SIEMENS

USER'S GUIDE

CPU III MODULE A80903 FOR GEO & WAYCONNEX

DECEMBER 2016

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The equipment covered in this manual has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

DOCUMENT HISTORY

Version	Release Date	Sections Changed	Details of Change
A	DEC 2016		Initial Release

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NOTES, CAUTIONS, AND WARNINGS

Throughout this manual, notes, cautions, and warnings are frequently used to direct the reader's attention to specific information. Use of the three terms is defined as follows:

WARNING

INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY. WARNINGS ALWAYS TAKE PRECEDENCE OVER NOTES, CAUTIONS, AND ALL OTHER INFORMATION.

CAUTION

REFERS TO PROPER PROCEDURES OR PRACTICES WHICH IF NOT STRICTLY OBSERVED, COULD RESULT IN A POTENTIALLY HAZARDOUS SITUATION AND/OR POSSIBLE DAMAGE TO EQUIPMENT. CAUTIONS TAKE PRECEDENCE OVER NOTES AND ALL OTHER INFORMATION, EXCEPT WARNINGS.

NOTE

Generally used to highlight certain information relating to the topic under discussion.

If there are any questions, contact Siemens Industry, Inc. Application Engineering.

ELECTROSTATIC DISCHARGE (ESD) PRECAUTIONS

Static electricity can damage electronic circuitry, particularly low voltage components such as the integrated circuits commonly used throughout the electronics industry. Therefore, procedures have been adopted industry-wide which make it possible to avoid the sometimes invisible damage caused by electrostatic discharge (ESD) during the handling, shipping, and storage of electronic modules and components. Siemens Industry, Inc. has instituted these practices at its manufacturing facility and encourages its customers to adopt them as well to lessen the likelihood of equipment damage in the field due to ESD. Some of the basic protective practices include the following:

- Ground yourself before touching card cages, assemblies, modules, or components.
- Remove power from card cages and assemblies before removing or installing modules.
- Remove circuit boards (modules) from card cages by the ejector lever only. If an ejector lever is not provided, grasp the edge of the circuit board but avoid touching circuit traces or components.
- Handle circuit boards by the edges only.
- Never physically touch circuit board or connector contact fingers or allow these fingers to come in contact with an insulator (e.g., plastic, rubber, etc.).
- When not in use, place circuit boards in approved static-shielding bags, contact fingers first. Remove circuit boards from static-shielding bags by grasping the ejector lever or the edge of the board only. Each bag should include a caution label on the outside indicating static-sensitive contents.
- Cover workbench surfaces used for repair of electronic equipment with static dissipative workbench matting.
- Use integrated circuit extractor/inserter tools designed to remove and install electrostatic-sensitive integrated circuit devices such as PROM's (OK Industries, Inc., Model EX-2 Extractor and Model MOS-40 Inserter (or equivalent) are highly recommended).
- Utilize only anti-static cushioning material in equipment shipping and storage containers.

For information concerning ESD material applications, please contact the Technical Support Staff at 1-800-793-7233. ESD Awareness Classes and additional ESD product information are also available through the Technical Support Staff.

GLOSSARY

TERM	DESCRIPTION
AAR:	Association of American Railroads – An organization that establishes uniformity and standardization among different railroad systems.
ACSES:	Advanced Civil Speed Enforcement System
AREMA:	American Railway Engineering and Maintenance-of-way Association
Aspect:	(Signal Aspect) The appearance of a fixed signal conveying an indication as viewed from the direction of an approaching train. A cab signal conveying an indication as viewed by an observer in the cab.
ATCS:	Advanced Train Control System – An industry standard used in equipment communications.
BCM:	Base Control Module
BCP:	Base Communication Package, or Base Station
Boot:	Startup sequence for the microprocessor. On the GEO system this can be accomplished by removing then reseating the CPU module or by pulling the 30 A chassis fuse for a few seconds.
CAD:	Computer Aided Dispatch. An automated system for processing dispatch business and automating many of the tasks typically performed by a dispatcher. Abbreviated CAD (not to be confused with computer-aided design which is also known as CAD) is application software with numerous features and functions.
CDL:	Control Descriptor Language – The programming language used by application engineers to customize operation, settings, and behavior.
CDMA:	Code Division Multiple Access. A protocol used in cellular telephony.
Checksum:	A simple way to protect the integrity of data by detecting errors in data that are sent through space (telecommunications) or time (storage). It works by adding up the basic components of a message, typically the asserted bits, and storing the resulting value. Anyone can later perform the same operation on the data, compare the result to the authentic checksum and (assuming that the sums match) conclude that the message was most likely not corrupted.
CETC:	Centralized Electrification & Train Control
CLS:	Color Light Signal – The GEO module used to control and monitor Color Light Signals.
Configuration File:	When changes are made to the default settings in the MCF (Master Configuration File), the custom settings are maintained in the configuration file.
CPU III:	Next Generation GEO central processing unit (CPU) module.
CRC:	Cyclical Redundancy Check – Used to determine that data has not been corrupted.
CTC:	Centralized Traffic Control. This is also known as CAD for Computer Aided Dispatch. This is the system in the office used to control and monitor the railroad signaling system.
DATAGRAM:	In general, any ATCS packet. Several types of datagrams are defined for specific functions within an ATCS environment.
dB:	Decibels
dBi	Abbreviation for decibels referenced to an isotropic (unipole) antenna.
dBm	Abbreviation for decibels above (or below) one milliwatt.

TERM	DESCRIPTION
DC offsets:	Condition in which one rail is kept at one voltage relative to the other even when the track circuit is disconnected.
Debounce:	The amount of time an input must remain constant to be considered a valid input. Debounce prevents random spikes of electrical energy from energizing an input.
DIAG.:	Diagnostic
DNS:	Domain Name Server
DOT Number:	Department of Transportation crossing inventory number assigned to every highway-railroad crossing. The number consists of six numbers with an alpha suffix.
Drop Delay	An internal delay time between when a function is ordered off and when it actually de-energizes.
DSU:	Data Service Unit
DT:	Diagnostic Terminal - Safetran's PC-based diagnostic software.
DTMF:	Dual Tone Multi-Frequency - The tones on a telephone or radio keypad.
ECD:	External Configuration Device – The non-volatile memory device used for storing the module configuration file.
Echelon®:	A Local Area Network, LAN, used by Safetran equipment.
EEPROM:	Electrically Erasable Programmable Read-Only Memory. A type of non-volatile memory used in computers and other electronic devices to store small amounts of data that must be saved when power is removed. When larger amounts of static data are to be stored, a specific type of EEPROM called a flash memory is used.
ELS:	Serial Link extension board
EMP:	Edge Messaging Protocol. A common message format used for edge integration. Examples of integration edges are wireless transports and various messaging systems that may be used by the various railroads (e.g., using EMP to communicate between mobile applications and back office applications using wireless communications). EMP defines the message format, header, and operating rules which facilitate interoperable message transmission, reception, decoding, and routing.
Firmware:	Software saved in ROM within a module and moved into main memory RAM for runtime use when the system is powered up.
FRA:	Federal Railroad Administration. The purpose of FRA is to: promulgate and enforce rail safety regulations; administer railroad assistance programs; conduct research and development in support of improved railroad safety and national rail transportation policy; and consolidate government support of rail transportation activities.
GCP:	Grade Crossing Predictor – A train detection device used as part of a highway-railroad grade crossing warning system to provide a relatively uniform warning time.
GEO®:	Geographic Signaling System - GEO® is vital microprocessor-controlled signaling equipment manufactured by Safetran Systems Corporation. It monitors and controls switches, signals, and relays at wayside locations on the railroad.
GENI (F):	Genisys Field Protocol
GENI (O):	Genisys Office Protocol

TERM	DESCRIPTION
GFT:	Ground Fault Tester – An optional external device connected to the Echelon LAN that constantly monitors up to two batteries for ground faults and indicates battery status.
GMT:	The time as measured on the prime meridian running through Greenwich, England: used in England and as a standard of calculation elsewhere. Also called Greenwich Mean Time, Greenwich Civil Time, Universal Time
GOL:	Geographic Object Library
GPS:	Global Positioning System.
HMAC:	Keyed-Hash Message Authentication Code. A type of message authentication code (MAC) calculated using a specific algorithm involving a cryptographic hash function in combination with a secret key.
HS:	Home Signal
Hz:	Hertz – Common reference for cycles per second or flashes per second.
Interconnection:	The electrical connection between the railroad active warning system and the traffic signal controller for the purpose of preemption.
IP:	Internet Protocol - ISO Model Layer 3 (network) protocol that performs proper routing of packets.
ITC:	Interoperable Train Control
ITCM:	Interoperable Train Control Message.
Interlocking:	An automatic or manual arrangement of signals and appliances so interconnected that their movements must succeed each other in proper sequence and for which interlocking rules are in effect.
IO or I/O:	Input/Output
kHz:	Kilohertz – 1000 Hz or 1000 cycles per second.
LAN:	Local Area Network – A limited network where the data transfer medium is generally wires or cable.
LCP:	Local Control Panel – A control and display interface device that allows field personnel to perform maintenance and troubleshooting procedures at a location.
LED:	Light-Emitting-Diode - A solid-state indicator.
LIN:	Line - The GEO module used to transmit and receive coded track patterns over cable.
LOD:	Light Out Detector - A device that monitors current flowing in a circuit such as a signal light, switch, etc., for the purpose of detecting a fault condition in the circuit.
LOR:	Lamp Out Relay - A GEO status indication using the DTU or the maintainer's interface that a signal lamp filament has been tested with current and failed.
LUI:	Local User Interface – Refers to the character display and keypad on the front panel of Safetran equipment.
MCF:	Module Configuration File
MEF:	Module Executable File

TERM	DESCRIPTION
Module:	Physical package including PCBs and input/output terminals for connecting to external devices and equipment.
NTP:	Network Time Protocol. The NTP is a protocol used to synchronize the clocks in millions of servers, workstations and PCs of the public internet and private networks.
OCG:	Office Communication Gateway
OCE:	Office Configuration Editor – A program used to create configuration package files (Pac files) for iVIU PTC GEO, iVIU, VIU, GEO, CPU III, and GCP equipment.
Out Of Service:	The process for taking one or more pieces of equipment out of service for repair and/or maintenance.
Pac File:	A configuration Package File that can either be created in the office using the OCE.
PCB:	Printed Circuit Board
Pick Up Delay:	An internal delay time between when an input receives the signal to pick up and when it actually responds.
PTC:	Positive Train Control. An automated control system for railways that ensures the safe operation of rail vehicles using data communication between various control entities that make up the system.
Reboot:	To cause the system to restart by removing power for a few seconds, then reapplying power.
RJ-45:	Industry standard Ethernet port
RIO:	Relay Input Output Module
RS232:	Industry standard serial port.
RS-485:	A higher speed version of RS-232 that supports longer distances and multiple devices.
RTU:	Remote Telemetry Unit
RX:	Receive
RXD:	Receive Data
Serial bus:	The communication path that carries messages between the CPU and I/O modules installed in the GEO chassis. The serial bus is a set of solder runs on the motherboard (backplane) of the chassis.
Signal aspect:	The appearance of a fixed signal conveying an indication as viewed from the direction of an approaching train; the appearance of a cab signal conveying an indication as viewed by an observer in the cab.
SIN:	Site (Subnode) Identification Number - A twelve-digit ATCS address representing the module as a subnode on the network.
SNMP:	Simple Network Management Protocol. SNMP is an Internet-standard protocol for managing devices on IP networks.
SNTP:	Simple Network Time Protocol. A simplified version of NTP where storage of state data is not required
SSH:	Secure Shell. SSH is a network protocol for secure data communication and remote command execution.

TERM	DESCRIPTION
TCP/IP Network:	Transmission Control Protocol / Internet Protocol. The suite of communications protocols used to connect hosts on the Internet. TCP/IP uses several protocols, the two main ones being TCP and IP. TCP/IP is built into the UNIX operating system and is used by the Internet, making it the de facto standard for transmitting data over networks.
Track circuit:	Defined by AREMA as “An electrical circuit of which the rails of a track form a part.” A track circuit’s limits are established by the use of insulated rail joints.
TRK:	Track – The GEO module used to transmit and receive coded track patterns for railroad track circuits.
True RMS AC+DC:	A scale on a multimeter that measures the effective combined AC and DC portions of the total voltage. Used to measure the pulsed output of a crossing controller. Measured as VRMS.
TSR:	Temporary Speed Restriction
TX:	Transmit
TXD:	Transmit Data
UAX:	Acronym for Upstream Adjacent Crossing (Xing). UAX inputs are used to receive prediction information from an upstream GCP as inputs to a downstream GCP when insulated joints are in the approach circuit.
UCN:	Unique Check Number – A number is used to detect file corruption.
UDP:	User Datagram Protocol - A transport protocol used primarily for the transmission of network management information. Not as reliable as TCP.
ULCP:	Universal Local Control Panel – Same as LCP.
USB Port:	Universal Serial Bus Port
USB Drive:	Types of memory devices that plug into a USB port. These devices are commonly called flash drives or memory sticks.
UTC:	Coordinated Universal Time.
VHF Communicator:	Communications device used for remote operations and calibration as well as data communications.
VIU:	Vital Interface Unit. A device that monitors switch positions and signal aspects and then generates vital status messages reflecting the current state of the monitored equipment.
VLAN:	Virtual Local Area Network
VLO:	Vital Lamp Output – A software-driven vital hardware output which drives a lamp on a Colorlight Signal to display a commanded aspect and verifies the lamp is operational (not shorted or out).
VLP:	Vital Logic Processor -- The processor mounted on the CPU module that is responsible for vital processing.
VPI:	Vital Parallel Input – A vital input to a module, designed primarily to read the state of a vital signaling relay.
VRMS:	Volt Root Mean Square – See True RMS AC + DC above.

TERM	DESCRIPTION
VTP:	Virtual Local Area Network (VLAN) Trunk Protocol. A Cisco proprietary Layer 2 messaging protocol that manages the addition, deletion, and renaming of VLANs on a network-wide basis. VTP reduces administration in a switched network. When you configure a new VLAN on one VTP server, the VLAN is distributed through all switches in the domain. This reduces the need to configure the same VLAN everywhere.
WAMS:	Wayside Alarm Management System – An office based application that communicates with and receives data from specially equipped crossings.
WCC/FPD:	Wayside Cluster Controller/Field Protocol Device. The WCC/FPD is often referred to as the Packet Switch. This equipment manages clusters of base stations and other communications links to the field. The WCC/FPD is installed in the office.
WCCT	WayConneX Configuration Tool
WCCMaint:	Software that runs on a PC used to configure and manage a network of WCC/FPD equipment. WCCMaint is often used to manage other communications equipment as well such as WCPs and BCPs.
WIU:	Wayside Interface Unit. Term used to refer to the VIU in PTC applications.
WSM:	Wayside Status Messages. Messages in EMP format reflecting the status of vital functions at a wayside location. These vital functions include signal aspects and switch positions.

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SECTION 1 - INTRODUCTION

1.0 INTRODUCTION

The A80903 CPU III Module is the next generation Central Processing Unit for use in the Geographic Signaling System (GEO®) and WayConneX equipment. The CPU III eliminates the need for a Diagnostic Terminal Module used with the GEO® System.

The CPU III is equipped with an Ethernet port and an internal Web User Interface (Web UI) for user Configuration, Diagnostics, Software upgrades, System status, and generating Reports and Logs. When used in the new WayConneX (A80610) chassis, the Ethernet port from the CPU III that is available on the chassis eliminates the need for intermediate equipment for IP communications.

The CPU III has an output RS-232 port for configuration of the GEO modules installed in the system using a DB-9 to DB-9 serial cable.

The CPU III can be used as a drop in replacement in existing GEO Appliance model systems that use the CPU2+ (A80403-003) module and A53510 chassis.

Note: it cannot be used with pre-appliance model application that use CPU2 (A53268), CPU (A53260), or CPU2+ (A80403-002, ones that use VPJxx_xx/NCJxx_xx MEFs).

The CPU III can also be used in the new WayConneX applications using the A80610 chassis. The WayConneX Configuration Tool (WCCT) can be used to create Boolean application programs (MCF) for controlling the signaling logic and allowing PTC interface functionality.

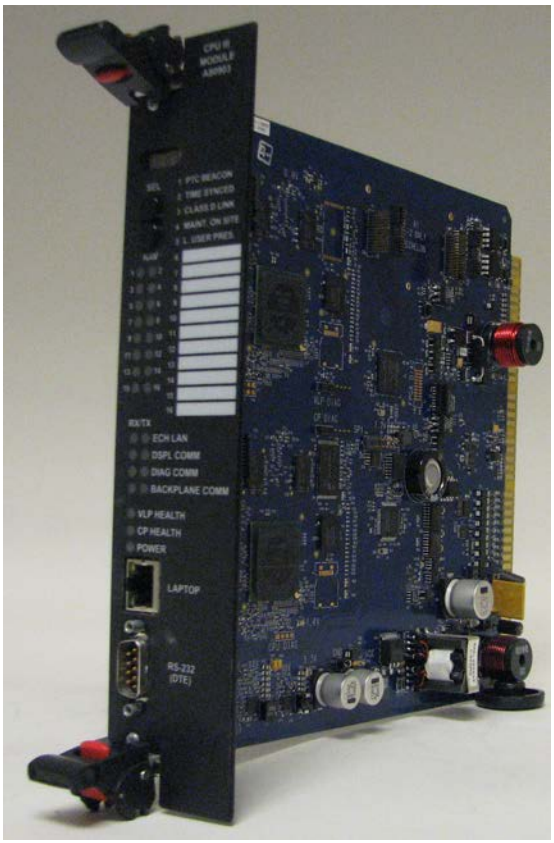


Figure 1-1 A80903 CPU III Module

1.1 ORDERING INFORMATION

The CPU III may be ordered with or without Echelon® communications.

The following is the ordering information for the A80903 CPU III Module.

8000-80903-X0XX

DRESS PANEL/MYLAR
1 – GEO BLACK PANEL
2 – GCP BLACK PANEL
3 – GEO LIGHT GRAY PANEL

1 - GEO SOFTWARE
9VC27-A01X
9VC52-A01X
9VC53-A01X
9VC54-A01X
9VC60-A01X
9VC81-A01X
9VC82-A01X
9VC83-A01X
9VC84-A01X
9VC85-A01X
2 – GCP4000/GCP5000 SOFTWARE

1 – WITH ECHELON® MODULE
2 – WITHOUT ECHELON® MODULE

SECTION 2 – CPU III MODULE LOCAL USER INTERFACE

2.0 CPU III MODULE LOCAL USER INTERFACE

This section will detail the display messages, indicators, controls, and connectors the user will use to perform functions locally using the module front panel.

2.1 INDICATORS, CONTROLS, AND CONNECTORS

Table 2-1 CPU III Indicators, Controls, and Connectors

Item	Name	Function
Displays	4-character display	Used with the SEL and NAV push buttons to provide a maintainer interface.
Controls	2-Push Button Select/Navigate	Select (SEL) button steps through each menu The Navigate (NAV) button steps through each sub menu of the selected menu.
Indicators	16 user-programmable LEDs (red)	User can generate a label for LEDs 6 thru 11. LEDs 1 through 5 are pre-programmed at the factory.
	RX ECH LAN LED (green)	On – a message is being received on the Echelon LAN interface.
	TX ECH LAN LED (red)	On – a message is being transmitted on the Echelon LAN interface.
	RX DSPL COMM LED (green)	Not Used in GEO/WayConneX Applications
	TX DSPL COMM LED (red)	Not Used in GEO/WayConneX Applications
	RX DIAG LED (green)	On – a message is being received on the DIAG (CP) serial port.
	TX DIAG LED (red)	On – a message is being transmitted on the DIAG (CP) serial port.
	RX BACKPLANE COMM LED (green)	On – indicates data activity on bus. (Receiving I/O module status)
	TX BACKPLANE COMM LED (red)	On – indicates data activity on bus. (Transmitting commands to I/O module)

Table 2-1 CPU III Indicators, Controls, and Connectors (Continued)

Item	Name	Function
	VLP HEALTH LED (yellow)	• Flashes 1 Hz when healthy and faster when unhealthy. Indicates CPU module Vital Logic Processor is performing properly. • On steady or completely off - indicates either a malfunction, or that the module is booting. If the module is booting it will be indicated by the four-digit display on the module.
	CP HEALTH LED (yellow)	• Flashes 1 Hz when healthy and faster when unhealthy. Indicates the CPU communications Processor is performing properly. • On steady or completely off - indicates either a malfunction, or the module is booting. If the module is booting, it is indicated by the four-digit display on the module.
	POWER LED (green)	On steady - indicates that external power is being supplied to the CPU III unit.
Connectors	RS-232 (DTE) Serial Port (DB-9)	RS-232 (DTE) used to interface the CPU III Communication Processor externally to other modules in the GEO/WC chassis.
	LAPTOP Ethernet (RJ-45)	RJ-45 Ethernet port used to interface the CPU Communication Processor with a laptop / personal computer. Provides access to external communication configuration files via the Web User Interface (Web UI)

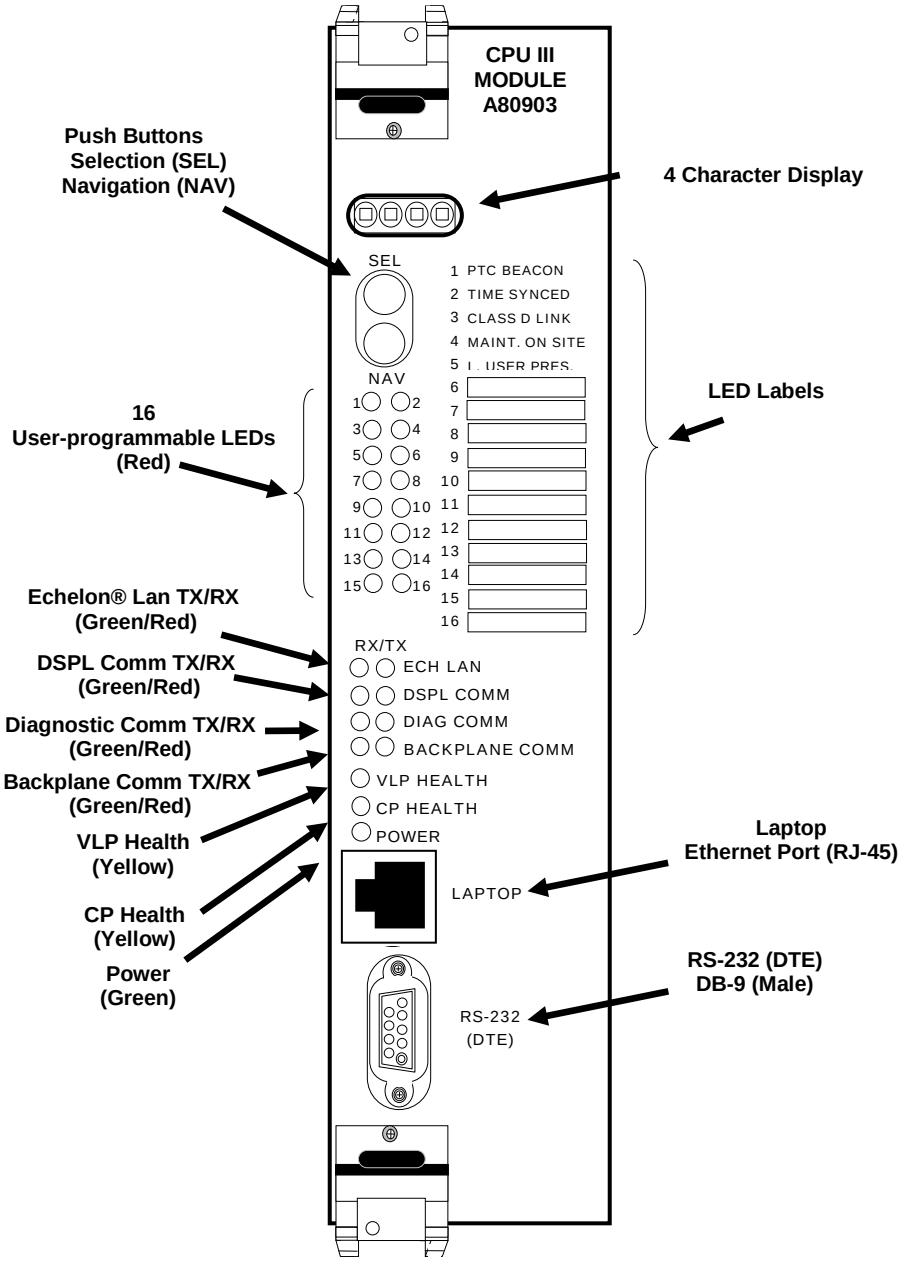


Figure 2-1 CPU III Indicators, Controls, and Connectors

2.1.1 CPU III Local User Interface

The CPU III Local User Interface consists of a 4 Digit Display and two push buttons, Select (SEL) and Navigate (NAV) that enable the user to manually program and view status of a number of parameters.

2.1.1.1 Using the Select and Navigate Push Buttons

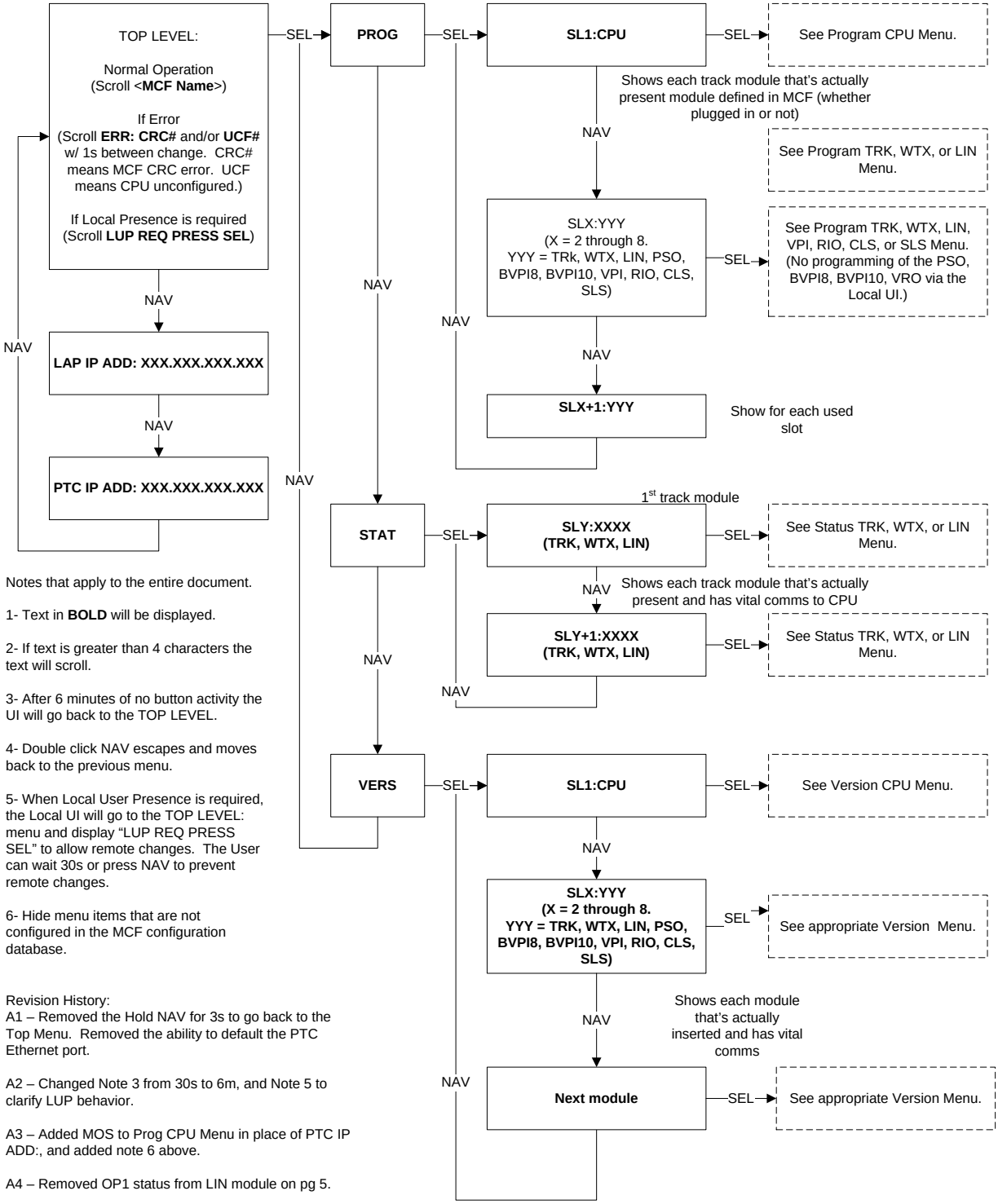
The Select and Navigate push buttons are used in the following manner. The Select (SEL) button is pushed to go to the next main menu. The Navigate (NAV) button is pushed to step through the sub menus. The Select (SEL) button will select the displayed parameter when the parameter is being modified. It also will select the displayed parameter allowing the Navigate (NAV) button to navigate sub-menu items of the displayed parameter. To back up to the previous sub menu, double click the Navigate (NAV) button. Continue to double click the NAV button to step back to the previous sub menu until the main menu is reached. The 4 Digit Display will show the current menu selected. Long titles will scroll across the display.

2.1.1.2 CPU III Local User Interface Map

The following Tables map the Local User Interface menus and sub-menus.

Table 2-2 CPU III Local UI Map

CPU3 Local UI Map



Notes that apply to the entire document.

1- Text in **BOLD** will be displayed.

2- If text is greater than 4 characters the text will scroll.

3- After 6 minutes of no button activity the UI will go back to the TOP LEVEL.

4- Double click NAV escapes and moves back to the previous menu.

5- When Local User Presence is required, the Local UI will go to the TOP LEVEL: menu and display "LUP REQ PRESS SEL" to allow remote changes. The User can wait 30s or press NAV to prevent remote changes.

6- Hide menu items that are not configured in the MCF configuration database.

Revision History:
A1 – Removed the Hold NAV for 3s to go back to the Top Menu. Removed the ability to default the PTC Ethernet port.

A2 – Changed Note 3 from 30s to 6m, and Note 5 to clarify LUP behavior.

A3 – Added MOS to Prog CPU Menu in place of PTC IP ADD:, and added note 6 above.

A4 – Removed OP1 status from LIN module on pg 5.

A5 – Removed VRO references in the Prog. Menu.
A6 - renamed GTK to WTX
A7 – change for generic backplane and add PSO/BVPI

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Table 2-3 Program CPU Menu

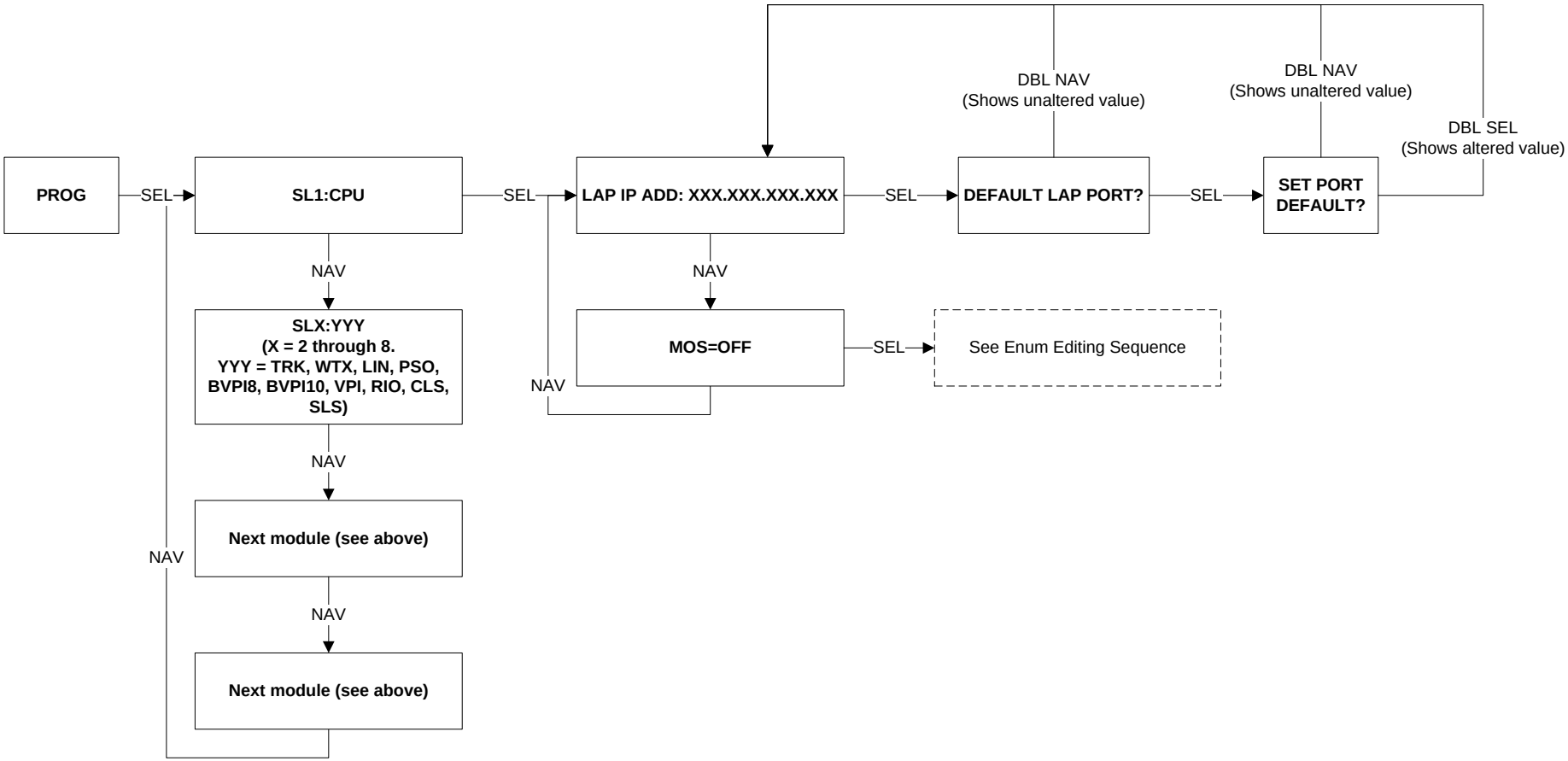

Table 2-4 ProgramTRK and LIN Menu

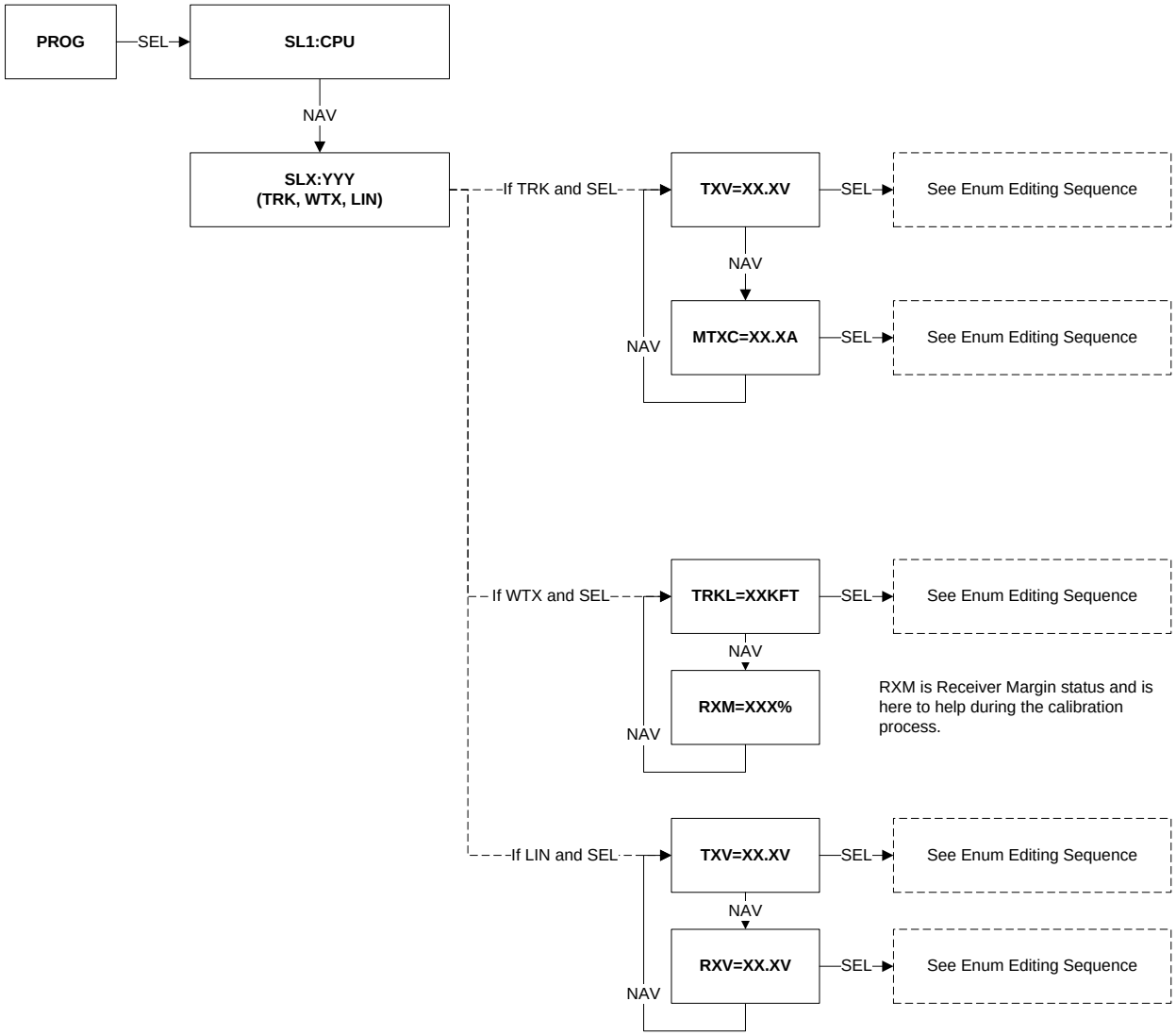

Table 2-5 Program VPI, RIO, CLS, and SLS Menu

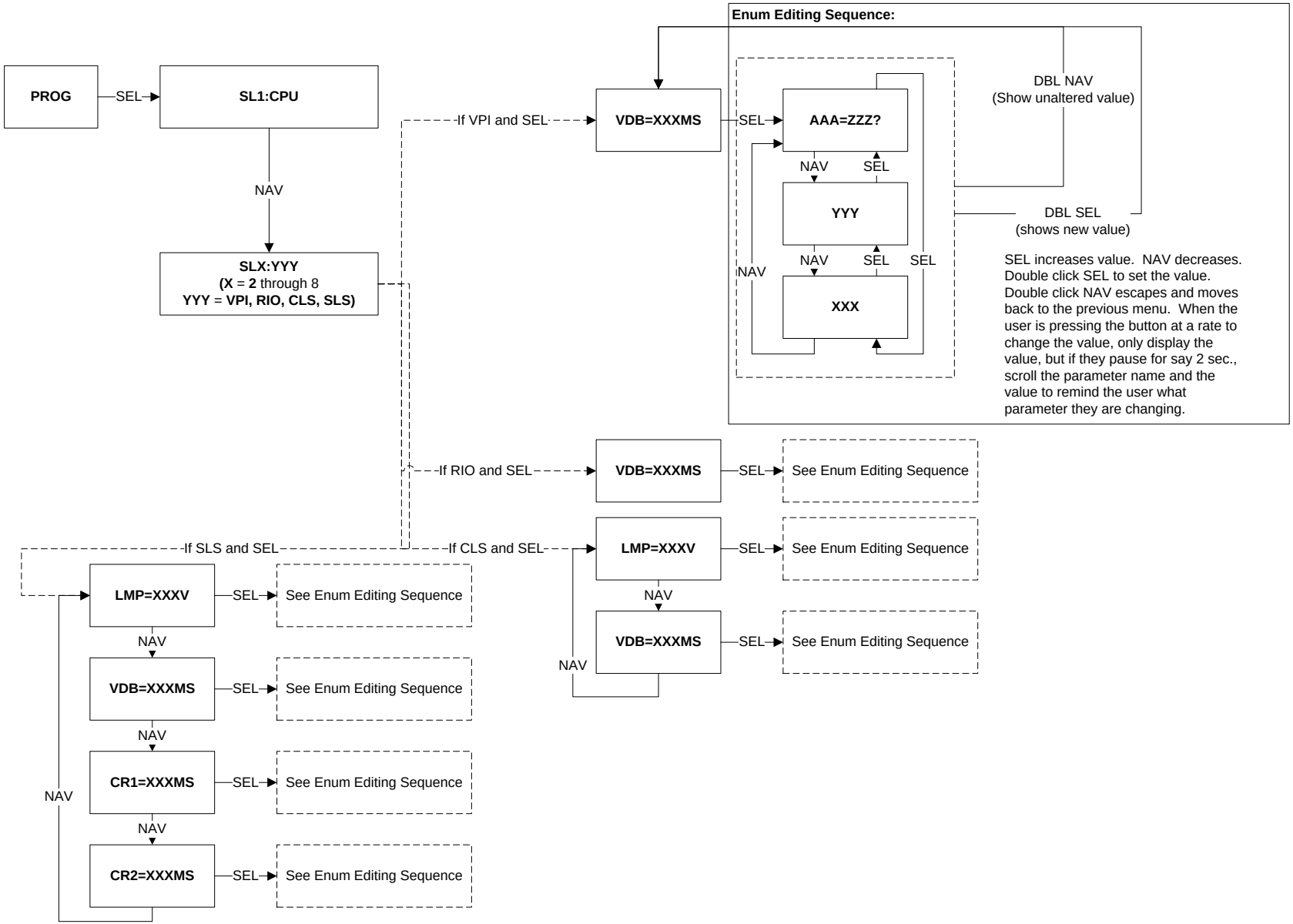

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Table 2-6 Status TRK, WTX, or LIN Menu

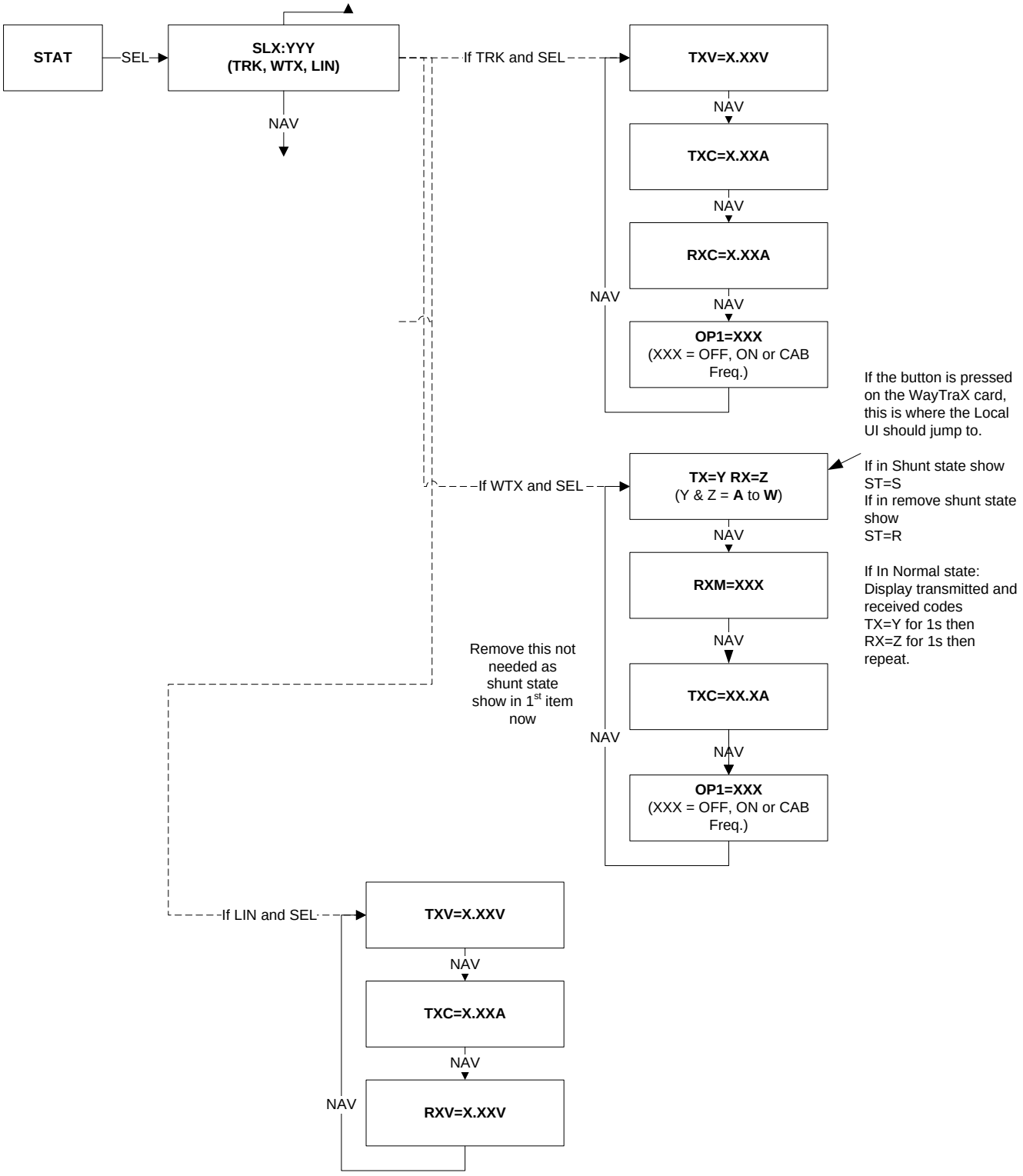
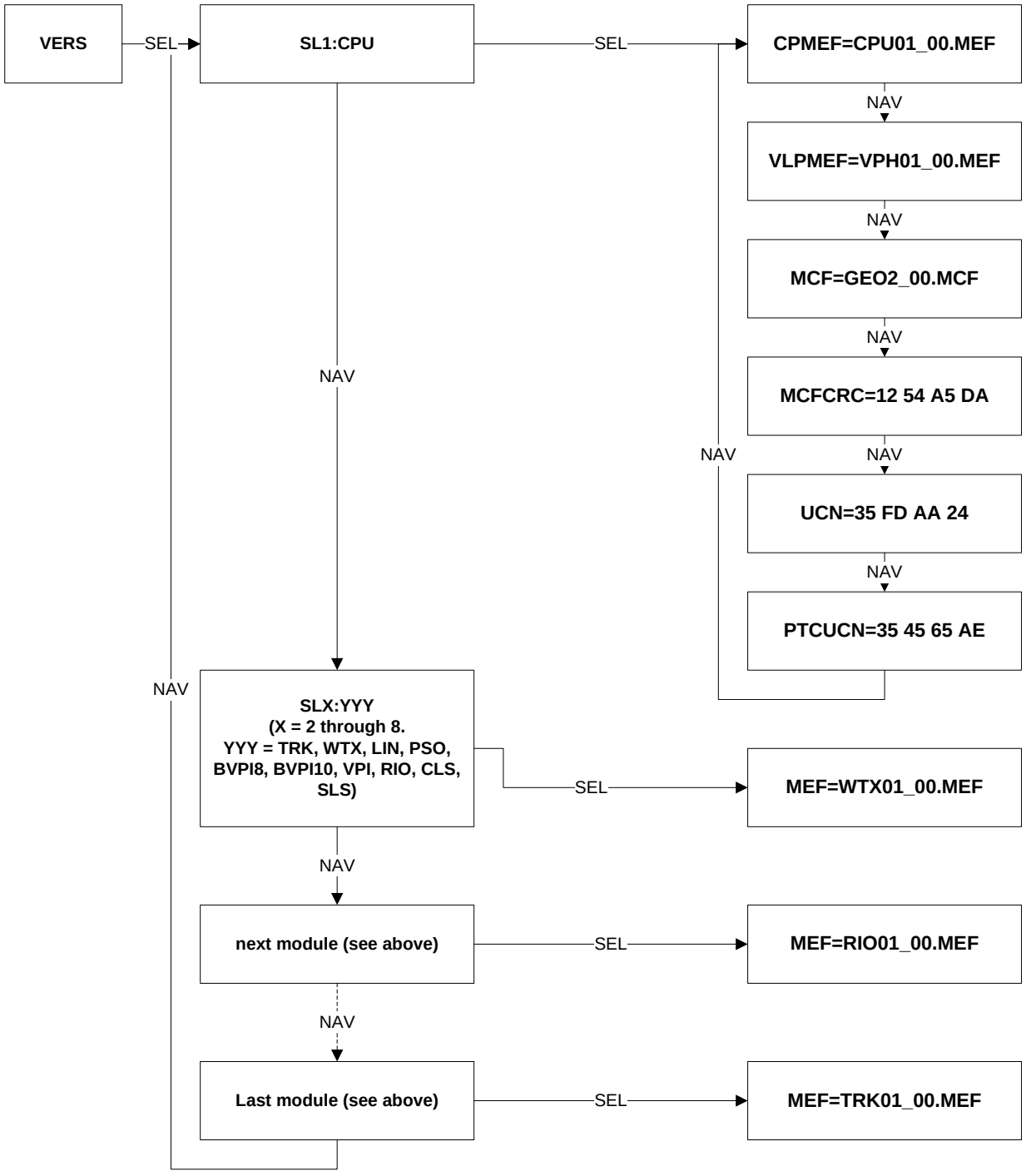


Table 2-7 Version Menu



SECTION 3 – CPU III WEB USER INTERFACE (WEB UI)

3.0 CPU III WEB USER INTERFACE (WEB UI)

The CPU III Web UI provides status and programming features found in the Diagnostic Terminal program. The following displays of the Web UI are examples and will vary in content depending on the configuration and type of application that the CPU III will be used. The CPU III can be used in three different types of applications:

- GEO Appliance Model Field Reference Manual (SIG-00-05-09)
- WayConneX Configuration Tool (WCCT) (SIG-00-14-01)
- WCCT Boolean PTC Applications
- WCCT Boolean Applications

Detailed programming information and parameters are found in:

- GEO Appliance Model Field Reference Manual (SIG-00-05-09)
- WayConneX Configuration Tool (WCCT) (SIG-00-14-01)

3.1 CPU III WEB UI SCREENS

Using a web browser enter the assigned IP address for the CPU III. Default address from the factory is 192.168.255.081. Enter the assigned password. Default password from the factory is Siemens (case sensitive). See Section 4.1 for information on finding current IP address.

