



G500 Access

Learning Module Objective

At the completion of this module you will be able to identify and recite all concepts presented.

If you are viewing this as part of a structured training program *PLEASE* complete the associated assessment test. You are required to score above 80%.

Here's What is Covered in this Module

Learning & Development Module Objective

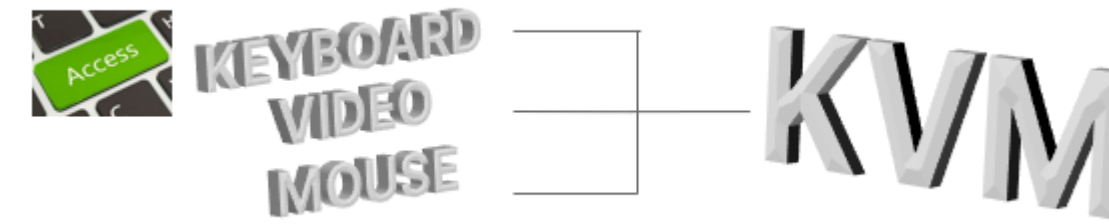
1. G500 Interface Options
2. Local KVM – Local HMI Task Functions
3. Local KVM – Screen Layout and Virtual Keyboard
4. Local KVM – MCP Local Configuration Utility (mcpcfg)
5. Local KVM – MCP Settings GUI
6. Local KVM – Local MCP Runtime HMI
7. Ethernet – MCP Local Configuration Utility (mcpcfg) via SSH
8. Ethernet – MCP Settings GUI via HTTPS
9. Ethernet – Remote MCP Runtime HMI via HTTPS
10. Ethernet – MCP Runtime HMI via Remote Desktop
11. Maintenance Serial Port – MCP Local Configuration Utility (mcpcfg)

G500 Interface Options

The following connection / interface options are available to connect to the G500:

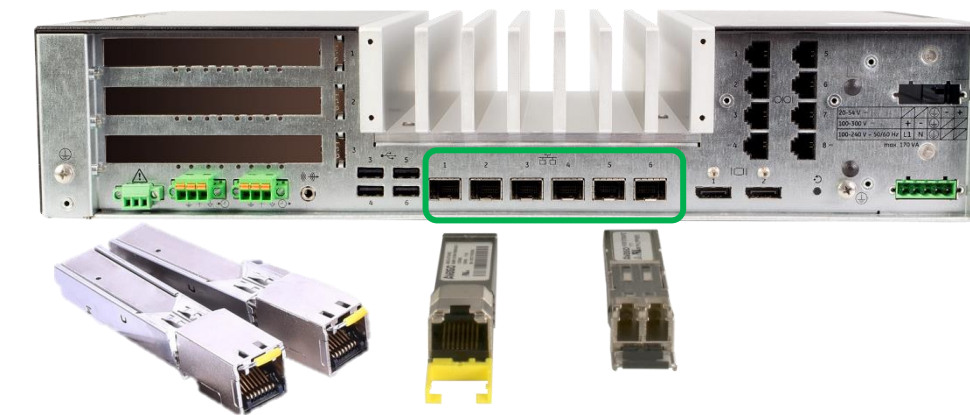
Local KVM (Keyboard, Video and Mouse) :

- Connect the Display Port to a monitor with a display cable
- Connect a keyboard and mouse to any of the USB type A ports
- G500 supports up to 2 monitors
- Support Access: MCP Local Configuration Utility (mcpcfg) / MCP Settings GUI / Local MCP Runtime HMI



Ethernet Interfaces:

- Front Maintenance Ethernet Port:
 - ✓ 100/1000 Base-T Maintenance Ethernet Port accessible via front of the unit
 - ✓ Default IP address: 192.168.168.81
- Rear SFP Ethernet Ports:
 - ✓ Support multiple 100 Base and 1000 Base SFP options
 - ✓ Must be in Internal Zone to access the G500
- Support Access: MCP Local Configuration Utility (mcpcfg) / MCP Settings GUI / remote MCP Runtime HMI / MCP Runtime HMI via Remote Desktop



Maintenance Serial Port:

- USB 2.0 type B serial console port on the front of chassis
- Default settings - 115200 Baud Rate
- First time users will have to install the required USB serial drivers, obtained from GE
- Support Access: MCP Local Configuration Utility (mcpcfg)



MCP Local Configuration Utility (mcpcfg) or MCP Settings GUI

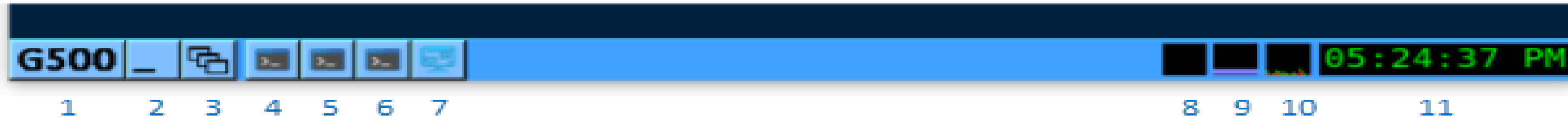
To configure MCP system settings and perform the initial MCP setup (e.g., Users, network, serial, time sync etc.)

