MP32A

RTU32M CPU Module

Data Sheet

Doc: 40419 v1.18

BRODERSEN

simplifying systems

INTRODUCTION

The RTU32M series is based on two different embedded 32 bit/64-bit industrial platforms, providing flexible RTU functionality for a wide range of remote monitoring
and
control applications in the utility and infrastructure markets.

Each RTU32M consists of a CPU module (MP32A), a power supply module, and the desired mix of I/O, communication, and system modules, as required.

The RTU32M supports a variety of standard and open protocols such as Modbus, IEC60870, IEC61850, OPC UA, MQTT, SNMP and DNP3. It also includes the fast event-based Binding protocol - a fast and reliable way to distribute time-stamped event data between any Brodersen RTU32M in the network.

The RTU32M CPU module (MP32A) has a web server configuration interface for setup of the RTU 'personality' "e.g., IP address, IO range, slave address etc."
Additional RTU functionality, including logic, messaging, and logging are configured in the Brodersen Worksuite.

The RTU32M CPU module (MP32A) supports up to 60 I/O modules.

The Brodersen RTU32M CPU module (MP32A) series includes the highly efficient Revision R and Revision S hardware variants, engineered specifically for high-reliability automation. Built upon an advanced, energy-efficient Dual-Core Cortex-M4/M7 Real-Time Architecture, these modules provide dedicated real-time processing capabilities along with robust hardware features, including dual 10/100 LAN ports, an industrial USB M8 management interface, and a wide-range 10–30VDC direct power input.
While both revisions share identical core processing power and physical interfaces, they are explicitly tailored for distinct operational roles within a control network:

- Revision R functions as a Remote I/O Rack Controller, enabling network-extended field I/O expansion for scalable control systems.
- Revision S operates as a lightweight, standalone RTU capable of independent edge control, communication, and processing.

POWER SUPPLY MODULE BACKPLANE PART

Description	Part Nr.
BUS module for CPU, Start	BB61A
BUS module for CPU, Middle	BB61B
BUS mod. for standby CPU (redund. setup)	BB61R

VERSIONS / ORDERING CODES

Hardware basic version

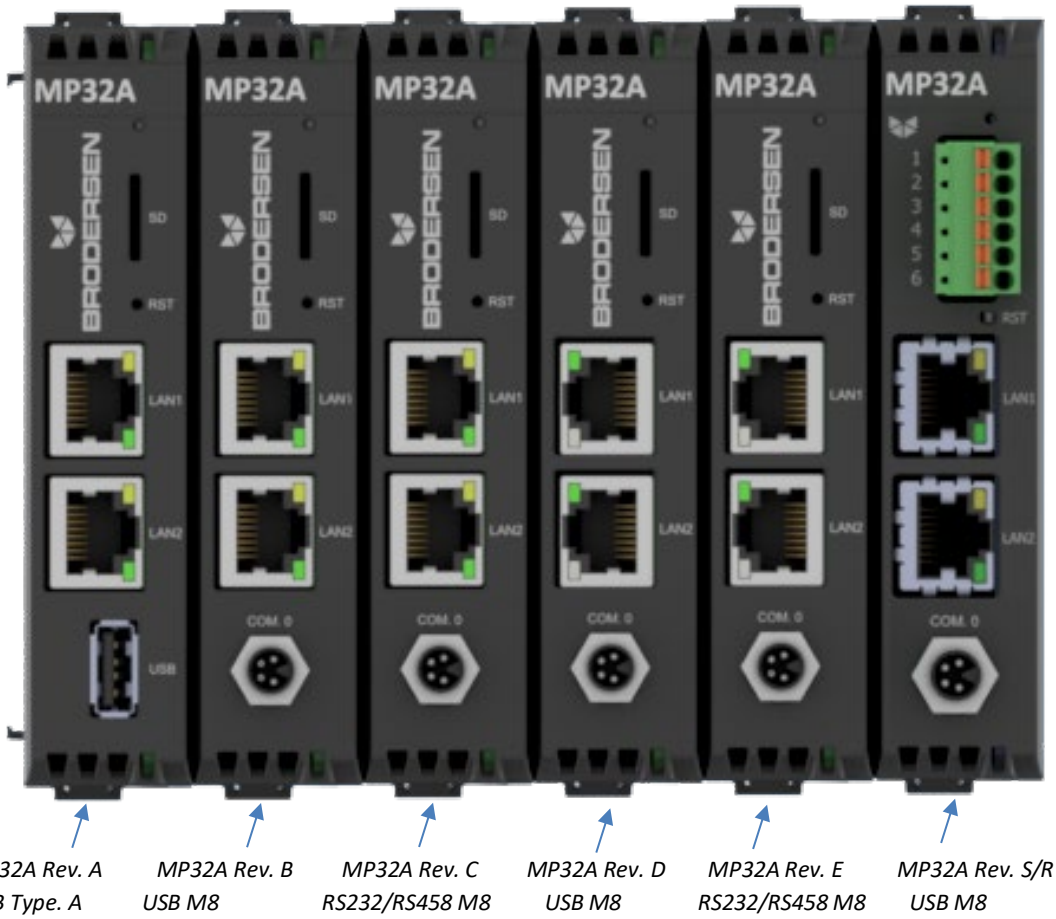
Order codes:

MP32A Rev. A: 200-900MHz, 2 x 10/100 LAN, 1 x USB
MP32A Rev. B: 200-900MHz, 2 x 10/100 LAN, 1 x USB (M8)
MP32A Rev. C: 200-900MHz, 2 x 10/100 LAN, 1 x serial (M8)

MP32A Rev. D: 900-1800MHz, 2 x 1000 LAN, 1 x USB (M8)
MP32A Rev. E: 900-1800MHz, 2 x 1000 LAN, 1 x serial (M8)

MP32A Rev. R: Dual-Core, 2 x 10/100 LAN, 1 x USB (M8), Pluggable Power (Remote I/O)
MP32A Rev. S: Dual-Core, 2 x 10/100 LAN, 1 x USB (M8), Pluggable Power (Standalone RTU)

MODULE FRONT VIEW



MP32A Rev. A USB Type. A | *MP32A Rev. B USB M8* | *MP32A Rev. C RS232/RS458 M8* | *MP32A Rev. D USB M8* | *MP32A Rev. E RS232/RS458 M8* | *MP32A Rev. S/R USB M8*

Figure 1 MP32A Rev. A, B, C, D, E, & R/S front view

FEATURE LIST

- Modular RTU, with or without integrated I/O and communication devices.
- Real-Time Operating System.
- Communication protocols include (>20 available).

Supported Protocols

- Full Modbus suite
- IEC60870-5-101 – Master & Slave
- IEC60870-5-103 – Master
- IEC60870-5-104 – Client & Server

- IEC61850 – Client & Server
- DNP3 – Master & Client
- DNP3 – Slave & Server
- OPC UA – Client & Server
- MQTT – Client
- PROFINET – Client
- Ethernet/IP – Client
- Siemens S7 – Client
- SNMP – Client (Manager)
- CANopen – Master
- WITS DNP3 – Client
- DF1 – Master
- Binding Protocol - Global Distribution and Subscription of Event-Based Time-Stamped Variables.

MP32A Rev. S Supported Protocols

- Full Modbus suite
- DNP3 Slave & Client

- Communication Protocols can also be created as part of the logic application interface.
- Communication interfaces:
  - **MP32A Rev. A/B/C :** 2 x Ethernet 10/100, 1 x USB/Serial.
  - **MP32A Rev. D/E:** 2 x Ethernet 10/100/1000, 1 x USB/Serial.
  - **MP32A Rev. R/S:** 2 x Ethernet 10/100, 1 x USB M8, 1 x 6-Way Power Supply Terminal.
- Full EN/IEC61131 PLC runtime – also used for special and flexible data manipulation.
- Includes power supply monitoring of the RTU32M supply voltage and temperature.
- Support for redundant power supplies and CPUs.
- Hot swappable I/O.
- Full remote management with configuration, programming and flexible distribution of all levels of software from and to RTUs on remote locations.