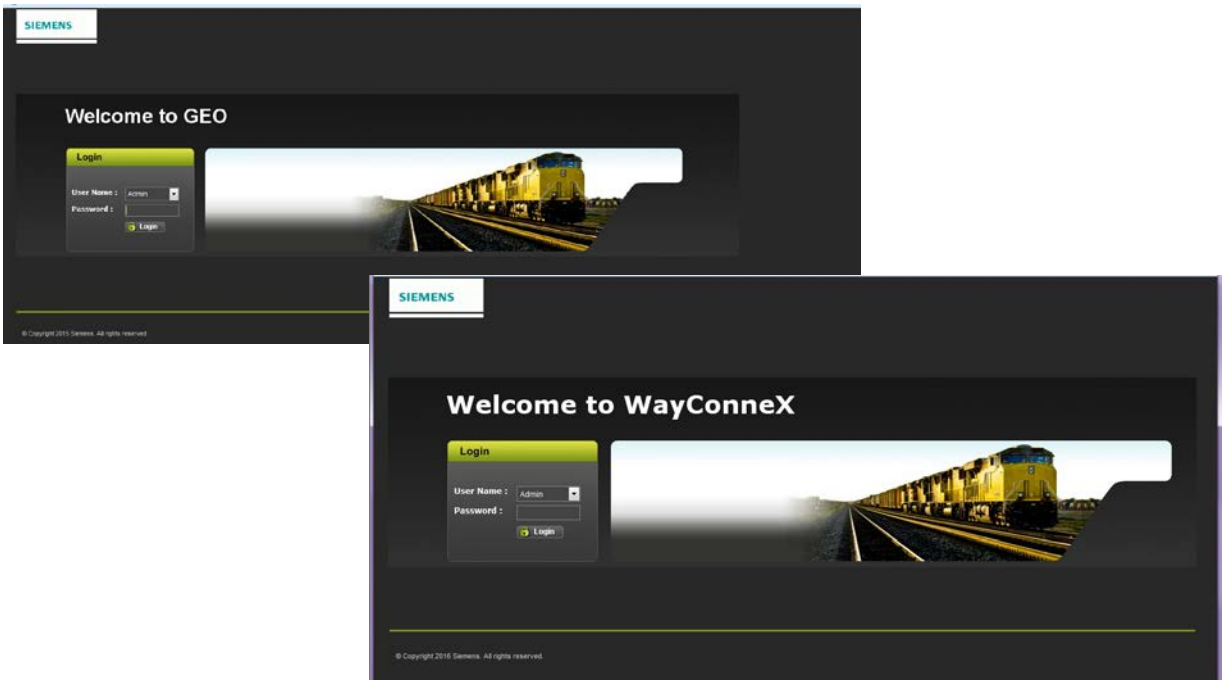


Figure 3-1 Web UI Log-in

The Web UI will open with the System View.

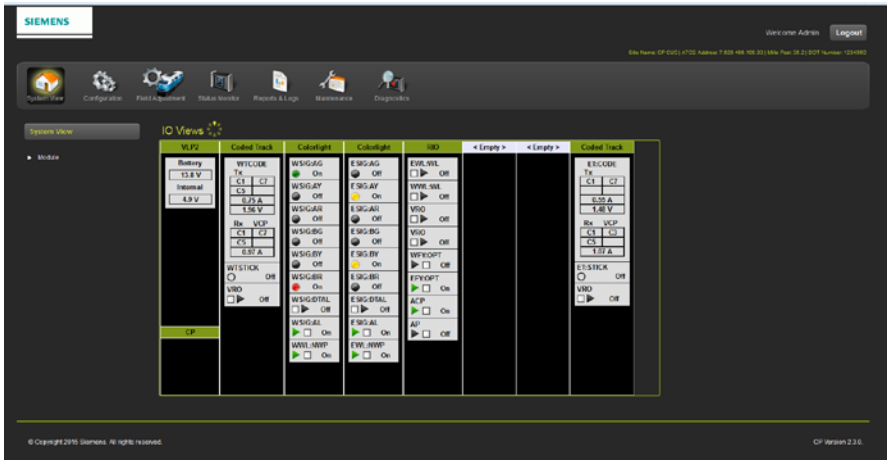


Figure 3-2 Web UI Opening Screen – IO Views

3.1.1 System View

The System View menu has a sub-menu, Module. The Module menu has three sub-menus IO Views, which displays the modules and their status, Version, which lists the module version information including installed software and the version numbers, and Refresh which refreshes the screen on command.

Figure 3-3 Web UI Opening Screen – System View Menu

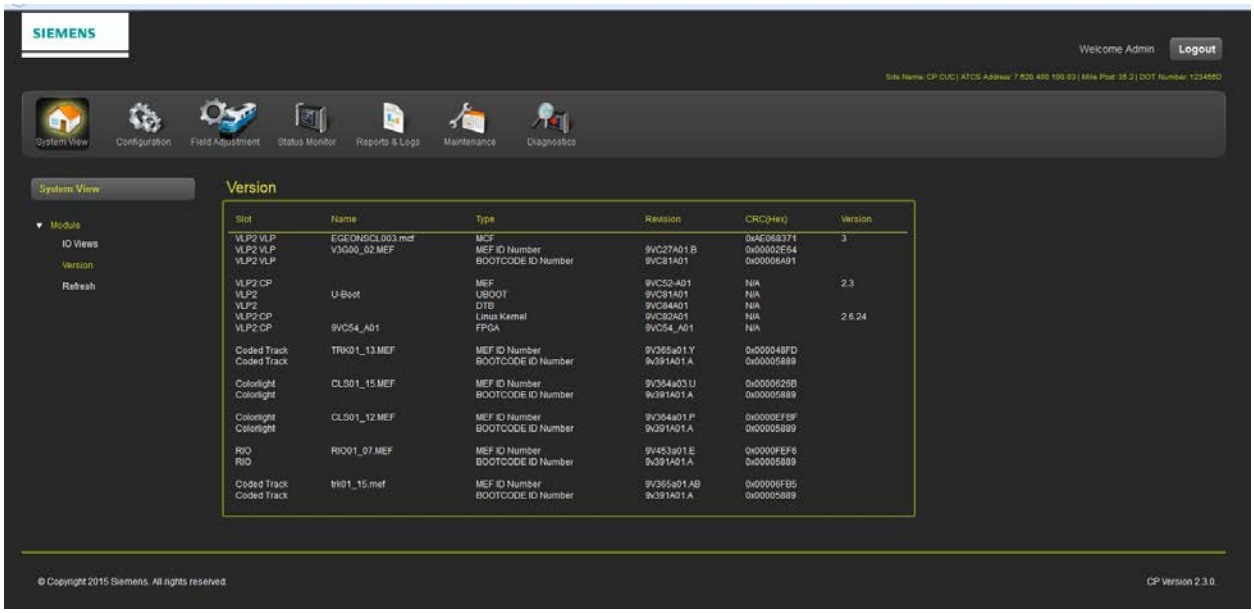


Figure 3-4 GEO Web UI – System View – Versions Display

3.1.2 Configuration Menu

The Configuration Menu has two sub menus for Non-Vital Configuration and Vital Configuration. The format of the Configuration menu will depend on whether the CPU III is running a WayConneX application created with WCCT or a GEO MCF.

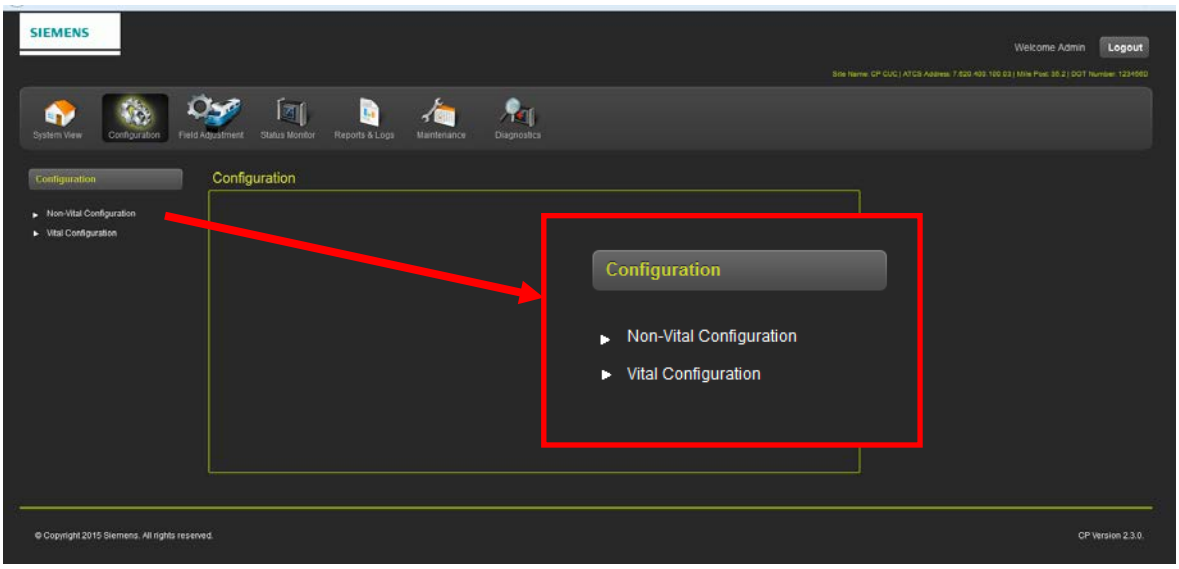


Figure 3-5 Web UI Opening Screen – Configuration Menu

3.1.2.1 GEO Configuration Menu – Non-Vital Menu Structure

The following menus are available under Non-Vital configuration:

Non-Vital Configuration

Communication
Ethernet Ports
Laptop Port - Use to set DHCP configuration
Disabled
Client
Server

Router Setting - Use to set route table timeouts
Router Table Entry Timeout

Log Setup
Diagnostic Logging - Use to enable diagnostic message tracing, this setting should be kept at Disabled unless specifically being used by Siemens Personnel to troubleshoot a problem.
Log Verbosity Settings – Sets the amount of data collected for the Diagnostic Log. High settings will cause large amounts of data to be logged to the Diagnostic log, which can slow the system down.

Security
Web UI Password – Sets the Web UI log in password
Server Inactivity Timeout – Sets the session inactivity timeout value

Web Server
Browser Access
https (Secure browser session)
http (Non-secure browser session)

Set to Default – Sets all Non-Vital configuration properties to factory default

3.1.2.2 Configuration Menu – Vital Menu Structure

Vital Configuration

LOGICAL Configuration
OBJECT Configuration – Enter OBJECT Name to be used
{OBJECT Name 1}
{OBJECT Name 2}
etc.
(Reset VLP command button to set properties for the OBJECT)

OTHER Configuration

Set to Default

PHYSICAL Configuration
MODULE Configuration – Sets properties for each module
SLOT 1 VLP2 thru 8
SLOT 2
etc.

CONNECTION Configuration – Sets ATCS Address, timeout, and message update rate for ATCS connection
{Connection Name 1}
{Connection Name 2}

CTC Configuration – Sets the ATCS Address for the non-vital controller

Set to Defaults – Sets the Vital configuration back to default

(There are also two Set to Default entries, one under LOGICAL configuration and one under PHYSICAL configuration, which sets all of the Vital configuration properties back to default.)

3.1.2.3 Configuration Menu – SITE Configuration

SITE Configuration

ATCS SIN
ATCS Address

Location – Sets the DOT Number, Milepost, and Site Name
DOT Crossing Number
Milepost Number
Site Name

Object Names – User can set new names for the OBJECTS
Enter Names of OBJECTS

Card Names – User can set new names for the modules
Enter Card Names

Time – Use to set the Time Zone, Time, and Date
Time Zone
Date
Time

Unique Check Number (UCN) - use this to set the UCN. When vital configuration parameters are changed, the UCN corresponding to these changes has to be loaded. The UCN will be supplied by the design office and is used as a check that the safety related configuration parameters have the values specified set by the design office.
Enter UCN

Reset VLP - use this to reset the VLP. Typically this will be used when the VLP has been put into edit mode so that vital parameters can be changed and after the new UCN has been entered.
Reset VLP command button

3.1.2.4 Configuration Menu – Non-Vital Structure (WayConneX, PTC Application)

The Configuration Menu has two sub-menus, Non-Vital Configuration and Vital Configuration. Figure 3-6 displays the Non-Vital configuration sub-menus.

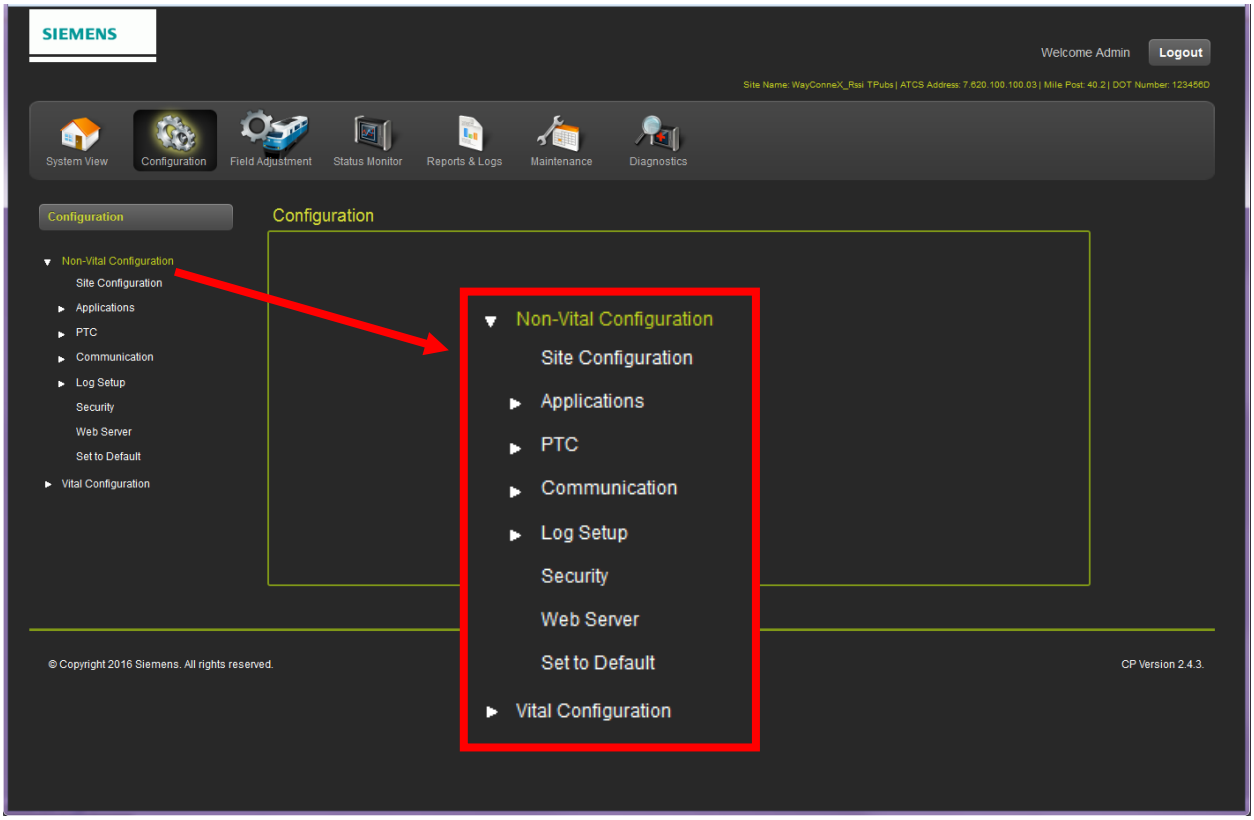


Figure 3-6 Configuration Menu – Non-Vital Configuration Sub-Menu (PTC)

- **Non-Vital Configuration – Site Configuration (PTC)**

The figure below shows the Site Configuration parameters for a PTC application.

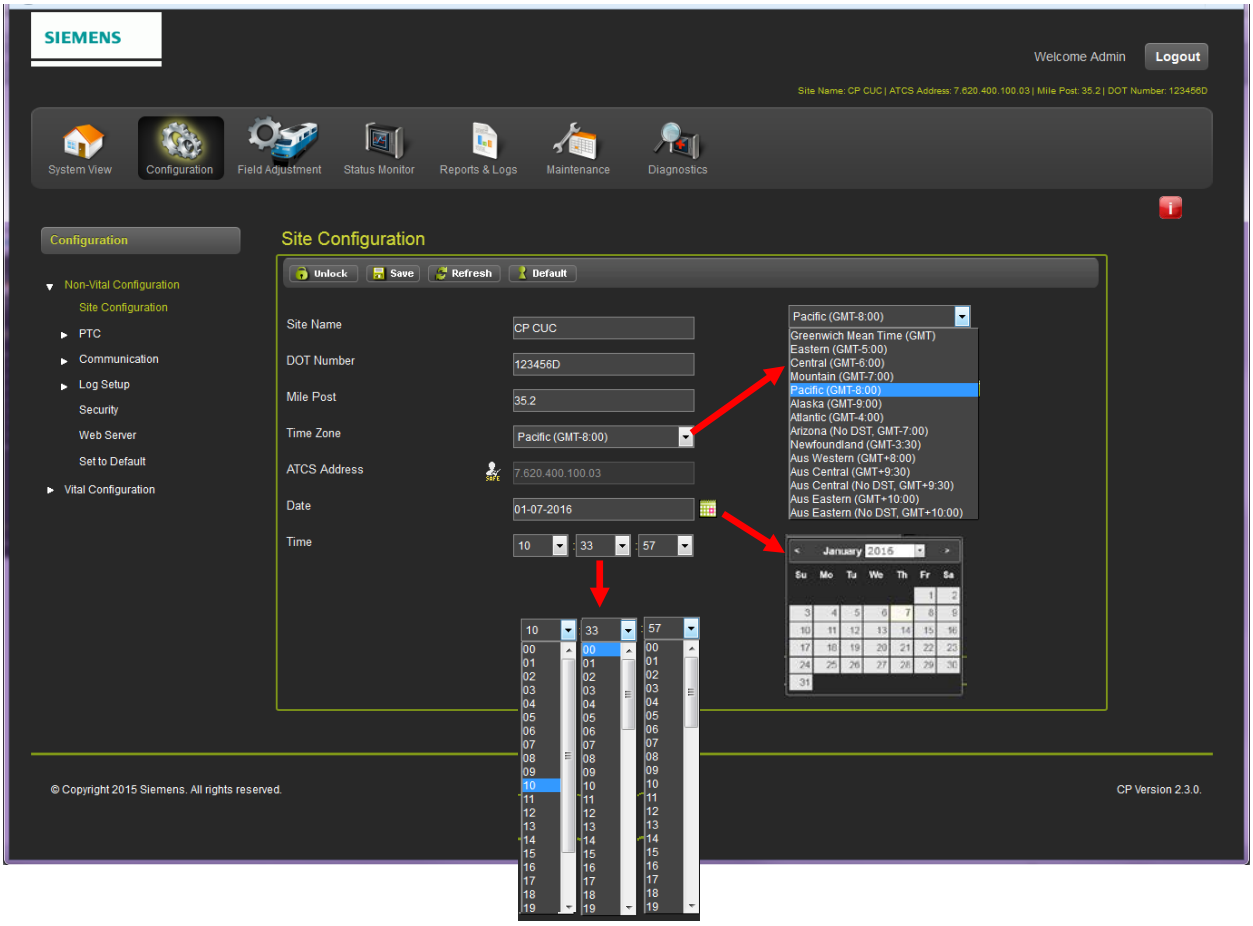


Figure 3-7 Non-Vital Configuration – Site Configuration (PTC)

Table 3-1 Site Configuration Parameters

NAME	DESCRIPTION	RANGE	DEFAULT
Site Name	User configured location ID	Up to 20 Alphanumeric char	Siemens Rail
DOT Number	DOT Number for site	Up to 7 Alphanumeric char	000000A
Mile Post	Location Mile Post ID	Up to 20 Alphanumeric char	000.0
Time Zone	Specifies the Hour offset from GMT	Select from drop-menu	Eastern (GMT -5:00)
ATCS Address	The unique 48-bit WIU Address field is in the format 7.RRR.LLL.GGG.DD, where: 7 = WIU address type identifier RRR = Railroad Number LLL = Routing Region Code GGG = Location Code DD = Device Number	Text (numeric values only)	UCN protected parameter
Date	User configurable date	Select from pop-up calendar or enter date (mm-dd-yyyy)	
Time	User Configurable time	Select from drop menus	

- **Non-Vital Configuration – Applications**

See Section 5.3.

- **Non-Vital Configuration – PTC- Menu**

Figure 3-8 displays the PTC menu and the six sub-menus.

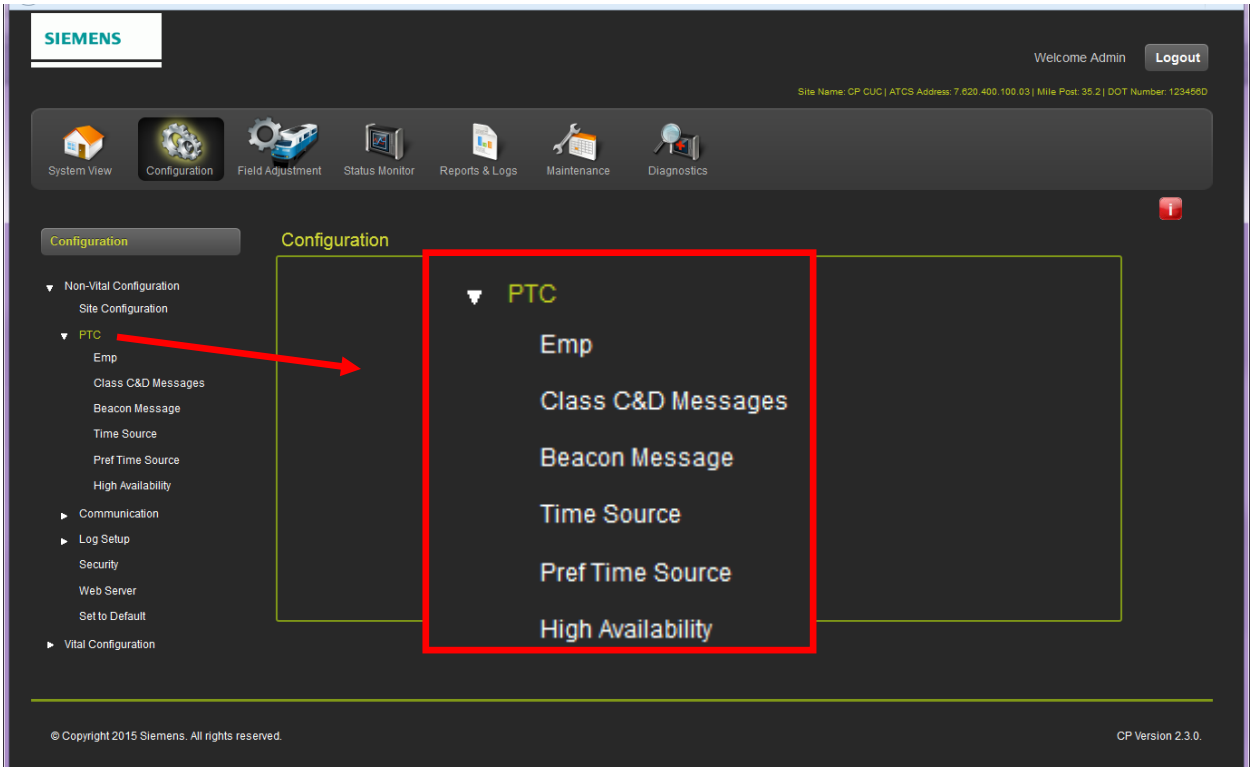


Figure 3-8 Non-Vital Configuration – PTC Sub-Menu

- **PTC – Emp Parameters**

Figure 3-9 displays the Edge Message Protocol (EMP) parameters.

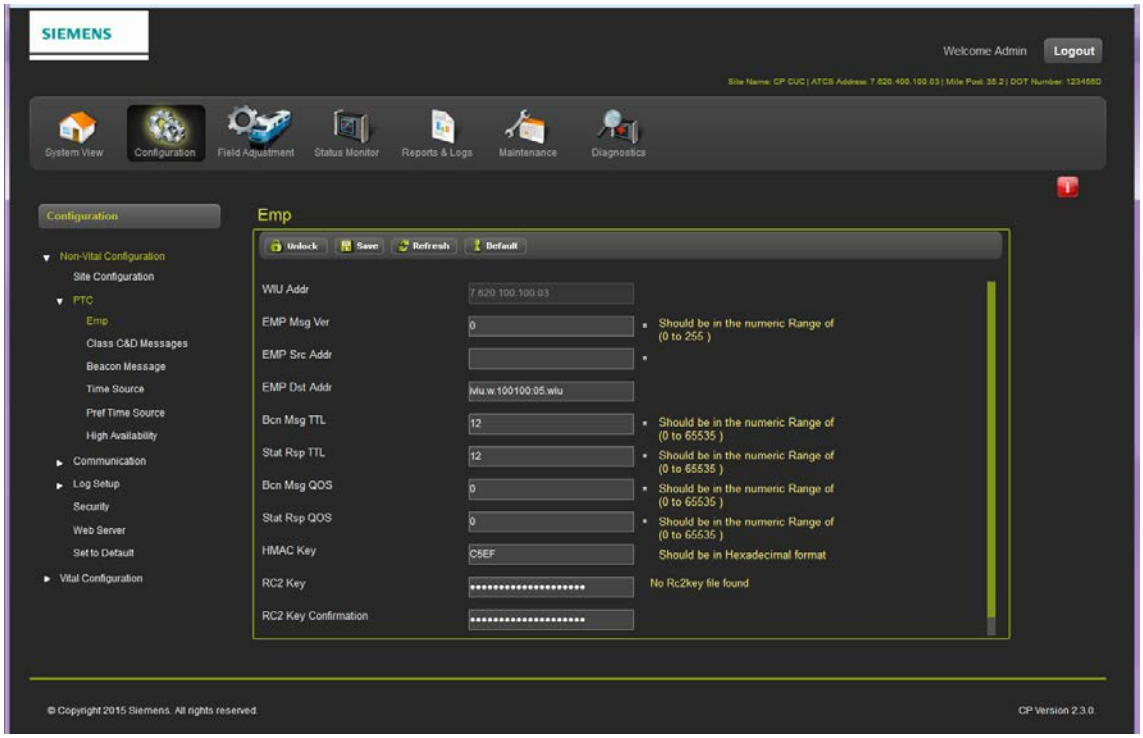


Figure 3-9 PTC – EMP Parameters

EMP Parameters

NAME	DESCRIPTION	RANGE	DEFAULT
WIU Addr	The unique 48-bit WIU Address field is in the format 7.RRR.LLL.GGG.DD, where: 7 = WIU address type identifier RRR = Railroad Number LLL = Routing Region Code GGG = Location Code DD = Device Number	Text (numeric values only)	7.620.100.100.03
EMP Msg Ver	DOT Number for site	Up to 7 Alphanumeric char	
EMP Src Addr	The source address where EMP-formatted messages will initiate.	Up to 20 Alphanumeric char	
EMP Dst Addr	The EMP-formatted destination address where all beacon messages will be sent	Up to 20 Alphanumeric char	iviu.w.100100:05.wiu
Bcn Msg TTL	Beacon Message Time-To-Live	0 to 65535 seconds	12
Stat Rsp TTL	Status Response Time-To-Live	0 to 65535 seconds	12
Bcn Msg QoS	Beacon Msg Quality of Service	0 to 65535 seconds	0
Stat Rsp QoS	Status Response Quality of Service	0 to 65535 seconds	0
HMAC Key	Hash Message Authentication Code cryptic key to authenticate messages		
RC2 Key	The RC2 embedded password used to decrypt keys used in the HMAC calculations. This value is hidden and encrypted so this Key is not made available to field personnel		
RC2 Key Confirmation	Confirms the above entry		

- **PTC – Class C&D Messages**

Figure 3-10 shows the parameters for the PTC Class C&D Messages.

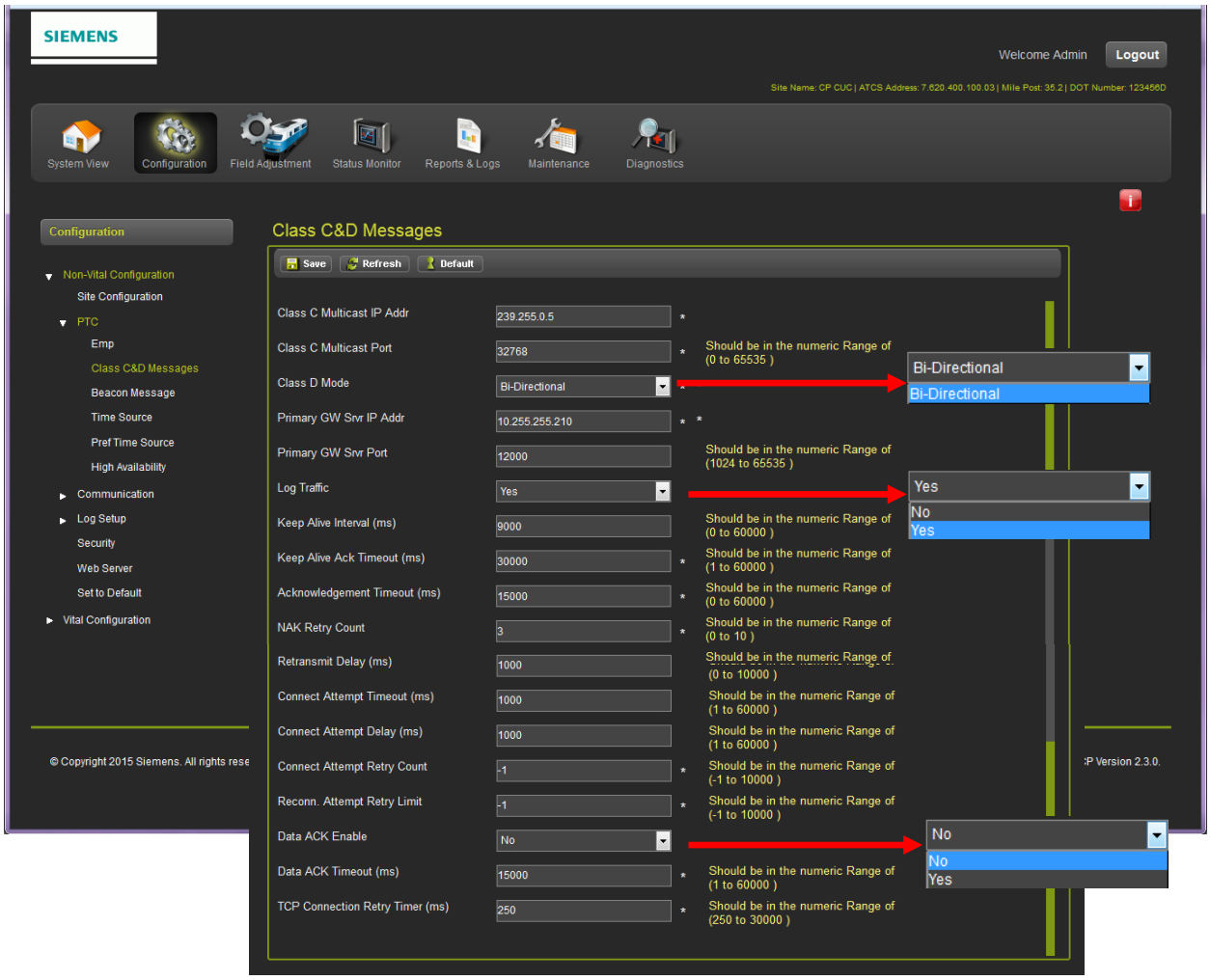


Figure 3-10 PTC – Class C&D Messages Parameters

Class C&D Messages Parameters

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NAME	DESCRIPTION	RANGE	DEFAULT
Class C Multicast IP Addr	IP Address logical identifier	Text (numeric values only)	239.255.0.5
Class C Multicast Port	Multicast Port	Numeric range 0 to 65535	32768
Class D Mode	Selects mode from drop-down menu		Bi-Directional
Primary GW Srvr IP Addr	Primary Gateway Server IP Address	Numeric 0 to 60000	10.255.255.210
Primary GW Srvr Port	Primary Gateway Server Port selection	Numeric 0 to 60000	3001
Log Traffic	Selection to Log Traffic	Drop-down Menu Yes or No	No
Keep Alive Interval (ms)	Time in milliseconds to keep message alive	Numeric 0 to 66535 ms	30000
Keep Alive Ack Timeout (ms)	Time in milliseconds to keep acknowledge of messages alive	Numeric 0 to 66535 ms	30000
Acknowledgement Timeout (ms)	Time in Milliseconds to acknowledge messages	Numeric 0 to 60000 ms	15000
NAK Retry Count	Specifies the number of times to retry a transmission a 0 entry disables the feature	Numeric 0 to 10	3
Retransmit Delay (ms)	Specifies the time in milliseconds before retransmitting a message	Numeric 0 to 10000	0
Connect Attempt Timeout (ms)	Specifies the time in milliseconds to establish a connection	Numeric 1 to 60000	30000
Connect Attempt Delay (ms)	Specifies the time in milliseconds before making a connection attempt	Numeric 1 to 60000	60000
Connect Attempt Retry Count	Specifies number of retries to attempt to make connection. A “-1” entry sets unlimited connection retries	Numeric -1 to 10000	-1
Reconn Attempt Retry Limit	Specifies number of reconnect retries to attempt retry. A “-1” entry sets unlimited reconnect retries	Numeric -1 to 10000	-1
Data ACK Enable	Selection from drop-down menu	Yes or No	No
Data ACK Timeout (ms)	Selection of timeout time in milliseconds for data acknowledgement	Numeric 1 to 60000	15000
TCP Connection Retry Timer (ms)	Selection of time in milliseconds to retry TCP connection	Numeric 250 to 30000	250

- **PTC – Beacon Message**

Figure 3-11 displays the PTC Beacon Message parameters.

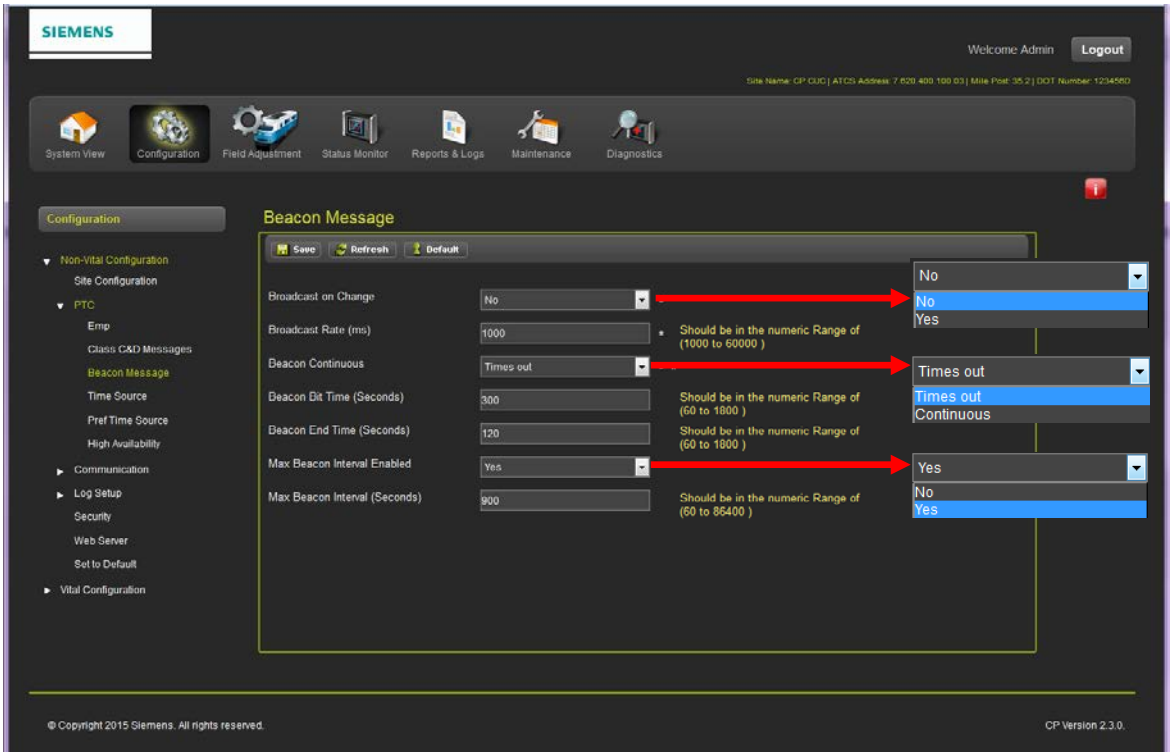


Figure 3-11 PTC – Beacon Message Parameters

Beacon Message Parameters

NAME	DESCRIPTION	RANGE	DEFAULT
Broadcast on Change	Enable from drop-down menu to broadcast messages when changes occur (event driven)	Yes, No	No
Broadcast Rate (ms)	Mainloop time greater than 1000 ms up to 60 seconds	Numerical 1000 to 60000 ms	1000
Beacon Continuous	Select from drop-menu for broadcasts to be sent continuously or to time out	Times out, Continuous	Times Out
Beacon Bit Time (Sec)	Time from Beacon on until Beacon TTL bit set to 0	Numeric 60 to 1800 Seconds	300
Beacon End Time (Sec)	Time from Beacon TTL bit 0 until end of beacon, Broadcast rate stops	Numeric 60 to 1800 Seconds	120
Max Beacon Interval Enabled	Select from drop-down menu to enable maximum beacon interval	No, Yes	Yes
Max Beacon Interval (Sec)	Interval between Beacons when not continuously beaconing. Location shall still beacon a change unless set to Disabled (No)	Numeric 60 to 86400	900

- **PTC – Time Source**

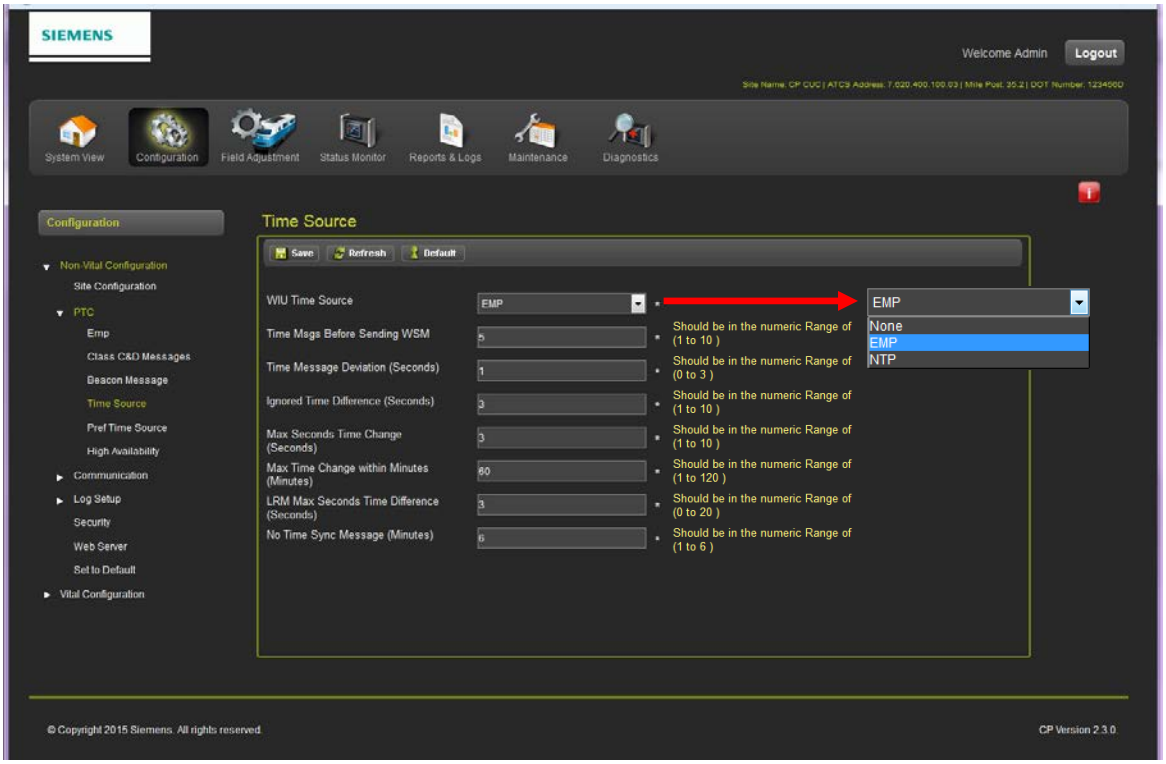
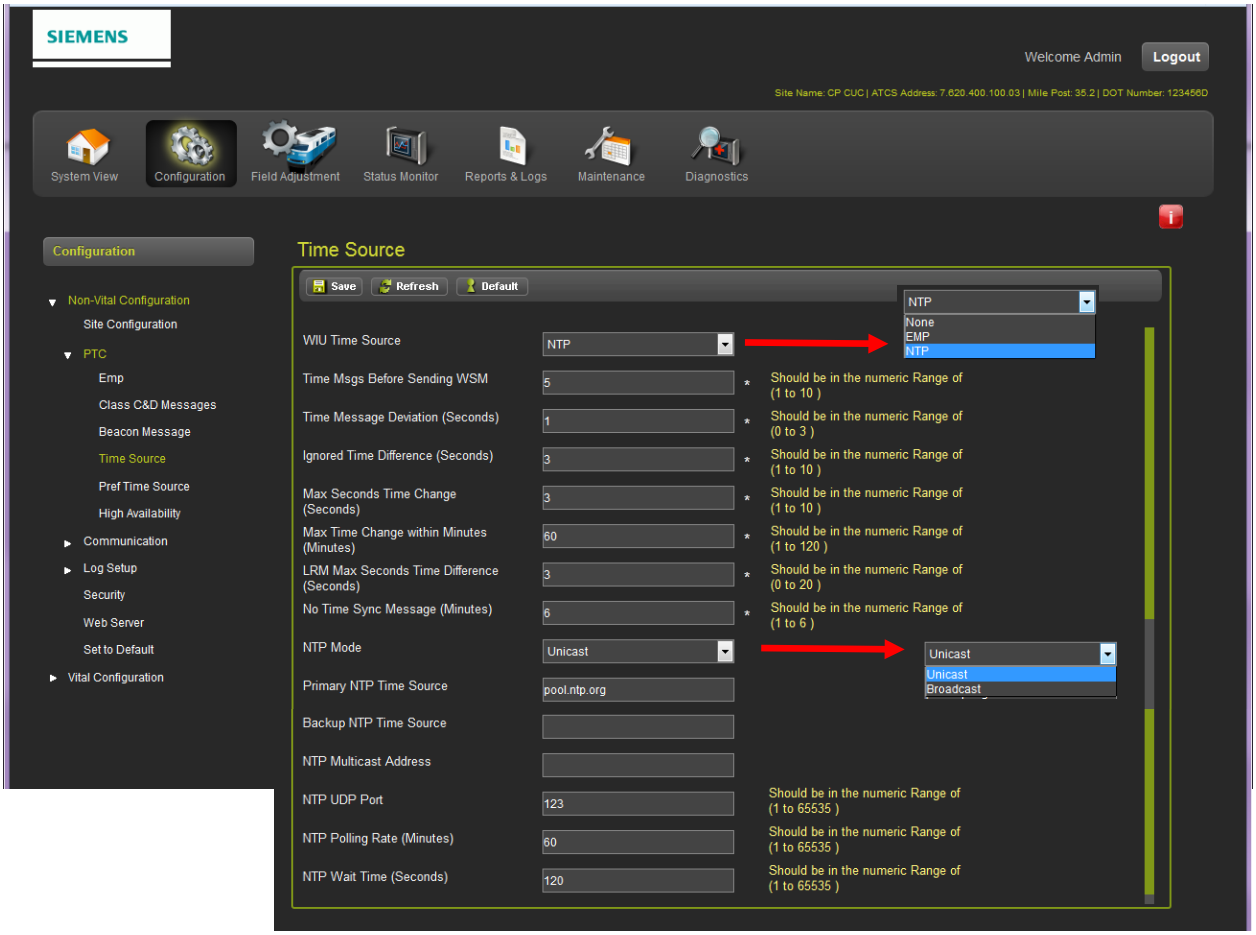


Figure 3-12 PTC – EMP Time Source Parameters

EMP Time Source Parameters

NAME	DESCRIPTION	RANGE	DEFAULT
WIU Time Source	Selection of None, EMP (Edge Message Protocol), or NTP Network Time Protocol)	Drop-down menu None, EMP, or NTP	EMP
Time Msgs Before Sending WSM	Number of Time messages collected before sending WSM	Numerical 1 to 10	5
Time Message Deviation (Seconds)	Plus or minus Time Deviation from UTC allowed in seconds	Numerical 0 to 3 seconds	1
Ignored Time Differences (Seconds)	Number of seconds of time difference before a message is ignored	Numerical 1 to 10 seconds	3
Max Seconds Time Change	Maximum Time drift from UTC allowed before halt of sending messages	Numeric 1 to 10 seconds	3
Max Time Change within Minutes	The maximum window of time between each time update before sending alarm	Numeric 1 to 120 minutes	60
LRM Max Seconds Time Difference (Seconds)	An alarm is sent if the LRM (Locomotive Request Message) exceeds maximum time difference allowed in seconds	Numeric 1 to 20 seconds	3
No Time Sync Message (Minutes)	An alarm is sent if a time sync message is not received within the configured time	Numeric 1 to 6 minutes	6



NTP Time Source Parameters

NAME	DESCRIPTION	RANGE	DEFAULT
WIU Time Source	Selection of None, EMP (Edge Message Protocol), or NTP Network Time Protocol)	Drop-down menu None, EMP, or NTP	EMP
Time Msgs Before Sending WSM	Number of Time messages collected before sending WSM	Numerical 1 to 10	5
Time Message Deviation (Seconds)	Plus or minus Time Deviation from UTC allowed in seconds	Numerical 0 to 3 seconds	1
Ignored Time Differences (Seconds)	Number of seconds of time difference before a message is ignored	Numerical 1 to 10 seconds	3
Max Seconds Time Change	Maximum Time drift from UTC allowed before halt of sending messages	Numeric 1 to 10 seconds	3
Max Time Change within Minutes	The maximum window of time between each time update before sending alarm	Numeric 1 to 120 minutes	60
LRM Max Seconds Time Difference (Seconds)	An alarm is sent if the LRM (Locomotive Request Message) exceeds maximum time difference allowed in seconds	Numeric 1 to 20 seconds	3
No Time Sync Message (Minutes)	An alarm is sent if a time sync message is not received within the configured time	Numeric 1 to 6 minutes	6

NTP Mode	Sets transmitting mode Unicast sends to specific IP Address, Broadcast sends to all devices on the network	Unicast, Broadcast	Unicast
Primary NTP Time Source	Enter address of desired NTP source to serve as the primary source		
Backup NTP Time Source	Enter address of another NTP source to serve as a backup time source		
NTP Multicast Address	Enter desired multicast address	Standard Multicast Address range 224.0.0.0 to 239.255.255.255	
NTP UTP Port	Enter desired port number	Numeric 1 to 65535	123
NTP Polling Rate (Minutes)	Time between each update of parameters	Numeric 1 to 65535 minutes	60
NTP Wait Time (Seconds)	Waits until the system's time is stabilized and synchronized before starting applications	Numeric 1 to 65535 seconds	120

- **PTC - Preferred Time Source**

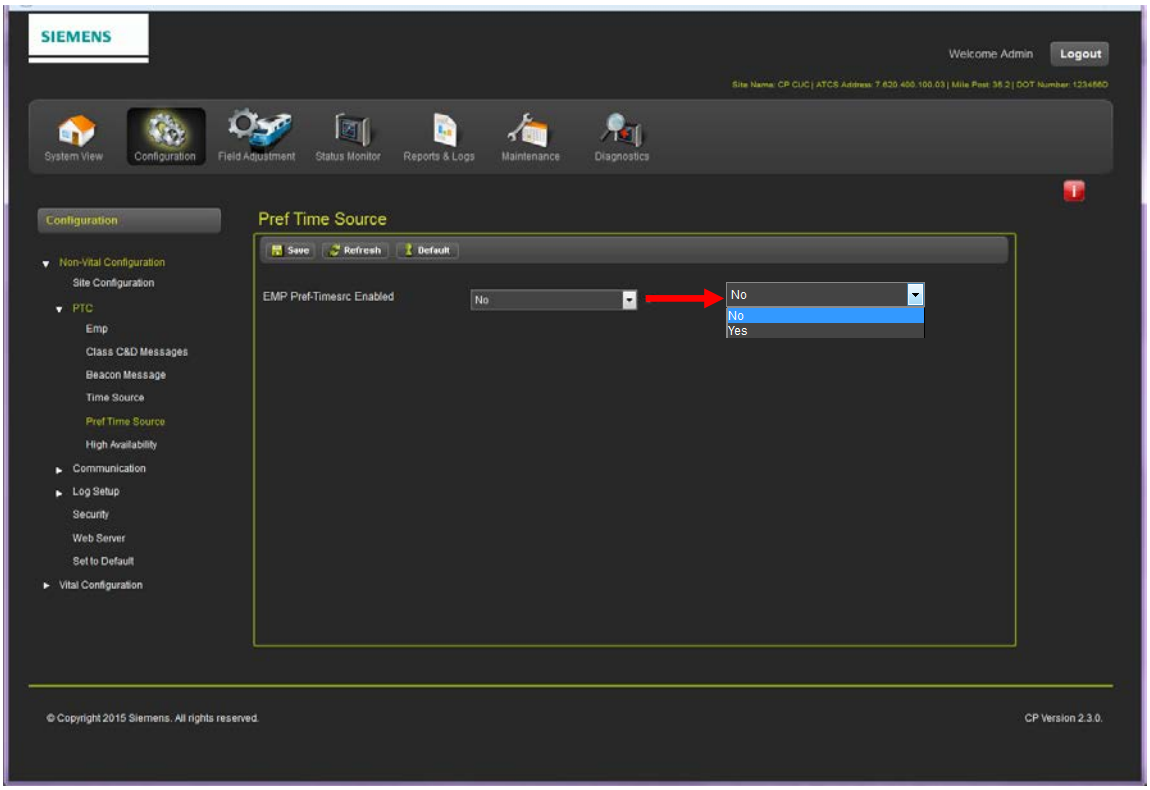


Figure 3-13 PTC EMP Preferred Time Source Not Enabled

EMP Preferred-Time Source Not Enabled Parameter

NAME	DESCRIPTION	RANGE	DEFAULT
EMP Pref-Timesrc Enabled	Select to enable or disable using a preferred EMP Time source	Drop-down menu Yes, No	No

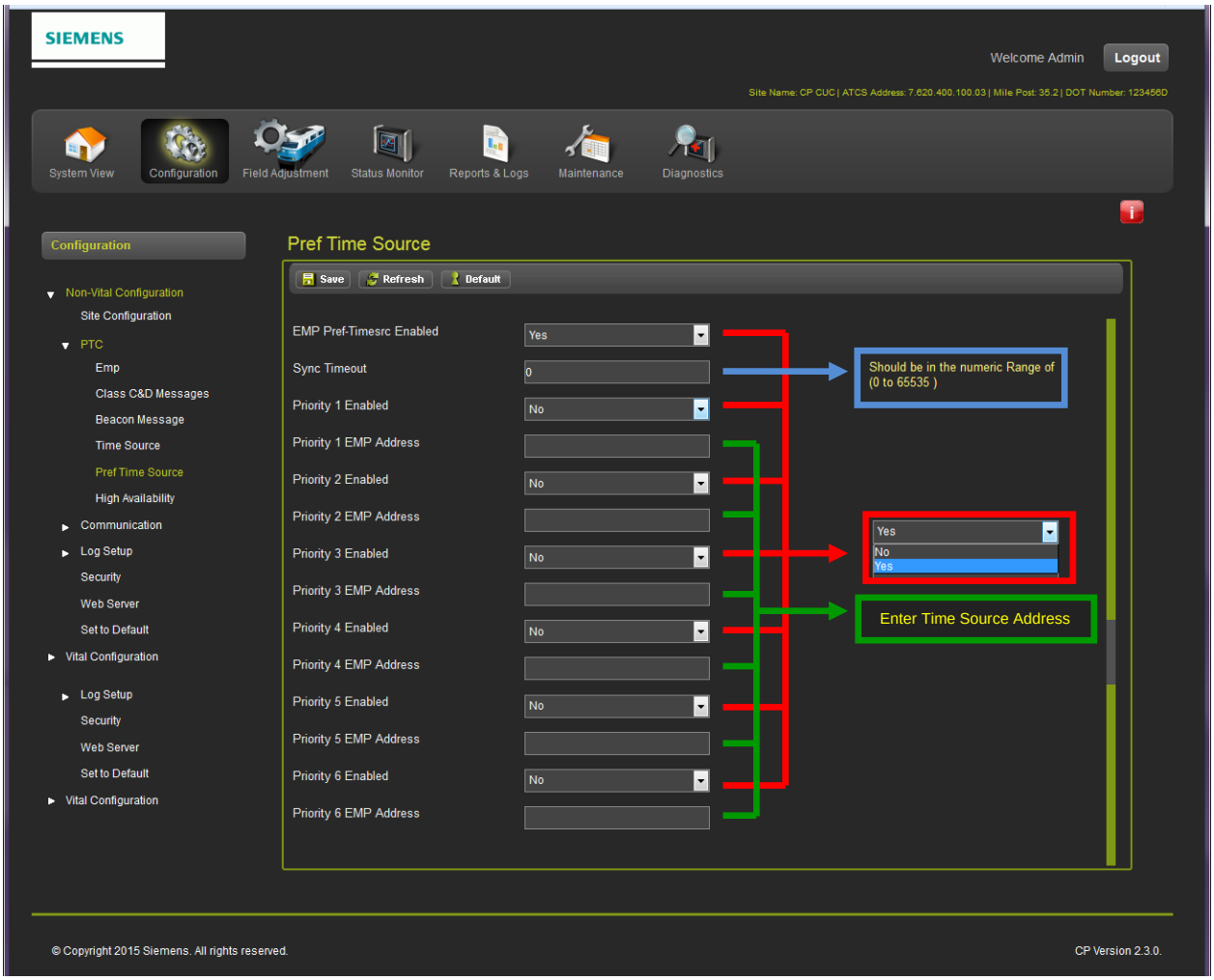


Figure 3-14 PTC EMP Preferred Time Source Enabled

EMP Preferred-Time Source Enabled Parameters

NAME	DESCRIPTION	RANGE	DEFAULT
EMP Pref-Timesrc Enabled	Select to enable or disable using a preferred EMP Time source	Drop-down menu Yes, No	No
Sync Timeout	Set timeout value to wait until time source has been synchronized to the unit	Numeric 0 to 65535 seconds	0
Priority 1 thru 6 Enabled	Select up to six (6) Time sources	Drop-down menu Yes, No	No
Priority 1 thru 6 EMP Address	Enter the EMP address for each EMP channel enabled making note of the desired priority level for each site		

- **PTC – High Availability**

Figure 3-15 PTC High Availability Parameters

High Availability Parameters

NAME	DESCRIPTION	RANGE	DEFAULT
HA Enabled	Select to enable or disable the High Availability function	Drop-down menu Yes, No	No
HA Link – 1 thru 12 IP Address	Enter the IP Address of up to 12 High Availability Links		
1 thru 12 IP Port	Enter the Port to be used for each High Availability Link	Numeric 1025 to 65535	12000
1 thru 12 Idle Timeout	Time in seconds when Idle sessions will expire a “0” setting means sessions will not expire	Numeric 0 to 65535 seconds	0
1 thru 12 Idle Enabled	Selecting “Yes” will enable inquires to idle (in-active) links configured by the user for backup	Drop-down menu Yes, No	No

- **Communications**

Figure 3-16 displays the PTC Communications Menu.

