

Base Station

Telemetry Gateway A850

User Guide

valid for A850 firmware release 1.0



SMART WIRELESS SOLUTIONS



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Chapter 1. Introduction

Scope

This manual describes the A850 Telemetry Gateway and its use as a Base Station of an Adcon Telemetry Network. Aside of the proprietary Base Station configuration consisting in an A850 Telemetry Gateway combined with an A440 Wireless Modem (“Adcon Wireless Telemetry Network”), also Base Station configurations using different means of communications between the Gateway and the other components of the Adcon Telemetry Network are covered.

Conventions

The following conventions apply to this documentation:

<i>Italics</i>	Indicates that the text formatted that way represents a variable which must be substituted for something specific, in accordance with an appropriate explanation. Otherwise, Italics can also be used just to emphasize certain words or letters.
Bold	Indicates special emphasis of the text, but also menu names and items in a window.
<code>fixed font</code>	Indicates either system messages or characters you must type in.
File » Save	Indicates a menu selection. The example at hand means that you have to select at first the File menu and then the Save option.
Note	Indicates information of interest. Notes appear after the information they apply to.
 CAUTION	Indicates that you may get unexpected results if you don't follow the instructions. Cautions appear before the information they apply to.
 WARNING	Indicates danger to yourself or damage to the device if you don't follow the instructions. Warnings appear before the information they apply to.
<value>	Indicates a required input parameter.
[value]	Indicates an optional input parameter.

What is the A850 Telemetry Gateway?

The A850 Telemetry Gateway is a low-power, battery-backed device that acts as an interface between an Adcon Telemetry Network and one or more hosts running addVANTAGE or similar data acquisition software. The capabilities of the A850 allow to manage up to 1000 Adcon RTUs (Remote Telemetry Units), depending on the version used. In combination with Adcon's Transceiver Module (Wireless Modem) A440, the A850 constitutes the Base Station of an Adcon Wireless Telemetry Network.

The A850 Telemetry Gateway provides the following functions to the user:

- Gateway: the A850 routes data, commands and events between different physical networks (GSM, POTS, LAN, Internet, Adcon Radio Network),
- Protocol converter: the A850 translates data and commands between different protocols (Adcon RTU command line, addUPI),
- Temporary storage: the A850 provides a short-term data buffer for actual and historical data,
- Monitor and debugger: the A850 provides monitoring and debugging capability for the Adcon Radio Network.

The data of the RTUs will be automatically acquired, buffered and forwarded through an Ethernet interface or a modem to one or more PCs for analysis and further utilization.

Thereby, the remote data acquisition (polling) of RTUs can be achieved through

- Wireless Modems A440,
- Telephone Modems,
- GSM Modems or
- TCP connections from GPRS Units.

The forwarding of the data from the A850 to the data assessment PC is achieved either through

- Ethernet or
- Telephone Modem.

For data communication from and to an A850, private (LAN, VPN) or public means for data communications (e.g. the Internet) can be used.

The Gateway is based on a powerful 32 bit ARM processor running the Linux operating system. It has 256 MB Compact Flash acting as a hard disk and 64 MB RAM.

The Compact Flash data storage device of the A850 with its capacity of 256 MB allows to buffer data sampled from 1000 stations for 14 days. The built-in rechargeable battery maintains the function of the A850 also in case of temporary outages of the primary power source for up to approximately 24 hours (the achievable time of operation without mains power depends on the number of RTUs the Gateway has to poll), preventing any data loss. The central unit is prepared for future software updates and can be upgraded on location. The communication with the Wireless Modem A440 mounted e.g. on a roof will be ensured by a serial RS-485 connection. This connection uses a cable which is by default 30 m long and easy to lay. Upon request, special low-attenuation cables of up to 90 m can be provided by Adcon.

The A440 Wireless Modem is a low-power, narrow-band data transceiver operating in the 70 cm band. It implements Adcon's low-speed radio protocol and is therefore compatible with all Adcon RTUs. In addition, the A440 modem supports a high-speed wireless protocol that will be used by future Adcon devices. The A440 has an 8 bit Flash-based microcontroller and can also be updated in the field. The A440 is delivered in an IP-65/67 enclosure.



WARNING This manual is valid only for release 1.0 of the Gateway's firmware. You can verify that you have the appropriate firmware by logging onto the web page of the A850 via your internet browser. The following should be displayed on the bottom of the web page of the A850:

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If firmware upgrades will become available in the future, you will be able to download a new image file from Adcon's web site (<http://www.adcon.at>) to your local PC or to get the new firmware on a data storage device from Adcon's technical support. In any case, as first step, you will have to make the new firmware available in form of an image or on a data storage device on your local PC and then to upgrade your A850 by transferring the new firmware from your local PC to your A850 by either uploading the software, proceeding as described in detail in chapter 2, "Web Interface", "Tools", "Firmware Tools", "Upload an A850 firmware image stored as local file" or, alternatively, by downloading the software from your PC to your A850 as described in chapter 5, "Configuration", "Upgrade your A850 Gateway".

However, as firmware upgrades may have various impacts on the function of the upgraded device, we strongly recommend that you first check on Adcon's web site or by contacting Adcon's technical support which effects you would have to expect from an upgrade before you perform it. Depending on the nature of an upgrade, this documentation may remain valid or may require also changes. Thus, Adcon cannot be held responsible for possible impacts of firmware upgrades made without appropriate precautions and accompanying measures.

Note: for USA: THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE CONDITION THAT THIS DEVICE DOES NOT CAUSE HARMFUL INTERFERENCE.

Adcon's Telemetry Network

The A850 represents the link between the various RTUs and the PC(s) used for evaluating the sensor data and for transmitting control commands, respectively.

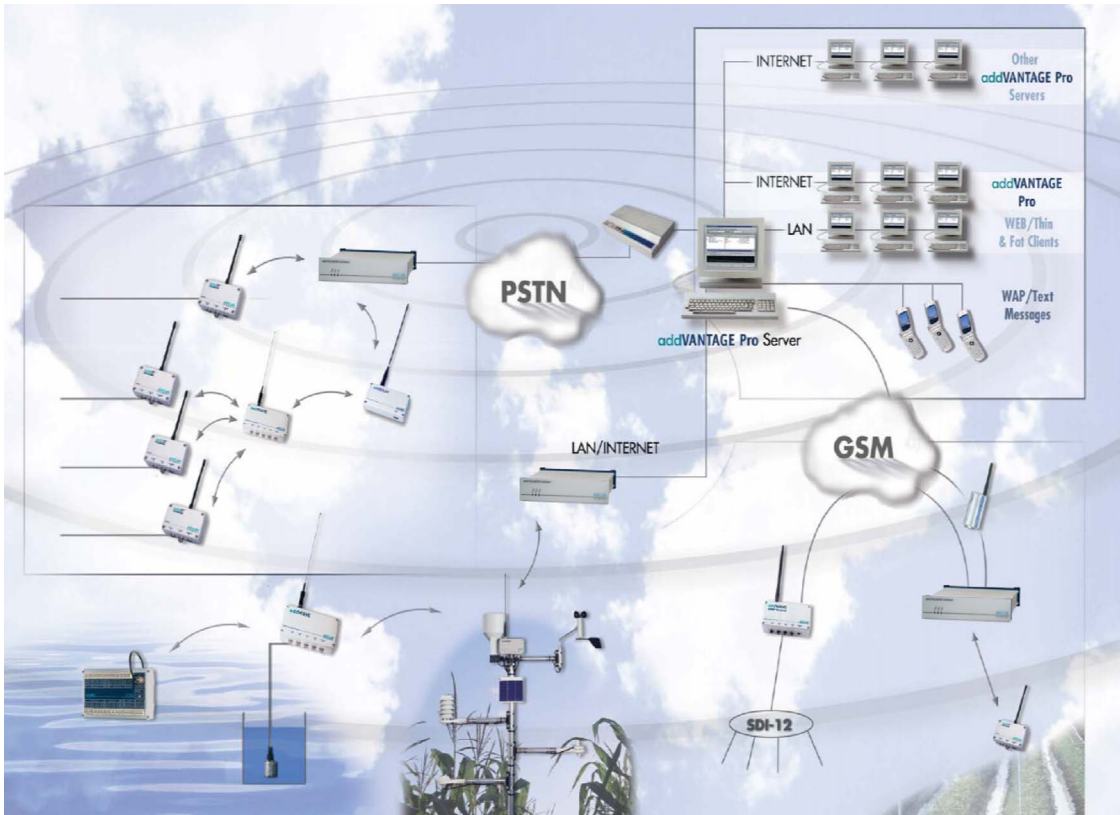


Figure 1. Schematics of a Remote Telemetry Network

To build a Remote Telemetry Network you need the following:

- one or more Remote Telemetry Units (RTUs) A720, A723, A731, A732, A733, A733GSM or A740,

- an A850 Base Station,
- data acquisition and control software, such as Adcon's addVANTAGE Pro 5 software,
- appropriate means of communications to access your Remote Telemetry Units, e.g. an Adcon Wireless Modem A440 or other means of communications, depending on the types of RTUs you are using. Specifically, if you use the A733GSM, you either need a telephone line with external modem or an external GSM modem such as the WorldCom M1206.

Note: For additional information about the RTUs and the addVANTAGE software, consult the respective user manuals.

What's new on the A850 ?

The A850 is the successor of the well proven A840 Gateway and offers the following new features:

- USB device support : USB based devices are supported as long as they conform to the USB standards for the storage or communication device classes. The device types that can be used are
 - USB to RS-232 adapters or
 - USB modems.

Note: A list of supported devices will be provided with the Firmware release notes. Devices not listed may work, but Adcon advises not to try as such attempts and possible damage resulting from it would be at the user's sole and own risk.

- Multiple modem support: The A850 support more than one modem. For every modem, the user can configure
 - a V110 mode whitelist which tells the A850 for which phone number the digital V110 mode is supported (V110 mode is supported by most GSM and ISDN networks, but not by POTS (analog) phone networks),
 - whether the modem should answer incoming calls (and after which number of rings).

Note: A list of supported modems will be provided with the firmware release notes. Devices not listed may work, but Adcon advises not to try as such attempts and possible damage resulting from it would be at the user's sole and own risk.

- Protocol support: The A850 supports encrypted network protocols, namely
 - SSH as replacement for TELNET,
 - HTTPS as replacement for HTTP.

Note: The unencrypted protocols is still be supported, however it is highly recommended not to use them when accessing the A850 over public (insecure) networks (especially the internet).

- Users and user permissions: The A850 support up to 100 users with different user permissions:
 - one root user which may configure the A850 hardware,
 - multiple administrator level users which may configure the RTU network and give RTU access permissions to ordinary users,
 - multiple ordinary users which may query and configure only RTUs and sensors for which they have access permissions.

Note: As default, only the root user is configured.

- Dial-up networking and dynamic IP addresses: To support A850 devices that do not have an official internet hostname and IP address, the following features are supported:
 - dialling an ISP on given schedule, as callback after dialling in and/or when notifications must be delivered,
 - updating dynamic DNS services, such as DynDNS (this requires that the A850 gets an official IP address accessible over the internet after connecting to an ISP. If the A850 is installed in a private network behind a NAT router, dynamic DNS is not guaranteed to work),
 - hiding the A850 behind an SSH server that is accessible from the internet (the A850 can be reached through the SSH server's address).

Note: For each of these services, a secondary (backup) connection may be configured which is used when the primary connection fails.

- RTU routing: The A850 support multiple alternative routes to an ISM-based RTU. Switching between routes is done by examining the usage period of the configured routes (if the usage times of routes overlap, the route with the higher priority is active).
- Polling:
 - The A850 supports multiple polling priorities: all RTUs with higher priority are served first, then all RTUs with

lower priorities. The user is responsible for choosing priorities and polling intervals properly (for example: configuring a short polling interval and a high priority for too many stations may result in RTUs of lower priority never being polled).

- The A850 supports polling multiple RTUs in parallel if they are reached using different modems or A440 interfaces.
- Statistics and monitoring: The A850 supports A850 and RTU network statistics:
 - load, memory and disk usage of the A850,
 - average delay and average radio error rates for the RTUs.
- Sensors: The RF quality, the battery level and the internal temperature of the RTU as well as the statistical data for average RTU delay time and average RTU connection quality may be considered as data from internal sensors of an RTU. This means that the data representing these parameters can be used by addVANTAGE like data from normal sensors.
- User interface: All interactions between the user and the A850 (configuration, monitoring, diagnostics, ...) are done by a JAVA based Graphical User Interface (GUI).

Note: An A440 device connected to an A850 must have firmware revision 3.0.0 or newer.



CAUTION The A850 do not support addVANTAGE 3.x software and the A730MD RTU.

Chapter 2. System Setup

Package Contents

Before proceeding to the installation of your Base Station, first verify that you have received all of the following components:

- the A850 Telemetry Gateway,
- a power cord,
- a serial null modem cable,
- a network cable (twisted-pair standard Ethernet cable),
- a CD with the manual,
- a CE conformity declaration.

If any of the above items is missing, contact your dealer.

If you plan to use the Gateway's built-in modem (e.g. in conjunction with A733GSM/GPRS RTUs), you will also need a modem cable suitable for your telephone jack (not included).

Elements on A850

LED Indicator

LEDs and LED patterns

The device has three LEDs which are forced on during a CPU reset and during the boot process.

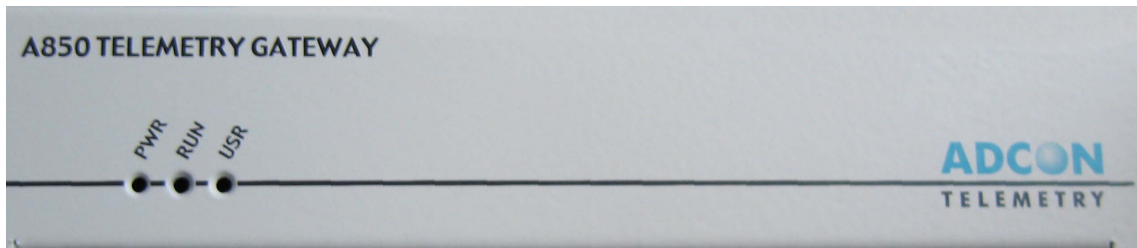


Figure 2. Front of the A850

Table 1. LED pattern

LED	On	Blinking slow	Blinking	Blinking fast	Flashing	Off
PWR	AC present	Battery > 75%	Battery > 50%	Battery > 25%	Battery low	-
RUN	Booting	-	-	Error	No configuration	-
USR	Kernel	-	-	-	RTU activity	Sysinit

All three LEDs are off if there is no power (neither AC nor battery). Please notify that this LED pattern is never used while the system is powered.

All three LEDs are on while the device is in reset state or booting the (Linux) operating system kernel.

The PWR and RUN LEDs are on and the USR LED is off while the A850 is initialized (the CF card is checked, the configuration is loaded and various services are started).

The activity LED flashes for 0.1 seconds if there is an RTU command sent or if the answer is received.

The "Error mode" LED pattern is used if there is a serious hardware error (unable to read CF card).

The "No configuration mode" LED pattern is used as factory default (as long as there is no root password configured and no basic network configuration given).

The "Battery low power" LED pattern is used while shutting down the Gateway due to low battery.

Connectors

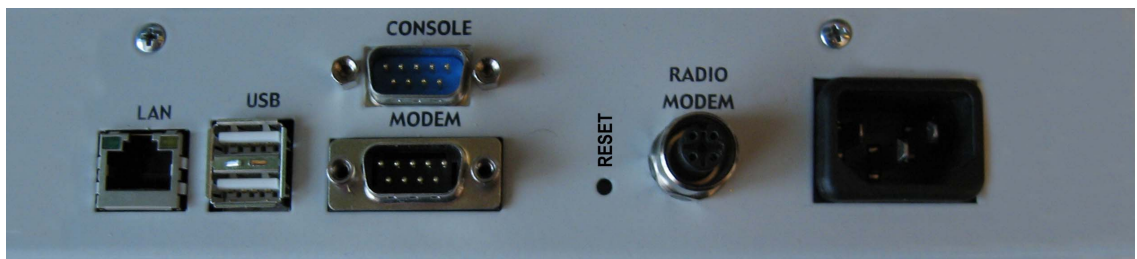


Figure 3. Back of A850

Mains:

AC Power Inlet (3 pin male connector for 90 - 240 V)

Radio Modem (connection to A440):

M 12 circular 4 pin female connector

Modem:

9 pin male D-SUB connector

Console:

9 pin male D-SUB connector

USB:

2 USB slots (USB 2.0 supported)

LAN:

RJ-45 8 pin female connector

Reset Button

The reset button can be reached at the back of the Gateway (by using a short piece of wire, a paperclip or a ballpoint pen). Depending on the AC state the Gateway is reset (if AC is present) or turned off (if no AC is present).

Note: since a reset destroys all configuration changes and measurement data not yet stored in the FLASH, as well as the system messages, the reset button should be only used as an emergency measure (i.e. when there is no other way to reboot the Gateway in a controlled way by using the CLI or web interface).

Installation

Before proceeding with the installation, take a moment to plan your network. First, in a Wireless (Radio) Network, it is essential to realize the importance of selecting a good location for the transceiver and, as the admissible distance between the transceiver and the Gateway is limited, for the complete Base Station. If the A850

is used in combination with one or several Adcon Wireless Modem(s) A440, the Base Station configuration will consist in an indoor unit (the A850) and one (or several) outdoor unit(s), the A440(s). You must consider several factors, some of them quite contradictory, when choosing the location:

- From a radio perspective, the height of the receiving antenna is essential: the higher the antenna, the greater the range of communication. For the GSM-operated RTUs, this is not an issue, but you must make sure you have good on-site coverage from your cellular provider.
- The Base Station should be situated in the same building where the people managing the Base Station work, or at least spend some of their time.
- Places like cellars, near heat sources, or damp locations are not suitable.
- Geographically, it is better to have the Base Station in the center of the area where the RTUs will be installed (this does not apply to A733GSM stations).
- If you plan to use the Base Station as a server to allow other people to log in and get data, be sure that a telephone line is available exclusively for this use.
- Adcon also recommends that you have a telephone connection next to the PC for when you need technical support.

The communication distance you can achieve is directly proportional to the mounting height of the receiving antenna. The propagation of the radio waves used by the Adcon Wireless Modem corresponds basically to the line of sight. Due to the curvature of

the earth, on flat terrain, the maximum distance which can be reached depends on the height above ground of the antennas of the transceivers of the Base Station and of the measuring stations. You can't do much on the remote station side, but you have more options with the Base Station. Some typical examples of distances achieved under various conditions are shown in Table 1.

The addIT RTU, however, uses low-power technology and was not designed to communicate over large distances. The typical "line-of-sight" distance an addIT can communicate is 800 m (approximately half a mile). This is valid if the partner device is mounted on a 3 m mast (9 ft) and the addIT is mounted on a 30 cm mast (1 ft). The above figures are estimates based on a great deal of experience with installing this kind of equipment and assume a typical height of 3 m (9 ft) for the antennas of the remote measuring stations. Similarly, ideal physical conditions are assumed for the terrain including a flat, open, non-urban environment.

Receiving antenna height	Typical distances achieved
6 m (18 ft)	5 km (3 miles)
10 m (31 ft)	8 km (5 miles)
20 m (62 ft)	16 km (10 miles)
30 m (92 ft)	24 km (15 miles)

Table 1. Communication between Base Station and RTUs A730MD/A733/A740

What conclusions can be drawn from Table 1? Primarily, you can see the importance of having the Base Station antenna as high as possible. To gain antenna height, you have several options:

- Build a mast directly on the ground; however, a 30 m (100 ft) mast may not be a practical option.
- Set up a mast on a tall building (of course, it has to be the building where you want to have the Base Station).
- Install the Base Station in a building that is situated on a hill.

Note: The cable for the outdoor unit delivered with the system is by default 30 m (about 100 ft) long. If necessary, however, you can increase the distance between your indoor and your outdoor unit up to 90 m by using special low-attenuation cables which can be provided upon request by Adcon.

To use the Telemetry Gateway and Wireless Modem, you need to do the following:

- Install the outdoor unit.
- Install the indoor unit.
- Initialize the Base Station.

Installing the outdoor unit

Install the outdoor unit (transceiver, "A440 Wireless Modem") on the rooftop of the house where the Base Station will be located or on top of a nearby mast. The transceiver has two connectors: one for a whip antenna (supplied with the A440) and a second that accommodates the connection cable to the indoor unit.

Note: The installation of the outdoor unit should be performed by a certified electrician. Make sure that the mast on which the A440 Wireless Modem will be installed is properly grounded. Local laws or other regulations may apply.

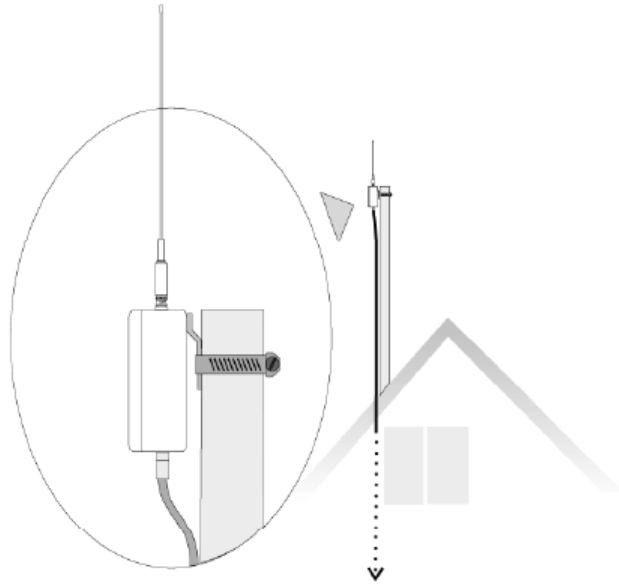


Figure 4. Outdoor Unit Installation

Complete the following steps to install the outdoor unit:

1. Fasten the Wireless Modem to the aluminum mast (provided by Adcon) using the supplied ring clamp.
2. Fasten the antenna to the Wireless Modem.
3. Plug the proper end of the communication cable into the lower connector of the Wireless Modem.
4. Secure the mast in its place on the roof.
5. Run the cable to the indoor unit.

Note: The cable supplied to connect the outdoor unit to the A850 Telemetry Gateway is 30 m long and cannot be extended, but special low-attenuation cables with a total length of up to 90 m can be provided upon request by Adcon.

In addition, if you are upgrading an existing A730SD installation, you can use the low attenuation coaxial cable provided with the A730SD's high gain roof antenna.



WARNING We highly recommend to only use the low attenuation RS-485 cables provided by Adcon with a total length of up to 90 m because attempts to make extensions using other cables could make your Wireless Modem inoperable, due to the voltage loss on the additional cable length. Also, damage to the Modem could result from inappropriate cable impedance.

Installing the indoor unit

The indoor unit is the Telemetry Gateway A850. Connect the cables to the Gateway as shown in Figure 5.

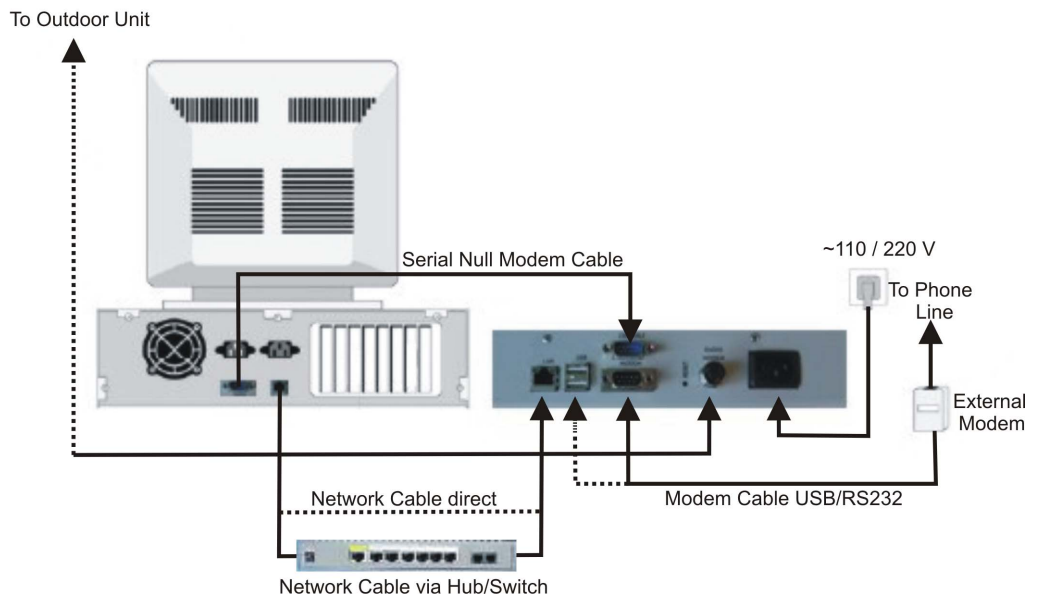


Figure 5. Indoor Unit Installation

If you are using a hub or switch to connect several computers in a local area network (LAN), use the twisted-pair Ethernet cable that Adcon provides to connect the Gateway to the hub. If your computer is a standalone PC and is not part of a LAN, you can connect it directly to the Gateway, as shown in Figure 5, but you will need

to provide your own "crossover" network cable, which you can find in most computer stores. If you plan to use the Base Station as a standalone unit (that is, without a computer), you need a telephone line and an external modem, connected to the A850 either by USB or to the connector marked "modem".

Note: Before you operate the Base Station, Adcon strongly recommends that you charge the internal battery to a level where it can sustain the operation of the Gateway. You can do this by plugging the power cable into the A850 device while disconnecting the serial cable from an A440 outdoor unit for at least six hours.

Initialize the Base Station

In order to be able to use your A850 Telemetry Gateway for the first time, you have to initialize it through its Console Interface by means of the Terminal emulation program Hyperterm (as, e.g., provided by WINDOWS operating systems as accessory, and also available for download from the internet). The initialisation encompasses some basic steps establishing your ownership and disposition of the device. Details are described in chapter 5.

Note: Before initialising the Gateway, the Installation of the indoor unit and of the outdoor unit has to be performed.

License of the Gateway

The Gateway software can enforce some limitations depending on a license key:

- the number of RTUs that can be inserted,
- the number of sensors that can be inserted,
- the number of Wireless Modems that can be inserted (with regard to the planned "multiple A440 support"),
- the number of dialup-modems that can be inserted,
- the number of GPRS pseudo-modems that can be inserted,
- an expiration time for the license.

By putting in an additional license key, certain or all restrictions can be abolished.

Connecting to the GUI

After having completed the preceding chapter, you can start now to use the Graphical User Interface (GUI) of the configurator of the A850 which offers advanced support and extremely user-friendly handling. The connection of a PC to the GUI of the A850 is established through HTTP/HTTPS via the Web Browser. In order to enable communication of your PC with the GUI, you first have to connect the A850 to the PC

- either via LAN connection by means of a network cable which has to be plugged into the LAN connector of the A850
- or via console connection by means of a serial null modem cable which has to be plugged into the console connector of the A850.

Note: If you want to be able to use the GUI via the console of the A850, you first have to set up a new connection with the role "Guest", proceeding as explained in "New Connection Wizard" - "Setup an advanced connection" - "Connect directly to another computer".

Note: THIS DESCRIPTION IS ONLY VALID FOR THE USE OF A PC WITH WINDOWS OPERATING SYSTEM!

Starting of the Web Browser

Now, start a Web Browser on the PC. A PC running Windows XP as Operating System has been used as reference to describe the steps of operation and to produce the following screen shots.

The Browser will be symbolized on the PC by an appropriate Icon:

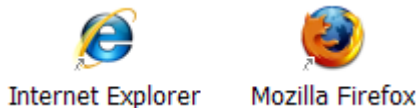


Figure 6. Web Browser Icon

The next step to enable the communication between your PC and the A850 is the input of the IP address in the web browser which you have settled as the IP address of your A850 in the Console Command Setup (see Chapter 5).

