

RTU32R

The versatile RTU and SNMP Alarm and Control Device with advanced control and communication options

Data Sheet

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INTRODUCTION

RTU32R – The Flexible SNMP Alarm and Control Device. The RTU32R is one of the most powerful and versatile SNMP Alarm and Control devices on the market. Besides offering all the standard SNMP Agent functions like Trap, Get and Set, the RTU32R also provide you with standard programmable function. Any kind of special control and communication functions can be programmed in a standard IEC61131-3 PLC language suite supporting 5 different ways of programming. That means that you with the RTU32R supporting programming facility will be able to meet any end customer requirements.

The benefit of using the local control and management functions provided in the PLC program facility is that it provide key features like;

- Enhanced intelligent alarm handling and control
- Local independent control functions like access control, dedicated UPS monitoring, power consumption monitoring and reporting, controlled actions like special shut down procedures and much more.
- Fast and event based reliable distribution of digital or analogue I/O signal from any remote site to another. Even string messages are distributable.
- Data communication with on-site equipment with a range of serial or Ethernet based drivers – e.g. meters, charger controllers, HVAC systems etc.
- Data logging of time stamped events in standard CSV files. You can freely design what and how and you get time stamps with up to milliseconds resolution.

All software including the actual configuration is placed on a replaceable Flash disc.

RTU32R VERSION/ORDERING CODES

RC-60IO/221B0100.P3

RTU32R with 48 digital inputs 30-60VDC PNP, 8 Relay outputs, 4 analogue inputs, 2 x LAN, 2 x RS232 and LocalBus for I/O Expansion. Power supply 12-16VDC.

RC-60IO/221B0100.P6

RTU32R with 48 digital inputs 10-30VDC PNP, 8 Relay outputs, 4 analogue inputs, 2 x LAN, 2 x RS232 and LocalBus for I/O Expansion. Power supply 12-16VDC.

RC-60IO/221B0110.P3

RTU32R with 48 digital inputs 30-60VDC PNP, 8 Relay outputs, 4 analogue inputs, 2 x LAN, 2 x RS232 and LocalBus for I/O Expansion. Power supply 115-230VAC/DC.

RC-60IO/221B0110.P6

RTU32R with 48 digital inputs 10-30VDC PNP, 8 Relay outputs, 4 analogue inputs, 2 x LAN, 2 x RS232 and LocalBus for I/O Expansion. Power supply 115-230VAC/DC.

RC-60IO/221B0130.P3

RTU32R with 48 digital inputs 30-60VDC PNP, 8 Relay outputs, 4 analogue inputs, 2 x LAN, 2 x RS232 and LocalBus for I/O Expansion. Power supply 24-48VDC.

RC-60IO/221B0130.P6

RTU32R with 48 digital inputs 10-30VDC PNP, 8 Relay outputs, 4 analogue inputs, 2 x LAN, 2 x RS232 and LocalBus for I/O Expansion. Power supply 24-48VDC.

RC-60IO/241B0130.P3

(extended RAM – 256MB, NV-RAM – 256MB)

RTU32R with 48 digital inputs 30-60VDC PNP, 8 Relay outputs, 4 analogue inputs, 2 x LAN, 2 x RS232 and LocalBus for I/O Expansion. Power supply 24-48VDC.



RC-60IO/241B0130.P6

(extended RAM – 256MB, NV-RAM – 256MB)

RTU32R with 48 digital inputs 10-30VDC PNP, 8 Relay outputs, 4 analogue inputs, 2 x LAN, 2 x RS232 and LocalBus for I/O Expansion. Power supply 24-48VDC.

Driver runtime license details:

RTU32R are delivered with a range of standard drivers that includes full Modbus suite, IEC60870 suite, RTU Binding and COMLI Master.

For additional drivers a runtime driver license has to be ordered separately.

The available driver licenses are;

Order code	Description
RDL-STRATON-RL	PLC runtime license

Special versions can be delivered as option. Contact us for more information.

