

# RTU32R

## RTU – Remote Terminal Unit

### Installation and Wiring Guide

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# 1. Customer Information

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Brodersen A/S makes no representation or warranty that such application will be suitable for the specified use without further testing or modification.

### Life Support Policy

BRODERSEN A/S'S PRODUCTS ARE NOT FOR USE AS CRITICAL COMPONENTS, IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE PRIOR WRITTEN APPROVAL OF BRODERSEN A/S.

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into body, or (b) support or sustain life and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

### Brodersen Customer Services

Your satisfaction is our primary concern. Here is a guide to Brodersen customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

### Technical Support

We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in the product documentation. These answers are normally a lot more detailed than the ones we can give over the phone. So please consult this manual first.

To receive the latest version of the user manual, please visit our Web site at:

<http://www.brodersen.com>,

Choose the product in question under product search and under each product you will find accompanying data sheets, manuals, user guides etc.

If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our distributors are well trained and ready to give you the support you need to get the most from your Brodersen products. In fact, most problems reported are minor and are able to be easily solved over the phone.

In addition, technical support is available from Brodersen engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products. Please do not hesitate to call or e-mail us on [support@brodersen.com](mailto:support@brodersen.com).

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### Product Warranty

Brodersen warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Brodersen, or which have been subject to misuse, abuse, accident or improper installation. Brodersen assumes no liability under the terms of this warranty as a consequence of such events. Because of Brodersen's high quality control standards and rigorous testing, most of our customers never need to use our repair service. If a Brodersen product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time, and freight. Please consult your distributor for more details. If you think you have a defective product, follow these steps: 1. Collect all the information about the problem encountered. (For example, Product type and s/n, hardware and software version etc.) Note anything abnormal and describe the error in a product failure report.

2. Call your distributor and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, make arrangement with your distributor about this.
4. Carefully pack the defective product, a complete failure report and a photocopy of proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Ship it to your distributor.



## 2. Introduction



This equipment is designed and manufactured to conform to the following EC standards:

- 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

Failure to use the equipment in the manner described in the product literature will invalidate the warranty.

A 'Declaration of Conformity' statement to the above standards, and a list of auxiliary equipment used for compliance verification, is available on request.



This product must be disposed of in accordance with the WEEE directive.





### 3. General Information

#### Technical Specification Summary

##### Mechanical

Enclosure ..... 1U 19" Rack Mount Enclosure  
Dimensions (H x W x D) ..... 1U (44.45mm) x 440mm x 250mm (excl. handles and connectors)  
Weight .....2,9kg

##### Digital Inputs

Quantity..... 48  
Type..... Opto-isolated 1kV  
Input Range ..... P6 type: 10 to 30VDC, P3 type: 30-60VDC  
Connection .....37 way D Plugs  
Position ..... RTU rear panel

##### Analogue Voltage Inputs

Quantity..... 4  
Input Range..... 4 to 20mA  
Connection .....37 way D Plugs  
Position ..... RTU rear panel

##### Digital Relay Outputs

Quantity.....8  
Type..... N/O  
Maximum Relay Contact Current .....0.5A  
Connection .....25 way D Plugs  
Position ..... RTU rear panel

##### IP Networking

Type..... Ethernet  
Number of Ethernet Ports ..... 2 / 100BASE-T Ethernet  
Connection ..... RJ45 Socket  
Position ..... RTU rear panel  
Communications protocols..... See data sheet

##### External I/O Expansion Ports

Quantity.....1  
Data Bus .....Localbus  
Connection ..... RJ45 Socket  
Position ..... RTU rear panel

##### COM ports

Quantity..... 2  
Data Bus ..... Multiple – see data sheet  
Connection ..... D-sub 9 pin male  
Position ..... RTU rear panel

##### Mains Power Supply

Power Supply..... 90-265V AC/DC  
Power Consumption.....13-25W depending on configuration and connected I/O expansion modules  
Connection ..... IEC320 socket  
Position ..... RTU rear panel