MCP Runtime HMI

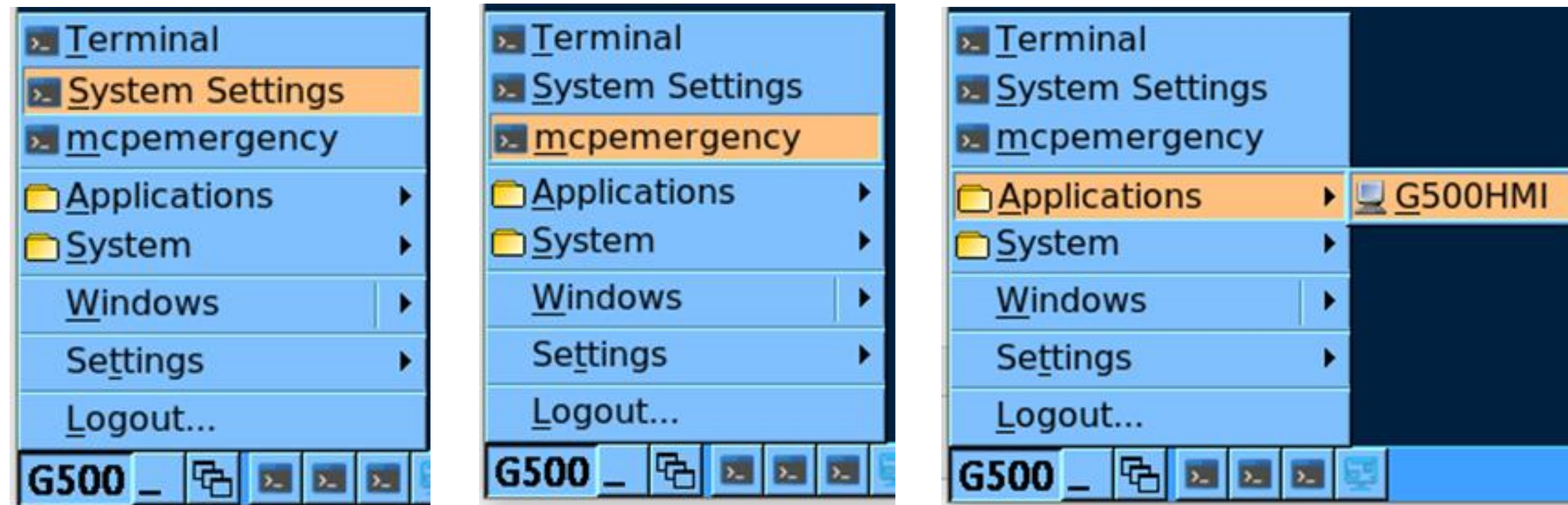
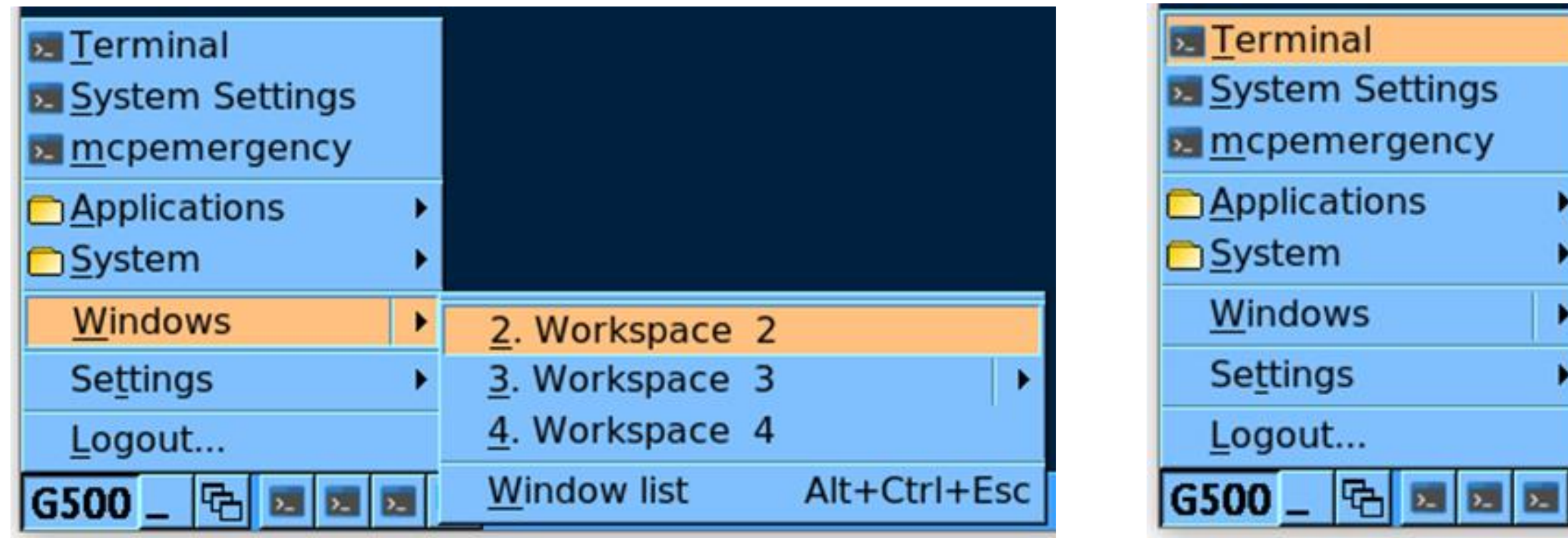
To view and control the runtime statistics including One-line diagrams and to configure the MCP Settings (e.g., User Management, Automatic Login etc.)

Local KVM – Local HMI Taskbar Functions

The Local HMI provides access to the G500 through a local substation computer setup via KVM. The Taskbar shown in the Local HMI on the bottom of the screen provides the following functions:



1. Access to Start applications
2. Minimize all windows and Show Desktop
3. Switch between active windows and workspaces
4. Launch a Terminal session to the MCP shell
5. Launch MCP System Settings GUI
6. Launch MCP Emergency access
7. Launch Local Runtime HMI
8. Network Interface 0 statistics
9. Memory statistics
10. CPU statistics
11. Local time clock



The Color theme can be changed using Start → Settings → Themes

The Local HMI and all applications running can be restarted using Start → Logout

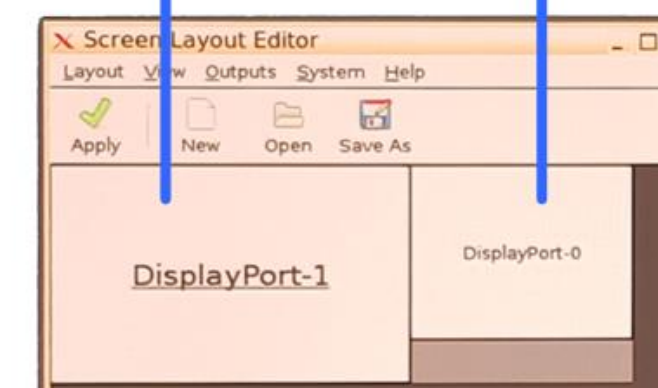
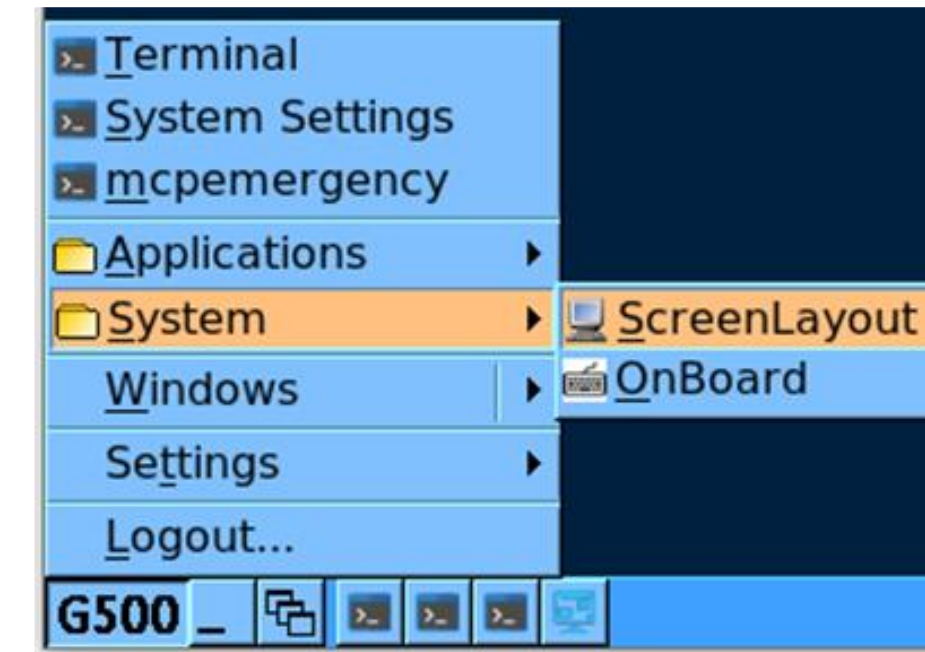
Local KVM – Screen Layout and Virtual Keyboard

Screen Layout

- Screen/Monitor layout and resolutions may be configured using Screen Layout utility
- This utility can be launched from Local HMI start menu using **Start → System → Screen Layout**
- When two monitors are connected to the G500, by default, the Monitor A connected to DP 1 becomes Primary. And the Monitor B connected to DP 2 becomes Extended monitor
- The user can reconfigure the monitor layout without changing the backend connections by dragging & dropping the monitors and placing at the required position on Screen Layout canvas and then click **Apply**

Virtual Keyboard

- A virtual keyboard may be displayed on the screen using **Start → System → OnBoard**
- Clicking on the top right X will close the virtual keyboard



The minimum resolution supported in Local HMI is 1280x1024 and the recommended resolution is FHD (1920x1024) or higher

The configured layout will always be persisted once the Screen Layout utility is closed. And whenever the HMI is relaunched, it will open as per the last configured layout

Local KVM – MCP Local Configuration Utility (mcpcfg)

The MCP Gateway Local Configuration Utility (mcpcfg) is used to configure system level settings on the G500

Once the G500 device is powered up and has a valid license installed, click on the G500 name via the taskbar then click **Terminal**



A default Terminal application will be opened showing Login screen

- Login using Administrator credentials
- Shell based command line interface
- Type “**sudo mcpcfg**” and the user password when prompted