TECHNICAL DESCRIPTION

General

The RTU32R offers 2 main functions:

A versatile SNMP Alarm and Control device with multiple I/Os for Network Management via the open SNMP protocol.

A free programmable controller and communication gateway for manipulation I/O and SNMP data providing options for grouping alarms, set special alarm limits, perform local control and interface communication with local devices via LAN and serial ports.

The RTU32R is based on an Industrial PC platform running WinCE operating system with all the well known embedded Microsoft environment facilities. A range of industrial power supplies is integrated to support industrial supply levels. The basic IPC includes a range of communication and other interfaces. The RTU32R provides additional interfaces like LocalBus for expansion I/O and other COMs via the LAN and COM interfaces.

The RTU32R software is stored on a removable Flash. During start-up, the operating system and applications are moved to RAM where it is executed. System configuration settings are stored on the Flash. Retained variables can be stored on Flash when required.

Integrated I/O and LocalBus for external I/O connectivity are controlled in an implemented I/O database. A PLC runtime VM (Virtual Machine) is ported to the WinCE real-time task. This enables the optional PLC runtime application program to be executed in the RTU32R.

Hardware and Connectivity

RTU32R is based on a 32bit 500MHz platform with 128MB RAM and removable 128MB Flash in standard configuration (extended version with 256MB RAM and 1MB NV-RAM available).

It offers 3 basic power supply versions; 12-16VDC, 110-230VAC/DC and 24-60VDC.

Communication interfaces include;

- 2 x LAN 10/100Mbit Ethernet interfaces
- 2 x RS232 interface for connecting local devices, modems etc.
- 2 x USB interfaces for mouse/keyboard, memory UCB devices, 3G/GPRS modem and LAN extension.
- VGA and PS/2 interface for connecting monitor and mouse/keyboard
- LocalBus RJ45 interface for I/O Expansion device connection
- 2 x Sub-D 37-pin female and 1 x Sub-D 25-pin female connections for internal I/O

All connections are available on the backplane of the RTU32R.

Configuration and Programming

The RTU32R are basically configured via the integrated WebServer using your browser. All network settings and SNMP configuration of SNMP Traps, Get, GetNext and Set settings for physical I/O can directly be configured. For analogue I/O you can assign several alarm limits and define use of Trap and/or only handled via Set/Get commands from your Network Management System.

Optionally RTU32R can be configured for local data manipulation via a standard full IEC61131 PLC runtime function – and work with full RTU functionality as the other RTU32 Series products. It can be programmed in any of the five IEC61131 compliant languages like e.g. Function Block of Structured Text programming. And only your imagination set the limits.

If you prefer to use Visual Studio and C or C# programming to manipulate data before sending SNMP it is also possible. A SDK and Toolkit are available from Brodersen A/S offering sample codes etc.

For configuration of your SNMP Host e.g. a Network Management System or SCADA System with a SNMP Driver, we provide you with a MIB file so you are ready to communicate with the RTU32R in a few minutes.

I/O's and Database

Internal I/O and expansion I/O are managed in an independent database. The I/O database structure is designed as a multi-accessible database. The database runs in its own task providing fast and reliable I/O communication. The SNMP driver and PLC runtime has drivers to access the database both at board level where



the I/O is accessed in I/O sections, and in single level where each I/O can be accessed individually according to the specific application requirement.

In addition, an API for WinCE provides access to the database from your own C#, C++ or VBA application. It can even be used as gateway access to a PLC application program.

Flexible I/O Configuration

RTU32R are available with integrated inputs / outputs and a number of I/O Expansion modules in 1U height can be connected to the RTU32R supporting digital inputs and analogue inputs. Build-in I/O and I/O expandability of up to thousands of digital and analogue input/output signal makes it suitable for any size of application – handled in one platform.

All digital inputs and outputs status are available via LEDs on the front of RTU32R.

PLC Runtime - Optional

Brodersen WorkSuite programming tool fully supports EN/IEC61131 and is used for making PLC programs in the RTU32R. The application program kernel is implemented and runs in WinCE real-time task. The PLC runtime offers complete PLC functionality and supports all features needed in today's industrial environment. WorkSuite supports programming languages such as Structured Text, Function Block, Ladder, Instruction List and Sequential Function Chart.

