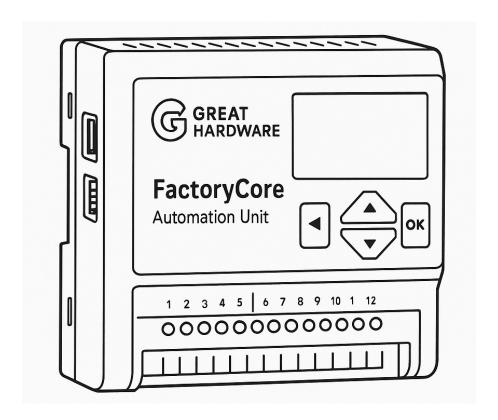


# **FactoryCore™ Automation Unit**

**User Manual** 



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**Model identification number:** GH-123-321A

**Warranty:** 2-year limited warranty

For support with your product contact:

support@greathardware.com

# **Symbols and Icons Explanation**

The following icons are used throughout this manual to highlight important information. Familiarize yourself with their meanings before proceeding with installation or commissioning.

Icon	Explanation
6	Information: Provides general information or context to help you understand a feature, step, or specification. This information is not safety-critical but may enhance your understanding.
A	Warning: Indicates a potential hazard that could result in personal injury, equipment damage, or process interruption if not followed correctly. Follow all instructions carefully when this icon appears.
8	Error: Highlights a condition, action, or result that is incorrect and must be avoided. May also indicate an operational fault or diagnostic code that requires attention.
•	Tip: Offers helpful suggestions, shortcuts, or best practices to improve efficiency, safety, or installation quality.
8	Note: Calls attention to specific details, exceptions, or references that are relevant to the task or procedure being performed.

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#### 1. Welcome

Welcome to the installation and commissioning manual for the **FactoryCore™ Automation Unit** by **Great Hardware**. This guide is intended for system integrators, field engineers, and technicians involved in installing and configuring FactoryCore in an industrial environment.

#### It provides:

- **Detailed installation instructions** for mechanical, electrical, and network connections.
- **Configuration procedures** to ensure optimal integration with your automation systems.
- Safety guidelines to protect personnel, equipment, and the surrounding work area.
- **Commissioning and testing steps** to confirm that the unit operates according to specifications.

This manual is structured to guide you through the process from **pre-installation preparation** to **final system handover**. Following the recommended procedures will help reduce setup time, avoid common issues, and ensure long-term reliability of the FactoryCore unit.



**Safety Notice:** Always read and understand the safety instructions before beginning any installation work. Compliance with local regulations and Great Hardware's recommended procedures is essential for safe and effective operation.

## 2. General Overview

## **Product Summary**

FactoryCore™ is an all-in-one PLC, HMI, and SCADA platform designed for smart industrial automation.

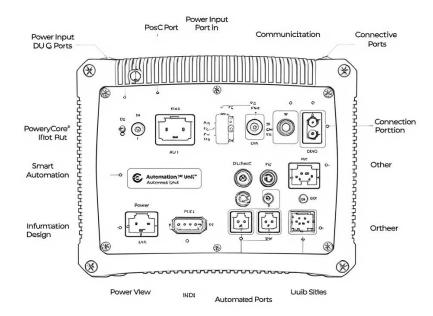
## Intended Use

- Control and monitor factory machinery
- Integrate with Modbus, OPC UA, or MQTT systems
- Designed for use in industrial control cabinets (IP20 rated)

## **Technical Specifications**

Feature	Specification
Power Supply	24V DC (±10%)
CPU	ARM Cortex-A72 Dual Core
I/O Ports	16 Digital, 8 Analog
Interfaces	Ethernet, USB, RS485
Operating Temp	-20°C to 60°C

# FactoryCore™ Automation Unit



FactoryCore™ Automation Unit — Detailed Front and Rear Views with Labeled Ports for PLC, HMI, and SCADA Integration in Smart Industrial Automation

## 3. Safety Information

## **General Safety Instructions**

Before installation or maintenance, **read all safety information carefully**. Failure to follow these instructions can result in serious injury or equipment damage.

- Only qualified personnel trained in electrical and industrial equipment should install or service FactoryCore™.
- Keep the manual accessible near the device for quick reference.
- Always follow local regulations and standards for industrial electrical installations.

## **Warning Callouts**

#### A

#### **WARNING: Electrical Shock Hazard**

Disconnect all power sources before opening the device or performing wiring to avoid electrical shock.

Ensure the device is properly grounded.

#### A

#### **WARNING: Risk of Equipment Damage**

Do not connect power supply voltages exceeding 24V DC  $\pm 10\%$ . Overvoltage can cause permanent damage.

Use recommended fuses and circuit protection devices.

#### Λ

#### **WARNING: Heat Dissipation Required**

Maintain at least 50 mm clearance on all sides of the unit for proper ventilation. Avoid installation near heat sources or in enclosed spaces without airflow.

