

User Interface Handbook

667/HU/46000/000

for

ST950 and Stratos Outstation

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2	Add language, SSH, HTTPS Order of sections reversed so loading an IC4 configuration is listed before owning the Heart, with more information provided on loading an IC4 configuration.	May 2014
3	Add Stratos Outstation. Most sections are now generic and platform specific information is highlighted with additional platform specific sections at the end of the document.	Feb 2015
4	RFC TS008011 - Updates for ST950 SR2, including addition of SiteUI and Real Time View sections, and various updates	June 2015
5	Add changes for Stratos and minor corrections & additions	November 2016
6	Add changes for ST950 Plus+	Feb 2020

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1 INTRODUCTION

This document describes the general aspects of the interface between the user and the ST950 Traffic Controller or Gemini 3 Stratos Outstation.

The interface between the user and the unit (i.e. the ST950 Traffic Controller or the Stratos Outstation) comprises the following:

- Summary visual status indications through LEDs
- Monitoring and control through web pages, menus and command mnemonics
- Temporarily connected items e.g. USB devices

Detail is included here where it is not covered in other handbooks. In many cases the layout and operation of web pages and commands relating to specific features are described along with those features e.g. in the ST950 Facility Handbook (667/HB/46000/001), ST950 Plus+ Handbook (667/HE/53000/000), etc..

The information is generally independent of the platform being used. Where there are differences, platform specific information is clearly identified e.g.

This text relates to the ST950 Traffic Controller platform.

ST950

This text relates to the Stratos Outstation platform.

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or else is covered in sections 14 for the ST950 and 15 for the Stratos Outstation.

This document is maintained to reflect the current latest released version of the equipment. In most cases existing features do not change significantly between versions but it is likely that users without the latest version may find that some of the items and features described are not present on their equipment. Updating equipment to the latest released version will make those items & features available.

1.1 Contact Us

If you have any comments on this handbook, or need any further information, you can contact us at trafficwebmaster.stc@siemens.com.

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1.2 Abbreviations

CLF	Cableless Linking Facility
CPU	Central Processing Unit
CRL	Certificate Revocation List
DFM	Detector Fault Monitor
ELV	Extra Low Voltage
ESP	Enhanced Serial Protocol
FAT	File Allocation Table
GSPI	Generic Serial Peripheral Interface
GPS	Global Positioning System
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Secure
I/O	Input/Output
IC4	Intersection Configurator version 4
LED	Light Emitting Diode
LRT	Light Rail Transit
LSLS	Lamp Switch Low-Voltage Serial
mA	milliamps
MOVA	Microprocessor Optimised Vehicle Actuation
ms	milliseconds
NTP	Network Time Protocol
OCSP	Online Certificate Status Protocol
OSS	Outstation Support Server – this may be a stand-alone product or functionality within Stratos
OTU	Outstation Transmission Unit
PCB	Printed Circuit Board
RLM	Red Lamp Monitoring
SDE/SA	Speed Discrimination Equipment / Speed Assessment
SSH	Secure Shell
SSL	Secure Sockets Layer
TLS	Transport Layer Security
UDP	User Datagram Protocol
UTC	Urban Traffic Control

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VA Vehicle Actuated

wrt With Respect To

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- Android is a trademark of Google Inc.
- Firefox is a registered trademark of the Mozilla Foundation.
- SD is a trademark of SD-3C, LLC in the United States, other countries or both.
- USB is a trademark of USB Implementers Forum, Inc.
- Windows is a registered trademark of Microsoft Corporation in the United States and other countries.

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2 INDICATORS

The ST950 CPU card LED status indicators are detailed in section 14.1.

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The Stratos Outstation indicators are detailed in section 15.1.

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3 USER CONNECTION

Connection to the unit can be made in a number of ways:

- USB Handset Port. The USB Handset port allows a Windows 7 PC to be connected using a standard USB A to B cable.
- WiFi Hotspot. The USB Host ports will accept a defined range of Wi-Fi dongles that provide a conventional Wi-fi HotSpot style connection.

- RS232 to USB convertor. The RS232 to USB convertor allows traditional handheld character terminals to access the GVP handset interface.

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- Ethernet port. The Ethernet port allows a user to be connected over a network.

- 25 way RS232 port. A 25 Way D Type connector on the front of the CPU Card provides a means to access the controller via the well established handset interface. Allows connection of a standard 20 character by 4 lines display handset or terminal emulation software. This interface does not support non ASCII characters. This interface only allows access to the controller handset commands and the WIZ command; it does not support other GVP handset commands or a web interface. See section 14.2.2 for baud rates etc.

ST950

There are several different styles of user interface available, as listed below.

- Web (section 4)
- WIZ menu (section 5)
- Controller handset (section 14.2)
- GVP handset[#] (section 6)

[#] On the Stratos Outstation, the XXC command can be used to access the controller connected serially to the Outstation.

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3.1 Protection Against Malicious Software

Files are loaded in and read out of the unit as part of its normal operation e.g.:

- Attachments to the site log
- Configuration files
- Log files

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In order to prevent infected files being uploaded to the unit and so possibly spreading to other connected devices it is important that all equipment connected to the unit has up to date protection against viruses and other malicious software e.g. virus checker installed and running on PCs and USB memory sticks being scanned before use.

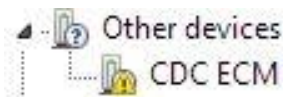
3.2 USB Handset Port Driver Installation

The USB drivers need to be installed before using the USB Handset Port. The USB drivers are held on a virtual CD drive on the unit. When the unit is plugged into a PC USB port for the first time the PC will automatically install two virtual CD drives:

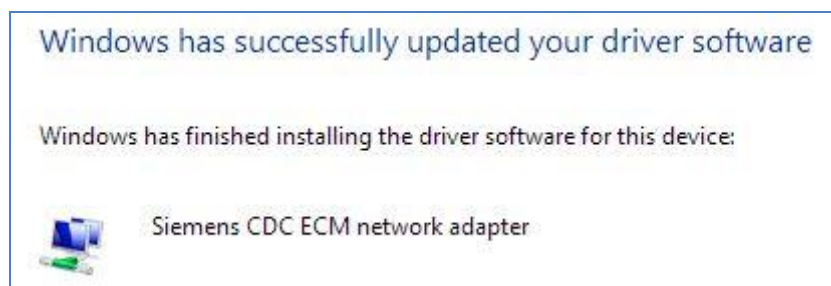
- 'SiemensDrivers' - holds the USB drivers for the interface and Third Party Information
- 'SiemensST950' or 'SiemensStratos' - holds files that the user might find useful, for example: MOVA shortcuts.

Windows will also automatically try to install drivers for the newly found interface. This will not succeed and the user should install the drivers from the 'SiemensDrivers' drive as follows.

- Open Control Panel → System → Device Manager
- Locate the CDC ECM item under Other Device



- Right click on the CDC ECM element and select 'Update Driver Software'
- Select 'Browse my Computer for Driver Software'
- Browse to the SiemensDrivers CD and select the appropriate 32bit (x86) or 64bit (x64) folder.
- Click 'Next' to continue with the installation.
- The drivers will be installed



- The device is now ready for use and now appears as a Network Adapter in Device Manager.

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3.3 USB Host Port

The unit has a number of USB host ports on the front and rear of the CPU card. Various USB devices can be connected to these ports including:

- USB memory stick
- USB smart card reader
- USB WiFi device
- RS232 to USB convertor.

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The unit flashes the Busy (BSY) LED while data is being written to devices connected to the USB host ports. It is important that devices are not disconnected or the power interrupted during this write operation otherwise data corruption and / or device failure may occur.



USB memory sticks formatted with the FAT file system should be used. Encrypted USB memory sticks and those formatted with file systems other than FAT are not supported.

3.4 WiFi Hotspot

The unit can provide a WiFi hotspot allowing wireless connection. In order to use this hotspot a suitable WiFi device should be connected to the USB Host port on the unit. A list of compatible devices can be obtained from Siemens.

Section 7 contains more information on the WiFi HotSpot.

3.5 Ethernet Configuration

It is necessary to configure Ethernet before using it to connect to other systems. Two methods are supported:

- DHCP
- Full manual configuration

Which is appropriate depends on the system(s) being connected to.

See also section 17 for further details on connecting to other systems including Stratos.

3.5.1 Configuring Ethernet IP to use DHCP

- Check that the Ethernet port is not connected during configuration to avoid network clashes
- Check / set the Ethernet IP mode is set to DHCP
- Connect the Ethernet port to a network which has connectivity to a DHCP service

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Ethernet IP Mode

The Ethernet IP mode can be checked on the System – Settings – Comms – DSL / Fibre web page.

Default	Item	Value
<input type="checkbox"/>	Ethernet IP Mode ?	DHCP
<input type="checkbox"/>	Ethernet IP Address ?	10.0.0.100
<input type="checkbox"/>	Ethernet IP Netmask ?	255.255.255.0
<input type="checkbox"/>	Ethernet IP Broadcast ?	0.0.0.255
<input type="checkbox"/>	Ethernet IP Gateway ?	0.0.0.0
<input type="checkbox"/>	Unique Site Name ?	
<input type="checkbox"/>	Site Location ?	
<input type="checkbox"/>	OSS Address ?	169.254.0.1
<input type="checkbox"/>	Enable OSS Interface ?	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Enable OSS Backup ?	<input checked="" type="checkbox"/>
<input type="checkbox"/>	DNS Nameserver ?	0.0.0.0
<input type="checkbox"/>	NTP Enable ?	<input checked="" type="checkbox"/>
<input type="checkbox"/>	NTP Peer Enable ?	<input checked="" type="checkbox"/>
<input type="checkbox"/>	NTP Peer ?	pool.ntp.org

3.5.2 Manual Configuration of Ethernet IP

If DHCP cannot be used then the Ethernet interface needs to be fully configured prior to use.



The network parameters should be supplied by the network administrator. It is important that these parameters are entered correctly as incorrect settings may affect other devices connected to the network.

Check that the Ethernet port is not connected during configuration to avoid network clashes.

The Ethernet parameters that need to be configured are:

- IP Mode
- IP Address
- IP Netmask
- IP Broadcast
- IP Gateway

Where the unit is to be connected to Stratos, the following also needs to be set up:

- DNS Nameserver

Where the unit is to be connected to a non-Stratos OSS, the following also need to be set up:

- OSS Address
- Enable OSS

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- Enable OSS Backup

These items can be configured using the web interface (section 4) or the WIZ interface (section 5).

Once configured, the unit can be accessed via the Ethernet Interface at the configured IP address.

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4 WEB INTERFACE

The primary interface for interacting with the unit is a web based interface available through the USB Handset and Ethernet ports and over WiFi when using a USB WiFi device. The web interface utilises HTML5 features and so an HTML5 compliant browser is required to obtain full functionality. Limitations in browser support for HTML5 may limit the operation of some aspects of the web interface.

The following combinations of operating system and web browser have been tested with the web interface:

- Windows 7
 - Internet Explorer (versions 10 and 11, versions earlier than 10 not supported)
 - Firefox
 - Google Chrome
- Android (Nexus 5 SmartPhone, Samsung Galaxy Note 10.1 tablet)
 - Firefox
 - Google Chrome



If using Internet Explorer, toggle the 'Compatibility View' icon in the address bar to ensure it is grey (off) and not blue (on), otherwise the 'Status and Configuration' menu will not appear in the left-hand pane of the web interface.

The address at which the web interface can be accessed depends upon the means of connection.

Means of Connection	Address
Ethernet	IP address configured in unit
USB Handset Port	siemens.
	172.29.100.1
WiFi	siemens.
	172.28.100.1

Table 1 Web interface addresses

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4.1 Connection

In ST950 firmware package version 5 and earlier the HTTP protocol is used to provide the web interface. In firmware package version 6 and later this is changed to HTTP over SSL (HTTPS) to provide greater security and protection from threats. If required then the HTTP protocol can be enabled on version 6 and later using the "Use Insecure" item on the System - Advanced - Network - HTTP web page.

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The Stratos Outstation uses the secure HTTPS protocol by default. If required then the HTTP protocol can be enabled using the "Use Insecure" item on the System - Advanced - Network - HTTP web page.

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When first connecting to a unit using the SSL (HTTPS) protocol then the user is alerted to the situation with the following screen.

Device Security

Communication to this Device is protected using SSL/TLS.

This is used to stop third-party's from capturing passwords and user names over the network interface.

This device is not using a certificate that is signed by a published certificate because it is on a private network, this means that most browsers will treat the connection as "untrusted" and warn the user.

The warning can safely be ignored and you should accept the certificate using the required method for this browser.

☐ Do not display this message again

Figure 4-1 - Device Security Warning

On pressing the "Continue" button the user is prompted to accept the security certificates provided by the unit. Different browsers handle the adding of certificates in different ways. The following shows the sequence used by Firefox. For Internet Explorer, take the "Continue to this website (not recommended)" option. If using Google Chrome, take the "Advanced" option when informed that "Your connection is not private", and then "Proceed to (unsafe)".

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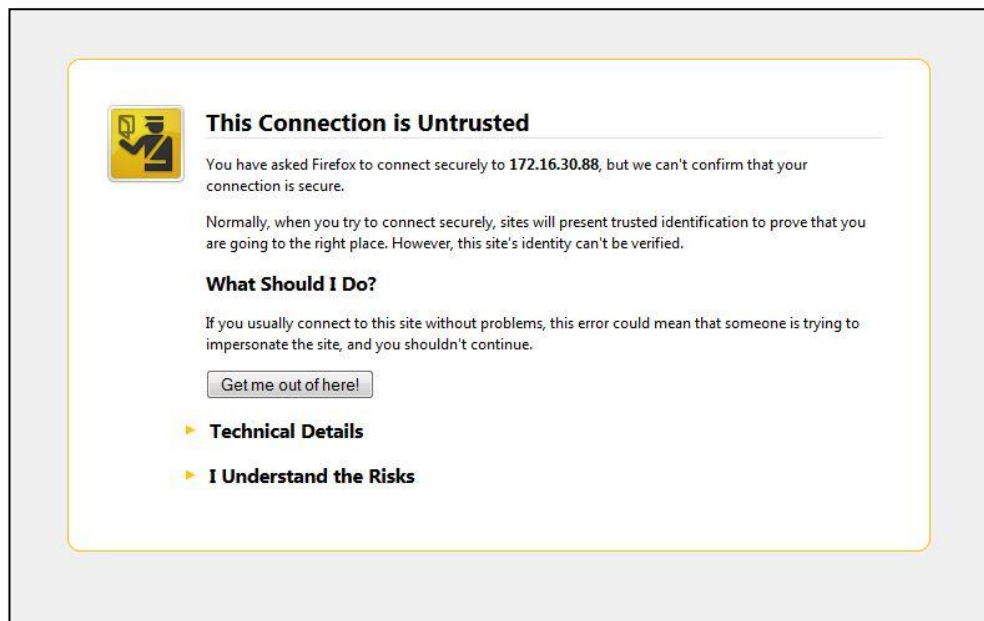


Figure 4-2 - Add Certificates, Step 1

Selecting "I understand the risks" continues the process and extends the screen as follows.

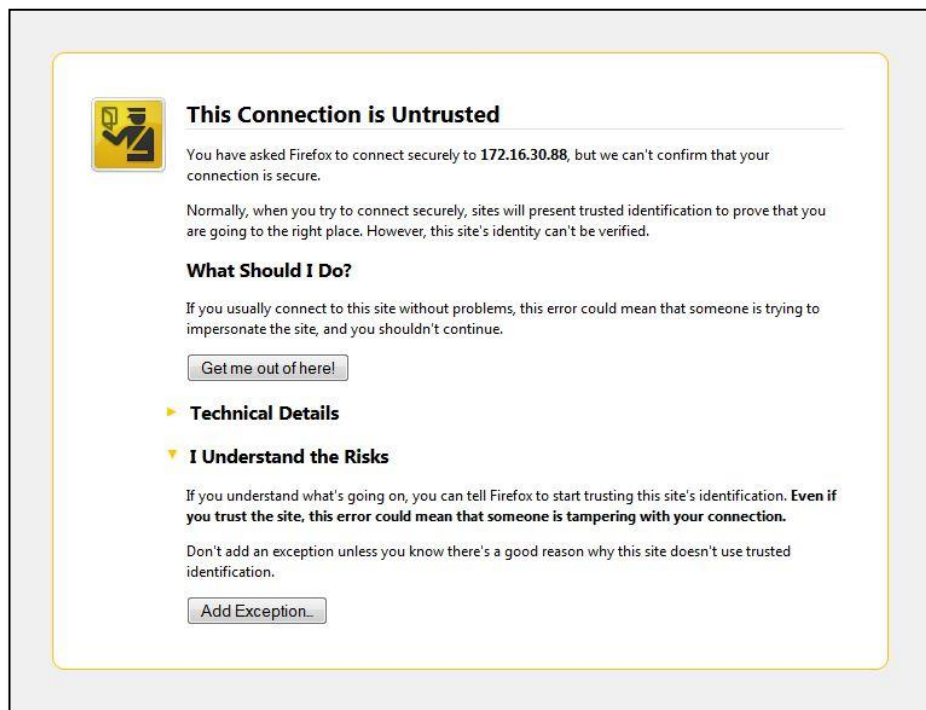


Figure 4-3 - Add Certificates, Step 2

"Add Exception ..." continues to the next step.

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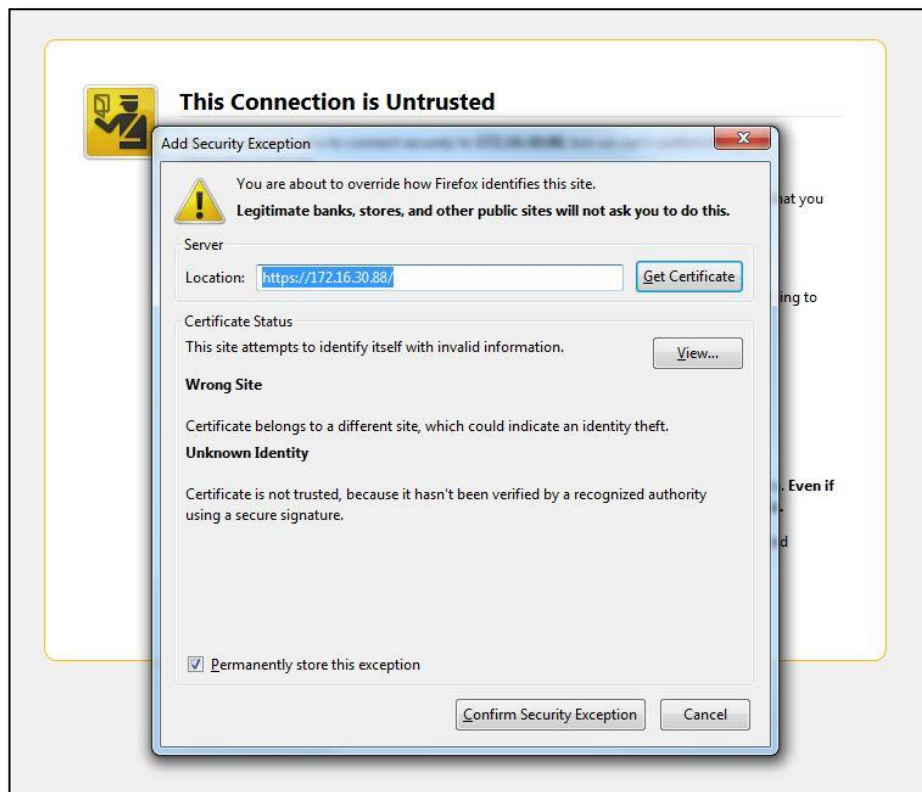


Figure 4-4 - Add Certificates - Step 3

The sequence is completed by pressing the "Confirm Security Exception" button.

If the browser is used to connect to a unit using HTTP after using HTTPS, the address prefix will need to be manually changed from https back to http in order to obtain a connection.

4.2 Android

The basic Android operating system released by Google and available on many tablet devices does not include some of the applications required to fully utilise the unit's functionality. Manufacturers often customise their devices so some of these applications may be available on some devices. Not all pre-installed applications communicate in a way that allows the unit's functions to be fully utilized. The following list identifies applications which have been tested with the unit's interface to give maximum functionality. These can be freely downloaded from the Google Play Store.

- Firefox[†] web browser
- Google Chrome[†] web browser
- File manager which integrates with Firefox e.g. OI File Manager[†]. This is required in order to find and view files downloaded from the unit and to allow selection of files to be uploaded to the unit through Firefox.
- Archive manager e.g. ZArchiver[†]. This is required in order to extract information from the compressed site information archive which can be exported from the unit.

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- Text file viewer e.g. Jota+[†]. This is required to view text files downloaded from the unit e.g. exported system logs.
- Virtual terminal client such as ConnectBot[†] for Telnet and SSH. This is required if a virtual terminal connection to the unit is desired.

[†] Siemens is not responsible for and accepts no liability in respect of the content of external sites or any material downloaded from them.

The inclusion of recommended 3rd party Apps from an external website should not be understood to be an endorsement of that content or the site's owners (or their products/services).

These sites will most often be free to access, but users may sometimes be asked to register or subscribe before viewing and / or downloading content.

Some of our external links may be to websites which also offer commercial services, such as online purchases.

4.2.1 Configuring Firefox on Android

By default on Android, Firefox does not report when the connection to the server is lost but instead continues to display pages which it has cached. While this behaviour is most useful when browsing the web over a mobile connection which might be unreliable, it is most unhelpful when up to date and timely information is required from the unit. The behaviour of Firefox on Android can be modified so that it immediately reports when the server connection is lost by setting the value of Firefox's *network.manage-offline-status* configuration item to false. This can be done as follows:

- Open Firefox on the Android device
- Enter "about:config" into the address bar
- Enter "network.manage-offline-status" into the search box
- Observe the current value of this configuration item
- If the value is true then set it to false by pressing the *toggle* button

Making this change will ensure that if Firefox cannot obtain a web page from the unit then it will report a problem rather than presenting a probably out of date cached version.

4.3 Common Features

4.3.1 Banner Menu

All web pages have a common banner across the top which shows the site name and gives access to the main areas of the web interface.

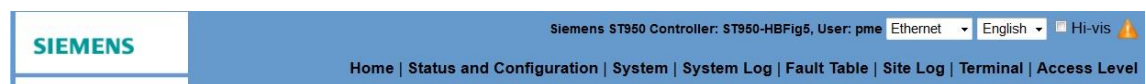


Figure 4-5 - Web page banner

This bar also allows the user to specify the type of connection being used (USB, 3G, WiFi, ADSL, GPRS, Ethernet). This information is used to tailor the behaviour of the interface, for example setting the update rate appropriately. It is important that this is

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set correctly so that the connection is not overloaded and so best performance is obtained.



It is important to select the appropriate connection type, especially on slower links, in order to optimise response time for user actions.

A high visibility mode can also be enabled through this banner. This alters the colours used on the web pages to make them more readable in difficult lighting conditions.

A warning triangle will appear in the top-right corner if there are any Faults or Notifications present in the Fault Table, which is described later in section 4.8.

4.3.2 Entering Data

In most cases data is entered by typing into boxes, pressing buttons and ticking boxes on the web pages. Where data is entered into a multiple fields on a form, changes are highlighted in orange to make it easier to keep track of changes made. Pressing the **Save** button implements the changes highlighted and pressing the *Reload* button discards all changes made to that table and restores the current values.

Default	Item	Value
<input type="checkbox"/>	Ethernet IP Mode ?	Enabled
<input type="checkbox"/>	Ethernet IP Address ?	172.16.30.100
<input type="checkbox"/>	Ethernet IP Netmask ?	255.255.254.0
<input type="checkbox"/>	Ethernet IP Broadcast ?	0.0.0.255
<input type="checkbox"/>	Ethernet IP Gateway ?	172.16.30.200
<input type="checkbox"/>	Unique Site Name ?	ST950-HBfig5
<input type="checkbox"/>	Site Location ?	Siemens, Sopers Lane, Poole, UK BH17 7ER
<input type="checkbox"/>	OSS Address ?	172.16.30.220
<input type="checkbox"/>	Enable OSS Interface ?	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Enable OSS Backup ?	<input checked="" type="checkbox"/>

Figure 4-6 - Highlighting of Changed Form Entries

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Data is checked when the Save button is pressed and if found to be invalid then that item is not updated and highlighted to the user (other changed items that are valid are updated).

Figure 4-7 - Highlighting of Invalid Data

See section 14.3 for details of additional access required when changing protected controller data.

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4.3.3 Help Information

Help information is available in two forms: hover over text & help text.

Hover Over Text

Additional information on some items on the web pages can be obtained by holding the cursor over the item for a short period of time.

Figure 4-8 - Hover over text for Fault Table

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Help Text

Most items within the *Status and Configuration* area have help text associated with them. This help text can be obtained by clicking on the question mark next to an item. The help text is displayed in a separate box which can be moved around the screen if necessary. A scroll bar allows scrolling where the amount of information is too great to fit in the box.

The screenshot shows the Siemens ST950 Controller web interface. The top navigation bar includes the Siemens logo, user information (Siemens ST950 Controller: ST950-HBfig5, User: pme), and language/visibility settings (Ethernet, English, Hi-vis). The main navigation menu on the left lists various system components like System, SiteUI, Controller, IC4 Config, CLF, Fixed Time, Heart, I/O, LMU, LRT, Pedestrian, Phases, Priority, Special Conditioning, SDE/SA, Stages, Timetable, and Advanced. The main content area is titled 'Controller - Clocks' and contains a table with columns 'Default', 'Item', and 'Value'. The 'Time Mode ?' item is selected, and a help window is open for it. The help window has a title bar 'Help' and contains the following text:

Summary: Time Mode

Description:

The relationship between the System Time and Controller Time.

Dual Time - the two clocks are independent.
System Time - the controller clock is synchronised to the system clock.
Controller Time - the system clock is synchronised to the controller clock.

Set the mode and click "Save" before setting any times.

System Time Mode should be used where the NTP or GPS device provides the time to the equipment. In this mode, Controller Time uses System Time.

Controller Time Mode should be used where there is no NTP or GPS device and the time should be maintained by the equipment itself, and is typically mains synchronised. In this mode, system time uses the Controller Time as the primary time source.

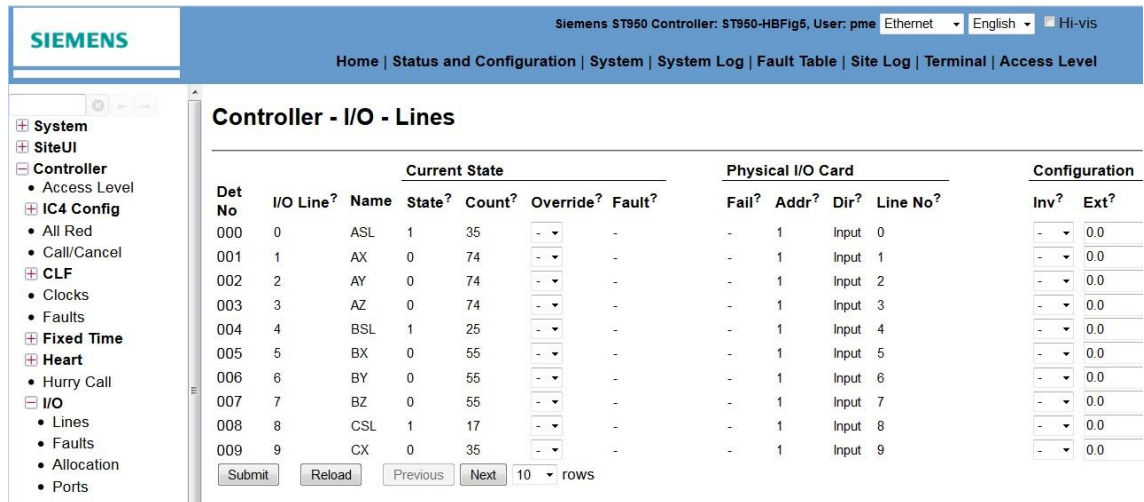
Dual Time Mode should be used where the system provides time to the equipment, but additionally the controller is required to remain synchronised with adjacent controllers with a

Figure 4-9 Help text for the Time Mode field on the Controller - Clocks web page

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4.3.4 Multi Row Pages

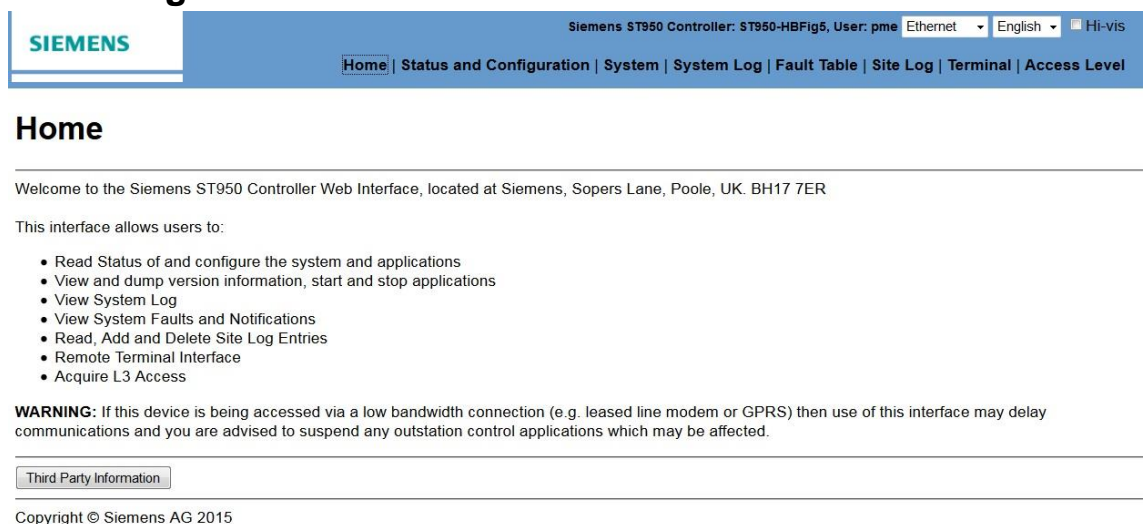
The number of rows displayed on multi row pages can be changed by changing the *rows* value at the bottom of the page. Where there are more rows than can be displayed on a single page, the pages can be cycled through using the *Next* and *Previous* buttons.



Det No	I/O Line?	Name	Current State				Physical I/O Card				Configuration	
			State?	Count?	Override?	Fault?	Fail?	Addr?	Dir?	Line No?	Inv?	Ext?
000	0	ASL	1	35	-	-	-	1	Input	0	-	0.0
001	1	AX	0	74	-	-	-	1	Input	1	-	0.0
002	2	AY	0	74	-	-	-	1	Input	2	-	0.0
003	3	AZ	0	74	-	-	-	1	Input	3	-	0.0
004	4	BSL	1	25	-	-	-	1	Input	4	-	0.0
005	5	BX	0	55	-	-	-	1	Input	5	-	0.0
006	6	BY	0	55	-	-	-	1	Input	6	-	0.0
007	7	BZ	0	55	-	-	-	1	Input	7	-	0.0
008	8	CSL	1	17	-	-	-	1	Input	8	-	0.0
009	9	CX	0	35	-	-	-	1	Input	9	-	0.0

Figure 4-10 Multi row page

4.4 Home Page



Siemens ST950 Controller: ST950-HBFig5, User: pme Ethernet English Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal | Access Level

Home

Welcome to the Siemens ST950 Controller Web Interface, located at Siemens, Sopers Lane, Poole, UK. BH17 7ER

This interface allows users to:

- Read Status of and configure the system and applications
- View and dump version information, start and stop applications
- View System Log
- View System Faults and Notifications
- Read, Add and Delete Site Log Entries
- Remote Terminal Interface
- Acquire L3 Access

WARNING: If this device is being accessed via a low bandwidth connection (e.g. leased line modem or GPRS) then use of this interface may delay communications and you are advised to suspend any outstation control applications which may be affected.

Third Party Information

Copyright © Siemens AG 2015

Figure 4-11 Home web page

The home page provides some basic information about the unit and a button which can be used to display third party information. (Note that the unit Site Location is specified using the *System – Settings – Comms – DSL/Fibre* web page).

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It is possible to display a user defined message on this home page to alert users to unusual or significant information about the unit, and also an image of the junction or site to aid identification. This information is set up using the *System - Settings - Web Interface* web page. The format of the image must be GIF, JPG or PNG. The image will be preserved and backed-up as part of the system's configuration data so a small file size is recommended, e.g. less than 250 kilobytes.

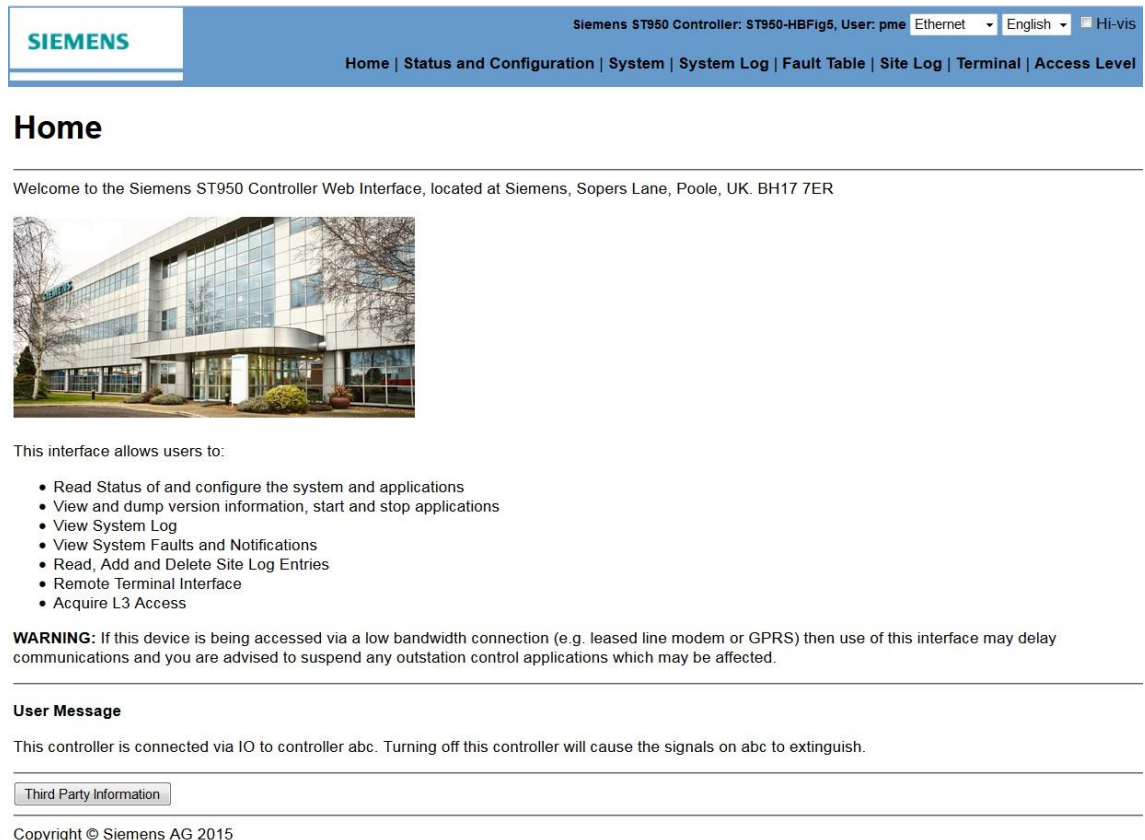


Figure 4-12 Site Image and User Message displayed on Home web page

4.5 Status and Configuration Page

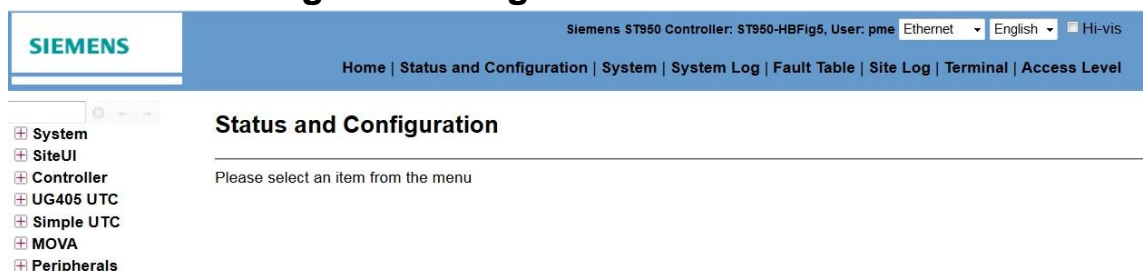





Figure 4-13 Status and Configuration web page

Much of the monitoring and configuration of the system is performed through the *Status and Configuration* web page. Clicking on an item in the menu on the left hand side of the page causes that menu to expand revealing further items which may themselves be expandable. Clicking on an expanded item will cause it to collapse back to a single line.