Proceed with the settings

```
GE Multilin MCP Firmware Release 300 Production Build 2528 2023-04-23:23:22:58
admin@G500:~$ sudo mcpcfg
[sudo] password for admin: █
```

```
=====
Gateway (G500) Settings Menu
=====

0. Back
1. Configure Authentication
2. Configure Network Settings
3. Configure Network Interfaces
4. Configure Secure Access
5. Configure Firewall
6. Configure Host Names
7. Configure Time & Time Sync
8. Reset System Logs
9. Reset Database Tables
10. Reset File Persistence Data
11. Local HMI
12. Configure Sync Manager
13. Redundancy
14. ARRM
15. Suppress Forced Qualities To Masters
16. Emulate D20 RTU IEC101 DPA Unbalanced Mode Functionality
17. Configure IEC101+104 DPA Startup Quality Event Suppress Interval
18. Configure Serial Ports
19. Configure D.20 Port Settings
20. EdgeOS Host
21. Clear Chassis Intrusion State
22. Restore Clone Snapshot
23. Restore Factory Default
24. Reboot Device

Enter Your Choice : ( Between 0 and 24 ):
```

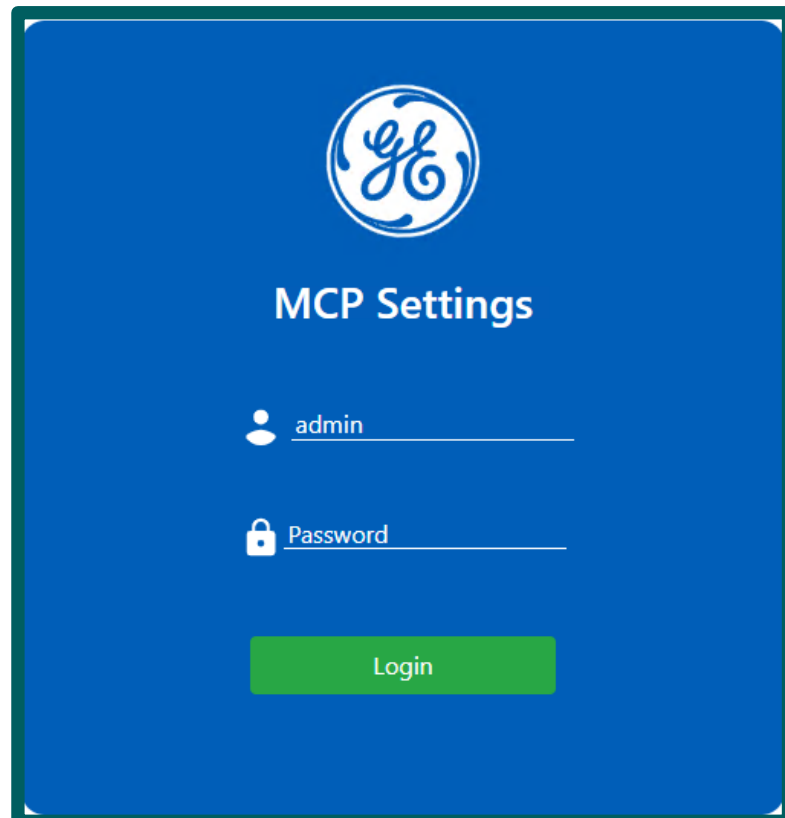
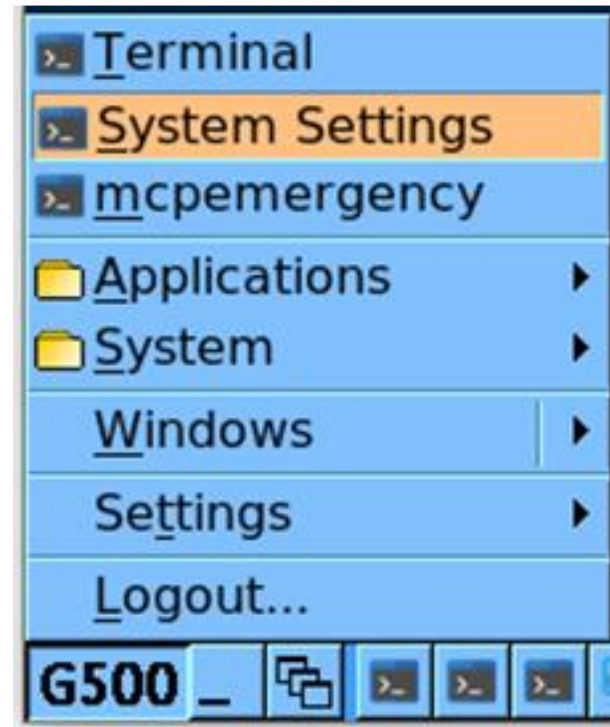
This interface is the Shell based equivalent of the MCP Settings GUI

Only one instance is allowed to run at any given time across both “mcpcfg” and “MCP Settings GUI”.

Local KVM – MCP Settings GUI

The MCP Settings GUI is the Web based equivalent of the MCP local Configuration Utility (mcpcfg), is used to configure system level settings on the G500

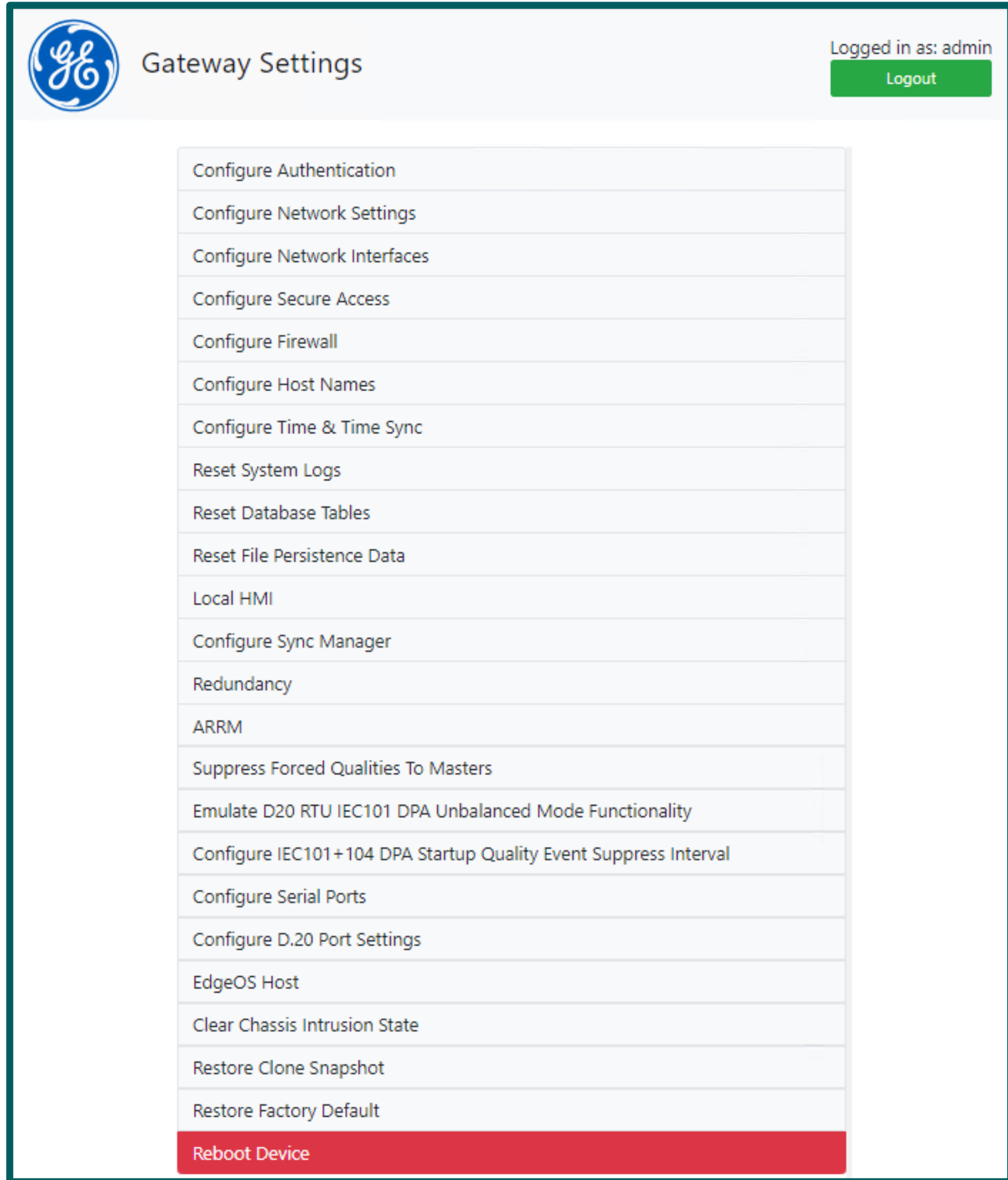
Once the G500 device is powered up and has a valid license installed, click on the G500 name via the taskbar then click **System Settings**