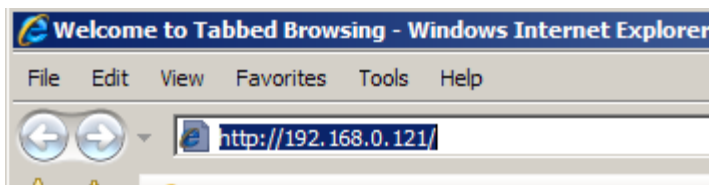


Figure 7. Web Browser - Entry of IP address

Note: The default IP address for accessing the GUI is
- 192.168.0.1 via the LAN and
- 192.168.1.1 via the console.

Note: For the screen shots in this manual, the IP address 192.168.0.121 was chosen.

The way how to connect the PC via browser to the Gateway depends now on a detail of the initialization which you made in the Console Command Setup: if you have generated a HTTPS certificate, you have now to put in `https://IP address/` within the Web Browser, and after the first contact via HTTPS, you have to install the certificate in your workstation to validate it.

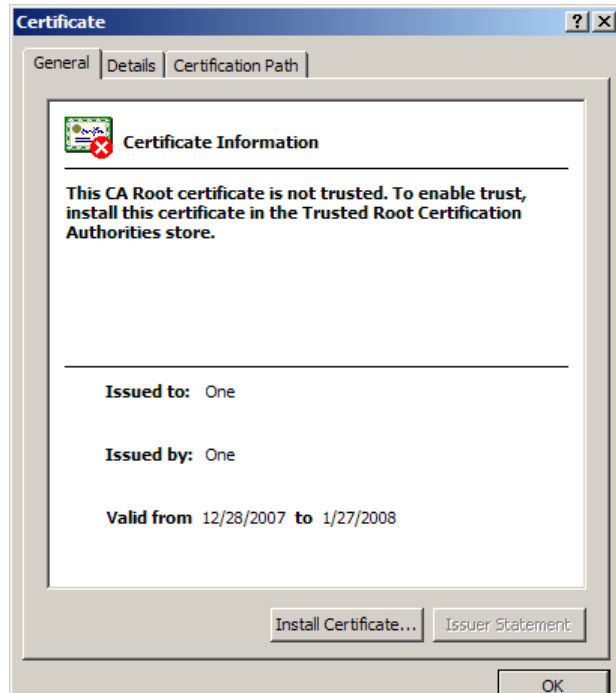


Figure 8. Install Certificate

If you have not generated a HTTPS certificate, you have to put in *http://IP address/* in order to initiate the communication.

In any case, the internal Web Page of the A850 will appear.

Note: For security reasons, it is strongly recommended that you always use an HTTPS connection if you communicate via internet.

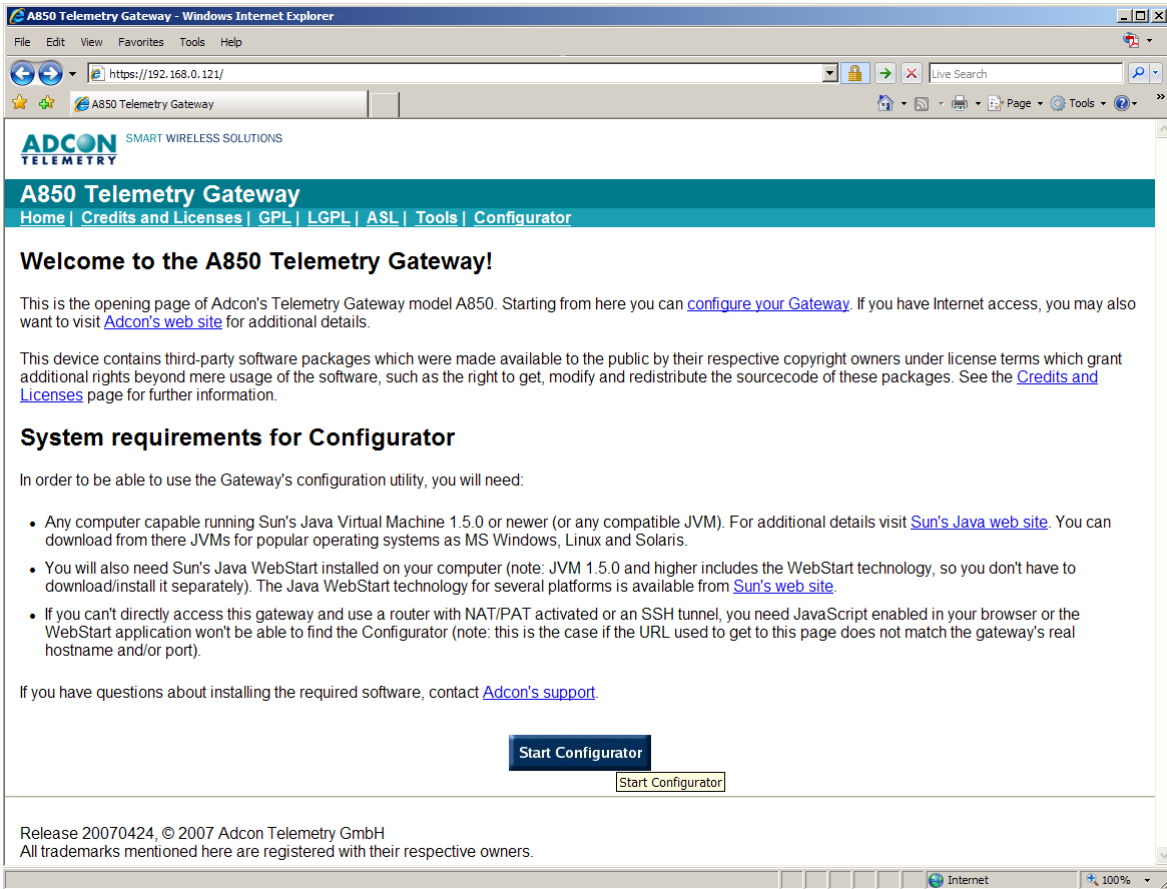


Figure 9. A850 Web Site via HTTPS with Valid Certificate

As you can see in Fig. 9, a closed keylock appears in the address line of the browser if you connect your Gateway through a secure HTTPS link. An open keylock means that the HTTPS certificate has not been validated. No keylock will be displayed if you use a simple non-encrypted HTTP link.

In order to be able to use the Gateway's configuration utility, you will need:

- Any computer capable running Sun's Java Virtual Machine 1.5. or newer (or any compatible JVM). For additional details, please visit Sun's Java web site. You can download from there

JVMs for popular operating systems as MS Windows, Linux and Solaris. We strongly recommend the use of the actual JVM version (1.6 at the date of document release).

- You will also need Sun's Java WebStart installed on your computer (note: JVM 1.4 and higher includes the WebStart technology, so you don't have to download/install it separately). The Java WebStart technology for several platforms is available from Sun's web site.
- If you can't access this Gateway directly, using a router with NAT/PAT activated or an SSH tunnel, you need JavaScript enabled in your browser, else the WebStart application will not be able to find the Configurator (note: this is the case if the URL used to get to this page does not match the Gateway's real hostname and/or port).

If the requirements postulated above are fulfilled, the GUI of the Configurator can be loaded and opened by clicking the button



Figure 10. Start A850 Configurator

The click on this button starts the download of the A850 Configurator to your workstation (if it does not yet exist there) and starts it. While the Configurator is loaded, you will see



Figure 11. Loading A850 Configurator

Note: At the first start of the Configurator, a security warning of the Java Virtual Machine is issued. Please check the box "Always trust content from this publisher" if you are sure that you are connected to your A850. Then, acknowledge the start of the Configurator by clicking the button "Yes".

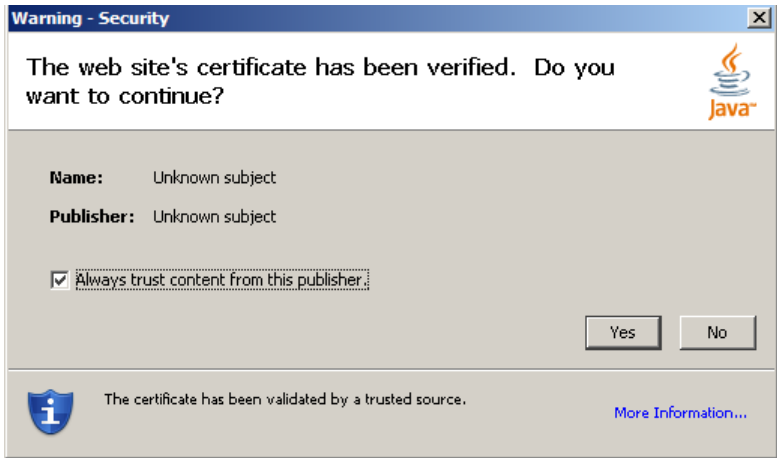


Figure 12. Java Virtual Machine Security Warning

Login Procedure

Now, the login window of the Configurator will appear:

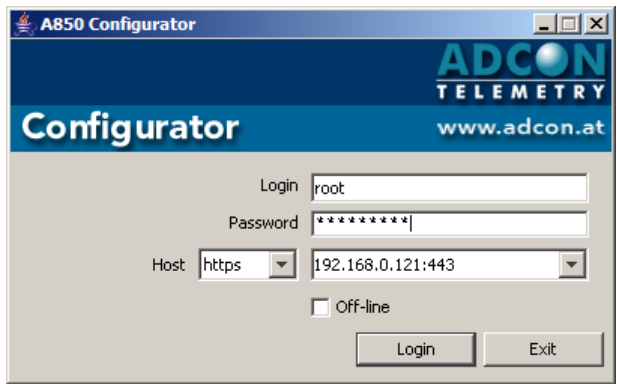


Figure 13. A850 Login Window

At this point, you have to fill in the User Name and the Password for logging in. The host is already predefined with the address and the type of communication, in analogy to the A850 web site.

Note: For security reasons, if you are working via internet, you should always choose a HTTPS connection for logging into the Configurator.

In this application mode, do not click the check box “Off-line” as this is only for the use of the Configurator on the PC in stand-alone-mode, i.e. without having an A850 connected.

After putting in the proper Login data and clicking the Login button, it will just take a little time until the GUI of the Configurator of the A850 will appear:

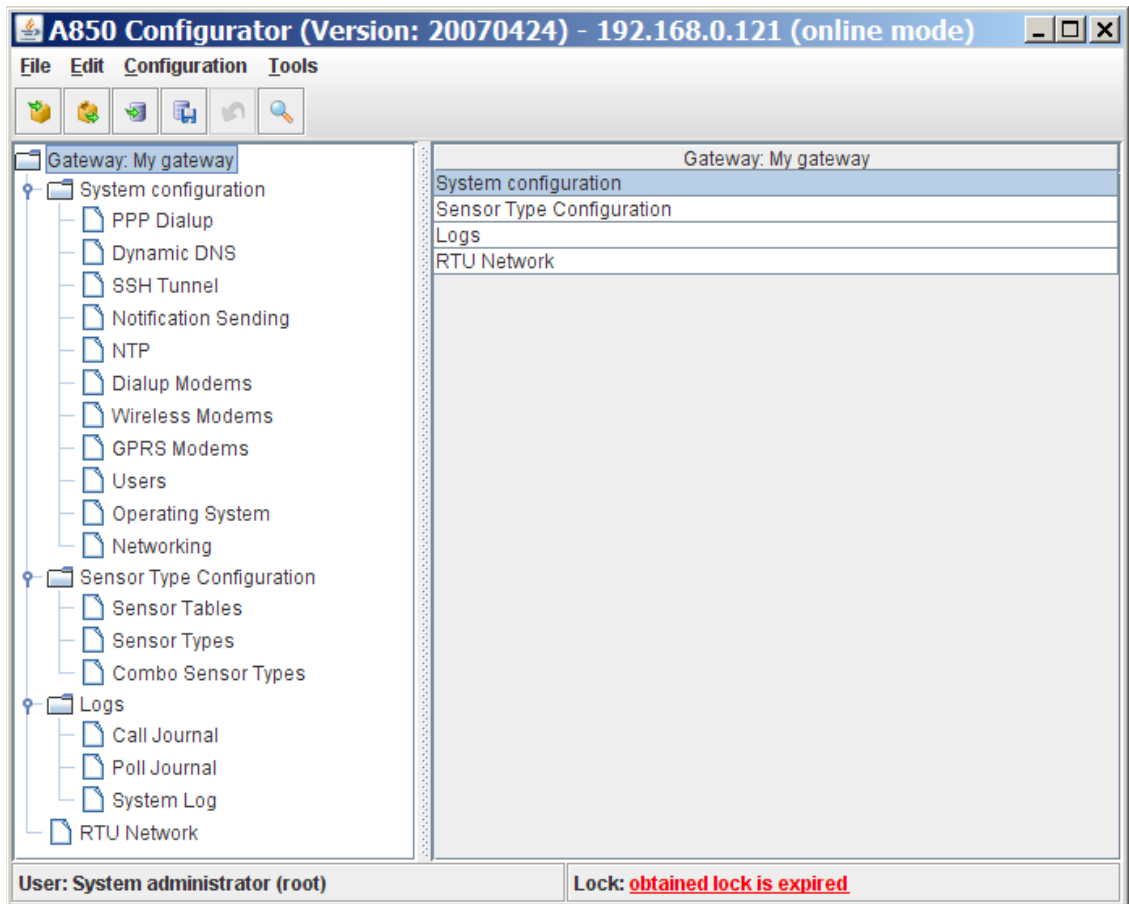


Figure 14. Main Window of the A850 Configurator

Principles of GUI operation

This chapter explains the principles of the GUI operation. A detailed description of the workflow will be given in Chapter 3.

The main window

The main window of the A850 configuration GUI consists in the following components (see Fig. 14):

- A title bar (the header) including the actual release of the A850 as well as the local IP address which has been set. The IP address represented in the header may differ from the address used as input in the internet browser: this is the case if the A850 is placed in a LAN behind an internet gateway (not an Adcon component). Please contact your Network administrator for setting up the internet gateway.
- A menu bar including the menus to invoke the provided functions.
- A tool bar providing shortcut access to specified functions. It is possible to customize the tool bar; this is helpful because the defined tool symbols allow quick access to specific functions which are harder to reach through the “regular” menu structure.
- Tree view providing access to all the objects of the actual configuration to be configured.
- Table view with a configurable column display to provide sufficient information to identify the object to be worked on, depending on the selected node of the tree view.
- Context menus for the nodes of the tree view and the rows of the table view providing functions to be performed on the underlying object.

From this main window, the user can start the navigation to either detailed views of objects or to other windows for issuing special functions or to the extended search interface for retrieving a limited view of objects.

Fig. 15 shows the header, the menu bar and the tool bar of the main window of the GUI in detail.



Figure 15. Title Bar, Menu Bar, Tool Bar

Commands on the Menu Bar

File Commands

File » Login

If you have worked in the Offline mode (locally on your PC without communication to an A850), you can always change to the Online mode by logging in, and then, you can forward the results of your offline work to your A850 with an “update” command. This means that you can prepare details of the configuration of your A850 in a convenient way on your PC away from your A850 which may even work at the same time in another configuration.



Figure 16. Login Menu Item

File» Look and feel

“Look and feel” allows you to change the looks of your GUI windows. You can select the aspect variant “Windows” which assumes, automatically, the colors, symbols and other design features of your PC’s MS WINDOWS display design (as selected by you individually)

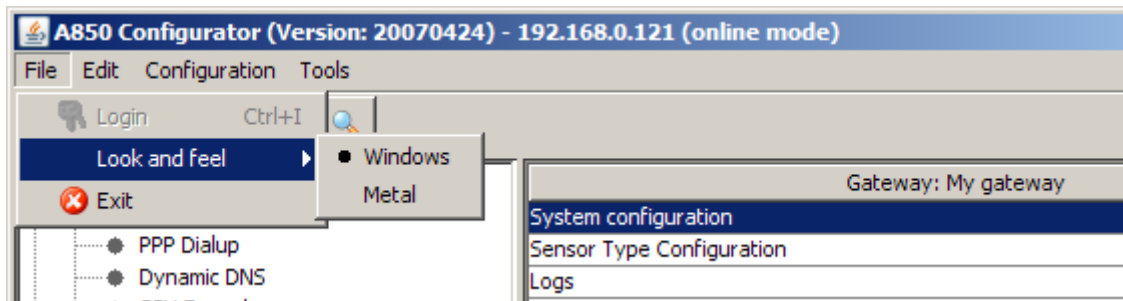


Figure 17. Look and feel: Windows

or the aspect variant “Metal” featuring proprietary colors, symbols and fonts:

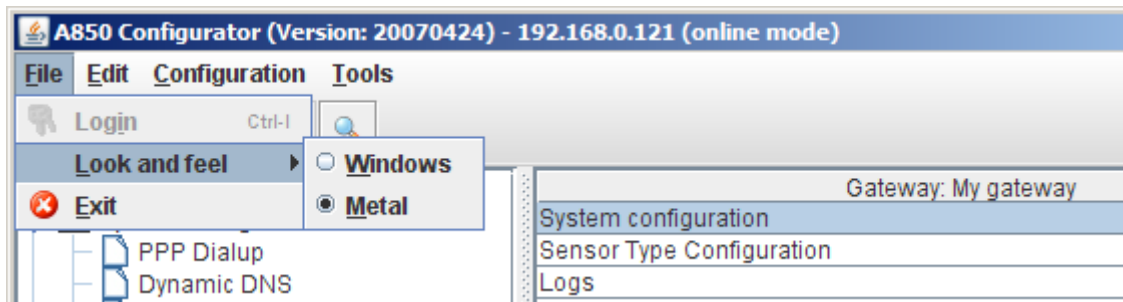


Figure 18. Look and feel: Metal

Note: The selection of “Look and feel” has no influence on the functions of the GUI.

File»Exit

Closes the GUI application:

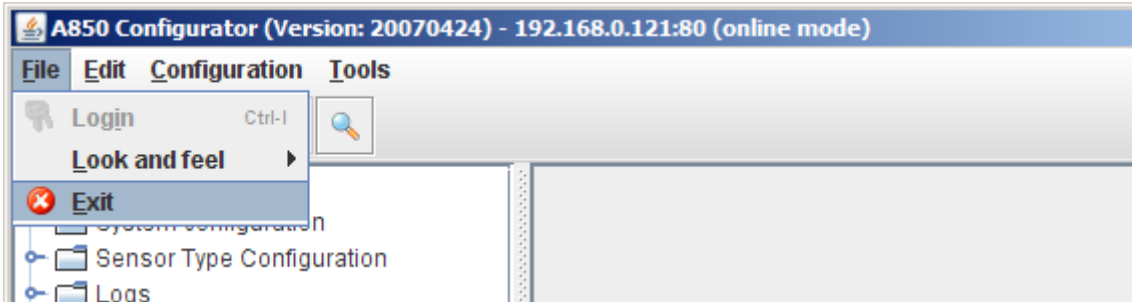


Figure 19. Exit Menu Item

If you have made changes on the settings which have not been saved in the A850 yet, you will be asked for safety reasons if you would really like to exit without saving your changes.

Edit Commands**Edit»Undo**

Changes made on the last objects representing the configuration can be revoked by the command "Undo" (each application of the command "Undo" revokes one change). However, this is only possible as long as you did neither execute a command "Update" or "Refresh" because the modification state of each object is recorded until an "Update" or "Refresh" command discards it.)

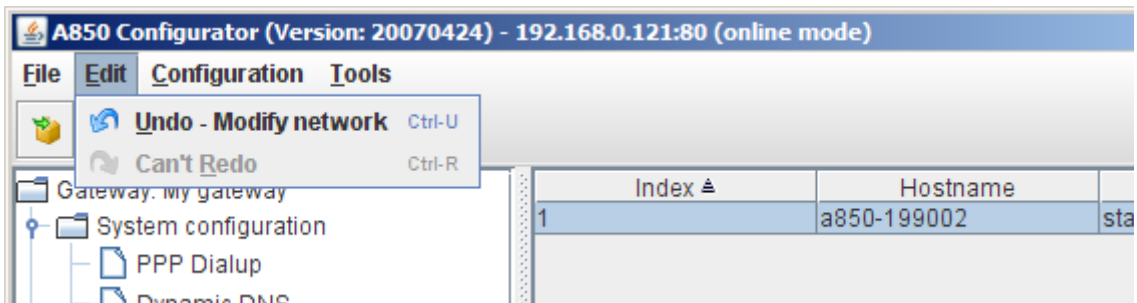


Figure 20. Undo Menu Item

Edit» Redo

If you, after having revoked one or several changes by applying the command "Undo", have changed your mind and would prefer now to still make the changes, you can reactivate them again with the command "Redo" (each "Redo" command reactivates one change). However, in analogy to "Undo", this is only possible as long as you did not apply an "Update" or "Refresh" command.

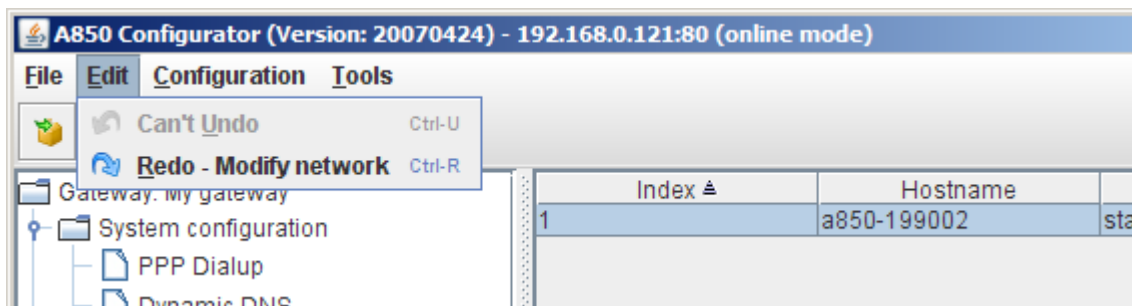


Figure 21. Redo Menu Item

Configuration Commands

Configuration» Refresh

The "Refresh" command fetches the current configuration from the A850 Gateway to the PC running the GUI, overwriting configuration data used on the PC up to that moment. The user must answer the question if he wants to discard any changes or cancel the action. This function is only available using the GUI in the Online mode.



WARNING If you select the command "refresh", all data which have been put into the GUI will be overwritten by the data from the A 850.

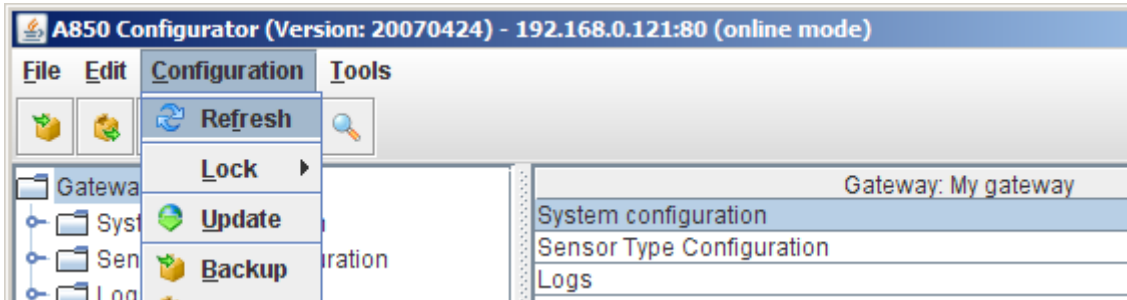


Figure 22. Refresh Menu Item

Configuration»Lock»Lock Gateway

This command locks the Gateway for other users to perform configuration changes.

The user is granted a requested lock if no other user has been locking the Gateway configuration before. A "Lock" granted contains a timeout. After this timeout is over, the lock will be released automatically unless it is renewed explicitly. A configurable amount of minutes (default 2) before the automatic release time expires, the user is warned by the GUI by the expiry reminder. This menu item is disabled (greyed out), when (and as long as) a lock is held.



Figure 23. Lock Selection

To let other users know who locked the A850 and to enable them to contact this user if necessary, the lockholder is obliged to enter his phone number and email address. The information about the lockholder is displayed if you select "Show Lock State".

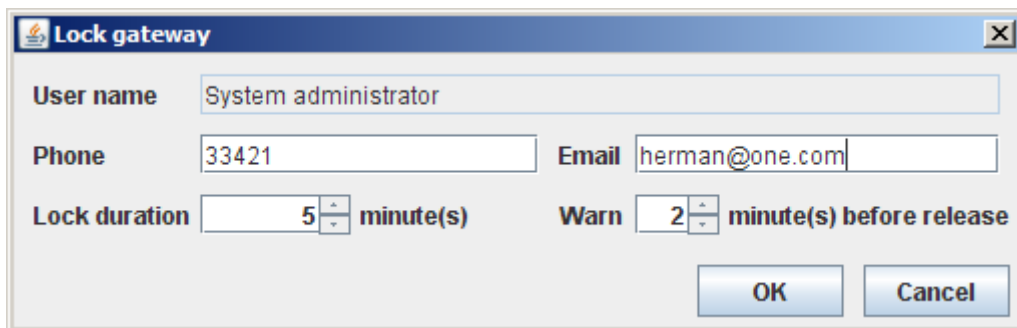


Figure 24. Lock Gateway Window

Configuration» Lock» Show Lock

This command displays the information about the current lock of the Gateway.

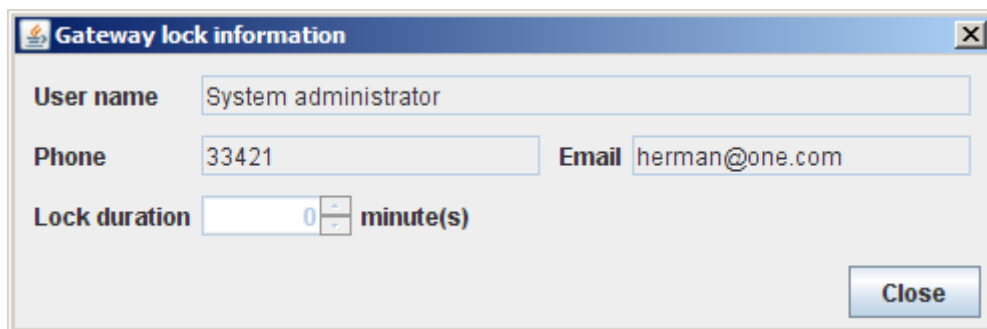


Figure 25. Show Lock Window

Configuration» Lock» Unlock

This command allows the owner of a lock or the user of the type "root" or "admin" (check box must be activated) to release the

current lock of the Gateway. This menu item is disabled (greyed out), when (and as long as) no lock is held.

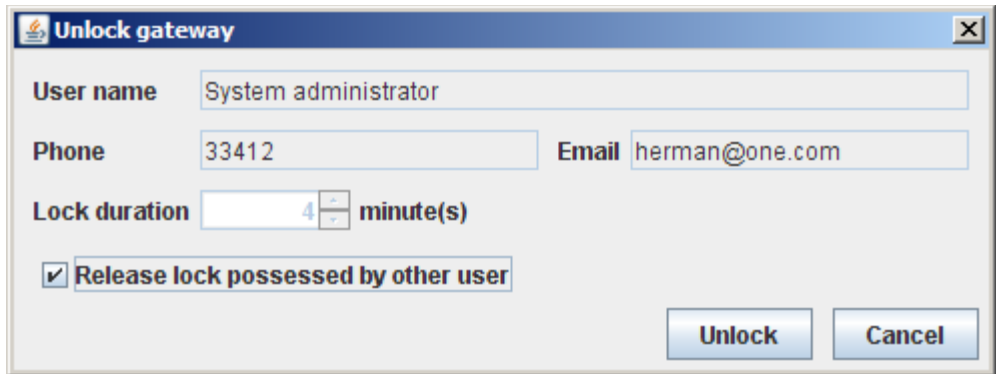


Figure 26. Unlock Window

Configuration → **Update**

The “Update” command writes the changes done by the configuration user to the A850 Gateway. To be able to update the configuration, the user must be the holder of the current lock of the Gateway. The function is only available using the configuration GUI in the Online mode.