CPU SPEED

The CPU module speed is managed via the RTU performance license options:

MP32A Rev. A, B, & C

DL-200MH-RL	200MHz
DL-500MHZ-RL	528MHz
DL-900MHZ-RL	900MHz

MP32A Rev. D, E

DL- Q - 900MHZ-RL	900MHz
DL- Q - 1800MHZ-RL	1800MHz

MP32A Rev. R, S

Dual Core Arm® Cortex®-M4 and Cortex®-M7, 480 MHz

RAM SIZE

MP32A Rev. A, B, & C

DL-128MB-RL	128MB
DL-256MB-RL	256MB

MP32A Rev. D, E

DL - Q - 1GB-RL	1GB
DL - Q - 4GB-RL	4GB
DL - Q - 8GB-RL	8GB

RUNTIME

Runtime performance for MP32A Rev. A, B, C, D & E:

Typical cycle time:	1msec
Scan time LB2 I/O:	0.5msec

I/O Detection and Configuration:

Self-discovering I/O

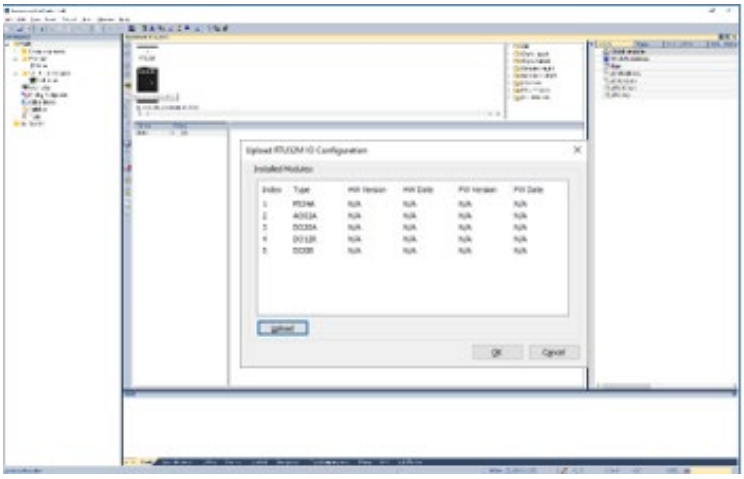


Figure 2 Self Discovering I/O

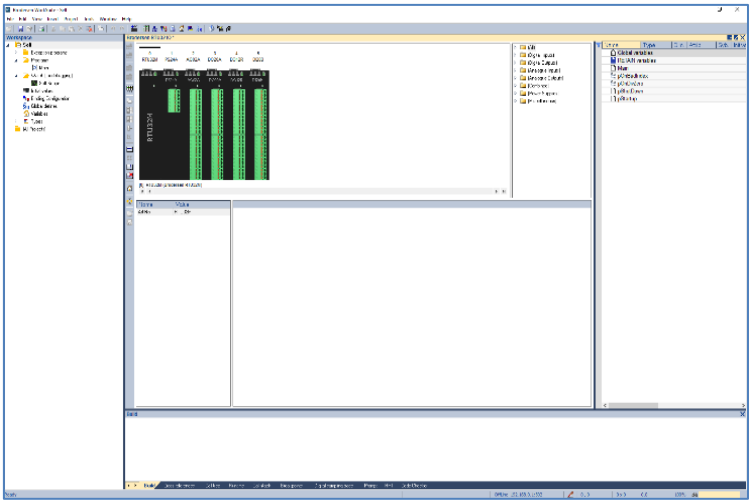


Figure 3 Discovered I/O

CPU HARDWARE

MP32A Rev. A, B, & C

CPU: ARM Cortex – A7, 32-bit
Freescale i.MX6, 200-900 MHz

Memory: RAM: 128-256MB SDRAM
NAND Flash: 128MB
NVRAM/FRAM: 128KB
Micro SD Card Flash disc – removable

RTC: Integrated and super capacitor backed
Realtime Clock with 1 msec resolution 10
Ppm

Interfaces: LAN: 2 x 10/100Mbps RJ45
MP32A Rev. A: 1 x USB 2.0 Host.
MP32A Rev. B: 1 x USB comm. with M8 connector
MP32A Rev. C: 1 x serial port (RS232/RS485) with M8

MP32A Rev. D, E

CPU: ARM Quad Cortex – A53, 64-bit
NXP i.MX8 Plus, 900-1800 MHz

Memory: RAM: 1-8GBRAM LPDDR4
eMMC Flash:8-64GB
NVRAM/FRAM: 128KB
Micro SD Card Flash disc – removable

Interfaces: LAN: 2 x 10/100/1000Mbps RJ45
MP32A Rev. D : 1 x USB comm. with M8 connector
MP32A Rev. E : 1 x serial port (RS232/RS485) with M8

MP32A Rev. R, S

CPU: Dual Core Arm® Cortex®-M4 and Cortex®-M7, 480 MHz

Memory/Bus Capacity: Integrated LB2 backplane interface to directly manage up to 60 local I/O expansion modules.