##### VDC Power Supply

Power Supply..... 20-60 VDC  
Power Consumption.....13-25W depending on configuration and connected I/O expansion modules



## RTU32R Installation and Wiring Guide

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Connection ..... Removable screw connector – 3 wires (+, -, gnd)  
Position ..... RTU rear panel

### Environmental

Temperature..... -10°C to +60°C (operation)  
Humidity Range .....0% to 95% Non-condensing



### Front Panel Indicators

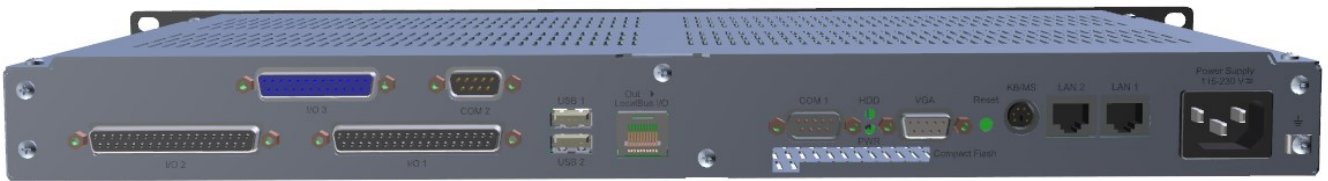
Figure 1: RTU Front Panel



- Power Green LED Lit when power is applied to the RTU
- System Green LED Lit when system is up
- Run Green LED Lit when PLC logic and scanning is running
- I/O Green LED Lit when I/O changes
- Comm1 Green LED Lit activity is detected on Comm1
- Comm2 Green LED Lit activity is detected on Comm2

### Rear Panel Connectors

Figure 2: RTU32R Rear Panel



Port Name	Connector	Functions
230V Mains Input	IEC320 socket	230V Main Power Supply Input
LAN 1 & LAN 2	RJ45 Socket	IP Network Connections
LocalBus I/O Port	RJ45 Socket	Brodersen LocalBus port
I/O 1	37 way D type socket	DI, DO and AI interface
I/O 2	37 way D type socket	DI, DO and AI interface
I/O 3	25 way D type socket	DI, DO and AI interface
USB 1 & 2	USB socket	External Connection
KB/MS	PS/2	Mouse or Keyboard
VGA	HD 15	Screen Output
COM1, COM2	D-sub 9pin Male	Serial interfaces
Earth	Screw Terminal	Safety Earth
Compact Flash	CF card interface slot	Software Flash disc slot





## 4. Installation

### Equipment and Tool Requirements

- The RTU32R unit
- A small flat-bladed screwdriver.
- A pair of wire cutters/strippers.
- A soldering iron.
- A standard 19-inch rack wired and configured to be connected to the RTU32R

### External Cabling Requirements

Connection	Termination and Suggested Type
230V AC mains power supply input	Cabling connector: IEC320 socket. Normal standard mains cabling installation. Current rating to suit particular installation
Ethernet Port	Cabling connector: RJ45 Socket Standard unscreened LAN cable
Expansion LocalBus	Cabling connector: RJ45 Socket. Special Brodersen LocalBus cable
I/O Ports Cabling connector:	37 Way and 25 Way cable
Battery	2mm <sup>2</sup> wires with fuse
PSTN Modem line	Standard twisted pair modem cable
COM ports RS232	Standard NullModem or Modem cables
COM ports RS485	Special Serial cable

### Recommended Installation Procedure

Please read and observe the instructions and guidelines in Section “Safety and Precautions” prior to installation. Failure to follow these instructions and guidelines may cause personal injury and/or damage to the equipment.

- Fit the RTU32R unit to a 19-inch standard equipment rack on supporting rails.
- Ensure that a 1U gap is left between RTUs or other sub-racks.
- Connect the wiring for digital and analogue input ports, digital output ports, expansion bus, COM ports, PSTN phone line and Ethernet port to the rear panel connectors according to the application.
- If using a 230V Mains power supply, connect the power supply cabling (as appropriate) to the rear panel IEC320 socket.