#### A

#### **WARNING: Static Electricity Sensitivity**

Handle the device with anti-static precautions to prevent ESD damage. Use wrist straps and grounded mats during installation.

#### Personal Protective Equipment (PPE)

- Wear insulated gloves when handling live wiring.
- Use safety glasses to protect eyes during mechanical installation or wire stripping.
- Wear safety shoes in the installation environment.

## **Environmental Safety**

- The FactoryCore<sup>™</sup> is rated IP20; it is **not waterproof**. Do not install in wet or dusty environments.
- Ambient temperature range: -20°C to 60°C; avoid exposure to extreme temperatures.
- Avoid exposure to corrosive gases or chemicals.

#### **Emergency Procedures**

- In case of electrical fire, use a Class C or CO2 fire extinguisher—**do not use water**.
- If a fault causes smoke or unusual smells, disconnect power immediately and contact support.

#### **Additional Best Practices**

- Label all wiring clearly to prevent confusion during maintenance.
- Use cable management systems to prevent strain on connectors.
- Keep the installation area clean and free of obstructions.



Industrial safety symbols in our product

# 4. Tools & Equipment Required

## **Required Tools**

- Screwdrivers (Phillips and flathead)
- Crimping tool
- Multimeter
- Torque wrench (for mounting screws)

## Optional

- Laptop with FactoryCore Config Tool (via USB or Ethernet)
- Industrial PC for HMI deployment

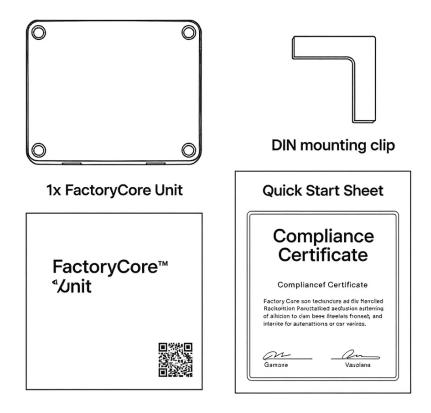
# 5. Unpacking & Inspection

## **Unboxing Checklist**

- 1x FactoryCore Unit
- 1x DIN rail mounting clip
- 1x Quick Start Sheet
- 1x Compliance Certificate

#### **Inspection Steps**

- Check for physical damage
- Confirm serial number matches delivery note
- Inspect connector pins



**Factory Core components** 

## 6. Mechanical Installation

## **Mounting Instructions**

- 1. Attach the DIN rail mounting clip securely to the back of the FactoryCore unit.
- 2. Mount the unit on a standard 35 mm DIN rail inside the control cabinet or panel.
- 3. Maintain a minimum clearance of **50 mm (2 inches)** on all sides of the unit for ventilation and heat dissipation.
- 4. Avoid mounting near high-vibration equipment to prevent mechanical stress on connectors and internal components.



**Tip:** Ensure the clip is fully snapped in place before mounting to prevent the unit from loosening.

#### Panel Layout and Environmental Considerations

- Install the unit in a dry, dust-free environment within the control panel.
- Position FactoryCore away from direct sunlight or heat sources such as transformers or power supplies.
- If multiple units are installed side-by-side, ensure at least 20 mm spacing between units to maintain airflow.
- Use cable ducts or trays to organize wiring and avoid strain on connectors.

## Mounting Weight and Handling

- FactoryCore unit weight: approximately 1.8 kg (4 lbs).
- Use appropriate lifting techniques when handling multiple units or heavy control panels.
- Avoid dropping or striking the device during installation.

## 7. Electrical Installation

## **Power Supply Wiring**

- Connect a 24 V DC ±10% power supply to the power terminals (marked + and -) using copper wire sized according to local electrical codes.
- Recommended wire gauge: **16 AWG (1.5 mm²)** minimum for runs up to 10 meters.
- Use an **external 3 A fast-blow fuse** or circuit breaker on the positive line to protect against overload.



**Warning:** Never connect AC voltage to the DC power terminals; this will cause irreversible damage.

## Grounding

- Connect the chassis ground terminal to a reliable earth ground to reduce electromagnetic interference (EMI) and ensure operator safety.
- Use a low-resistance grounding conductor, preferably copper wire sized per local regulations (typically 14 AWG or larger).
- Avoid using the neutral line as a ground.

#### Digital and Analog I/O Wiring

- Digital inputs/outputs operate at **24 V DC logic level**. Ensure sensors and actuators are compatible with this voltage.
- Analog inputs accept 0–10 V or 4–20 mA signals (configurable via the FactoryCore Config Tool).
- Shielded twisted-pair cable is recommended for analog signals to reduce noise.



Tip: Label all input/output wiring clearly at both ends for easy troubleshooting.