Note: The rights to perform an “Update” command are granted only the system administrator (user “root”).

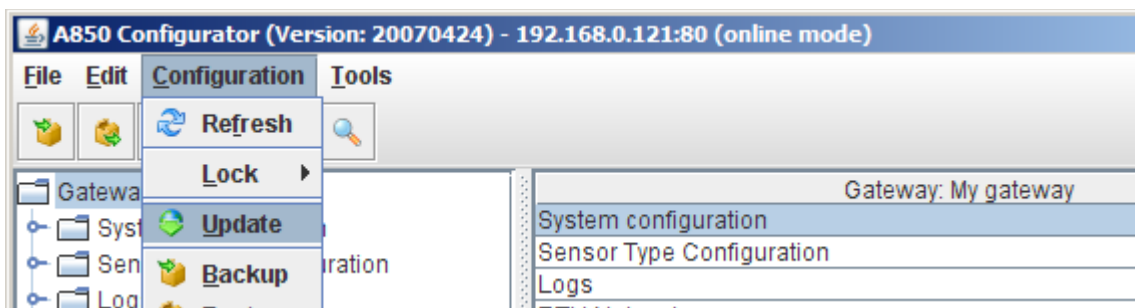


Figure 27. Update Selection

After choosing "Update", you will be asked first if you are sure that you want to commit all changes (Fig. 27). In order to confirm, click "Yes" and the data will be transferred from the GUI to the A850.



WARNING If you confirm by clicking "Yes", the data having been stored in the A850 will be overwritten by the data from the GUI.

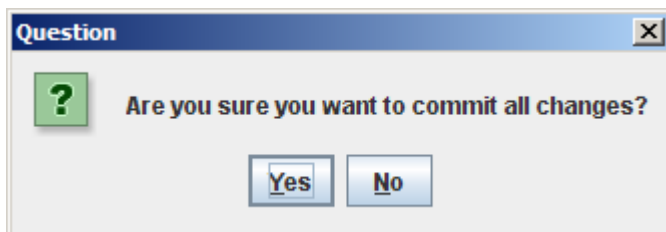


Figure 28. Update Question

Configuration » Backup

The command "Backup" allows you to save the data from the A850 locally on your PC, giving you the opportunity to replay these data later again into the A850 by the command "Restore" which allows you to reestablish the state stored by "Backup".

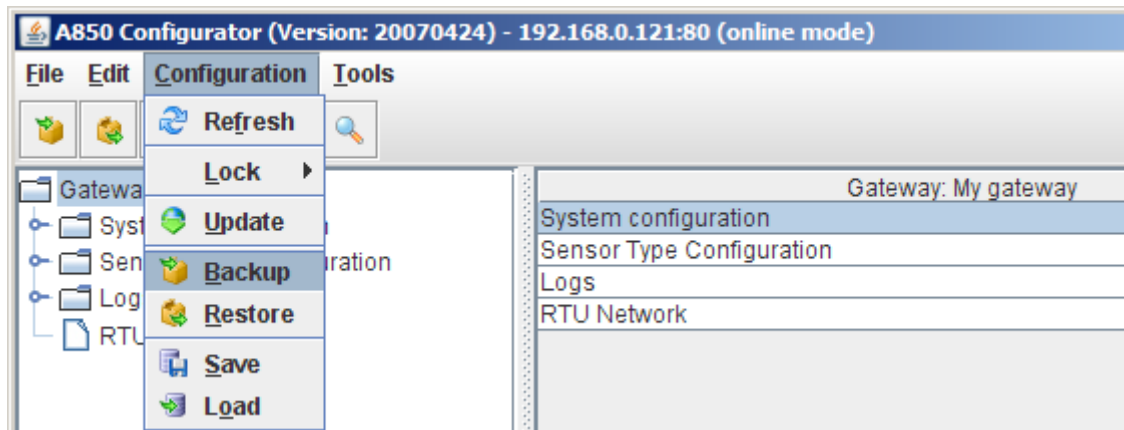


Figure 29. Backup Selection

In order to enable the data to be saved, you must choose a file name by "Select". We suggest to label the backup file by combining the name of the Base Station with the actual date as this will make it easy to you to find the file again later.

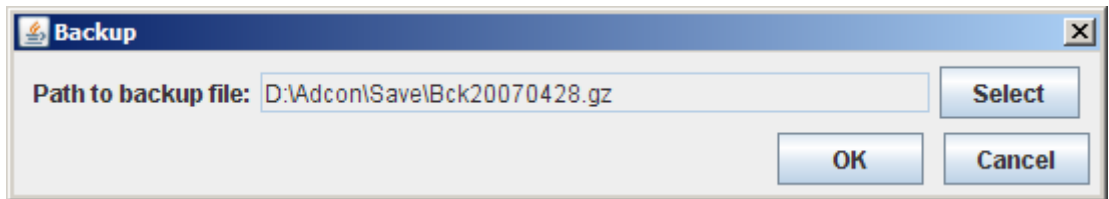


Figure 30. Backup File Name Selection

Configuration » **Restore**

The command "Restore" allows you to reload data from the A850 saved by the command "Backup" on your PC again into the A850 if you want to reestablish a certain state of the A850.

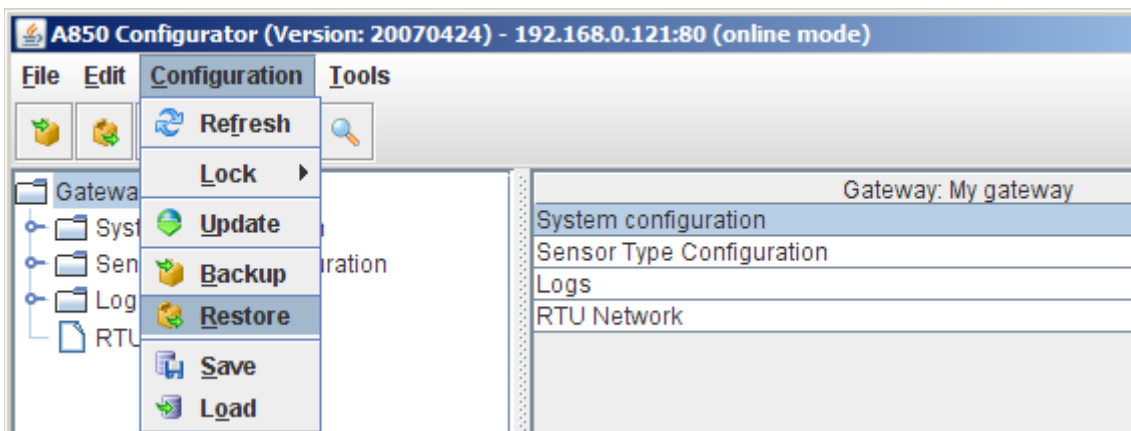


Figure 31. Restore Selection

In order to be able to replay data again into your A850 by using the command “Restore”, you have to choose the appropriate file on your PC by “Select” and then to click “OK”.

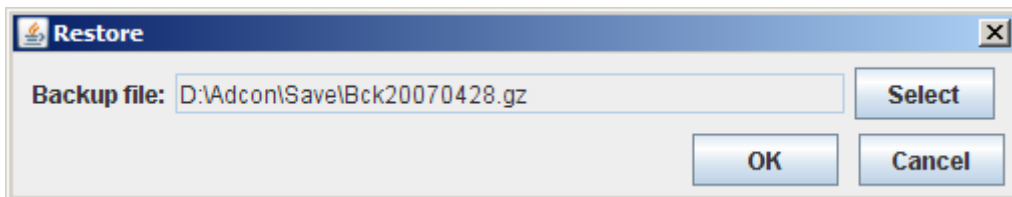


Figure 32. Restore File Name Selection

Then, you have to confirm that you want to replay the data into your A850.



WARNING If you confirm by “Yes”, the data stored in the A850 will be overwritten by the corresponding data from the selected file.

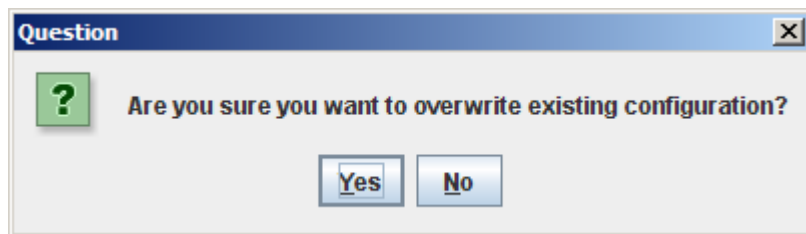


Figure 33. Restore Question

Configuration » Save

If you are using your PC to work on the configuration of the A850 by running the GUI, the current configuration data will be held in the RAM of your PC (which means that the data are stored in a volatile memory and that e.g. an operating system error could cause loss of these data). By the “Save” command, the current configuration data will be stored to the local file system of your PC which will

usually reside on its harddisk. This function is also available using the configuration GUI in the Offline mode.

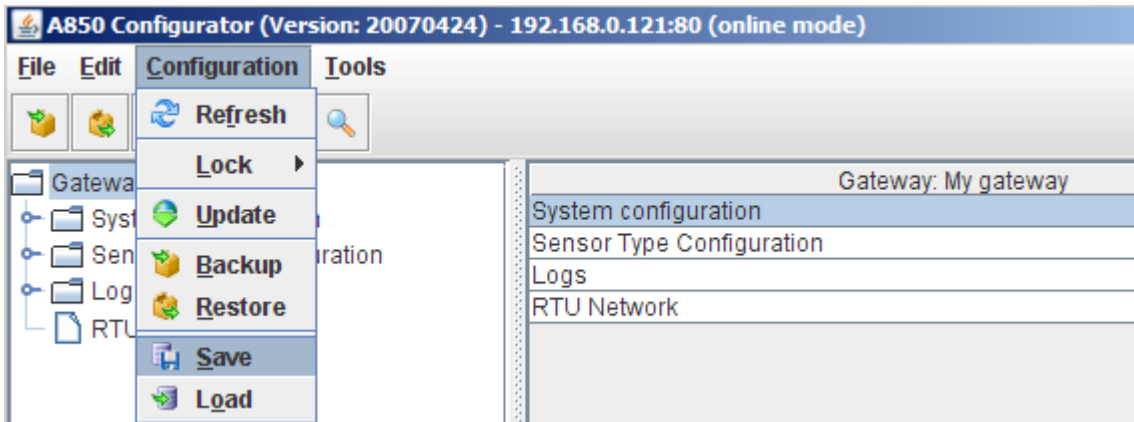


Figure 34. Save Selection

In order to enable the data to be saved, you must choose a file name by "Select". We suggest to label the file of the GUI to be saved by combining the name of the Base Station with the actual date as this will help you to find the file later easily.

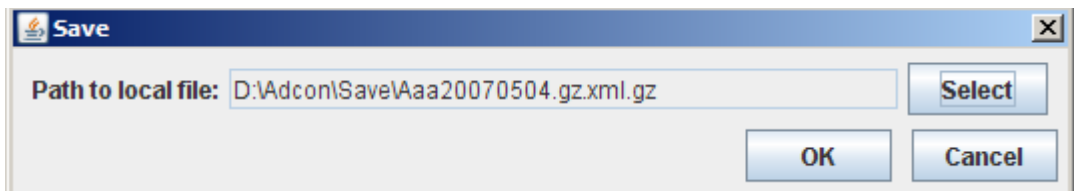


Figure 35. Save File Name Selection

Configuration» Load

The "Load" command reads a file previously saved by the "Save" function and loads it into the RAM of the PC running the A850 configuration GUI. This function is also available using the configuration GUI in the Offline mode.

Note: Each time a "Load" command is performed, the GUI switches automatically from online mode to offline mode.

For resuming the parameters in the A850 which have been loaded that way, the user "root" has to give first the command "Login" and consecutively the command "Update".

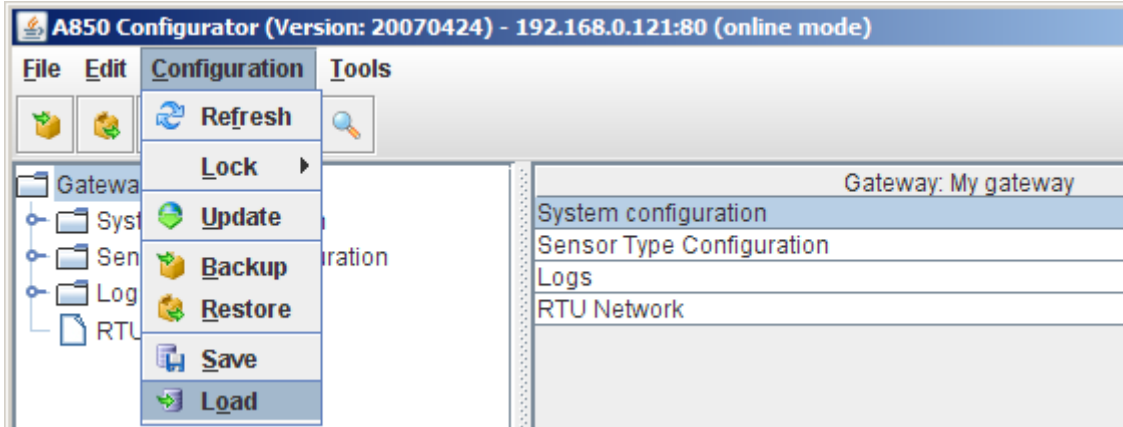


Figure 36. Load Selection

For replaying data into your GUI by using the command "Load", you have to choose the desired file on your PC by the command "Select" and then to click "OK".

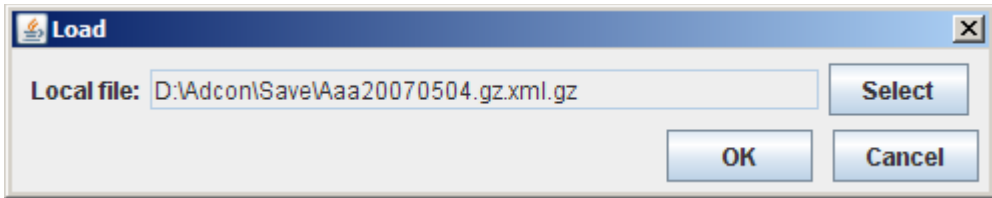


Figure 37. Load File Name Selection

Tools Commands

Tools » License » Show License

This command retrieves the current license information from the A850 Gateway.

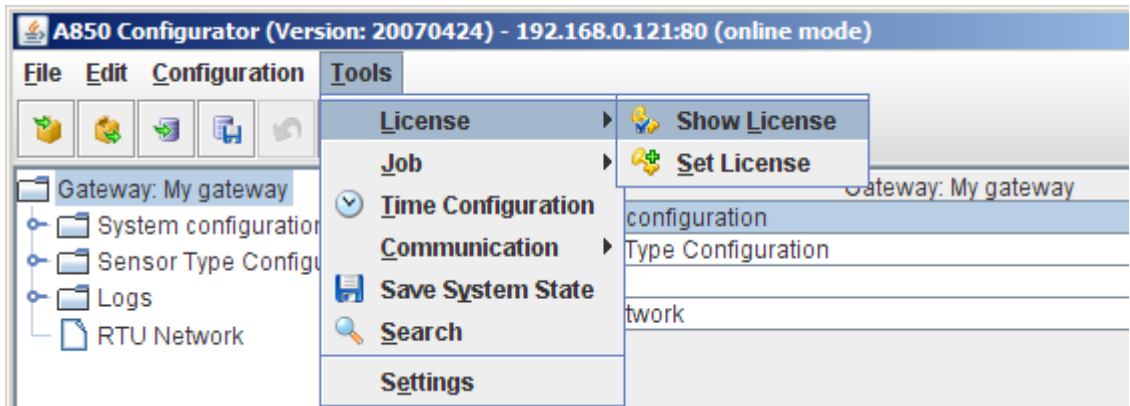


Figure 38. Show License Selection

If an additional license has been installed on your A850, it will be displayed in this window:

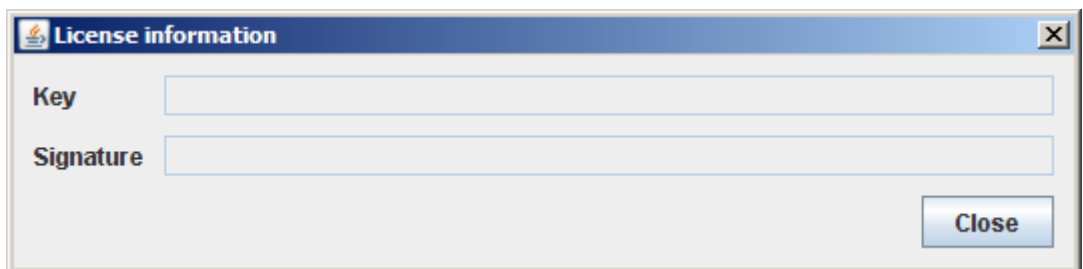


Figure 39. Show License Window

Note: If there is no special license on the Gateway, the License information window is empty.

Tools» License» Set License

This command supports the update of the license of the A850 Gateway.

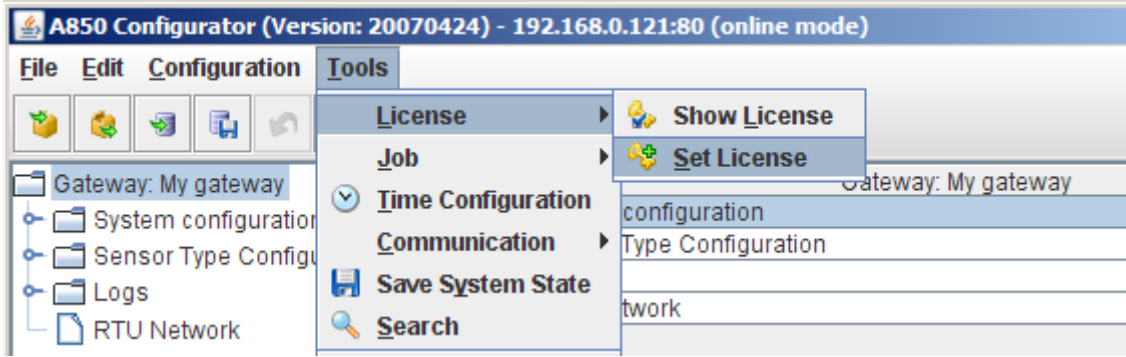


Figure 40. Set License Selection

“Set license” allows you to enter additional licenses for special purposes by input of the license key provided by Adcon as well as by input of the license signature.

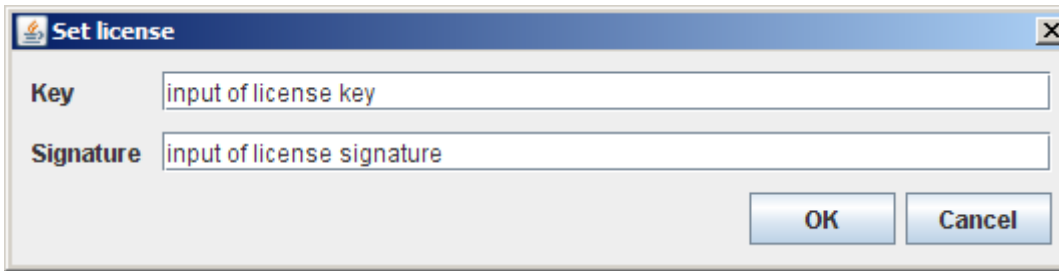


Figure 41. Set License Window

Note: For regular operation of the Gateway, no special license is necessary.

Tools» Job» Start Job

This command allows starting jobs manually outside of the job scheduling selected by you in the respective detail windows. The

job to be started can be one of the names "ntp update" or "dyndns update", "send ntf" "ppp dialup", and "ssh tunnel" .

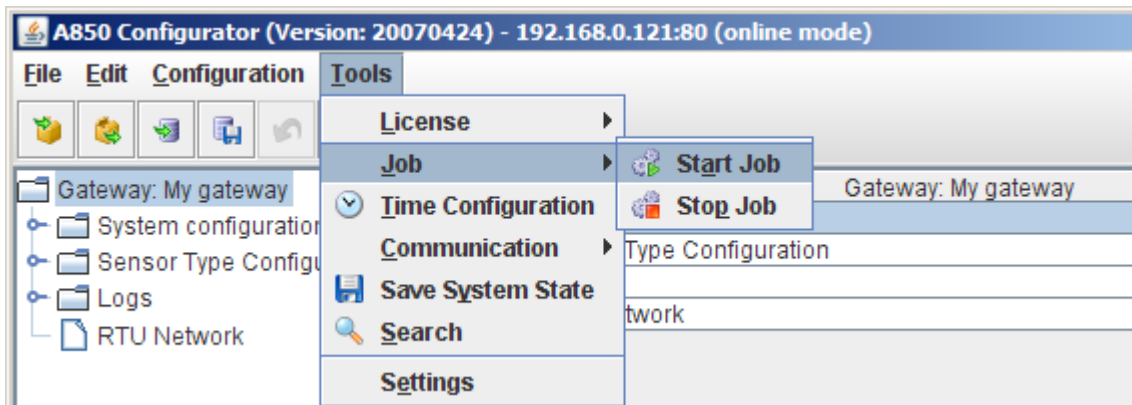


Figure 42. Start Job Selection

The following window allows you to select the job that you want to start,

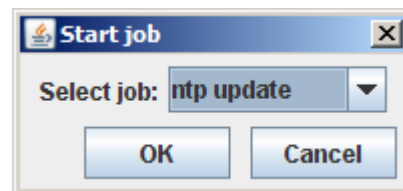


Figure 43. Start Job Window

giving you the choice shown in Fig. 44:

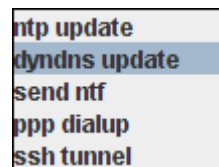


Figure 44. Choose Job to Start

Tools»Job»Stop Job

This command allows stopping jobs manually which have been started automatically by the "job scheduling" in their respective detail windows or which have been started manually. The job to be stopped can bear one of the names "ntp update" or "dyndns update", "send ntf" "ppp dialup", and "ssh tunnel".

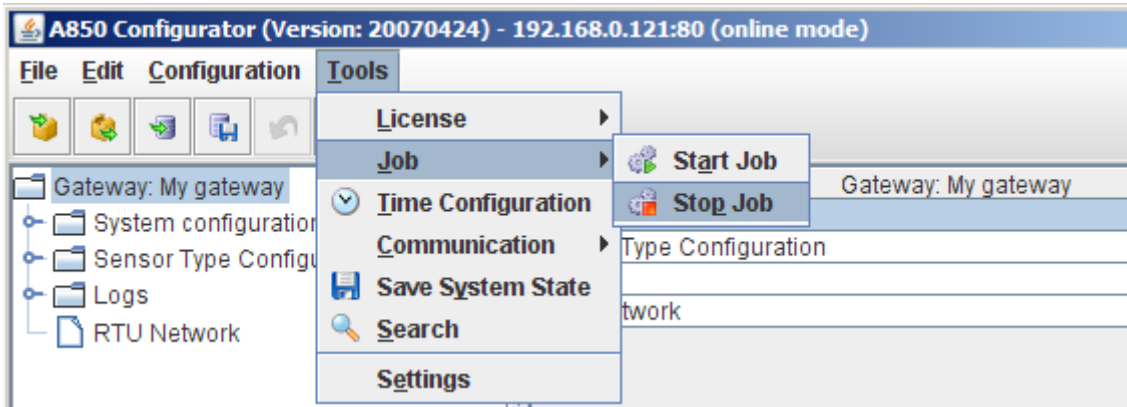


Figure 45. Stop Job Selection

The following window allows you to select the job which you want to stop,

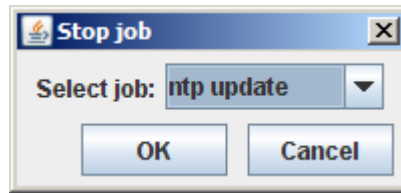


Figure 46. Stop Job Window

giving you - in analogy of the start job list above - the following selection possibilities:

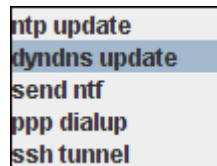


Figure 47. Choose Job to Stop

Tools» Time Configuration

This command retrieves the current time from the Gateway and allows also to set it to a new value.

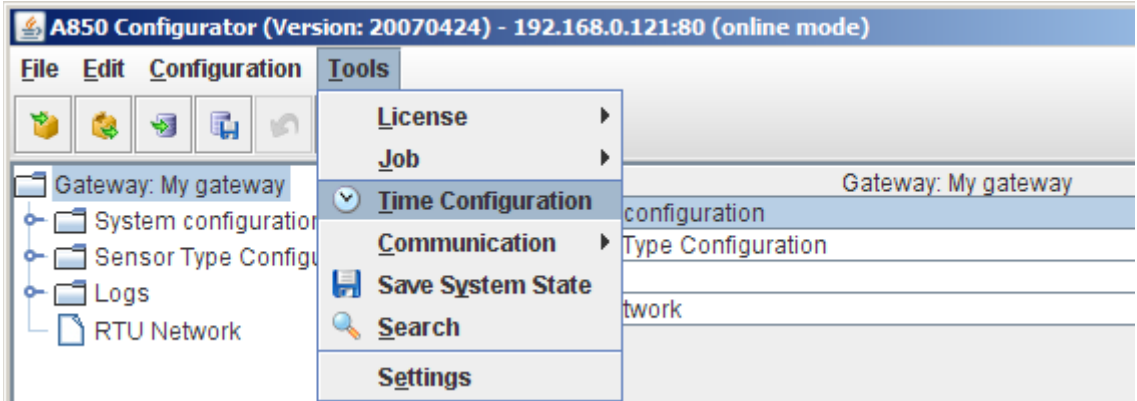


Figure 48. Time Configuration Selection

The Time Configuration window can be used to read the actual system time of the A850 and to correct it if necessary.

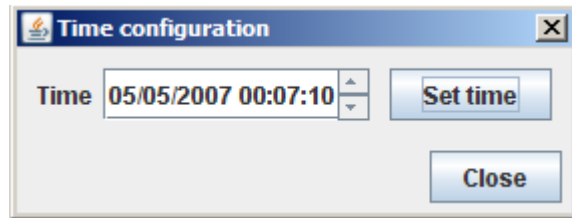


Figure 49. Time Configuration Window

After having corrected the time as appropriate, you will have to click first "Set time" and then to confirm:

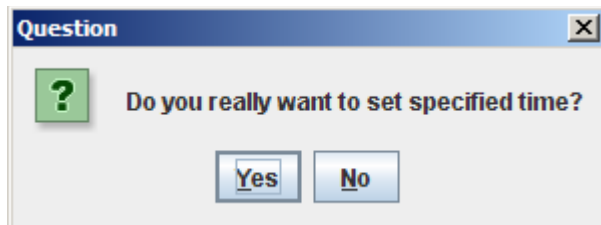


Figure 50. Time Update Question

Tools » Communication » Direct Commands

For RTUs and Wireless Modems, this command allows the user to initiate radio commands to the respective receiver and effectuates the responses to be displayed. The user must have the “direct” access right to the RTU for being able to use this function. Each command is initiated by sending a “direct” request to the Gateway. Before issuing the request entered by the user, the GUI prefixes it with the ID of the targeted RTU or the Wireless Modem if it is missing. The protocol of the commands sent and the corresponding responses are displayed by a multiline text control, but can also be exported to a text file and printed. The lines entered by the user are presented in bold font. The maximum number of lines available for scrolling is configurable (1000 lines default).

Note: Direct Commands can be used depending on the RTU type and are described in the respective RTU manuals.