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Items which can be expanded in this way are presented in a bold font and prefixed with a  or  depending upon whether they are currently “open” or “closed”. Menu items which cannot be expanded are presented in normal font prefixed with .



If using Internet Explorer, toggle the ‘Compatibility View’ icon in the address bar to ensure it is grey (off) and not blue (on), otherwise the ‘Status and Configuration’ menu will not appear in the left-hand pane of the web interface.

Text can be entered into the box above the menu to quickly find items within the menu structure which match that text. If a menu item which contains the entered text is found then the menu is expanded to show that item and the corresponding page is displayed. If more than one match is found then the items found can be cycled through using the arrow buttons to the right of the text box. Pressing the "x" button between the text box and the arrow buttons clears the text box and returns the menu to its normal operation.

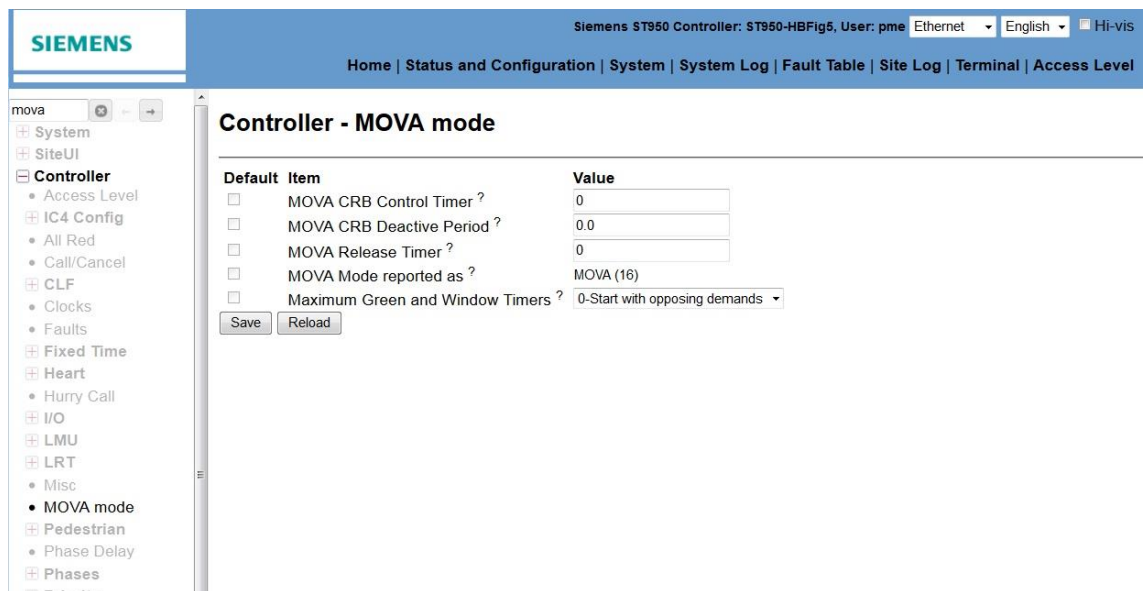


Figure 4-14 First menu item found for text "mova"

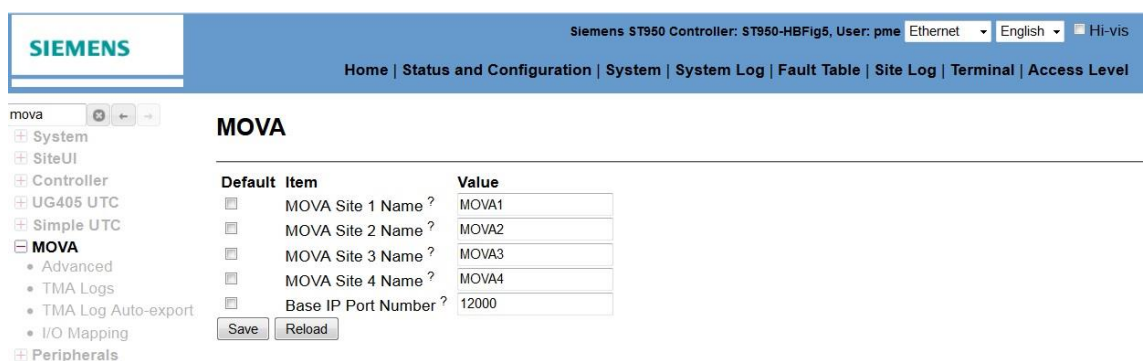


Figure 4-15 Second menu item found for text "mova"

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The following sections give a brief overview of the use of the general options available in the Status and Configuration menu. More detailed descriptions are given in the sections which describe the facilities themselves.

The Status & Configuration page also contains application specific entries. These are described separately.

See section 14.4 for details of status and configuration web pages which are specific to the controller:

ST950

- SiteUI: section 14.4.1
- Controller: section 14.4.2
- UTMCM: section 14.4.3

See section 15.2 for details of status and configuration web pages which are specific to the Stratos Outstation.

Stratos OS

- Controller Monitor: section 15.2.1
- Controller Serial Link: section 15.2.2
- Heart: section 15.2.3
- Support Battery: section 15.2.4
- Intelligent Parking: section 15.2.5

See the ST950 Plus+ Handbook (667/HE/53000/000) for details of status and configuration web pages which are specific to a Plus+ controller.

4.5.1 Status & Configuration - System

General system configuration and monitoring is performed through the web pages found under the *System* menu item.

Settings - general system configuration

The *profile* to be used is defined on this page. A *profile* defines the value of a number of items in order to configure the equipment suitably for its role. This can include inhibiting user changes of certain items for security reasons. Currently two profiles are defined:

- Default: allows full manual configuration
- Stratos: applies configuration and security restrictions to allow connection to Stratos

Select the *Stratos* profile if connection to Stratos is required otherwise select the *Default* profile.

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Stratos Outstation: StratosOutstation3, User: Demo User
Ethernet
English
Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal

System
Settings
Status
Advanced
Upgrade
OSS Data Files
Controller Monitor
UG405 UTC
Simple UTC
MOVA
Peripherals
Controller Serial Link
Heart
Support Battery
Intelligent Parking

System - Settings

Set the settings for the System

Default	Item	Value
<input type="checkbox"/>	Default Profile ?	Stratos

Save
Reload

- *Comms* - submenus to configure common communication mechanisms
 - *DSL / Fibre* - used to configure direct connection over Ethernet
 - *Leased Line* - used to configure leased line connection
 - *GPRS* - used to configure connection over GPRS
 - *Stratos* – used to configure and monitor the connection to Stratos
- *System Date & Time*
 - *Set System Date & Time* - use to change the System (GVP) time

On an ST950, use the Controller-Clocks page instead (page 84)
 - *System Time Zone* - select the correct Time Zone (including daylight saving) for all clocks (including ST950 'Controller Time')
- *Licence System*
 - *Facilities* - view the licence status of the facilities
 - *Manager* - transfer licences to and from the unit
- *Security* – control authentication of users
- *Language* - set the language used by the system
 - *Packs* - load new language packs into the system
- *Web Interface* - configure general aspects of the web interface including home page message and image, high visibility mode.
- *Import Export* - import and export system configuration to file and OSS

Status - view general system configuration

- *Real Time View* - view events in real time (available in version 6 onwards)
- *System* - system performance measurements
- *Network* - network statistics
- *Inventory* - information on the system components
 - *Applications* - part and version numbers for the applications present in the system
 - *Loadable Packages* – information regarding the loadable packages installed

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- *Devices* - manufacturing information regarding the system hardware
- *Firmware* - part and version numbers for the firmware running on the devices in the system
- *Platform* - release information regarding the system platform
- *Wifi Hotspot* - WPA pre-share key for the Wifi hotspot (only available when Wifi device fitted)

Advanced - advanced system configuration

To be used only under specific direction.

Upgrade - system firmware upgrade

Initiate a system firmware upgrade from file or OSS.

OSS Data Files

Trigger the upload of various information to the OSS or local PC.

4.5.2 Status & Configuration - UG405 UTC

These web pages are described in the UTMIC OTU Handbook 667/HB/46000/004.

4.5.3 Status & Configuration - Simple UTC

These web pages are described in the UTMIC OTU Handbook 667/HB/46000/004.

4.5.4 Status & Configuration - MOVA

These web pages are described in the MOVA Handbook 667/HB/46000/003.

4.5.5 Status & Configuration - Peripherals

Update the firmware installed on the non-Plus+ GSPI peripheral cards. During this process the GSPI peripheral cards become unavailable to the system so it is important to consider the effect of this before carrying out an update. For example, if IO cards are connected then during the update their inputs will not be available to the system and their outputs will be set to their default state. If either these inputs or outputs control important features of this or a connected system then the timing of the update needs to be carefully considered.

Disturbance to the power during an upgrade could result in one or more peripherals to require replacement so it is important to ensure that power and cabling are not disturbed during the update.

See the ST950 Plus+ Handbook for information on updating the firmware on Plus+ peripherals.

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4.6 System Page

The System web page provides:

- Information about the applications, plugins and platform.
- The ability to start and stop the applications to match the requirements of the installation.
- A means of extracting important site information for viewing off site.
- A means of rebooting the EFC.



IMPORTANT: Depending on the configured Reserve State settings, the traffic signals may extinguish while the EFC reboots.

ST950

Siemens ST950 Controller: ST950-HBfig5, User: pme Ethernet English Hi-VIS

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal | Access Level

System

Package Part Number	Package Version
667/TZ/46059/000	8.28

Site Information Export:

Use this option to download a ZIP file containing the site information. It will take the system a few seconds to create this file; please be patient.

Export Site Information

Applications:

Name	Description	Part Number	Issue	State	Control
TesterApp	Application to test drivers, etc..	667/TZ/31795/000	1.0.0	Not Running	Start
UTMCFullUTC	UTMC Type 2 UTC (full) Application	667/TZ/32373/002	2.16.1	Not Running	Start
UTMCSimpleUTC	UTMC Type 1 UTC (Simple) Application	667/TZ/32374/002	2.14.1	Not Running	Start
OSEWebConf	I/O Mapping (OSE) Web Configuration	667/TZ/32376/002	2.22.1	Not Running	Start
Mova1	MOVA 7 application	667/TZ/32377/002	2.18.1	Not Running	Start
Mova2	MOVA 7 application	667/TZ/32377/002	2.18.1	Not Running	Start
Mova3	MOVA 7 application	667/TZ/32377/002	2.18.1	Not Running	Start
Mova4	MOVA 7 application	667/TZ/32377/002	2.18.1	Not Running	Start

Plugins:

Description	Type	SubType	Part Number	Issue	API Version
GVP Self Test Plugin	5325	1	667/TZ/46473/000	1.26.0	1
GSPI Library Plugin	666	1	667/TZ/33970/000	3.36.0	7
GSPI IO Plugin	7639	1	667/TZ/48087/000	1.18.0	1
GSPI Bridge Plugin	beef	1	667/TZ/46052/000	1.18.1	1

Figure 4-16 System web page

4.6.1 Applications



The starting and stopping of applications should only be undertaken with care when the full implications are understood.

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In general different applications are available on different products although many applications may be available on more than one product. This is illustrated in the lists in the following figures taken from a Stratos Outstation and an ST950.

It is important to ensure that the correct application(s) required for a specific installation are started e.g.

- UTMCFullUTC or UTMCSimpleUTC where UTC is required.
- One or more MOVA applications where MOVA is required.
- ControllerMonitor where controller status is to be monitored and reported in the fault and notification tables. This will also automatically configure the controller serial link.
- IntelligentParking for monitoring and reporting of parking spaces to Stratos.

Applications:

Name	Description	Part Number	Issue	State	Control
TesterApp	Application to test drivers, etc..	667/TZ/31795/000	1.0.0	Not Running	<input type="button" value="Start"/>
UTMCFullUTC	UTMC Type 2 UTC (full) Application	667/TZ/32373/002	2.58.1	Not Running	<input type="button" value="Start"/>
UTMCSimpleUTC	UTMC Type 1 UTC (Simple) Application	667/TZ/32374/002	2.22.1	Not Running	<input type="button" value="Start"/>
OSEWebConf	I/O Mapping (OSE) Web Configuration	667/TZ/32376/002	2.28.0	Running	<input type="button" value="Stop"/>
Mova1	MOVA 7 application	667/TZ/32377/002	3.14.0	Running	<input type="button" value="Stop"/>
Mova2	MOVA 7 application	667/TZ/32377/002	3.14.0	Running	<input type="button" value="Stop"/>
Mova3	MOVA 7 application	667/TZ/32377/002	3.14.0	Running	<input type="button" value="Stop"/>
Mova4	MOVA 7 application	667/TZ/32377/002	3.14.0	Running	<input type="button" value="Stop"/>
IntelligentParking	Parking bay monitoring application	667/TZ/47360/000	1.12.1	Not Running	<input type="button" value="Start"/>
ControllerMonitor	Application to monitor controllers	667/TZ/32480/000	1.10.0	Running	<input type="button" value="Stop"/>

Figure 4-17 Stratos Outstation Applications

Applications:

Name	Description	Part Number	Issue	State	Control
TesterApp	Application to test drivers, etc..	667/TZ/31795/000	1.0.0	Not Running	<input type="button" value="Start"/>
UTMCFullUTC	UTMC Type 2 UTC (full) Application	667/TZ/32373/002	2.56.1	Not Running	<input type="button" value="Start"/>
UTMCSimpleUTC	UTMC Type 1 UTC (Simple) Application	667/TZ/32374/002	2.22.1	Not Running	<input type="button" value="Start"/>
OSEWebConf	I/O Mapping (OSE) Web Configuration	667/TZ/32376/002	2.28.0	Running	<input type="button" value="Stop"/>
Mova1	MOVA 7 application	667/TZ/32377/002	3.14.0	Running	<input type="button" value="Stop"/>
Mova2	MOVA 7 application	667/TZ/32377/002	3.14.0	Running	<input type="button" value="Stop"/>
Mova3	MOVA 7 application	667/TZ/32377/002	3.14.0	Running	<input type="button" value="Stop"/>
Mova4	MOVA 7 application	667/TZ/32377/002	3.14.0	Running	<input type="button" value="Stop"/>
UTMCRMSApp	UTMC Remote Monitor Application	667/TZ/46175/000	1.14.0	Not Running	<input type="button" value="Start"/>
ControllerMonitor	Application to monitor controllers	667/TZ/32480/000	1.10.0	Not Running	<input type="button" value="Start"/>

Figure 4-18 ST950 Applications

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4.7 System Log

Important events are recorded in the System Log.

Siemens ST950 Controller: ST950-HBFig5, User: pme Ethernet English Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal | Access Level

System Log

This page was generated at (controller time) Mon 22 Jun 2015 16:19:35 BST

Filter by Module: Filter by Severity Level: All

Number of Display Lines: 99 Newest at top of page Oldest at top of page Colour Redisplay

Oldest Older Newer Newest Export Log File

Page 28 of 28.

Date	Level	Module	Message
Mon 22 Jun 2015 16:10:42 BST	Notice	ConfigWatcher	The System Configuration was changed (pme)
Mon 22 Jun 2015 16:02:45 BST	Notice	ConfigWatcher	The System Configuration was changed (pme)
Mon 22 Jun 2015 16:01:22 BST	Notice	ConfigWatcher	The System Configuration was changed (pme)
Mon 22 Jun 2015 15:53:50 BST	Notice	CtrlLog	RTC FLF 7.0 (Cleared)
Mon 22 Jun 2015 16:01:22 BST	Notice	ConfigWatcher	The System Configuration was changed (pme)
Mon 22 Jun 2015 16:01:18 BST	Error	CtrlLog	RTC FLF 7.255 (Set)
Mon 22 Jun 2015 15:58:15 BST	Notice	CtrlStreamInfo	Stream 0 forced to start-up mode
Mon 22 Jun 2015 15:58:15 BST	Notice	CtrlStreamInfo	All Streams restarted
Mon 22 Jun 2015 15:58:15 BST	Notice	CtrlStreamInfo	Signals On/Off Switch = ON
Mon 22 Jun 2015 15:50:12 BST	Notice	CtrlStreamInfo	Signals On/Off Switch = OFF
Mon 22 Jun 2015 15:41:52 BST	Notice	ConfigWatcher	The System Configuration was changed (pme)
Mon 22 Jun 2015 15:35:24 BST	Notice	CtrlLog	NDIM FLF 38.0 (Cleared)
Mon 22 Jun 2015 15:34:19 BST	Notice	ConfigWatcher	The System Configuration was changed (pme)
Mon 22 Jun 2015 15:34:03 BST	Notice	ConfigWatcher	The System Configuration was changed (pme)
Mon 22 Jun 2015 15:33:13 BST	Notice	ConfigWatcher	The System Configuration was changed (pme)
Mon 22 Jun 2015 15:32:50 BST	Notice	ConfigWatcher	The System Configuration was changed (pme)
Mon 22 Jun 2015 15:25:55 BST	Notice	ConfigWatcher	The System Configuration was changed (pme)
Mon 22 Jun 2015 15:25:10 BST	Notice	ConfigWatcher	The System Configuration was changed (pme)
Mon 22 Jun 2015 15:23:19 BST	Notice	ConfigWatcher	The System Configuration was changed (pme)
Mon 22 Jun 2015 12:49:49 BST	Notice	ConfigWatcher	The System Configuration was changed (pme)
Mon 22 Jun 2015 12:49:12 BST	Notice	ConfigWatcher	The System Configuration was changed (pme)
Mon 22 Jun 2015 12:48:35 BST	Notice	ConfigWatcher	The System Configuration was changed (pme)
Mon 22 Jun 2015 12:47:43 BST	Notice	ConfigWatcher	The System Configuration was changed (pme)

Figure 4-19 System Log web page

4.7.1 Event Format

The source of the event and the time at which the event occurred is recorded along with an indication of its severity:

- E - error
- N - notice
- W - warning
- I - information

Usually only errors and notices are stored in the log but if required this can be changed using the System - Advanced - Logging web page. The following examples illustrate the various parts of the event.

Date and Time of Occurrence

Mon 17 Mar 2014 15:33:08 GMT	Notice	CtrlLog	NDIM FLF 38:0 (Cleared)
Thu 13 Mar 2014 16:54:02 GMT	Error	CtrlLog	NDIM FLF 38:255 (Set)

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Severity of Event

Mon 17 Mar 2014 15:33:08 GMT	Notice	CtlrLog	NDIM FLF 38:0 (Cleared)
Thu 13 Mar 2014 16:54:02 GMT	Error	CtlrLog	NDIM FLF 38:255 (Set)

Source of Event

Mon 17 Mar 2014 15:33:08 GMT	Notice	CtlrLog	NDIM FLF 38:0 (Cleared)
Thu 13 Mar 2014 16:54:02 GMT	Error	CtlrLog	NDIM FLF 38:255 (Set)

Event Details

Mon 17 Mar 2014 15:33:08 GMT	Notice	CtlrLog	NDIM FLF 38:0 (Cleared)
Thu 13 Mar 2014 16:54:02 GMT	Error	CtlrLog	NDIM FLF 38:255 (Set)

The Event Details for log entries relating to data changes are accompanied by an indication of the connection method and mechanism via which the change was enacted. Depending on the platform and firmware version, the identity of the user making the change is shown, e.g. "(Alex Smith)" for changes made via a web based interface, or "(RS232)" for changes made via the ST950 RS232 handset port.

- for a change made via a web page:

Mon 15 Jun 2015 15:22:44 BST	Notice	ConfigWatcher	The System Configuration was changed (Alex Smith)
------------------------------	--------	---------------	--

- for a change made via a Controller web page:

Mon 15 Jun 2015 15:22:44 BST	Notice	CtlrHandset	Web Interface change 'DET 000=1' was '2' (Alex Smith)
------------------------------	--------	-------------	--

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- for a change made via Handset commands entered on a web Terminal:

Mon 15 Jun 2015 13:28:50 BST	Notice	CtlrHandset	Handset command entered 'DET0=1' was 'DET 0 AX:2' (Alex Smith)
------------------------------	--------	-------------	---

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- for a change made via the RS232 handset:

Mon 15 Jun 2015 15:21:44 BST	Notice	CtlrHandset	Handset command entered 'DET0=1' was 'DET 0 AX:2' (RS232)
------------------------------	--------	-------------	--

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4.7.2 View Control

Several aspects of the view of System Log can be configured using the controls above the logged events themselves. These options affect only the items displayed and do not alter what is written into the log.

- Filter by Module - select the desired module from the list and press the *Redisplay* button. Only events from that module will be displayed.
- Filter by Severity - select the desired severity from the list and press the *Redisplay* button. Only those events with the severity selected or more serious will be displayed.
- Number of Display Lines - select the number of lines of log to be displayed per web page.
- Newest / Oldest at top of page - select whether the events should be ordered with the newest or the oldest at the top of the page.
- Oldest / Older / Newer / Newest - navigate through the pages of the log. The current page and number of pages in the log are shown just below these buttons.
 - Oldest - the earliest available events in the log
 - Older - the events immediately previous to those currently displayed
 - Newer - the events immediately following those currently displayed
 - Newest - the most recent event available in the log.
- Colour - display events in colour according to severity:
 - Error – red
 - Warning – orange
- Redisplay - refresh the display of the log.
- Export Log File - extract the log as a plain text file. This is an unformatted plain text file and can be viewed with a text editor or similar tool such as WordPad on Windows and Jota+ on Android.

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4.8 Fault Table

Siemens Siemens ST950 Controller: ST950-HBFig5, User: pme Ethernet English Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal | Access Level

Fault Table

This table displays all the currently active faults. ?

- No Faults Active

Notification Table

This table displays all the currently active notifications. ?

- No Notifications Active

Figure 4-20 Fault Table web page

The Fault Table shows faults and notifications that are currently active.

A *fault* is an abnormal condition which requires corrective action to be taken e.g. a lamp fault. The red SE LED is illuminated when a fault is present in the Fault Table.

A *notification* provides information to the user but does not necessarily require any immediate action e.g. signals off.

Clearing Faults

Many faults will be automatically removed from the Fault Table when the condition which caused the fault is removed. Some faults are latched and require manual clearing. A button is displayed next to this latter type of fault which can be used to clear the fault. To clear the fault, press the button and follow the instructions.

Siemens Siemens ST950 Controller: ST950-HBFig5, User: pme Ethernet English Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal | Access Level

Fault Table

This table displays all the currently active faults. ?

- Controller Fault - FLF 3 - Correspondence failure?

Notification Table

This table displays all the currently active notifications. ?

- Controller FLF faults logged? Reset Faults

Figure 4-21 Fault table containing fault requiring manual clearance

Fault & Notification History

A historical record of faults & notifications raised and cleared since the last equipment reset is available through the View History buttons. Faults & Notifications are removed from the history when the list becomes too long.

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Siemens ST950 Controller: ROLLESTONE, User: Stratos User 3G English Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal | Access Level

Fault Table

This table displays all the currently active faults.?

[View History](#)

- No Faults Active

Summary	Raised	Cleared
Controller Fault - FLF 7 - Controller Time not set	Thu Aug 11 2016 06:48:12 GMT+0100 (GMT Standard Time)	Thu Aug 11 2016 06:50:59 GMT+0100 (GMT Standard Time)
MOVA 1 disabled	Thu Aug 11 2016 06:48:42 GMT+0100 (GMT Standard Time)	Thu Aug 11 2016 06:55:51 GMT+0100 (GMT Standard Time)
Controller is not currently being monitored	Wed Aug 17 2016 09:48:23 GMT+0100 (GMT Standard Time)	Wed Aug 17 2016 09:48:26 GMT+0100 (GMT Standard Time)

4.9 Site Log

Siemens ST950 Controller: ST950-HBfig5, User: pme Ethernet English Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal | Access Level

Site Log

Add entry to site log.

User:

Text (maximum 500 characters):

Attach File: No file selected.

Free space left for attachments: 10441255 Bytes

Site Log.

Date Stamp	User	Text	Attachment (Size Kbytes)	Delete
Wed 17 Jun 2015 16:55:46 BST	Web	Imported IC4 Configuration from eHandbookFigure5-ELV.8ZP.	eHandbookFigure5-ELV.8ZP (11)	<input type="button" value="Delete"/>
Wed 17 Jun 2015 16:19:03 BST	Web	Imported IC4 Configuration from eHandbookFigure5.8ZP.	eHandbookFigure5.8ZP (11)	<input type="button" value="Delete"/>
Fri 05 Jun 2015 10:56:43 BST	Web	Imported IC4 Configuration from 950ELVHAPRI.8ZP.	950ELVHAPRI.8ZP (10)	<input type="button" value="Delete"/>
Thu 21 May 2015 11:01:14 BST	Web	Imported IC4 Configuration from 950ELVHAPRI - bad CKSUM.8ZP.	950ELVHAPRI - bad CKSUM.8ZP (10)	<input type="button" value="Delete"/>

Figure 4-22 Site Log web page

The Site Log records significant site events. The following are automatically recorded:

- System firmware update
- IC4 configuration load (8ZP file is stored as an attachment)

It is also possible for the user to create records, either with or without an file attachment. To create a site log entry:

- Enter name in the *User* box
- Enter the details of the log entry in the *Text* box

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- If desired, navigate to and select a file to attach
- Press the *Add to Site Log* button

Attachments can be useful to record site details through diagrams, photographs, documents, etc.

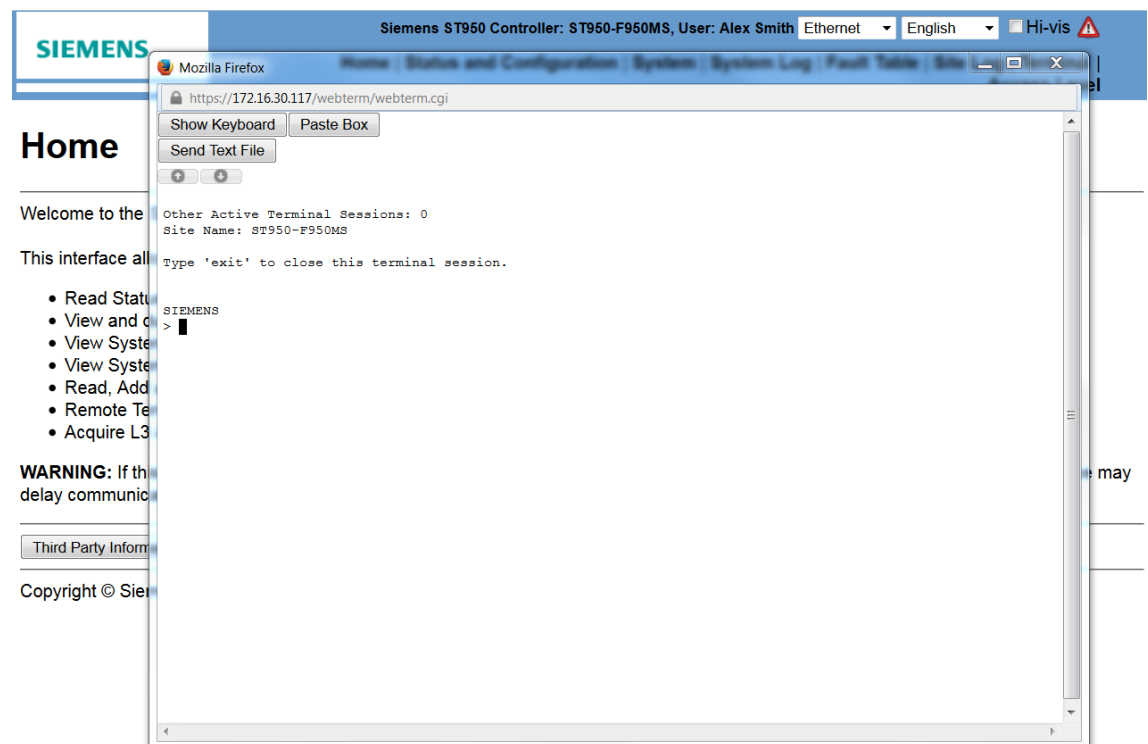


Attachments are not checked for viruses or other malicious software by the unit so it is important that devices used to attach and read attachments are equipped with suitable protection e.g. virus checker installed and running on a PC.

The maximum size for an attachment is 1MB. Any attempt to attach a larger attachment will produce an on screen error and the record is created without the attachment.

It is not possible to delete an entry from the site log although attached files can be deleted in order to save space.

4.10 Terminal



4-23 - Terminal Window

The Terminal Window offers a virtual Handset session to the user that accepts GVP handset interface commands. This avoids having to install a bespoke terminal application on the PC/mobile device.

The banner message that appears above the SIEMENS prompt includes

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- a statement about the number of Other Active Terminal sessions, which includes any handset sessions via any appropriate connection. This makes the user aware of concurrent access.
- the Site Name
- an instruction to use the 'exit' command to close this session. (The number of other active sessions will not be updated for several minutes if 'exit' is not used).

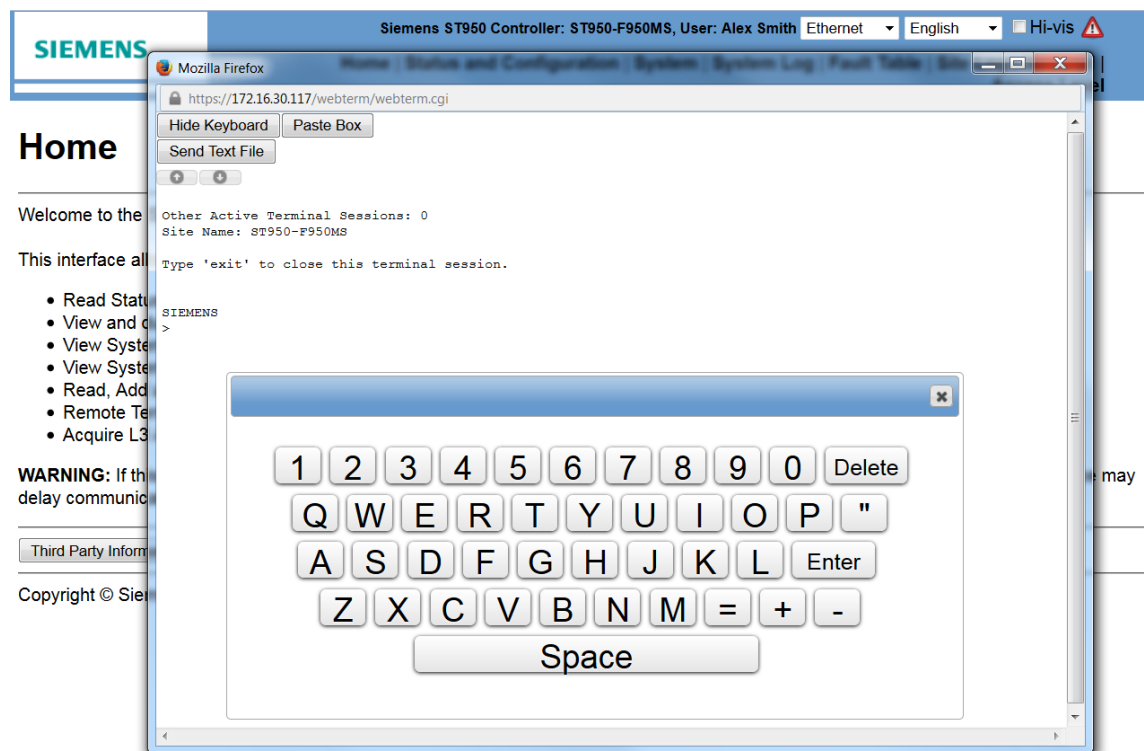
The number of active Handset Terminals is also given by a Notification in the Fault Table.

The XXC command can be used to switch to the Controller Handset, allowing use of the Controller Handset and WIZ commands.

Use EXIT (or the XXO command) to exit from the Controller Handset session and to return to the GVP session, as instructed, otherwise it may take several minutes before Level 3 access can be granted to another Active terminal session via the PME=249 command.

The "Show Keyboard" button can be used to present a keyboard for character input.

This is intended for use on touch-screen devices where the device keyboard may not be offered when tapping in the Terminal window.



4-24 - Terminal Window with shown Keyboard

The "Hide Keyboard" button can be used to remove the keyboard.

Tip: On Android devices, the "Hacker's Keyboard" App may be enabled and used instead of the default keyboard, if preferred.

