ioPAC 6500 Series User Manual

Version 1.4, November 2026

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ioPAC 6500 Series User Manual

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1. About This Manual

In this chapter, we explain the scope of and how to use this document.

Revision History

Version	Change	Date
v1.0	First release	2024-11-27
v1.1	Add 5290, 3800H, 5801. Updating Services, Software Configuration	2025-08-01
v1.2	Minor corrections	2026-02-01
v1.3	Add 2804, 4450. Refresh architecture overview and installation guides.	2026-07-31
v1.4	Add Static Route, Tag synchronization, Protocol service optimization, and 5621.	2026-11-05

Relevant Models

This document only applies to the models listed below.

Model Name	Description
65M-CPU14-IEC-CT-T	Control CPU Module with IEC61131 programming, 3-in-1 serial port x 2, 10/100/1000 Ethernet port x 2
65M-PW0075-CT-T	Power module, 24 VDC, 75 W
65M-5011M-CT-T	Layer 2 managed switch module with 2 100/1000 fiber ports, 8 10/100/1000 Ethernet ports
65M-5290-CT-T	Expansion module, RJ45 x 2, SFP x 2, Combo Port
65M-5621-CT-T	Firewall module with 2 1000 fiber ports, 4 10/100/1000 Ethernet ports
65M-1900-CT-T	32 DI module, 24 VDC, with 8CH/10 KHz counter mode
65M-2804-CT-T	8 relay module, VAC and VDC with 2 COMs
65M-2901-CT-T	32 DO module, 24 VDC, with 8CH pulse-out mode
65M-3600-CT-T	16 AI modules 0-20 mA/4-20 mA
65M-3610-CT-T	16 AI modules,1 to 5 VDC/0 to 10 VDC
65M-3800H-CT-T	8 AI module 4-20 mA with HART
65M-4450-CT-T	4 Ch-Ch Isolated AO module, Voltage and Current mode
65M-4820-CT-T	8 AO group isolation modules, voltage and current mode
65M-5801-CT-T	8 serial module RS232/422/485-2w
65M-BMPW01-CT-T	Power module backplane 1 slot
65M-BMPW02-CT-T	Power module backplane 2 slots
65M-BMCM01-CT-T	Communication or networking module backplane 1 slot
65M-BMCM02-CT-T	Communication or networking module backplane 2 slots
65M-BMCPU01-CT-T	CPU module backplane 1 slot
65M-BMCPU02-CT-T	CPU module backplane 2 slots
65M-BMIO02-CT-T	I/O module backplane 2 slots
65M-BMIO04-CT-T	I/O module backplane 4 slots
65M-TB-1900-CT-T	Terminal block for 32 DI modules, 24 VDC, with 8CH/10 KHz counter mode
65M-TB-2804-CT-T	Terminal block for 8 relay modules, VAC and VDC, with 2 COMs
65M-TB-2901-CT-T	Terminal block for 32 DO modules, 24 VDC, with 8CH pulse-out mode
65M-TB-3600-CT-T	Terminal block for 16 AI modules 4-20 mA
65M-TB-3610-CT-T	Terminal block for 16 AI modules 1 to 5 VDC/0 to 10 VDC
65M-TB-4450-CT-T	Terminal block for 4 Ch-Ch isolated AO modules voltage and current mode
65M-TB-4820-CT-T	Terminal block for 8 AO group isolation modules 4-20 mA/1 to 5 VDC
65M-TB-3800H-CT-T	Terminal block for 8 AI module 4-20 mA with HART
65M-TB-5801-CT-T	Terminal block for 8 serial modules

Package Contents

The following items are included in the product package.

- The 65M module device
- Quick installation guide (Printed)
- Pinout card (65M-TB Series only)
- Warranty card

Hardware and Software Requirements

You will need the following hardware and software to use the ioPAC 6500 Series.

- A power source that provides 24 VDC, and power wires
- A PC running a Windows 11 OS with Chrome installed and an Ethernet cable
- IINxpress software utility
- PACTware (If HART module is used)

Safety Precautions

Observe the following safety precautions when installing and using the ioPAC 6500 Series:

DANGER

Never work on the device while the power source is switched on. Disconnect all power sources to the device before performing installation, repair, or maintenance work.

DANGER

Disconnect the power when you want to remove or replace components or disconnect equipment unless the area is free of ignitable substances.

- If you connect or disconnect the Removable Terminal Block when field power is applied, an electrical arc can occur. This could cause an explosion when installed in hazardous locations. Ensure that power is removed, or the area is nonhazardous before installation.
- If you connect or disconnect wiring while the power is on, an electrical arc can occur. This could cause an explosion in hazardous environments. Ensure that power is removed, or the area is nonhazardous before installation.
- Do not disconnect the unit unless the power has been disconnected, or the area is nonhazardous. In a hazardous area, the unit must be powered down before removing it.

WARNING

This unit is sensitive to Electrostatic Discharge, which can cause internal damage and affect operations. Follow these guidelines when you handle this unit:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wristband.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- Use a static-safe workstation, if available.
- Store the device in static-safe packaging when not in use.

WARNING

Check the voltage supplied by the power source. Make sure the voltage provided by the power source matches the voltage required by the device.

WARNING

Check the voltage or current of the sensors or loads. Make sure the voltage and/or current shown on the sensors or loads correspond to the specifications of your 65M module before you connect the device.

WARNING

Connect your device to an earthed ground.

CAUTION

Do not use the device if the device is already damaged. Replace defective or damaged devices to ensure that your devices function properly.

CAUTION

Do not repair the device yourself. If your device needs to be repaired, return the device to Moxa's customer service department. Attempting to repair the device yourself could invalidate the device's warranty.

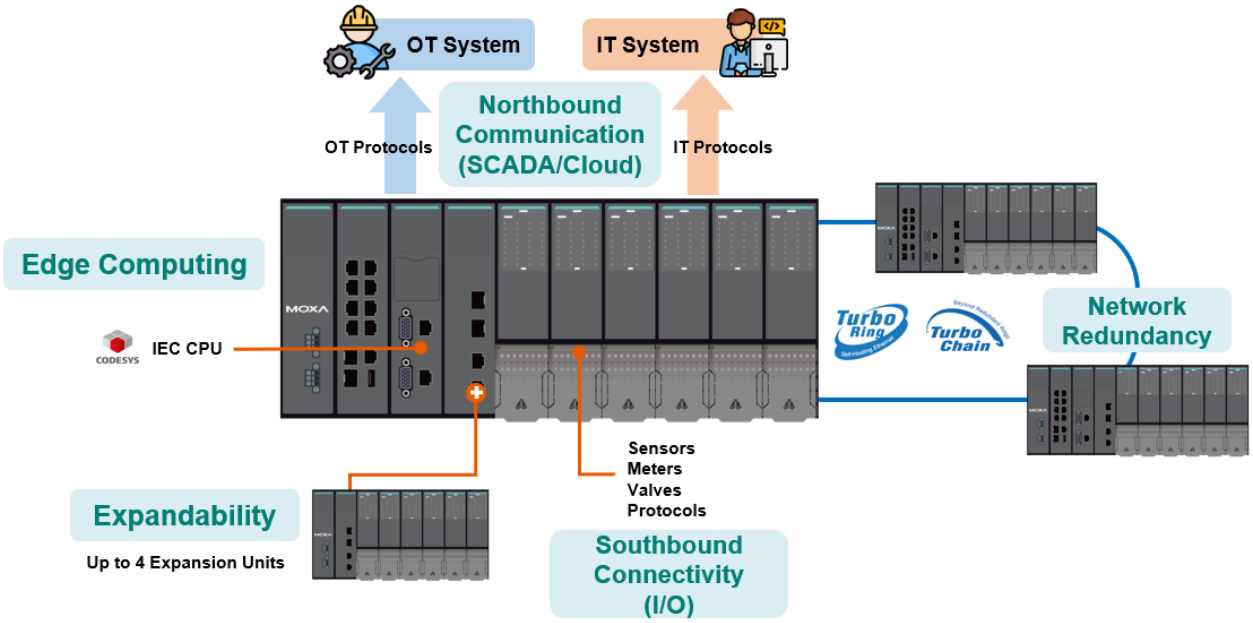
Additional Resources

Refer to the following documents for additional information.

- Datasheets for the following products:
  - ioPAC 6500 Series

2. Architecture Overview

About ioPAC 6500 Series



The ioPAC 6500 Series Integrated Intelligent Node (IIN) is a modular Linux-based RTU. It collects data from sensors and meters through input channels, and performs actions on valves, actuators, or pumps through output channels after the data has been processed by the CPU.

Because the IIN is modular, it scales, allowing additional I/O to be added to each unit, or allowing multiple expansion units to be connected in a system.

About Systems

A system is one or more units connected. A system contains one control unit, and up to four expansion units. A system may be only a single control unit.

Limitation

A system supports up to five units: one control unit, and up to four expansion units.

About Units

A unit consists of at least a power module (PWR) and either a CPU module (CPU)or an expansion module (EXP). Multiple units may be connected with expansion modules to form systems.

Limitation

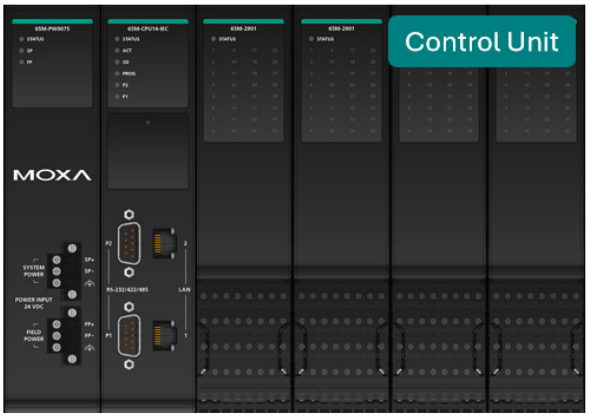
A unit can supports up to 8 I/O modules, subject to power constraints.

> **Caution**
>
> Risk of device malfunction. Ensure total unit power draw does not exceed 75 W.

Introduction to Control Units

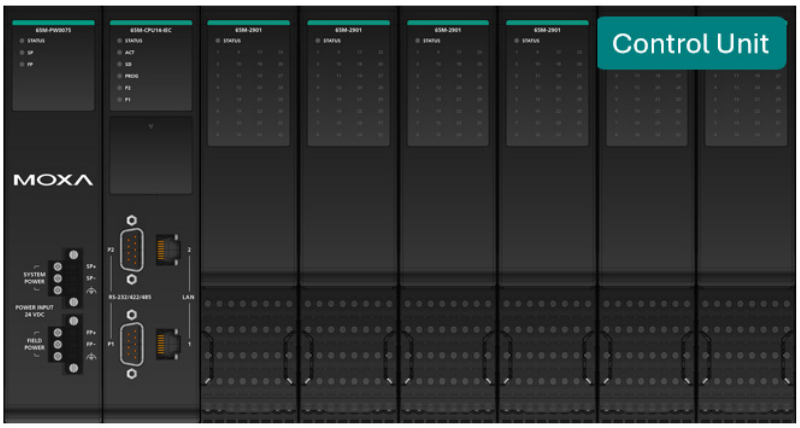
A control unit consists of at least one power module (PWR) and CPU module. Depending on the application requirements, optional communication modules, expansion modules, and I/O modules may also be used.

Control Unit With 4 I/O Modules



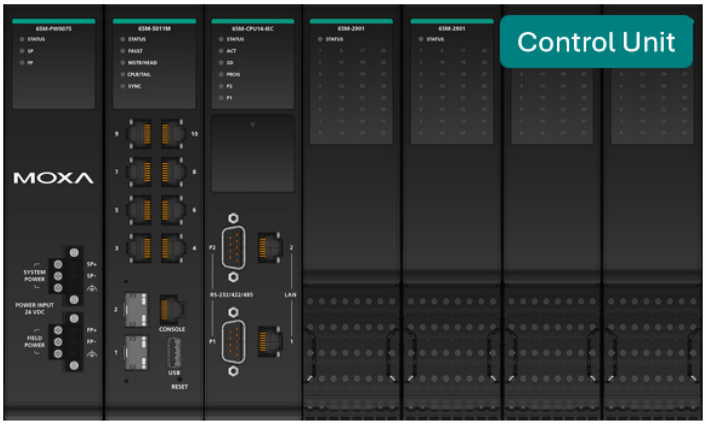
Power Module | CPU Module | I/O Module | I/O Module | I/O Module | I/O Module

Control Unit With 6 I/O modules



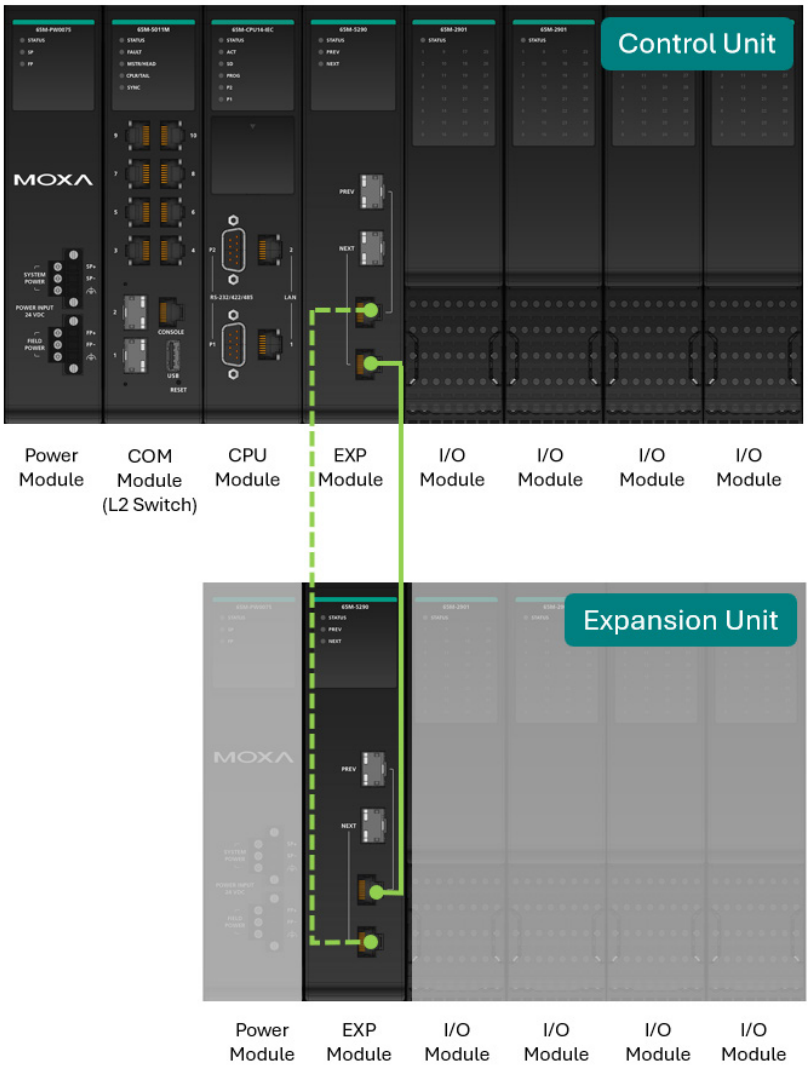
Power Module | CPU Module | I/O Module | I/O Module | I/O Module | I/O Module | I/O Module | I/O Module

Control Unit With COM Module (L2 Switch) and 4 I/O Modules



Control Unit With COM and EXP Module

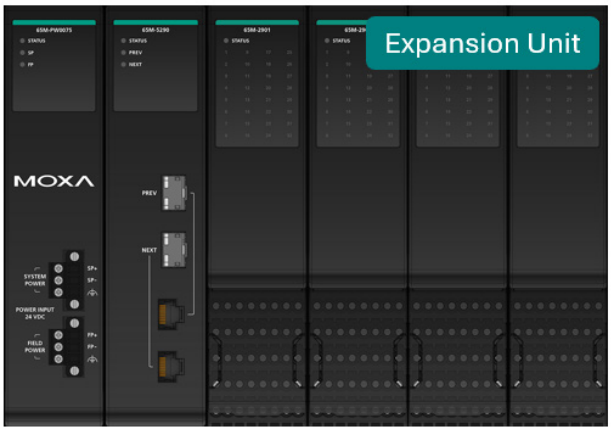
The expansion module on the control unit connects to an expansion module on an expansion unit.



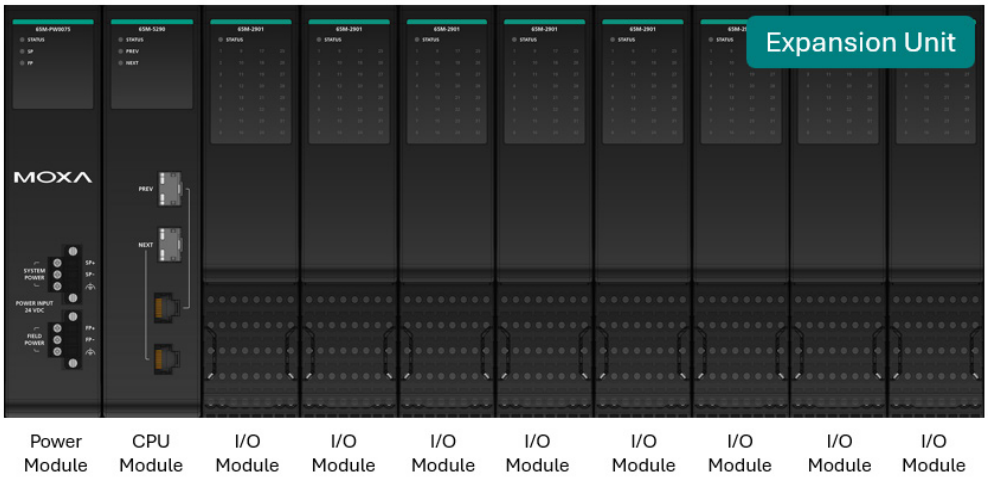
Introduction to Expansion Units

An expansion unit consists of at least a power module, an expansion module, and I/O modules. The expansion module transmits all data back to the control unit for processing. The CPU module on the control unit is effectively the "brain" of the system. Consequently, expansion units do not require CPU modules. For more information about connecting expansion modules, refer to Expansion Module Connections on page 59 for more information.

Expansion Unit With 4 I/O Modules



Expansion Unit With 8 I/O Modules



Introduction to Modules

Modules define the functionality of units. Units can be assembled from different modules for a wide variety of applications. This section describes basic module types. Refer to About Modules on page 16 for a detailed listing of all module types.

Backplane Module

Backplane modules are the foundation of the device in which all other modules are installed. They contain the internal bus enabling data and power exchange between modules. Each backplane module is labeled to indicate which type of module it supports. The mechanical design on the rear side allows it to be mounted on a DIN rail.

PWR Module

The power module supplies power to the device (System Power) and the I/O circuits (Field Power). Currently, only the LV power module is available, which accepts 24 VDC input.

COM Module

Communication modules are optional, and connect to subsystems, parallel systems, SCADA or enterprise-level systems.

CPU Module

The brain of the system. All collected data is processed by the CPU module, which then executes subsequent actions. The IEC CPU is powered by CODESYS runtime, while IINxpress is the IDE used to configure the device and write IEC 61131-3 code, such as LD, FBD, ST, etc.

EXP Module

The expansion module is an optional module. When an application requires additional I/O points, the expansion module comes into play. It enables collection of more field data, while its combo port design, with copper wire or optical fiber options, allows the expansion unit to be deployed remotely from the control unit. The system prioritizes optical fiber (SFP).

I/O Module

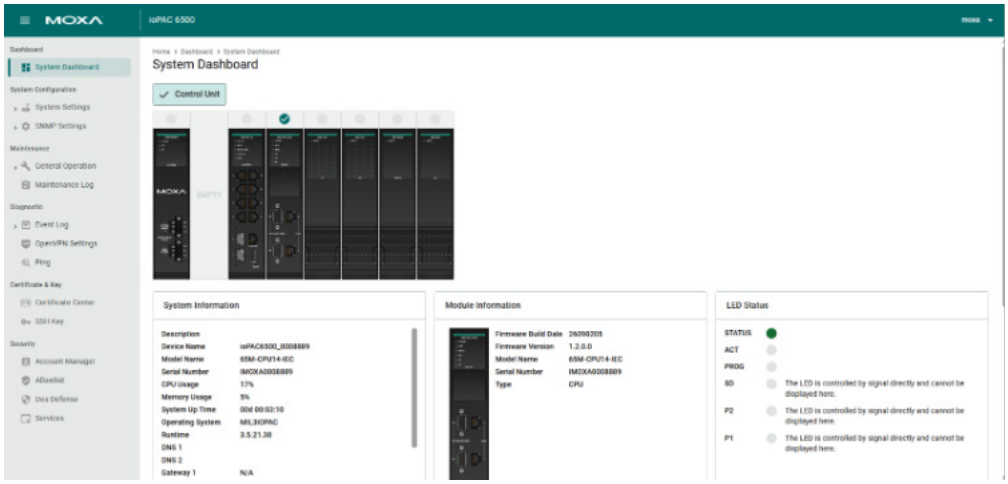
I/O modules collect data from sensors and meters via input channels, and perform actions on motors, valves, or actuators via output channels. Each I/O module requires a corresponding Terminal Block Module

Terminal Block Module

Used by I/O modules, Terminal Block modules are where physical wiring is connected. Each I/O module requires a corresponding Terminal Block Module. For example, a DI module requires a DI Terminal Block Module. The same principle applies to all other I/O modules

Introduction to Software Tools

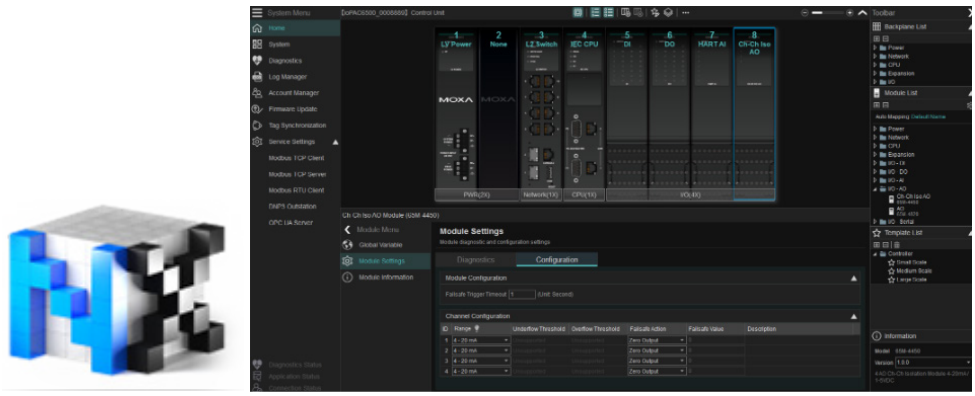
Web Interface



The web interface provides a dashboard with an overview of system status. The interface includes cybersecurity-related functions: OpenVPN, Certificate Center, Account Manager, Allowlist, DoS Defense, and Service Management.

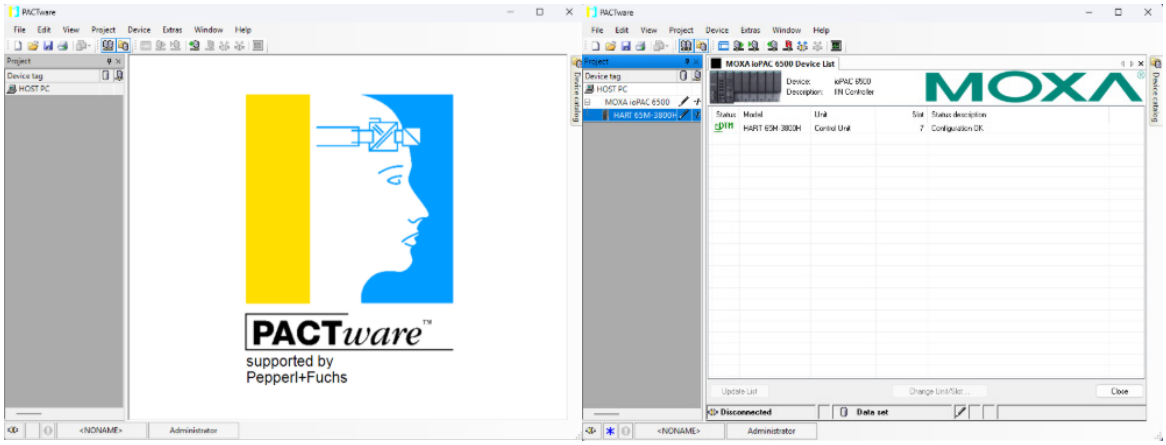
With the Switch module (65M-5011M) or Firewall module (65M-5621) installed, you can also access the corresponding module settings through the web interface under Switch Information or Firewall Information, respectively. Refer to Software Configuration on page 67 for more information.

IINxpress



IINxpress is an all-in-one software utility that integrates configuration, system status, diagnostics, log management, account management, firmware updates, mass deployment, protocol services, and IEC 61131-3 programming. Refer to IINxpress on page 94 for more information.

PACTware



PACTware is an optional software tool for configuring and managing HART field devices connected to the HART modules of the ioPAC 6500 Series. PACTware is only required when a HART module is used.

For detailed information, see the "ioPAC 6500 Series (65M) I/O Modules HART Module Configuration Manual (PACTware)".

3. Hardware Overview

In this chapter, we summarize each ioPAC 6500 Series device.

About Modules

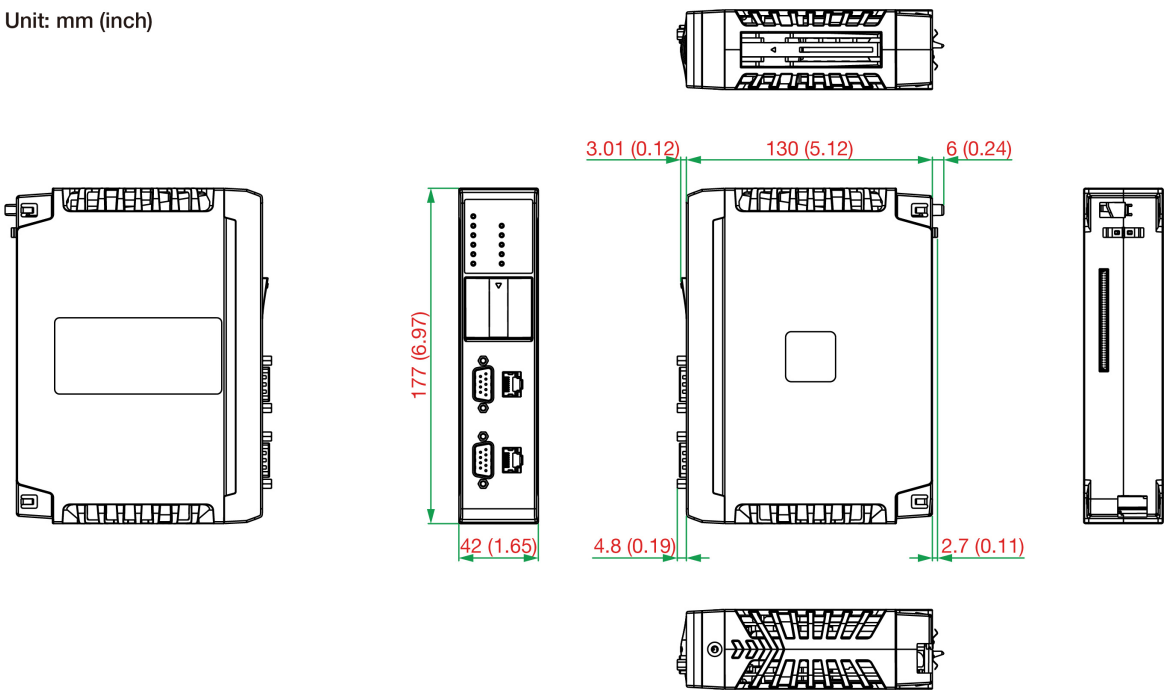
The ioPAC 6500 supports the following module types:

Category	Sub-Category	Model	Note
Backplane Module (BM)	Backplane Module for PWR Module	65M-BMPW01-CT-T	1-slot power backplane
		65M-BMPW02-CT-T	2-slot power backplane (redundant)
	Backplane Module for COM Module	65M-BMCM01-CT-T	1-slot COM backplane
		65M-BMCM02-CT-T	2-slot COM backplane (redundant)
	Backplane Module for CPU Module	65M-BMCPU01-CT-T	1-slot CPU backplane
		65M-BMCPU02-CT-T	2-slot CPU backplane (redundant, planned)
	Backplane Module for EXP Module	65M-BMEXP01-CT-T	1-slot EXP backplane
		65M-BMEXP02-CT-T	2 slots EXP backplane (redundant)
	Backplane Module for I/O Module	65M-BMIO02-CT-T	2 slots I/O backplane
		65M-BMIO04-CT-T	4 slots I/O backplane
Power Module (PWR)	LV Power	65M-PW0075-CT-T	Insert into backplane for PWR Module
Communication Module (COM)	L2 managed Switch	65M-5011M-CT-T	Insert into backplane for COM Module
	Firewall	65M-5621-CT-T	Insert into backplane for COM Module
CPU Module	IEC CPU	65M-CPU14-IEC-CT-T	Insert into backplane for CPU Module
Expansion Module (EXP)	Wired Expansion	65M-5290-CT-T	Insert into backplane for EXP Module
I/O Module	DI	65M-1900-CT-T	Insert into backplane for I/O Module
	DO	65M-2901-CT-T	
	AI (mA)	65M-3600-CT-T	
	AI (V)	65M-3610-CT-T	
	AO	65M-4820-CT-T	
	HART AI	65M-3800H-CT-T	
	Serial	65M-5801-CT-T	
	Relay	65M-2804-CT-T	
	Ch-Ch Iso AO	65M-4450-CT-T	
Terminal Block Module (TB)	TB for DI	65M-TB-1900-CT-T	Insert into backplane for I/O Module
	TB for DO	65M-TB-2901-CT-T	
	TB for AI (mA)	65M-TB-3600-CT-T	
	TB for AI (V)	65M-TB-3610-CT-T	
	TB for AO	65M-TB-4820-CT-T	
	TB for HART AI	65M-TB-3800H-CT-T	
	TB for Serial	65M-TB-5801-CT-T	
	TB for Relay	65M-TB-2804-CT-T	
	TB for Ch-Ch Iso AO	65M-TB-4450-CT-T	

Module Physical Dimensions

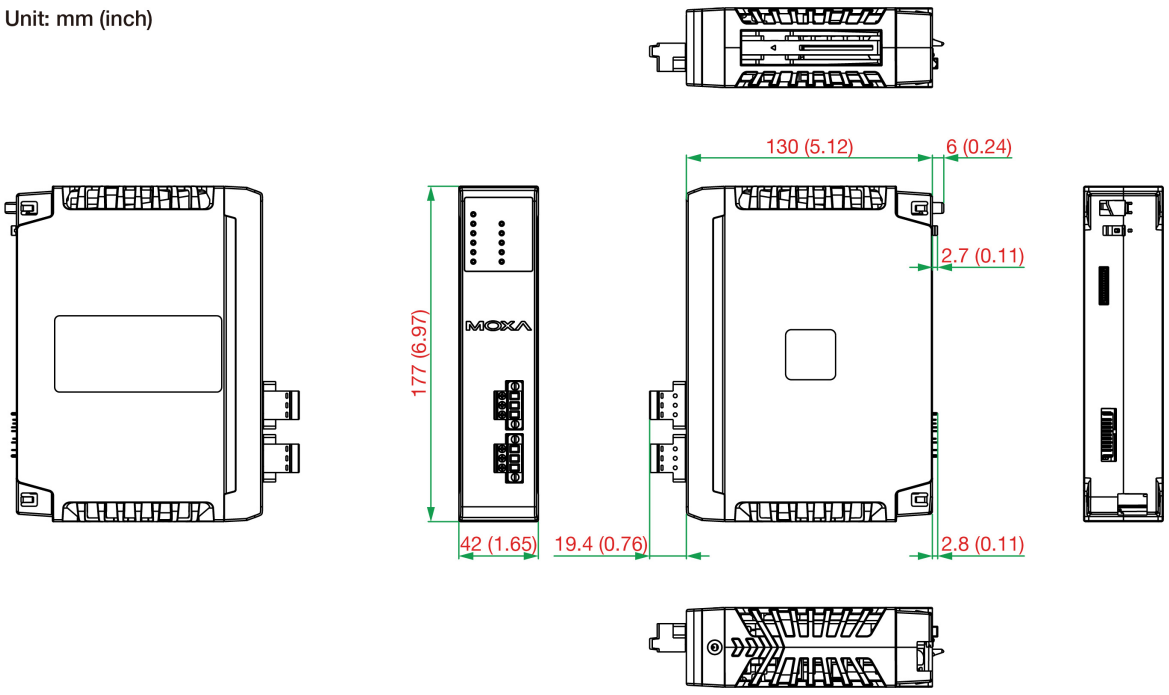
65M-CPU14-IEC-CT-T

Unit: mm (inch)



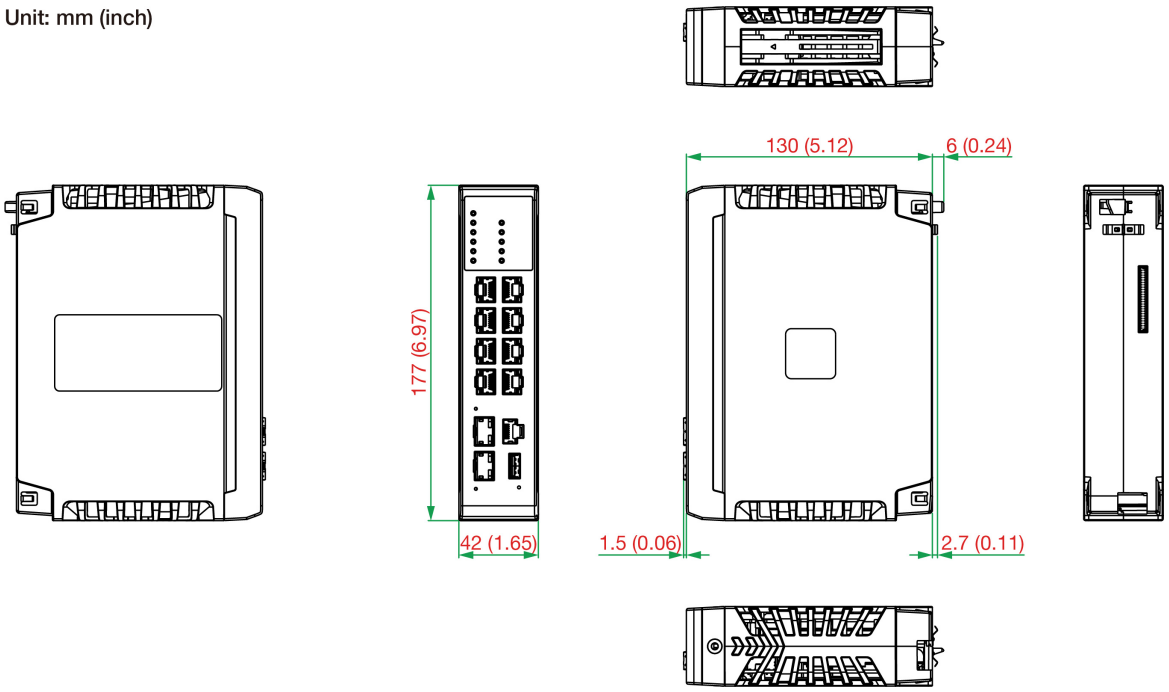
65M-PW0075-CT-T

Unit: mm (inch)



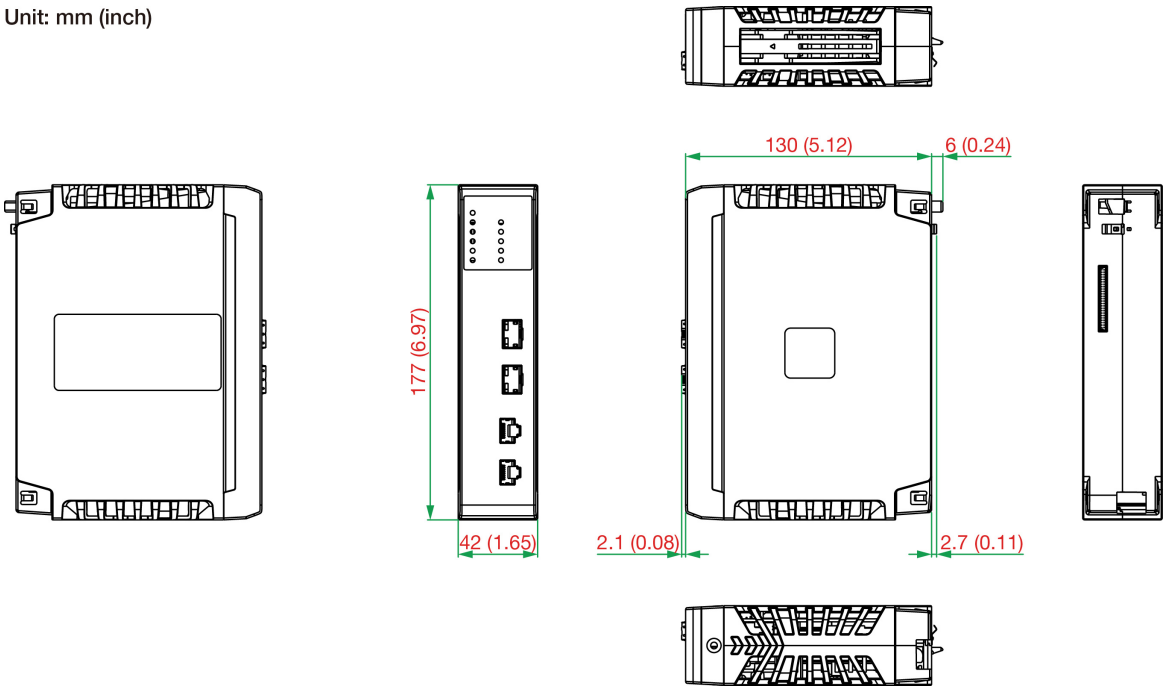
65M-5011M-CT-T

Unit: mm (inch)



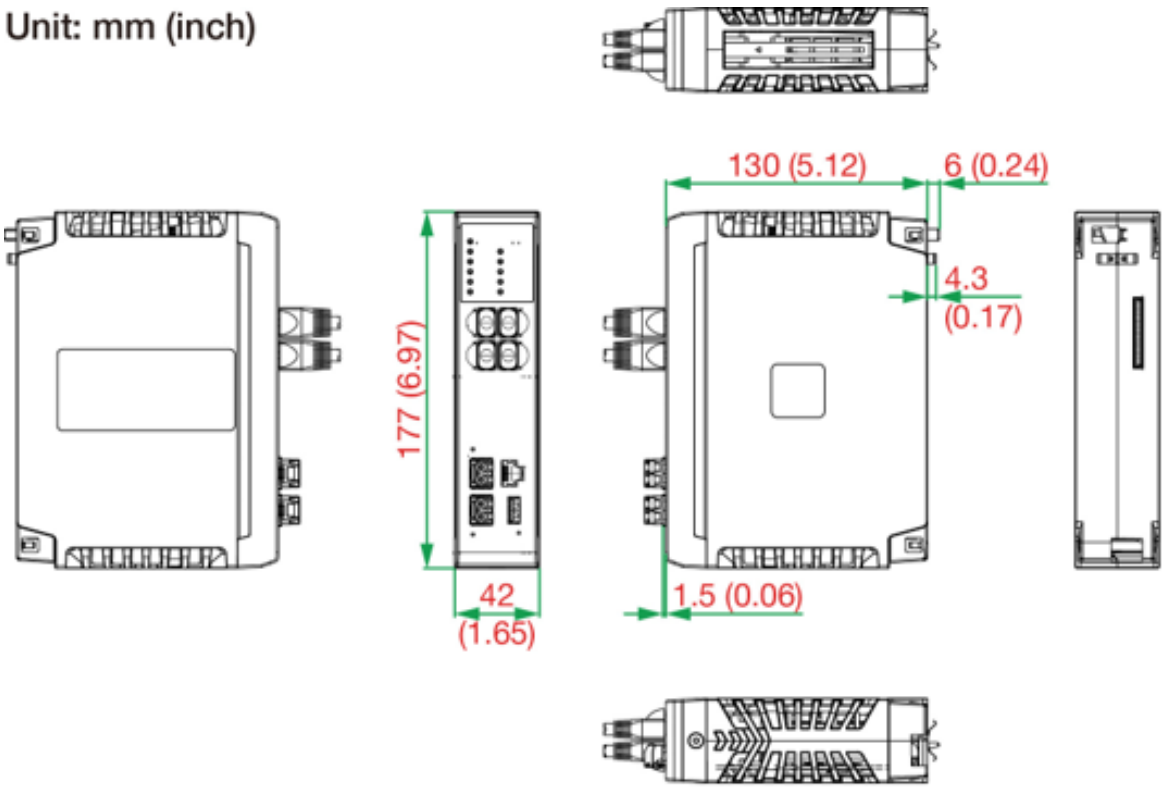
65M-5290-CT-T

Unit: mm (inch)



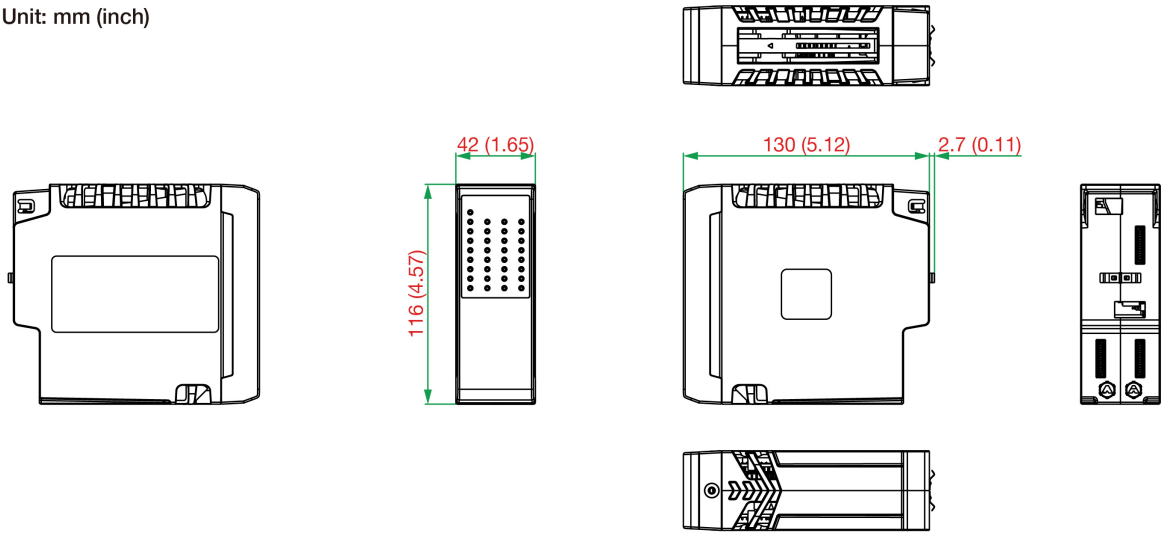
65M-5621-CT-T

Unit: mm (inch)



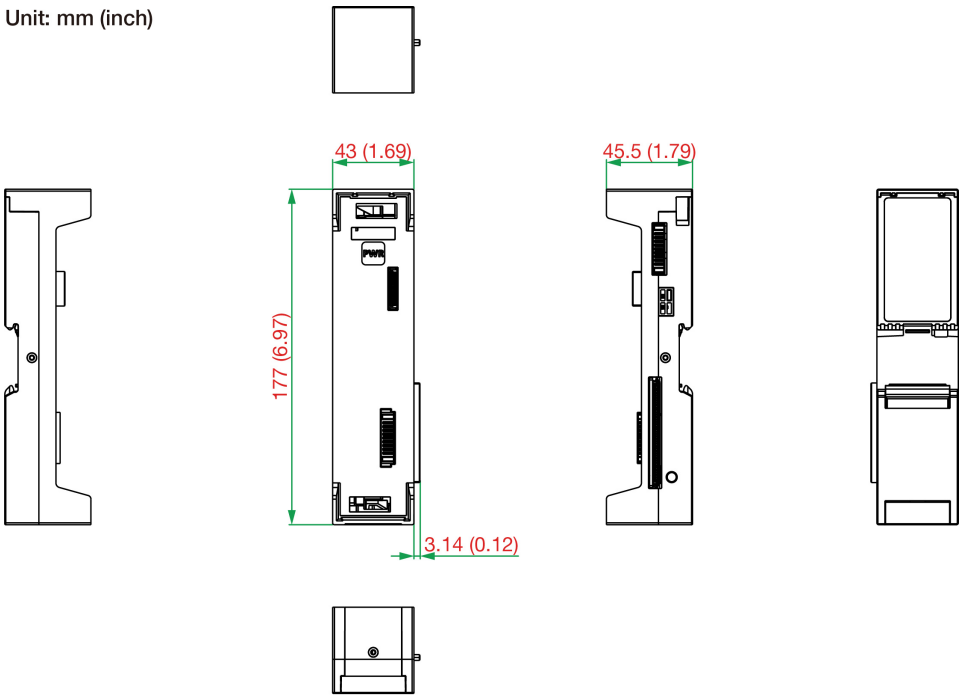
65M-1XXX/2XXX/3XXX/4XXX/5801-CT-T (IO Module)

Unit: mm (inch)



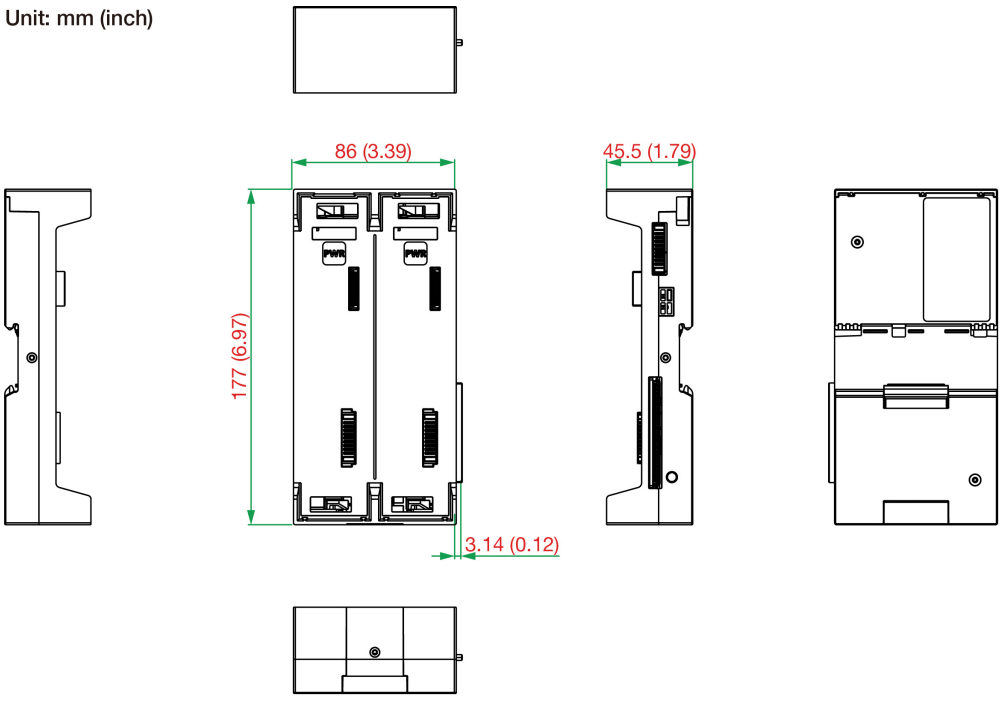
65M-BMPW01-CT-T

Unit: mm (inch)



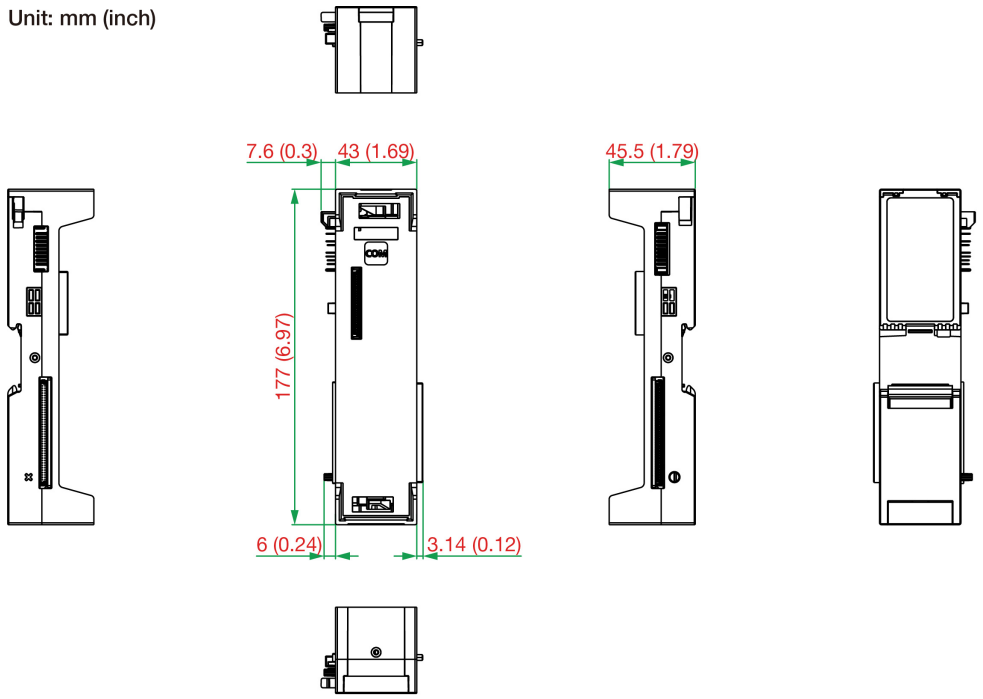
65M-BMPW02-CT-T

Unit: mm (inch)



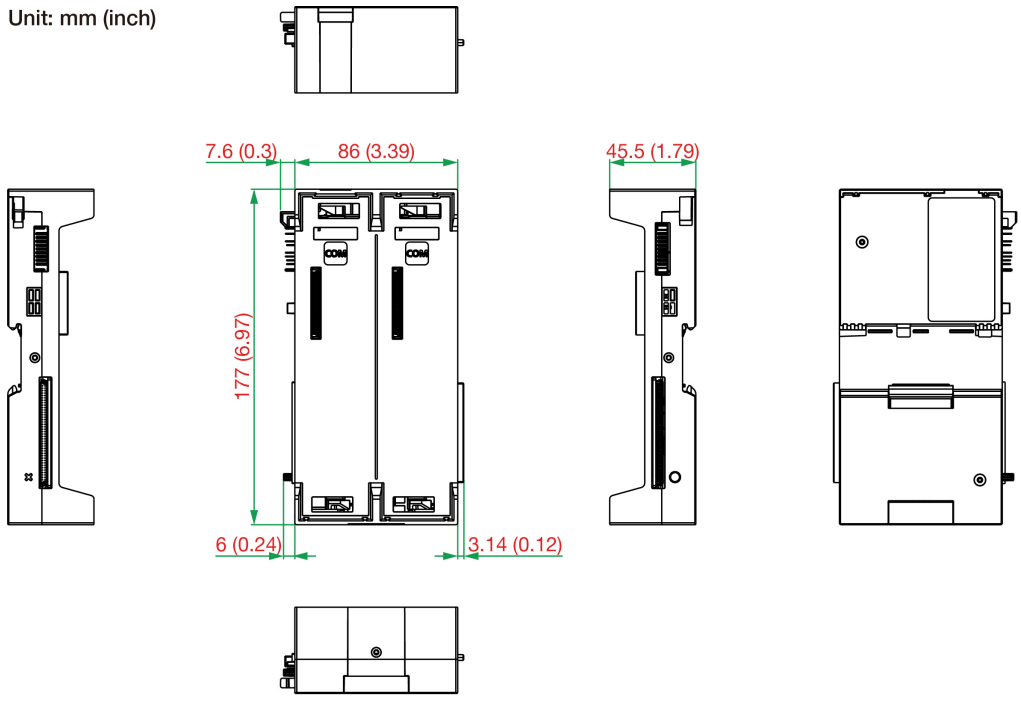
65M-BMCM01-CT-T

Unit: mm (inch)



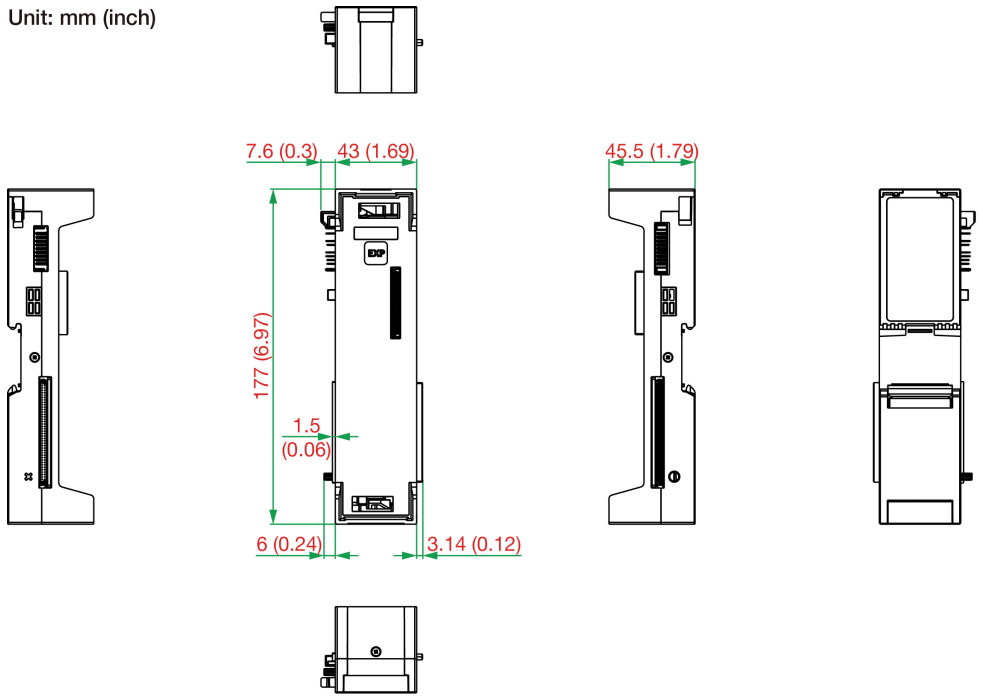
65M-BMCM02-CT-T

Unit: mm (inch)