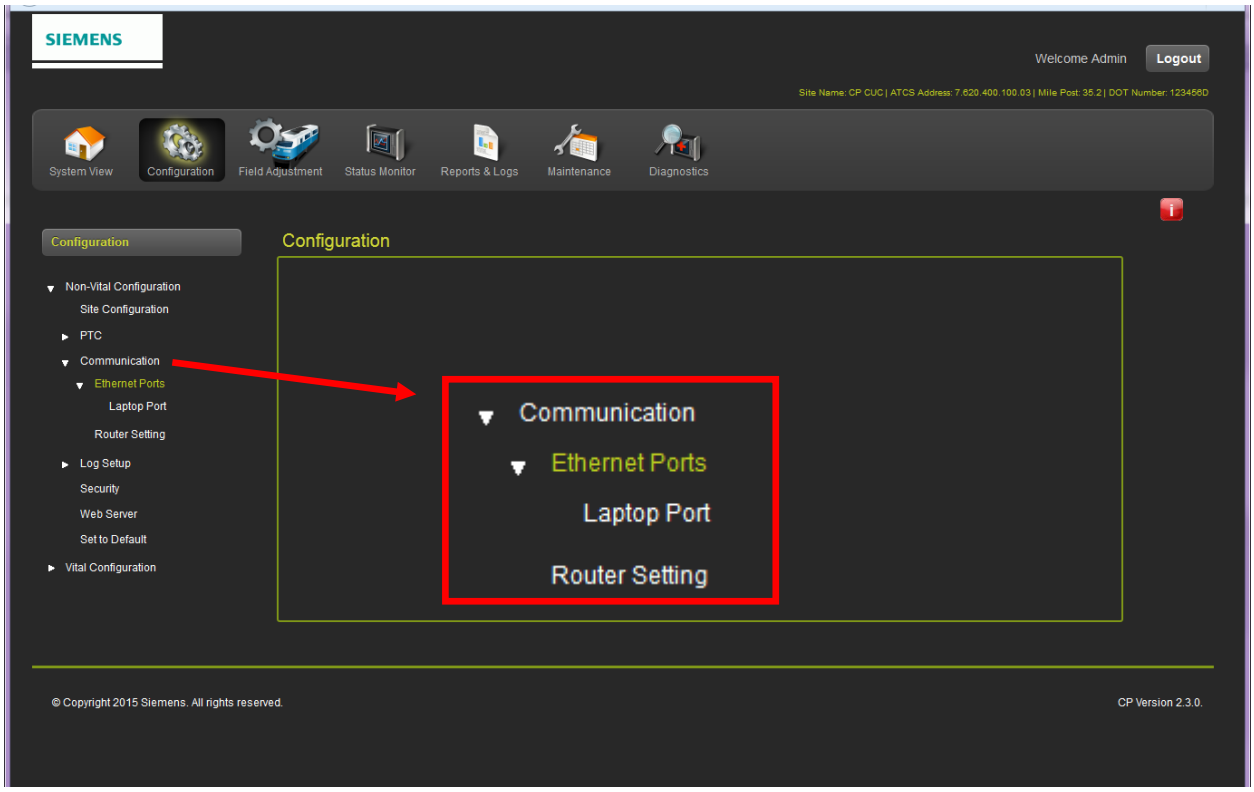


Figure 3-16 PTC – Communications Menu

- **PTC – Ethernet Ports – Laptop Port**

Figure 3-17 and Figure 3-18 display the parameters for the Ethernet Laptop Port.

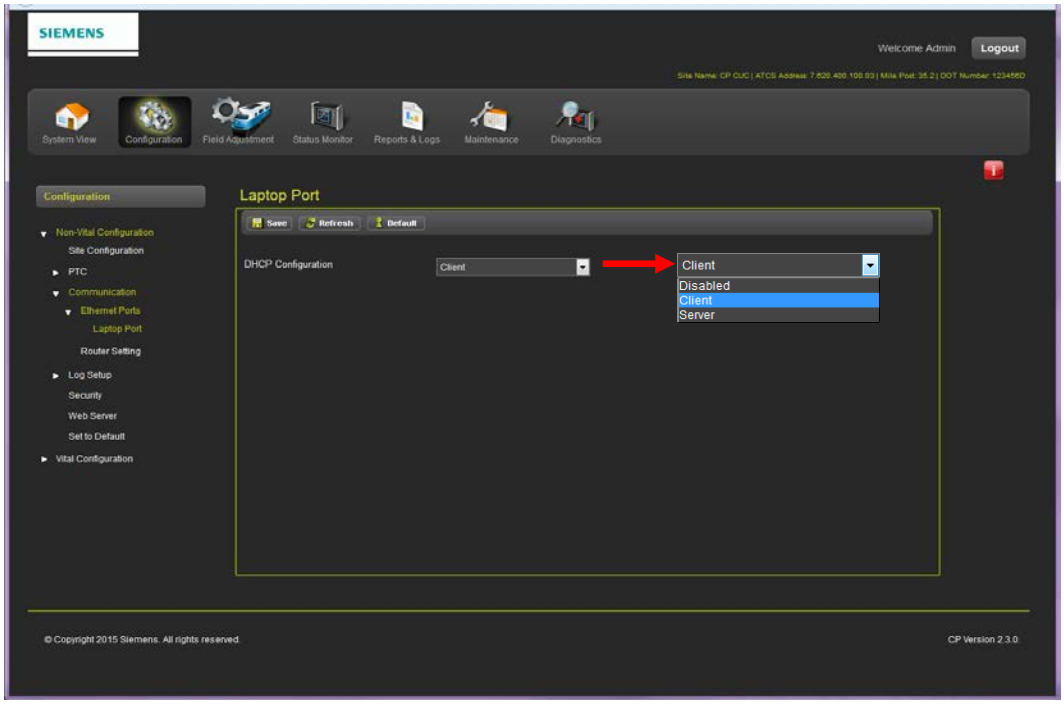


Figure 3-17 PTC – Ethernet Ports – Laptop Port - Client

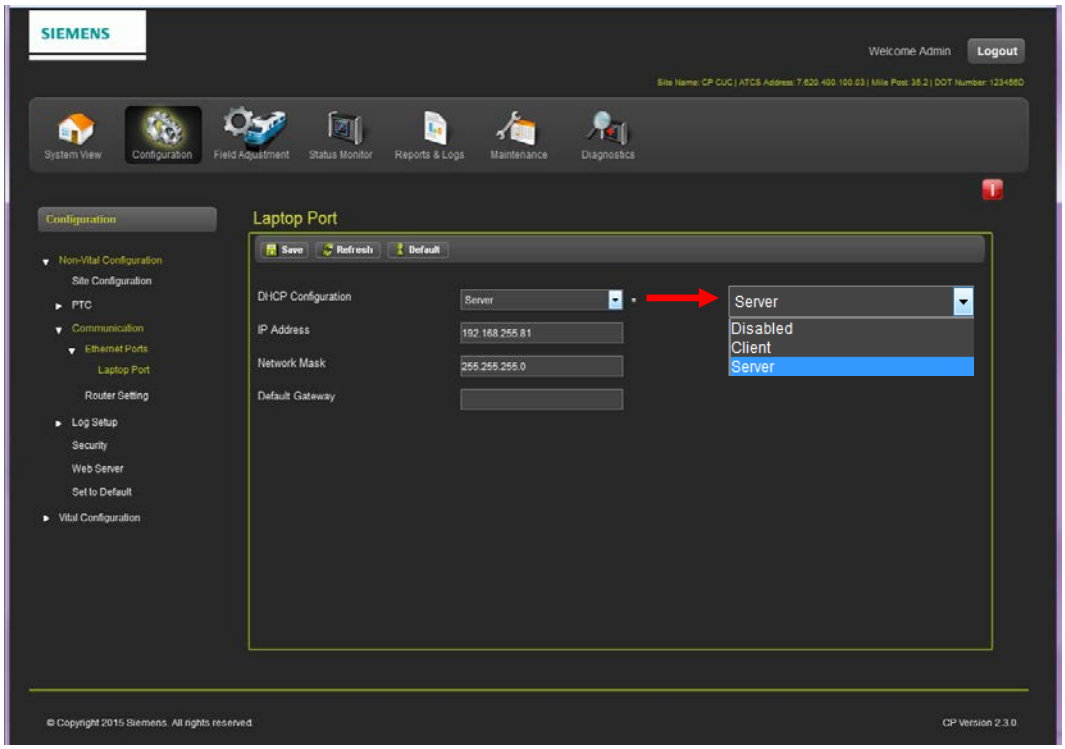


Figure 3-18 PTC – Ethernet Ports – Laptop Port - Server

Ethernet Laptop Port Parameters

NAME	DESCRIPTION	RANGE	DEFAULT
DHCP Configuration	Select to disable the port or to set as a Client or Server	Drop-down menu Disabled, Client, or Server	Server
The following parameters appear when the Server configuration is selection			
IP Address	Enter the IP Address desired for this device		192.168.255.81
Network Mask	Enter the Network Mask desired for this device		255.255.255.0
Default Gateway	Enter the Default Gateway desired for this device		

- **PTC – Ethernet Ports – Server Routing**

Figure 3-19 displays the Router Setting parameters.

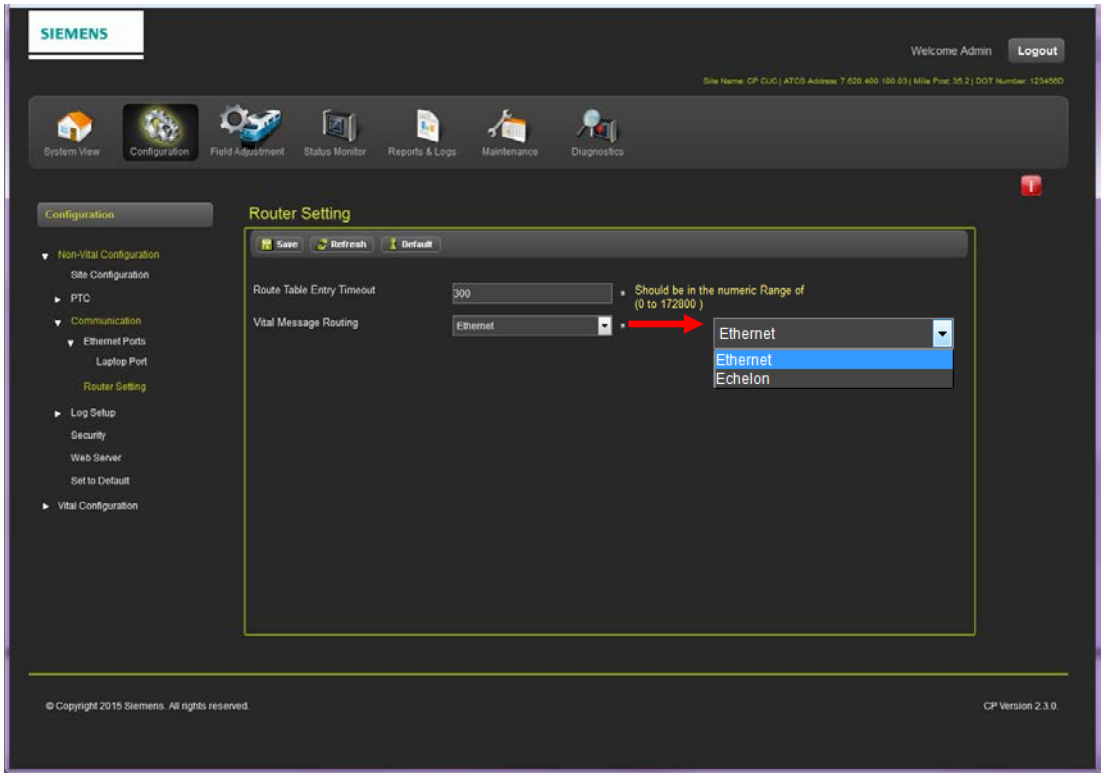


Figure 3-19 PTC – Ethernet Ports – Server Routing

Ethernet Server Routing Parameters

NAME	DESCRIPTION	RANGE	DEFAULT
Route Table Entry Timeout	Select to disable the port or to set as a Client or Server	Drop-down menu Disabled, Client, or Server	Server
Vital Message Routing	Select routing through an Ethernet Network or an Echelon® Network	Drop-down menu Ethernet, Echelon®	Ethernet

- **PTC – Log Setup**

Figure 3-20 displays the Log Setup Menu with sub-menus for Diagnostic Logging and Log Verbosity Settings.

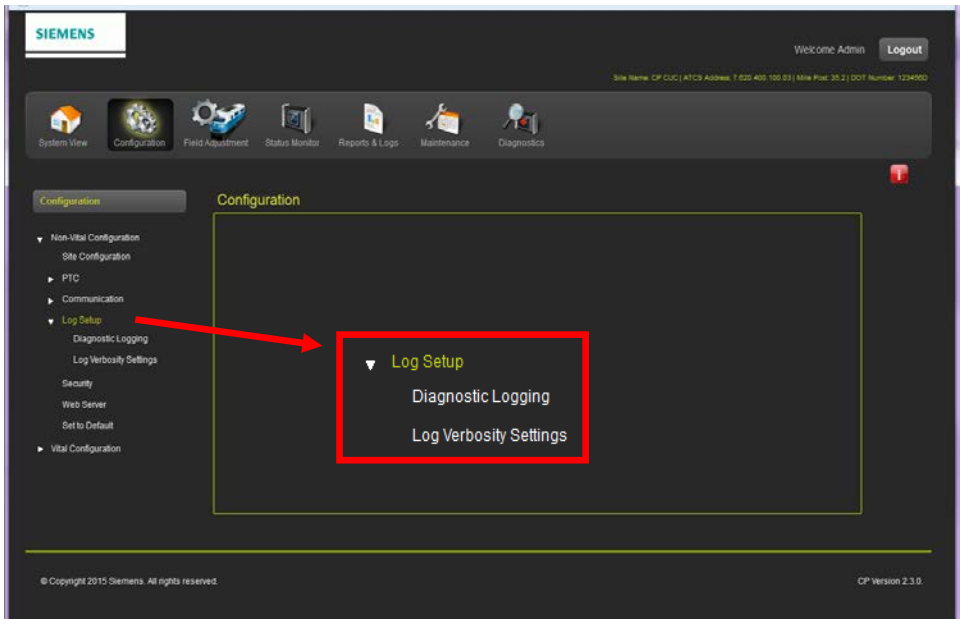


Figure 3-20 PTC – Log Setup Menu

- **PTC – Ethernet Ports – Server Routing**

Figure 3-21 displays the Diagnostic Logging parameters.

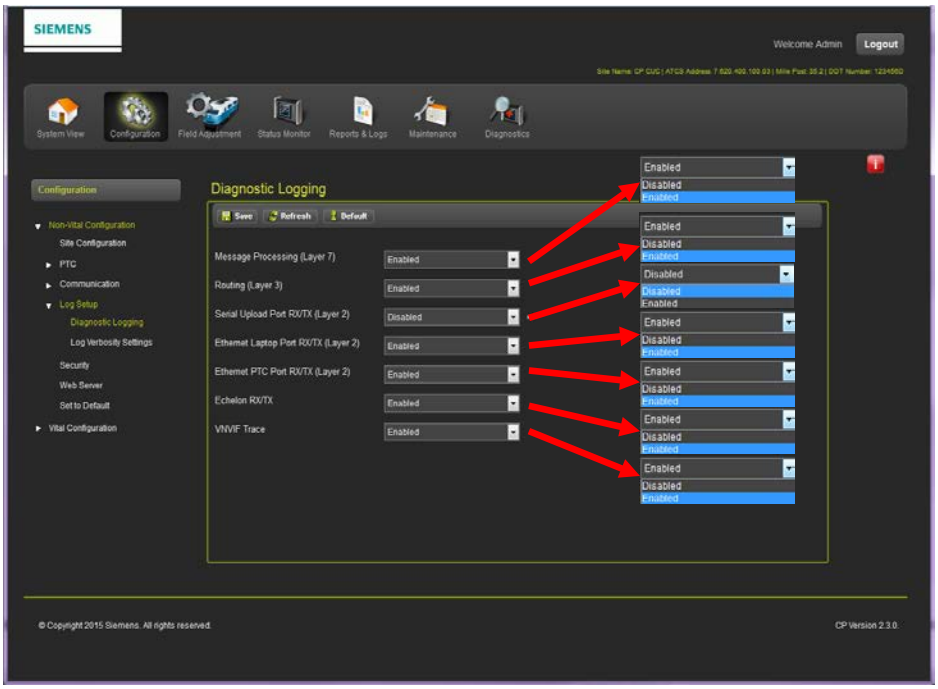


Figure 3-21 PTC – Log Setup – Diagnostic Logging

Diagnostic Logging Parameters

NAME	DESCRIPTION	RANGE	DEFAULT
Message Processing (Layer 7)	Select to disable the port or to set as a Client or Server	Drop-down Menu, Enabled, Disabled	Disabled
Routing (Layer 3)	Select routing through an Ethernet Network or an Echelon® Network	Drop-down Menu, Enabled, Disabled	Disabled
Serial Upload Port RX/TX (Layer 2)	Enables Serial Port logging	Drop-down Menu, Enabled, Disabled	Disabled
Ethernet Laptop Port RX/TX (Layer 2)	Enables Ethernet Laptop Port logging	Drop-down Menu, Enabled, Disabled	Disabled
Ethernet PTC Port RX/TX (Layer 2)	Enables Ethernet PTC Port logging	Drop-down Menu, Enabled, Disabled	Disabled
Echelon RX/TX	Enables Echelon Port logging	Drop-down Menu, Enabled, Disabled	Disabled
VNVIF Trace	Enables tracing of program execution for debugging	Drop-down Menu, Enabled, Disabled	Disabled

- **PTC – Ethernet Ports – Server Routing**

Figure 3-22 displays the Log Verbosity settings.

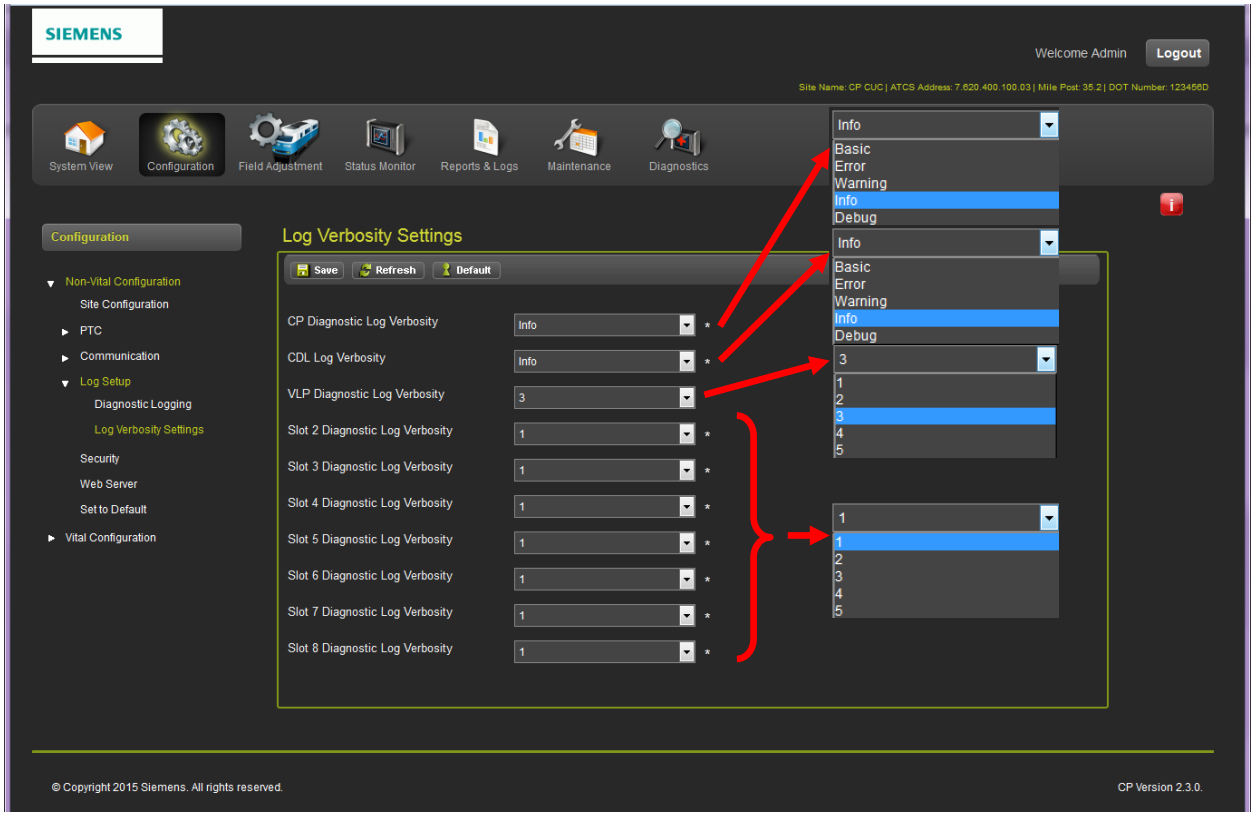


Figure 3-22 PTC – Log Setup – Log Verbosity Settings

Log Verbosity Parameters

NAME	DESCRIPTION	RANGE	DEFAULT
CP Diagnostic Log Verbosity	Set Verbosity level for CPU Module	Drop-down Menu, Basic, Error, Warning, Info, Debug	Info
CDL Log Verbosity	Set Verbosity level for CDL Log	Drop-down Menu, Basic, Error, Warning, Info, Debug	Info
VLP Log Verbosity	Set Verbosity level for VLP Module	Drop-down Menu, 1, 2, 3, 4, or 5 (1=Basic, 2=Info, 3=Warning, 4=Info, 5=Debug	3
Slot 2 thru 8 Diagnostic Log Verbosity	Set Diagnostic Log Verbosity for each Slot (2 through 8) with modules installed on the GEO unit	Drop-down Menu, 1, 2, 3, 4, or 5 (1=Basic, 2=Info, 3=Warning, 4=Info, 5=Debug	1

- **PTC – Security**

Figure 3-23 displays the Web User Interface parameters.

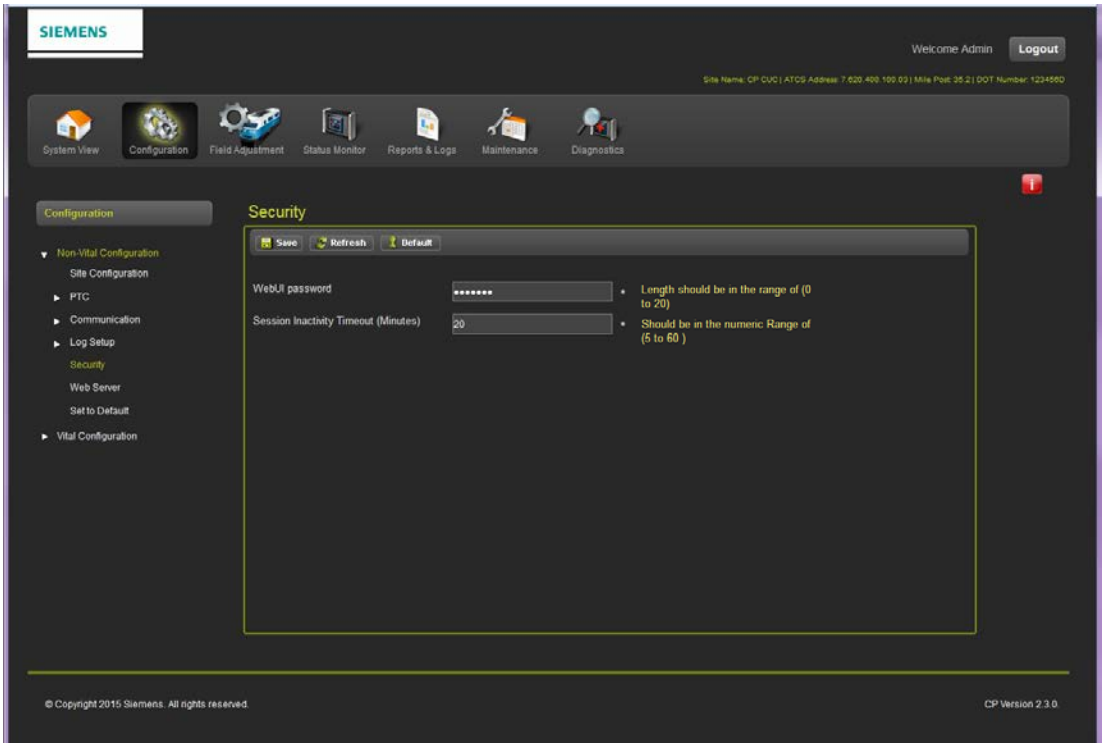


Figure 3-23 PTC - Security

Security Parameters

NAME	DESCRIPTION	RANGE	DEFAULT
WebUI Password	User can set password for Web UI access	Alphanumeric 0 to 20 characters	Siemens
CDL Log Verbosity	Set Web UI session inactivity timer in minutes	Numeric 5 to 60 minutes	20

- **PTC – Web Server**

Figure 3-23 displays the Web Server parameters

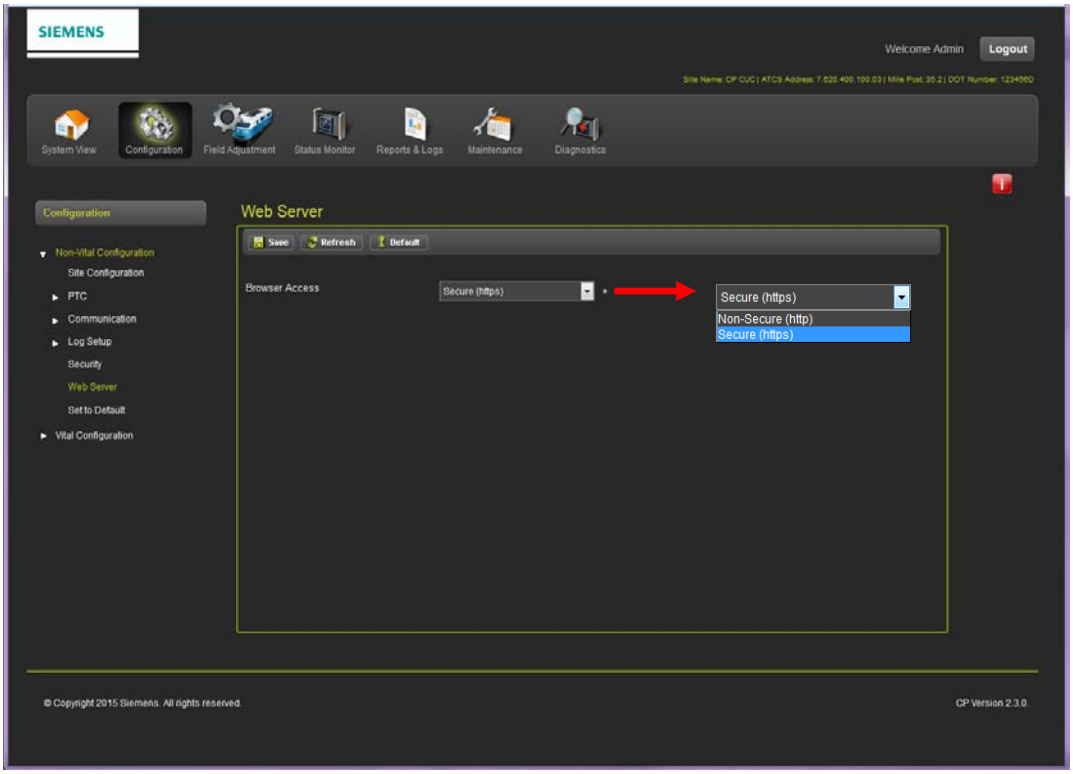


Figure 3-24 PTC – Web Server Parameters

Web Server Parameters

NAME	DESCRIPTION	RANGE	DEFAULT
Browser Access	Set Browser as a Secure (https) or Non-Secure (http) web server	Drop-down Menu, Secure (https) or Non-Secure (http)	Secure (https)

- **PTC – Set to Default**

Figure 3-25 displays the Set to Default screen. Initiating this screen will set all Non-Vital parameters back to their original factory settings. Click on the Default button, a warning pop-up screen will appear to confirm initiation of returning all Non-Vital parameters to their default settings

⚠ CAUTION

CAUTION

SETTING NON-VITAL PARAMETERS TO DEFAULT WILL RETURN ALL PARAMETERS TO THE ORIGINAL FACTORY DEFAULT SETTINGS. ALL PREVIOUS SETTINGS WILL BE LOST WITHOUT ANY MEANS OF RECOVERY.

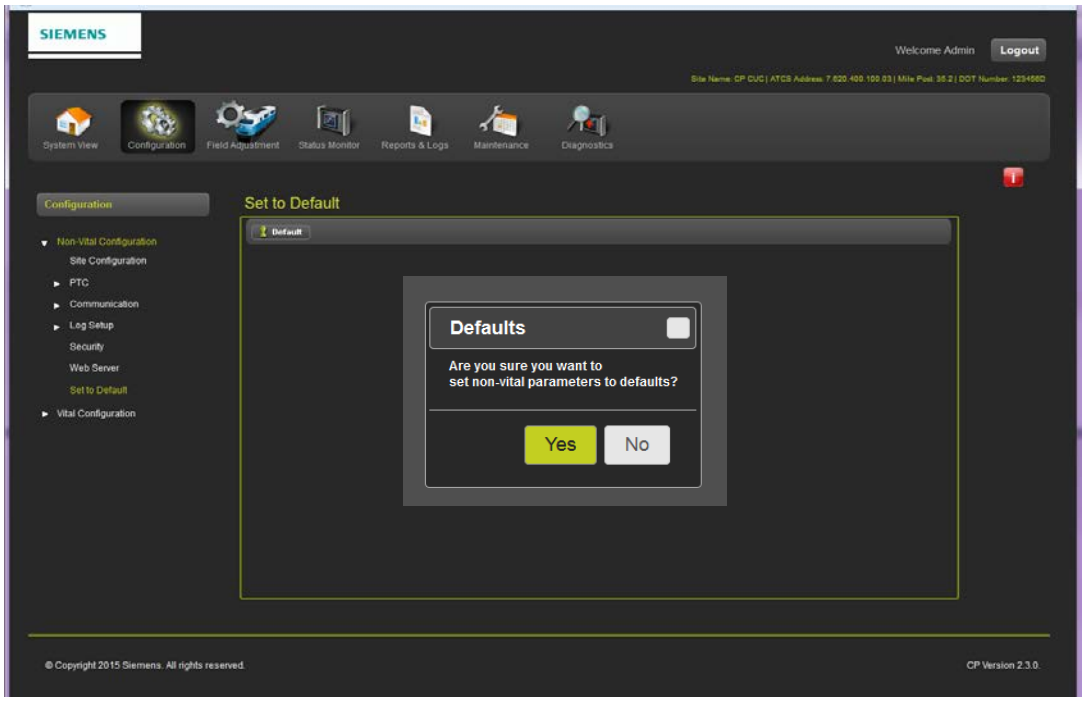


Figure 3-25 Non-Vital Parameters Set to Default

3.1.2.5 Configuration Menu – Vital Menu Structure

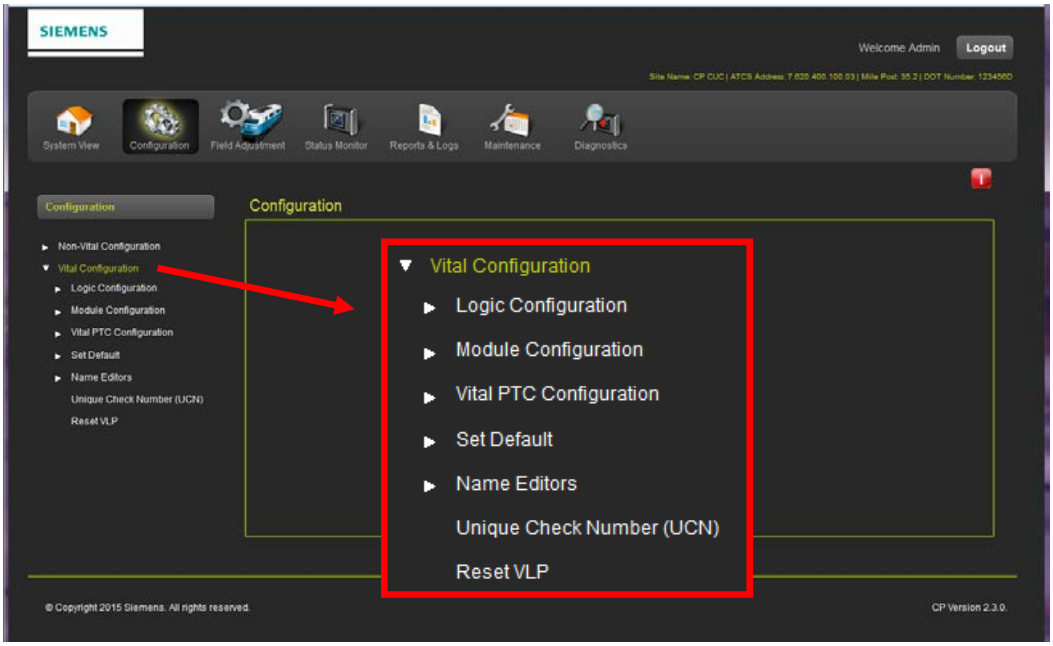


Figure 3-26 Vital Configuration Menu

Vital Configuration

Logic Configuration

Main - Use this to set the user defined properties created in the MCF

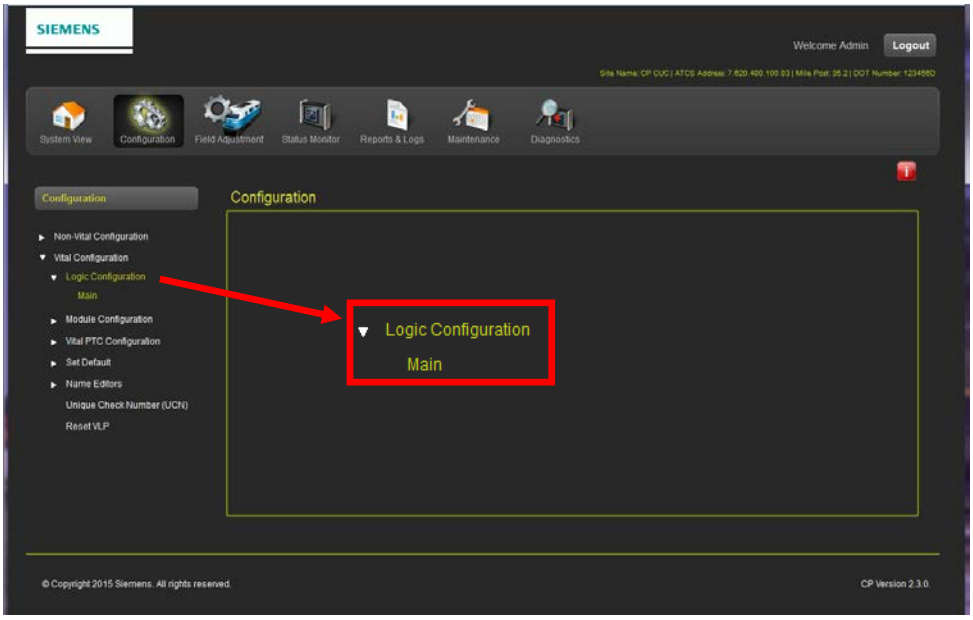


Figure 3-27 Logic Configuration Menu

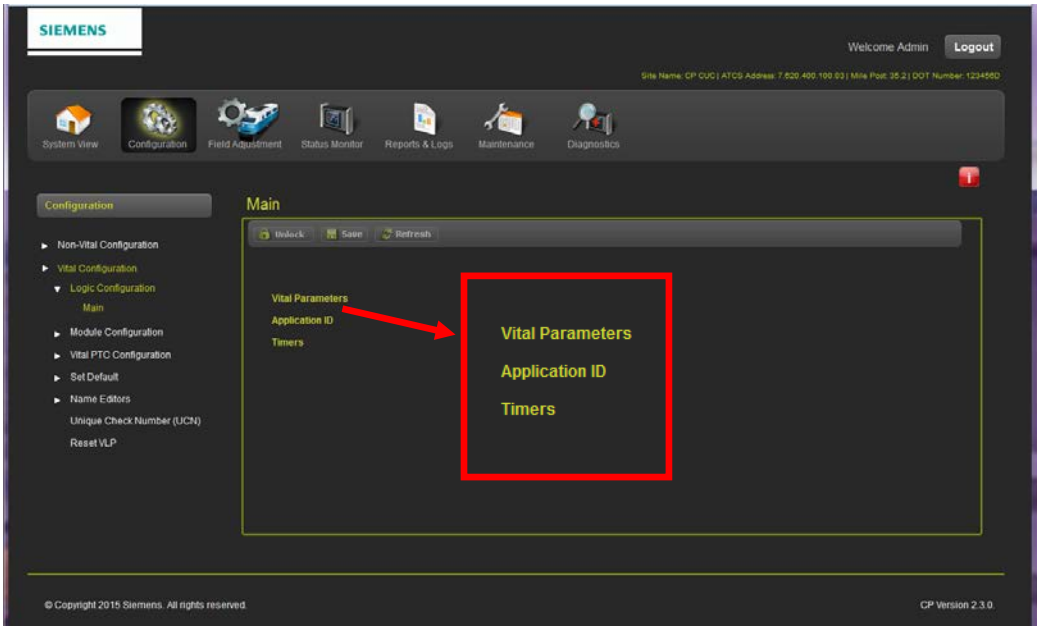


Figure 3-28 Logic Configuration Main Menu Sub Menus

Vital Parameters

List of Parameters (e.g. WFY_SEL, EFY_SEL, W28_SEL. E28_SEL, etc.)

False, True (for each parameter)

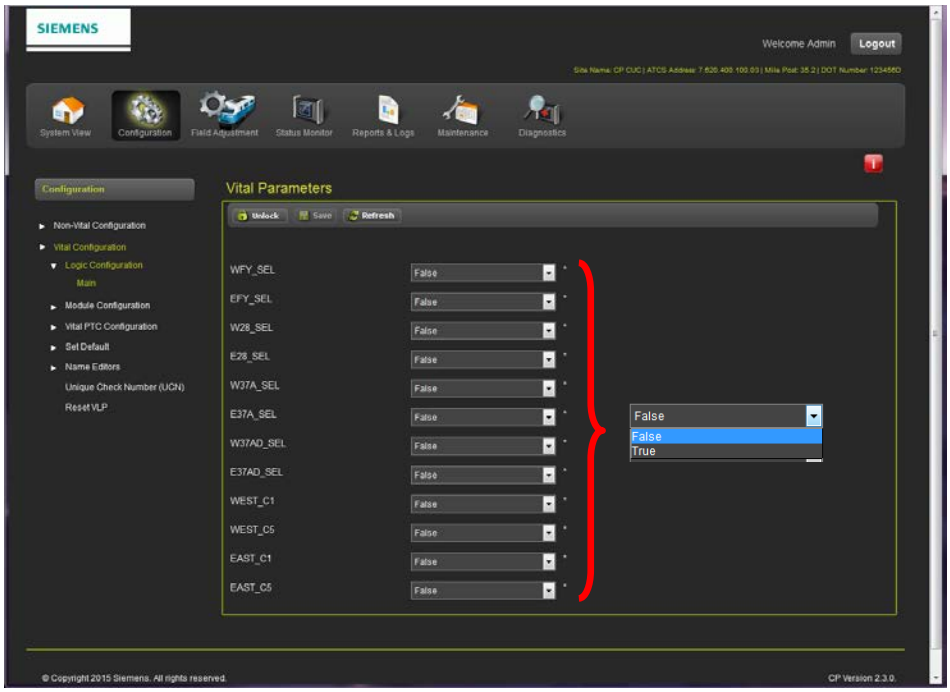


Figure 3-29 Vital Parameters

Application ID

List of IDs (e.g. WFY_SW1, EFY_SW2, W28_SW3, E28_SW4, etc.)

False, True (for each ID)

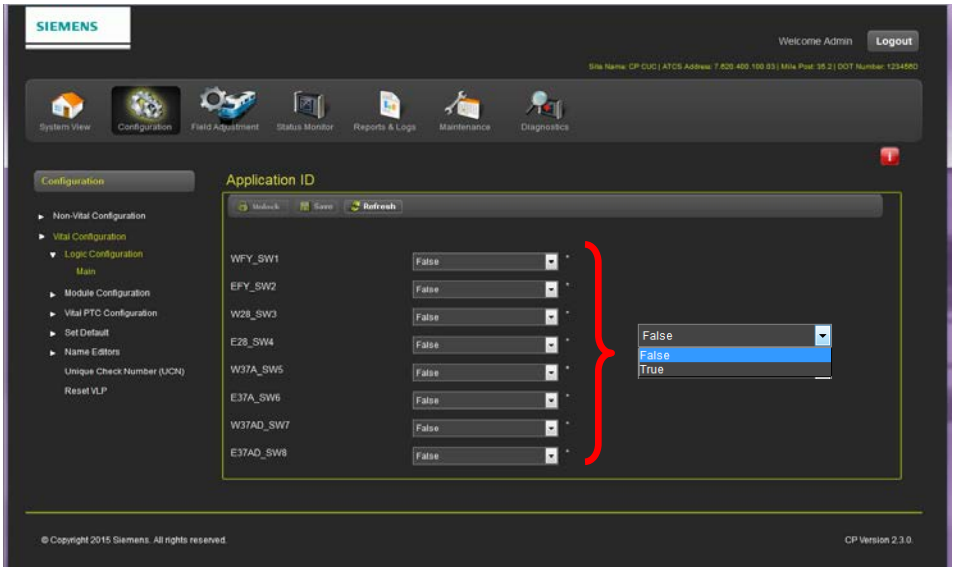


Figure 3-30 Application IDs

Timers

Set timer parameters

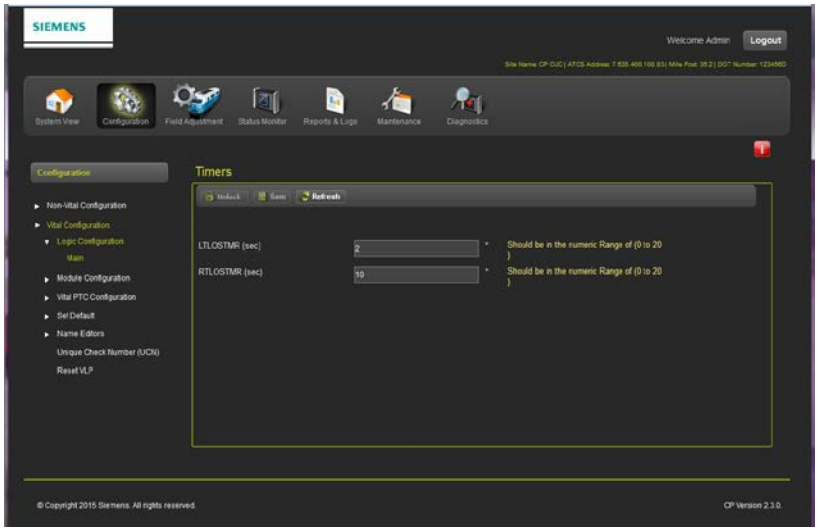


Figure 3-31 Timer Parameters

Logic Configuration Variations

Depending on the content of the MCF installed the Logic Configuration will have different sub menus.

Main - Lamps

The Lamps sub-menu enable the user to select Convertor mode for the Colorlight Module selected.

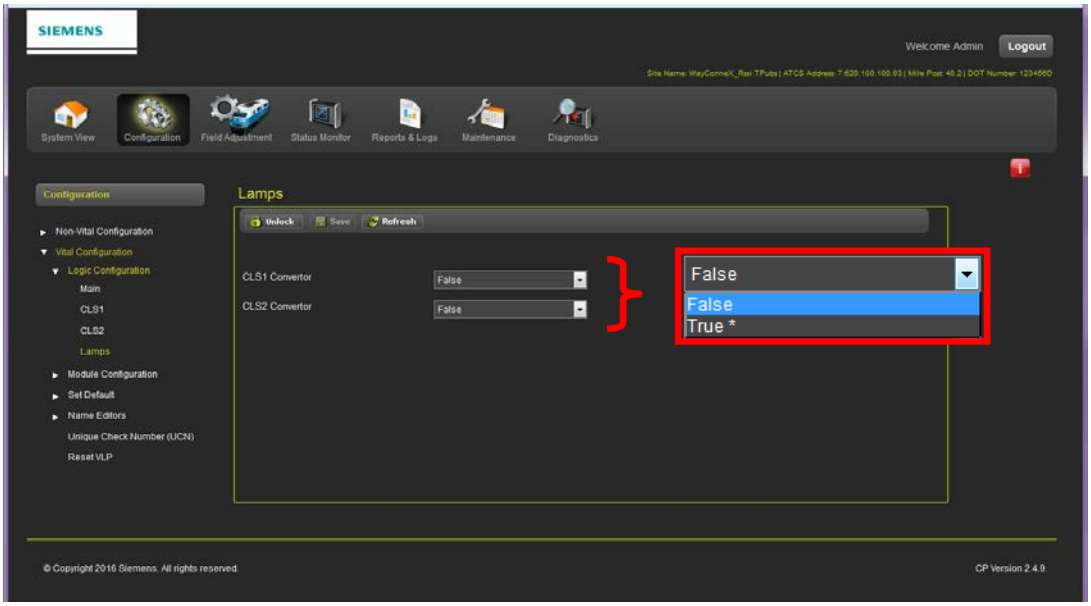


Figure 3-32 Lamps – Colorlight Module Convertor Selection

Module Configuration

SLOT n - Use to configure the modules and their properties. The type of modules shown will depend on the MCF information. Figure 3-34 displays a Module Configuration Screen for a WayConneX using PSO Modules.

