RTU32

SNMP Alarm and Control Module
for
Network Management

User's Manual
Operation and Installation Guidelines
V. 1.03 / Nov 2015 / Doc 40261 103

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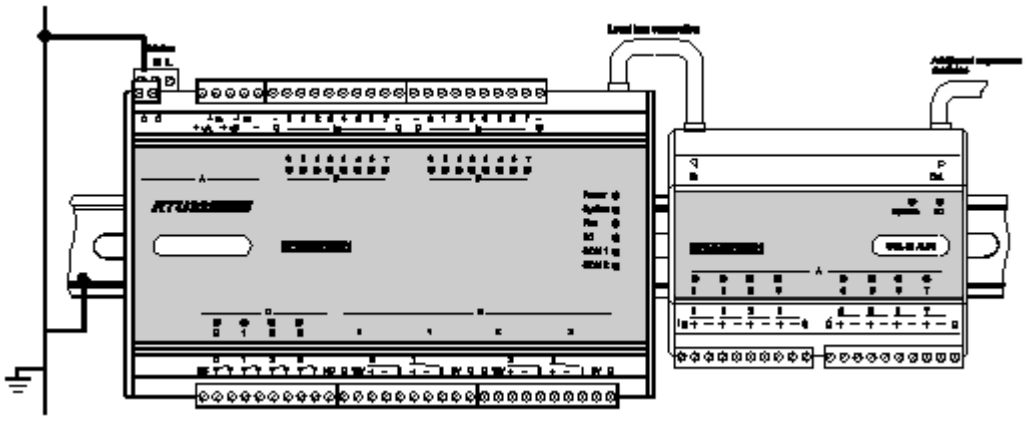
1. Introduction

SNMP (Simple Network Management Protocol) is the common language of network monitoring and used for telecommunications, facility and asset monitoring applications. The protocol allows IT Network Administration staff to easily monitor the RTU32 Alarm and Control modules in big networks. An even more powerful feature of the protocol is to use the RTU32 to monitor the network by sending/receiving SNMP network alarms. This is a feature often used by network facility managers.
The Brodersen RTU32 SNMP Alarm module is a simple to use configurable device for SNMP Trap Alarm and Control.
It is designed for alarm, monitoring and control applications on sites in Data Communication Networks (DCN), Server rooms etc.
The module provides you with all necessary functions for converting, communicating and reporting alarms in network communication systems to an SNMP Management System. The unit can e.g. be used for UPS and Generator System alarms, air-condition system alarms, voltage level alarms, direct environmental alarming like temperature, relative humidity, water etc. Up to several hundreds alarms can be managed.



2. RTU32 SNMP Agent Alarm and Control Functions

The RTU32 SNMP works as a general SNMP Agent and includes basic SNMP Agent functions. The MS WinCE operating system provides network information such as general network device parameters, statistical information etc.
The RTU32 SNMP Agent complies in general with the SNMPv2C standard.

The SNMP Agent in RTU32 is designed for fully dynamic management via the SNMP Management software. Settings in tables can dynamically be edited/changed using your SNMP Manager. It means that once you have setup the basic network and SNMP settings (like IP addresses, Community, Trap receivers and Permitted Managers), all settings for trap handling i.e. alarm messages, physical I/O link etc. can be configured directly via the SNMP manager as an alternative to using the configuration web pages in the RTU32.

Example: SNMP Manager with tables and alarm list:

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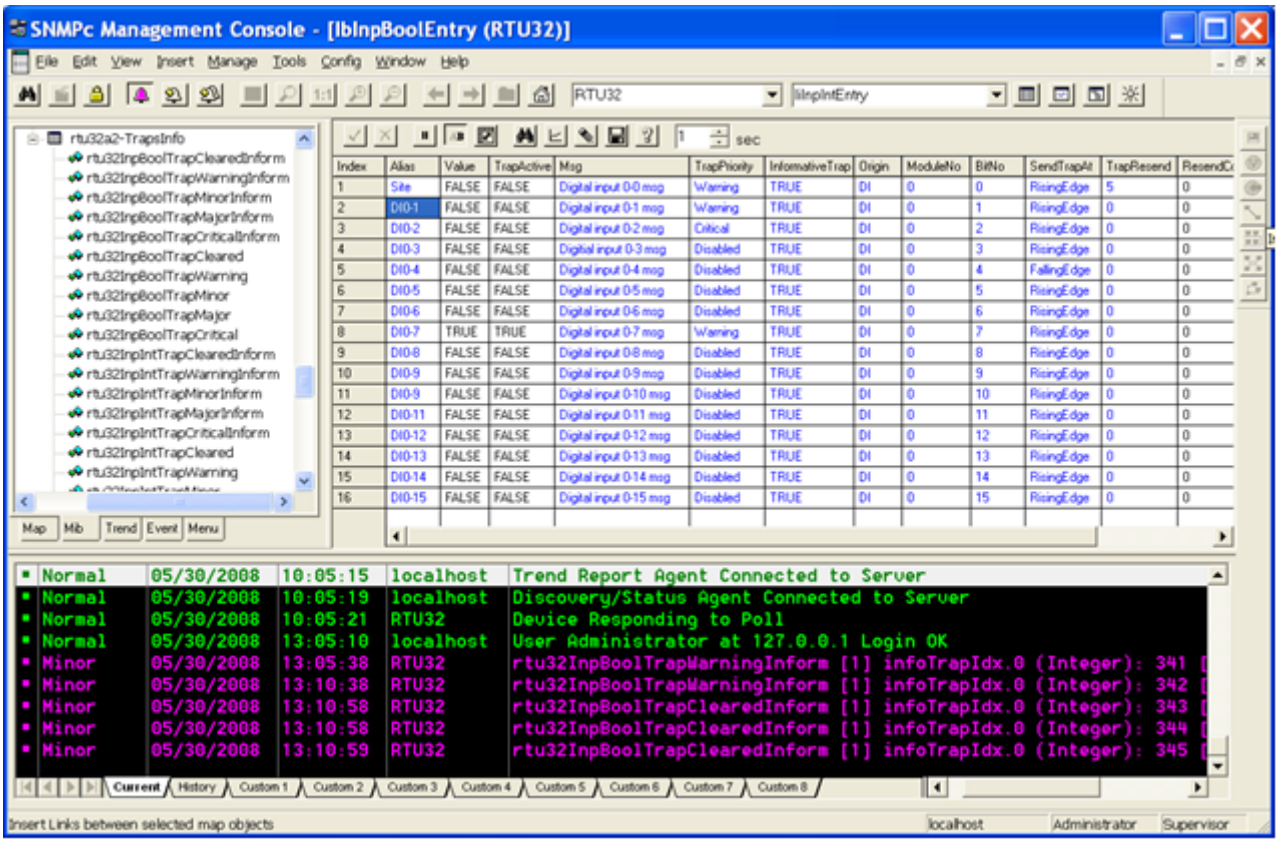
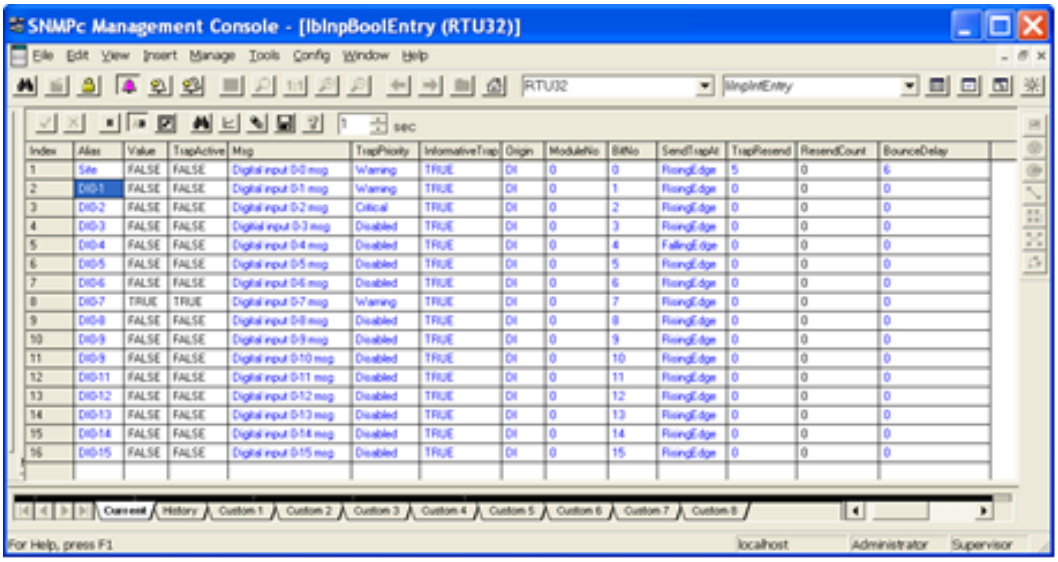


Alarm, monitoring and control functions in the Alarm module are managed by the basic SNMP functions TRAPs, Get/GetNext and Set commands.
In general, all configured I/Os points can be monitored with TRAPs sent to several Network Managers.

Example detailed of table for monitoring and editing RTU32 SNMP agent configuration in a SNMP Management System



Analogue I/Os are equipped with 4 alarm levels. Alarms can be configured according to your requirements, using multiple alarm levels, prioritizing alarms etc.
Any SNMP I/O can be polled for status with Get/GetNext, and all control outputs can be managed with the Set function.
I/Os are easy to manage as tables in SNMP Management Systems

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3. Technical Details

3.1 Basic Features

As the RTU32 SNMP is running MS WinCE, it includes a basic SNMP Master Agent plus a basic Extension Agent. The basic Extension Agent is part of the Microsoft environment for reporting network information etc. The SNMP Agent complies with the SNMPv2C standard.