A default web browser will be opened showing MCP Settings Login screen

Login using Administrator credentials

Proceed with the settings



The functionality of the system is identical when system is configured via MCP Setting GUI or MCP Local Configuration Utility (mcpcfg). The only difference is that settings GUI is a Web based interface

Local KVM – Local MCP Runtime HMI

Local Runtime HMI will be started automatically once G500 is powered up and has a valid license installed

Local Runtime HMI can be launched by clicking on the G500 name via the taskbar then click **Application** → **G500HMI**

The Local Runtime HMI access is protected by a Login screen that requires a username and password

If configured with Auto Login, then Local Runtime HMI will be launched automatically with G500 Home Page and the configured user privileges

Local HMI Settings

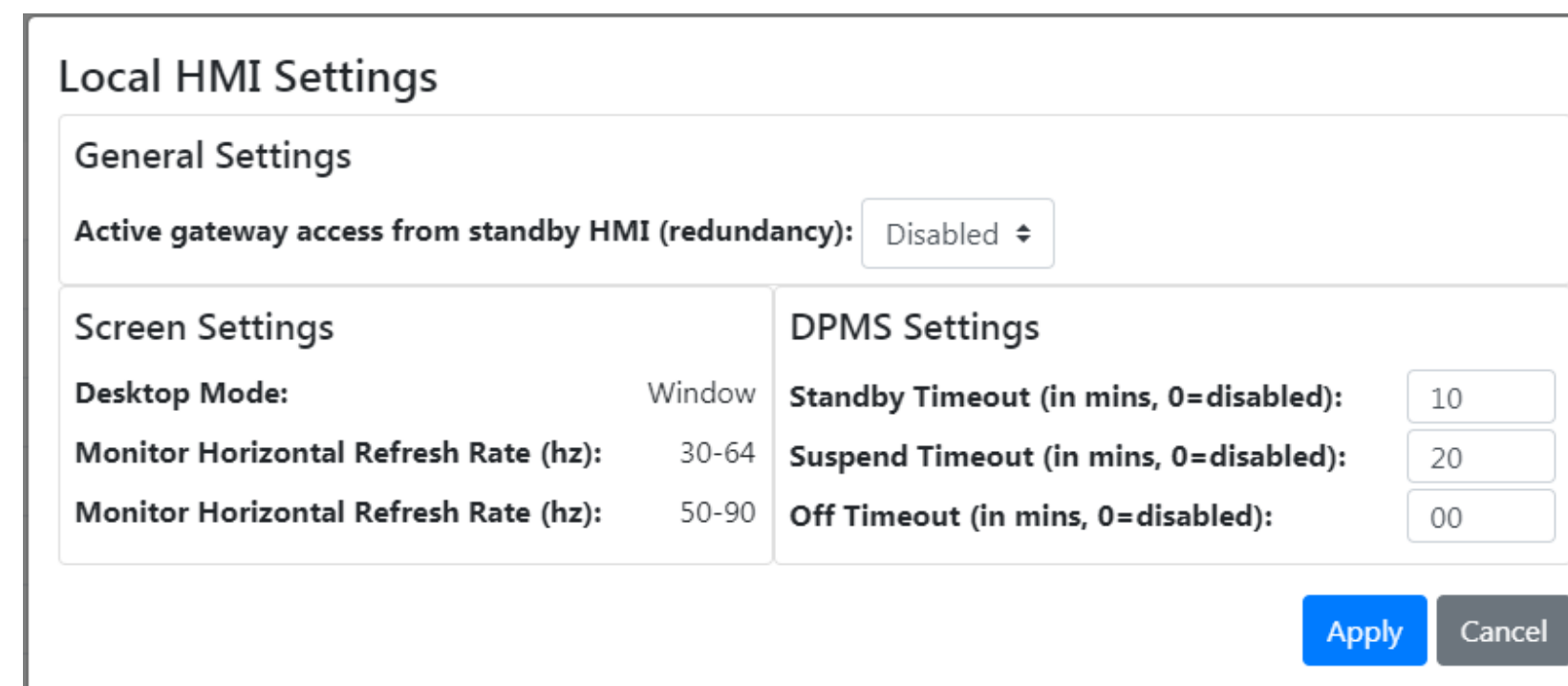
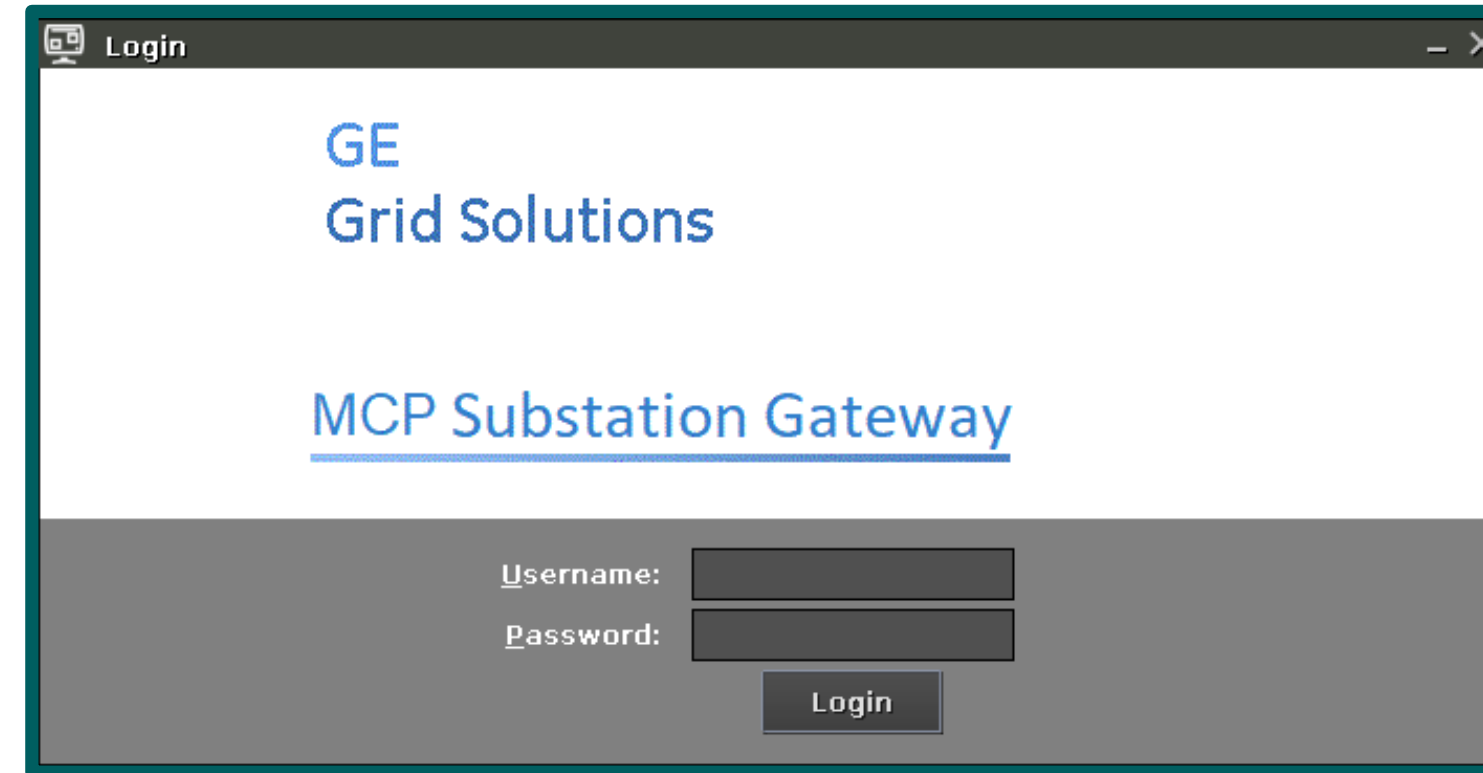
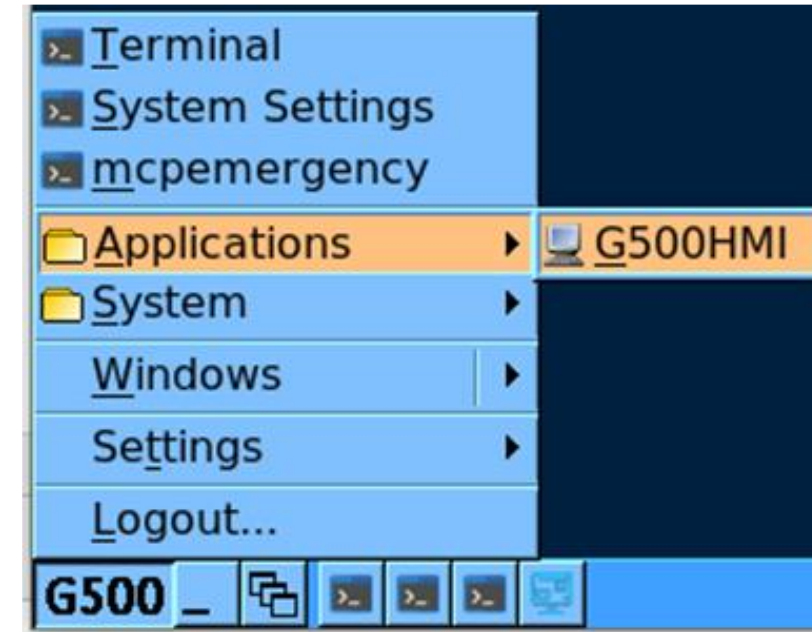
From system settings (mcpcfg or MCP Settings GUI), you can:

- Configure the settings of the monitor
- Enable/Disable Standby HMI Redirect to Active

Standby HMI Redirects to Active

If the Standby HMI redirects to the Active G500 when redundancy is enabled, both the Local HMI monitors connected to each G500 unit points to Active MCP only

The Local HMI Power Bar on each G500 indicates whether the Local HMI is showing information for this G500 or the PEER G500



The Local HMI provides the same functions for local display and control as the remote HMI with few exceptions

The User Login level/role determines which Local Runtime HMI features and functions the user can have access to/support

Multiple users can use the MCP Runtime HMI simultaneously, using any of the Local/Remote/Remote Desktop concurrently

The number of concurrent users is configurable under **Systemwide** → **Access Manager** → **Max Simultaneous Observers/ Operators/ Supervisors**

Ethernet – MCP Local Configuration Utility (mcpcfg) via SSH

- Establish network connection between the PC and the G500 (any LAN port)
- Terminal session with SSH as Protocol type with Port number: 22
- Login with Administrator credentials
- Shell based command line interface
- Type “sudo mcpcfg” and the user password when prompted
- Proceed with the settings

The PC and the G500 shall be in the same subnet to establish communications

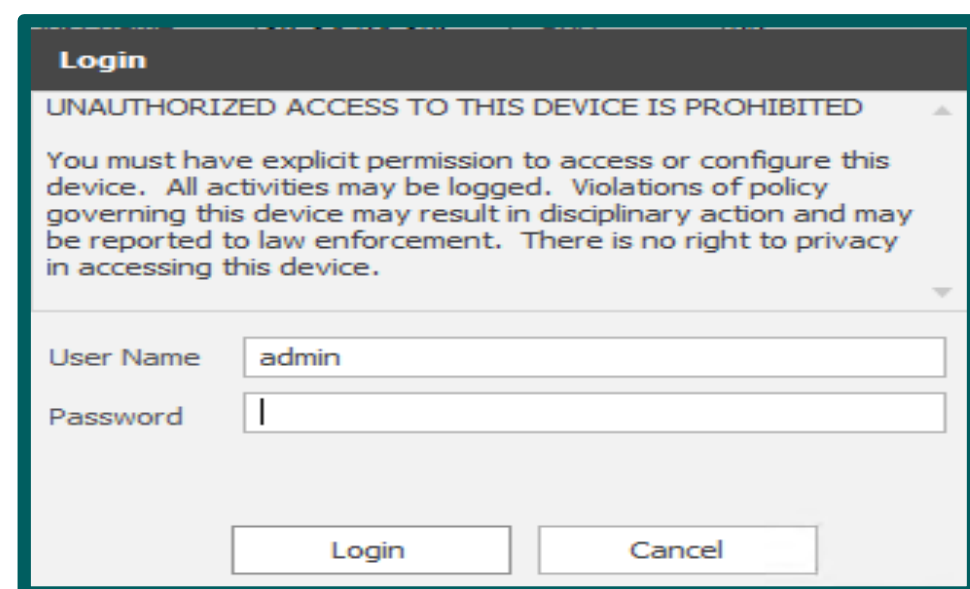
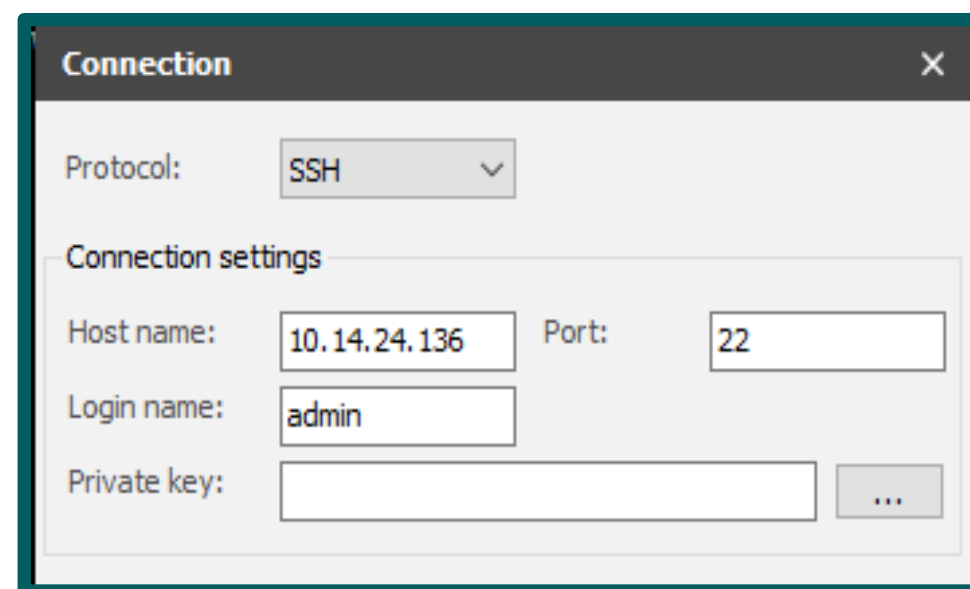
Ping is not enabled by default and can be enabled through the “Network Settings” option in mcpcfg

```
GE Multilin MCP Firmware Release 300 Production Build 2528 2023-04-23:23:22:58
admin@G500:~$ sudo mcpcfg
[sudo] password for admin: █
```

```
=====
Gateway (G500) Settings Menu
=====

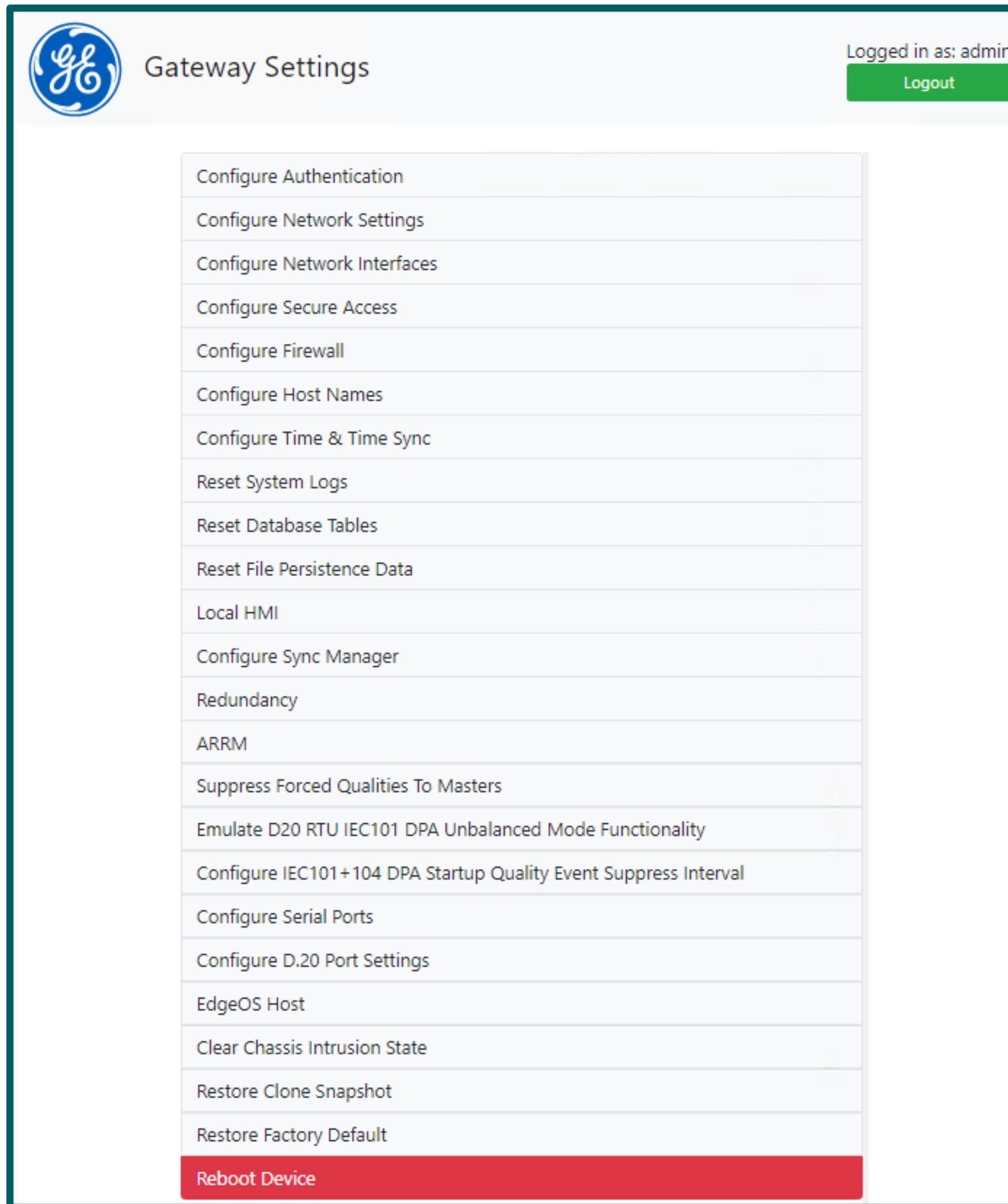
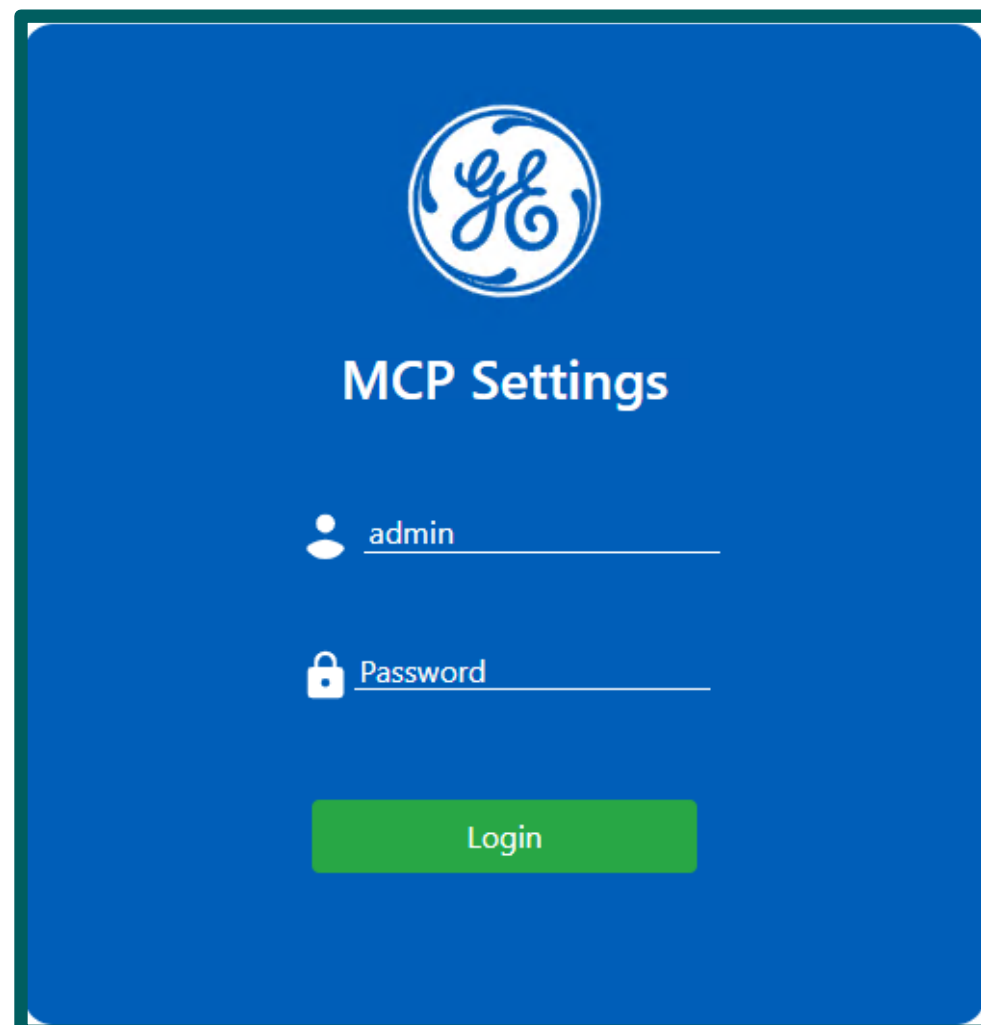
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24. Reboot Device

Enter Your Choice : ( Between 0 and 24 ):
```