Interfaces: LAN: 2 x 10/100 Mbps RJ45 Ethernet ports (Integrated switch supports redundant/daisy-chain network topologies)

MP32A Rev. R/S :

- 1 x USB comm with M8 connector.
- Power: 1 x 6-way 3.5mm pluggable spring clamp connector.

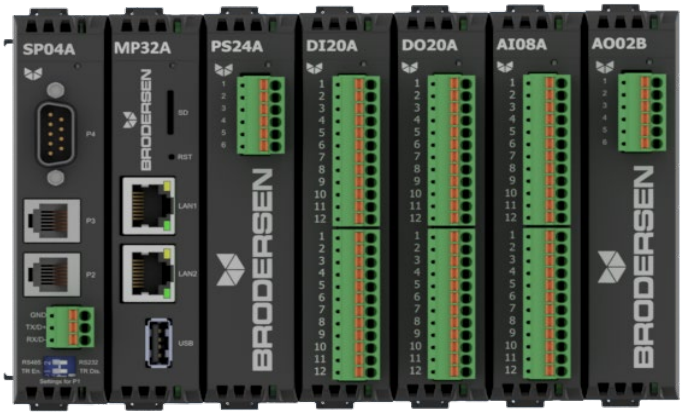


Figure 4 MP32A Rev. A hardware interface with I/O

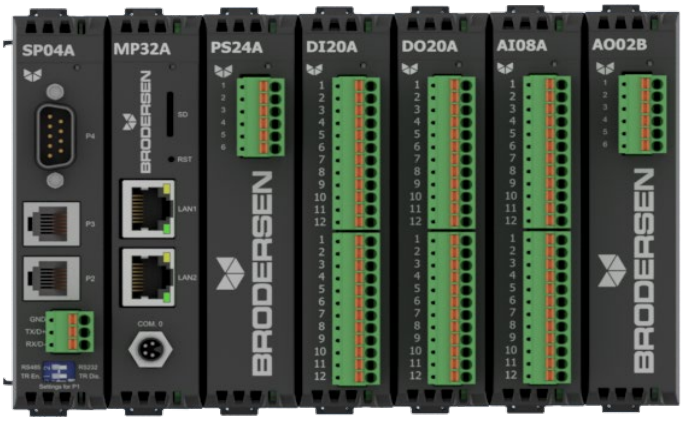


Figure 5 MP32A (Rev. B & Rev. C) hardware interface with I/O

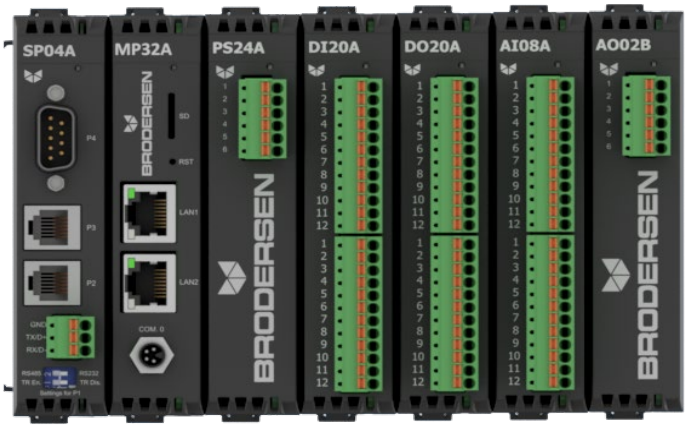


Figure 6 MP32A (Rev. D &Rev E) hardware interface with I/O

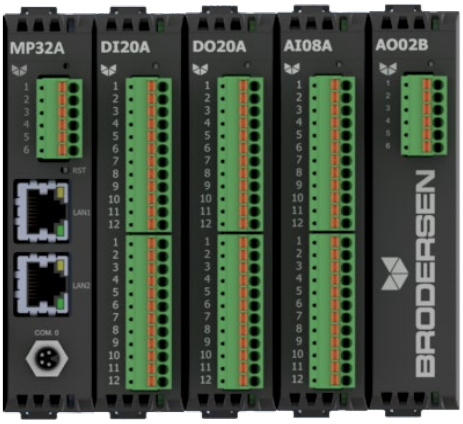


Figure 7: MP32A Rev. S hardware interface with I/O

ELECTRICAL

Power consumption (from backplane bus MP32A Rev. A, B, C, D, E):

- Current consumption: 200mA (typ.) @ 12V
- Power consumption: 2.4W (typ.)