The Brodersen WorkSuite is used for configuration protocols, programming and debugging. It supports several tools for multi-program handling and documentation. It is also a powerful tool for complete system design and programming, providing unique functions for event based communication. The Global Binding Editor makes it possible to publish and subscribe variables in a large network with minimum communication load. Programming, debugging and upload and download of application programs can be done remotely via the Ethernet connections.

Via the PLC functionality a range of optional drivers and protocols are available for the RTU32R – including:

- IEC60870-5-101 Master and Slave.
- IEC60870-5-103 Master.
- IEC60870-5-104 Client and Server.
- PROFi NET Client.
- IEC61850 Client/Server/Goose
- IEC61400-25
- DNP3 Suite
- Ethernet/IP Scanner
- DF1 Master

Data Logging

When using the PLC option a special data logging function block is available for logging event based or cyclical data to the flash file system. And you can freely design your log with time stamps and values directly from physical I/Os or manipulated after your own design.

Log files can be downloaded from the RTU32R via FTP.

Modem Control / Dial-up / Dial-in

Both dial-up and dial-in functions via a PSTN, ISDN or GSM modem connected to the serial port of the RTU32R are possible when using the PLC modem function. It can be used for any serial communication e.g. ModbusRTU serial protocol.

3G / GPRS Modem controlled directly by RTU32R

The RTU32R support Brodersen 3G/GPRS modems connected to USB Interface. Webpage configuration for the 3G/GPRS modems is available to automatic handling connection to defined APN. Alternative and more advanced modem connection handling are supported via dedicated PLC Functions.

Real-Time / Real-Time Clock

The WinCE real-time task is used for the application program execution. Time stamps and cyclic execution are also based on the WinCE real-time clock. Time stamps are reported in milliseconds. In order to achieve high time accuracy the clock has synchronisation option with SNTP and special clock slave and master function for synchronisation from RTU32R to RTU32R.

Power supply options

The RTU32R can be delivered with some different built-in power supplies. Option for 12-16VDC, 24-48VDC and 115-230VAC/DC is available. The 12-16VDC version provides an internal power supply voltage measurement function available in the PLC Logic. Measuring range is 10,5-18VDC.

Security

Security in access and communication is supported. The network servers like Webserver and FTP Server is login and password protected and provides multiple access levels with dedicated adjustable rights.

The RTU32 Series support PPTP and L2TP VPN Clients and can be used to login to VPN Servers. VPN is configured via Webserver and can also be controlled from the PLC logic

Utility drivers including authentication or encryption features are supported in the extent that it is commonly used. E.g. DNP3 drivers all support Secure Authentication V2.

Firewall functions can be enabled and adjusted via Remote Desktop and the Registry Editor.

**TECHNICAL DATA****Basic 32-bit CPU System**

CPU: Onboard AMD Geode™ LX800 500 MHz with 128K L2 cache.
BIOS: AWARD 512KB Flash BIOS
System chipset: AMD Geode™ LX800 / CS 5536.
System RAM memory: 200-pin SODIMM socket with 128 or 256MB DDR 333/400 SDRAM.
Disc / SSD: Min. 128MB removable Compact Flash in Type I/II socket. Support up to 1GB.

Physical Interfaces

Dual Ethernet: LAN: Dual Realtek RTL8101L.
COMS: 2 x RS232
USB: 2 x USB 2.0 ports.
VGA/LCD: PCI bus VGA/LCD interface
PS/2: Single interface for keyboard and PS/2 mouse. Twin interface cable included.
I/O Expansion: RJ45 LocalBus interface for Brodersen I/O Expansion modules.

Expansion I/O

Expansion I/O: Expansion I/O is possible via the Brodersen I/O LocalBus system to all Brodersen I/O Expansion modules. Supports up to 32 I/O Expansion modules of any type.