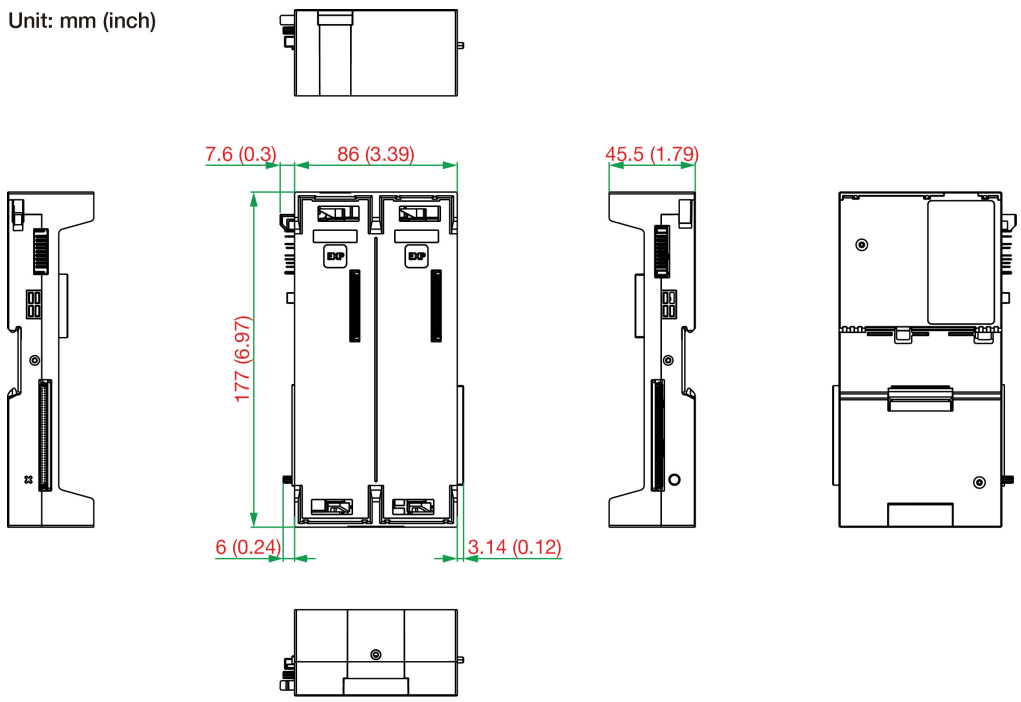
65M-BMEXP01-CT-T

Unit: mm (inch)



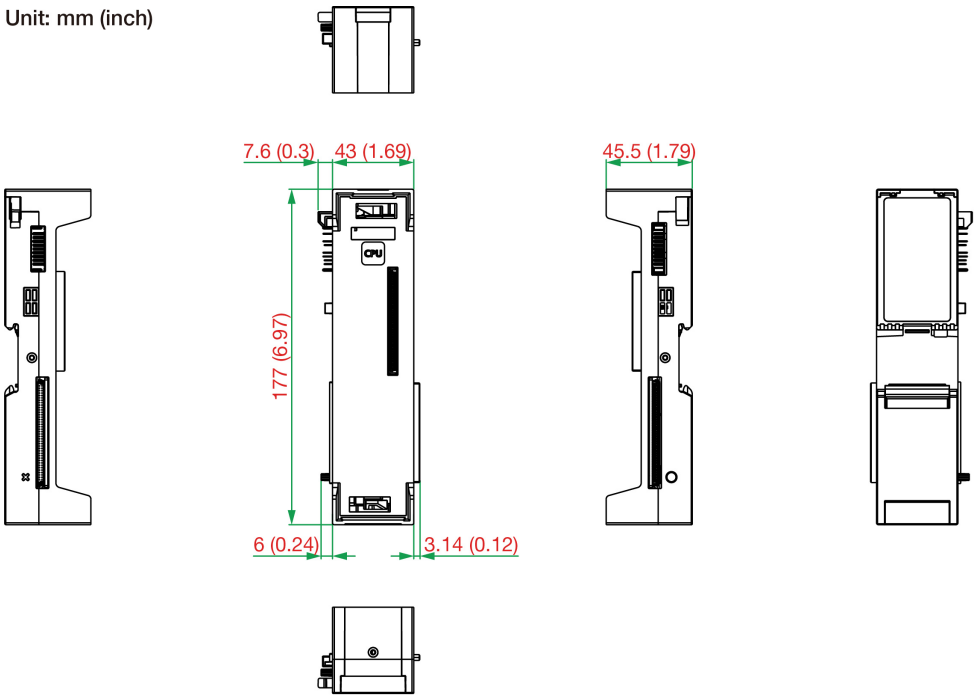
65M-BMEXP02-CT-T

Unit: mm (inch)



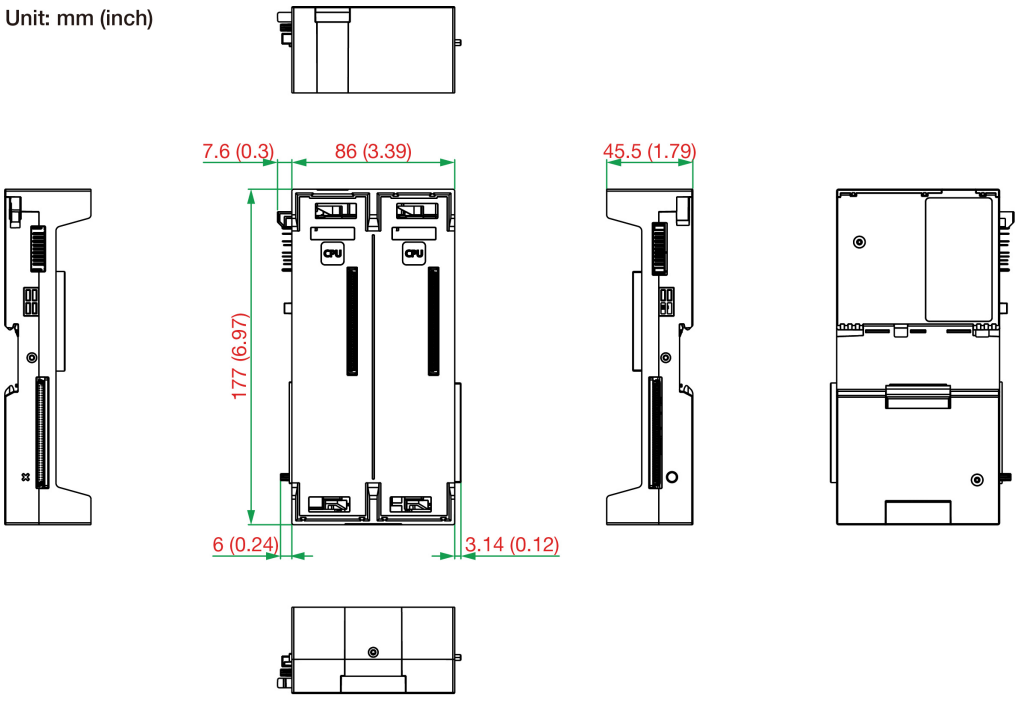
65M-BMCPU01-CT-T

Unit: mm (inch)



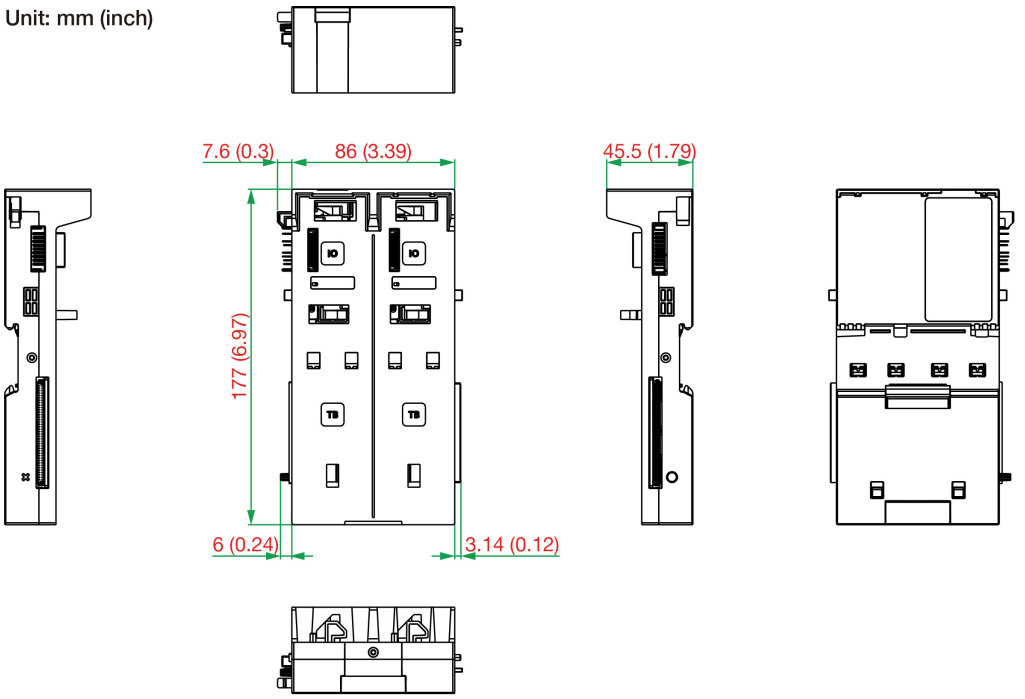
65M-BMCPU02-CT-T

Unit: mm (inch)



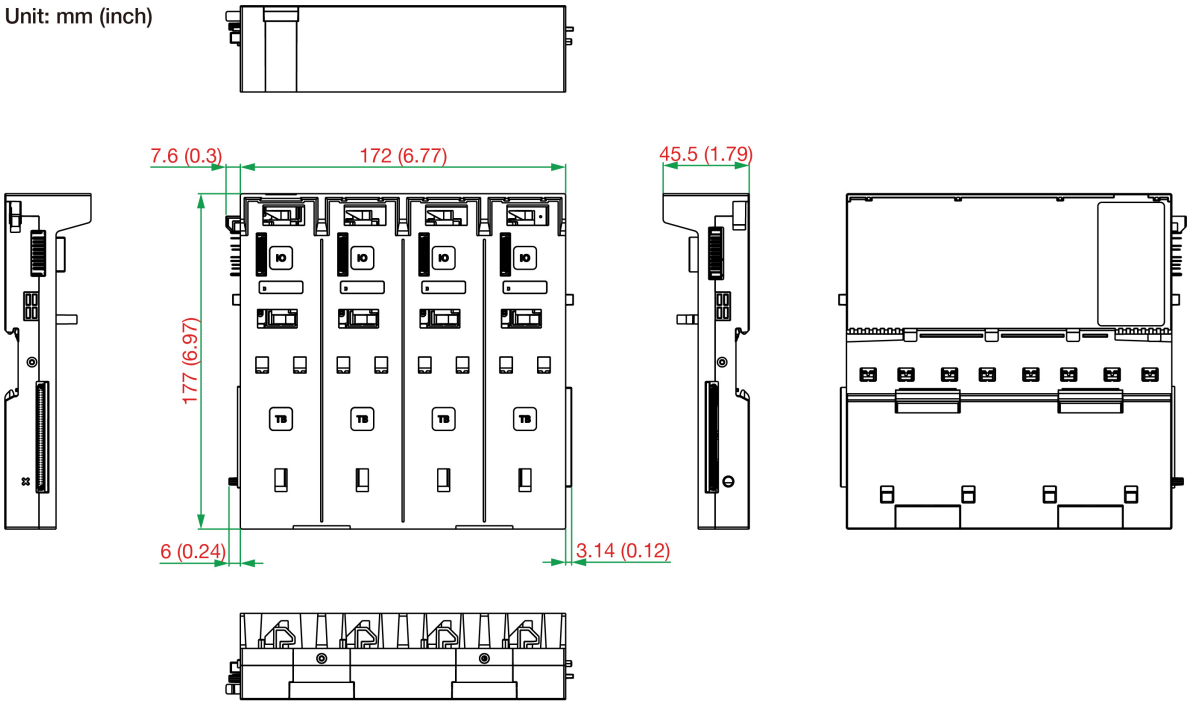
65M-BMIO02-CT-T

Unit: mm (inch)



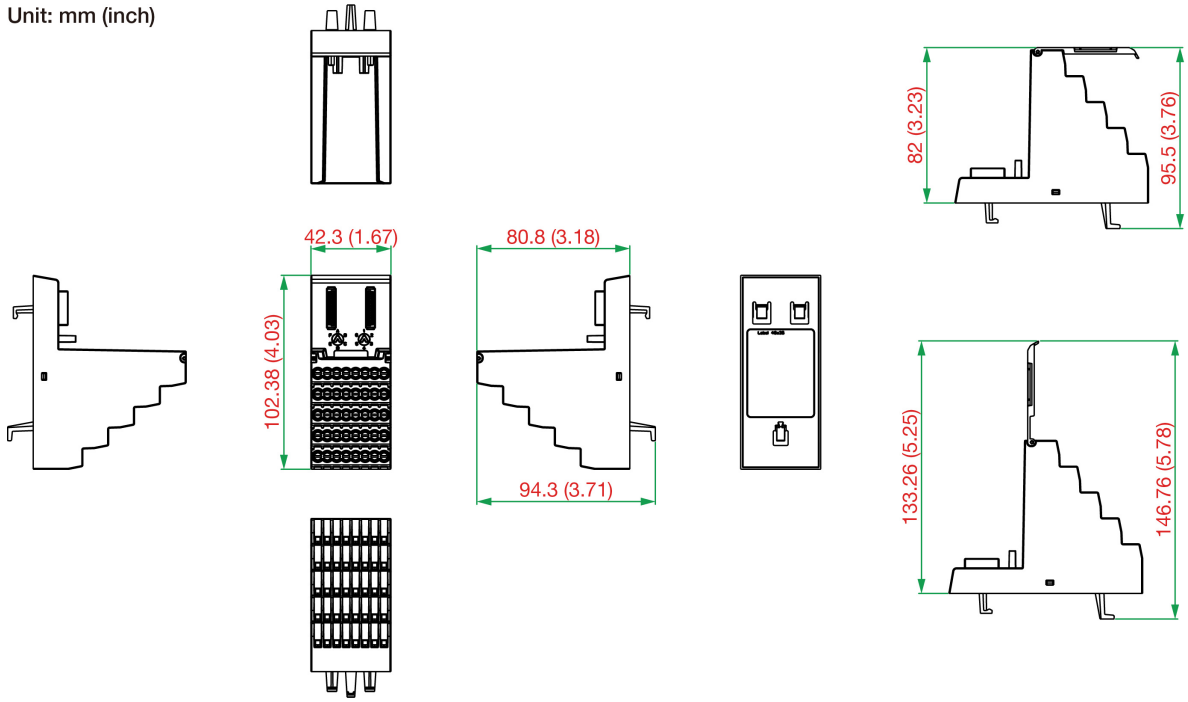
65M-BMIO04-CT-T

Unit: mm (inch)



65M-TB-1XXX/2XXX/3XXX/4XXX/5801-CT-T

Unit: mm (inch)



Module LED Behavior

65M-CPU14-IEC-CT-T

Front View



LED Description

LED	Color	Status	Description
STATUS (module status)	Green	Solid	Module running normally
		Blinking(5 Hz)	Firmware upgrade in progress
		Blinking (0.5 Hz)	Module booting up
		Double blink (1.11 Hz)	Module located
	Red	Solid	Module failed to initialize
		Blinking (0.5 Hz)	Service failed to initialize
		Double blink (1.11 Hz)	Module reset in progress
ACT (active)	N/A	N/A	Reserved
PROG (program status)	Green	Solid	Program running
	Red	Solid	Program runtime failure
	Off		Program stopped
SD	Green	Blinking (0.5 Hz)	SD card read
P1/P2 (serial)	Green	Blinking (0.5 Hz)	Serial port transmitting data (Tx)
	Amber	Blinking (0.5 Hz)	Serial port receiving data (Rx)
	Off		Serial port inactive
LAN1/LAN2	Green	Solid	Port active and linking at 1 Gbps
		Blinking	Port transmitting data at 1 Gbps
	Amber	Solid	Port active and linking at 10/100 Mbps
		Blinking	Port transmitting data at 10/100 Mbps
	Off		Port inactive or link down

65M-PW0075-CT-T

Front View

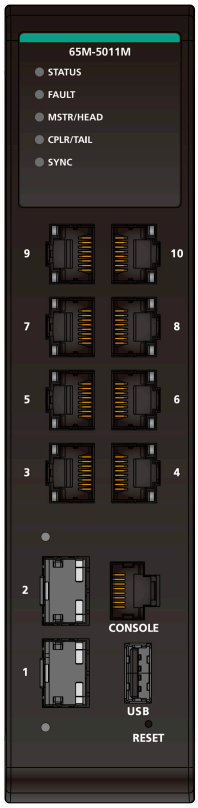


LED Description

LED	Color	Status	Description
STATUS (module status)	Green	Solid	Module running normally
		Blinking (5 Hz)	Firmware upgrade in progress
		Blinking (0.5 Hz)	Module booting up
		Double blink (1.11 Hz)	Module located
	Red	Solid	Module failure
		Blinking (5 Hz)	Connection to CPU lost
		Blinking (0.5 Hz)	Diagnostic error
SP (system power status)	Green	Solid	System power is normal
		Blinking (5 Hz)	Abnormal
FP (field power status)	Green	Solid	Normal
		Blinking (5 Hz)	Abnormal

65M-5011M-CT-T

Front view



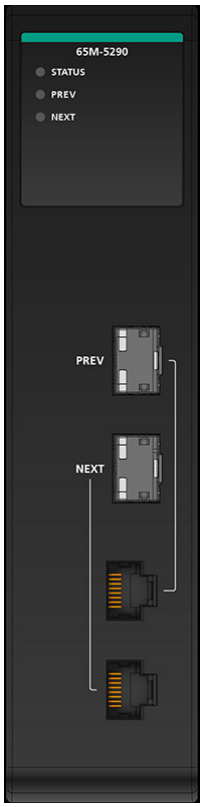
LED Definition

LED	Color	Status	Description
STATUS (module status)	Green	Solid	Module passed POST and running normally
		Blinking (1 Hz)	Module initializing
		Blinking (2 Hz)	External storage connected to module
	Red	Solid	• Boot-up failure • Module info read failure • EEPROM info error
FAULT	Red	Solid	• Network loop detected (loop protection enabled). • External storage load or save failure • Port disabled (Ingress rate limit for shutdown mode exceeded) • Invalid connection to Ring port
		Off	• Module running normally • A user-configured event not triggered
MSTR/HEAD (master or head status)	Green	Solid	Switch is master/head of Turbo Ring/Turbo Chain
		Blinking (4 Hz)	• Switch has become the master of Turbo Ring after Turbo Ring went down • Switch set as head of Turbo Chain and the Chain went down • Switch set as a Turbo Ring member and the corresponding Ring port is down • Switch set as a Turbo Chain member/tail and the corresponding head-end Chain port is down
		Off	Switch is not the master/head of this Turbo Ring/Turbo Chain
CPRL/TAIL	Green	Solid	Ring coupling or dual homing function is enabled Switch set as the tail of a Turbo Chain

LED	Color	Status	Description
(coupling or tail status)		Blinking (4 Hz)	• Turbo Chain is down • Switch set as a Turbo Chain member/head and the corresponding tail-end Chain port is down
		Off	Switch has disabled the coupling or tail role of Turbo Chain
SYNC	N/A	N/A	Reserved
3 to 10 (10M/100M/1000M RJ45 Ethernet port status)	Green (top LED)	Solid	Port active and linking at 1 Gbps
		Blinking	Port transmitting data at 1 Gbps
		Off	Port inactive or link down
	Amber (bottom LED)	On	Port active and linking at 10/100 Mbps
		Blinking	Port transmitting data at 10/100 Mbps
		Off	Port inactive or link down
1 to 2 (100M/1000M SFP port status)	Green	Solid	Port active and linking at 1 Gbps
		Blinking	Port transmitting data at 1 Gbps
		Off	Port inactive or link down
	Amber	Solid	Port active and linking at 100 Mbps
		Blinking	Port transmitting data at 100 Mbps
		Off	Port inactive or link down

65M-5290-CT-T

Front view

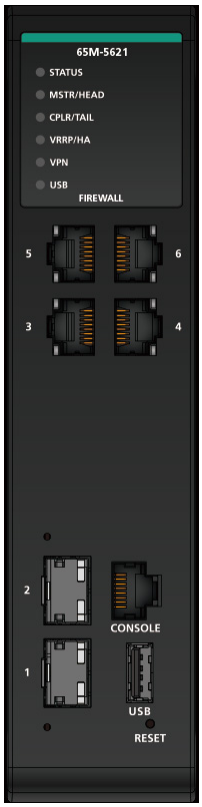


LED Definition

LED	Color	Status	Description
STATUS (module status)	Green	Blinking (0.5 Hz)	Module initializing
		Solid	Module running normally
		Double blink (1.11 Hz)	Module located
		Blinking (5 Hz)	Firmware upgrade in progress
	Red	Solid	Module failed to initialize or other component error
		Blinking (5 Hz)	Connection to CPU lost
		Blinking (0.5 Hz)	Firmware upgrade failed
PREV	Green	Solid	Connection established
NEXT	Green	Solid	Connection established

65M-5621-CT-T

Front View



LED Definition

LED	Color	Status	Description
STATUS (module status)	Green	Solid	Module passed POST and running normally
		Blinking (1 Hz)	Module initializing or resetting to factory default
	Red	Solid	Boot-up failure
MSTR/HEAD (Turbo Ring/Chain master or head status)	Green	Solid	Module is master/head of Turbo Ring/Turbo Chain
		Blinking	• Module has become the master of Turbo Ring after Turbo Ring went down • Module set as head of Turbo Chain and Turbo Chain went down • Module set as a Turbo Ring member and the corresponding Ring port is down • Module is set as a Turbo Chain member/tail and the corresponding head-end Chain port is down
		Off	Module is not the master/head of this Turbo Ring/Turbo Chain
CPLR/TAIL (Turbo Ring/Chain coupling or tail status)	Green	Solid	• Ring coupling or dual homing function is enabled • Module is set as the tail of a Turbo Chain
		Blinking	• Module set as the tail of the Turbo Chain and the Chain is down • Module set as a Turbo Chain member/head and the corresponding tail-end chain port is down
		Off	Module has disabled the coupling or tail role of Turbo Chain
VRRP/HA (VRRP/HA master status)	Green	Solid	Module is the VRRP or HA master
		Off	Module is not the VRRP or HA master
VPN	Green	Solid	All VPN tunnels working normally
		Off	No active VPN connections
	Amber	Solid	One or more VPN tunnels not working normally
		Off	No active VPN connections
USB	Green	Solid	USB device connected
		Blinking	USB channel transmitting data

		Off	Channel inactive
	Red	Solid	USB channel error
		Off	Channel inactive
3 to 6 (10M/100M/ 1000M RJ45 Ethernet port status)	Green	Solid	Port active and linking at 1000 Mbps
		Blinking	Port transmitting data at 1000 Mbps
		Off	Port inactive or link down
	Amber	Solid	Port active and linking at 10/100 Mbps
		Blinking	Port transmitting data at 10/100 Mbps
		Off	Port inactive or link down
1 to 2 (1G SFP port status)	Green	Solid	Port active and linking at 1000 Mbps
		Blinking	Port transmitting data at 1000 Mbps
		Off	Port inactive or link down

65M-1900-CT-T

Front View



LED Definition

LED	Color	Status	Description
STATUS (module status)	Green	Solid	Module running normally
		Blinking (5 Hz)	Firmware upgrade in progress
		Blinking (0.5 Hz)	Module booting up
		Double blink (1.11 Hz)	Module located
	Red	Solid	Module failed
		Blinking (5 Hz)	Connection to CPU lost
		Blinking (0.5 Hz)	Diagnostic error
		Double blink (1.11 Hz)	Field power error
1 to 32 (DI channel status)	Green	Solid	DI channel is on
	Red	Solid	Diagnostic error
	Off	Solid	DI channel is off or inactive

65M-2804-CT-T

Front View

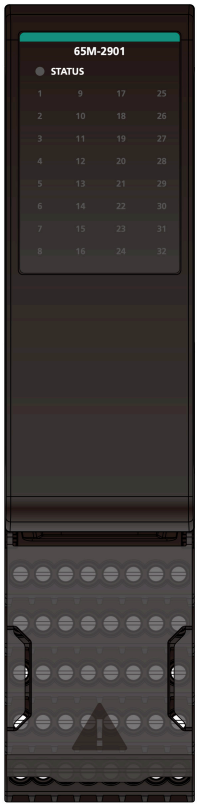


LED Definition

LED	Color	Status	Description
STATUS (module status)	Green	Solid	Module running normally
		Blinking (5 Hz)	Firmware upgrade in progress
		Blinking (0.5 Hz)	Module booting up
		Double blink (1.11 Hz)	Module located
	Red	Solid	Module failed or firmware upgrade failed
		Blinking (5 Hz)	Module in fail-safe mode
1 to 8 (Relay channel status)	Green	Solid	Relay channel is on or booting up
	Off		Relay channel is off or inactive

65M-2901-CT-T

Front View



LED Definition

LED	Color	Status	Description
STATUS (module status)	Green	Solid	Module running normally
		Blinking (5 Hz)	Firmware upgrade in progress
		Blinking (0.5 Hz)	Module booting up
		Double blink (1.11 Hz)	Module located
	Red	Solid	Module failed
		Blinking (5 Hz)	Module in fail-safe mode
		Blinking (0.5 Hz)	Diagnostic error
		Double blink (1.11 Hz)	Field power error
1 to 32 (DO channel status)	Green	Solid	DO channel is on
	Red	Solid	Diagnostic error
	Off		DO channel is off or inactive

65M-3600-CT-T

Front view



LED Definition

LED	Color	Status	Description
STATUS (module status)	Green	Solid	Module running normally
		Blinking (5 Hz)	Firmware upgrade in progress
		Blinking (0.5 Hz)	Module booting up
		Double blink (1.11 Hz)	Module located
	Red	Solid	Module failed
		Blinking (5 Hz)	Connection to CPU lost
		Blinking (0.5 Hz)	Diagnostic error
		Double blink (1.11 Hz)	Field power error
1 to 16 (AI channel status)	Green	Solid	AI channel is on
	Red	Solid	Diagnostic error
	Off		AI channel is inactive

65M-3610-CT-T

Front View



LED Definition

LED	Color	Status	Description
STATUS (module status)	Green	Solid	Module running normally
		Blinking (5 Hz)	Firmware upgrade in progress
		Blinking (0.5 Hz)	Module booting up
		Double blink (1.11 Hz)	Module located
	Red	Solid	Module failed
		Blinking (5 Hz)	Connection to CPU lost
		Blinking (0.5 Hz)	Diagnostic error
		Double blink (1.11 Hz)	Field power error
1 to 16 (AI channel status)	Green	Solid	AI channel is on
	Red	Solid	Diagnostic error
	Off		AI channel is inactive

65M-3800H-CT-T

Front View



LED Definition

LED	Color	Status	Description
STATUS (module status)	Green	Solid	Module running normally
		Blinking (5 Hz)	Firmware upgrade in progress
		Blinking (0.5 Hz)	Module booting up
		Double blink (1.11 Hz)	Module located
	Red	Solid	Module failed
		Blinking (5 Hz)	Connection to CPU lost
		Blinking (0.5 Hz)	Diagnostic error
		Double blink (1.11 Hz)	Field power error
1 to 8 (AI channel status)	Green	Solid	AI channel is on
	Red	Solid	Diagnostic error
	Off		AI channel is inactive

65M-4820-CT-T

Front View



LED Definition

LED	Color	Status	Description
STATUS (module status)	Green	Solid	Module running normally
		Blinking (5 Hz)	Firmware upgrade in progress
		Blinking (0.5 Hz)	Module booting up
		Double blink (1.11 Hz)	Module located
	Red	Solid	Module failed
		Blinking (5 Hz)	Module in fail-safe mode
		Blinking (0.5 Hz)	Diagnostic error
		Double blink (1.11 Hz)	Field power error
1 to 8 AO channel status	Green	Solid	AO channel is on
	Red	Solid	Diagnostic error
	Off		AO channel is inactive

65M-4450-CT-T

Front View



LED Definition

LED	Color	Status	Description
STATUS (module status)	Green	Solid	Module running normally
		Blinking (5 Hz)	Firmware upgrade in progress
		Blinking (0.5 Hz)	Module booting up
		Double blink (1.11 Hz)	Module located
	Red	Solid	Module failed
		Blinking (5 Hz)	Module in fail-safe mode
		Blinking (0.5 Hz)	Diagnostic error
		Double blink (1.11 Hz)	Field power error
1 to 4 AO channel status	Green	Solid	AO channel is on
	Red	Solid	Diagnostic error
	Off		AO channel is inactive

65M-5801-CT-T

Front View



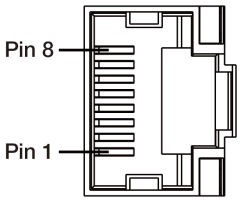
LED Definition

LED	Color	Status	Description
STATUS (module status)	Green	Solid	Module running normally
		Blinking (5 Hz)	Firmware upgrade in progress
		Blinking (0.5 Hz)	Module booting up
		Double blink (1.11 Hz)	Module located
	Red	Solid	Module failed
		Blinking (5 Hz)	Module in fail-safe mode
		Blinking (0.5 Hz)	Diagnostic error
		Double blink (1.11 Hz)	Field power error
1 to 8 (serial channel status)	Green	Blinking (0.5 Hz)	Tx: Serial channel transmitting data
	Red		Rx: Serial channel receiving data
	Off		Channel inactive

Module Pinouts, Wiring, and Interfaces

65M-CPU14-IEC-CT-T

Ethernet Port



Pin	Media Direct Interface Signal
1	TRD(0)+
2	TRD(0)-
3	TRD(1)+
4	TRD(2)+
5	TRD(1)-
6	TRD(2)-
7	TRD(3)+
8	TRD(3)-

Note

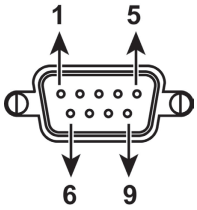
Typical maximum cable length: 100 m (350 ft) Actual limit depends on environmental electrical noise.

Caution

Risk of interference from electrical noise. Do not run Ethernet cables parallel to power cables or sources of electrical noise.

Serial Port

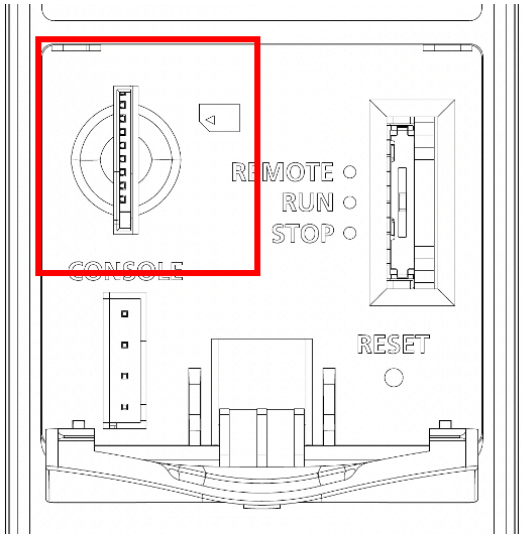
The ioPAC 6500 is equipped with two 3-in-1 serial ports that support RS-232/422/485, making it more convenient to connect field serial devices.



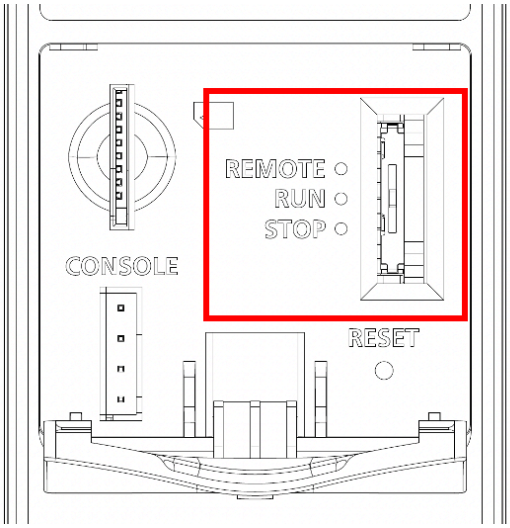
Pin	RS-232	RS-422	2-wire RS-485
1	DCD	TxD-(A)	–
2	RXD	TxD+(B)	–
3	TXD	RxD+(B)	Data+(B)
4	DTR	RxD-(A)	Data-(A)
5	GND	GND	GND
6	DSR	–	–
7	RTS	–	–
8	CTS	–	–
9	RI	–	–

microSD™ Card

This function is currently reserved. The physical slot is located inside the main cover.



Mode Switch



Located under the CPU Module cover, the switch supports the following modes:

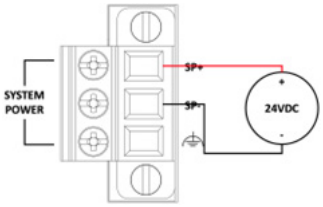
- **Remote**
  The device is allowed to download programs and change device settings remotely. Requires authorized user.
- **Run**
  The device is actively running the program. It rejects any attempt to interrupt the device running, either locally or over the network. Device storage is set to read only.
- **Stop**
  The device will not execute the program in any condition. Authorized users are allowed to download programs and change device settings.

	STOP	RUN	REMOTE – Run	REMOTE - STOP
IDE				
Configuration Download	Yes	No	Yes	Yes
Online Change	Yes	No	Yes	Yes
Firmware Upgrade	Yes	No	No	Yes
Warm / Cold Reboot	Yes	No	Yes	Yes
Force Output	Yes	Yes	Yes	Yes
Reset Warm, Reset Cold, Reset Origin	Yes	No	No	Yes
STOP COMMAND	No	No	Yes	No

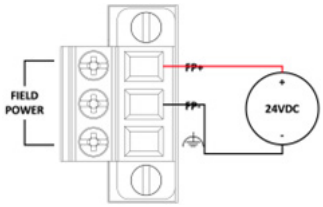
	STOP	RUN	REMOTE – Run	REMOTE - STOP
Factory Default/ Device Decommission	Yes	No	No	Yes
Backup	Yes	Yes	Yes	Yes
Restore	Yes	No	Yes	Yes
Security Hot Plug	Yes	Yes	No	No
Web				
System Settings	Yes	View/Export only	Yes	Yes
Maintenance	Yes	View/Export only	Yes	Yes
Diagnostic	Yes	View/Export only	Yes	Yes
Certificate	Yes	View/Export only	Yes	Yes
Security	Yes	View/Export only	Yes	Yes

65M-PW0075-CT-T

System Power



Field Power

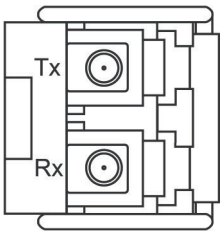


For details on wiring the power module, see Power Module Wiring Requirements on page 58.

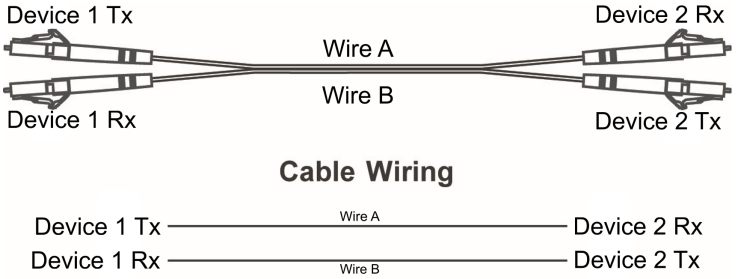
65M-5290-CT-T

100/1000BaseSFP (mini-GBIC) Fiber Port

LC-Port Pinouts



LC-Port to LC-Port Cable Wiring



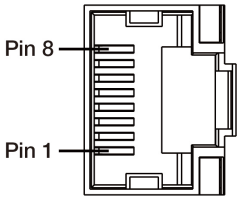
Important

- Connect Tx ports of each device to the Rx ports of the other to ensure full-duplex transmission.
- Mini-GBIC transceivers are required for optical connections.

Caution

Risk of eye damage. Do not stare directly into the laser beam. This is a Class 1 Laser/LED product.

Ethernet Port



Pin	Media Direct Interface Signal
1	TRD(0)+
2	TRD(0)-
3	TRD(1)+
4	TRD(2)+
5	TRD(1)-
6	TRD(2)-
7	TRD(3)+
8	TRD(3)-

Note

Typical maximum cable length: 100 m (350 ft) Actual limit depends on environmental electrical noise.

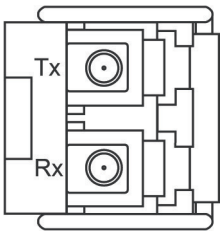
Caution

Risk of interference from electrical noise. Do not run Ethernet cables parallel to power cables or sources of electrical noise.

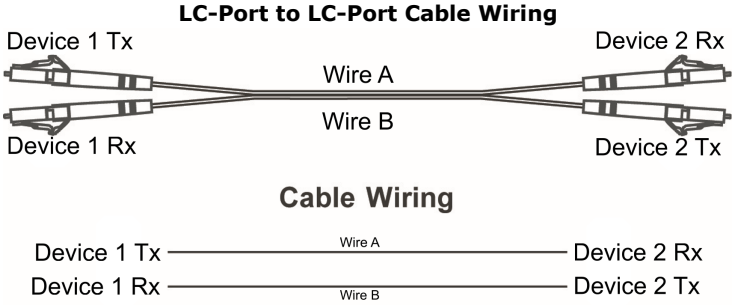
65M-5621-CT-T

100/1000BaseSFP (mini-GBIC) Fiber Port

LC-Port Pinouts



LC-Port to LC-Port Cable Wiring



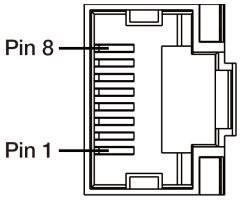
Important

- Connect Tx ports of each device to the Rx ports of the other to ensure full-duplex transmission.
- Mini-GBIC transceivers are required for optical connections.

Caution

Risk of eye damage. Do not stare directly into the laser beam. This is a Class 1 Laser/LED product.

Ethernet Port



Pin	Media Direct Interface Signal
1	TRD(0)+
2	TRD(0)-
3	TRD(1)+
4	TRD(2)+
5	TRD(1)-
6	TRD(2)-
7	TRD(3)+
8	TRD(3)-

Note

Typical maximum cable length: 100 m (350 ft) Actual limit depends on environmental electrical noise.

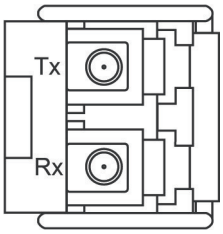
Caution

Risk of interference from electrical noise. Do not run Ethernet cables parallel to power cables or sources of electrical noise.

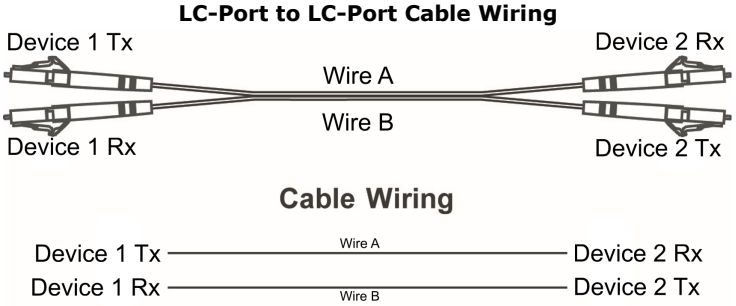
65M-5011M-CT-T

100/1000BaseSFP (mini-GBIC) Fiber Port

LC-Port Pinouts



LC-Port to LC-Port Cable Wiring



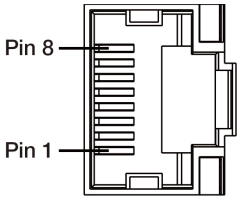
Important

- Connect Tx ports of each device to the Rx ports of the other to ensure full-duplex transmission.
- Mini-GBIC transceivers are required for optical connections.

Caution

Risk of eye damage. Do not stare directly into the laser beam. This is a Class 1 Laser/LED product.

Ethernet Port Definition



Pin	Media Direct Interface Signal
1	TRD(0)+
2	TRD(0)-
3	TRD(1)+
4	TRD(2)+
5	TRD(1)-
6	TRD(2)-
7	TRD(3)+
8	TRD(3)-

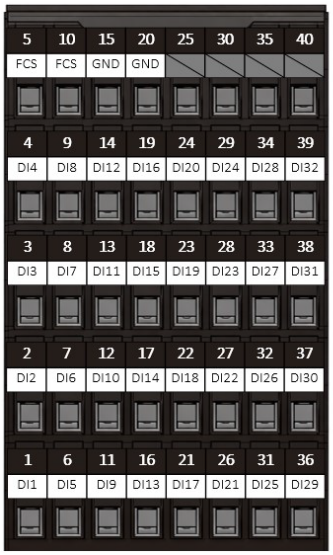
Note

Typical maximum cable length: 100 m (350 ft) Actual limit depends on environmental electrical noise.

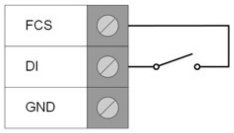
Caution

Risk of interference from electrical noise. Do not run Ethernet cables parallel to power cables or sources of electrical noise.

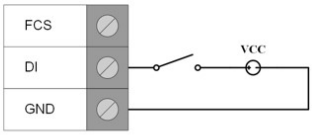
65M-TB-1900-CT-T DI



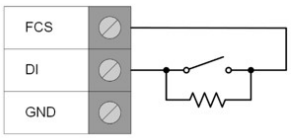
Dry Contact
(Internal FCS)



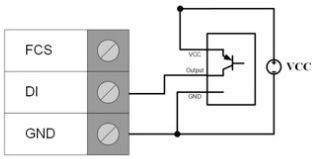
Dry Contact
(External Power)



Dry Contact
(With Wire Break Diagnostic)



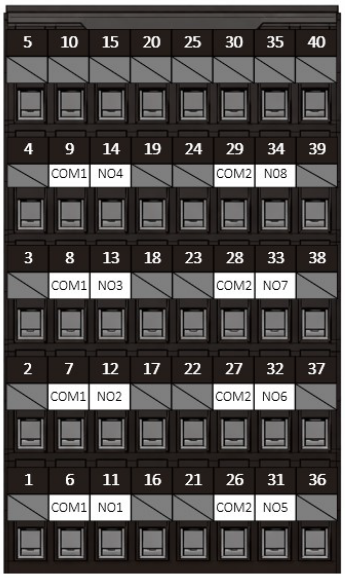
Wet Contact



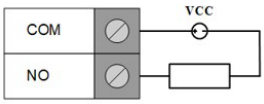
65M-TB-2804-CT-T Relay

NOTE

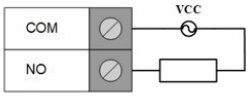
- Do not connect both AC (VAC) and DC (VDC) voltages, or voltages of different levels (e.g., 24 VDC and 250 VAC), to the same COM group.
- Minimum load must exceed 5V, 0.1A. Continuous operation below the minimum rated load may affect relay contact resistance.
- The relay supports the following voltages at max. 2 A:
  - 24 VDC
  - 125 VDC
  - 250 VAC
- Only 24 VDC (max. 2 A) UL 61010-certified.



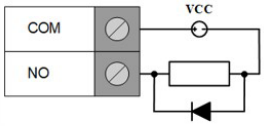
DC Source
(Resistive Load)



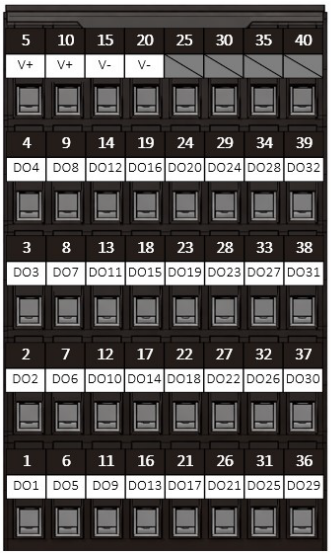
AC Source



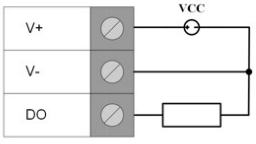
DC Source
(Inductive Load)



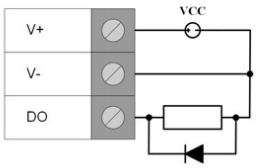
65M-TB-2901-CT-T DO



Resistive Load



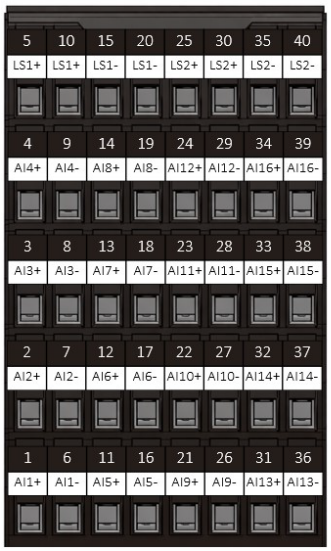
Inductive Load



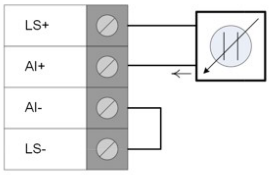
65M-TB-3600-CT-T AI (mA)

NOTE

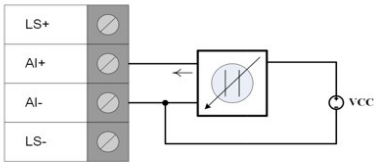
LS1 should be wired with AI1-AI8 and LS2 should be wired with AI9-AI16.



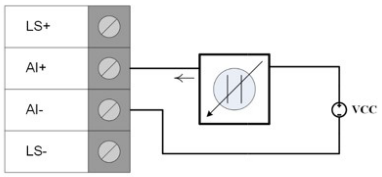
2-Wire Current Sensor
(Internal Loop Power)



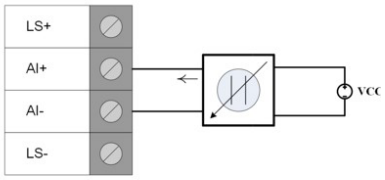
3-Wire Current Sensor



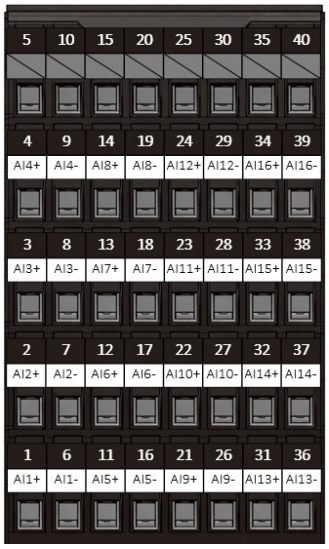
2-Wire Current Sensor
(External Loop Power)



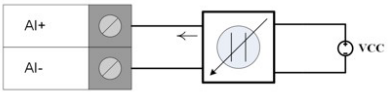
4-Wire Current Sensor



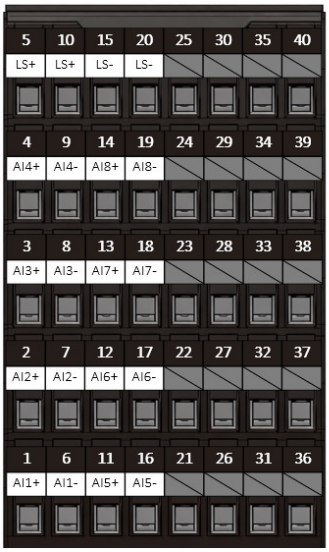
65M-TB-3610-CT-T AI (V)



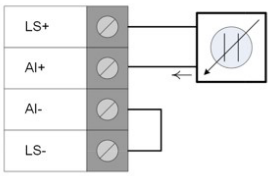
4-Wire Voltage Sensor



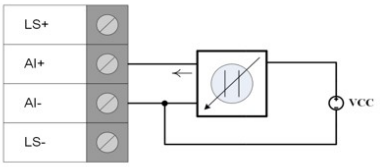
65M-TB-3800H-CT-T AI (HART)



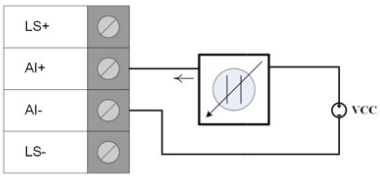
2-Wire Current Sensor
(Internal Loop Power)



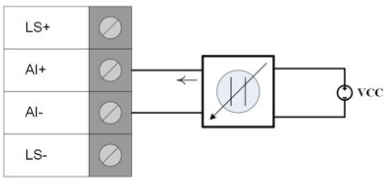
3-Wire Current Sensor



2-Wire Current Sensor
(External Loop Power)

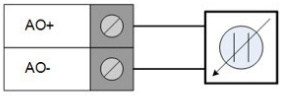


4-Wire Current Sensor

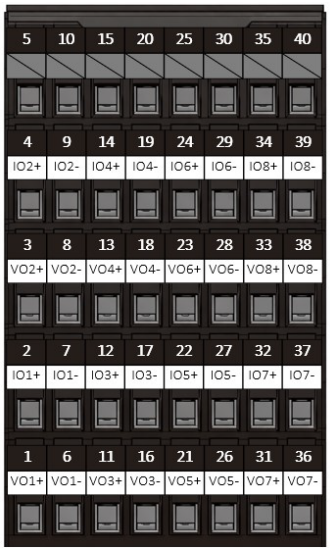


65M-TB-4450-CT-T (Ch-Ch Iso AO)

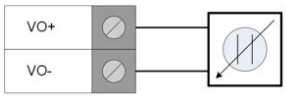




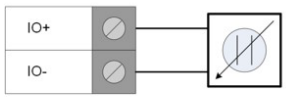
65M-TB-4820-CT-T AO



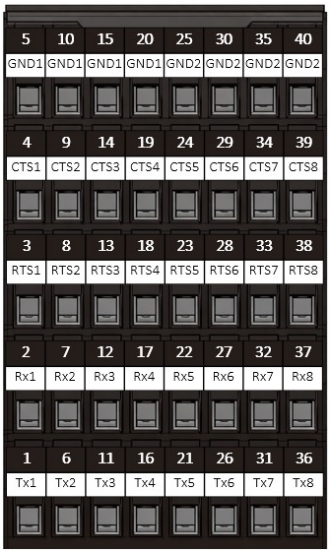
Voltage Output



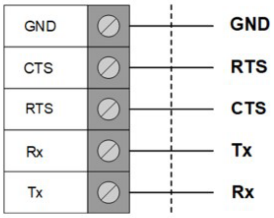
Current Output

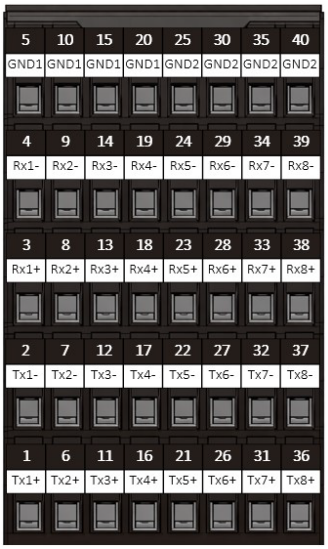


65M-TB-5801-CT-T Serial

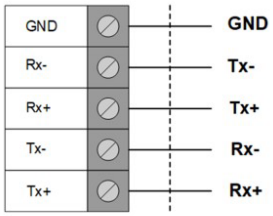


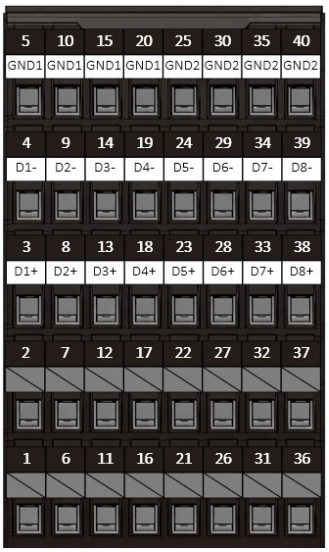
RS-232



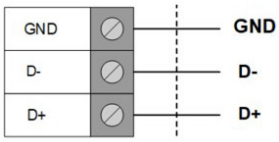


RS-422





RS-485-2w



4. Hardware Installation

In this chapter, we describe how to install the ioPAC 6500 Series devices.

Supported Modules

The ioPAC 6500 supports the following modules.

- CPU module
- Power module
- Backplane module for CPU
- Backplane module for power
- Communication (switch) module (optional)
- Backplane module for communication (switch) (optional)
- IO module (optional)
- Backplane module for IO (optional)
- Terminal block (TB) module for IO (optional)
- Expansion module (optional)
- Backplane module for expansion

Determine all required modules before installation.

Refer to About Modules on page 28 for a detailed listing of all module types.

Unit Installation Requirements and Limitations

Modules must be arranged in the following order from left to right:

1. Power Module(s)
2. Communication Module(s) (optional)
3. CPU Module(s) (Control units only)
4. Expansion Module (optional)
5. IO Module(s) (optional)

Determine the correct backplane and module sequence before mounting to avoid unmounting. Modules are hotswappable. However, once mounted, module backplanes are difficult to rearrange without unmounting.

Unit/Module Limitations

Each unit may have the following:

Module Type	Maximum Backplanes	Multislot
Power	1	1-slot or 2-slot
Communication	1	1-slot or 2-slot
CPU	1	1-slot or 2-slot
Expansion	1	1-slot or 2-slot
IO	2	2-slot or 4-slot



Caution

Risk of device malfunction. Ensure total unit power draw does not exceed 75 W.

Mounting Requirements

Mounting requires an earth-grounded DIN rail and sufficient clearance for heat dissipation.

Caution

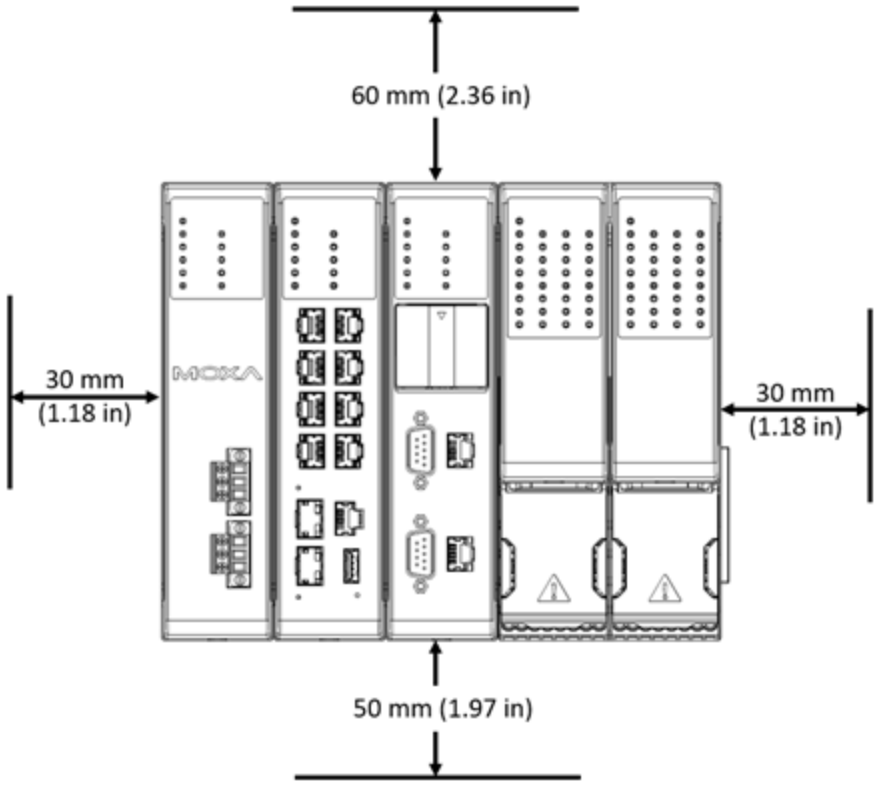
Risk of device malfunction. Install units with release latch facing up. Fanless heat dissipation requires exhaust vents on the top of each module to face up.

Caution

Risk of electrical hazard if ungrounded. DIN rails must be connected to earth ground.

