NWC OT Cybersecurity TCBU L1 Devices Hardening Design

National Water Company (NWC), KSA

SCADA/OT Information Security Implementation Project

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REVISION HISTORY

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GLOSSARY

Acronyms	Meaning
ACL	Access Control Lists
AD	Active Directory
ADC	Additional Domain Controller
ATM	Advance System and Technology
ATP	Adaptive Threat Protection
BOM	Bill of Material
BU	Business Unit
BYOD	Bring Your Own Device
CAP	Client Authorization Policy
CAS	Central Administration Server
CIP	Critical Infrastructure Protection
CMC	Central Management Console (Nozomi)
CSMS	Cyber Security Management System
DCS	Distributed Control System
DLD	Detailed-Level Design
DMZ	Demilitarized Zone
DNS	Domain Name System
DNS	Domain Name System
ECC	Essential Cybersecurity Controls
ePO	ePolicy Orchestrator
EPP	End Point Protection
GPS	Global Positioning System
HCIS	High Commission for Industrial Security
HLD	High Level Design
HMI	Human Machine Interface
HSE	Health, Safety, And Environmental
ICS	Industrial Control System
IDS	Intrusion detection System
IPS	Intrusion Prevention System
ISA	International Society of Automation
ISO	International Organization for Standardization
IT	Information Technology
JCBU	Jeddah Central Business Unit
KSA	Kingdom of Saudi Arabia
MBSS	Minimum Baseline Security Standards
MCBU	Makkah Central Business Unit
MDCBU	Madinah Central Business Unit
MGMT	Management
NCA	National Cybersecurity Authority
NERC	North American Electric Reliability Corporation
NGFW	Next Generation Firewall

Acronyms	Meaning
NIST	U.S. National Institute of Standards and Technology
NTP	Network Time Protocol
NWC	National Water Company
OT	Operational Technology
PDC	Primary Domain Controller
PLC	Programmable Logic Controller
RAP	Resource Authorization Policy
RCBU	Riyadh Central Business Unit
RD	Remote Desktop
RDS	Remote Desktop Services
RTO	Recovery Time Objective
RPO	Recovery Point Objective
SCADA	Supervisory Control and Data Acquisition
SIEM	Security Incident & Event Management Solution
SSL	Secure Socket Layer
TCBU	Taif Central Business Unit
VLAN	Virtual Local Area Network
VM	Virtual Machine
VPN	Virtual Private Network

REFERENCE DOCUMENTS

S/N	Document No.	Title
1	A01001045-HLD-ARCH.00	NWC OT Cybersecurity HLD Reference Architecture
2	A01001045-HLD	NWC OT Cybersecurity High-Level Design
3	A01001045-INV.00	NWC SCADA/OT Asset Inventory
4	ECC – 1: 2018	KSA NCA Essential Cybersecurity Controls (ECC – 1: 2018)
5	ISA–62443-1-1 (99.01.01)–2007	Security for Industrial Automation and Control Systems Part 1-1: Terminology, Concepts, and Models

Table of Contents

1. DOCUMENT PURPOSE

The purpose of this document is to describe the Hardening Configuration of different L1 Devices in TCBU.

Following are list of L1 Devices installed at sites:

- Modicon Quantum & Premium
- Siemens S7-1200, 400 & 300
- Rockwell MicroLogix 1400
- Motorola ACE3600
- Siemens Scalene X-204
- ConneXium TCSESM