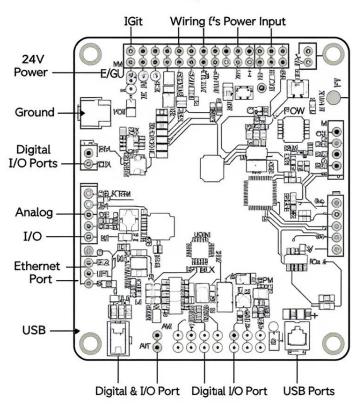
#### **Communication Ports**

- Ethernet port supports 10/100 Mbps connections; use shielded CAT5e or better cable.
- USB ports for device configuration or firmware updates should use standard USB 2.0 cables.
- RS485 port uses a 2-wire differential bus; maintain proper termination resistors at bus ends.

## Cable Management and Strain Relief

- Use cable ties or cable ducts to bundle wires neatly and prevent strain on connectors.
- Leave service loops near connectors to facilitate maintenance and replacement.
- Avoid running signal cables parallel and close to high-power lines to minimize interference.

# **FactoryCore**



Electrical wiring diagram

## 8. Initial Configuration

## Steps for Initial Configuration

#### 1. Power On the Unit

• Connect power and verify the status LEDs light up as specified in the User Guide.

#### 2. Connect to the Configuration Interface

- Use a USB cable or Ethernet connection to link your PC with the FactoryCore.
- Launch the FactoryCore Config Tool software (available on the official website or USB provided).

#### 3. Firmware Verification

- Check the firmware version in the Config Tool's info panel.
- If outdated, follow the update procedure (see Appendix A).

#### 4. Set Network Parameters

- Assign a static IP or enable DHCP according to your network policy.
- Configure subnet mask, gateway, and DNS if needed.

#### 5. Configure I/O Settings

- Define digital inputs and outputs according to connected sensors and actuators.
- Configure analog input types (0-10 V or 4-20 mA) per sensor specs.

#### 6. Set Communication Protocols

 Enable protocols required for your system, such as Modbus TCP, PROFINET, or custom APIs.

#### 7. Save and Apply Configuration

- Validate all settings and save configuration to the device.
- Restart the device if prompted.

Note: Always back up the configuration file externally after saving.

# 9. Commissioning Procedures

## Step-by-Step Commissioning

#### 1. Pre-Commissioning Checks

- Verify installation quality (mechanical and electrical).
- Ensure initial configuration is complete.

#### 2. Power-Up Test

- Confirm all LEDs indicate normal operation.
- Check for error codes on the Config Tool.

#### 3. Functional Tests

- Activate inputs and verify corresponding outputs.
- Test communication with connected PLC or SCADA system.

#### 4. Load Test

• Simulate operational loads to confirm stable performance.

#### 5. Safety Systems Verification

• Test emergency stop signals and safety interlocks.

#### 6. Final Configuration Validation

• Verify all settings and operational parameters are correct.

# Commissioning Checklist (To Be Filled by Technician)

Item	Status (Pass/Fail)	Comments	Technician Initials	Date
Mechanical Installation Check				
Electrical Wiring Verification				
Power-On Status LEDs				
Firmware Version Verified				
Network Settings Configured				
I/O Configuration Verified				
Communication Protocols Tested				
Functional Input/Output Test				
Load Test Performed				
Safety System Checks				
Final Validation Completed				



**Tip:** Keep the completed checklist as part of the installation documentation for audit and support purposes.

# 10. Troubleshooting

## **Common Issues and Solutions**

Issue	Possible Cause	Suggested Action
Device does not power on	Power supply disconnected or faulty	Check power wiring and fuse; verify voltage
Status LEDs do not light up	Faulty device or no power	Verify power; reset device; contact support
Network communication failure	Incorrect IP or cabling issue	Check network settings and cables
Inputs not responding	Wiring issue or configuration error	Verify wiring; check input config in software
Outputs do not activate	Load issue or configuration problem	Check output wiring; verify output config
Firmware update fails	Interrupted update or incompatible version	Retry update; ensure correct firmware file
Device overheating	Insufficient ventilation	Check clearance and cooling

## **Diagnostic Tools**

- FactoryCore Config Tool: Provides live status, error logs, and configuration validation.
- LED Indicators: Refer to the LED status table in the User Guide for error diagnostics.
- Multimeter: For verifying voltage and continuity on power and signal lines.

## When to Contact Support

- Persistent hardware faults after restart.
- Firmware update issues not resolved by retrying.
- Complex network integration problems.
- Safety system malfunctions.

8

**Note:** When contacting support, provide device serial number, firmware version, and a description of the issue with troubleshooting steps already taken.

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Warranty term	2-year limited warranty
Product name	FactoryCore™ Automation Unit
Documentation link	https://docs.greathardware.com/factorycore
Company name	Great Hardware
Identification number	GH-123-321A
Support contact	support@greathardware.com