The minimum clearance for heat dissipation is:

Direction	Clearance
Top	60 mm (2.36 inches)
Sides	30 mm (1.18 in)
Bottom	50 mm (1.97 in)



Note

Airflow recommendations for ambient temperatures exceeding 65°C:

- 65°C to 70°C: Minimum airflow of 0.7 m/s
- Above 70°C: Minimum airflow of1.7 m/s

Assembling a Unit

1. Assemble and mount backplane modules on a grounded DIN rail. Refer to Assembling and Mounting Backplane Modules on page 55.
2. Insert the modules into backplane slots. Refer to Installing Non-I/O Modules Into Slots on page 56 and Installing I/O Modules Into Slots on page 56.
3. While making sure power is not connected, wire modules. Refer to relevant sections.
4. Power up the unit. The boot up process takes 90 seconds.
5. Perform software configuration. Refer to Software Configuration on page 67.

Assembling and Mounting Backplane Modules

Backplanes link modules together and anchor them on the DIN rail.

Note

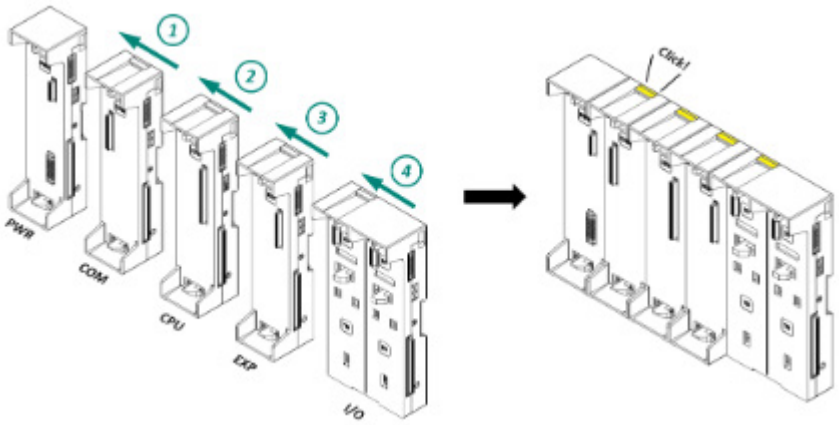
Refer to Unit Installation Requirements and Limitations on page 53.

Note

Install in a tool-accessible enclosure. Devices are open-type.

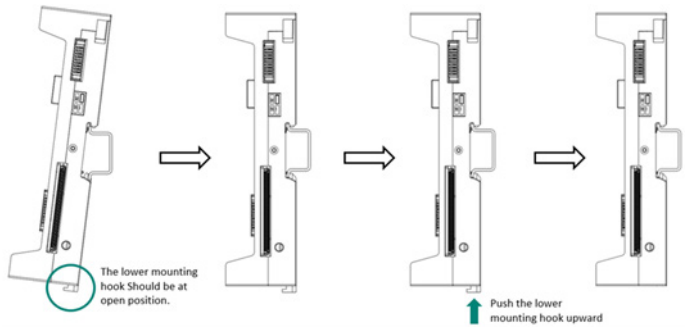
Assembled units may be heavy. Mounting backplanes first is recommended before installing modules into slots.

1. To attach one backplane to another, align the two backplanes and gently push.



   The top clip should snap downward when connected. If the clip does not snap, gently push it down. Do not force.
   If it still doesn't lock, make sure the backplanes are in the correct order and flush, then try again.
2. Repeat until all necessary backplanes are connected and all top clips are flush.
3. On the back of the assembled backplanes, make sure that the lower mounting hooks of all backplane modules are extended.
4. Hang the upper mounting hook of the assembled backplanes on the upper lip of the DIN rail.
5. Allow the bottom mounting hook of the assembled backplanes to rest flush against the DIN rail.
6. Secure the backplanes by pushing the lower mounting hook clasps up.

The backplane modules are now secure.



Installing Non-I/O Modules Into Slots

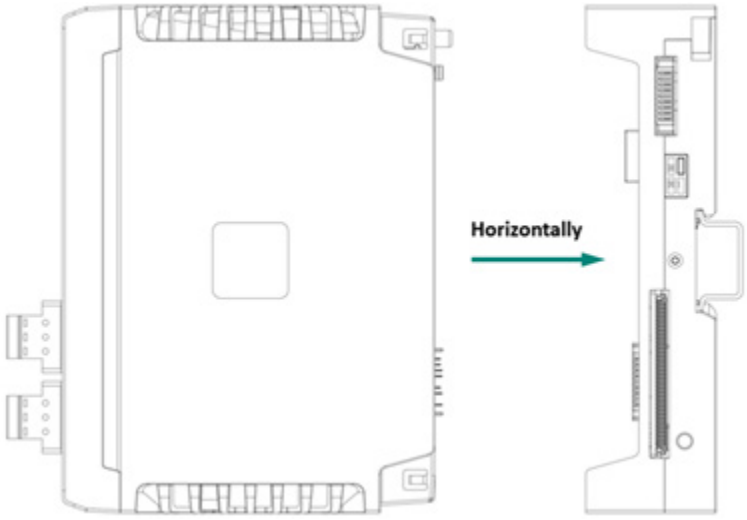
Note

I/O Modules have special instructions. Refer to Installing I/O Modules Into Slots for more information.

Caution

Risk of device damage. Do not force. Valid module combinations should snap easily into place.

Hold the module with both hands, and insert it horizontally into the corresponding slot on the backplane assembly.



The tab on the top of the module should be flush with the top of the module.

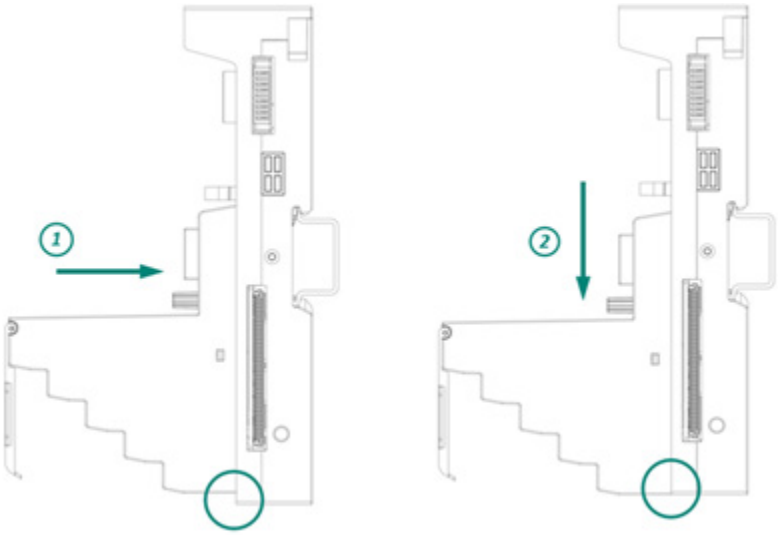
Repeat until all modules are installed. Note that some modules have special installation instructions. See corresponding module sections for details.

Installing I/O Modules Into Slots

Caution

Risk of device damage. Do not force. Valid module combinations should snap easily into place.

Place the terminal block module on the I/O backplane module, then pull down to lock into place.



Hold the module with both hands, and insert it horizontally into the corresponding slot on the backplane assembly.



The tab on the top of the module should be flush with the top of the module.

Repeat until all modules are installed. Note that some modules have special installation instructions. See corresponding module sections for details.

Module Power

Backplane modules distribute power to each module in the unit. Modules are powered automatically once power is supplied to the unit. After the power supply is turned on, boot-up takes approximately 90 seconds.

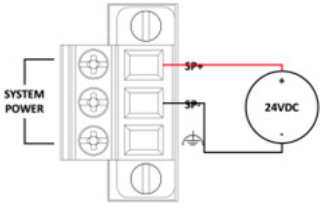
Power Module Wiring Requirements

Use isolated power supplies for System Power and Field Power to ensure isolation.

System Power Requirements

Direction	Clearance
Wire Material	Copper
Wire Gauge	18 to 12 AWG (0.75 to 4 mm²)
Wire Strip Length	10 mm (0.39 in)
Recommended Torque	5.0 kg-cm (4.34 lb-in)

> **Note**
>
> One wire per pin recommended.

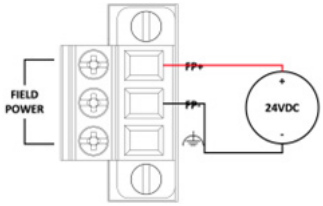


Each ioPAC 6500 unit requires a 24 VDC System Power input, which powers the unit through an internal bus located in the backplane modules.

Field Power Requirements

Direction	Clearance
Wire Material	Copper
Wire Gauge	18 to 12 AWG (0.75 to 4 mm²)
Wire Strip Length	10 mm (0.39 in)
Recommended Torque	5.0 kg-cm (4.34 lb-in)

> **Note**
>
> One wire per pin recommended.

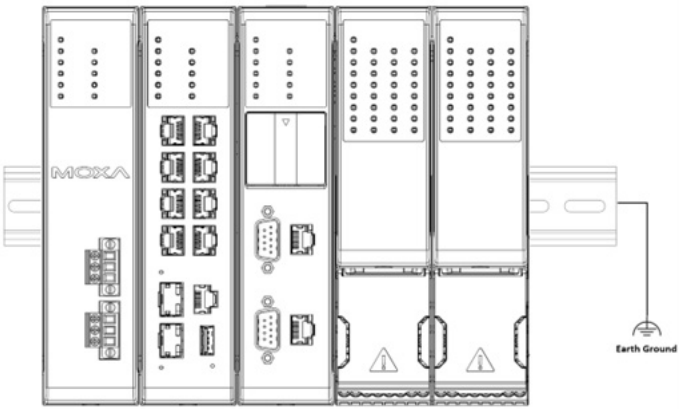


Each ioPAC 6500 unit requires a 24 VDC Field Power input, which powers the IO Circuit through an internal bus located in the backplane modules.

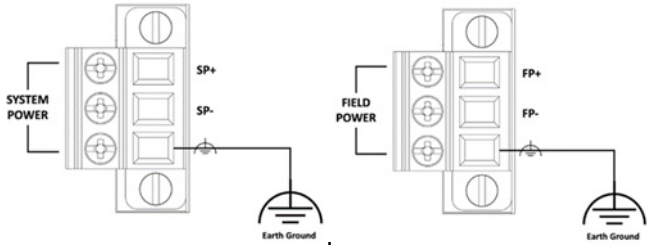
Module Grounding

Modules must be grounded through the following mechanisms:

- Each backplane module has a grounding spring that directly connects to the grounded DIN rail. DIN rails must be connected to earth ground.



- Each backplane module connects to the other backplane modules, with their own grounds.
- Power Modules must additionally be grounded through System Power and Field Power terminals. Terminals must also be connected to the earth ground.



Powering on the Unit

When all the installation and wiring are complete, you can turn on the power to boot up the system. After turning on the system power supply, it will take 90 seconds for the operating system to boot up. The green Status LED will illuminate continuously until the operating system is ready.

Expansion Module Connections

Caution

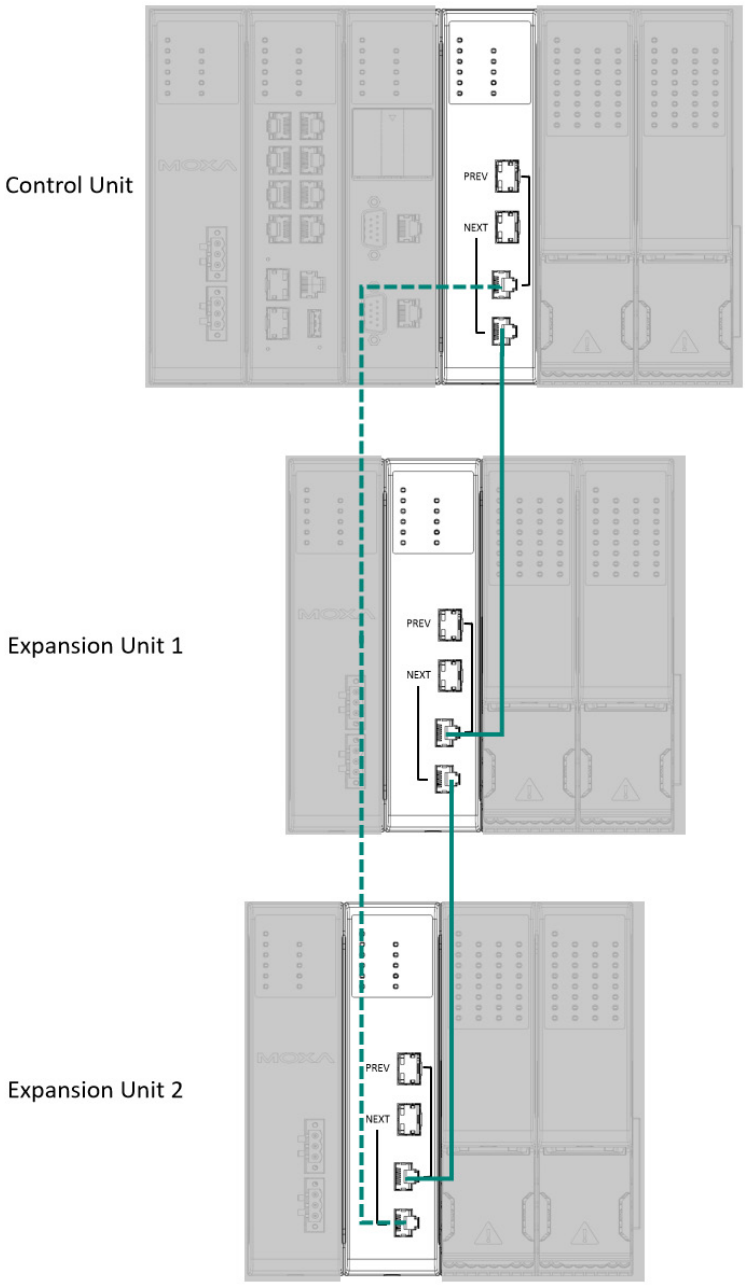
Risk of eye damage. Do not stare directly into the laser beam. This is a Class 1 Laser/LED product.

Expansion modules operate in the following operating modes:

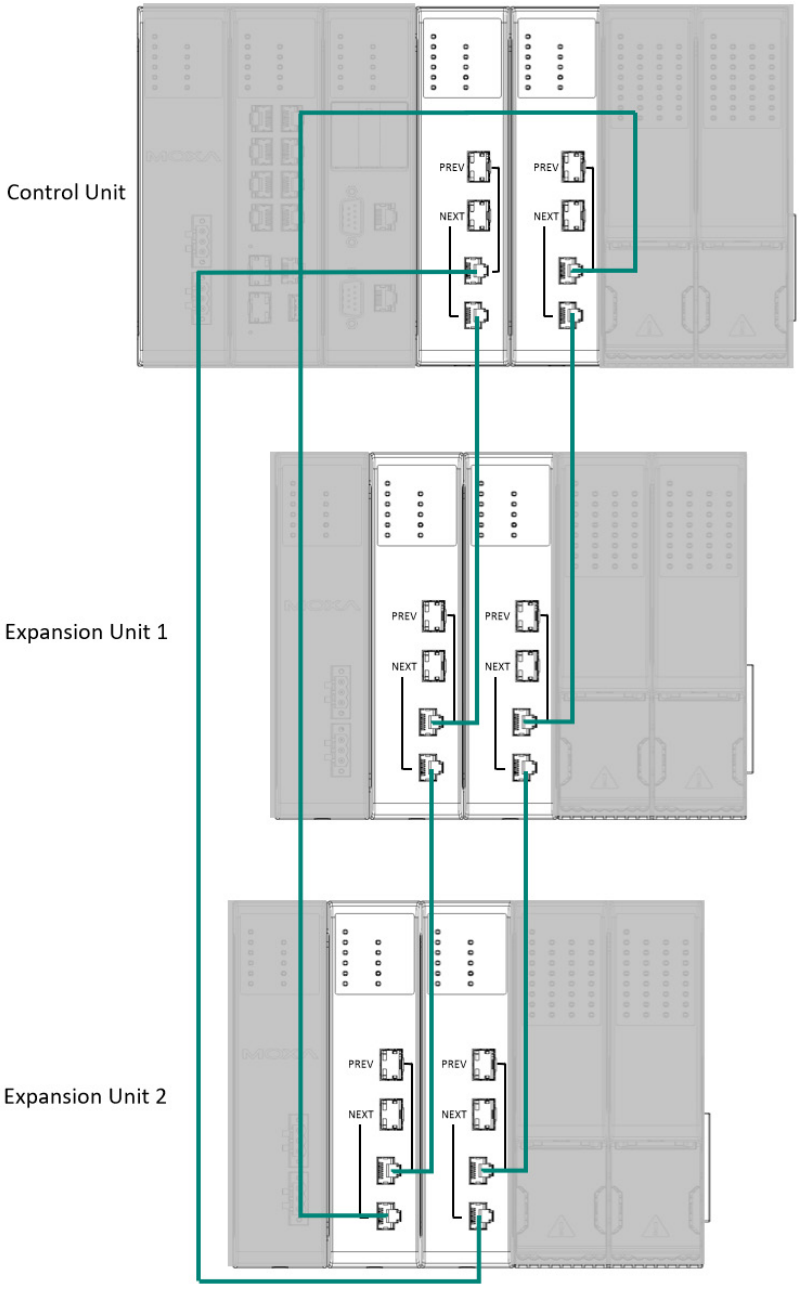
- One module per unit
  May be single line or ring topology
- Two modules per unit
  Maximum redundancy. Two expansion modules per unit with a ring topology ensures significantly enhanced redundancy. Strongly recommended for critical applications.

Up to four expansion units are supported per system (1 control unit, 4 expansion units).

Example: One Expansion Module Per Unit



Example: Two Expansion Modules Per Unit



Performing a Factory Reset on the CPU Module (65M-CPU14-IEC-CT-T)

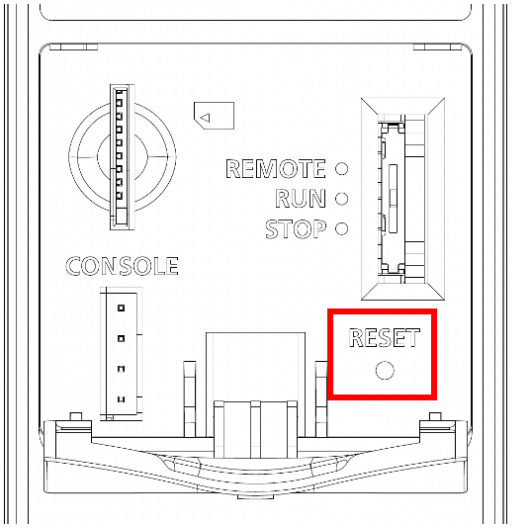
Each module has separate settings, and resets performed on one module do not affect other modules.

IMPORTANT

Do not power off the device during the reset process.

To reset the module to factory settings:

1. Open the CPU module front cover.
2. Press and hold the reset button for 15 seconds
   The STATUS LED blinks double red.
3. When the STATUS LED blinks double red, release the reset button.
   The module begins resetting to factory settings.



Performing a Factory Reset on the Switch Module (65M-5011M-CT-T)

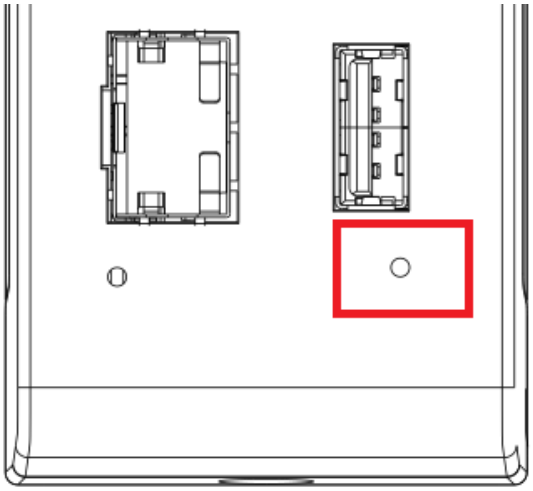
Each module has separate settings, and resets performed on one module do not affect other modules.

IMPORTANT

Do not power off the device during the reset process.

To reset the module to factory settings:

1. Press and hold the reset button for 5 seconds
   The STATE LED blinks at 1 Hz.
2. Once the STATE LED blinks at 1 Hz, release the reset button.
   The STATE LED blinks rapidly, indicating that factory default settings have been loaded.



NOTE

To reboot the module, press the reset button for less than 5 seconds.

Performing a Factory Reset on the Firewall Module (65M-5621-CT-T)

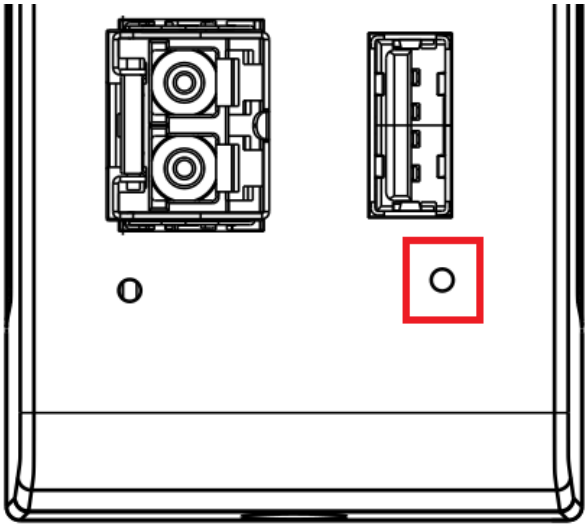
Each module has separate settings, and resets performed on one module do not affect other modules.

IMPORTANT

Do not power off the device during the reset process.

To reset the module to factory settings:

1. Press and hold the reset button for 5 seconds
   The STATE LED blinks at 1 Hz.
2. Once the STATE LED blinks at 1 Hz, release the reset button.
   The STATE LED blinks rapidly, indicating that factory default settings have been loaded.



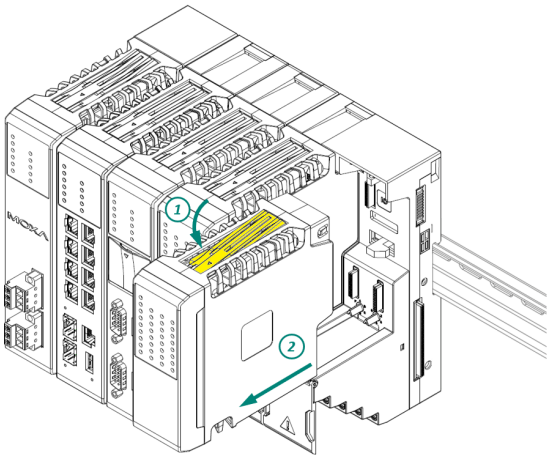
Disassembling the Unit

Modules should be removed before unmounting and disassembling the backplanes.

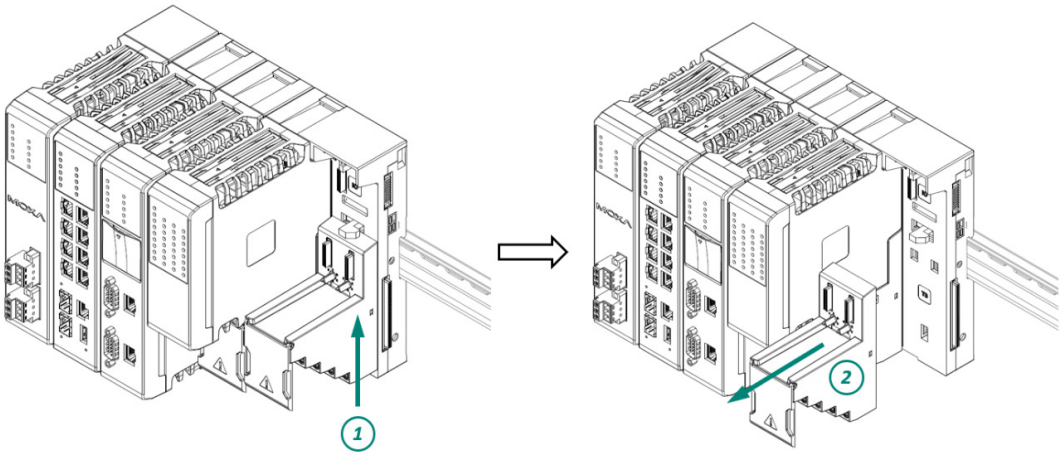
Before you begin:

- Power off the unit by disconnecting the power.
- Disconnect wires and cabling.

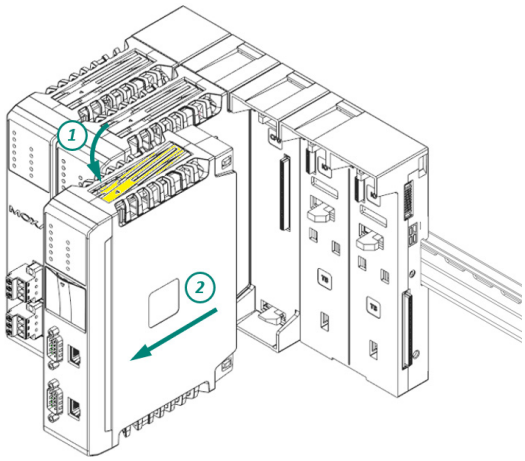
1. To remove I/O modules, press down on the removal tab, then slide outward



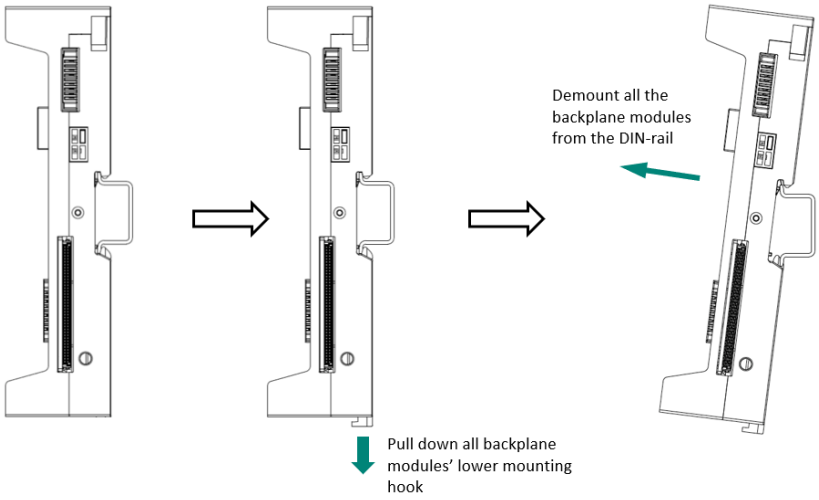
2. Repeat for all IO modules.
   Remove the terminal block modules by sliding up, then out.



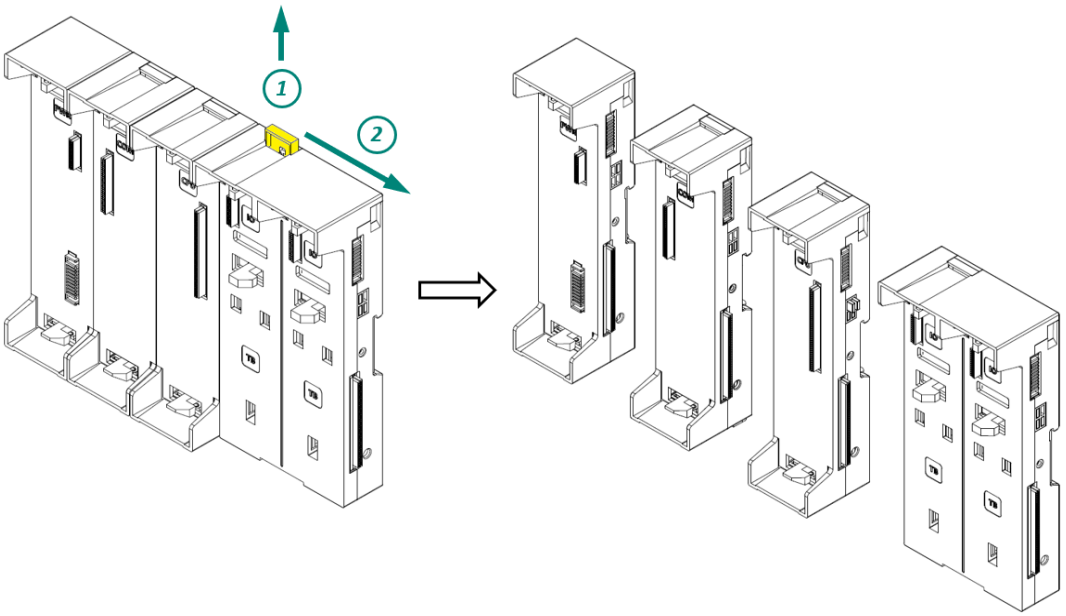
3. To remove other modules, press the removal tab, then slide outward.



4. To remove backplanes from the DIN rail, pull down all mounting hooks, then lift off from the bottom.



To detach backplanes, slide all top clips up, then gently separate.



5. Software Configuration

In this chapter, we introduce the web interface and serial console of the ioPAC 6500 CPU module.

Connecting the Web Interface

The Web Console is already embedded in the ioPAC 6500 system. Use the web console to check the device status, configure network settings, or update the firmware of the device. Follow the steps below to connect to the web interface.

1. Connect the system to your PC through an Ethernet cable.
2. Power on the unit.
3. Open a web browser (Chrome is recommended) on your PC and type the default IP address shown on the model label of the unit.
4. Default IP LAN1: 192.168.126.1~2

   Default IP LAN2: 192.168.127.1~2

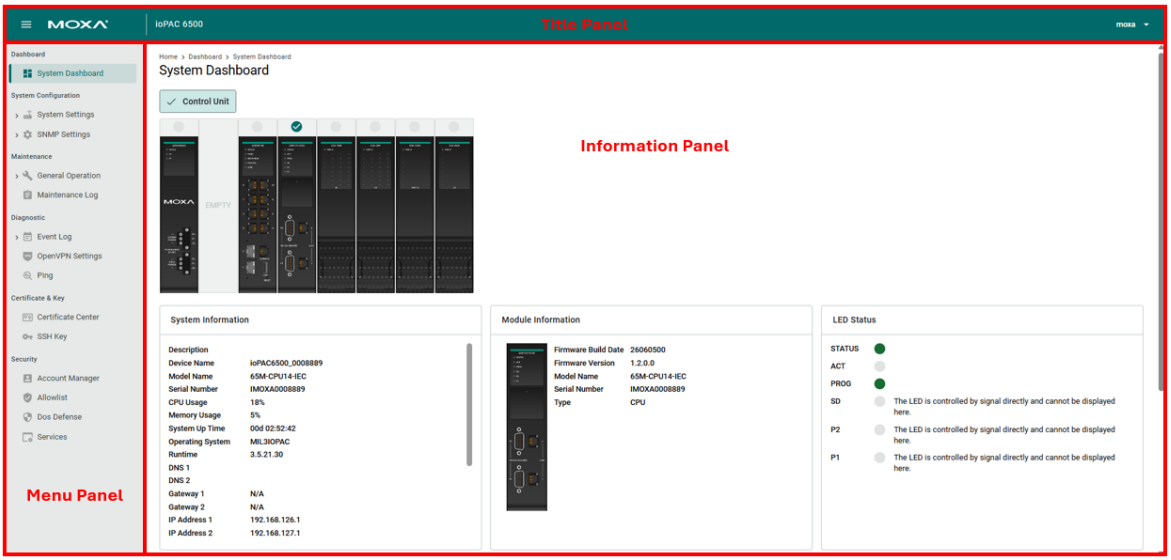
   The last octet is 1 or 2, depending on which slot is plugged. (Only applicable when 2-slot CPU backplane module is used)
5. Default Account Name: moxa

   Default Password: moxa

INFORMATION

Type in the IP address (if the IP address is not set by default). If the IP address is not available, use the IINxpress utility to search for the device, or load the factory default settings by holding down the RESET button to access the device through the default IP address.

Upon successful log in, a 3-part product page appears.



1. **Title panel:** Provides the log out function. The login account will be shown at the top right corner.
2. **Menu panel:** Provides the access monitor the device status to configure functions or services.
3. **Information panel:** The device information associated with the functions selected in the menu panel.

> **NOTE**
>
> For security reasons, select Logout when no longer accessing this device. DO NOT leave the web interface unattended.

Dashboard

System Dashboard

System Dashboard is the first page when you log in the device. The dashboard provides information about the module information, panel status, service status, protocol status, and IEC 61131-3 program status.

On the top of the system dashboard, the system combination will be displayed. Select the Control Unit, Expansion Unit 1, etc. to check the system combination of each unit.



On the bottom of the system dashboard, the information will be displayed.

System Information

The system information will be displayed here. For example, device name, system status, Ethernet status, time status, etc.

Module Information

The information of the selected module will be displayed here. For example, model name, firmware version, serial number, etc.

> **NOTE**
>
> For detailed information on the switch module, check in the built-in web of the switch module.

LED Status

The LED status of all modules will be displayed here. For the LED definition, refer to the LED definition section.

> **NOTE**
>
> For the LED status of the switch module, check in the built-in web of switch module.

Mode Switch Status

The mode switch status will be displayed here. There are three statuses of mode switch.

Remote: The device is allowed to download the program and change the device setting remotely. An authorized user with secure access is required.

Run: The device is actively running the program. It rejects any attempt to download the program or change the device settings. The device information is set to read only.

Stop: The device will not execute the program in any condition. The authorized user is allowed to download the program and change the device setting.

Protocol Status

The status of all protocol services will be displayed here. There are three statuses.

Run: the service is running.

Stop: the service is stopped.

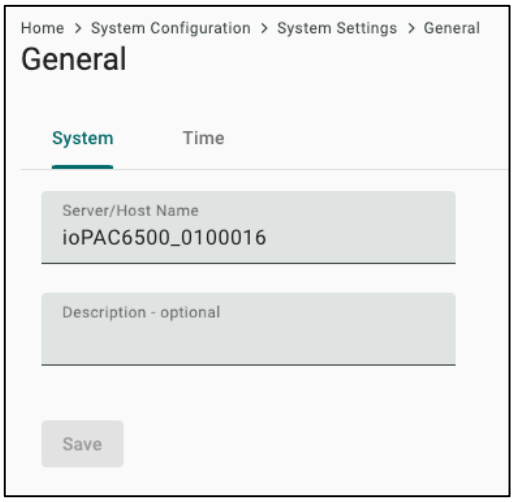
Disable: the service is currently disabled.

IEC 61131-3 Program Status

The IEC engine status will be displayed here. **RUN** and **STOP** are two statuses for you to identify if the engine is running or not.

System Configuration

System Settings—General

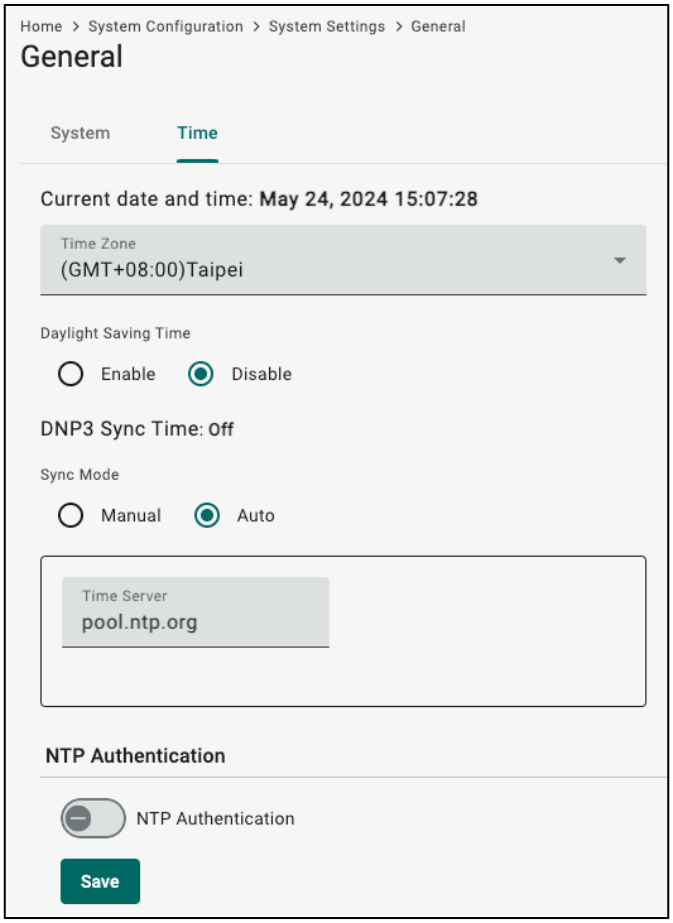


Go to **System Settings > General > System** to specify a new device name and enter a description for the device.

Device Name: Set enter a name to identify the whole ioPAC 6500 system. The maximum length is 64 characteristics, alphanumeric, and special characteristics are allowed.

Description: Extra information for you to better identify the device.

Go to **System Settings > General > Time** to set up the time of the device.

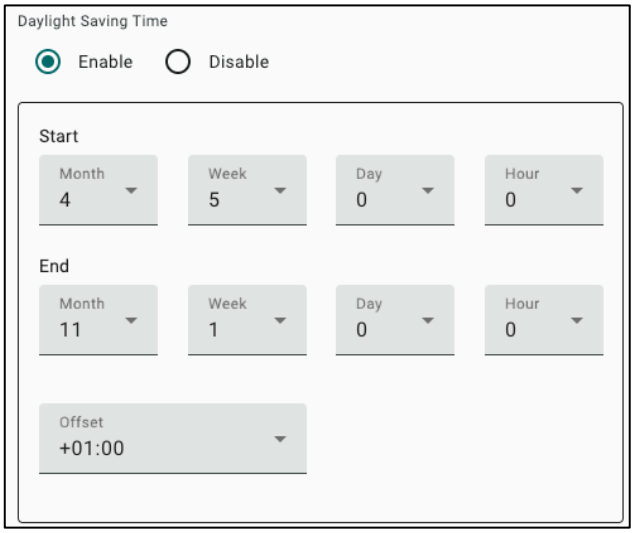


The current data and time will be displayed here.

NOTE

The current date and time are based on the system setting.

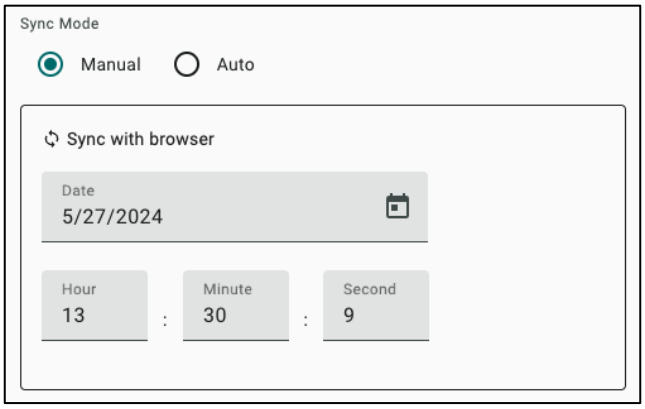
Time Zone: Specify the time zone where the devices is located.



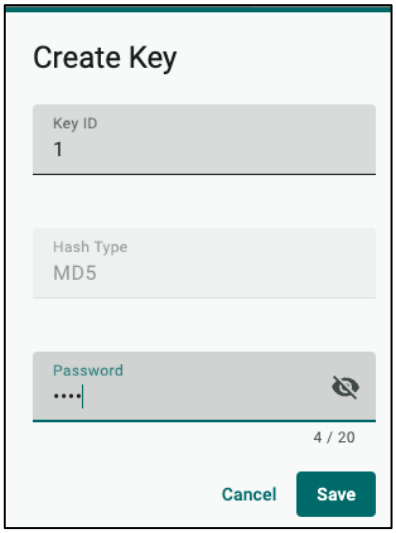
Daylight Saving Time: Enable and enter the daylight-saving time of the device.

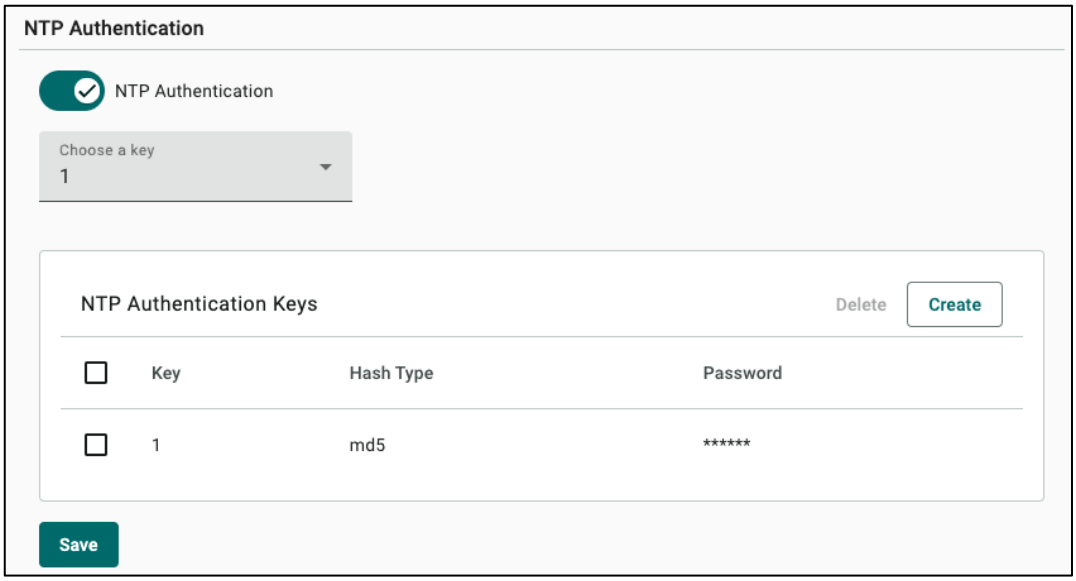
NOTE

0 to 6 in Day represents Sunday to Saturday, respectively.



Sync Mode: How to sync up the device time. In **Auto** mode, the device will sync with the time server you specified automatically. In Manual mode, select Sync with browser icon to sync with the browser, or input a specific time.

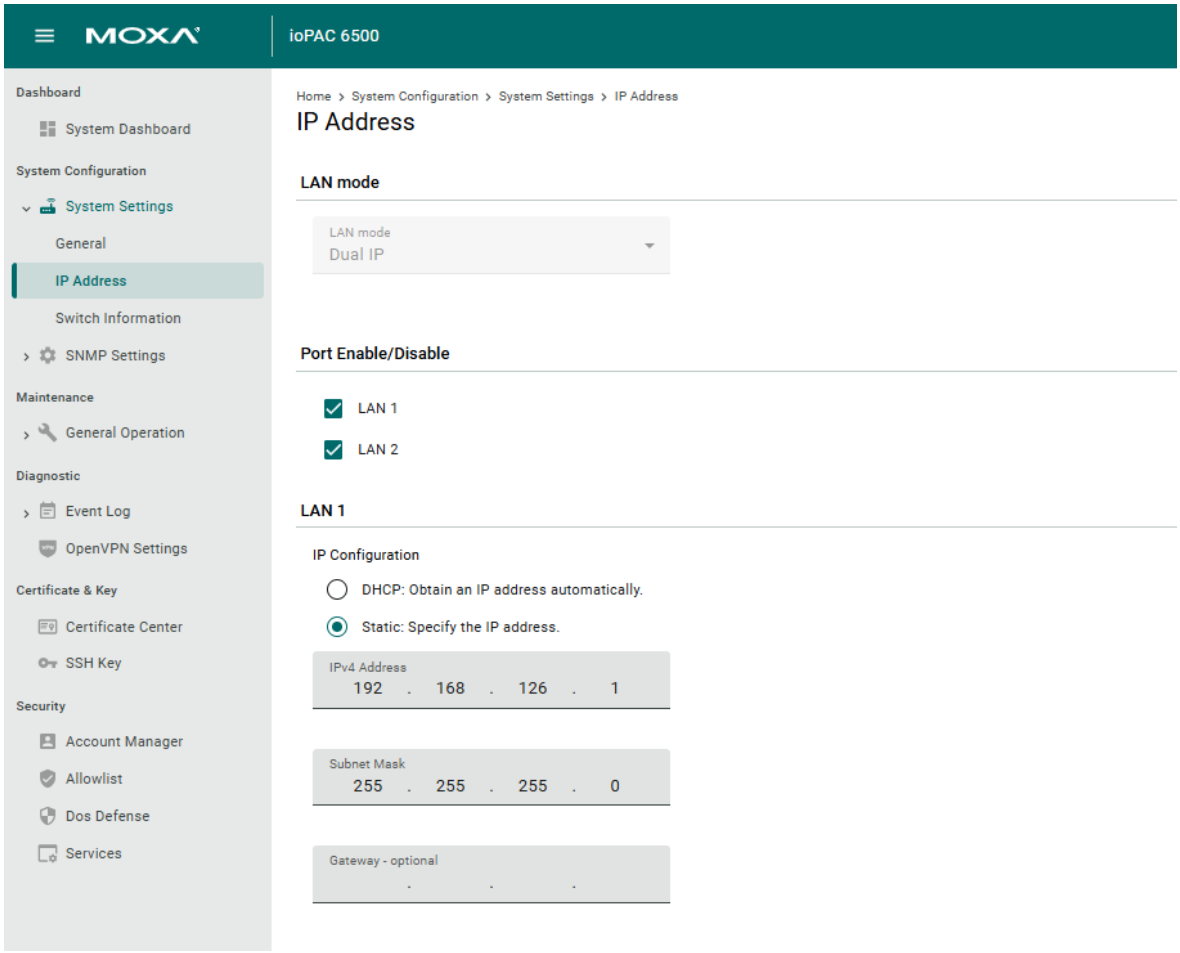




NTP Authentication: The device supports NTP Authentication for a secured connection between NTP servers. If you want to use the NTP authentication, follow the steps to enable the NTP authentication.

1. Select **Create**, enter the key ID and password in the pop out window, and then **Save** to close the window.
2. Choose the created key, then **Save** to enable the NTP Authentication.

System Settings—IP Address



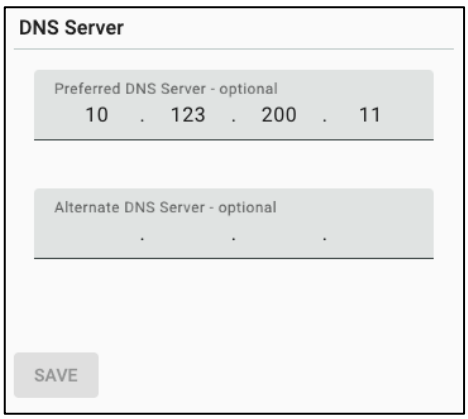
Go to **System Settings > IP Address** to set up the device IP.

LAN mode: The device supports **Dual IP** mode currently.

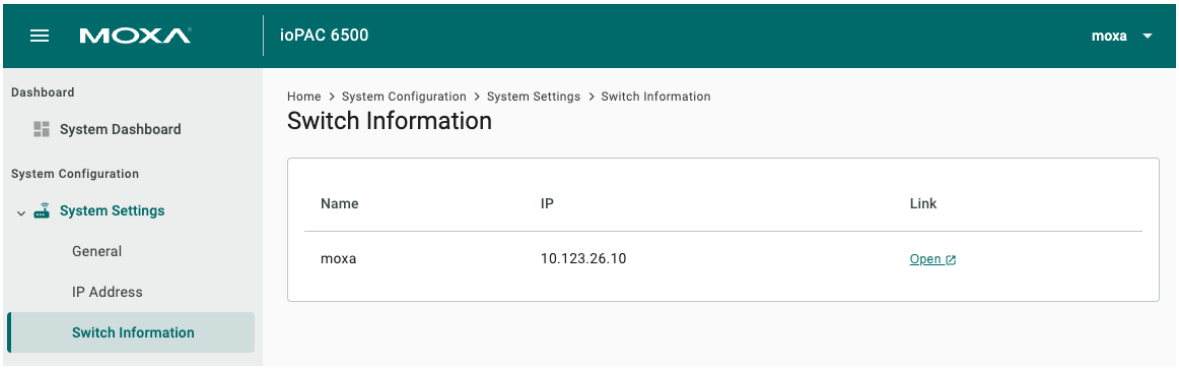
Port Enable/Disable: Enable or disable port by selecting LAN1 or LAN2

LAN1/LAN2: Set up the IP for LAN1 or LAN2. The device supports **DHCP** or **Static** mode.

DNS Server: Need to input the DNS server.

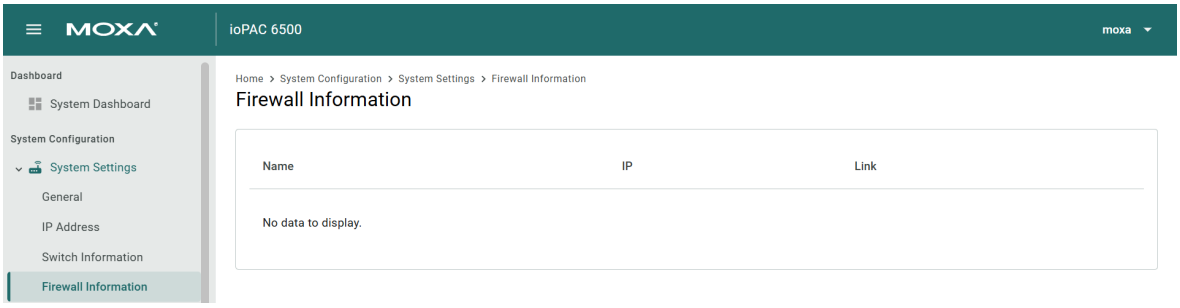


System Settings—Switch Information



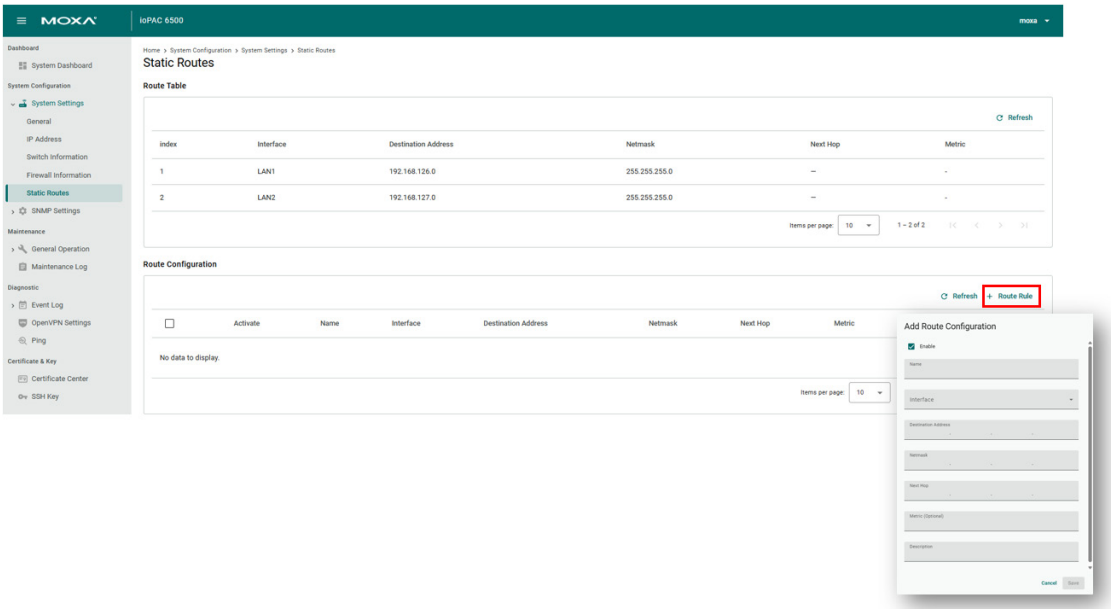
Go to **System Settings > Switch Information** to check the switch information. If any switch module is installed in the system, the IP information will be displayed here. For the switch module setup, select Open and set up in the web of the switch module.

System Settings—Firewall Information



Go to **System Settings > Firewall Information** to check the Firewall information. If a Firewall module is installed in the system, the IP information will be displayed here. For the Firewall module setup, select and set up in the web of the Firewall module.

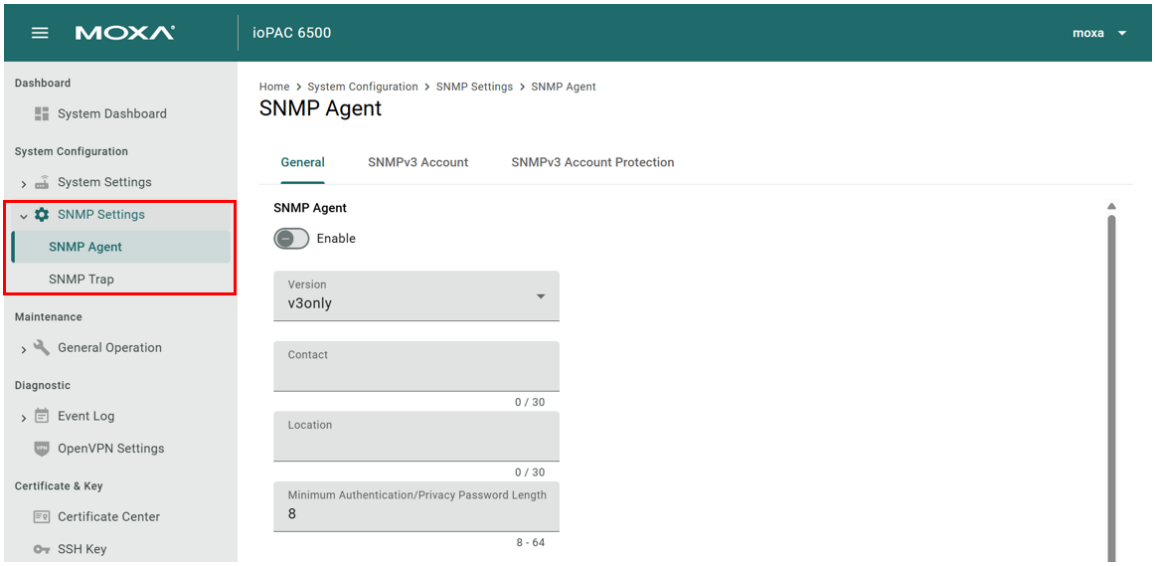
System Settings—Static Routes



Go to **System Settings > Static Routes** to add and configure static routes. The Static Routes section allows you to manually define network paths for data traffic. By adding a static route, you can direct traffic destined for specific networks to a designated gateway or interface, overriding the device's default routing behavior. Select **+ Route Rule** to add a route configuration.

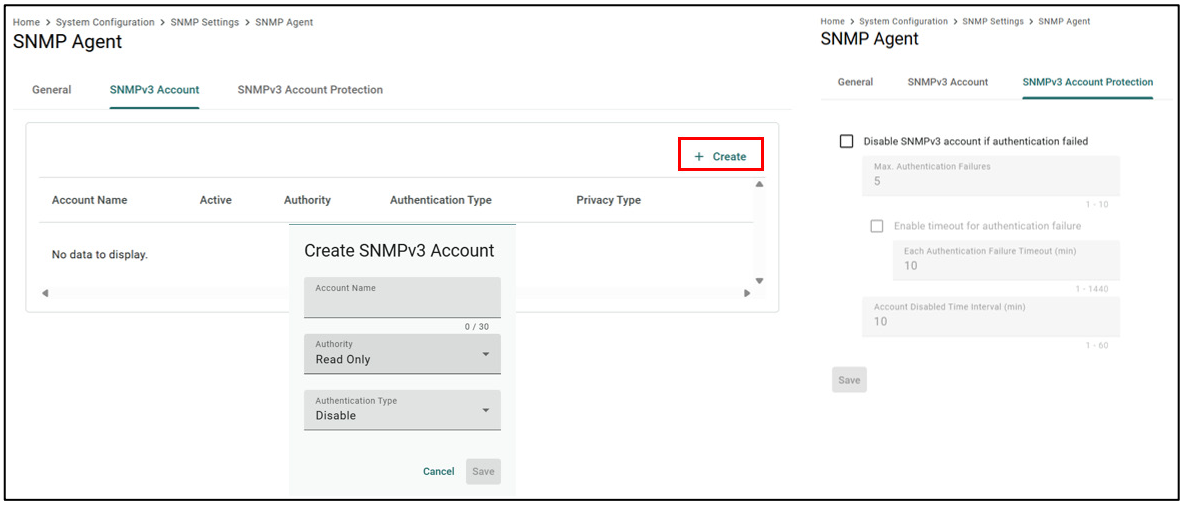
SNMP Settings

SNMP Agent: The SNMP agent continuously gathers information about the device. When an SNMP manager sends a request, the agent responds with the requested data. **Versions: v1v2c, v3only, v1v2cv3**.