Power supply & telemetry characteristics (MP32A Rev. R & S direct module power):

- **Module Input Power Voltage:**
  - 10...30 VDC (V_{in}).
- **Input Power Consumption:**
  - 24W ±5% (fully configured, including full LB2 bus load).
- **Module Internal Power Output (LB2 Bus Supply):**
  - Output Voltage:
    - 12 VDC ±10% designated for I/O modules and core electronics.
  - Output Current:
    - Maximum 1.2A continuous for I/O modules.
    - maximum 1.6A overload current limit and short-circuit protection.
- **Module self Consumption:**
  - Current consumption of 155mA (typical) @ 12VDC
  - Power consumption of 1.9W (typical).

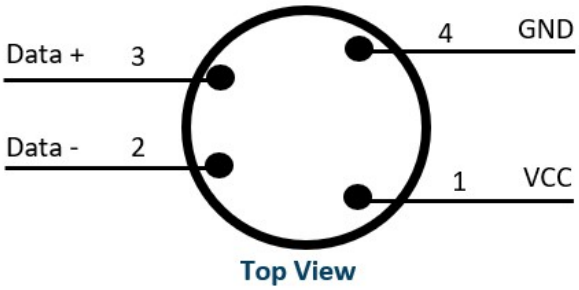
- Module input voltage, input current, output voltage, and output current are continuously monitored by the CPU and reported to the system.
- Note: In the event of an overload or short circuit, the module turns off and retries automatically after approx. 10 seconds.

Separated/Safe Extra Low Voltage (SELV) limits:

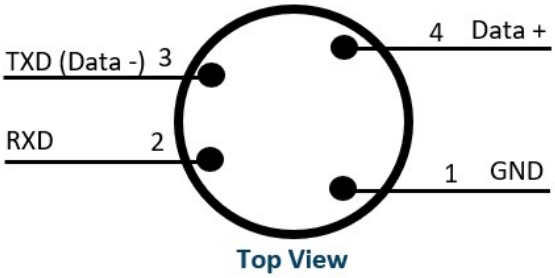
VAC (RMS)	30V
VAC (Peak)	42.4V
VDC	60V

Note: The SELV limits relies on input supply and all connected voltages.

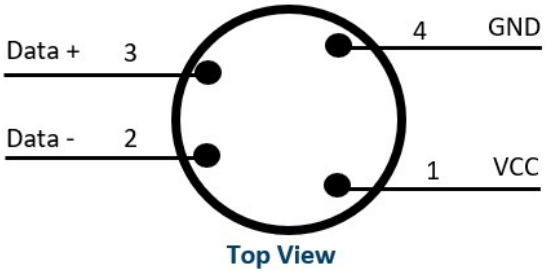
MP32A REV. B USB PORT PIN OUT:



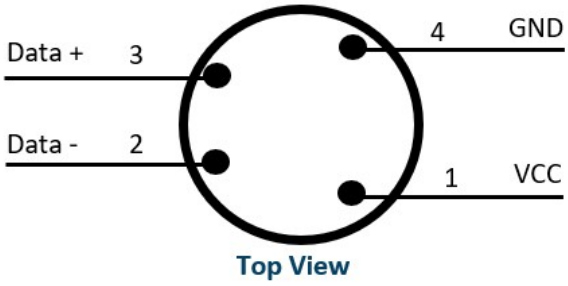
MP32A REV. C & E SERIAL PORT PIN OUT:



MP32A REV. D USB PORT PIN OUT:



MP32A REV. R/S USB PORT PIN OUT:



COMMUNICATION PORTS

The MP32A Rev. C & E serial communication provides the following communication ports:

COM1: Isolated RS232/RS485, configurable through web page, with M8 connector (4 Pins).