The enterprise id for the RTU32 SNMP in managed networks is 24122 (branch name/number for Brodersen A/S).

The basic RTU32 SNMP includes a fixed number of I/Os and additional inputs/output can be added via I/O Expansion modules.

3.2 Interfaces

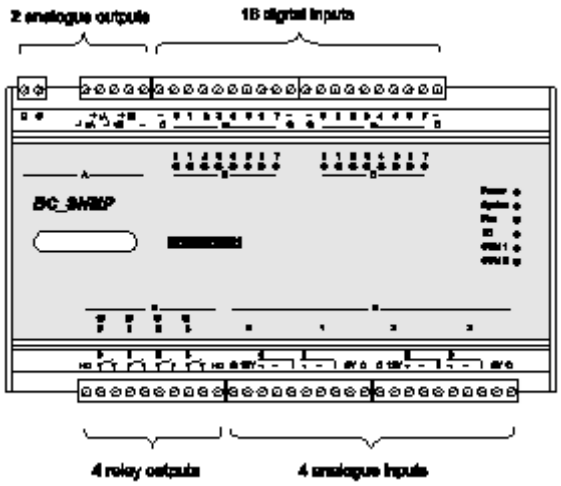
The RTU32 provides a number of interfaces. The primary interfaces for use are:

- Power supply input: 24-48VDC (optional 115-230VAC/DC)
- Network connections LAN1 and LAN2: 10/100MBit Fast Ethernet compatible
- Localbus Interface: RJ45 for connection I/O Expansion modules
- 12VDC supply output for alarm inputs

3.3 I/O for Alarms and Control

3.3.1 Basic I/O Configuration

A basic module features 16 digital bipolar inputs, 4 relay outputs, 4 analogue inputs and 2 analogue outputs. The inputs are designed for 24-60VDC with positive or negative common



3.3.2 Expansion I/O Configuration

I/O expansion is provided by adding I/O expansion modules. They are available with:

- 32 bipolar digital inputs 24-60VDC

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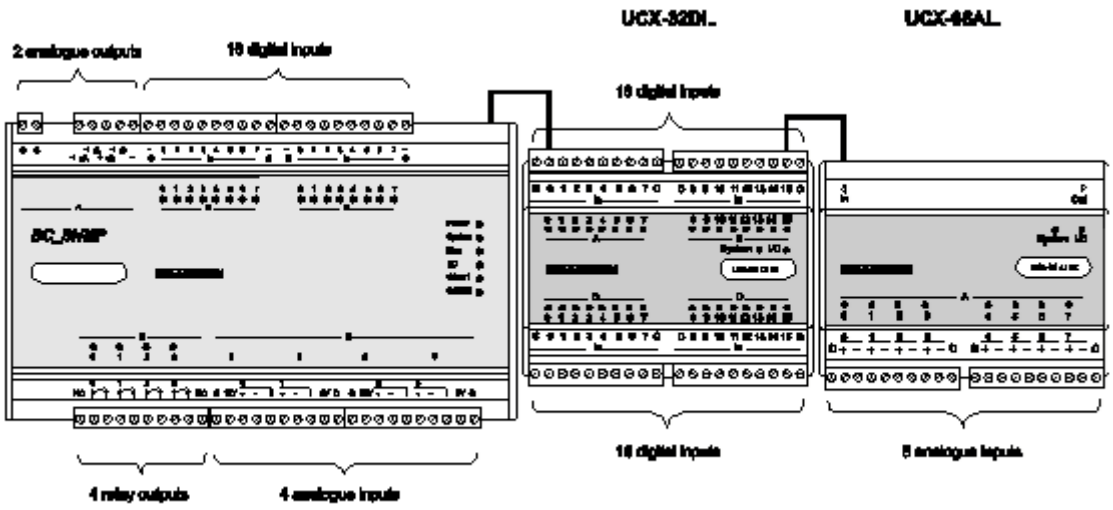
- 16 relay outputs
- 8 analogue inputs (Pt100, 0-10VDC or 4-20mA)
- 4 analogue outputs as 0-10V or 4-20mA.

The I/O expansion modules are simply added to the basic module with a small bus cable that includes internal communication and power supply – no additional wiring needed except for the I/Os.



If your configuration of I/O Expansion modules exceed consumption of more than 900mA an additional power supply (type UCS-53 or UCS-54) must be added. See I/O Expansion selection guide for details.

The RTU32 SNMP support setup of a maximum I/O configuration of;

- 512 bipolar digital inputs 24-60VDC
- 200 relay outputs
- 200 analogue inputs
- 200 analogue outputs

4. Basic Configuration

All configurations of the RTU32 SNMP alarm and control modules are done via the built-in web pages. As default the LAN1 is assigned with IP address 192.168.0.1 and LAN2 is set to DHCP.

After having set up your password, the main configuration page of the RTU32 will appear in your browser. Next time you connect to the web pages you will be asked for username and password authentication to get access.

NOTE: That the basic configuration for the RTU32 SNMP ONLY includes **Network Settings** and **SNMP Settings** – all other setting can be ignored.

4.1 Settings Overview

The first page that appears when you enter the RTU32 Web pages is the “Settings Overview” page.
On this page you will get an overview of the network settings and version of the primary system files. If you are contacting your support office or distributor, you will be asked for the software version numbers.

IMPORTANT NOTE: The local IP will report 0.0.0.0 if the LAN port is not active (not connected/no connection). Check the network settings page for getting the last saved network setting

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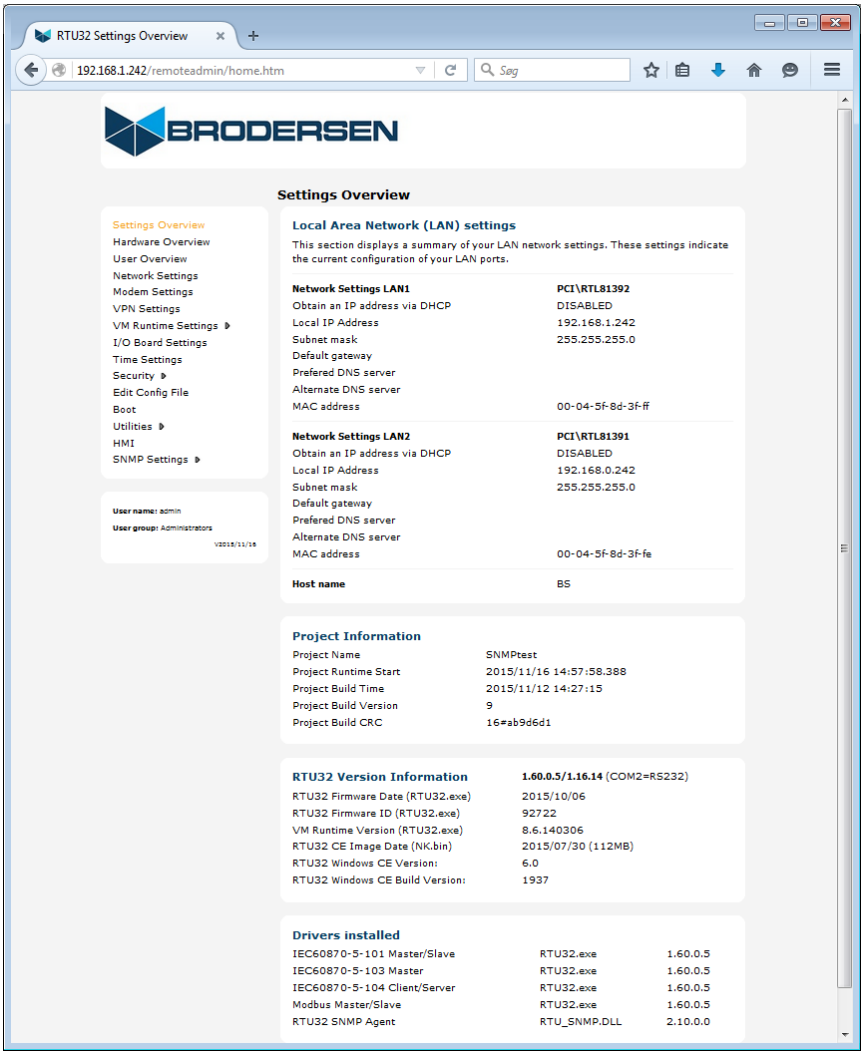

