

RTU32M Data Sheet

Brodersen Modular RTU

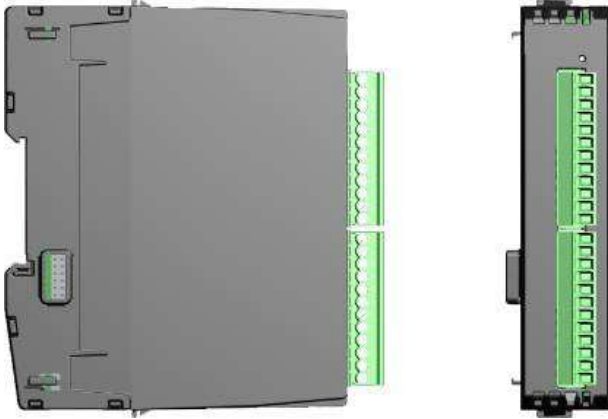
Data Sheet

January 2019





Introduction



Brodersen Modular RTU32M Series with advanced RTU/PLC functionality.

The RTU32M series is based on an embedded 32-bit industrial platform providing flexible RTU functionality for a wide range of remote monitoring and control applications in the utility and infrastructure markets.

Each RTU32M comprises of a CPU module, power supply module and the desired mix of IO modules and system modules, as required.

The RTU32M supports a variety of standard and open protocols such as Modbus, IEC60870, IEC61850 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 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.

Each module is housed in a robust plastic enclosure suitable for DIN rail mounting. The RTU32M modules are 110mmH, 25mmW and 110mmD.

The RTU32M power supply module operates from 10-30VDC.

The RTU32M Backplane bus supports up to 250 I/O modules.

FEATURE LIST

- Modular RTU with or without integrated I/O and communication device.
- Real Time Operating System.
- Communication Protocols Supported;
 - Full Modbus suite.
 - IEC60870-5-101/103/104
 - IEC61850 Client / Server Protocol.
 - DNP3 Master and DNP3 Slave.
 - Binding - Global Distribution and Subscription of Event Based Time Stamped Variables.
- Communication Protocols can also be created as part of the logic application interface.
- Communication interfaces; 2 x Ethernet 10/100, 1x USB are featured on the CPU module.
- 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
- Hot swappable IO.
- Full remote management with configuration, programming and flexible distribution of all levels of software from and to RTUs on remote locations.



MP32A, MP32E CPU – Controller Module

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

Default	200MHz
DL-528MHZ-RL	528MHz
DL-900MHZ-RL	900MHz

The default RAM size is 128MB, performance license option DL-256MB-RL allows 256MB

RTU32M PLC RUNTIME

PLC Runtime performance:

Typical cycle time: 1msec

Maximum PLC variables: 2 x 20kb – calculated as sum of all variables.

Scan time internal I/O: Min. 0,5 msec

SMART IO

I/O Detection and Configuration

Self discovering I/O...

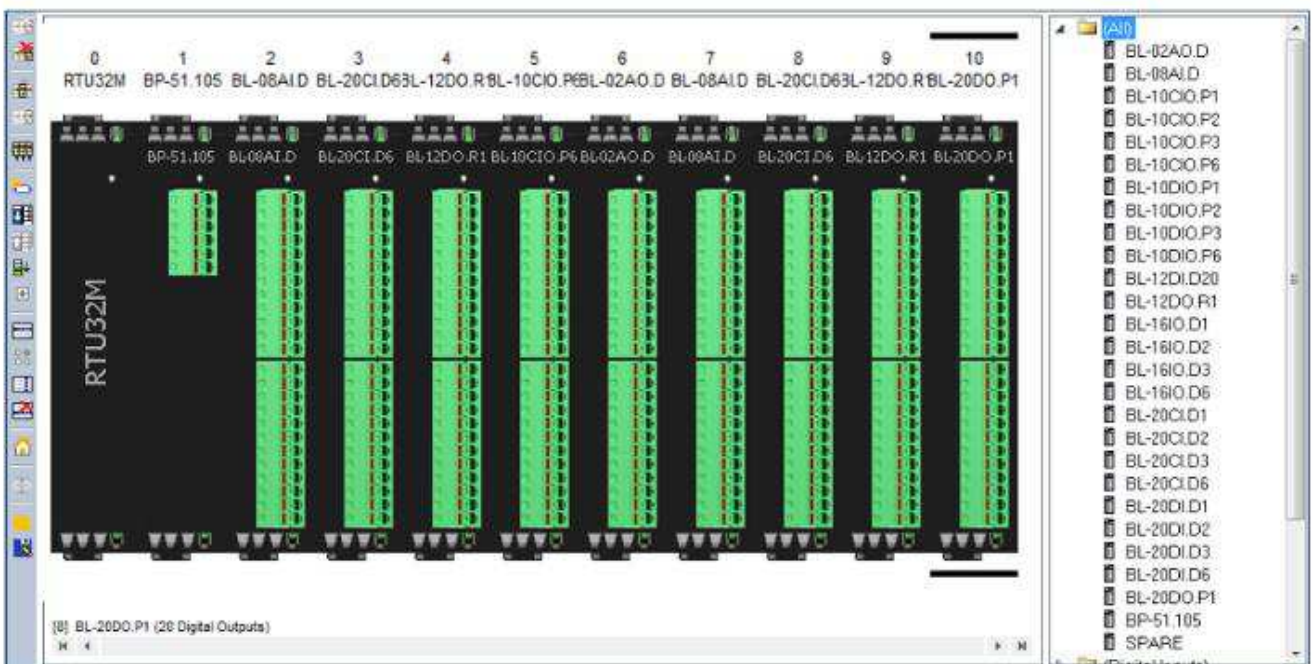
CPU HARDWARE

CPU: ARM Cortex – A7
Freescale i.MX6UL, 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 RealTimeClock with 1 msec resolution

Interfaces: LAN: 2x 10/100Mbps RJ45
1 x USB 2.0 Host.
1x USB OTG Micro-B for maintenance and diagnostics.