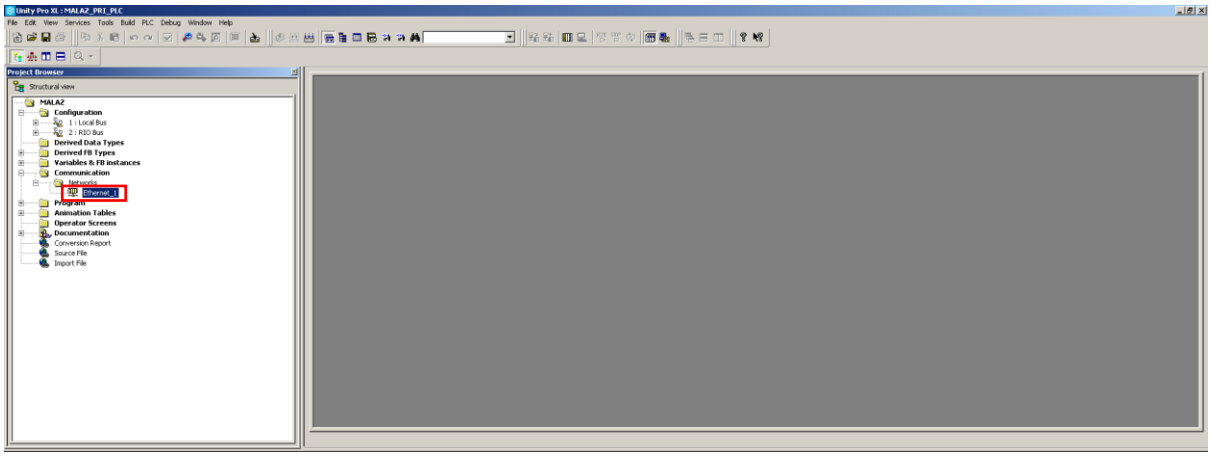
2. TCBU LEVEL 1 DEVICE HARDENING SETTINGS

2.1 MODICON QUANTUM & PREMIUM

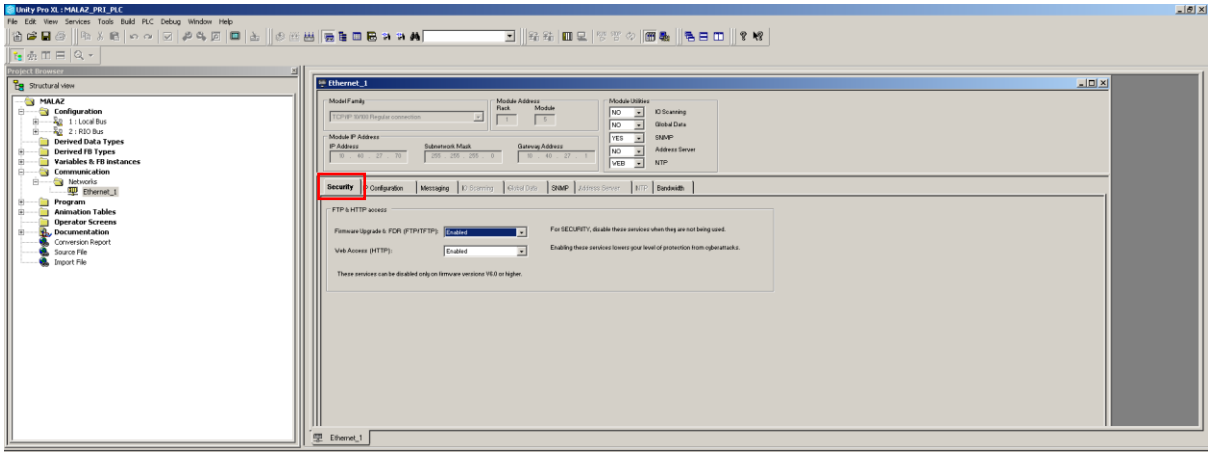
- Upgrade firmware
- Set password for security lock feature
- Disable HTTP/FTP ethernet services

Following is the procedure of how to disable HTTP/FTP services:

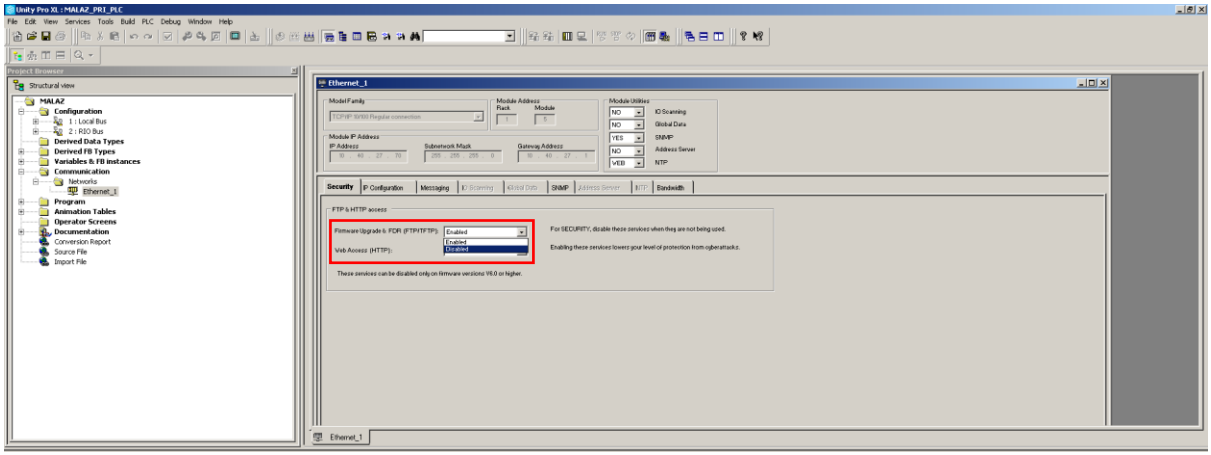
Step 1: Select Communication >> Networks >> Ethernet_1



