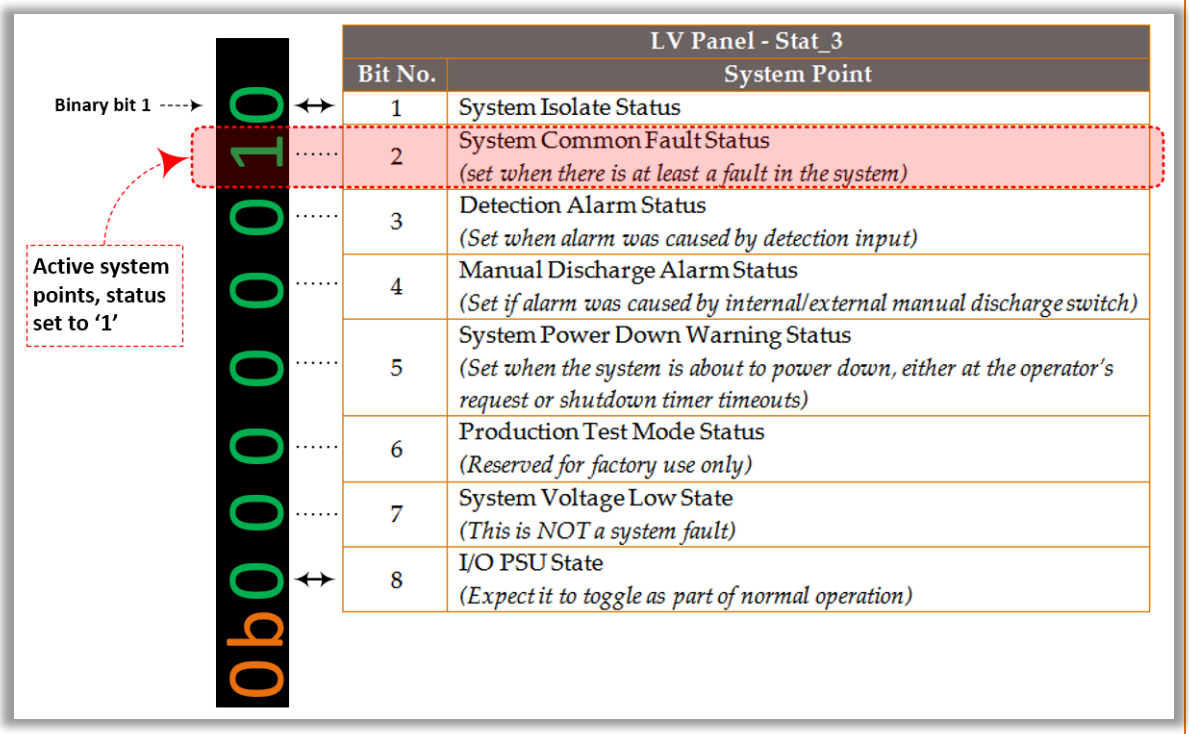
Figure 34 – Stat_1 Mapping

Step 3: Once the mapping has been done, look for the system points with its status bit set to '1'. From Figure 34 there are two system points with their status set to '1', '***Post Discharge Fault***' and '***Discharge Output Ground Fault***'. According to the descriptions, both are fault status points, so that indicates there were two faults active in the system at the time the record was captured.

© 2018 Kidde Australia

Example D Interpreting a Status Byte of a Trend Log Record

Step 4: Apply the same procedures as above to Stat_3 and we would find that '***System Common Fault Status'*** (Bit No. 2 of Table 12) system point was active. This system point is not a fault point; it is the system common fault status and is set when there is at least one fault in the system. In this case, it is set due to the two faults as indicated by Stat_1.



LV Panel - Stat_3	
Bit No.	**System Point**
1	System Isolate Status
2	System Common Fault Status *(set when there is at least a fault in the system)*
3	Detection Alarm Status *(Set when alarm was caused by detection input)*
4	Manual Discharge Alarm Status *(Set if alarm was caused by internal/external manual discharge switch)*
5	System Power Down Warning Status *(Set when the system is about to power down, either at the operator's request or shutdown timer timeouts)*
6	Production Test Mode Status *(Reserved for factory use only)*
7	System Voltage Low State *(This is NOT a system fault)*
8	I/O PSU State *(Expect it to toggle as part of normal operation)*