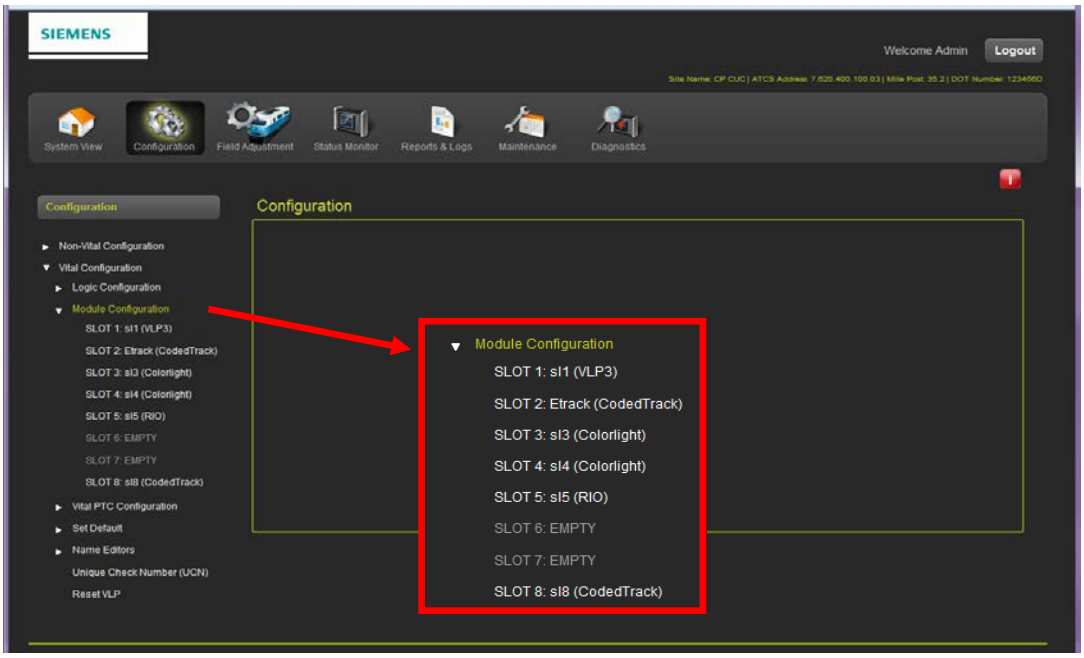


Figure 3-33 Module Configuration Menu

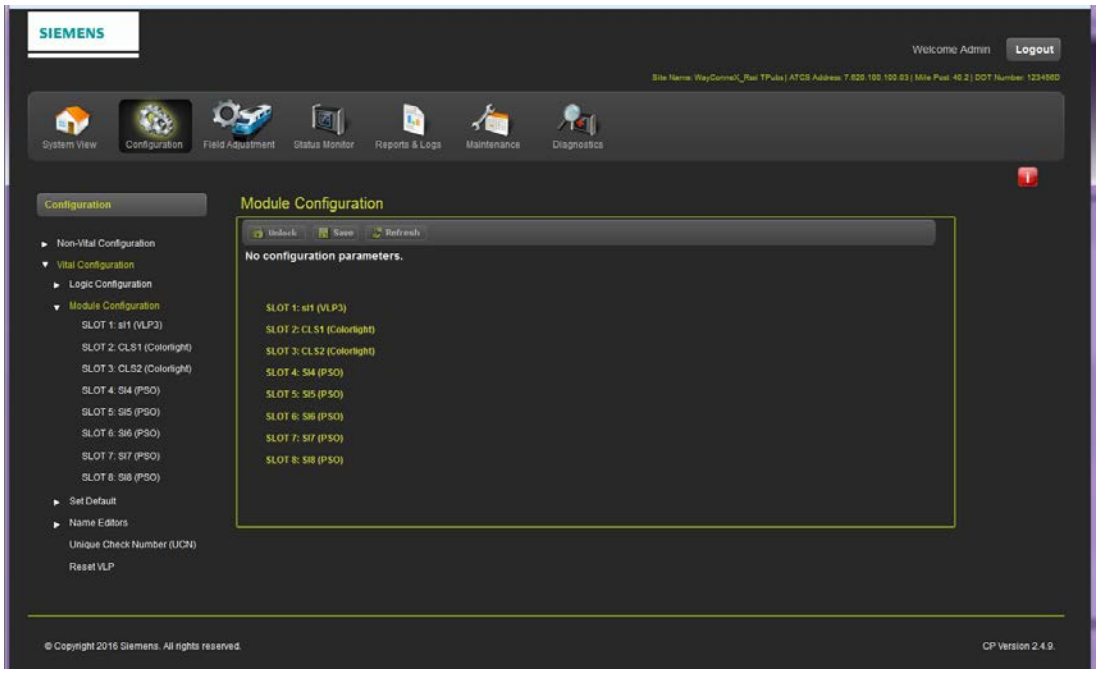


Figure 3-34 Module Configuration PSO Modules

Slot 1: sl1 (VLP3)

PTC Signal Configuration – This parameter should not be edited and is set be the

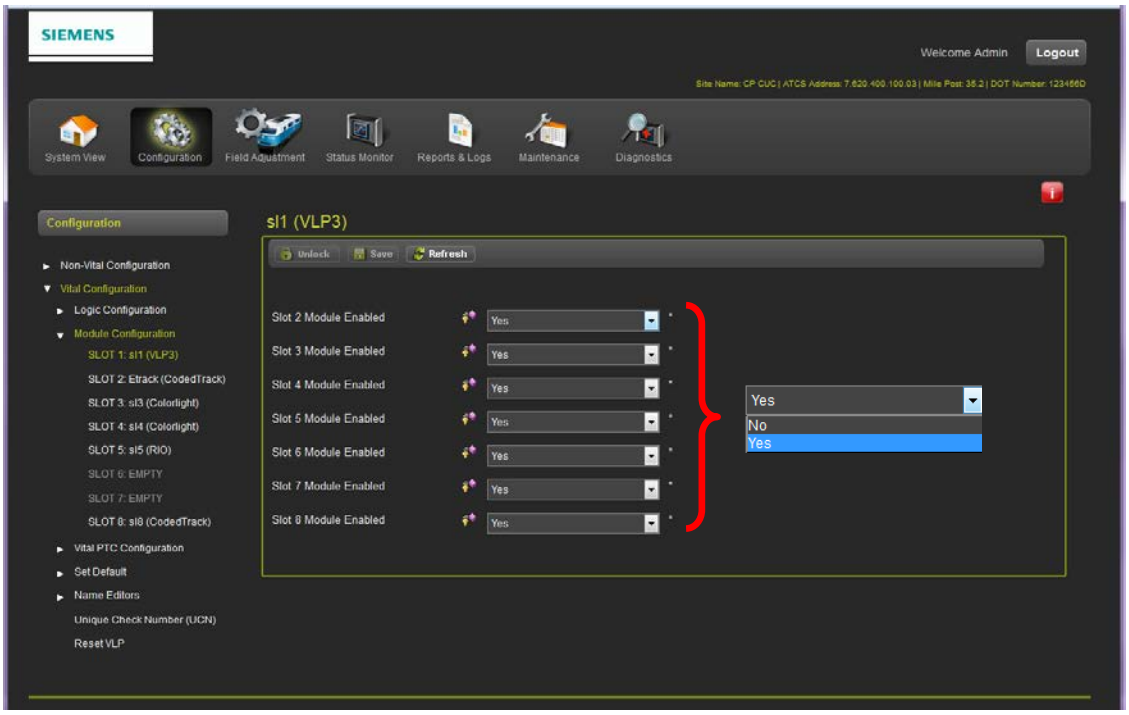


Figure 3-35 Enabling/Disabling Modules

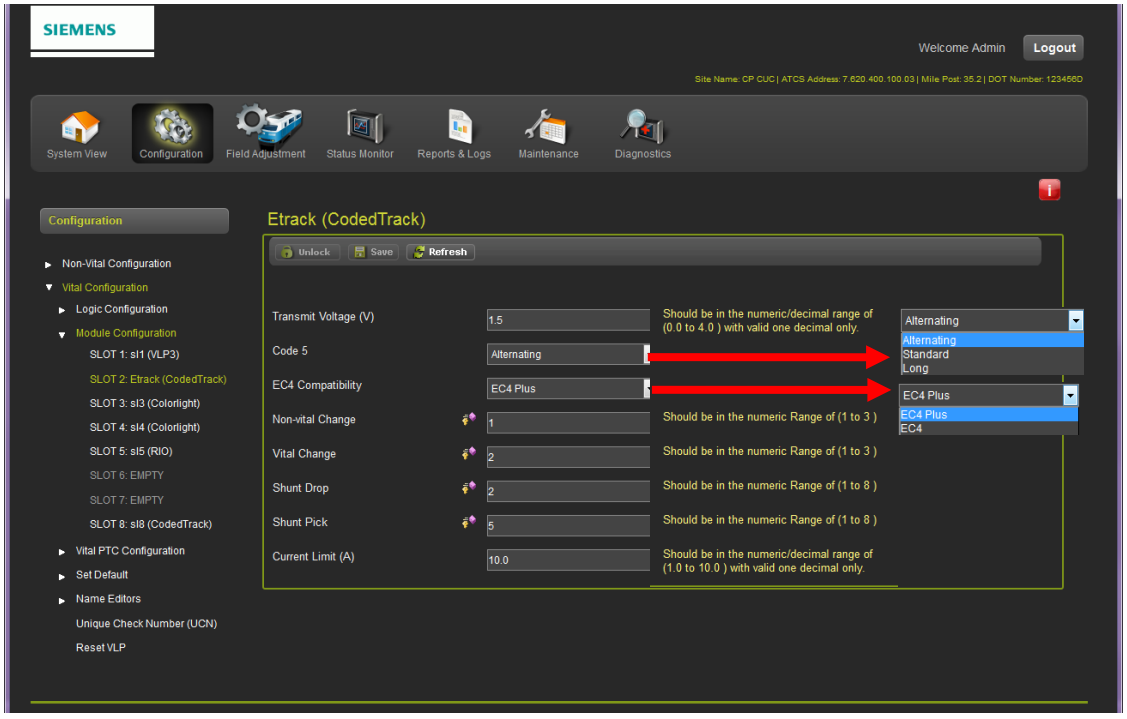
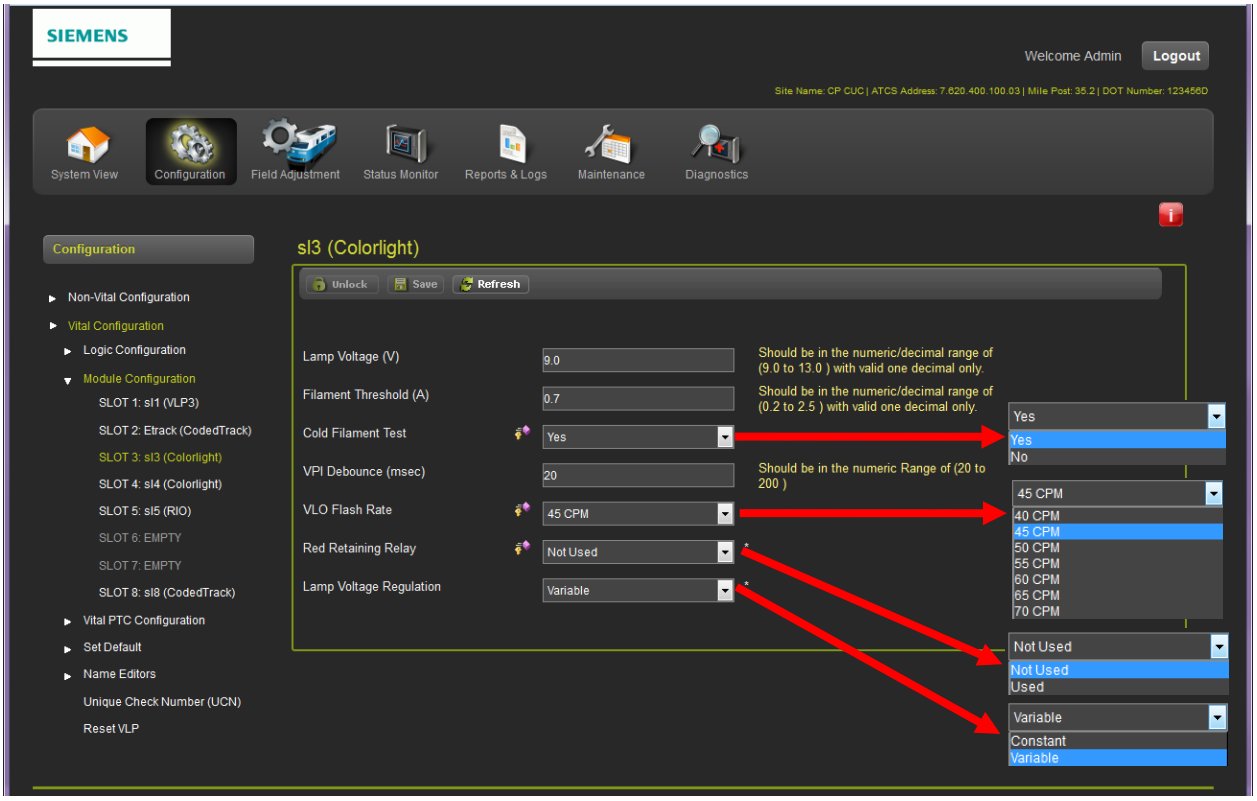


Figure 3-36 Slot 2 Etrack (Coded Track) Parameters



Vital PTC Configuration

PTC Signal Configuration – This parameter should not be edited and is set be the loaded configuration package.

PTC Item Count

PTC Order 1

PTC Order 2

Set to Defaults – Sets all Vital configuration parameters to factory default

Name Editors

Object Names

Main – User can set names for the Main Objects

Card Names – Sets new names for modules (default names shown).

sl1

Etrack

sl3

sl4

sl5

sl8

PTCSignal

Unique Check Number (UCN) – Is entered per Site plans

Reset VLP - Use this to reset the VLP. Typically this will be used when the VLP has been put into edit mode so that vital parameters can be changed and after the new UCN has been entered.

PSO Module Configuration – Coded Mode

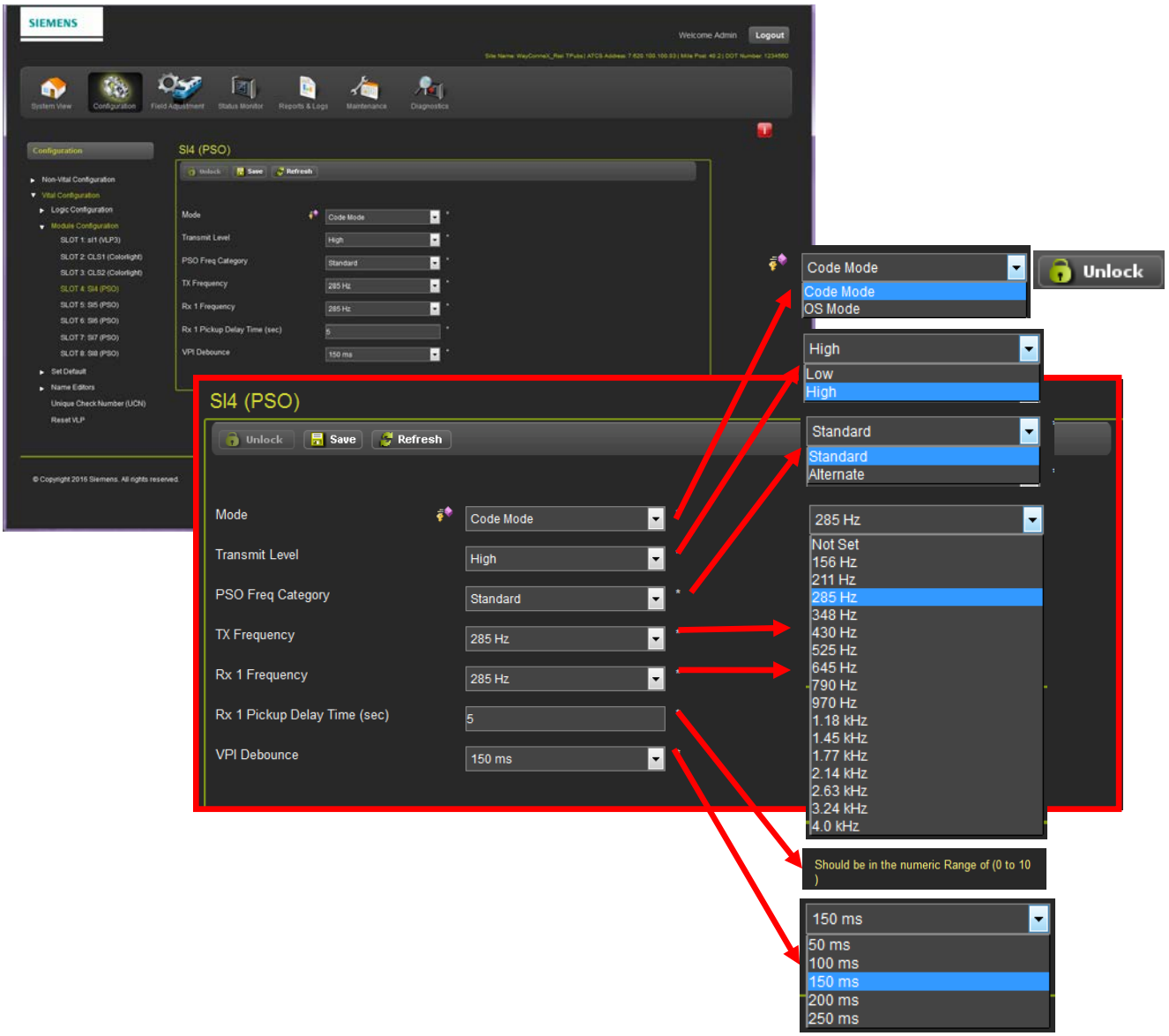


Figure 3-37 PSO Module Configuration – Coded Mode

PSO Module Configuration – Code Mode

Mode – This parameter selects Code Mode (Coded Track) or OS Mode (Operational Siding)
Transmit Level – Low or High
PSO Freq Category – Standard or Alternate
TX Frequency – Lists Frequencies for PSO Frequency Category selected
RX 1 Frequency – Lists Frequencies available for receiver 1
RX 1 Pickup Delay Time (sec) – Sets delay time (Range 0-10 seconds)
VPI Debounce – Sets VPI Debounce from drop-menu list

PSO Module Configuration – OS Mode

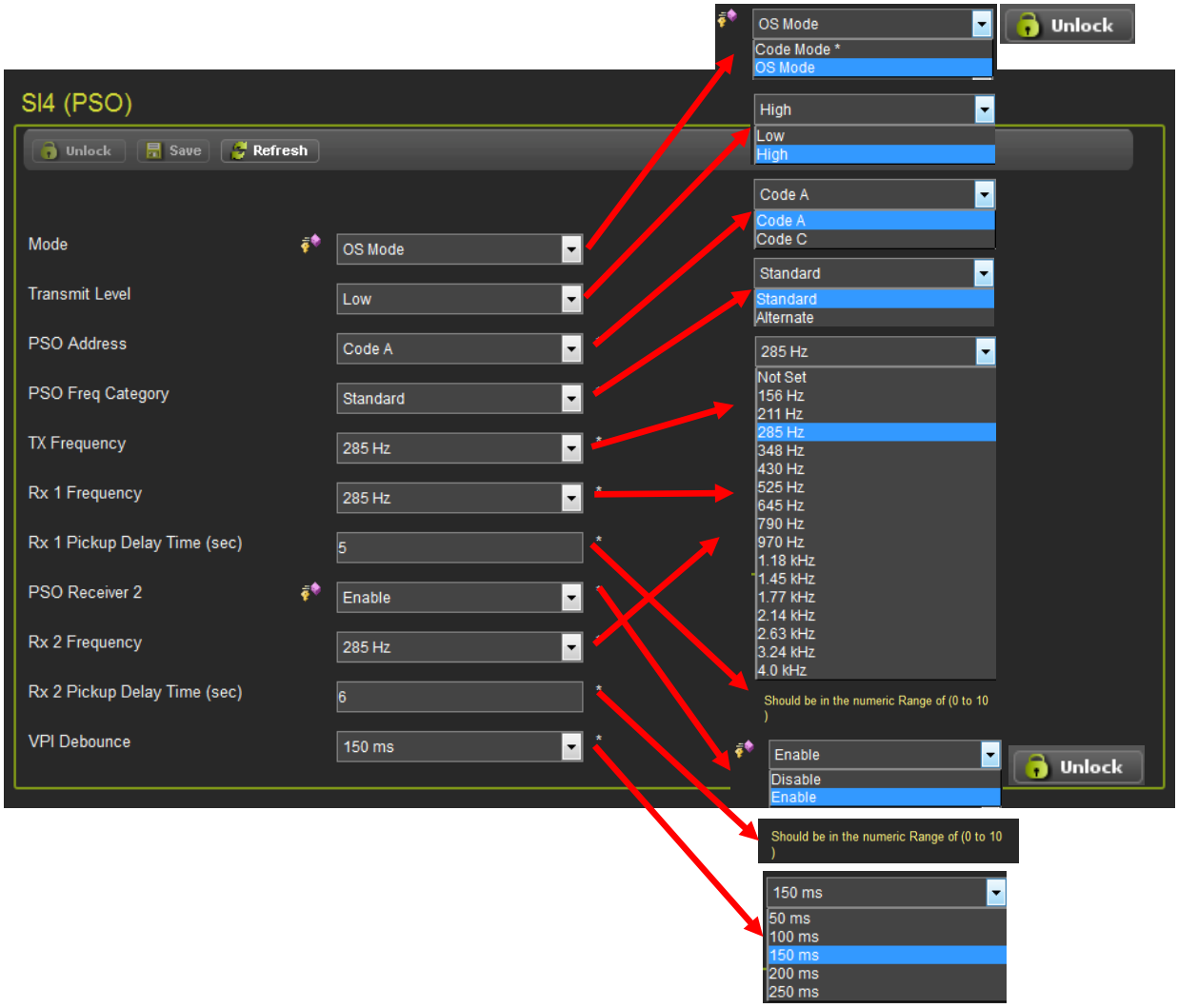


Figure 3-38 PSO Module Configuration – OS Mode

PSO Module Configuration – OS Mode (Requires system Unlock)

Mode – This parameter selects Code Mode (Coded Track) or OS Mode (Operational Siding)
Transmit Level – Low or High
PSO Address – Set PSO Address Code
PSO Freq Category – Standard or Alternate
TX Frequency – Lists Frequencies for PSO Frequency Category selected
RX 1 Frequency – Lists Frequencies available for receiver 1
RX 1 Pickup Delay Time (sec) – Sets delay time (Range 0-10 seconds)
PSO Receiver 2 – Enables or Disable second PSO Receiver (used with sidings) (Requires system Unlock)
RX 2 Frequency – Lists Frequencies available for receiver 2
RX 2 Pickup Delay Time (sec) – Sets delay time for Receiver 2 (Range 0 – 10 seconds)
VPI Debounce – Sets VPI Debounce from drop-menu list

3.1.3 Web UI Field Adjustment Menu

The Field Adjustment Menu has three sub menus:

- Track Setup – used for setting up the Coded Track Cards.
- WayTrax Setup – used to setup the WayTrax parameters
- Lamp Setup - used to adjust lamp voltages on Colorlight and Searchlight modules.
- PSO – used to calibrate
- Maintainer On Site – enables the user to suppress alarm conditions when the Maintainer is on site.

3.1.3.1 ElectroCode Compatible Track Module Setup

The Track Setup screen allows the user to adjust Coded track module voltage and current limit. (Refer to the GEO manual SIG-00-05-09 or WayConneX manual SIG-00-16-08 for parameters and procedures). The screen allows the user to see the codes the track card is sending or receiving and the transmit currents and voltage. The figure below displays the track setup screen.

Track Module

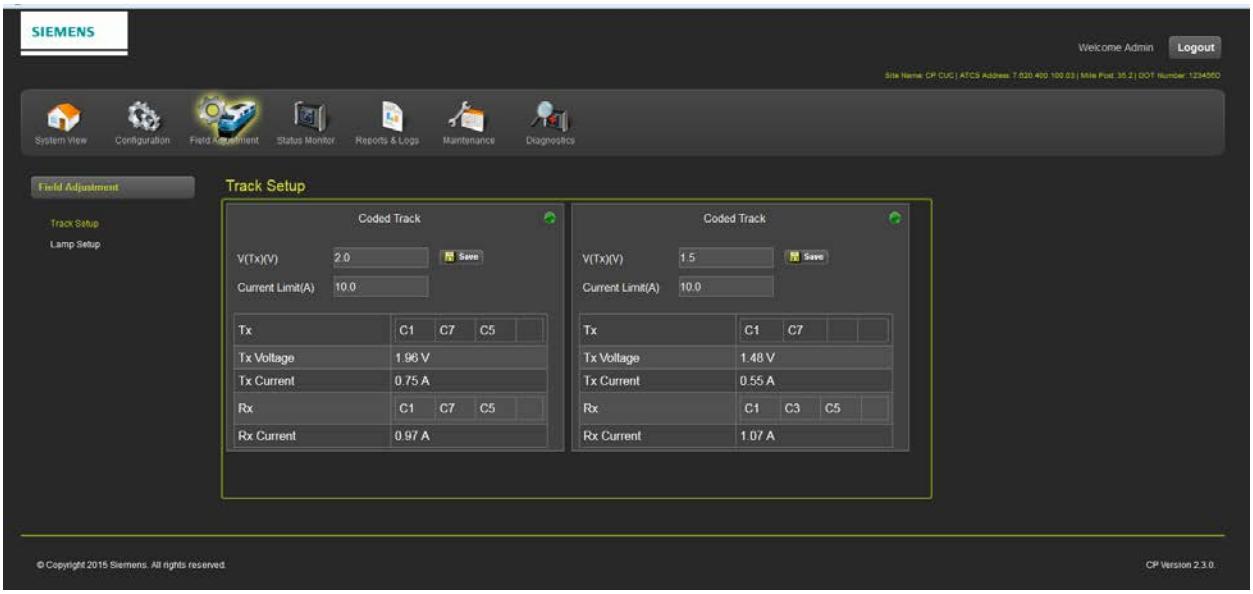


Figure 3-39 Web UI - Field Adjustment – Track Module Track Setup Screen

3.1.3.2 WayTrax Setup (WayConneX Only)

The Track Setup screen for the WayTraX card is slightly different than the Track Card and also allows the user to adjust Coded track module voltage and current limit. (Refer to the WayConneX Manual SIG-00-16-08 for parameters and procedures). The screen allows the user to see the track length, the codes the WayTraX card is sending or receiving, and the transmit currents and voltages. The figure below displays the WayTrax track setup screen.

WayTraX Module (WayConneX Only)

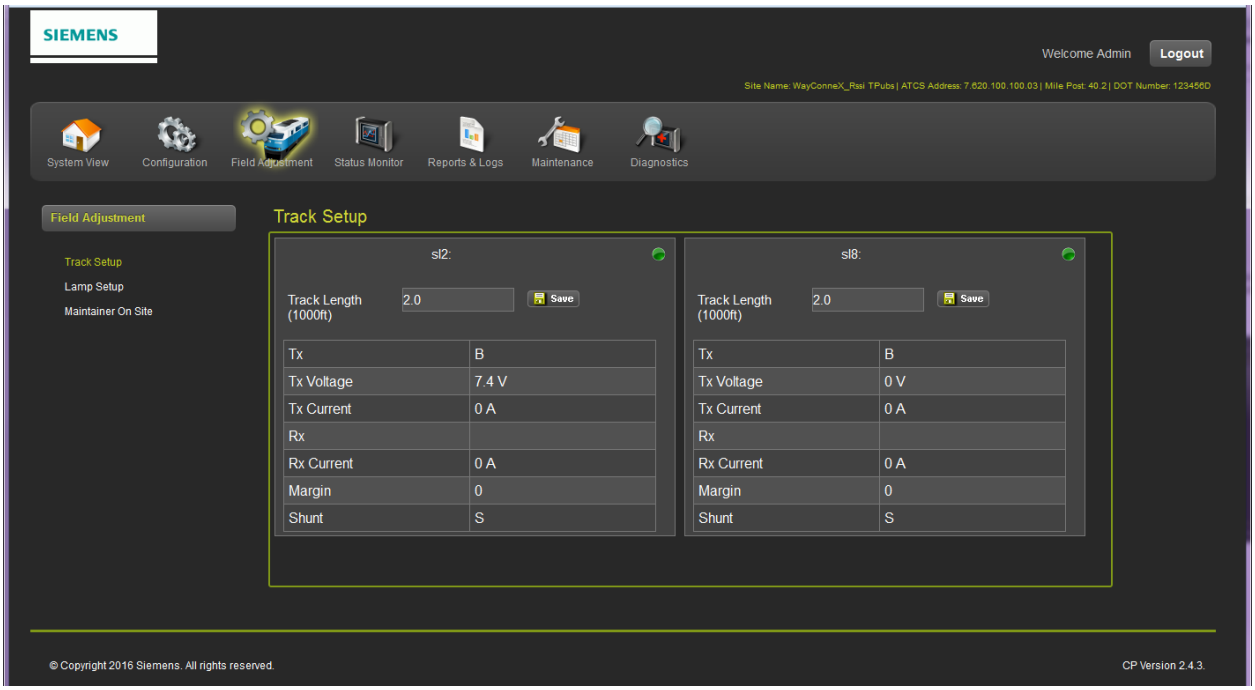


Figure 3-40 Web UI – Field Adjustment – WayTrax Module Track Setup Screen

3.1.3.3 Lamp Setup

This screen allows the user to adjust lamp voltage for colorlight modules. It shows whether the lamps are currently on, off or flashing, (Refer to the GEO manual SIG-00-05-09 and WayConneX manual SIG-00-16-08 for parameters and procedures). The figure below displays the Lamp setup screen.

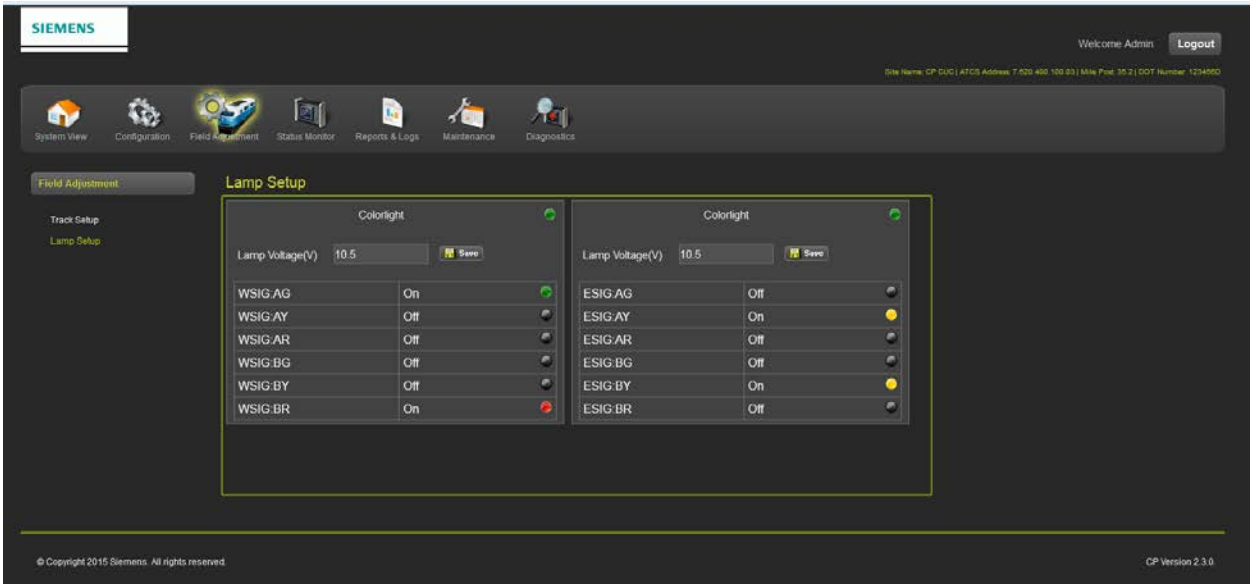


Figure 3-41 Web UI - Field Adjustment – Lamp Setup Screen

3.1.3.4 PSO Setup (WayConneX Only)

The PSO Setup screen enables the user to calibrate the PSO Module. Refer to the WayConneX Manual SIG-00-16-08 for the calibration procedures

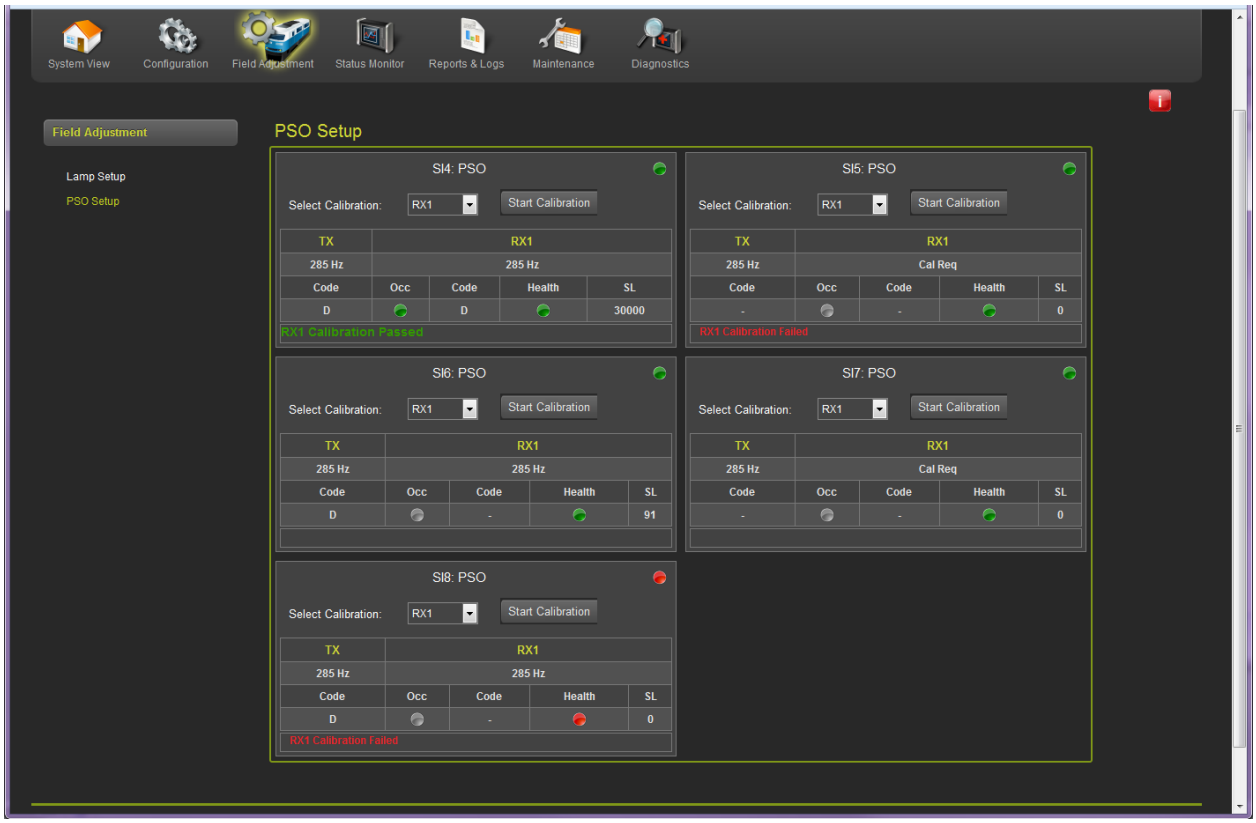
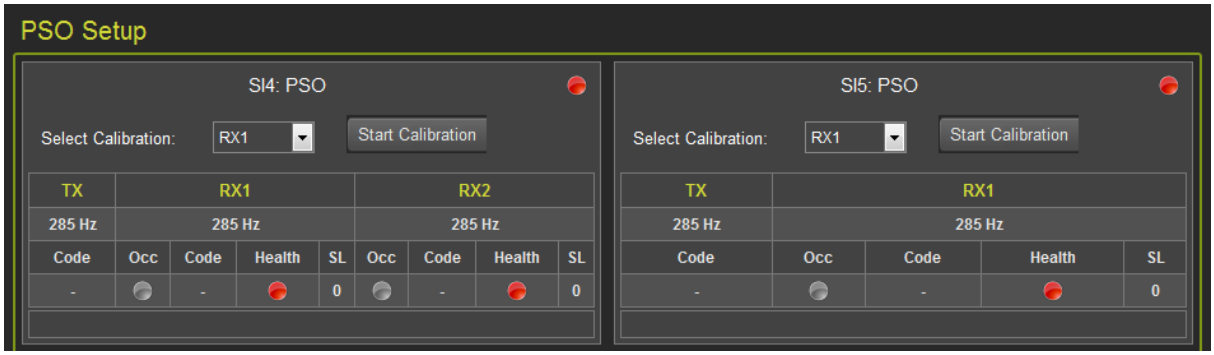


Figure 3-42 Web UI – Field Adjustment – PSO Setup Screen

A comparison of PSO Setup screens is shown in Figure 3-43



OS Mode Screen **Code Mode Screen**

Figure 3-43 PSO Setup Screen Comparison (OS Mode – Code Mode)

3.1.3.5 Maintainer On Site

This screen is used in applications where a CDL program is running that generates alarms to the back office. The Maintainer on Site function is used to tell the system that a maintainer is present, the user sets the time duration, during this time, alarms are suppressed

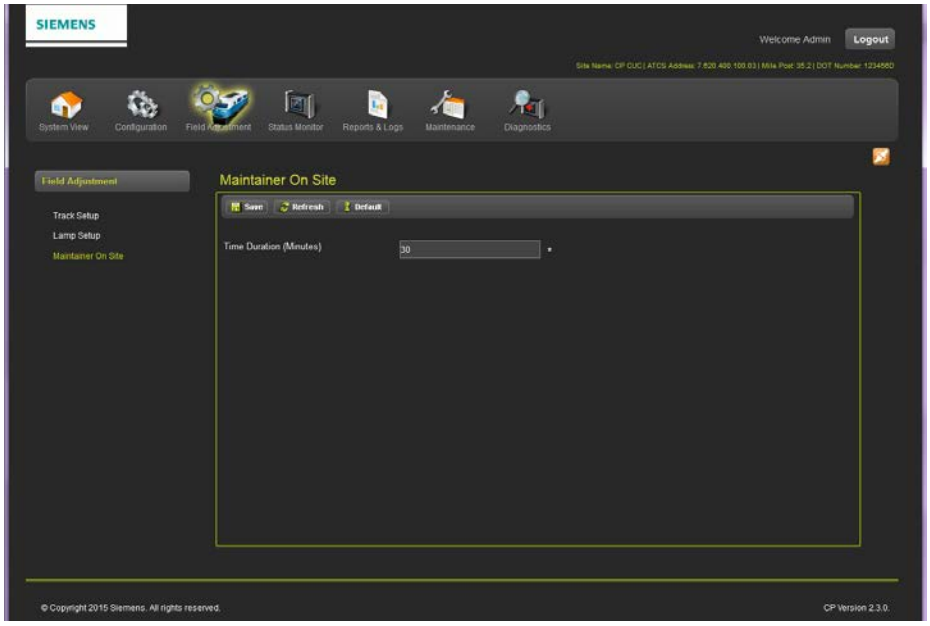


Figure 3-44 Web UI - Field Adjustment – Maintainer On Site Screen

3.1.4 Web UI Status Monitor Menu

The Web UI Status Monitor enables the user to view the System, PTC Status, Communications, Ethernet ports, Echelon® Network, the Routing Table, and Statistics. Many of the screens displayed are for Siemens service personnel use. The PTC Status only shows in PTC applications.

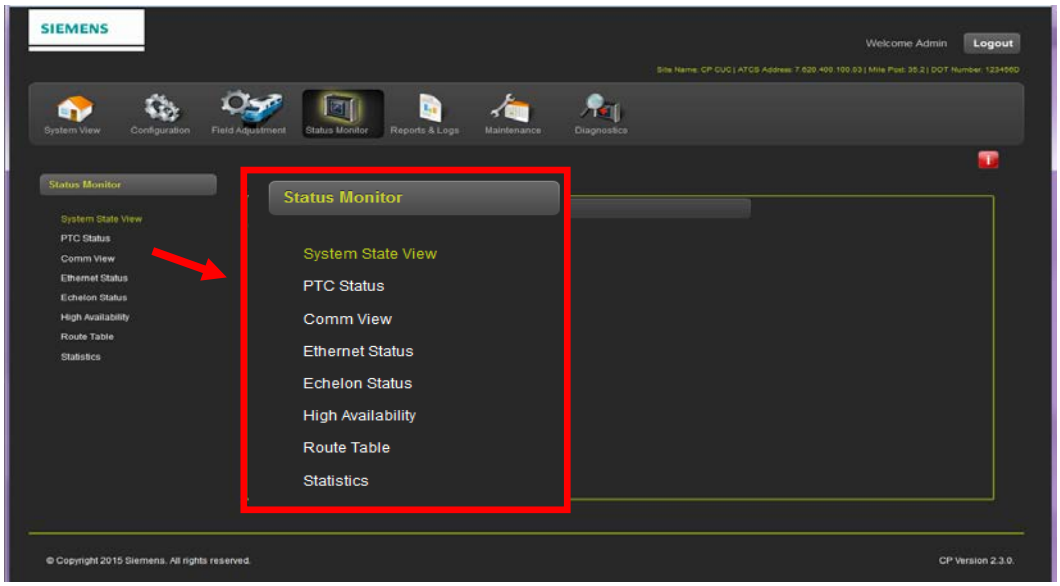


Figure 3-45 Web UI – Status Monitor Menu Screen

3.1.4.1 System State View

This allows the user to see the states of the internal variables of the MCF. For GEO appliance model MCFs this shows the states for each Geographic object. For Boolean MCFs created using WCCT this will show the states of the variables created by the user in the MCF.

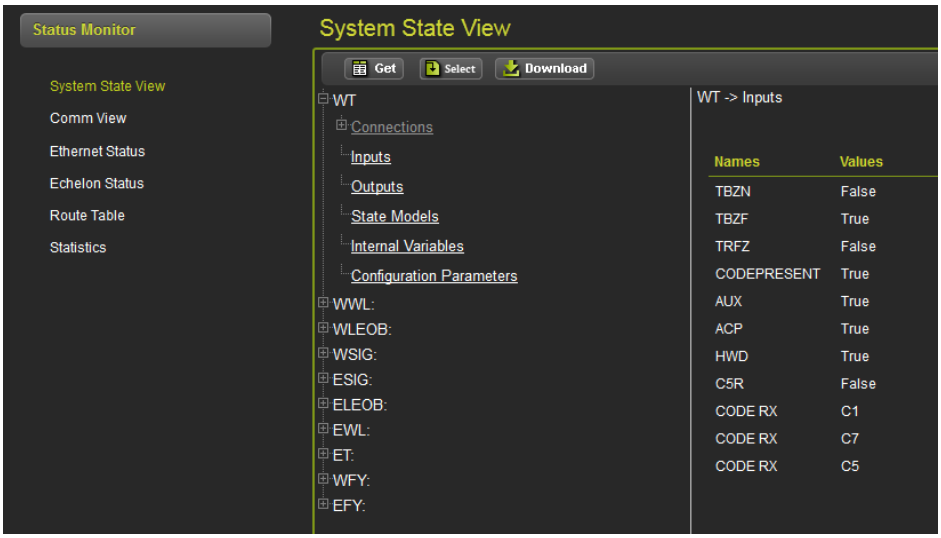


Figure 3-46 Web UI – Status Monitor – System State View

3.1.4.2 PTC StatusView

This is only present when a PTC application is installed.
When running a PTC enabled MCF, this screen is used to show the status of the PTC.
The Beaconing LED shows green when the CPU is currently sending Beacon messages
The GPS Present shows green when GPS communication is established and red when no GPS communication is available.

Under the Object heading is a list of the PTC devices defined in the MCF. For signals, the Status will show the PTC aspect defined for this signal, for switches, it will show the whether the switch is reporting normal, reverse, error or out of correspondence, for hazards detectors it will show normal or fault

The time column shows the time and date the last PTC message data was updated for this device.
The order of the objects reflects the order that the devices appear in the PTC message.

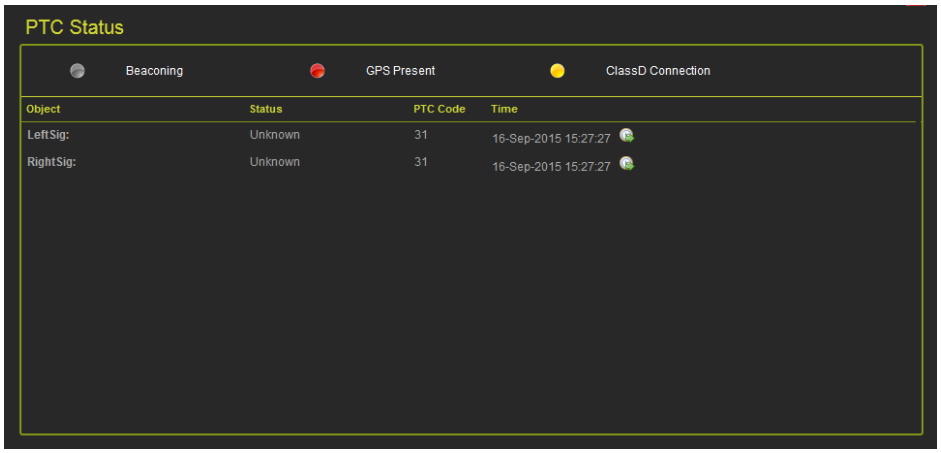


Figure 3-47 Web UI – Status Monitor – PTC Status

3.1.4.3 Comm View

This is used to show the status of the vital communications from this CPU to other WayConneX/GEO systems.

Figure 3-48 Web UI – Status Monitor – Communication View

3.1.4.4 Ethernet Status

This shows the state of the laptop and PTC Ethernet connections.

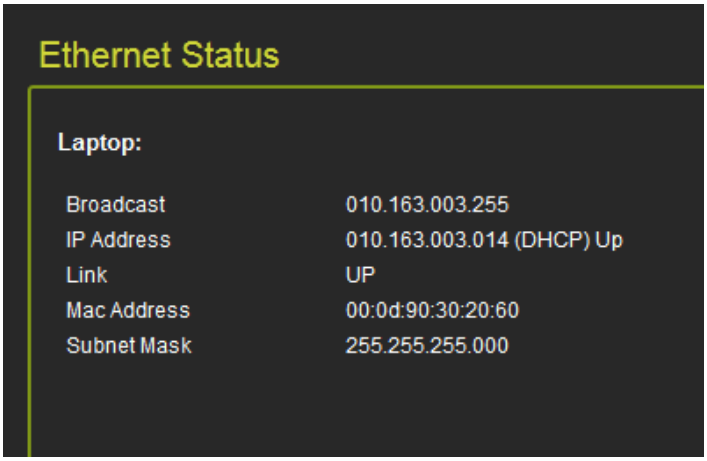


Figure 3-49 Web UI – Status Monitor – Ethernet Status

3.1.4.5 Echelon® Status

This shows the number of packets transmitted and received over the Echelon®.

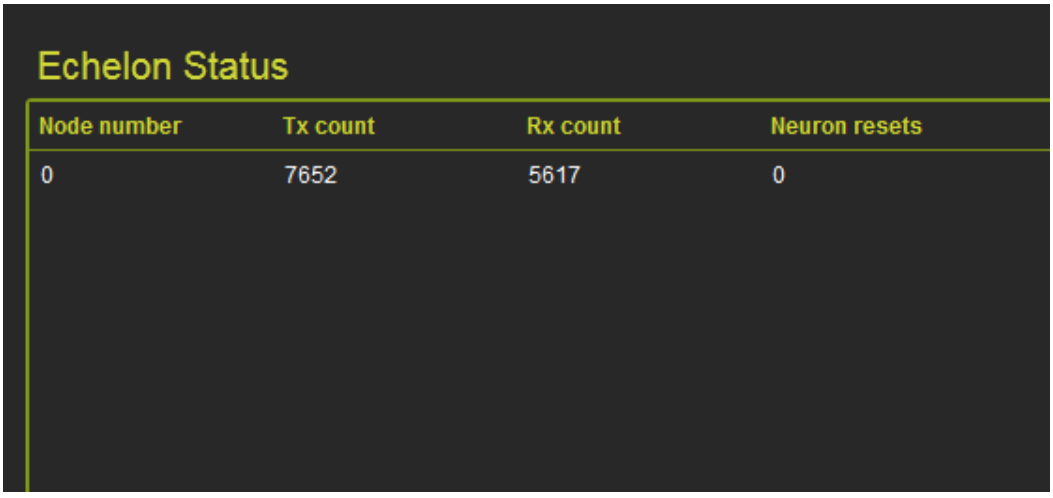


Figure 3-50 Web UI – Status Monitor – Echelon® Status

3.1.4.6 Route Table

This shows the ATCS address of other devices that the CPU III has established communications.

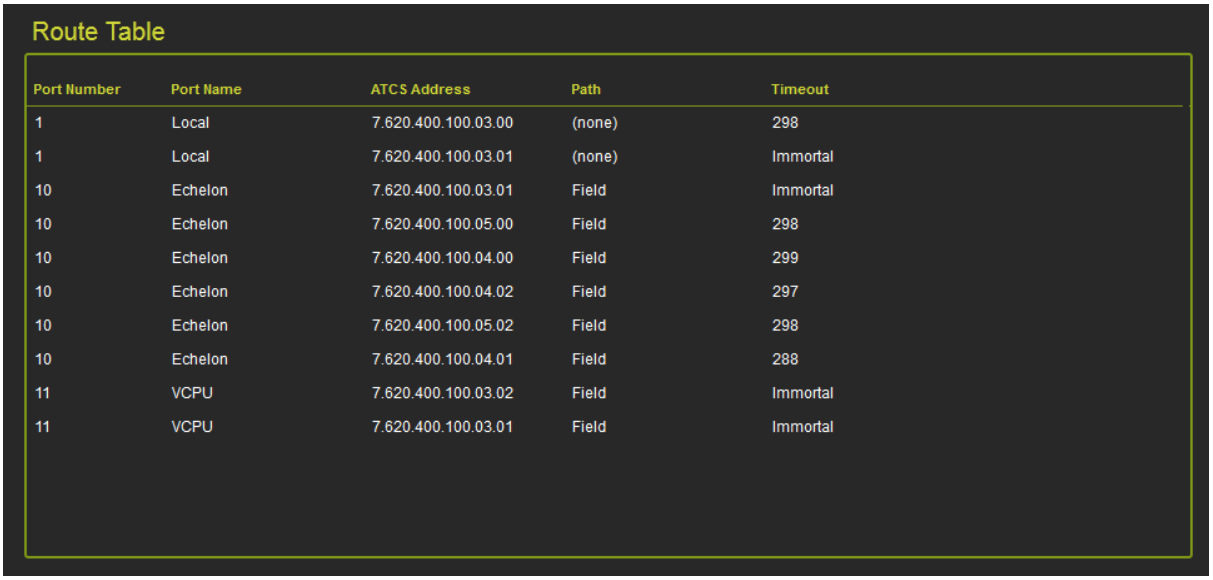


Figure 3-51 Web UI – Status Monitor – Route Table

3.1.4.7 Statistics

These are primarily for Siemens Personnel use. The Vital I/O Module statistics show the communication statistics between the CPU and the I/O modules.

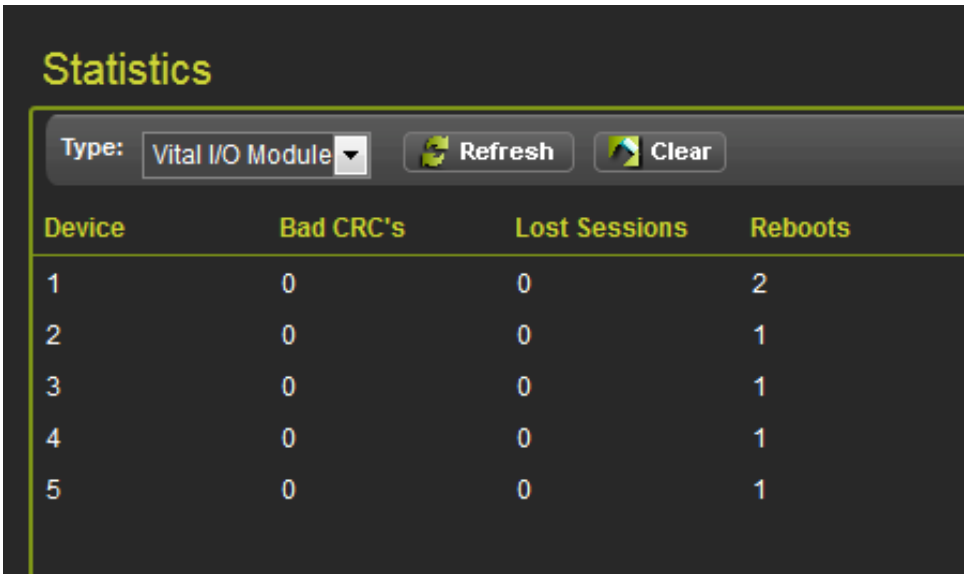


Figure 3-52 Web UI – Status Monitor – Statistics

3.1.5 Web UI – Reports & Logs

The CPU III can generate Event Logs, Diagnostic Logs, Configuration Reports, Version Reports, and VLP/IO Card Logs. All Logs and Reports can be viewed on the screen or can be saved to files for hard copy printing and off-site storage.