Ethernet – MCP Settings GUI via HTTPS

- Web based equivalent of the MCP local Configuration Utility (mcpcfg)
- Establish network connection between the PC and the G500 (any LAN port)
- Using a supported web browser, disable proxy and enter the G500's IP address with port number 8081 into the address bar
- User is required to confirm security certificate exception
- The MCP Settings Login screen is displayed
- Login with Administrator credentials
- Proceed with the settings



The PC and the G500 should be in the same subnet to establish communication

Supported web browser: **Internet Explorer, Microsoft Edge, Mozilla Firefox and Google Chrome**

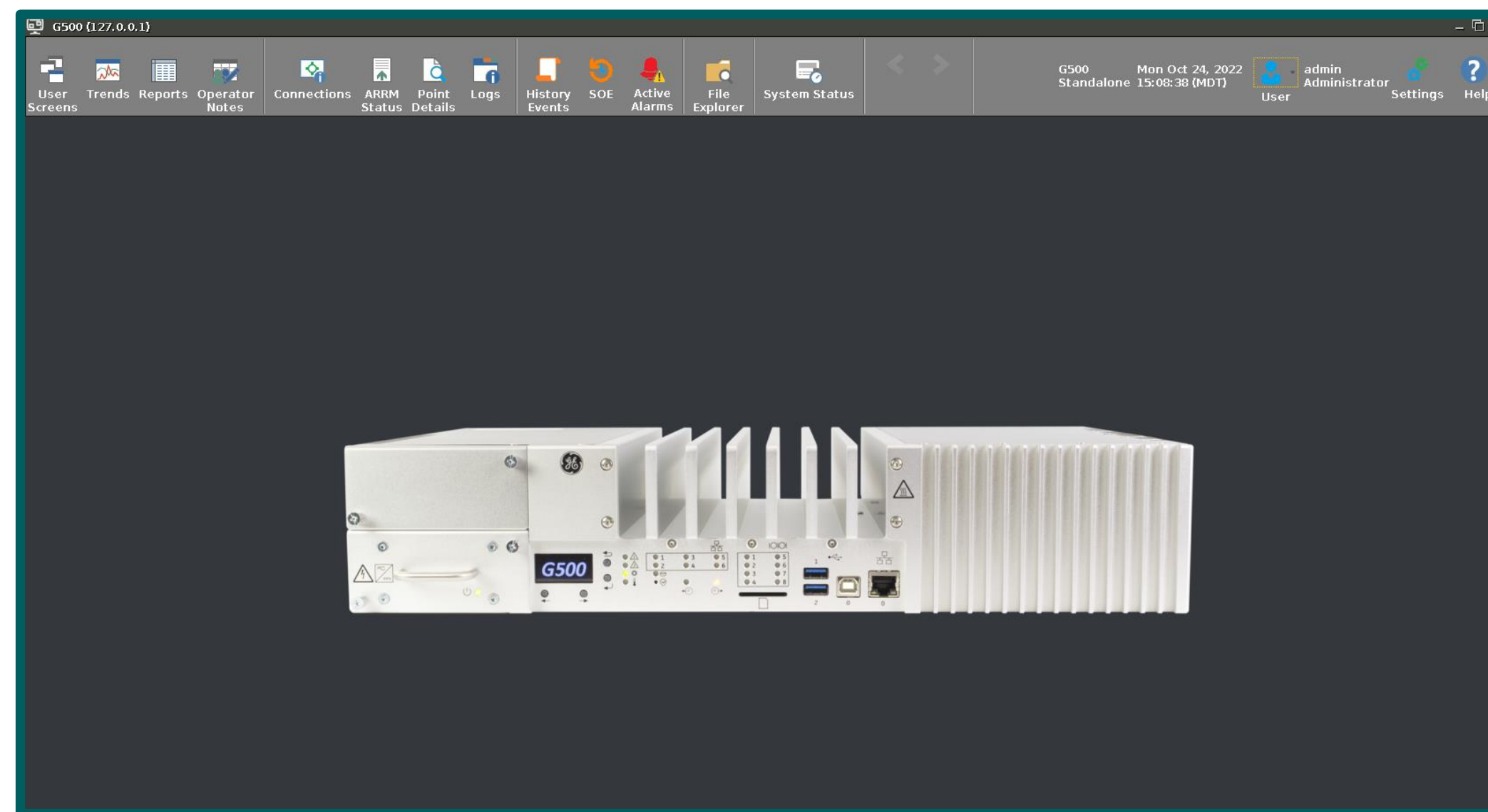
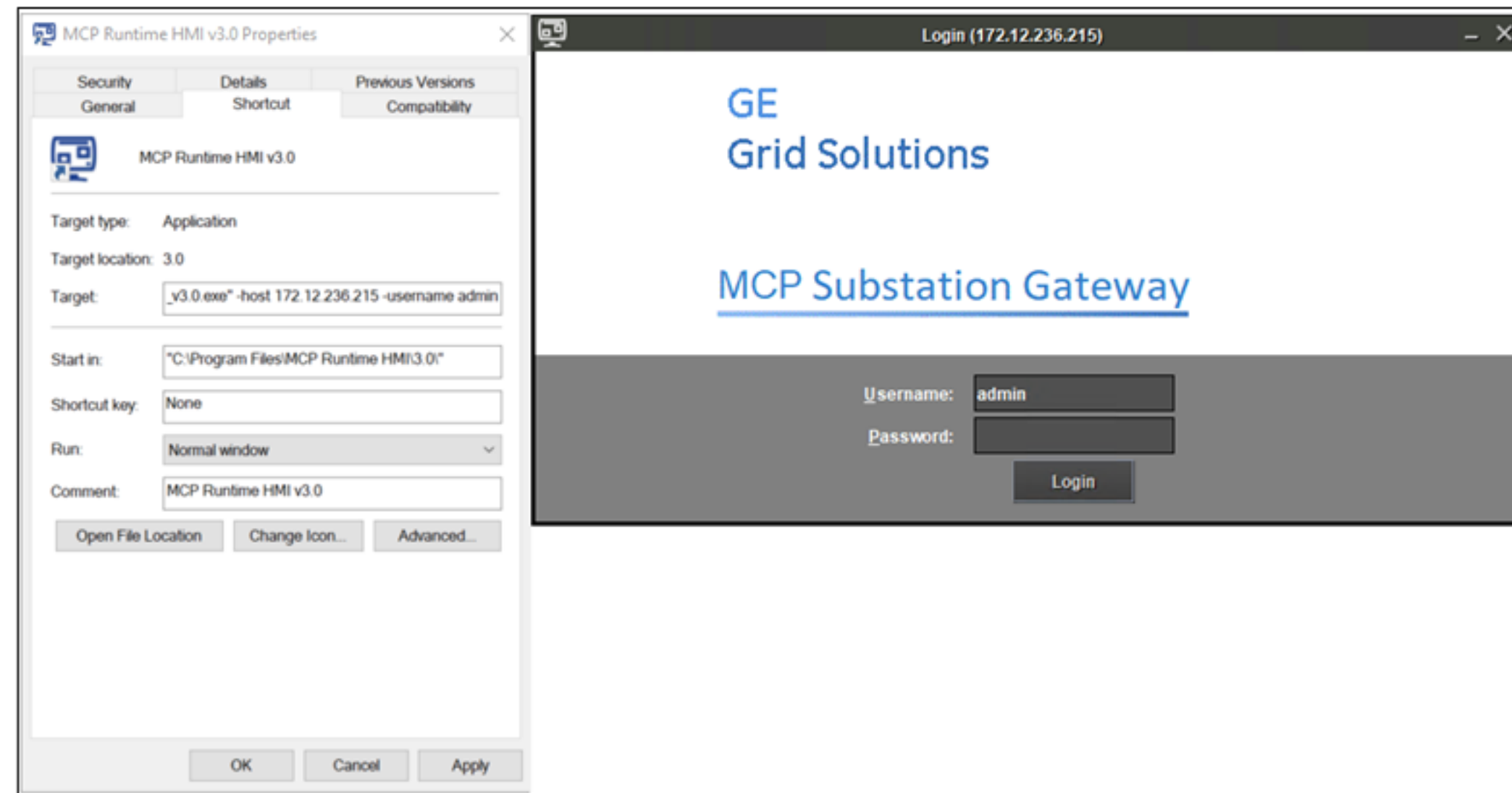
Only one instance is allowed to run at any given time between "mcpcfg" and "MCP Settings GUI".