Step 2: Select Security tab in Ethernet_1 window

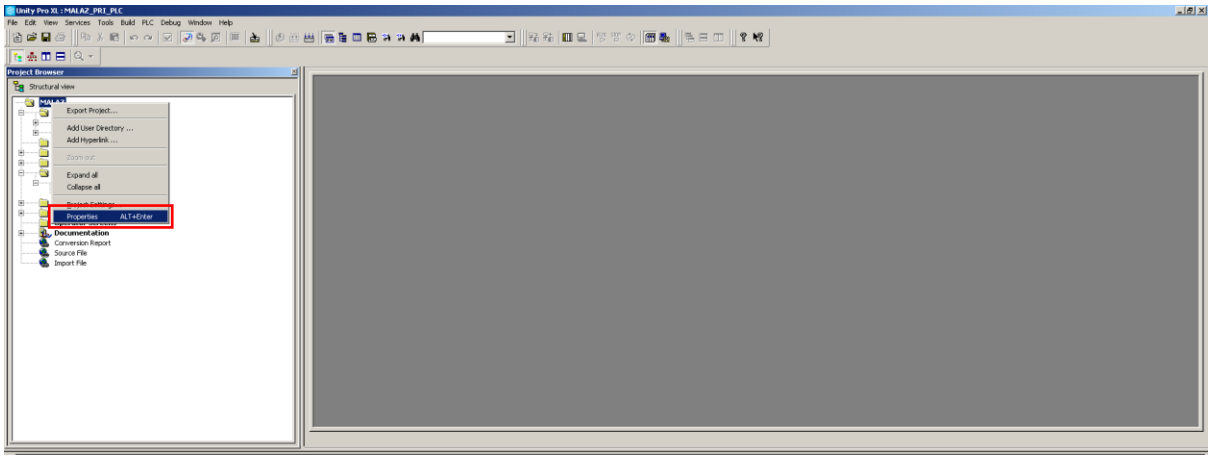


Step 3: In security tab, disable HTTP/FTP services

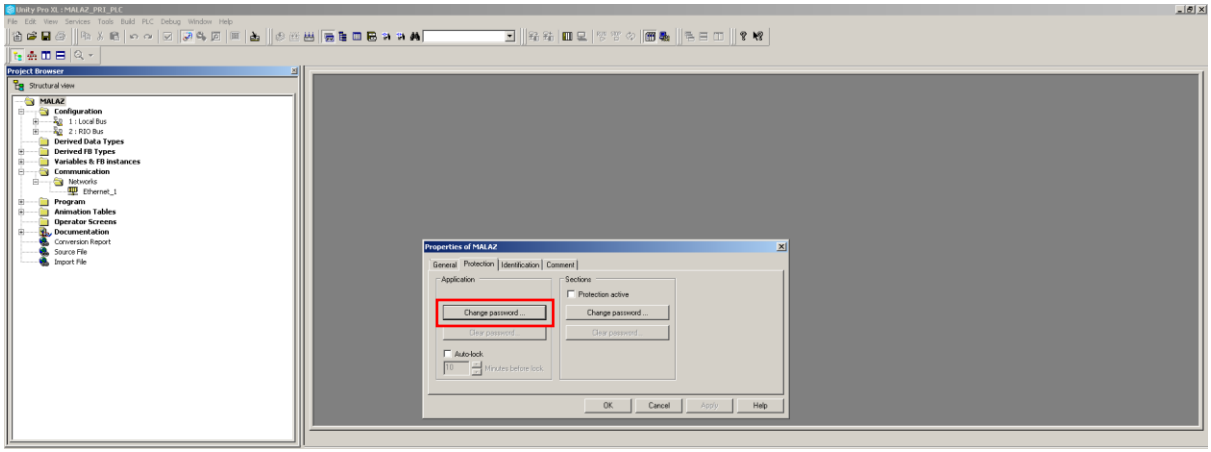


Following is the procedure to password protect the application:

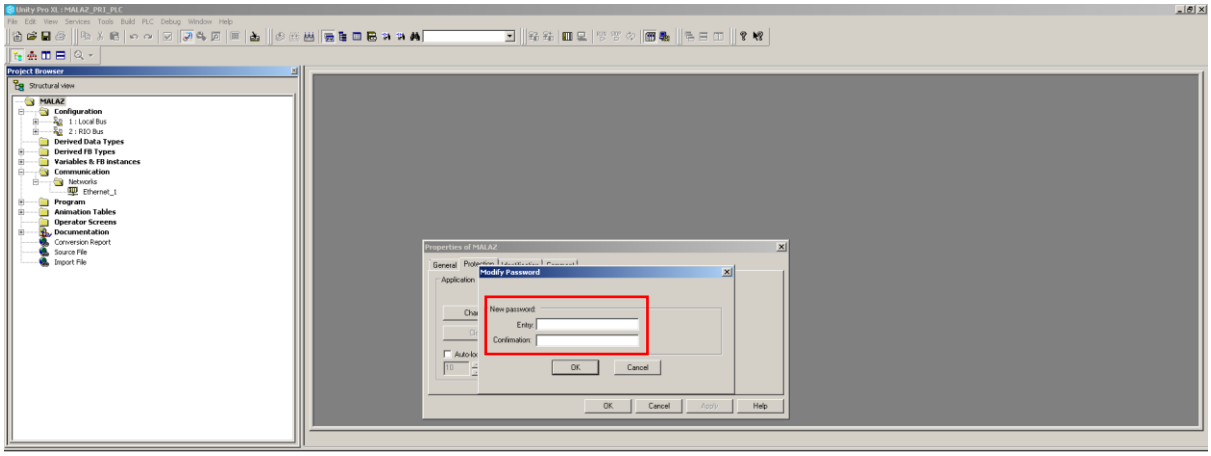
Step 1: Select the project and right click to select the properties