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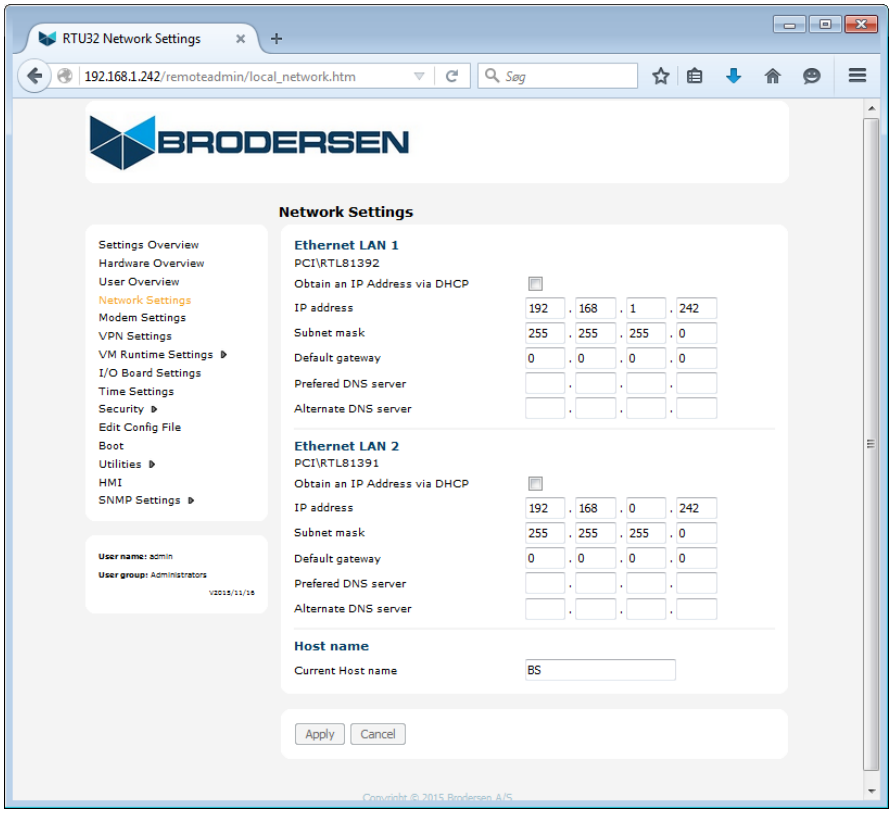
4.2 Network Settings



On the “Network Setting” page you can change the LAN1 and LAN2 settings to fit your local network. You must assign fixed IP addresses to gain access to the RTU32 SNMP with your browser in your LAN network.
After entering the new network settings, select “Apply” to save the settings. Note that the new settings will NOT be activated before you reboot the RTU32 SNMP. Use the Boot function on the menu at the left side of the page.
The RTU32 SNMP unit can also be assigned a unique device name (Station name), which is entered in top of the “Network Settings” page.

4.3 Time Settings

The “Time Settings” web page is used for setting the RTU32 SNMP real-time clock. You can choose to enter the time manually or set the time from a network time server using SNTP. If you use SNTP you have to enter the domain name (like www.example.com) or IP address of the time server

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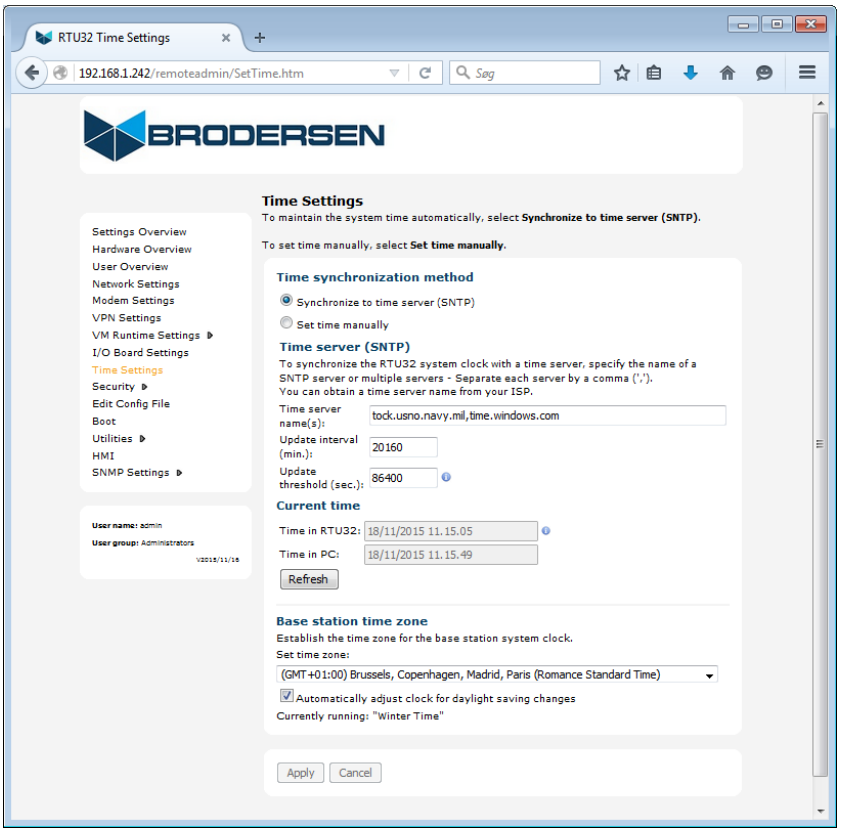
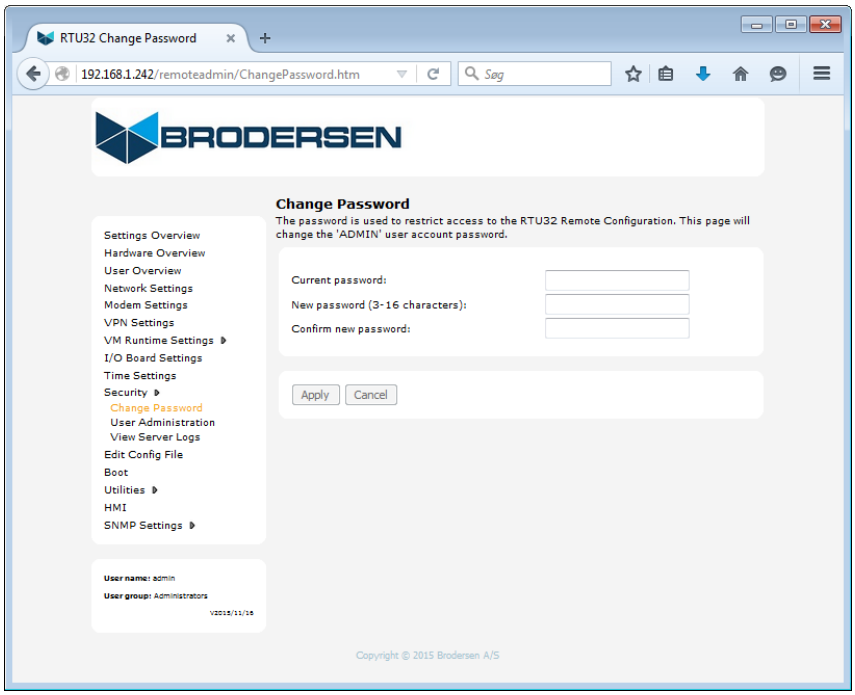


4.4 Change Password

You can change the login password for web server access, FTP etc. The User name is always admin.



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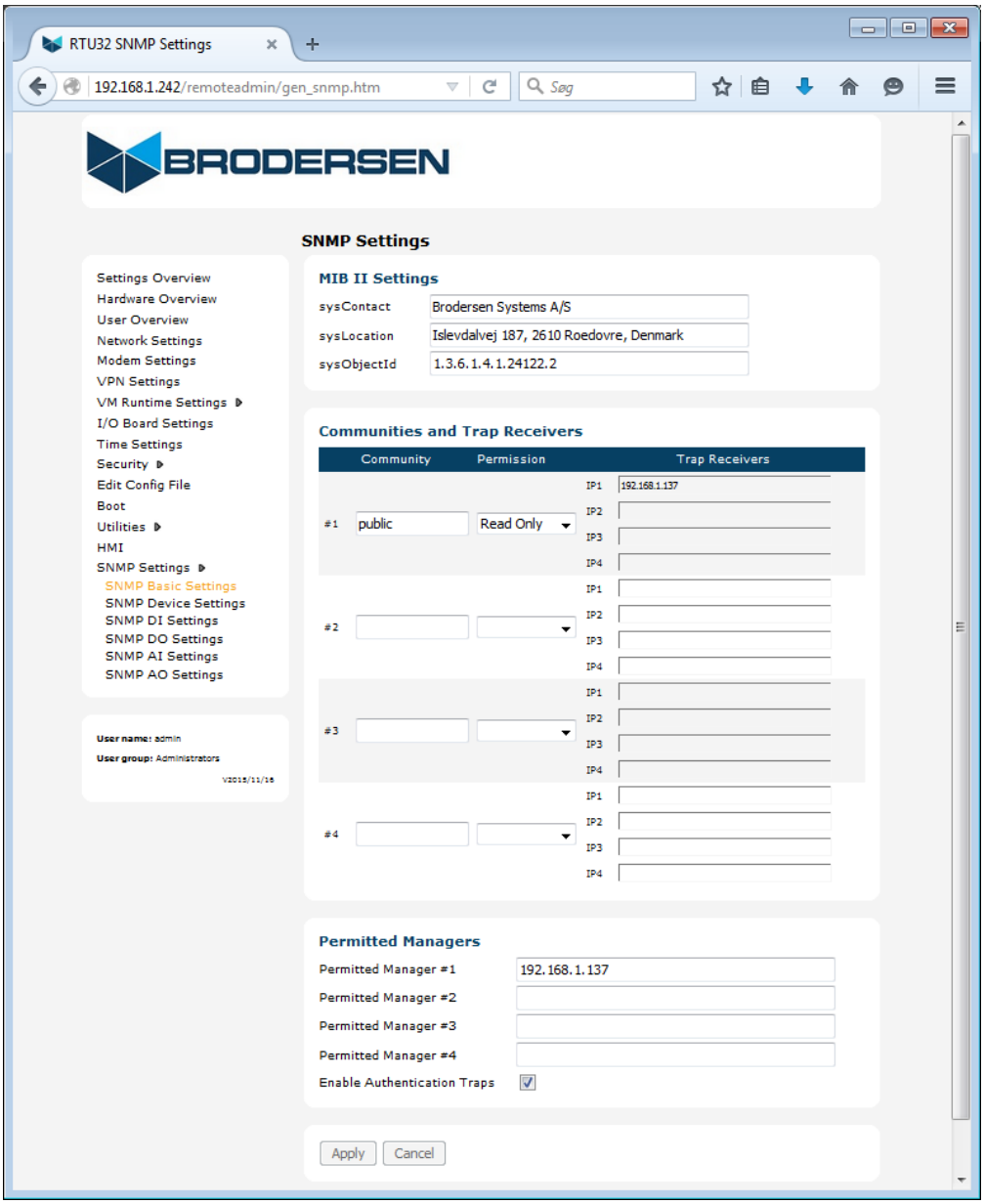
5. SNMP Basic Configuration

The "SNMP Settings" page covers the basic settings of the SNMP Agent driver in the RTU32. It covers both settings for the basic WinCE Agent Driver which report network parameters and the RTU32 SNMP Alarm Extension Agent. The basic RTU32 SNMP Agent is handled by the WinCE OS and includes the standard functions for network data and statistics implemented by Microsoft©.