Direct commands can be sent to separate Wireless Modems. To do this, you first have to select them in “Direct commands”, to choose the corresponding Wireless Modem in the “Table view” and to mark it by the mouse before you can send the command.

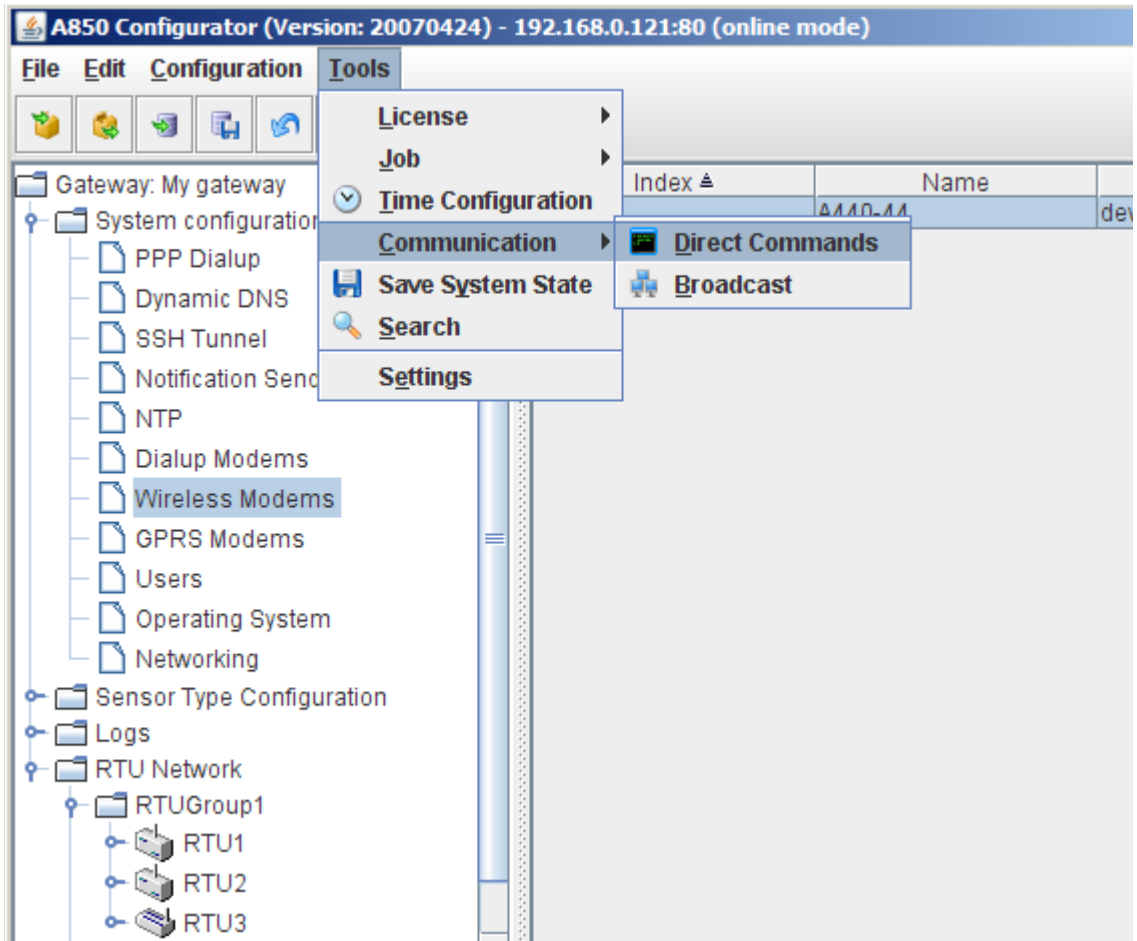


Figure 51. Direct Commands Selection for Wireless Modem

Direct commands can be sent also to a separate RTU. To do this, you have to choose the corresponding RTU in the “Table view” and to mark it with the mouse before selecting “Direct commands”.

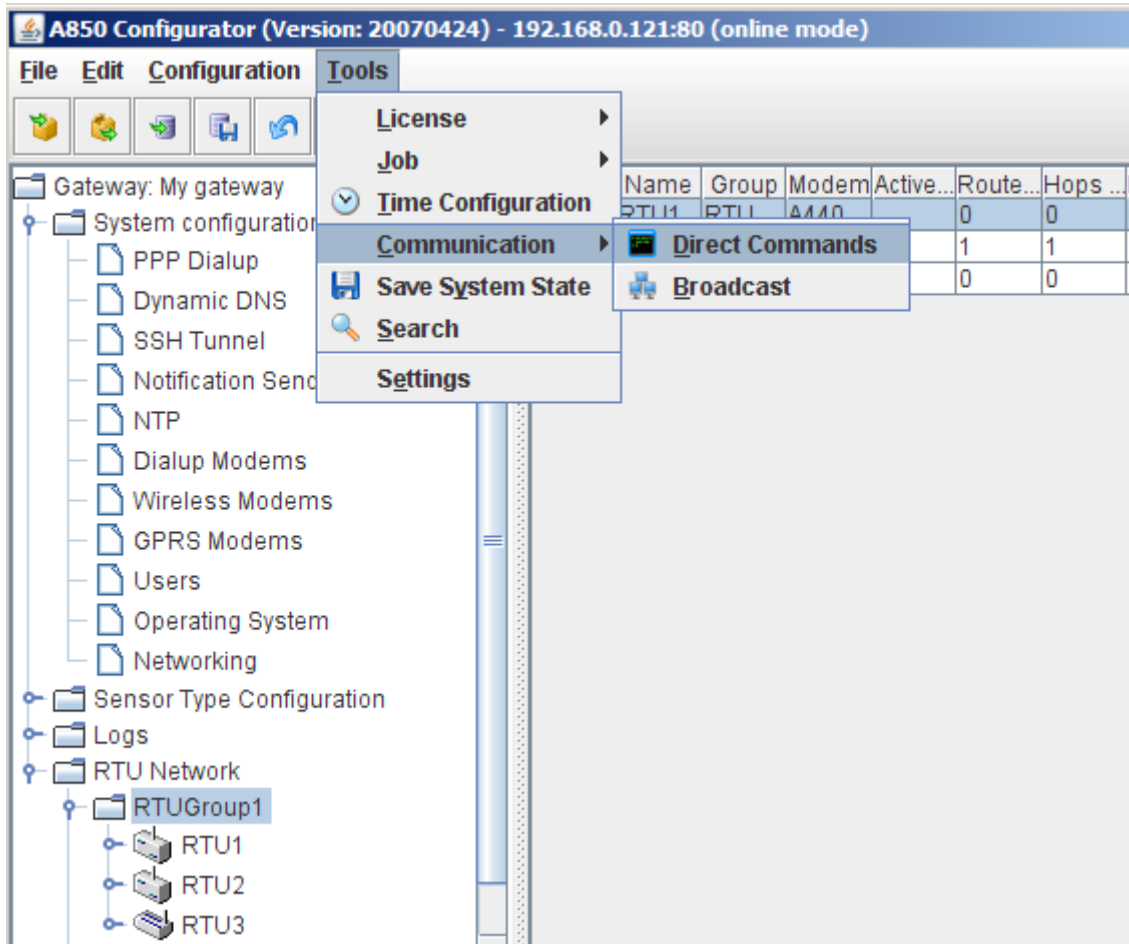


Figure 52. Direct Commands Selection for single RTU

For sending a command to a Wireless Modem or to a RTU, enter the corresponding "Direct command" in the nether window part and click the "Send" button. This will cause the the command to be sent to the respective device whose feedback will be received. The sent command as well as the received feedback will be displayed in the upper window part.

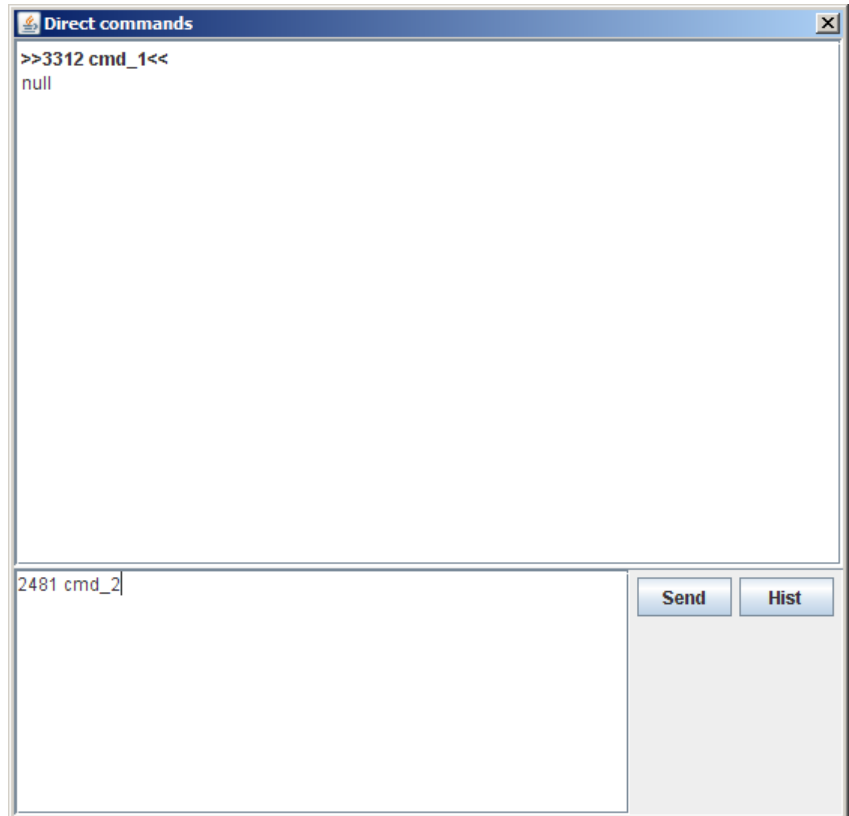


Figure 53. Direct Command Window

For tracking the commands already sent, click the button "Hist" (history). This will result in list of the sent commands to be displayed in a new window.

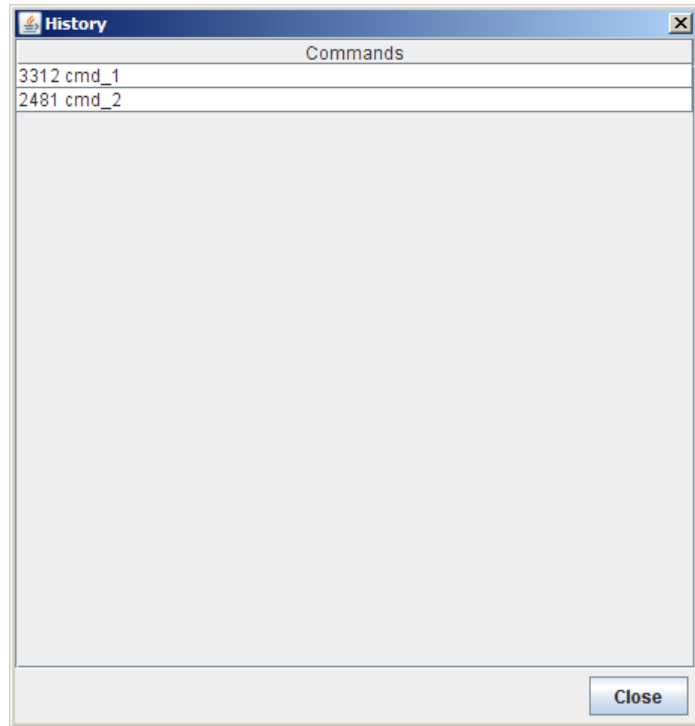


Figure 54. Direct Command History

Tools»Communication»Broadcast

The purpose of the command "Broadcast" is to detect all RTUs within the Wireless Network. If the command "Radio Broadcast" is sent, all RTUs receiving this broadcast will send a feedback. Thus, sending a broadcast allows to find out which RTUs communicate actively with the A850 via the connected Wireless Modems.

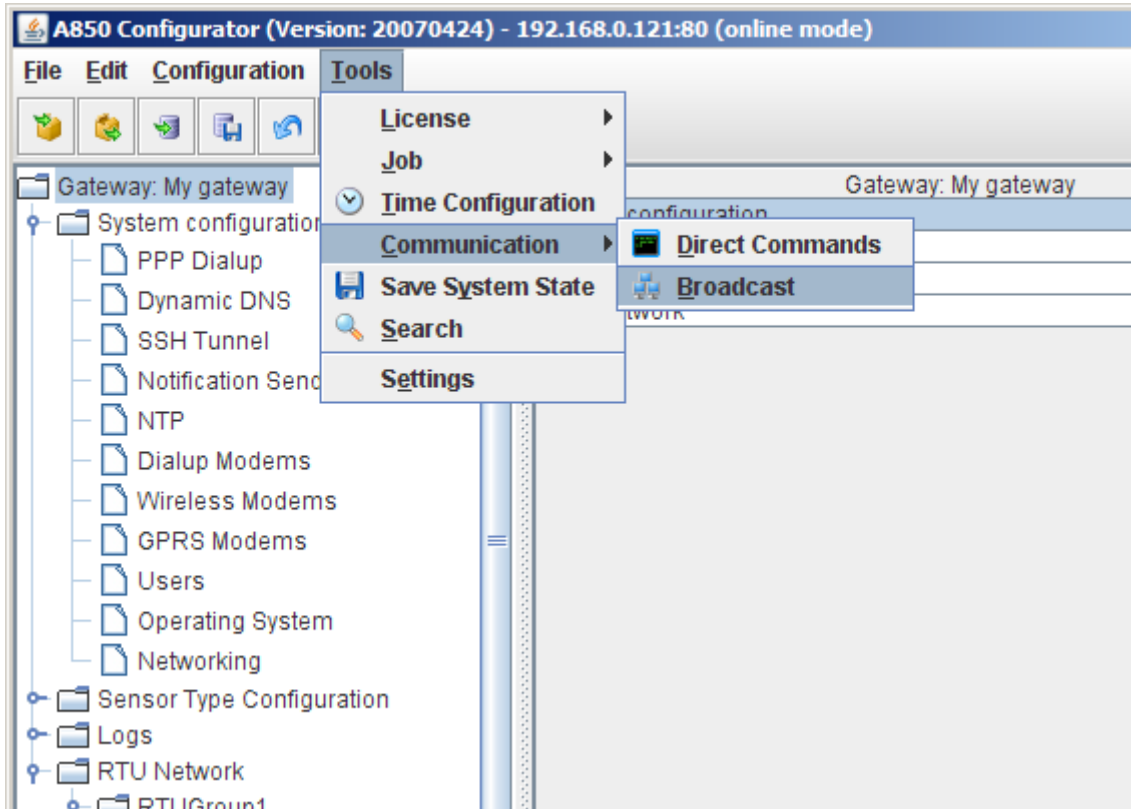


Figure 55. Broadcast Selection

The RTUs which did respond to the broadcast will be displayed thereafter in a list in the Remote broadcast window.

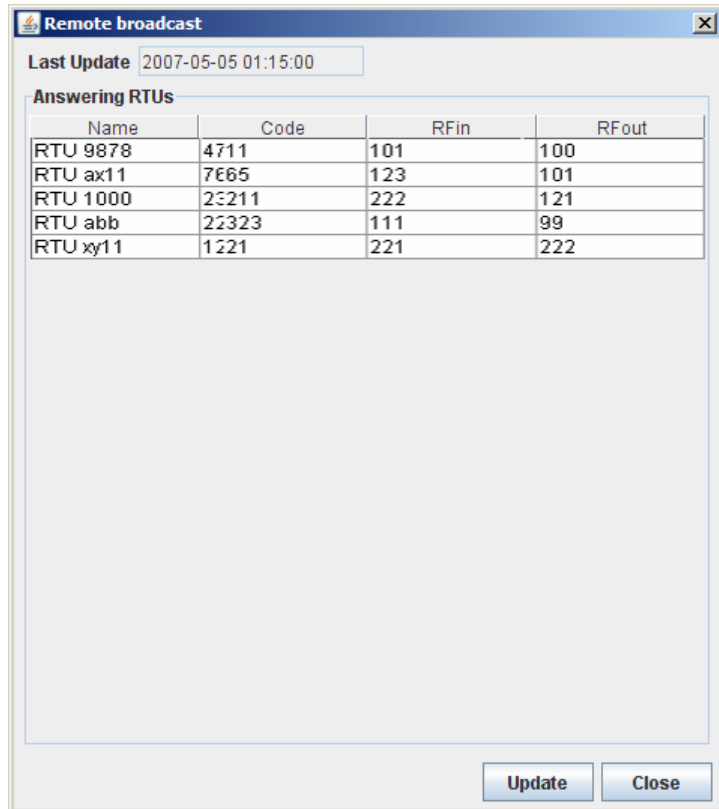


Figure 56. Broadcast Window

By clicking the button "Update", another broadcast is initiated so that changes (admissions or outages of RTUs, respectively) will be displayed.

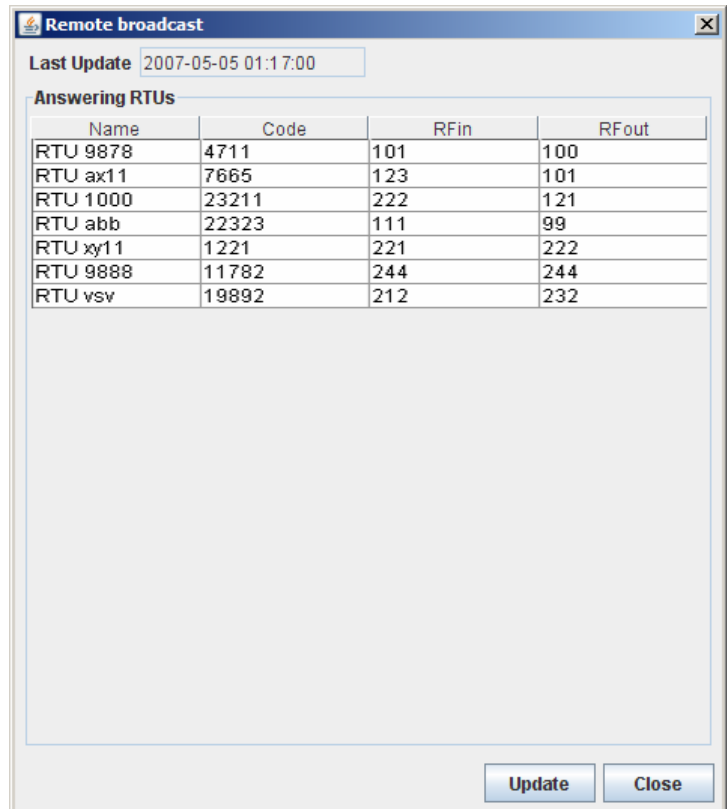


Figure 57. Broadcast Window Update

Tools» **Save System State**

The "Save System State" function is very useful to debug the A850 if any error or problem occurs. This command opens the interfaces to specify the data to be stored.

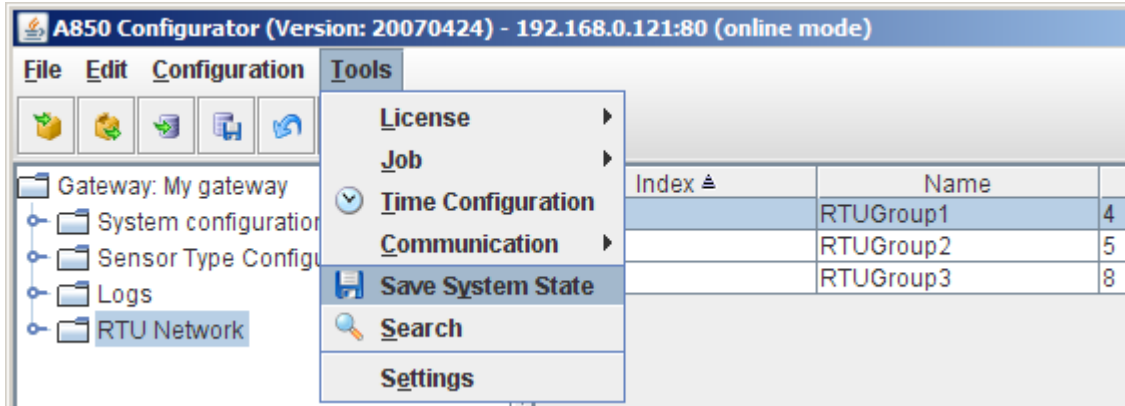


Figure 58. Save System State Selection

The following data can be selected in the check boxes for saving: "local logfiles", "modems configuration", "last backup file" and "user settings". By default, all data are checked for saving.

The local log files of the activities will be stored on the selected place.

Clicking the button "Estimate file size" allows to estimate the approximate size of the data file to be saved on the PC.

This function is very important for reporting bugs or other problems back to experts; the stored file allows a deep analysis of the occurred problem. In case of trouble, before doing anything else, please use this function! If the available debugging information is not stored this way, and if a reset is made, it will be impossible to trace the problem later on.

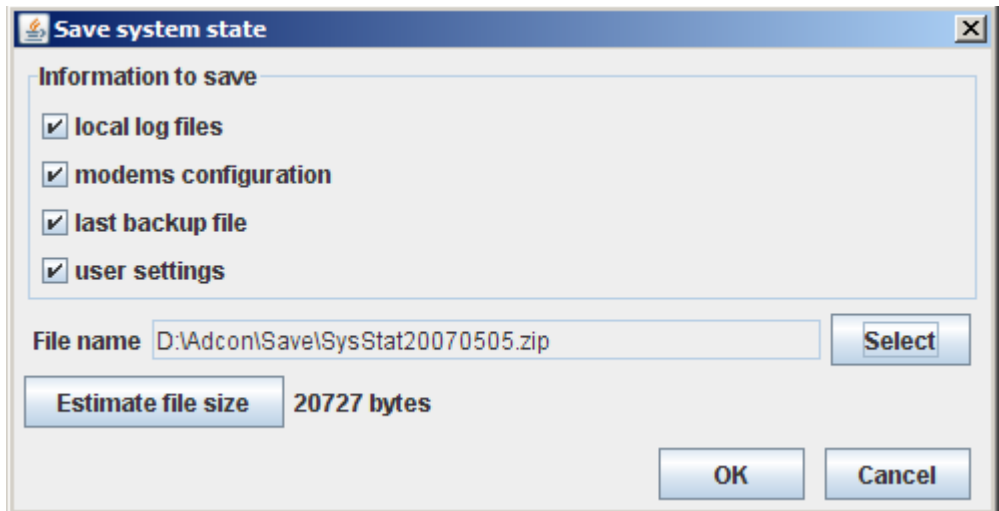


Figure 59. Save System State Window

Tools» Search

Opens the “Extended Search interface” which allows to specify and to submit queries for retrieving a subset of RTU and sensor objects.

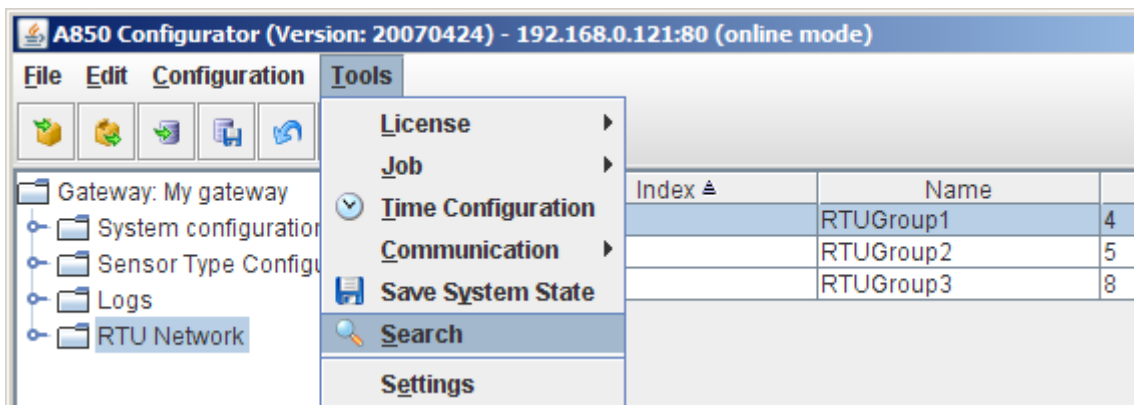


Figure 60. Search Selection

In the Search window, RTUs can be searched for according to certain selectable criteria and logical interconnections. In doing so, also complex search queries can be created.

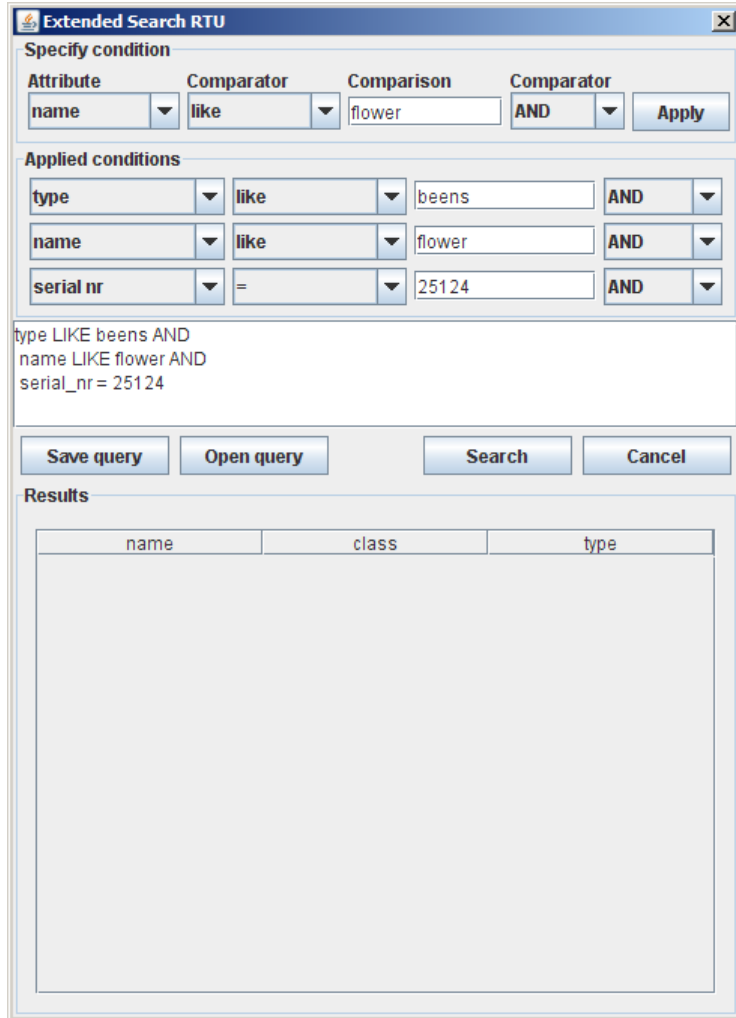


Figure 61. Search Window

In order to allow more complex queries to be used again in the future, query dialogues can be saved by clicking the button "Save query" (one file name has to be selected for each query). Later, these queries can be reactivated again by "Open query".