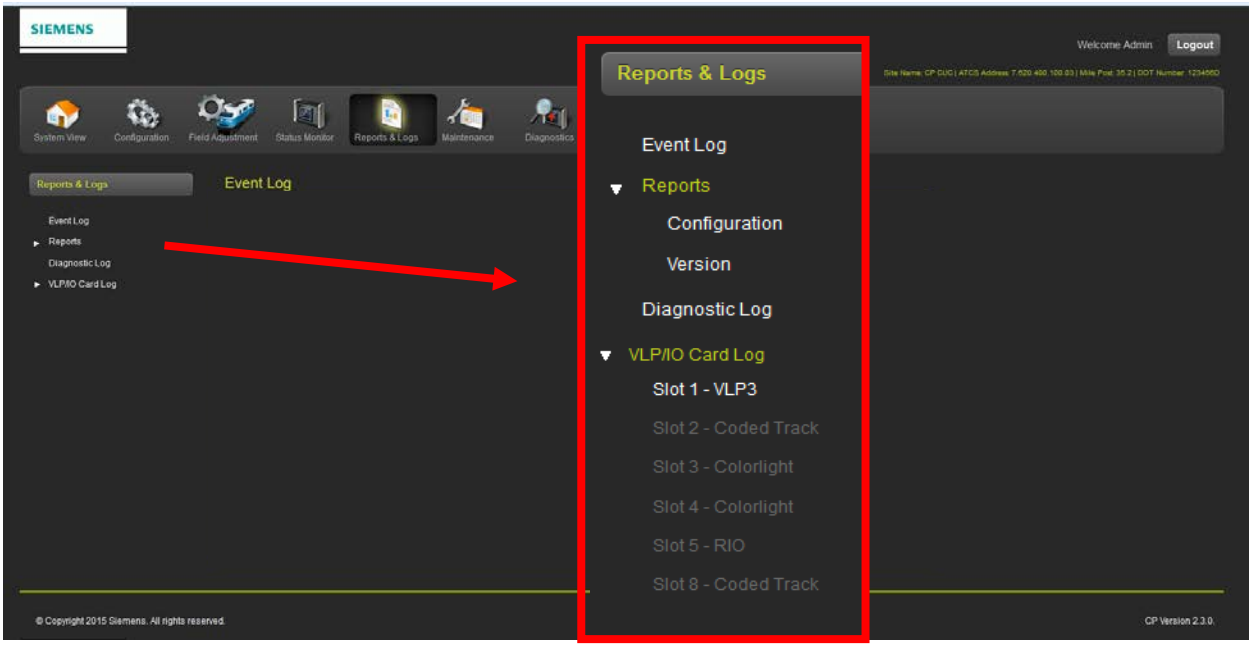


Figure 3-53 Web UI – Reports & Logs Menu

3.1.5.1 Event Log

The primary log in the system is the Event Log. When the user selects download they have the three options for the log content:

- The currently viewed events
- Events of the last 24hrs
- The entire event log

The left drop box shows 3 options:

- BASIC
- ADVANCE
- TRACE

The following screen displays the BASIC view with the entire log displayed:

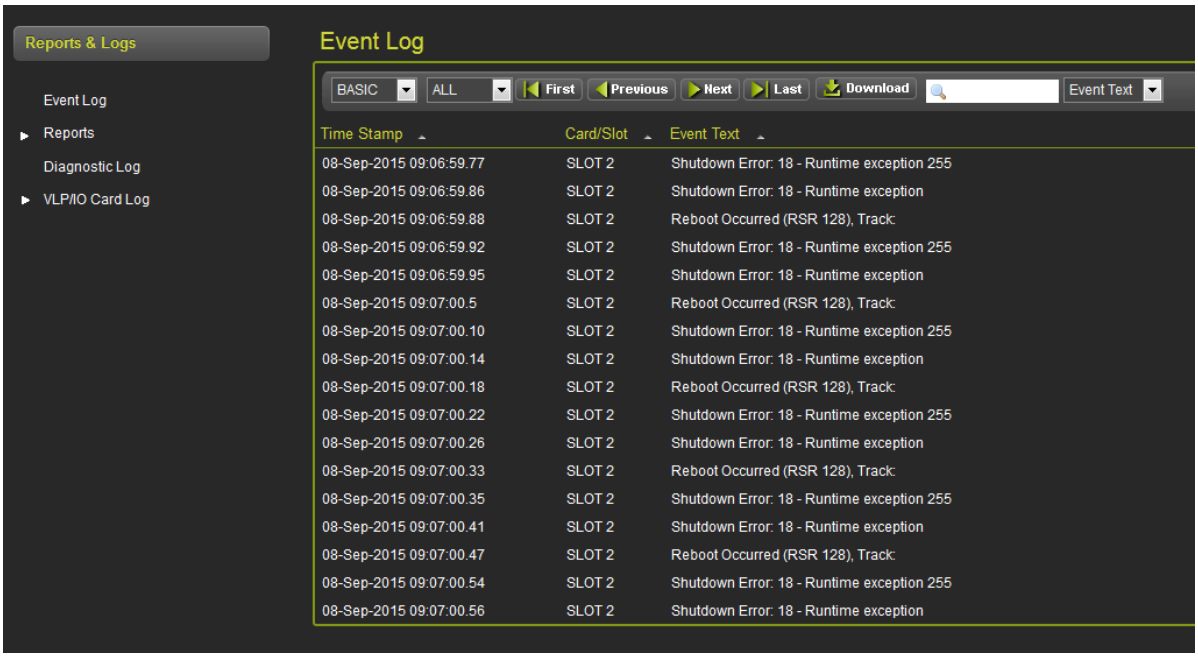


Figure 3-54 Web UI – Reports & Logs – Event Log – Basic View

When ADVANCE is selected then user can select a portion of the log by time and date as shown in Figure 3-55.

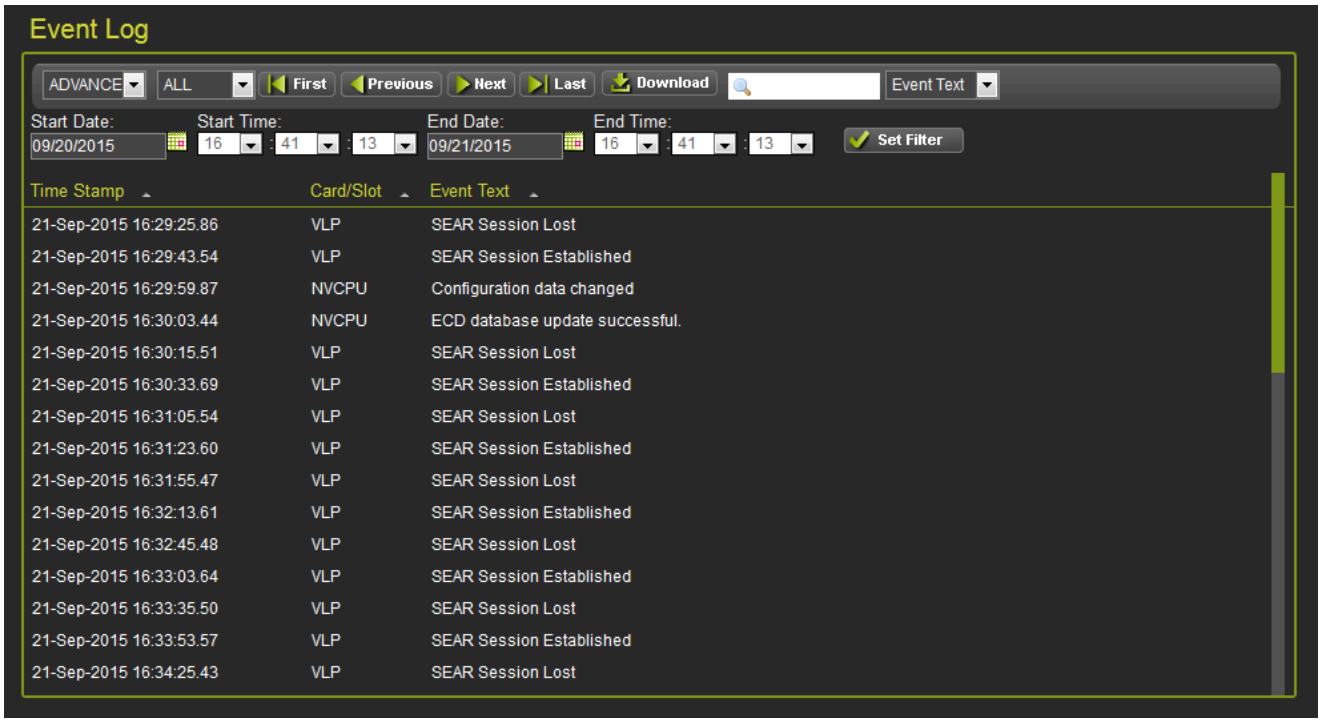


Figure 3-55 Web UI – Reports & Logs – Event Log – Advanced View

When TRACE is selected the events are recorded in real time, they will be shown in the trace buffer. Use the Clear button to clear the current buffer, and Start and Stop to start and stop Tracing.

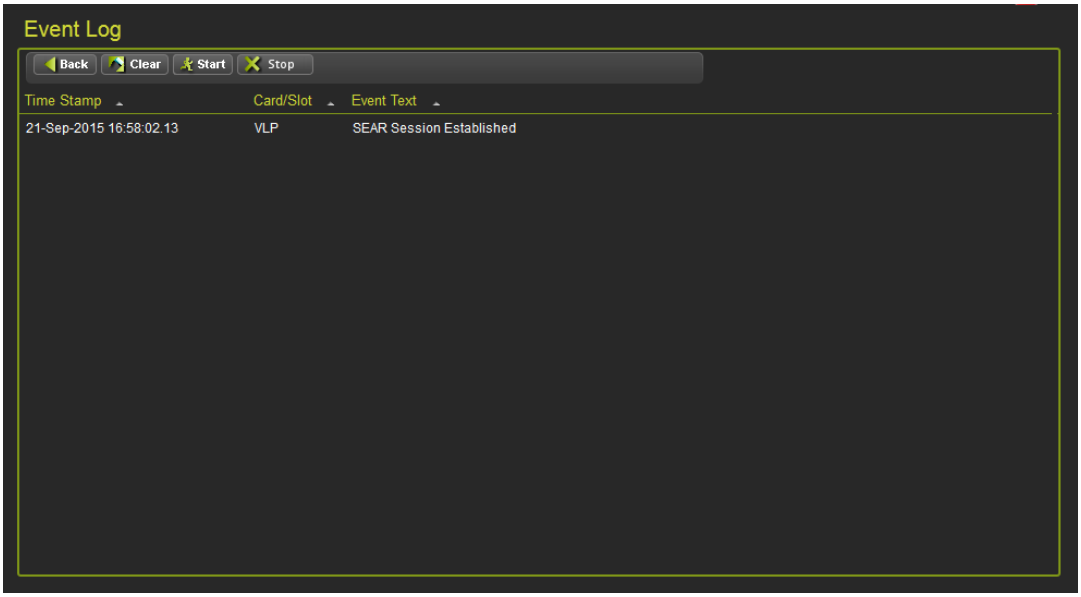


Figure 3-56 Web UI – Reports & Logs – Event Log – Trace View

The second button on the Event Log page can be used to select the type of event.

- ALL – shows all events from all sources
- Status – this shows events logged from the VLP module (equivalent to what would be logged in CPUII+ Status log)
- Summary – this shows summary level events logged from the VLP module (equivalent to what would be logged in CPUII+ Summary log)
- Shutdown – this shows events logged from the VLP module that help diagnose the cause of a shutdown.

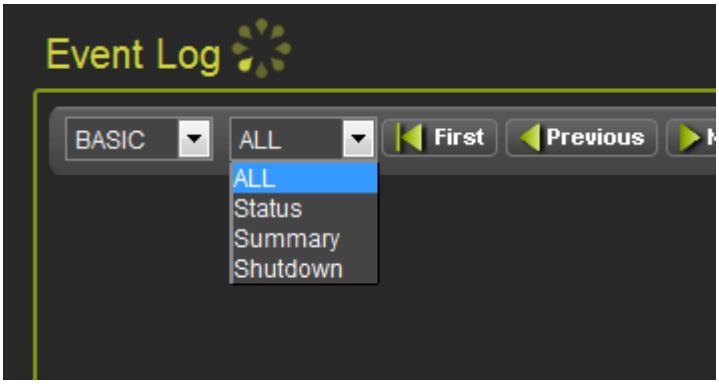


Figure 3-57 Web UI – Reports & Logs – Event Log – Event Type Filter

The last filter enables searching for specific text strings in the Event Text, Card/Slot or Time Stamp field. Type the text to be found in the text box and press enter. This text search only works on the events in the current view.

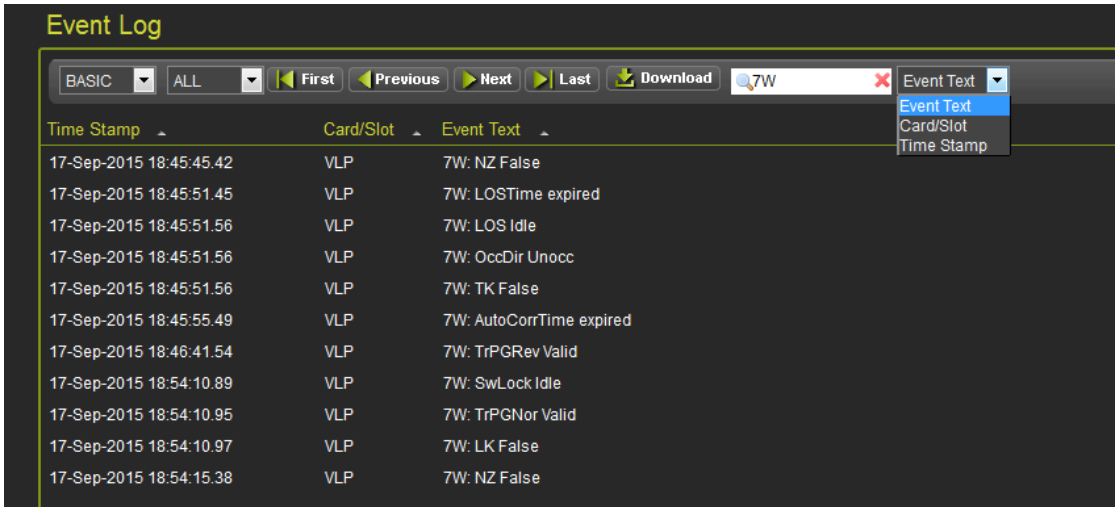


Figure 3-58 Web UI – Reports & Logs – Event Log – Search

3.1.5.2 Configuration Report

Configuration Reports and Version Reports are available on the Reports sub menu. Select the desired report and click on the Create button [2]. The appropriate report will be shown on the screen. Select the download button [3] to download the report as a file onto your PC.

The Configuration Report contains all of the software and hardware versions (from the Version Report) in addition to the currently configured parameters including all the vital and non-vital configuration settings and check numbers (UCN, PTC UCN).

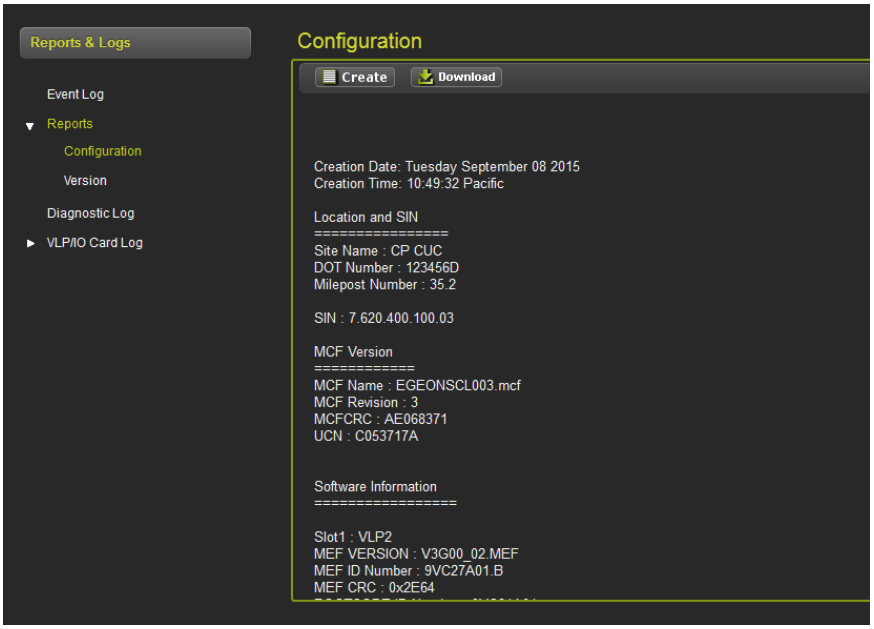


Figure 3-59 Web UI – Reports & Logs – Configuration Report

3.1.5.3 Version Report

The Version Report contains all of the version information for the hardware and software in the system.

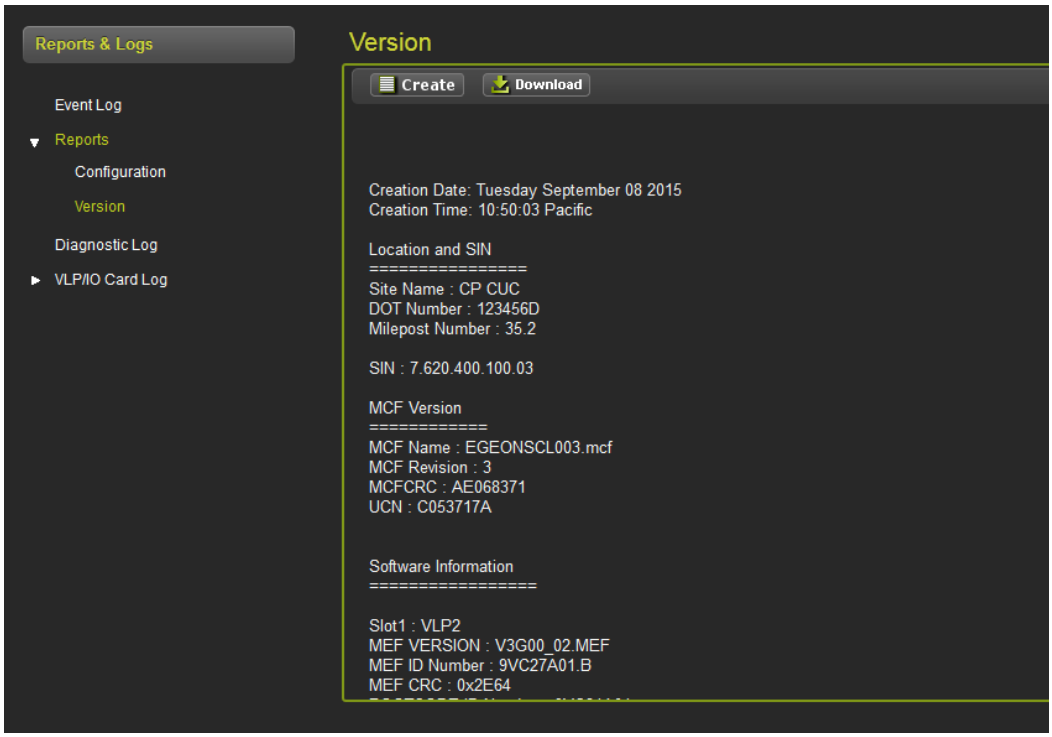


Figure 3-60 Web UI – Reports & Logs – Version Report

3.1.5.4 Diagnostic Log

The Diagnostic Log is primarily for Siemens service personnel to diagnose anomalies that may occur in the system.

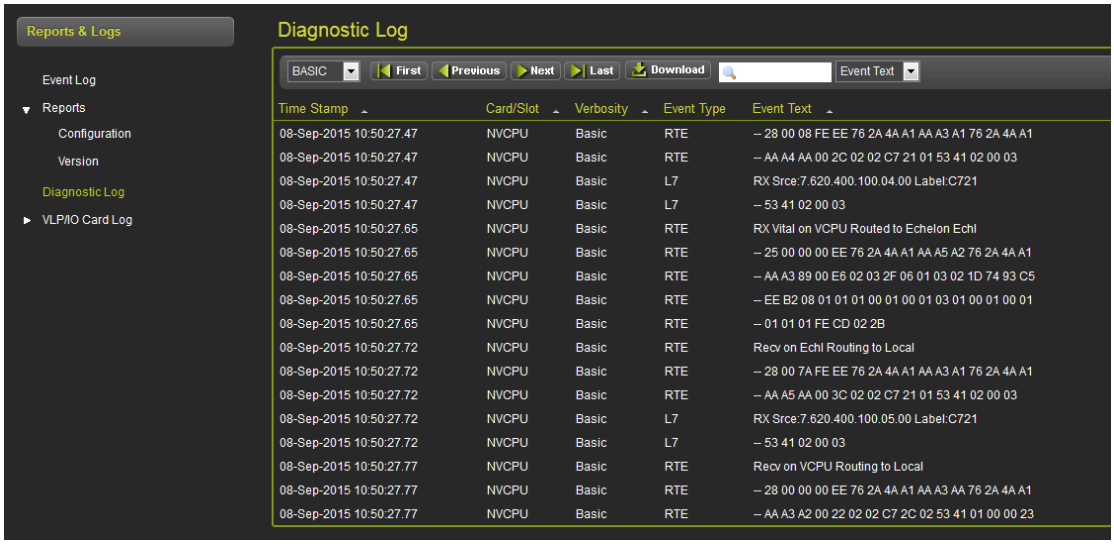


Figure 3-61 Web UI – Reports & Logs – Diagnostic Log

3.1.5.5 VLP/IO Card Log

The VLP/IO Card Logs are for Siemens service personnel for diagnosing unusual issues.

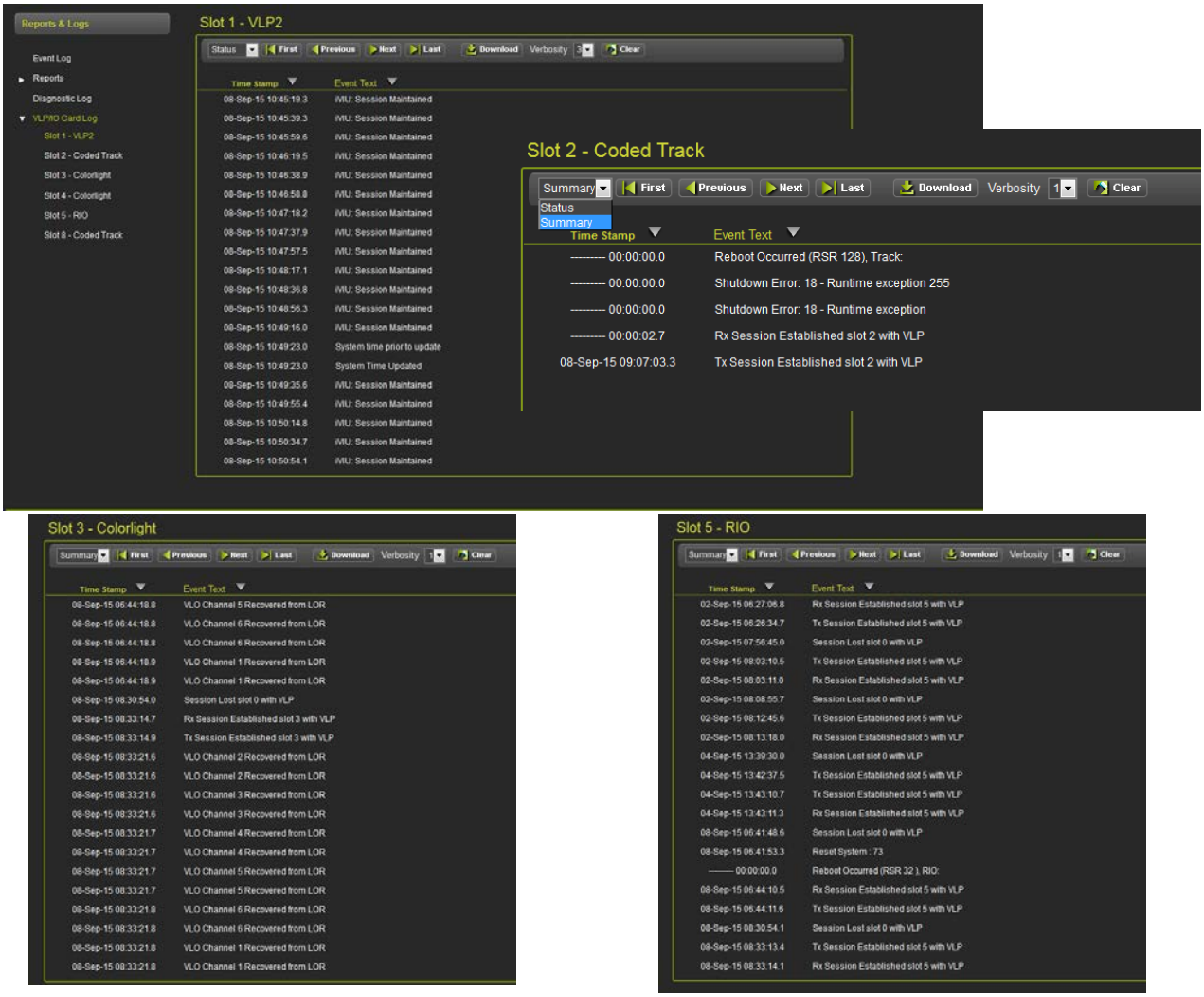


Figure 3-62 Web UI – Reports & Logs – VLP/IO Card Log – Card Slot Screens

3.1.6 Web UI - Maintenance

The GEO Web UI Maintenance Menu has the following sub menus:

- **Configuration** – This menu is only available on the WayConneX and enables the user to load a new configuration. For GEO appliance model applications the user has to program the CPU III using the Configuration menu.
- **CP MEF** – This menu enables the user to upload new Executive Software (MEF) to the CP.
- **VLP** – This menu has sub menus for uploading the MEF, MCF, MCFCRC, or Clearing the ECD or CIC, and Resetting the VLP.
- **Modules** – This menu is used to load software to the individual modules from the CPU III to the module using a serial cable from the CPU III to the module as shown in Figure 3-72 and Figure 3-73. Software from each module may also be downloaded from the module to an external computer.
- **PTC Class D Tests** – This menu is used to test the PTC Class D Link

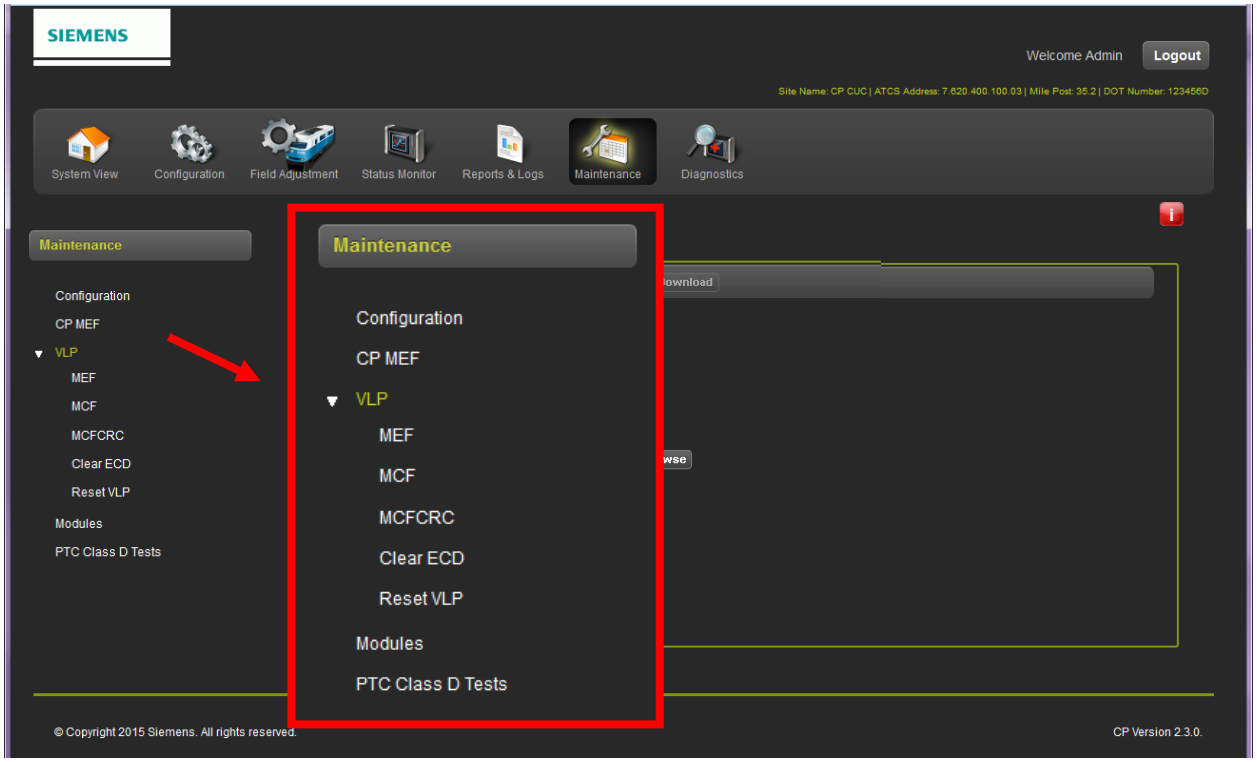


Figure 3-63 Web UI – Maintenance Menu

3.1.6.1 Web UI Maintenance – Configuration Menu

Figure 3-64 displays the Configuration menu. This menu is only available on the WayConneX. The Office Configuration Editor (OCE) can be used to create the configuration for the WayConneX system see the OCE manual SIG-00-11-15 for details. The non-vital and the vital settings can be saved to a configuration package (select Export in OCE and it creates a zip file). This configuration package can then be loaded by pressing the browse button then selecting the zip file.

Before loading a configuration package, ensure that the correct MCF and MCF CRC is loaded into the CPU III first, and then reboot the VLP so the VLP is running the new MCF. Then load the configuration package.

The option of loading a configuration package is not available for GEO applications.

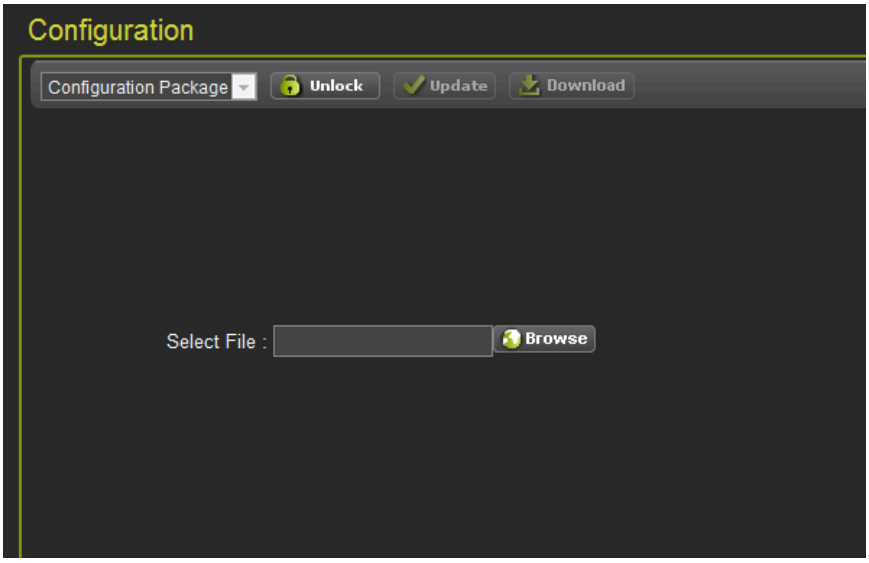


Figure 3-64 Web UI – Maintenance – Configuration Menu (WayConneX Only)

3.1.6.2 Web UI Maintenance – CP MEF

Use the CP MEF menu to upload new non-vital executive software to the CP. The names of the CP software are of the form ncp3_mef_x.x.xr.tgz (where x.x.x. is the version). As with the majority of screens, press unlock button and confirm local user presence by pressing the Select button on the CPU III, then select the non-vital executive software file to be updated. While the upload is in progress the current CP executive software will continue to run. Once the upload has completed the CP will reboot to load the new executive software. When the CP reboots, it causes the VLP to reboot as well, thus the signaling system will go into a restrictive state while the reboot is in progress.

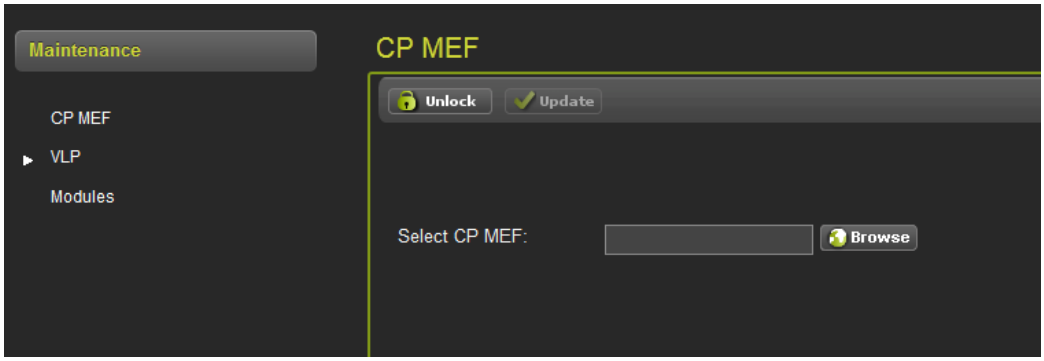


Figure 3-65 Web UI Maintenance Menu – CP MEF – Update MEF

3.1.6.3 Web UI – Maintenance – VLP – MEF Menu

Use the VLP MEF menu to upload new vital executive software to the VLP. The names of the VLP software are of the form 9VC27-V3Gxx_xx.mef (where xx.xx. is the version). First press unlock button and confirm local user presence, this will put the Vital executive software into edit mode, which will cause the signaling system to go into a restrictive state while the reboot is in progress. Select the vital MEF file to load by clicking the Browse button and locate the file desired. Once the MEF has been uploaded the VLP will reboot and resume operation.

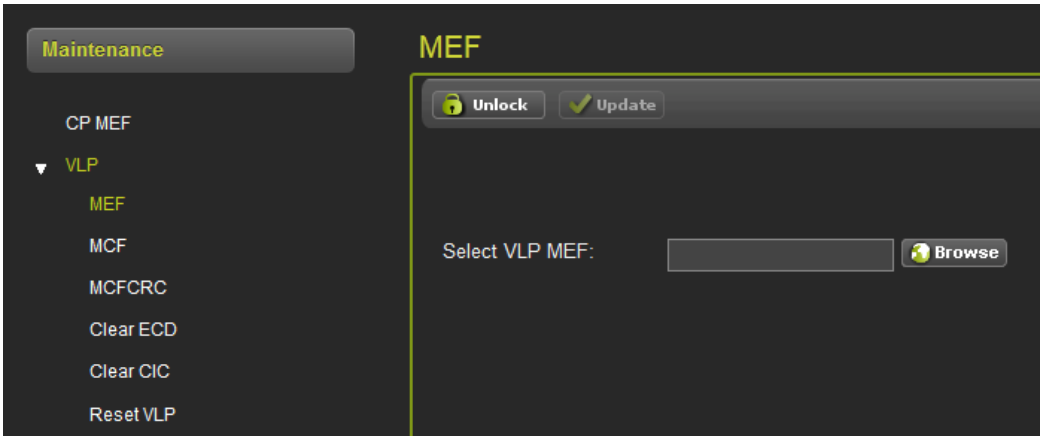


Figure 3-66 Web UI Maintenance Menu – VLP – Update MEF

3.1.6.4 Web UI – Maintenance – VLP – MCF Menu

The MCF menu enables the user to upload a new MCF into the VLP. Press the Unlock button and confirm local user presence, this will place the VLP in the edit mode which will cause the signaling system to go into a restrictive state while the reboot is in progress. Select the vital MCF file to load by clicking the Browse button and locate the file desired and enter the MCFCRC number provided in the site plans. Once the MCF has been uploaded the VLP will reboot and resume operation.

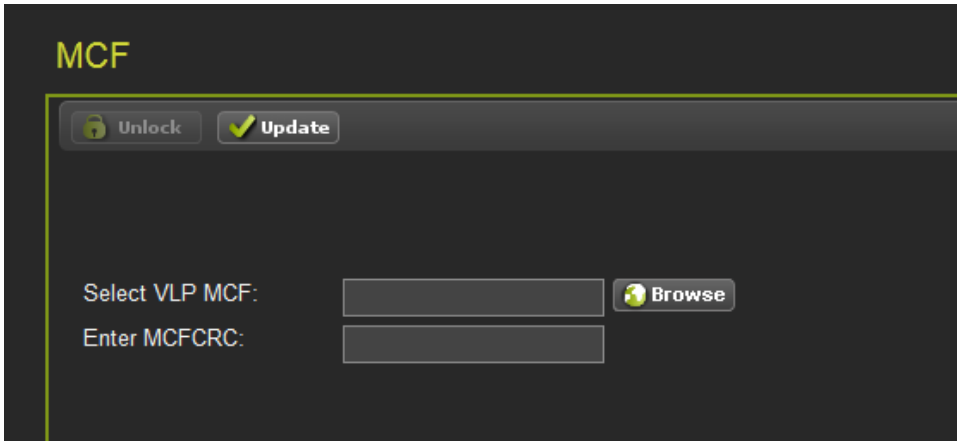


Figure 3-67 Web UI Maintenance Menu – VLP – Update MCF

3.1.6.5 Web UI – Maintenance – VLP – MCFCRC Menu

In the event the MCF gets updated but the CRC is incorrect (4 character display shows Err: MCF), the MCF CRC can be updated independently of the MCF by going to the MCF CRC selection and entering the MCF CRC value and selecting update. Note that this just causes the MCF stored in the CIC to be updated. To make the MCF CRC take effect, reboot the VLP

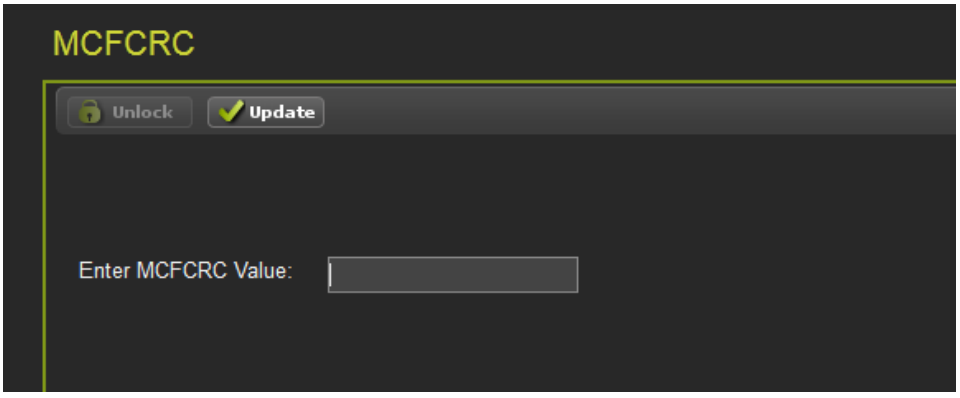


Figure 3-68 Web UI Maintenance Menu – VLP – Update MCFCRC

3.1.6.6 Web UI – Maintenance – VLP – Clear ECD Menu

In general the Clear ECD and Clear CIC options should only be used when setting up a new system. If the ECD is cleared, a new MCF and MCF CRC will need to be loaded. The system will also go into the restrictive state.

WARNING

CLEARING THE ECD WILL REMOVE ALL DATA STORED ON THE ECD FOR BOOT UP OF THE SYSTEM. CLEARED DATA CANNOT BE RECOVERED.

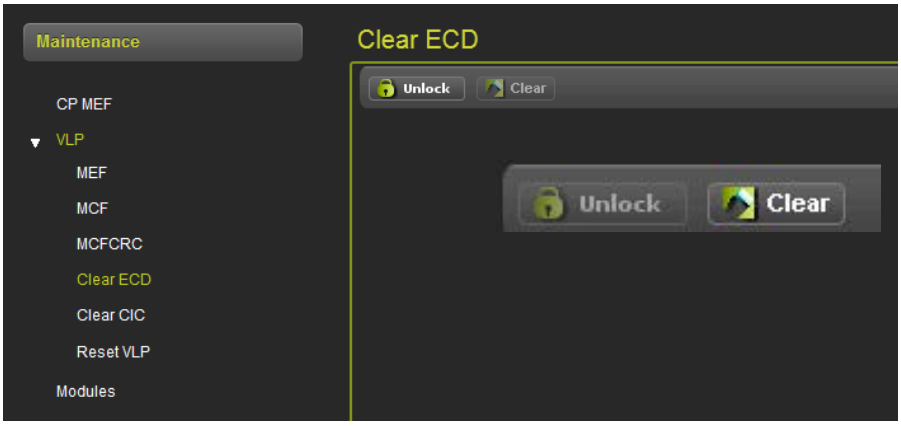


Figure 3-69 GEO Web UI Maintenance Menu – VLP – Clear ECD

3.1.6.7 Web UI – Maintenance – VLP – Clear CIC Menu (GEO Only)

When clearing the CIC, note that the MCF CRC will need to be re-entered, the non-vital and vital parameters set, then the UCN and PTC UCN entered.

WARNING

CLEARING THE CIC WILL REMOVE ALL CIC DATA. THE CLEARED DATA CANNOT BE RECOVERED.

Figure 3-70 Web UI Maintenance Menu – VLP – Clear CIC

3.1.6.8 Web UI – Maintenance – VLP – Reset VLP Menu

The Reset VLP menu is used to reset the VLP. Typically this will be used when the VLP has been put into edit mode so that vital parameters can be changed and the new UCN has been entered.

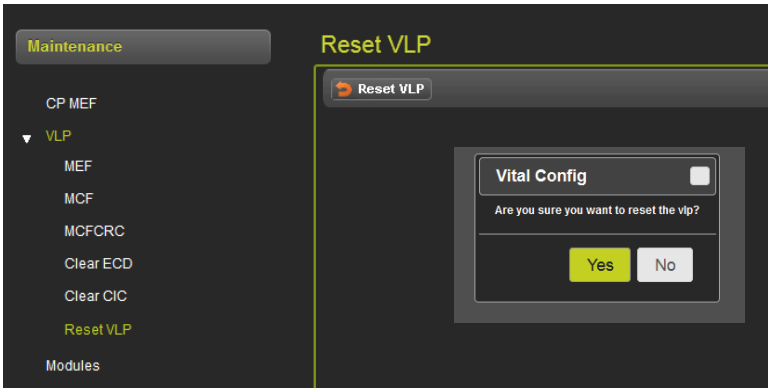


Figure 3-71 Web UI Maintenance Menu – VLP – Reset VLP

3.1.6.9 Web UI – Maintenance – Modules Menu

The Modules menu will bring up the screen in Figure 3-72. Click on the Install Software button, this is used to update the software on the I/O modules. To perform this task, a serial cable has to be connected between the CP Diag port and the I/O module's Diag port as shown in Figure 3-73. Select the appropriate MEF for the module to update.

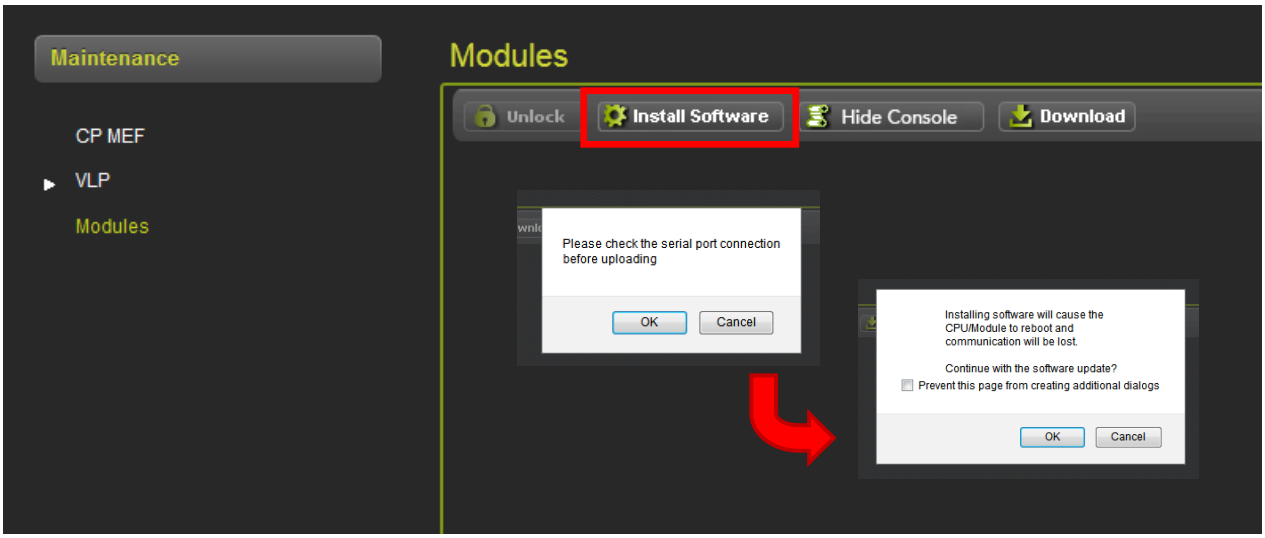


Figure 3-72 Web UI Maintenance Menu – Modules – Install Software

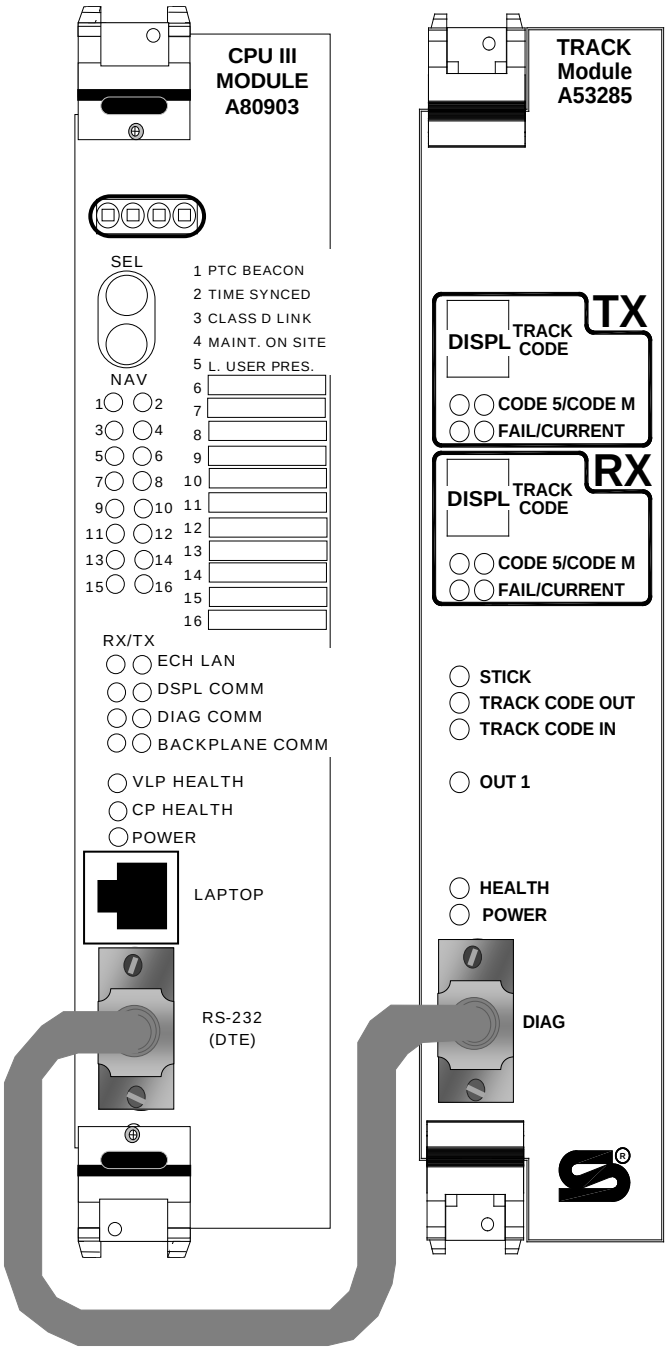


Figure 3-73 Serial Cable Connection for Module Software Updates

3.1.6.10 Web UI – Maintenance – PTC Class D Tests Menu

When running a PTC application the PTC Class D Tests menu can be used to perform self-tests on the Class D connection. The PTC Class D Test screen is shown below.

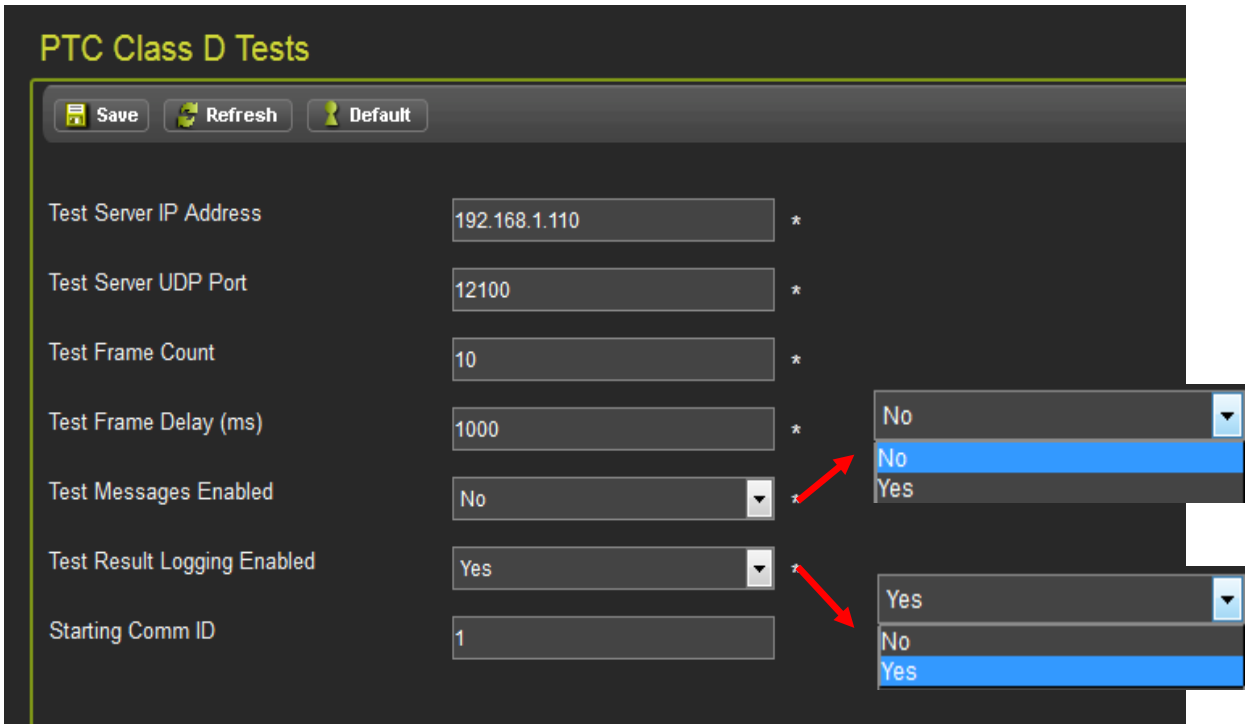


Figure 3-74 Web UI Maintenance Menu – PTC Class D Tests

3.1.7 Web UI - Diagnostics

The System Diagnostics screen provides information on system anomalies that occur from time to time. In the example below, an incorrect MCF CRC number has been configured into the system; this has caused a UCN Error and has resulted in the VLP to be unconfigured. The attention icon appears in the right corner of all Web UI screens when a Diagnostic incident is present.