The configurable parameters for the SNMP Agent Driver are listed in the following sections.

5.1 Basic SNMP settings



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5.1.1 MIB II Settings

MIB II is the basic WinCE SNMP Agent. It is possible to define specific information in the basic agent. The information covers Contact, Location and Object Id. NOTE: Do not remove the object id unless you have full control over the SNMP Manager settings.

5.1.2 SNMP Communities and Trap receivers

In this configuration area you are able to set-up up to 4 communities with each 4 SNMP Managers' IP addresses. Note that the community "public" is default and normally recognised by all SNMP Management software. In addition each community can be adjusted to different levels of access permissions. Note also that permission is default set to Read Only. Remember to change this if you want to control outputs.

5.1.2.1 Generic Traps

Some Generic Traps are generated by the RTU32 SNMP as default. These include:

ColdStart: When the RTU32 SNMP is started it sends two Cold Start Traps. One from the Microsoft SNMP agent with enterprise ID:

- enterprise: 1.3.6.1.4.1.311.1.1.3.3 (iso.3.6.1.4.1.311.1.1.3.3)

And one from the Brodersen SNMP agent, with enterprise ID:

- enterprise: 1.3.6.1.4.1.24122.2 (iso.3.6.1.4.1.24122.2)

AutenticationFailure: authentication traps will be generated when a request is received from a non-valid manager or community. This is enabled/disabled on the web page: SNMP Basic Settings.

5.1.2.2 Trap Receivers for Generic Traps and I/O Alarms

Generic trap receivers are specified in then "SNMP Basic Settings" page. I/O Trap alarms are also sent to these trap receivers if there is no specific trap destinations specified on the specific I/O.

If however individual trap destinations are defined for the specific I/O then the trap will sent to the generic trap receivers. This means that I/O Alarm Traps are sent either to the generic trap receiver or the trap destinations specified individually on each I/O, and not to both lists.

5.1.3 Permitted Managers

You can control access to Get/GetNext request and Set commands by adding Permitted Managers IP addresses. If no SNMP Managers are entered, all Managers are allowed access.

If you enable the Authentication Trap function, the permitted managers will get a Trap report if unauthorized requests have been attempted.

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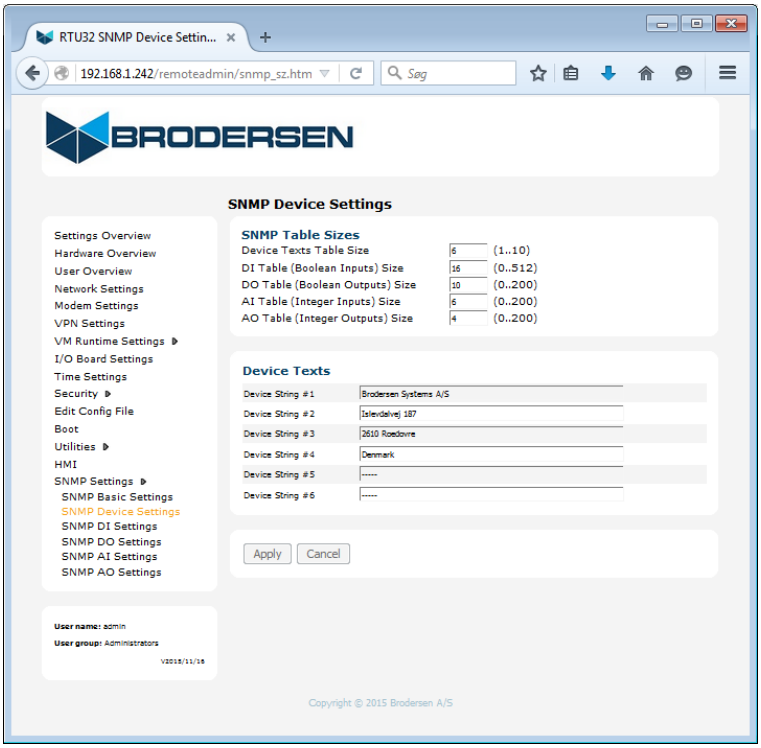
6. SNMP Device settings



6.1 SNMP Table Sizes Section

You must here define the numbers of Device texts and I/O configuration you want to work with. You may freely define the number of I/Os with-in the limits shown in brackets.

6.2 Device Texts Section

Here you define text strings that describe details of the device. Each text string is defined in SNMP with its own OID.

7. SNMP DI Settings / Digital (Boolean) Input

SNMP digital (Booleans) inputs are configured on this page. Each digital input in a system configuration is assigned a number starting from 0 to max 511. If you have only the basic module with 16 digital inputs, you will physically have SNMP DI 0 to 15. If you have added a 32 digital expansion module you will have SNMP DI 0 to 47 (16+32). The numbers of SNMP DI available is according to your settings on the Device Setting page.
The DIs can be monitored with SNMP Get commands. Each DI is defined by an OID id in the MIB file.

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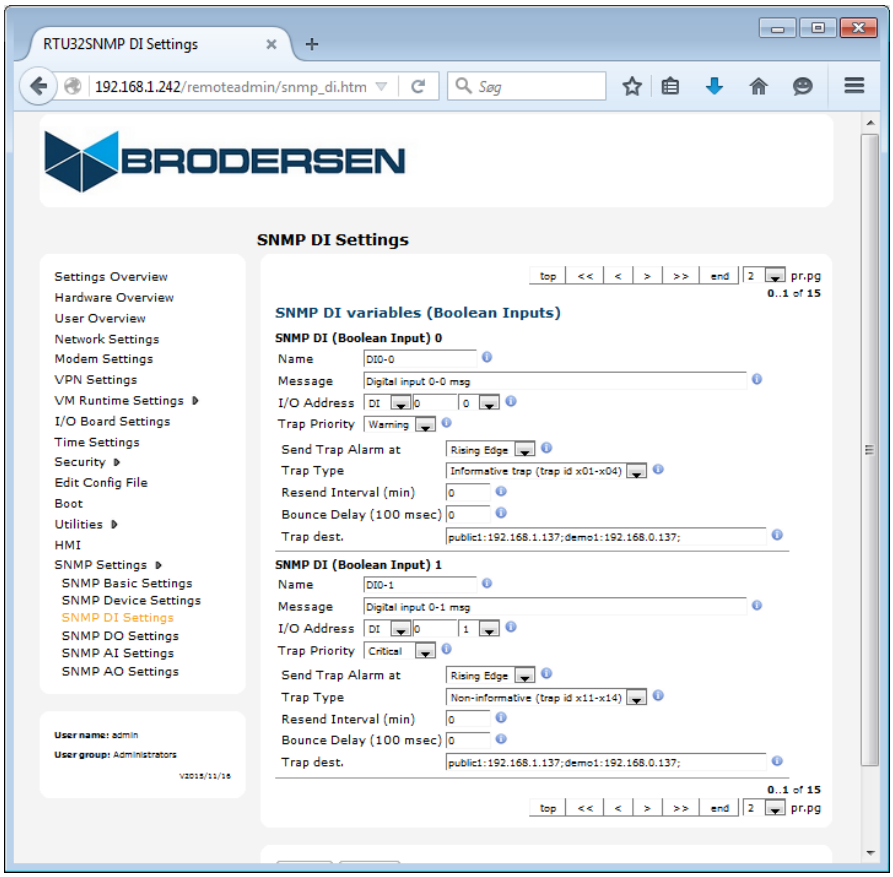

Name / Description of input: (text)
Description of the actual inputs. It could be UPS main monitor, door alarm etc. Max.30 characters.

Message / Description of alarm: (text)
Description of the alarm event, like UPS failure, door open alarm etc. Max.255 characters.

I/O Address
See the section for I/O addressing.

Trap Priority
Enables and define Trap priority. There are 5 possibilities;

- Disabled (1) – disable Trap for this DI
- Warning (2) – DI will send warning Trap
- Minor (3) – DI will send minor Trap
- Major (4) – DI will send major Trap
- Critical (5) – DI will send critical Trap

Send Trap alarm at / Send Trap conditions
The condition for sending Trap – send trap on DI rising edge (OFF to ON) or DI falling edge (ON to OFF).

Trap Type
The Trap can be select if it should be as informative or none–informative type. If informative the Trap contains all user variables, descriptions and texts.
If none-informative Trap it contain only value and priority – and readable ASCII are not transmitted.

Resend Interval (min)
Define the resend interval in minutes. If set to 0 the Trap is only send once.

Bounce Delay (100 msec)

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Defines how many milliseconds the input change should be active before the alarm Trap is sent.