Step 2: Select “Protection” tab in properties, select change password

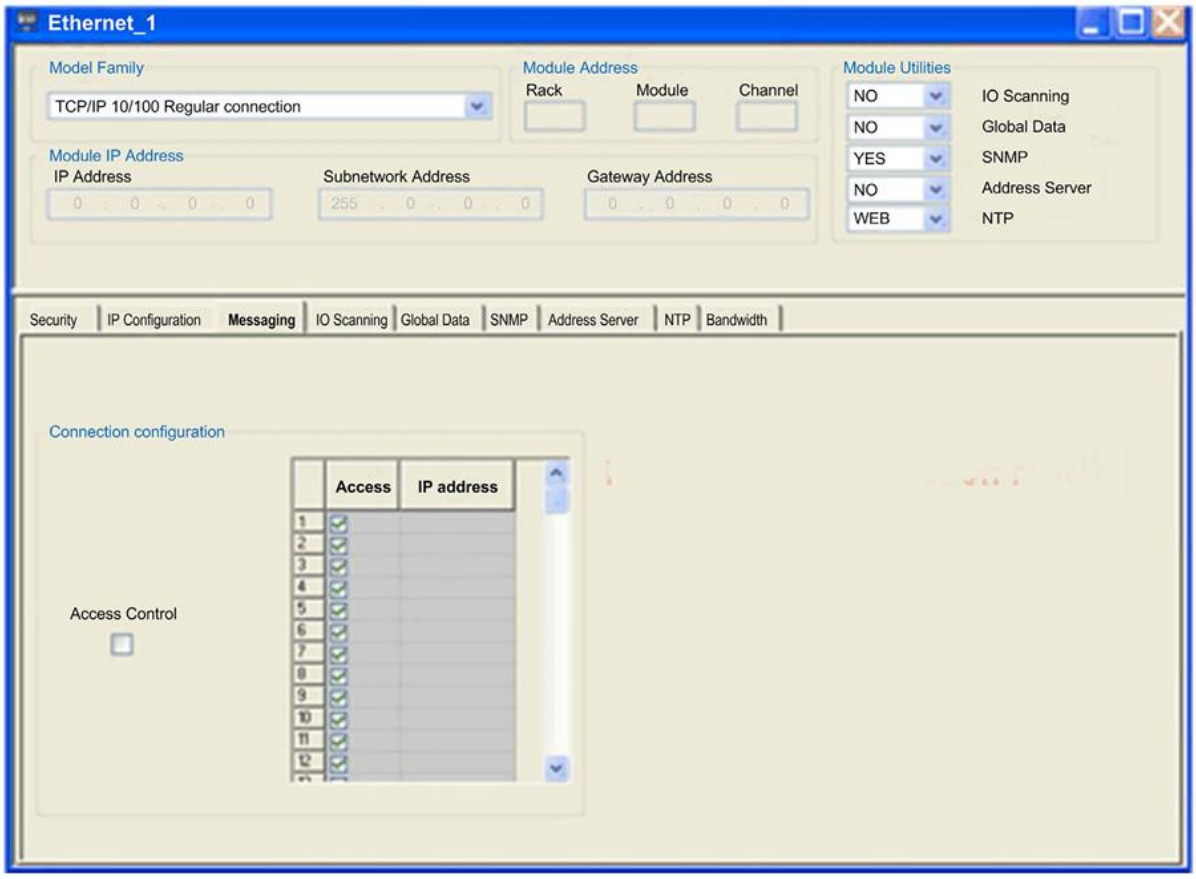


Step 3: Enter the new password and confirm it

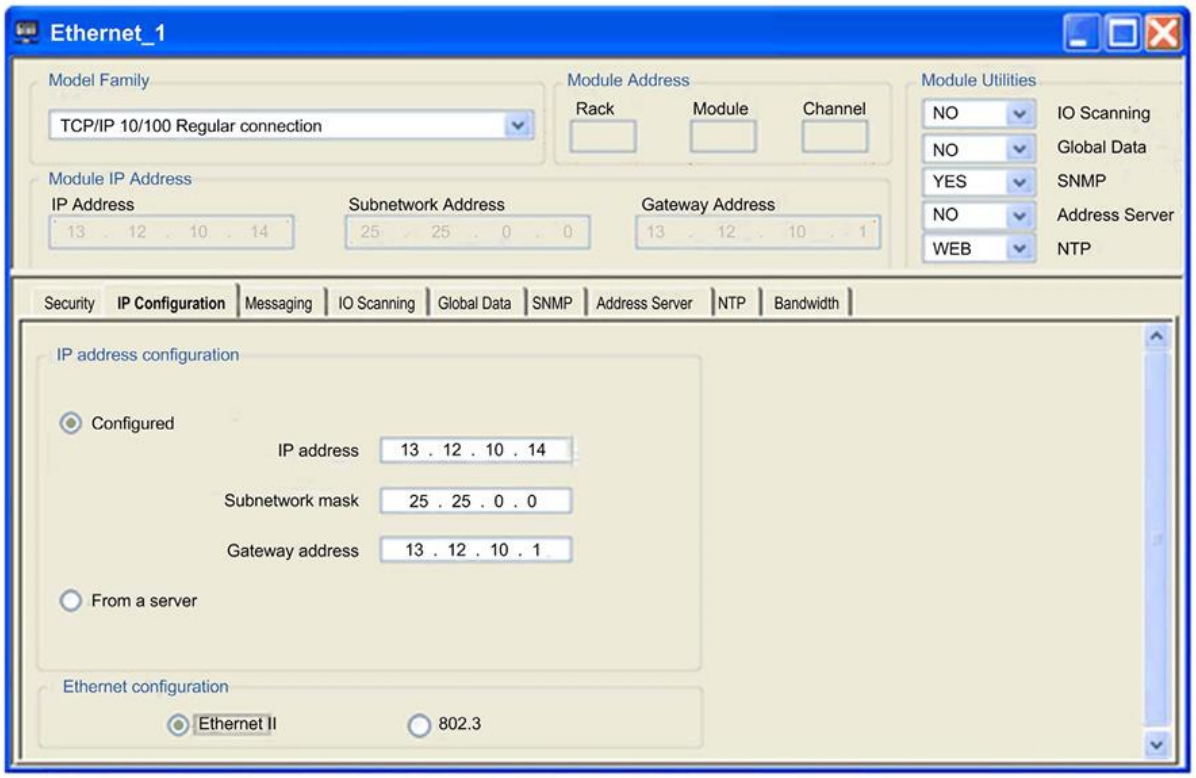


For IP Setting:

Step 1: Go to Communication > Networks > Ethernet_1 and double click Ethernet_1