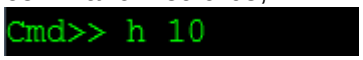
Figure 35 - Stat_3 Mapping

© 2018 Kidde Australia

Appendix A Terminal Commands

Command Mnemonic	Function Description	Format	Shortcut Key	Remarks
HELP	Displays a list of all available commands with brief description of their function.	HELP		Listed commands that are not in this table are intended for engineering uses only.
T	Displays the panel's current time & date	T	F5	
ST	Sets the panel's time & date	ST 'dd/mm/yy' 'hh:mm:ss' Parameters must be supplied with the date ('/') and time (':') field separators. All leading zeroes must be supplied. Time is specified in 24hr format. 'dd' Two digits date 'mm' Two digits month 'yy' Two digits year 'hh' Two digits hour 'mm' Two digits minutes 'ss' Two digits seconds Example: To set the panel's time & date to 8 March 2012 1:24:23pm, the full command would be, `Cmd>> ST 08/03/12 13:24:23`	F11	Generally, the shortcut key should be used, refer to Table 2 on page 16 for more information on the shortcut key. In rare circumstances, it may require setting the panel's time and date different to the computer's clock, then this command can be used to manually achieve that.
I	Displays system report	I	F1	

© 2018 Kidde Australia

<table>
<tr><th>Command Mnemonic</th><th>Function Description</th><th>Format</th><th>Shortcut Key</th><th>Remarks</th></tr>
<tr><td>H</td><td>Displays historical event log</td><td>H [‘filter’]
‘filter’ – This optional parameter instructs the panel to display a filtered version of the history log. ‘filter’ can take on any one of the parameter below,
<table><tr><td>1 to 600</td><td>Limits print out to only a number of latest records</td></tr><tr><td>F</td><td>Displays only FAULT events</td></tr><tr><td>I</td><td>Displays only ISOLATE events</td></tr><tr><td>S</td><td>Displays only STATE change events</td></tr><tr><td>O</td><td>Displays other events that do not fall in to the above event filter categories. This is an alpha character not number zero.</td></tr></table><u>Example 1:</u>
To retrieve just the latest ten (10) records from the history log, the command would be,

<u>Example 2:</u>
To retrieve only fault entries from history log, the command would be,
</td><td>F2</td><td>Shortcut key is functionally equivalent to this command without parameters.</td></tr>
<tr><td>E</td><td>Displays system error log</td><td>E</td><td>F3</td><td></td></tr>
<tr><td>C</td><td>Displays system configuration</td><td>C</td><td>F7</td><td></td></tr>
<tr><td>CPS</td><td>Returns all the ‘soft’ configurable items back to factory default</td><td>CPS 0

The first parameter must be zero (‘0’) and is mandatory.</td><td></td><td></td></tr>
</table>

© 2018 Kidde Australia

Command Mnemonic	Function Description	Format	Shortcut Key	Remarks
RST	Performs a system reset, functionally equivalent to using key combinations on the keypad to reset the panel.	RST		
F	Displays a list of all the current faults in the system	F	F4	
TL	Displays trend log records	TL ['records'] The valid values for the optional parameter are 1 to 1440. If supplied, it will only show a number of latest records as specified. If omitted, all available records will be displayed. Example: To retrieve only the latest one hundred (100) records from the log, the command would be, `Cmd>> TL 100`		

© 2018 Kidde Australia

Command Mnemonic	Function Description	Format	Shortcut Key	Remarks
SSC	Sets a system configuration item. **Caution** This command will modify the system configuration; refer to System Configuration section on page 22 for details on correct usage of this command.	SSC ‘cfg_item_id’ ‘value’ This command requires both parameters to be specified. ‘cfg_item_id’ The configuration item number ‘value’ The value to set the configuration item number to		