Trap Destinations

A trap destination is a combination of a community and IP address. It is entered in the form:

community:IPaddr;

It is possible to enter 4 destinations.
Some examples:

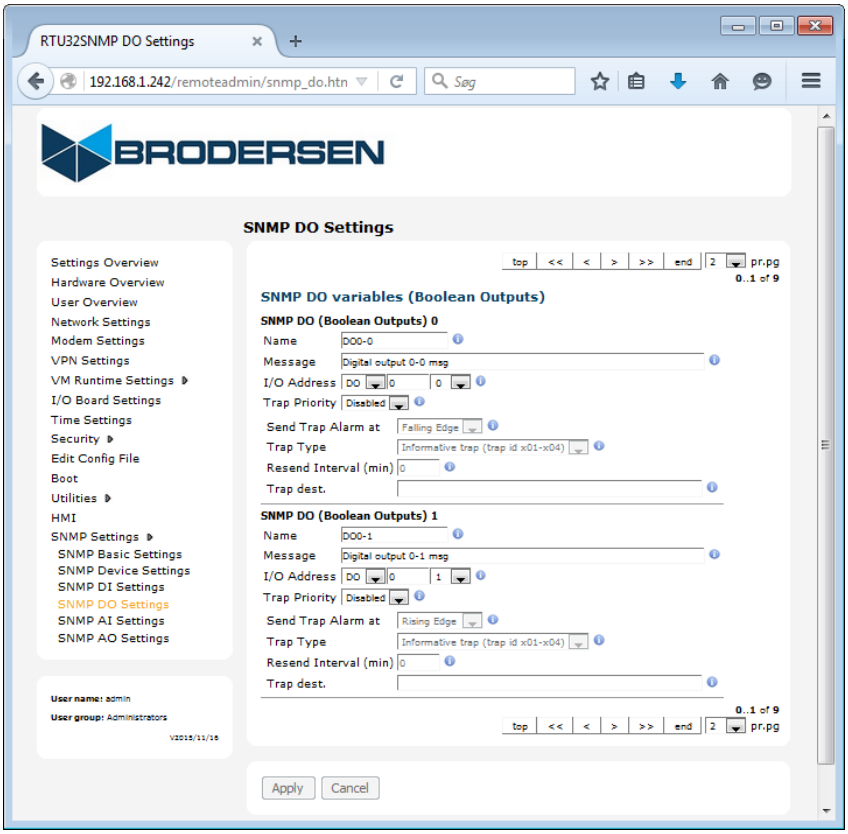
public:192.168.1.123;
public:192.168.1.123;users:10.1.1.123;system:192.1.1.234;

This trap receiver configuration is an alternative to the "Communities and Trap Receivers" configuration on the SNMP Basic Settings page. If a trap receiver is entered here then the trap will be sent to those addresses and not the one specified on the SNMP Basic Settings page.

8. SNMP DO Settings / Digital (Boolean) outputs

SNMP digital (Booleans) outputs are configured on this page. Each digital output in a system configuration is assigned a number starting from 0 to max 200. If you have only the basic module with 4 digital inputs (relay outputs), you will physically have SNMP DO 0 to 3. If you have added a 16 Relay output expansion module you will have SNMP DI 0 to 19. The numbers of SNMP DO available is according to your settings on the Device Setting page.
The relay outputs can be controlled with SNMP Set commands. Each relay output is defined by an OID id in the MIB file.

The SNMP digital outputs are configured on the SNMP DO Settings page;



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The parameters for each physical relay output are configured as follows:

Name / Description of output: (text)
Description of the actual output. It could be control of emergency shut down, change of equipment settings, acknowledge of alarm etc. Max.30 characters.

Message / Description of alarm: (text)
Description of the output controlled by the manager – like door alarm acknowledged etc. The Trap will always be a consequence of a Manager controlled change. Max.255 characters.

I/O Address
See the section for I/O addressing.

Trap Priority
Enables and define Trap priority. There are 5 possibilities;
Disabled (1) – disable Trap for this DO
Warning (2) – DO will send warning Trap
Minor (3) – DO will send minor Trap
Major (4) – DO will send major Trap
Critical (5) – DO will send critical Trap

Send Trap alarm at / Send Trap conditions
The condition for sending Trap – send trap on DO rising edge (OFF to ON) or DO falling edge (ON to OFF).

Trap Type
The Trap can be select if it should be as informative or none–informative type. If informative the Trap contains all user variables, descriptions and texts.
If none-informative Trap it contain only value and priority – and readable ASCII are not transmitted.

Resend Interval (min)
Define the resend interval in minutes. If set to 0 the Trap is only sent once.

Trap Destinations

A trap destination is a combination of a community and IP address. It is entered in the form:

community**:**IPaddr**;**

It is possible to enter 4 destinations.
Some examples:

public:192.168.1.123;
public:192.168.1.123;users:10.1.1.123;system:192.1.1.234;

This trap receiver configuration is an alternative to the "Communities and Trap Receivers" configuration on the SNMP Basic Settings page. If a trap receiver is entered here then the trap will be sent to those addresses and not the one specified on the SNMP Basic Settings page.

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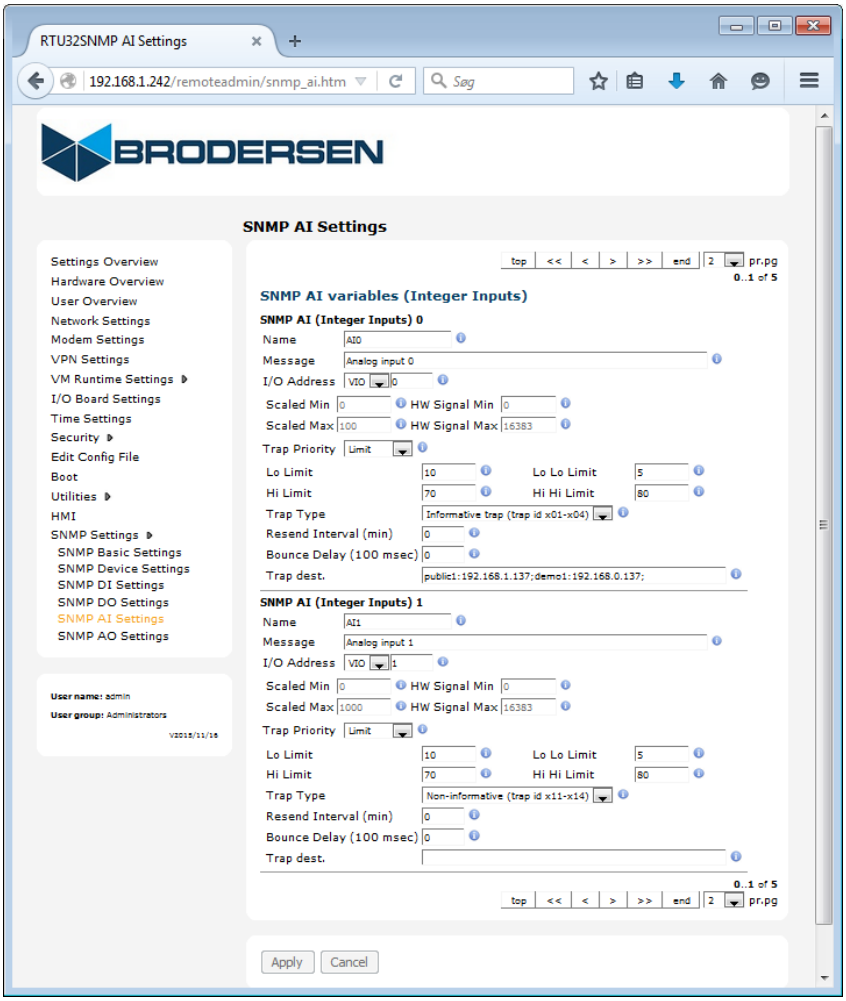
9. SNMP AI Settings / Analogue inputs (Integers)

SNMP AI reported on analogue inputs are configured on this page.



Each analogue input in a system configuration is assigned a number starting from 0, 1, 2, etc. If you have only the basic module with 4 analogue inputs, you will physically have alarm inputs 0 to 3. If you have added an 8 analogue expansion module, you will have alarm inputs 0 to 11. The numbers of SNMP AI available is according to your settings on the Device Setting page.
Traps are defined in up to 4 configurable alarm levels. They are called Lo Lo, Lo, Hi and Hi Hi. The levels are defined in scaled values.

The parameters for each SNMP AI are configured with:

Name / Description of input: (text)
Description of the actual input. It could be UPS voltage level, in house temperature etc. Max.30 characters.

Message / Description of alarm: (text)
Description of the alarm event, like UPS voltage level failure etc. Max.255 characters

I/O Address
See the section for I/O addressing.

Scaled Min.
Defines the scaled minimum value (the scaled value is the value you want to get/read at the manager).

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Scaled Max.
Defines the scaled minimum value (the scaled value is the value you want to get/read at the manager).

HW Signal Min.
HW signal min is the minimum value for the physical input. Normally it is 0.

HW Signal Max.
HW signal max is the maximum value for the physical input. If the AI has resolution of 14bit it is 16383, and if it is 12bit it is 4095. In general the RTU32 AI is 14bit and expansion module AI is 12 bit.

Trap Priority
Enables and define Trap priority. There are 6 possibilities:

- Disabled (1) – disable Trap for this AI
- Warning (2) – send warning Trap
- Minor (3) – send minor Trap
- Major (4) – send major Trap
- Critical (5) – send critical Trap
- Limit (6) – send limit information Trap

If you select 2-6 you will receive Trap type for each alarm level e.g. a HiHi (high-high) Trap alarm.
If priority 2-5 you get the selected priority for all alarm levels. The value and other info will still be available in the Trap.