Step 2: Select the IP Configuration tab and change the IP settings



For firmware upgrade, see “Attachment 1-Section 2.1 - Modicon Quantum_Firmware Upgrade Process”

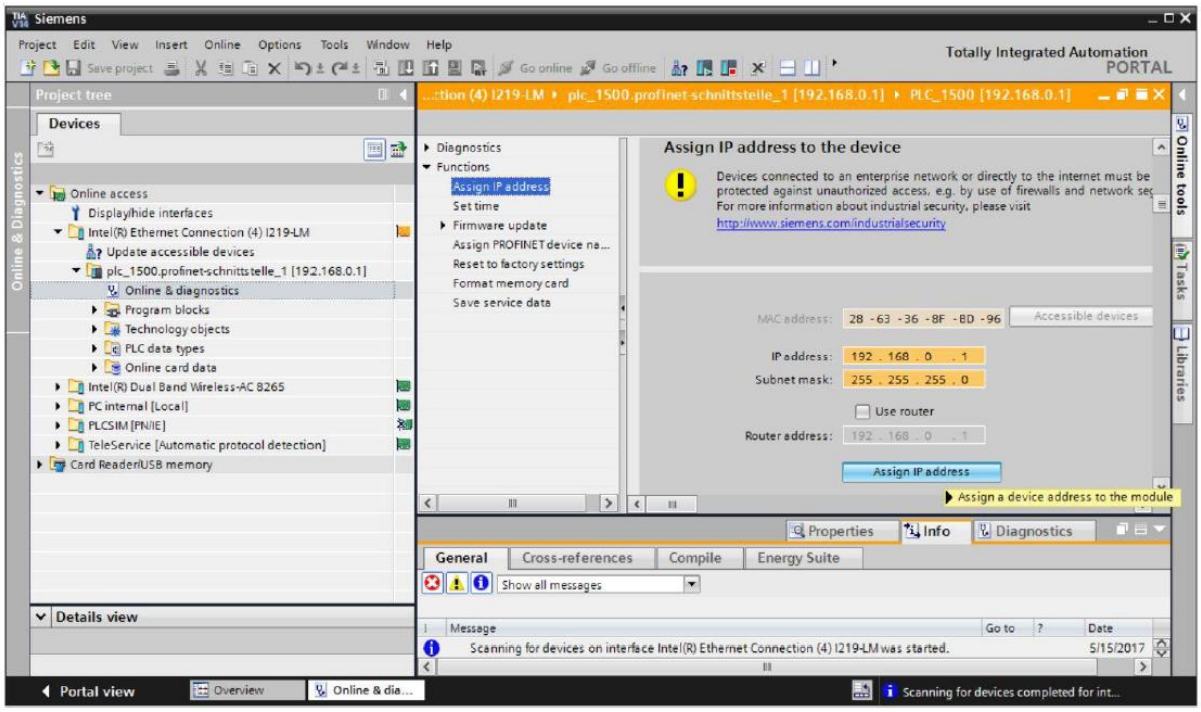
2.2 SIEMENS S7-1200, S7-400 & S7-300

- Upgrade firmware
- Set password for security lock feature
- Disable HTTP/FTP ethernet services