Table 6 - Terminal Commands

© 2018 Kidde Australia

Appendix B LV Panel 'Soft' Configuration Table

LV PANEL 'SOFT' CONFIGURATIONS					
Group	**Item**	**ID**	**Value**		**Remarks**
Hybrid Operating Mode	[V1.0-3 or later] Enable Hybrid Mode	45	**0**	**Disable (Default)**	In Hybrid mode, the system switches between AUTO and MANUAL mode based on the status of the "External Backup Battery" input. **Note** *If enabled, this setting overrides the AUTO/MANUAL discharge mode set via DIP switch 7 on the board.*
			1	Enable	
	[V1.0-3 or later] Mode Change Notification Period (seconds)	46	0	2s	The duration in seconds of the audible notification on mode change. **Note** *Only applicable to the audible notification.*
			1	**4s (Default)**	
			2	8s	
			3	20s	
	[V1.0-3 or later] Notify on MANUAL to AUTO	51	0	Disable	Enable/disable the audible notification when changing from MANUAL mode to AUTO mode.
			1	**Enable (Default)**	
	[V1.0-3 or later] Notify on AUTO to MANUAL	52	0	Disable	Enable/disable the audible notification when changing from AUTO mode to MANUAL mode.
			1	**Enable (Default)**	
	[V1.0-3 or later] Shut Down Engine in HYBRID-AUTO Mode	50	**0**	**Disable (Default)**	Applicable only if the Engine Shutdown Facility is enabled. The engine shutdown facility can be selectively disabled/enabled during the AUTO phase of the Hybrid mode. **Note** Shutting down the engine during the AUTO phase is considered redundant as the ignition key switch must be off to put the system in AUTO mode.
			1	Enable	
	[V1.0-3 or later] Allow MANUAL to AUTO Mode Change during Alarm	49	**0**	**Disable (Default)**	Enable/Disable switching from MANUAL mode to AUTO mode during an alarm condition. **Caution** If both "Shut Down Engine in HYBRID-AUTO Mode" and "Allow MANUAL to AUTO Mode Change during Alarm" are enabled. Considerations should be given to the undesired effect below, A fire can destroy the power supply and therefore causes the system to transition from MANUAL to AUTO mode. This will cause the equipment to shut down and discharge while the operator is present.
			1	Enable	

© 2018 Kidde Australia

LV PANEL 'SOFT' CONFIGURATIONS					
Group	**Item**	**ID**	**Value**		**Remarks**
AUX Output	Trigger Event	8	0	Fault only	The active system event(s) that will activate the AUX output
			1	**Alarm only (Default)**	
			2	Fault or Alarm	
			3	Fault or Alarm or Isolate	
Discharge Confirmation Input	Contact Configuration	13	**0**	**Normally Closed (Default)**	
			1	Normally Open	
	Short-circuit Supervision	17	**0**	**Disable (Default)**	
			1	Enable	
	Open-circuit Supervision	20	**0**	**Disable (Default)**	
			1	Enable	
Detection Input	Open-circuit Supervision	18	0	Disable	
			1	**Enable (Default)**	
Discharge Output	Open-circuit Supervision	19	0	Disable	
			1	**Enable (Default)**	
Event Acknowledge Facility	Acknowledge Fault Events	22	0	Disable	
			1	**Enable (Default)**	
	Acknowledge Alarm Events	23	0	Disable	
			1	**Enable (Default)**	
	Timeout	24	0	15 min	
			1	30 min	
			2	45 min	
			3	**60 min (Default)**	
			4	90 min	
			5	120 min	
			6	150 min	
			7	180 min	
	Link to AUX output	25	0	Disable	
			1	**Enable (Default)**	
Trend Logging	Logging Interval	26	0	Disable Logging	It is NOT recommended to permanently set the logging interval to less than 30 minutes as that will shorten the life of the memory chip. Those options are designed for trouble shooting purposes over a short period of time.
			1	1 min	
			2	2 min	
			3	5 min	
			4	10 min	
			5	20 min	
			6	**30 min (Default)**	
			7	60 min	
	Log on History Events	27	**0**	**Disable (Default)**	If enabled, a trend log record will be logged on every history event logging. This can be useful for trouble-shooting purposes in correlating information in the trend log with the history log. Refer to Trend Log section for more details.
			1	Enable	

© 2018 Kidde Australia

LV PANEL 'SOFT' CONFIGURATIONS					
Group	**Item**	**ID**	**Value**		**Remarks**
Engine Shutdown Facility	[V1.0-3 or later] Enable Engine Shutdown Sequence	41	0	Disable	Disabling the engine shutdown sequence inhibits visual indications and switching of the output. If disabled, all other settings in this group are inapplicable. **Caution** *If disabled, ensure that the Actuation output delay (set via DIP switches on the board) is NOT set to link to the Engine Shutdown output. Otherwise the Actuation output will not operate (No discharge will occur).*
			1	**Enable (Default)**	
	[V1.0-3 or later] Trigger Event	42	**0**	**ANY ALARM (Default)**	Set the type of alarm event that initiates the engine shutdown sequence. Applicable only in MANUAL or HYBRID-MANUAL operating modes. In AUTO or HYBRID-AUTO modes, regardless of the setting, the behaviour is the same as "ANY ALARM" setting. "ANY ALARM" - First registered alarm starts the engine shutdown sequence, regardless of the type of alarm input. "MANUAL DISCHARGE ALARM" - The engine shutdown sequence starts only on activation of the built-in FIRE SYSTEM DISCHARGE" switch. **Note** If Hybrid mode is selected, Manual Discharge Alarm should be considered.
			1	MANUAL DISCHARGE ALARM	
	Enable Independent Delay Times	29	**0**	**Disable (Default)**	If enabled, the engine shutdown initial delay is taken from the setting on the DIP switches, whilst the extension delay is taken from the 'Extension Delay Time' setting.
			1	Enable	
	Extension Delay Time	10	0	0s	Applicable only if using independent delay times. To use this option, 'Enable Independent Delay Times' setting must be set to 'Enable'.
			1	5s	
			2	10s	
			3	15s	
			4	20s	
			5	**30s (Default)**	
			6	40s	
			7	60s	