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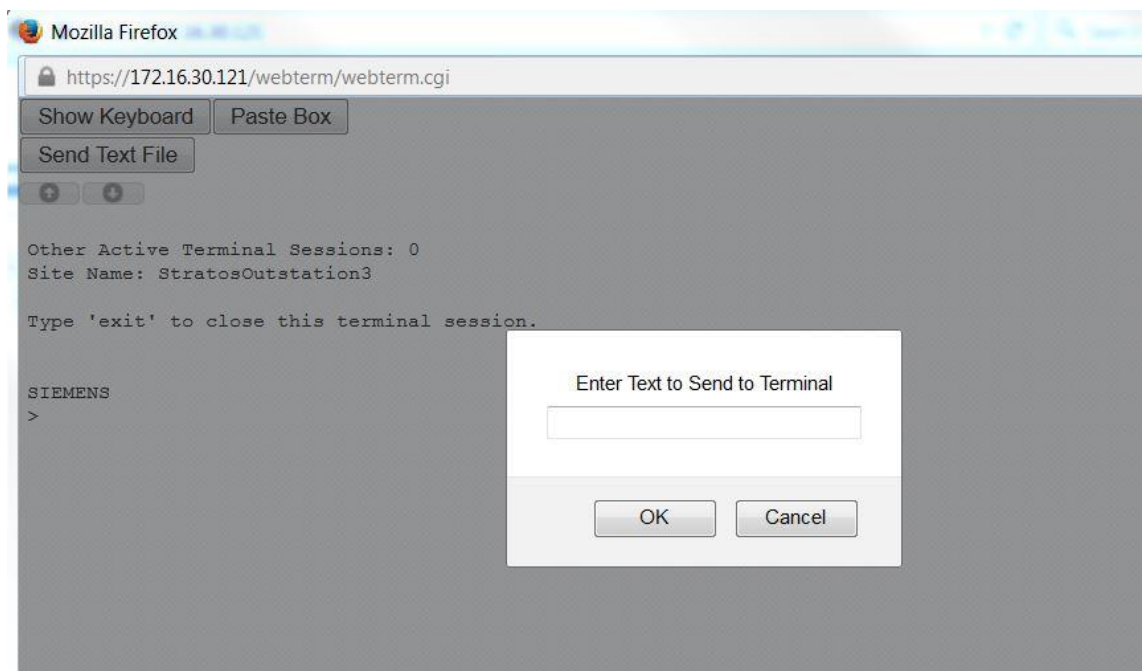
Limitation: the 'Shown' keyboard has no case shifting key, which is required for some GVP handset commands.



If using Internet Explorer, toggle the 'Compatibility View' icon in the address bar to ensure it is grey (off) and not blue (on), otherwise the 'Show Keyboard' button will not work.

Limitation: When Internet Explorer is being used with the 'Compatibility View' icon in the address bar grey (off), as advised above, the Enter key on the PC keyboard may not work when entering commands into the Terminal window. Use 'Show Keyboard' to obtain access to an 'Enter' key when typing commands on a PC keyboard.

Limitation: Pasting text into the Terminal Window has to be performed through the *paste box* activated using the *Paste Box* button.



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4.11 Access Level

This menu option is specific to the ST950 and covered in section 14.3.

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5 WIZ INTERFACE

The WIZ facility is a menu driven handset facility which allows the user to perform various system functions and access various status and configuration items.

On the ST950, WIZ is available on both Controller and GVP handset interface.

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WIZ requires level PME access and remains enabled whilst PME access is enabled. Invoking WIZ without PME access results in the access error "WIZ*A".

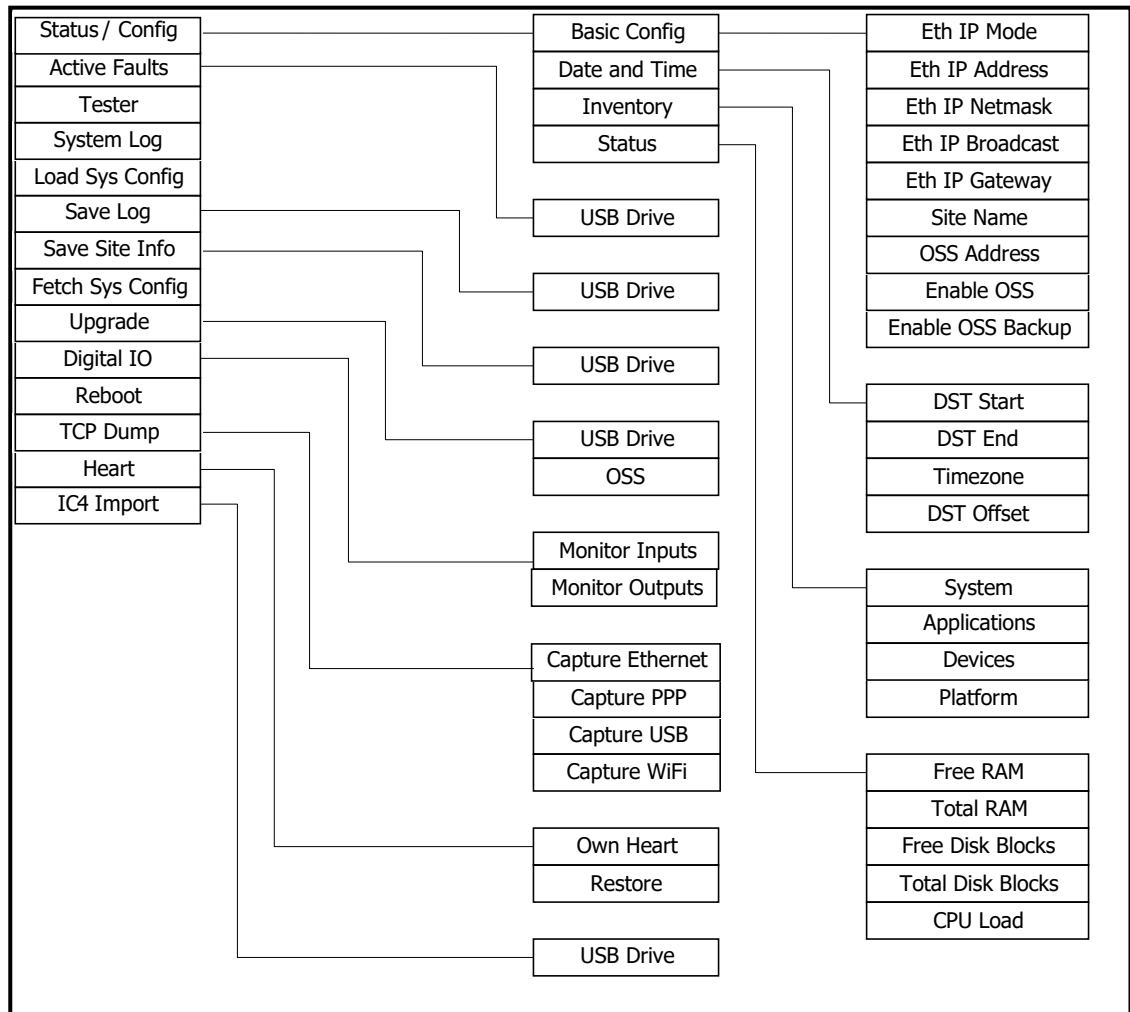


Figure 5-1 WIZ menu structure

5.1 MENU NAVIGATION

Apart from the initial WIZ command itself, all menu items are uniquely selectable via a numeric prefix.

Since WIZ must operate on a standard 4-line display, the number of menu items is restricted to four to fit the display.

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When WIZ is first invoked, the following menu structure is displayed.

```
1> Config/Status
2> Active/Faults
3> Tester
4+ System Log
```

To select a given menu item, the user enters the number associated with the item i.e. 1 through 4.

The “+” next to the “4” of the last menu item indicates that there are further menu items available and by typing “+” these items are displayed as follows.

```
1- Load Sys Config
2> Save Log
3> Save Site Info
4+ Fetch Sys Config
```

The “-” next to the “1” of the first menu item indicates that there are earlier menu items available and by typing “-” these menu items can be displayed.

Selecting a given menu item produces the next level of menu items associated with the selected item. So for example, selecting the “Config/Status” item produces the following sub-menu.

```
1> Basic Config
2> Date and Time
3> Inventory
4+ Status
```

Typing “Q” or “q” at any time causes WIZ to jump up one level of menu items. If already at the top menu, then the WIZ facility is exited.

5.2 MODIFYING DATA

Several of the WIZ menu items allow the user to modify data. For example, the Ethernet IP mode can be set to enabled (1) or disabled (0) as shown in the following display.

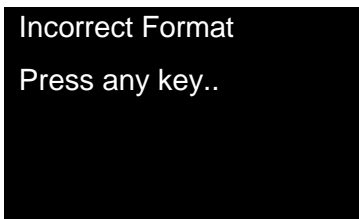
```
Eth IP Mode
0="Disabled" 1="Enabled"
Enabled
```

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Pressing the RETURN or ENTER abandons the modification dialog and reverts to the parent menu. The value of the affected data item is unchanged.

Entering an invalid value results in the following display. The value of the affected data item is unchanged.



Pressing any key returns the user to the parent menu.

5.3 STATUS / CONFIG

The following are accessible from the “Config/Status” item on the top level menu.

Basic Config

The “Basic Config” contains network items related to the Ethernet link at the rear of the processor card and the external OSS. The items are also accessible from the web pages:

- Status and Configuration – System – Advanced – Network – Ethernet
- Status and Configuration – System – Advanced – Network – OSS Interface

Date and Time

The “Date and Time” contains items related to Daylight Saving Time and time zone. The items are also accessible from the web page:

- Status and Configuration – System – Advanced – Date and Time

Inventory

The “Inventory” provides access to version related information about the firmware and hardware deployed on the unit. The items are also accessible from the web page:

- Status and Configuration – System – Status – Inventory

Status

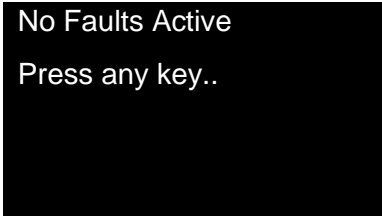
The “Status” contains items related to the performance of the unit in terms of memory and CPU load. The items are also accessible from the web page:

- Status and Configuration – System – Status – System

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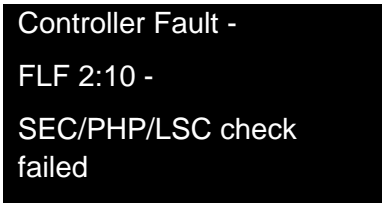
5.4 Active Faults

This option presents the user with a list of the currently active faults in the unit. Where no faults are present the following is output.



No Faults Active
Press any key..

The following is an example of an active fault.

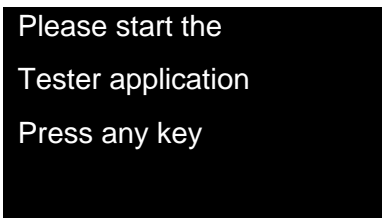


Controller Fault -
FLF 2:10 -
SEC/PHP/LSC check
failed

The user must keep pressing any key to scroll through the list of current faults. When there are no further faults to list, the user is returned to the parent menu.

5.5 Tester

This option is used to interact with the Tester application. By default the Tester application is not started when the unit is power on and the following is output.



Please start the
Tester application
Press any key

Pressing any key returns the user to the parent menu.

The Tester application is started via the "System" Web page. Once Tester has been started, selecting this option invokes a further level of menus as shown below.

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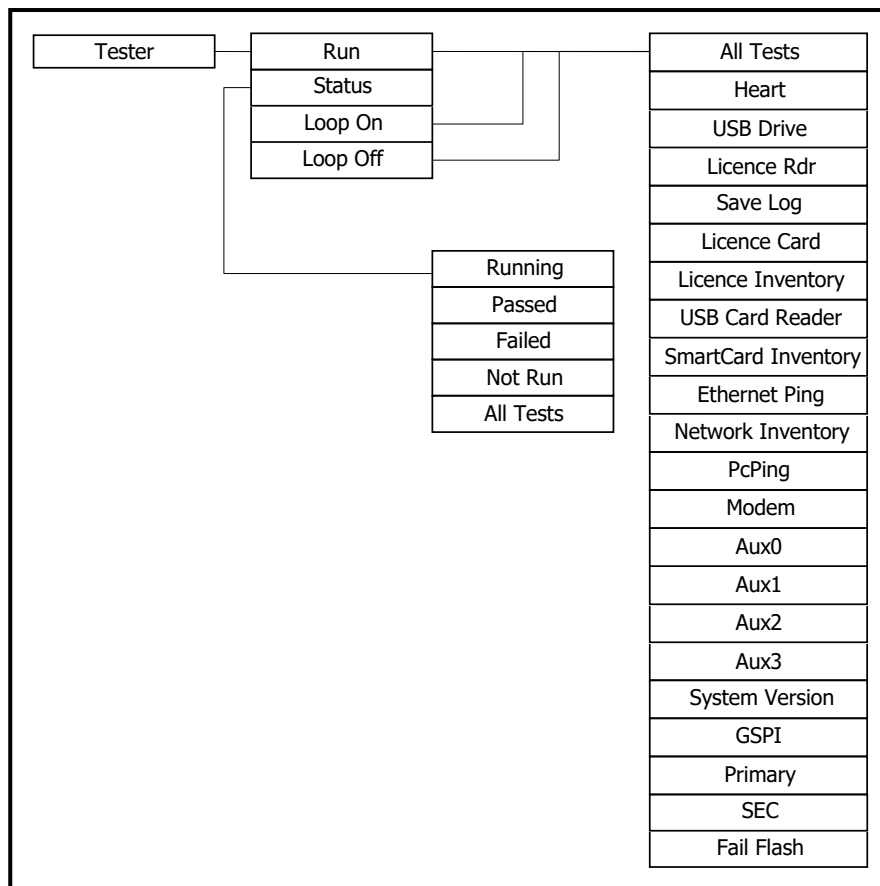


Figure 5-2 WIZ Tester menus

The “Run”, “Loop On” and “Loop Off” options present the user with a list of tests which are supported by the Tester application. Individual tests or all tests can be selected to run on a once only basis (“Run”) or loop forever (“Loop On”). Tests which have been put into run forever mode can subsequently be stopped (“Loop Off”).

The “Status” option allows the user to interrogate the Tester application to determine the execution status of the tests. This status is expressed in terms of tests which are currently “Running”, tests which have already run and have “Passed” or “Failed” and test which have “Not Run”.

The following is a list of tests which could appear in any of the selected status categories.

```

1> Heart
2> Licence Rdr
3> Licence Card
4+ Licence Inventor
  
```

If there are no tests which satisfy the selected status category then the output is similar to the following.

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```
There are no tests
With status Not Run
Press any key
```

Pressing any key returns the user to the parent menu.

5.6 System Log

This option allows the user to view the contents of the System Log.

Selecting this option results in the following output.

```
1> Error Filter
2> Notice Filter
3> Warning Filter
4> Info Filter
```

The filters allow the user to view log entries by severity level, where the Error level is the highest and Info level is the lowest. Higher levels exclude all entries from lower levels.

Once a filter is selected, the following is output.

```
Viewing Page 12/12
25/07/13 11:12:34
23/07/13 23:15:21
[OUDN]
```

This informs the user that by continuing, 20 log entries will be displayed starting from the first time stamp 25/07/13 11:12:34 and ending at 23/07/13 23:15:21.

If the time frame is not acceptable the user can select one of the four keys 'O', 'U', 'D' or 'N' to navigate to a different time frame (key is case insensitive).

- 'O' = Oldest entries.
- 'U' = Up one page.
- 'D' = Down one page.
- 'N' = Newest entries.

Pressing 'Q' returns the user to the parent menu.

Pressing any other key outputs the first entry in the selected time frame (an example is show below).

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```
25/07/13 11:12:34
N(CtrlrHandset)
Handset command
Entered 'PME=249'.
```

Pressing 'Q' returns the user to the time frame selection.

Occasionally a log entry will exceed the 4 lines available on the handset display. In this event, the remainder of the entry can be viewed by pressing the '+' key for each additional line until the entry is complete. The '-' key can be used to step backwards through each line in the entry.

Pressing any other key advances to the next entry in the time frame.

5.7 Load Sys Config

This option allows the user to load a GVP configuration (user changes) from a USB memory stick connected to the USB host port on the front of the Processor Card.

Selecting this option results in the following output.

```
1> USB Drive
```

If "1" is entered with no USB memory stick connected, the following error output is produced.

```
Cannot find USB
Drive
```

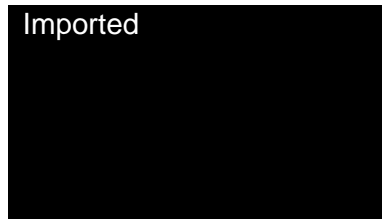
The user must press any key to return to the parent menu.

If a USB memory stick is detected, the following typical output is produced.

```
1> abc.xml
2> config.xml
```

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Selecting a file to input produces the following output.



Pressing any key returns the user to the parent menu.

5.8 Save Log

This option allows the user to save the System Log to a USB memory stick connected to the USB host port on the front of the Processor Card. The saved log is an ASCII readable file in Microsoft Wordpad format which can be viewed offline.

A save typically takes a couple of seconds.

Selecting this option results in the following output.

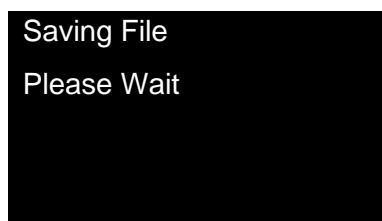


If “1” is entered with no USB memory stick connected, the following error output is produced.



The user must press any key to return to the parent menu.

If a USB memory stick is detected, the following output is produced.



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Log File Saved

The user must press any key to return to the parent menu.

5.9 Save Site Info

See section 9 “Site Information Export” for the use of this option.

5.10 Fetch Sys Config

This option allows the user to fetch the latest GVP configuration (user changes) from the OSS.

If the OSS has not been enabled, the following is output.

```
Fetching Latest...
Failed
OSS Disabled
Press any key..
```

If the OSS has been enabled and the configuration is retrieved from the OSS, the following is output.

```
Fetching Latest...
Success
Press any key..
```

If the OSS has been enabled and no configuration is retrieved from the OSS, the following is output.

```
Fetching Latest...
Failed
Cannot Fetch.
Press any key..
```

The user must press any key to return to the parent menu.

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5.11 Upgrade

See section 11 “Firmware Upgrade” for the use of this option.

5.12 Digital IO

This option allows the user to monitor the states of the various inputs and outputs which are configured on the unit. The IO states are presented as 8-bit quantities irrespective of the size of the physical IO port so that a given port may be characterised by multiple 8-bit values.

The states are those seen by GVP. That is, an input state is the raw state of the physical input without any inversions applied by the unit. An output state is the state of the physical output after any inversions have been applied by the unit.

5.13 Reboot

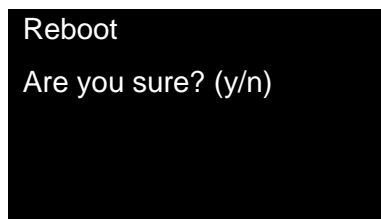
This option allows the user to reboot the EFC.



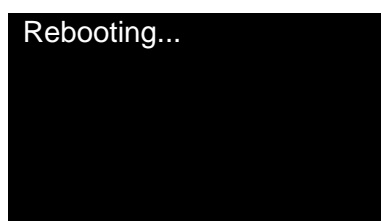
IMPORTANT: The Primary assumes control of the lamps whilst the EFC is rebooting with control being returned to the EFC on a successful restart. Depending on the configured Reserve State settings, the traffic signals may extinguish while the EFC reboots – check the IC4 print-out.

ST950

When the reboot option is selected, the following is displayed.



Pressing the “y”, outputs the following. Pressing any other key reverts to the parent menu.



Contact with the unit is lost during the reboot.

5.14 TCP Dump

This option provides the user with the ability to record communications on various interfaces for subsequent offline analysis during diagnosis of communications issues.

When the option is selected the following is displayed.

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```
1> Capture Ethernet
2> Capture PPP
3> Capture USB
4> Capture Wi-Fi
```

Data capture requires a USB memory stick to be inserted into the USB host port on the front of the Processor Card.

Selecting “Capture Ethernet” option results in the following.