For IP Setting:

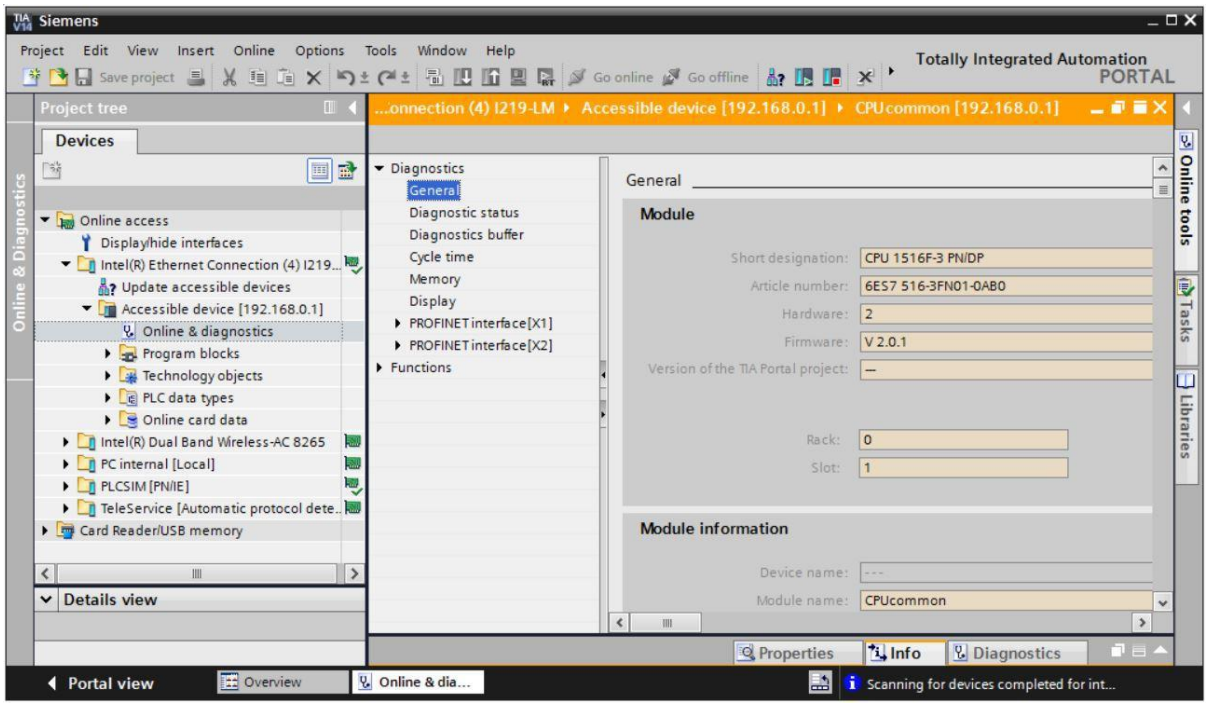
Step 1: Go to “Online & Diagnostics”

Step 2: Under "Functions", you now find the "Assign IP address" item. Enter the following IP address here (example): IP address: 192.168.0.1 Subnet mask 255.255.255.0. Next, click "Assign IP address" and this new address will be assigned.