NOTE: RTU32R can supply max. 1000mA for supply of I/O Expansion modules.

Integrated digital inputs

48 isolated digital inputs all equipped with opto couplers.

12-24V bipolar type (P6):

Input voltage activated: 10 - 30V DC
Input voltage deactivated: Max. 3V DC
Input current: 12V DC: Typical 3mA
24V DC: Typical 6mA

48V - bipolar type (P3):

Input voltage activated: 30 - 60V DC
Input voltage deactivated: Max. 8V DC
Input current: 48V DC: Typical 4mA

Input delay: Typical 5ms.
Isolation: 1kV AC (input to electronics)
Indicators: One for each digital input
Connectors: 2 x D-sub 37 pin female

Integrated relay outputs

Relay outputs: 8 potential free SPST-N/O contacts.
Output voltage: Max. 72V AC/DC.
Output current: Max. 0,5A AC/DC (resistive).

Output delay: Typical 5ms.

Lifetime (relay): Min. 100.000 operations at rated load.
Contact material: Gold overlay silver alloy.
Isolation (coils-contacts): 2kV AC 50Hz 1 min (IEC255-5).
4kV 1,2/50micro s. / impulse withstand (IEC255-5).
Indicators: One LED for each output (yellow) indicating active output.
Connector: D-sub 25 pin female

Integrated analogue inputs

Inputs: 4 multiplexed analogue channels with solid state multiplexer.
Input configuration: Differential (+/-), flying capacitor type.
Input measuring range: Default set to 4 - 20mA.
Other ranges on request.
Resolution: 14 bit, 0-16383.
Impedance: Voltage: 1M Ohm.
Current: 100 Ohm \pm 0,25%.
Absolute maximum ratings: Input voltage: \pm 15V DC.
Input current: \pm 30mA DC.
Update time: Better than 150 ms.
Measuring accuracy: 25°C: \pm 0.1% (typically 0.05%).
-10°-55°C: \pm 0.3% (typically 0.1%).
Linearity: Better than \pm 0,05%.
Temperature stability: Better than \pm 50ppm/°C (typical).
Common mode voltage: Max. \pm 80V DC.
Common mode rejection ratio: Min. 72dB.
Series mode rejection: Min. 36dB (50-120Hz)
Isolation: (input to input): 500V.
Connector: D-sub 37 pin female

**Power Supply**

Supply Voltage versions:

12-16VDC (10.4-18VDC)
24-48VDC (20-60VDC).
115-230VAC/DC (90-265VAC/DC)

Frequency for AC versions:

40-70Hz

Power consumption: Max. 25W – typically 13W.

Isolation: Power supply to electronics: 3750V
(12-16V version has NO isolation).Max loads: LocalBus (for supply of I/O Expansion
modules) are 1000mA.Connector: 115-230VAC/DC: IEC Connector type
EN60320-1 C14 Class I
24-48VDC: 3 pin screw connector**GENERAL****Indicators (LEDS):**

Power (green): Indicating power ON.
System (green): Indicate system status.
Run (green): Indicate PLC program status. Is
always on if no PLC runtime is
available
in the RTU32R.
I/O (green): Indicate status of integrated and
expansion I/O.
Com x (yellow): Indicate Rx/Tx activity on the specific
com port.

Protection: IP20.**Mounting:** 19" rack mounting. Fixed with 2 x 2
screws in front plate – EIA module.

Due to product reliability the RTU32R
is designed without any moving parts
and forced fan cooling. Free space of
minimum 1 EIA module (1U) **shall** be
available at top for natural cooling
airflow.