Limit level settings
You can define trap alarms in 4 levels – LoLo, Lo, Hi and HiHi. Level is defined as Scaled Value. If you don't want to use all levels, you must define the range to be either very high or very low so the actual levels are not reached at any time.

Trap Type
The Trap can be select if it should be as informative or none–informative type. If informative the Trap contains all user variables, descriptions and texts.
If none-informative Trap it contain only value and priority – and readable ASCII are not transmitted.

Resend Interval (min)
Define the resend interval in minutes. If set to 0 the Trap is only send once.

Bounce Delay (100 msec)
Defines how many milliseconds the actual level should be reached before the alarm Trap is sent.

Trap Destinations

A trap destination is a combination of a community and IP address. It is entered in the form:

community**:**IPaddr**;**

It is possible to enter 4 destinations.
Some examples:

public:192.168.1.123;
public:192.168.1.123;users:10.1.1.123;system:192.1.1.234;

This trap receiver configuration is an alternative to the "Communities and Trap Receivers" configuration on the SNMP Basic Settings page. If a trap receiver is entered here then the trap will be sent to those addresses and not the one specified on the SNMP Basic Settings page.

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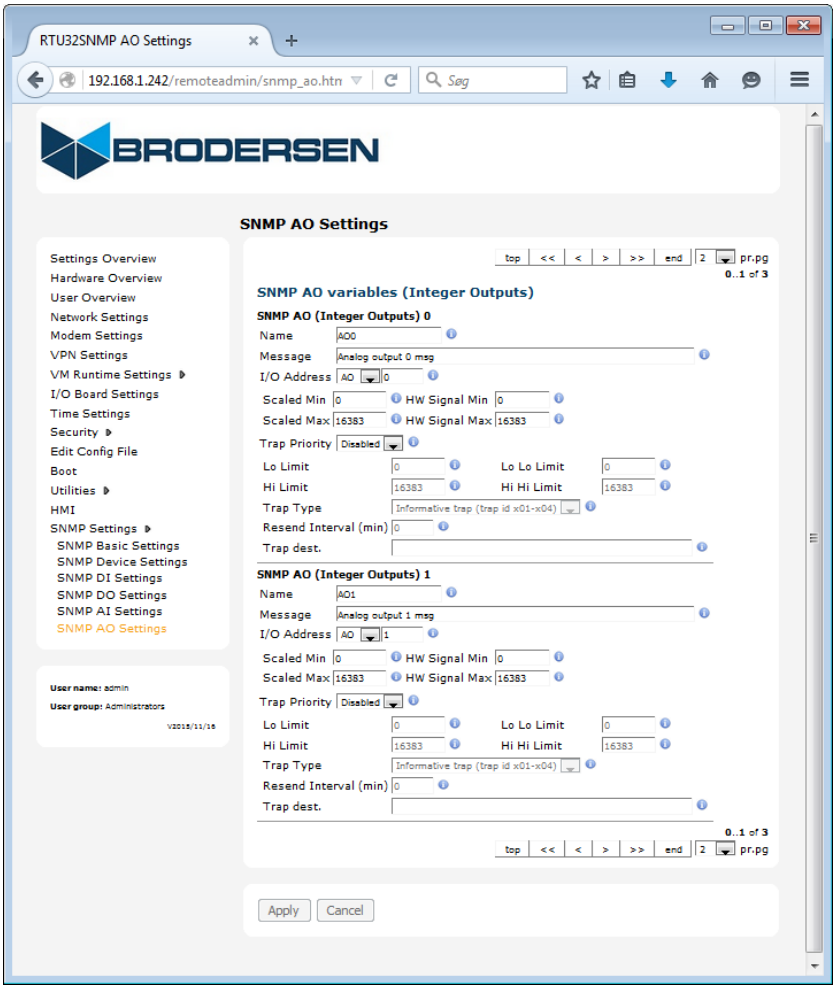
10. SNMP AO Settings / Analogue output (Integers)

SNMP AO reported on analogue outputs are configured on this page.



Each analogue output in a system configuration is assigned a number starting from 0, 1, 2, etc. If you have only the basic module with 2 analogue outputs, you will physically have analogue outputs 0 to 1. If you have added a 4 analogue expansion module, you will have outputs 0 to 5. The numbers of SNMP AO available is according to your settings on the Device Setting page.
The analogue outputs can be controlled with SNMP Set commands. Each output is defined by an OID id in the MIB file. Note that you use the scaled resolution when setting values.

Traps are defined in up to 4 configurable alarm levels for the output. They are called Lo Lo, Lo, Hi and Hi Hi. The levels are also defined in scaled values.
The parameters for each SNMP AO are configured with:

Name / Description of output: (text)
Description of the actual output. It could be air conditioning system set point etc. Max.30 characters.

Message / Description of alarm/info: (text)
Description of the event, like A/C set point adjusted to low level. Max.255 characters.

I/O Address
See the section for I/O addressing.

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Scaled Min.
Defines the scaled minimum value (the scaled value is the value you want to set/write at the manager).

Scaled Max.
Defines the scaled maximum value (the scaled value is the value you want to set/write at the manager).

HW Signal Min.
HW signal min is the minimum value for the physical output resolution. Normally it is 0.

HW Signal Max.
HW signal max is the maximum resolution value for the physical output. If the AO has resolution of 14bit it is 16383, and if it is 12bit it is 4095. In general the RTU32 internal AI is 14bit and expansion module AI is 12 bit.

Trap Priority
Enables and define Trap priority. There are 6 possibilities:

- Disabled (1) – disable Trap for this AO
- Warning (2) – send warning Trap
- Minor (3) – send minor Trap
- Major (4) – send major Trap
- Critical (5) – send critical Trap
- Limit (6) – send limit information Trap

If you select send limit Trap, you will receive Trap type for each alarm level e.g. a HiHi (high-high) Trap alarm. If priority 2-5 you get the selected priority for all alarm levels. The value and other info will still be available in the Trap.

Limit level settings
You can define trap alarms in 4 levels – LoLo, Lo, Hi and HiHi. Level is defined as Scaled Value. If you don't want to use all levels, you must define the range to be either very high or very low so the actual levels are not reached at any time.

Trap Type
The Trap can be select if it should be as informative or none–informative type. If informative the Trap contains all user variables, descriptions and texts.
If none-informative Trap it contain only value and priority – and readable ASCII are not transmitted.

Resend Interval (min)
Define the resend interval in minutes. If set to 0 the Trap is only send once.

Trap Destinations

A trap destination is a combination of a community and IP address. It is entered in the form:

community:IPaddr;

It is possible to enter 4 destinations.
Some examples:

public:192.168.1.123;
public:192.168.1.123;users:10.1.1.123;system:192.1.1.234;

This trap receiver configuration is an alternative to the "Communities and Trap Receivers" configuration on the SNMP Basic Settings page. If a trap receiver is entered here then the trap will be sent to those addresses and not the one specified on the SNMP Basic Settings page.

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11. I/O Addressing

11.1 Introduction

The addressing of I/Os in the configuration pages are actually quite simple if you understand the structure. The addressing is as standard supposed to be direct to physical embedded I/Os and I/Os in expansion modules. See section about optional addressing if you require more local control of special handling of events, grouping of alarms etc.
Note that in addressing everything is counted from 0 (zero). That means that the first input will be addressed as 0, the second as 1 etc.
In Appendix 1 you will find an I/O addressing guide which will be helpful when you read the next sections about I/O addressing.

11.2 Addressing of digital I/Os – DI/DO

DI and DO is Boolean data types (single bits). At addressing the bits are bundled in words (sections of 16 bits) which is defined as "modules".
For each DI or DO you must define:

- I/O type: DI or DO
- Module no: 0….n
- Bit no: 0…15

Example:

Physical input placed furthest to right on the RTU32 has address DI-0-15 as:

- it is the first DI word (bundle of 16 digital input bits) = module 0
- it is the last bit in the word = bit no 15

When you add I/O expansion modules to your RTU32, you will count the modules (words) from the basic module and out to the last expansion module – and note that each type (DI, DO) is counted separately.

11.3 Addressing of analogue I/Os – AI/AO

AI and AO are Word data types. At addressing they are just counted from the basic module to that last expansion module. And note that each type (AI, AO) is counted separately.

Example:

Physical analogue input placed furthest to right on the RTU32 has address AI-3 as there is 4 AIs on the basic module and the last one will be addressed =3 (the first 3 AIs has address 0, 1 and 2).

11.4 Optional Addressing – VIO

In all drop down addressing menus you will find that you can select the VIO option instead of e.g. DI or AI. This optional addressing is only used if you want to use I/Os from another user program. In this case the SNMP OIDs will not be linked to physical I/Os but are available to be linked to either an Embedded C or Worksuite program. The VIO a range of Virtual I/Os in a database. This database can be accessed by STRATON Worksuite or your own program in C, VBA, C# etc. Contact Brodersen A/S support if you want to learn more.

12. OID Structure and MIB

12.1 Introduction

OID structure is in general structured as defined in the RTU32 MIB file RTU32_2.MIB. The MIB file is supporting tables as commonly used by SNMP managers.

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The MIB file for the RTU32 SNMP agent module is used for defining the SNMP variables for SNMP Managers.

12.2 MIB and OID – general information

The MIB file for the RTU32 SNMP module is used for defining the SNMP variables for an SNMP Manager. The MIB file is entered in the SNMP Manager software and compiled to configure the SNMP manager to work with RTU32 SNMP.

The primary OID is defined according to the RFC specifications for SNMP, and the unique OID address for the RTU32 as an alarm, monitoring and control device in networks is:

1.3.6.1.4.1.24122.2….. (iso.org.dod.internet.private.enterprises……)

where the "24122" is the Brodersen Systems A/S branch id and the ".2" is the unique RTU32 device id.