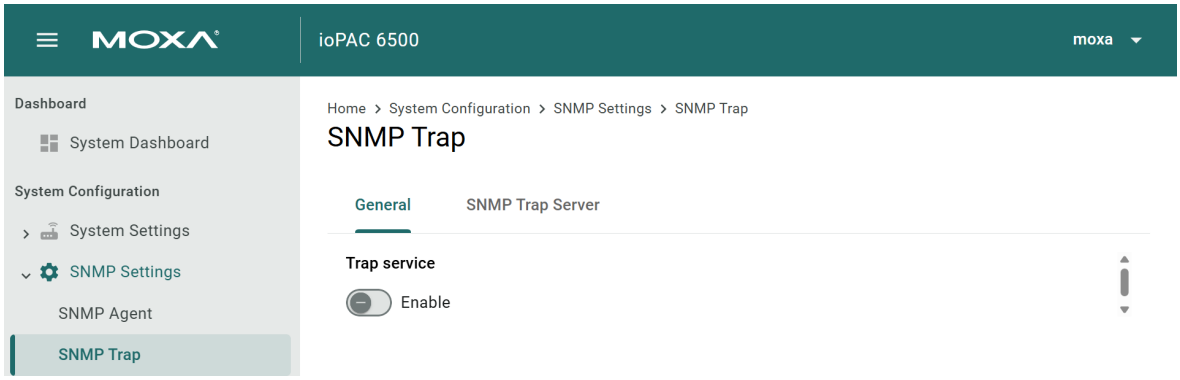


SNMPv3 Account and Account Protection

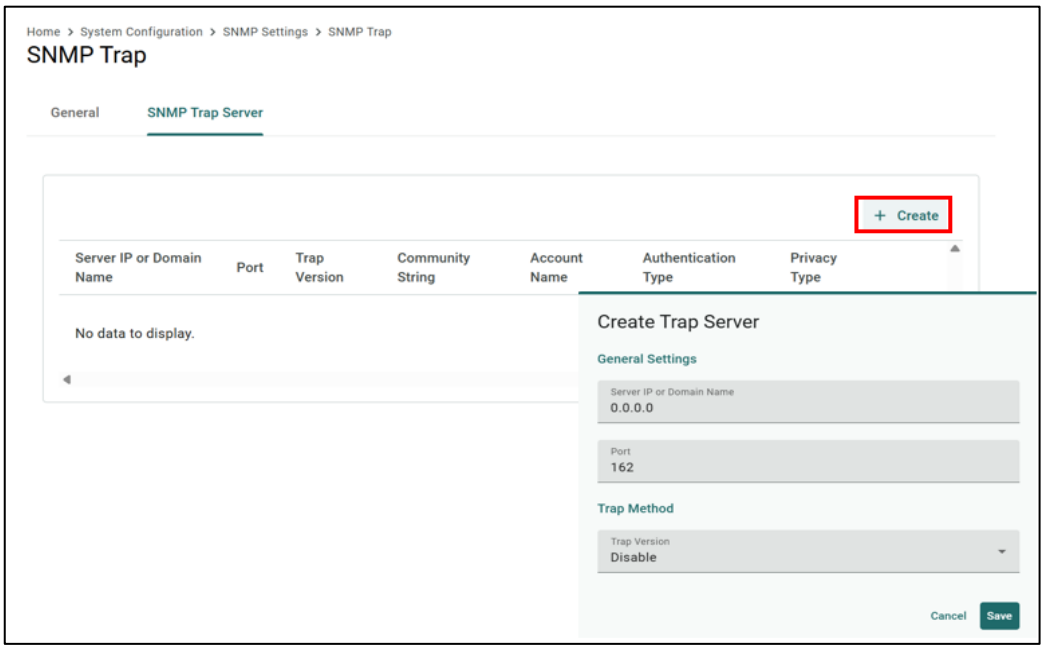
Click "Create" to configure the SNMPv3 Account and you could decide whether to disable the SNMPv3 Account if authentication failed.



SNMP Trap: The agent proactively sends a notification to the server without waiting for a request, should a critical event occur.

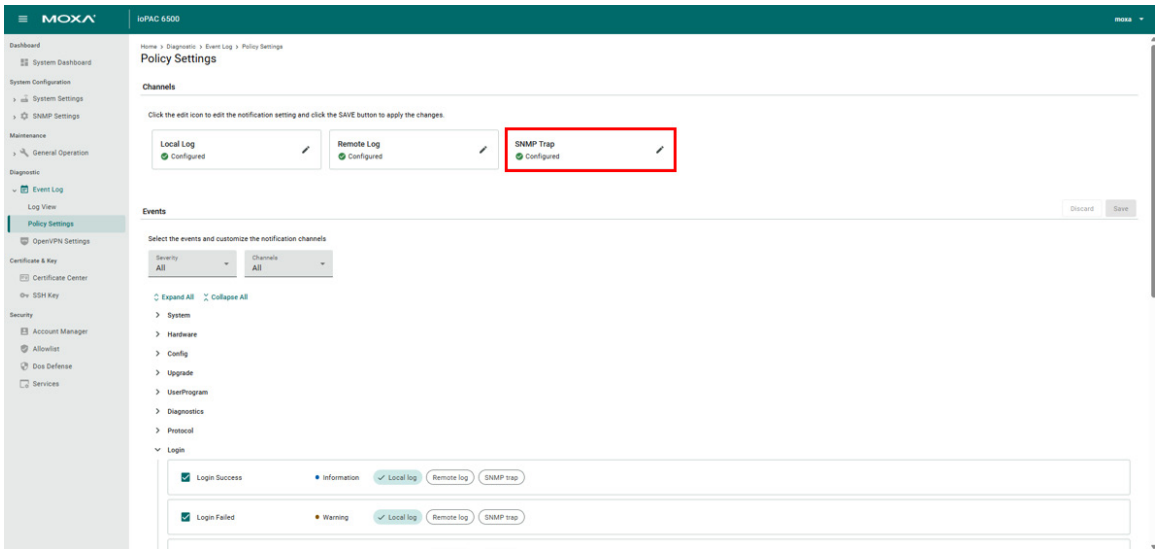


Click "Create" to configure the Trap Server.



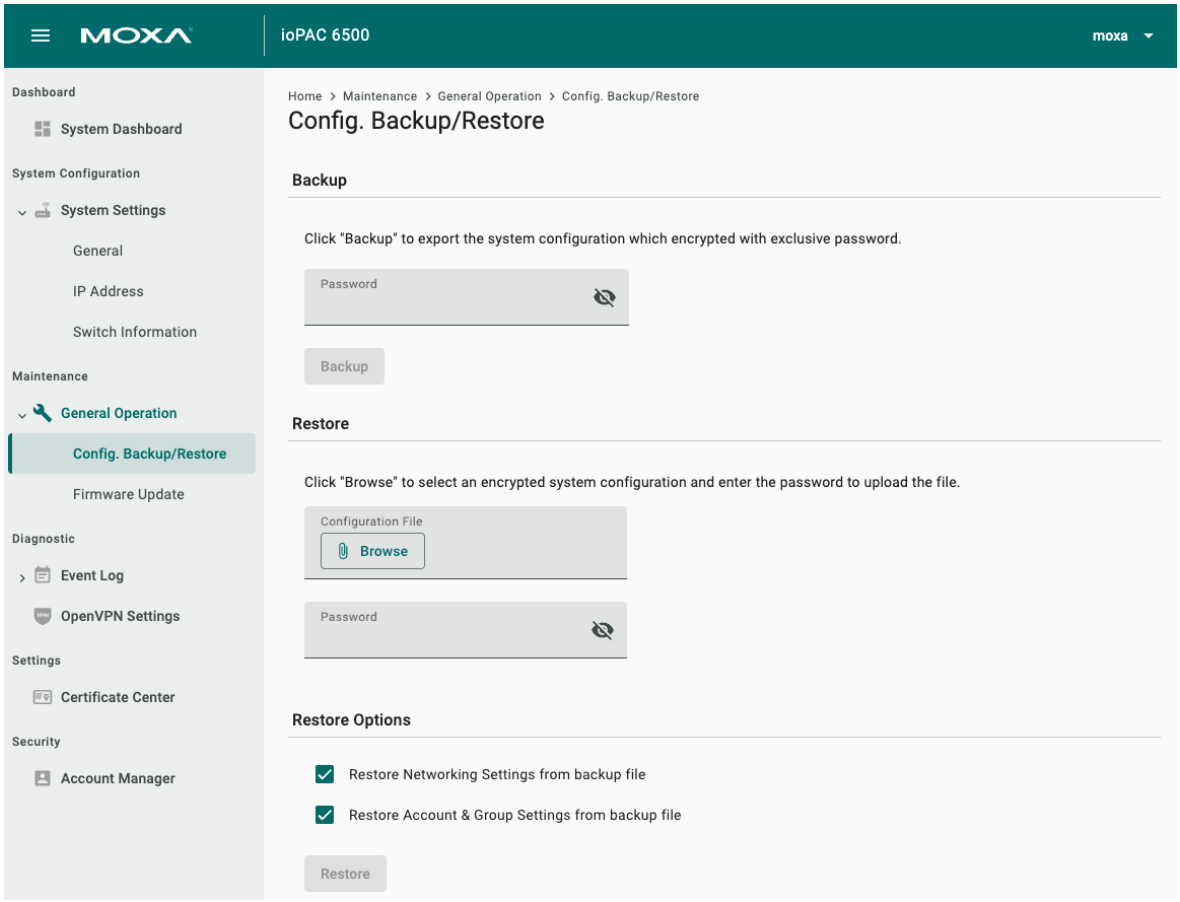
NOTE

Events could also be sent via SNMP Trap. See **Event Log - Policy Settings.**



Maintenance

General Operation—Config. Backup/Restore

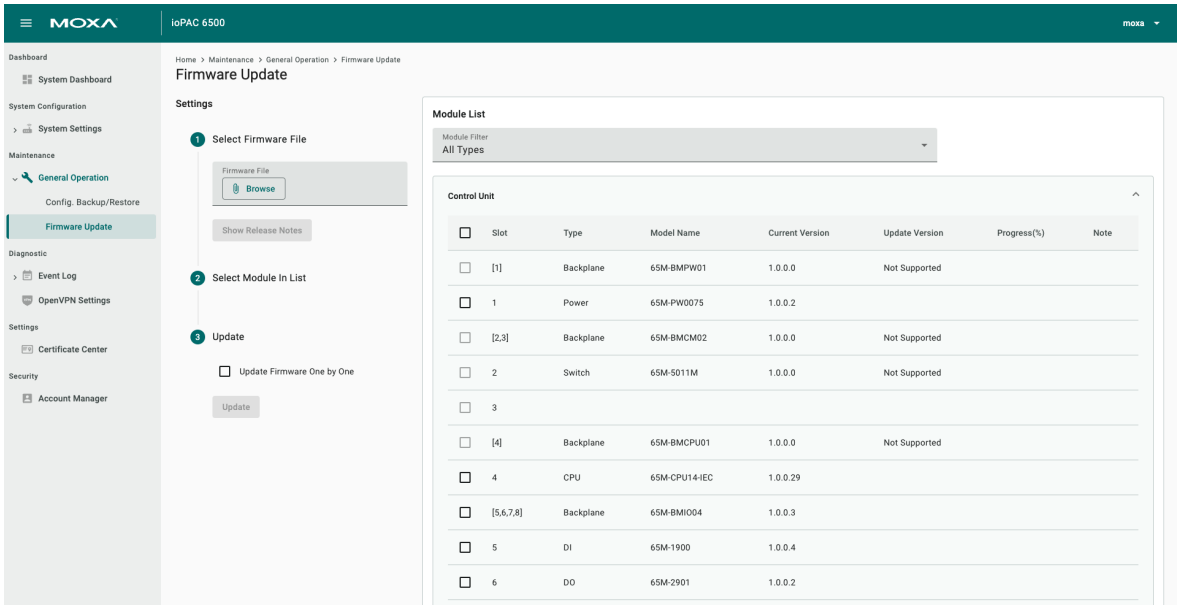


Go to **General Operation > Config. Backup/Restore** to back up the system settings to the encrypted configuration file or restore the system settings from an encrypted configuration file.

Backup: Input a password first, then select **Backup** to save the configuration file which is encrypted with the password specified by you. The maximum length of password is 40 characteristics, alphanumeric, and special characteristics are allowed.

Restore: Restore the system with an encrypted configuration file. Select **Browse** to choose the file and input the password. You can choose to restore the networking, account, and group setting from the backup file by selecting the checkbox or not. Once all the information is ready, select the **Restore** to restore the system.

General Operation—Firmware Update



Go to **General Operation > Firmware Update** to update the firmware to the system. The page provides three steps to guide you in updating the firmware.

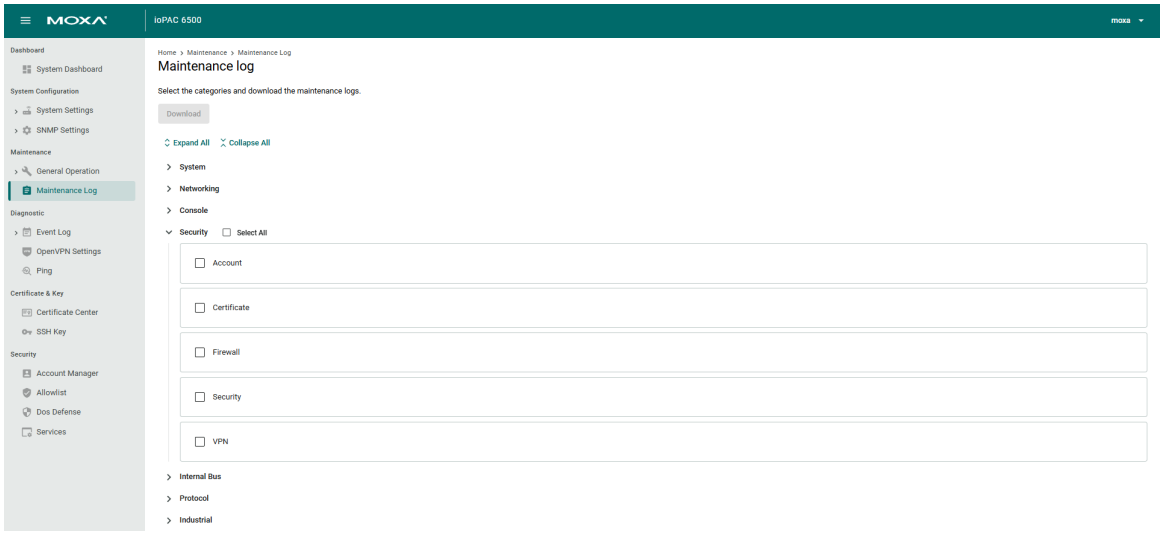
1. **Select Firmware File:** Select **Browse** to choose the firmware file that needs to be updated to the system. Select the release note to check the details.
2. **Select Module on List:** Select the modules that need to be updated on the **Module List**. Use the module filter to speed up the module selection. Module information will be displayed in the module list.
   - **Slot:** It shows the slot that the module is installed in. The slot number is calculated based on the current system combination. The number 1 shows the leftmost module of each unit. The slot of the backplane module will be displayed with a number in square brackets, e.g., [1].
   - **Type:** It shows the module type. E.g. CPU, DI, Backplane, etc.
   - **Model Name:** The model name of the module will be displayed here.
   - **Current Version:** Current firmware version of the module will be displayed here.
   - **Update Version:** The firmware version included in this firmware file will be displayed here.

NOTE

Update the switch module's firmware on the web page of the switch module.

   - **Progress(%):** The progress of the update will be here
   - **Note:** Any other information that cannot be categorized will be displayed here.
3. **Update:** Select **Update** to start the system firmware update. Choose **Update Firmware One by One** to update the firmware module by module.

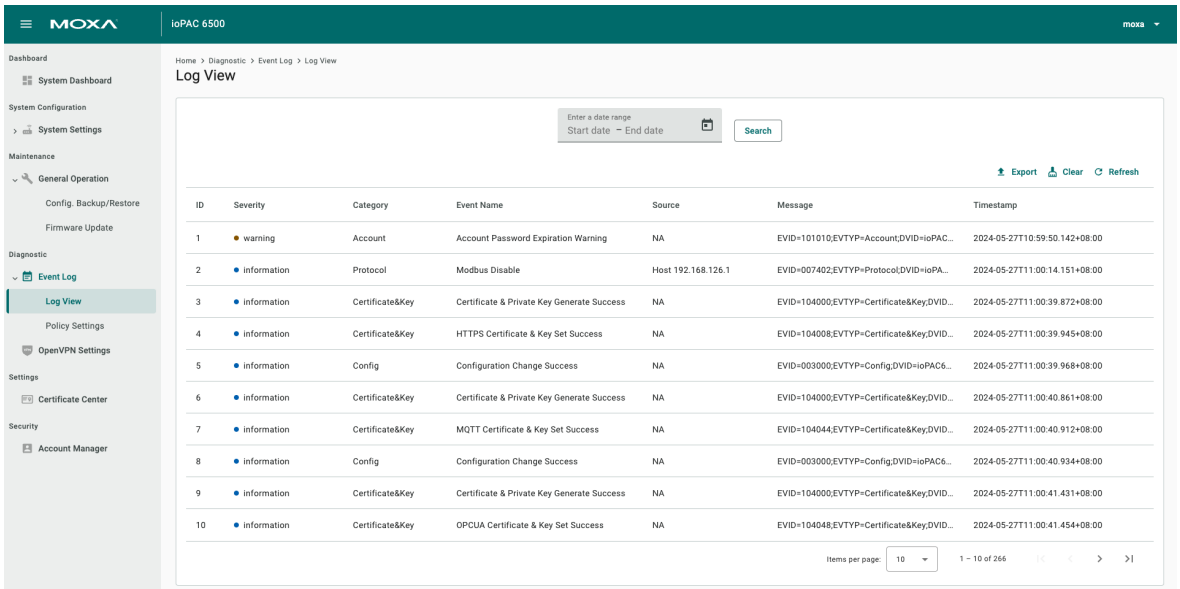
Maintenance Log



Select categories to download maintenance logs

Diagnostic

Event Log—Log View

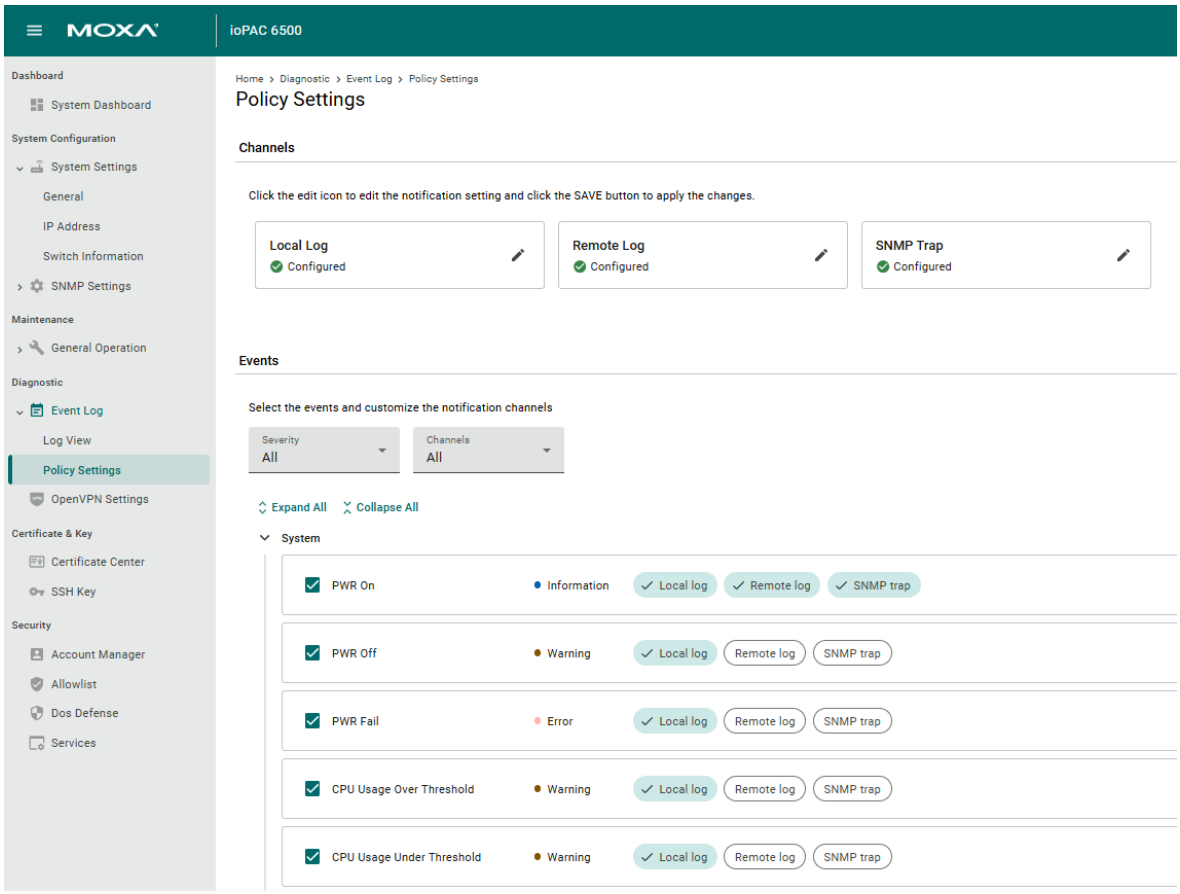


Go to **Event Log > Log View** to check all logs generated by the system. The following information of the logs will be displayed in the table.

- **ID:** The orders of the logs in the list
- **Severity:** The severity of the event; three severities (alert, warning, information).
- **Category:** The category from which the log is generated. Check the categories in the Policy Settings page.
- **Event Name:** Event name shows why the log was generated.
- **Source:** If the log is generated by an external source, the information will be displayed here.
- **Message:** The message included in the log.
- **Timestamp:** When the log is generated.

Export, **Clear**, and **Refresh** the log list based on the requirement.

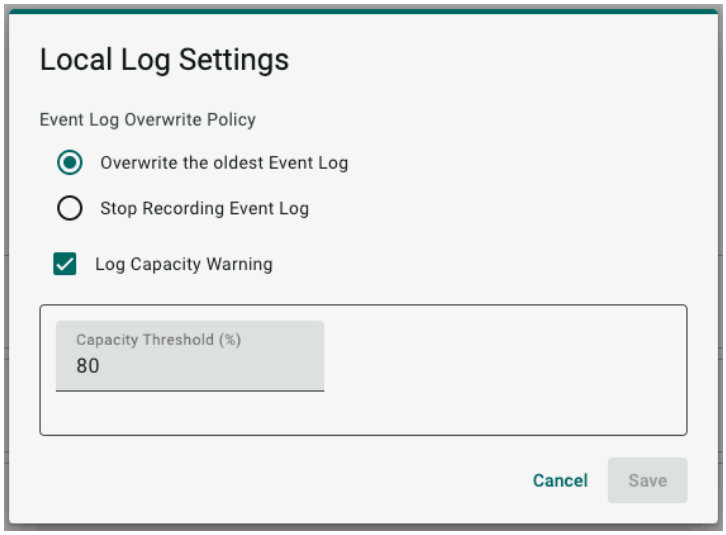
Event Log—Policy Settings



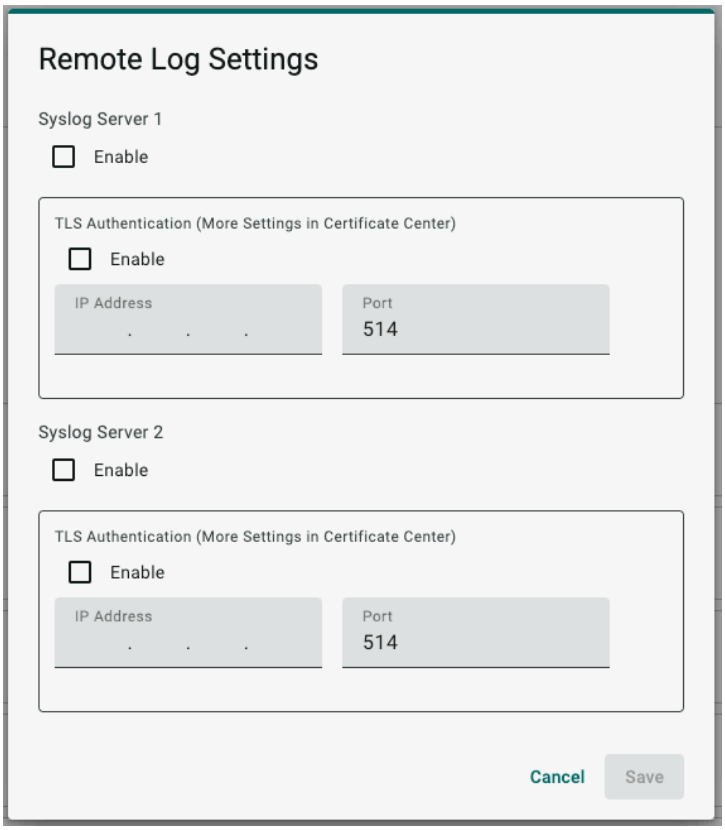
Go to **Event Log > Policy Settings** to check the policy settings of the log.

The log will be stored locally as the default. The modification can be done in the **Channels**.

Local Log: Select the ✎ to change the settings. **Event Log Overwrite Policy** and **Log Capacity Warning** can be configured.

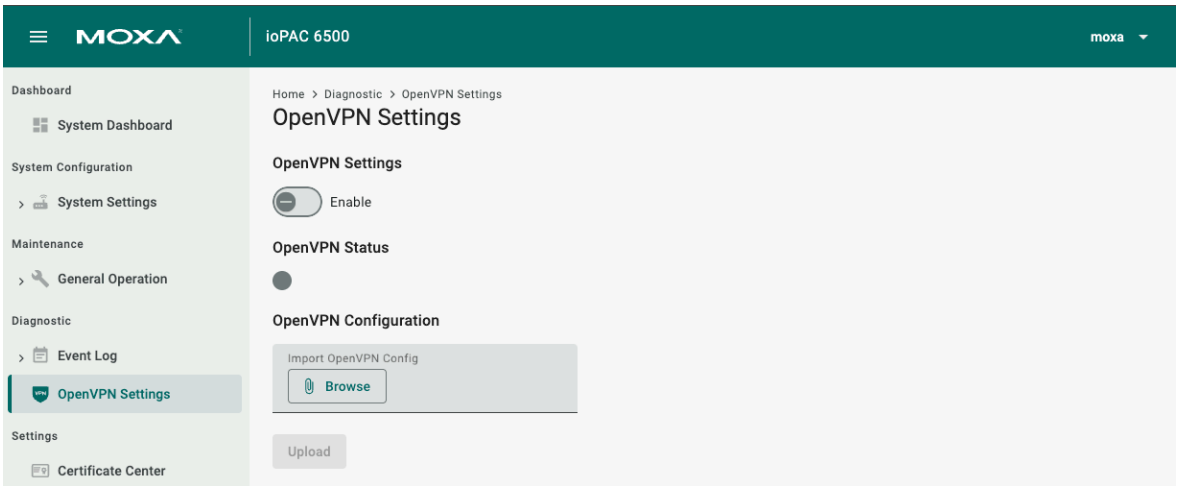


Remote Log: Select the ✎ to change the settings. The system supports two syslog servers and can deliver the log to two syslog servers simultaneously. Enable the server and key in the IP to activate the syslog server. The system supports TLS authentication. Remember to complete the settings in the **Certificate Center**.



The logs supported by systems are listed in the **Events** section. The events are enabled and stored locally in default. Change the logs based on the application.

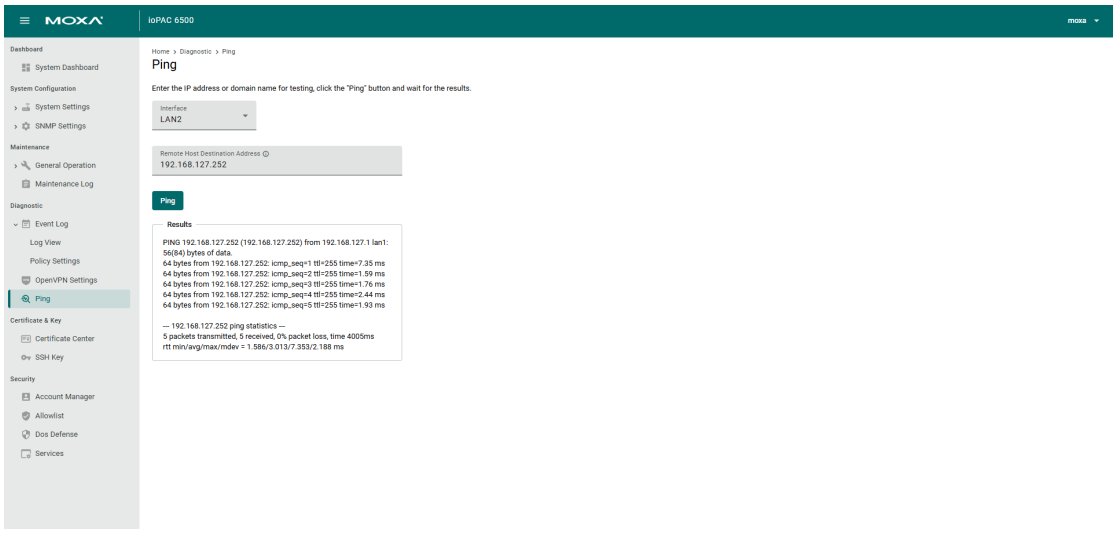
OpenVPN Settings



Go to **OpenVPN Settings** to configure the OpenVPN settings. Follow the steps to enable the OpenVPN

1. Import the OpenVPN config file. The file is generated in an OpenVPN server.
2. Enable the OpenVPN.
3. If connected successfully, the status will become Green.

Ping

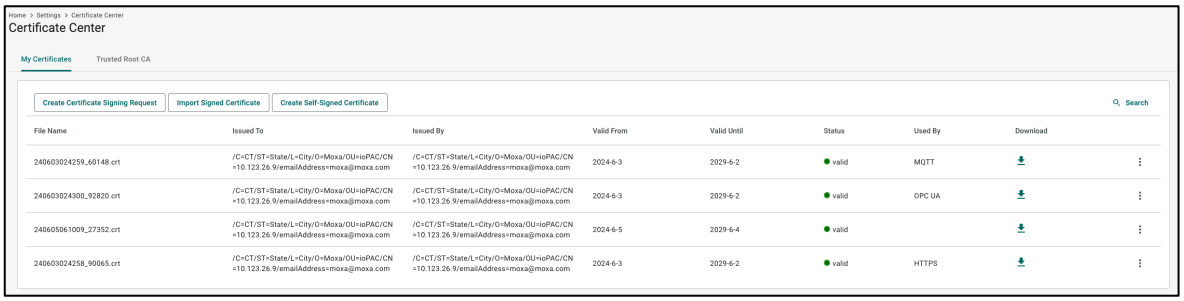


To easily verify a connection between the ioPAC 6500 and other network devices, use the Ping function.

Enter the IP address or domain name for testing, select **Ping,** and wait for the results

Certificate

Certificate Center

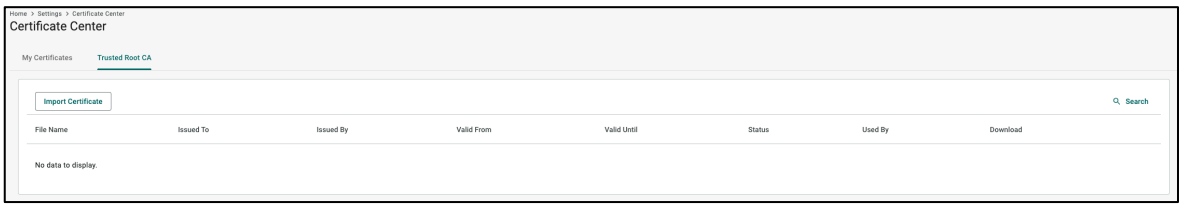


Go to **Certificate Center > My Certificates** to check the search, view the status, and download the system certificates.

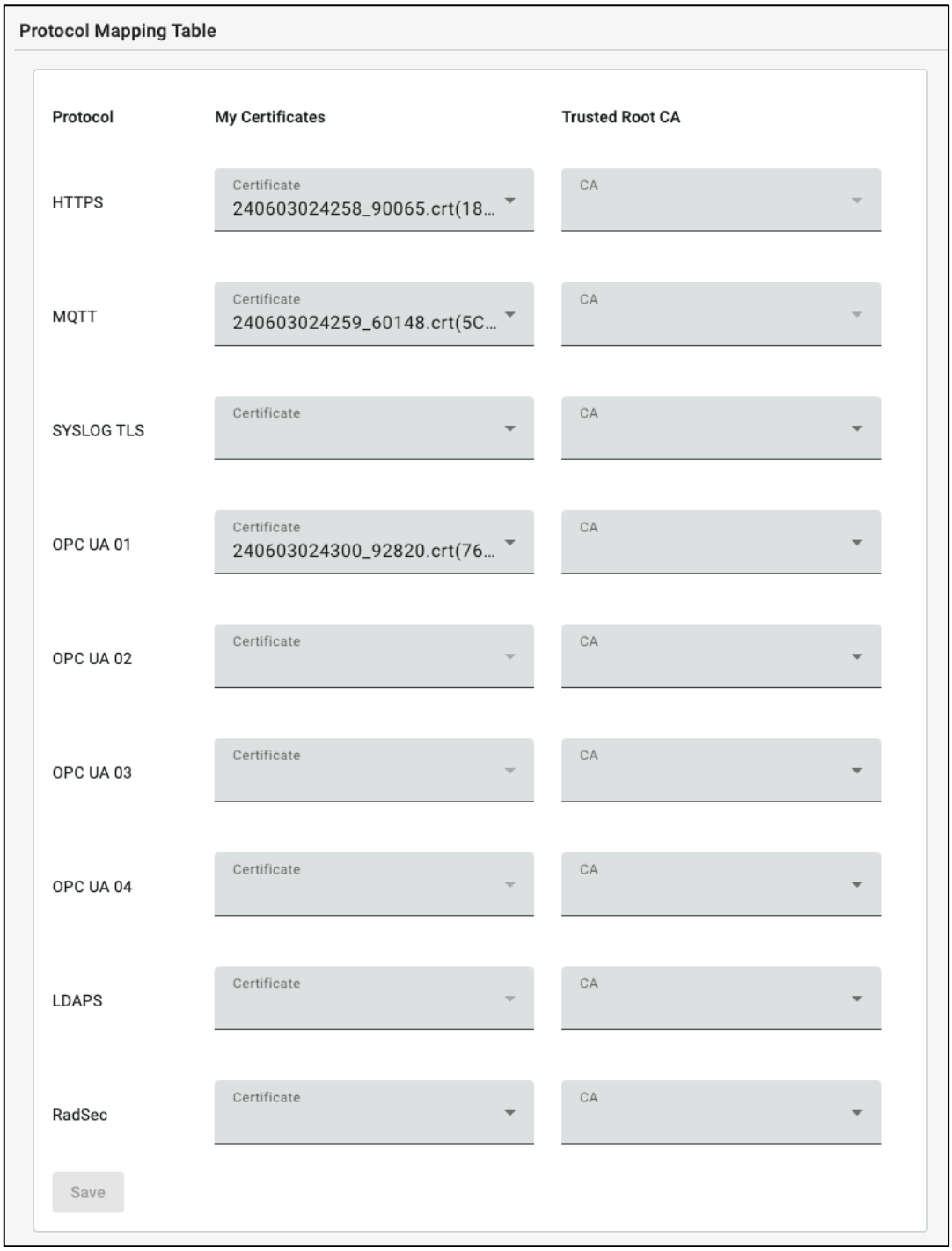
Create Certificate Signing Request: This function will generate a .csr file based on current system status. Use the .csr file to obtain a signed certificate from Root CA.

Import Signed Certificate: The signed Certificate generated by Root CA in the previous step should be imported here.

Create Self-signed Certificate: If the Root CA is not available, the system also provides the self-signed certificate for you to download.



Go to **Certificate Center > Trusted Root CA** to import the certificate of the Trusted Root CA.

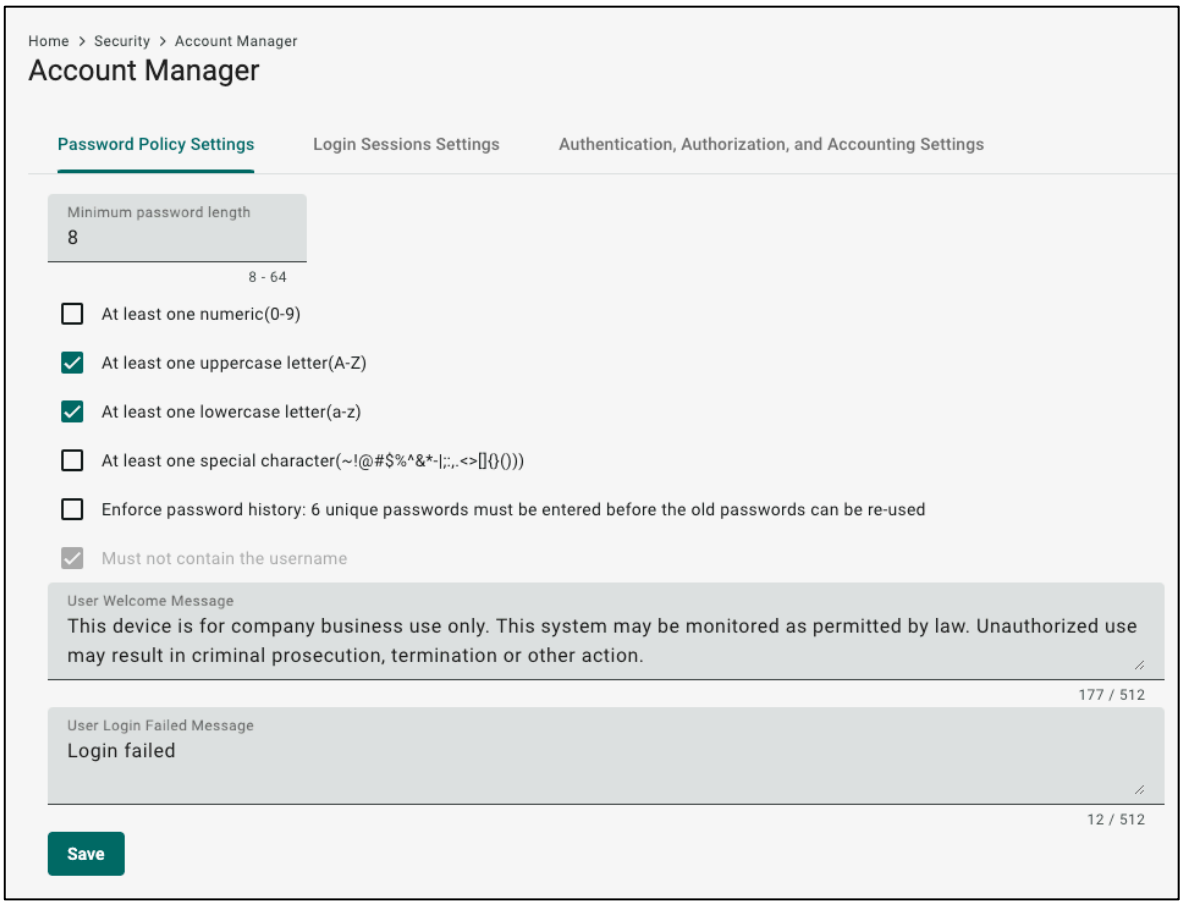


Go to **Certificate Center > Protocol Mapping Table** to link the saved My Certificates and Trusted Root CA to a protocol. Note that not all protocols need My Certificate and Trusted Root CA.

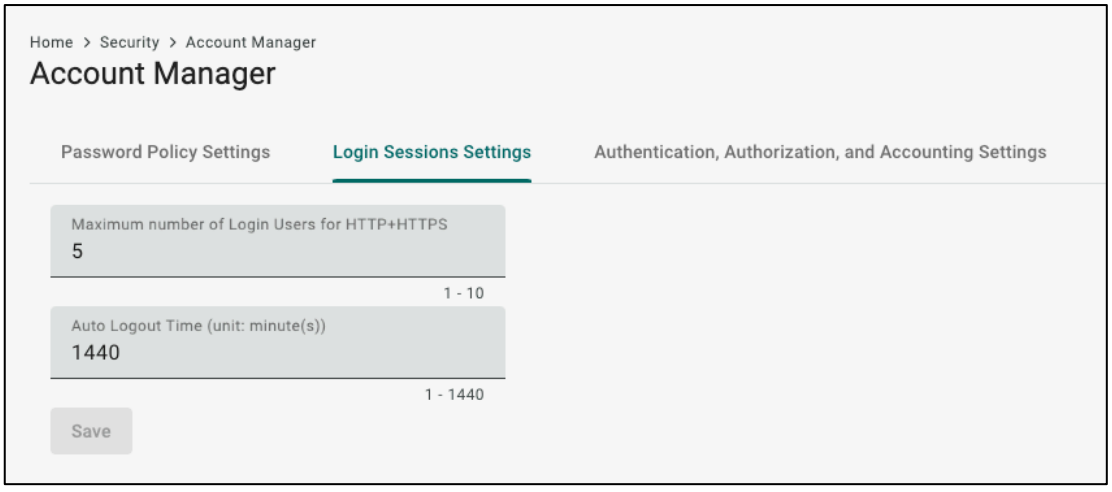
- Only My Certificate: HTTPS, MQTT
- Only Trusted Root CA: OPC UA 2/3/4, LDAPS, RadSec

Security

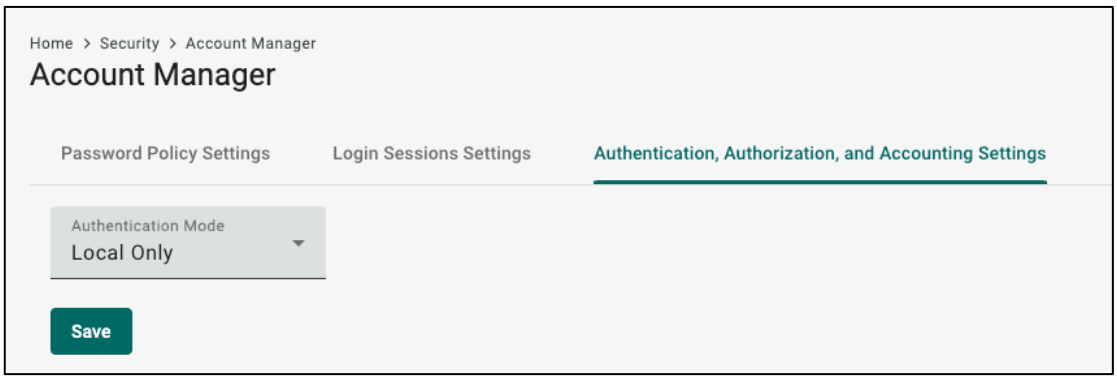
Account Manager



Go to **Account Manager > Password Policy Settings** to set up the password policy of the device. The length, letter combination, and uniqueness of the password can be set up. Besides the password policy, change the welcome and login-failed message on this page.



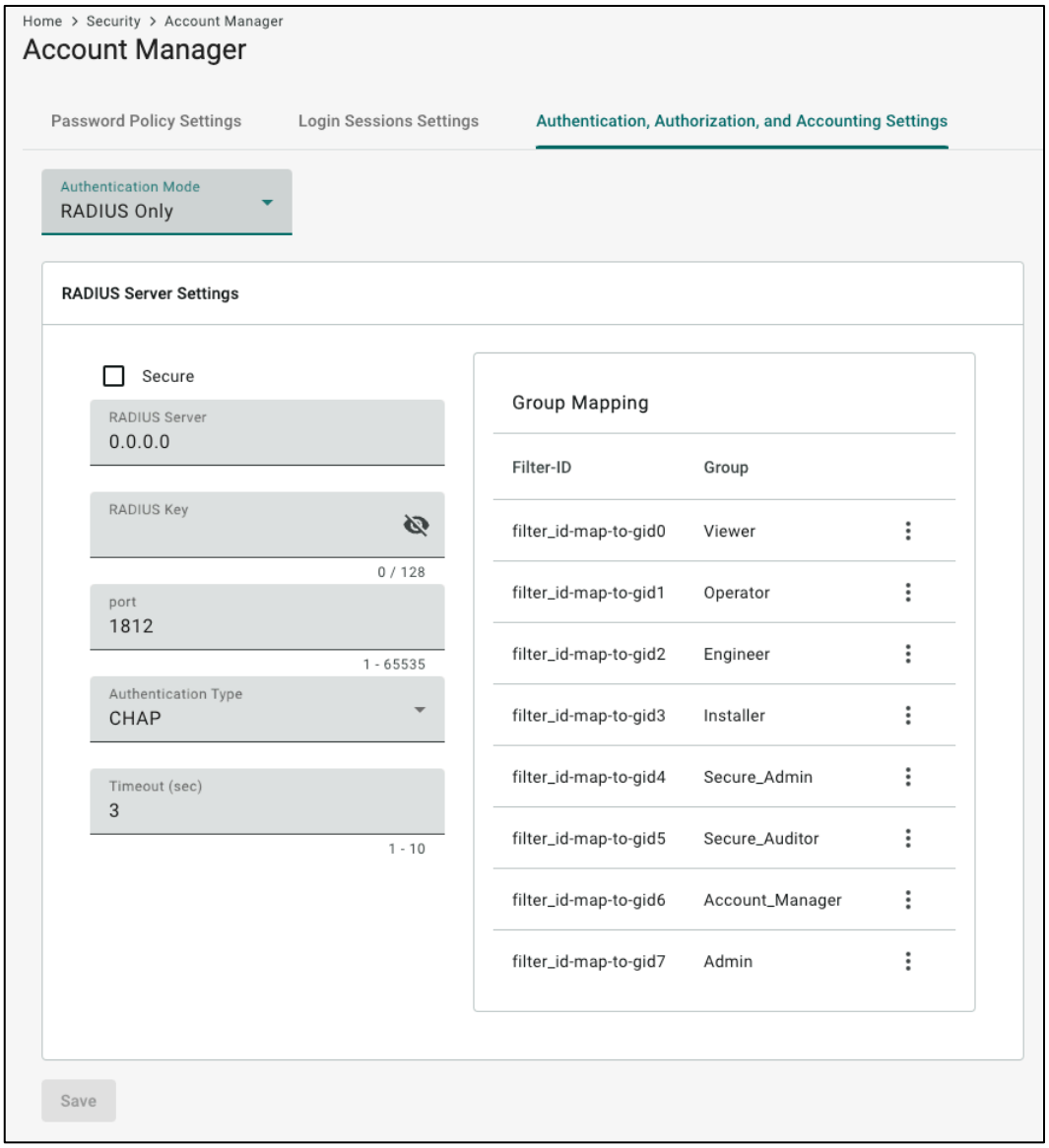
Go to **Account Manager > Login Session Settings** to set up the login sessions. The maximum connection and logout time.



Go to **Account Manager > Authentication, Authorization and Accounting Settings** to set up the AAA settings. Several authentication modes are available.

- **Local Only:** Use the accounts that have been set up in the system.
- **RADIUS Only:** Link to the RADIUS server to verify the login account.
- **TACACS+ Only:** Link to the TACACS+ server to verify the login account.
- **LDAP Only:** Link to the LDAP server to verify the login account.
- **RADIUS Then Local:** Link to the RADIUS server to verify the login account first. If a timeout happens, use the accounts set up in the system as an alternative.
- **TACACS+ Then Local:** Link to the TACACS+ server to verify the login account first. If a timeout happens, use the accounts set up in the system as an alternative.
- **LDAP Then Local:** Link to the LDAP server to verify the login account first. If a timeout happens, use the accounts set up in the system as an alternative.

RADIUS Settings



The ioPAC 6500 supports RADIUS. Here are detailed descriptions of the RADIUS server settings:

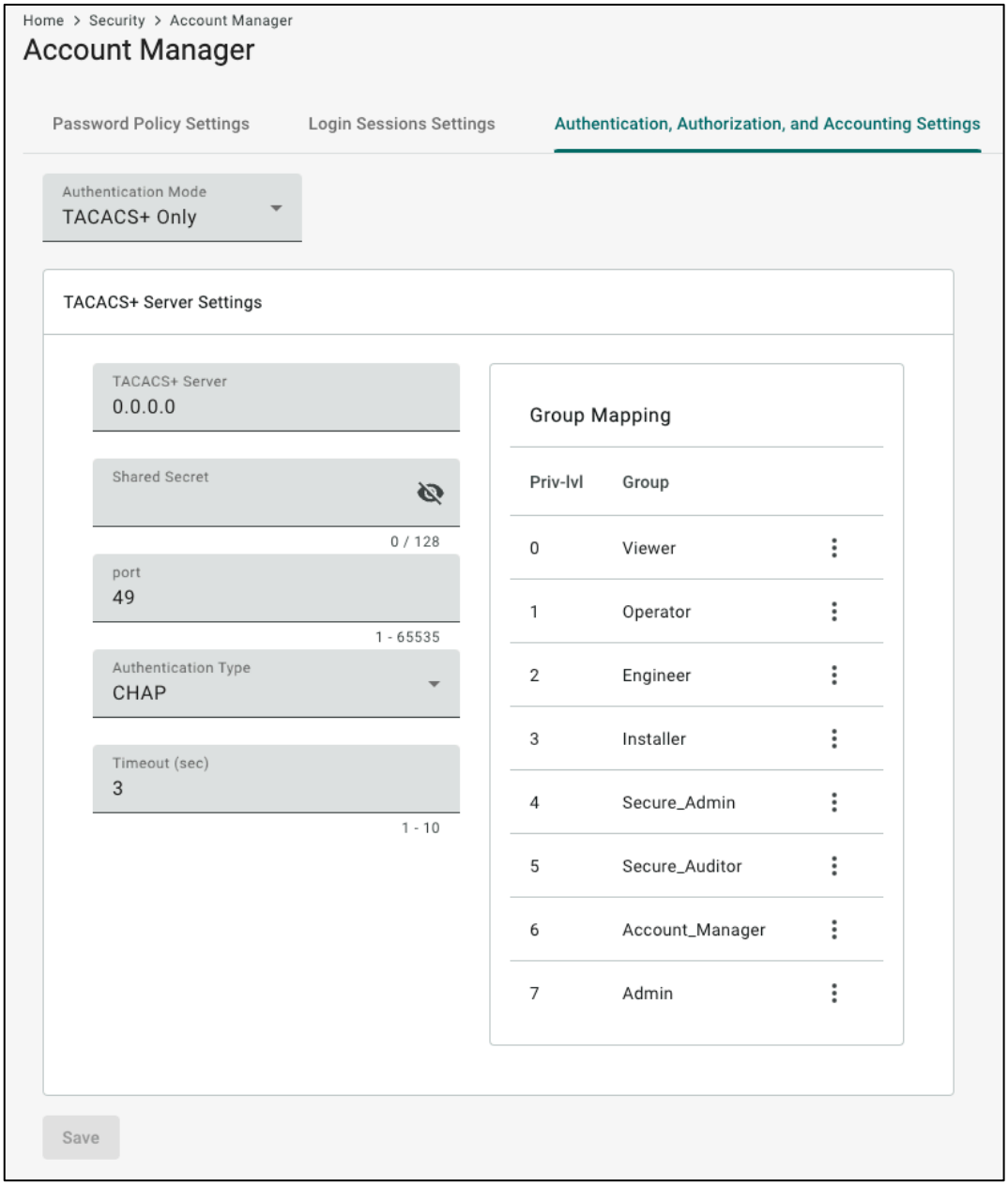
- **Secure:** Enabling the system to communicate encrypted data with the RADIUS server. The certificate will be specified in the Certificate Center.
- **RADIUS Server:** Input the IP of the RADIUS server here.
- **RADIUS Key:** Input the key of the RADIUS server here.
- **Port:** The port that communicates with the RADIUS server.
- **Authentication Type:** The authentication type used in the RADIUS server. The ioPAC 6500 supports PAP, CHAP, MSCHAP, and EAP-MD5, offering a total of four authentication types.
- **Timeout:** How long the ioPAC 6500 will wait for the response from the RADIUS server.
- **Group Mapping:** It listed the Filter-ID and Group mapping in the ioPAC 6500 system. The current groups will be displayed here. The table shows the authority of each default group of users.

NOTE

1. The ioPAC 6500 system supports a maximum of 16 groups, eight are default and another eight are user-defined.
2. The group's modification should be done in IINxpress.