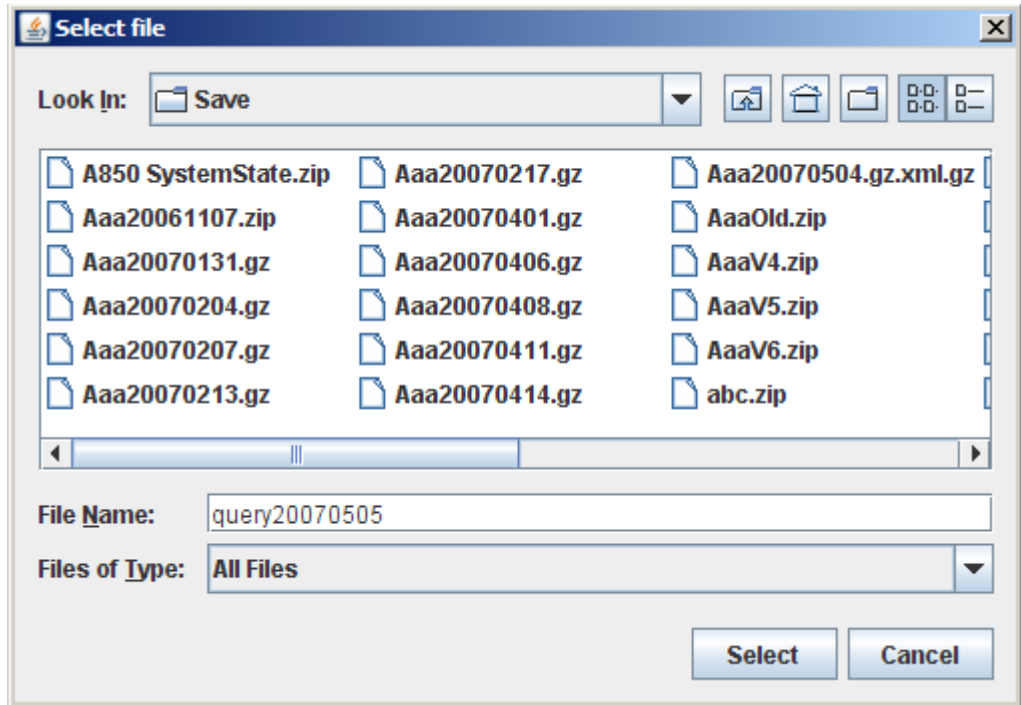


Figure 62. Search Window

Tools» Settings

By the use of Settings, certain parameters determining the amount of commands and loggings to be held in the GUI can be set up; as soon as the limit of the specified amount is exceeded, an appropriate amount of the oldest saved information will be deleted.

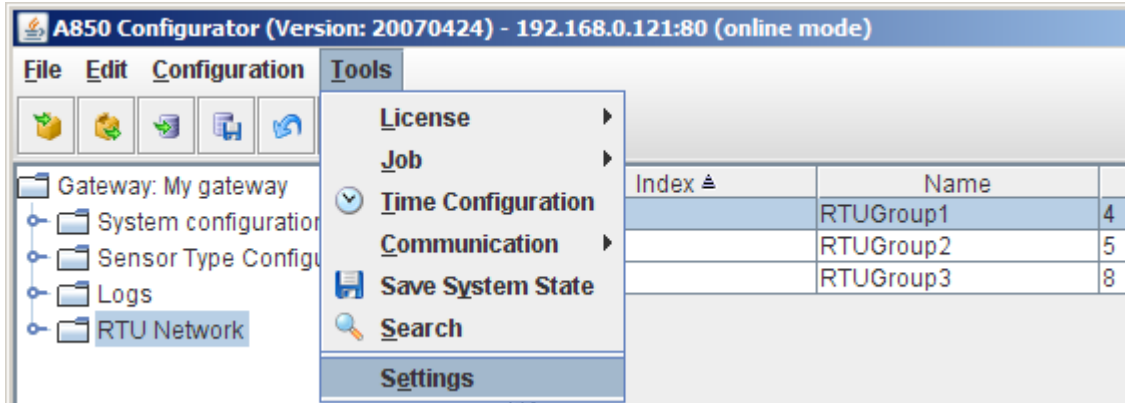


Figure 63. Settings Selection

"Settings" - "Direct commands" allows you to set up the number of commands to be held by history (which is necessary to be able to make use of the "Undo" command) and the number of lines displayed by the output field (for printing).

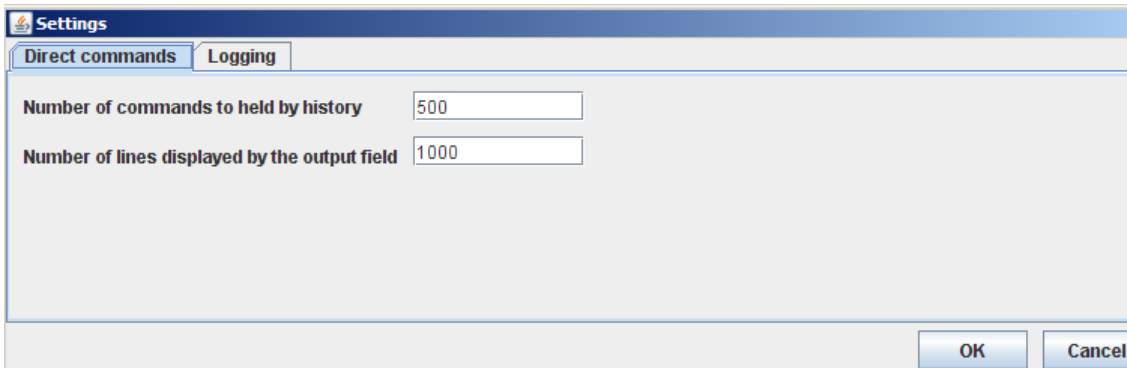


Figure 64. Settings ► Direct Commands Window

"Settings" - "Logging" allows you to define the maximum size of the log file as well as the location where the log file will be stored. If the character 0 is used as input variable for "maximum size", the size of the log file will be limited only by the storage capacity limitations of your PC.

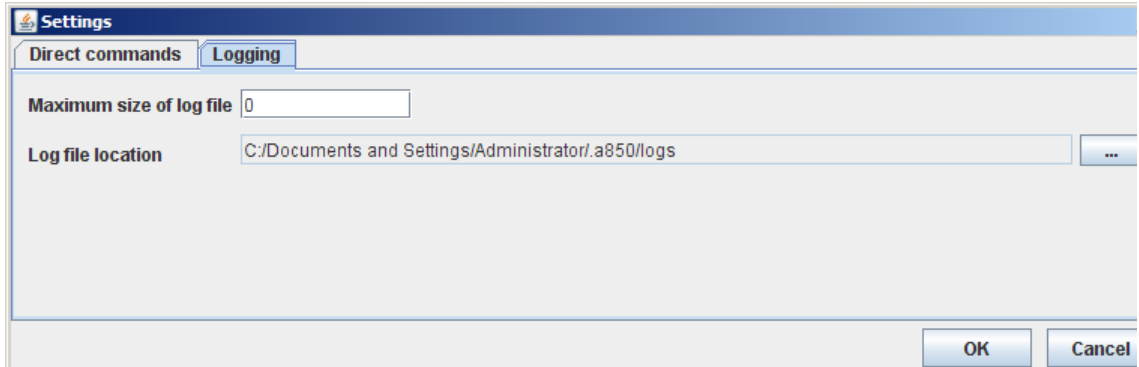


Figure 65. Settings ► Logging Window

Commands on Tool Bar

The main window of the Configuration User Interface has a configurable toolbar to shortcut menu selections.



Figure 66. Tool Bar

Each user can select his own subset of buttons to be shown out of a predefined list of available toolbar buttons. The list of the buttons has an unchangeable predefined order.

The buttons are activated corresponding to the rights the user has to perform the actions on the actual selected object(s) or class provided by the individual button.

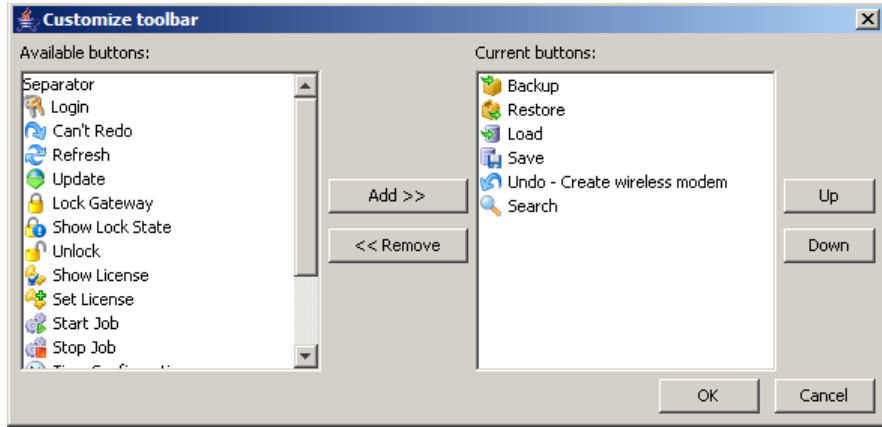


Figure 67. Customize Tool Bar

There are some predefined tool bar elements:

Backup

see Configuration ►► Backup

Restore

see Configuration ►► Restore

Load

see Configuration ►► Load

Save

see Configuration ►► Save

Undo

see Edit ►► Backup

Search

see Tools ►► Backup

Main Window views

The main window of the A850 configuration GUI consists of the following components:

- Tree view providing access to all the objects to be configured of the actual configuration,
- Table view with a configurable column display to provide sufficient information to identify the object to be worked on, dependent on the selected node of the tree view,
- A menu bar including the menus to invoke the provided functions,
- A tool bar providing shortcut access to specified functions,
- Context menus for the nodes of the tree view and for the rows of the table view providing functions to be performed on the underlying object.

From this main window, the user can start the navigation to either detailed views of objects or to windows for issuing special functions or to the extended search interface for retrieving a limited view of objects.

Tree view

The view in the left part of the main window shows the configuration data structured as tree to accelerate the navigation within it.

The nodes of the tree can either be mere structure constructs without configuration data (e.g. RTU groups) or objects with configuration data and containing multiple child objects (e.g., a RTU with several sensors connected) or objects without further child objects (e.g. sensors).

The tree view only contains objects which the actual user is permitted to see or to modify.

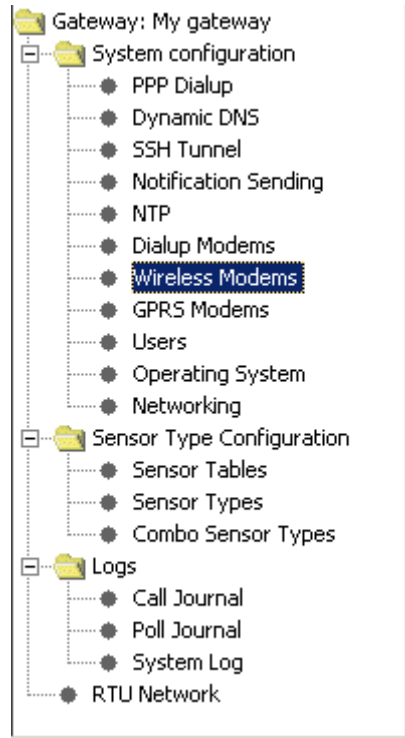


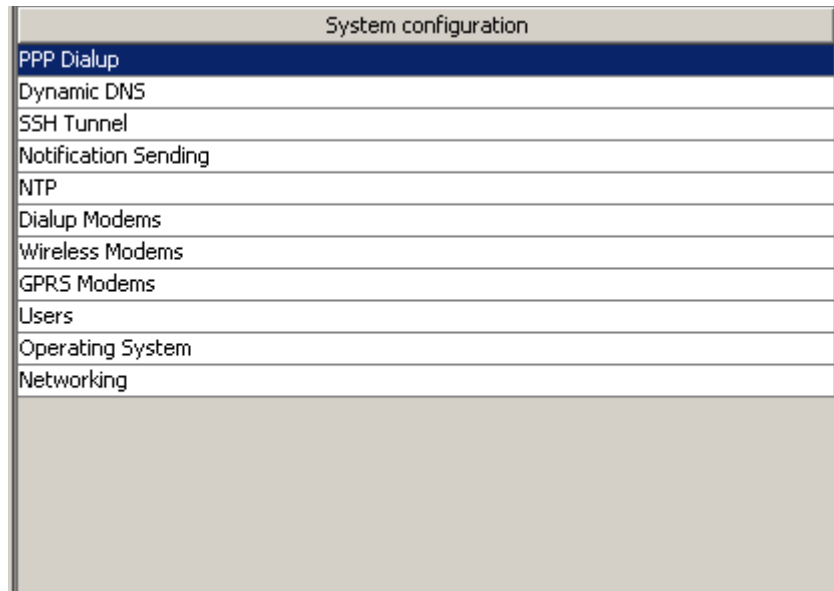
Figure 68. Tree view

Table view

The right part of the main window contains a table representation of data.

The data shown depends on the selection of one or more nodes in the tree view. The table view is a preview of the objects displayed to support a quick selection of objects to be worked on.

A table can only contain objects of the same class.



System configuration
PPP Dialup
Dynamic DNS
SSH Tunnel
Notification Sending
NTP
Dialup Modems
Wireless Modems
GPRS Modems
Users
Operating System
Networking

Figure 69. Table view

Popup Context Menu

For each object represented as row in the table view or as node in the tree view, a popup context menu can be activated by clicking the right mouse button when the object is selected.

In the popup context menu, the commands applicable in each case to the object or list entry, respectively, are provided.

Thereby, the following commands are always at your disposal:

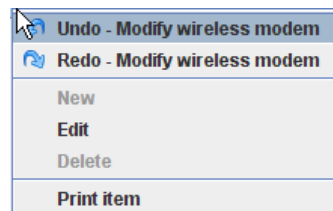


Figure 70. Common Popup Context Menu

Note: If you have the right to carry out changes at the A850, the command "Edit" is available; otherwise, the command "View" will be provided instead.

- Menu items "Undo" or "Redo" - initiate the "Undo" or "Redo" function related to the undoable/redoable actions with the selected object;

Note: The menu items "Undo" or "Redo" appear in each context menu, depending on if one or both of these menu items is or are applicable, respectively (see descriptions for "Edit-Undo" and "Edit-Redo").

- Menu item "New" - open the detail window of the selected object to define a new one;
- Menu item "Edit" - open the respective detail window and display the attributes of the selected object for modification,
- Menu item "View" - open the respective detail window and display the attributes of the selected object for inspection,

Note: The menu item "Edit" appears only if the user has been granted appropriate access privileges for modifying the selected object; otherwise, the menu item "View" will always appear.

- Menu item "Delete" - delete the selected objects;
- Menu item "Print" - see a print preview of the details of the selected objects in a formsheet processed for the printer and start the printout on your default printer,.

Depending additionally from the object to be dealt with, accessory menu entries will be listed. As example, the popup context menu for the object RTU is shown in the following figure:

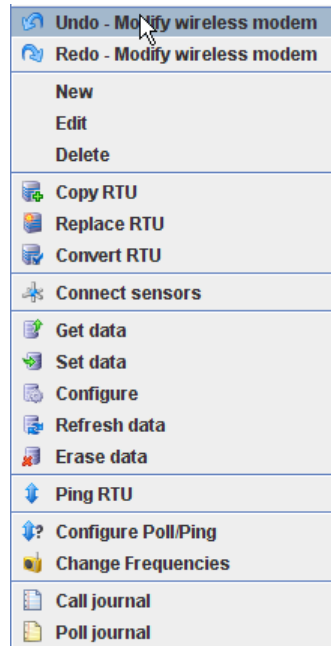


Figure 71. Extended Popup Context Menu for RTUs

Detail window

For each class of configurable objects, a detail window provides the detailed view on a specific object. It is used to enter the data of a newly created object or to change the attributes of an existing object.

A detail window of a class can be instantiated for each different object. Trying to open a detail window of an already displayed object results in activating the window with the selected object.

In each detail window, the buttons described consecutively are available:

- Print - see a print preview of the details in a formsheet processed for the printer and start the printout on your default printer,
- OK - affirmation and acceptance of the entries made in the respective detail window,

Note: The OK button is only available if the right to enter or to modify data has been granted and if data were really entered or modified, respectively. In order to resume entered or modified data, respectively, in the A850, the command "Update" has to be performed consecutively, as described in "Configuration ► Update",

- Cancel - by "Cancel", possible entries/modifications having been made in the respective detail window are discarded, i.e. the entries/modifications will not be resumed if the button "Cancel" is clicked.

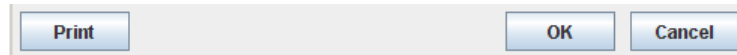


Figure 72. Detail Window Buttons

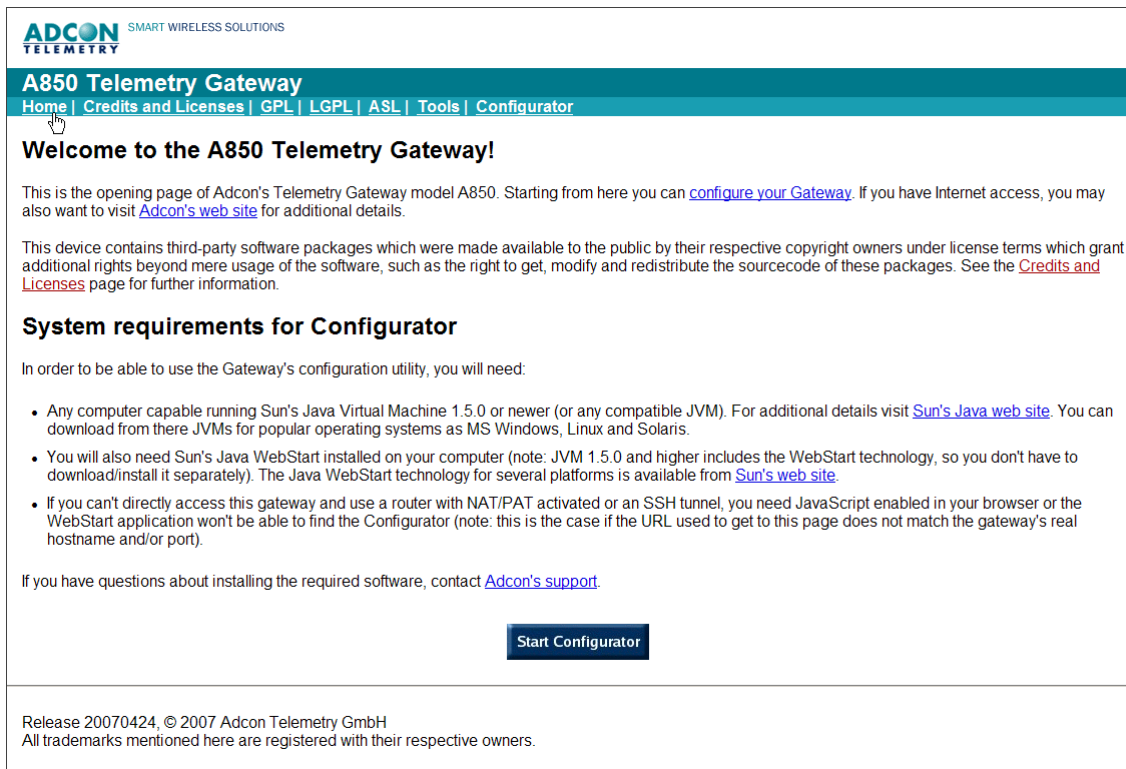
Note: The Detail windows are described in the following chapters "Configuring the Gateway" and "Using the Gateway".

Web Interface

The web interface allows you to communicate with your A850 via a web browser. The A850 provides the following web pages:

Home

The web page "Home", the front page of Adcon's Telemetry Gateway A850, provides information about the device.



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A850 Telemetry Gateway

[Home](#) | [Credits and Licenses](#) | [GPL](#) | [LGPL](#) | [ASL](#) | [Tools](#) | [Configurator](#)

Welcome to the A850 Telemetry Gateway!

This is the opening page of Adcon's Telemetry Gateway model A850. Starting from here you can [configure your Gateway](#). If you have Internet access, you may also want to visit [Adcon's web site](#) for additional details.

This device contains third-party software packages which were made available to the public by their respective copyright owners under license terms which grant additional rights beyond mere usage of the software, such as the right to get, modify and redistribute the sourcecode of these packages. See the [Credits and Licenses](#) page for further information.

System requirements for Configurator

In order to be able to use the Gateway's configuration utility, you will need:

- Any computer capable running Sun's Java Virtual Machine 1.5.0 or newer (or any compatible JVM). For additional details visit [Sun's Java web site](#). You can download from there JVMs for popular operating systems as MS Windows, Linux and Solaris.
- You will also need Sun's Java WebStart installed on your computer (note: JVM 1.5.0 and higher includes the WebStart technology, so you don't have to download/install it separately). The Java WebStart technology for several platforms is available from [Sun's web site](#).
- If you can't directly access this gateway and use a router with NAT/PAT activated or an SSH tunnel, you need JavaScript enabled in your browser or the WebStart application won't be able to find the Configurator (note: this is the case if the URL used to get to this page does not match the gateway's real hostname and/or port).

If you have questions about installing the required software, contact [Adcon's support](#).

[Start Configurator](#)

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Figure 73. Adcon's A850 Home Page

The web page provides:

- The link "Configurator", the hyperlink "configure your Gateway" and the button "Start Configurator", allowing you to start the A850 GUI as described in chapter 3 and 4,
- "Adcon's web site", a hyperlink forwarding you to the official homepage of Adcon where you can retrieve other information about Adcon products,
- "Sun's Java web site" and "Sun's web site", hyperlinks forwarding you to the official homepage of SUN where you can read up on the actual version of "Sun's Java Virtual Machine" and download it if necessary,
- "Adcon's support", a hyperlink forwarding you to your mail client, allowing you to edit and send mail to the address support@adcon.at.

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- The [Free Software Foundation](#)
- The [Open Source Initiative](#)

The sourcecode to these software packages and the toolchain needed to build the corresponding binaries are available as downloadable archives on [Adcon's web site](#) or on digital storage media (contact [Adcon's Support](#)). However, there are a few things you have to consider:

- Some software packages installed on the gateway are neither derived from nor licensed as FOSS like the bootloader, the data logging and retrieval software and the Configurator application. These packages are not available in sourcecode form and may not be redistributed without explicit written permission of their respective copyright owners!
- Adcon provides support only for the A850 firmware packages distributed by Adcon running on the gateway hardware. Modified software or running the A850 firmware packages on other hardware is not supported by Adcon.
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The FOSS software packages installed on the gateway are:

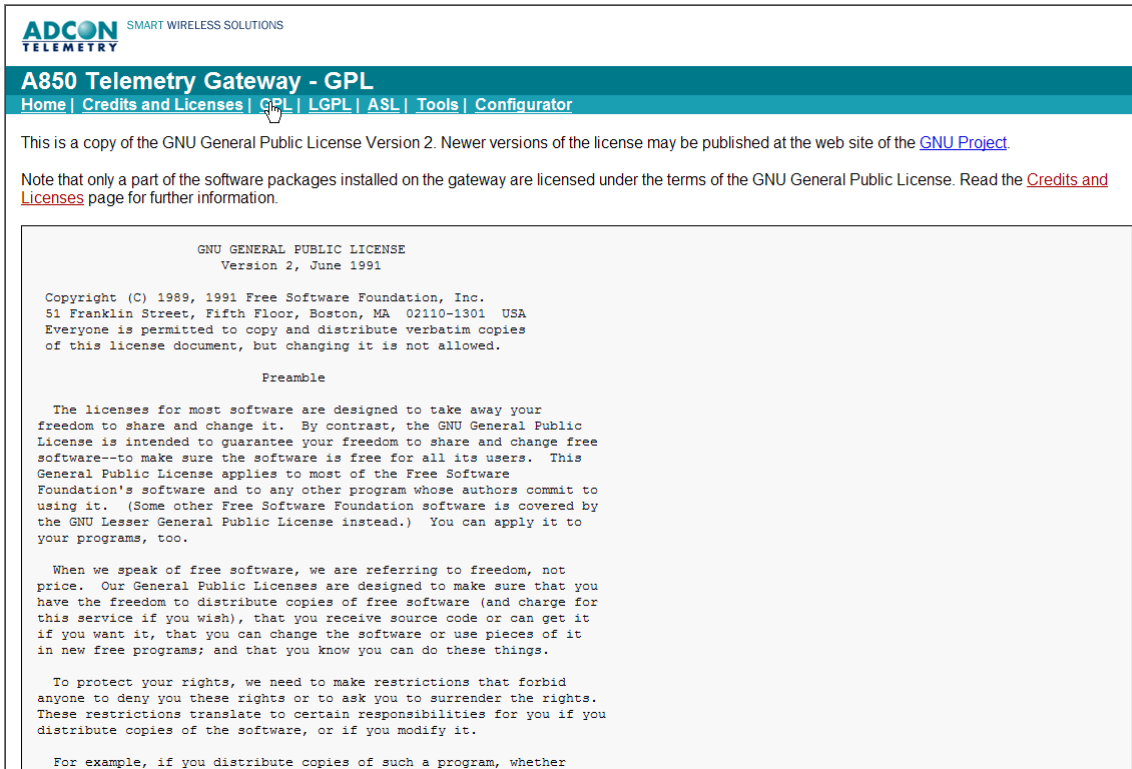
Linux Kernel (<http://www.kernel.org/>)

The kernel is the core of an operating system and provides basic resources (hardware drivers, task and memory management, ...) for the application that run on top of it. Further informations can be found on the following web sites: <http://www.arm.linux.org.uk/> (Linux port to the ARM processor architecture), <http://www.embeddodarm.com/linux/ARM.htm> (Linux port to the TS-7200 single board computer). Licensed under the terms of the GPL version 2.