```
Capturing packets.
Press any key to
stop
```

Pressing any key will stop the data capture and the user is informed of the name of the file on the USB memory stick which contains the data.

Similar outcomes are generated for the other data capture options.

5.15 Heart

See section 14.6 for the use of this facility on the controller.

ST950

See section 15.3 for the use of this facility on the Stratos Outstation.

Stratos OS

5.16 IC4 Import

See section 14.5 “Loading IC4 Configuration” for the use of this option.

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6 GVP HANDSET INTERFACE

The GVP handset interface is available using a virtual terminal connection over the USB handset port, Ethernet port and WiFi hotspot.

The GVP handset interface commands are described in 667/HB/31760/000.

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7 WiFi HOTSPOT

The unit is able to act as a temporary WiFi hotspot to allow wireless connection to the unit for short periods of time e.g. during a site maintenance visit. This facility should not be used for permanent wireless connection. The WiFi link supports all facilities available on the USB serial handset.

Each WiFi device has a WPA pre-share key associated with it which will be valid for the device no matter which unit it is connected to. Before using a WiFi device for the first time, this WPA pre-share key must be obtained using a non-WiFi connection (section 7.2). Once obtained, this WPA pre-share key can be used when connecting to the WiFi hotspot provided by the unit.

7.1 Configuration

The WiFi hotspot SSID is set to “Siemens Hotspot” by default. Where two or more units are within WiFi range of each other this should be changed so that they can be distinguished when connecting. This SSID can be configured using the System – Advanced – Network – Wifi Hotspot web page.

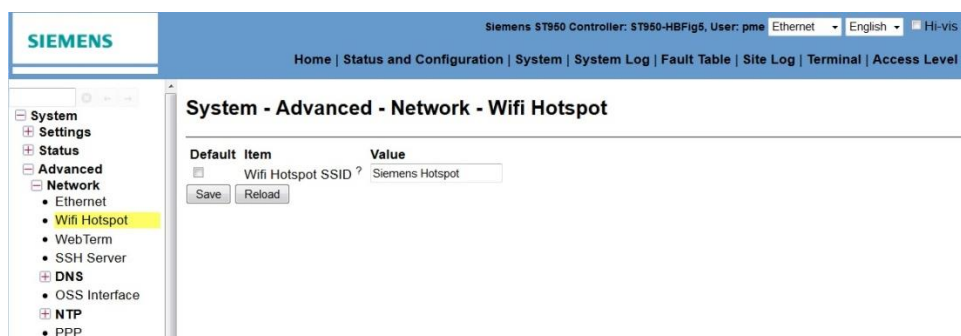


Figure 7-1 - Setting the WiFi hotspot SSID

7.2 Determining WPA Key

Each WiFi dongle has its own WPA key. The WPA key is fixed for a dongle and different dongles may have different keys. To determine the WPA key for a WiFi dongle:

- Connect to the unit’s web interface e.g. using the USB handset port.
- Plug the WiFi dongle in to the unit.
- View the System – Status – Wifi HotSpot web page. The WPA key is given in the “Value” column.

7.3 Connecting

Connection from a device is performed in the same way as connection to any other WiFi network. The details vary depending on the operating system in use on the device but tend to follow the following sequence.

- Search for available WiFi networks.
- Select the WiFi network for the unit (default SSID “Siemens Hotspot”).
- Enter WPA key

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- Wait for connection to be completed.

Once connected via WiFi the web pages can be viewed by entering one of the following in the browser address bar:

- <http://siemens/>
- <http://172.28.100.1/>

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8 ASSET INFORMATION

The asset information is available on demand through the web interface and is also contained in the exported Site Information.

8.1 Applications

A number of applications are installed on the unit. The details of these are listed on the System – Status – Inventory – Applications web page.

Siemens ST950 Controller: ST950-HBfig5, User: pme Ethernet English Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal | Access Level

System - Status - Inventory - Applications

ID	Part Number?	Major?	Minor?	Description?
Mova1	667/TZ/32377/002	2	18	MOVA 7 application
Mova2	667/TZ/32377/002	2	18	MOVA 7 application
Mova3	667/TZ/32377/002	2	18	MOVA 7 application
Mova4	667/TZ/32377/002	2	18	MOVA 7 application
OSEWebConf	667/TZ/32376/002	2	22	I/O Mapping (OSE) Web C
TesterApp	667/TZ/31795/000	1	0	Application to test drivers,
UTMCFullUTC	667/TZ/32373/002	2	16	UTMC Type 2 UTC (full) A
UTMCSimpleUTC	667/TZ/32374/002	2	14	UTMC Type 1 UTC (Simpl

Reload Previous Next 10 rows

- System
 - Settings
 - Status
 - Real Time View
 - System
 - Network
 - Inventory
 - Applications**
 - Devices
 - Firmware
 - Platform
 - Wifi HotSpot
 - Advanced
 - Upgrade
 - OSS Data Files
 - SiteUI
 - Controller
 - UG405 UTC
 - Simple UTC
 - MOVA
 - Peripherals

Figure 8-1 - Applications inventory information

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8.2 Loadable Packages

Details of the installed loadable packages are available on the System – Status – Inventory – Loadable Packages web page.

System - Status - Inventory - Loadable Packages

ID	Part Number?	Major?	Minor?	Description?
ControllerMonitor	667/TZ/32480/000	1	10	ControllerMonitor

Reload Previous Next 12 rows

Figure 8-2 – Loadable package inventory information

8.3 Devices

Details of the devices (CPU card hardware and peripheral card hardware) are available on the System – Status – Inventory – Devices web page.

In the example below some devices contain dummy asset information and others do not support asset information.

System - Status - Inventory - Devices

ID	Part Number?	Issue?	S/n?	DoM?	Description?
GSPIPeripheral_1					GSPI card at address 1
GSPIPeripheral_2	667/1/11111/000	99	1234	2012/08/11	IO Card
LSL50					LSLS
cpuboard	667/1/46010/001	C	09162094	2012/09/06	ST950 CPU Card

Reload Previous Next 10 rows

Figure 8-3 - Devices inventory information

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8.4 Firmware

Details of the firmware installed in the devices is available on the System – Status – Inventory – Firmware web page.

ID	Part Number?	Major?	Minor?	Checksum?	Description?
GSPIPeripheral_1	667/TZ/32998/000	4	0		GSPI address 1
GSPIPeripheral_2	667/TZ/32998/000	4	0		GSPI address 2
LSLS0	667/TZ/32941/000	5	0		LSLS card 0 (address 1)
fail_flash	667/TZ/46041/000	1	0		Fail Flash micro
primary	667/TZ/46020/000	7	0	C1D0401A	Primary micro
secondary	667/TZ/46040/000	2	0		SEC micro

Buttons: Reload, Previous, Next, 10 rows

Figure 8-4 - Firmware inventory information

8.5 Platform

Details of the underlying platform are available on the System – Status – Inventory – Platform web page.

Default	Item	Value
<input type="checkbox"/>	Part Number ?	667/TZ/31760/000
<input type="checkbox"/>	Major ?	24
<input type="checkbox"/>	Minor ?	8
<input type="checkbox"/>	Release Candidate ?	1505281537
<input type="checkbox"/>	Platform ?	linuxEFC
<input type="checkbox"/>	GVP API Version ?	104

Button: Reload

Figure 8-5 - Platform inventory information

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9 SITE INFORMATION EXPORT

Information about the site can be exported, quickly and easily. It provides a snapshot of the state of the unit.

This information is therefore very useful in the following situations:

- As part of the hand-over and approval process between installation engineers and customers.
- The Controller Data page contains important controller settings (e.g. intergreen timings & conflicts) that the customer ought to review as part of an acceptance procedure. ST950
- The information may also be useful at PI visits (Periodic Inspection), quickly capturing and recording the status of the unit and inventory information on that visit. This is why this feature is sometimes referred to as the 'PI Dump'.
- If a problem cannot be resolved and further assistance is required, it is recommended that this information is extracted from the unit and further assistance sort.
- For problem resolution on the controller, the snapshot contains the current state and trace records from the lamp monitor. ST950

9.1 Form of exported information

The information is exported as a ZIP file with a filename in the form:

<Site name>-<date>T<time>.zip

Where:

- The site name is that manually configured.
- By default the ST950 site name is the EM-Number (part of the CIC String) of the IC4 configuration, prefixed by 'ST950', e.g. 'ST950-e12345'. ST950
- The date and time is in the numerical form 'yyyymmdd' and 'hhmmss', separated by the character 'T', e.g. '20130716T182630' for 16th July 2013 at time 18:26:30. This is the date and time according to the unit, not the time according to the PC used to extract the information for example.

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9.2 Requesting Export

Export of site information can be requested through the web interface and WIZ.

9.2.1 Export Using Web Interface

From the 'System' web page, it is possible locally or remotely to export the file and store it on the users device (PC, laptop, smart phone, tablet, etc.). This will use the browser's standard approach for downloading and saving a file, e.g. a dialog box asking the user whether they want to open or save the document. Given a choice, select save and find a suitable directory in which to store the file.

Siemens ST950 Controller: ST950-HBfig5, User: pme Ethernet English Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal | Access Level

System

Package Part Number	Package Version
667/TZ/46059/000	8.28

Site Information Export:

Use this option to download a ZIP file containing the site information. It will take the system a few seconds to create this file; please be patient.

[Export Site Information](#)

Applications:

Name	Description	Part Number	Issue	State	Control
TesterApp	Application to test drivers, etc...	667/TZ/31795/000	1.0.0	Not Running	Start
UTMCFullUTC	UTMC Type 2 UTC (full) Application	667/TZ/32373/002	2.16.1	Not Running	Start
UTMCSimpleUTC	UTMC Type 1 UTC (Simple) Application	667/TZ/32374/002	2.14.1	Not Running	Start

Figure 9-1 - Site Information Export on System web page

9.2.2 Export Using WIZ

It is also possible to obtain this file on site without needing a PC. Insert a USB memory stick into the socket on the front of the Processor Card, attach a handset terminal and use the WIZ handset command.



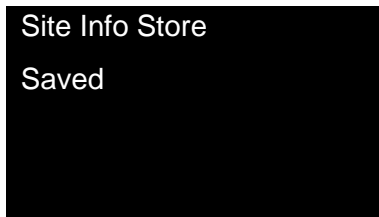
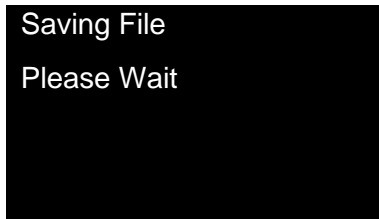
USB memory sticks formatted with the FAT file system should be used. Encrypted USB memory sticks and those formatted with file systems other than FAT are not supported.

The WIZ options used are shown in bold:

- 1> Config/Status
- 2> Active Faults
- 3> Tester
- 4+ System Log
- 1- Load Sys Config
- 2> Save Log
- 3> Save Site Info
- 4+ Fetch Sys Config
- 1> USB Drive

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After selecting 1 the following is displayed:



If there is not space on the USB memory stick to store the file then the handset command indicates failure. If a file already exists with this same filename then it is overwritten without warning, although this is unlikely because the filename includes the date and time.

9.3 Examining the Contents

The ZIP file contains a number of separate files.



The file is a standard ZIP file and can be opened & files extracted using a standard archive manager such as 7zip for Windows and ZArchiver for Android.

The first thing to do is to extract all the files to a convenient location. By default the files are extracted to a subdirectory also named 'sitename-date-T-time' so a number of ZIP files can be extracted to the same location with the contents of each file separately in directories based on the site name and time obtained.

Then open the file called 'index.html', which opens a short index page in your default browser.

The options available from the index are as follows. In most cases, the information provided is similar to the view available via the web interface on the unit.

- **System Log** – The same view as when the log is exported from the System Log web page.
- **Status Database** – Currently for engineering use only.
- **Fault Table and Notification Table** – Contains the active faults and notifications.
- **Site Log** – This is a copy of the Site Log table, a similar view to that available via the web interface. It also includes attachments.

Tip: If the browser does not access or open an attachment directly from this log view, the attachment file can be located manually. The attachments are

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also extracted from the ZIP file and stored in a sub-directory named 'sitelog'.

- **Inventory** – A list of hardware and firmware inventory information (e.g. part numbers and issue states)
- **System Configuration File** – Currently for engineering use only. Note: The IC4 Configuration files are recorded in the Site Log and can be obtained via that option.
- **Licence Facilities** – A list of licences installed on the unit, e.g. the details of the MOVA licences installed.
- **Controller Data** – A summary of the controller configuration. This includes fundamental timings such as the minimum and maximums green times, intergreen times, phase delays, DFM times. It also lists the lamp monitor loads and lamp faults. It also displays the safety configuration settings used for conflict and correspondence monitoring.
- **LMU Trace** – Captures the lamp monitor diagnostic information. Refer to the details on the KTR handset command for more information.

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10 LICENSING

The unit requires licences to be fitted before certain facilities are enabled. The facilities which are currently licensed are listed below.

- Serial Handset – enables continuous connection and monitoring over the controller's serial handset interfaces ST950
- Light Weight Tunnel – enables use of the light weight tunnel
- Remote Access – enables use of the remote access interfaces (e.g. Ethernet)
- MOVA7 streams 1 & 2 – enables use of MOVA streams 1 & 2
- MOVA7 streams 3 & 4 – enables use of MOVA streams 3 & 4
- UTMCI OTU – enables use of the following:
 - UTMCI OTU application
 - Stratos monitoring
 - UTMCI remote monitoring ST950

Each facility is licensed individually and some licences enable more than one facility. For example the UTMCI OTU and MOVA7 licences each enable the Remote Access facility as this is required to make full use of the licensed feature.

For convenience some commonly requested facility combinations are available in a single combined licence e.g. UTMCI OTU + MOVA7 streams 1-2. Such combined licences cannot be split. Contact Siemens Intelligent Traffic Systems for licence options. ST950

By default, the controller has no licences fitted and those required must be ordered and installed on the controller.

By default, the Stratos Outstation has the UTMCI OTU licence fitted. Stratos OS

Part Number	Licence Description	ST950	Stratos
667/1/47560/000	LIGHTWEIGHT TUNNEL (VPN)	Y	Y
667/1/47561/000	REMOTE ACCESS	Y	n/a
667/1/47562/000	MOVA 7 streams 1 & 2	Y	Y
667/1/47563/000	MOVA 7 streams 3 & 4	Y	Y
667/1/47564/000	UTMCI OTU (controller)	Y	n/a
667/1/47565/000	SERIAL HANDSET (continuous monitoring)	Y	n/a
667/1/47566/000	UTMCI OTU, MOVA 7 streams 1 & 2	Y	Y*1
667/1/47567/000	UTMCI OTU, MOVA 7 streams 1,2,3 & 4	Y	Y*1
667/1/47568/000	UTMCI OTU (Stratos Outstation)	n/a	Y

Table 2 – Available Licences

*1 - This licence would not normally be used on the Stratos outstation as it includes the UTMCI OTU facility which is already enabled on the outstation. Stratos OS

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10.1 Distribution and Storage of Licences

Licences are distributed and held on Smart Cards. For distribution either a full size (credit card size) or SIM size Smart Card can be used. On the installed unit, a SIM size Smart Card is used and is fitted in the Smart Card holder on the CPU Card.

In addition to licences, Smart Card of version 2 onwards also hold the credentials required for the equipment to connect to Stratos. A Licence Smart card of at least this version is required to support connections to Stratos.

The version of the Licence Smartcard fitted can be checked on the System – Settings – Comms – Stratos configuration web page.

Default	Item	Value
<input type="checkbox"/>	Tenant Pass Phrase ?	*****
<input type="checkbox"/>	Tenant Name ?	Automation1
<input type="checkbox"/>	Site Location ?	ST700 Biscuit Tin SysLab
<input type="checkbox"/>	Unique Site Name ?	StratosOutstation2
<input type="checkbox"/>	Unique Site ID ?	1427900621531
<input type="checkbox"/>	Stratos Link ?	Connected
<input type="checkbox"/>	Stratos Credentials ?	Active
<input type="checkbox"/>	Smartcard Secure Store ?	Available
<input type="checkbox"/>	Smartcard Version ?	2

Save Reload

10.2 Installing Licences

If no Licence Smart Card is fitted in the unit then the licence is installed by fitting the supplied Licence Smart Card into the Smart Card holder on the CPU Card.

If a Licence Smart Card is already fitted to the unit then the licence is installed using the Licence Manager to transfer the licence from the Smart Card used for distribution to the Smart Card fitted to the unit.

10.3 Licence Manager

The Licence Manager can be used to:

- View licences installed on the unit
- Transfer a licence to the unit
- Transfer a licence off the unit

The Licence Manager is found on the System - Settings - Licence System - Manager web page. To view the licence information, press the *Read Licences* button.

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Siemens ST950 Controller: ST950-HBfig5, User: pme Ethernet English Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal | Access Level

System - Settings - Licence System - Manager

Manage Licences

Read Licences

Currently Installed Licences

Facility	Order Code	
Remote Access	19082013	Uninstall
UTMC OTU + MOVA 7 streams 1-4	19082013	Uninstall

Plug-in Card Reader

No External Reader Detected

Figure 10-1 - Licence Manager web page with no external reader fitted

10.3.1 Transferring Licences to and from the Equipment

To transfer a licence:

- Ensure a Licence Smart Card is fitted to the unit.
- Fit a Licence Smart Card into a USB Smart Card reader.
- Connect the USB Smart Card reader to the USB port on the front of the CPU Card.
- View the Licence Manager web page.
- Press the *Read Licences* button.

Siemens ST950 Controller: ST950-HBfig5, User: pme Ethernet English Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal | Access Level

System - Settings - Licence System - Manager

Manage Licences

Read Licences

Currently Installed Licences

Facility	Order Code	
Remote Access	19082013	Uninstall
UTMC OTU + MOVA 7 streams 1 - 4	19082013	Uninstall

Plug-in Card Reader

OmniKey CardMan 3121 00 00

Facility	Order Code	
LwTunnel	19082013	Install
LwTunnel	19082013	Install
LwTunnel	19082013	Install
Remote Access	19082013	Install
Remote Access	19082013	Install

Figure 10-2 - Licence Manager web page with external reader fitted

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The *Currently Installed Licences* table shows the licences currently installed in the unit (contained in the Licence Smart Card fitted to the CPU Card). The example above shows that the unit currently has two licences installed: Remote Access and a combined OTU & MOVA licence. Each installed licence has an associated *Uninstall* button which can be used to transfer the licence from the unit to the Licence Smart Card in the external USB Smart Card reader. Pressing this button results in the licence being removed from the *Currently Installed Licences* table and added to the *Plug-in Card Reader* table and the facility becoming unlicensed.

The *Plug-In Card Reader* table shows the licences contained in the Licence Smart Card fitted in the external USB Smart Card Reader. This Licence Smart Card holds a number of licences. Any of these can be transferred to the unit by pressing the *Install* button associated with the licence. In the example above, the unit already has a Remote Access licence fitted, so transferring this licence to the unit would not enable any additional facilities (it would just end up with two of the same licence). Transferring a LwTunnel licence to the unit would permit the lightweight tunnel facility.

When a licence is installed, it is removed from the list of licences held on the Licence Smart Card in the external USB Smart Card reader and added to the list of currently installed licences. Once a licence has been installed, the associated facility can be operated without restriction.

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11 FIRMWARE UPGRADE

Most of the firmware within the unit is stored in non-removal devices. This firmware can be updated using the mechanisms described in this section.

11.1 Updating CPU Card Firmware

11.1.1 Delivery of Updates

An update is contained in a single file and may be delivered either directly to the user or through OSS. Where the file is delivered directly to the user it may be transported by any means appropriate for a file of several megabytes in size e.g. file transfer, memory stick.

11.1.2 Compatibility with Stand-Alone OSS

Where the firmware is delivered to the equipment through a stand-alone OSS it is important that the OSS firmware and equipment TFTP Block Size configuration are compatible with the firmware version as described in the following table.

Equipment	Firmware	Version	Stand-Alone OSS Version	TFTP Block Size
ST950	667/TZ/46059/000	< 11	Any	512
		>= 11	10	1024
Stratos Outstation	667/TZ/52255/000	< 7	Any	512
		>= 7	10	1024

The TFTP Block Size of the equipment (ST950 / Stratos Outstation) can be configured using the *System – Advanced – Network – TFTP Client* configuration web page.

11.1.3 Compatibility of Updates

Any important information regarding an update is displayed to the user before the upgrade proceeds, giving the user the option to cancel the upgrade. Such important information may indicate a change in functionality and / or interfaces or may indicate a change would be made to the system. Account can then be taken of the change and the update applied later.

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It may not be possible to update from the version for firmware running to the version desired. This is only likely if the upgrade skips many intermediate firmware versions. In such cases it will be necessary to perform the upgrade in two or more steps, first going to intermediate version before going to the final desired version.

11.1.4 Initiating an Update

An update can be initiated through the web interface or the WIZ interface as follows.

Update from OSS using web interface

- Visit the System – Upgrade web page. The updates available from OSS are listed under the title “Outstation Support Server – Platform Package Upgrade”.
- Click on “Use” next to the required package.

Update from file using web interface

- Visit the System – Upgrade web page.
- Under the title “File Upgrade”, browse to the location of the file and select the file.
- Click on “Start Upgrade”.

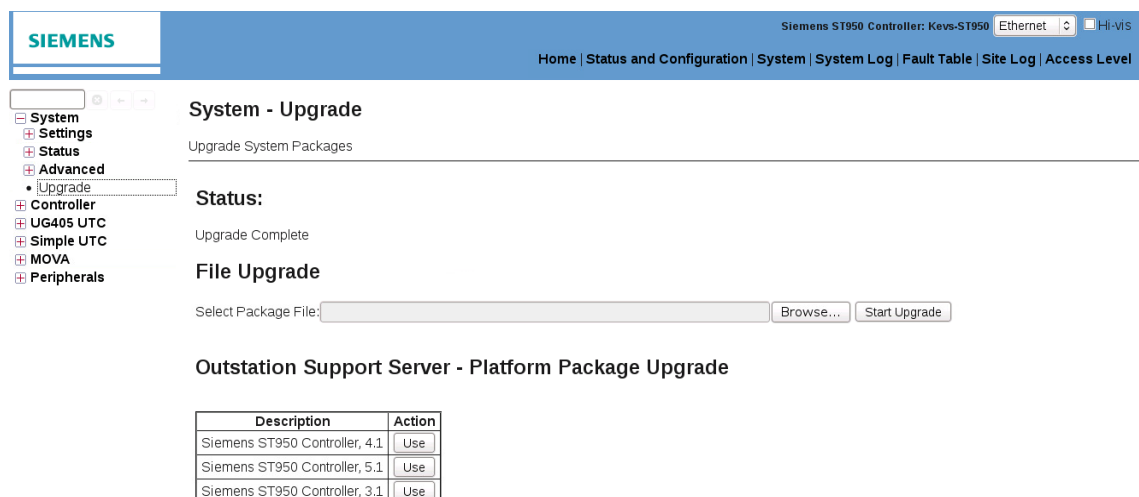


Figure 11-1 System - Upgrade web page

Update from OSS using WIZ interface

When using the WIZ interface, the latest update is selected automatically. If an update other than the latest is required then the web interface should be used.

- Type WIZ at the chevron prompt
- Press “+” until “Upgrade” appears in the list of available options
- Press the number corresponding to “Upgrade”
- Press the number corresponding to “OSS”

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Update from file using WIZ interface

USB memory sticks formatted with the FAT file system should be used. Encrypted USB memory sticks and those formatted with file systems other than FAT are not supported.

- Copy the update file to a USB memory stick. The file should be placed at the top level and not in a subdirectory.
- Insert the USB memory stick into the USB port on the front of the CPU card.
- Type WIZ at the chevron prompt.
- Press “+” until “Upgrade” appears in the list of available options.
- Press the number corresponding to “Upgrade”.
- Press the number corresponding to “USB Drive”.
- Observe that the update files available on the USB memory stick are listed. Pressing ‘+’ and ‘-’ cycles through the available update files where there are more on the USB memory stick than can be listed on a single WIZ page.
- Press the number corresponding to the update file to be used.

Each of these sequences will cause the update to be loaded into the unit and actioned.

There are additional considerations when upgrading the ST950 and these are described in section 14.7

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11.2 Updating non-Plus+ GSPI Peripheral Firmware

This section describes updating the firmware in non-Plus+ GSPI peripherals e.g. IO Cards. Please see the ST950 Plus+ Handbook (667/HE/53000/000) for information on upgrading the firmware in Plus+ peripherals.

It is possible to update the firmware running in the non-Plus+ peripherals connected to the CPU card via the Generic Serial Peripheral Interface. Time taken to update a peripheral varies depending on peripheral type but it is typically less than one minute per peripheral. Operation of the peripherals is stopped during this process so are unavailable to the unit and its applications for the duration of the upgrade process.

11.2.1 Delivery of Updates

The firmware for the GSPI peripherals is held within the EFC file system and so any update of unit firmware could contain an update to the firmware for one or more types of GSPI peripheral. Consult the release information for the firmware update for details of the changes it contains and the actions which should be taken.

The following procedure can be used if at any time it is necessary to compare the version of the GSPI peripheral firmware held within the EFC file system with that currently running in the GSPI peripherals.

- Determine the version of firmware running in the GSPI peripherals using the System – Status – Inventory – Firmware web page. The screen shot below shows one GSPI peripheral running 667/TZ/32998/000 issue 4.0 and one GSPI peripheral running 667/TZ/45350/000 issue 3.8.

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Siemens ST950 Controller: Kevs-ST950 Ethernet Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Access Level

System - Status - Inventory - Firmware

ID	Part Number?	Major?	Minor?	Description?
Fail Flash	667/TZ/46041/000	1	0	Fail Flash
GSPIPeripheral_1	667/TZ/32998/000	4	0	GSPI address 1
GSPIPeripheral_f	667/TZ/45350/000	3	8	GSPI address 15
LSLS0	667/TZ/32941/100	7	4	LSLS card 0 (address 1)
LSLS1	667/TZ/32941/100	8	0	LSLS card 1 (address 2)
LSLS2	667/TZ/32941/000	7	0	LSLS card 2 (address 3)
Primary	667/TZ/46020/000	2	0	Primary
SEC	667/TZ/46040/000	1	0	SEC

Reload Previous Next 50 rows

Figure 11-2 System - Status - Inventory - Firmware web page

- Determine the version of firmware available as an upgrade using the Peripherals – F/W Update web page. The following screen shot shows that firmware upgrade is available for two types of firmware: 667/TZ/32998/000 and 667/TZ/45350/000 at 4.0 and 3.8 respectively.

Siemens ST950 Controller: ST950-EMCELV, User: pme English Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Access Level | Tester

Peripherals - F/W Update

This facility allows the user to update the firmware installed on the GSPI peripheral cards (e.g. IO card, WiMag interface card). During this process the GSPI peripheral cards become unavailable to the system so it is important to consider the effect of this before carrying out an update. For example, if IO cards are connected then during the update their inputs will not be available to the system and their outputs will be set to their default state. If either these inputs or outputs control important features of this or a connected system then the timing of the update needs to be carefully considered.

Please ensure that power and cabling are not disturbed during the update since such interference could cause the operation to fail and one or more peripherals to require replacement.

It is recommended that all applications in use are stopped prior to commencement of the update and restarted on completion of the update (applications are stopped and started through the System web page).

The following files are available. The correct file will be used for the peripheral type.

- 667-TZ-32998-000.hex version 4 (IO Card / Detector Backplane)
- 667-TZ-45350-000.hex version 3 (WiMag Standard Interface Card)

Click start to initiate upgrade

Start

Figure 11-3 Peripherals - F/W Update web page

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11.2.2 Performing An Update

If it is determined that an update is required then the following should be considered before performing the update:

- Is the unit connected such that loss of the GSPI peripherals for a few minutes could cause a problem? An example of what might cause a problem is if IO outputs from the unit are used to control the state of another controller. In such a case it may be that the loss of IO on this unit might cause one or more connected controllers to turn off their signals.
- Is the current state of the junction such that the loss of the GSPI peripherals for a few minutes will cause a problem? An example of what might cause a problem is if loss of detector inputs connected to the unit IO makes the controller operation unsuitable for the prevailing traffic conditions.
- Is the local power supply currently stable and unlikely to be interrupted? An interruption to the power during a GSPI peripheral update may result in one or more of the GSPI peripherals requiring repair.

When a suitable time for the upgrade has been determined and reached then the upgrade can be initiated by pressing the “Start” button on the Peripherals – F/W Update web page. Progress information will be displayed during the upgrade with the page returning to its initial state a little while after the upgrade completes.

11.3 Updating Loadable Packages

Some equipment functionality is provided through loadable packages which can be updated independently of the main firmware. The primary means of updating a loadable package is as part of a firmware update (which will always contain the current version at the time of release) or through Stratos. It is also possible to load a loadable package through the *Advanced* configuration web pages.

12 REAL TIME VIEW AND IO STATUS

12.1 Introduction

The Real Time View can be used to view I/O events and other state changes in a web browser as they occur in real time, as event/time Plots. This view is available on the System – Status menu, and the following events can be monitored against time:

- System Parameters, giving a graphical view of the CPU Load, and the 24V logic supply voltage
- System I/O, showing the state of I/O Port Input bits (Active/Inactive)
- Controller I/O, showing the state of the Detector bits (Active/Inactive)
- Phases, giving a graphical representation of the phase state as the aspects change

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The Peripherals menu also offers a view of the state of the System I/O Input bits, via the Real Time IO Status View.

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The Real Time View is also available under the Controller – I/O menu.

12.2 Speech

In ST950 firmware version 9 and later, Speech Match Rules can be used to allow many of the events to be spoken, resulting in a 'Talking Controller'.

Note that this feature is not currently available on the Stratos Outstation.

Stratos OS

Tip: This feature is of particular benefit during system commissioning, when a bluetooth headset connected to a user's SmartPhone (or other device) can be used to provide an audible indication of events as they occur.



For European languages using a Latin script, the pronouncement of terms such as "Active", "Inactive" or "per cent" will be made in the language selected in the drop down menu in the banner at the top of the web page. For other languages, e.g. Chinese, the English terms are spoken.

This feature is supported by Firefox version 25.0 and Chrome version 35 onwards. Note that the Speech facility is not supported if Internet Explorer is being used as the web browser. On Android devices, Firefox browsers tend to be more timely than Google Chrome when announcing events, particularly when a number of Plots are open.

12.3 Opening the Real Time View

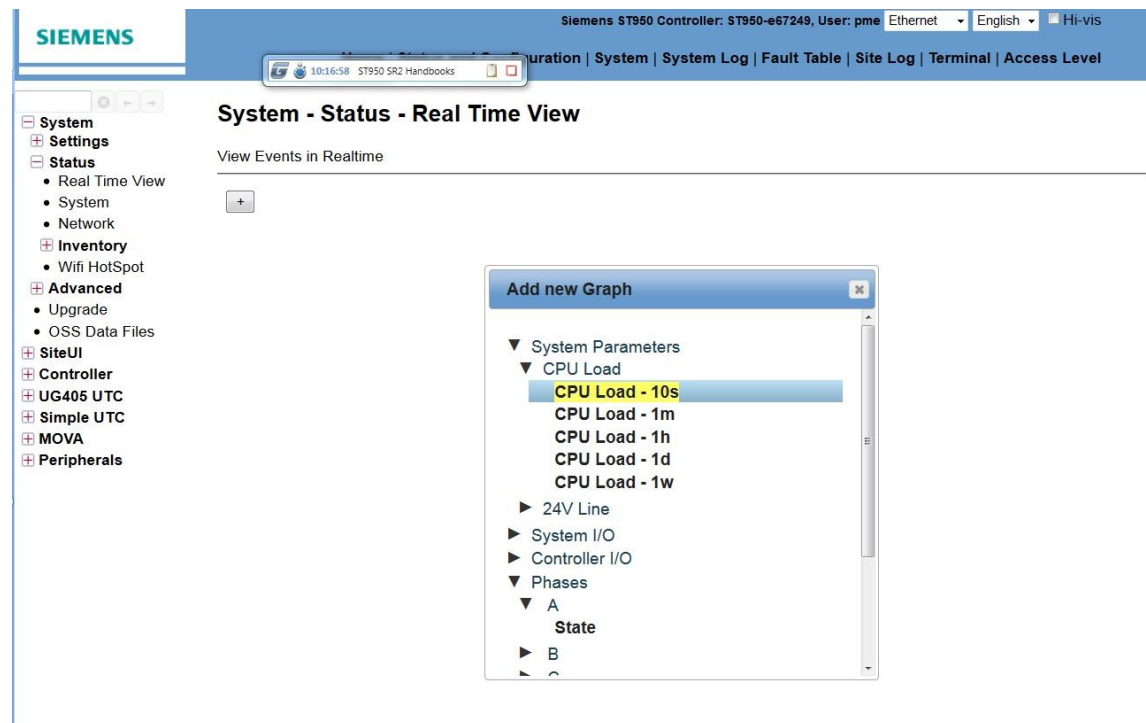
On selecting the Real Time View, context specific Menu items are loaded which offer Graphical definitions of the available Plots.

Note that these Menu items can take approximately twenty seconds to load.

12-1 - Real Time View, Loading menu Items

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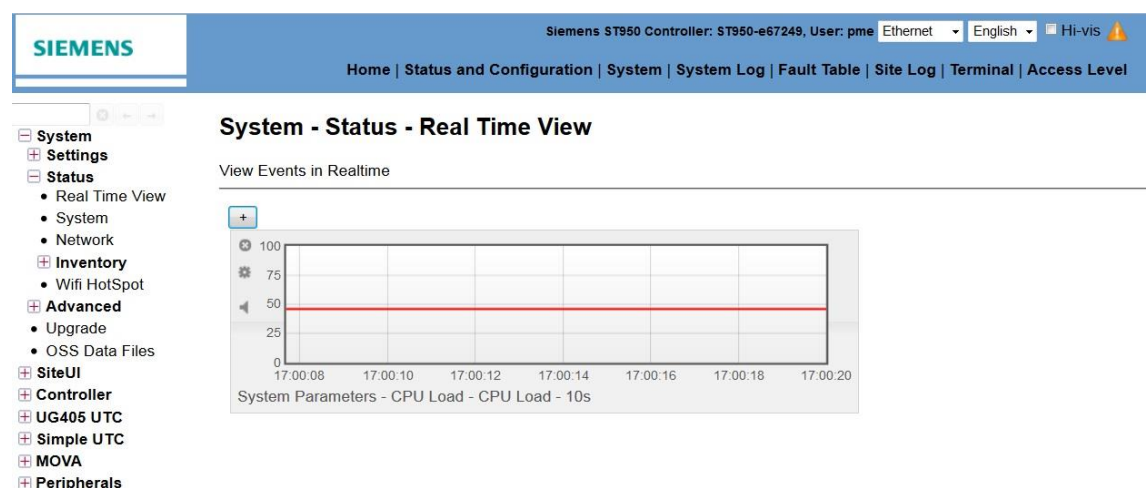
Graphs or Plots of interest are added to the View by selecting the “+” button, and then navigating down the menu tree to select the Graph of interest.



12-2 - Add new Graph window

On selecting a Graph, the Add new Graph window is closed and an additional Plot is added to the Real Time View, with current time scaled appropriately on the x-axis and the Event value/state represented on the y-axis. The web browser stores the historic data for display in the Real Time View.

The  button can be used to close the Add new Graph window if no plot is selected.



12-3 - Additional Plot Added

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Tip: There is no limitation on the number of Plots which can be added. However, browser performance and usability may be affected by the number of Plots currently open.

Tip: It is recommended that the Real Time View Is opened from the Status and Configuration menu in a new web browser tab or instance. This will avoid inadvertently navigating away from the Real Time View and losing the Plots, when other web pages are being accessed.

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12.4 Plot Settings and Controls

The settings and controls for each Plot are provided by a column of buttons appearing to the left of the y-axis, if supported by the particular Plot and web browser being used.

-  Selecting this button closes the Plot
-  This button opens the Plot Settings window, which defines the manner in which the 'Talking Controller' announces event changes for this particular Plot.
-  This icon indicates that Speech output is disabled. Speech can be enabled by pressing this button, at which time the  icon is displayed. The browser will then announce Event/state changes as they occur, according to the Plot Settings window. Note that there may be a small delay between activating the speech icon and the speech starting to be announced.
-  Selecting this results in the Plot displaying current data. This button is displayed after zooming or scrolling to show historic data.

The displayed Plot data can be horizontally scrolled to show previously displayed data by selecting and dragging across the Plot window. If a mouse is being used, left-clicks can be used to zoom in, or scrolling with a mouse wheel can be used to rescale the x-axis. Note that Pinch zoom behaviour on touch screen devices to re-scale the x-axis is currently not supported.


12.4.1 Plot Settings Window

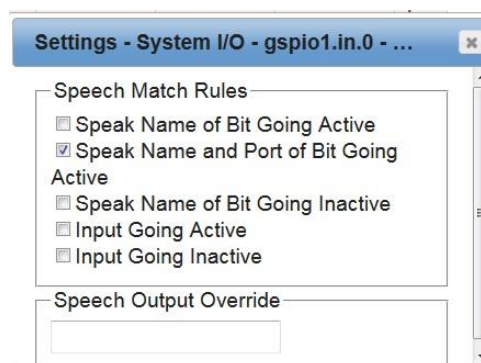
This window defines the Rules by which the 'Talking Controller' announces event changes for each Plot, in terms of Speech Match Rules and the Speech Output Override. Note that the Speech match rules are specific to each type of Graph.

The Speech Match Rules define how and when events are to be spoken, and are applied to the events in top-down order. Multiple Rules can be selected, which may result in multiple announcements of the same event.

Each plot has a default spoken expression. The Speech Output Override can be used to specify an alternative expression, which will be announced for each matching rule.

Changes to the Plot Settings window are effective as soon as they are made.

Use the  button to close the Settings window.



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12-4 - Plot Settings Window

12.5 Real Time Graph Types

The following Graph Types are supported, and Plots for any type of Graph can be opened on the Real Time View in any order.

Tip: Plots can be vertically rearranged within the View by selecting and dragging to the desired location.

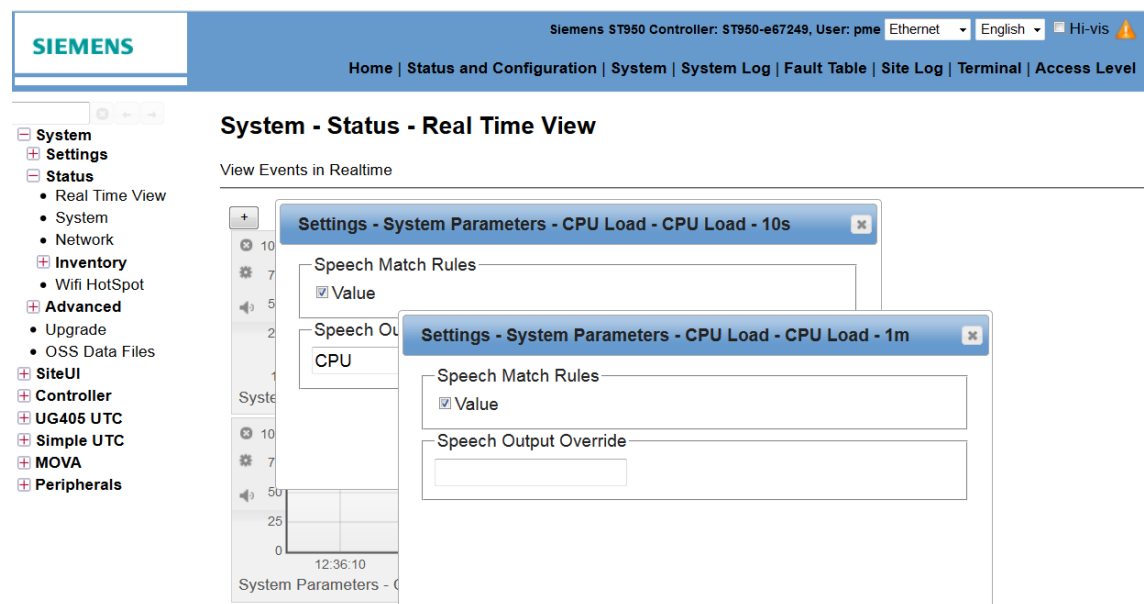
The Controller I/O and Phases groups are described in section 14.9.

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12.5.1 System Parameters

The CPU Load can be displayed as a plot against various time-bases, ranging from a ten second view to one week. If speech is enabled and the default Speech match Rules used, the browser will announce the CPU Load value as it changes.

Under normal operating conditions the CPU Load may reach 100%, e.g. when background activities are running or user interfaces are open, and this is not a cause for concern.



12-5 - CPU Load, Speech Match Rules, with Speech Output Override set for one Plot

The 24V Line logic supply voltage can be displayed as a plot against various time bases. Note that only the display of values for 24V Line plots is supported, speech cannot be enabled.

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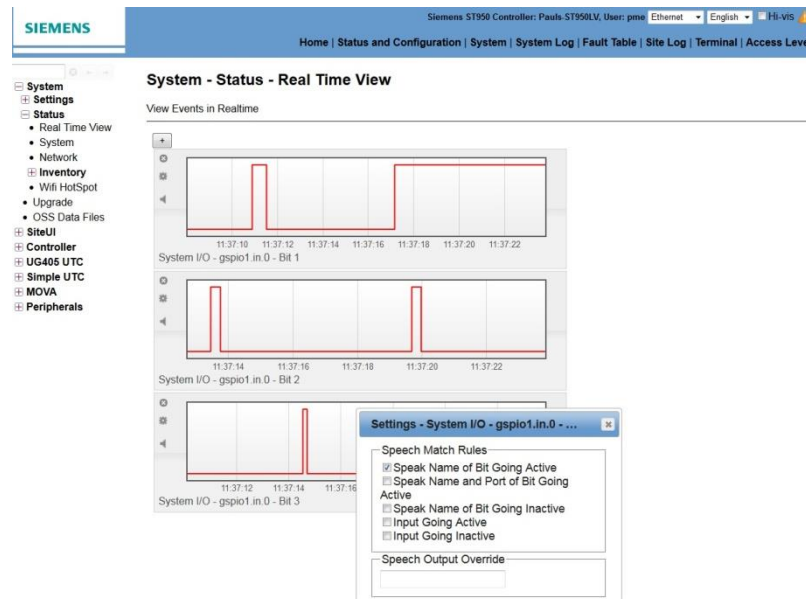
12.5.2 System I/O

These plots can be used to monitor the I/O at a System Communications level.

An Active bit state (i.e. System I/O Bit at state 1) is indicated by the Plot line going high.

An Inactive bit state (i.e. System I/O Bit at state 0) is indicated by the Plot line going low.

The Speech Match Rules are set by default to allow the Name of a Bit to be announced when it goes Active.



12-6 - System I/O, Speech Match Rules

The “Input Going Active” and/or “Input Going Inactive” rules can be specified to announce “Active” or “Inactive” when the state of the Port Bit changes, and this is announced after any speech which matches earlier rules.

Tip: With an ST950 controller it is easier to locate and identify controller detectors using the dedicated ‘Controller I/O’ group (section 14.9.1), rather than this generic ‘System I/O’ group.

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13 LANGUAGE

Alternative languages are supported through loading and selecting "language packs". The selected language is used for the web and handset interfaces. It is important to ensure that the unit and software used to access these interfaces is capable of displaying the characters used by the chosen language. Non ASCII characters are not supported on the 25 way RS232 port.

Note that a change of language only affects items created after the language change; the language of some items such as historic system log entries is not affected.

13.1 Loading Language Packs

Language packs are loaded through the System - Settings - Language - Packs web page.

Figure 13-1 - Loading Language Pack

The language packs which are currently loaded are listed and additional packs can be loaded as follows:

- Press the "Add Row" button to add an additional row to the table
- Press the "Browse" button on the appropriate row and navigate to and select the required language pack
- Press the "Save" button

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13.2 Selecting Language

The languages available can be viewed and selected using the drop down menu in the banner at the top of the web page. This field only appears if alternate languages are available.

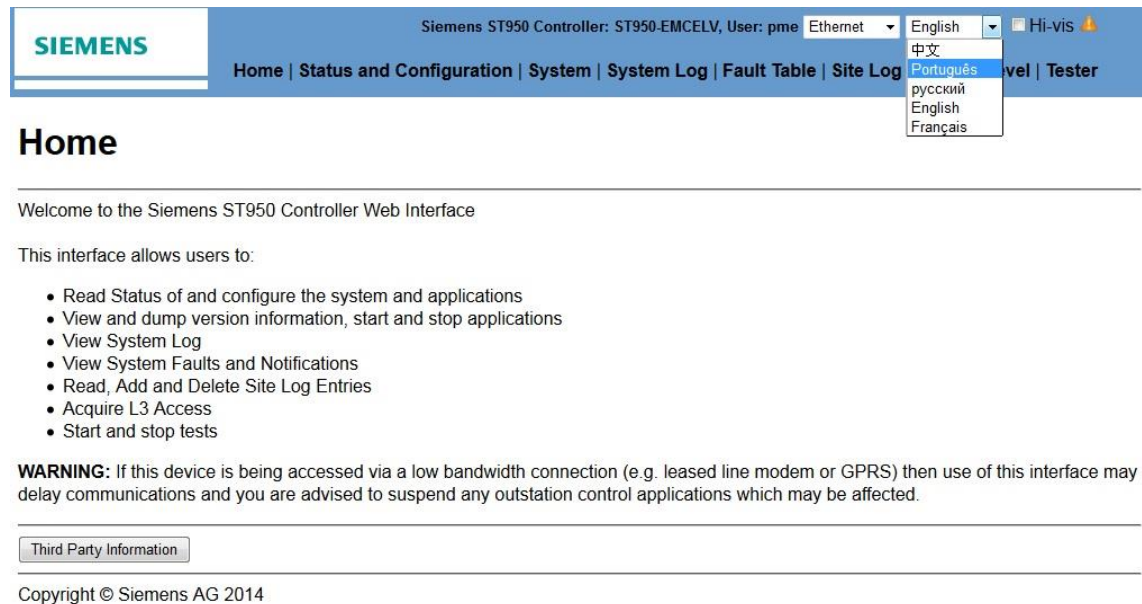


Figure 13-2 - Language Selection

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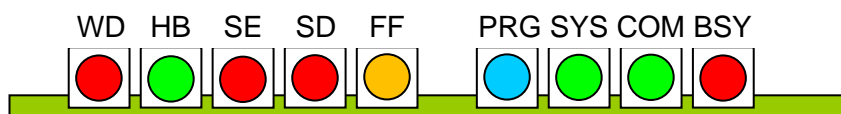
14 ST950 CONTROLLER SPECIFIC FEATURES

14.1 ST950 Indicators

LEDs are located on the front of the Processor Card and immediately behind the handset port. These are used to convey controller operational states and other information to the user.

14.1.1 Front of Processor Card

There are nine LEDs on the front of the Processor Card as shown below (viewed from the front of the Processor Card).



The function of each LED is described below.

WD – Watchdog (Red)

Illuminated when the Primary CPU is not running or an internal fault has been detected.

HB – Heartbeat (Green)

- Heartbeat flash: Primary CPU software is operating normally.
- Slowly flash (once per second): Controller self test.
- Fast flash (several times per second): Non normal operation e.g. startup.

SE - System Error (Red)

- Permanently on: Fault is present, e.g. one or more entries present in the Fault Table.
- Slow flash with Heartbeat LED flashing in a heartbeat pattern: Reserve State
- Fast flash with Heartbeat LED flashing in a heartbeat pattern: Reserve State is latched; manual reset required.
- Fast flash with fast flash Heartbeat LED: Fault with the Primary CPU, e.g. self test fault found.
- Fast flash at power-up with the Heartbeat LED not flashing: RTC faulty, e.g. backup support expired.

SD – Shutdown (Red)

Illuminated when the controller is in the Shutdown Mode i.e. signals are not being controlled.

FF – Fail Flash (Yellow)

Flashes when hardware fail flash is active.

PRG – Program (Blue)

Flashes to indicate programming of an IC4 configuration or new firmware is pending or in progress.

- Single pulse:

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- IC4 configuration available for programming.
- Double pulse:
 - Firmware upgrade available.
 - Heart restore pending.
 - Wipe request pending.
- Fast flash: Programming in progress.
- Solid on: Programming complete, power cycle required.

SYS – System (Green)

Flashes to indicate status.

- Slow flash: Normal operation.
- Medium flash: Normal operation, Fault present.
- Very fast flash: Restricted mode.

COM – Communications (Green)

- On: Under UTC control, pulses off indicate receipt of messages.
- Off: Not under UTC control, pulses on indicate receipt of messages.

BSY – Busy (Red)

Flashes to indicate the system is busy performing an operation that must not be interrupted, for example start up, upgrade, USB "memory stick" style interface is busy. Do not remove USB device or switch off the controller while this LED is flashing.

14.1.2 Behind Handset Connector

There is a pair of multicolour LEDs behind the handset connector are as shown below (viewed from the front of the Processor Card).



The function of each LED is described below.

SEC – SEC Status

- Green flash, long on, short off: Awaiting start request from Primary
- Green flash, equal on and off: Normal operation
- Green flash, short on, long off: Shutdown
- Red: SEC requested controller shutdown

FF – Fail Flash Status

- Green flash, equal on and off: Normal operation

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14.2 ST950 Controller Handset Interface

The controller handset interface is available directly through the 25 way RS232 port and by virtual terminal connection via the USB handset port, Ethernet port and WiFi hotspot.

The controller handset interface commands are described in 667/HH/46000/000.


14.2.1 ST950 Handset Virtual Terminal

When using a virtual terminal connection there are several means available for connection:

- IP Port 22 (standard SSH port). This connects to the GVP handset port where the command `XXC` can be used to switch to the Controller handset port. SSH gives greater security and provides support for languages using characters other than those in the ASCII character set. This port is enabled by default from version 6 onwards of the firmware package. This port is disabled when the Stratos profile is selected (section 16.1.1).
- IP Port 23 (standard telnet port). This connects to the GVP handset port where the command `XXC` can be used to switch to the Controller handset port. This port is enabled by default in version 5 and earlier of the firmware package. It is blocked by default in version 6 and later of the firmware package, but can be unblocked through the System - Advanced - Network - Telnet Server web page. This port is disabled when the Stratos profile is selected (section 16.1.1).
- User defined IP port (default 60023). When enabled this connects directly to the Controller handset port. This port can be enabled and the port number defined through the Controller – Advanced Status and Configuration web page.
- Web interface web terminal (section 4.10). This connects to the GVP handset port where the command `XXC` can be used to switch to the Controller handset port.

14.2.2 ST950 Handset RS232 Port

The RS232 interface provides automatic baud rate detection for 1200, 9600 and 19200 Baud and uses full RS232 handshaking to control data flow. The default RS232 parameters are 1200 Baud, 7 Bits, 1 Stop Bit, Even Parity. Other baud rates are detected when the user first plugs the handset device in and issues a number of Carriage Return characters. When the controller has recognized the baud rate it will provide the prompt:



```
Siemens
>
```

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14.3 ST950 Web Interface: Controller Level 3 Data

For the UK and other markets*, it is only permissible to change some data when present on site. This data is known as Level 3 data. To confirm the user is present on site, there is a button on the front of the CPU Card. Also, the process for changing this data is different to that previously described in order to ensure that the user changing the data is on site and that the data is correctly transferred to the controller.

* For other markets there is an IC4 option to disable this constraint, described below.

Obtaining Level 3 Access

Only one web session and one command line session (handset / telnet / SSH) can have Level 3 access at any one time.

Access levels for command line sessions are described in the Handset Handbook 667/HH/46000/000.

On the web interface Level 3 access can be obtained through either the *Access Level* item on the top banner menu or the *Controller - Access Level* submenu on the Status and Configuration pages.

Tip: The access level popup from the top banner menu can be used to obtain Level 3 access without moving away from the web page currently being viewed.

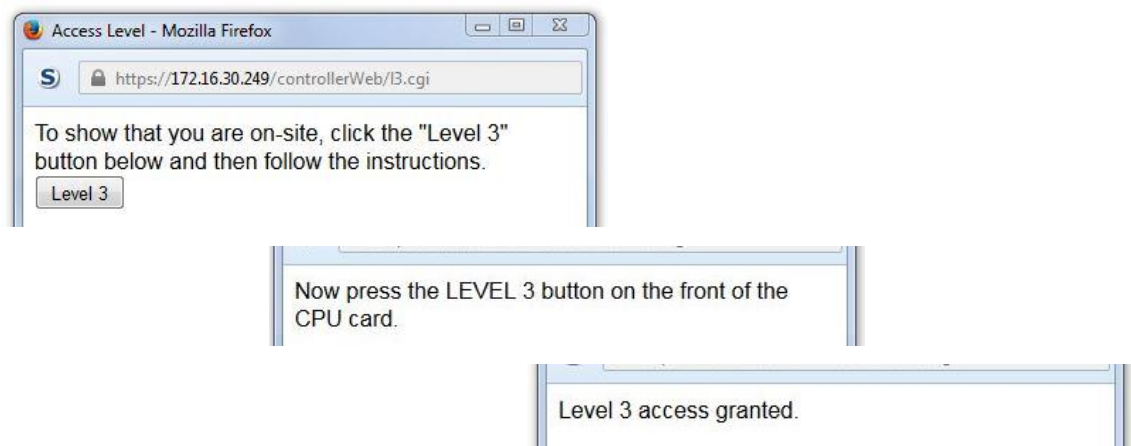


Figure 14-1 Access Level popup steps

Once granted, the Web session has level 3 access for 20 minutes, unless seized by another Web session. If a different Web session currently has level 3 access, the following warning is displayed but the user can still request level 3 access, seizing it away from the other session.



Figure 14-2 Access Level in use

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For Non-UK markets, web session Level-3 access can be obtained remotely by enabling the 'Download To Level 3' option in the IC4 Configuration. With this configuration option selected, Level-3 access is now granted when requested through the web interface – the user does not need to press the button the front of the CPU Card.



Figure 14-3 Access Level in use

Changing Level 3 Data

Until Level 3 access is obtained, it is not possible to change any Level 3 data on a web page (non Level 3 data can be changed in the usual manner). If a web page containing Level 3 data is viewed without Level 3 access then a message is displayed to indicate that there is data which cannot be changed and those items which cannot be changed are shown in a bold font (as highlighted in the image below).

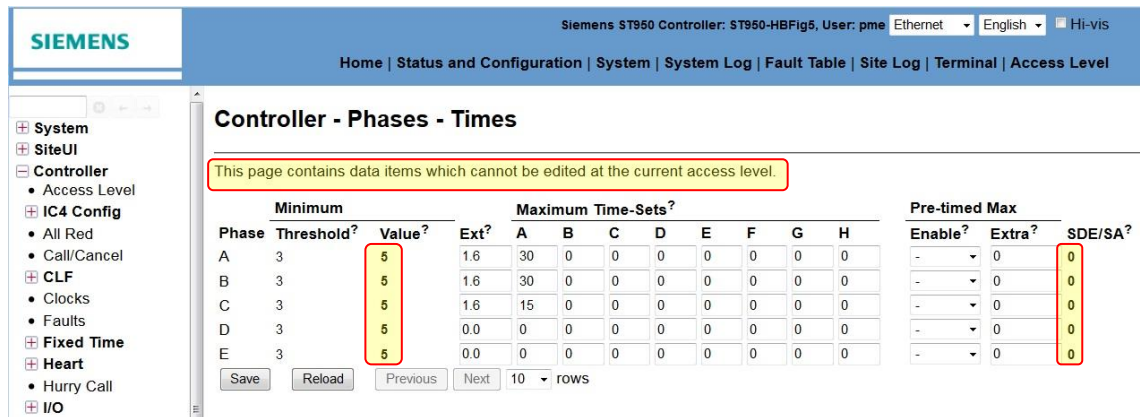


Figure 14-4 - User does not have Level 3 access

After obtaining Level 3 access the Level 3 data is shown in a text entry box and the Save button is changed to a Submit button. (If Level 3 access is obtained while viewing a page then it may be necessary to press the Reload button to refresh the page and so display the text entry boxes.)

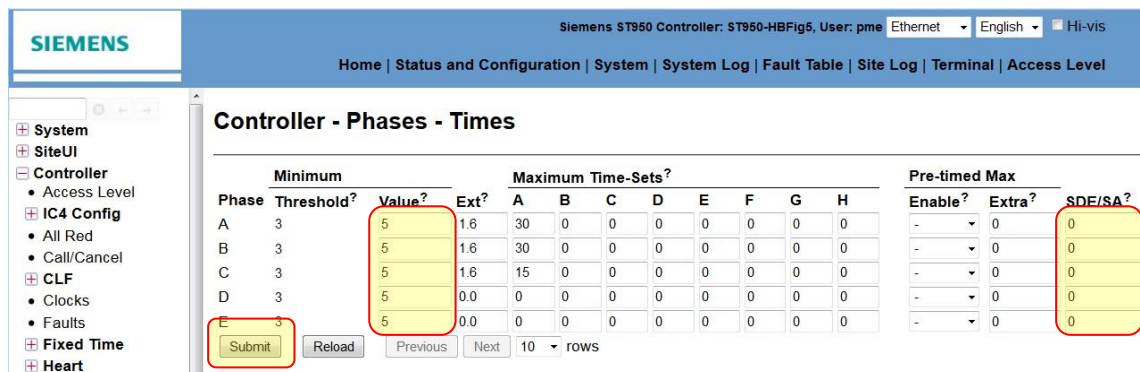


Figure 14-5 View of web page containing editable Level 3 items

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It is now possible to enter new values for the Level 3 items and changes are shown highlighted.

Siemens ST950 Controller: ST950-HBFig5, User: pme Ethernet English Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal | Access Level

Controller - Phases - Times

Phase	Minimum			Maximum Time-Sets?								Pre-timed Max		
	Threshold?	Value?	Ext?	A	B	C	D	E	F	G	H	Enable?	Extra?	SDE/SA?
A	3	5	1.6	30	0	0	0	0	0	0	0	-	0	2
B	3	5	1.6	30	0	0	0	0	0	0	0	-	0	0
C	3	5	1.6	15	0	0	0	0	0	0	0	-	0	0
D	3	6	0.0	0	0	0	0	0	0	0	0	-	0	0
E	3	5	0.0	0	0	0	0	0	0	0	0	-	3	0

Submit Reload Previous Next 10 rows

Figure 14-6 Level 3 items changes ready for submission

Updates to the page now undergo a two-stage submission process to ensure that the data is changed as the user intends. This process is initiated by pressing the *Submit* button. This causes a confirmation page to be displayed.

Siemens ST950 Controller: ST950-HBFig5, User: pme Ethernet English Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal | Access Level

Controller - Phases - Times

Phase	Minimum			Maximum Time-Sets?								Pre-timed Max		
	Threshold?	Value?	Ext?	A	B	C	D	E	F	G	H	Enable?	Extra?	SDE/SA?
A	3	5	1.6	30	0	0	0	0	0	0	0	-	0	2
B	3	5	1.6	30	0	0	0	0	0	0	0	-	0	0
C	3	5	1.6	15	0	0	0	0	0	0	0	-	0	0
D	3	6	0.0	0	0	0	0	0	0	0	0	-	0	0
E	3	5	0.0	0	0	0	0	0	0	0	0	-	3	0

The proposed changes are highlighted above. Please review these and select either 'Confirm' or 'Reload' below.

Confirm Reload

Figure 14-7 Confirmation page for Level 3 item changes

The changes are shown in bold and can be reviewed to ensure that they are as desired. The *Confirm* button can be pressed to accept the changes. To discard the changes and return to the current values press the *Reload* button.

14.4 ST950 Web Interface: Status & Configuration Web Pages

14.4.1 Status & Configuration - SiteUI

A live site map is supported through the web pages found under the *SiteUI* menu item (available in version 9 onwards), presenting the status of key items (Features), such as phases and detectors, in real time: see section 14.8 for further details.

- *View Map* - opens the Site UI diagram. Also allows the representation and location of the Features to be modified to better reflect site operation.
- *Initialisation* – data for the Site UI diagram can be configured from the IC4 Emulator tool output using this web page
- *Feature List* – the Features (objects) represented on the Site UI diagram are listed, and can also be modified via this page.

14.4.2 Status & Configuration – Controller

Configuration and monitoring of the controller functionality is performed through the web pages found under the *Controller* menu item of *Status and Configuration*.

Access Level

Level 3 access is obtained by pressing the *Level 3* button on this page followed by the Level 3 button on the controller Processor Card. Only one user session is permitted to have Level 3 access at any one time. This menu option provides the same functionality as the Access Level option on the top banner menu, but without using a pop-up window.

IC4 Config

Details of IC4 configuration currently in use.

- *Import Config* - load an IC4 configuration

All Red

Monitor & configure the All Red facility

Call / Cancel

Monitor and configure the Call / Cancel facility

CLF

Monitor and configure the Cable-less Linking Facility

- *Plans* – For each Plan accessing the configured cycle time, offset, entry and exit times, Smooth CLF options, and the selected Influence set.
- *Plan Times* – One page per Plan accessing the group times for the Plan.
- *Influences* – One page per Influence Set, allowing the functions and stages of each group (step) of each set (plan) to be changed. Note that one Influence Set may be being used by more than one CLF Plan.
- *Status* – view the current status of CLF mode, showing the current Plan and cycle time for example.
- *Groups* – shows the group active on each stream, and the time remaining for that group.

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Clocks

There are two clocks within the system:

- System - used for non-controller applications
- Controller - used by the controller application

These clocks can run independently or be joined together to match the way in which the controller is being used. This relationship between the clocks is called the Time Mode. There are three options for Time Mode, used as follows:

- System Time - controller clock is synchronised to system clock. Use this mode where NTP or GPS is providing the source of time to the system and synchronisation to other controllers (e.g. for CLF) is not required.
- Controller Time - system clock is synchronised to the controller clock. Use this mode where there is no NTP or GPS time source and the system is to generate its own time (usually mains synchronised).
- Dual Time - system and controller clocks keep independent time. Use this mode where the system must be synchronised to NTP or GPS but the controller needs to be synchronised to other controllers e.g. to support CLF.

Faults

Allows remote reboot and management of detector faults.

Remote reboot allows the controller to be recovered from a shutdown but only under strict conditions:

- The controller is shutdown
- The feature is permitted by a hardware link fitted on the Processor Card
- The controller has been running for at least ten minutes
- There has not been a previous unsuccessful remote reboot attempt
- The correct Remote Reboot Code is provided

Fixed Time

- *Standard* – view the fixed time configuration and update the stage times.
- *Linked* – view the combination of stages across the streams for each step and update the step times.

Heart

- *Ownership* - The Heart must be associated with the controller before the signals can be illuminated. The process of associating the Heart with the controller is known as ownership. This page displays the ownership status and if not owned, provides the means to initiate ownership. By owning the Heart, it allows the system to detect when the CPU PCB (or Heart SD Card) is changed.
- *Backup & Restore* - The system periodically saves a snapshot of the system software and configuration to the Heart. This snapshot is known as a Restore Point. Each snapshot updates the latest Restore Point. The latest Restore Point may be saved so it no longer gets overwritten. This makes it a *retained* Restore Point.

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This page lists the restore points which are present on the Heart and provides options to:

- Create a *latest* Restore Point if one doesn't already exist
- Operations on *latest* Restore Point:
 - Restore - initiate the restore from Heart process which replaces the software and configuration currently in the controller with that stored in the *latest* Restore Point
 - Delete - delete the *latest* Restore Point
 - Refresh - generate a new Restore Point and overwrite the *latest* restore point
 - Retain - move the Restore Point to the list of retained restore points
- Operations on *retained* Restore Point:
 - Restore - initiate the restore from Heart process which replaces the software and configuration currently in the controller with that stored in this *retained* Restore Point
 - Delete - delete this *retained* Restore Point

Hurry Call

Review and update the delay, hold and prevent times for each of the Hurry Call units.

I/O

- *Lines* - view and update the IO states
- *Faults* - view and update the IO fault action
- *Allocation* - view and update the IO allocation
- *Ports* - view the IO port states
- *Cards* - view and update the IO cards required
- *DFM Groups* - view and update the DFM group timings
- *U / D* - view and update uni-directional loops
- *Real Time View* - view I/O and other events in real time (sections 12 and 14.9)

LMU

- *General* - view and update general lamp monitoring parameters
- *Reset/Learning* - request full lamp monitor reset and monitor overall learning
- *RLM Faults* - trigger a recheck of Red Lamp Monitor faults that have extinguished the signals (KRD=1)
- *Sensors* - view and update the sensors' configuration, including the selection of Load Types and Last Lamp profiles.
- *Readings* - monitor the lamp monitor status of the various sensors, including whether a Lamp Fault has been detected.
- *Last Lamp - Profiles* - configuration of Last Lamp Monitoring
- *Last Lamp - Status* - view live currents, thresholds and fault indications

LRT

- *General Timing*

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- *Prepare Actions*
- *Advance Actions*
- *Compensation Times*
- *Status*

Misc

Enable / disable the mimic LEDs (ELV only) and manual mode.

MOVA mode**Pedestrian**

- *RLM* - number of Red Lamp Monitor channels on each stand-alone stream
- *Phase* - pedestrian demand and clearance times
- *Standalone* - overall options for stand-alone pedestrian controllers
- *Streams* - settings for individual stand-alone pedestrian streams, including the pedestrian all-red (PAR) periods and pelican intergreen times (PIT).
- *Linking* - PV1 and PV settings

Phase Delay

View and update the delays applied to phases when moving between stages.

Phases

- *Times* - view and update the various phase timings (minimums, maximums, etc)
- *Status* - monitor the current status of the phases (and streams)
- *Intergreen* - view and update phase intergreen timings
- *Intergreen Matrix* - view a matrix showing the intergreen timings between all phases
- *Intergreen Delays* - view the configuration and adjust the timings
- *Lamp Test* - illuminate single aspects during testing and commissioning

Priority

View and update the [Bus] Priority and Emergency Vehicle facility.

- *General* – demand enable/disable, monitoring and reversion
- *Times* – delay, extension, inhibit, maximum times
- *Inhibit* – interaction between units
- *VA* – demands from the street to be allowed or ‘enforced’ (introduced).

Special Conditioning

Always refer to the site-specific information (e.g. IC4 print-out) to determine what Special Conditioning features, faults and timers are provided.

- *Facilities* – enable/disable conditioning facilities (CFE)
- *Faults* – view the state of the various conditioning fault flags

Timers – view and adjust the conditioning time periodsSDE / SA

- *Assessors* – monitor the counts and speed detected by the SDE / SA assessors

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- *Phases* – monitor this influence of SDE / SA on the controller activity

Stages

- *Settings* – review and update general stage related configuration
- *Window Times* – limit when 'Type 3' demand-dependant phases can appear in each stage

Supply

Monitor and configure mains power supply and dimming.

Timetable

- *Special Day*
- *Special Holiday*
- *Time Switch*

UTC Mode

UTC mode settings, such as force bit watchdog and max green/window time operation.

Advanced

Configure for unusual circumstances. Only modify these settings if explicitly requested by Siemens Poole.

Wipe Config

Wipe the system of all stored configuration and log information – return to factory settings.

14.4.3 Status & Configuration – UTMC RM

Network

View and configure the network settings for UTMC Remote Monitoring.

Poll Rates

View and configure the frequency at which states are monitored in order to detect changes that trigger Inform Notification Events.

MOVA

If MOVA isn't used or there is a one-to-one mapping between Controller streams and the MOVA Applications (e.g. MOVA1 controls Stream 0 through to MOVA4 controlling Stream 3) then this page can be ignored. However, if the mapping is different use this page to map MOVA status information for each MOVA Application to the correct controller stream information in the RM-MIB.

I/O Mapping

View and configure the I/O mapping setting for UTMC Remote Monitoring.

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14.5 ST950 Loading An IC4 Configuration

An IC4 configuration can be loaded into the controller using either the web interface or the WIZ command. In both cases the controller assesses the difference between the configuration currently running and that being loaded and will either perform a full initialisation or a Quiet Initialisation.

Before loading a new IC4 Configuration, remember that even a Quiet Initialisation will still *'initialise'* the controller. Loading a new IC4 configuration...

- Will erase any changes made to handset alterable controller timings and settings. Consider using the IC4 View Differences facility to detect differences between these settings in the controller and the IC4 configuration.
- Will clear any controller fault indications. Check the Fault Table before proceeding.
- May also reset the Lamp Monitor, which will automatically start learning. After the configuration has been loaded, check all lamps are working and learning completes correctly.

When a new IC4 configuration is loaded, an entry is automatically added to the Site Log, see section 4.9. These log entries include the imported IC4 configuration files as attachments, which can be accessed by selecting the Attachment name in the Site Log, or as part of the Export of site information, see section 9.

14.5.1 Delivery of IC4 Configuration

In all cases the IC4 configuration is delivered to the controller in the form of an 8ZP file generated by IC4. The means of transporting this to the controller depends on whether the web interface or WIZ is to be used to load the configuration into the controller.

- Where the web interface is to be used the 8ZP file can be stored at any location that the device displaying the web pages has access to.
- Where WIZ is to be used the 8ZP file must be stored on a USB memory stick.

14.5.2 Initiation of IC4 Configuration Update Using the Web Interface

Acquire Level 3 Access

Level 3 access can be obtained using either the *Access Level* option on the web page banner or the *Controller - Access Level* web page.

Specify the file to be loaded

View the *Controller - IC4 Config - Import Config* web page, click on the *Browse* button and navigate to the 8ZP file to be loaded then press the *Submit* button.

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Siemens ST950 Controller: ST950-HBFig5, User: pme Ethernet English Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal | Access Level

Controller - IC4 Config - Import Config

This facility guides the user through the import of a new controller configuration and how to force the controller to adopt this configuration.
The controller configuration can be imported using a file with an 8ZP extension.

Warnings

Importing and using a configuration initialises the controller.
When the controller initialises, the imported configuration will replace the current configuration and erase any changes made to handset alterable timings and settings.
It may also reset the Lamp Monitor and automatically begin learning. Check all lamps are working and learning completes correctly.

Click the 'Browse' button to locate the 8ZP file on your computer and then click the 'Submit' button.
The controller will check the file before importing it.

Configuration File: No file selected.

Figure 14-8 Web page to select IC4 8ZP file for loading

Review the changes

The configuration currently in use and that to be loaded is displayed. If the change is as desired then press the *Import Configuration* button.

Siemens ST950 Controller: ST950-HBFig5, User: pme Ethernet English Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal | Access Level

Controller - IC4 Config - Import Config

This facility guides the user through the import of a new controller configuration and how to force the controller to adopt this configuration.
The controller configuration can be imported using a file with an 8ZP extension.

Warnings

Importing and using a configuration initialises the controller.
When the controller initialises, the imported configuration will replace the current configuration and erase any changes made to handset alterable timings and settings.
It may also reset the Lamp Monitor and automatically begin learning. Check all lamps are working and learning completes correct

'HBFig5 0.76' is the current configuration active in the controller.
'HBFig5 0.79' is the submitted configuration.

Click the 'Import Configuration' button if you wish to import the submitted configuration.
Click the 'Reject Configuration' button if you wish to reject the submitted configuration.

Figure 14-9 Web page to confirm import of IC4 configuration

Implement the change

The updated 8ZP file has now been loaded onto the controller file system but has not yet been implemented. At this point the controller checks to determine whether or not the change can be implemented by Quiet Initialisation. A web page appropriate to what is found is displayed.

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14.5.3 Implementation by Quiet Initialisation

Quiet Initialisation is possible, press the **OK** button to start the procedure. Access to the web pages will be interrupted while the controller reboots.



Important: Although many controllers will be configured with a Reserve State that keeps the traffic signals illuminated and cycling in Fixed Time mode, Reserve State can be configured to extinguish the signals in a controlled manner – check the IC4 Printout.

SIEMENS Siemens ST950 Controller: ST950-HBFig5, User: pme Ethernet English Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal | Access Level

Controller - IC4 Config - Import Config

This facility guides the user through the import of a new controller configuration and how to force the controller to adopt this configuration.
The controller configuration can be imported using a file with an 8ZP extension.

Warnings

Importing and using a configuration initialises the controller.
When the controller initialises, the imported configuration will replace the current configuration and erase any changes made to handset alterable timings and settings.
It may also reset the Lamp Monitor and automatically begin learning. Check all lamps are working and learning completes correctly.

The new configuration 'HBFig5 0.79' has been successfully imported.

Quiet Initialisation can be used with this configuration.
Only the Controller Application needs to reboot to load this configuration.
The traffic signals will be in their configured Reserve State until the Controller Application returns.

This procedure has not yet started.

Press Ok to start the procedure now.
Press Cancel to delete the imported configuration file.

Ok Cancel

Figure 14-10 Web page to start Quiet Initialisation

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Quiet Initialisation Progress

The Quiet Initialisation process waits for the switch off stages before proceeding to reboot the EFC and incorporate the IC4 configuration changes into the system. If for any reason the switch off stages don't gain right of way through the natural cycling of the junction, then they can be forced by pressing the *Force Stages* button.

This Force Stages option may be required if the switch off stage does not gain right of way because there are no suitable demands from the street or all the switch off stages may not gain right of way at the same time on all streams of a multi-stream controller.

Controller - IC4 Config - Import Config

This facility guides the user through the import of a new controller configuration and how to force the controller to adopt this configuration.
The controller configuration can be imported using a file with an 8ZP extension.

Warnings

Importing and using a configuration initialises the controller.
When the controller initialises, the imported configuration will replace the current configuration and erase any changes made to handset alterable timings and settings.
It may also reset the Lamp Monitor and automatically begin learning. Check all lamps are working and learning completes correctly.

Quiet Initialisation requested:
- The new configuration file will be used after reboot.
- The Controller Application will reboot during the configured Switch Off Stage(s).
Access to the web pages will be interrupted while the Application reboots.

Waiting for the configured Switch Off Stage(s) to gain ROW...

The controller may not grant the Switch Off Stage(s) right of way naturally.
Reasons include:
- No street demands for the Switch Off Stage(s), or
- The Switch Off Stage(s) don't gain right of way at the same time on all streams.
Press the button below to **force** the Switch Off Stage(s) to right of way.

Figure 14-11 Web page while waiting for shutdown stages to gain right of way

Completion of Quiet Initialisation

The controller enters the Reserve State and the EFC reboots. On exit from the Reserve State after the EFC reboot the controller is running the newly loaded IC4 configuration.

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14.5.4 Implementation by Full Initialisation

The changes to the configuration are such that a Quiet Initialisation cannot be performed. The System Log will identify the areas where the proposed configuration differs in such a way that Quiet Initialisation is not possible. The web page lists the steps to perform to implement a full initialisation.

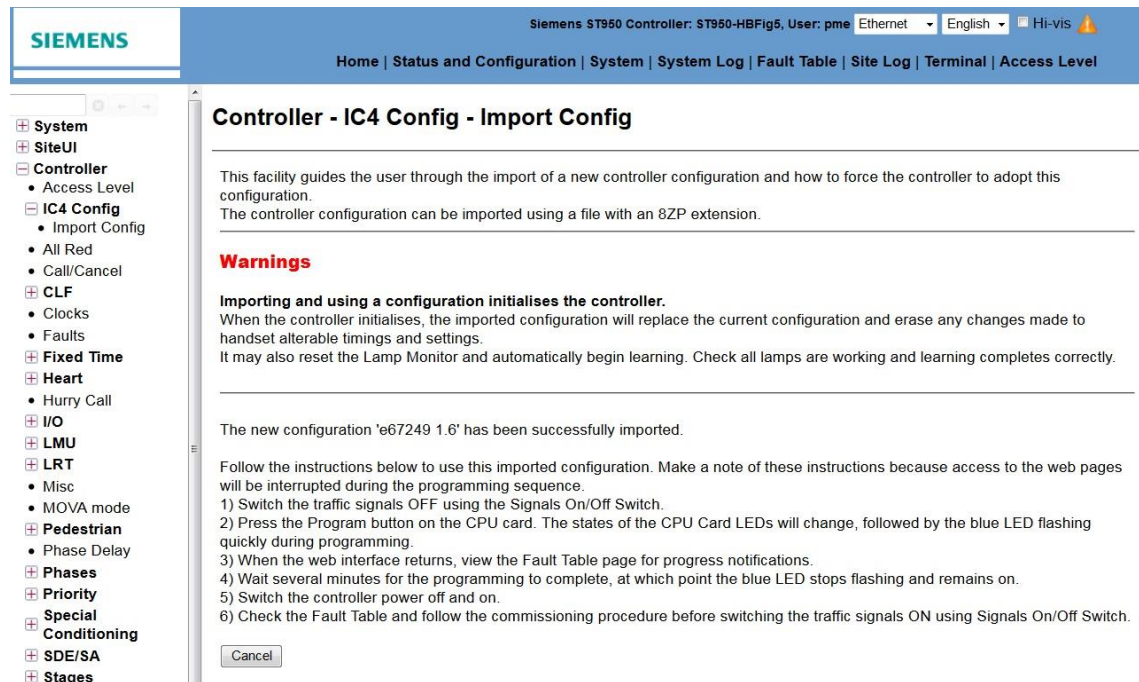


Figure 14-12 Web page showing full initialisation is required

To perform a Full Initialisation, follow these steps.

- 1) Switch the traffic signals OFF using the Signals On/Off Switch, observing the usual procedures for this action.
- 2) Press the Program button on the CPU card. The states of the CPU Card LEDs will change instantly, followed after a period of time by the blue LED flashing quickly during programming.
- 3) When the web interface returns, view the Fault Table page for progress notifications.
- 4) Wait several minutes for the programming to complete, at which point the blue LED stops flashing and remains on.
- 5) Switch the controller power off and on.
- 6) Check the Fault Table and follow the commissioning procedure before switching the traffic signals ON using Signals On/Off Switch.

After loading a new IC4 Configuration that differs significantly from the previous, it may be necessary to 'Own the Heart' (section 14.6). If this is required, there will be an appropriate entry in the Fault Table and the Signals On/Off Switch will be ignored, keeping the signals extinguished until the Heart is owned.

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14.5.5 Initiation of IC4 Configuration Update Using WIZ

To initiate an IC4 configuration change using WIZ, first copy the required 8ZP file onto a USB memory stick (do not place in sub directory on the memory stick) and insert the memory stick into the USB connector on the front of the CPU card.



USB memory sticks formatted with the FAT file system should be used. Encrypted USB memory sticks and those formatted with file systems other than FAT are not supported.

Next run WIZ and select the options highlighted in bold in the following:

- 1> Config/Status
- 2> Active Faults
- 3> Tester
- 4+ System Log
- 1- Load Sys Config
- 2> Save Log
- 3> Save Site Info
- 4+ Fetch Sys Config
- 1- Upgrade
- 2> Digital IO
- 3> Reboot
- 4+ TCPDump
- 1- Heart
- 2> IC4 Import
- 1> USB Drive

The controller now lists the IC4 configurations available on the USB memory stick. During the following sequence information is often displayed with the user then asked to press a key to continue. This sequence is to ensure that the user has the opportunity to view the information on a four line display before it is scrolled out of view.

Select the desired configuration.

```
1> e2PhLV_SDE.8ZP
2> eEMC-ST950ELV-QI
3> eEMC-ST950ELV-QI
```

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The controller now provides further information and asks for confirmation.

1> Imp EMCELV 0.5

Press 1 to continue. The controller now asks for confirmation:

Import:
eEMC-ST950ELV-QI1.8ZP

Y/N

Press Y to confirm and the controller reports progress while it loads the 8ZP file from the memory stick:

Importing:
eEMC-ST950ELV-QI1.8ZP

Please wait...

Imported:
eEMC-ST950ELV-QI1.8ZP

Press any key

Press a key to continue. The controller now checks the differences between the IC4 configuration running and that loaded from the memory stick to determine if a Quiet Initialisation can be performed with the sequence continuing accordingly.

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14.5.6 WIZ Quiet Initialisation

Quiet Init
available

Press any key

Press any key to continue, there is now one final opportunity to abort the operation:

1> Can EMCELV 0.5
2> Quiet Init



Important: Although many controllers will be configured with a Reserve State that keeps the traffic signals illuminated and cycling in Fixed Time mode, Reserve State can be configured to extinguish the signals in a controlled manner – check the IC4 Printout.

Press 2 to continue (or 1 to cancel):

Quiet Init

Press L3 Button

Press the Level 3 button on the front of the CPU board.

Initiating:
Quiet Init

Please wait...

Initiated:
Quiet Init

Press any key

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Press any key to force the switch-off stage to right of way. (Page 91 has more information on forcing the stages).

Forced Stages
No action possible

Press any key

Press any key to continue. The controller enters reserve state and the EFC reboots. On exit of reserve state after the EFC reboot the controller is running the newly loaded IC4 configuration.

14.5.7 WIZ Full Initialisation

If the differences between the configurations are such that a Quiet Initialisation cannot be performed then the user is prompted to perform the actions required for a full initialisation:

To re-program
Switch signals off
Press program button
Press any key

At this point, the Blue 'PRG' LED on the front of the CPU Card starts pulsing slowly. The signals switch on the manual panel must be moved to the OFF position followed by a single press of the 'PRG' button (Located behind the Level 3 push button). This causes the controller to reboot and adopt the newly imported IC4 configuration. The procedure is completed when the 'PRG' remains on solidly at which point the controller should be turned off then on.

If desired, it is still possible to cancel the adoption of the imported configuration as the handset display is now as follows.

1> Can EMCELV 0.5

Cancel:
EMCELV 0.5

Y/N

Press 'Y' to confirm the cancel of the operation.

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Cancelling:
EMCELV 0.5

Please wait...

Cancelled:
EMCELV 0.5

Press any key

The blue 'PRG' LED stops pulsing at this point.

14.6 ST950 Heart of the Controller

The Heart of the Controller (also referred to as simply the 'Heart') holds a backup of the system which can be used to:

- Clone the system onto a replacement Processor Card if the original requires replacement.
- Return the system to an earlier state.

All aspects of the system are recorded in the backup including firmware, configuration, system log, site log and all changes made to the point at which the backup was taken.

The Heart is implemented using an SD card fitted to the Processor Card.

Backups are created and written to the Heart periodically, usually at 00:30am but this can be changed if required using the System - Advanced - Backup web page. Backups can also be created and 'retained' on demand.

14.6.1 Ownership

It is important both that the Heart is fitted and working in a controller (to ensure that the system is backed up) and that the correct Heart is fitted to the correct controller (to ensure that another controller's backup is not accidentally restored). *Ownership* is the means by which this is achieved.

When a controller is started with a new or unrecognised Heart, illumination of the signals will be disabled to prevent a replacement Processor Card running with a configuration from a different site and to ensure that the ownership process takes place correctly. This state is reported in the Fault Table.

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Fault Table

This table displays all the currently active faults. ?

- Change of heart or significant config change detected - signals on/off switch disabled?

Notification Table

This table displays all the currently active notifications. ?

- Signals off?

Figure 14-13 - Fault Table indicating that the Heart is not recognised

And the *Active Faults* on WIZ reports:

Change of heart or
significant config
change detected -
signals on/off

The action to be taken depends on the reason for the Heart not being recognised. If a new or replacement SD has been placed in the Processor Card then the Heart should be owned. If a new or significantly different IC4 configuration has just been loaded then the Heart should be owned. If a Heart from an existing site has been placed in a replacement Processor Card then a restoration from the Heart should be performed.

14.6.2 Owning the Heart

Before using a new SD as a Heart it must be owned. This operation can be carried out either using the web pages or using WIZ, as described in the following sections.

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14.6.3 Owning the Heart Using Web Pages

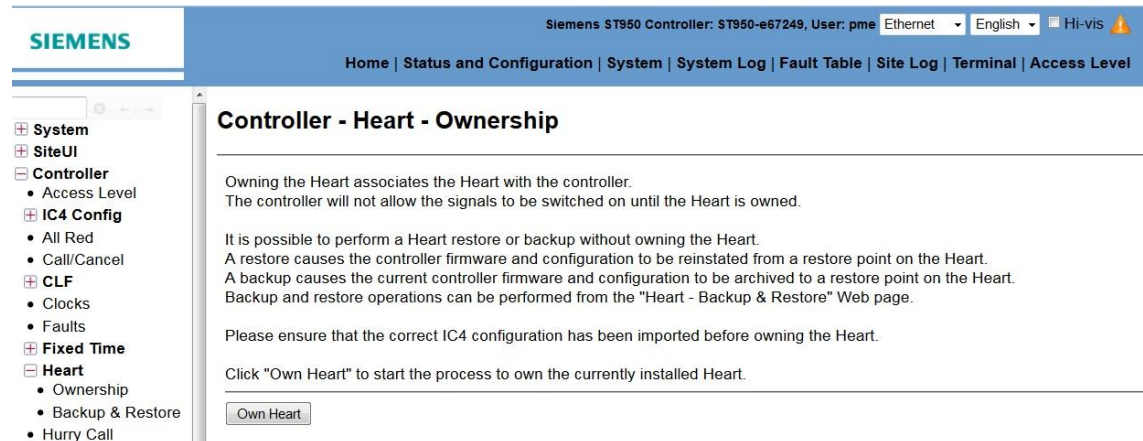


Figure 14-14 - Web page used to own the Heart

The Heart is owned using the Controller - Heart - Ownership web page. To start the process, press the *Own Heart* button. It is important to confirm that the operation is being performed on site (to ensure that the Heart / Processor combination has been reviewed and the correct decision been made) so it is necessary to press the Level 3 button as instructed.

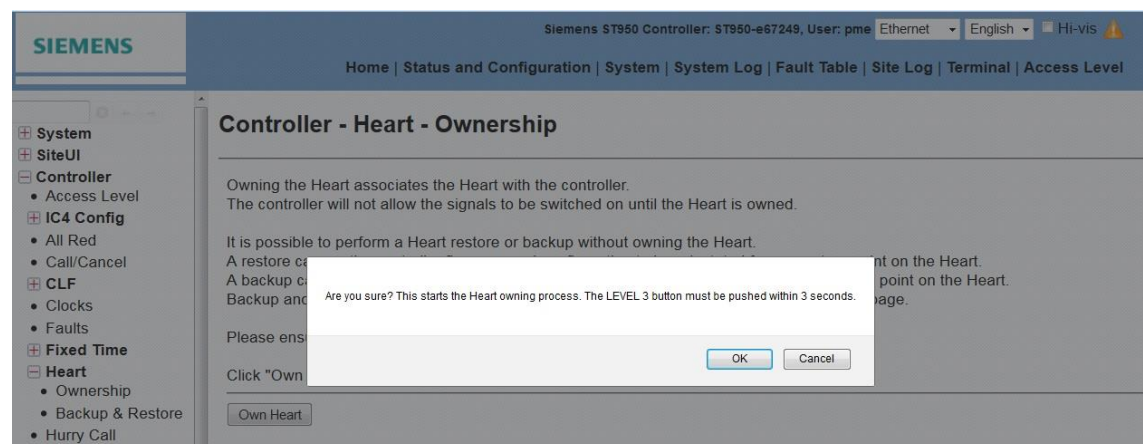


Figure 14-15 - Request to press Level 3 button during Heart ownership sequence

The ownership sequence is completed by turning the controller off and then on. This is reported in the Fault Table.

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Fault Table

This table displays all the currently active faults.?

- Heart owned - Power off/on required?

Notification Table

This table displays all the currently active notifications. ?

- Signals off?

Figure 14-16 - Fault Table indication that the controller must be turned off then on to complete the Heart ownership

14.6.4 Owning the Heart using WIZ

In WIZ there are two options within the Heart menu:

- 1> Own Heart
- 2> Restore

Select the first of these for this operation and the following will be displayed:

Signals are not
controlled unless
Heart is owned
Press any key.

Press any key and the following is displayed:

To own Heart press
any key, then the
LEVEL 3 button
within 3 seconds.

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Follow the instructions and the following is displayed:

```
Success:
Power off/on
required.
Press any key
```

Power the controller off then on and the controller will start normally and allow the signals to be turned on.

Other Possible Routes

If the controller is shutdown then the following is displayed.