EMC, Safety and Environmental standards (all modules)

EMC: IEC 61000-6-2, IEC 61000-6-4

Safety Requirements:

IEC 60950-1, 61010-1

Climatic:

- Damp Heat: IEC 60068-2-30
- Damp Heat Steady: IEC 60086-2-3
- Dry Heat: IEC 60086-2-2

Mechanical:

- Vibration: IEC 60255-21-1
- Shock: IEC 60068-2-27
- Shock and Bump Test: IEC 60255-21-2

Immunity:

- Class IV Criteria A IEC 6100-4-2
- Class III Criteria A IEC 6100-4-3
- Class III Criteria A IEC 6100-4-4
- Class IV Criteria A IEC 6100-4-5
- Class III Criteria A IEC 6100-4-6
- Class IV Criteria A IEC 6100-4-8
- Class III Criteria A IEC 6100-4-12
- Class IV Criteria A IEC 6100-4-16
- Class IV Criteria A IEC 6100-4-29
- Dielectric 2.5 KV IEC 60255-5
- Impulse 5.0 KV

Ambient temperature range:

-40°C to +70°C



STANDARDS

EMC/LVD:

- IEC61000-3-2:2018
- IEC61000-3-3:2013
- EN55011:2009
- EN61000-6-2:2016 (with reference to EN61000-4-2:2008, EN61000-4-3:2010, EN61000-4-4:2012, EN61000-4-5:2014, EN61000-4-6:2013, EN61000-4-8:1009, EN61000-4-11:2020)
- IEC61000-4-12:2006
- IEC61000-4-13:2002+ADM2015
- IEC61000-4-17:1999+AMD:2008
- IEC60950-1:2005+AMD1:2009+AMD2:2013 Safety requirements for electrical equipment for measurement and control

Climatic:

- Dry heat: IEC 60068-2-2:2007, Temp. +70°C, Duration 72h
- Cold: IEC 60068-2-1:2007, Temp. -40°C, Duration 72h
- Damp heat cyclic: IEC 60068-2-30:2005, Temp. 25°C to 70°C, RH 98%, Duration 8h

Mechanical:

- Vibration: IEC 60068-2-6:2007, Test Fc (sinusoidal), Freq. 10-150Hz, Amp.4g, 5 sweeps in 3 orthogonal axes
- Shock: IEC 60068-2-27:2008 (half sine), Acc. 15g, Pulse time 11 msec, 3 x 6 shocks

Module status LED flashing codes.

A two color (red/yellow) LED is provided on the module. This indicates the module status with different blinking patterns. The yellow is indicating module mode (run, stop). The red indicate module error or warnings. Each pattern / color will operate in 2 sec duty cycles. When the red LED is inactive (off), only the 2 sec yellow duty cycle will operate (yellow is always active). When the red LED is active, a switch between 2 sec yellow, and 2 sec red patterns will occur. These patterns are possible:

Module LED pattern

LED	Pattern
Off	LED is constantly off
on	LED is constantly on
Blinking:	LED is flashing, 200 ms on, 200 ms off
Flickering:	LED is flashing, 50 ms on, 50 ms off
Single Flash:	LED pattern is, 200 ms on, 1800 ms off
Double Flash:	LED pattern is, 200 ms on, 200 ms off, 200 ms on, 1400 ms off
Triple Flash:	LED pattern is, 200 ms on 200 ms off, 200 ms on 200 ms off, 200 ms on 1000 ms off
Quadruple Flash:	200 ms on 200 ms off, 200 ms on 200 ms off, 200 ms on 200 ms off, 200 ms on 600 ms off

Yellow I/O module LED Codes:

Yellow LED	Pattern Description
Off	No module power
on	Module is Operational mode.
Blinking:	Module is in Operational Timeout, caused by missing RTU heartbeat "timeout from CPU to I/O module". Outputs will be managed according to failsafe configuration (Last state, forced On, forced Off)
Flickering:	NA
Single Flash:	No valid node ID. Normal after power up.
Double Flash:	Module is assigned a valid node ID, and is Stopped.
Triple Flash:	NA
Quadruple Flash:	Module is in firmware update mode.

RED I/O module LED Codes:

Red LED	Pattern Description
Off	No warnings or errors.
on	Module LB2 communication error. A number of LB2 communication errors has occurred, which has caused the LB2 error counters to reach the error level. The module will automatically stop any transmission on the bus, to prevent LB2 bus corruption for other modules (nodes). The module will still listen for NMT commands, and a communication reset command will reconfigure module configuration / communication, if the error was temporary.
Blinking:	NA
Flickering:	Corrupted module information / calibration data in eeprom. Fatal error
Single Flash:	Module communication error warning. A number of LB2 communication errors has occurred, which has caused the LB2 error counters to reach the warning level. A number of successful communications will automatically reset this warning.
Double Flash:	NA
Triple Flash:	NA
Quadruple Flash:	NA