## 5. Connections

### Power supply wiring - 110-230VAC/DC

The power supply interface connected via an IEC Connector EN60320-1 C14 Class I (IEC320 socket).



A C15 connector with screw terminals for power supply wires and standard IT equipment power supply cables for 230VAC are available on request.

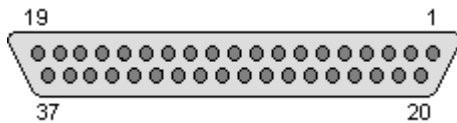
### Power supply wiring – 24-48VDC

If 24-48 VDC option, supply is connected via a 3 pin removable screw connector Phoenix type on the rear panel. The 3 pin power screw terminal wiring are minus(-), plus(+) and GND.

### I/O Wiring

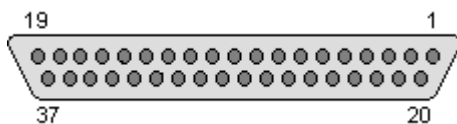
All I/Os are available through two 37-pin and one 25 pin female D-Sub connectors on the back of the module marked I/O-1, I/O-2 and I/O-3.

#### I/O-1 connector



<u>D-sub pin no:</u>	<u>I/O type and no:</u>	<u>LED Section:</u>
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

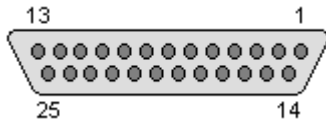


<u>D-sub pin no:</u>	<u>I/O type and no:</u>	<u>LED Section:</u>
1, 20, 2, 21, 3, 22, 4, 23	DI 32 – DI 39	E
5	Common	E
24, 6, 25, 7, 26, 8, 27, 9	DI 40 – DI 47	F
28	Common	F
10	AI 0 + (plus)	None
11	AI 0 – (minus)	None
29	Ground	
12	AI 1 + (plus)	None
13	AI 1 – (minus)	None



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

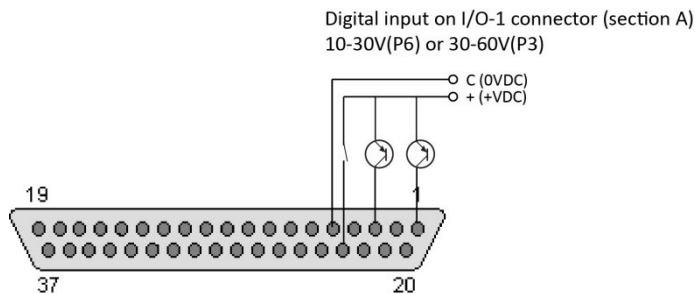


Relay NO

contact wirings:

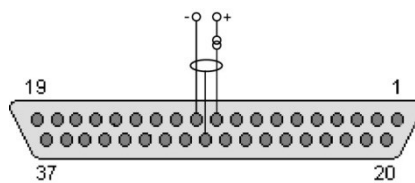
D-sub pin no:	I/O type and no:	LED Section:
1-14	DO 0	G
2-15	DO 1	G
3-16	DO 2	G
4-17	DO 3	G
5-18	DO 4	G
6-19	DO 5	G
7-20	DO 6	G
8-21	DO 7	G

**Wiring example for standard digital input**



**Wiring example for analogue current input**

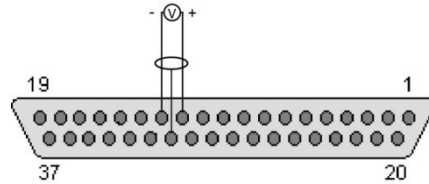
Analog input AI0 on I/O-2 connector  
Current Input via pin 10,11 and 29





### Wiring example for analogue - voltage input

Analog input AI1 on I/O-2 connector  
Voltage Input via pin 12,13 and 31



### Digital output / relay wiring

Digital outputs are provided via NO (normally open) relay contacts. It means that the outputs are to be considered equal to totally potential free Normally Open relay contacts. I.e. pin 2 and 15 are to be considered to be two contact pin on any standard relay. None of the pins at the D-sub 25 pin are internally connected!