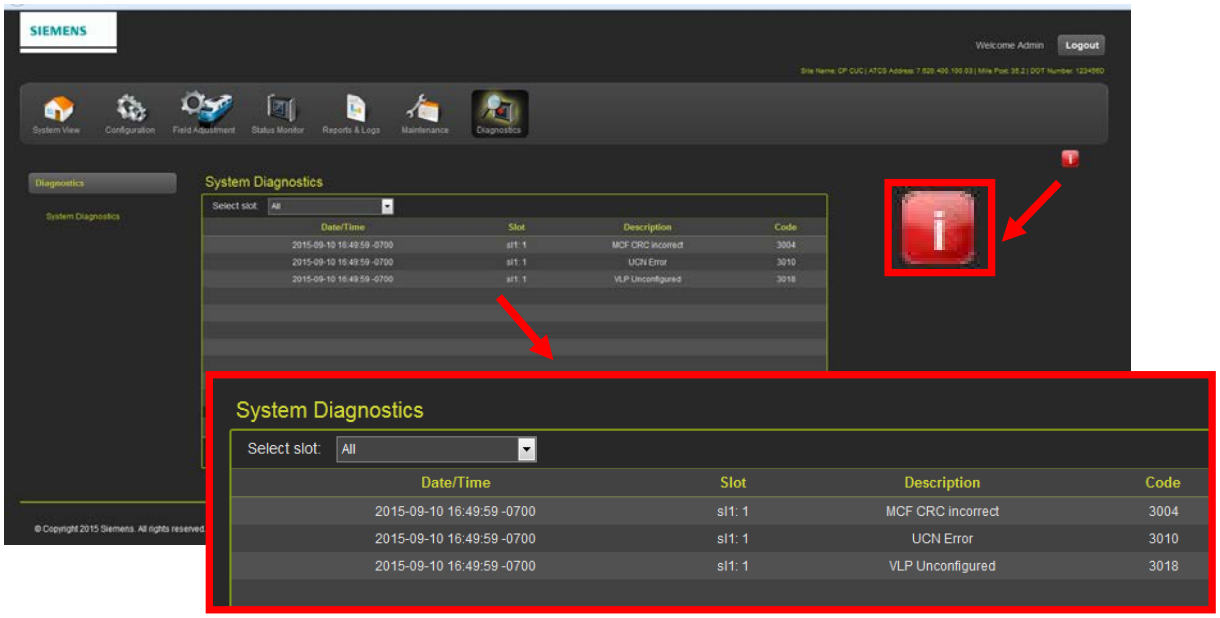


Figure 3-75 Web UI Maintenance Menu – System Diagnostics

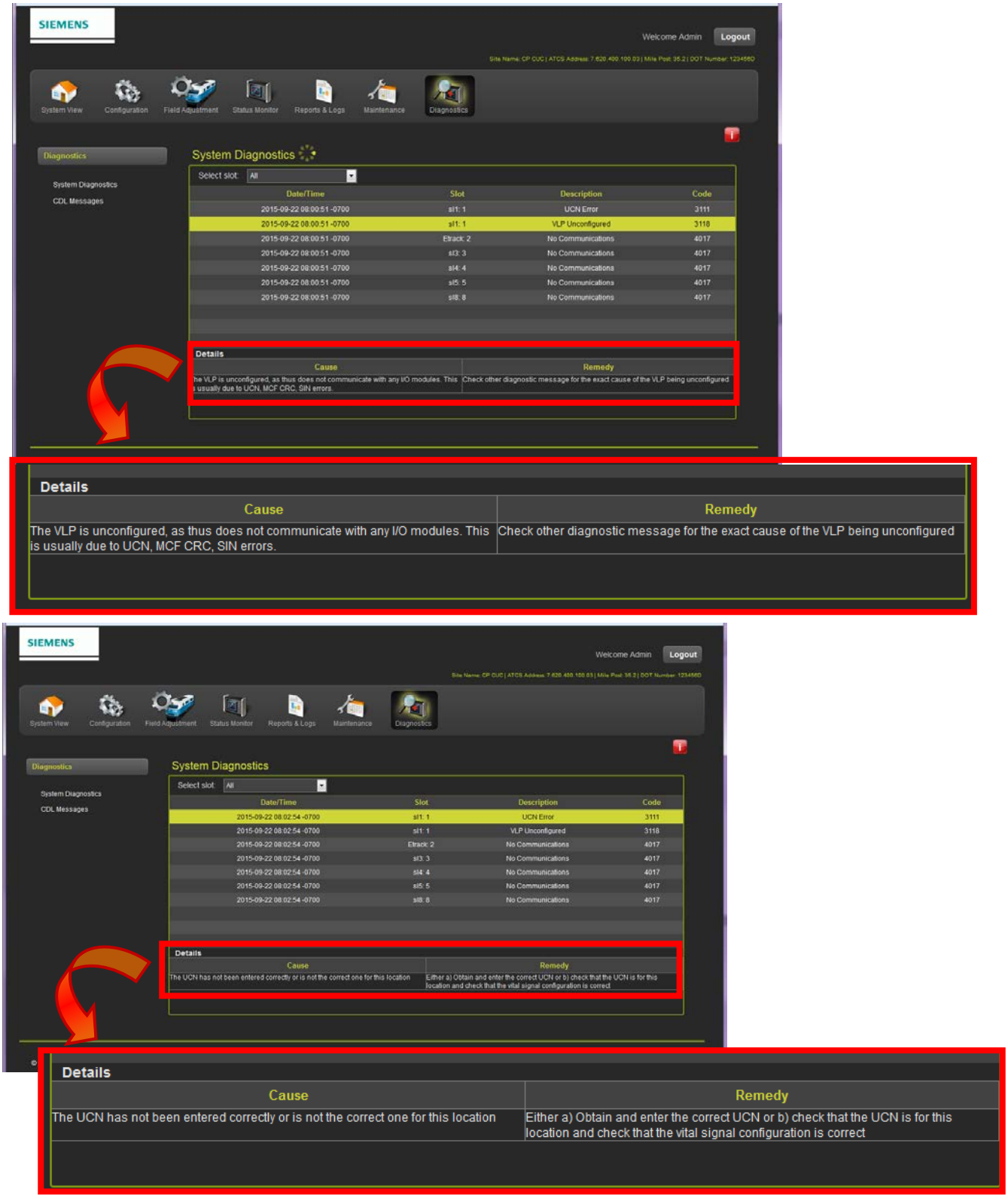


Figure 3-76 Web UI Maintenance Menu – System Diagnostics Detail Screens

When the non-vital CP is not communicating with the VLP, the ‘No VLP Communications’ icon is appear.
The MCF, AUX and RT icons appear when the CP first starts to connect to the VLP. The typical boot up sequence would show these 4 icons in order:

•No VLP Communications
•MCF
•AUX
•RT

Once the system reboots, the Diagnostics Alert icon will clear if the system is healthy, if the system is not healthy the Alert icon will be present.

When a new MCF is loaded the ‘MCF’ icon may show for several minutes while the new MCF database is created. The next time the CPU is reboots process this will take just a few seconds.

DIAGNOSTIC ICONS

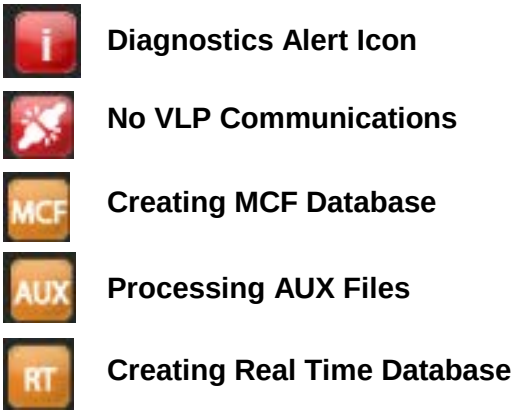


Figure 3-77 Web UI Maintenance Menu – System Diagnostics Icons

3.1.8 CPU III Web UI – Unlock Procedure

The GCP System is “Locked” to prevent accidental changes made to the system that could render an inoperative and/or restrictive condition. Therefore, an unlocking procedure is required to ensure the safety of trains, vehicles, and pedestrians. Any time the system is unlocked, a local maintainer must be present at the equipment whether accessing the system locally or remotely. The following procedure is used to unlock the system:

When Unlocking the system is required, click on the Unlock button **[1]**, a pop-up screen will appear to send a request to the CPU III display for the local presence person to acknowledge, press the OK button **[2]**. At the site the CPU III display will scroll **…LUP REQ PRESS SEL… [3]** for one minute. The local presence person presses the Select (SEL) button **[4]** and the CPU III display will acknowledge with OK **[5]**. The remote user will receive a confirmation **[6]** that authentication has been successful.

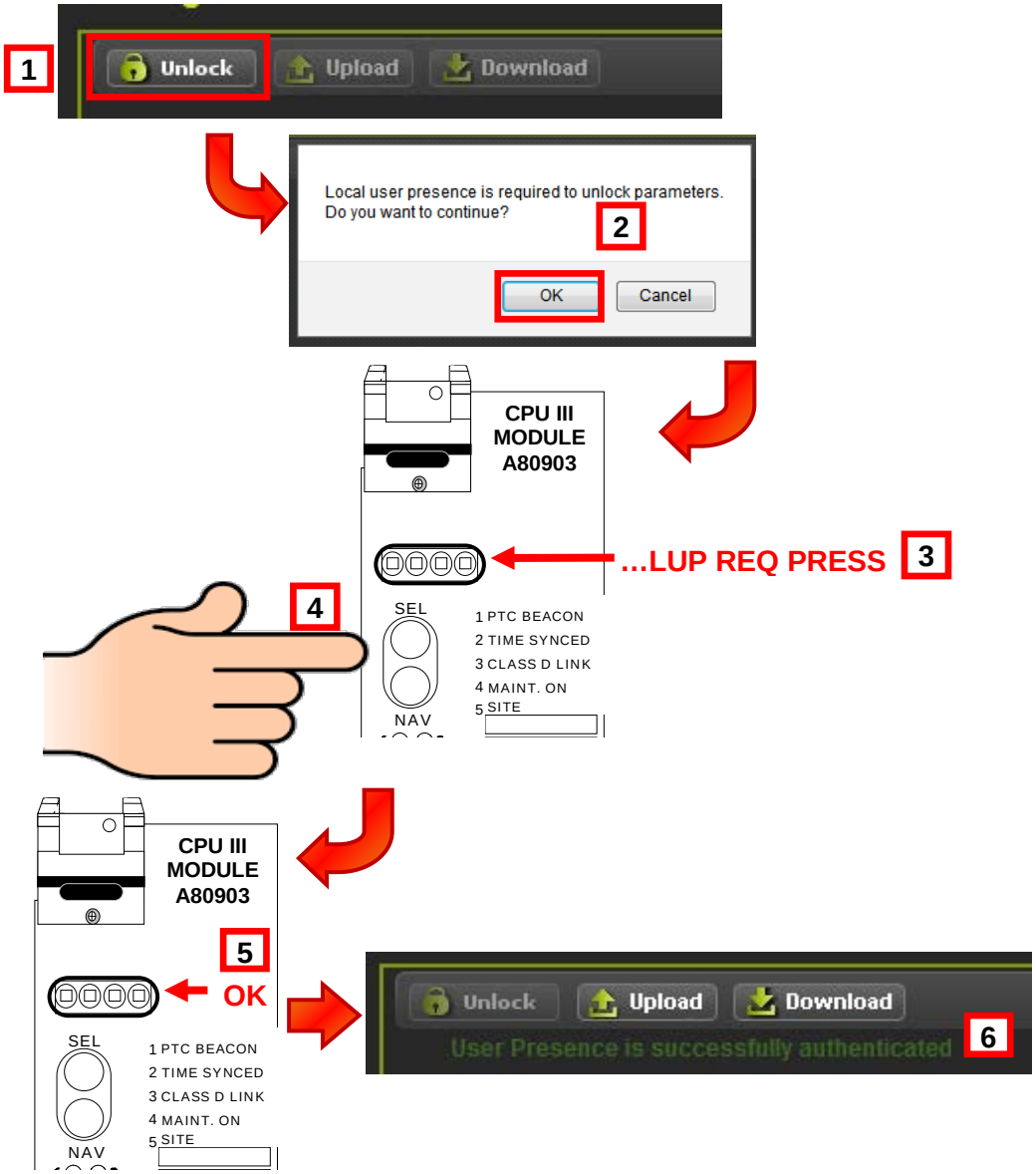


Figure 3-78 CPU III Web UI – Unlock Procedure

3.1.8.1 CPU III Web UI – Unlocking Procedure – Reset VLP Module

After unlocking the system, most procedures will include resetting the VLP module to restore system operation. In the event a procedure is cancelled or does not include resetting of the VLP module, it will be necessary to manually reset the VLP module to restore the system from the restrictive state to normal operation. Use the following procedure to rest the VLP Module:

To manually reset the VLP Module navigate to the Software Updates **[1]** menu. From the Software Updates menu expand the VLP Menu **[2]** and select the Reset VLP Module Menu **[3]**. Click on the Reset VLP button **[4],** a pop-up screen **[5]** will appear to verify the CPU is to be rebooted. A confirmation screen **[6]** will appear confirming the CPU has been rebooted.

Verify no alarms are present (no Diagnostic icons on the screen) and the system is operating properly.

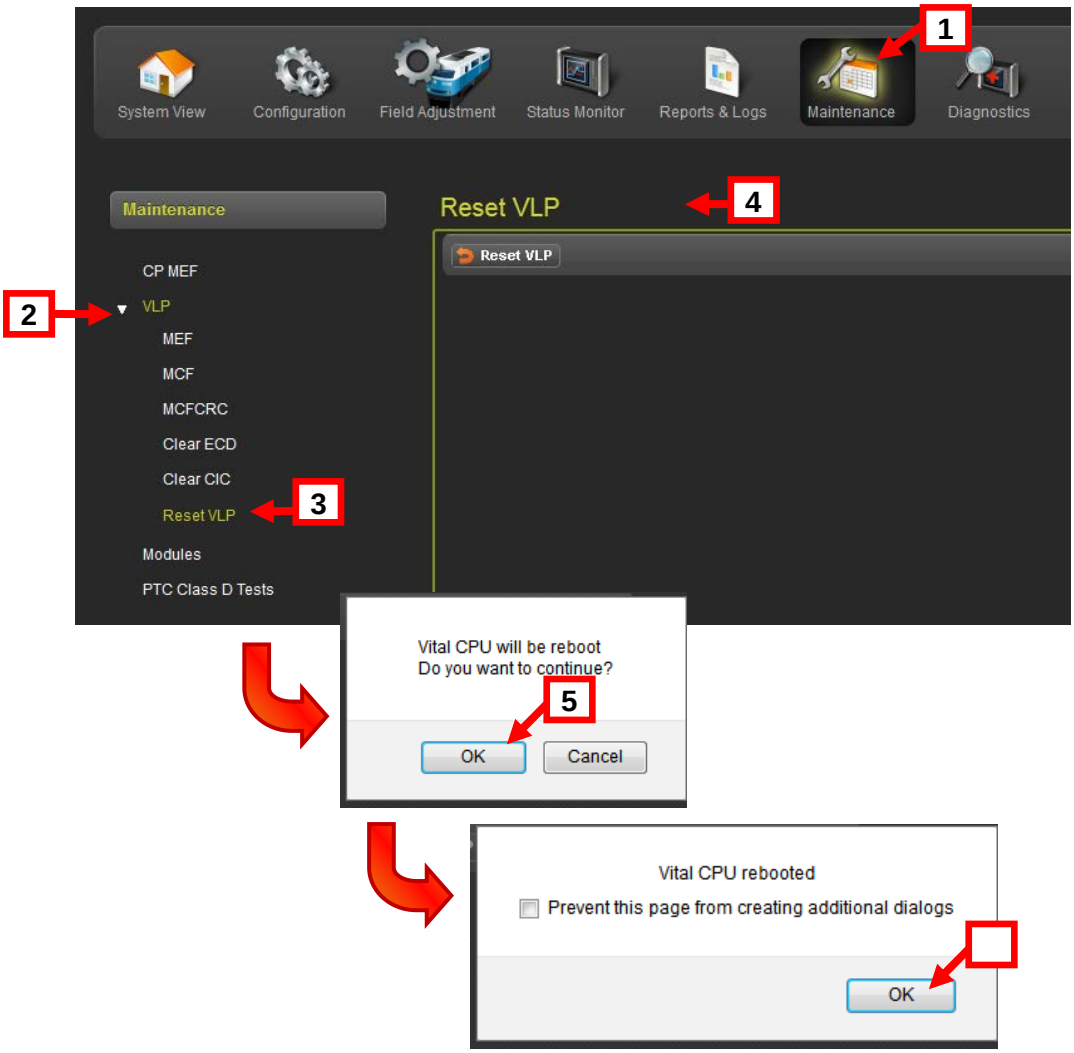


Figure 3-79 CPU III Web UI – Manually Reset VLP Procedure

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SECTION 4 – CPU III SETUP

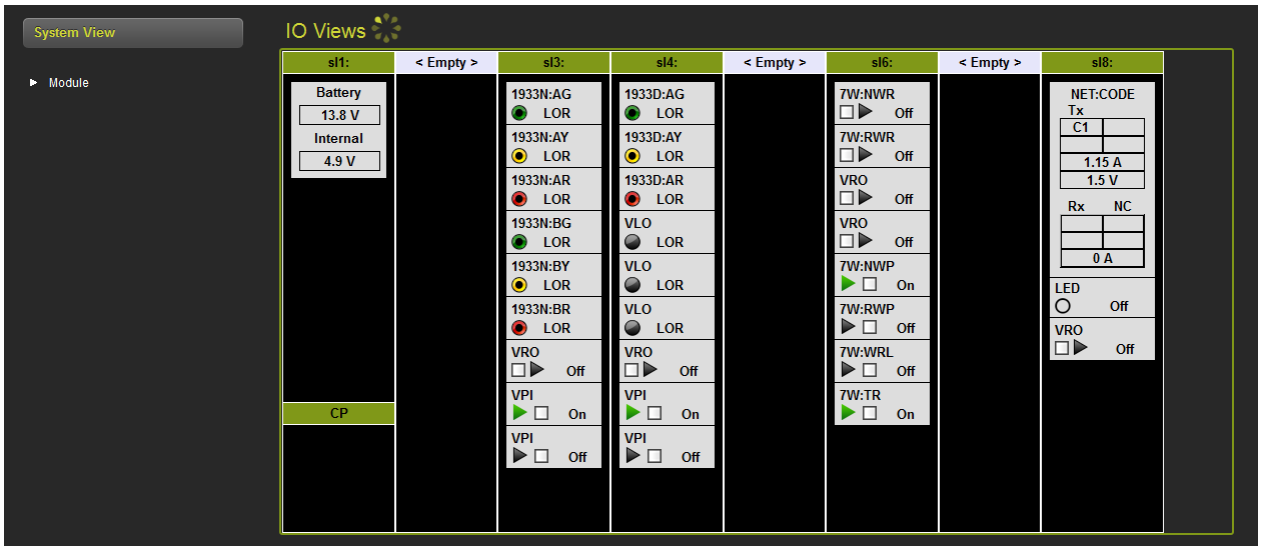
4.0 CPU III SETUP

4.1 SETUP EXISTING GEO APPLICATIONS

For an existing GEO installation that uses the CPUII+ (A80403-003) module, the CPU III can be used as a drop in replacement. The CPUII+ can be removed and the CPU III plugged into its slot. When this is done, the CPU III will first read the MCF from the ECD and transfer it across to the VLP, this may take a few minutes. The 4 character display will show “MCF XFER ” and a percentage complete during the transfer process.

When the 4 digit display on the CPU III scrolls the MCF number, the Web UI will be available. To find the IP Address for the Laptop port, press the NAV button on the front panel of the CPU III, the 4 character display will show LAP IP ADD: xx.xx.xx.xx. If the user logs into the Web UI while the MCF is still being transferred it will show the “No VLP Communications” icon in the top right.

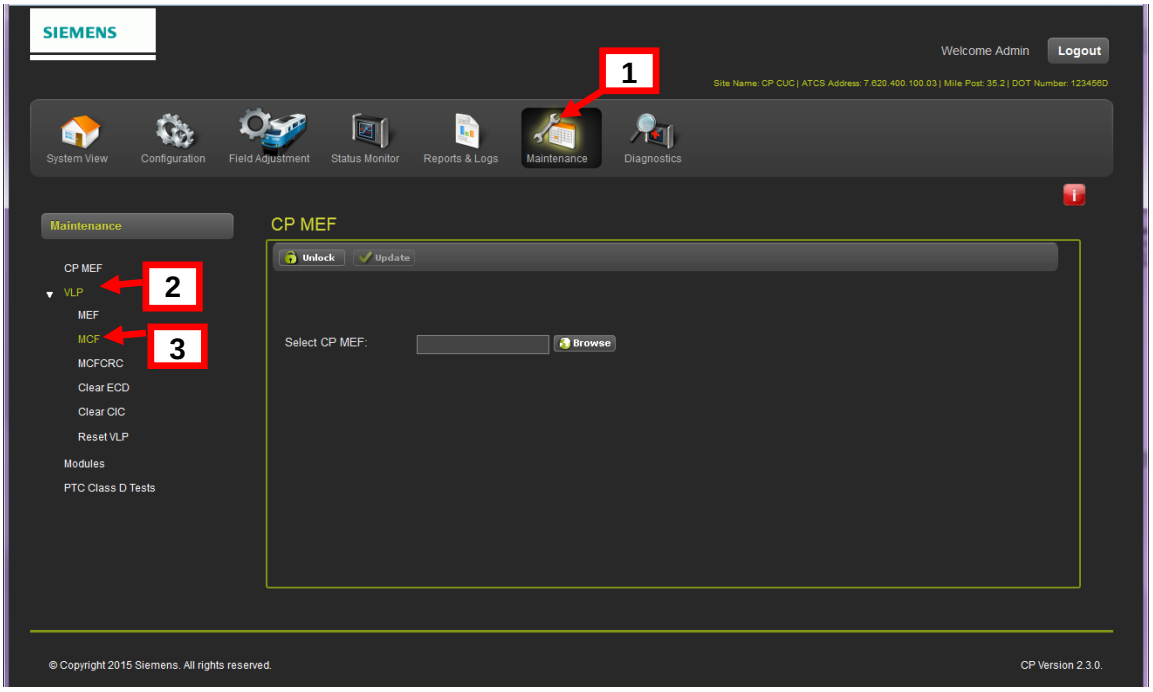
Once the MCF has transferred the VLP will reboot and will come up fully operational (assuming the GEO installation was in operation previously). The WebUI will then show the “Creating MCF Database” MCF icon . This may take several minutes to complete, this only occurs once during the initial time the CPU loads this MCF. Once the MCF is loaded the CPU will process the AUX files. The AUX icon AUX will appear during the process. The CPU will create the Real Time Database and display the RT icon RT during the creation period. When complete the WebUI will show the System view screen.

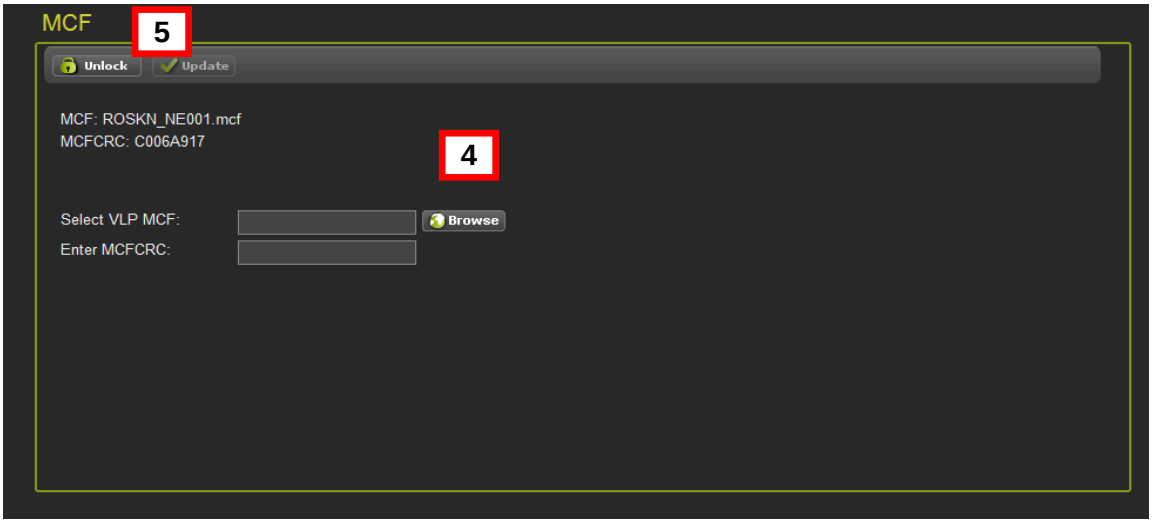


4.2 NEW GEO INSTALLATION APPLICATION

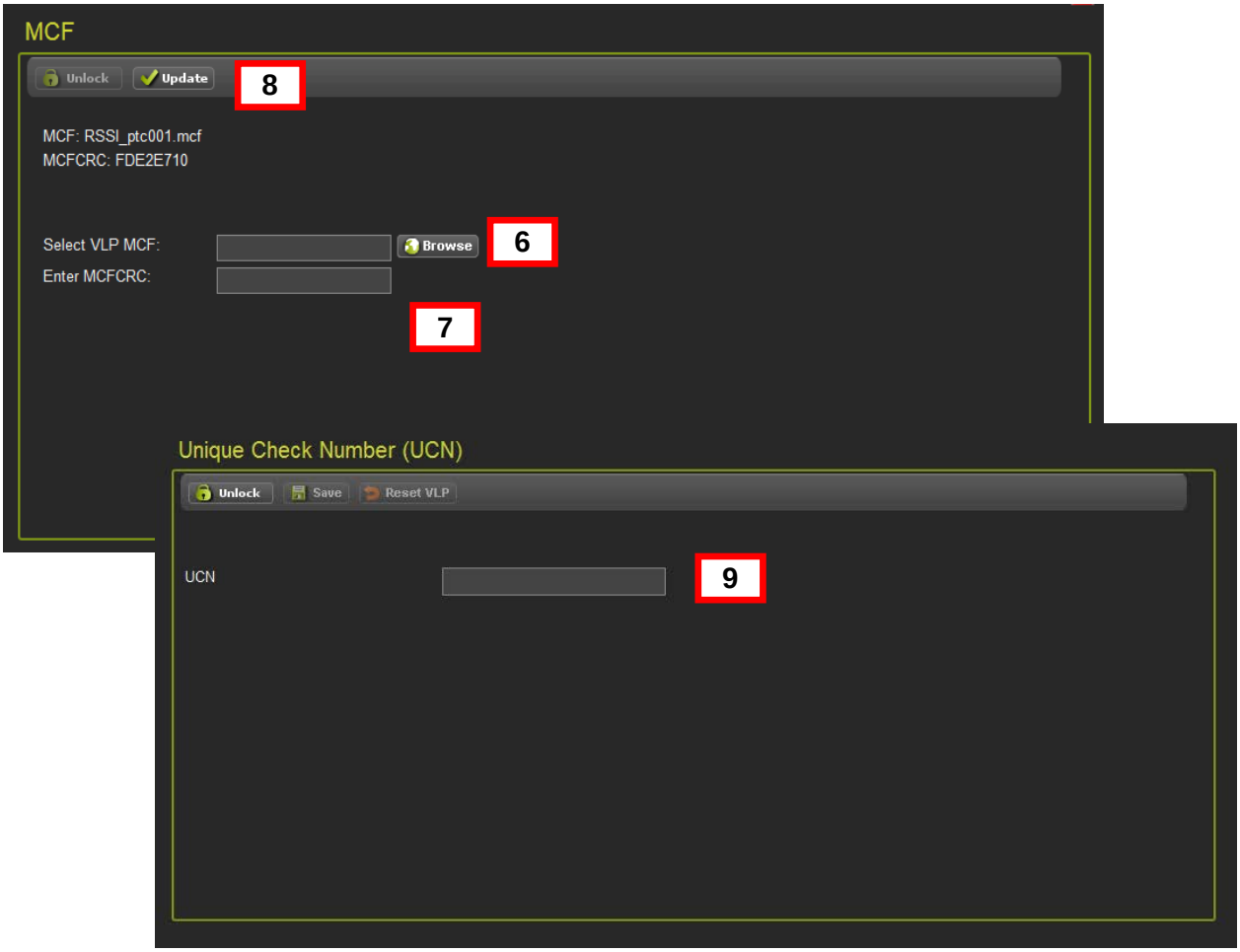
If installing a new GEO installation using the CPU III, perform the following steps:

1. Power up the CPU III
2. Once it is powered up, find the IP Address for the Laptop port, this can be found by pressing the NAV button on the front panel, the 4 character display will show LAP IP ADD: xx.xx.xx.xx
3. Type this address into a web browser. Log on to the Web UI, default password is Siemens (case sensitive).
4. To load the MCF, go to the Maintenance tab [1] on the Web UI, the select the VLP [2] from the left hand menu, then select MCF [3]. The MCF screen [4] will display as shown below.





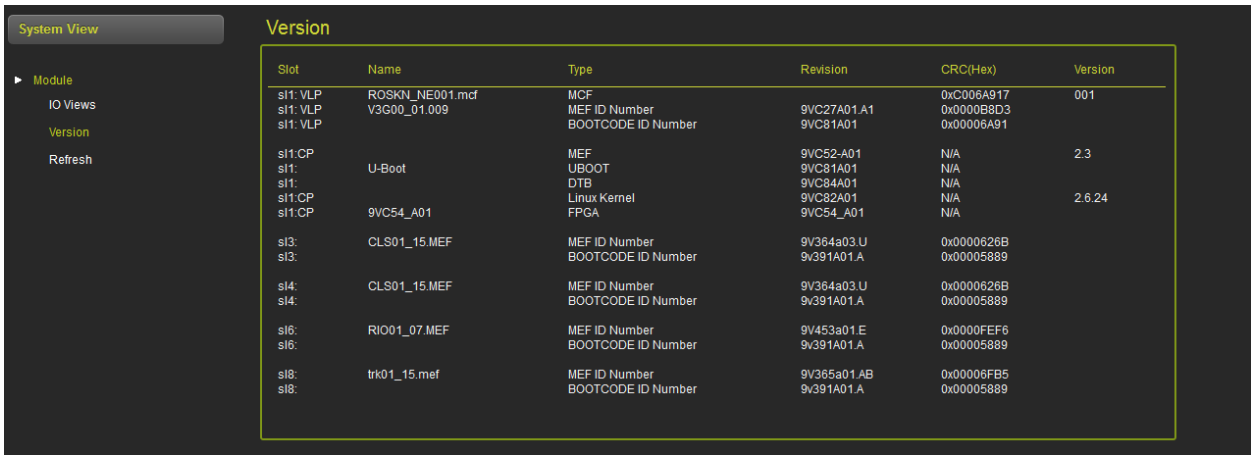
1. Then select the Unlock button [5], accept the confirmation. At this stage the 4 character display will ask for confirmation that a person is present in the field at this location by showing "LUP REQ PRESS SEL". Press the SEL button on the front of the CPU III to confirm that is the correct CPU. The Web UI screen will then update and Browse and Update buttons will be enabled.
2. Select the MCF file to upload [6] and enter its MCF CRC [7], and select update [8]. This will cause the MCF to be transferred and stored in the ECD, and then the VLP to reboot and the MCF to be transferred to the VLP. The 4 character display will show MCF XFER and a % complete while this is happening.
3. Once the MCF transfer has finished the 4 character display will show Err: UCN, indicating that the UCN is not correct.
4. Set program parameters: go to the Configuration tab the Vital Configuration. Select the Unlock button again and press SEL button on CPU III when prompted. Then enter the Logical configuration, Physical configuration and Site configuration parameters as specified in the installation plans.
5. Select the Vital Configuration / Unique Check Number(UCN) menu and enter the UCN specified on the site plans [9]. The reset the VLP by pressing the Reset VLP button



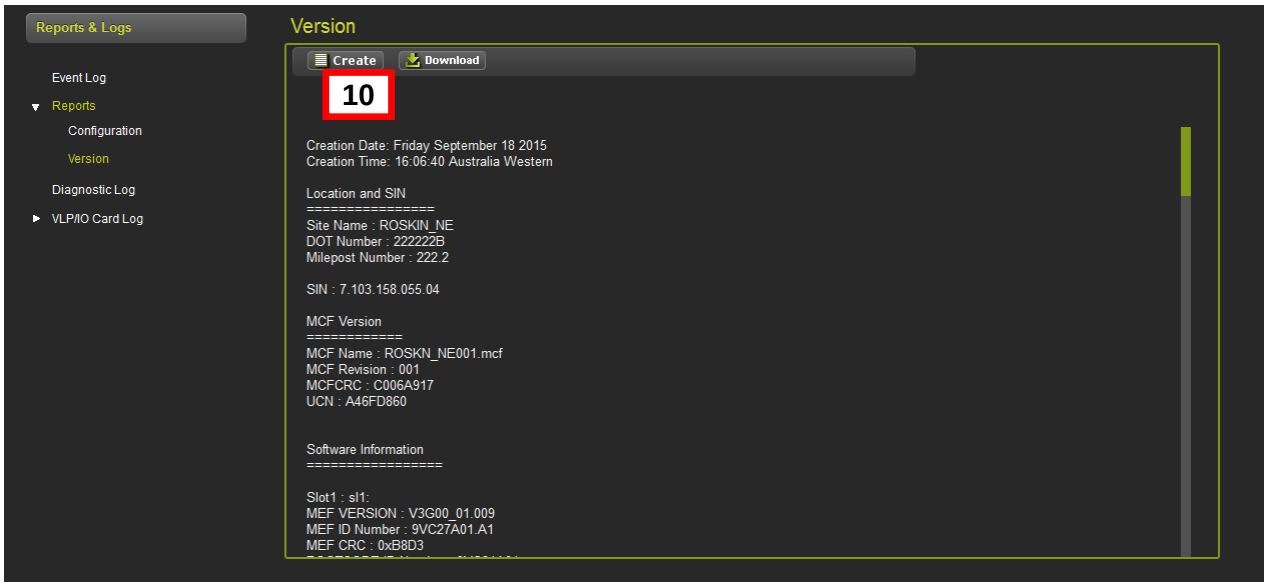
6 The VLP will reboot and provided that the vital parameter settings match with the UCN entered it will come up fully operational

7 While the VLP is rebooting the Web UI will show the “No VLP communications” icon 

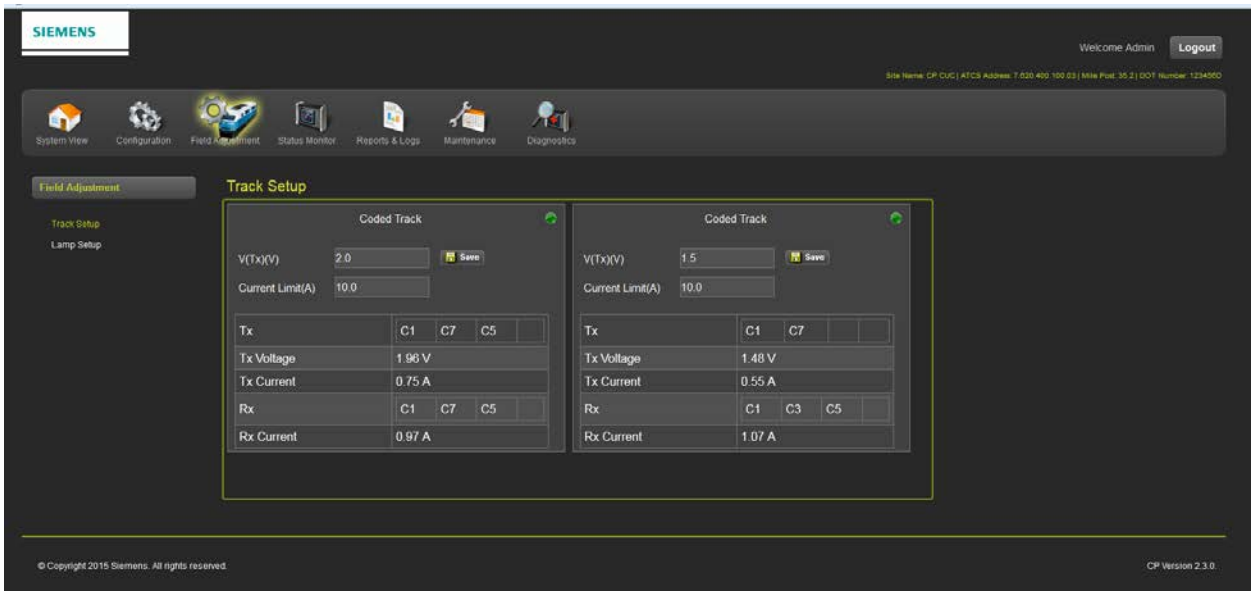
8 Select the System View on Web UI, verify there are no MCF, AUX, or RT icons present. Verify the software versions are correct. This can be done by selecting the Module / Version menu (see Section 3.1.1) as shown in the figure below.



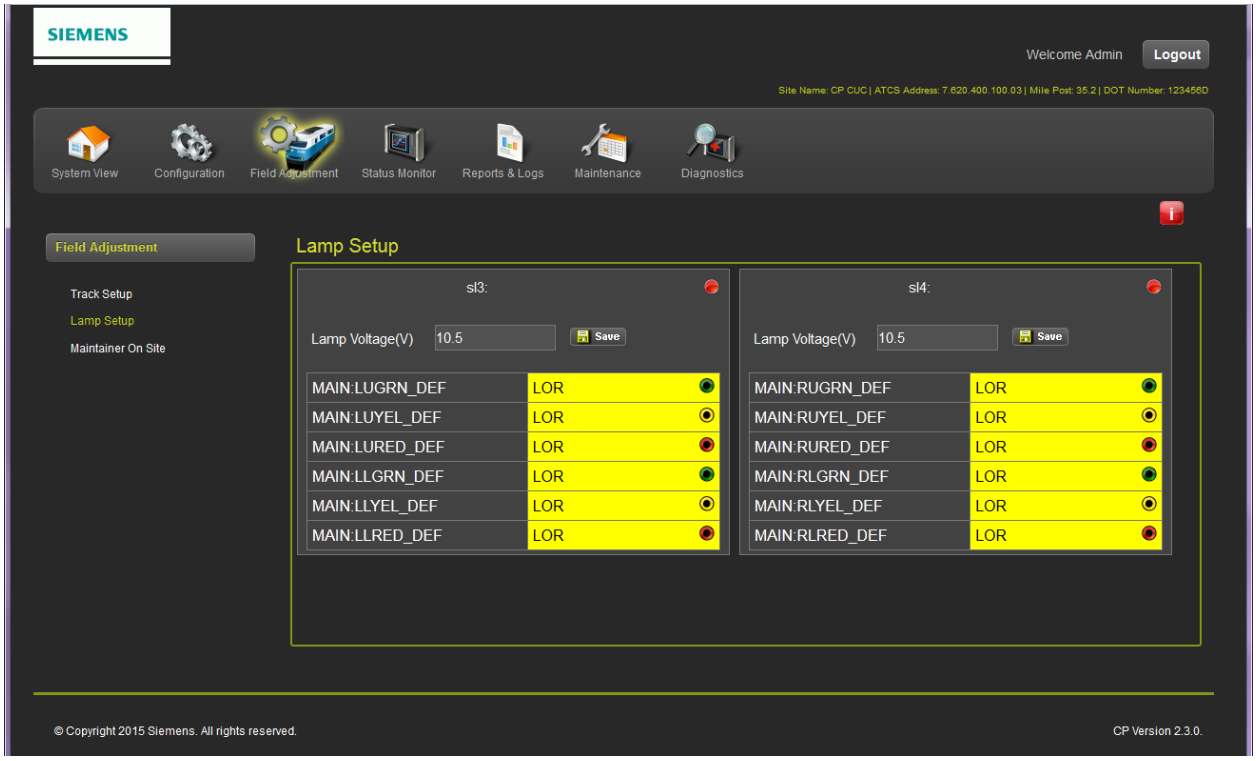
9 Or by going to the Reports & Logs, selecting Reports / Version and the pressing Create button [10]. If the software versions are not correct for the CPU III or any of the I/O modules, upload the proper software, see Section 3.1.6 for details.



10 To set up the coded track modules go to the Field Adjustment / Track Setup menu and adjust the transmit voltage as described in the track setup section of the GEO manual SIG-00-05-09 and WayConneX manual SIG-00-16-08.



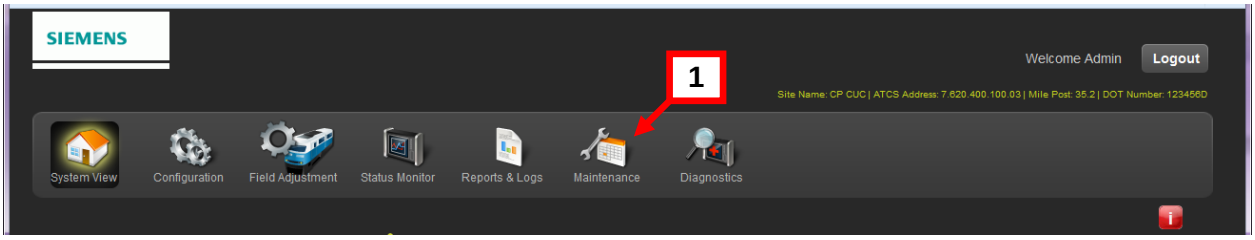
11 To set up the Colorlight lamp voltages go to the Field Adjustment / Lamp Setup menu and adjust the lamp voltage as described in the lamp setup section of the GEO manual SIG-00-05-09 and WayConneX manual SIG-00-16-08.

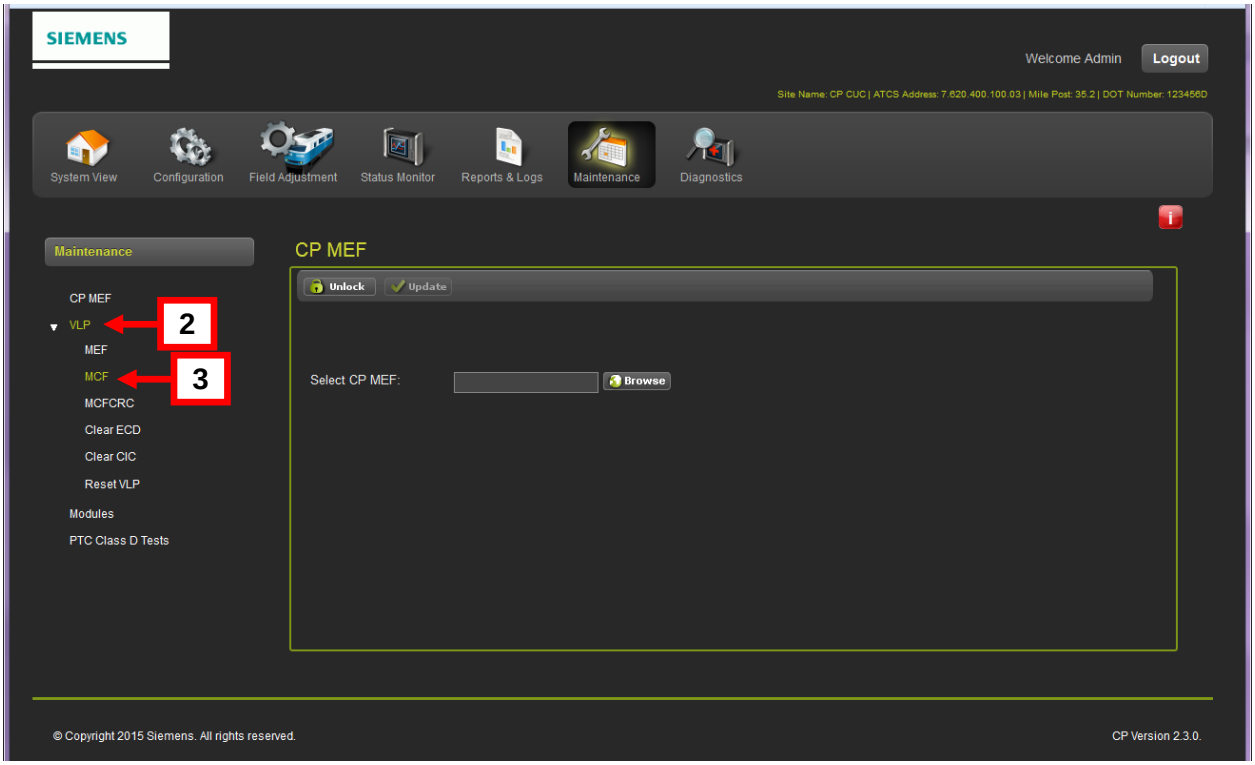


4.3 SETUP WAYCONNEX APPLICATIONS

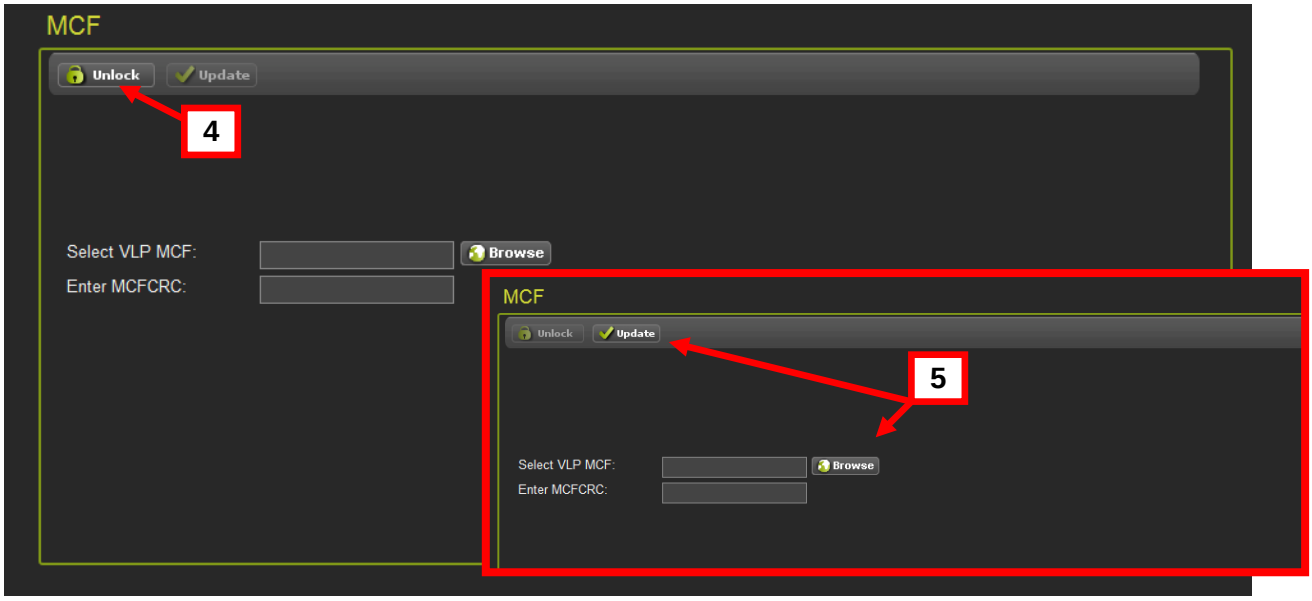
If installing a new WayConneX installation using the CPU III, perform the following steps:

1. Power up the CPU III
2. Once it is powered up, find the IP Address for the Laptop port, this can be found by pressing the NAV button on the front panel, the 4 character display will show LAP IP ADD: xx.xx.xx.xx
3. Type this address into a web browser. Log on to the Web UI, default password is Siemens.
4. To load the MCF, go to the Maintenance tab **[1],** the select the VLP **[2]** from the left hand menu, then select MCF **[3]**.

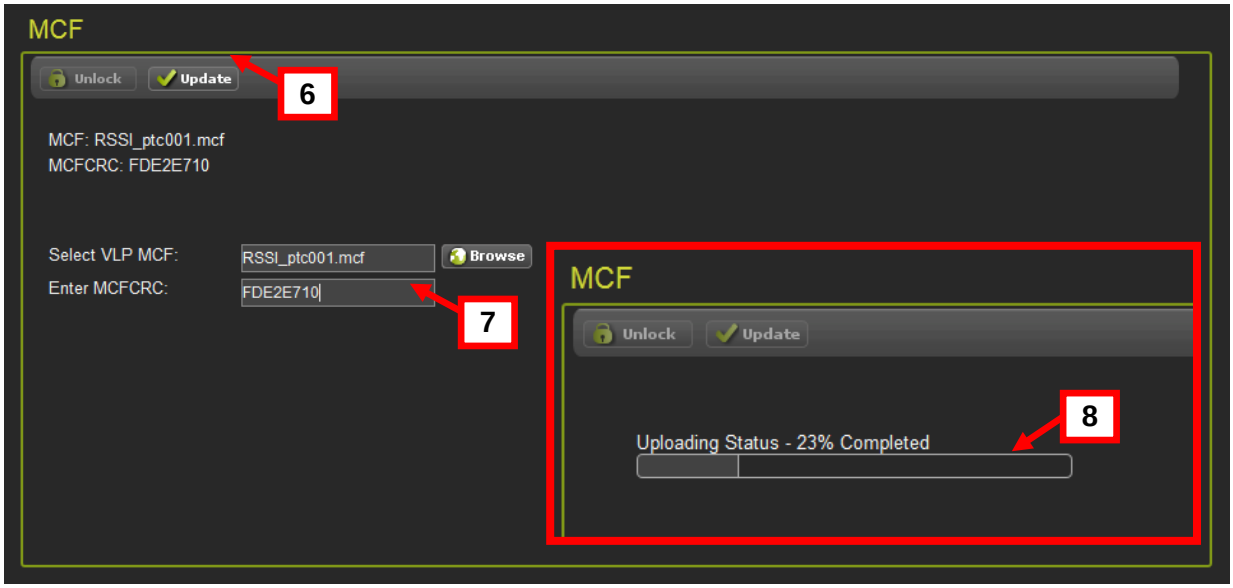




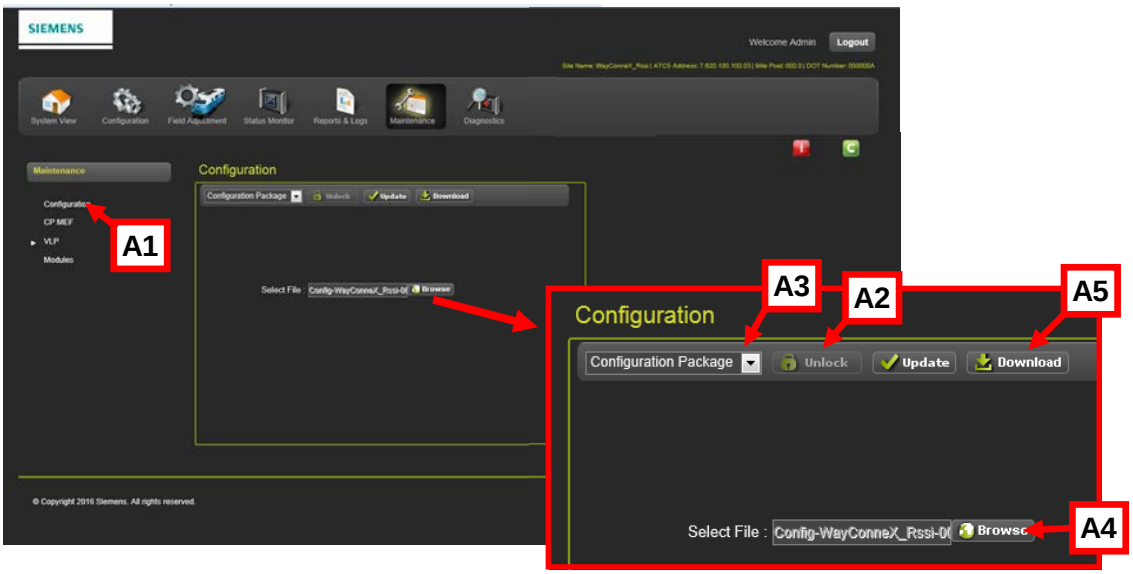
5. Then select the Unlock button **[4]**, accept the confirmation. At this stage the 4 character display will ask for confirmation that a person is present in the field at this location by showing "LUP REQ PRESS SEL". Press the SEL button on the front of the CPU III to confirm that is the correct CPU. The Web UI screen will then update and Browse and Update buttons **[5]** will be enabled.