Pin No.	RS232	RS485
Pin 1	GND	GND
Pin 2	RXD	NA
Pin 3	TXD	Data -
Pin 4	NA	Data +

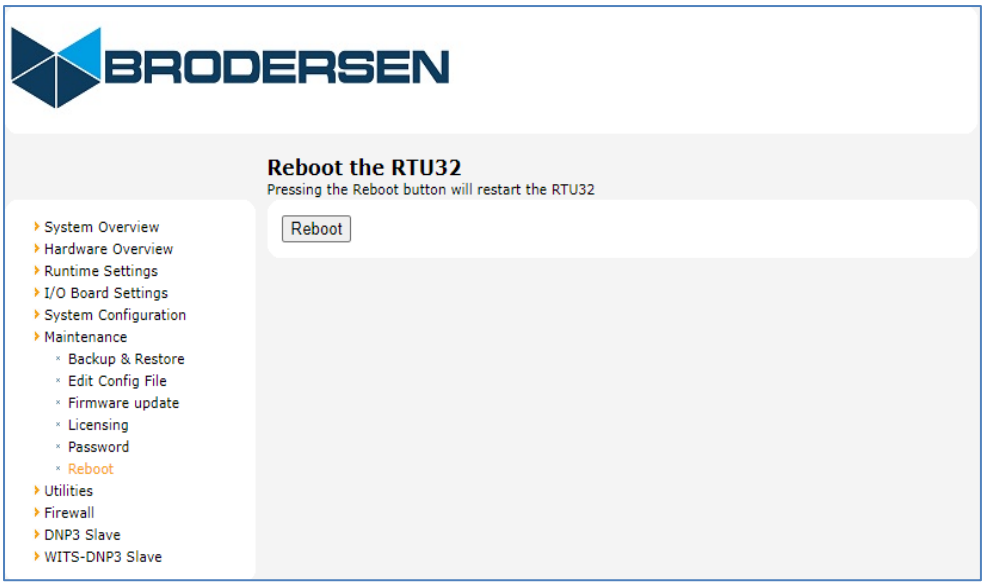


Figure 8 By default, serial port web configuration

Note: RTU must be rebooted from web page once the communication port is configured.