```
Cannot own Heart
while controller
is shutdown.
Press any key.
```

If the Heart is already owned then the following is displayed.

```
Heart is already
owned.
Press any key.
```

14.6.5 Restoring from the Heart

When a Processor Card needs to be replaced it is possible to clone the system which was running on the old Processor Card onto the replacement Processor Card. This operation can be performed using either web pages or WIZ.

The system backups held on the Heart are known as Restore Points.



If the restoration from Heart is being performed to clone a system onto a replacement CPU card then it is important that the Ethernet cable (if used) is **not** connected to the replacement CPU card until the restore from Heart operation is complete. This is because if the replacement CPU card has been previously used it might have network configuration remaining within it which conflicts with the network being connected to.

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14.6.6 Restoring from the Heart Using Web Pages

Controller - Heart - Backup & Restore

The buttons below may be used to manage the restore points held on the Heart.

Latest Restore Point:

This is the latest available restore point, which is automatically generated and replaced. This restore point can be retained so that it is not automatically replaced. If a newer restore point is required, then this can be created / refreshed to represent the current system.

Platform	File System Description	File System Part Number	File System Version	Site Name	Serial Number	Date Time Generated	Restore	Delete	Refresh	Retain
linuxEFC	Siemens ST950 Controller	667/TZ /46059/000	8.28	ST950-HBfig5	09162094	Mon 22 Jun 2015 16:01:32 BST (latest)	Restore	Delete	Refresh	Retain

Retained restore points from this system:

Platform	File System Description	File System Part Number	File System Version	Site Name	Serial Number	Date Time Generated	Restore	Delete
linuxEFC	Siemens ST950 Controller	667/TZ /46059/000	8.28	ST950-HBfig5	09162094	Fri 19 Jun 2015 18:15:56 BST (rp)	Restore	Delete
linuxEFC	Siemens ST950 Controller	667/TZ /46059/000	8.28	ST950-31071	09162094	Thu 18 Jun 2015 00:32:15 BST (rp)	Restore	Delete
linuxEFC	Siemens ST950 Controller	667/TZ /46059/000	8.28	ST950-HBfig5	09162094	Wed 17 Jun 2015 17:26:07 BST (rp)	Restore	Delete
linuxEFC	Siemens ST950 Controller	667/TZ /46059/000	8.28	ST950-e67249	09162094	Wed 17 Jun 2015 00:31:37 BST (rp)	Restore	Delete
linuxEFC	Siemens ST950 Controller	667/TZ /46059/000	8.28	ST950-e67249	09162094	Fri 12 Jun 2015 00:31:20 BST (rp)	Restore	Delete

Figure 14-17 - Restore Points available for use

The Restore Points available are shown on the Controller - Heart - Backup & Restore web page. Restoration to one of the listed Restore Points is initiated by:

- Turning off the signals
- Pressing the *Restore* button associated with the Restore Point.
- Pressing the Program Button on the Processor Card within 30 seconds of the previous step.

Controller - Heart - Backup & Restore

A restore has been requested.

To start the restore ensure the signals are switched off then press the program button within 30 seconds. If the button is not pressed within the specified time, the contents of the Heart will be redisplayed.

Figure 14-18 - Restoration instruction screen

Controller - Heart - Backup & Restore

Backup and Restore system is busy.

The restore will take several minutes to complete.

The controller will reboot during the restore at which time the Web interface will not be available. During the subsequent initialisation, contact with the Web interface will be restored. When the Web interface is restored, progress and further instructions can be viewed by accessing the Fault Table Web page.

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Figure 14-19 - Restoration progress screen

The EFC now reboots, performs the restoration then programs the Primary, SEC and Fail Flash processors in order to restore their state to that requested. The operation is completed by turning the power to the controller off then on and owning the Heart if required (see 14.6.3).



Fault Table

This table displays all the currently active faults. ?

- No Faults Active

Notification Table

This table displays all the currently active notifications. ?

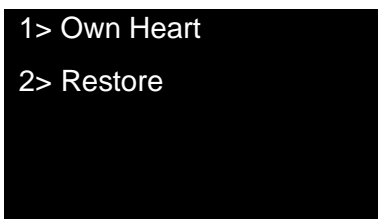
- GSPI Bridge awaiting GSPI initialisation?
- Programming of the Primary completed successfully.
- Programming of the SEC completed successfully.
- Programming of the Fail Flash completed successfully.
- Signals off?
- Please turn the controller off then on.

Figure 14-20 - Fault Table on completion of restoration from Heart

14.6.7 Restoring from the Heart Using WIZ

It is only possible to restore the most recent Restore Point when using WIZ. To start the operation, invoke WIZ from the handset command line and select the *Heart* menu item from the top level WIZ menu.

The user is presented with a sub-menu containing the following two options.



Select option 2.

The controller reads the available restore points from the Heart and outputs the following. NOTE : The restore point name shown below is representative of a typical restore point.

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Restore from:

ST950-LV32B

Y/N?

Selecting “N” will display the following.

Restore not

started.

Press any key

Pressing any key returns to the original sub-menu. If no key is pressed, the user is automatically returned to the sub-menu after a few seconds.

Selecting “Y” will display the following.

Switch signals off

and press the PRG

button.

Press any key

The blue LED on the front of the Processor Card starts pulsing in a heartbeat fashion for 30 seconds. The user has this period in which to ensure the signals switch is turned OFF and to press the program button on the front of the Processor Card. If the program button is pressed whilst the signals switch is ON or after the blue LED has extinguished, the restore operation is not started.

The original WIZ menu is displayed irrespective of whether the user presses any key.

The restore operation takes several minutes to complete during which time the controller reboots. Contact via the handset is not possible whilst the restore is in progress. Completion is indicated by the blue LED remaining permanently lit (on but not flashing).

The process is completed by turning the controller off then on.

14.6.8 Creating Restore Points

A Restore Point is created periodically by the controller. This Restore Point is known as the *Latest Restore Point*. If the *Latest Restore Point* exists at the time of the periodic creation then it is overwritten with the new system snapshot.

A Restore Point can also be created on demand by the user if there is not already a *Latest Restore Point*.

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The following operations are possible on the *Latest Restore Point*:

- Restore - restore the system to that stored in the Restore Point
- Delete - delete the Restore Point. It is not possible to recover the Restore Point after deletion.
- Refresh - update the Restore Point with a snapshot of the current system.
- Retain - move the Restore Point to the list of *Retained Restore Points* so it is not overwritten by the next scheduled backup.

Controller - Heart - Backup & Restore

The buttons below may be used to manage the restore points held on the Heart.

Latest Restore Point:

This is the latest available restore point, which is automatically generated and replaced. This restore point can be retained so that it is not automatically replaced. If a newer restore point is required, then this can be created / refreshed to represent the current system.

Platform	File System Description	File System Part Number	File System Version	Site Name	Serial Number	Date Time Generated	Restore	Delete	Refresh	Retain
linuxEFC	Siemens ST950 Controller	667/TZ /46059/000	8.28	ST950-HBfig5	09162094	Mon 22 Jun 2015 16:01:32 BST (latest)	Restore	Delete	Refresh	Retain

Retained restore points from this system:

Platform	File System Description	File System Part Number	File System Version	Site Name	Serial Number	Date Time Generated	Restore	Delete
linuxEFC	Siemens ST950 Controller	667/TZ /46059/000	8.28	ST950-HBfig5	09162094	Fri 19 Jun 2015 18:15:56 BST (rp)	Restore	Delete
linuxEFC	Siemens ST950 Controller	667/TZ /46059/000	8.28	ST950-31071	09162094	Thu 18 Jun 2015 00:32:15 BST (rp)	Restore	Delete
linuxEFC	Siemens ST950 Controller	667/TZ /46059/000	8.28	ST950-HBfig5	09162094	Wed 17 Jun 2015 17:26:07 BST (rp)	Restore	Delete
linuxEFC	Siemens ST950 Controller	667/TZ /46059/000	8.28	ST950-e67249	09162094	Wed 17 Jun 2015 00:31:37 BST (rp)	Restore	Delete
linuxEFC	Siemens ST950 Controller	667/TZ /46059/000	8.28	ST950-e67249	09162094	Fri 12 Jun 2015 00:31:20 BST (rp)	Restore	Delete

Figure 14-21 - Latest and list of Retained Restore Points

There can be many *Retained Restore Points*, up to the capacity of the SD card being used for the Heart. The following operations are possible on a *Retained Restore Point*:

- Restore - restore the system to that stored in the Restore Point
- Delete - delete the Restore Point. It is not possible to recover the Restore Point after deletion.

Restore Point operations can take a little time to complete. During this time the following web page is displayed unless there is a more operation specific page to display.

Controller - Heart - Backup & Restore

Backup and Restore system is busy.

The contents of the Heart will be automatically displayed when the requested user action has completed.

Figure 14-22 - Restore Point busy page

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14.7 ST950 Firmware Upgrade

Most of the firmware within the ST950 controller is stored in non-removal devices. This firmware can be updated using the mechanisms described in this section. The following firmware can be upgraded in this way:

- CPU card
 - EFC firmware
 - Primary firmware
 - SEC firmware
 - Fail Flash firmware
- Non-Plus+ GSPI peripheral card (e.g. Serial I/O Cards)
 - GSPI peripheral firmware
- Plus+ peripherals (e.g. CIC, RAG Node) – see ST950 Plus+ Handbook (667/HE/53000/000)

The following firmware is stored in a removable device and if upgrade is required then the device must be replaced with a part containing the new firmware:

- CPU card
 - PHP firmware

The following firmware is stored in a non-removable device and is not upgradable by the user:

- LSLS card

14.7.1 Updating CPU Card Firmware

There are four devices on the CPU card which can be updated using this process:

- EFC
- Primary
- SEC
- Fail Flash

An update may change the firmware in either the EFC alone or in all four devices. During an upgrade the controller detects which devices are affected and performs varies the procedure accordingly.

The controller implements a firmware update in one of two ways depending upon the extent of the change, as described below.

14.7.2 Immediate Implementation

For most “EFC-only” updates the update is implemented immediately and the EFC restarted. This will cause the controller to enter Reserve State. The controller will leave Reserve State and the signals return to their normal operation once the restart of the EFC is complete.

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14.7.3 Delayed Implementation

Update of the Primary, SEC and Fail Flash always results in the signals going off so is not implemented immediately but held until an appropriate time is determined by somebody on site. Some EFC only changes might be considered extensive enough to also warrant an on-site presence. That an update is pending in this manner is indicated by the following:

- A status of "Update on Hold" reported on the System – Upgrade web page.
- Entries in the Notification Table indicating how to proceed with or cancel the update.
- The blue LED on the CPU board flashing with a double beat.



Power cycling the controller does not abort the upgrade as the upgrade is held pending across a power cycle.

To proceed with this update, perform the following:

- When safe to do so, turn off the signals using the signals on / off switch.
- Press the programming button on the CPU board.

This action causes the EFC to reboot then program the Primary, SEC and Fail Flash (although if the Fail Flash switch is in the ON position, the Fail Flash CPU will not be reprogrammed but continue to flash the signals). On completion of this programming operation the blue LED on the CPU board stops flashes quickly and remains on solid. At this point the update is completed by powering the controller off then on.



Important: Firmware upgrade and programming will take several minutes. Do not power off/on until the programming operation has completed and the blue LED remains on.

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14.8 SiteUI

The Site UI Diagram or Map shows the status of the signal heads and detectors (Features) as their state varies in real time.

The number, identity and type of the displayed Features are initially based on the Controller Configuration, and stored with their location and size in a Feature List. The Map is drawn when opened using the Feature values from this List.

The Features (and any duplicate Features) can be automatically located on the Site UI Map in positions similar to that shown by the IC4 Emulator tool. This is done by importing an IC4 Emulator Project file (.8PJ), which if used must also include a 'bitmap' background image for the site.

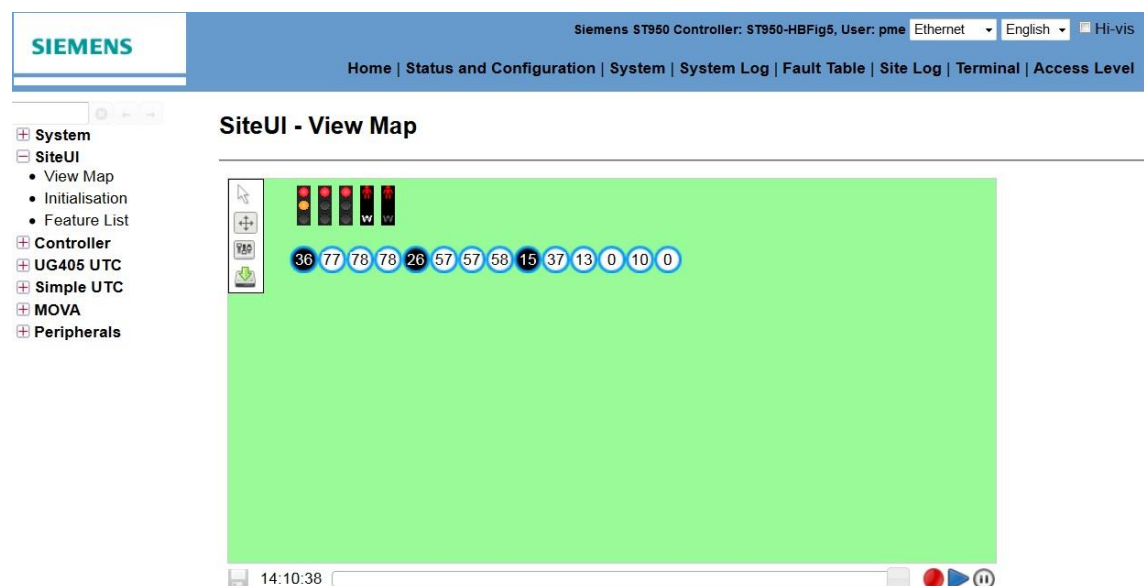
The representation of the Features can be modified either directly on the map, or by modifying entries in the Feature List, to give a more intuitive view of site operation.

Note that the resulting Feature List and background image definition are considered part of the System Configuration written to the Restore Points on the Heart or imported/exported to file and the OSS.

14.8.1 SiteUI – View Map



The Site UI Map displays the signal heads and detectors referenced in the controller configuration, via the Features List, and opens by default in View Mode. It incorporates a Timeline Slider for historic data display and the pausing of data recording, and a set of Map Modification buttons. The signal heads and detectors are considered as Map Features which can be modified, re-positioned, duplicated and hidden to allow different aspects of site operation to be reviewed.

Should an IC4 Emulator Project file not have been specified (or the Features are not placed within the area of the background image), then unplaced Features are located on the Map towards the top left of the Map, adjacent to the Modification buttons.

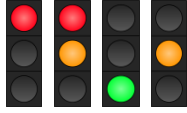








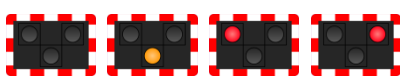
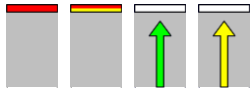
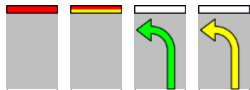
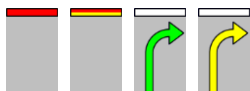
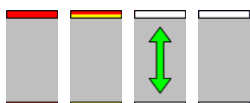







14-23 - Site UI Map, with no IC4 Emulator Project file loaded

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Detectors are represented by circles on the map, enclosing the corresponding Detector counts. A currently active Detector appears black , an inactive detector white .

Phases can be represented in a variety of ways on the Map, as Signal Heads, Stop Lines or as STS symbols. The typical phase Type representations are shown below.

Signal Heads	Head: 3-Aspect	
	Head: Ped with Wait	
	Head: Green Arrow	
	Head: LRT (Ahead)	 or for other states: 
	Head: LRT (Left)	 or for other states: 
	Head: LRT (Right)	 or for other states: 
Stop Line	Head: Wig-Wag (F/Red)	
	Stop Line and Arrow	
	Stop Line and Arrow (Left)	
	Stop Line and Arrow (Right)	
	Stop Line (Crossing)	
STS	STS (Standard)	
	STS Left Arrow	
	STS Right Arrow	
	STS Ahead Arrow (drawn on left)	
	STS Ahead Arrow (drawn on right)	


14-24 – Typical Phase representations

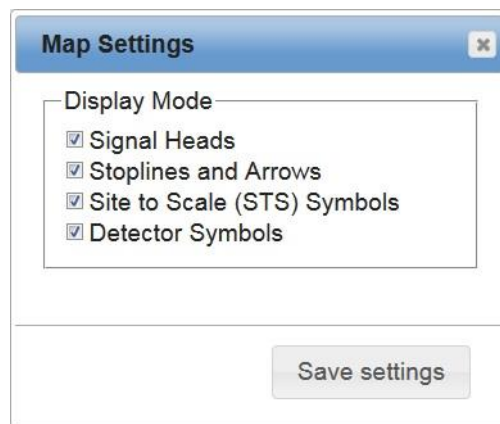
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Limitation: Switched Signs are presented as ‘Head: 3-Aspect’ Features, mapped from their respective Controller Outputs on the phase hardware (Lamp Switch Cards).

Limitation: The SiteUI Map may not operate correctly on some Android devices using Firefox. If Features are not consistently shown, check for Firefox updates or consider using a Chrome browser.

14.8.2 Map Settings Window


The Map Settings window can be opened by selecting the  button, and is used to specify which types of Features are displayed on the Map. By default all Feature types are displayed.



14-25 - SiteUI Map - Map Settings window

Unticking a Feature type and then selecting “Save settings” results in that type of Feature being removed from the SiteUI Map display.

Changing the Map Settings does not result in any changes being made to the Feature List. Selecting “Reset Features” on the SiteUI – Initialisation web page results in the Map Settings being returned to their defaults whereby all Features are displayed.


The  button can be used to close the Map Settings window without saving the modified settings.

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14.8.3 Timeline Slider




14-26 - Default Timeline Slider, playing and recording live states

The Timeline Slider can be used to pause live recording by selecting the  button.



14-27 - Timeline Slider, recording and playing live states Paused

To resume live data recording and display, select the  button.

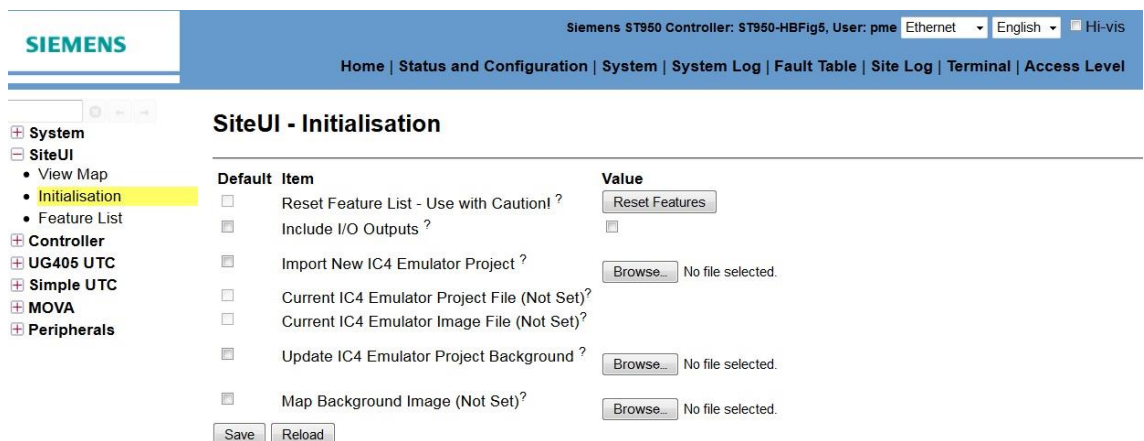
To review historic recorded data, drag the Timeline slider across the bar.



14-28 – Timeline slider dragged to review Historic recorded data

14.8.4 SiteUI – Initialisation

This web page provides initial data settings for the Features and can be used to configure and size the Site UI Map from the IC4 Emulator tool output.



14-29 - Site UI Initialisation web page

The following selections are available:

- *“Reset Features”* – this can be used to repopulate the Feature List from the controller configuration, discarding any changes made via the Site UI Map.
- *“Include I/O Outputs”* - I/O Outputs that are not present in the imported IC4 Emulator project file can be added to the Feature List and shown on the Site UI Map by selecting this option. All Outputs will be drawn to the Map when it is next opened. By default, Outputs are not included to avoid clutter.
- *“Import New IC4 Emulator Project”* – this allows a Project file (.8PJ) saved by the IC4 Emulator tool to be imported to locate and orientate the Features in

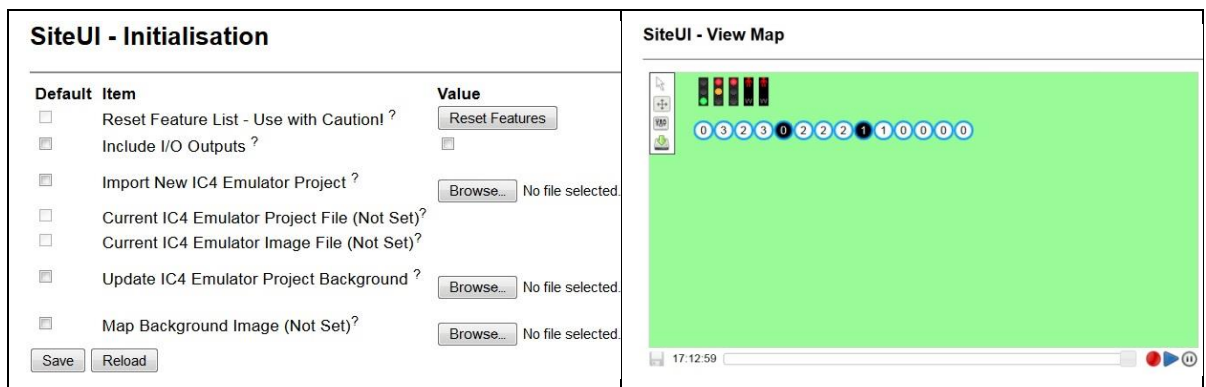
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similar positions to that shown in the IC4 Emulator. It also imports the Bitmap background image for display as the Site UI Map background. Note that the dimensions of the background image are used to size the map area.

- **“Update IC4 Emulator Project Background”** - this can be used to import the Bitmap background image for display as the Site UI Map background, but will not result in modifying the location or orientation of the Features. However, the new image will be used to size the map area, so the feature positions may change if the new image is of a different size.
- **“Map Background Image”** – an image file (.GIF, .JPG or .JPEG) can be imported as the background image using this option, if no IC4 Emulator Project file is available. The recommended image size is 768 x 384 pixels.

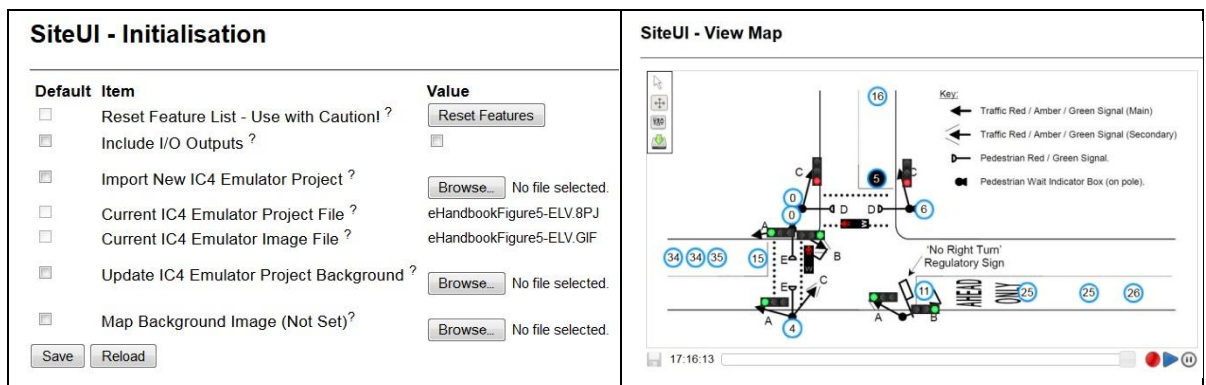
The Site UI – Initialisation web page does not auto-refresh; use the Reload button to confirm any changes made.

Figure 14-30 shows the Site UI with nothing imported from the IC4 Emulator and no Background Image set.



14-30 - Site UI with no Project File or Background Image imported

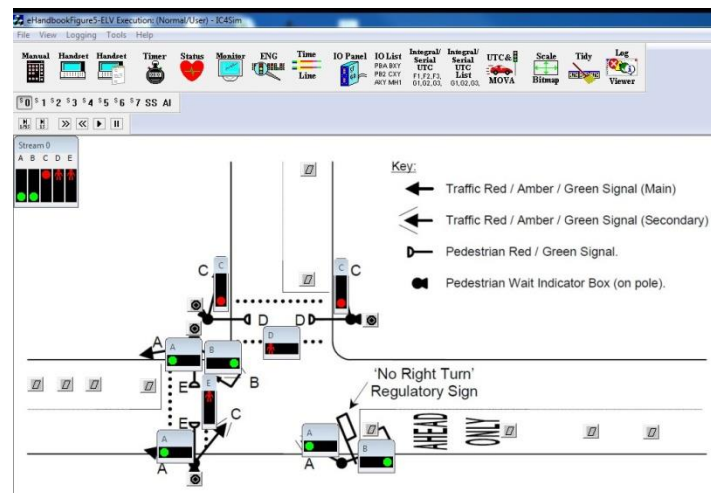
Figure 14-31 shows the result of mapping an IC4 Emulator Project File. Note that it can take a minute or so to process the bitmap image and redefine the Features in the Feature List, during which time the message “The requested map is regenerating, please wait” will be displayed when the Site UI Map is opened.



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14-31 - Site UI Importing an Emulator Project File

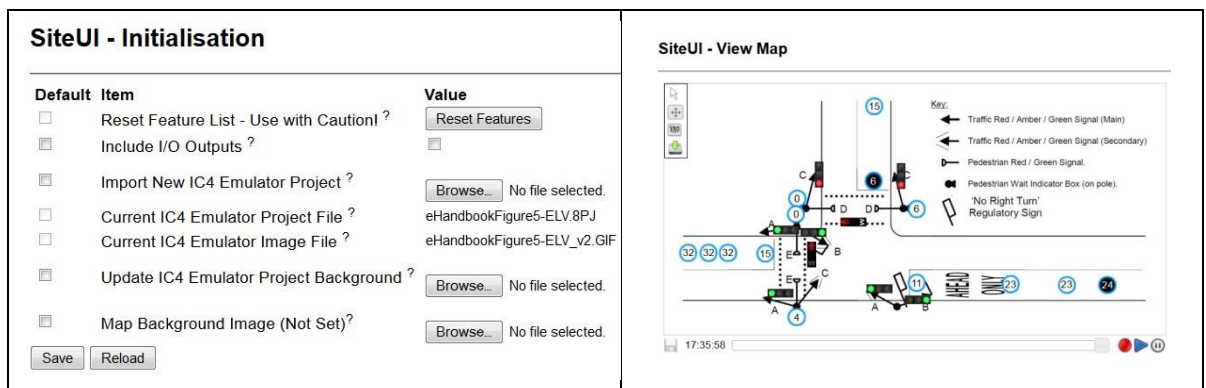
The corresponding view in the IC4 Emulator is shown in Figure 14-32.



14-32 - Corresponding view in IC4 Emulator Tool

Tip: A background image with an aspect ratio of 4:3 or 16:9 gives the best results, particularly on smaller screened devices.

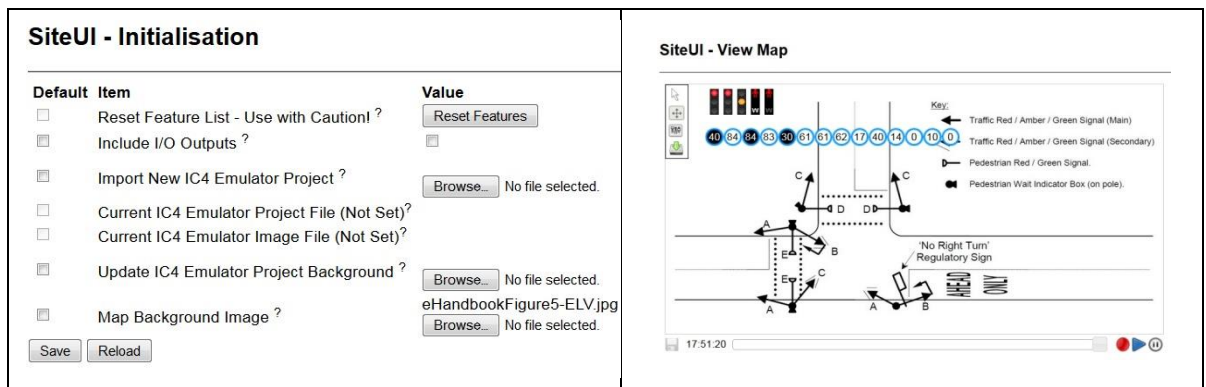
If the 'bitmap' background image is changed in the IC4 Emulator tool, the new background image can be imported from the 'updated' project file by using the "Update IC4 Emulator Project Background". This will not result in the location of the Features on the Site UI Map changing (but may result in the map being re-sized), see Figure 14-33.



14-33 - Site UI Importing just the Emulator Background Image

If no IC4 Emulator project file is available a background image can be separately imported by browsing on the "Map Background Image" option, see Figure 14-34. The Feature positions can then be manually adjusted from their default positions by using the Map in 'Edit Mode' (see 14.8.8).

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14-34 - Site UI importing a background image only

Tip: Always re-open the SiteUI Map after importing an IC4 Emulator Project file or after any change made on the Initialisation or Feature List web page.

Limitation: Some SmartPhones may refuse to receive an 8PJ IC4 Emulator Project file over Bluetooth, although the device will accept JPG background images, possibly due to the file type not being recognised. As an alternative, try sending the 8PJ file via email as an attachment and downloading the email onto the device, or physically connect the device to a PC using a USB cable (refer to the device's user instructions).

Limitation: If the background image within the imported IC4 Emulator Project file is more than twice as wide as it is tall, e.g. 1000x400 pixels, the extreme left and right edges are cropped, and any features located in those areas will not be visible. If this occurs, use the Feature List to locate any affected Features within the visible area.

Limitation: Head: Green Arrow Features are not located next to their corresponding 3-aspect signal Features when the IC4 Emulator Project file is imported, but remain in their default positions towards the top of the Site UI Map. These Features will need to be manually moved by the user to their desired location on the Site UI Map, see section 14.8.8).



The background image in the IC4 Emulator 8PJ file is converted from a large bitmap .BMP file to smaller .GIF file before being stored in the equipment's configuration data, and this process may take several minutes, depending on file size

Use of large detailed 24-bit photographs, including aerial 'satellite' images of the intersection, is discouraged as this may take more than ten minutes to convert and the resultant image file may exceed the file size limit (default 512KB) resulting in the import being rejected.

For large detailed 24-bit images, consider using a third-party imaging application to convert the image to a smaller JPEG or GIF file and use the 'Map Background Image' option instead to import the image.

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14.8.5 SiteUI – Feature List

This web page provides a list of the Features (objects) shown on the Site UI diagram.

The Feature List is initially populated from the controller configuration information when the “Reset Features” button is selected. The size of the map area is configured from a Map Background image, if supplied, which may be imported from an IC4 Emulator Project file. This project file also contains the location of any duplicated Features.