The Microsoft© WinCE operating system in RTU32 also provides basic information about the basic IPC hardware, network interfaces etc. The OID for this is defined in the standard MIBII – and will be recognized by the enterprise id 311 which belongs to Microsoft©.
OID overview can be read in RTU32_2.MIB file, where a MIB view is listed in the start of the file. In the next section you will find the OID structure where we have added some comments we consider necessary to understand the structure and define OID addresses for each single input/output information.

12.3 MIB and OID - overview

Below the OID structure is listed with some notes (in italic). The MIB view explains in short form that OID structure – and if you require details you may find every OID described later in the MIB file.

Anyway there is some general information we consider important to list here;

- The {rtu32a2} equals the general part of the IOD address: 1.3.6.1.4.1.24122.2 – and you can then build up the OID for a single entry by adding this to the address in the MIB view. As example will the value for the first input Boolean have the OID address: 1.3.6.1.4.1.24122.2.3.2.1.3.1
- Some notes are marked in the MIB view – see end of view for details.

```
-- ************************************************************************
-- MIB View (short form)
-- ************************************************************************
-- info                            {rtu32a2}.1
   --   infoVersion                {rtu32a2}.1.1.0
   --   infoTrapIdx                {rtu32a2}.1.2.0 (see note 1)
   --   infoConfigCmd              {rtu32a2}.1.3.0
   --   infoConfigCmdResult        {rtu32a2}.1.4.0
   --   infoTableSizeDevice        {rtu32a2}.1.11.0
   --   infoTableSizeInpBool       {rtu32a2}.1.12.0
   --   infoTableSizeInpInt        {rtu32a2}.1.13.0
   --   infoTableSizeOutBool       {rtu32a2}.1.15.0
   --   infoTableSizeOutInt        {rtu32a2}.1.16.0
   --   infoDebugString            {rtu32a2}.1.101.0
   --   infoDebugNumber            {rtu32a2}.1.102.0
-- device                          {rtu32a2}.2
--   dtNumber                      {rtu32a2}.2.1.0
--   dtDeviceTable                 {rtu32a2}.2.2
--     dtDeviceEntry               {rtu32a2}.2.2.1
--       dtDeviceIndex             {rtu32a2}.2.2.1.1.row(1..dtNumber)
--       dtDeviceString            {rtu32a2}.2.2.1.2.row(1..dtNumber)
-- inpboolean                      {rtu32a2}.3
--   ibInpBoolNumber               {rtu32a2}.3.1.0
--   ibInpBoolTable                {rtu32a2}.3.2
--     ibInpBoolEntry              {rtu32a2}.3.2.1
--       ibInpBoolIndex            {rtu32a2}.3.2.1.1.row(1..ibInpBoolNumber)
--       ibInpBoolAlias            {rtu32a2}.3.2.1.2.row(1..ibInpBoolNumber)
--       ibInpBoolValue            {rtu32a2}.3.2.1.3.row(1..ibInpBoolNumber)
--       ibInpBoolTrapActive       {rtu32a2}.3.2.1.4.row(1..ibInpBoolNumber)
--       ibInpBoolMsg              {rtu32a2}.3.2.1.5.row(1..ibInpBoolNumber)
--       ibInpBoolTrapPriority     {rtu32a2}.3.2.1.6.row(1..ibInpBoolNumber)
--       ibInpBoolInformativeTrap  {rtu32a2}.3.2.1.7.row(1..ibInpBoolNumber)
--       ibInpBoolOrigin           {rtu32a2}.3.2.1.8.row(1..ibInpBoolNumber)
```