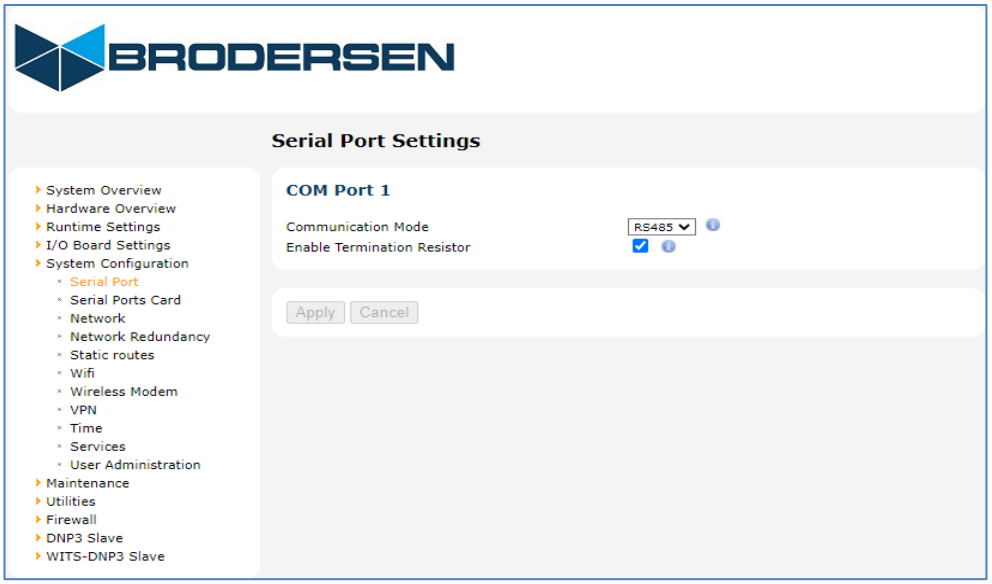
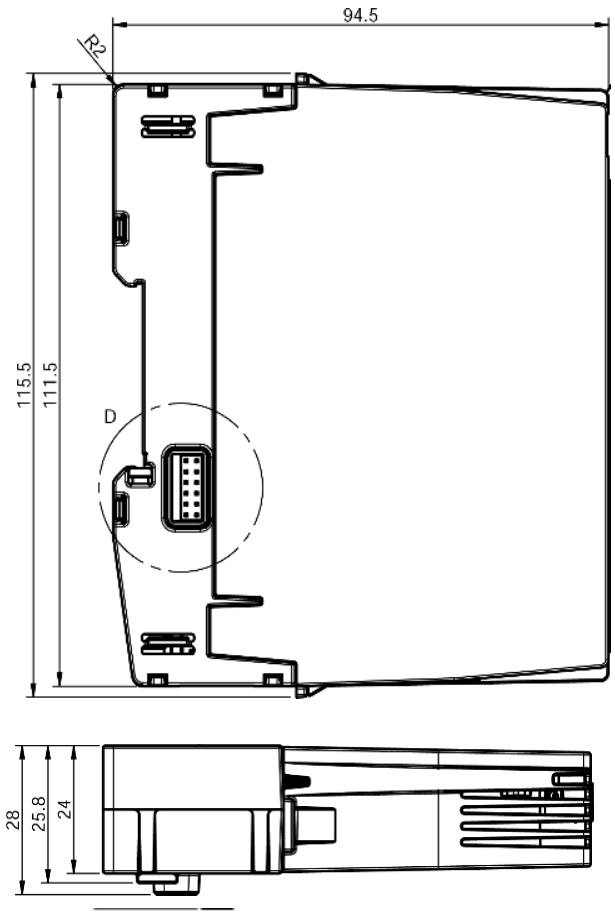
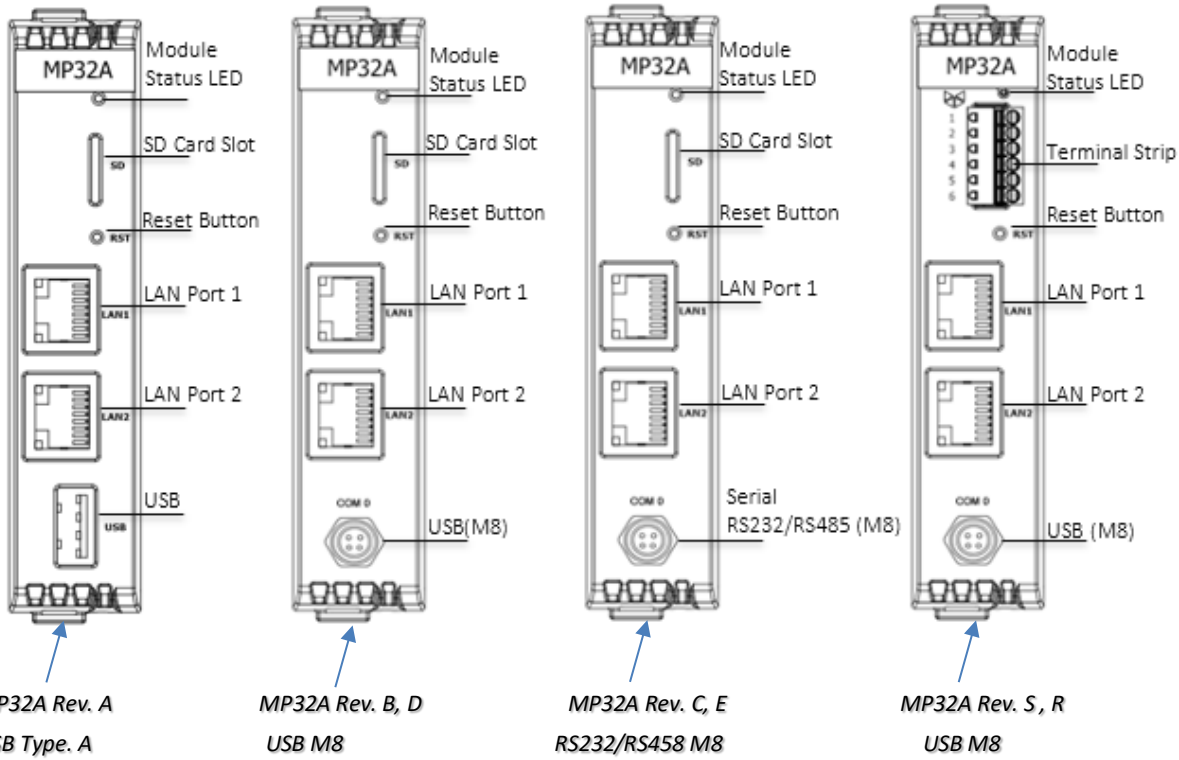