Figure 74. A850 Credits and Licenses Web Page

GPL

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Figure 75. A850 GPL Web Page

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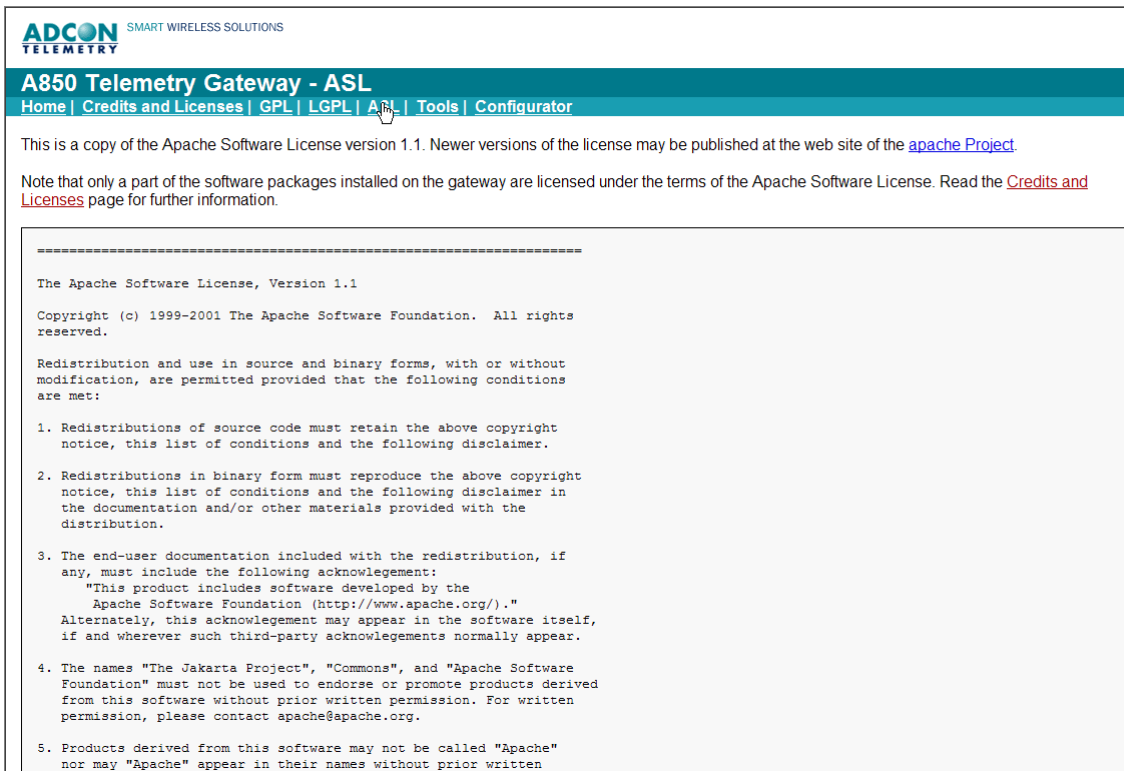
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Figure 76. A850 LGPL Web Page

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Figure 77. A850 ASL Web Page

Tools

The web page "Tools" provides you support for debugging or for using, respectively, your A850:

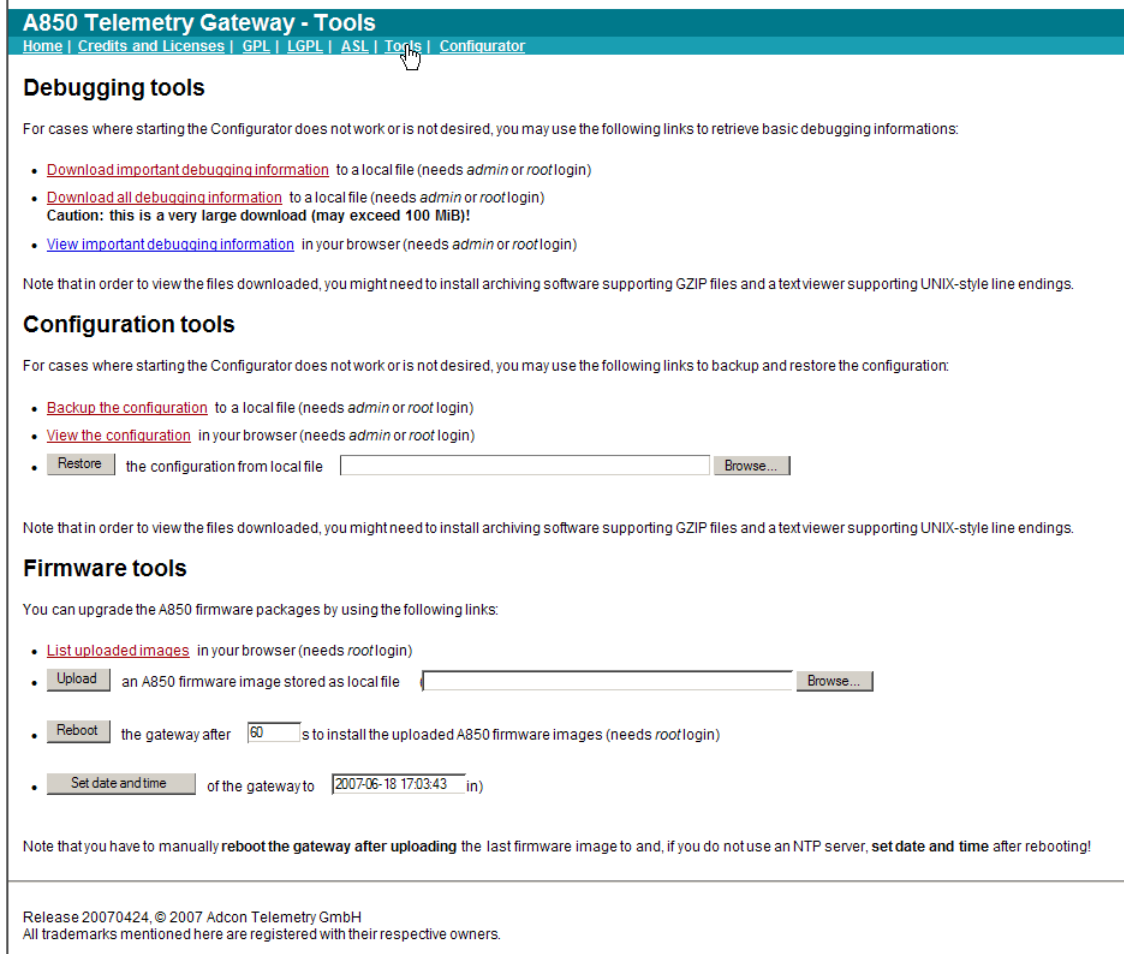


Figure 78. A850 Tools Web Page

This website offers to you access to

- Debugging tools,
- Configuration tools and
- Firmware tools.

Debugging tools

For cases where starting the Configurator does not work or is not desired, you may use the following links to retrieve basic debugging information:

- “Download important debugging information to a local file” allows you in case of possible problems to download the most important information about the status of your A850 for problem analysis to your PC and to save it in a local file,
- “Download all debugging information to a local file” allows you in case of possible problems to download all available information about the status of your A850 for problem analysis to your PC and to save it in a local file,
- “View important debugging information” allows you in case of possible problems to retrieve the most important information about the status of your A850 and to get it displayed via your web browser.

Note: In order to be able to use the “Debugging tools”, you have to login as system administrator (user “root”) or as user administrator (user “admin”).

Configuration tools

For cases where starting the Configurator does not work or is not desired, you may use the following links to backup and restore the configuration:

- “Backup the configuration to a local file”: the command “Backup” allows you to save the data from the A850 locally on your PC, giving you the opportunity to replay these data later again into the A850 by the command “Restore” which allows you to reestablish the state stored by “Backup”(see [Configuration ▶ Backup](#));
- “View the configuration in your browser”: view a XML-based information of the actual configuration of the A850;
- “Restore the configuration from local file”: the command “Restore” allows you to reload data from the A850 saved by the command “Backup” on your PC again into the A850 if you want to reestablish a certain state of the A850 (see [Configuration ▶ Restore](#));

Note: In order to be granted the rights to use the configuration tools, you must have logged in as system administrator (user "root") or as user administrator (user "admin").

Firmware tools

Firmware tools are provided for your support when performing firmware upgrades which may become available in the future. As soon as an upgrade of the firmware will be available, you will be able to download it from Adcon's website, following the instructions given there, or by receiving it from your Adcon distributor, respectively. After having the new firmware available on your local PC, you will have to transfer it to your A850.

The following firmware tools are provided:

- "List uploaded images in your browser": view all uploaded firmware images stored in the flash memory of your A850,

Note: The purpose of this feature is to provide the possibility to check if all files required for a firmware upgrade have been uploaded to the A850. This check should be made before the new firmware is started with "reboot", after that, the list of uploaded images will be erased again.

- "Upload an A850 firmware image stored as local file": load an actual version of the firmware image in your A850,

Note: Perform an upgrade only if you have problems with your A850 or if an upgrade is recommended by Adcon, respectively.

- "Reboot the Gateway": after a firmware upgrade has been prepared, you have to reboot your A850 anew in order to activate the new firmware.
- "Set Date and Time of the Gateway": in any case, after a firmware upgrade, you have to enter date and time anew.

Note: In order to be granted the rights to use the firmware tools, you must have logged in as system administrator (user "root").

Chapter 3. Configuring the Gateway

The configuration of the Gateway summarizes all administrative settings required for its use and is therefore to be entrusted only to skilled users qualified as system administrators. According to this, only the user "root" (the system administrator) has the rights to make all the settings for configuring the Gateway. As a basic principle, all other users have only the right to view the settings, but not to make any changes. The only exception to this rule is coupled with the point "Users" in the tree window (see below) as this functionality gives other user groups a limited capability to make some settings of the configuration. This feature will be described in detail in chapter 4, "Using the Gateway".

In order to configure the Gateway, you have to proceed as follows:

- Login as system administrator (user "root") as already explained in chapter 2, "Connecting to the GUI" (Fig. 13, "Login"). After the login, the main window of the A850 Configurator (Fig. 14) appears.
- Lock the Gateway by "Lock Gateway" as already explained in chapter 2, "Commands on the Menu Bar", Figs. 23 - 25. This is necessary by reason of the multi-user-capability of the Gateway, in order to prevent other users from attempting any conflicting activities while the Gateway is configured.
- Open the "System configuration" in the "Tree view" by double clicking. Now, the main window of the A850 Configurator as displayed below in Fig. 79 will appear.

The procedure of configuring the Gateway is considerably facilitated by the user-friendly GUI. As you will notice, the status line of the window will show the user having logged in as well as the remaining time the Gateway will stay locked yet.

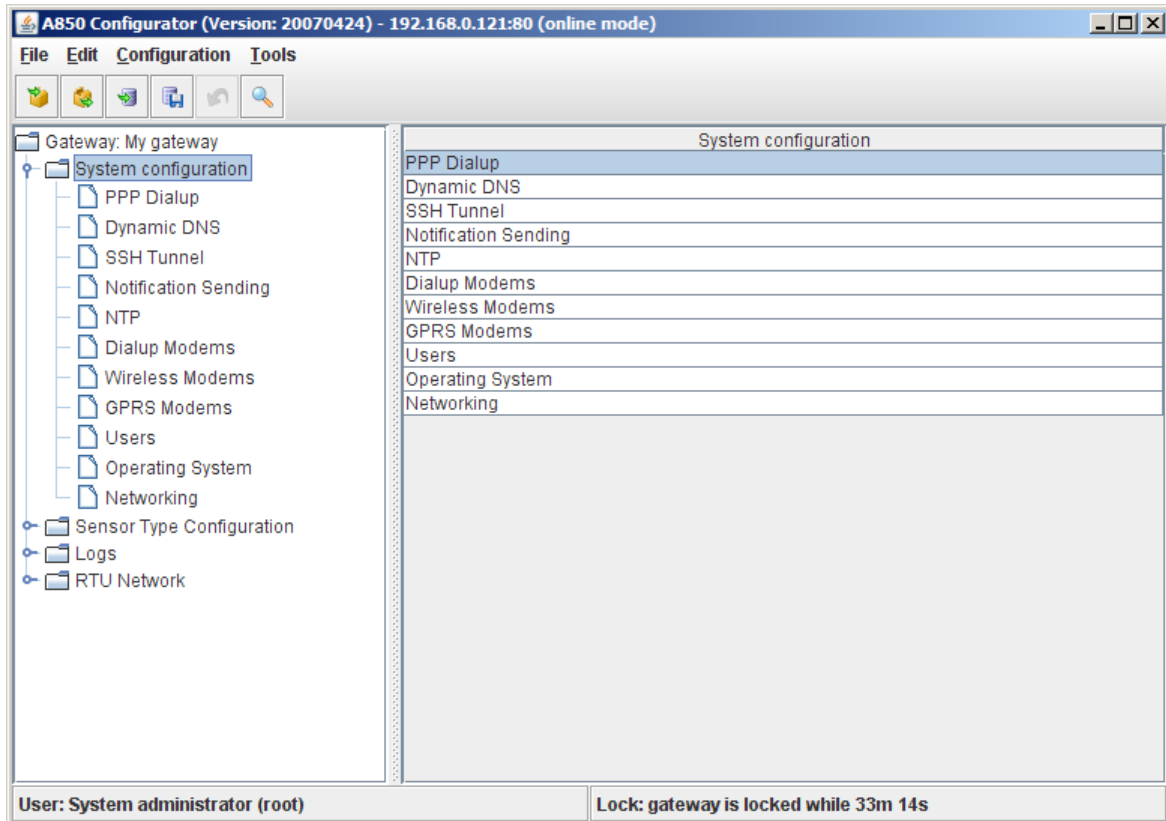


Figure 79. System Configuration List Window

The left part of the system configuration list shows the tree structure ("Tree view") of the system configuration while the right part displays the respective corresponding table ("Table view") of the marked item. The settings required for configuring the Gateway are summarized in the tree window in the folder named "System configuration". The topmost folder named "Gateway: My Gateway" contains some basic information about the Gateway itself which will be discussed at the end of this chapter.

The system configuration list window shows you the items to be configured as well in its left part as in a "Tree view" as in its right part in "Table view".

The system configuration settings encompass:

- PPP (Point-to-Point Protocol) Dialup - management of the PPP internet connection,
- Dynamic DNS (Domain Name System) - management of your host name in the DNS to convert host names into affiliated IP (Internet Protocol) addresses in cases where the IP address is not static,
- SSH (Secure Shell) Tunnel - management of Secure Shell Tunnelling to connect terminal devices via internet and by secure communication,
- Notification Sending - management of the allocation of recipients for transmissions of messages related to specific events,
- NTP - management of the Network Time Protocol (a protocol for time synchronization between computers),
- Dialup Modems - management of dialup modem communications with their RTUs,
- Wireless Modems - management of Wireless Modem communications with their RTUs,
- GPRS Modems - management of GPRS modem communications with their RTUs,
- Users - management of users and user groups as well as of their respective access rights,
- Operating System - management of operating system specific assignments,
- Networking - management of the network configuration,
- Gateway Detail - management of Gateway specific information.

PPP Dialup

With PPP Dialup, a network connection to the internet or to a PPP server, respectively, is established by means of a dialup modem. The concerned menu allows you to determine the configuration of a PPP network for a dialup modem connection.

Note: In order to be able to use the PPP network, you have to enable at least one of your dialup modems for PPP dialup ("allow PPP dialup").

The A850 supports two dial-up peer configurations: a primary which is tried first and a secondary which is only used if the primary connection can't be established. A secondary configuration is not required as a matter of principle, but as it enhances the redundancy of your network, it is recommended to make use of this practical feature.

Note: Points which require execution of a login script are not supported.

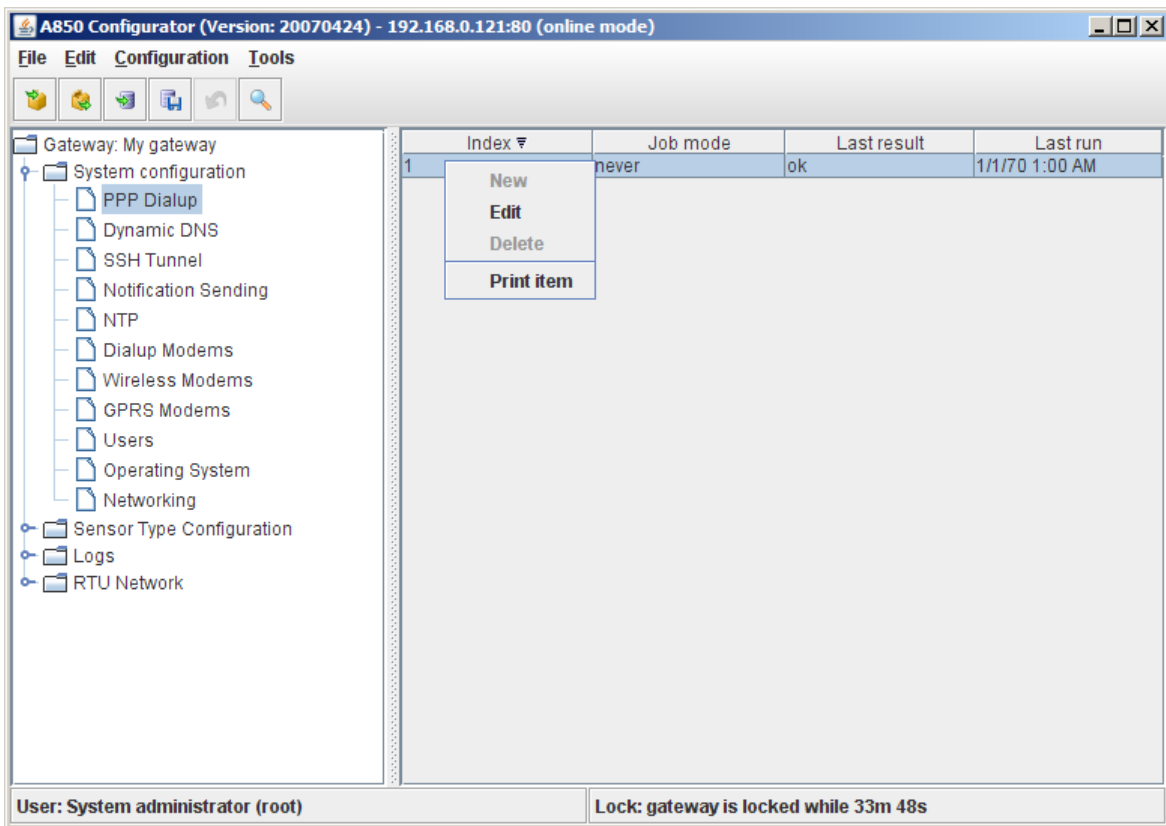


Figure 80. PPP Dialup Selection

Via the context menu for PPP Dialup, you can

- lay down the PPP Dialup configuration by "Edit",
- see a print preview of the selected PPP Dialup configuration in a formsheet processed for the printer and start the print on your default printer by "Print item".

Note: The greyed-out choices “New” and “Delete” are not available in this context. The choice “Edit” is only available if the Gateway is locked while “View” is only available if the Gateway is unlocked.

Note: Menu items “Undo” or “Redo”: see “Popup Context Menu” in chapter 2.

Double-clicking the PPP Dialup selected in the “Table view” allows you to check the selected PPP Dialup configuration.

Note: If not otherwise stated explicitly, the action performed in a screenshot containing a context menu like the one depicted in Fig. 80 will always be a click on “Edit”, and the screenshot displayed as the next will always be the one illustrating the situation resulting from this action, regardless of any peculiar properties of the window appearing next (e.g. replacing the previous window or just appearing in addition to it as a “pop-up window”).

Note: For being able to use PPP Dialup, it is necessary to make a PPP Dialup setup on at least one Dialup Modem.

The screenshot shows a window titled "PPP Configuration" with a close button (X) in the top right corner. The window is divided into several sections:

- Job scheduling:** A "Mode" dropdown menu is set to "always".
- Job status:** "Last run" is 1/1/70 1:00 AM, "Last result" is "ok", and "Next run" is 1/19/38 4:14 AM.
- Job dependent settings:** A checkbox for "notify on success" is unchecked.
- Primary Account:** Fields include Phone (33421), Login (account1), Password (masked with dots), Max. connect time [s] (900), Idle timeout [s] (60), IP addr. local (192.168.254.1), remote (192.168.254.2), and Netmask (255.255.255.0). A checkbox "Set the default route on PPP connect" is checked.
- Secondary Account:** Fields include Phone (33422), Login (account2), Password (masked with dots), Max. connect time [s] (900), Idle timeout [s] (60), IP addr. local (192.168.254.1), remote (192.168.254.2), and Netmask (255.255.255.0). A checkbox "Set the default route on PPP connect" is checked.

At the bottom of the window, there are three buttons: "Print", "OK", and "Cancel".

Figure 81. PPP Configuration Window

The following window areas are provided in the window “PPP Configuration”:

- Job scheduling: allows to define a time schedule (“Mode”) to determine when the A850 has to establish a PPP connection to the internet;
- Job status: allows to get the information when the last PPP connection attempt was made, with which success it was performed, and when the next attempt to connect to the internet is scheduled;
- Job dependent settings: allow to lay down that a message will be forwarded to the address entered into the tree window “Notification Sending” in case of a successful set-up of a connection with the internet;
- Primary Account: allows to set up the access data of the primary account;
- Secondary Account: allows to set up the access data of the secondary account.

Job scheduling

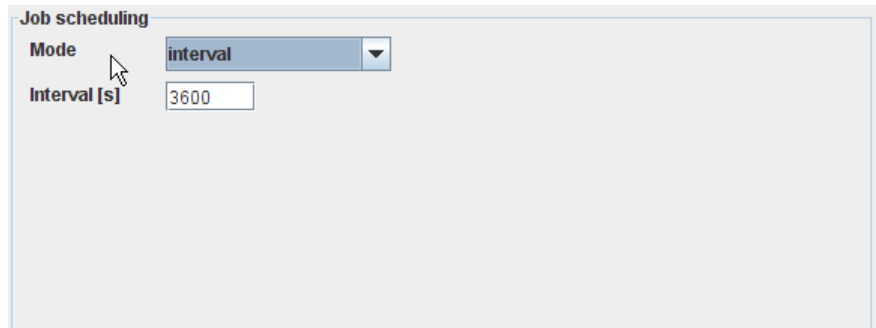


Figure 82. PPP Configuration - Job scheduling

Within “Job scheduling”, the pull down menu “Mode” provides the following set-ups to gather contact with the internet:

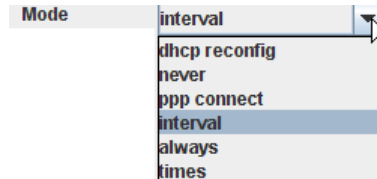


Figure 83. PPP Configuration - Job scheduling - Mode

Note: The job scheduling layed down can be oversteered by the commands "Start Job" or "Stop Job" according to Fig. 43 or 46, respectively.

- Mode - in this combo box, the time of establishment of a PPP connection is determined, featuring the following selections:
 - dhcp reconfig - to re-establish your former dhcp settings after having changed them in the tree window "Networking";
 - never - to prevent an PPP connection to be established automatically;
 - ppp connect - to force a PPP connection to be established automatically;
 - interval - to force a PPP connection to be established at certain regular intervals (the interval in seconds has to be put into the field "Interval [s]");

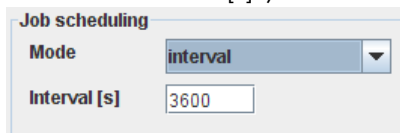


Figure 84. PPP Configuration - Job scheduling - Mode - Interval

- always - to force an internet connection to be always established;

- times - to force an internet connection to be established at specific times:

Job scheduling

Mode

00:00	00:30	01:00	01:30	02:00	02:30	03:00	03:30
04:00	04:30	05:00	05:30	06:00	06:30	07:00	07:30
08:00	08:30	09:00	09:30	10:00	10:30	11:00	11:30
12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30
16:00	16:30	17:00	17:30	18:00	18:30	19:00	19:30
20:00	20:30	21:00	21:30	22:00	22:30	23:00	23:30

Figure 85. PPP Configuration - Job scheduling - Mode - Times

Job status

“Job status” allows you to check the time and the result of the last PPP network connection set-up.:

Job status

Last run Last result

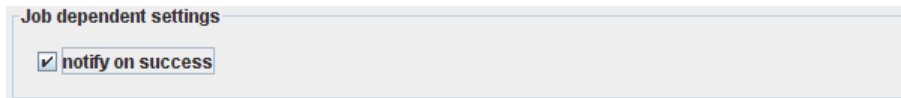
Next run

Figure 86. PPP Configuration - Job status

- Last run - displays the time of the last PPP network connection set-up;
- Last result - displays the result of the last connection set-up;
- Next run - displays the time of the next planned connection set-up with the PPP network.

Job dependent settings

Allow you to determine that, in case of successful connection to the internet, a message has to be forwarded to the address enlisted in the tree window “Notification Sending”.



Job dependent settings

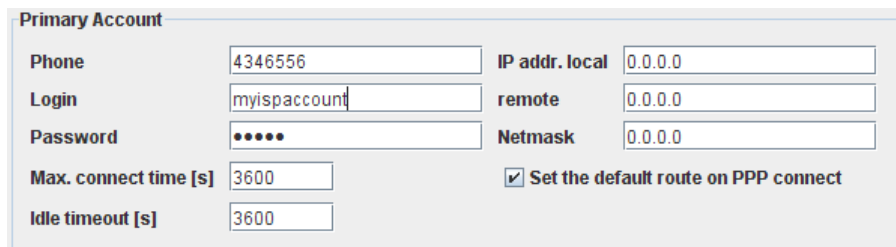
notify on success

Figure 87. PPP Configuration - Job dependent settings

- notify on success - if the checkbox “notify on success” is marked, a “PPP network connection success message” will be sent in case of successful connection.

Primary Account

Allows you to enter the following access data to your ISP or PPP server for the Primary Account:



Primary Account

Phone	<input type="text" value="4346556"/>	IP addr. local	<input type="text" value="0.0.0.0"/>
Login	<input type="text" value="myispaccount"/>	remote	<input type="text" value="0.0.0.0"/>
Password	<input type="password" value="••••"/>	Netmask	<input type="text" value="0.0.0.0"/>
Max. connect time [s]	<input type="text" value="3600"/>	<input checked="" type="checkbox"/> Set the default route on PPP connect	
Idle timeout [s]	<input type="text" value="3600"/>		

Figure 88. PPP Configuration - Primary Account

- Phone - enter the phone number provided by your ISP or PPP server for dialup connection;
- Login - enter the account name provided by your ISP or PPP server for the login;
- Password - enter the password provided by your ISP or PPP server;
- Max. connect time [s] - allows you to determine the maximum time a connection to your ISP or PPP server shall be allowed to persist; if you enter the digit 0, the connection will persist as long as it will be interrupted either by the defined “Job scheduling” or by manual termination by the command “Stop job”;

- Idle timeout [s] - allows you to determine after which period of inactivity the connection to your ISP or PPP server shall be terminated;
- IP addr. local - allows you to enter a local IP address for your PPP connection;
- remote - allows you to enter a remote IP address for your PPP connection;
- Netmask - requires the masking of the IP address;

Note: If your ISP or PPP server assigns dynamic IP addresses, you have to enter "0.0.0.0" in the fields "IP addr. local", "remote" and "Netmask".

- Set the default route on PPP connect - if the checkbox is marked, the opposing communications device is used as a router when the PPP connection is established.

Secondary Account

Secondary Account			
Phone	<input type="text" value="0716334567"/>	IP addr. local	<input type="text" value="192.168.254.1"/>
Login	<input type="text" value="mysppserver"/>	remote	<input type="text" value="192.168.254.2"/>
Password	<input type="password" value="*****"/>	Netmask	<input type="text" value="255.255.255.0"/>
Max. connect time [s]	<input type="text" value="900"/>	<input checked="" type="checkbox"/> Set the default route on PPP connect	
Idle timeout [s]	<input type="text" value="60"/>		

Figure 89. PPP Configuration - Secondary Account

A secondary account is an alternative account for an internet or PPP server connection which will be used if no internet connection comes about through the primary account. The secondary account can be either an independent access to an ISP or only represent another dialup phone number for the ISP of the primary account.

Note: A secondary account for an internet connection is a matter of redundancy and as such, not necessary on principle.

Dynamic DNS

Dynamic DNS (Domain Name System) means that your A850 will be accessible in the internet by a host name. This is important if your ISP provides only dynamic IP addresses, i.e. IP addresses which can always change with each login into the internet. Dynamic DNS allows you to assign a fixed host name to a dynamic IP address and to access this address through the host name.

The dynamic DNS updates enables other hosts on the internet to connect to the A850, as long as the following preconditions are met:

- If the A850 is directly connected to the ISP, it must get an official static or dynamic IP address assigned by the ISP;
- If the A850 is acting behind a NAT (Network Address Translation) router, the NAT router must get an official static IP address assigned by the ISP;

Note: For cases where the A850 is acting behind a NAT router which gets a dynamic ISP address assigned by the ISP, dynamic DNS updates should be supported by and enabled on the router.

- If there is a transparent firewall between the A850 and the internet, it must allow certain incoming TCP/IP connection types (HTTP or HTTPS as a minimum);
- The user must create an account on a supported dynamic DNS service.