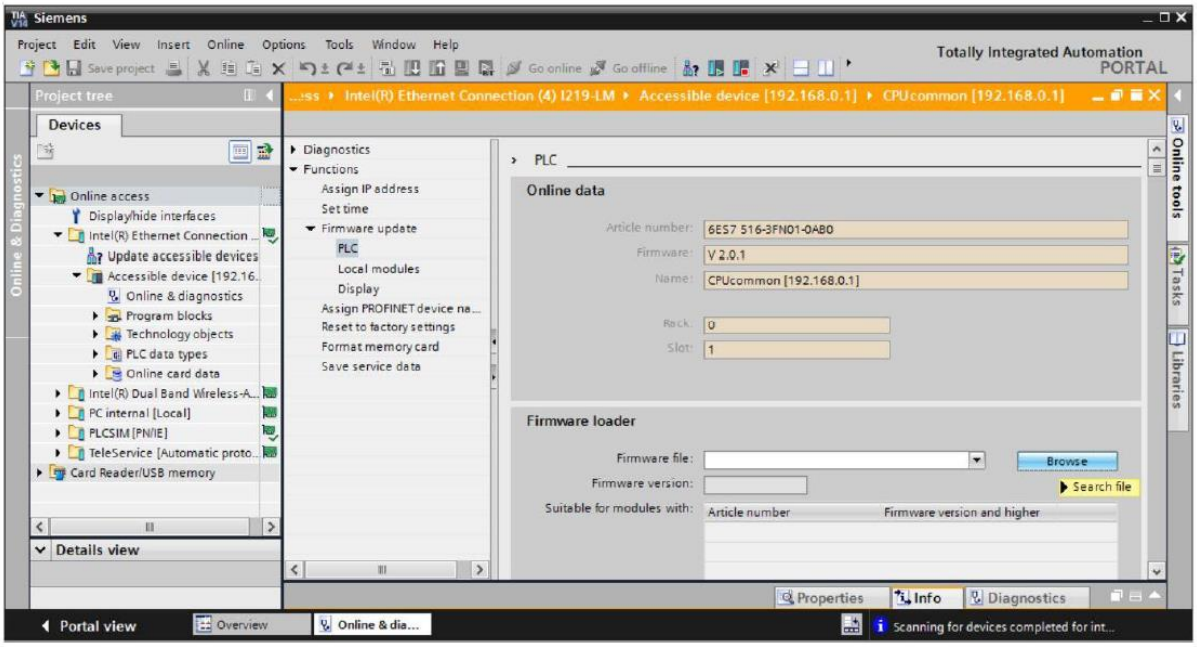


For firmware upgrade:

Step 1:

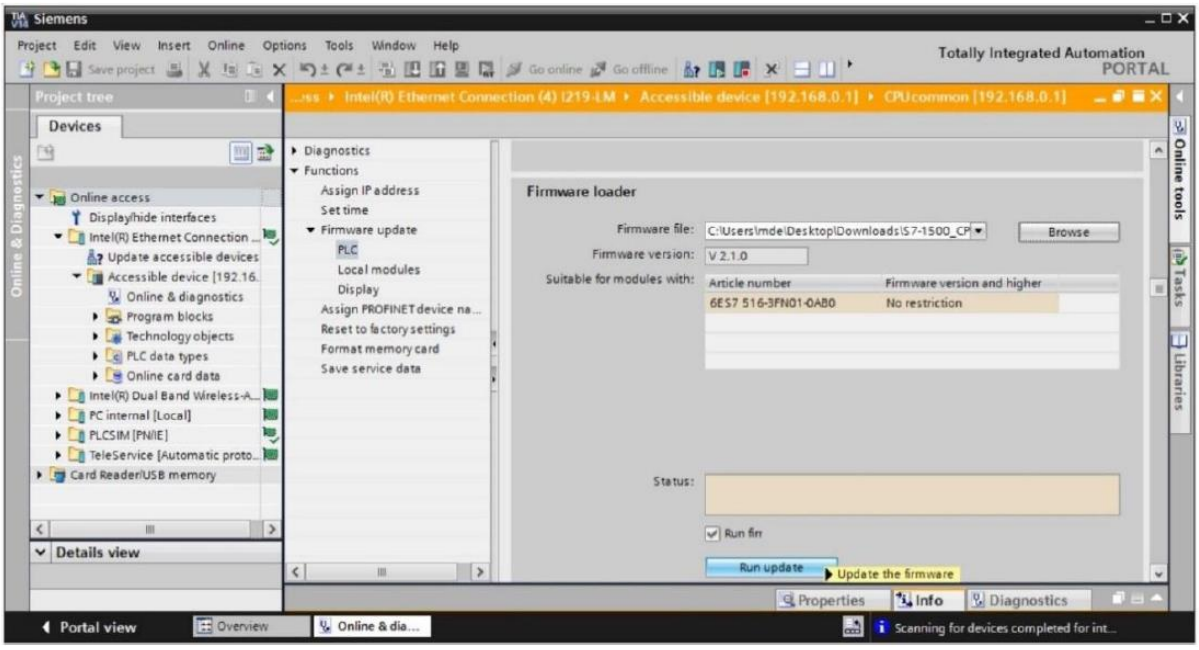


Step 2: In the "Functions" menu, change to "Firmware update" > "PLC". In the "Firmware loader" sub-item, click "Browse".

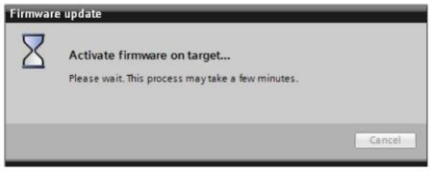


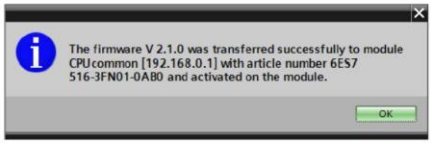
Step 3: Select the downloaded and extracted firmware file.

Step 4: The following dialog indicates whether your firmware file is compatible with your CPU. Now start the update. ("Run update")



Step 5: The progress of the update and its successful completion are indicated with the following dialogs. Click "OK" to confirm.





2.3 ROCKWELL MICROLOGIX 1400

- Upgrade firmware
- Set password for security lock feature
- Disable HTTP/FTP ethernet services

For IP Setting:

Step 1: Using RS Logix 500, go to Channel configuration, Channel 1, uncheck the BootP/DHCP tick box, edit the IP and subnet mask fields (gateway too if necessary), then apply the changes.