Group	Monitor and Diagnostic	Operational Activities	Configu-ration	IEC Code	System Log	Security Configu-ration and Secure Log	Upgrade and Rollback	Account Management
Viewer	R	R		R	R			
Operator	R	R/W		R/W	R			
Engineer	R/W	R/W	R/W	R/W	R			
Installer	R/W	R	R/W	R/W	R	R	R/W	
Secure Admin	R/W	R	R/W	R	R/W	R/W	R/W	R/W
Secure Auditor	R	R	R		R	R		R
Account Manager	R					R/W		R/W
Admin	R/W	R/W	R/W	R/W	R/W	R/W	R/W	R/W

TACACS+ Settings



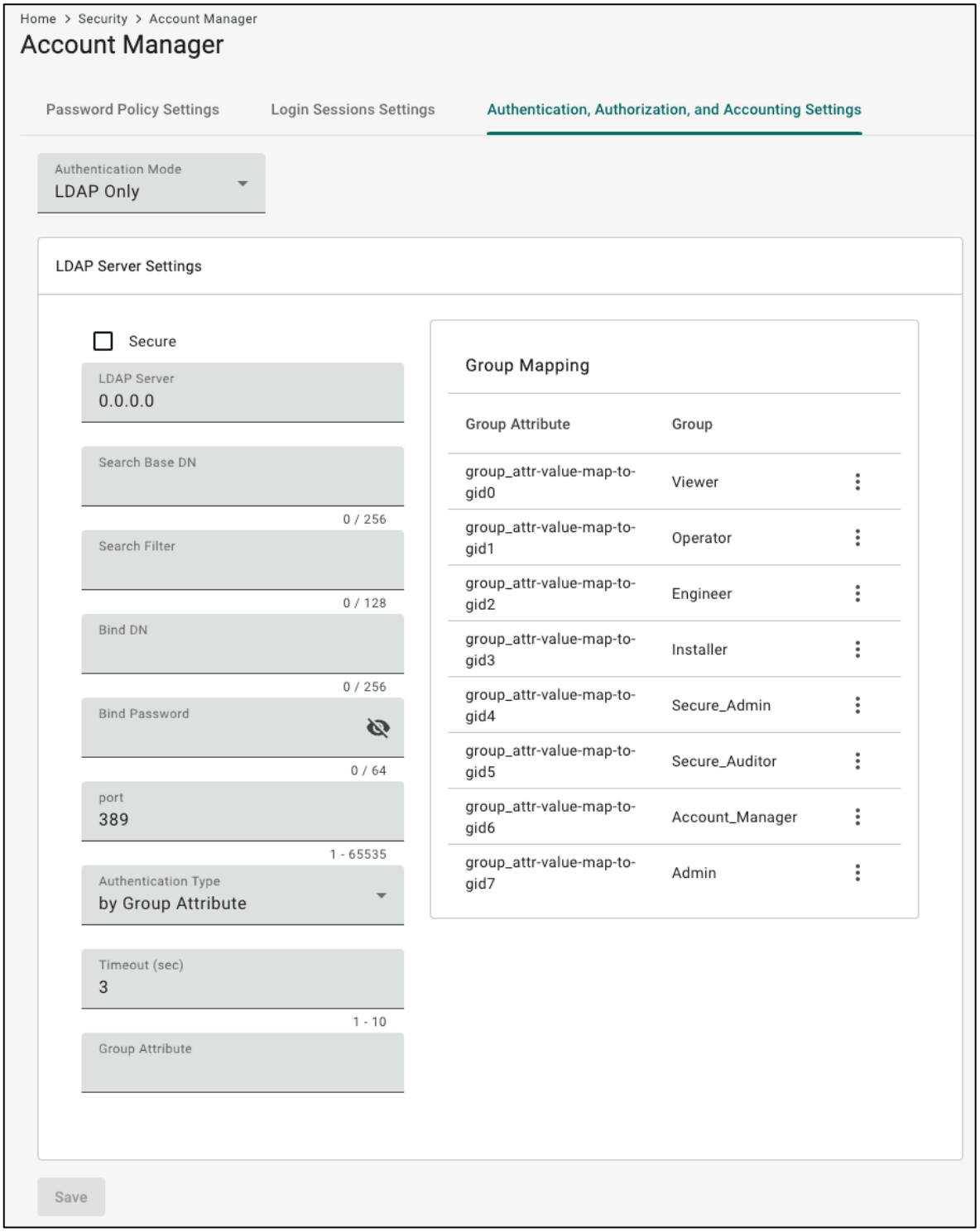
The ioPAC 6500 supports TACACS+. Here are detailed descriptions of the TACACS+ server settings:

- **TACACS+ Server:** Input the IP of TACACS+ server here.
- **Shared Secret:** Input the key of TACACS+ server here.
- **Port:** The port used to communicate with the TACACS+ server.
- **Authentication Type:** The authentication type used in the TACACS+ server. The ioPAC 6500 supports PAP, CHAP, ASCII, three authentication types in total.
- **Timeout:** How long the ioPAC 6500 will wait for the response from the TACACS+ server.
- **Group Mapping:** The privilege level and group mapping in the ioPAC 6500 system. The current groups will be displayed here. The authority of each default group of users is the same as RADIUS.

NOTE

1. The ioPAC 6500 system supports a maximum of 16 groups; eight are default and another eight are user-defined.
2. The group modification should be done in IINxpress.

LDAP Settings



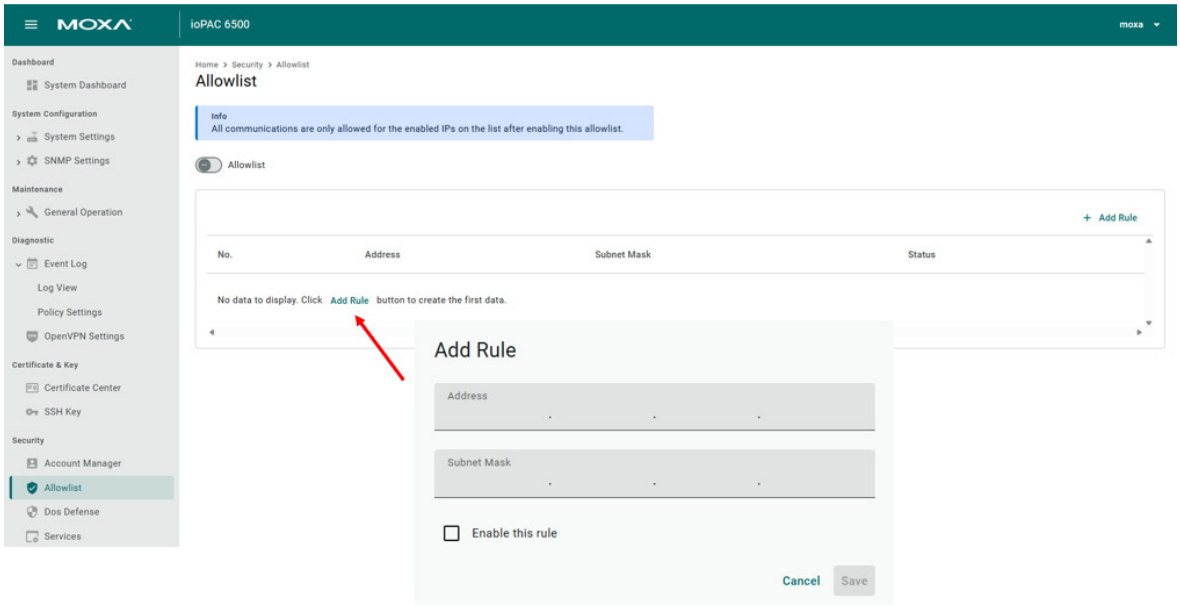
The ioPAC 6500 supports LDAP. Here are the detailed descriptions of the LDAP server settings:

- **Secure:** Enabling the system to communicate encrypted data with the LDAP server. The certificate will be specified in the Certificate Center.
- **LDAP Server:** Input the IP of LDAP server here.
- **Search Base DN:** The LDAP DN (Distinguished name) that serves as a starting point for the search for users over all child nodes.
- **Search Filter:** The LDAP search filter used for the search for users
- **Bind DN:** Enter the Distinguished Name of the user to search in the LDAP directory.

- **Port: T**he port used to communicate with the LDAP server.
- **Authentication Type:** The authentication type used in the server. The ioPAC 6500 supports Group Attributes and DN, two authentication types.
- **Timeout:** How long the ioPAC 6500 will wait for the response from the LDAP server.
- **Group Mapping:** Listing the Group Attributes and Group mapping in the ioPAC 6500 system. The systems consist of 8 default groups and 8 user-defined groups. The authority of each group of users is the same as RADIUS.

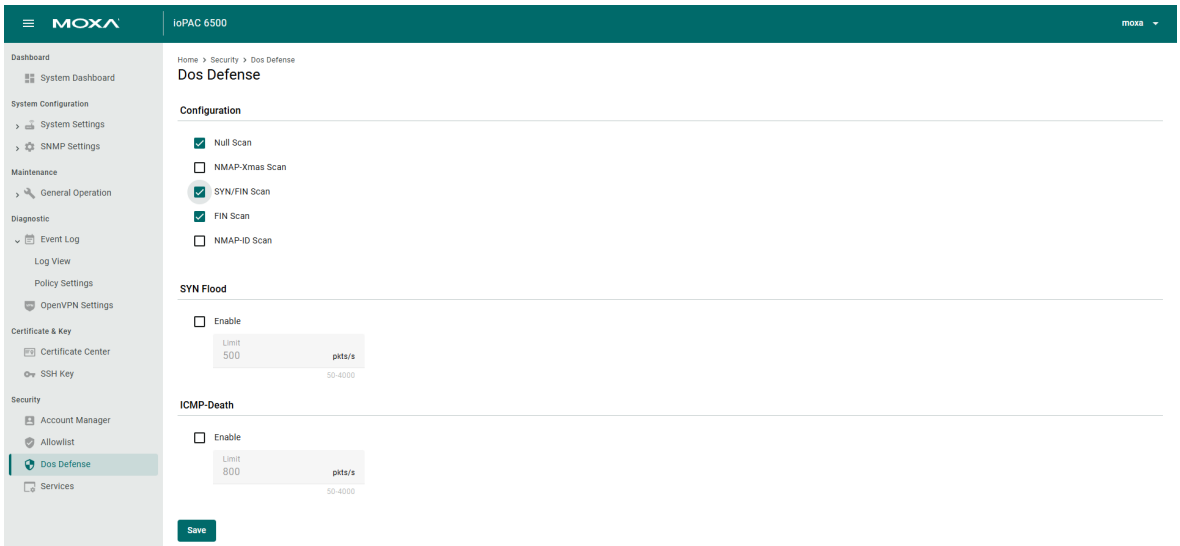
Allowlist

All communications are only allowed for the enabled IPs on the list after enabling this allowlist. Select **Add Rule** to edit the IP and subnet mask.



DoS Defense

This section configures protections against **Denial-of-Service attacks**, which are attempts to make a device or network service unavailable by overwhelming it with traffic.



Configuration

Items	Description
Null Scan	TCP scan with no flags set; used in stealth attacks to probe for open ports
NMAP-Xmas Scan	TCP scan with FIN, URG, PSH flags; used to bypass simple detection methods
SYN/FIN Scan	Sends TCP packets with both SYN and FIN flags set; non-standard combination
FIN Scan	Sends TCP packets with only the FIN flag; used for stealth port scanning
NMAP-ID Scan	Detects IP ID-based scans used in host discovery and fingerprinting

SYN Flood

When enabled, it activates protection against SYN flood attacks. The packet limit can be set from 50 to 4000.

ICMP-Death

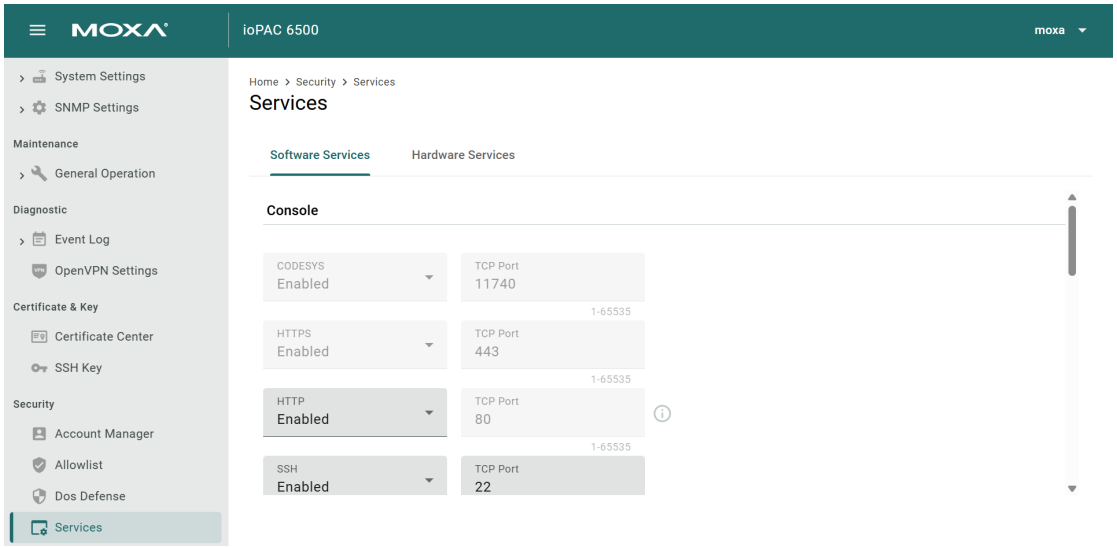
When enabled, it activates protection against ICMP flood attacks. The packet limit can be set from 50 to 4000.

Services

This section allows you to supervise and configure the software and hardware services, including the service and its corresponding port.

Software services: Console, System, Industrial Data.

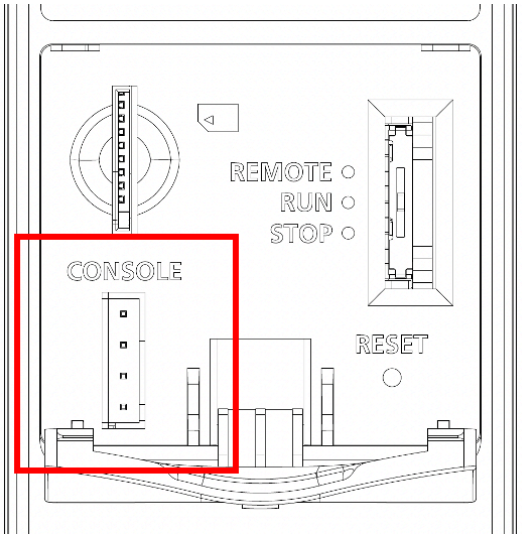
Hardware services: CPU module.



Logging in by Console Port

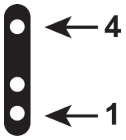
The ioPAC 6500 Series offers a serial console port, allowing you to reboot and reset to default. Followed the steps to use the console port.

Step 1: Open the cover on the CPU module to see the console port inside.



Step 2: Connect the 4-pin serial console cable to the console port. The following diagram shows the 4-pin serial connector and pin connections.

Pin Assignment for the Serial Console Port



Pin	Definition
1	TxD
2	RxD
3	NC
4	GND

Serial Console Default Settings

Parameter	Value
Baudrate	115200 bps
Parity	None
Data bits	8
Stop bits	1
Flow Control	None



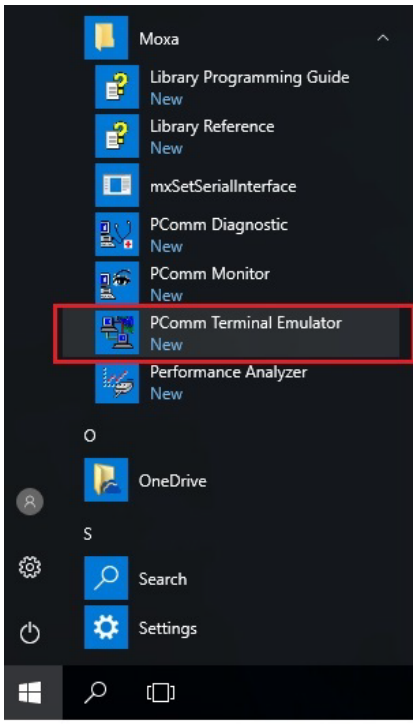
NOTE

Contact the sales representative in your region for the console cable.

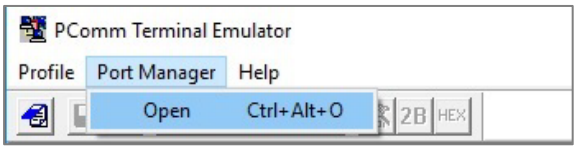
We recommend you use PComm Terminal Emulator for serial communication. Download the software free from Moxa's website.

After installing PComm Terminal Emulator, access the Moxa switch's console:

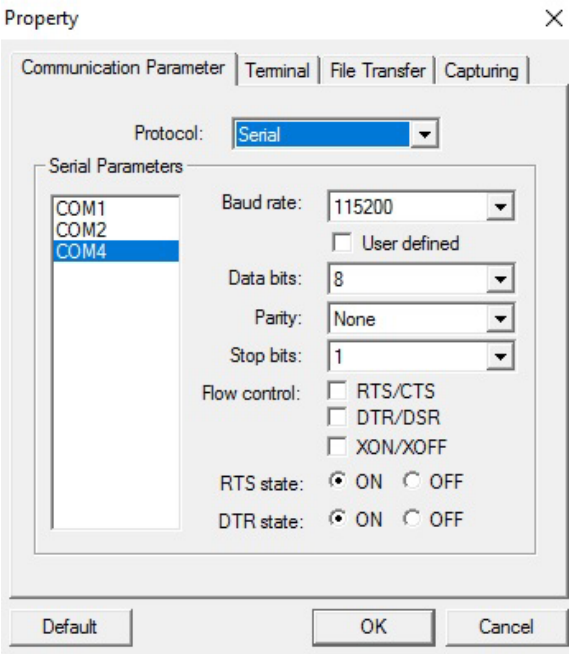
1. From the Windows desktop, select **Start > Moxa > PComm Terminal Emulator**.



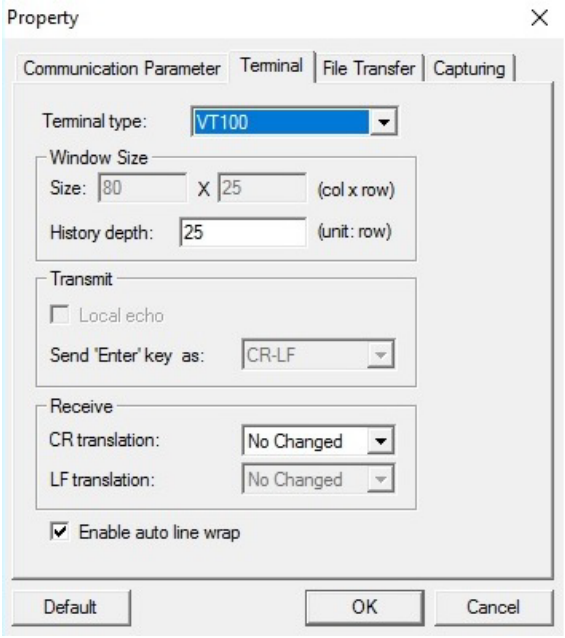
2. Select **Open** under the **Port Manager** menu to open a new connection.



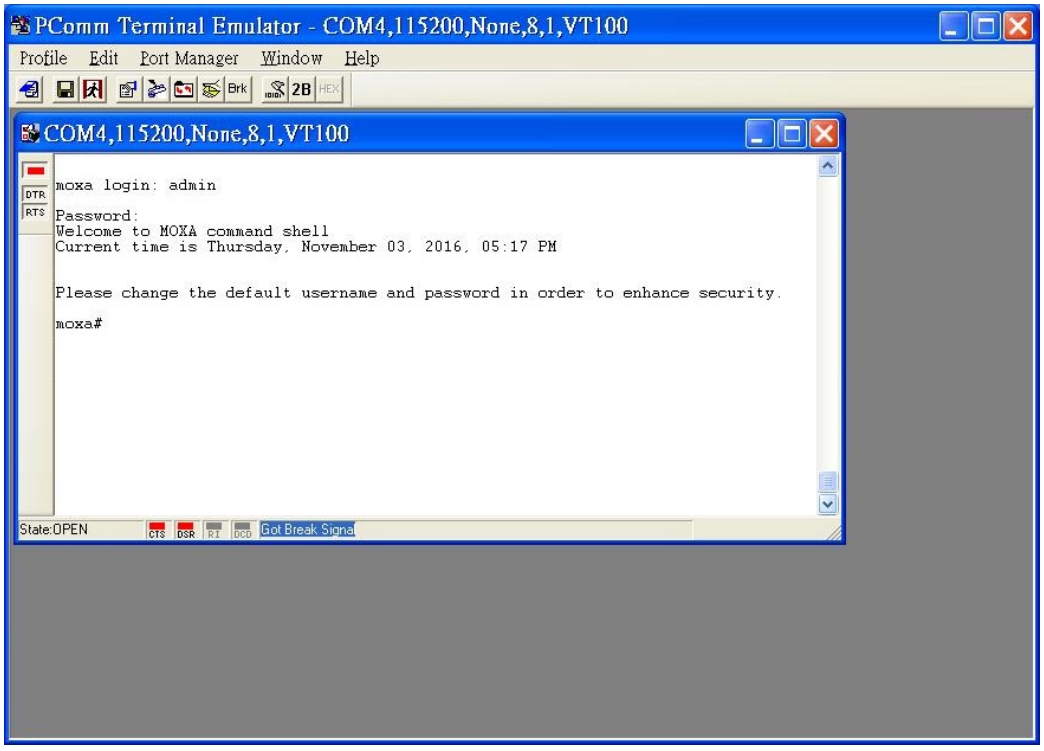
3. The **Property** window will open. On the **Communication Parameter** tab for **Ports**, select the COM port that is being used for the console connection. Set the other fields: **115200** for **Baud Rate**, **8** for **Data Bits**, **None** for **Parity**, and **1** for **Stop Bits**.



4. On the **Terminal** tab, select **VT100** for **Terminal Type**, and then select **OK** to continue.



5. The console will prompt you to log in. The default login name is **moxa**, and the default password is **moxa**. This password will be required to access any of the consoles (web, serial, Telnet).



6. After successfully connecting to the switch by serial console, start configuring the switch's parameters by using command line instructions. Refer to the **Moxa Command-line Interface Manual** for details.

NOTE

By default, the password assigned to the Moxa switch is **moxa**. Be sure to change the default password after you first log in to help keep your system secure.

6. IINxpress

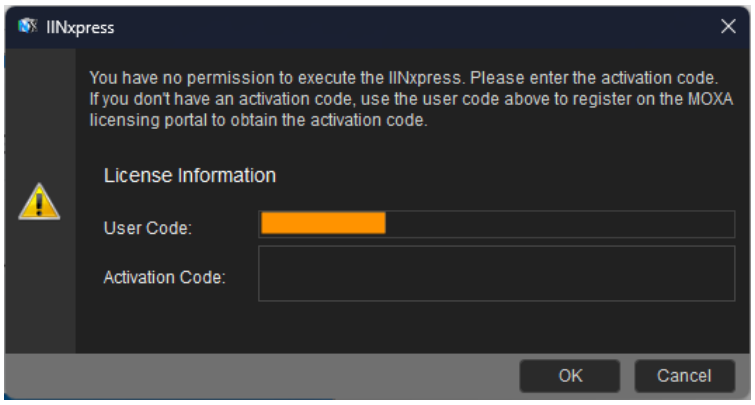
In this chapter, we introduce how to configure the ioPAC 6500 by IINxpress. IINxpress is a Moxa utility, which is the integrated development environment (IDE) software for the Moxa ioPAC 6500 Series. IINxpress provides easy access to all status information, ready-to-run service settings, and IEC 61131-3 programming ability. IINxpress requires a paid license, but it can be upgraded for free when future basic functions are available.

NOTE

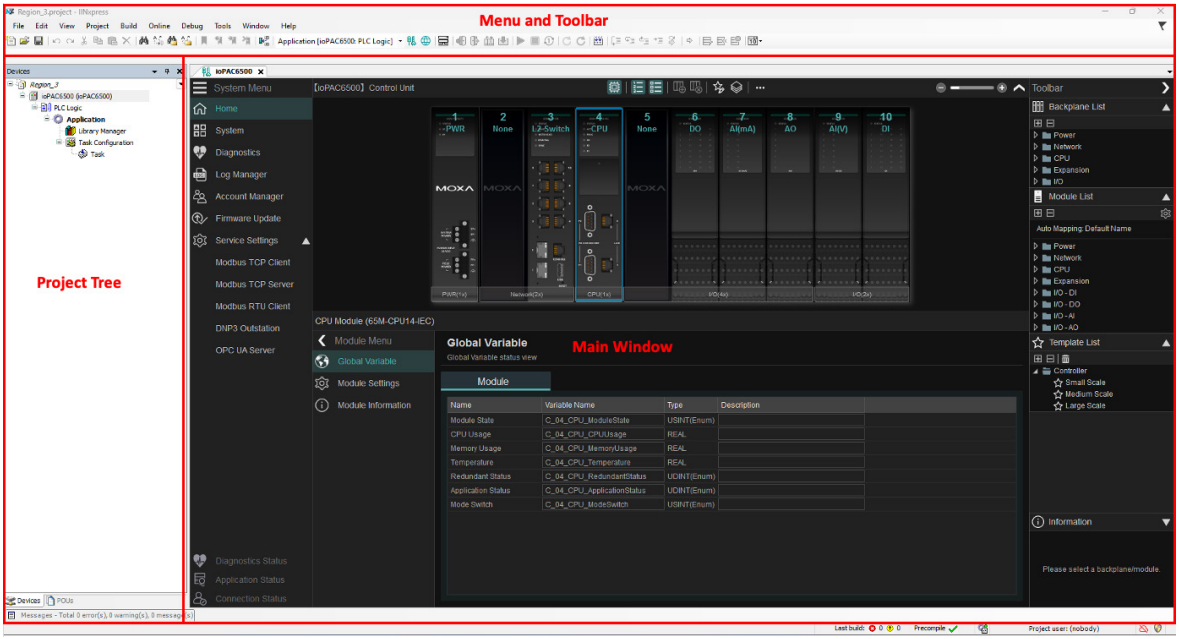
Avoid installing IINxpress on ARM-based CPUs. To ensure a smooth user experience, the recommended specifications are: x86-64 CPU (i5 or above), 8+ GB of RAM, and 256+ GB of storage and make sure enough storage is reserved for the project; project file size varies depending on the application.

NOTE

Download the IINxpress software from Moxa's official website (https://www.moxa.com/) to do the installation. Once the installation is completed, the following window will appear to ask you to activate the IINxpress. The window will display a 21-digit encrypted user code. Use this code to register on the Moxa Licensing Portal (https://license.moxa.com/) and get an activation code. Then, activate IINxpress.



When IINxpress is launched successfully, you see the following windows. The IINxpress user interface can be divided into three blocks.



Menu and Toolbar: The settings related to the device can be found here.

Project Tree: The functions of the projects will be listed here hierarchical.

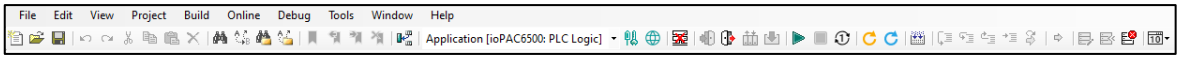
Main window: The detailed parameters of each function will be displayed here, switch between each function by the tab.

NOTE

When logging in for the first time into IINxpress, follow the iinstructions in the **Build New Project** section to create a new project.

Menu and Toolbar

IINxpress' menu and toolbar provide the functions for you to develop the program. We will now discuss functions related to the device's configuration and program execution.



New Project: Built a new project. Refer to the **Build New Project** section for details.

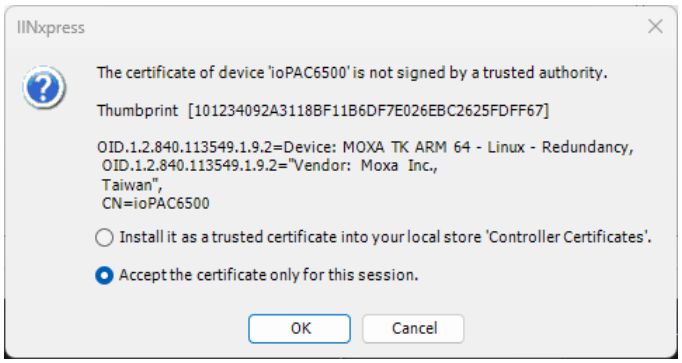
Open project: Opens an existing project.

Device helper: Provides the device scan, mapping functions, and performs some basic settings.

Open ioPAC 6500 Configuration: Opens the ioPAC 6500 configuration page where you configure all the device settings. Refer to the **ioPAC 6500 Configuration** section for details.

Open ioPAC 6500 Web page: Opens the ioPAC 6500 webpage where you configure IT-related device settings.

Connect device: Used to connect the ioPAC 6500 devices. When connecting the device for the first time, IINxpress will show the warning message about the certificate. Choose the preference option to **accept the certificate once** or **put the certificate into a local store**. The log-on window will show. Key in the username and password to log into the device. After a successful connection, monitor the real-time device status on the ioPAC 6500 Configuration page.



Login application: When you log in the application, you can control the device to run and stop the program remotely. Note: The mode switch should be switched to "REMOTE" to allow the control from the remote side.

Logout application: Logs out the application to close the remote control session.

Online change: You can use this command to initiate an online change on the current application. When this is done, CODESYS re-downloads only the changed parts of an application that is already running on the PLC.

Download: Downloads the compiled program to the device.

Run: Runs the program remotely.

Stop: Stops the program remotely.

Single cycle: Asks the device to run one cycle.

Reset warm: Resets the program with warm-start condition.

Reset cold: Resets the program with cold-start condition.

Generate code: Compiles the code on completing the program.

Step over: The command executes the statement where the program is currently located and stops before the next statement in the POU. For details, check **Help**.

Step into: The command executes the statement where the program is currently located and stops before the next statement. For details, check **Help**.

Step out: The command executes the program until the next return and stops afterwards. For details, check **Help**.

Run to cursor: The command executes a program until a specified position as marked by the cursor. For details, check **Help**.

Set next statement: The command determines which statement is executed next. For details, check **Help**.

Show next statement: The command displays the program statement that is processed in the next step. For details, check **Help**.

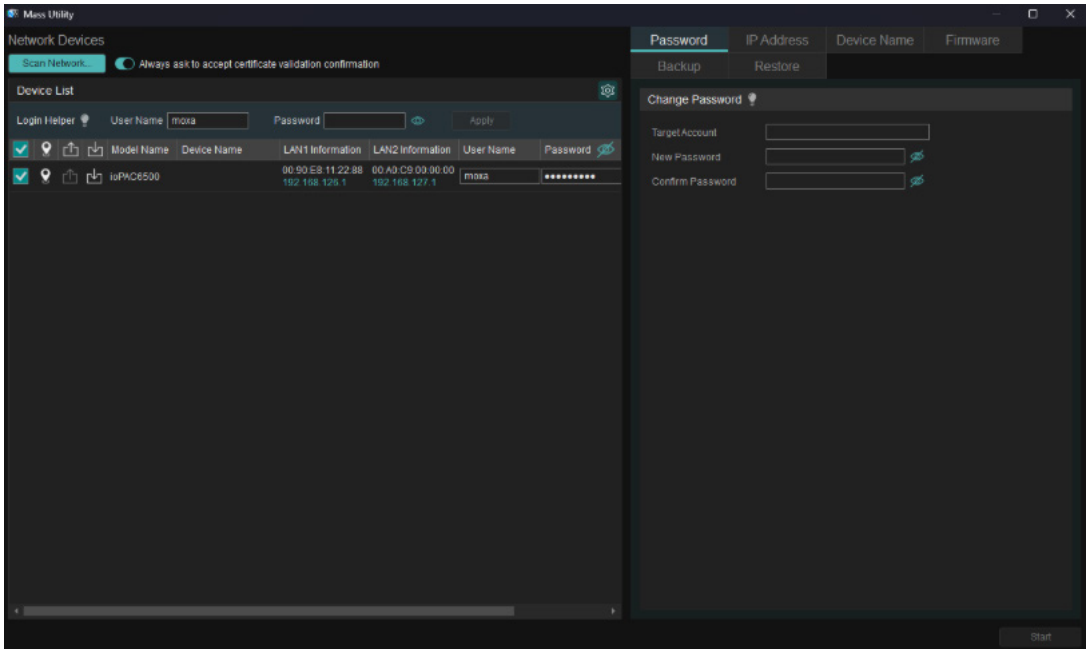
Write values: This command sets a predefined value to a variable on the controller once. For details, check **Help**.

Force values: The command sets a permanent predefined value to a variable on the controller. For details, check **Help**.

Unforce values: This command resets the forcing of all variables. The variables receive their current values from the PLC. For details, check **Help**.

Display mode: The value in the project is displayed in Binary, Decimal, and Hexadecimal.

Mass Utility: Allows users to batch-configure passwords, IP addresses, and device names. It also supports batch backup and restoration of configuration files, as well as batch firmware upgrades.



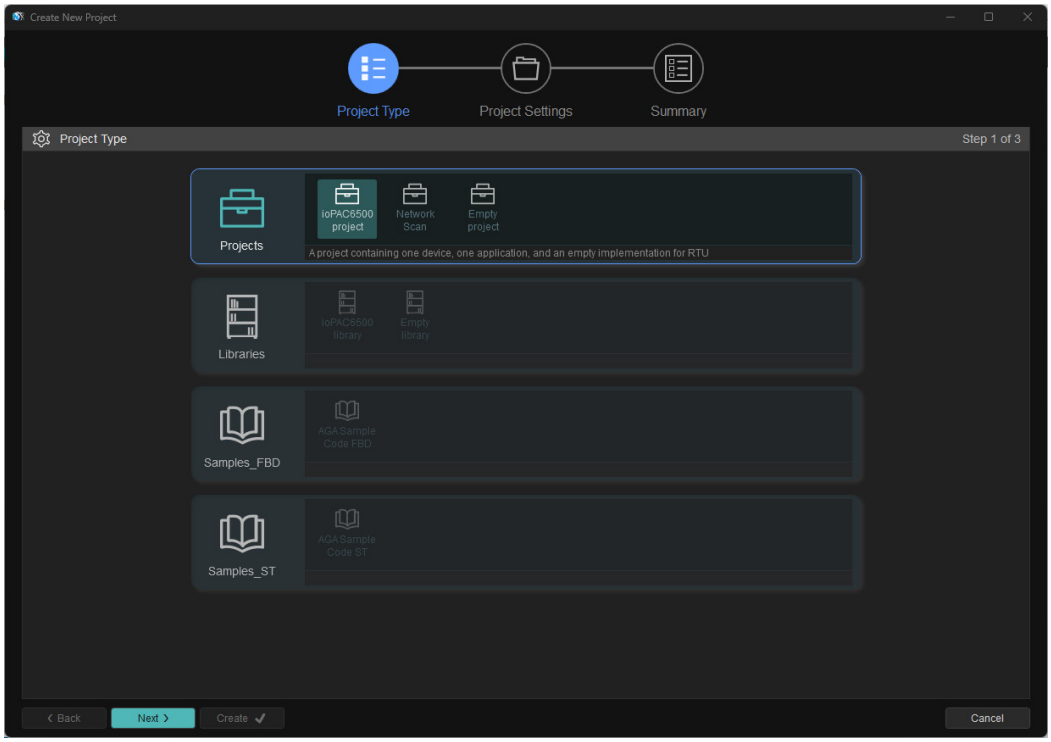
Build New Project

Selecting the New project button allows you to select from three ways to create a new project.

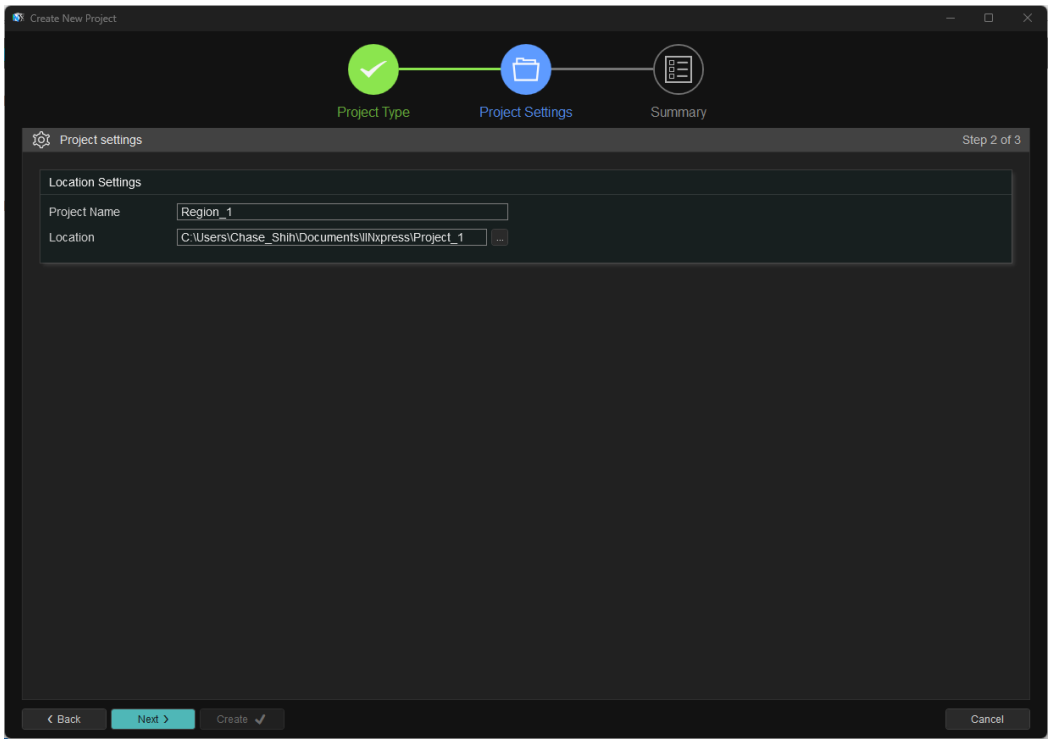
ioPAC 6500 Project

If there are no ioPAC 6500 devices on hand, we suggest using this option to start a project.

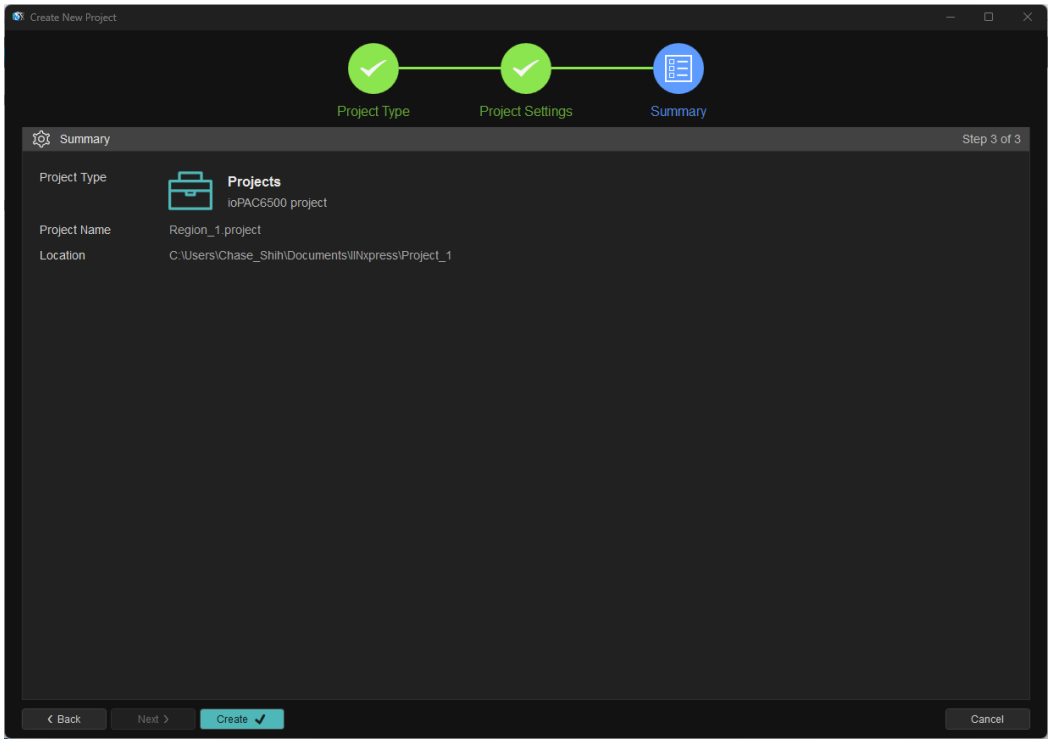
Step 1: Choose ioAPC 6500 Project icon and select **Next**.


Create New Project
Project Type
Project Settings
Summary
Project Type
Step 1 of 3
Projects
ioPAC6500 project
Network Scan
Empty project
A project containing one device, one application, and an empty implementation for RTU
Libraries
ioPAC6500 library
Empty library
Samples_FBD
AGA Sample Code FBD
Samples_ST
AGA Sample Code ST
Back
Next
Create
Cancel

Step 2: Specific a project name and assign a location. Customize a location by selecting .



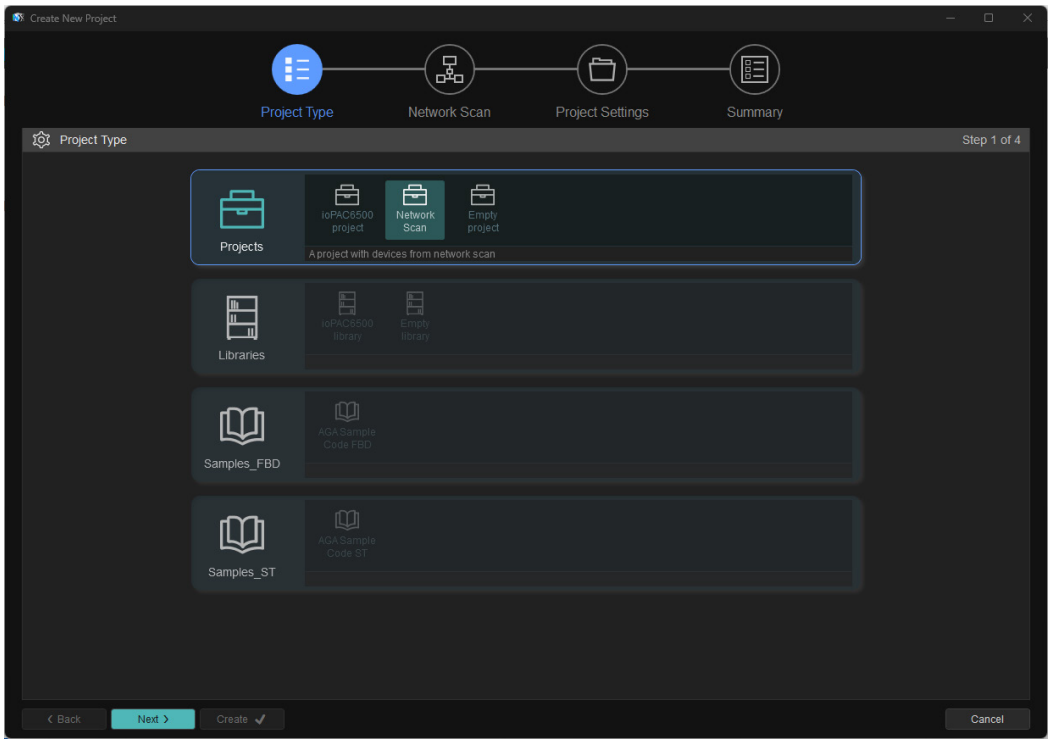
Step 3: Finally, review the project information, and then select **Create** to create a project.



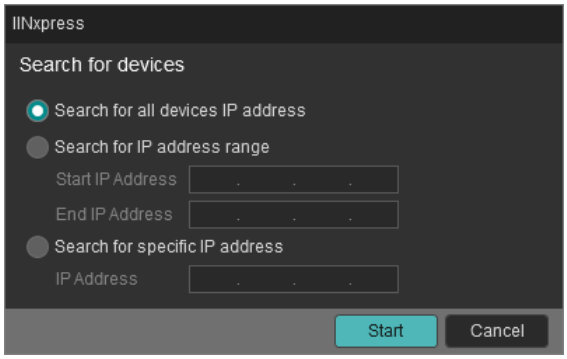
Network Scan

When powering up the device and connecting it to the Ethernet, use the scan function to find the device.

Step 1: Choose Network Scan icon and select **Scan Network**.



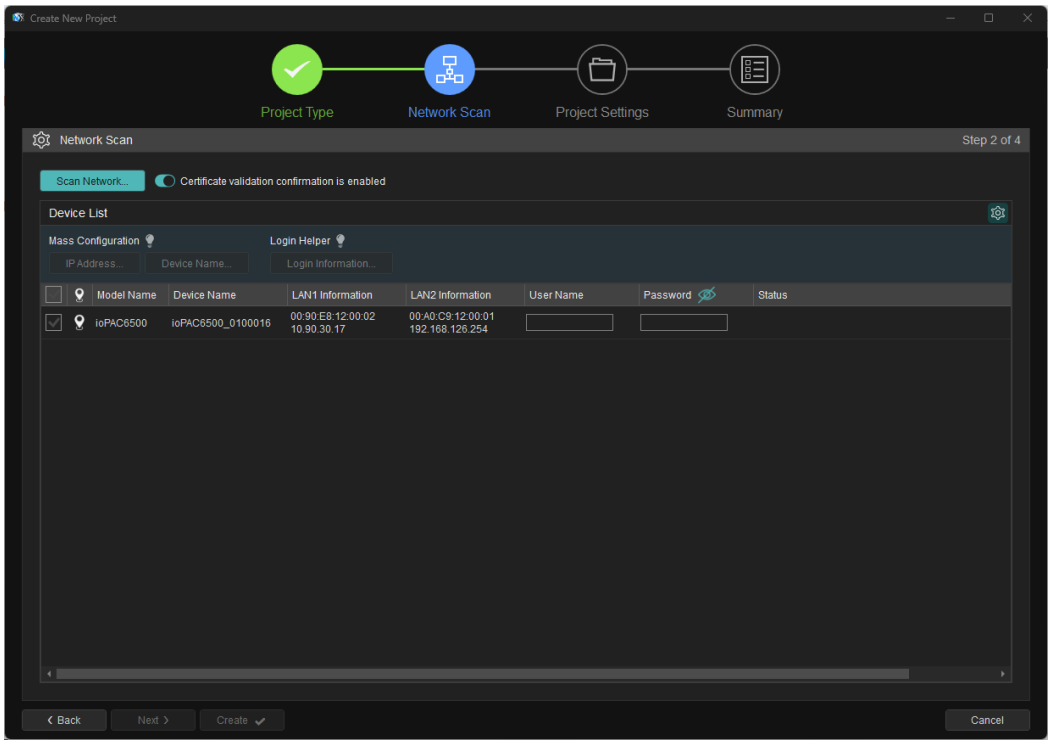
Step 2: Choose one from Scan all network, scan an IP range, and appoint a specific IP.



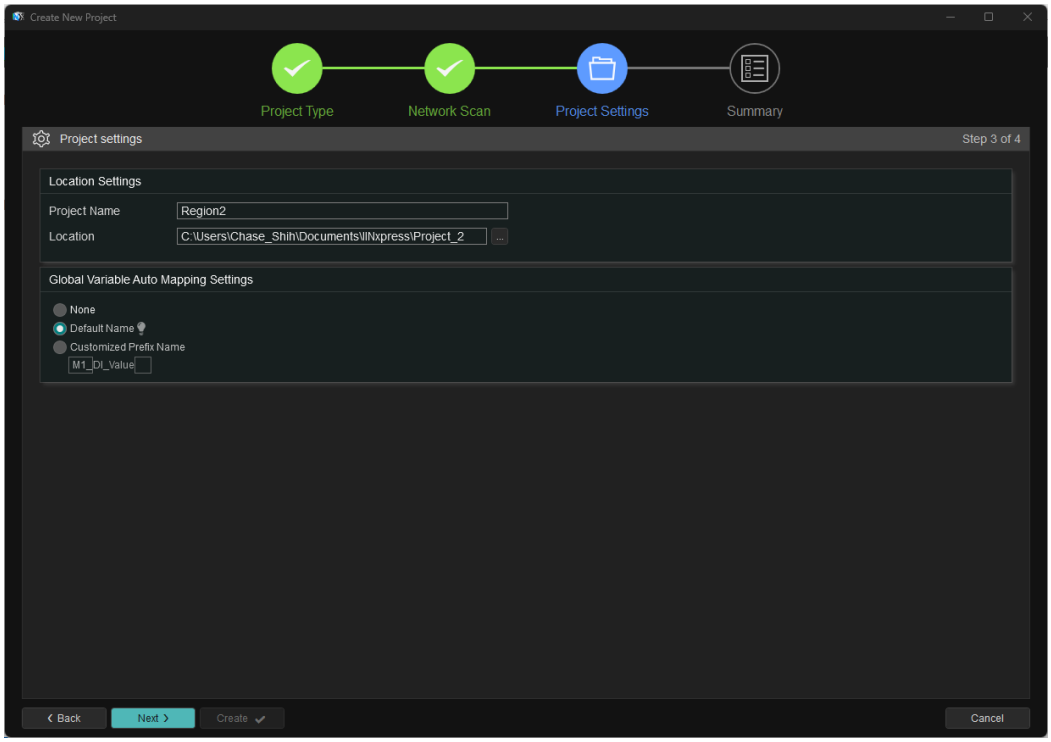
Step 3: The scanned device(s) will be displayed in the table. Choose the device, input the **Username** and **Password**, then select **Next**.

Default Username: moxa

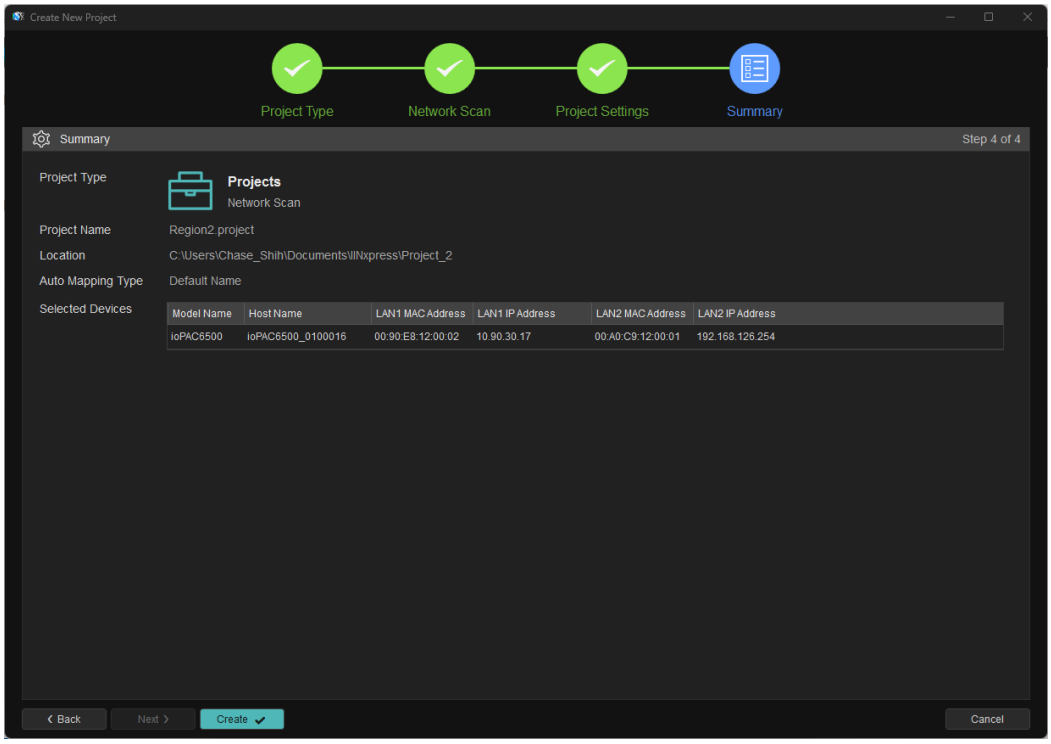
Default Password: moxa



Step 4: Input the project information. Set up the mapping of the global variable in this step. When the setup is completed, select **Next**.



Step 5: Finally, review the project and device information, and then select **Create** to create a project.



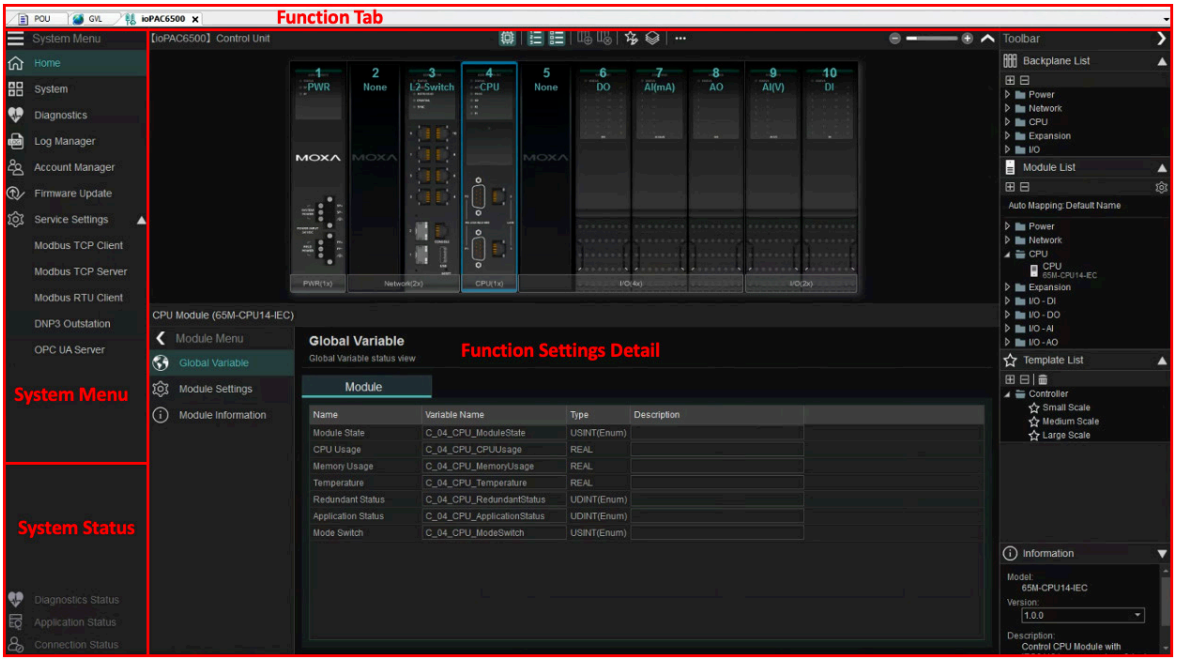
Empty Project

The process to open an empty project is the same as opening an ioPAC 6500 project. The only difference is there will be no pre-loaded ioPAC 6500 in the project file.

ioPAC 6500 Configuration

The ioPAC 6500 Configuration is one of the most important parts of IINxpress. Double-click the ioPAC 6500 (ioPAC 6500) in the project tree or the icon on the toolbar to open it.

The ioPAC 6500 configuration page can be categorized into the following parts.



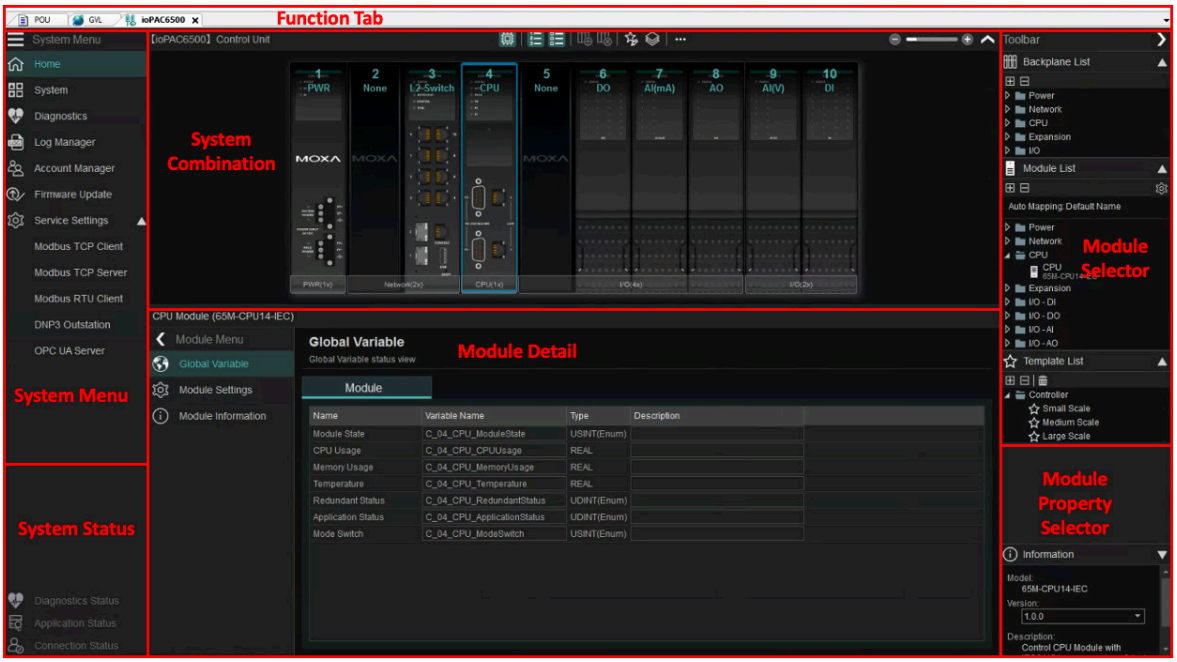
System Menu: The function related to the devices are listed here.