Ethernet – Remote MCP Runtime HMI via HTTPS

The Remote Runtime HMI provides access to the G500 from a remote computer setup:

- Requires Windows x64 bit OS
- Requires download and installation of setup file
- The remote MCP Runtime HMI runs as a standalone application.
- Once launched, the login mode is always secure HTTPS and the default port number is 443
- The User Login level/role determines which MCP HMI features and functions the user can have access to/support
- By customizing MCP Runtime HMI shortcut, user can predefine the login User, IP Address, or Remote Port.
- When Remote HMI auto login is enabled, the configured user screen is launched automatically with the configure user and privilege level

User Management Authentication Automatic Login	
Name	
Local UI Automatic Login	false
Local UI Automatic Login Wait Time	60
Local Automatic Login Privilege Level	Observer
Local Automatic Login User	
Remote UI Automatic Login	true
Remote UI Automatic Login Wait Time	60
Remote Automatic Login Privilege Level	Observer
Remote Automatic Login User	auto_observer



Installation of Java/JRE on the Windows PC is not required.

After successful login, the MCP runtime HMI shows either G100 or G500 automatically, by detecting the connected device type.

The G500 contains a lock out feature which prevents you from logging in after several failed attempts for a set period.

Ethernet – MCP Runtime HMI via Remote Desktop (RD)

Starting with MCP v3.00 is possible to connect to a separate instance of the Local HMI using Remote Desktop (RD)

- Requires a Remote Desktop MCP license and a separate RD HMI Application installed using PETC based workflow
- RD sessions use the Windows Remote Desktop Connection application
- For security reasons, all RD sessions are handled inside an RD SSH tunnel.
- Only users declared Rdtunnel role will be able to initiate the RD SSH Tunnel session.
- Only one RD session is allowed at a time

RD Configuration and Settings

- Declare users with Rdtunnel role
- Enabled /Disabled RD functionality
- Configure RD inactivity timeout (default 15 mins)

Systemwide Settings	
System	
RTDB	
Event Logger	
Locale	
Access Manager	
GUI	
Holidays	
	Name
	Value
	8
	4
	5
	15
	1,440
	15
	5
	15
	Enabled
	10

```

Command Prompt - ssh -N -p 53389 -L 33389:127.0.0.1:33389 rduser1@192.168.168.81
C:\>ssh -N -p 53389 -L 33389:127.0.0.1:33389 rduser1@192.168.168.81
UNAUTHORIZED ACCESS TO THIS DEVICE IS PROHIBITED

You must have explicit permission to access or configure this device. All activities
may be logged. Violations of policy governing this device may result in disciplinary
action and may be reported to law enforcement. There is no right to privacy in access
ing this device.
rduser1@192.168.168.81's password:
    
```



The RD HMI application is not included in firmware images of MCP 3.0 (G100 and G500), unless was factory ordered

Users can operate independently the KVM Local HMI and the RD Local HMI Sessions

RD sessions with HMI application runs in the target, therefore the user experience relative to performance depends on the target device resources and loading

Maintenance Serial Port – MCP Local Configuration Utility (mcpcfg)

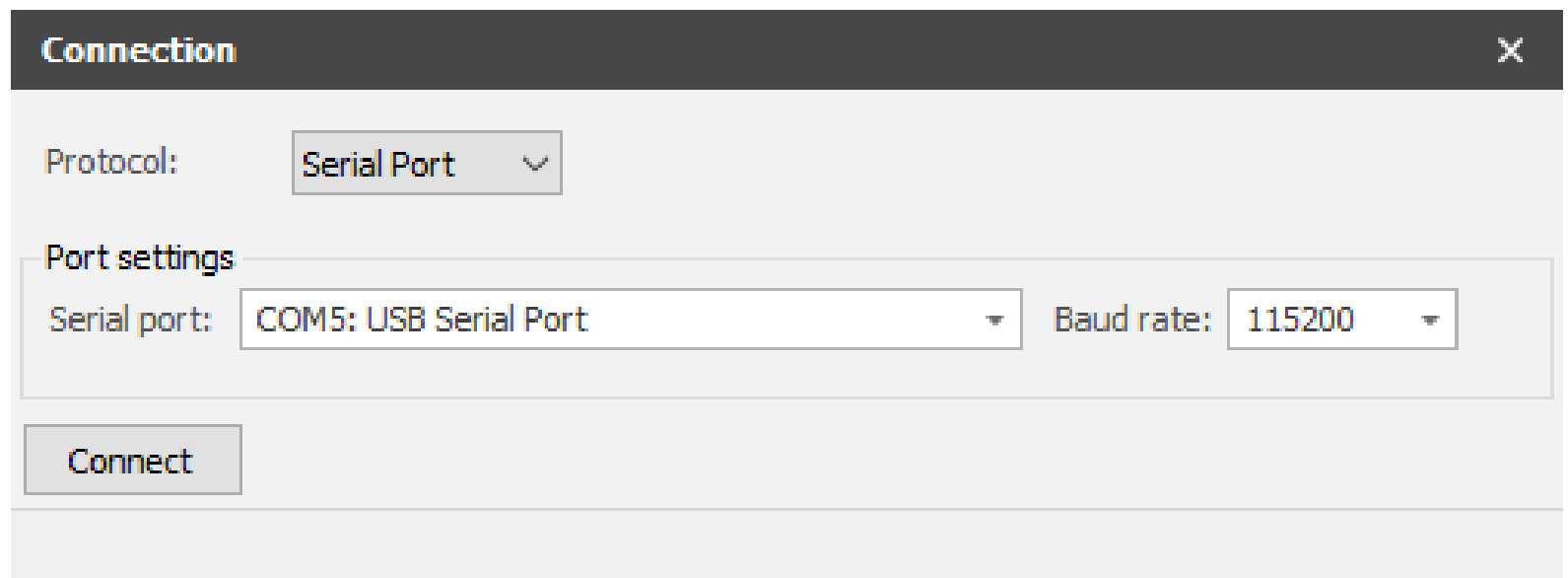
- Connect a USB 2.0 type B cable to your computer USB port and to the G500 front **Maintenance Serial Port**
- First time users will have to install the required Windows USB serial driver – **CDM21228_Setup.exe**:
 - Download G500 Resource ISO image file from GE Grid Solutions website
 - Under /Software folder when opened ISO image
- Launch the Terminal Application such as **Secure Terminal Emulator** from the **DS Agile Studio** folder in the start menu
- Select **File → Connect** and ensure the Protocol is set to **Serial Port**. Select the simulated G500 **USB Serial Port** with Baud rate – 115200 and then **Connect**.
- Login with Administrator credentials at the G500 command shell prompt.
- Type “**sudo mcpcfg**” and the user password when prompted
- Proceed with the settings

```
GE Multilin MCP Firmware Release 300 Production Build 2528 2023-04-23:23:22:58  
  
admin@G500:~$ sudo mcpcfg  
[sudo] password for admin: █
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Enter Your Choice : (Between 0 and 24):



Only one instance is allowed to run at any given time across both “mcpcfg” and “MCP Settings GUI”.



Learning & Development
Thank You

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