The display properties for each Feature can be modified on the Feature List or on the Site UI Map. Changes saved from the Site UI Map can be viewed in the Feature List by selecting the “Reload” button, or by reopening the Feature List. Note that the Site UI Map needs to be re-opened to import changes saved from the Feature List.

Features can be edited and deleted using this web page, but should not be added, (even though the web page includes an ‘Add Row’ button). Use the Site UI Map in Edit Mode to add any additional Duplicate Features, or to change the displayed Type of a Feature.

SiteUI - Feature List

List of features (objects) shown on the Site UI diagram. Features can be Edited and Deleted, but should not be Added.

ID	Type?	Hide?	X-Pos?	Y-Pos?	Rotation?	Size?	Name?	Description?
det-000-0	detector	<input type="checkbox"/>	194.000000	172.000000	0.000000		0:ASL	ASL (I/O Line Number 0)
det-001-0	detector	<input type="checkbox"/>	31.000000	174.000000	0.000000		1:AX	AX (I/O Line Number 1)
det-002-0	detector	<input type="checkbox"/>	74.000000	174.000000	0.000000		2:AY	AY (I/O Line Number 2)
det-003-0	detector	<input type="checkbox"/>	115.000000	174.000000	0.000000		3:AZ	AZ (I/O Line Number 3)
det-004-0	detector	<input type="checkbox"/>	516.000000	109.000000	0.000000		4:BSL	BSL (I/O Line Number 4)
det-005-0	detector	<input type="checkbox"/>	922.000000	105.000000	0.000000		5:BX	BX (I/O Line Number 5)
det-006-0	detector	<input type="checkbox"/>	835.000000	106.000000	0.000000		6:BY	BY (I/O Line Number 6)
det-007-0	detector	<input type="checkbox"/>	716.000000	107.000000	0.000000		7:BZ	BZ (I/O Line Number 7)
det-008-0	detector	<input type="checkbox"/>	424.000000	326.000000	0.000000		8:CSL	CSL (I/O Line Number 8)
det-009-0	detector	<input type="checkbox"/>	426.000000	485.000000	0.000000		9:CX	CX (I/O Line Number 9)
det-010-0	detector	<input type="checkbox"/>	516.000000	267.000000	0.000000		10:DPB1	DPB1 (I/O Line Number 10)
det-011-0	detector	<input type="checkbox"/>	262.000000	289.000000	0.000000		11:DPB2	DPB2 (I/O Line Number 11)
det-012-0	detector	<input type="checkbox"/>	261.000000	37.000000	0.000000		12:EPB1	EPB1 (I/O Line Number 12)
det-013-0	detector	<input type="checkbox"/>	260.000000	255.000000	0.000000		13:EPB2	EPB2 (I/O Line Number 13)
phase-A-0	phase	<input type="checkbox"/>	227.000000	88.000000	90.000000		Phase A	Phase A
phase-A-1	phase	<input type="checkbox"/>	239.000000	221.000000	90.000000		Phase A	Phase A
phase-A-2	phase	<input type="checkbox"/>	437.000000	97.000000	90.000000		Phase A	Phase A
phase-B-0	phase	<input type="checkbox"/>	296.000000	217.000000	270.000000		Phase B	Phase B
phase-B-1	phase	<input type="checkbox"/>	518.000000	74.000000	270.000000		Phase B	Phase B
phase-C-0	phase	<input type="checkbox"/>	309.000000	339.000000	180.000000		Phase C	Phase C
phase-C-1	phase	<input type="checkbox"/>	483.000000	336.000000	180.000000		Phase C	Phase C
phase-D-0	pedestrian	<input type="checkbox"/>	381.000000	238.000000	270.000000		Phase D	Phase D
phase-E-0	pedestrian	<input type="checkbox"/>	292.000000	169.000000	0.000000		Phase E	Phase E

Buttons: Save, Delete Selected, Add Row, Reload, Previous, Next, 25 rows

14-35 - Feature List showing all Features

Detectors are listed first in the Feature List, followed by phases.

The Feature IDs are formatted as follows:

- For detectors, det-<Detector Number>-<index>
- For phases, phase-<Phase letter>-<index>

Duplicate Features are given an index > 0.

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Help Text is provided on the web page to guide the user.

Tip: Features can be 'hidden' from view on the Site UI Map by ticking the Hide box. Use this in preference to Deleting Features, as the deletion of a feature can only be 'undone' by use of the "Reset features" button on the Initialisation web page. This will result in the loss of any Feature modifications made via the Feature List or Site UI Map. The option to 'hide' a feature is available on the Feature List table as well as the map's Edit Feature Window (section 14.8.7)

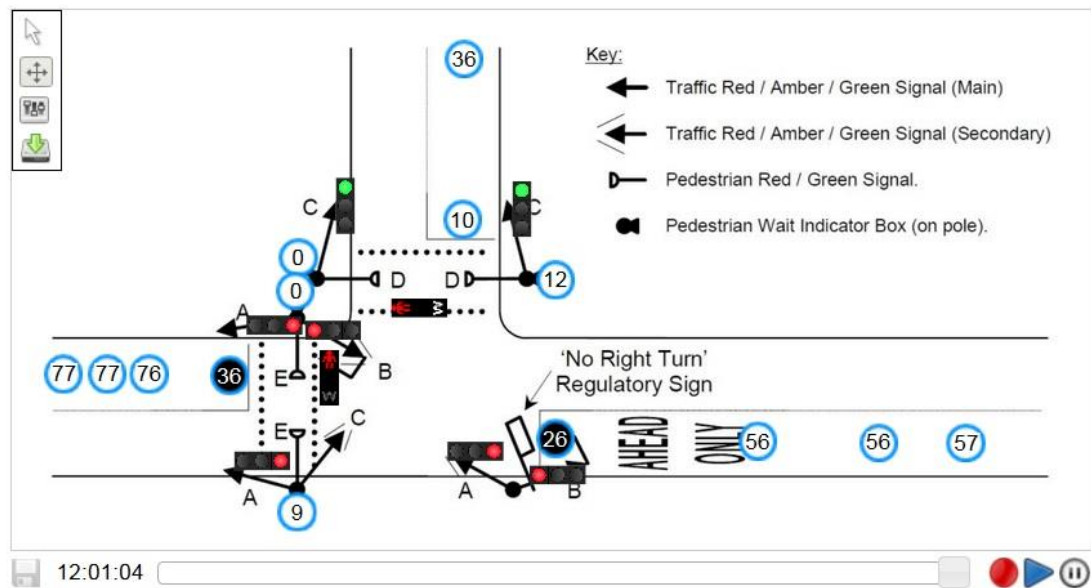
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14.8.6 Changing Features via the SiteUI - Map

Changes to the Features displayed on the Map can be made either on the Map itself, or via the Feature List (see section 14.8.5).

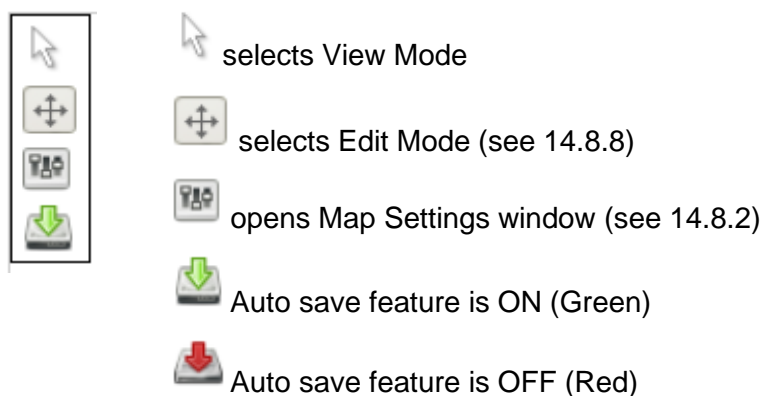
The Site UI Map opens in 'View Mode'. In 'View Mode', the Features on the Map can be modified or hidden from the Map. The location, orientation and size of the Features can only be changed when the Site UI Map is in 'Edit Mode'. This is to avoid the inadvertent moving or resizing of Features when using a touch screen device.

SiteUI - View Map



14-36 - SiteUI Map in default View Mode



The Map Modification buttons have the following behaviour with the Map in View Mode.





14-37 - Map Modification buttons in View Mode

Changes made on the Map are automatically saved to the Feature List if the 'Auto save feature' is shown ON. Selecting this button toggles the Auto save.

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When Auto save is OFF, the 'Save feature properties' button  adjacent to the Timeline Slider at the bottom left of the Map can be selected, when highlighted , to save any changes to the Feature List.

Tip: If the 'Save feature properties' button is displayed as , then a save to the Feature List has failed, possibly due to the Network Connection being lost. Correct the underlying issue before making further changes.

Tip: If the 'Save feature properties' button is permanently highlighted  when Auto save is ON, then the Auto save cannot complete, possibly due to the Network Connection being lost. Correct the underlying issue before making further changes.

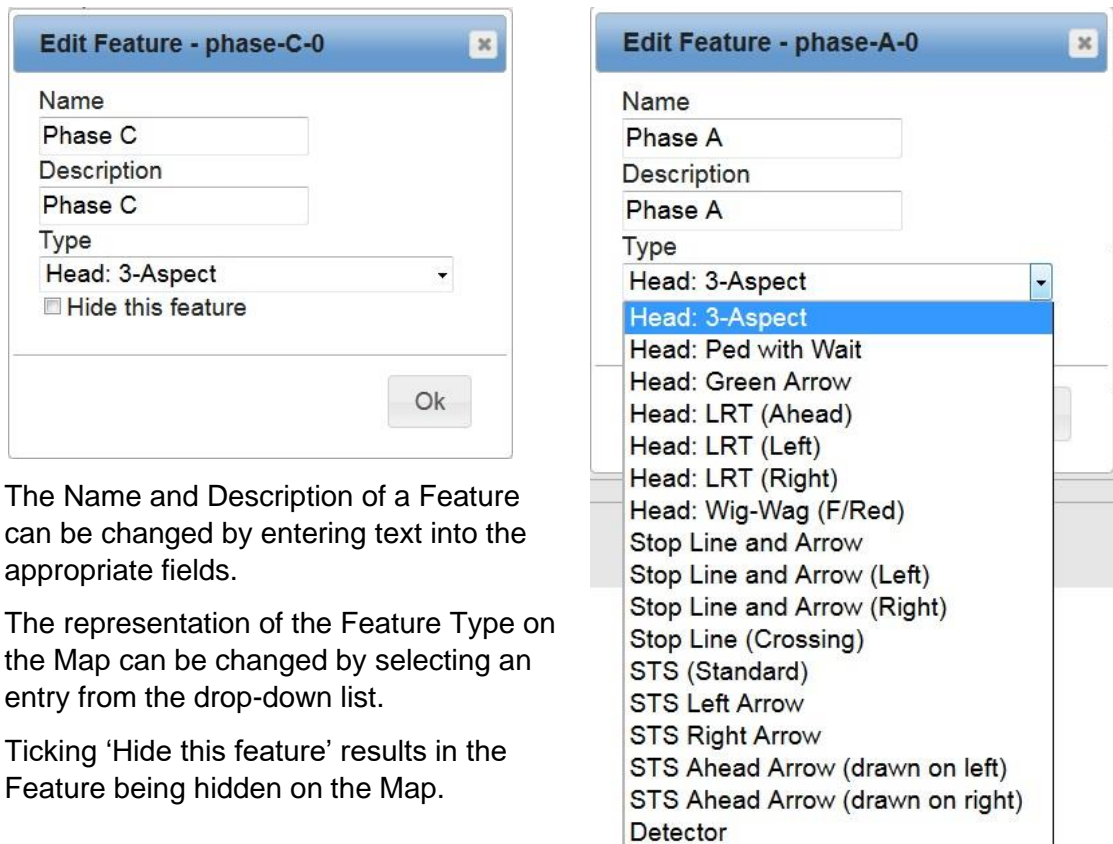
In View Mode, selecting a Feature opens the 'Edit Feature' window. This can be used to change the Name, Description and display Type of a Feature, and also whether to 'Hide this feature' from the Map.

Limitation: Use of the 'pen' pointer device supplied with a tablet device (e.g. Samsung Galaxy Note 10.1) is not recommended. Depending on the browser being used the 'pen' may not reliably select/deselect Features and Map Modification buttons. With a Chrome browser, it is difficult to get the pointer to drop a feature once it is selected, e.g. for Rotation or resize. With Firefox, use of the pointer may cause Firefox to freeze or the browser response to slow significantly.

Limitation: Hover text for Phase Features may be offset slightly to the left when using Chrome and Internet Explorer browsers. When selecting a Feature using these browsers, point and select towards the left of the Feature. Note that hover text is correctly positioned when using Firefox.

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14.8.7 Edit Feature Window



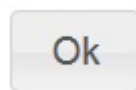
The Name and Description of a Feature can be changed by entering text into the appropriate fields.

The representation of the Feature Type on the Map can be changed by selecting an entry from the drop-down list.

Ticking 'Hide this feature' results in the Feature being hidden on the Map.


14-38 - SiteUI Map - Edit Feature window

Note that the Name of the Feature is the text that appears in the hover text for the Feature on the Site UI Map.



Selecting the  button saves the change to the Map.




Selecting the  button can be used to close the Edit Feature window without saving the changes to the Map.

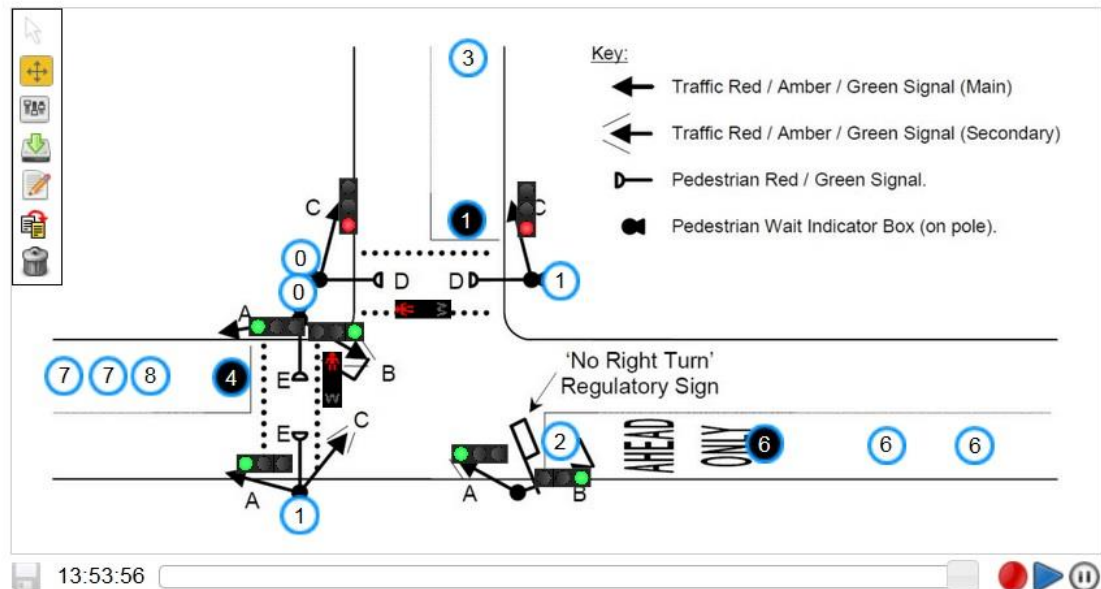
Any changes made may be 'Auto saved' or manually saved to the Feature List.

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14.8.8 SiteUI Map in Edit Mode

Selecting the  button puts the Site UI Map into Edit Mode.

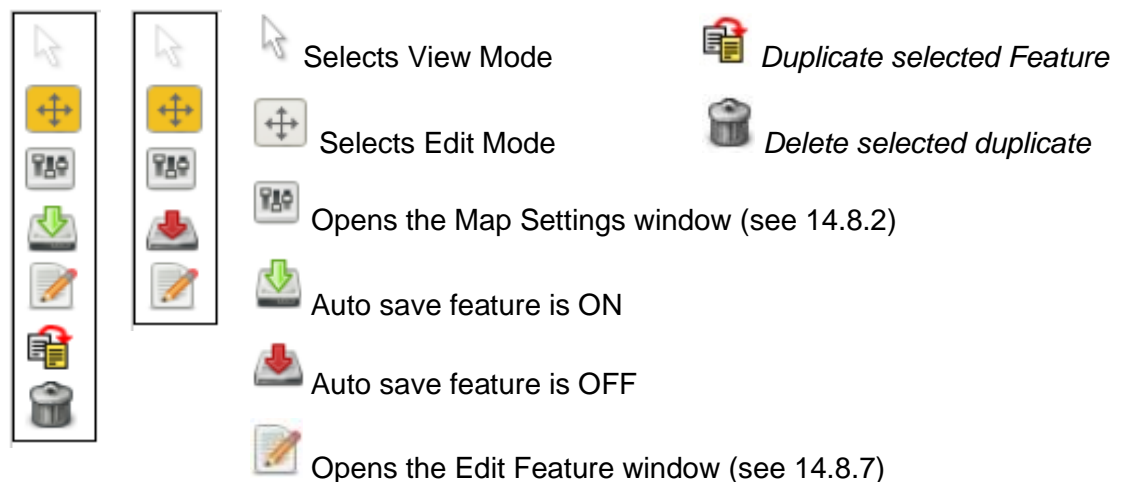
SiteUI - View Map



14-39 SiteUI Map in Edit Mode

The Map Modification buttons have the following behaviour with the Map in Edit Mode.


Note that the duplication of selected features and their deletion is only available if the 'Auto save' feature is ON.



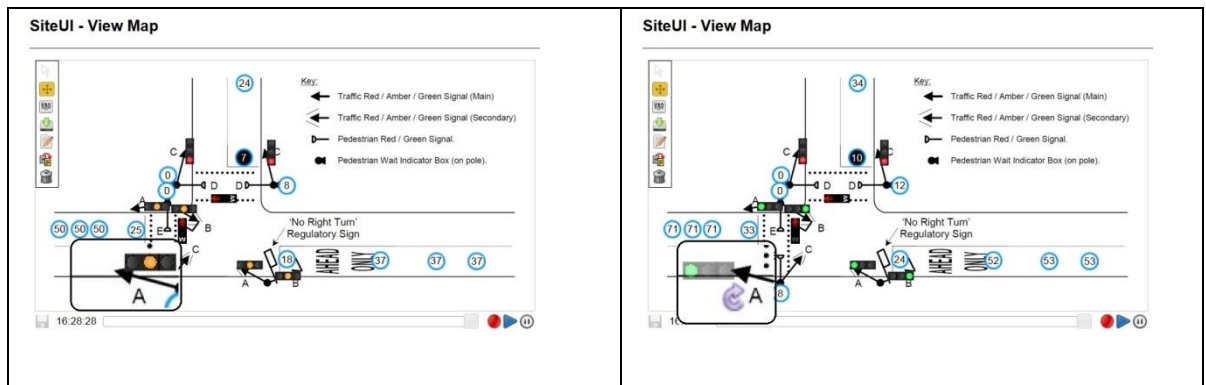
14-40 - Map Modification buttons in Edit Mode

Changes made on the Map are automatically saved to the Feature List if the 'Auto save feature' is shown ON. Selecting this button toggles the Auto save.


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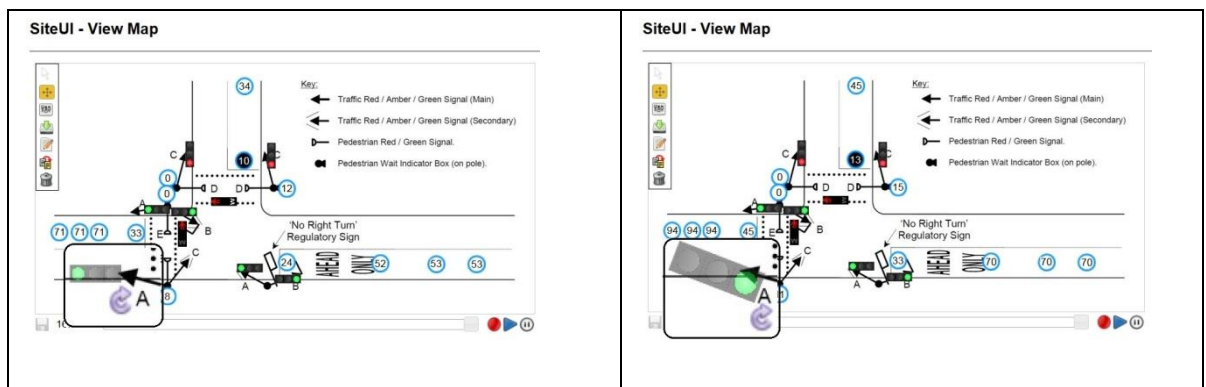
Limitation: With Auto save OFF, selecting a Feature and then selecting another without making any changes may result in the 'Save feature properties' button adjacent to the Timeline Slider being highlighted .

A Feature can be moved, rotated and resized on the Map by selecting the Feature whilst in Edit Mode. On selecting a Feature, the Feature is greyed out and can then be moved across the Map by selecting it and dragging to the required location.




14-41 Phase A selected and moved to top of Arrow

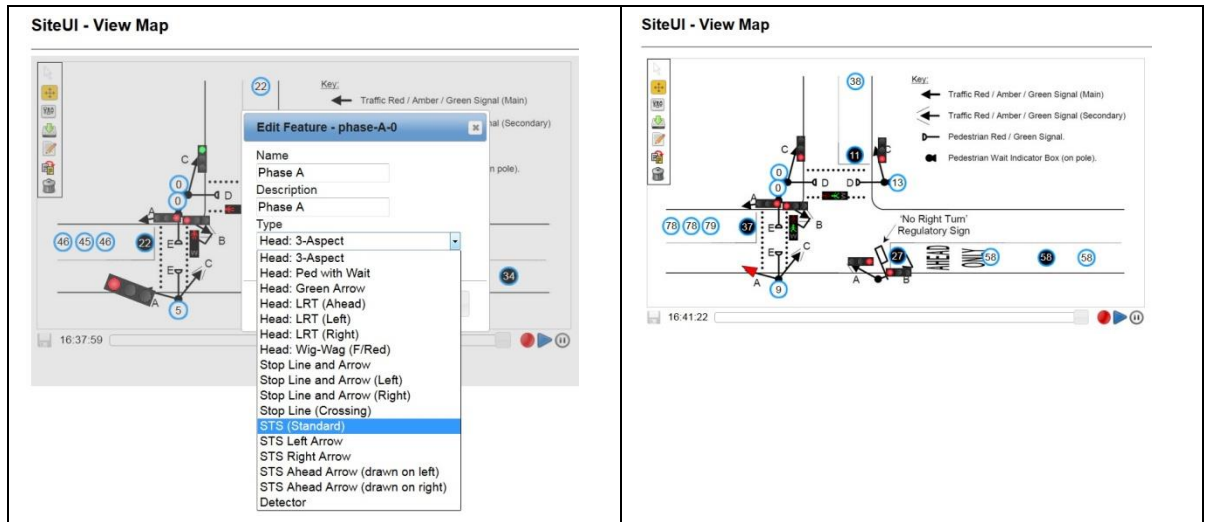
A 'Grab Arrow'  is also displayed. The Feature can be resized and rotated by dragging the 'Grab Arrow' and moving it relative to the centre of the Feature.




14-42 - Phase A rotated and resized

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By selecting the “Edit selected feature” button , the Feature type can be changed, if desired, and then the Feature re-selected and placed in its final location.

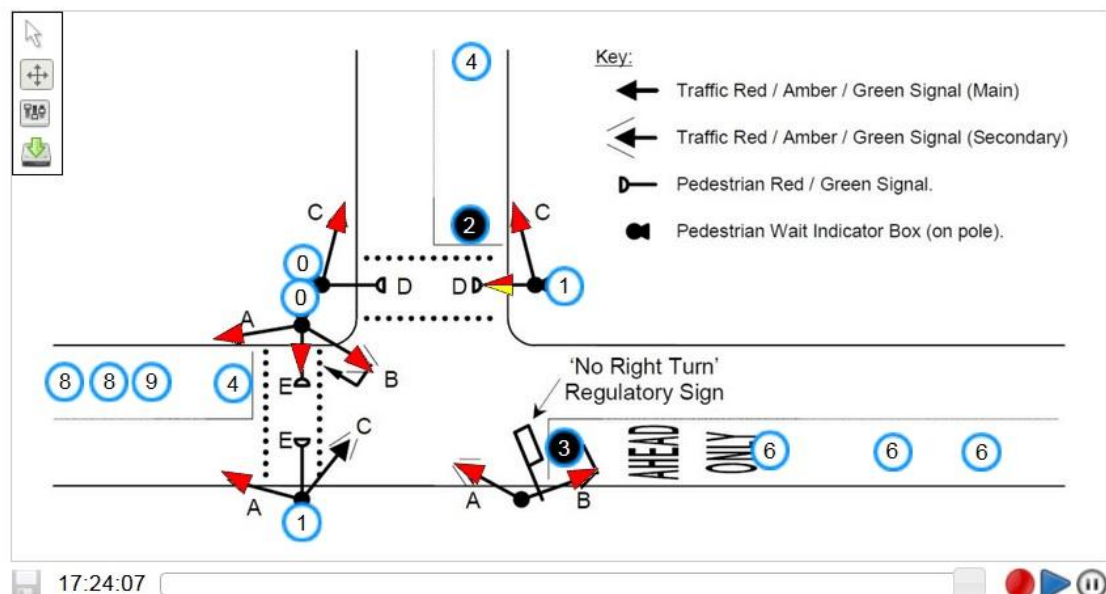


14-43 - Phase A Changed to STS (Standard) and finally positioned

Tip: Make sure that all changes made to the Site UI map have been saved to the Feature List before leaving the web page. Check that the “Save feature properties” button is not highlighted , and that a Feature is not currently selected (greyed out) before leaving SiteUI.

Tip: The Feature List can be used to harmonize the size of the Features (section 14.8.5).

SiteUI - View Map



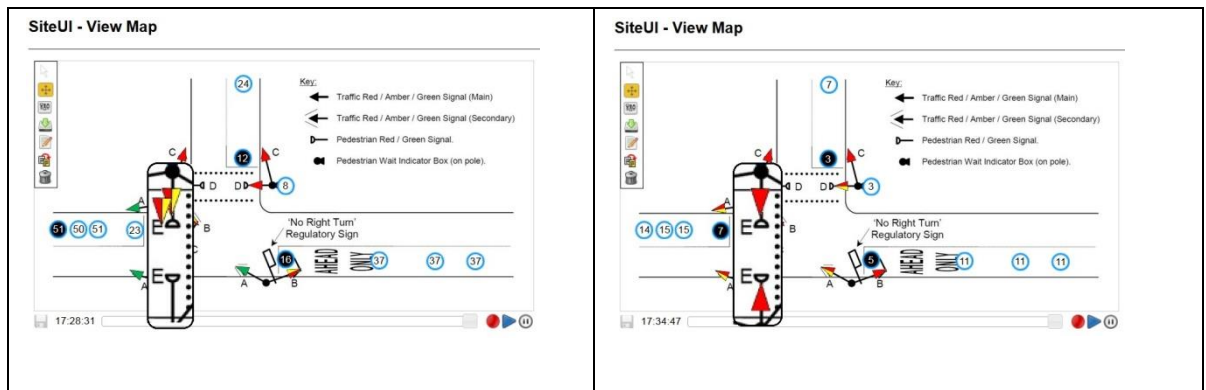
14-44 - All Phases changed to STS (Standard) symbols and relocated

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Features can be duplicated on the Site UI Map in Edit Mode.



To duplicate a Feature, select the Feature and then select the “Duplicate selected feature” button. A duplicate will be created and placed on the Site UI Map adjacent to the original. This can then be selected and moved to the desired location.



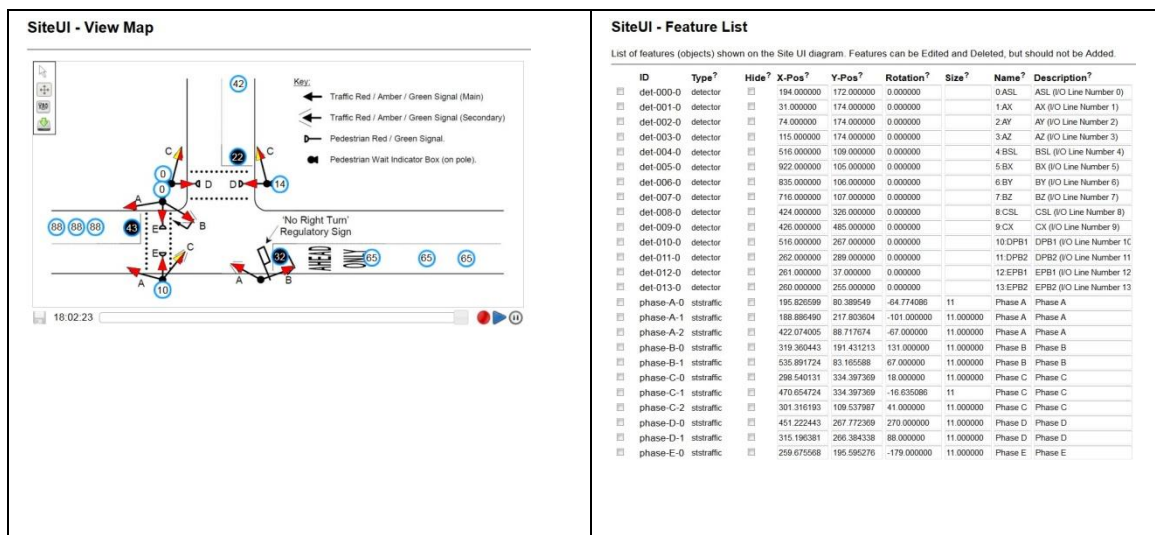
14-45 - Phase E duplicated, duplicate Feature then moved

Duplicate Features are created with the next available index number for that Feature.



Duplicate Features can be deleted by selecting the Feature and then selecting the “Delete selected duplicate” button. Only duplicated Features can be deleted from the Site UI Map. If no instances of a Feature (Phase or Detector) are required on the map, use the ‘hide’ option.

When sufficient Features have been duplicated, moved and resized to give a representative view of the Site Operation, the Site UI Map is ready for use.



14-46 - Final Site UI Map and Feature List

Limitation: If the Edit Mode button is selected when the SiteUI Map is opening before the features are displayed, then the Map may open in Select Mode but with the Map Modification buttons presented in Edit Mode. If this occurs, re-open the Site UI Map and wait for the Features to be displayed before putting the Map into Edit Mode.

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14.9 ST950 Real Time View

The Controller I/O and Phases Graph Types are also supported by the ST950 Controller, in addition to those shown in section 12.5.

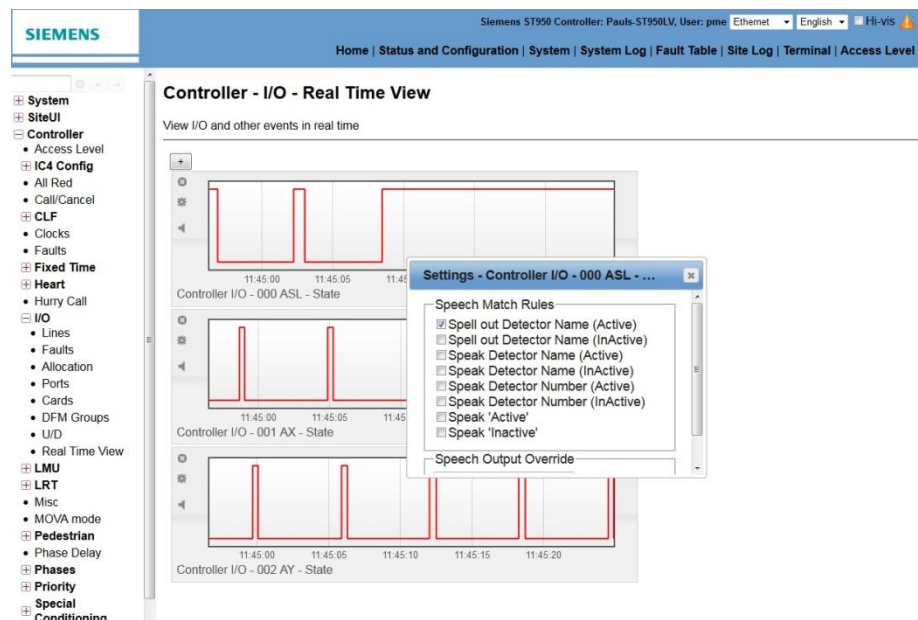
14.9.1 Controller I/O

The state of the Detector I/O lines can be monitored using these plots.

An Active bit state (i.e. I/O line at state 1) is indicated by the Plot line going high.

An Inactive bit state (i.e. I/O line at state 0) is indicated by the Plot line going low.

The Speech Match Rules are set by default to allow the Detector name to be spelt out as individual characters when the Detector Bit goes Active.



14-47 - Controller I/O, Speech Match Rules

By default the Detector name is spelt out one letter at a time (e.g. 'A – S – L'), but the settings also provide options that attempt to speak the name as a word (e.g. 'STOP1'). Alternatively, a phrase can be manually entered in the 'Override' field in the settings (e.g. just 'X' rather than the full name 'AX12').

The "Speak 'Active'" and/or "Speak 'Inactive'" rules can be specified to announce "Active" or "Inactive" to reflect the state of a Detector Bit, and this is announced after any other speech which matches earlier rules.

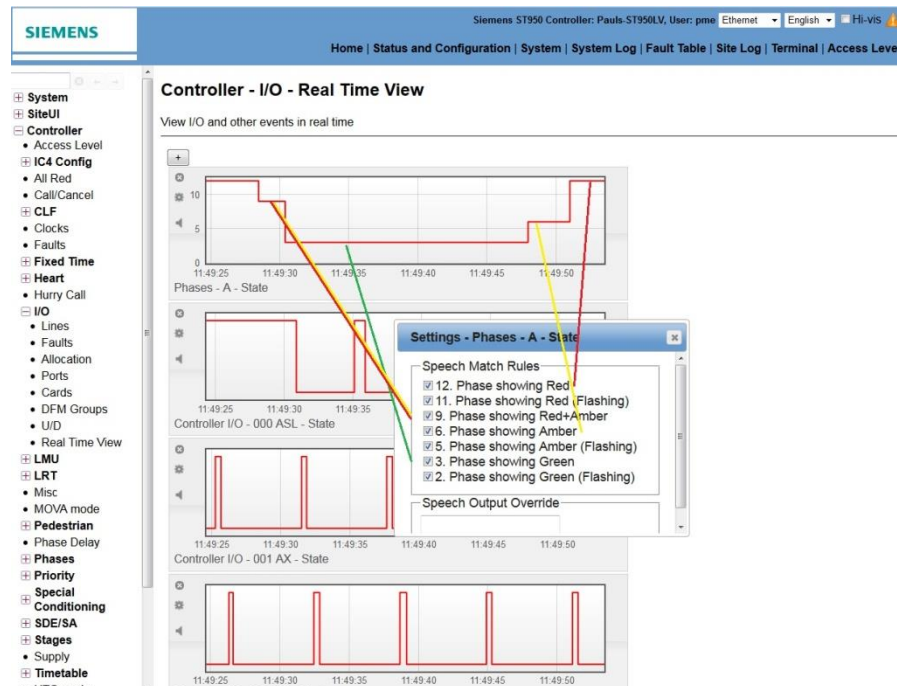
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14.9.2 Phases

Phase aspect states can be monitored using these plots as the aspects change.

The Real Time View allocates a numeric value to each aspect state, as indicated in the Speech Match Rules, these values being assigned to the y-axis on the resulting Plots.

In Figure 14-48, Phase A is cycling through the normal traffic sequence of Red, Red-Amber, Green, Leaving Amber, Red.



14-48 - Phases, Speech Match Rules

By default, the Speech Match Rules assume all lit Phase aspects are to be spoken when they occur, if speech is enabled.

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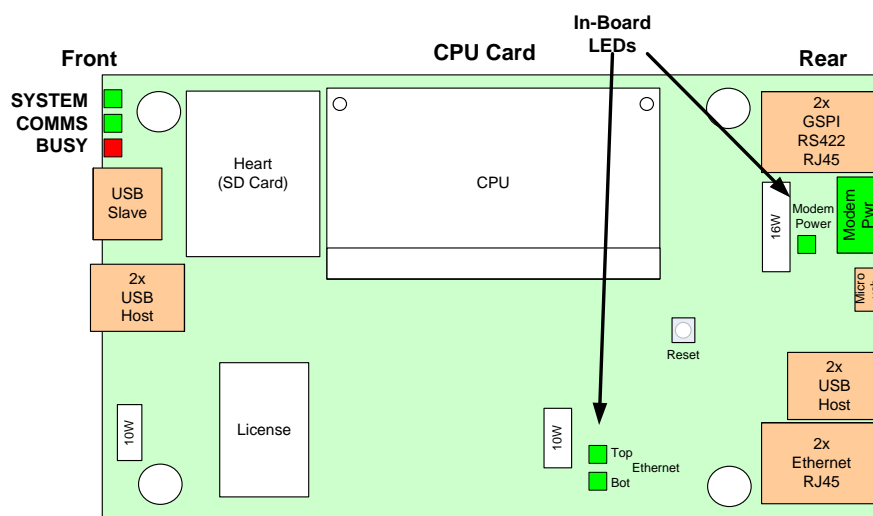
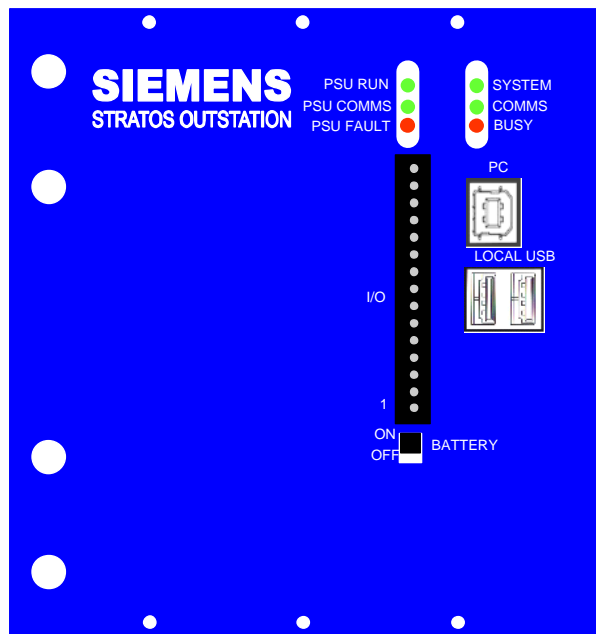
15 STRATOS OUTSTATION SPECIFIC FEATURES

15.1 Stratos Outstation Indicators

The main indicator LEDs are located on the unit front panel. In addition, there are three auxiliary indicator LEDs inboard on the CPU card. The LEDs are described in the following sections.

15.1.1 LED Locations

The LED locations on the front panel and on the CPU card are shown below.



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15.1.2 CPU LED Status Indications



CPU Front Panel LEDs

LED	State	Description
SYSTEM (Green)	Slow flash	Normal operation
	Medium flash	Normal operation, Fault present
	Very fast flash	Restricted mode - no applications running *
COMMS Communications (Green)	On	Under UTC control, pulses off indicate receipt of messages
	Off	Not under UTC control, pulses on indicate receipt of messages
BUSY (Red)	Off	Normally off
	Flashing	Flashes to indicate the system is busy performing an operation that must not be interrupted, for example start up, upgrade, USB "memory stick" style interface is busy. Do not remove USB device or switch off the outstation while this LED is flashing.

Table 3 – CPU Front Panel LED States

* Restricted mode is similar to safe mode on a PC where the user can access the unit to examine logs, diagnose problems and perform firmware updates.

TOP



BOT

In-Board Ethernet LEDs

LED	State	Description
Ethernet Connectivity (2x Green inboard)	On / Flashing	Indicate activity for the two Ethernet interfaces, corresponding to the Top (eth1) and Bottom (eth0) Ethernet RJ45 sockets. Instation comms is normally via the bottom RJ45.

Table 4 – CPU In-Board Ethernet LED States

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MDM

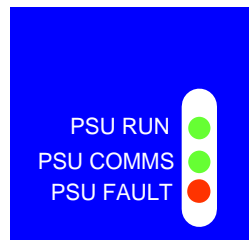


In-Board Modem Power LED

LED	State	Description
Modem Power (inboard rear)	On	Indicates that the Modem Power is on.
	Off	Indicates that the Modem Power is off.

Table 5 – CPU In-Board Modem LED States

15.1.3 PSU and I/O Card LED Status Indications



PSU LEDs



I/O Card LEDs

LED	State	Description
SYS / RUN System / Run (Green)	Slow Flash	Normal Operation
	Medium Flash	Configuration or Firmware Download in progress
	Double Pulse	Low power mode
COMMS Communications (Green)	On	Normal operation, GSPI messages being received regularly
	Off	No relevant GSPI messages received in the last second (implies loss of communications), or low power mode
FLT Fault (Red)	Off	Normal operation
	On	Fault detected see fault section for details of possible faults.
	Double Pulse	Firmware is in Error and low power mode

Table 6 – PSU & I/O Board LED States

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15.2 Stratos Outstation Web I/F: Status & Configuration Web Pages

The status and configuration web pages which are specific to the Stratos Outstation are described in the following sections.

15.2.1 Status & Configuration - Controller Monitor

Command Response Matching

It is not usual to have to make changes on this page. If necessary, the conditions which are considered errors on the interface to a monitored controller can be tailored on this page.

Controller Port

It is only necessary to make changes on this page where a controller which is not supported by the Controller Monitor is connected.

If the Controller Monitor is unable to recognise the attached controller then it leaves the controller port at the baud rate specified. This allows access to the controllers handset port (using the command `xxc`) even for unrecognised controller types. ESP will not be used for an unrecognised controller unless enabled on this page.

It is also possible to prevent the Controller Monitor from attempting to recognise the connected controller if it is known that it is of an unsupported type. This is not necessary but does reduce the time taken before `xxc` can be used.

The screenshot shows the Siemens Stratos Outstation web interface. The top navigation bar includes the Siemens logo, the user 'Stratos User', and the connection type 'Ethernet'. The main menu includes 'Home', 'Status and Configuration', 'System', 'System Log', 'Fault Table', 'Site Log', and 'Terminal'. The left sidebar shows a tree view with 'System' expanded, containing 'Controller Monitor', 'UG405 UTC', 'Simple UTC', 'MOVA', 'Peripherals', 'Controller Serial Link', 'Heart', 'Support Battery', and 'Intelligent Parking'. The 'Controller Monitor' section is expanded, showing 'Command Response Matching', 'Controller Port', and 'Monitored Supply'. The 'Controller Port' page is displayed, showing a table with configuration items and their values. The table has columns for 'Default', 'Item', and 'Value'. The items are 'Inhibit controller identification and scanning?', 'Enable Enhanced Serial Protocol?', and 'Unrecognised Controller Serial Port Baud Rate?'. The 'Unrecognised Controller Serial Port Baud Rate?' is set to '1200'. There are 'Save' and 'Reload' buttons at the bottom of the table.

Default	Item	Value
<input type="checkbox"/>	Inhibit controller identification and scanning ?	<input type="checkbox"/>
<input type="checkbox"/>	Enable Enhanced Serial Protocol ?	<input type="checkbox"/>
<input type="checkbox"/>	Unrecognised Controller Serial Port Baud Rate ?	1200

Save Reload

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Monitored Supply

Monitoring of the connected voltage can be enabled and a threshold set on this page.

Stratos Outstation: StratosOutstation_06, User: pme USB Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal

Controller Monitor - Monitored Supply

Default	Item	Value
<input type="checkbox"/>	Monitored Supply Enable ?	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Monitored Supply Threshold (mV) ?	20000

Save Reload

15.2.2 Status & Configuration - Controller Serial Link

Prior to firmware v7, configuration of the serial link between the Stratos Outstation and the controller is performed through the web page found under the *Controller Serial Link* menu item of *Status and Configuration*.

From firmware v7 onwards, configuration of the serial link between the Stratos Outstation and the controller is performed by the Controller Monitor – see section 15.2.1.

The format of this page is different for firmware pre & post version 7.

Stratos Outstation: Gemini3_PreProd_1, User: pme Ethernet Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Controller Log | Controller Files

Controller Serial Link

Default	Item	Value
<input type="checkbox"/>	Enable Semi-Integral Link to Siemens Controller ?	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Freestanding Controller Serial Port Baud Rate ?	1200
<input type="checkbox"/>	Controller Diagnostics Upload Interval ?	10
<input type="checkbox"/>	Max Controller Historic Fault Log Records ?	800
<input type="checkbox"/>	Controller Settings Files Upload Interval ?	1440
<input type="checkbox"/>	Enable Controller Serial Interface Facility ?	<input checked="" type="checkbox"/>

Save Reload

Figure 15-1 – Controller Serial Link page prior to firmware version 7

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Stratos Outstation: StratosOutstation_06, User: Stratos User
Ethernet
Hi-vis

Home | Status and Configuration | System | System Log | Fault Table | Site Log | Terminal

System
Controller Monitor
UG405 UTC
Simple UTC
MOVA
Peripherals
Controller Serial Link
Controller Log
Controller Files
Heart
Support Battery
Intelligent Parking

Controller Serial Link

Default	Item	Value
<input type="checkbox"/>	Controller Diagnostics Upload Interval ?	10
<input type="checkbox"/>	Max Controller Historic Fault Log Records ?	800
<input type="checkbox"/>	Controller Settings Files Upload Interval ?	1440
<input type="checkbox"/>	ESP Override state ?	No Override
<input type="checkbox"/>	Enable MOVA Sim Compatible ?	0
<input type="checkbox"/>	Inhibit Upload/Download Messages (Not Set)?	<input type="checkbox"/>

Save
Reload

Figure 15-2 – Controller Serial Link page firmware version 7 onwards

Enable Semi-Integral Link to Siemens Controller

Select to Enable the Semi-Integral Link to Siemens Controller. The semi-integral link carries data for UTC, MOVA, detectors, faults and controller handset. Disable for freestanding OTU. Default Enabled.

Freestanding Controller Serial Port Baud Rate

Select the baud rate for the serial handset interface to a freestanding controller. For Semi-Integral Link to Siemens controller, the value is not used.

Controller Diagnostics Upload Interval

Defines the time interval between each retrieval of the controllers Current Fault Flags, and Historic Fault Log. Range 5 to 1440 minutes. Current fault flags are asserted in the main Gemini Fault Table. The Historic Fault Log may be found in the Controller Log tab. Default 10 minutes.

Max Controller Historic Fault Log Records

Defines the maximum number of records from the controllers Historic Fault Log to be saved on the outstation file system. Each record holds either date, time or fault data. Range 800 to 12000. Default 800.

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Controller Settings Files Upload Interval

Defines the time interval between each automatic retrieval of the controllers 8UL file and UDD file. Range 10 to 10080 minutes. The 8UL file is an IC4 compatible compressed version of the original controller configuration file, for back up purposes. The UDD file contains a subset of controller settings, and may be viewed and edited in Convert. It may then be sent back to the controller to effect settings changes. Default 1440 minutes (24 hours).

ESP Override State

For test & simulation purposes only. Allows the use of ESP on the connection to be overridden.**Enable MOVA Sim Compatible**

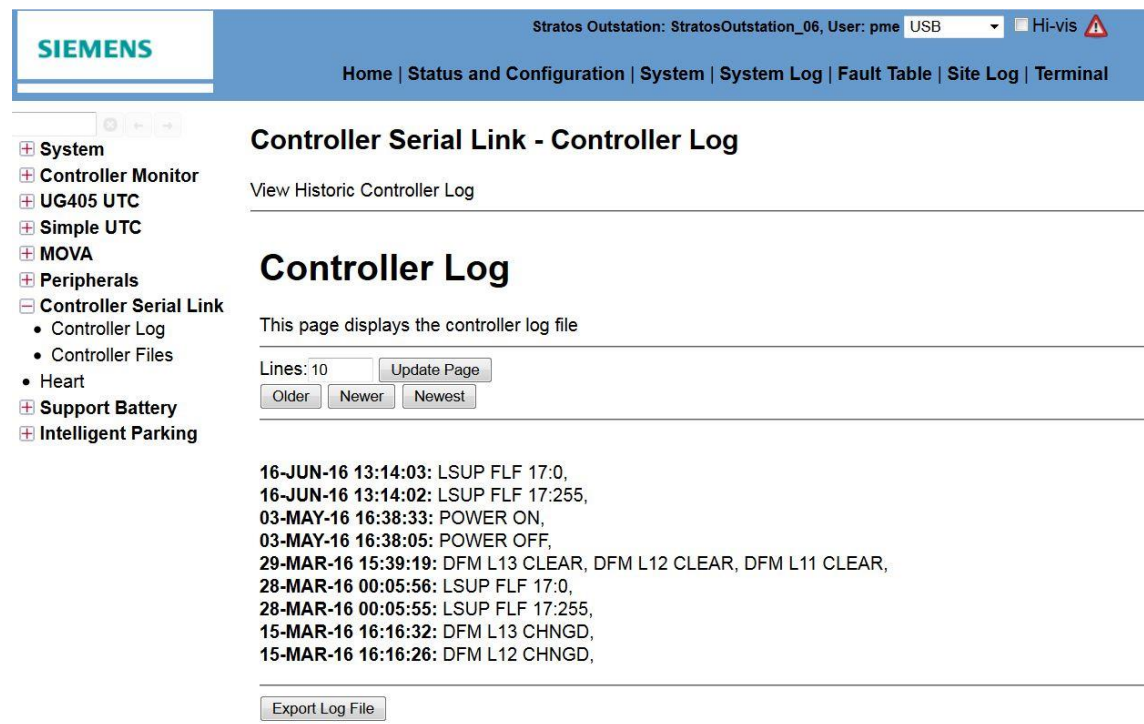
For test & simulation purposes only. Set this to 123 to allow MOVA Sim to be used.

Inhibit Upload / Download Messages

Allows the use of upload download messages to be inhibited when the Siemens Enhanced Serial Protocol is used.

Controller Log

Displays a recent extract of the controller historic log. Only supported for modern Siemens controllers.



The screenshot shows the Siemens Stratos Outstation web interface. The top navigation bar includes links for Home, Status and Configuration, System, System Log, Fault Table, Site Log, and Terminal. The left sidebar lists various system components, with 'Controller Serial Link' expanded to show 'Controller Log' and 'Controller Files'. The main content area is titled 'Controller Serial Link - Controller Log' and contains a 'View Historic Controller Log' link. Below this, the 'Controller Log' section displays a list of log entries with timestamps and messages, such as '16-JUN-16 13:14:03: LSUP FLF 17:0,' and '03-MAY-16 16:38:33: POWER ON,'. At the bottom, there is an 'Export Log File' button.