System Status: The diagnostic status (error or not), application status (run or stop), and connection status (which connection is established) are displayed here.

Function Settings Detail: The settings detail of each function is displayed here once the function was selected in the system menu.

Home

On the home page, the function settings detail window is categorized into the following parts.



System Combination

The module list of the system will be displayed here. There are some operations can be done in the system combination window.

1. Left select on the module: The module details will be displayed in the module detail window.
2. Right select on the module: You can remove and remap the variables supported by the module and import/export the module configuration.
3. Drag and drop the module: The module can be moved to the empty slot or be deleted.
4. For frequently used system combinations, select **Save as Template** () to save the combination in the Template List.
5. Add/Remove expansion unit:

   Select **Add Expansion** () to add an expansion unit. The ioPAC 6500 Series supports up to four expansion units.

   Select **Remove Expansion** () to remove the expansion unit.

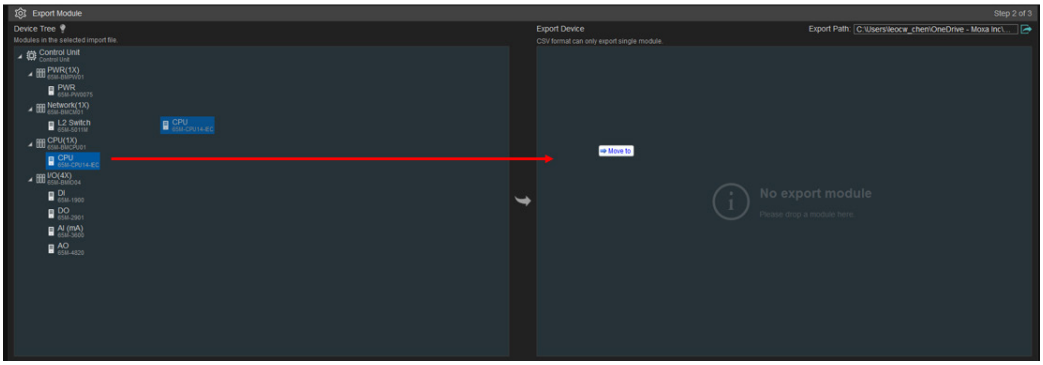
6. Mass configuration:

   Select **Mass Configuration** () to export/import configuration.

   ➢ **Export Configuration:**

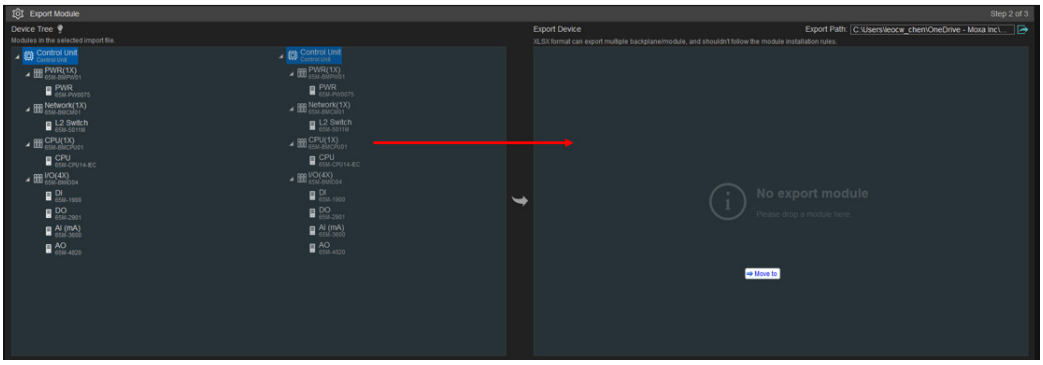
   ❒ Export module file (csv.)—supports only single module





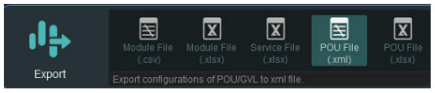
   ❒ Export module file (xlsx.)—supports multiple modules



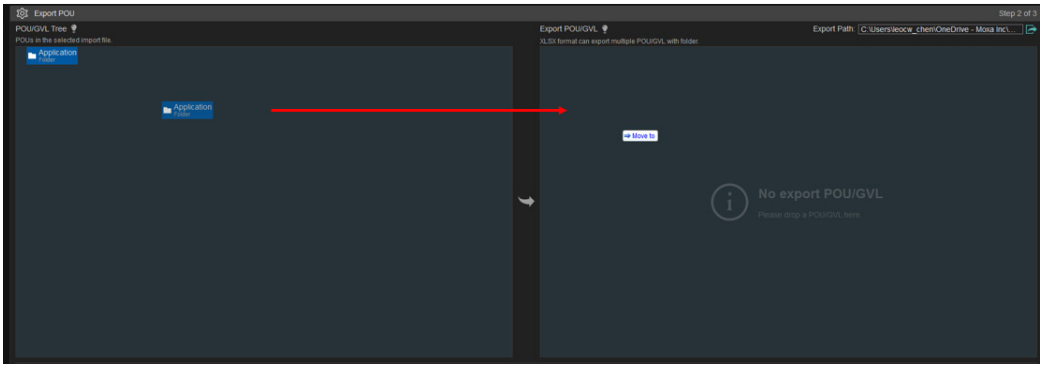


   ❒ Export Service file—see details in Service Settings

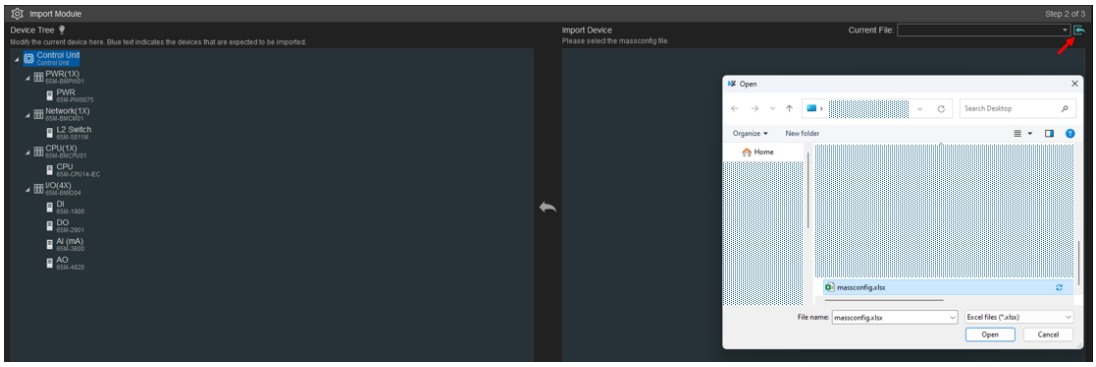
   ❒ Export POU file (xml. or xlsx.)—POU and GVL

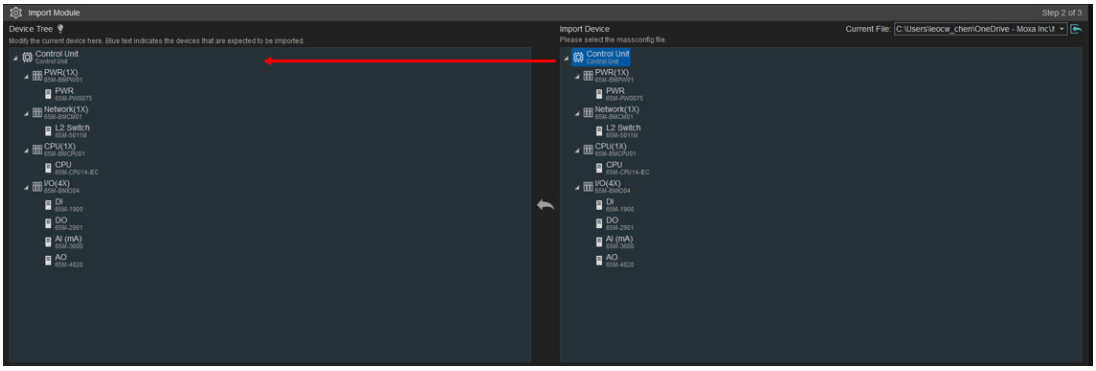




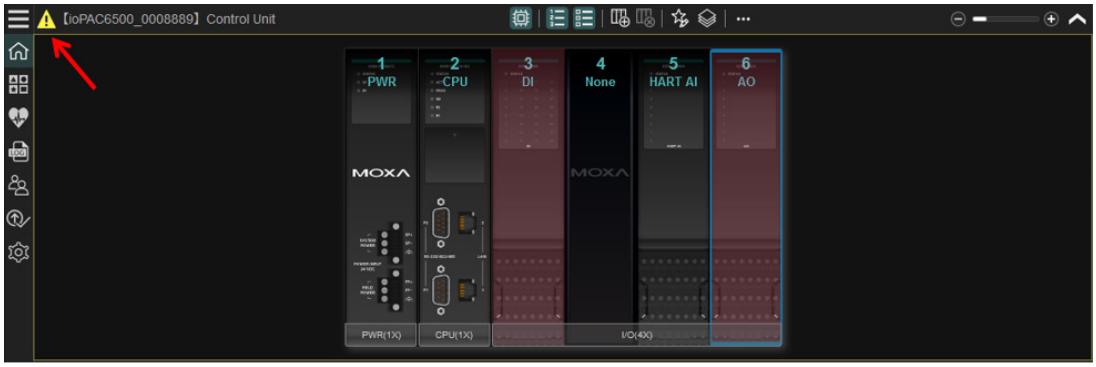


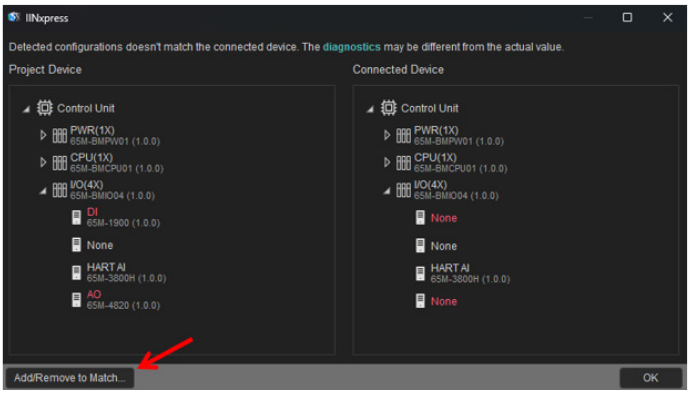
➢ **Import Configuration:** Reverse the process of exporting. Choose the file that's meant to be imported, drag and drop the configuration from right to left.





7. When connecting device, please ensure there is no topology or configuration mismatch between projects and devices. If a mismatch occurs, please address it promptly (See top left yellow exclamation mark)



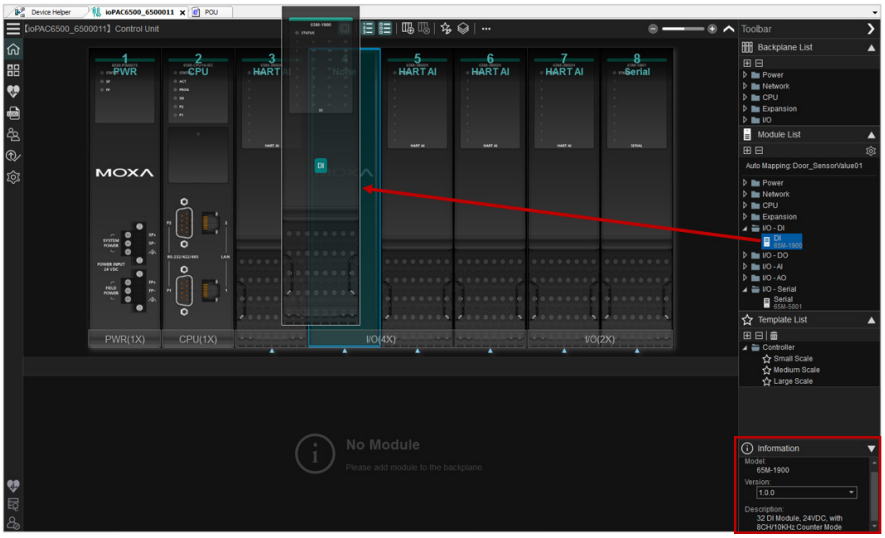


Module Detail

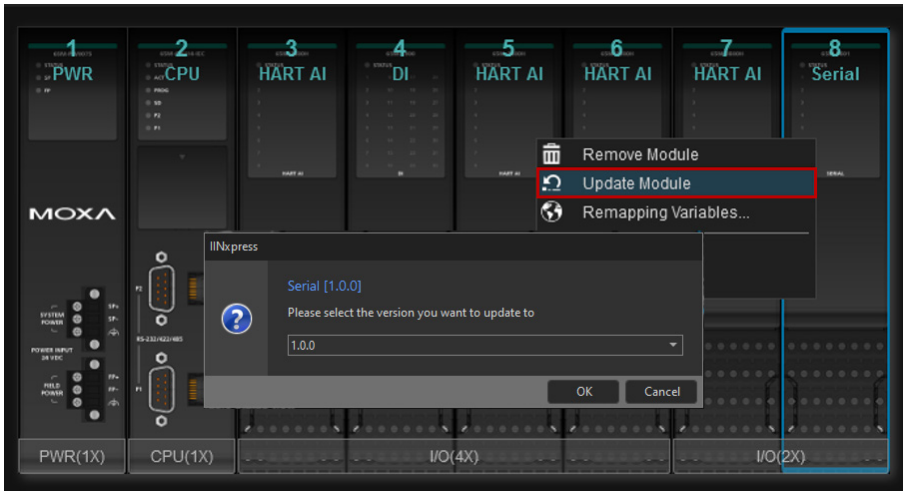
The selected module details will be displayed here. The details can be grouped into three sections: **Global Variables, Module Settings, Module Information**.

General information and settings for all modules:

- Before dragging and dropping the module into the desired slot, be sure to check the firmware version on the bottom right to avoid any incompatible issues.



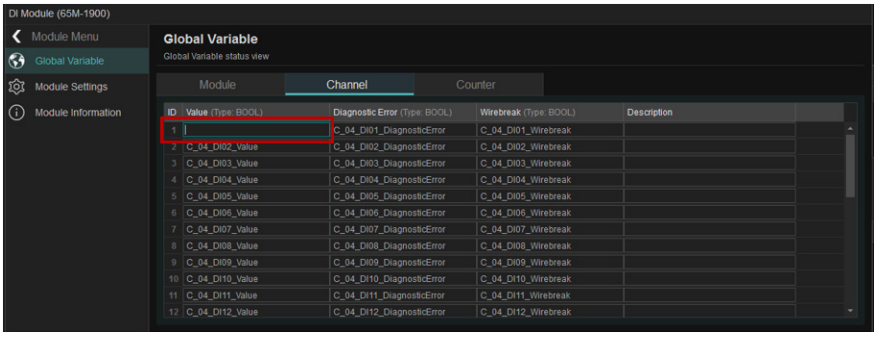
- Right-select on the module to update module firmware when deemed necessary.



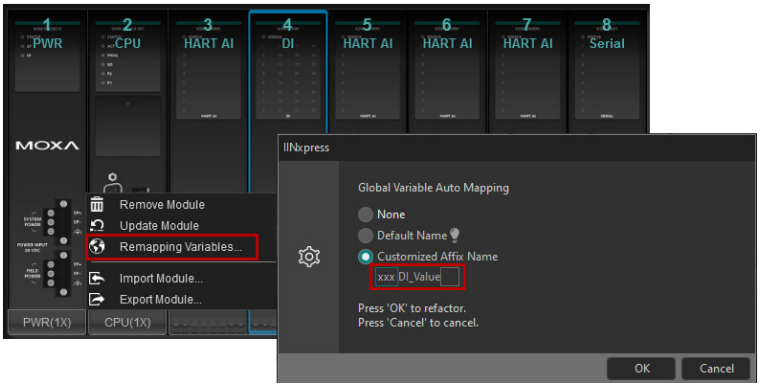
> **NOTE**
>
> Be aware that an old project (configuration) must be updated to be compatible with hardware preloaded with newer firmware to enable the use of new functions (if applicable).

Global Variables: The Global Variables supported by the module will be displayed here. The module and channel will be listed as global variables, which can be used in POUs. When the device is connected, the value of variables can also be monitored as well.

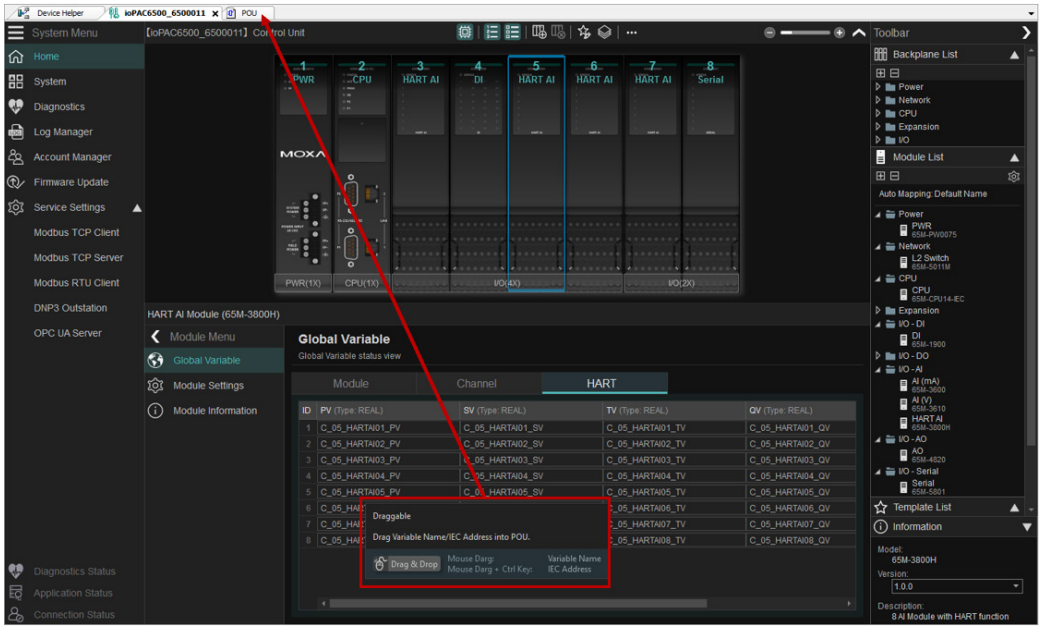
- Double-click the default name to rename the Global Variable based on the application's context, which can be useful when later called in the POU.



- Right-select on the module and select "Remapping Variables" to customize in a batch the affix naming of the Global Variables.



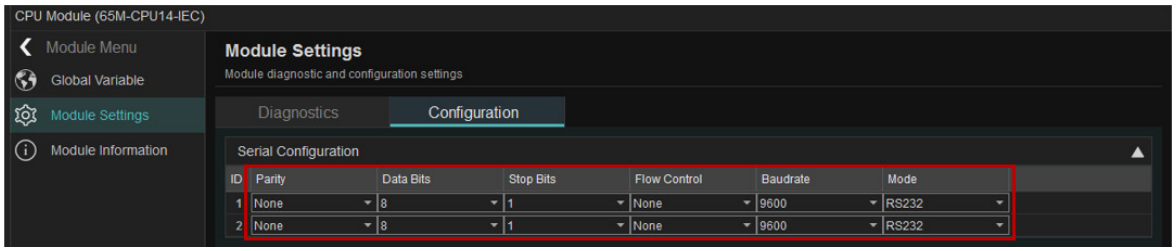
- After renaming the Global Variables, they can simply be dragged and dropped into the POU.



Module Settings: The diagnostic variable and module configuration will be displayed here. See below for more detailed module information.

65M-CPU14-IEC CPU Module:

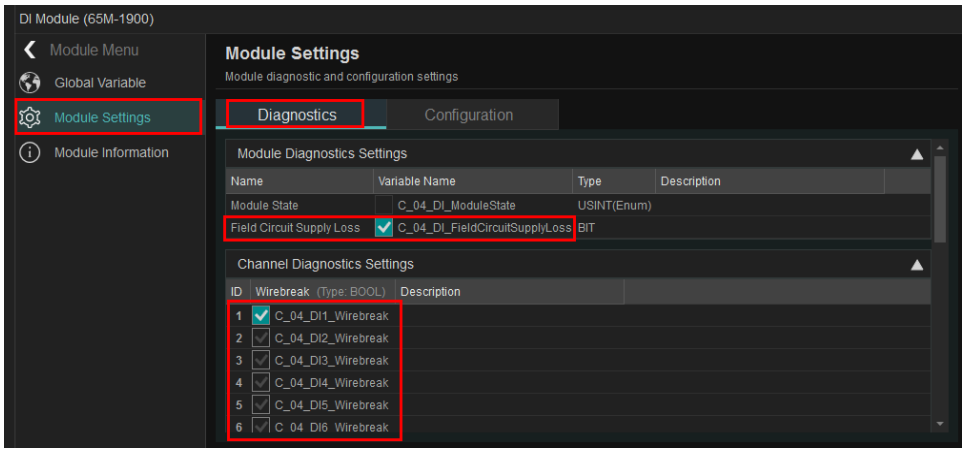
Configuration: There are two serial ports on the CPU module with DB9 interfaces. The parameters for serial communication can be configured as shown below.



65M-1900 DI Module Settings:

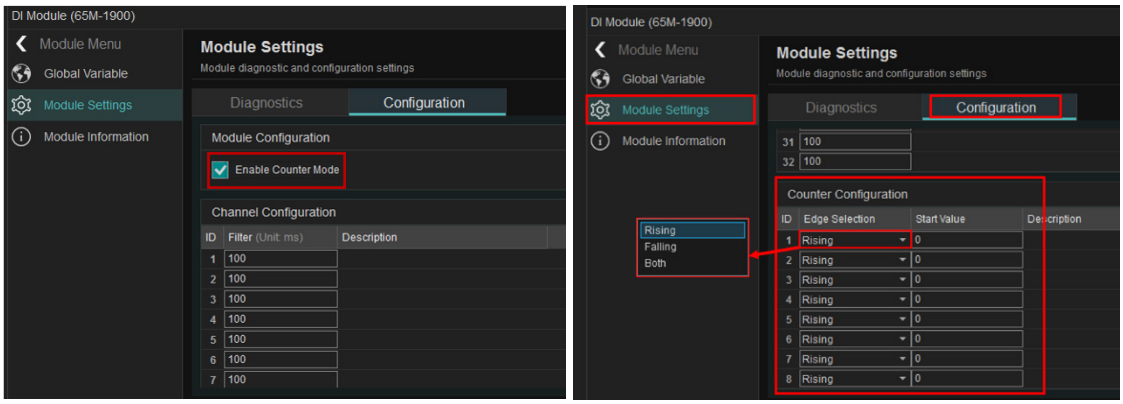
Enable/Disable Diagnostics:

- Field Circuit Supply Loss: To detect if the field power supplying for DI contacts fails.
- Wirebreak: To detect if the wiring between the DI contact to the channel is broken.

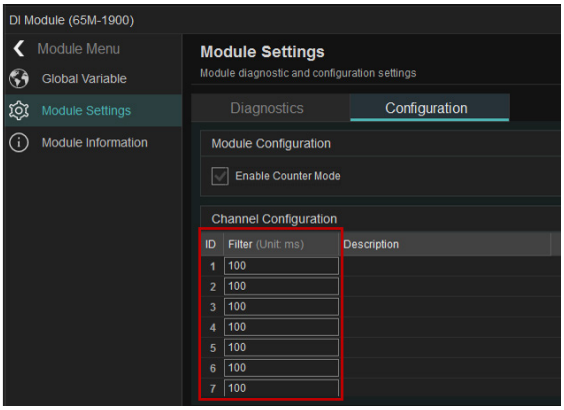


Configuration:

- Enable counter mode: Only Channel 1 to 8 can be configured in counter mode, while the triggering condition can be defined as rising, falling, or both.



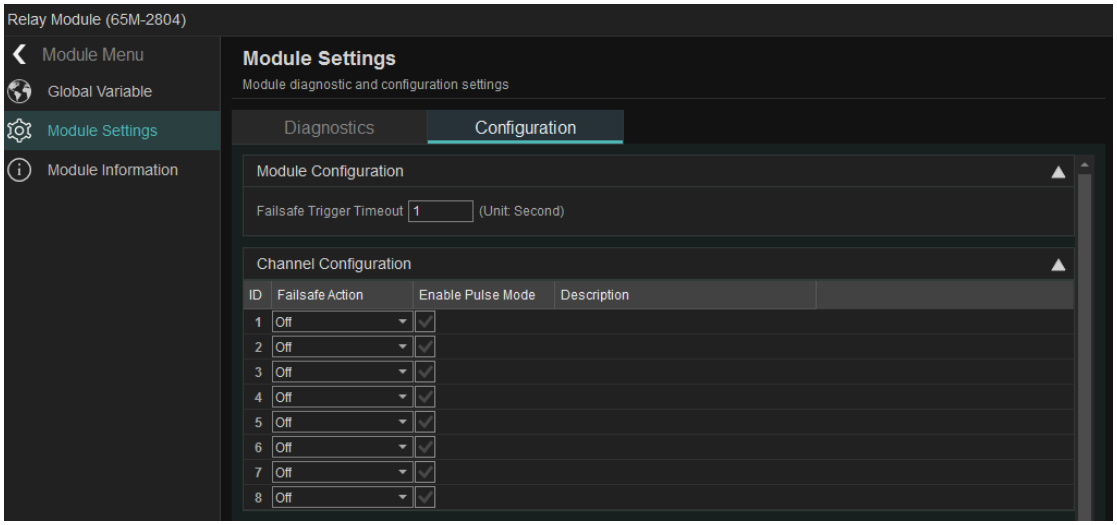
- Filter: The filter can be set to ignore the spurious signals by waiting for a certain period before registering a valid state change.



65M-2804 Relay Module Settings:

Configuration:

- Enable Pulse Mode: Each Channel can be configured in Pulse mode. Scroll down in configuration, set the following parameters for pulse output mode.
- Pulse Count: Set the number of counts to output after the start.
- Low Width: Set the time of the low state in the pulse.
- High Width: Set the time of the high state in the pulse.
- Failsafe action: Set the action of each Relay output channel after Relay module communication loss. The action of the Relay channel can be OFF/ON/Hold Last.

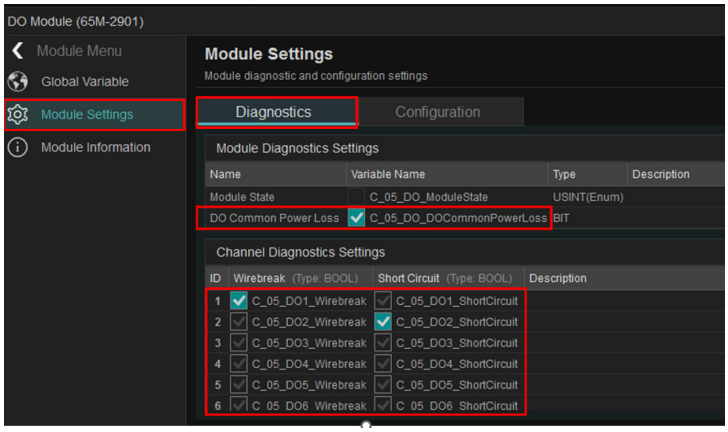




65M-2901 DO Module Settings:

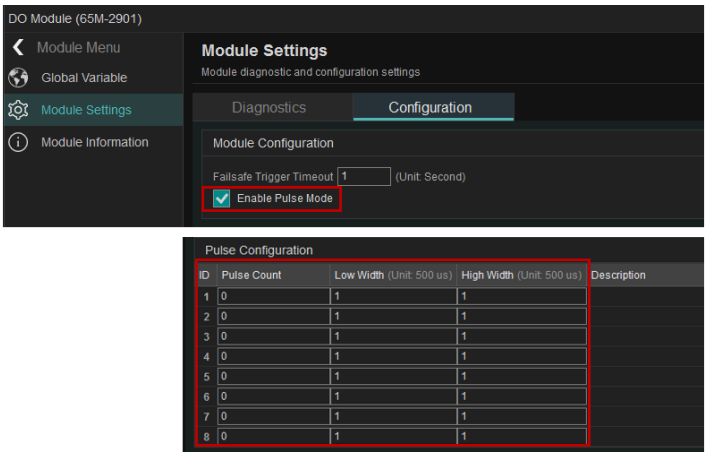
Enable/Disable Diagnostics:

- DO Common Power Loss: To detect if external power supplying for DO contacts fails.
- Wirebreak: To detect if the wiring between the DO unit to the channel is broken.
- Short Circuit: To detect if there is a short circuit on the DO channel.



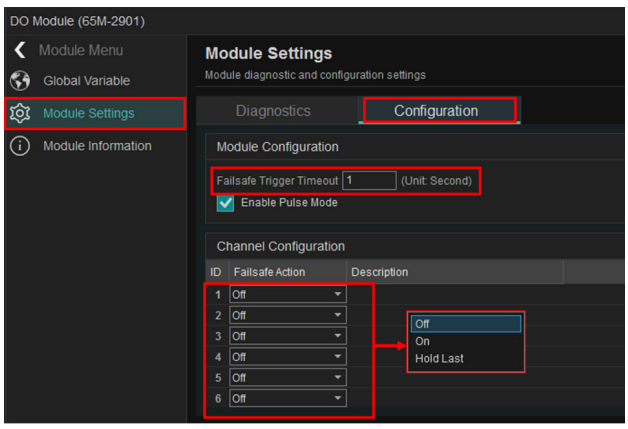
Configuration:

- Enable Pulse Mode: Only Channel 1 to 8 can be configured in Pulse mode. Scroll down in configuration, set the following parameters for counter mode.
- Pulse Count: Set the number of counts to output after the start.
- Low Width: Set the time of the low state in the pulse.
- High Width: Set the time of the high state in the pulse.



Failsafe configuration:

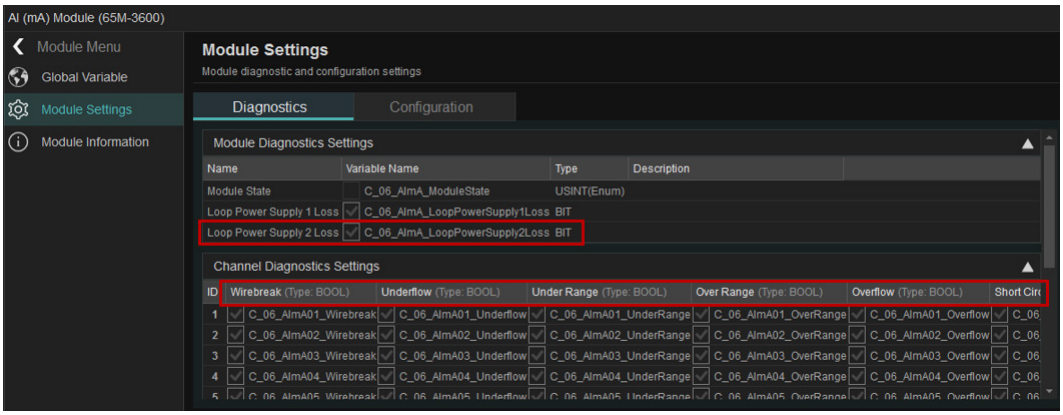
- Failsafe Trigger Timeout: Set timeout failsafe will be triggered after DO module communication loss.
- Failsafe Action: Set the action of each DO channel after DO module communication loss. The action of the DO channel can be OFF/ON/Hold Last.



65M-3600 AI (mA) module settings:

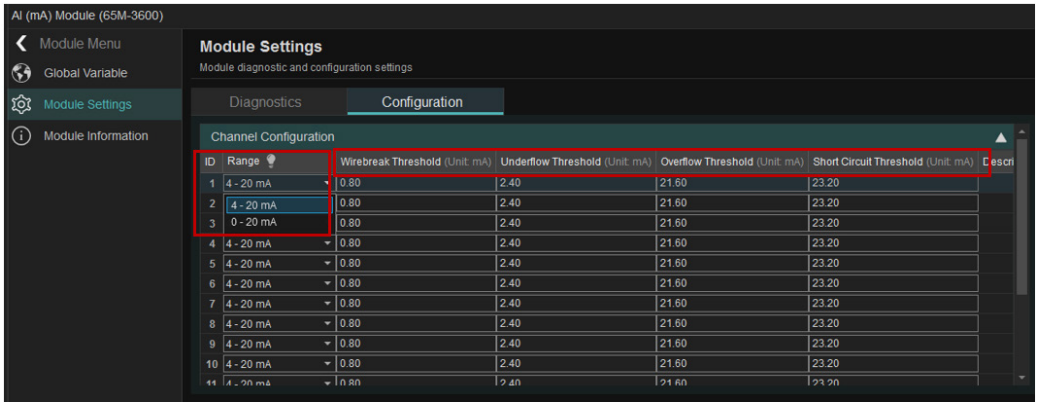
Enable/Disable AI (mA) diagnostics:

- Loop Power Supply Loss: To detect if the field power supplying for AI fails.
- Wirebreak: To detect if the wiring between the sensor and the channel is broken, which means the current value is smaller than the wirebreak threshold.
- Underflow: To detect if the current value is smaller than the underflow threshold.
- Under Range: To detect if the current value is below the range of the AI (mA) channel.
- Over Range: To detect if the current value is over the range of the AI (mA) channel.
- Overflow: To detect if the current value is larger than the overflow threshold.
- Short Circuit: To detect if there is a short circuit on the AI (mA) channel, which means the current value is larger than the short-circuit threshold.



Configuration:

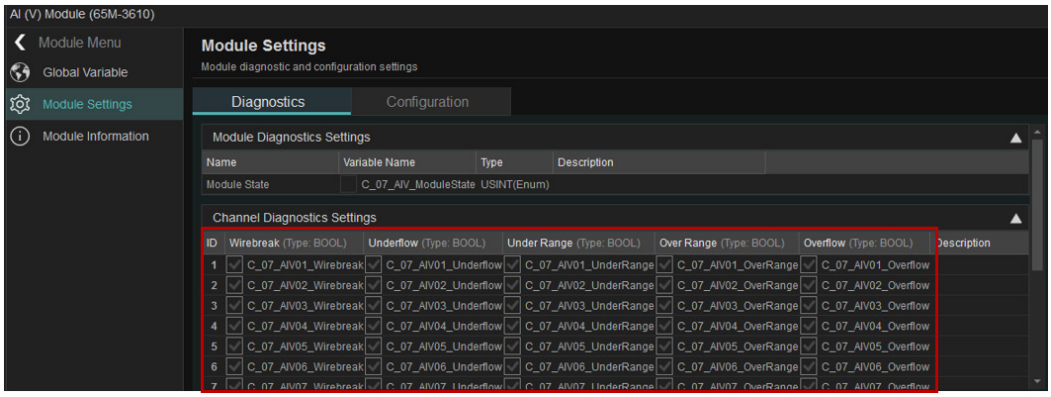
- Range: 0 to 20 (mA), 4 to 20 (mA)
- The Diagnostics threshold for Wirebreak, Underflow, Over Range and Short Circuit can be adjusted.



65M-3610 AI (V) module settings:

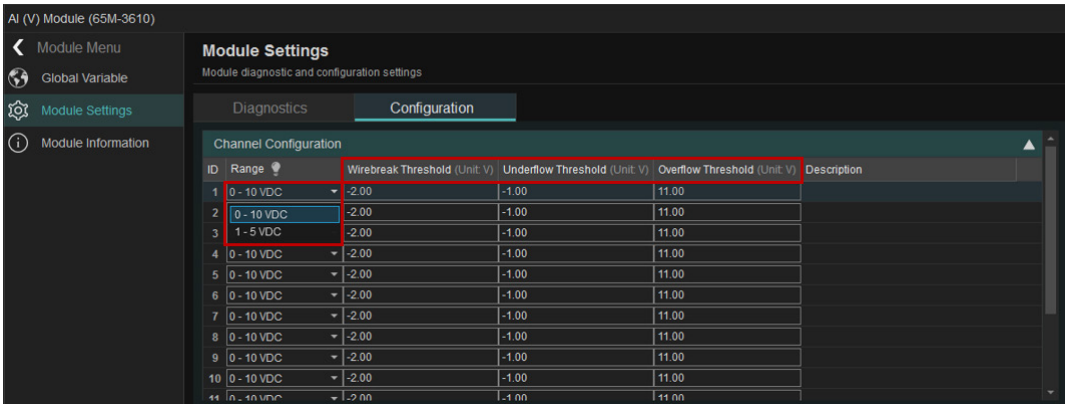
Enable/Disable AI (V) diagnostics:

- Wirebreak: To detect if the wiring between the sensor and the channel is broken, which means the voltage value is smaller than the wirebreak threshold.
- Underflow: To detect if the voltage value is smaller than the underflow threshold.
- Under Range: To detect if the voltage value is below the range of the AI (V) channel.
- Over Range: To detect if the voltage value is over the range of the AI (V) channel.
- Overflow: To detect if the voltage value is larger than the overflow threshold.



Configuration:

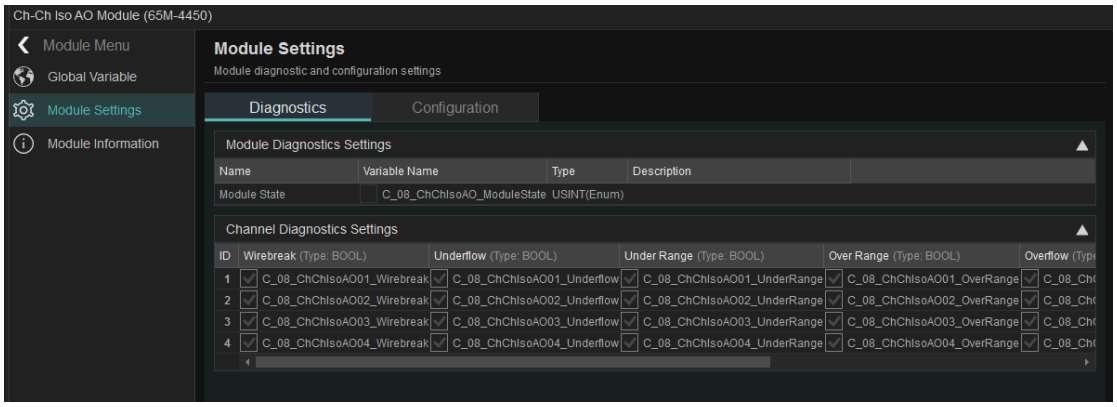
- Range: 1 to 5 (V), 0 to 10 (V)
- The diagnostic thresholds for Wirebreak, Underflow, and Overflow can be adjusted.



65M-4450 Ch-Ch Iso AO Module Settings:

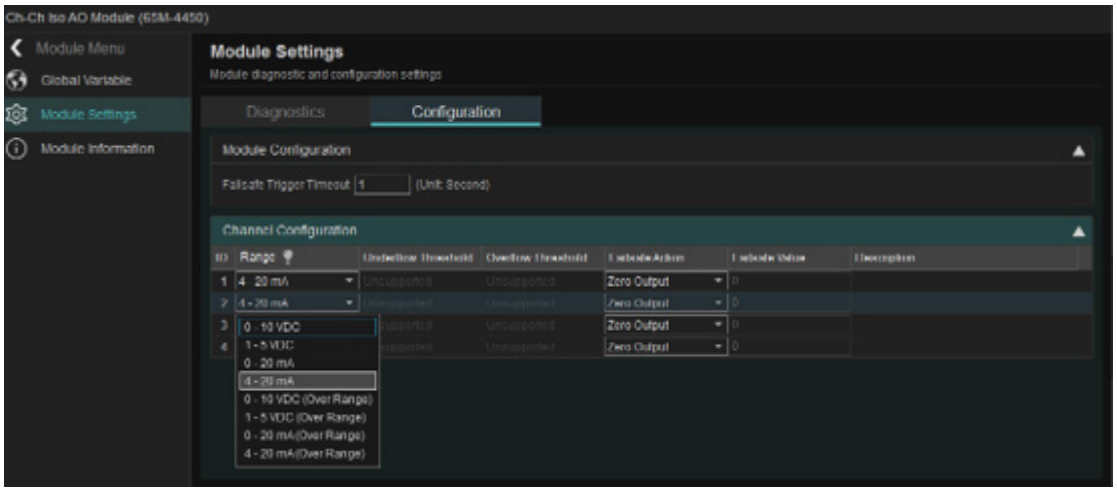
Diagnostics:

- Wirebreak: Detects if the wiring between the sensor and the channel is broken. The determination is made by a voltage value smaller than the wirebreak threshold.
- Underflow: Detects if the voltage value is lower than the underflow threshold.
- Under Range: Detects if the voltage value is below the range of the AI (V) channel.
- Over Range: Detects if the voltage value is over the range of the AI (V) channel.
- Overflow: Detects if the voltage value is larger than the overflow threshold.
- Short circuit: Detects if there is a short circuit on the AO channel.



Configuration:

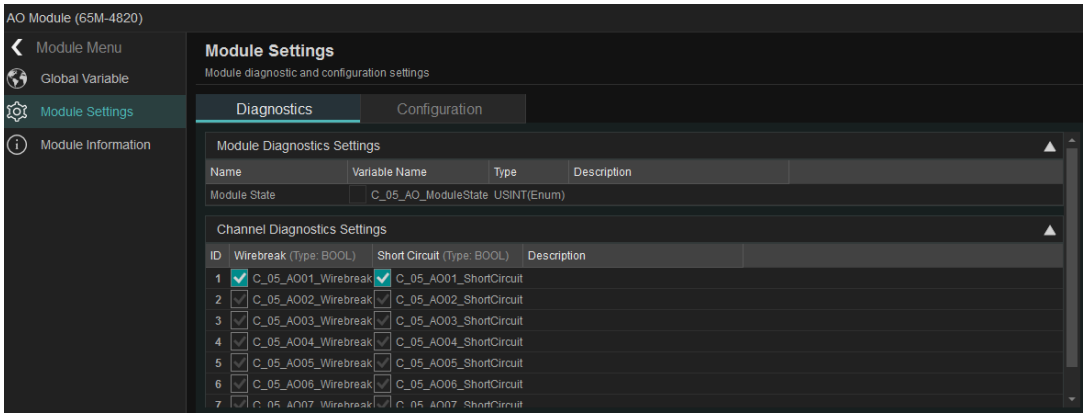
- Configure the Range of the AO channel. Choose 0 to 10 VDC / 1 to 5 VDC / 0 to 20 mA / 4 to 20 mA.
- Failsafe Action: Set the action of each AO channel after AO module communication loss. The action of the AO channel can be Zero Output / User-defined Value / Hold Last.



65M-4820 AO module settings:

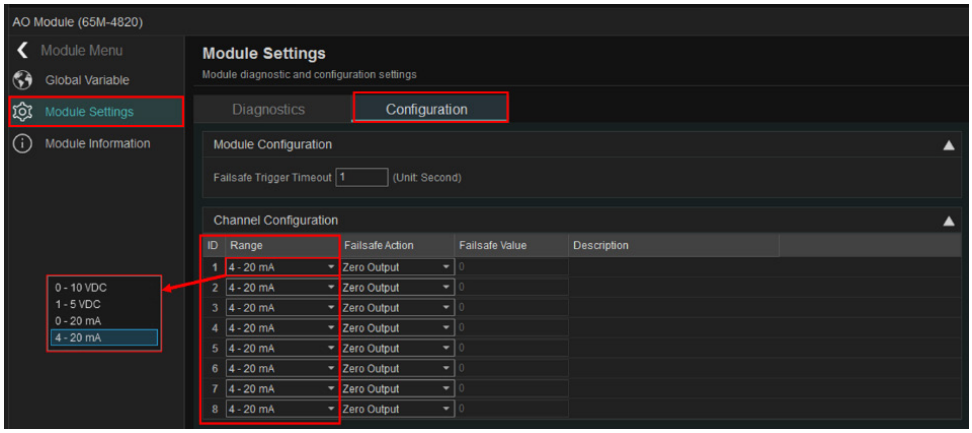
Enable/Disable AO diagnostics:

- Wirebreak: To detect if the wiring between the AO unit and the channel is broken.
- Short Circuit: To detect if there is a short circuit on the AO channel.



Configuration:

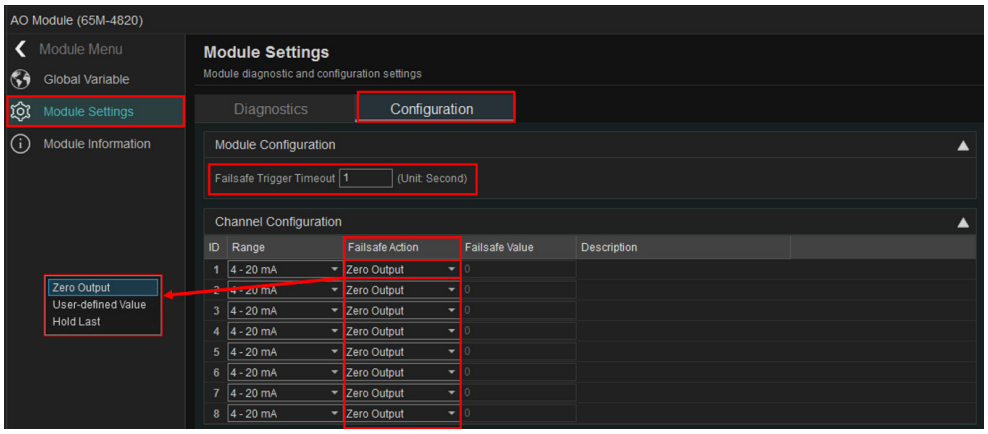
- Configure the Range of the AO channel. Choose 0 to 10 VDC / 1 to 5 VDC / 0 to 20 mA / 4 to 20 mA.



- Set the parameters for Failsafe.

  Failsafe Trigger Timeout: Set timeout failsafe will be triggered after AO module communication loss.

  Failsafe Action: Set the action of each AO channel after AO module communication loss. The action of the AO channel can be Zero Output / User-defined Value / Hold Last.



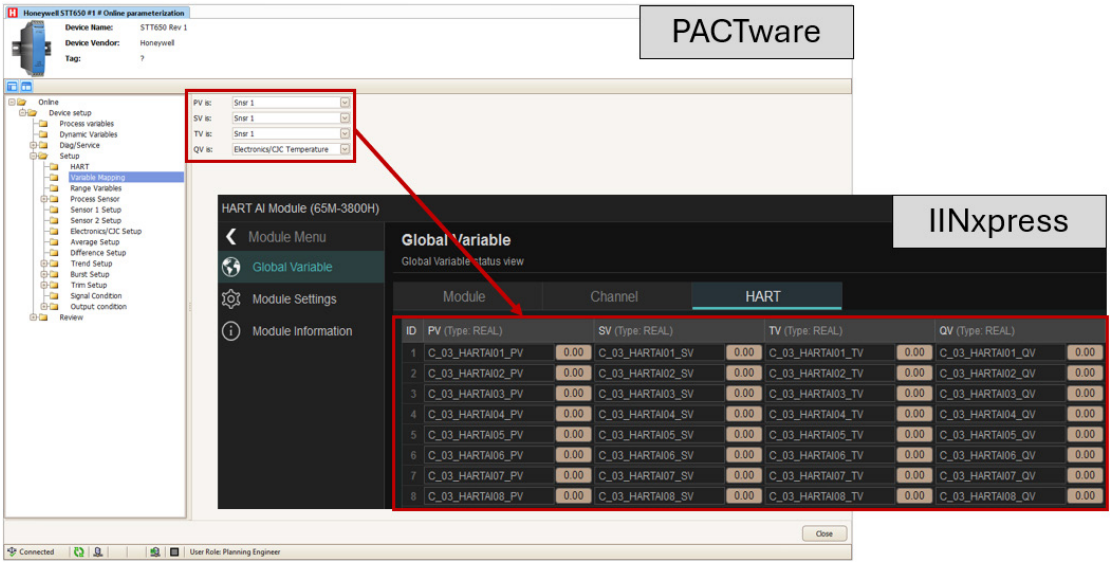
65M-3800H HART AI (mA) module Settings:

Global Variable:

PV, SV, TV, QV Setting—After configuring PV, SV, TV, and QV via PACTware, these data will also be sent to IINxpress (ioPAC 6500 IDE Utility Software) and can be accessed in the POU. Make sure the HART is enabled.

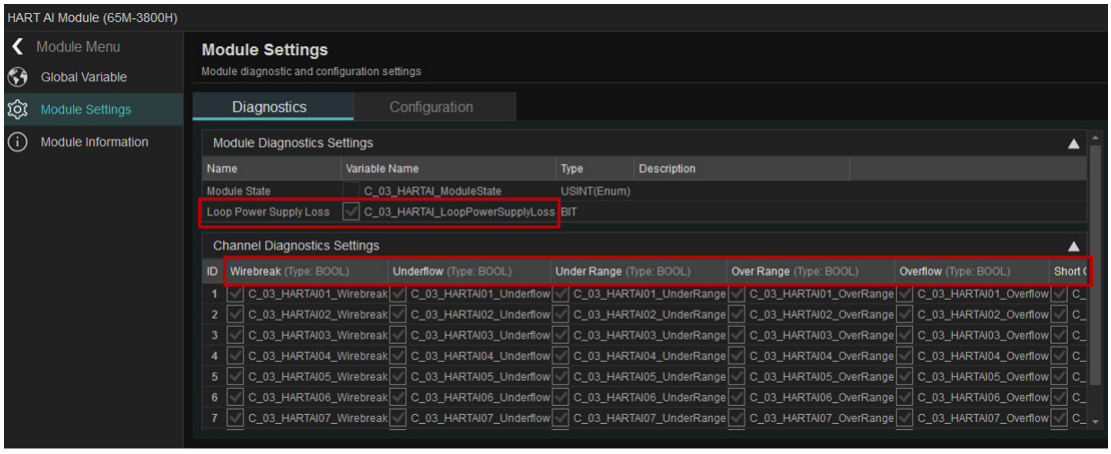
NOTE

For detailed PACTware configuration guidance, refer to "ioPAC 6500 Series HART Module Configuration Manual—PACTware"



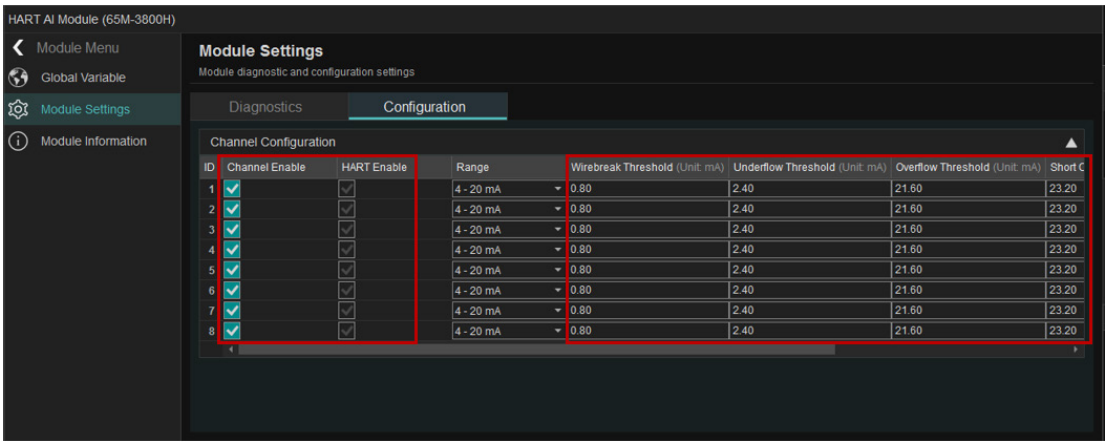
Enable/Disable AI (mA) diagnostics:

- Loop Power Supply Loss: To detect if field power supplying for AI fails.
- Wirebreak: To detect if the wiring between the sensor to the channel is broken, which means the current value is smaller than the wirebreak threshold.
- Underflow: To detect if the current value is smaller than the underflow threshold.
- Under Range: To detect if the current value is below the range of the AI (mA) channel.
- Over Range: To detect if the current value is over the range of the AI (mA) channel.
- Overflow: To detect if the current value is larger than the overflow threshold.
- Short Circuit: To detect if there is a short circuit on the AI (mA) channel, which means the current value is larger than the short-circuit threshold.



Configuration:

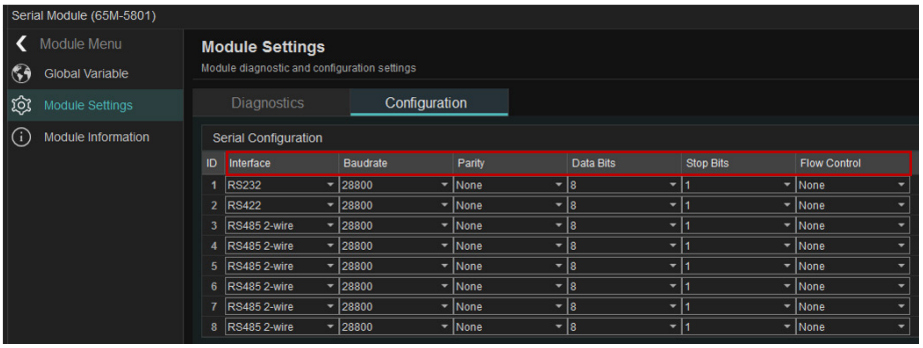
- Channel Enable/Disable (Default Enabled): The disabled channel will be skipped when polling.
- HART Enable/Disable (Default Disabled): The disabled channel is used as a regular 4-20 (mA) AI. Check "enable" box if HART field device is used.
- The range is set to be 4-20 (mA) and can't be adjusted.
- The threshold for Wirebreak, Underflow, Overflow, and Short Circuit can be adjusted.



65M-5801 Serial module settings:

Configuration:

- Interface, Baud rate, Parity, Data bits, Stop bits and Flow control can be adjusted in configuration.



Module Information: The module information (e.g., firmware version, module serial number, LED status, serial status, mode switch, etc.) will be displayed here. IINxpress shows product specifications here for reference. **Connect the device** to access information.

NOTE

All the information and settings of the switch module can be completed in the web interface of the switch module. Select the link in the module detail page, and the web interface of the switch module will open in the default browser.

Module Selector

The available modules are listed here. Drag and drop the selected module to the system combination window for the system setup. Follow the steps to set up the system combination.

1. Choose the backplane module: The ioPAC 6500 is fully modular design. Drag and drop the needed backplane module in designated order.
2. Choose the other modules: Drag and drop other modules to the designated slot. The module can only be placed on the corresponding backplane. The restricted sign will appear when you drag a module to an unsupported backplane, reminding you not to place it in the slot.

IINxpress also supports the template list. Drag and drop the whole system combination and make some minor changes to meet your application's requirements. IINxpress provides small, medium, and large scale as template. You can also reuse a system combination that you saved previously.