The A850 supports two dynamic DNS update servers: a primary which is tried first and a secondary which is only used if the primary connection can't be established. The A850 supports updating its IP address on a selection of the following dynamic DNS services:

- dyndns, <http://www.dyndns.org/>
- eurodyndns, <http://www.eurodyndns.org/>
- hn, <http://www.hn.org/>
- no-ip, <http://www.no-ip.com/>
- ods, <http://www.ods.org/>
- ovh, <http://www.ovh.com/>
- regsh, <http://www.regsh.com/>

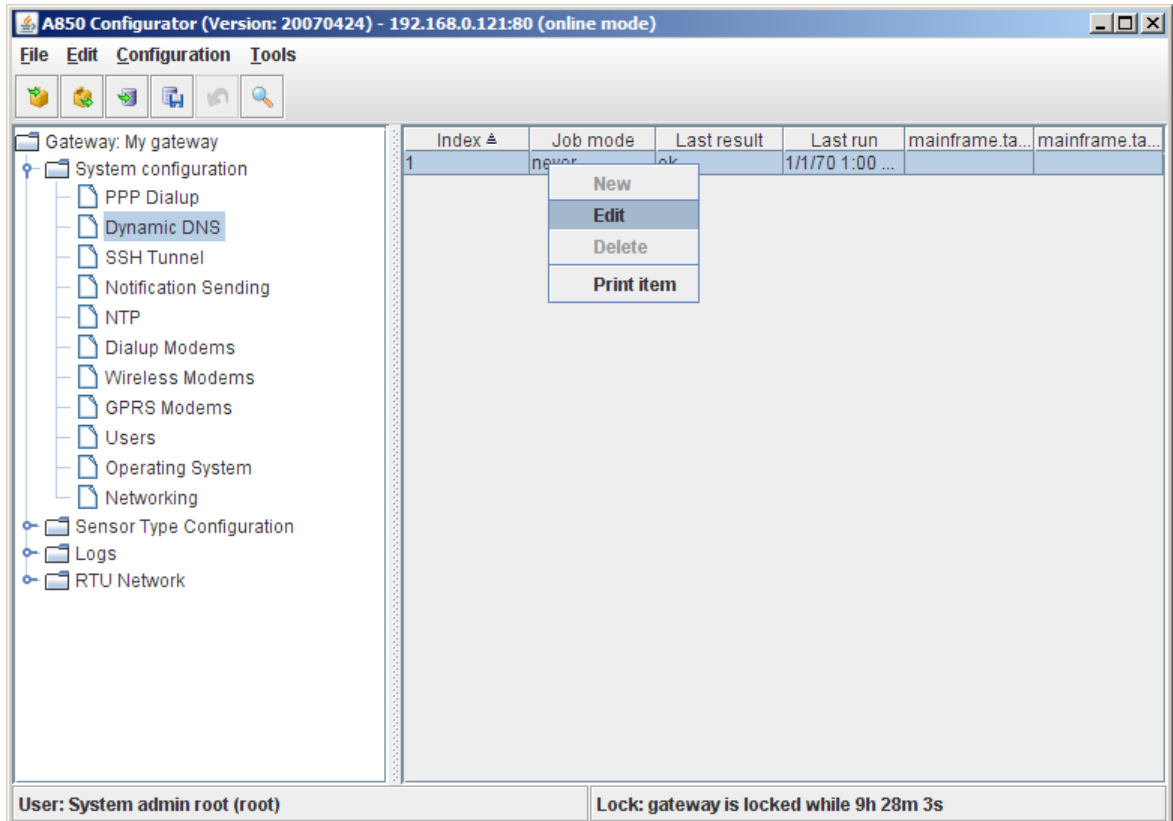


Figure 90. Dynamic DNS Selection

The context menu for Dynamic DNS gives you the following options:

- “Edit” - to define the Dynamic DNS Update configuration;
- “Print item” - to display the defined Dynamic DNS Update configuration in a form formatted for the printer which can be printed from there on your default printer.

Note: The greyed-out choices “New” and “Delete” are not available in this context.

Note: Menu items “Undo” or “Redo”: see “Popup Context Menu” in chapter 2.

Double-clicking the Dynamic DNS selected in the "Table view" allows you to check the selected Dynamic DNS configuration.

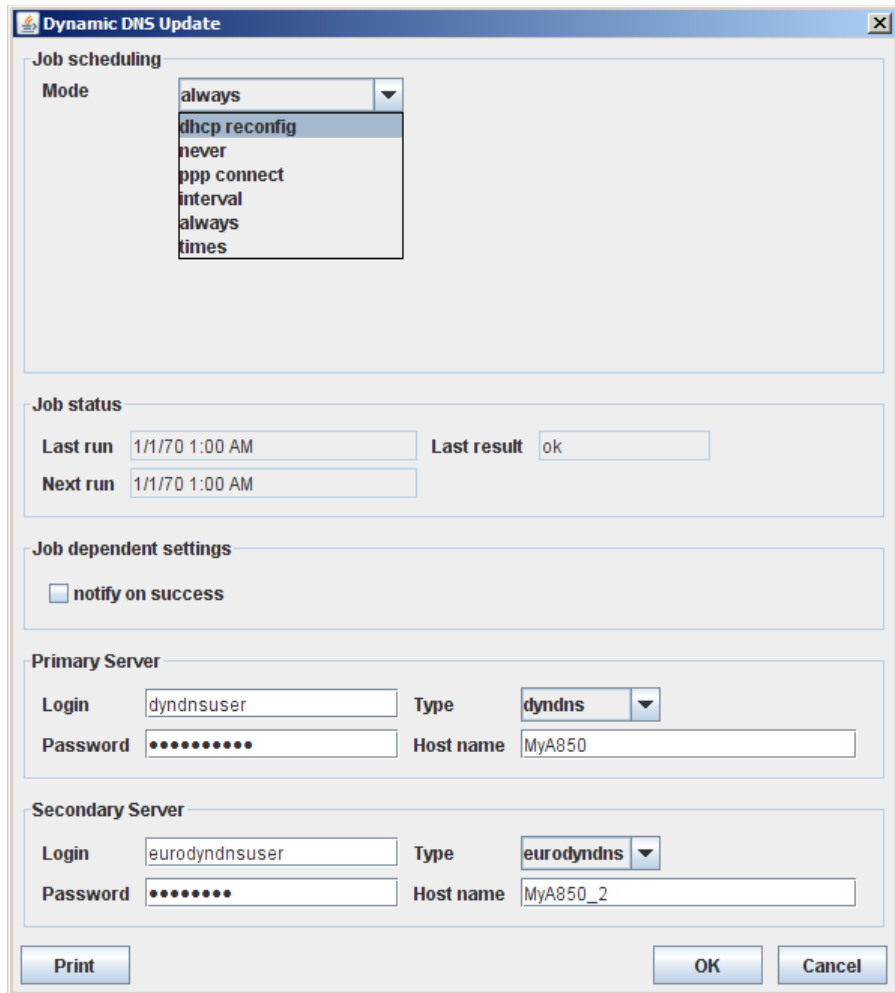


Figure 91. Dynamic DNS Update Window

The window "Dynamic DNS Update" provides the following window areas:

- Job scheduling - allows to define a time schedule ("Mode") to which time the A850 has to perform a Dynamic DNS Update;
- Job status - for information at which time the last Dynamic DNS Update has been performed and with which success, as well as at which time the next update is planned;
- Job dependent settings - allow to arrange that, in case of a successful Dynamic DNS Update, a message will be forwarded to the address entered in the tree window "Notification Sending";
- Primary Server - allows to assess the access data for the primary Dynamic DNS server;
- Secondary Server - allows to assess the access data for the secondary Dynamic DNS server.

Job scheduling

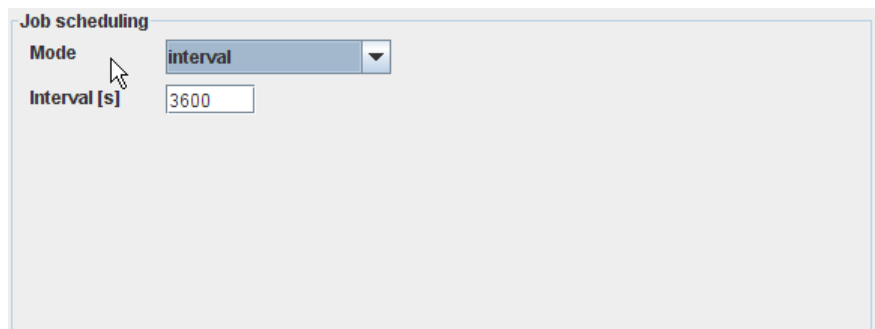


Figure 92. Dynamic DNS Update - Job scheduling

Within "Job scheduling" in the pull down menu "Mode", the following possibilities for a Dynamic DNS Update are provided:

Note: The job scheduling layed down can be oversteered by the commands "Start Job" or "Stop Job" according to Fig. 43 or 46, respectively.

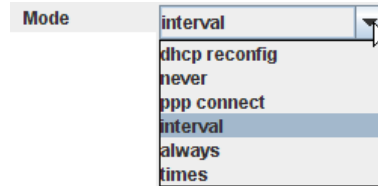


Figure 93. Dynamic DNS Update - Job scheduling - Mode

- Mode - in this combo box, it will be determined in detail how the Dynamic DNS Update is to be performed, offering the following selections:
 - dhcp reconfig - a Dynamic DNS Update has to be performed after changes of dhcp settings made in the tree window "Networking";
 - never - a Dynamic DNS Update must never be performed automatically;
 - ppp connect - a Dynamic DNS Update has to be performed after connection to the internet through PPP dialup;
 - interval - to force a Dynamic DNS Update to be established at certain regular intervals (the interval in seconds has to be put into the field "Interval [s]");

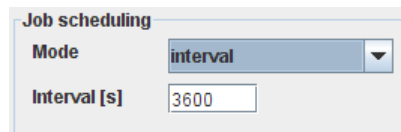


Figure 94. Dynamic DNS Update - Job scheduling - Mode - Interval

- always - the Gateway is always connected to the DNS server (it is always logged in and can always fetch DNS information);
- times - a Dynamic DNS Update has to be performed at certain fixed times:

Job scheduling

Mode

00:00	00:30	01:00	01:30	02:00	02:30	03:00	03:30
04:00	04:30	05:00	05:30	06:00	06:30	07:00	07:30
08:00	08:30	09:00	09:30	10:00	10:30	11:00	11:30
12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30
16:00	16:30	17:00	17:30	18:00	18:30	19:00	19:30
20:00	20:30	21:00	21:30	22:00	22:30	23:00	23:30

Figure 95. Dynamic DNS Update - Mode - Times

Job status

“Job status” allows you to check the time and the result of the last dynamic DNS server connection:

Job status

Last run Last result

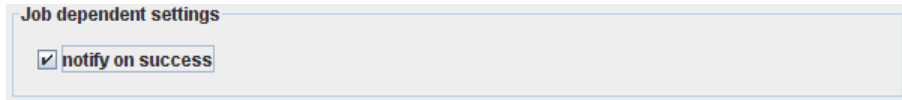
Next run

Figure 96. Dynamic DNS Update - Job status

- Last run - displays the point in time when the last contact with the DNS server was established;
- Last result - displays the result of the establishment of the contact;
- Next run - displays the point in time of the planned next establishment of contact with the DNS server.

Job dependent settings

Allow you to determine that in case of successful connection to the DNS server, a message has to be forwarded to the address enlisted in the tree window “Notification Sending”.



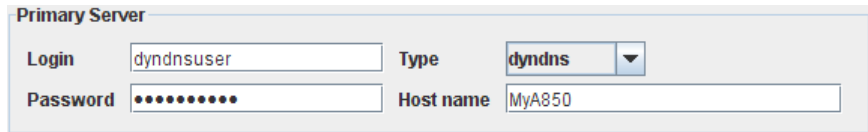
The screenshot shows a window titled "Job dependent settings". Inside, there is a single checkbox labeled "notify on success" which is checked.

Figure 97. Dynamic DNS Update - Job dependent settings

If the checkbox “notify on success” is marked, a “DNS server connection success message” will be sent in case of successful connection to the DNS server.

Primary Server

Allows you to define the access data for the Primary DNS server:



The screenshot shows a window titled "Primary Server" with four input fields: "Login" containing "dyndnsuser", "Password" with masked characters, "Type" with a dropdown menu set to "dyndns", and "Host name" containing "MyA850".

Figure 98. Dynamic DNS Update - Primary Server

- Login - enter the account name provided by your DNS service for the login;
- Password - enter the password provided by your DNS service;
- Type - allows you to determine which DNS service you want to use;
- Host name - allows you to determine which internet name (host name) should be assigned to your A850 by the DNS server.

Note: If your ISP assigns dynamic IP addresses, you have to enter “0.0.0.0” in the fields “IP addr. local”, “remote” and “Net-mask”.

Secondary Server

Secondary Server			
Login	<input type="text" value="eurodynsuser"/>	Type	<input type="text" value="eurodyns"/>
Password	<input type="password" value="•••••••"/>	Host name	<input type="text" value="MyA850_2"/>

Figure 99. Dynamic DNS Update - Secondary Server

A secondary DNS server can be used e.g. if no connection to the primary DNS server can be accomplished. An alternative DNS service with identical or different host name can be used for the secondary DNS server.

Note: In principle, a secondary DNS server is not necessary for a dynamic DNS update.

SSH Tunnel

The SSH tunneling enables other hosts on the internet to connect to the A850 by using a SSH server as a proxy, even if the A850 has no official IP address or cannot be directly reached from the internet, as long as the following preconditions are met:

- The A850 must be able to initiate SSH connections to a SSH server which can be reached from the internet. If there is a firewall between the A850 and the internet, connections to the SSHserver's IP address and port must be allowed by the firewall.
- The SSH server must support SSH version 2 and allow remote port forwarding without a parallel shell connection.
- The user must create an account on the SSH server.

The A850 supports two SSH tunnel connections: a primary which is tried first and a secondary which is only used if the primary connection can't be established. Both SSH servers must support remote port forwarding (for more than one port if necessary).

Note: You can also perform the Console Commands of the A850 from a remote PC through a SSH tunnel if you define a "Remote Telnet port" at the SSH server.

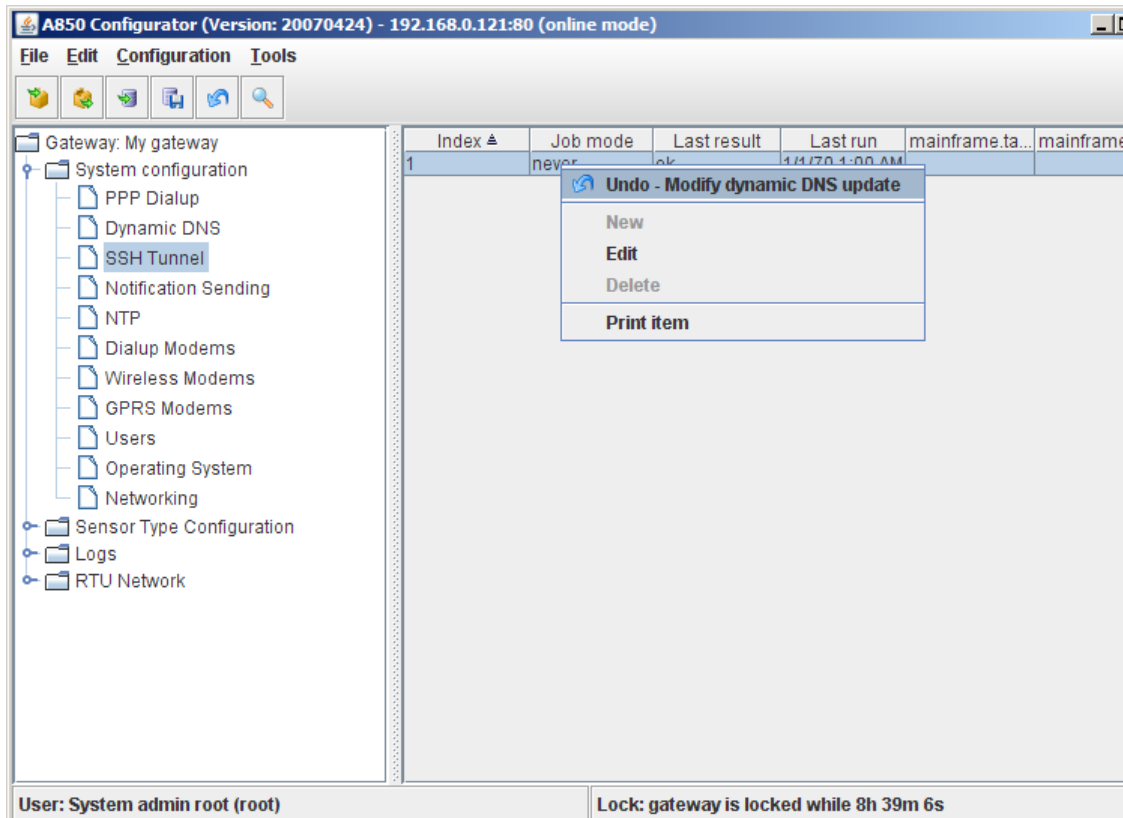


Figure 100. SSH Tunnel Selection

The context menu for SSH tunnel allows you to:

- determine the SSH tunnel configuration by "New" or "Edit",
- see a print preview of the determined SSH tunnel configuration in a formsheet processed for the printer and start the printout on your default printer by "Print item".

Note: The greyed-out choices "New" and "Delete" are not available in this context.

Note: Menu items "Undo" or "Redo": see "Popup Context Menu" in chapter 2.

The determined SSH tunnel configuration can be checked by double-clicking the SSH tunnel selected in the "Table view".

SSH Tunnel

Job scheduling

Mode: always

- dhcp reconfig
- never
- ppp connect
- interval
- always
- times

Job status

Last run: 1/1/70 1:00 AM Last result: ok

Next run: 1/1/70 1:00 AM

Job dependent settings

notify on success

Primary Server

Login	sshuser1	Remote HTTP port	10080
Password	••••••••	Remote HTTPS port	10443
Host name	sshserver1	Remote TELNET port	151
Port	22	Remote SSH port	10022

Secondary Server

Login	sshuser2	Remote HTTP port	10080
Password	••••••••	Remote HTTPS port	10443
Host name	sshserver2	Remote TELNET port	151
Port	22	Remote SSH port	10022

Print OK Cancel

Figure 101. SSH Tunnel Window

The following window areas are available through the “SSH tunnel” window :

- Job scheduling - allows to define a time schedule ("Mode") to which time the A850 has to perform a SSH tunneling;
- Job status - for information at which time the last SSH tunneling has been performed and with which success, as well as at which time the next SSH tunnelling is planned;
- Job dependent settings - allow to arrange that a message will be forwarded to the address entered in the tree window "Notification Sending" in case of successful SSH tunneling;
- Primary Server - allows to assess the access data for the primary SSH tunnel server;
- Secondary Server - allows to assess the access data for the secondary SSH tunnel server.

Job scheduling



Figure 102. SSH Tunnel - Job scheduling

Within "Job scheduling", the pull down menu "Mode" provides the following set-ups to start a SSH tunneling:

Note: The job scheduling layed down can be oversteered by the commands "Start Job" or "Stop Job" according to Fig. 43 or 46, respectively.

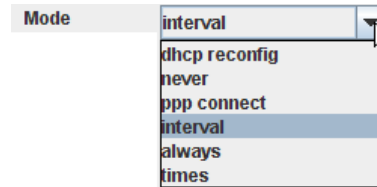


Figure 103. SSH Tunnel - Job scheduling - Mode

- Mode - This combo box is used for determining details of the SSH tunnelling; the following selections are offered:
 - dhcp reconfig - a SSH tunnelling has to be performed after changes of dhcp settings made in the tree window "Networking";
 - never - a SSH tunnelling must never be performed automatically;
 - ppp connect - a SSH tunnelling has to be performed after connection to the internet through PPP dialup;
 - interval - a SSH tunnelling has to be performed in certain regular time intervals. In doing so, the interval in seconds has to be put into the field "Interval [s]":

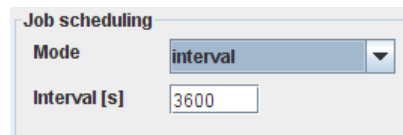


Figure 104. SSH Tunnel - Job scheduling - Mode - Interval

- always - to force a SSH tunnelling to be always established;
- times - to force a SSH tunnelling to be established at specific times:

Job scheduling

Mode

00:00	00:30	01:00	01:30	02:00	02:30	03:00	03:30
04:00	04:30	05:00	05:30	06:00	06:30	07:00	07:30
08:00	08:30	09:00	09:30	10:00	10:30	11:00	11:30
12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30
16:00	16:30	17:00	17:30	18:00	18:30	19:00	19:30
20:00	20:30	21:00	21:30	22:00	22:30	23:00	23:30

Figure 105. SSH Tunnel - Job scheduling - Mode - Times

Job status

“Job status” allows you to check the time and the result of the last SSH tunnel connection:

Job status

Last run Last result

Next run

Figure 106. SSH Tunnel - Job status

- Last run - displays the point in time when the last contact with the SSH tunnel server took place;
- Last result - displays the result of the establishment of the contact;
- Next run - displays the point in time of the planned next establishment of contact with the SSH tunnel server.

Job dependent settings

Determine that in case of successful connection to the SSH tunnel server, a message has to be forwarded to the address enlisted in the tree window “Notification Sending”.

Job dependent settings

notify on success

Figure 107. SSH Tunnel - Job dependent settings

If the checkbox “notify on success” is marked, a “SSH tunnel connection success message” will be sent in case of successful SSH tunnel connection.

Primary Server

Allows you to define the access data for the SSH tunnel Primary server:

Primary Server

Login	<input type="text" value="sshuser1"/>	Remote HTTP port	<input type="text" value="10080"/>
Password	<input type="password" value="••••••"/>	Remote HTTPS port	<input type="text" value="10443"/>
Host name	<input type="text" value="sshserver1"/>	Remote TELNET port	<input type="text" value="151"/>
Port	<input type="text" value="22"/>	Remote SSH port	<input type="text" value="10022"/>

Figure 108. SSH Tunnel - Primary Server

- Login - enter the account name provided by your SSH service for the login;
- Password - enter the password provided by your SSH service;
- Host name - enter the name of the primary SSH server;
- Port - enter the number of the port to be used locally;
- Remote HTTP port - enter the respective port number of the SSH server for a HTTP connection;
- Remote HTTPS port - enter the respective port number of the SSH server for a HTTPS connection;
- Remote TELNET port - enter the respective port number of the SSH server for a TELNET connection;
- Remote SSH port - enter the respective port number of the SSH server for a SSH service connection.

Secondary Server

Secondary Server			
Login	<input type="text" value="sshuser2"/>	Remote HTTP port	<input type="text" value="10080"/>
Password	<input type="password" value="••••••••"/>	Remote HTTPS port	<input type="text" value="10443"/>
Host name	<input type="text" value="sshserver2"/>	Remote TELNET port	<input type="text" value="151"/>
Port	<input type="text" value="22"/>	Remote SSH port	<input type="text" value="10022"/>

Figure 109. SSH Tunnel - Secondary Server

A secondary SSH server can be used as alternative SSH tunnel, e.g. if no connection to the primary SSH service can be established. An alternative SSH service with identical or different host name can be used for the secondary SSH server.

Note: In principle, a secondary SSH server is not necessary for a SSH tunneling.

Notification Sending

A notification is an event that is either created by a sensor of an RTU changing its value (digital ports) or reaching a configured threshold (analog ports), an RTU itself (depending on data delay and radio error rates) or the Gateway (for some internal events like rebooting, configuration changes, dialling into an ISP). These notifications are queued and sent to the notification server.

The A850 supports sending notifications to servers using HTTP, SMS and SMTP (E-Mail) over a primary and a secondary server for each of these methods. The primary server is tried first, the secondary only when the primary server couldn't be contacted.

Note: To send notifications as SMS messages, an external GSM modem must be connected to the A850!

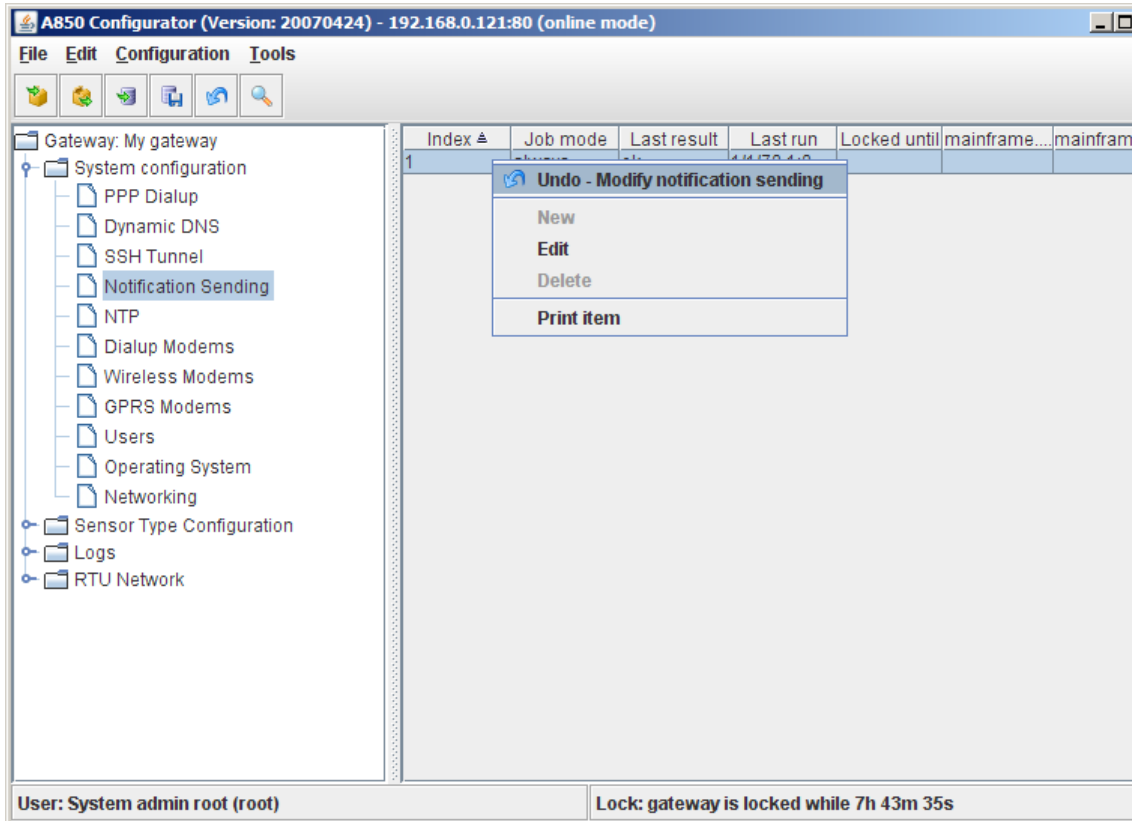


Figure 110. Notification Sending Selection

The context menu for notification sending selection allows you to:

- determine the notification sending configuration by “Edit”,
- see a print preview of the determined notification sending configuration in a formsheet processed for the printer and start the printout on your default printer by “Print item”.

Note: The greyed-out choices “New” and “Delete” are not available in this context.

Note: Menu items “Undo” or “Redo”: see “Popup Context Menu” in chapter 2.

The selected notification sending configuration can be checked by double-clicking the notification sending configuration in the "Table view".

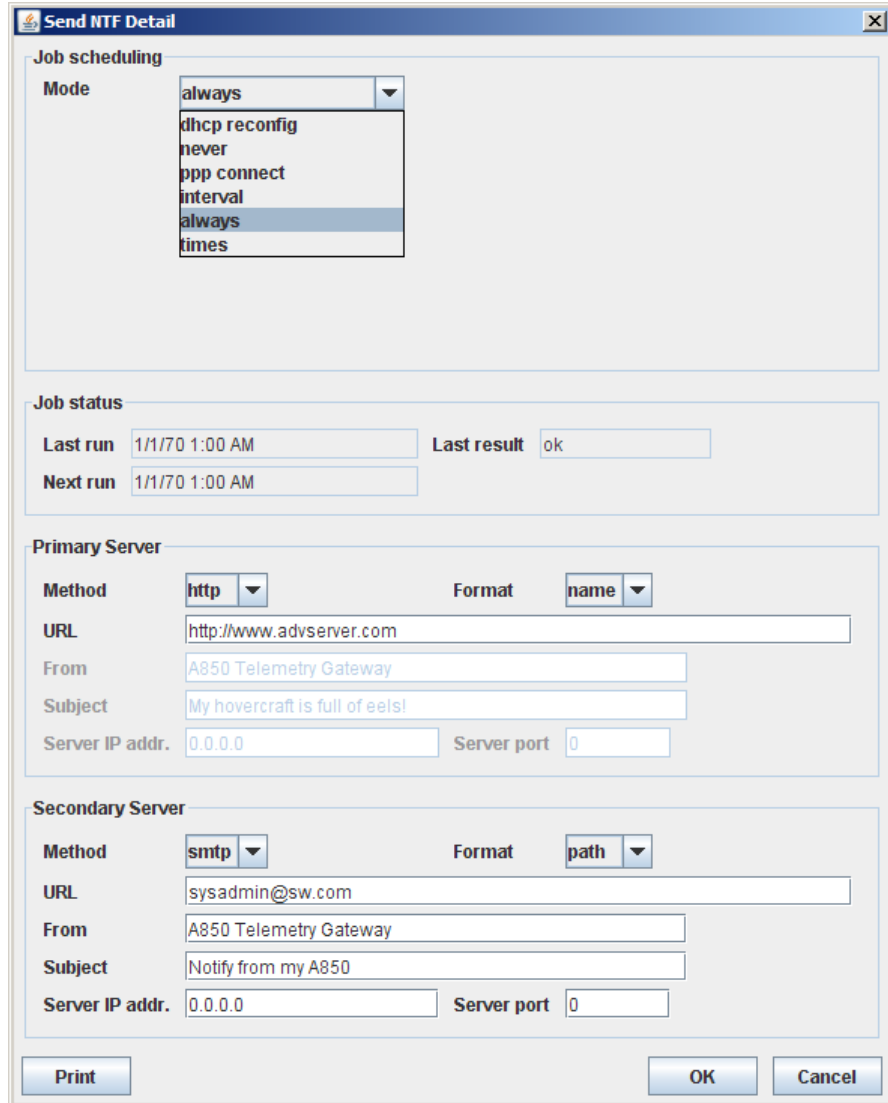


Figure 111. Send NTF Detail Window

The notification sending window ("Send NTF Detail") provides the following window areas:

- Job scheduling - allows to define a time schedule ("Mode") to which time the A850 has to perform a notification sending;
- Job status - for information at which time the last notification sending has been performed and with which success, as well as at which time the next update is planned;
- Primary Server - allows to assess the access data for the primary notification sending server;
- Secondary Server - allows to assess the access data for the secondary notification sending server.