Housing: Light duty steel 19" rack cabinet
with black rugged textured powder
paint finish.
Depths = max. 300mm excl. con-
nectors.**Dimensions:** Height: 1U (44.45mm)
Depth: 250mm (excl. connectors)**Weight:** 2.95kg in basic version with 60IO**Standards and compatibility – environmental**Ambient temperature:

Storage: -40 - +85°C
Operation: -10 - +60°C

EMC/LVD:

EN55011: Class A
EN55022: Class A
EN61000-4-2
EN61000-4-3
EN61000-4-4
EN61000-4-5
EN61000-4-6
EN61000-4-8
EN61000-4-11
EN61000-3-2
EN61000-3-3
EN60950 Safety of information
technology equipment

Climatic:

Dry heat: IEC 68-2-2 Test Bd, Temp.
+55°C, Duration 8h.
Cold: IEC 68-2-1, Test Ad, Temp.
-10°C, Duration 8h.
Damp heat: IEC 68-2-3, Test Ca,
Temp. 40°C, RH 95%, Duration 8h.

Mechanical:

Vibration: IEC 68-2-6, Test Fc
(sinusoidal), Freq. 10-150Hz, Amp.4g,
5 sweeps in 3 orthogonal axes.
Shock: IEC 68-2-27 (half sine), Acc.
15g, Pulse time 11msec., 3 x 6
shocks.

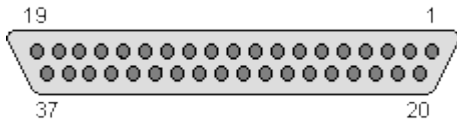


CONNECTORS AND WIRING

I/O Wiring

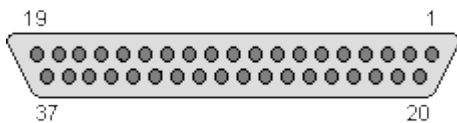
All I/Os are available through two 37-pin and one 25 pin female D-Sub connectors on the back of the module marked I/O-1, I/O-2 and I/O-3.

I/O-1 connector



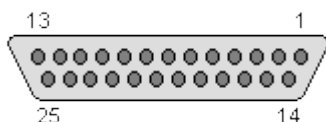
D-sub pin no:	I/O type and no:	LED Section:
1, 20, 2, 21, 3, 22, 4, 23	DI 0 – DI 7	A
5	Common	A
24, 6, 25, 7, 26, 8, 27, 9	DI 8 – DI 15	B
28	Common	B
10, 29, 11, 30, 12, 31, 13, 32	DI 16 – DI 23	C
14	Common	C
33, 15, 34, 16, 35, 17, 36, 18	DI 24 – DI 31	D
37	Common	D

I/O-2 connector



D-sub pin no:	I/O type and no:	LED Section:
1, 20, 2, 21, 3, 22, 4, 23	DI 32 – DI 39	E
5	Common	E
24, 6, 25, 7, 26, 8, 27, 9	DI 40 – DI 47	F
28	Common	F
10	AI 0 + (plus)	None
11	AI 0 – (minus)	None
29	Ground	
12	AI 1 + (plus)	None
13	AI 1 – (minus)	None
31	Ground	
14	AI 2 + (plus)	None
15	AI 2 – (minus)	None
33	Ground	
16	AI 3 + (plus)	None
17	AI 3 – (minus)	None
35	Ground	

I/O-3 connector



Relay NO contact wirings:

D-sub pin no:	I/O type and no:	LED Section:
1-14	DO 0	G
2-15	DO 1	G
3-16	DO 2	G
4-17	DO 3	G
5-18	DO 4	G
6-19	DO 5	G
7-20	DO 6	G
8-21	DO 7	G

Wiring examples is defined in the RTU32R Mounting and Wiring Manual. Brodersen System supply cable accessories available for I/O cabling in different lengths and types. And special cables can be provided on requests.

Power supply wiring 12-16VDC and 24-48VDC

The power supply interface connected via a 3 pin removable screw connector Phoenix type.

The 3 pin power screw terminal wiring are minus(-), plus(+) and Ground.

Power supply wiring 110-230VAC/DC

The power supply interface connected via an IEC Connector EN60320-1 C14 Class I.



A C15 connector with screw terminals for power supply wires is included in the product package. Standard IT equipment power supply cables for 230VAC are available if required.

Communication Interfaces

The communication interfaces like LAN, COM, USB etc. are connected via standard connectors. More details are found in the RTU32R Mounting and Wiring Manual.