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```
--       ibInpBoolModuleNo          {rtu32a2}.3.2.1.9.row(1..ibInpBoolNumber)
--       ibInpBoolBitNo             {rtu32a2}.3.2.1.10.row(1..ibInpBoolNumber)
--       ibInpBoolSendTrapAt        {rtu32a2}.3.2.1.11.row(1..ibInpBoolNumber)
--       ibInpBoolTrapResend        {rtu32a2}.3.2.1.12.row(1..ibInpBoolNumber)
--       ibInpBoolResendCount       {rtu32a2}.4.2.1.13.row(1..ibInpBoolNumber)
--       ibInpBoolBounceDelay       {rtu32a2}.3.2.1.14.row(1..ibInpBoolNumber)
-- inpinteger                       {rtu32a2}.4
--   iiInpIntNumber                 {rtu32a2}.4.1.0
--   iiInpIntTable                  {rtu32a2}.4.2
--     iiInpIntEntry                {rtu32a2}.4.2.1
--       iiInpIntIndex              {rtu32a2}.4.2.1.1.row(1..iiInpIntNumber)
--       iiInpIntAlias              {rtu32a2}.4.2.1.2.row(1..iiInpIntNumber)
--       iiInpIntValue              {rtu32a2}.4.2.1.3.row(1..iiInpIntNumber)
--       iiInpIntAlarmLevel         {rtu32a2}.4.2.1.4.row(1..iiInpIntNumber)
--       iiInpIntMsg                {rtu32a2}.4.2.1.5.row(1..iiInpIntNumber)
--       iiInpIntTrapPriority       {rtu32a2}.4.2.1.6.row(1..iiInpIntNumber)
--       iiInpIntInformativeTrap    {rtu32a2}.4.2.1.7.row(1..iiInpIntNumber)
--       iiInpIntOrigin             {rtu32a2}.4.2.1.8.row(1..iiInpIntNumber)
--       iiInpIntModuleNo           {rtu32a2}.4.2.1.9.row(1..iiInpIntNumber)
--       iiInpIntLoLoLimit          {rtu32a2}.4.2.1.10.row(1..iiInpIntNumber)
--       iiInpIntLoLimit            {rtu32a2}.4.2.1.11.row(1..iiInpIntNumber)
--       iiInpIntHiLimit            {rtu32a2}.4.2.1.12.row(1..iiInpIntNumber)
--       iiInpIntHiHiLimit          {rtu32a2}.4.2.1.13.row(1..iiInpIntNumber)
--       iiInpIntTrapResend         {rtu32a2}.4.2.1.14.row(1..iiInpIntNumber)
--       iiInpIntResendCount        {rtu32a2}.4.2.1.15.row(1..iiInpIntNumber)
--       iiInpIntBounceDelay        {rtu32a2}.4.2.1.16.row(1..iiInpIntNumber)
--       iiInpIntScaleMin           {rtu32a2}.4.2.1.17.row(1..iiInpIntNumber)
--       iiInpIntScaleMax           {rtu32a2}.4.2.1.18.row(1..iiInpIntNumber)
--       iiInpIntAIMin              {rtu32a2}.4.2.1.19.row(1..iiInpIntNumber)
--       iiInpIntAIMax              {rtu32a2}.4.2.1.20.row(1..iiInpIntNumber)
-- outboolean                       {rtu32a2}.6
--   obOutBoolNumber                {rtu32a2}.6.1.0
--   obOutBoolTable                 {rtu32a2}.6.2
--     obOutBoolEntry               {rtu32a2}.6.2.1
--       obOutBoolIndex             {rtu32a2}.6.2.1.1.row(1..obOutBoolNumber)
--       obOutBoolAlias             {rtu32a2}.6.2.1.2.row(1..obOutBoolNumber)
--       obOutBoolValue             {rtu32a2}.6.2.1.3.row(1..obOutBoolNumber)
--       obOutBoolTrapActive        {rtu32a2}.6.2.1.4.row(1..obOutBoolNumber)
--       obOutBoolMsg               {rtu32a2}.6.2.1.5.row(1..obOutBoolNumber)
--       obOutBoolTrapPriority      {rtu32a2}.6.2.1.6.row(1..obOutBoolNumber)
--       obOutBoolInformativeTrap   {rtu32a2}.6.2.1.7.row(1..obOutBoolNumber)
--       obOutBoolOrigin            {rtu32a2}.6.2.1.8.row(1..obOutBoolNumber)
--       obOutBoolModuleNo          {rtu32a2}.6.2.1.9.row(1..obOutBoolNumber)
--       obOutBoolBitNo             {rtu32a2}.6.2.1.10.row(1..obOutBoolNumber)
--       obOutBoolSendTrapAt        {rtu32a2}.6.2.1.11.row(1..obOutBoolNumber)
--       obOutBoolTrapResend        {rtu32a2}.6.2.1.12.row(1..obOutBoolNumber)
--       obOutBoolResendCount       {rtu32a2}.4.2.1.13.row(1..obOutBoolNumber)
-- outinteger                       {rtu32a2}.7
--   oiOutIntNumber                 {rtu32a2}.7.1.0
--   oiOutIntTable                  {rtu32a2}.7.2
--     oiOutIntEntry                {rtu32a2}.7.2.1
--       oiOutIntIndex              {rtu32a2}.7.2.1.1.row(1..oiOutIntNumber)
--       oiOutIntAlias              {rtu32a2}.7.2.1.2.row(1..oiOutIntNumber)
--       oiOutIntValue              {rtu32a2}.7.2.1.3.row(1..oiOutIntNumber)
--       oiOutIntAlarmLevel         {rtu32a2}.7.2.1.4.row(1..oiOutIntNumber)
--       oiOutIntMsg                {rtu32a2}.7.2.1.5.row(1..oiOutIntNumber)
--       oiOutIntTrapPriority       {rtu32a2}.7.2.1.6.row(1..oiOutIntNumber)
--       oiOutIntInformativeTrap    {rtu32a2}.7.2.1.7.row(1..oiOutIntNumber)
--       oiOutIntOrigin             {rtu32a2}.7.2.1.8.row(1..oiOutIntNumber)
--       oiOutIntModuleNo           {rtu32a2}.7.2.1.9.row(1..oiOutIntNumber)
--       oiOutIntLoLoLimit          {rtu32a2}.7.2.1.10.row(1..oiOutIntNumber)
--       oiOutIntLoLimit            {rtu32a2}.7.2.1.11.row(1..oiOutIntNumber)
--       oiOutIntHiLimit            {rtu32a2}.7.2.1.12.row(1..oiOutIntNumber)
--       oiOutIntHiHiLimit          {rtu32a2}.7.2.1.13.row(1..oiOutIntNumber)
--       oiOutIntTrapResend         {rtu32a2}.7.2.1.14.row(1..oiOutIntNumber)
--       oiOutIntResendCount        {rtu32a2}.7.2.1.15.row(1..oiOutIntNumber)
--       oiOutIntScaleMin           {rtu32a2}.7.2.1.16.row(1..oiOutIntNumber)
--       oiOutIntScaleMax           {rtu32a2}.7.2.1.17.row(1..oiOutIntNumber)
--       oiOutIntAOMin              {rtu32a2}.7.2.1.18.row(1..oiOutIntNumber)
--       oiOutIntAOMax              {rtu32a2}.7.2.1.19.row(1..oiOutIntNumber)
-- last                             {rtu32a2}.2.100
```

NOTE 1: The infoTrapIdx OID is a sequential counter that gives any trap sent from the device a unique number. This OID is used for acknowledgement of Traps. An additional OID called infoTrapAckx can be implemented for the

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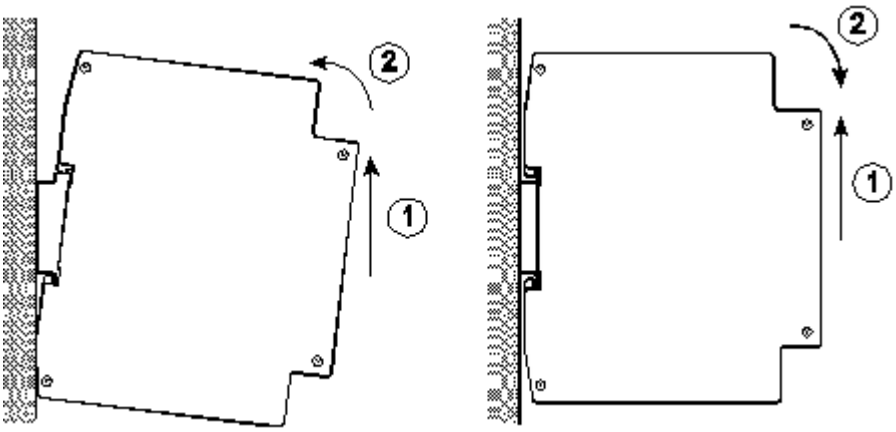
manager to return the unique id of a Trap to report acknowledge of the actual Trap. The RTU32 SNMP Agent will then stop the resending Trap procedure

13. Installation and Wiring

13.1 Mounting

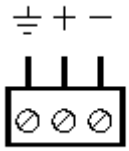
The RTU32 and I/O expansion modules are mounted on a 35mm DIN rail.



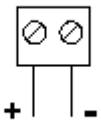
13.2 Power supply

The module is powered by +24-60VDC or -24-60VDC.

Supply input:

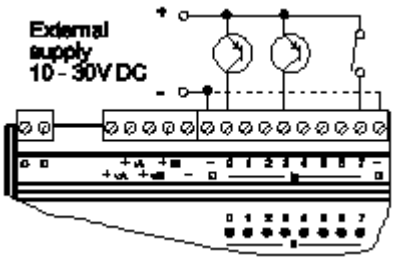


Supply output 12VDC:



13.3 Digital inputs

Digital inputs for alarms are 24-60VDC bipolar inputs. Wiring according to figure below:



13.4 Relay outputs

The relays provide potential free normally open (NO) contacts.

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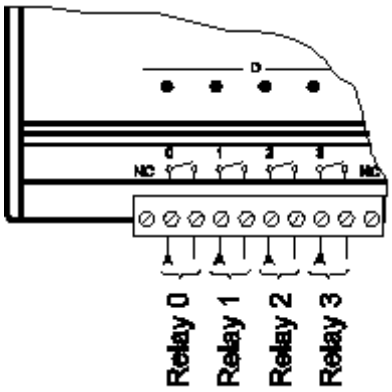
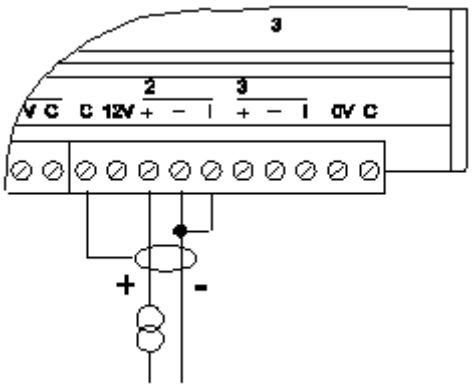


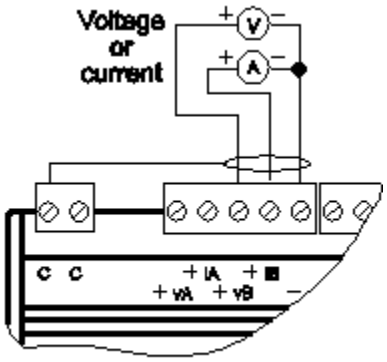
13.5 Analogue inputs

The analogue inputs are sourced by either the 12VDC output on the RTU32 or from the general application current source.



13.6 Analogue outputs

The analogue output sources directly 4-20mA.



13.7 I/O Expansion modules

The I/O Extension modules are connected via Brodersen LocalBus cable.

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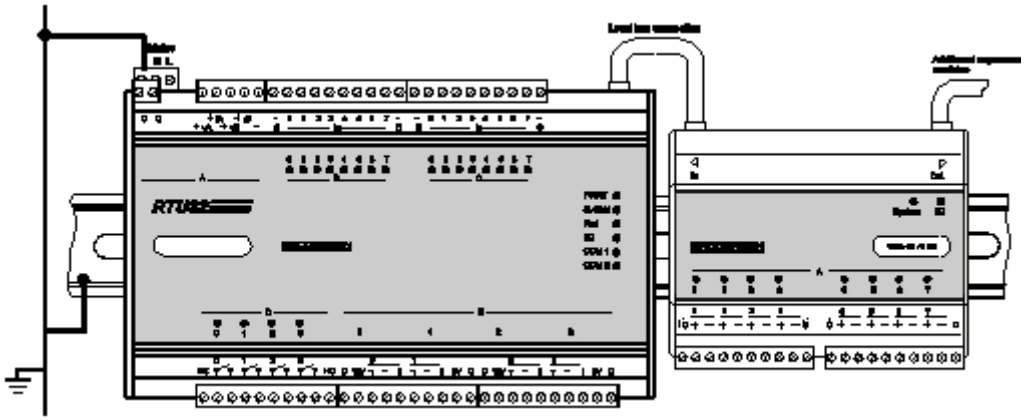


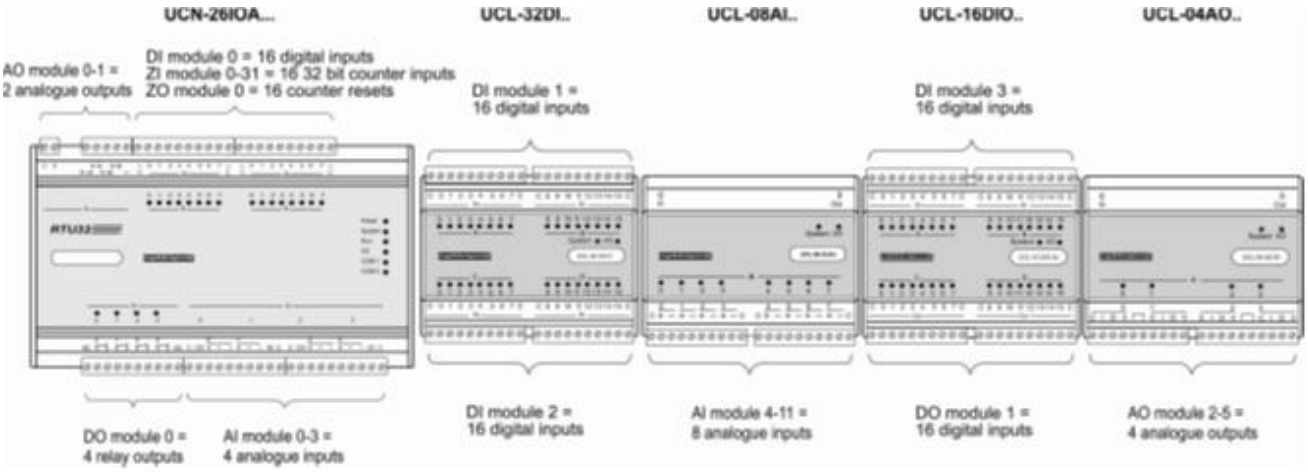
You can find details of the different I/O Expansion modules in the I/O Expansion overview brochure and selection guide. And if you need detailed data sheets that are also available from our home page www.brodersensystems.com.

14. Technical Data

For more technical data details – see RTU32 Data sheet and RTU32 User Guide. Available on our website

15. Appendix 1 – I/O Addressing

Addressing guide – please ignore the ZI and ZO addressing is not available in the SNMP agent and needs to mapped into VIO using Worksuite.



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