© 2018 Kidde Australia

LV PANEL 'SOFT' CONFIGURATIONS					
Group	**Item**	**ID**	**Value**		**Remarks**
	The Number of Shutdown Delay Allowed	11	0	No delay allowed	The number of times the operator can delay the engine shutdown event using the DELAY key.
			1	1 time only **(AS5062 compliance)**	
			2	2 times	
			3	3 times	
			4	4 times	
			5	5 times	
			6	6 times	
			7	**Unlimited (Default)**	
Internal Battery	On Battery Auto Power Down Timer	30	0	Disable Timer	From F/W V1.0-3, the default setting has been changed to '1 day' as oppose to '3 days' as per AS5062-2016, which calls for 24Hr standby. **Note** *The option 'Disable' will disable the auto power down function and keeps the system running off the internal battery until the primary power is restored or until the battery is depleted. The shortest power down time available is 10s (option 1).*
			1	10s	
			2	30s	
			3	1 min	
			4	5 min	
			5	10 min	
			6	15 min	
			7	30 min	
			8	1 hr.	
			9	2 hr.	
			10	4 hr.	
			11	8 hr.	
			12	12 hr.	
			13	**1 day (Default)**	
			14	2 days	
			15	3 days	
Manual Discharge Switch	[V1.0-3 or later] Enable Fire System Discharge Switch	43	0	Disable	Enable/Disable the built-in Fire System Discharge switch. If disabled, all other settings in this group are inapplicable.
			1	**Enable (Default)**	
	[V1.0-2 or later] Manual Discharge Operating Mode	37	**0**	**Immediate (Default)**	If set to 'Immediate', activation of the Fire System Discharge or any of the external Manual Release switches will discharge the system immediately, irrespective of the Discharge Time Delay setting. In contrast, if set to 'Delayed' mode, activation of any of the above switches will delay the system discharge according to the Discharge Time Delay setting. In firmware versions prior to V1.0-2, the default mode of operation is 'Delayed' and is not configurable.
			1	Delayed	

© 2018 Kidde Australia

LV PANEL 'SOFT' CONFIGURATIONS					
Group	**Item**	**ID**	**Value**		**Remarks**
Miscellaneous	[V1.0-2 or later] Log History Events to Terminal	40	**0**	**Disable (Default)**	If enabled, when there is a change in system event that needs to be logged to the history log, the same event will also be printed out to Terminal. Handy for trouble-shooting purposes but must be disabled in normal operation.
			1	Enable	
	[V1.0-4 or later] Monitor for Severe Short-to-Chassis	54	0	Disable	If enabled, the system monitors I/O lines for severe short-to-chassis condition.
			1	**Enable (Default)**	
	[V1.0-4 or later] Enable Maintenance Isolate via Keypad	55	0	Disable	If enabled, the operator will be allowed to isolate/de-isolate the system via the panel keypad.
			1	**Enable (Default)**	