Controller Files

Presents a recent snapshot of some important controller files. Only supported for modern Siemens controllers.

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15.2.3 Status & Configuration - Heart

Use of the heart web page for system backup and restore is described in section 15.3.

15.2.4 Status & Configuration - Support Battery

Configuration of the unit support battery is performed through the web page found under the *Support Battery* menu item of *Status and Configuration*.

Enable Battery Reports

Setting this configuration option enables reporting of battery test results. When this option is false, the battery fault reports and notifications are inhibited. The support battery is used to supply power to the unit when the mains electricity supply fails (e.g. so that the power fail event can be reported to a central instation). Default Enabled.

Notify Running On Battery

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When this option is true, a notification table entry is generated on detection of mains power fail, when the unit is being powered from a support battery. An entry is also placed in the system log.

When this option is false, the notifications are inhibited. Default Enabled.

Battery Capacity Low Threshold

This is the threshold value for notifying of support battery capacity low.

It is the time in minutes for which the battery is expected to maintain voltage when on test load discharge. Range 0 to 60. Default 60.

The battery capacity is tested every 30 days (approx). The test is delayed if the temperature is outside range or if there has been a mains failure in the previous 12 hours.

Battery Voltage Drop Threshold

This is the threshold value for notifying of support battery voltage drop test fail.

It is the max voltage drop expected from the battery when the test load is initially applied. Range 0.0 to 19.9. Default 1.0.

The battery voltage drop is tested at the same time as battery capacity (every 30 days).

15.2.5 Status & Configuration - Intelligent Parking

Configuration of Intelligent Parking is described in 667/HB/52800/000 *User Manual for IPS On Street Equipment*.

15.3 Stratos Outstation Heart / System Backup

The Heart holds a backup of the system which can be used to:

- Clone the system onto a replacement Processor Card if the original requires replacement.
- Return the system to an earlier state.

All aspects of the system are recorded in the backup including firmware, configuration, system log, site log and all changes made to the point at which the backup was taken.

The Heart is implemented using an SD card fitted to the Processor Card.

Backups are created and written to the Heart periodically, usually at 00:30am but this can be changed if required using the System - Advanced - Backup web page. Backups can also be created and 'retained' on demand.

15.3.1 Restoring from the Heart

When a Processor Card needs to be replaced it is possible to clone the system which was running on the old Processor Card onto the replacement Processor Card.

The system backups held on the Heart are known as Restore Points.



When restoring to an old Restore Point, any configuration changes, system log entries and site log entries which were made after that point will be lost.

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15.3.2 Restoring from the Heart

Heart

Latest Restore Point:

This is the latest available restore point, which is automatically generated and replaced. This restore point can be retained so that it is not automatically replaced. If a newer restore point is required, then this can be created / refreshed to represent the current system.

Platform	File System Description	File System Part Number	File System Version	Site Name	Serial Number	Date Time Generated	Restore	Delete	Refresh	Retain
linuxEFC	Stratos Outstation	667/TZ /52255/000	0.14	Gemini3_PreProd_1	09466554	Fri 08 Aug 2014 12:13:09 BST (latest)	<button>Restore</button>	<button>Delete</button>	<button>Refresh</button>	<button>Retain</button>

Retained restore points from this system:

Platform	File System Description	File System Part Number	File System Version	Site Name	Serial Number	Date Time Generated	Restore	Delete
linuxEFC	Stratos Outstation	667/TZ /52255/000	0.14	Gemini3_PreProd_1	09466554	Fri 08 Aug 2014 12:06:45 BST (rp)	<button>Restore</button>	<button>Delete</button>
linuxEFC	Stratos Outstation	667/TZ /52255/000	0.14	Gemini3_PreProd_1	09466554	Thu 07 Aug 2014 00:31:55 BST (rp)	<button>Restore</button>	<button>Delete</button>

Figure 15-3 - Restore Points available for use

The Restore Points available are shown on the Status and Configuration - Heart web page. Restoration to one of the listed Restore Points is initiated by pressing the *Restore* button associated with the Restore Point.

The EFC now reboots and performs the restoration.

15.3.3 Creating Restore Points

A Restore Point is created periodically. This Restore Point is known as the *Latest Restore Point*. If the *Latest Restore Point* exists at the time of the periodic creation then it is overwritten with the new system snapshot.

A Restore Point can also be created on demand by the user if there is not already a *Latest Restore Point*.

The following operations are possible on the *Latest Restore Point*:

- Restore - restore the system to that stored in the Restore Point
- Delete - delete the Restore Point. It is not possible to recover the Restore Point after deletion.
- Refresh - update the Restore Point with a snapshot of the current system.
- Retain - move the Restore Point to the list of *Retained Restore Points* so it is not overwritten by the next scheduled backup.

There can be many *Retained Restore Points*, up to the capacity of the SD card being used for the Heart. The following operations are possible on a *Retained Restore Point*:

- Restore - restore the system to that stored in the Restore Point

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- Delete - delete the Restore Point. It is not possible to recover the Restore Point after deletion.

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15.4 Stratos Outstation - Wiping Configuration and Firmware

There are two levels of initialisation, each of which is described below. It is important to follow the procedure correctly to activate the desired level of initialisation.

Configuration Wiping

This initialisation sequence will completely erase all working data, system logs, site logs and configuration settings.



CAUTION: Wiping will completely initialise the unit, clearing all working data, system logs, site logs and configuration settings. Once a unit has been wiped, remote access to it is lost and it will need to be re-configured locally to restore network access.



Any system backups which have already been created on the Heart mass storage device are not affected by the configuration wipe, and so can be used to restore all the files to that point if required.

Un-installing Firmware

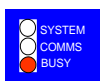
This initialisation sequence will perform a configuration wipe as described above and in addition, the application firmware will be un-installed and the unit will return a base level of execution.



CAUTION: Do not follow this sequence without having a means of reprogramming the unit with new firmware e.g. USB stick image.

Procedure

1. Ensure the unit is powered off.
2. Press and hold the reset button located in the middle of the CPU card, slightly toward the rear.
3. Power on the unit.
4. Continue to hold the reset button (while the red "BUSY" LED starts flashing) until the red "BUSY" LED is illuminated and steady – this takes approximately 15 seconds.



5. Release the reset button briefly and then press it again.
6. Continue to hold the reset button until either:-
 - after 5 seconds, **one** green CPU LED is illuminated and steady – **for configuration wiping**



- after 10 seconds, **both** green CPU LED's are illuminated and steady – **for firmware un-install**

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7. Release the reset button.
8. The unit will now reboot and perform the initialisation.

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16 SECURITY

16.1 User Authentication & Identification

Several levels of user authentication and identification are possible. These are configured through the System – Settings – Security configuration web page. This web page differs slightly between the ST950 and Stratos Outstation.

Users may be authenticated and / or identified to the system by one of the following means:

- Username and password
- User Credentials allocated through Stratos. These take the form of a certificate which can be loaded into the user's browser and / or operating system.

Figure 4 - ST950 System – Setting – Security Configuration web page

Figure 5 – Stratos Outstation System – Settings – Security Configuration web page

The options are presented on the web page such that selecting the option is always the more secure option.

Prevent Web Password Login

Selecting this option will prevent users being able to log into the web interface using a username and password. Only user credentials allocated by Stratos will be permitted.

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Restrict Web Password Login to Local USB & WiFi

Selecting this option will prevent remote users being able to log into the web interface using a username and password. Only user credentials allocated by Stratos will be permitted for remote users. Local users connected by USB or WiFi will still be able to log in using username and password.

Prevent Unauthenticated Handset Changes

ST950

Selecting this option will prevent write operations being performed using the ST950 25 way handset interface.

16.1.1 Effect of Stratos Profile on User Authentication and Identification Settings

User authentication is one area in which a policy is enforced when the Stratos profile is selected on the System – Settings configuration web page. When this selection is made, remote access is restricted to the web interface only and the web password login is restricted to local USB and WiFi connections only. This option is shown as ticked on the web page and cannot be changed by the user unless the Stratos profile is deselected on the System – Settings web page.

16.2 Outstation User Credentials

The following information can also be found in 667/HQ/46000/007 *ST950 / Stratos Outstation User Credentials Quick Start Guide*.

Outstation user credentials are an alternative to the traditional username and password used to identify and authenticate users to equipment. This feature is supported by Stratos v3, ST950 v11 and Stratos Outstation v7 onwards.

16.2.1 Creation of Outstation User Credentials

Stratos outstation user credentials can be issued to any Stratos user through the user management screens in Stratos. These credentials can then be used by a user to identify and authenticate with an outstation without the need to enter a username or password. At present Stratos supports a single type of credentials for all customer tenants so a user with these credentials will be able to identify and authenticate with all equipment.

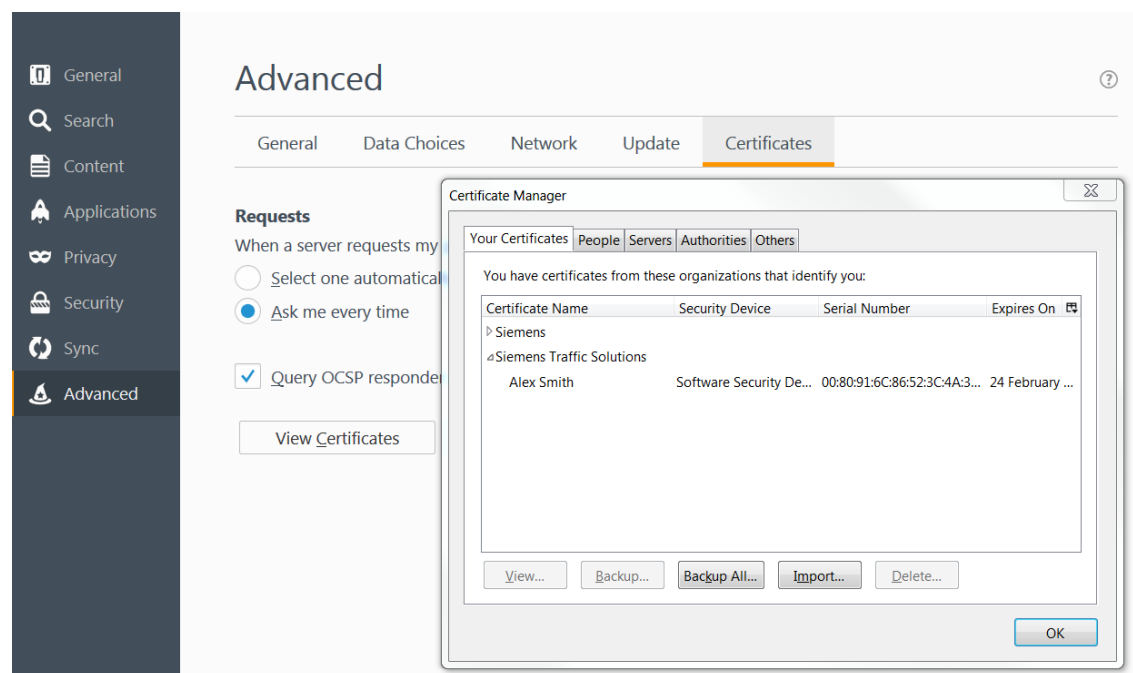
16.2.2 Distribution of Outstation User Credentials

The primary means of distribution is by email containing a certificate along with a transportation pass phrase supplied in an SMS text. The certificate is loaded into the user's computer or browser as appropriate, a process during which the transportation pass phrase will be requested in order to decrypt & authenticate the certificate. The details of this process depend on the computer / operating system / browser but generally follow the following sequence:

- User is prompted for certificate
- User browses to location where certificate has been stored from email and submits certificate
- User is prompted for transport pass phrase
- Certificate is incorporated into list of certificates held by computer / operating system / browser

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Example certificate import screen from Firefox 45.2.0:



16.2.3 Use Of Outstation User Credentials

Once installed in the user's computer / browser, the credentials allow the user to authenticate and identify themselves to ST950 and Stratos Outstation equipment without the need to use a username and password. Depending on the operating system / browser, the credentials may be used automatically or the user may be prompted to select the credentials to be used.

This method of authentication is considered more secure and continues to be available when equipment security / identification levels are set to more enhanced levels which cause the username / password mechanism to be disabled. For example, when an outstation is configured to be in Stratos mode, all non-local access must be authenticated using credentials (local access (USB handset port & WiFi) may still use username and password).

Any prompt for credentials when connecting to ST950 or Stratos Outstation running firmware which does not support this feature (earlier than v11 & v7) should be cancelled. This will return to the username & password authentication method.

16.2.4 Lifetime of Outstation User Credentials

Outstation User Credentials are created with a limited lifetime so will need to be renewed periodically. Stratos will automatically send updates before expiry so it is important to keep contact details up to date in Stratos.

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17 CONNECTION TO OTHER SYSTEMS

The equipment may need to be connected to other systems such as Stratos and / or UTC or maybe simply to gain access to the user interface from a remote location. Such access is usually achieved using the Ethernet interface which first has to be configured as described in section 3.5.

17.1 Connection to Stratos

The guidance in this section is sufficient when only connecting to Stratos. If connecting to other systems in addition to Stratos (e.g. UTC) then the considerations described in section 17.2 also need to be taken into account.

17.1.1 Effect of Connecting to Stratos

When the connection profile is set to Stratos (see section 17.1.3) the equipment enforces certain restrictions in order to ensure the security of the system. These restrictions include:

- Telnet & ssh are disabled. If terminal access is required then instead use the web terminal described in section 4.10.
- Username / password authentication is disabled for remote access. Instead use Outstation User Credentials as described in section 16.2. Note:
 - Outstation User Credentials are not required when accessing the equipment through Stratos
 - Outstation User Credentials need to be installed on all systems used for remote access not through Stratos including personal computers, UTC systems, tablets, phones.
- Remote use of the TRL Movacomm tool is prohibited. Instead use the built-in *movacomm* command as described in 667/HB/46000/003.

17.1.2 Requirements for Connection to Stratos

Equipment

ST950 CPU board 667/1/46010/101 is required in order to support connection to Stratos. 667/1/46010/001 does not support connection to Stratos so will need to be replaced if connection is required.

There is no restriction on Stratos Outstation hardware for connection to Stratos.

Network Configuration

In order to connect to Stratos, the following internet services must be accessible to the equipment:

- DHCP (UDP 67 & 68)
- DNS (UDP 53)
- NTP (UDP 123)
 - pool.ntp.org
- HTTPS (TCP 443)
 - www.stratostraffic.com (TLS trusted time)
 - www.stratosemerge.com (CRLs)

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- ovpn1.stratostraffic.com (OpenVPN)
- HTTP or HTTPS (TCP 80 or 443)
 - OSCP authenticator for stratosmerge HTTPS certificate (OCSP)

Other applications and features of the equipment may require access to additional services either on the internet or on a local network. The documentation for these applications and features record these requirements.

Licence Card

A Licence Smartcard version 2 is required to support connections to Stratos. The version of the Licence Smartcard fitted can be checked on the System – Settings – Comms – Stratos configuration web page.

The UTMIC OTU licence controls whether or not connection to Stratos is permitted – see section 10.

Default	Item	Value
<input type="checkbox"/>	Tenant Pass Phrase ?
<input type="checkbox"/>	Tenant Name ?	Automation1
<input type="checkbox"/>	Site Location ?	ST700 Biscuit Tin SysLab
<input type="checkbox"/>	Unique Site Name ?	StratosOutstation2
<input type="checkbox"/>	Unique Site ID ?	1427900621531
<input type="checkbox"/>	Stratos Link ?	Connected
<input type="checkbox"/>	Stratos Credentials ?	Active
<input type="checkbox"/>	Smartcard Secure Store ?	Available
<input type="checkbox"/>	Smartcard Version ?	2

17.1.3 Configuring for Connection to Stratos

To connect the unit to Stratos perform the following:

1. Set the date and time (*System - Settings - System Date & Time - Set System Date & Time* web page).
2. On the *System - Settings - Comms – Stratos* web page:
 - Set the Tenant Pass Phrase.
 - Set the Site Location.
 - Set the Site Name.
3. Set the profile to Stratos (*System – Settings* web page).
4. Check that Ethernet is suitably configured (*System - Settings - Comms - DSL/Fibre* web page). Using the Stratos profile sets this to DHCP. If this not suitable then configure as described in section 3.5.2.
5. Connect the Ethernet port to a network which has connectivity to the services described above.

Setting the Site Name, Site Location & Tenant Pass Phrase

These items are set on the System – Settings – Comms – Stratos configuration web page.

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Specifying a Tenant Pass Phrase prior to initial connection allows the equipment to be automatically allocated to the specified tenant on initial connection to Stratos. If the Tenant Pass Phrase is not specified at the time of initial connection then the equipment will be allocated to the Siemens Support team who can then make the allocation when required based on the outstation name, unique site id and destination tenant. This item has no effect after initial connection to Stratos.

Default	Item	Value
<input type="checkbox"/>	Tenant Pass Phrase (Not Set)?	
<input type="checkbox"/>	Tenant Name ?	Automation1
<input type="checkbox"/>	Site Location ?	Systems lab
<input type="checkbox"/>	Unique Site Name ?	StratosOutstation3
<input type="checkbox"/>	Unique Site ID ?	1427901275846
<input type="checkbox"/>	Stratos Link ?	Connected
<input type="checkbox"/>	Stratos Credentials ?	Active
<input type="checkbox"/>	Smartcard Secure Store ?	Available
<input type="checkbox"/>	Smartcard Version ?	2

Setting the profile to Stratos

Equipment is supplied configured for use in non-Stratos systems. To configure it for use with Stratos, visit the System – Settings configuration web page and set the *Profile* to *Stratos*.

Default	Item	Value
<input type="checkbox"/>	Default Profile ?	Stratos

17.2 Connection to Systems Other than Stratos

17.2.1 General Considerations

When set to the Stratos profile and connected to Stratos only, the equipment provides suitable security to allow it to be connected to the Internet. If either of these conditions is not met (i.e. the Stratos profile isn't selected and / or the unit is connected to systems

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other than Stratos e.g. UTC systems) then a suitable analysis should be performed to ensure that there are no security vulnerabilities in the network configuration and / or equipment used. Hard rules cannot be given here because the details will depend on the networks and connections involved and will change over time. What is considered appropriate security now may not be so in a year's time and is unlikely to be adequate in five or ten year's time. The following are examples of what should be considered:

- General:
 - Are the reasons for connection clear?
 - Has the system (including all equipment and interconnections) been reviewed for vulnerability / susceptibility weakness appropriate to the environment in which it is used?
 - Has a plan been drawn up to ensure that the findings of this analysis are implemented and maintained?
- Configuration:
 - Does the configuration meet the needs for connection and no more?
 - Is configuration of equipment suitably protected?
 - Are only the services & features which are necessary enabled?
 - Is encryption used where privacy is required?
 - Is authentication used where trust is required?
 - Are the endpoints of trusted and / or private links in appropriate places?
 - Are firewalls in place to ensure traffic only flows as desired (and cannot flow elsewhere)?
- Maintenance:
 - Is all equipment running the latest firmware available for the manufacturer?
 - Is there a plan and means to apply security fixes to firmware used in all elements of the system?
 - Are secrets (e.g. passwords, encryption / authentication keys) held securely?
 - Is there a plan and means to update secrets as required (e.g. password update & strength)?
 - Is there a plan to regularly review the system to determine if it is still secure?
- Disposal:
 - Is equipment which is replaced or no longer required disposed of in a way which does not compromise the system (e.g. through leakage of secrets, configuration, etc.)?

Note that this consideration applies to all types of networks including those considered "private". Often "private" networks will have external connections to some services and may also have some internal threats. These need to be identified and considered in order to ensure that the system is secure.

17.2.2 Example Specification

Below is an example specification which might be drawn up for the connection of equipment to an instation. This is an example only and should not be taken as complete or suitable for any particular purpose.

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All communications between equipment and instation shall be over VPN.

- Where IPSEC is used as the VPN, the following ciphers or stronger shall be used (weaker ciphers shall not be used):
 - SHA256
 - AES128/AES256
- Where PKI is used to secure the VPN link, the following shall be the minimum used:
 - 2048 Kbit Private keys
 - The CA shall be the responsibility of, managed and maintained by the customer. Siemens shall review the customer's proposal for this process to ensure adequate and acceptable.
- Where a shared secret is used to secure the VPN link:
 - The Security key shall be unique for each connection e.g a separate shared key shall be used for each connection.
 - The shared secrets shall be the responsibility of, secured by, managed and maintained by the customer. Siemens shall review the customer's proposal for this process to ensure adequate and acceptable.

All equipment shall:

- Be running latest firmware available from the manufacturer.
- Have firmware updated at least every three months if an update is available.
- Have all passwords set to non-default values unique to that equipment
- Not have Admin Web interface available on WAN interface
- Be returned to Siemens when no longer required (e.g. replaced, decommissioned) for secure disposal

All routers shall:

- Be configured with an acceptable firewall to prevent unauthorized access from WAN
- Have no additional services available on the WAN interface (SNMP, Telnet, SSH)
- Have UPNP disabled
- Have no port forwarding from the WAN to the ST950 / Stratos Outstation shall be used.

The ST950 / Stratos Outstation:

- Shall have the Firewall setup to include rules to only accept known traffic from the known Instation IP address.

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