Step 2: Power cycle the PLC.

For firmware upgrade, refer to the “Attachment 2-MicroLogix 1400 Firmware Upgrade”.

2.4 MOTOROLA ACE3600

- Upgrade firmware
- Set password for security lock feature
- Disable HTTP/FTP ethernet services

For IP Change refer to the “Attachment 3-Motorola ACE3600 IP Config”.

For Firmware Upgrade refer to “Attachment 4-Motorola ACE3600 Firmware Upgrade”.

2.5 SEIMENS SCALANCE-X-204

- Default username and password should be changed

Note Default password when supplied ● For Admin: admin ● For the user: user.

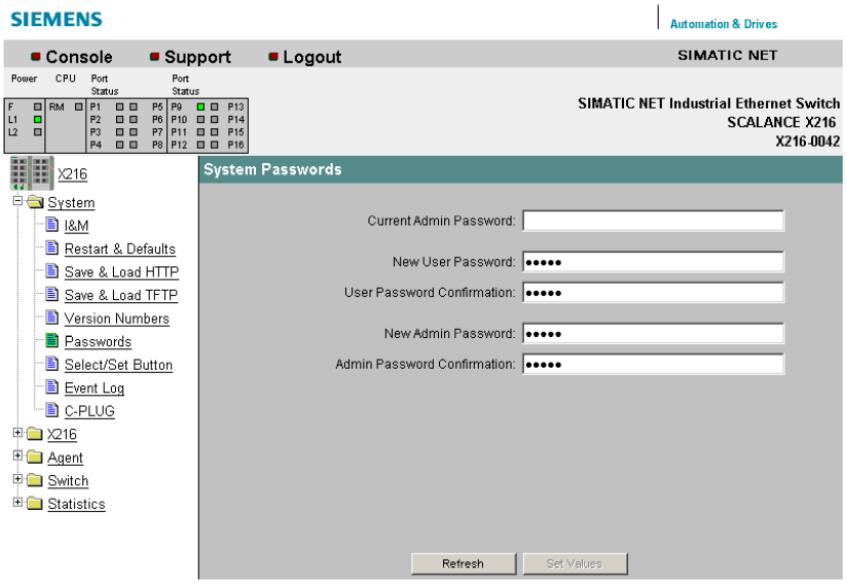


Figure 7-7 System Passwords

Table 7-7 System Passwords - CLI\SYSTEM>

Command	Description	Comment
password <admin | user> <password>	Sets a new password for the user or administrator.	Administrator only

- Unused Port should be block for Managed switch

- IP http/telnet/ftp should be disable only HTTPs/ssh/sftp should used
- Serial Access should be password Protected
- Should configure the Login Banner
- Firmware needs to be upgraded from vendor release

2.6 CONNEXIUM TCSESM, TCSESM-E MANAGED SWITCH

- Default username and password should be changed

Figure 3: Logging in to the Command Line Interface program

☐ Enter a user name. The default setting for the user name is **admin** . Press the Enter key.
☐ Enter the password. The default setting for the password is **private** . Press the Enter key.
You can change the user name and the password later in the Command Line Interface.
Please note that these entries are case-sensitive.

The start screen appears.

Note: For a TCSESM Switch, the preset CLI prompt is `(Schneider Electric TCSESM) >` , for a TCSESM-E Switch it is `(Schneider Electric TCSESM-E) >`.

- Unused Port should be block for Managed switch

Switching the port on and off
In the state on delivery, all the ports are switched on. For a higher level of access security, switch off the ports at which you are not making any connection.

- ☐ Select the `Basics:Port Configuration` dialog.
- ☐ In the "Port on" column, select the ports that are connected to another device.

Selecting the operating mode
In the state on delivery, all the ports are set to the “Automatic configuration” operating mode.

Note: The active automatic configuration has priority over the manual configuration.

- ☐ Select the `Basics:Port Configuration` dialog.
- ☐ If the device connected to this port requires a fixed setting
  - select the operating mode (transmission rate, duplex mode) in the "Manual configuration" column and
  - deactivate the port in the "Automatic configuration" column.

- IP http/telnet should be disable only HTTPs/ssh should be used for access

`enable`	Switch to the privileged EXEC mode.
`configure`	Switch to the Configuration mode.

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Assistance in the Protection from Un-authorized Access 6.3 Telnet/Web/SSH access

`lineconfig`	Switch to the configuration mode for CLI.
`transport input telnet`	Enable Telnet server.
`no transport input telnet`	Disable Telnet server.
`exit`	Switch to the Configuration mode.
`exit`	Switch to the privileged EXEC mode.
`ip http server`	Enable Web server.
`no ip http server`	Disable Web server.

- Serial Access should be password Protected

- Should configure the Login Banner
- Firmware needs to be upgraded from vendor release

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