Module Property Selector

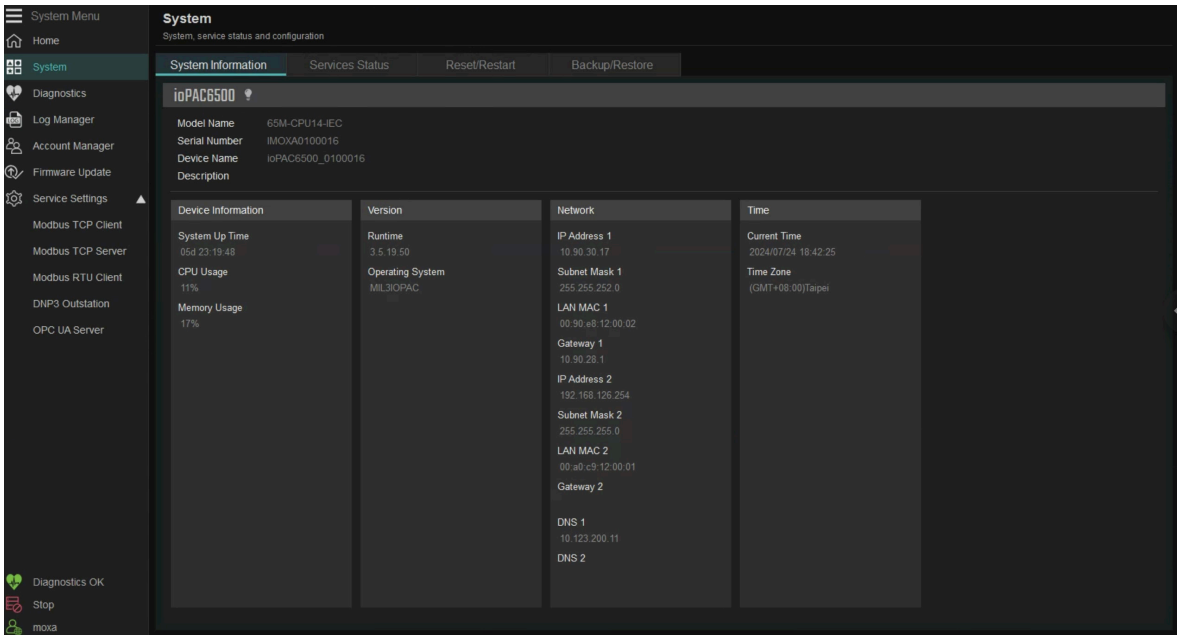
When you select an available module, you will see its properties displayed here. Choose the property version here to match the combination you need.

System

All the system information, settings, and configuration can be found on the system page.

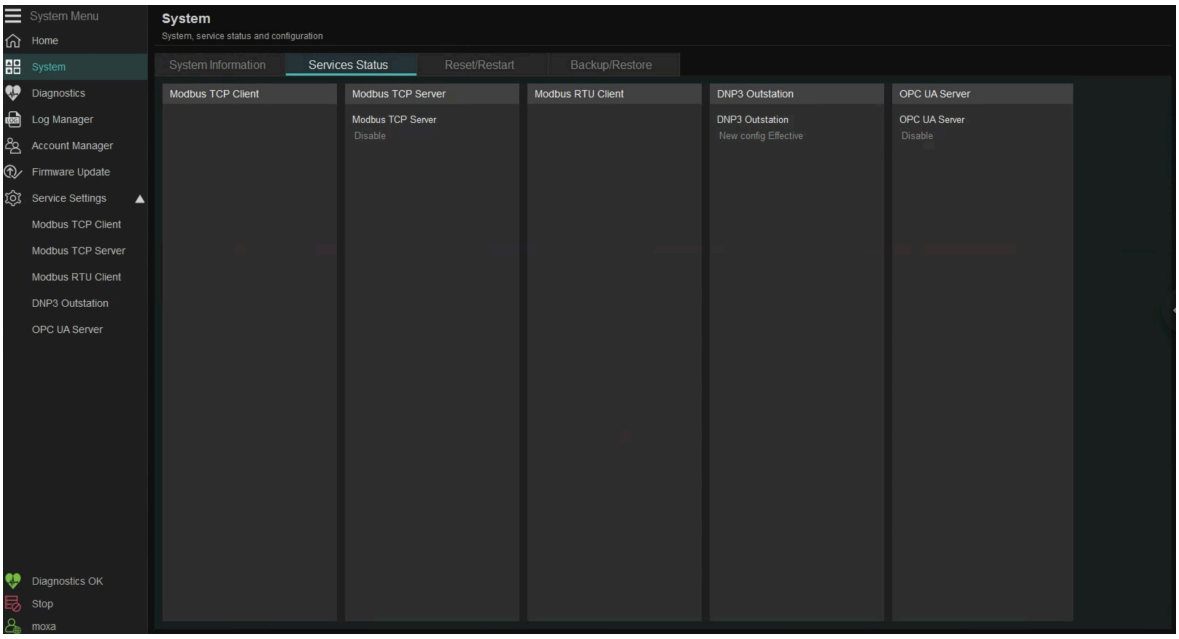
System Information

System identification (model name, serial number, device name), device information (system uptime, CPU/memory usage), runtime/OS version, network information, and time can be found here. All the information is read-only.



Service Status

It shows the status of all supported services, which include the Modbus TCP/RTU Server/Client, DNP3 outstation, OPC UA, etc.



Reset/Restart

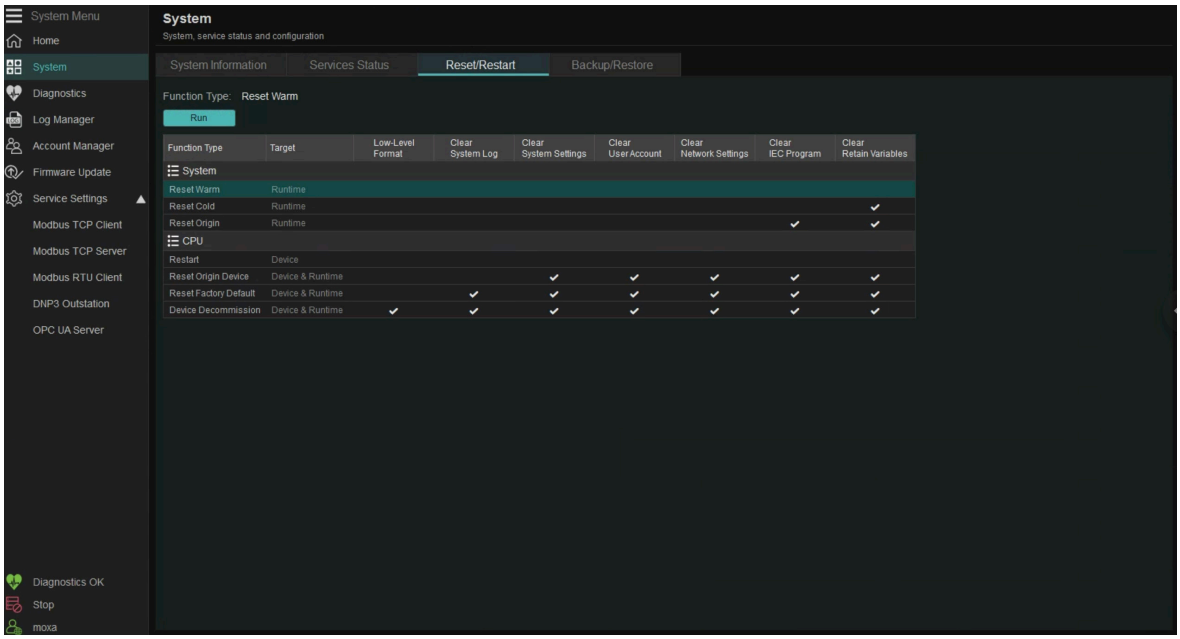
There are several reset/restart types supported by ioPAC 6500, and all of them are listed on the page. Select an action first, then select Run. A pop-up warning message will appear. Follow the instructions to complete the reset/restart process.

NOTE

Resetting or restarting the system will clear different system information. Make sure to read the table before performing the rest/restart process.

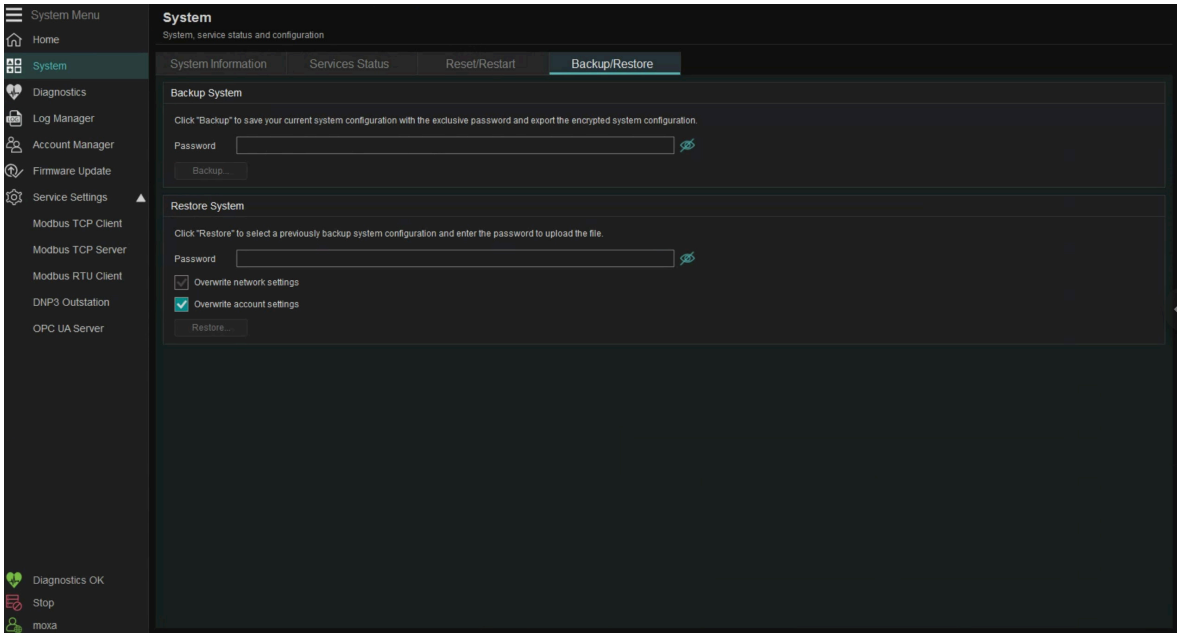
NOTE

Push the reset button to complete the **Reset Factory Default** and **Device Decommission**. Follow the instructions to complete the process.



Backup/Restore

Back up and restore the system configuration on this page.



Follow these steps to back up the system configuration.

1. Key in the password.
2. Select the **Backup** button and choose where you want to save the configuration file. The password length is required to be between 8 and 40 characters.

Follow these steps to restore the system configuration.

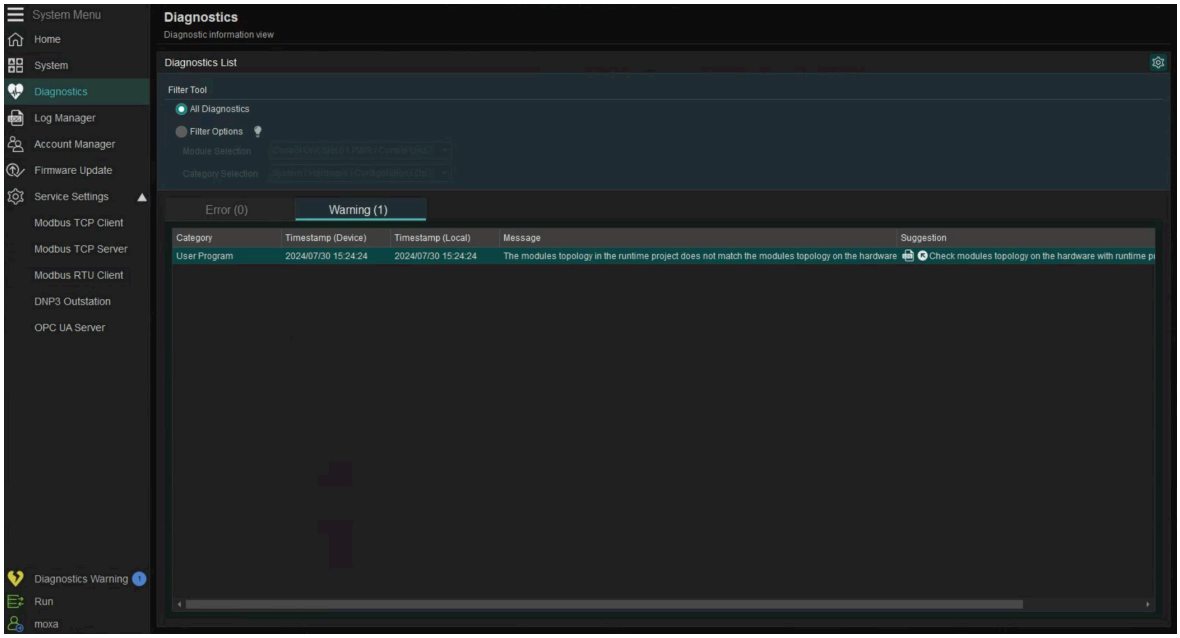
1. Key in the password
2. Choose to overwrite the network and account settings or not.
   - Overwrite the network settings: The restore process will overwrite the network settings. The system's Ethernet connection might be lost during the restoration.
   - Overwrite the account settings: The restore process will overwrite the account settings. The account you are using might not be available anymore.
3. Select the **Restore** button and choose the configuration file which you want to restore.

Diagnostic

The diagnostic information will be displayed on the Diagnostic page. The error and warning messages that are persistent can be found in the Error and Warning tab, respectively.

NOTE

Diagnostics will not display the error and warning messages that occur once.

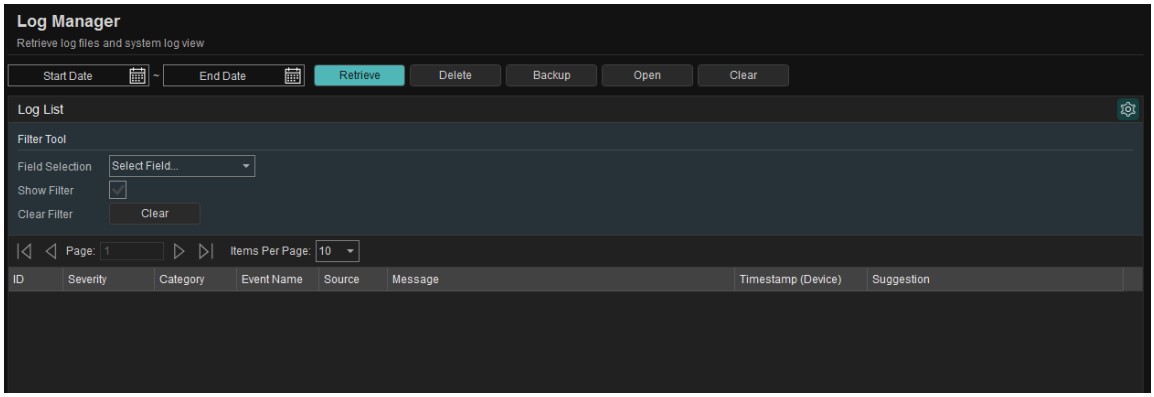


Log Manager

All the logs will be stored inside the ioPAC 6500 system. Use IINxpress to retrieve the log and show in IINxpress. IINxpress can perform five actions in a log.

- **Start Date and End Date:** Select the time range for log retrieval.
- **Retrieve:** Retrieves the log from the device and shows it in IINxpress.
- **Delete:** Deletes the log stored in the device.
- **Backup:** Back ups the displayed log to the file.
- **Open:** Opens the backup log file.
- **Clear:** Clears the log list in IINxpress. This action will not clear the log inside the device.

For the detailed log list, refer to the log section of the web interface.

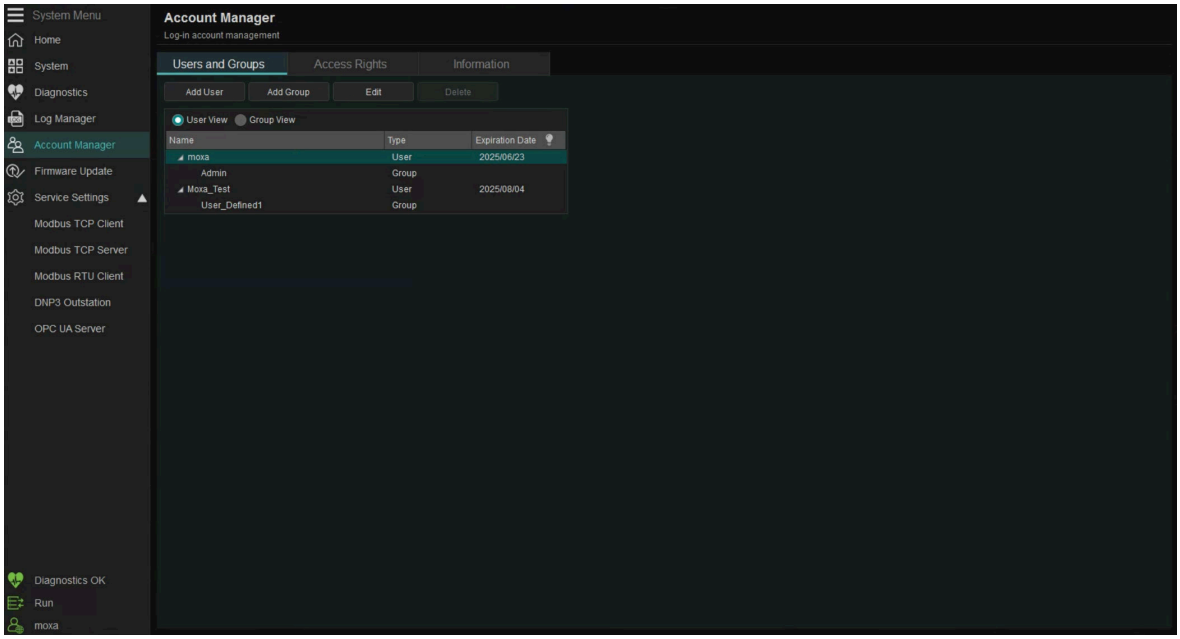


Account Manager

The account and its authority can be managed on the Account Manager page. Account manager settings consist of three main parts.

Users and Groups

On this page, make changes related to the users and groups. All user accounts will be displayed on this page. Choose to show in User view and Group view. In the ioPAC 6500 system, the login property of account belongs to the user group.

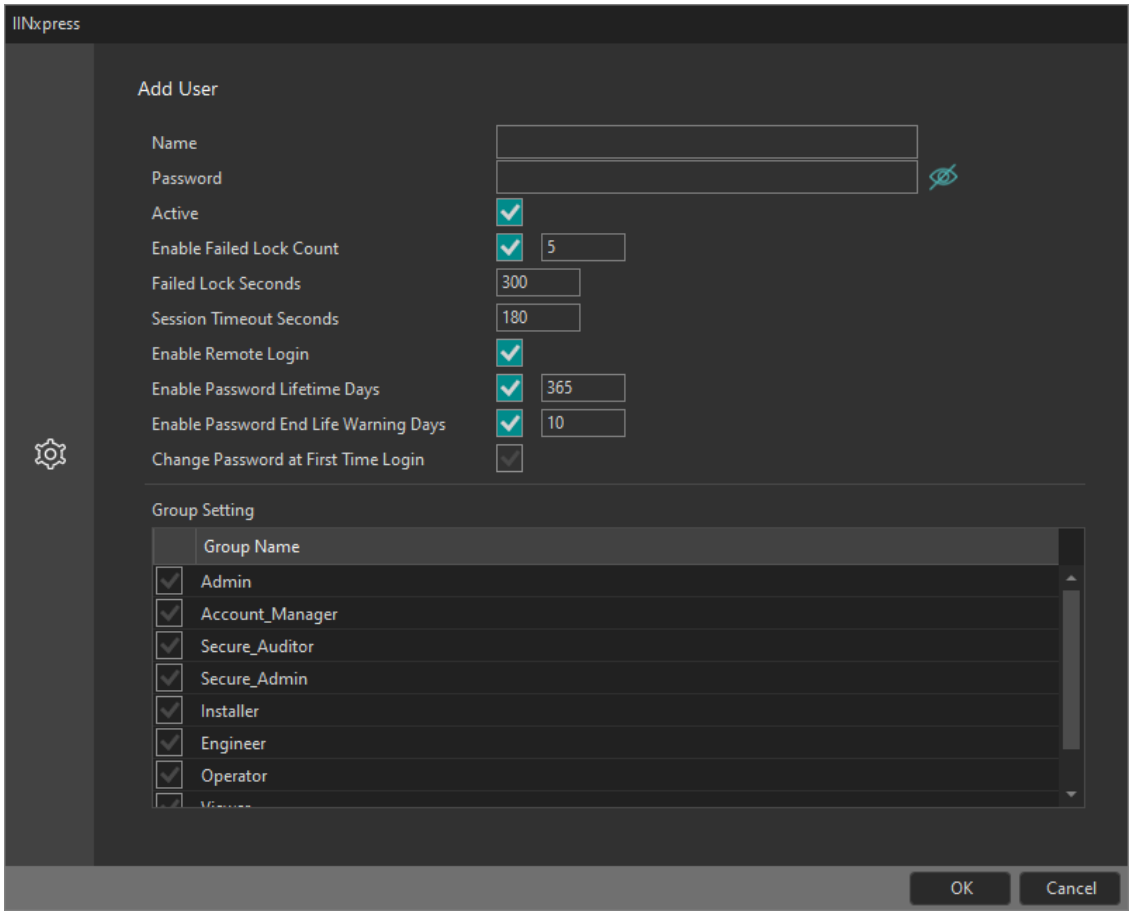


Add User

When you want to create a new user account, select the **Add User** and a window will pop up. Once you confirmed all the account property and group assignments, select OK to complete the account creation.

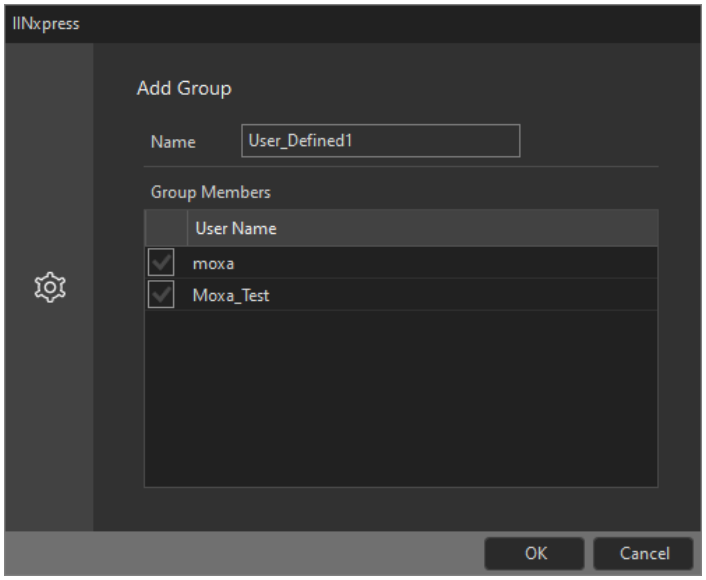
NOTE

Before editing the users and groups, make sure the login account has permission to change the account settings.



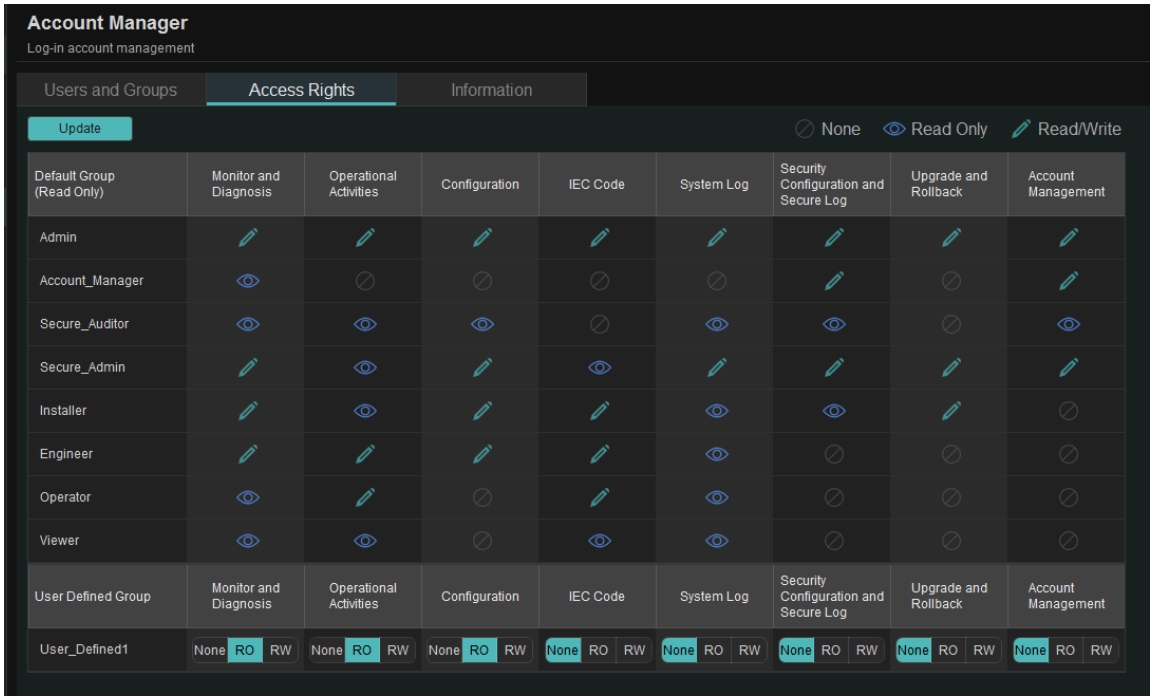
Add Group

When you want to create a new user group, select the **Add Group** and a window will pop up. Specify the group name and assign the user accounts to the group. For the group property, change in Access Rights tab.



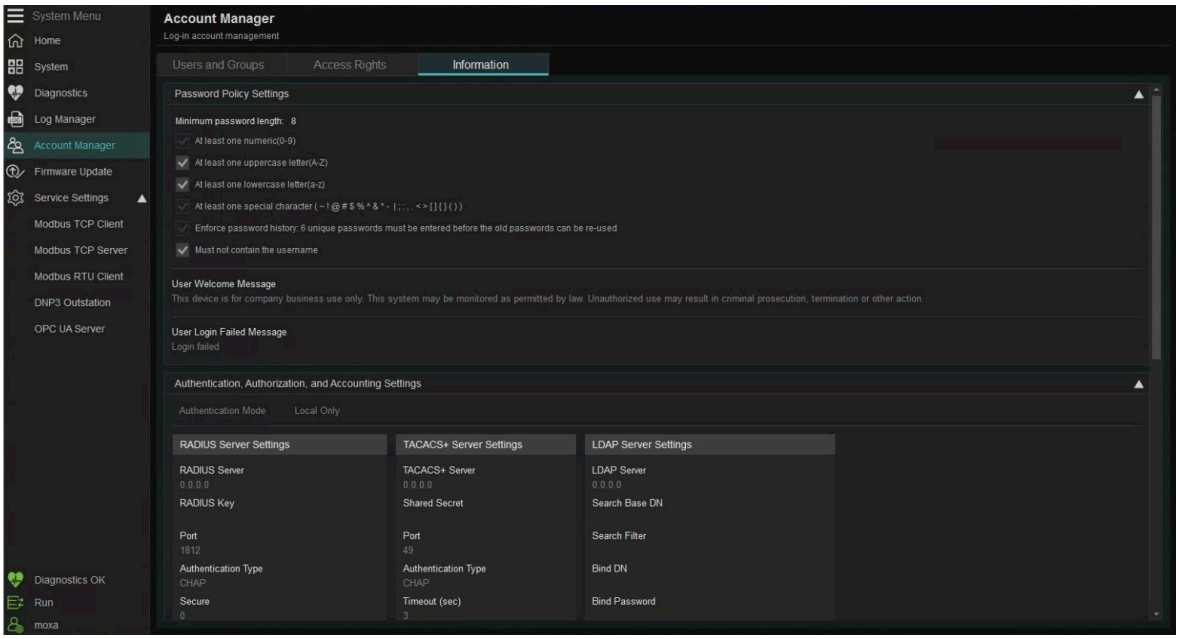
Access Rights

Change the property of the group on the Access Rights page. You cannot change the authority of the default 8 groups. You can only change the authority of the user-created group.



Information

The information will display the current password policy. It can only be modified on the system webpage. When IINxpress connects the device, the latest password policy will be loaded automatically. For the details about the password policy, refer to the Account Manager section on the webpage.



Firmware Update

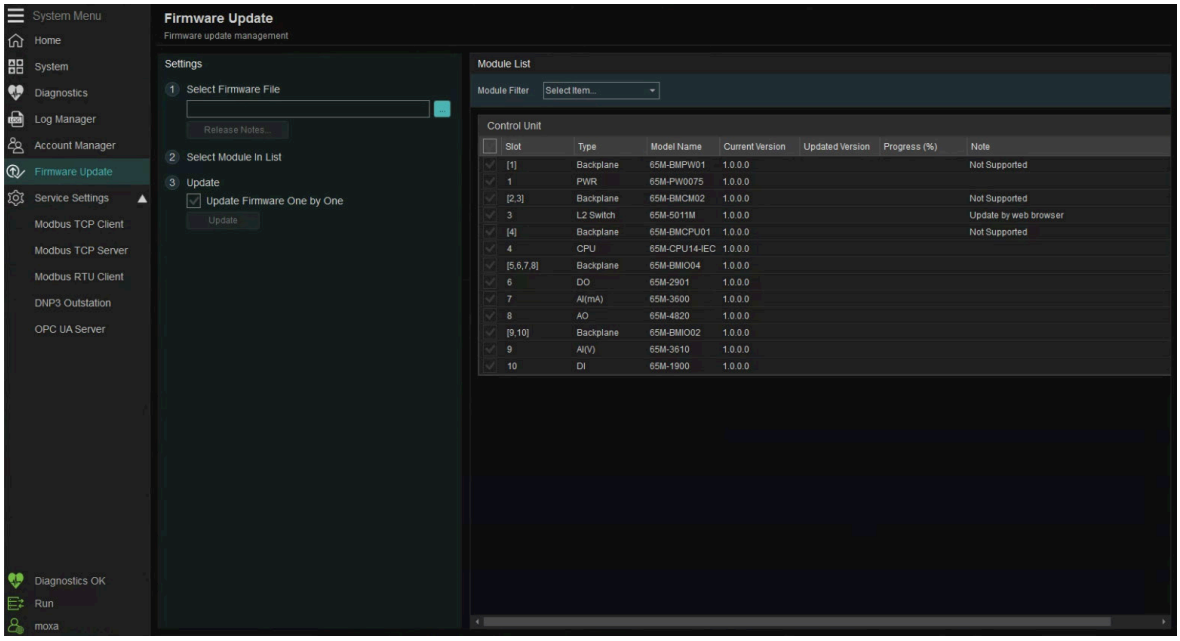
IINxpress also allows you to update the firmware to the system. Follow the following three steps to complete the firmware update.

1. **Select Firmware File:** Select ... to choose the firmware file that needs to be updated to the system.

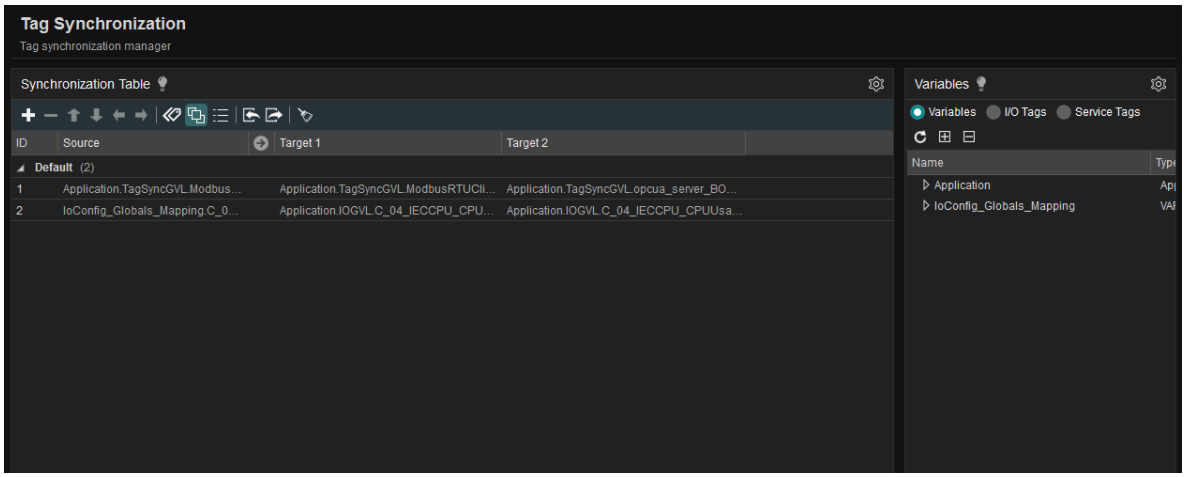
   The firmware file can be chosen from the local disk or a SFTP from a remote site. You can also select the Release Notes button to check the release details.
2. **Select Module on List:** Select the modules that need to be updated on the **Module List**. Use the module filter to speed up module selection. The module list will display module information.
   - **Slot:** Shows the slot where the module is installed. The system combination determines the slot number. The number 1 shows the most leftmost module of each unit. The slot of the backplane module will be displayed with a number in square brackets, e.g., [1].
   - **Type:** It shows the module type. E.g., CPU, DI, backplane, etc.
   - **Model Name:** The model name of the module will be displayed here.
   - **Current Version:** The current firmware version of the module will be displayed here.
   - **Update Version:** The firmware version included in this firmware file will be displayed here.
   - **Progress(%):** The updated progress will be here.
   - **Note:** Any other information that cannot be categorized will be displayed here.
3. **Update:** Select **Update** to start the system firmware update. Choose Update **Firmware One by One** to update the firmware module by module.

NOTE

Update the switch module's firmware on the web page of the switch module.



Tag Synchronization



Tag Synchronization automatically keeps tags in sync between a source (e.g. a Global Variable List) and one or more targets (e.g. Modbus, OPC UA tag lists).

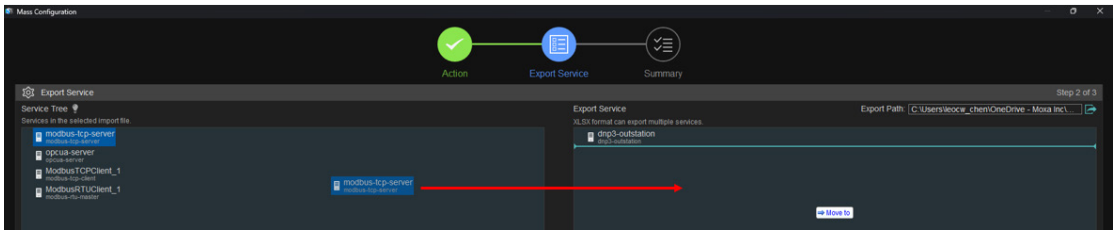
Service Settings

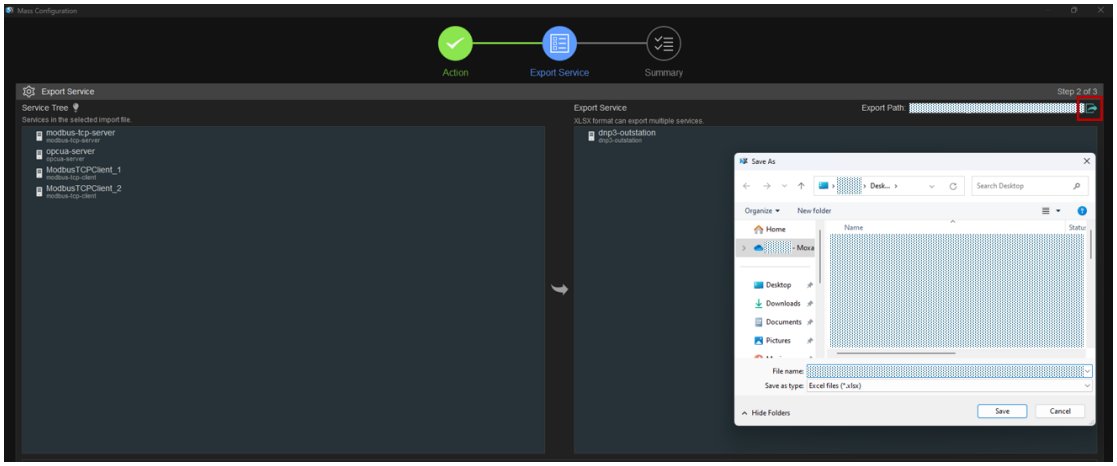
The ioPAC 6500 system provides a protocol service to lower your programming effort. Use the protocol service to collect data from other devices and use the collected data in the program or deliver to the upper-level system.

General Information for All Services

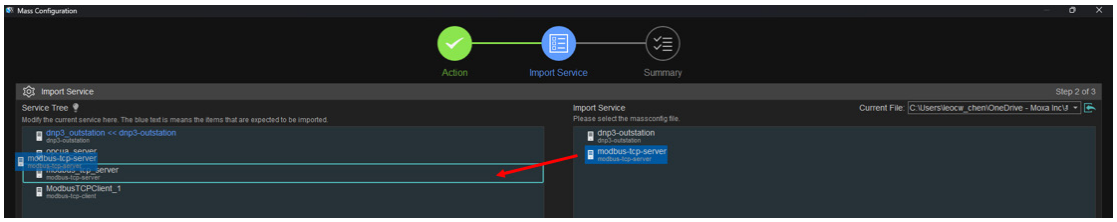
Import / Export: They can be seen in each of the service pages, prompting easier mass configuration and better service management.

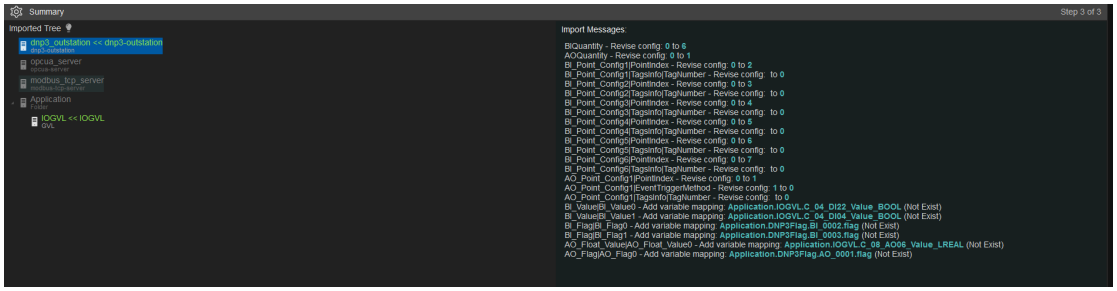
Export: Drag and drop the service from Service Tree to Export Service. The configuration will be stored as .xlsx file.





Import: Select the desired .xlsx file. Drag and drop from import service to service tree. Blue text indicates the services that are expected to be imported



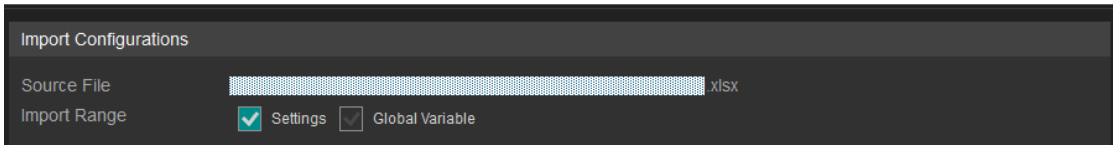


NOTE

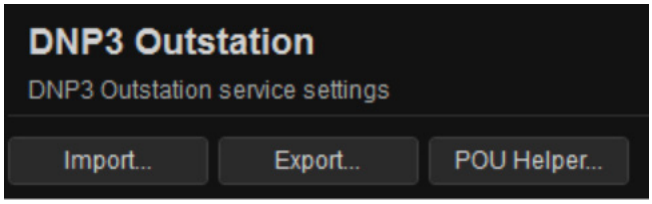
When importing the service configuration, the system checks the following:

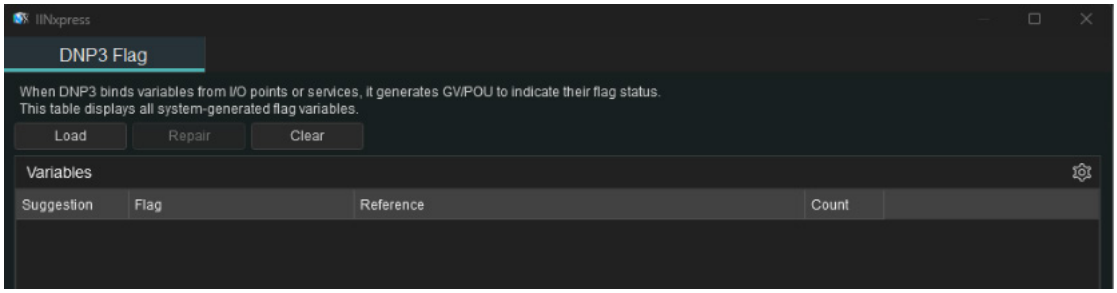
1. When a new variable is specified, the system checks whether the variable name already exists. If a duplicate is found, the variable cannot be created, and the importing operation will be blocked.
2. When an existing variable is specified, the system checks whether it is an I/O variable. If so, the system will attempt to generate the corresponding IOGVL. If the generation fails, the importing operation will also be blocked.

Uncheck the "Global Variable" in import Configurations, if variables importing is not needed.



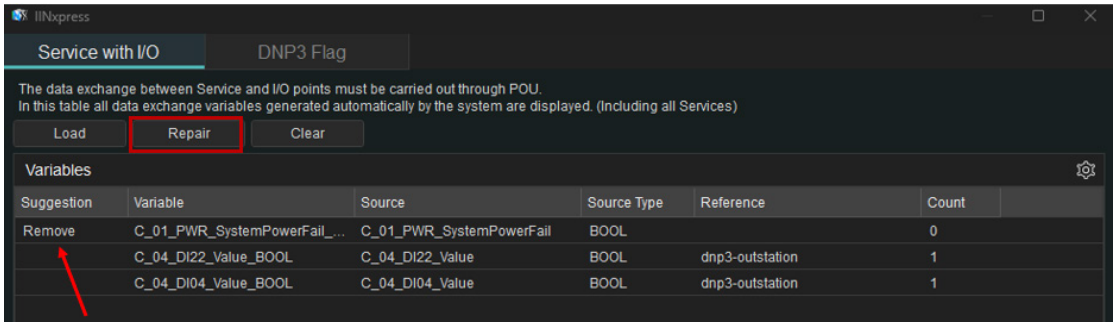
POU Helper (DNP3 Outstations Only): POU Helper shows detailed information on how sources and variables are mapped, as the data exchange between service and I/O points are carried out via POU. Select Load to get the status. Select Clear to delete everything.

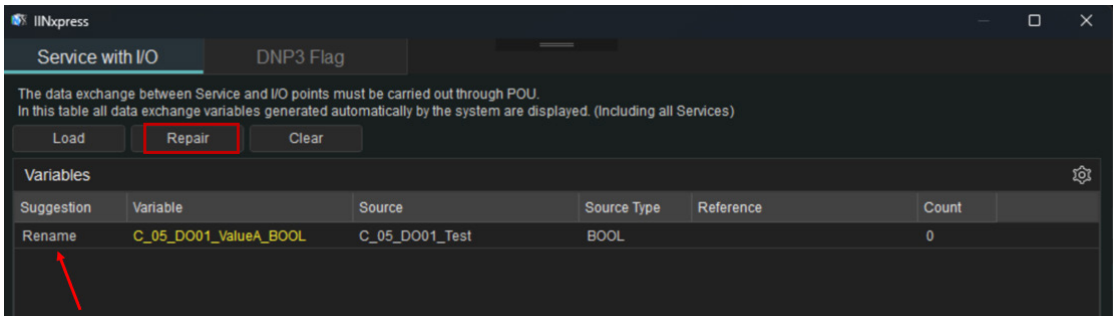


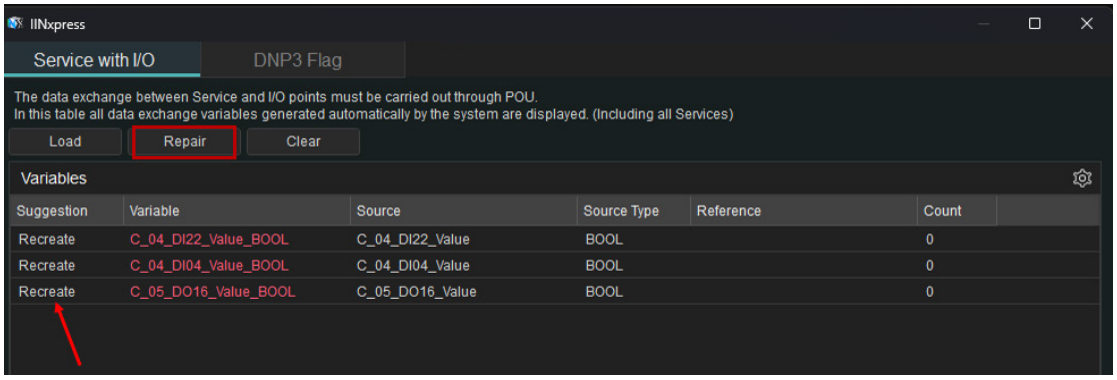


NOTE

If "Remove", "Rename" or "Recreate" appears in the suggestion, revisit the configuration within your application or select **Repair**.

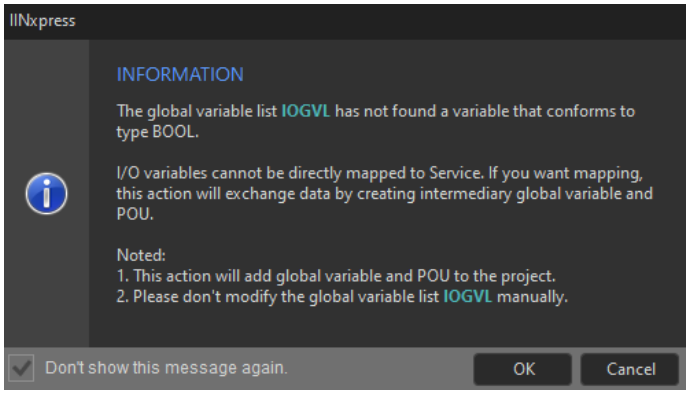






NOTE

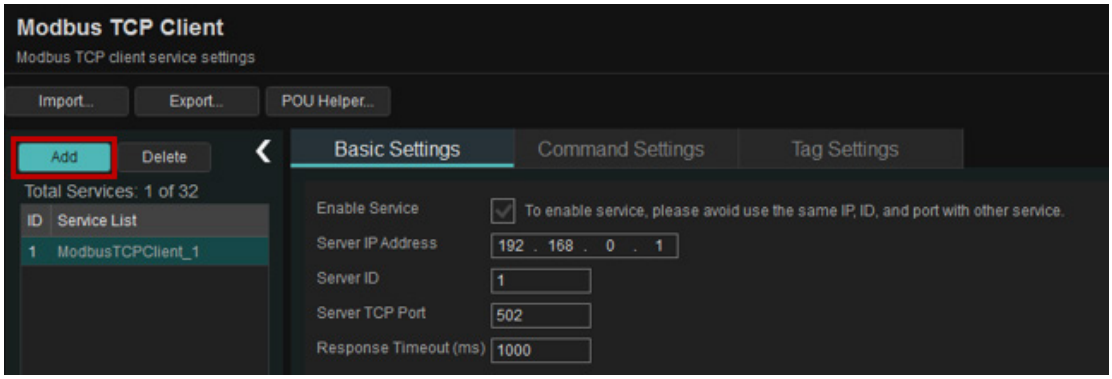
When mapping the variables, a message tells you that a variable was automatically created. Select OK to proceed.



Modbus TCP Client

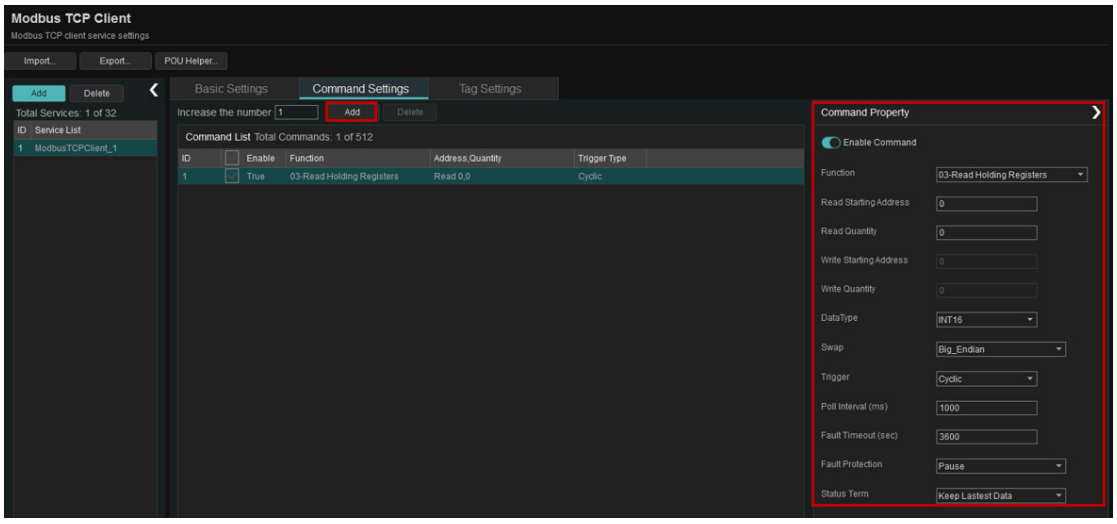
Modbus TCP Client can collect data from up to 32 Modbus TCP servers. To add a Modbus TCP client, clselectick the Add button and a new Modbus client profile will be added to the Service List. All properties of the Modbus TCP client are categorized into **Basic Settings**, **Command Settings**, and **Tag Settings**.

Basic Settings: Enable the service, set up the Server IP Address, Server ID, Server port, and response timeout on this page.

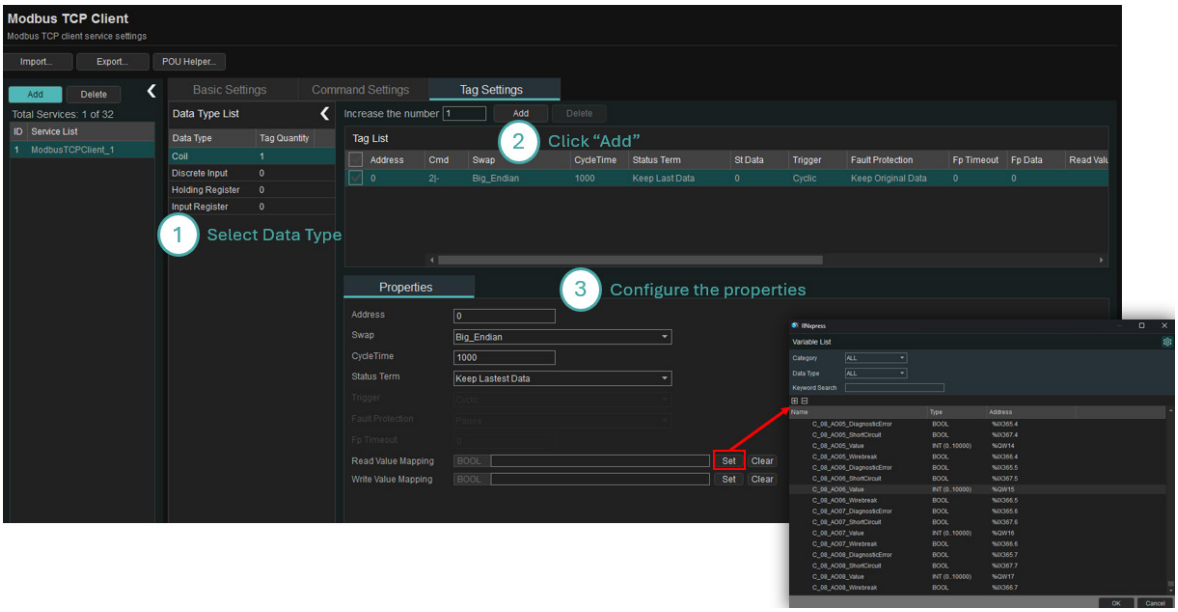


> **NOTE**
>
> Double-click the Name (ModbusTCPClient_1) on the Service list to rename.

Command Settings: Create command profiles to read from or write to Modbus TCP Server devices. Select **Add** and configure the command property on the right-hand side, e.g., Function Code, Start Address, Read Quantity, etc.



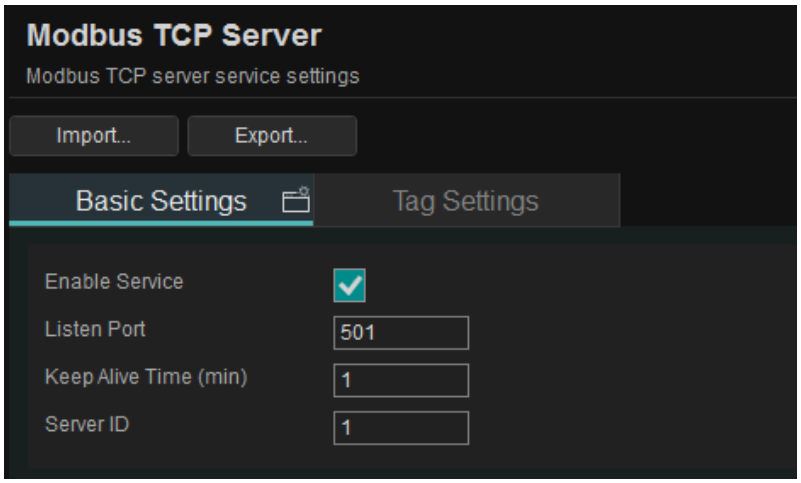
Tag Settings: The data array created on the Command Settings page will automatically appear on the Tag Settings page. Select **Set** to map the variables. Alternatively, follow the steps below to create tags manually.