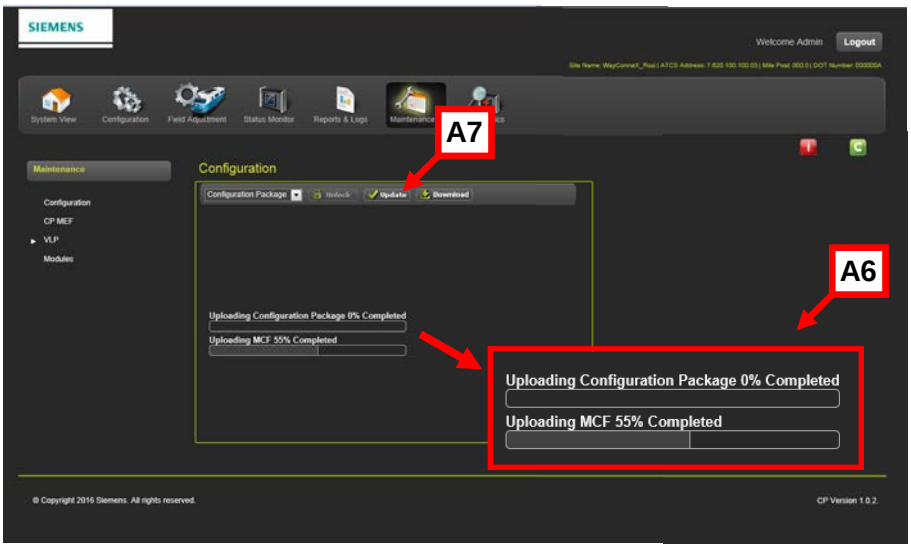
6. Select the MCF file to upload and enter its MCF CRC **[6]**, and select Update **[7]**. This will cause the MCF to be transferred and stored in the ECD, and then the VLP to reboot and the MCF to be transferred to the VLP. The 4 character display will show MCF XFER and a % complete while this is in progress **[8]**.



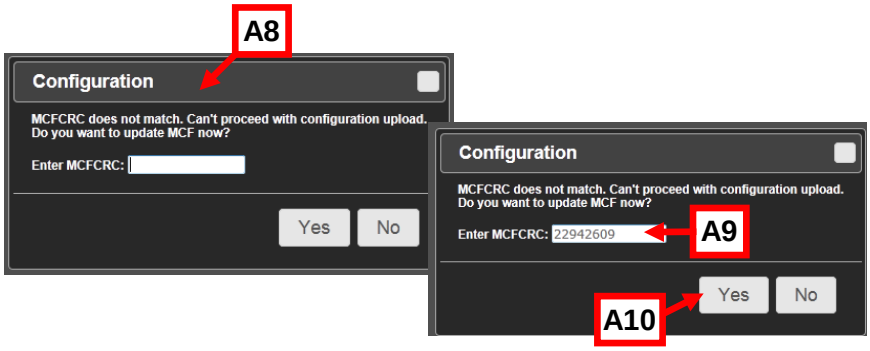
7. The MCF can also be transferred using the Configuration Package. Use the following Steps. (If not using the Configuration Package go to Step 13).
8. From the Configuration screen click on the Configuration text in the left column **[A1].**
9. Unlock the system by clicking the Unlock button **[A2]**, select Configuration Package from the drop down menu **[A3]**.
10. Click on the Browse button **[A4]** and locate the Configuration Package file. Click on the Download button **[A5]**.



11. A pop up screen will appear showing the uploading process **[A6].**
12. When the upload is complete click on the Update button **[A7].**

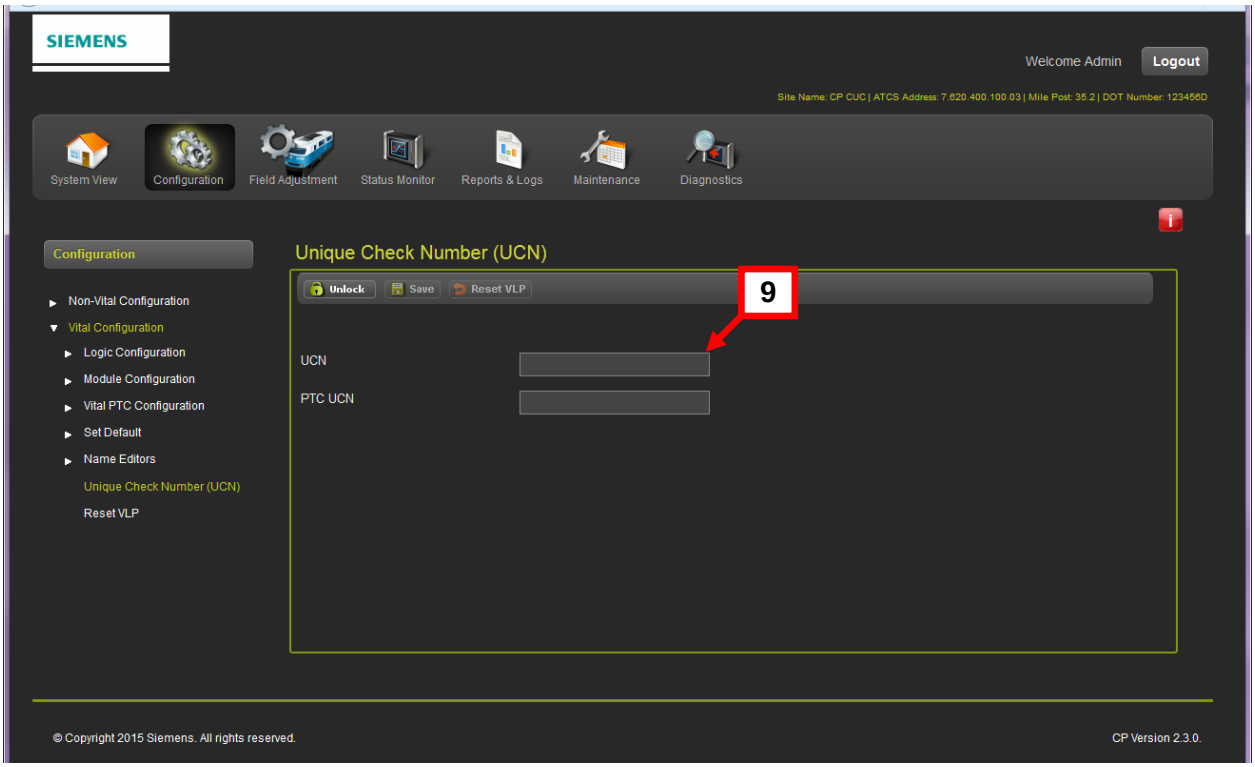


13. A pop up screen will appear asking for the MCFCRC number **[A8]**, enter the number from the Site Plans **[A9]** and click the YES button **[A10]** to update the MCF.



14. Once the MCF transfer has finished the 4 character display will show Err: UCN, indicating that the UCN is not correct.

15. Enter the UCN and PTC UCN by selecting the Vital Configuration / Unique Check Number(UCN) menu and enter the UCN **[9]** specified on the site plans. Take note that this is performed before loading the configuration package, since loading the configuration package will cause the VLP to reboot.

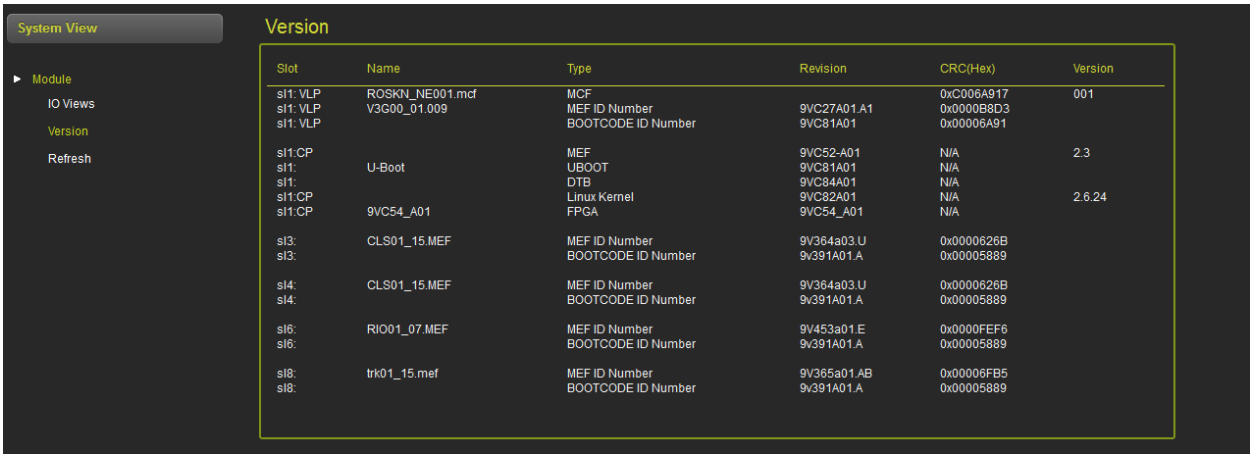


16. To program the CPU III load the configuration package settings generated from the Office Configuration Editor. Select the Maintenance tab, then click on the unlock button and press SEL button on CPU III front panel to confirm local user presence. Then select the configuration package zip file **[10]** and press Update **[11]**. Once the package has been loaded the CP and VLP will reboot to load the new settings.

17. After the reboot, provided that the vital parameter settings match with the UCN entered, the VLP will come up fully operational

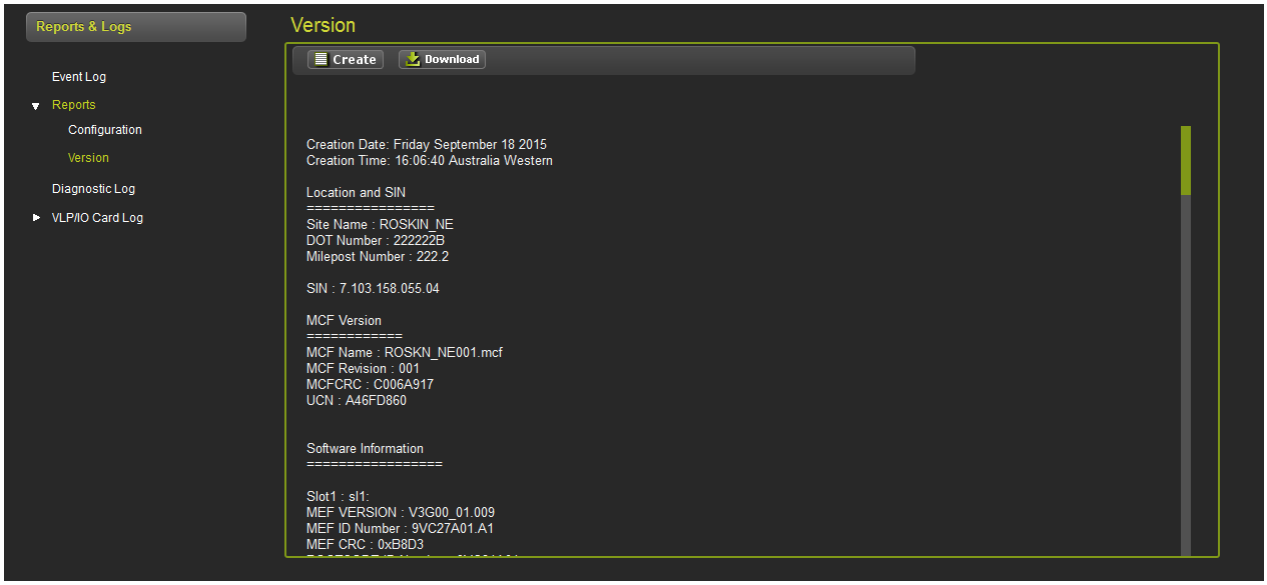
18. While the VLP is rebooting the Web UI will show the “No VLP communications” icon

19. Select the System View on Web UI, once this shows up and no MCF, AUX, RT icon is present verify the software versions are correct. This can be done by selecting the Module / Version menu as shown below.



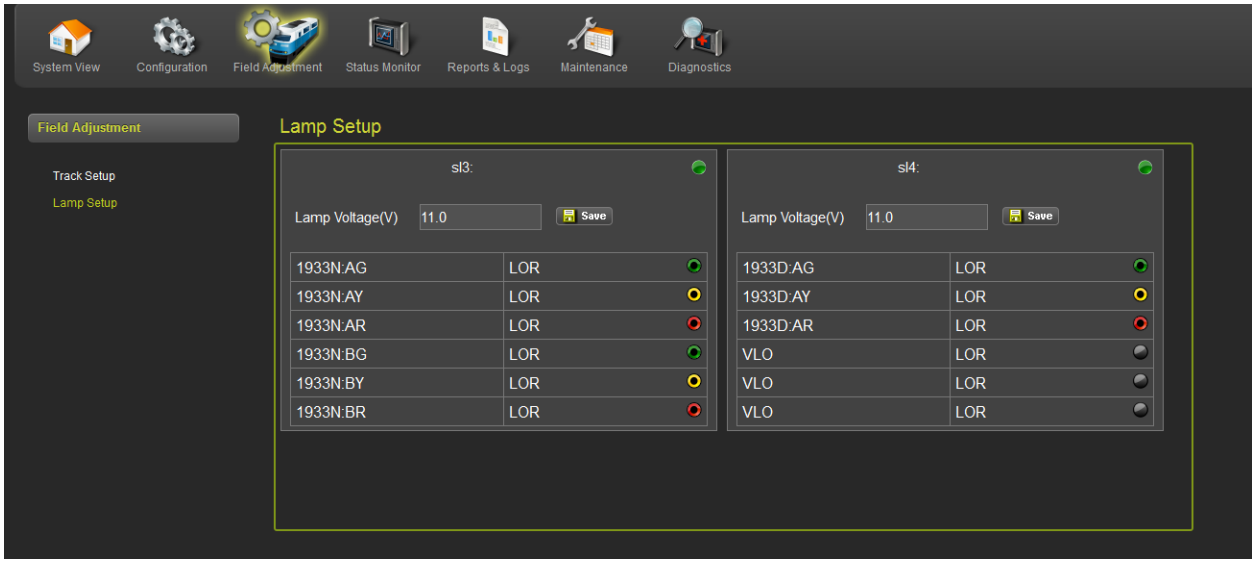
Slot	Name	Type	Revision	CRC(Hex)	Version
sl1: VLP	ROSKN_NE001.mcf	MCF		0xC006A917	001
sl1: VLP	V3G00_01.009	MEF ID Number	9VC27A01.A1	0x0000B8D3	
sl1: VLP		BOOTCODE ID Number	9VC81A01	0x00006A91	
sl1:CP		MEF	9VC52-A01	N/A	2.3
sl1:	U-Boot	UBOOT	9VC81A01	N/A	
sl1:		DTB	9VC84A01	N/A	
sl1:CP		Linux Kernel	9VC82A01	N/A	2.6.24
sl1:CP	9VC54_A01	FPGA	9VC54_A01	N/A	
sl3:	CLS01_15.MEF	MEF ID Number	9V364a03.U	0x0000626B	
sl3:		BOOTCODE ID Number	9v391A01.A	0x00005889	
sl4:	CLS01_15.MEF	MEF ID Number	9V364a03.U	0x0000626B	
sl4:		BOOTCODE ID Number	9v391A01.A	0x00005889	
sl6:	RIO01_07.MEF	MEF ID Number	9V453a01.E	0x0000FEF6	
sl6:		BOOTCODE ID Number	9v391A01.A	0x00005889	
sl8:	trk01_15.mef	MEF ID Number	9V365a01.AB	0x00006FB5	
sl8:		BOOTCODE ID Number	9v391A01.A	0x00005889	

20. Or by going to the Reports & Logs, selecting Reports / Version and the pressing Create button. If the software versions are not correct for the CPU III or any of the I/O modules, upload the expected software, see Section 3.1.2.5 for details.



21. To set up the coded track modules go to the Field Adjustment / Track Setup menu and adjust the transmit voltage as described in the track setup (see WayConneX manual SIG-00-05-09).

22. To set up the Colorlight lamp voltages go to the Field Adjustment / Lamp Setup menu and adjust the lamp voltage as described in the lamp setup (see WayConneX manual SIG-00-05-09).



SECTION 5 – CPU III APPLICATIONS

5.0 CPU III APPLICATIONS

5.1 GEO APPLIANCE MODEL APPLICATIONS

The CPU III can be used in place of a CPU II+ in GEO applications. It will offer the benefits of much faster logic processing thus improving the reaction time of the system.

When creating GEO MCFs with the GCS, the module type for slot 1 should still be VLP2.

Since the GEO chassis does not have an Ethernet port, in applications where multiple GEO units are used, the communications between them still has to be via Echelon, thus the -1 version should be used which incorporates the Echelon Module.

NOTE

NOTE

The CPU III has a limitation on the number of GEO units that can be used on the Echelon® Network, at this time only 4 GEOs can be networked on the Echelon® LAN.

The Web UI performs the functions previously performed by the Diagnostic Terminal (DT) program.

The PTC console can be used to PTC enable a GEO using a CPU III in an identical way to a GEO using a CPU II+. No changes are required on the CPU III configuration. See PTC Console manual SIG-00-13-12, Sections 2.1.1 and 3.1.1 for further details.

5.2 WAYCONNEX PTC APPLICATIONS

WayConneX uses many of the same I/O modules as GEO, but has two new chassis types, a 2 track chassis similar to GEO and a generic chassis where any I/O module can be put in any slot, thus allowing more than 2 track modules to be used.

The two track chassis has options to use either GEO track or line modules, or the WayTrax Microtrax compatible long distance track circuit module.

The WayConneX chassis is built specifically to use CPU III. They provide an Ethernet port on the chassis that can be used in PTC applications or for vital communications between multiple WayConneX systems. The user can choose whether to use the Ethernet port or the Echelon® network for routing vital message by setting the Vital Message Routing parameter on the Configuration / Non-Vital Configuration / Router Settings page as shown in Figure 5-1.

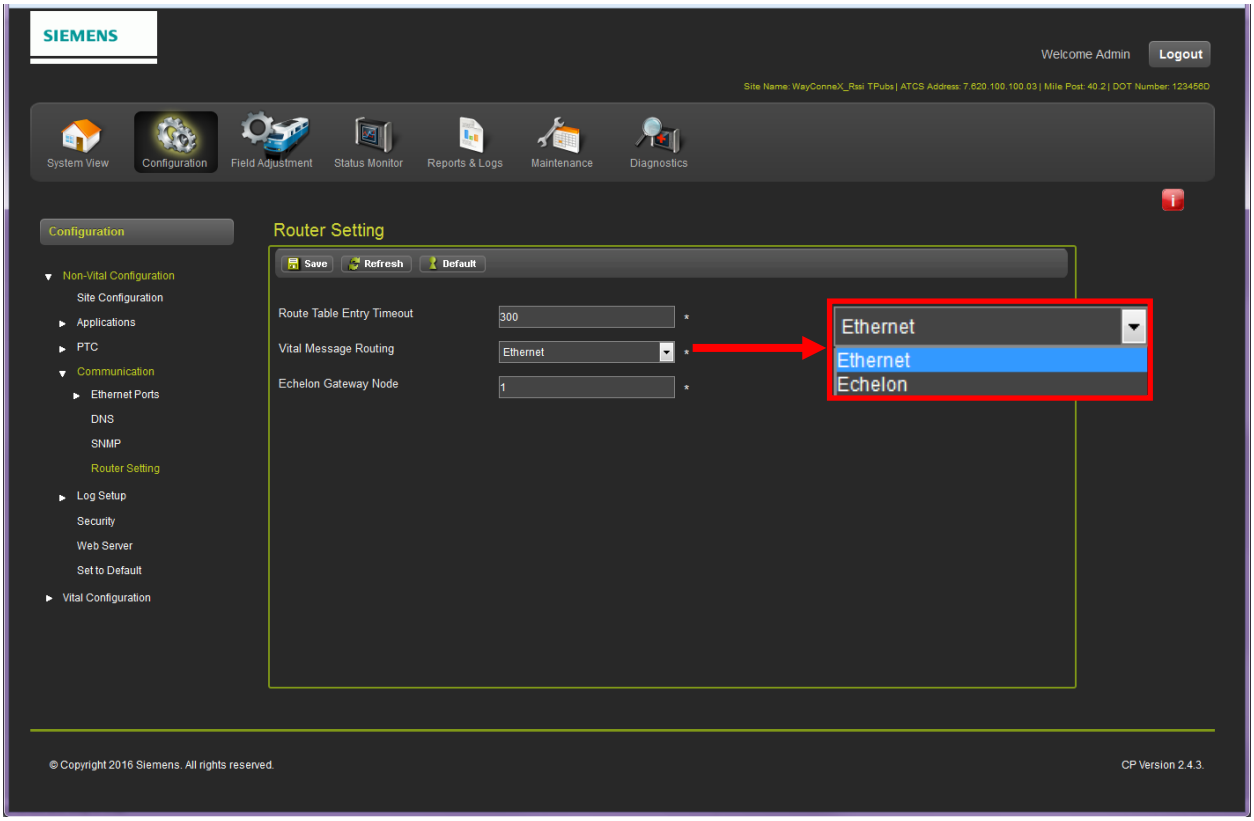


Figure 5-1 Router Setting Screen

5.2.1 PTC Applications

To create a PTC application for WayConneX, first an MCF that includes PTC Logic has to be created using the WCCT. Then the OCE has to be used to create a site using this MCF and should set the vital and non-vital configuration values for the site. If the order of the PTC devices in the MCF needs to be changed from the default order listed in the MCF, this has to be done using the OCE, it can't be done from the CPU web UI. After the configuration has been created in the OCE, the user can load the configuration package created by the OCE into the WayConneX CPU III using the Web UI. The user should then set the UCN and PTC UCN, these are listed on the configuration listing created by the OCE.

The PTC Status screen (see Figure 5-2) on the Web UI shows the status of the PTC connection and devices.

The Beaconing LED shows green when the CPU is currently sending Beacon messages
The GPS Present shows green when GPS communication is established and red when no GPS communication is available.

Under the Object heading is a list of the PTC devices defined in the MCF. For signals, the Status will show the PTC aspect defined for this signal, for switches, it will show the whether the switch is reporting normal, reverse, error or out of correspondence, for hazards detectors it will show normal or fault

The time column shows the time and date the last PTC message data was updated for this device. When the WayConneX is currently beaconing the time will increment each time a Wayside Status message is sent. Once the beaconing stops, the time will stop incrementing, and show the time the last message was sent.

The order of the objects reflects the order that the devices appear in the PTC message.

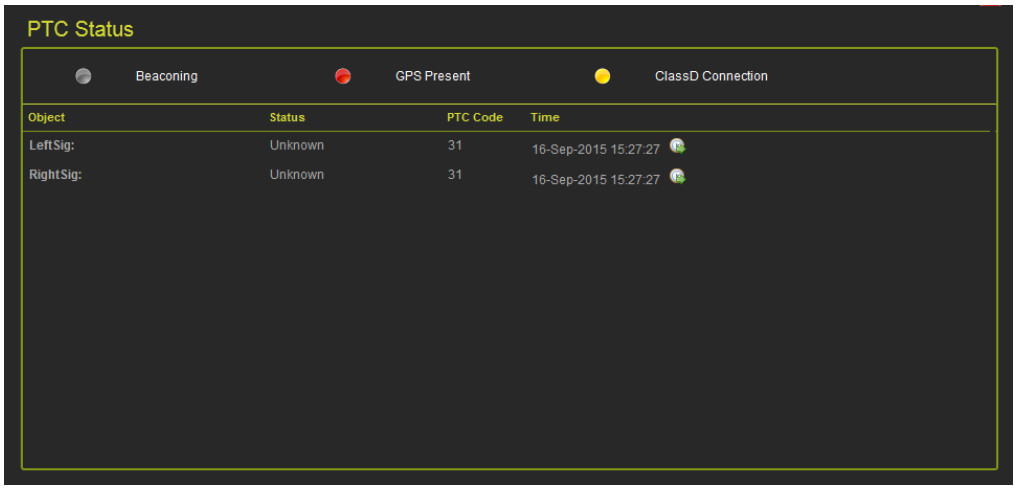


Figure 5-2 PTC Status Screen

5.3 SYSTEM MANAGEMENT APPLICATIONS

5.3.1 Introduction

System Management provides monitoring of the health and operation of devices connected to a WayConneX System. System Management defines a subset of functions required for devices installed in a Positive Train Control (PTC) system. When the devices detect problems, they report these through system management, which allows the railroad to quickly identify and resolve problems. System Management provides remote upgrade options for PTC equipment and remote access to logs and other information.

The following diagram shows the general system management context and the systems management functions in the WayConneX

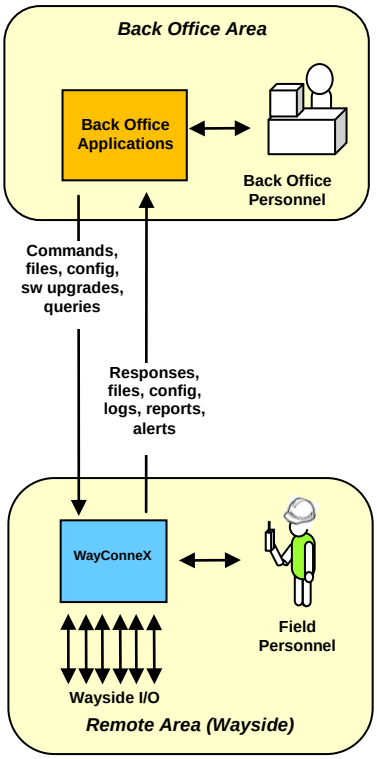


Figure 5-3 System Management Function in the WayConneX

The following diagram shows the context of a WayConneX using the SNMP, SCP, and SSH for System Management. Back-office applications can send commands, files, software upgrades, status queries, etc. through the system. The WayConneX System can respond and send unsolicited alerts through the IP Network to the Back Office.

The diagram in Figure 5-4 shows the system context using SNMP, SCP, and SSH for System Management.

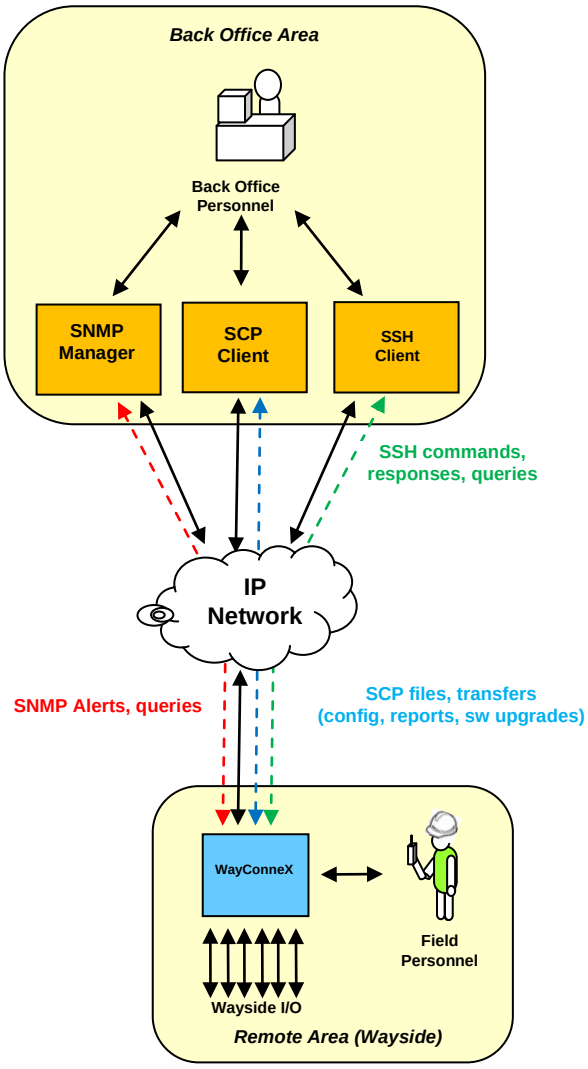


Figure 5-4 SNMP, SCP, and SSH for System Management

The goal of deploying SNMP, SCP, and SSH for System Management is to enable the user to manage their equipment, as much as possible, from the back-office by leveraging their PTC communications network infrastructure.

5.3.2 Commands

Each systems management command is described in the following sections. The command names and parameters are case-sensitive unless specified otherwise. This document does NOT show how to use standard Linux commands, such as scp and ssh.

5.3.2.1 GET_DIAG, GET_EVENTS

SYNOPSIS

`get_diag [-t <hours>]`

Print the last <hours> worth of diagnostic log entries.

`get_diag [-s <time>] [-e <time>]`

Print diagnostic log entries in the given date/time range.

`get_events [-t <hours>]`

Print the last <hours> worth of event log entries.

`get_events [-s <time>] [-e <time>]`

Print event log entries in the given date/time range.

DESCRIPTION

The `get_diag` command returns the contents of the system's diagnostic log. The diagnostic log contains detailed information about the internal workings of the WIU. The `get_events` command returns the contents of the event log, which contains the application level view of the operation of the location. Both commands allow the user to specify a date/time range of entries to return. If the command is used without arguments, the entire log is returned.

`-t <number_of_hours>`

Prints the last <`number_of_hours`> worth of log entries. For example, `get_events -t 24` would display the last 24 hours of events in the event log.

`-s YYYY-MM-DD hh:mm:ss -e YYYY-MM-DD hh:mm:ss`

Prints the entries in the given date/time range. The `-s` specifies the start time and the `-e` specifies the end time. Times must be specified in 24 hour format. If no date and time given after `-s` or `-t`, starting time defaults to the beginning of the log and ending time defaults to the end of the log. If you omit the time portion of the date and time, it defaults to midnight. If you omit the date portion, it defaults to today.

EXAMPLES

The following shows requesting the last 24 hours from the diagnostic log:

```
# get_diag –t 24
```

The following shows requesting between 15:30 and 18:00 today from the event log:

```
# get_events –s 15:30:00 –e 18:00:00
```

The following shows requesting from the beginning of the log to a certain date (at midnight).

```
# get_events –s –e 2013-01-15
```

5.3.3 Upgrader

SYNOPIS

```
Upgrader –s <source file> [-d <destination>] [-v] [-x]
```

Upgrades the non-vital executive software.

DESCRIPTION

This command upgrades the non-vital software from the given non-vital software package file. All file paths must be specified as an absolute path from root (/).

-s <source file>

Tells the Upgrader command the location of the package file (*.tgz) used to upgrade from.

-d <destination>

Optional. The location that package file will be expanded into. By default, this is the root directory (/). As of this writing, this should always be the root directory.

-v

Optional. If specified, enables verbose output. The output will show information about each file included in the package, as it is expanded.

-x

Optional. If specified, the any included upgrade script in the package will not be executed and the system will not automatically reboot at the end of the upgrade. This option should only be used by development or manufacturing personnel.

EXAMPLES

If the user transferred a new non-vital executive software package file, iv_mef_1.2.3.tgz into the /tmp directory, the following command would update the system from that file:
Upgrader –s /tmp/iv_mef_1.2.3rtgz

5.3.4 WHO

SYNOPSIS

`who [m|r|s]`

Display the WayConneX model, revision, and serial number

`who [m <model>]`

Used by manufacturing to set the model number.

`who [r <revision>]`

Used by manufacturing to set the revision level of the WayConneX.

`who [s <serialnum>]`

Used by manufacturing to set the serial number.

The who command displays the above information and is used for setting only.

DESCRIPTION

The who command displays the model, hardware revision, and serial number of the WayConneX product. This command also shows the site name, DOT number (unused), milepost, and ATCS address for the product. Siemens manufacturing use the who command to set the model, revision, and serial number data.

This command will also show the software and hardware revision information for the connected WayConneX systems. For each WayConneX and for each card in the WayConneX chassis, the following will be shown:

- Software version
- Software ID
- Software CRC
- Latest Hardware Revision
- Hardware Revision Shipped
- Part number
- Serial number
- Build date
- Warranty date

Use the who command with no arguments to view the information.

The following are the command line options, which are used by Siemens manufacturing.

`m, M <model>`

Used by Siemens manufacturing to set the WayConneX model number.

`r, R <revision>`

Used by Siemens manufacturing to set the WayConneX revision level.

`s, S <serialnum>`

Used by Siemens manufacturing to set the WayConneX revision level.

EXAMPLES

The following example shows viewing the information provided by the command.

```
# who
Site: CP 360
DOT is:
Mile post: 122.2
ATCS Address: 7.620.100.100.02
Model: WayConneX
Revision: B6
Serial #: 172
```

5.3.5 WIUCONF

SYNOPSIS

`wiuconf –g <filename> [-v|-nv|-c]`
Generate text file of WIU configuration options

`wiuconf –a <filename>`
Apply new configurations settings, contained in provide text file.

`wiuconf -s <variable> -t <value>`
Sets a configuration setting (variable) to the given value.

`wiuconf –d <variable>`
Displays the value of the given configuration settings (variable).

`wiuconf –c <cdlfile>`

New CDL file will be compiled and CDL engine will execute based on the logic that’s generated.

DESCRIPTION

The wiuconf command can:

- Generate text files containing the vital and non-vital configuration settings currently in the unit. It also contains CDL menu and operational parameter options.
- Apply text files containing non-vital settings (include Encrypted HMAC key) to the unit
- Set the value of individual configuration parameters
- View the value of individual configuration parameters and the UCN values
- Apply automated changed for existing or new CDL

The following are the possible command options

```
-g <filename>, --generate <filename>,
-g <filename>[-v|-nv|-c|--nonvital|--vital|--cdl]
--generate <filename>[-v|-nv|-c|--nonvital|--vital|--cdl]
```

The wiuconf utility will generate a text file with the given <filename>, which contains all the configuration parameters. Optionally, the command can generate just the non-vital settings (those not covered by the UCN) using the “-nv” or “--nonvital” option, or the vital settings using the “-v” or “--vital” option, or CDL menu and operational parameters with“-c” or “--cdl” option, or all the above configuration parameters without any of the [-v|-nv|-c|--nonvital|--vital|--cdl] options.

```
-a <filename>, --apply <filename>
```

The wiuconf utility will parse the given file and apply the contents of the file to the unit’s non-vital configuration settings. The non-vital configuration file can also contain CDL-defined menu or operational parameters. If necessary, this may result in a re-compile of the CDL logic loaded in the unit. The command will report any errors parsing the file or compilation errors.

`-s <variable> -t <value>, --set <variable> --to <value>`

The wiuconf utility will set the given variable to the given value (*Note: You may only set the value of non-vital variables*). The variable name must match the variable name from the text file format and the value must match one of the possible values for that variable. Variable names and values are **not** case sensitive. If the variable is nested, you must specify the sections. However, if the variable name within the section is unique, you will not need the section name. For example:

```
wiuconf --set EMP_WIU:Broadcast_Rate_ms --to
1000
wiuconf --set Broadcast_Rate_ms --to 1000
```

`-s <variable> -t ?`

The wiuconf utility will show a listing of possible values for the variable if you use a question mark for the –t parameter. For example, it will show all the available options, and user can type in only partial string of the option instead of the whole string:

```
# wiuconf -s timezone -t ?
Options:
    1. Greenwich Mean Time (GMT)
    2. Eastern (GMT-5:00)
    3. Central (GMT-6:00)
    4. Mountain (GMT-7:00)
    5. Pacific (GMT-8:00)
    6. Alaska (GMT-9:00)
    7. Atlantic (GMT-4:00)
    8. Arizona (No DST, GMT-7:00)
    9. Newfoundland (GMT-3:30)
    10. Aus Western (GMT+8:00)
    11. Aus Central (GMT+9:30)
    12. Aus Central (No DST, GMT+9:30)
    13. Aus Eastern (GMT+10:00)
    14. Aus Eastern (No DST, GMT+10:00)

# wiuconf -s timezone -t central
# wiuconf -d timezone
Central (GMT-6:00)
```

`-d <variable>, --display <variable>`

The wiuconf utility will display the current value of the given variable (see the text file reference for the variable names).

`-c <cdlfile>, --cdl <cdlfile>`

This option is used to do automated changes for new CDL. The wiuconf utility will compile the CDL program, and generate the logic based on the given non-vital configuration file. And then triggers the CDL engine to begin executing that logic. Before wiuconf command is run, user needs to transfer the new CDL file to the default directory /mnt/ecd/0/, and also upload the configuration file to any user picked directory.

EXAMPLES

The following will generate the complete text file of the configuration settings supported by the WIU. The text file can be used as a reference for what variables are supported.

```
# wiuconf –g /tmp/wiu_conf.txt
```

The following is an example to view the PTC UCN (PTC Configuration CRC).

```
# wiuconf -d ptc_ucn
5e5ab213
```

The following is an example to set the encrypted HMAC key:

```
# wiuconf -s hmac_key –t ABC123XYZETC
```

SPECIAL CONSIDERATIONS

Eth_Laptop: DHCP
Eth_Laptop: IP_Address
Eth_Laptop: NetMask
Eth_Laptop: Gateway

Eth_PTC: DHCP
Eth_PTC: IP_Address
Eth_PTC: NetMask
Eth_PTC: Gateway

5.3.6 Operation

The System Management application is a program written in CDL to determine when to generate events and alerts.

The WayConneX will send the vital CPU's diagnostic messages to the CDL program. The CDL program can choose to send an alert based on the state of diagnostic information. When triggered by the CDL program, the WayConneX unit will send an event/alert to the back-office. All the logic for events/alerts is contained in the CDL, allowing it to be changed without loading new executive software into the WayConneX.

The CDL program defines configurable parameters, which the user can change while the CDL is running without re-compiling the CDL or re-performing the entire site setup procedure. The user can individually enable or disable sending each event/alert defined by the CDL program. The WayConneX will still write all events/alerts to the logs even if events/alerts are not sent to the back office. The status of the internal vital/non-vital CPU communications session will be provided to the CDL program. The CDL program will send an alert to the back office if the CPUs are not in session, which would prevent the delivery of WSMs. The WayConneX will provide the status of the Class D connection to the CDL program and send an alert if the WayConneX is not able to transmit WSMs.

The WayConneX will collect events/alerts as defined in the CDL program created for a specific application. Refer to the documentation provided with the CDL program for details

5.3.6.1 CDL Installation and Setup

The CDL program can be installed and setup using the Web User Interface. To start the setup process select the Configuration icon **[1]** and from the Non-Vital Configuration menu on the left column select the Applications sub-menu **[2]** and under Applications select the CDL sub menu followed by Site Setup. From the Site Setup screen click on the Upload CDL button **[3]** and click on Browse **[4]** and locate the CDL file desired then click the Update button **[5]**. The CDL will upload into the system.

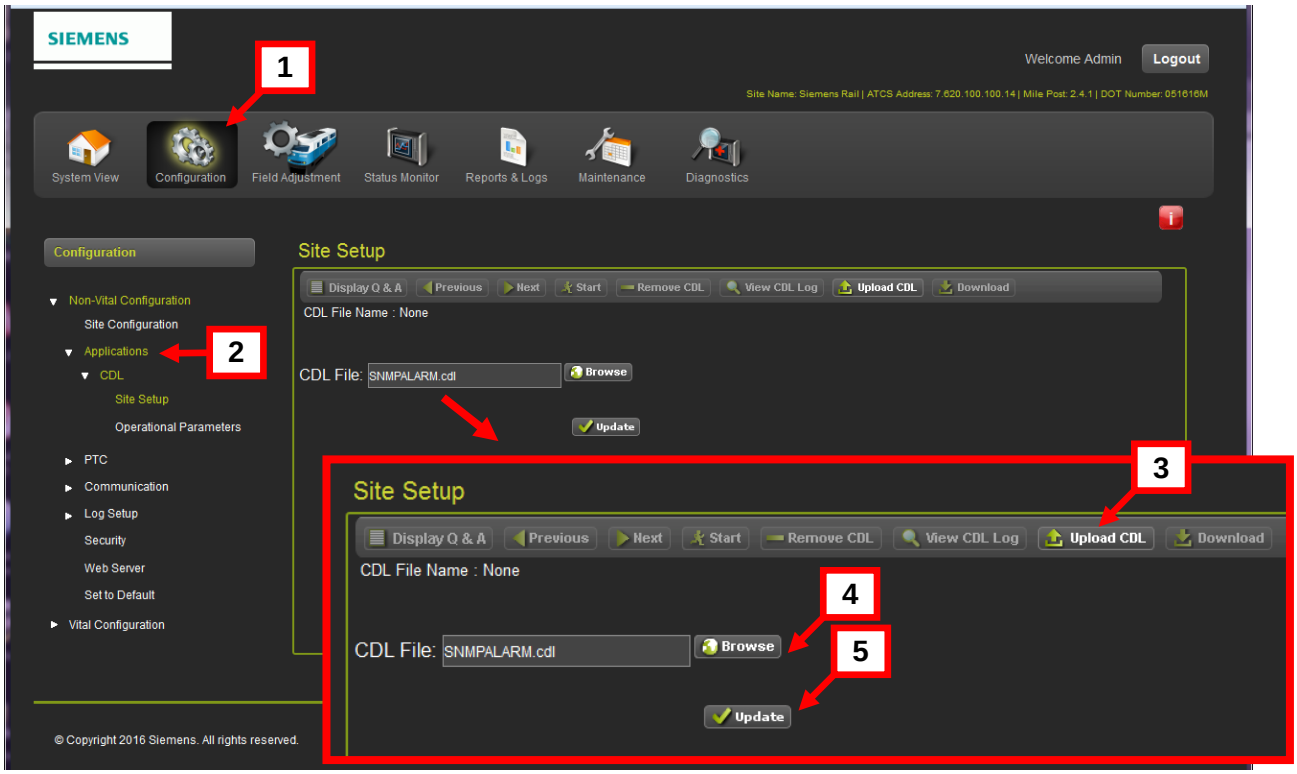


Figure 5-5 Uploading CDL Application

When the CDL file has been uploaded the file name will appear on the Site Setup screen **[6]**. To start the CDL setup click on the Start button **[7]**.

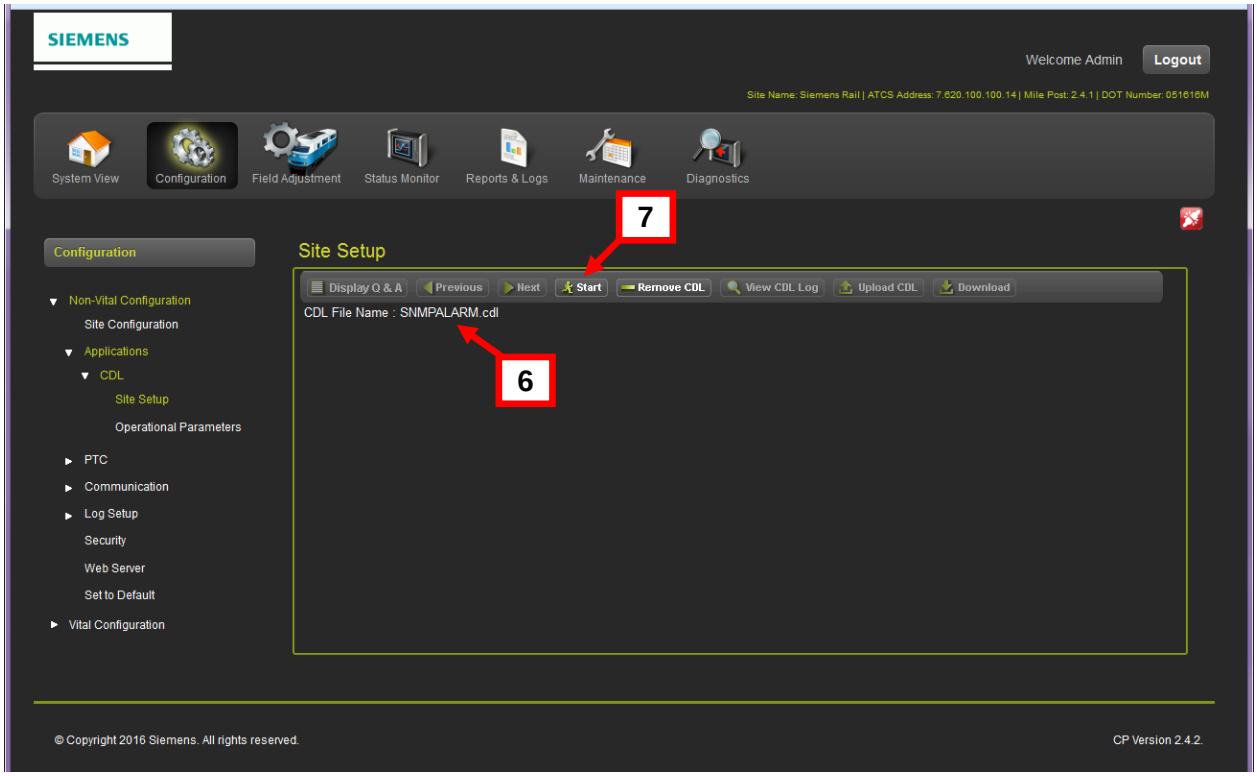


Figure 5-6 Start CDL Setup

A pop up will appear asking if the user desires to reset the module names, click YES or NO **[8]** to proceed.

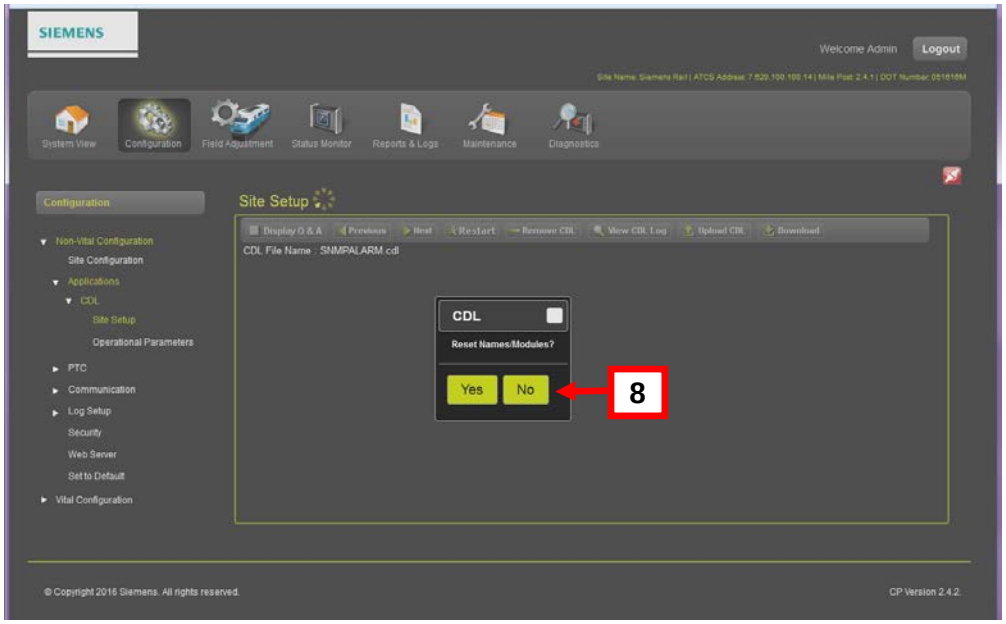


Figure 5-7 Reset Module Names inquiry Screen

Depending on the type of CDL content, a question, series of questions, or no questions may appear. With each question **[9]** select the desired answer and then click the Next button **[10]** to continue. Repeat the process for each question. To repeat the process starting with the first question click on the Restart button **[11]** and repeat steps **[9]** and **[10].** When all questions (if any) are answered, clicking on the Next button **[10]** will cause a pop up to appear asking if the user wants to compile the CDL. Selecting YES will start the compiling process, selecting NO will return to the last question

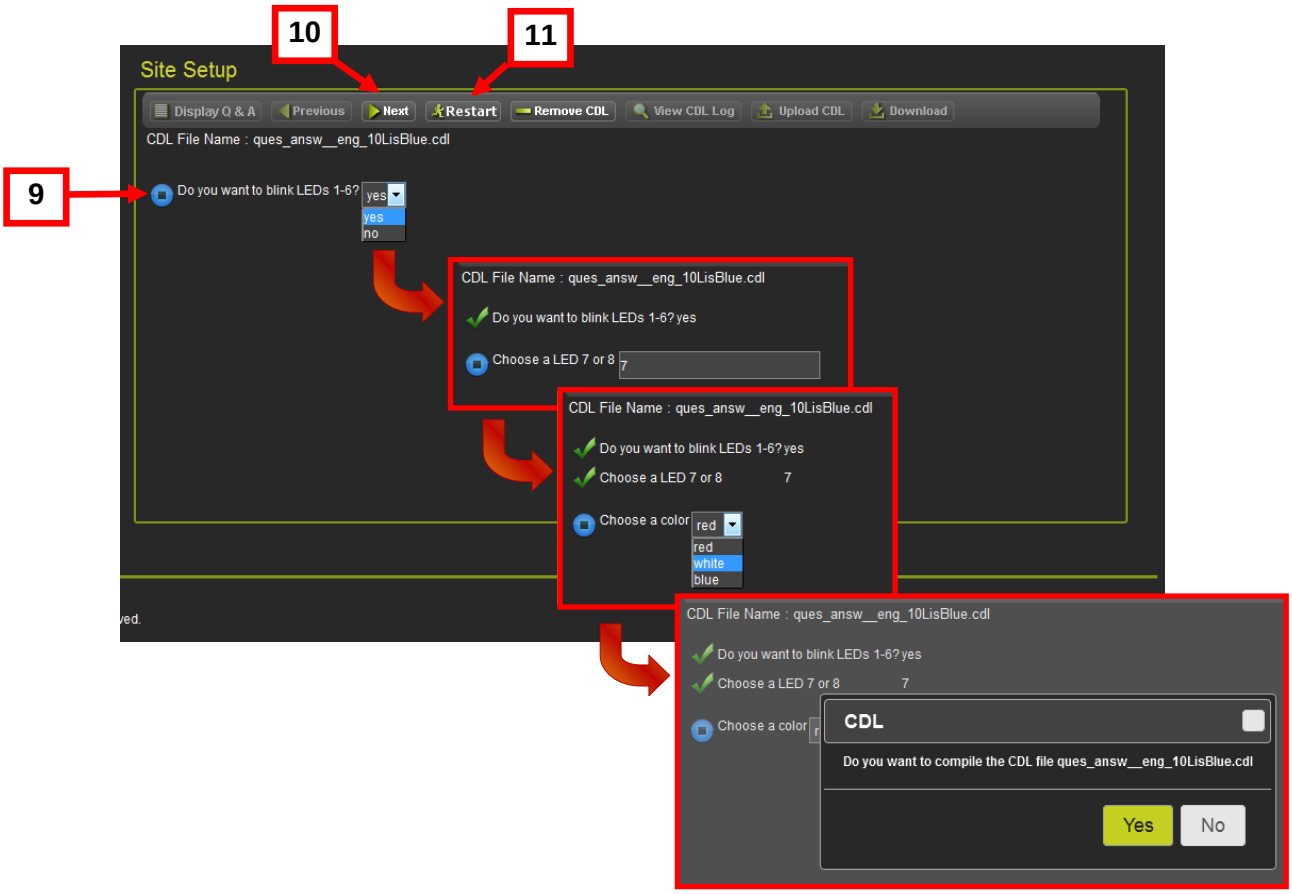


Figure 5-8 CDL Question Sequence

Figure 5-9 Viewing CDL Questions

A message will appear advising successful or unsuccessful compilation of the CDL application **[13]**. An Icon will appear **[14]** on the upper right corner of the screen indicating a CDL application is present. See Section 5.3.6.4 for details. To display the Questions and Answers, click on the Display Q&A button **[15]** and the question and answer selected will appear on the screen. See Figure 5-11 . In the event of an unsuccessful compilation click on the Restart button **[16]** and repeat the process. If the CDL will not compile remove the CDL file (see Section 5.3.6.2 Remove CDL).