### Communication Interfaces – LAN1 and LAN2

The LAN communication interfaces are standard 10/100BASE-T Ethernet. Each RJ45 have online and Ethernet activity LEDs directly on connector.

Pin	Signal Description
1	Transmit+
2	Transmit-
3	Receive+
4	Unused
5	Unused
6	Receive-
7	Unused
8	Unused
Shell	Ground

### Communication Interfaces – COM1 – COM2

COM1 – COM2 are standard serial interfaces with all hardware handshake signals.

#### COM1 – COM2 RS232 Wiring

COM1 – COM3 port connector are 9-pin D-sub males. The wiring is standard V.24 RS232 wiring;

Pin	Signal	Description
1	DCD	Data Carrier Detect (input)
2	Rx	Receive data (input)
3	Tx	Transmit data (output)
4	DTR	Data Terminal Ready (output)
5	SG	Signal Ground
6	DSR	Data Send Ready (input)
7	RTS	Request to send (output)
8	CTS	Clear to send (input)
9	RI	Rind indicator (input)

#### COM2 RS485 Wiring – special factory configuration

The RS485 option does only support 2-wire communication for local equipment. As the interface is not isolated it is not recommend in used for communication for non-local equipment.

Pin	Signal	Description
1	Data-	Data minus
2	NC	Not used
3	Data+	Data plus
4	SG	Signal ground



5	NC	Not used
6	NC	Not used
7	NC	Not used
8	NC	Not used
9	NC	Not used

## 6. Maintenance

Under operation no special product specific maintenance measures are required.

In general we recommend that you keep the RTU32R free from dust and moisture and periodically ensure the all ventilation holes are free and not covered by any means.

Of connected equipment we recommend that the UPS battery is replaced according to the lifetime specification defined for the batteries. In general the batteries are monitored by the RTU32R and will find any defects based on measurements of battery voltage etc.



## 7. Safety and Precautions

### Environmental

Always ensure adequate ventilation is provided for the equipment and do not obstruct ventilation holes.

The temperature and humidity ranges shown in the specifications for this product must not be exceeded.

This equipment must not be installed in an area that is subject to a corrosive atmosphere, excessive moisture or may allow water or other liquids to come into contact with the unit or its external connections.

In the close proximity of some radio frequency transmitters, the signal to noise ratio of this product may be reduced. If this occurs, re-location of the equipment or the signal cables is recommended.

### ESD

This product contains static-sensitive devices. Observe ESD precautions when working on the equipment with the cover removed.

### Electrical Safety



When powered by a Mains Power supply the product contains wiring that is energised to 230 V RMS AC mains.



Always ensure that the equipment is correctly earthed by connection to an AC mains supply with a protective earthing connection.

Ensure power supply cabling is adequately rated for the unit's operating current and protected, in case of short circuit, by a correctly rated fuse or circuit breaker.



Always replace blown fuses with the correct type and rating.

### Unpacking and Handling

The equipment should be unpacked and inspected immediately on receipt. If damage has occurred please advise your carrier or supplier.



This equipment contains electronic devices that are sensitive to electrostatic discharge. Please take precautions to avoid damage to the electronics by static electricity.

It is advisable to retain the original equipment packing in the event that the equipment ever needs returning for service.

Ensure that the name and address of the Authorised Distributor from whom you purchased the unit is recorded for future reference.

### Packing for Return for Repair



All electronics assemblies must be properly packed in ESD protective packing for transport, to prevent physical and ESD damage.



The filler material used for packing for return for repair must be antistatic or static dissipative, as this may come into contact with exposed connectors, wiring, or PCB assemblies. The use of nonconductive filler material may cause damage to the electronic assemblies reducing their operational life, or even destroying them.

Advice on packing the product for return can be provided by Brodersen.