Table 7 LV Panel 'Soft' Configurations

© 2018 Kidde Australia

Appendix C MV Panel 'Soft' Configuration Table

MV PANEL 'SOFT' CONFIGURATIONS					
Group	**Item**	**ID**	**Value**		**Remarks**
AUX Output	Trigger Event	8	0	Fault only	The active system event(s) that will activate the AUX output.
			1	**Alarm only (Default)**	
			2	Fault or Alarm	
			3	Fault or Alarm or Isolate	
	Overload Fault Supervision	36	**0**	**Disable (Default)**	In firmware prior to V1.0-2, this option is enabled by default and is not configurable.
			1	Enable	
Discharge Confirmation Input	Contact Configuration	13	**0**	**Normally Closed (Default)**	
			1	Normally Open	
	Short-circuit Supervision	17	**0**	**Disable (Default)**	
			1	Enable	
	Open-circuit Supervision	20	**0**	**Disable (Default)**	
			1	Enable	
Discharge Output	Operating Mode	4	**0**	**Squib/Stat-X (Default)**	In 'Squib/Stat-X' mode, the 'Post Discharge' system fault will latch on once the output has activated. The holding time is fixed to 15 seconds, regardless of the operating mode.
			1	Solenoid	
	Short-circuit Supervision	16	**0**	**Disable (Default)**	If the operating mode of the Actuation output is set to 'Squib/Stat-X', short-circuit supervision must be manually disabled if not already disabled.
			1	Enable	
	Open-circuit Supervision	19	0	Disable	
			1	**Enable (Default)**	
	Overload Fault Supervision	35	**0**	**Disable (Default)**	In firmware prior to V1.0-2, this option is enabled by default and is not configurable
			1	Enable	
Event Acknowledge Facility	Acknowledge Fault Events	22	0	Disable	
			1	**Enable (Default)**	
	Acknowledge Alarm Events	23	0	Disable	
			1	**Enable (Default)**	
	Timeout	24	0	15 min	
			1	30 min	
			2	45 min	
			3	**60 min (Default)**	
			4	90 min	
			5	120 min	
			6	150 min	
			7	180 min	
	Link to AUX output	25	0	Disable	If enabled, the AUX output will be de-activated if the event(s) that caused the output to activate have been acknowledged.
			1	**Enable (Default)**	

© 2018 Kidde Australia

MV PANEL 'SOFT' CONFIGURATIONS					
Group	**Item**	**ID**	**Value**		**Remarks**
Trend Logging	Logging Interval	26	0	Disable Logging	It is NOT recommended to permanently set the logging interval to less than 30 minutes as that will shorten the life of the memory chip. Those options are designed for trouble shooting purposes over a short period of time.
			1	1 min	
			2	2 min	
			3	5 min	
			4	10 min	
			5	20 min	
			6	**30 min (Default)**	
			7	60 min	
	Log on History Events	27	**0**	**Disable (Default)**	If enabled, a trend log record will be logged on every history event logging. This can be useful for trouble-shooting purposes in correlating information in the trend log with the history log. Refer to Trend Log section for more details.
			1	Enable	
Pre-Discharge Output	Overload Fault Supervision	34	**0**	**Disable (Default)**	In firmware prior to V1.0-2, this option is enabled by default and is not configurable
			1	Enable	
Detection Input	Line Voltage	30	0	12V	The line voltage is coarsely regulated and it's normal to expect the unloaded (without EOL resistor) voltage reading to be a few volts higher than the set voltage.
			1	13V	
			2	14V	
			3	15V	
			4	16V	
			5	17V	
			6	18V	
			7	19V	
			8	**20V (Default)**	
			9	21V	
			10	22V	
			11	23V	
			12	24V	
			13	25V	
			14	26V	
			15	27V	
Miscellaneous	Log History Events to Terminal	40	**0**	**Disable (Default)**	If enabled, when there is a change in system event that needs to be logged to the history log, the same event will also be printed out to Terminal. Handy for trouble-shooting purposes but should be disabled in normal operation. This option is only available on firmware V1.0-2 or later.
			1	Enable	
	[V1.0-4 or later] Monitor for Severe Short-to-Chassis	54	0	Disable	If enabled, the system monitors I/O lines for severe short-to-chassis condition.
			1	**Enable (Default)**	
	[V1.0-4 or later] Enable Maintenance Isolate via Keypad	55	0	Disable	If enabled, the operator will be allowed to isolate/de-isolate the system via the panel keypad.
			1	**Enable (Default)**	

Table 8 – MV Panel 'Soft' Configurations

© 2018 Kidde Australia

Appendix D LV Panel's Status Byte Lookup Tables

There are four trend log status byte lookup tables on LV panel; each table corresponds to a status byte.