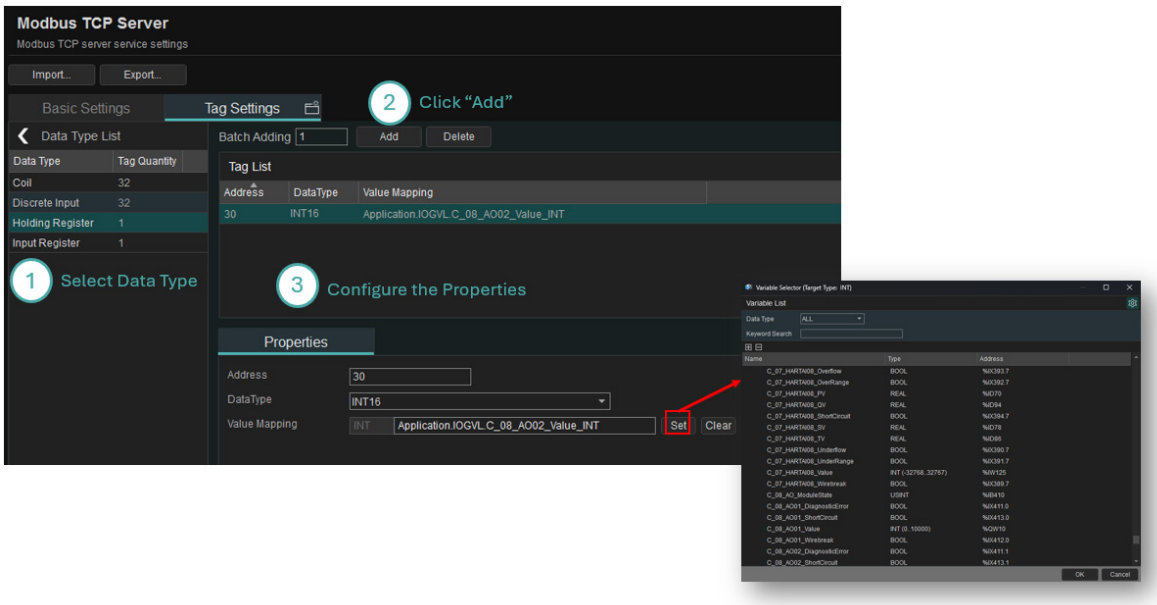
Modbus TCP Server

Modbus TCP Server services can provide data to other Modbus TCP Client systems. All properties of the Modbus TCP Client are categorized into **Basic Settings**, **Function Settings**, **Variable Mapping**, and **Tag Summary**.

Basic Settings: Enable Service, Listen Port, Keep Alive Time and Server ID can be configured here.



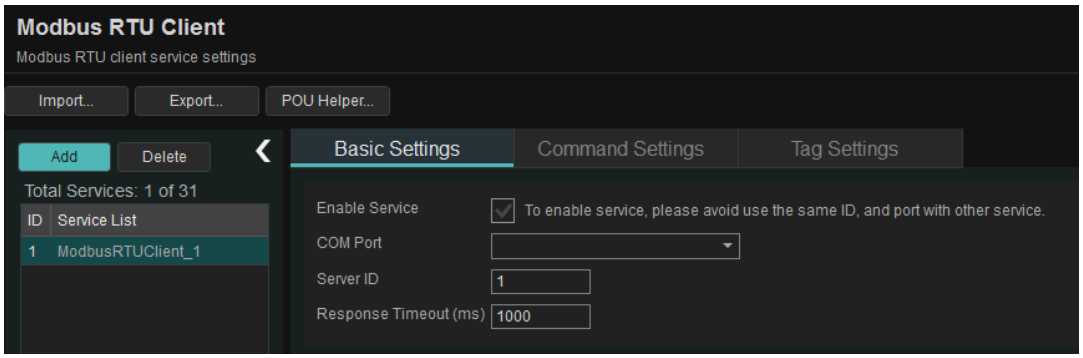
Tag Settings: The ioPAC 6500 supports the function types: Coil, Discrete Input, Holding Register, and Input Register. Set up the tag quantity in the Function Settings based on the application. Follow the steps below to configure the functions.



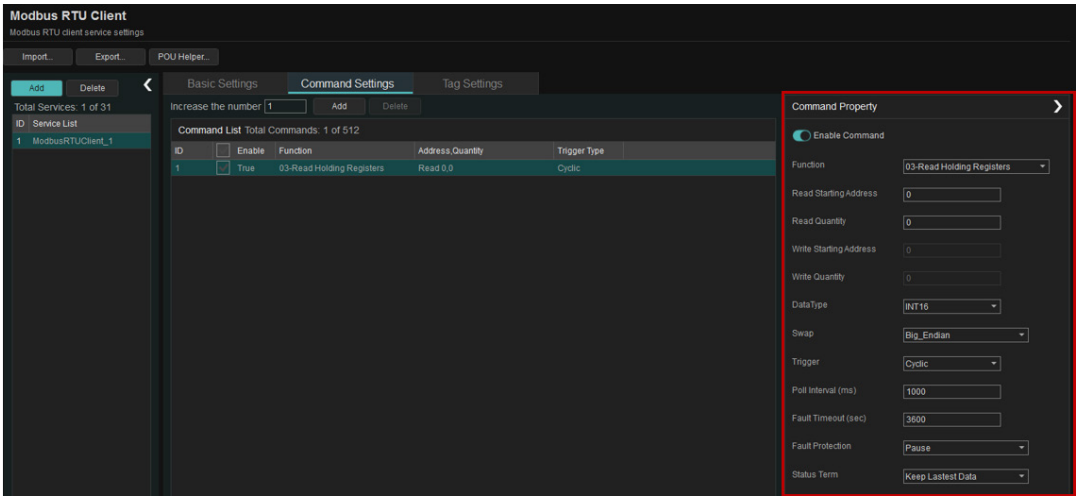
Modbus RTU Client

The ioPAC 6500 system also supports the Modbus RTU client service. The only difference between Modbus TCP and RTU client service is the COM Port settings, which can be found on the basic setting page.

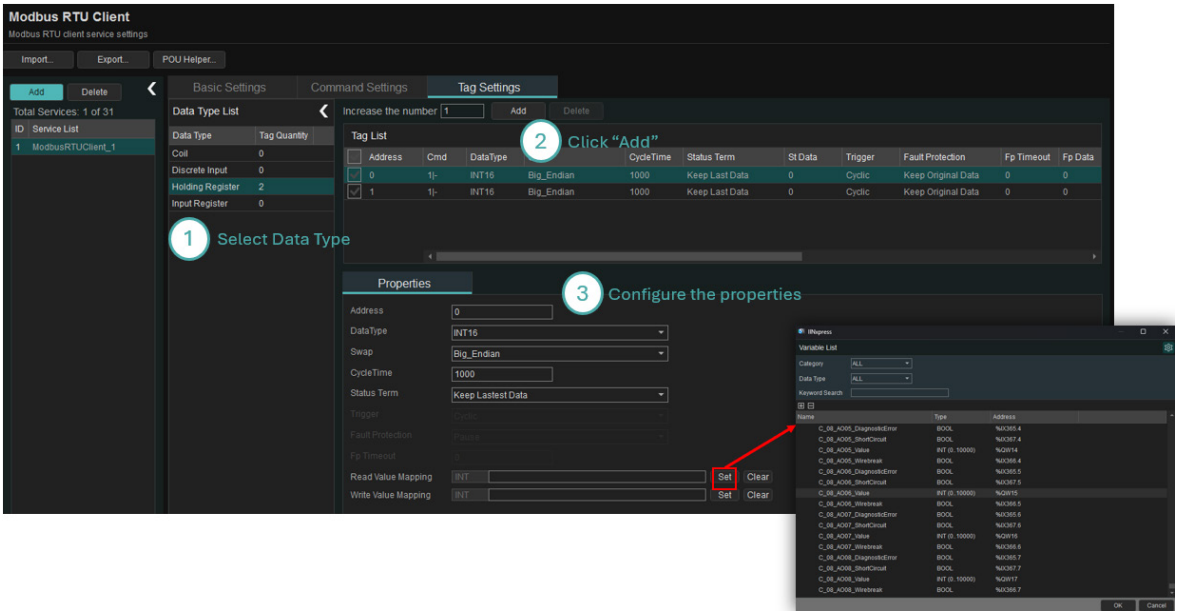
Basic Settings: Select **Add**, Enable Service, COM Port, Server ID, and Response Timeout can be configured here.



Command Settings: Create command profiles to read from or write to Modbus RTU Server devices. Select **Add** and configure the command property on the right-hand side, e.g., Function Code, Start Address, Read Quantity, etc.



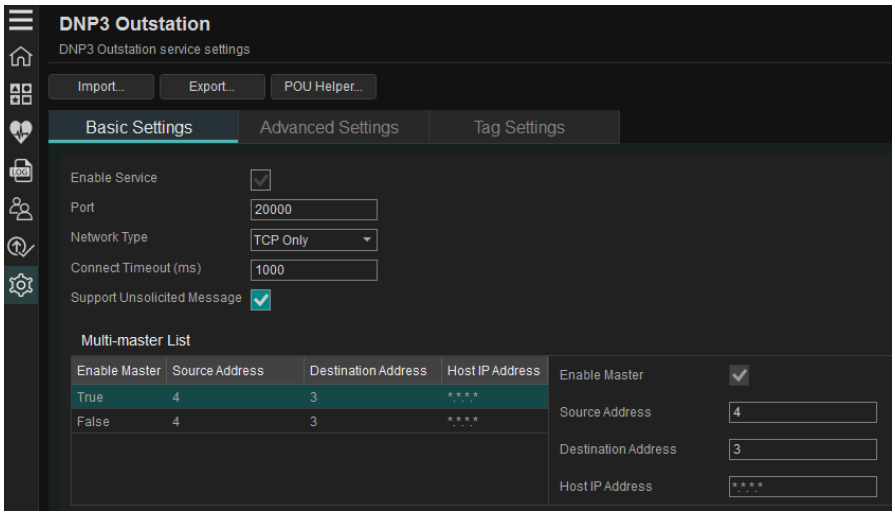
Tag Settings: The data array created on the Command Settings page will automatically appear on the Tag Settings page. Select **Set** to map the variables. Alternatively, follow the steps below to create tags manually.



DNP3 Outstation

DNP3 Outstation services can be used to provide data to other systems via DNP3 protocol. All properties of the DNP3 Outstation are categorized into **Basic Settings**, **Advanced Settings**, and **Tag Settings**.

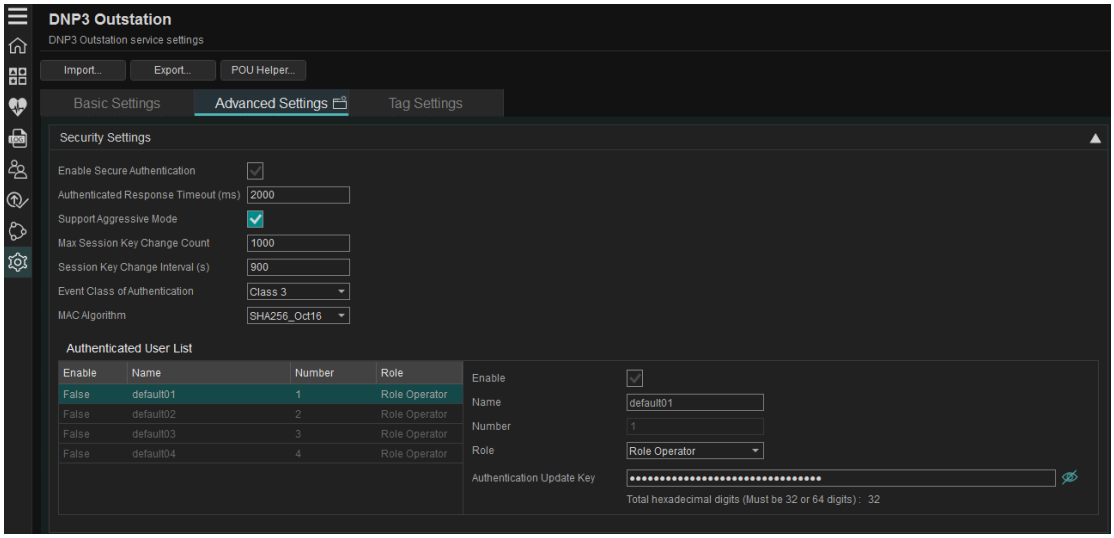
Basic Settings: The basic settings page provides the essential functions, such as port, Network Type, etc., for you to set up. Multi-master can be enabled on this page as well. The ioPAC 6500 Series supports up to 2 clients. When the DNP 3 Outstation service is enabled, the first client is set to enabled.



Advanced settings

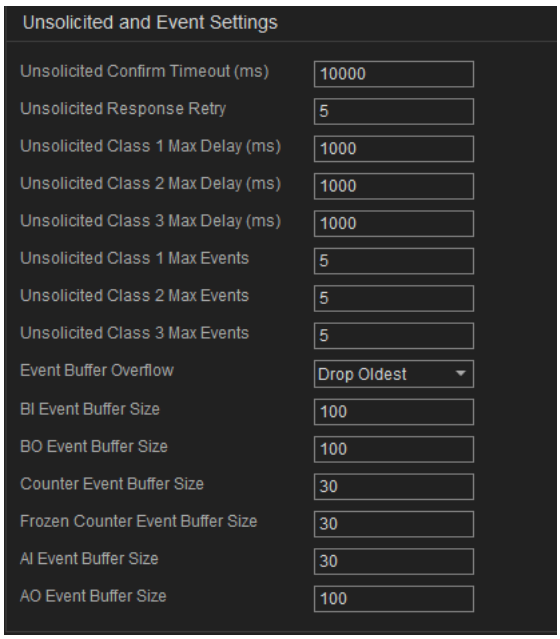
Security settings: These settings configure DNP3 Secure Authentication (SA) to protect communication between master and outstation from spoofing, tampering, or replay attacks.

Authenticated User List: This list defines who may operate or view. Please type the authentication update key before checking the "Enable User" box.



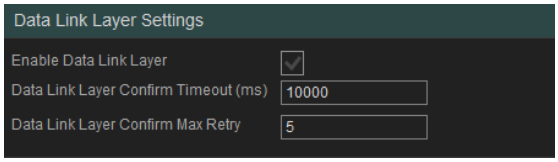
Item	Description
Enable Secure Authentication	Enables DNP3 Secure Authentication. Required to authenticate control commands or data exchanges.
Authenticated Response Timeout (ms)	Time (in milliseconds) the outstation waits for a “challenge” response from the client. If exceeded, the request is rejected.
Support Aggressive Mode	When enabled, the outstation proactively initiates challenge.
Max Session Key Change Count	The number of authenticated operations before a new session key must be generated. Enhances security by limiting key reuse.
Session Key Change Interval (s)	Minimum time interval (in seconds) between session key changes. Prevents overly frequent updates.
Event Class of Authentication	Defines the class of authentication events.
MAC Algorithm	Specifies the Message Authentication Code (MAC) algorithm. 3 options are available: SHA1_Oct10, SHA256_Oct16 and AES_GMAC.

Unsolicited and event settings:



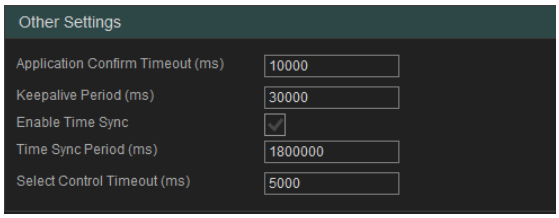
Item	Description
Unsolicited Confirm Timeout (ms)	Timeout for waiting for an application layer confirmation (ACK) from the client after the outstation sends an unsolicited message.
Unsolicited Response Retry	Number of retries if the unsolicited message is not confirmed.
Unsolicited Class (X) Max Delay (ms)	Maximum delay allowed before the outstation sends an unsolicited message if any events are waiting in each class.
Unsolicited Class (X) Max Events	Limits how many events of each class are bundled into a single unsolicited response.
Event Buffer Overflow	What would be dropped if buffer overflows? Two options are available: Drop Oldest or Drop Latest.
BI Event Buffer Size	Number of Binary Input events stored
BO Event Buffer Size	Number of Binary Output events stored
Counter Event Buffer Size	Number of Counter events (e.g., pulse count changes) stored
Frozen Counter Buffer Size	Number of frozen counters (e.g., snapshots) values stored
AI Event Buffer Size	Number of Analog Input changes stored
AO Event Buffer Size	Number of Analog Output feedback or confirmation events stored

Data Link Layer Settings:



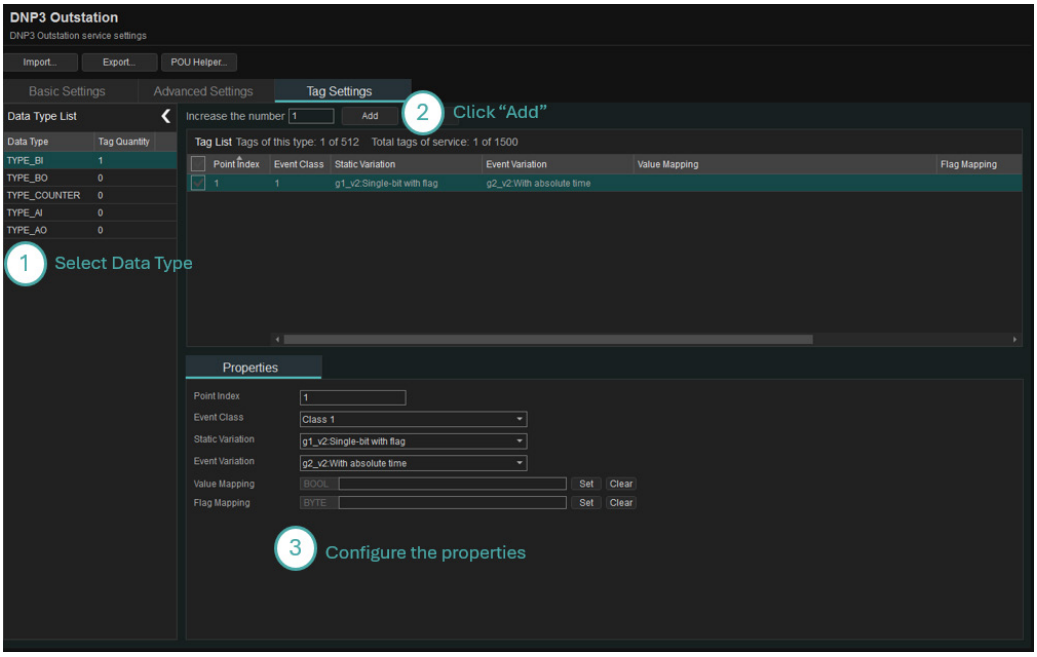
Item	Description
Enable Data Link Layer	Enables data link layer functions
Data Link Layer Confirm Timeout (ms)	Time to wait for data link acknowledgment before retrying
Data Link Layer Confirm Max Retry	Number of times the outstation will retry a message if the link-layer acknowledgment isn't received

Other Settings:

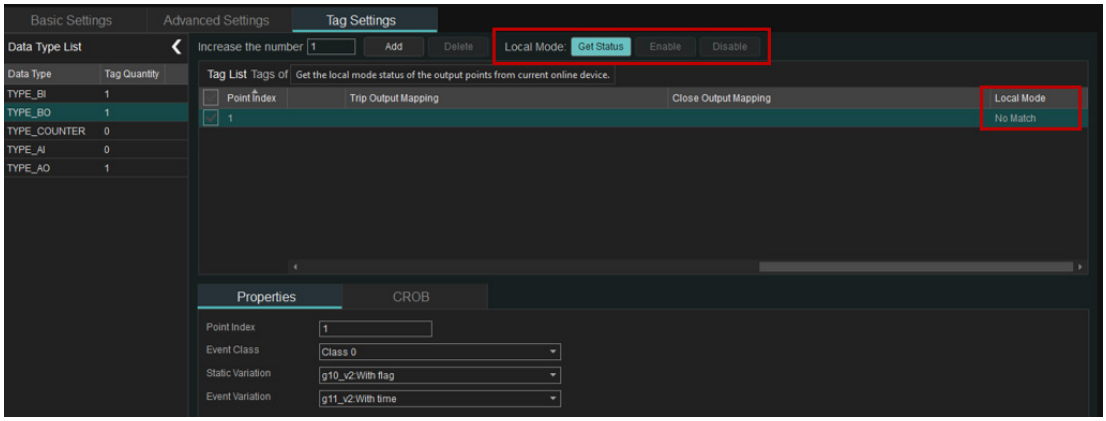


Item	Description
Application Confirm Timeout	The time the outstation waits for an application-layer confirmation (APPL-CONFIRM) after sending a message that requires one.
Keepalive Period	Interval at which the outstation sends an idle test message. If no activity has occurred, to keep the session alive.
Enable Time Sync	Whether the outstation allows the client to synchronize its internal clock.
Time Sync Period	How often does the outstation expect a time sync.
Select Control Timeout	Time allowed between the Select and Operate commands in a Select-Before-Operate (SBO) control.

Tag settings: Follow the steps below to configure Tags

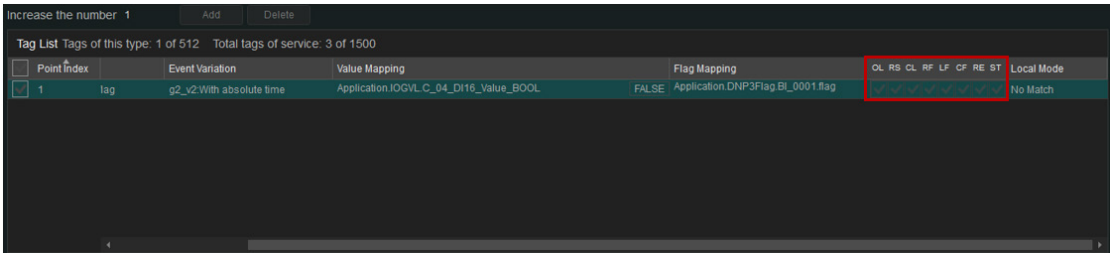


Local Mode: The DNP3 Outstation service in ioPAC 6500 system supports Local Mode. It prevents all output categories, including TYPE_BO and TYPE_AO, from being remotely controlled when the ioPAC 6500 is connected locally, ensuring the safety of field site personnel. To enable/disable the Local Mode, steps are as follows: Download Application (Connect the device) > Select **Get Status > Select Point > Enable/Disable Local Mode.**



Flag: Log in to application to see the flag status.

OL	RS	CL	RF	LF	CF	RE	ST
Online	Restart	Comm Lost	Remote Forced	Local Forced	Chatter Filter	Reserved	State

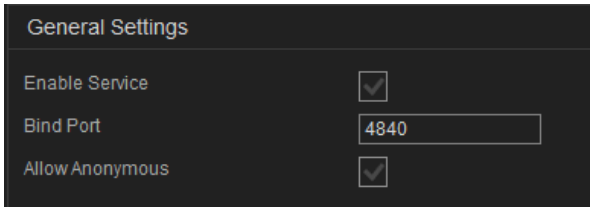


OPC UA Server

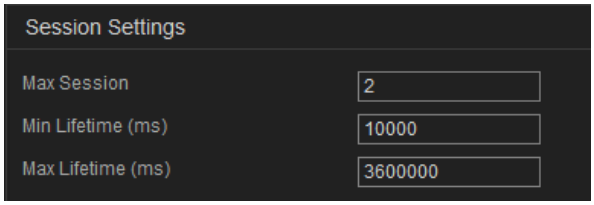
OPC UA Server services can be used to provide data to other systems via the OPC UA protocol. All properties of the OPC UA are categorized into **Basic Settings**, **Tag Settings**, and **Variable Mapping**.

Basic Settings: The Basic Function Settings page provides the essential functions setup, including General Settings, Session Settings, and Subscription Settings.

General Settings:

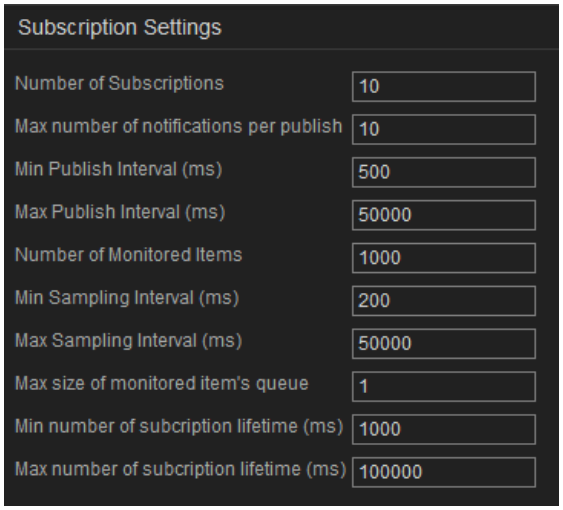


Session Settings:



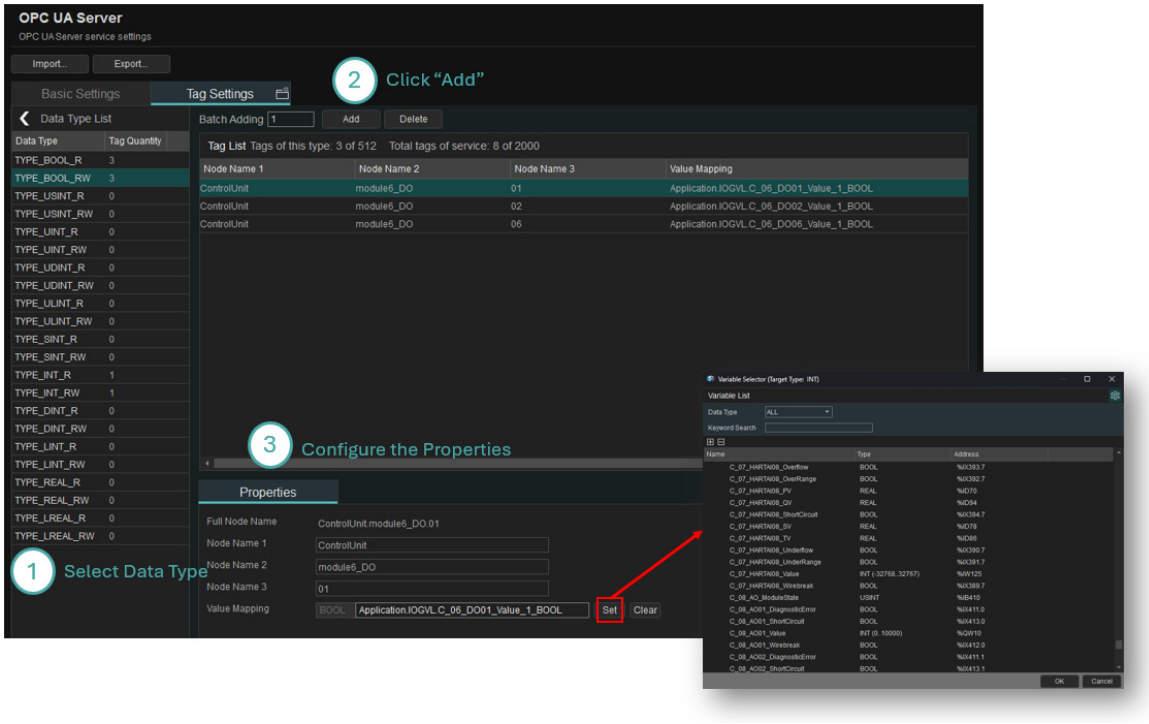
Items	Description
Max Session	Maximum number of concurrent client sessions allowed
Min Lifetime (ms)	Minimum time (in milliseconds) a session is held before being eligible for termination.
Max Lifetime (ms)	Maximum duration a session can stay active without being renewed by the client.

Subscription Settings:



Items	Description
Number of Subscriptions	Maximum number of concurrent OPC UA subscriptions the server will allow.
Max number of notifications per publish	Limits how many data change events are sent in a single publish response.
Min Publish Interval (ms)	Minimum interval for sending published responses.
Max Publish Interval (ms)	Maximum interval for sending published responses.
Number of Monitored Items	Max number of variables (tags) that can be monitored across all subscriptions.
Min Sampling Interval (ms)	Fastest rate at which a monitored item is sampled.
Max Sampling Interval (ms)	The slowest rate at which a monitored item is sampled.
Max size of monitored item’s queue	The number of historical values stored in the queue per monitored item.
Min number of subscription lifetime (ms)	Minimum amount of time a subscription remains valid without interaction.
Max number of subscription lifetime (ms)	Maximum allowable time a subscription can exist before it's deleted.

Tag Settings: The ioPAC 6500 supports multiple data types to suit various applications. Each type allows up to 200 tags, with a total limit of 2,000 tags. Up to three names can be assigned to each tag for identification purposes. Follow the steps below to configure tags.



System Status

In the ioPAC 6500 Configuration page, the system status is in the bottom-left corner. The Diagnostic Status, Application Status, and Connection Status will be displayed here. Log in the system and all status will be displayed here.

Diagnostic Status: Diagnostic Status: Warnings and errors will trigger an alert here, reminding you to check the status. Select the icon and open the Diagnostic page to review the status.

Application Status: Shows the system is in run or stop mode.

Connection Status: Shows which accounts are logged into the system.



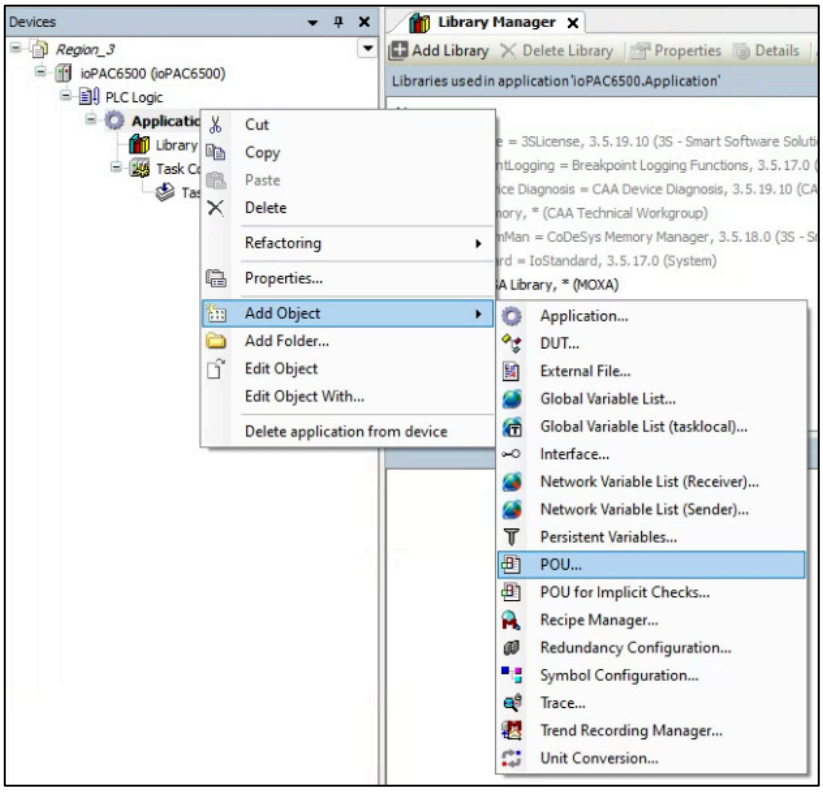
Library Manager

Double-click the Library Manger in the project tree, and the Library Manager page will show in the main window. The libraries supported by IINxpress can be found here. Besides the standard library, Moxa also provides the AGA3, 5, 8 libraries for oil-and-gas applications.

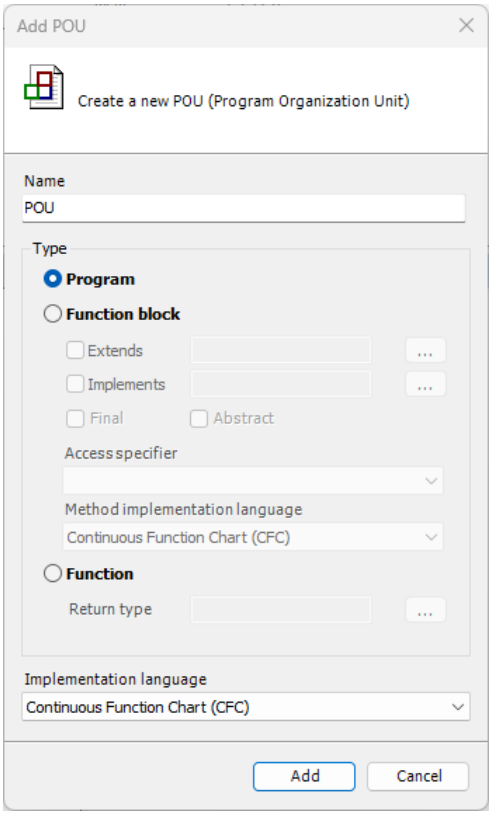


POU

POU stands for Programming Organization Unit, where you can develop your application. Add the POU by the path **Application (right-select) > Add Objects > POU**.



Once opening the POU, you will see the following window. Specify the information you need, then select **Add** to create the POU.



Name: The name to identify the program.

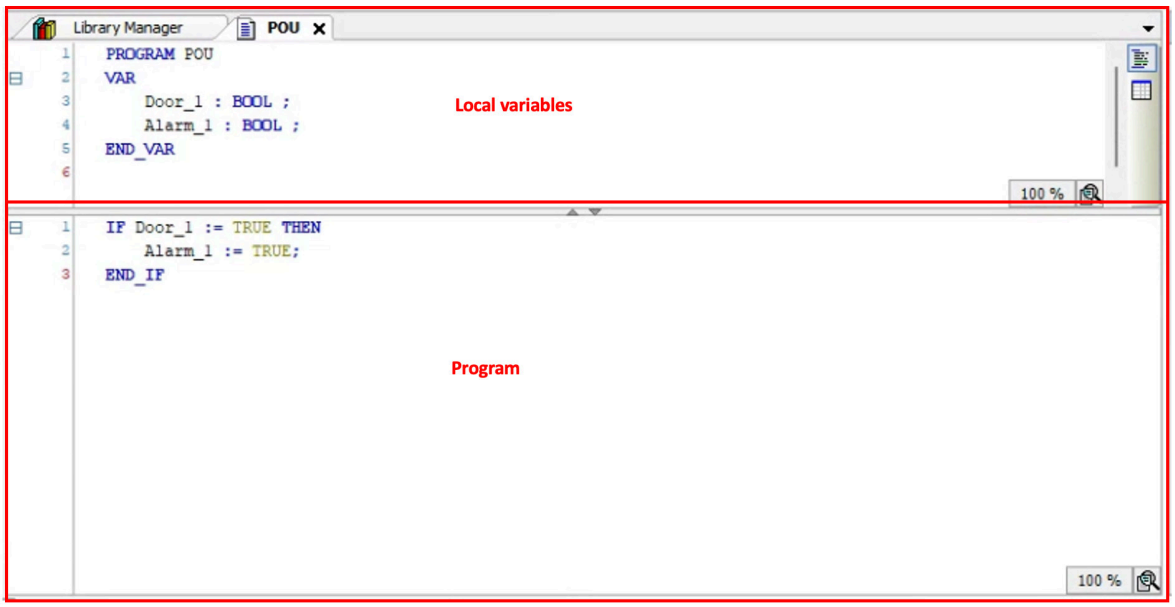
Type: You can choose from three different types.

- **Program:** These POUs contain logical control or function block calls.
- **Function Block:** These are POUs with multiple input and output parameters and can be called into other programs.
- **Function:** These are POUs with multiple input parameters and only one output parameter.

Implemented language: You can choose the familiar IEC 61131-3 language to develop the program. The following languages are supported.

- Continuous Function Chart (CFC)
- Function Block Diagram (FBD)
- Ladder Logic Diagram (LD)
- Sequential Function Chart (SFC)
- Structured Test (ST)

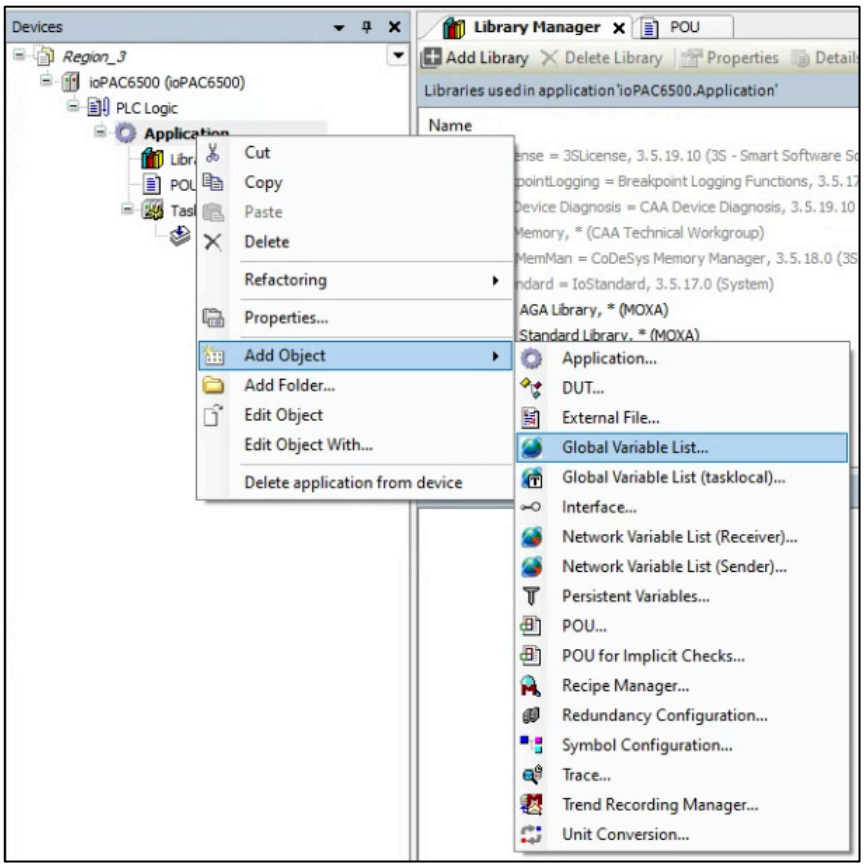
After selecting **Add**, one POU page will be created. You will see the following page.



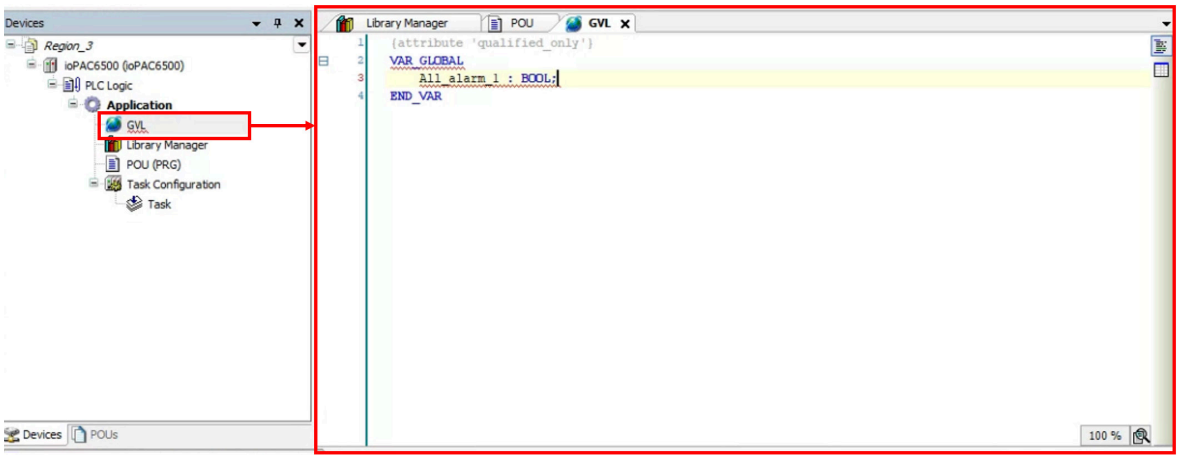
The POU window can be separated into two parts. You can define the local variable on the upper side. The lower side is where you develop your own program.

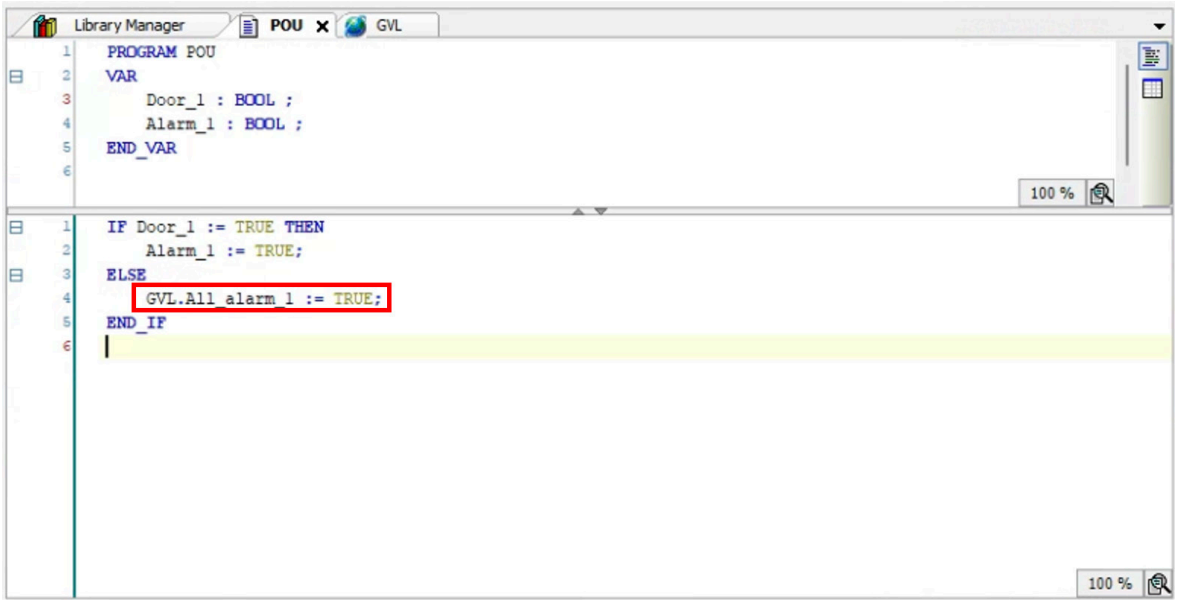
GVL

If you have the global variable demand, you can create the global variables by the path **Application (right-select) > Add Objects > GVL**.



Define the global variable in the window, and these global variables can be used in the program. Add a "GVL." prefix to distinguish the variables are local or global.




Library Manager
POU
GVL
PROGRAM POU
VAR
Door_1 : BOOL ;
Alarm_1 : BOOL ;
END_VAR
100 %
IF Door_1 := TRUE THEN
Alarm_1 := TRUE;
ELSE
GVL.All_alarm_1 := TRUE;
END_IF
100 %

7. Switch Module Configuration

For information about configuring the switch module, consult the ioPAC 6500 (65M) Switch Module User Manual.

8. Firewall Module Configuration

The firewall module Web UI uses MX-ROS V3. For information about configuring the firewall module software, consult the MX-ROS V3 User Manual.

A. Activate and Transfer the IINxpress

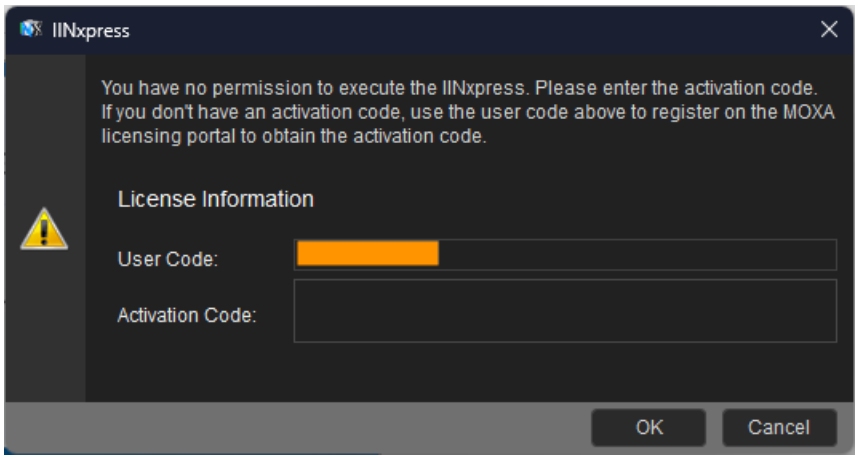
In this appendix, we demonstrate how to activate the IINxpress and transfer the activation code between the IINxpress.

Activate the IINxpress

The activation code is needed to activate the IINxpress. Follow the steps to complete the activation in your computer.

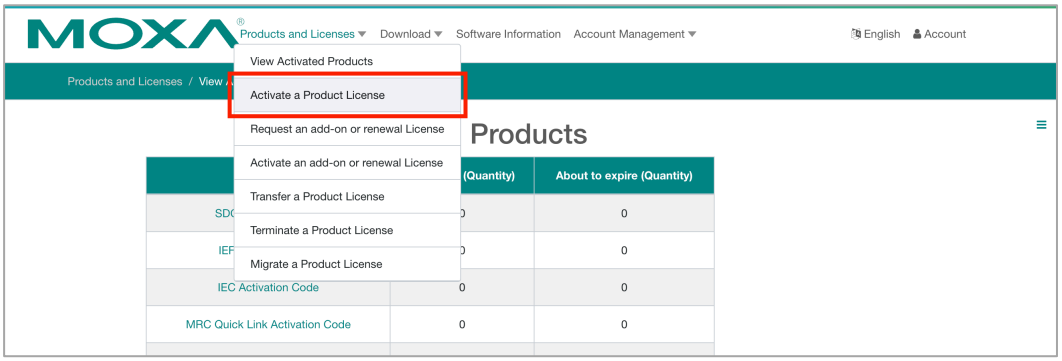
Step 1: Contact Moxa sales representatives or Moxa official distributors to purchase the license of IINxpress. One computer is required for one license. Once the license procurement is complete, the **Registration Code** will be mailed to you.

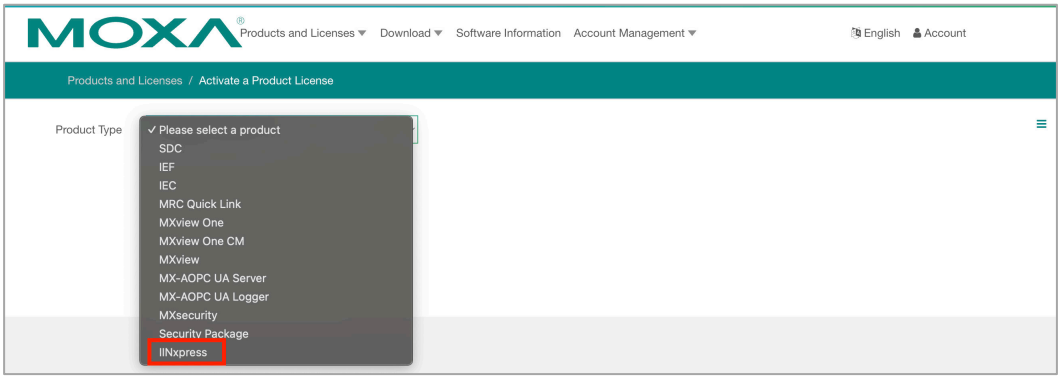
Step 2: Download the IINxpress from the Moxa website (https://www.moxa.com/) and install in the computer. When a first-time user opens IINxpress, the user can find the **User Code** in the pop-up window.



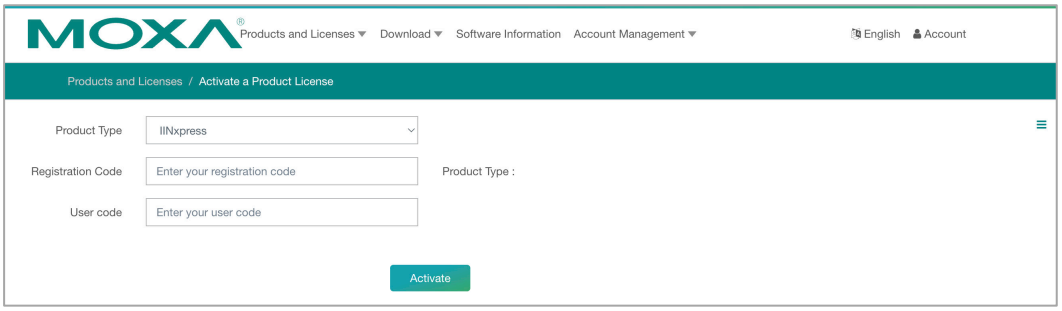
Step 3: Create an account on Moxa Software Licensing System. (https://netsecuritylicense.moxa.com/Account/Login)

Step 4: Go to **Products and Licenses > Activate a Product License** and select the **IINxpress**.





Step 5: Enter the Registration Code and User Code. Select the **Activate**.



Step 6: If activated successfully, you will receive a mail notice with the **Activation Code**.

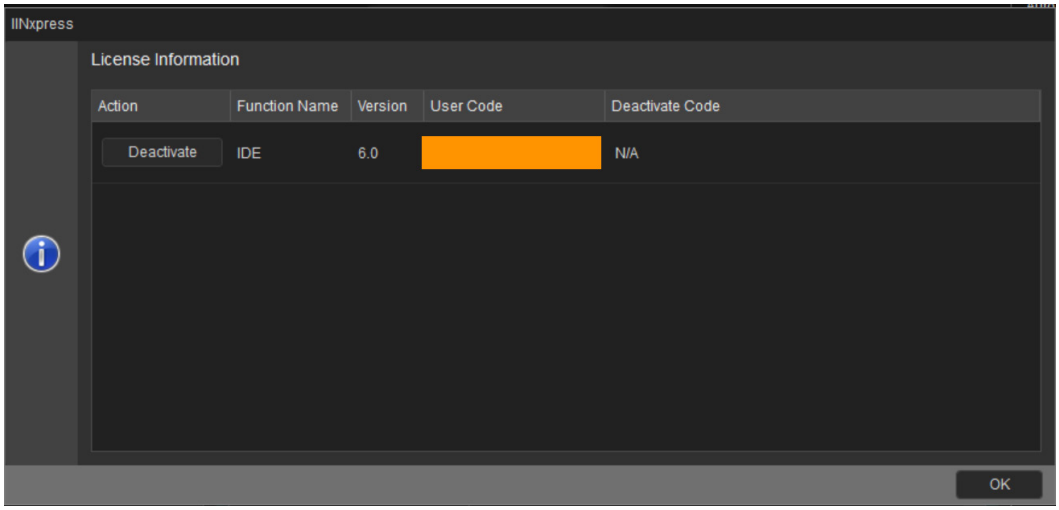
Step 7: Activate the IINxpress with the Activation Code.

Transfer the Activation Code Between IINxpress

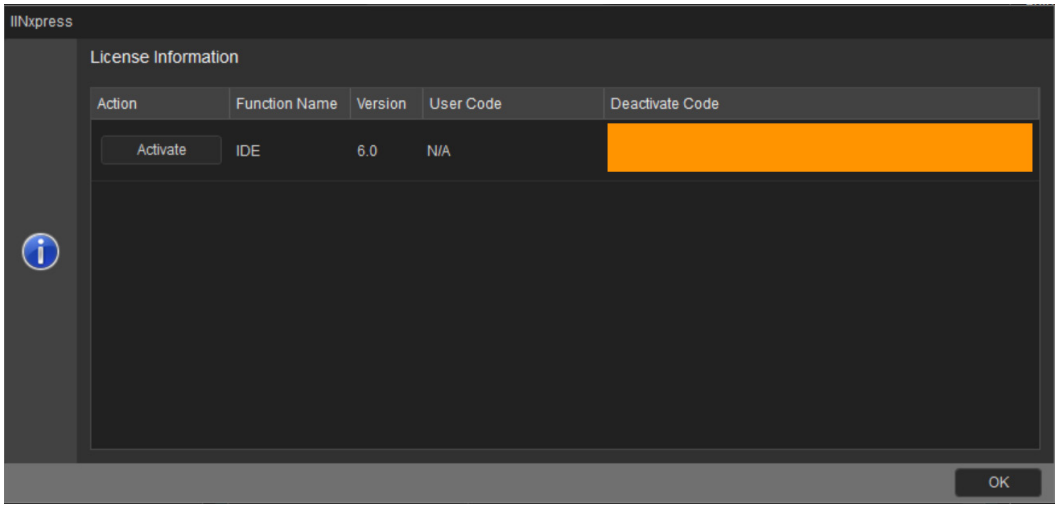
When you want to change the development environment to a new computer, the IINxpress can transfer to a new computer accordingly. Follow the steps to complete the transfer between the IINxpress.

Step 1: Download the IINxpress and complete the installation on the new computer. Get the new **User Code** from the IINxpress on the new computer.

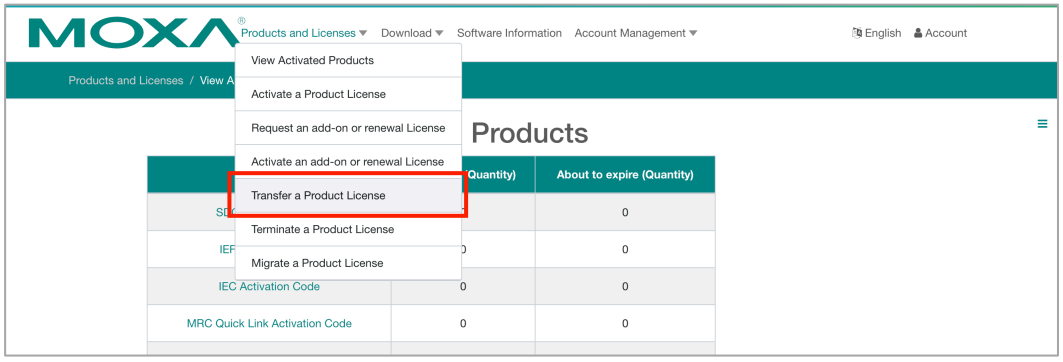
Step 2: Open the IINxpress on the old computer, go to **Help > License Information,** and launch the license management tool.



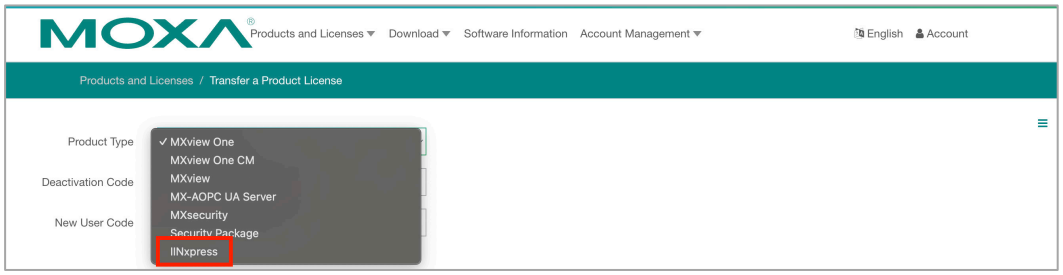
Step 3: Select the **Deactivate** button, the IINxpress will ask you to reconfirm again. Select OK and the IINxpress will provide a **Deactivation Code**.



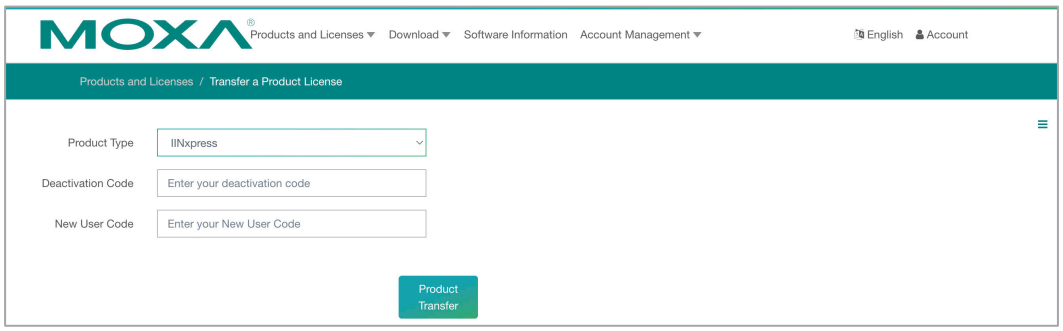
Step 4: Go to Moxa Software Licensing System and find the Transfer page via **Products and Licenses > Transfer a Product License**.



Step 5: Select the IINxpress.



Step 6: Enter the Deactivation Code and New User Code. Then, select the **Product Transfer**.



Step 7: If the transfer is successful, you will receive a mail notice with new **Activation Code**.

Step 8: Activate the IINxpress on a new computer with the new Activation Code.