Figure 9 Rebooting RTU via webpage

MECHANICAL


94.5
R2
115.5
111.5
D
28
25.8
24


MP32A
Module Status LED
SD Card Slot
Reset Button
LAN Port 1
LAN Port 2
USB
MP32A Rev. A
USB Type. A
MP32A
Module Status LED
SD Card Slot
Reset Button
LAN Port 1
LAN Port 2
USB(M8)
MP32A Rev. B, D
USB M8
MP32A
Module Status LED
SD Card Slot
Reset Button
LAN Port 1
LAN Port 2
Serial RS232/RS485 (M8)
MP32A Rev. C, E
RS232/RS458 M8
MP32A
Module Status LED
Terminal Strip
Reset Button
LAN Port 1
LAN Port 2
USB (M8)
MP32A Rev. S , R
USB M8

Mounting	DIN 35
Width	24 mm
Height	111.5 mm
Depth	94.5 mm
Weight	102 grams

ENVIRONMENTAL CONDITIONS

Ambient operating temperature range	-25°C to +75°C
Ambient storage temperature range	-40°C to +85°C
Marked degree of protection	IP20
Humidity	0...99.8%
Ventilation Restrictions	No
Pollution Degree	2

STANDARDS

EMC:

- **IEC 61000-6-2**: EMC - Immunity standard for industrial environments
- **IEC 61000-6-4**: EMC - Emission standard for industrial environments
- **IEC 50121-4**: Railway applications - EMC - Emission and immunity of the signalling and telecommunications apparatus

Safety:

- **IEC 60950-1**: Safety requirements for Information technology equipment
- **IEC 61010-1**: Safety requirements for electrical equipment for measurement, control, and laboratory use

Environmental:

- **IEC 60068-2-1**: Environmental testing - Cold
- **IEC 60068-2-2**: Environmental testing - Dry heat
- **IEC 60068-2-30**: Environmental testing - Damp heat, cyclic (12 h + 12 h cycle)
- **IEC 60068-2-78**: Environmental testing - Damp heat, steady state
- **IEC 60068-2-6**: Environmental testing - Vibration (sinusoidal)
- **IEC 60068-2-27**: Environmental testing - Shock

MODULE LED STATUS

MP32A Rev. A, B, C, D, E (Dual-Color Red/Yellow LED System)

A dual color (red/yellow) LED is provided on the module to indicate the module status. Yellow indicates the module mode / state and red indicates module error or warnings (according to the table below):

Status	Yellow	Red
Power up	OFF	ON
Logic application Start	ON	OFF
Logic application Stop	OFF	OFF
Reboot: after pressing Reset Button while powered up	ON 400ms	OFF
	OFF 400ms	
Reset Button (Rebooted)/ Power up	OFF	ON
Factory default: after pressing Reset Button during power up (restores factory default settings)	3 times ON for 500ms	OFF
	3 times OFF for 500ms	
Passive Redundancy Partner (standby)	ON 500ms OFF 500ms	OFF

MP32A Rev. R & S (Tri-Color Red/Green/Blue LED System)

A tri-color (Red/Green/Blue) LED is provided on the module to indicate the module status. Green and Blue LED patterns indicate the current operational mode or system state, while a Red LED indicates critical errors or hardware warnings (according to the table below):

Status	LED Color	Pattern
Normal operating	Green	ON
Remote I/O Master (RTU32M) Not Connected	Green	Single Flash
I/O Configuration Mismatch	Green	Double Flash
IP address unconfigured	Blue	Double Flash
Bootloader Mode	Blue	ON
Firmware update in Progress	Blue	Blinking
No Valid Firmware Image	Red	Blinking
Irrecoverable Error (Will reboot shortly)	Red	ON
Identify Device	Red/Green/Blue	RGB Cycling (100ms)

Each status pattern operates as a continuous state. The LED displays the specific Green or Blue color and flash pattern (Single, Double, or Blinking) associated with the current module mode. If a critical error occurs, the LED will transition to a Red state . When the Identify Device command is active, the LED overrides all other status indications with a rapid RGB (RED/Green/Blue) Cycling pattern.

SAFETY PRECAUTIONS

- Follow the national safety regulation (IEC 61010-1)⚠
- Only skilled personnel are to install and operate the modules.
- Modules can only be mounted in an end-use enclosure which provides protection against fire, electrical and mechanical hazards.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.