LV Panel - Stat_0	
Bit No.	**System Point**
1	Engine Shutdown Overload Fault
2	I/O Power Supply Fault
3	Internal Battery Disconnected Fault
4	Internal Battery Capacity Low Fault
5	Discharge Confirmation Input Ground Fault
6	Detection Input Ground Fault
7	Detection Input Open Circuit Fault
8	Discharge Output Open Circuit Fault

Table 9 – LV PANEL Stat_0

LV Panel - Stat_1	
Bit No.	**System Point**
1	Engine Shutdown Output Fault
2	Post Discharge Fault
3	System Configuration Fault
4	System Reset Required
5	Discharge Confirmation Input Fault
6	Failed Production Test
7	Discharge PSU Fault
8	Discharge Output Ground Fault

Table 10 – LV Panel Stat_1

LV Panel - Stat_2	
Bit No.	**System Point**
1	ADC Fault
2	History Log - Disabled Fault
3	Card Fault
4	Flash Memory Error
5	EEPROM Memory Error
6	Manual Discharge Switch – Open Circuit Fault
7	Primary Power Supply Fault
8	Shorted to Chassis

Table 11 – LV Panel Stat_2

© 2018 Kidde Australia

LV Panel - Stat_3	
Bit No.	**System Point**
1	System Isolate Status
2	System Common Fault Status *(set when there is at least a fault in the system)*
3	Detection Alarm Status *(Set when alarm was caused by detection input)*
4	Manual Discharge Alarm Status *(Set if alarm was caused by internal/external manual discharge switch)*
5	System Power Down Warning Status *(Set when the system is about to power down, either at the operator's request or shutdown timer timeouts)*
6	Production Test Mode Status *(Reserved for factory use only)*
7	System Voltage Low State *(This is NOT a system fault)*
8	I/O PSU State *(Expect it to toggle as part of normal operation)*

Table 12 – LV Panel Stat_3

© 2018 Kidde Australia

Appendix E MV Panel's Status Byte Lookup Tables

There are four trend log status byte lookup tables on MV panel; each table corresponds to a status byte.

MV Panel - Stat_0	
Bit No.	**System Point**
1	*'unassigned'*
2	Discharge Output Overload Fault
3	Aux Output Overload Fault
4	Pre-Discharge Output Overload Fault
5	Discharge Confirmation Input Ground Fault
6	Detection Input Ground Fault
7	Detection Input Open Circuit Fault
8	Discharge Output Open Circuit Fault

Table 13 – MV Panel Stat_0

MVP - Stat_1	
Bit No.	**System Point**
1	Pre-Discharge Output Fault
2	Post Discharge Fault
3	System Configuration Fault
4	System Reset Required
5	Discharge Confirmation Input Fault
6	Failed Production Test
7	Discharge Switch Activated Fault
8	Discharge Output Ground Fault

Table 14 – MV Panel Stat_1

MV Panel - Stat_2	
Bit No.	**System Point**
1	ADC Fault
2	History Log - Disabled Fault
3	Card Fault
4	Flash Memory Error
5	EEPROM Memory Error
6	Manual Discharge Switch – Open Circuit Fault
7	I/O Supply Fault
8	Shorted to Chassis

Table 15 – MV Panel Stat_2

© 2018 Kidde Australia

MV Panel - Stat_3	
Bit No.	**System Point**
1	System Isolate Status
2	System Common Fault Status *(set when there is at least a fault in the system)*
3	Detection Alarm Status *(Set when alarm was caused by detection input)*
4	Manual Discharge Alarm Status *(Set if alarm was caused by internal/external manual discharge switch)*
5	Pre-Discharge Alarm Status *(Set when the system is armed via the ARM key)*
6	Production Test Mode Status *(Reserved for factory use only)*
7	System Voltage Low State *(This is NOT a system fault)*
8	I/O PSU State *(Expect it to toggle as part of normal operation)*

Table 16 – MV Panel Stat_3

© 2018 Kidde Australia

Feedback form

Your feedback …

We welcome your feedback regarding the Terminal Interface Manual for LV and MV Panels.
If you have any recommendations for improvement to this manual, please provide details using this form.
Send the completed form to Kidde Australia – **email** to hung.tran@fs.utc.com

About you …	
Name	
Organisation	
Organisation address	
Contact phone number	
Email address	

About this manual …						
Manual title	Terminal Interface Manual for LV and MV Panels					
Version number	1.2					
How do you rate this manual? (circle response)	Excellent	Good	Fair	Poor	Complete	Incomplete
What type of feedback do you want to leave? (✓)	☐ Problem	☐ Question	☐ Suggestion	☐ Comment		

Your recommended changes to this manual …					
Page no.	**Paragraph no.** (from top of page)	**Paragraph line no.**	**Figure no.**	**Column no.**	**Recommended change and your reason(s)**

Office use only			
Receive date	**Action(s) required**	**Priority**	**Comments**

© 2018 Kidde Australia