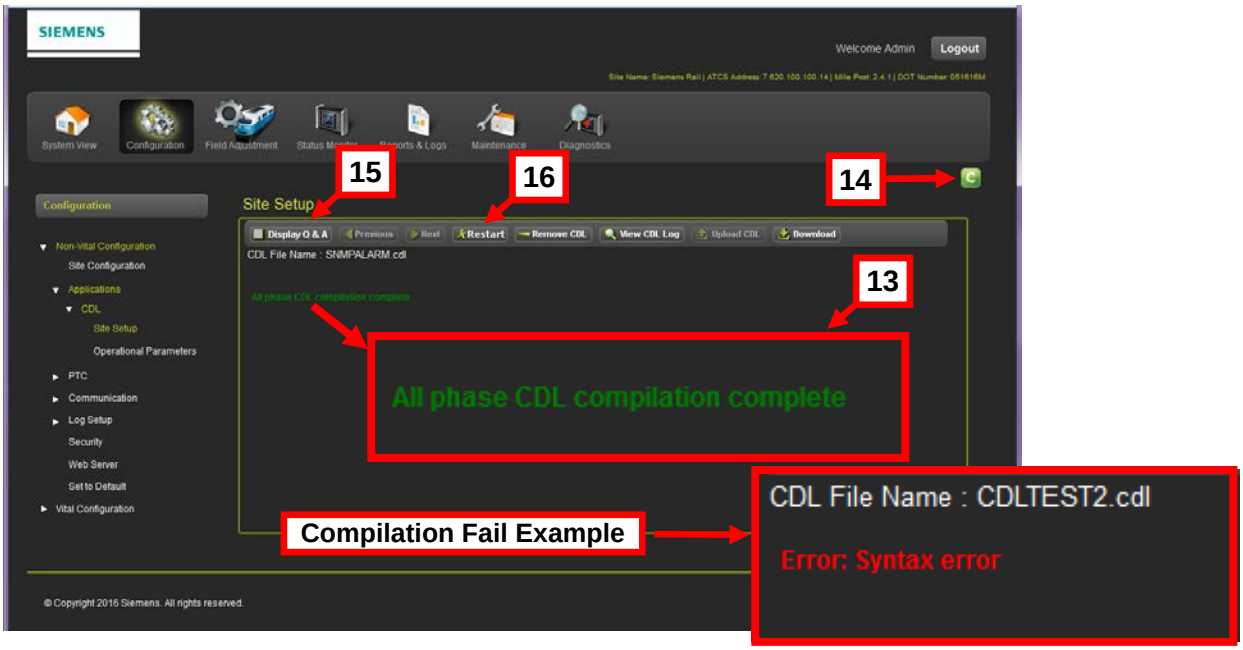


Figure 5-10 CDL Compilation Complete and Additional Options Screen

The figure below shows an example of display of CDL questions and answers.

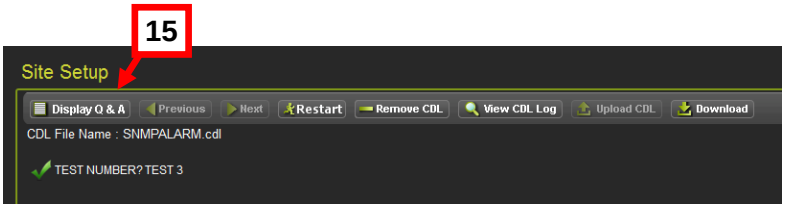


Figure 5-11 Display CDL Q & A

To view the CDL click on the View CDL Log button **[17]** and the log will appear on the screen **[18]**.

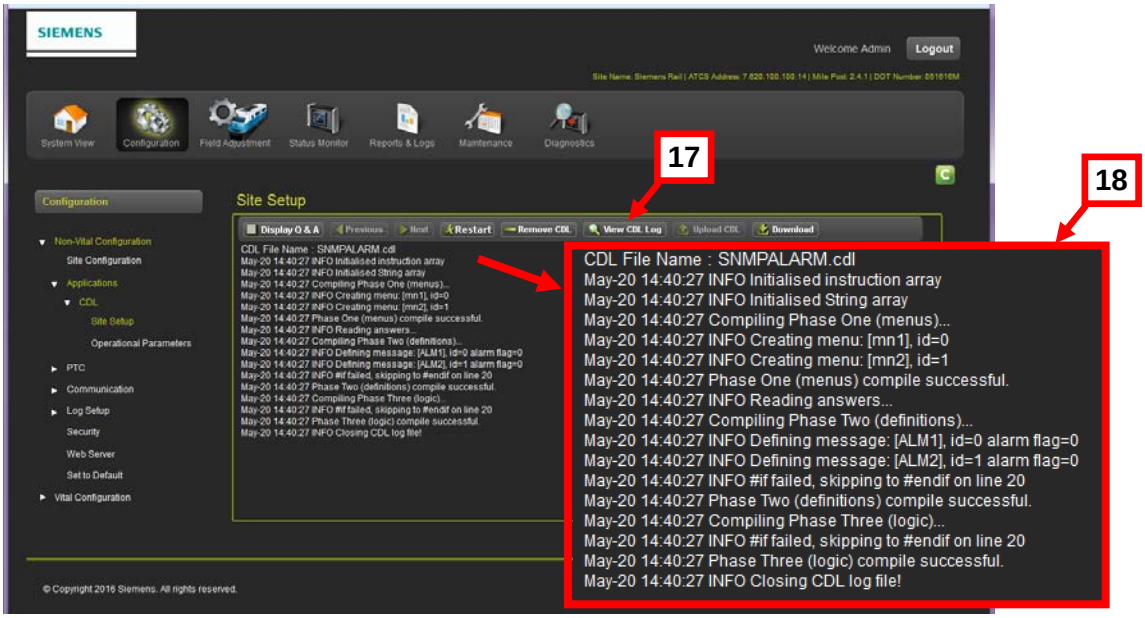


Figure 5-12 CDL Log Screen

To download the log in a file format click on the Download button **[19]**, two options will appear, CDL File and CDL Log. CDL File enables the user to download the CDL file to an external drive or computer. The CDL Log enables the user to open the CDL Log in a text program (Notepad is the default selection) or the log may be saved to an external drive or computer.

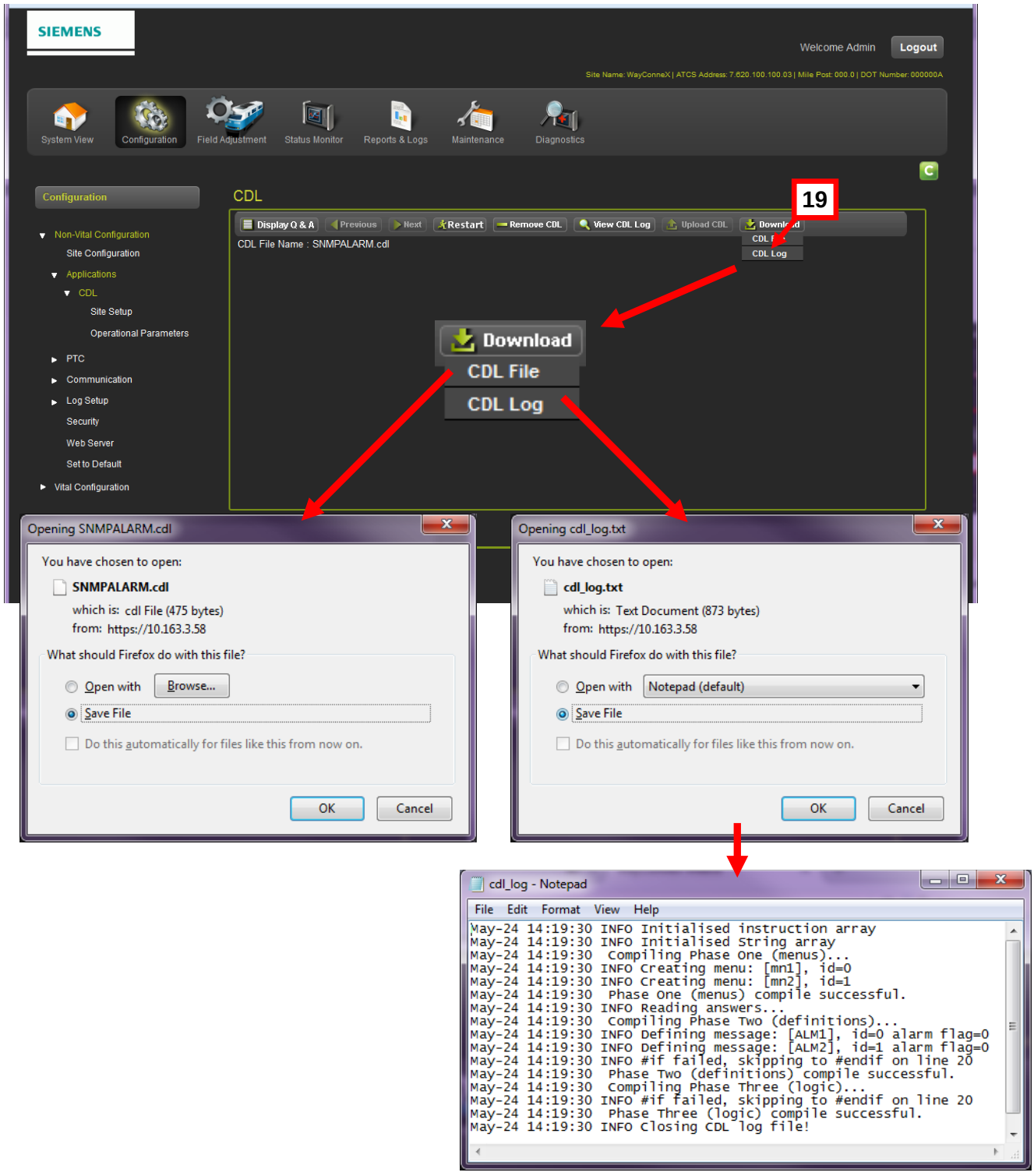


Figure 5-13 Downloading CDL Files and Logs

5.3.6.2 Remove CDL

To remove a CDL file click on the Remove CDL button **[1]**.

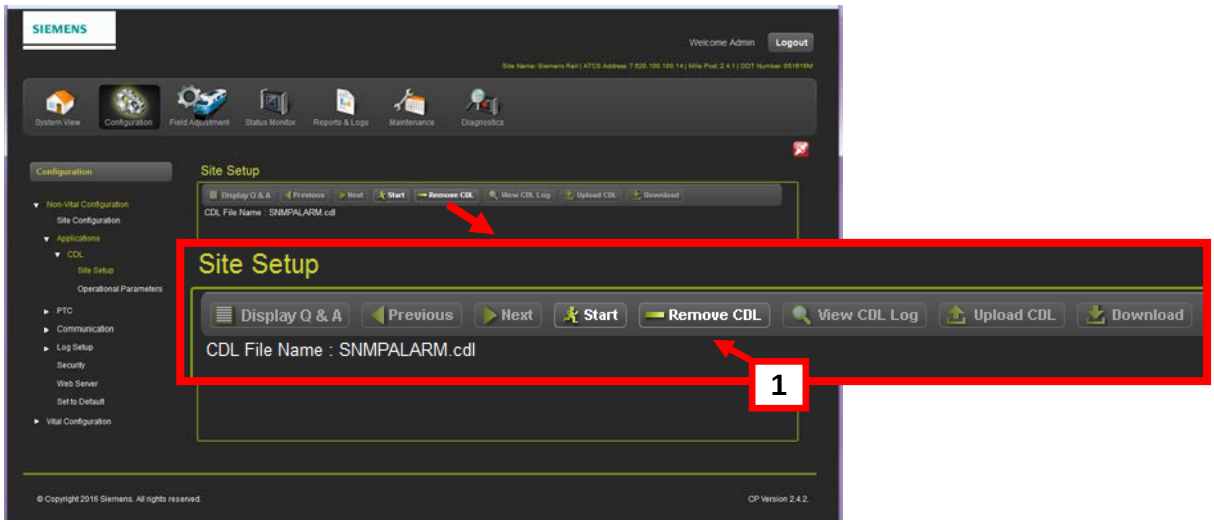


Figure 5-14 Remove CDL

A message will appear on the screen advising the CDL file was successfully removed also the CDL File Name will indicate None **[2]**.

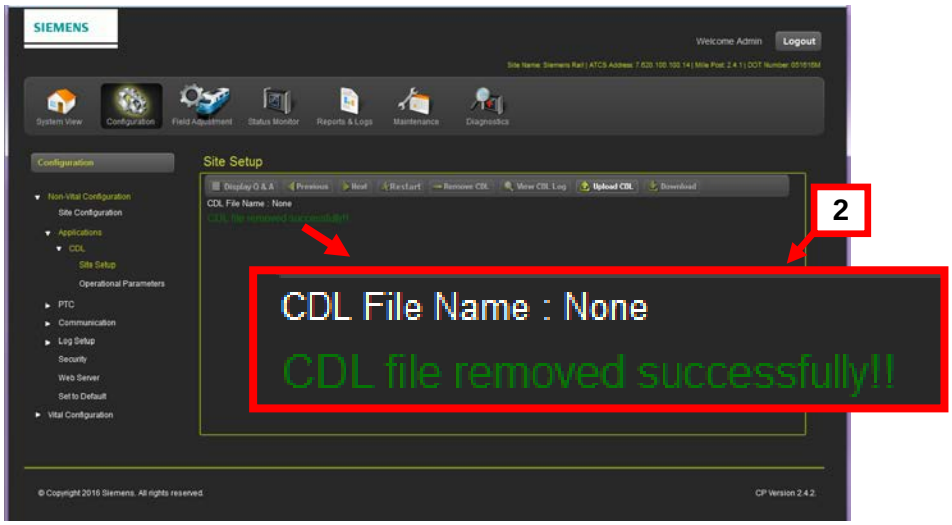


Figure 5-15 CDL Removed Successfully

5.3.6.3 CDL Operational Parameters

Depending on the content of the CDL application operational parameters may be available. Click on the Operational Parameters sub menu will display any parameters that are a part of the installed CDL. In the following example the user can set parameters for sending messages.

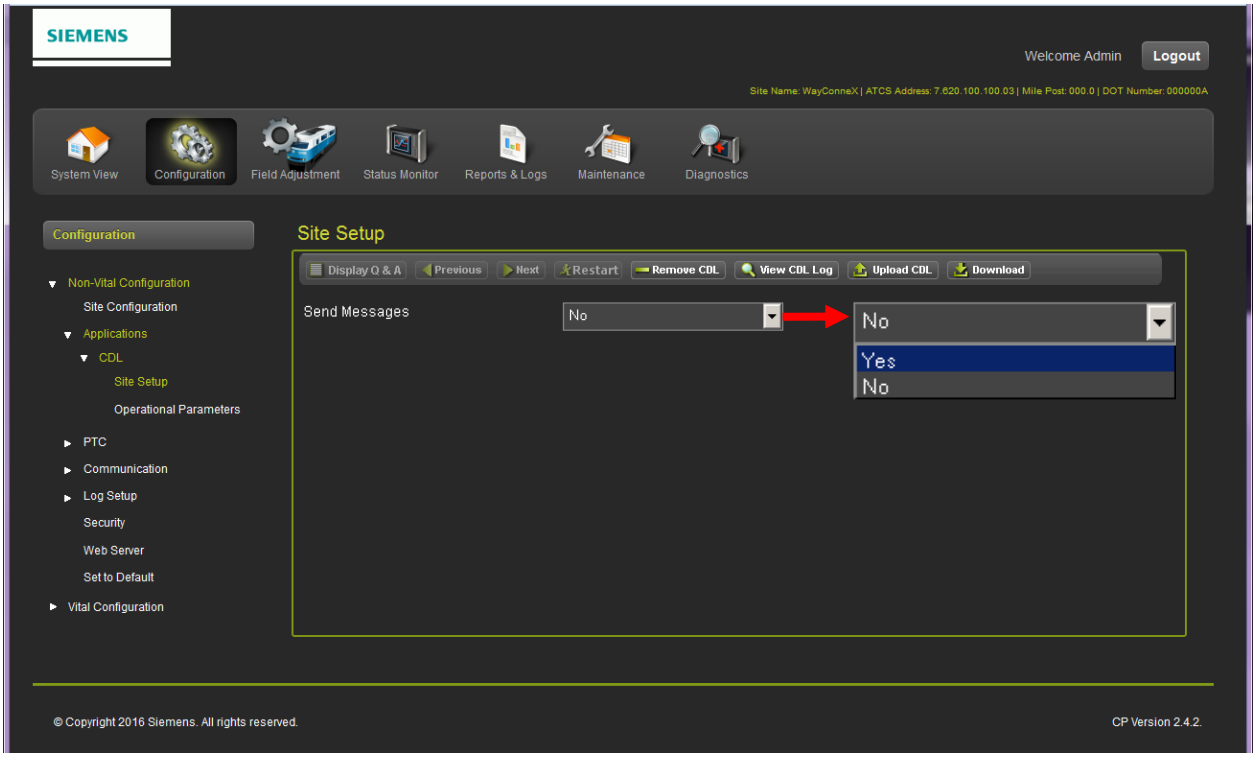


Figure 5-16 CDL Operational Parameters Screen

5.3.6.4 CDL Present and Status Indicator

When a CDL is installed an icon will appear in the upper right corner on all Web UI screens showing the current status of the CDL application. As shown in Figure 5-17, The CDL Status Icon has three indications, Green CDL is running, Red CDL is not running, Yellow there is a CDL Status Alert present.

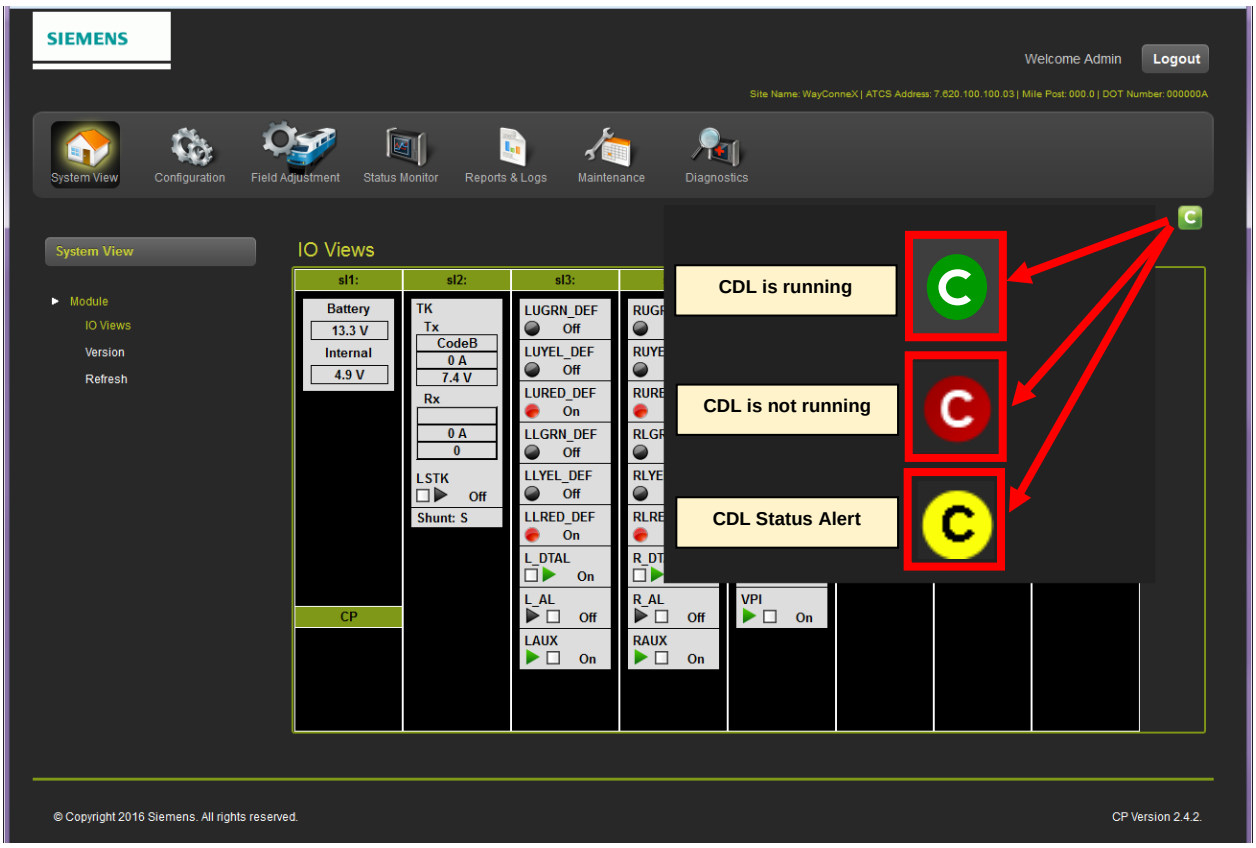


Figure 5-17 CDL Application Status Icons

5.3.6.5 CDL Messages

If the CDL Alert icon appears in the upper right corner of the Web UI screens, the user can view any CDL Messages by navigating to the Diagnostics Menu [1] and clicking on the CDL Messages [2] sub menu. Any CDL message will appear on the screen with the Date and Time of the alert, the Slot affected, and the Description of the alert. In the example shown in Figure 5-18 an internal temperature alert on slot 2 is listed.

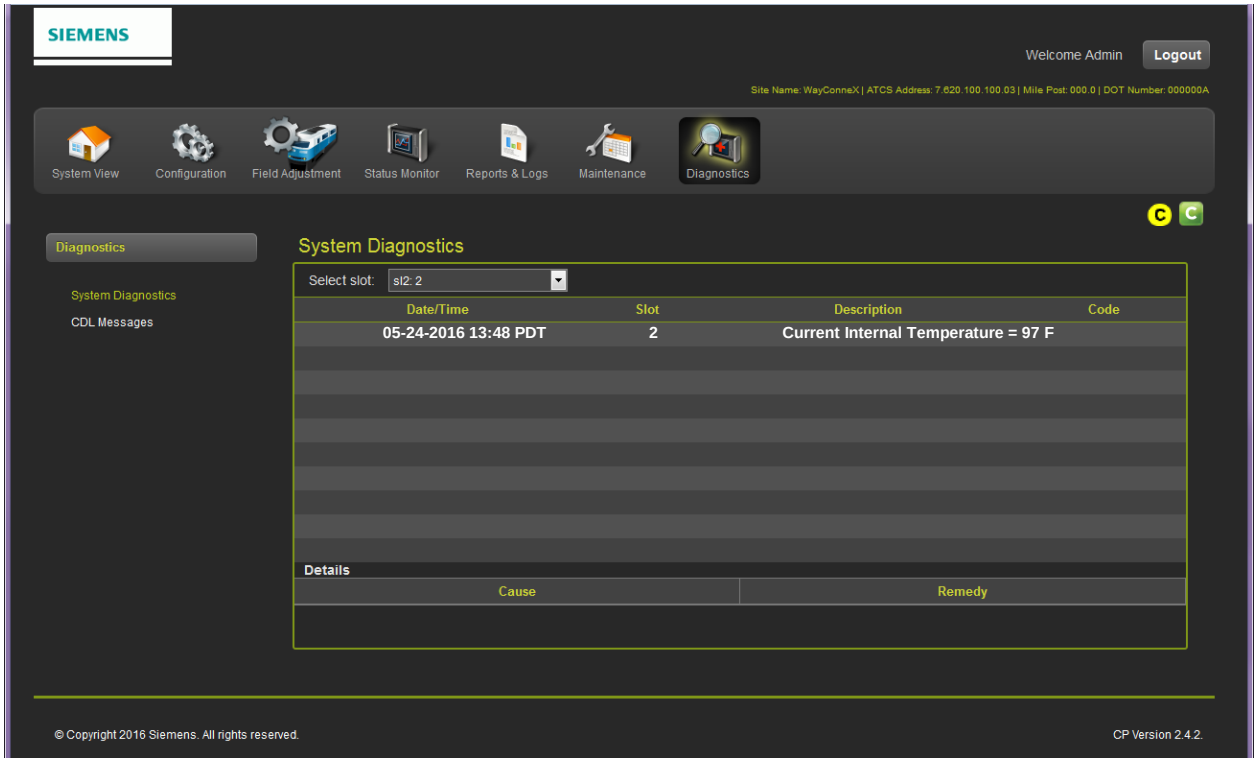


Figure 5-18 CDL Messages

5.4 PSO APPLICATIONS (WAYCONNEX ONLY)

The WayConneX unit will accommodate PSO (Phase Shift Overlay) modules.

5.4.1 PSO Module Setup

Using the CPU III Web UI the PSO modules can be setup as follows:

1. Set Track Code
    a. Click on Configuration Icon
    b. Click on Vital Configuration Menu
    c. Click on Logic Configuration
    d. Click on Main Sub-menu
    e. Select the Track Code and set the drop-menu to TRUE
    f. Save the selection

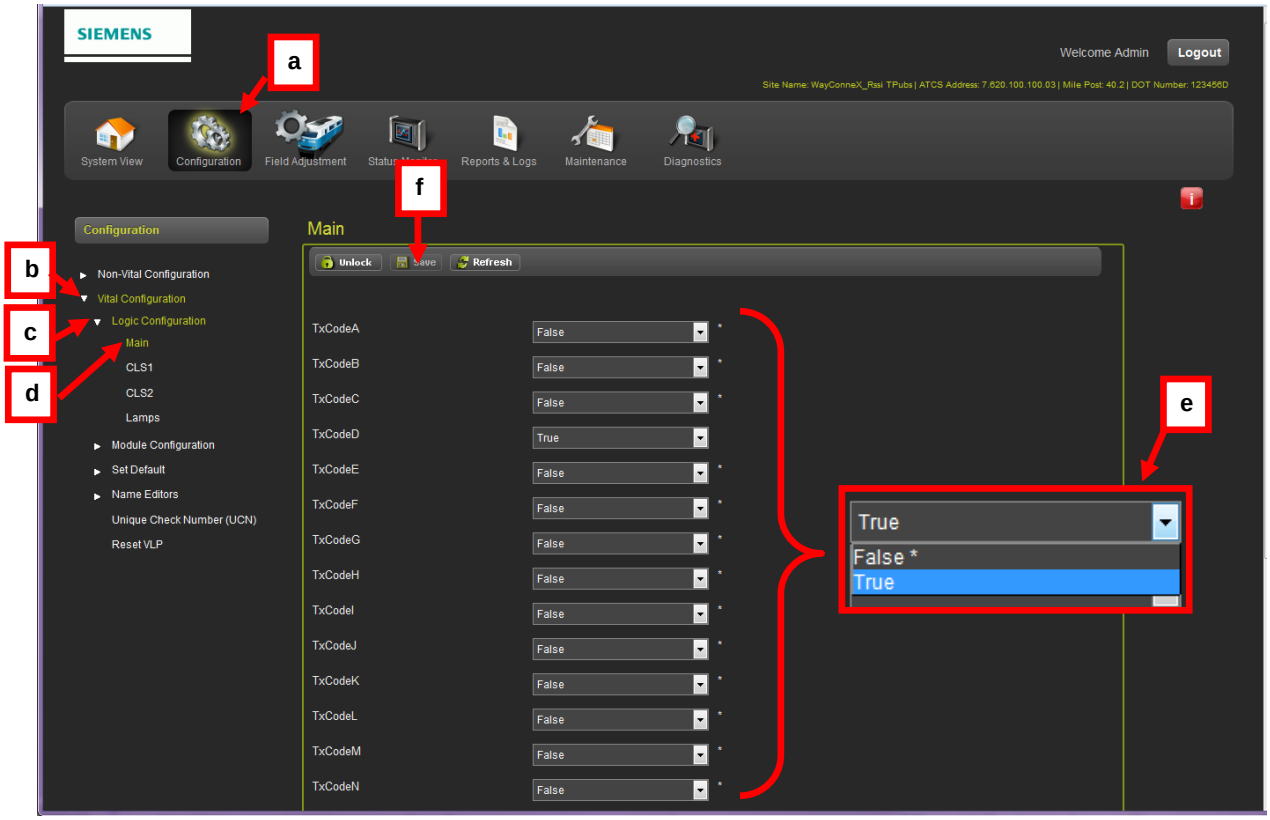


Figure 5-19 Setting PSO Module Track Code

2. Configure PSO Modules
    a. Click on Configuration Icon
    b. Click on Vital Configuration Menu
    c. Click on Module Configuration
    d. Select the Module Slot
    e. Configure parameters
    f. SAVE parameters

PSO Module Configuration – Code Mode Parameters

Mode – This parameter selects Code Mode (Coded Track) or OS Mode (Operational Siding)
Transmit Level – Low or High
PSO Freq Category – Standard or Alternate
TX Frequency – Lists Frequencies for PSO Frequency Category selected
RX 1 Frequency – Lists Frequencies available for receiver 1
RX 1 Pickup Delay Time (sec) – Sets delay time (Range 0-10 seconds)
VPI Debounce – Sets VPI Debounce from drop-menu list

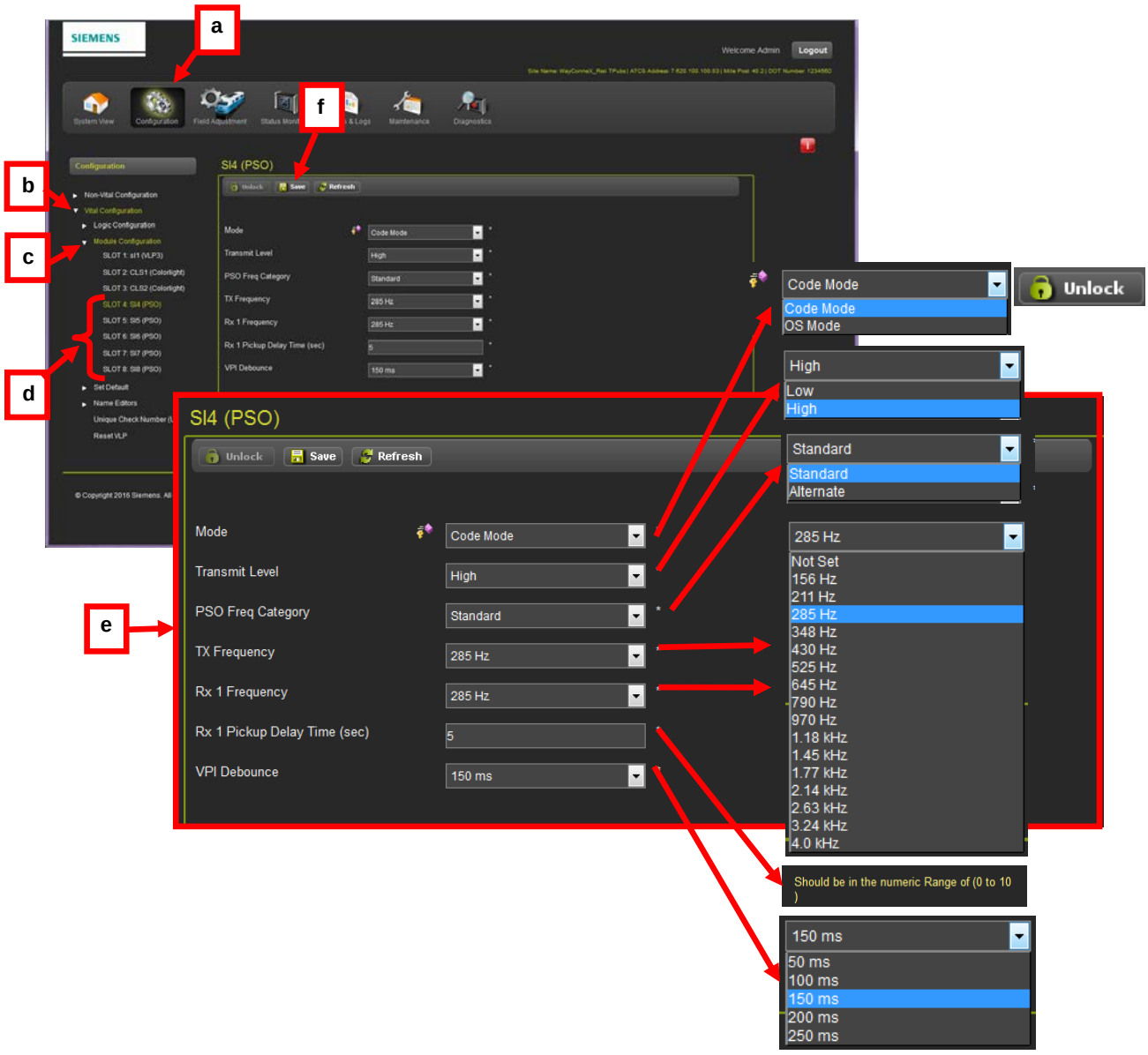


Figure 5-20 PSO Module Setup Screen – Code Mode

PSO Module Configuration – OS Mode

The OS Mode sets up a second receiver Operational Sidings. Parameters for the second receiver will appear on the screen upon selection of the OS Mode.

Mode – This parameter selects Code Mode (Coded Track) or OS Mode (Operational Siding)(Requires System Unlock)
Transmit Level – Low or High
PSO Address – Set PSO Address Code
PSO Freq Category – Standard or Alternate
TX Frequency – Lists Frequencies for PSO Frequency Category selected
RX 1 Frequency – Lists Frequencies available for receiver 1
RX 1 Pickup Delay Time (sec) – Sets delay time (Range 0-10 seconds)
PSO Receiver 2 – Enables or Disable second PSO Receiver (used with sidings) (Requires system Unlock)
RX 2 Frequency – Lists Frequencies available for receiver 2
RX 2 Pickup Delay Time (sec) – Sets delay time for Receiver 2 (Range 0 – 10 seconds)
VPI Debounce – Sets VPI Debounce from drop-menu list

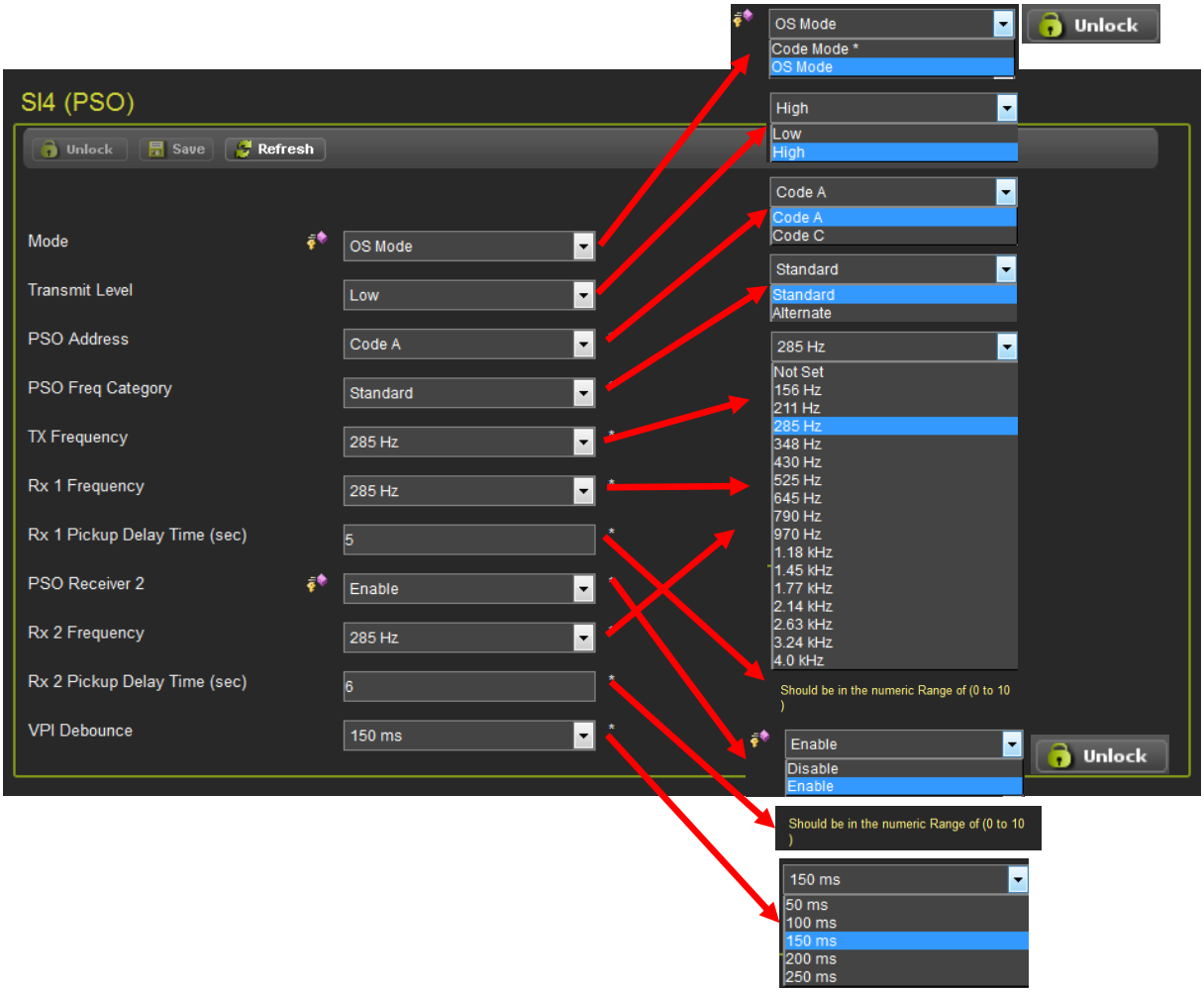


Figure 5-21 PSO Module Setup Screen – OS Mode

3. Configure PSO Modules
    a. Click on Field Adjustment Icon
    b. Click on PSO Setup Menu
    c. Calibrate each PSO module

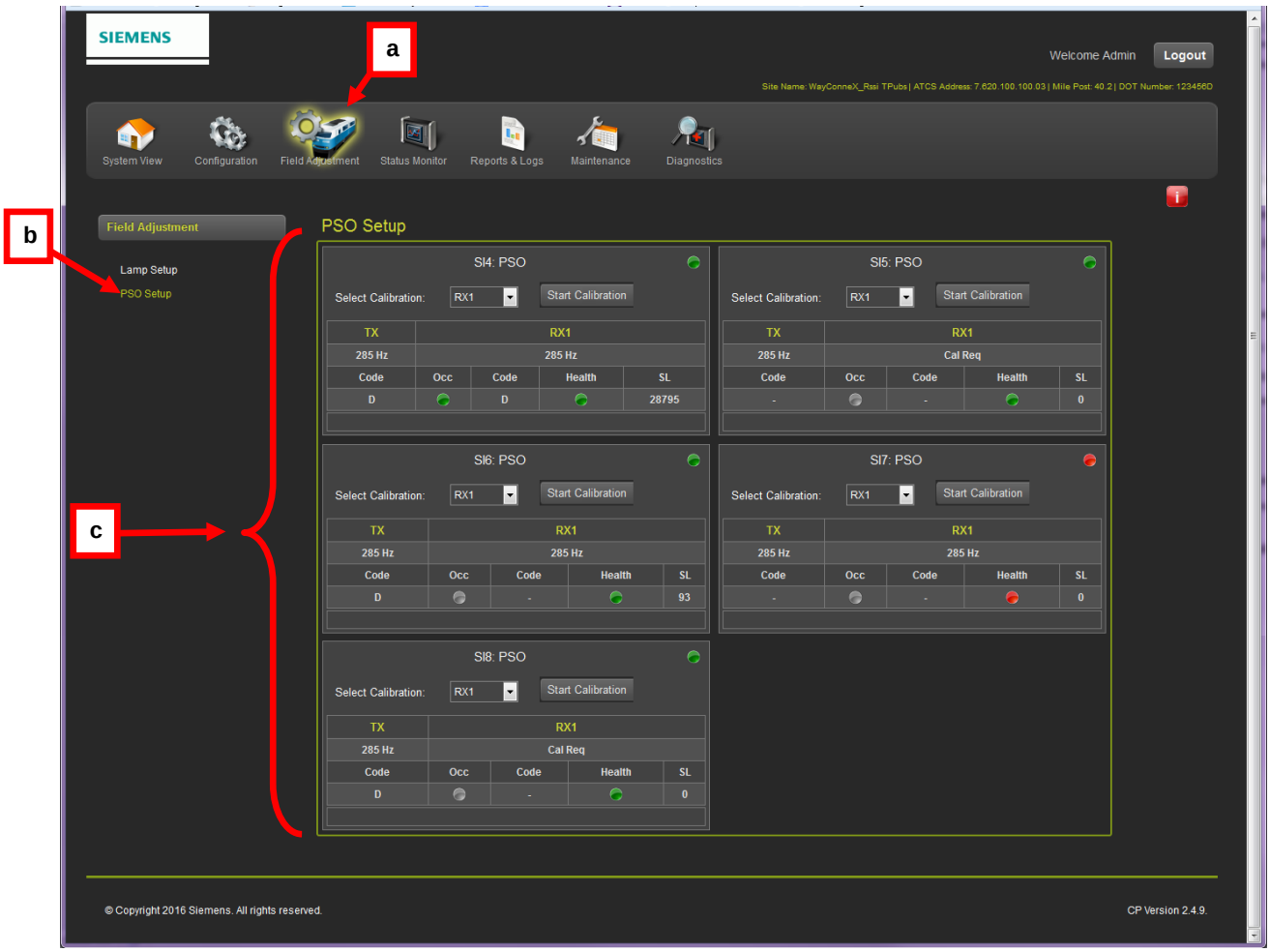


Figure 5-22 Field Adjustment – PSO Setup

Calibrate each PSO Module as shown in Figure 5-23.

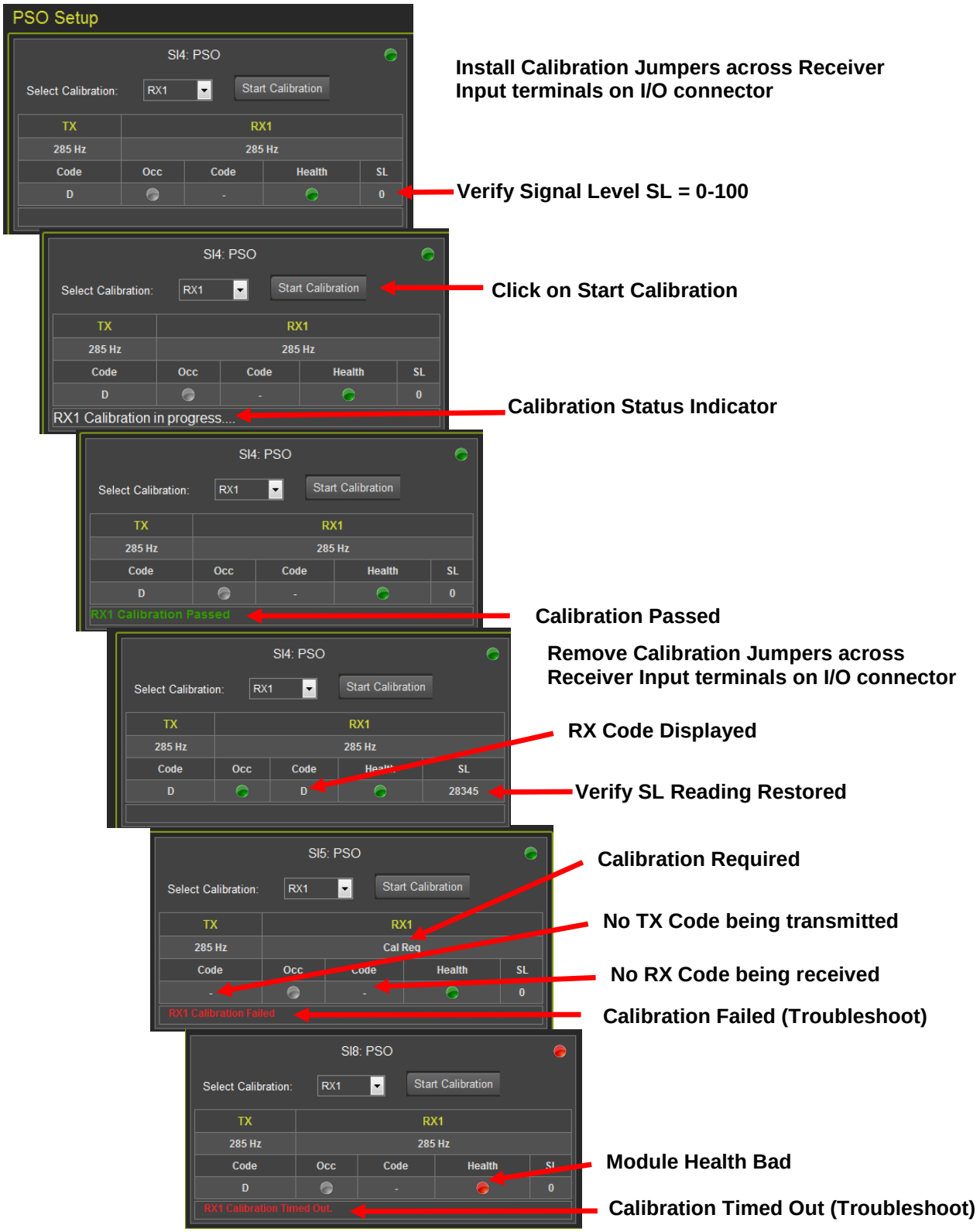
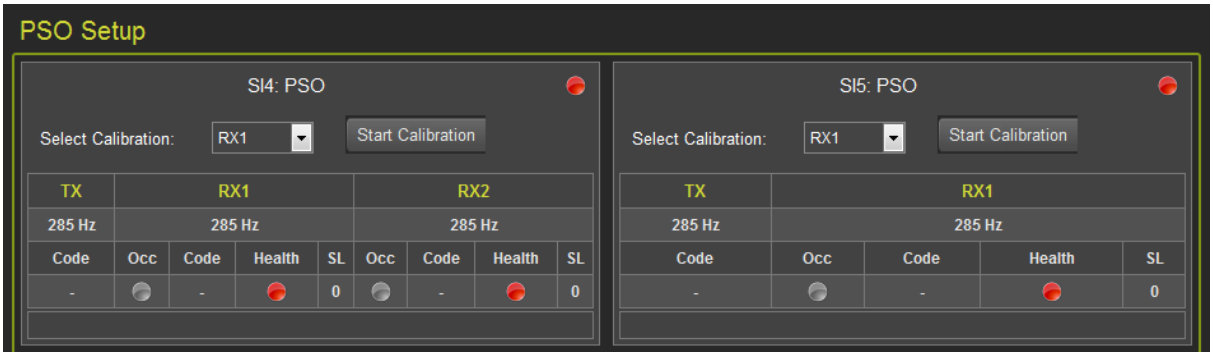


Figure 5-23 Field Adjustment - PSO Module Calibration

5.4.2 PSO Setup Screens – OS Mode and Code Mode

The PSO Setup screens for OS Mode and Code Mode reflect the difference in parameters between the two modes. Figure 5-24 shows both screens. The OS Mode uses two receivers verses the Code Mode which has only one receiver.



OS Mode Screen **Code Mode Screen**

Figure 5-24 PSO Setup Screens – OS Mode and Code Mode

5.4.3 PSO Module System View

Figure 5-25 shows an example of the System View of PSO Modules.

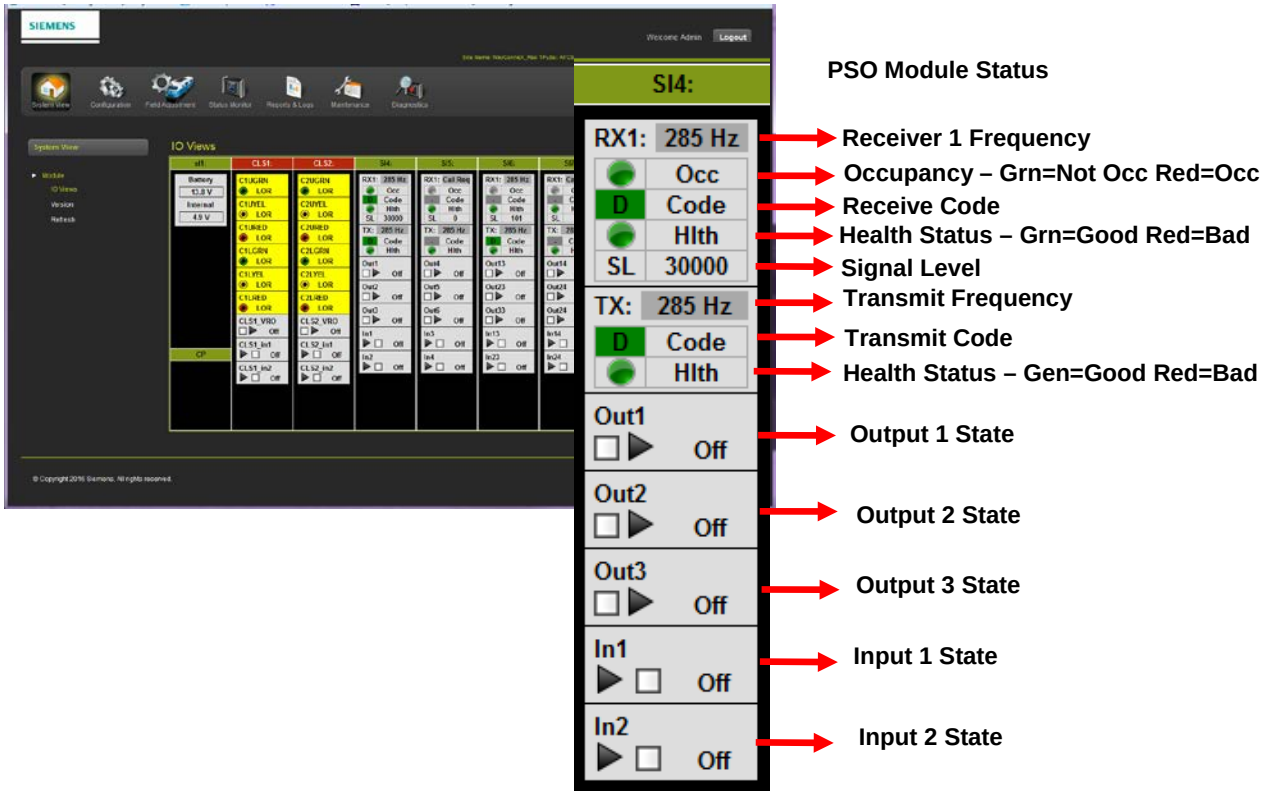


Figure 5-25 System View – PSO Module Display