Job scheduling

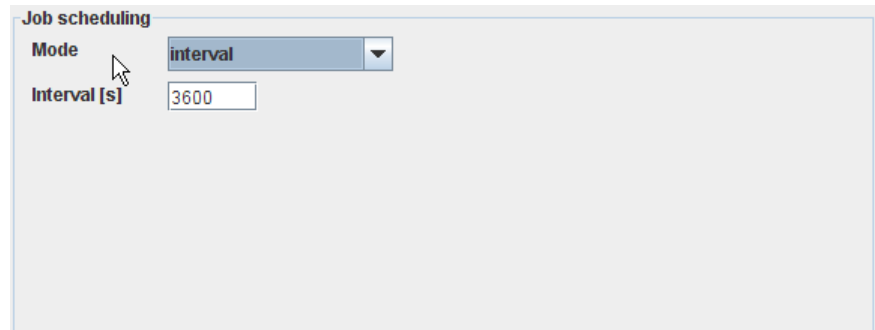


Figure 112. Send NTF Detail - Job scheduling

Within "Job scheduling", the pull down menu "Mode" provides the following set-ups to start a notification sending:

Note: The job scheduling layed down can be oversteered by the commands "Start Job" or "Stop Job" according to Fig. 43, respectively.

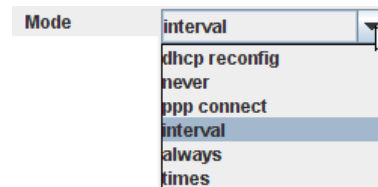


Figure 113. Send NTF Detail - Job scheduling - Mode

- Mode - This combo box is used for determining details of notification sending; the following selections are offered:
 - dhcp reconfig - a notification sending has to be performed after changes of dhcp settings made in the tree window "Networking";
 - never - a notification sending must never be performed automatically;
 - ppp connect - a notification sending has to be performed after connection to the internet through PPP dialup;
 - interval - a notification sending has to be performed in certain regular time intervals. In doing so, the interval in seconds has to be put into the field "Interval [s]":

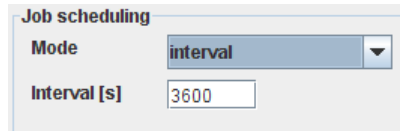


Figure 114. Send NTF Detail - Job scheduling - Mode - Interval

- always - a notification sending has to be performed always;
- times - a notification sending has to be performed at certain fixed times:



Figure 115. Send NTF Detail - Job scheduling - Mode - Times

Note: if no connection to a notification server is established, the notifications will be buffered in a queue and after establishing a notification connection, the notifications will be forwarded to the notification addressee.

Job status

“Job status” allows you to check the time and the result of the last notification sending connection:

The screenshot shows a form titled "Job status" with three input fields. The first field is labeled "Last run" and contains the text "1/1/70 1:00 AM". The second field is labeled "Last result" and contains the text "ok". The third field is labeled "Next run" and contains the text "1/1/70 1:00 AM".

Figure 116. Send NTF Detail - Job status

- Last run - displays the point in time when the last contact with the notification server was established;
- Last result - displays the result of the establishment of the contact;
- Next run - displays the point in time of the planned next establishment of contact with the notification server.

Primary Server

Allows you to define the method of forwarding to the primary notification addressee:

The screenshot shows a form titled "Primary Server" with several input fields. The "Method" field is a dropdown menu set to "http". The "Format" field is a dropdown menu set to "name". The "URL" field contains "http://www.advserver.com". The "From" field contains "A850 Telemetry Gateway". The "Subject" field contains "Notification from my A850". The "Server IP addr." field contains "0.0.0.0" and the "Server port" field contains "0".

Figure 117. Send NTF Detail - Primary Server

- Method - select the method how to send a notification. The notification can be sent via HTTP to a notification server (e.g. Advantage Server), by SMS to a cellular phone or via a SMTP server to an E-mail address;

Note: To send notifications as SMS messages, an external GSM modem must be connected to the A850!



Figure 118. Method selection

- Format - allows to select the format in which notifications are sent; notifications can be sent in formats "path", "short" or "name". The format specifies how the sender of the notification is identified in the E-mail/SMS/HTTP request:
 - short - the sender is only identified by its node ID contained in the message;
 - name - the message contains the name of an user-configured Gateway, RTU or sensor;
 - path - the names of the Gateway, the RTU and the sensor concerned are contained in the message, concatenated like a directory path;

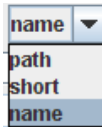


Figure 119. Format selection

- URL - for entering the address of the recipient of notifications;
- From - for entering the name of the sender of notifications;
- Subject - for entering a general message title;
- Server IP addr. - for entering the IP address of your SMTP server.

Note: To enter "From", "Subject" and "Server IP addr." is only necessary if the notifications are to be sent via E-Mail.

Secondary Server

The screenshot shows a configuration window titled "Secondary Server". It contains the following fields and controls:

- Method:** A dropdown menu with "sms" selected.
- Format:** A dropdown menu with "path" selected.
- URL:** A text input field containing "http://sysadmin.sw.com". A mouse cursor is positioned over this field.
- From:** A text input field containing "A850 Telemetry Gateway".
- Subject:** A text input field containing "Notify from my A850".
- Server IP addr.:** A text input field containing "0.0.0.0".
- Server port:** A text input field containing "0".

Figure 120. Send NTF Detail - Secondary Server

Allows you to define an alternative of forwarding to a secondary notification addressee.

Note: As a matter of principle, a secondary notification addressee is not necessary, but it's an enhancement of the redundancy of your Network.

NTP

The Network Time Protocol (NTP) is a standard for synchronizing clocks in computer systems via packet-based communications networks.

The A850 supports acting as both NTP server (provides the system time to other NTP Clients) and NTP client (fetches the system time from a NTP Server). It supports both permanent and dial-up networking connections to the NTP servers.

Note: For example, the Gateway might get the system time from an NTP server using a dial-up connection, and in parallel, act as a timeserver on the local ethernet.

Public NTP servers:

- pool.ntp.org – public pool of NTP servers
- europe.pool.ntp.org – public pool of NTP servers in Europe
- de.pool.ntp.org – public pool of NTP servers in Germany
- ntp.lanzl.net – NTP pool member

The primary server is tried first, the secondary only if the primary server couldn't be contacted.

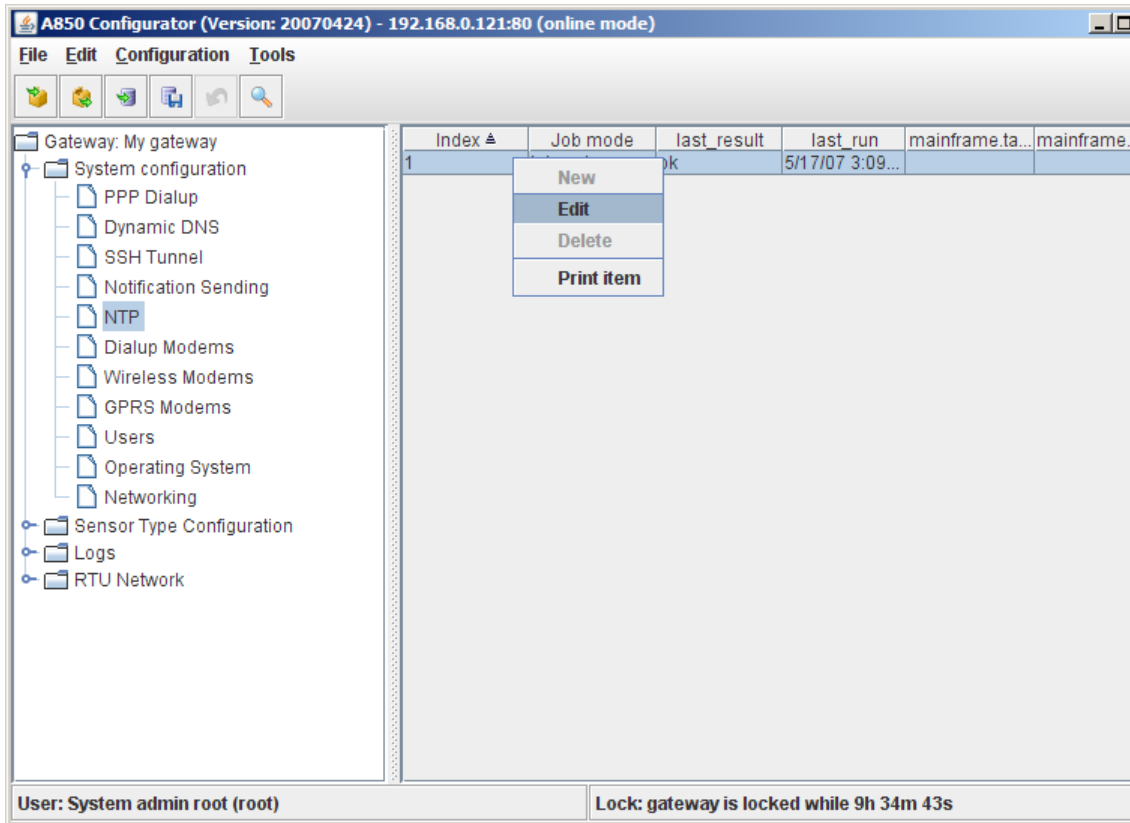


Figure 121. NTP Selection

The context menu “NTP” allows you to:

- modify the Network Time Protocol configuration by “Edit”,
- see a print preview of the determined Network Time Protocol configuration in a formsheet processed for the printer and start the printout on your default printer by “Print item”.

Note: The greyed-out choices “New” and “Delete” are not available in this context.

Note: Menu items “Undo” or “Redo”: see “Popup Context Menu” in chapter 2.

Double-clicking the Network Time Protocol in the “Table view” allows you to check the selected Network Time Protocol configuration.

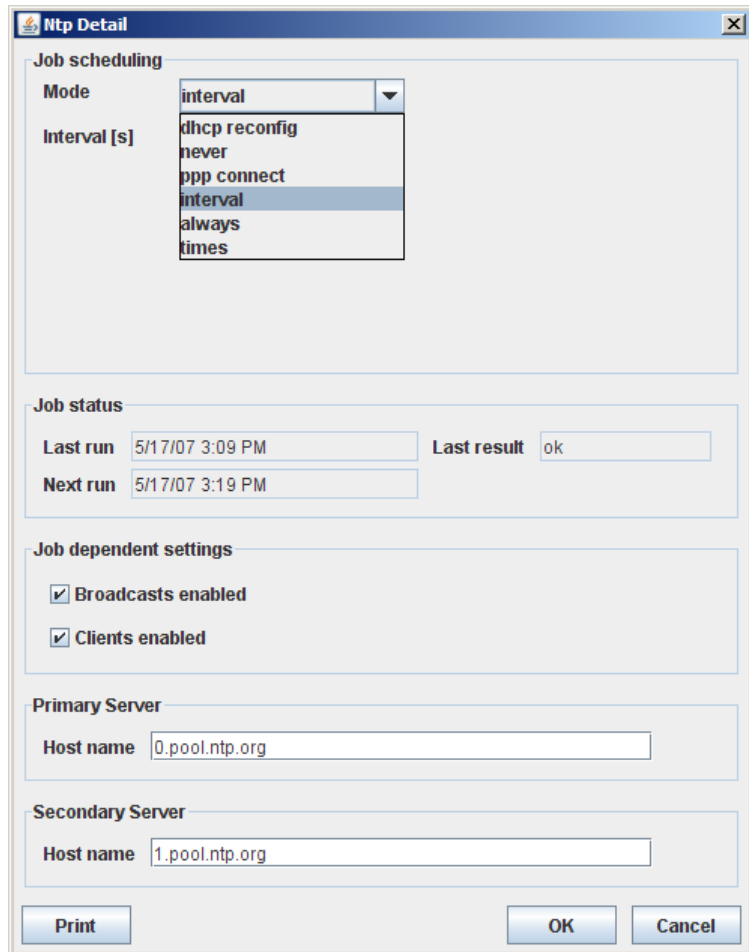


Figure 122. NTP Detail Window

The “NTP Detail” window provides the following window areas:

- Job scheduling - allows to define a time schedule ("Mode") to which time the A850 has to perform a time synchronization as client and/or server;
- Job status - for information at which time the last time synchronization has been performed and with which success, as well as at which time the next time synchronization is planned;
- Job dependent settings - allow to define time synchronization measures for the clients of the Gateway;
- Primary Server - allows to define the primary NTP server;
- Secondary Server - allows to define the secondary NTP server.

Job scheduling

Note: The job scheduling layed down can be oversteered by the commands "Start Job" or "Stop Job" according to Fig. 43 or 46, respectively.

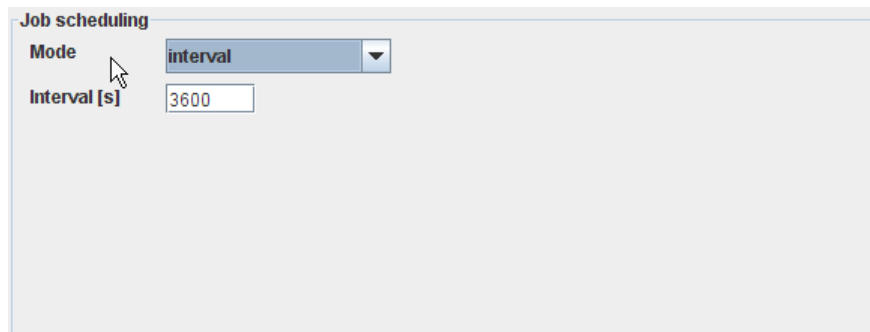


Figure 123. NTP Detail - Job scheduling

Within "Job scheduling", the pull down menu "Mode" provides the following set-ups to start establishing contacts to NTP servers:

- Mode - This combo box is used for determining details of the time synchronization; the following selections are offered:

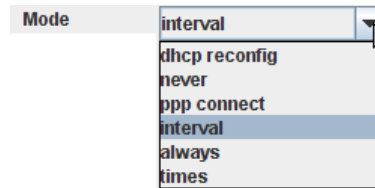


Figure 124. NTP Detail - Job scheduling - Mode

- dhcp reconfig - a time synchronization has to be performed after changes of dhcp settings made in the tree window "Networking";

Note: The input of time and date (in local time) is made in Tools Commands - Time Configuration described in chapter 2.

- never - a time synchronization is not performed automatically;
- ppp connect - a time synchronization has to be performed after connection to the internet through PPP dialup;
- interval - a time synchronization has to be performed in certain regular time intervals. In doing so, the interval in seconds has to be put into the field "Interval [s]":

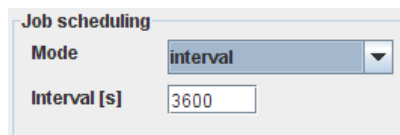


Figure 125. NTP Detail - Job scheduling - Mode - Interval

- always - a time synchronization has to be performed always;
- times - a time synchronization has to be performed at certain fixed times:

The screenshot shows a 'Job scheduling' window. At the top, there is a 'Mode' dropdown menu set to 'times'. Below this is a grid of 64 time slots arranged in 8 rows and 8 columns. Each slot contains a time value in HH:MM format, starting from 00:00 and ending at 23:30 in 30-minute increments.

00:00	00:30	01:00	01:30	02:00	02:30	03:00	03:30
04:00	04:30	05:00	05:30	06:00	06:30	07:00	07:30
08:00	08:30	09:00	09:30	10:00	10:30	11:00	11:30
12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30
16:00	16:30	17:00	17:30	18:00	18:30	19:00	19:30
20:00	20:30	21:00	21:30	22:00	22:30	23:00	23:30

Figure 126. NTP Detail - Job scheduling - Mode - Times

Job status

“Job status” allows you to check the time and the result of the last time synchronization:

The screenshot shows a 'Job status' window with three input fields. The 'Last run' field contains '5/17/07 5:22 PM', the 'Last result' field contains 'ok', and the 'Next run' field contains '5/17/07 5:32 PM'.

Last run	5/17/07 5:22 PM	Last result	ok
Next run	5/17/07 5:32 PM		

Figure 127. NTP Detail - Job status

- Last run - displays the point in time when the last time synchronization took place;
- Last result - displays the result of the last time synchronization;
- Next run - displays the point in time of the planned next time synchronization.

Job dependent settings

Allow to determine which method of time synchronization is to be used by the Gateway acting as NTP server towards its clients:

Job dependent settings

Broadcasts enabled Clients enabled

Figure 128. NTP Detail - Job dependent settings

- Broadcast enabled - if this checkbox is marked, the A850 will broadcast time messages allowing all listening clients to time-synchronize to these messages;
- Clients enabled - if this checkbox is marked, clients are allowed to send time requests for getting time messages (in this case, the A850 acts as NTP server);

Primary Server

Allows to enter the data to access your primary NTP server:

Primary Server

Host name

Figure 129. NTP Detail - Primary Server

Host name - enter the name of the primary NTP server which you selected in the Internet.

Secondary Server

Secondary Server

Host name

Figure 130. NTP Detail - Secondary Server

Allows you to enter access data for selecting an alternative NTP server.

Note: As a matter of principle, a secondary NTP server is not necessary for time synchronization - it's just an enhancement of the redundancy of your Network.

Dialup Modem

“Dialup Modem” allows to establish a connection between your A850 and the Internet as well as with your RTUs and with your server on which you run the Adcon Advantage software (for more details, check your ADCON Advantage manual), as far as these system components are not connected via the LAN.

At present, the only RTU type which can be reached via “Dialup modem” is the A733GSM.

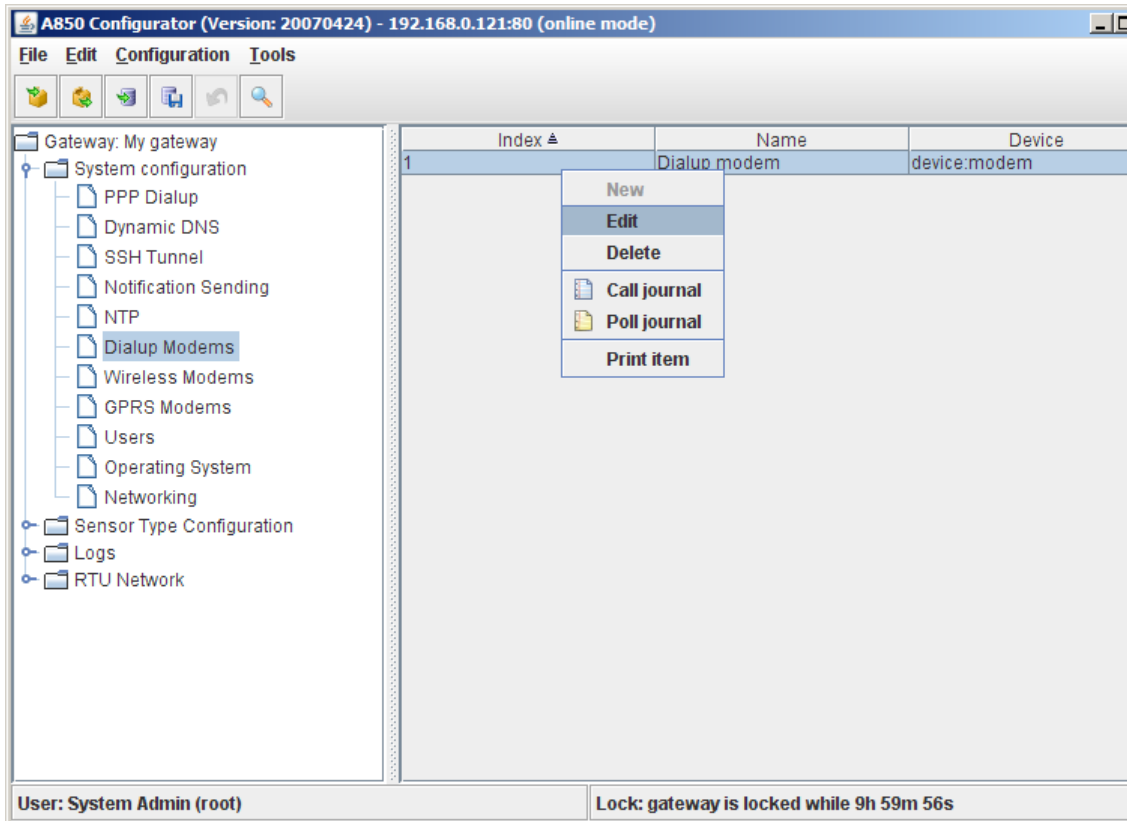


Figure 131. Dialup Modem Selection

The selections offered by the “Dialup Modem” context menu are:

- “New” - allowing to add a new dialup modem and to determine the configuration (function currently not available);
- “Edit” - allowing to define a dialup modem configuration;
- “Delete” - allowing to delete a previously defined dialup modem configuration;
- “Call journal” - the call journal is a list of the last outgoing phone calls (see chapter 4, “Logs”);
- “Poll journal” - the poll journal is a list of the last RTU data polls (in this context, “polling” means that the Gateway contacts an RTU and polls for new measurement data; see chapter 4, “Logs”);
- “Print item” - see a print preview of the determined dialup modem configuration in a formsheet processed for the printer and start the printout on your default printer.

Note: Menu items “Undo” or “Redo”: see “Popup Context Menu” in chapter 2.

Double-clicking the dialup modem in the “Table view” allows you to check the selected dialup modem configuration.

The “Dialup modem” window provides the following window areas:

- Dialup Parameter - allows you to enter information specified below for your dialup connection;
- Dialup status - allows you to achieve information about the status of the dialup connection;
- Job dependent settings - allow to determine if you admit or not that SMS may be sent, that dialing in into your A850 may also take place, and that also PPP dialup connections may be used;
- PPP Parameter - allows you to enter additional information required for a PPP dialup connection (details see below).

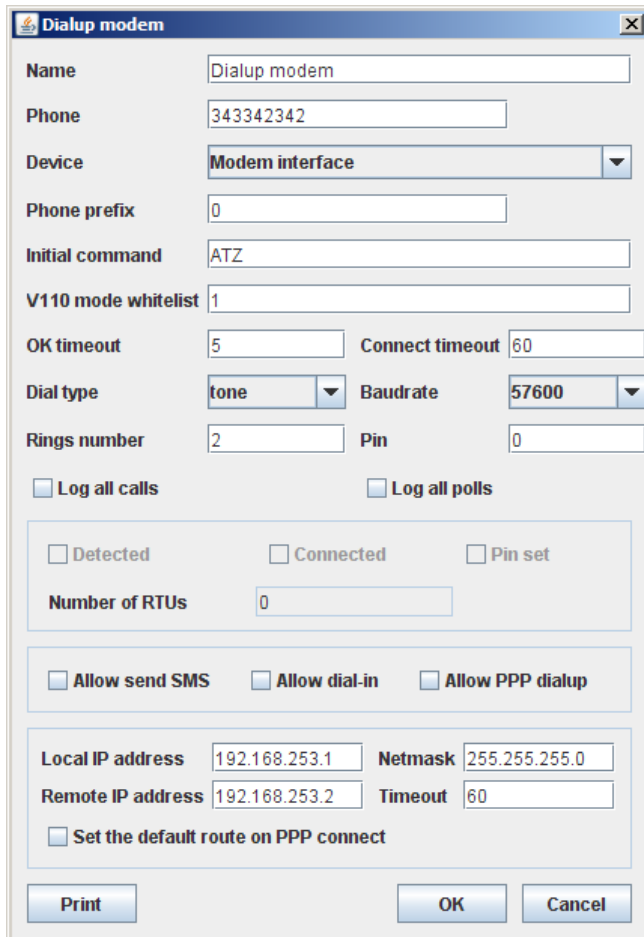


Figure 132. Dialup Modem Window

Dialup Parameter

Name	Dialup modem	
Phone	343342342	
Device	Modem interface	
Phone prefix	0	
Initial command	ATZ	
V110 mode whitelist	1	
OK timeout	5	Connect timeout 60
Dial type	tone	Baudrate 57600
Rings number	2	Pin 0
<input type="checkbox"/> Log all calls		<input type="checkbox"/> Log all polls

Figure 133. Dialup modem - Dialup Parameter

- Name - if you use several dialup modems, you have to choose here for each modem an unique name;
- Phone - enter the phone number by which a connection is to established;
- Device - as a modem can either be connected to the serial modem connector or to one of the two USB connectors of the A850 or indirectly to an USB connector of the A850 via an USH hub, the respective connector is to be selected here:

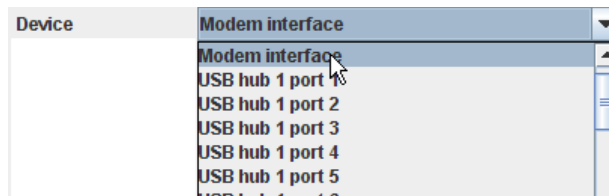


Figure 134. Dialup modem - Dialup Parameter - Device

- Phone prefix - if your dialup modem is connected to an interphone system (PABX), you can enter the prefix to get a public line here (so you don't have to specify it on front of

each phone number); if your modem is connected directly to the trunk line, this field is to be left empty;

- Initial command - enter here which is required by your modem. As default, ATZ is set; if your modem needs another initialization sequence, please inform yourself about it by consulting the manual of your modem;
- V110 mode whitelist - if your dialup connection supports the V110 mode, enter here a list of phone number prefixes for which V110 mode shall be enabled (for example, the network numbers of your GSM providers).

Note: V110 is a standard for serial data transmission over ISDN or GSM networks. The advantage over plain old modem connections is a shorter dialling time and a higher reliability. However, since V110 mode can be used only with GSM modems and ISDN terminal adapters, this mode is turned off per default.

- OK timeout - specifies how long to wait for an answer from the modem (time in minutes);
- Connect timeout - specifies how long to wait for the connection to be established (time in minutes);
- Dial type - please specify if your phone system works with pulse or tone dialling:

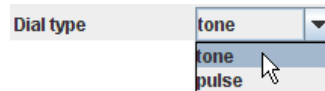


Figure 135. Dialup modem - Dialup Parameter - Dial type

- Baud rate - enter the transmission rate of your modem as specified in its manual;
- Rings number - allows you to determine after how many ring tones your dialup modem should take over the connection (This selection makes only sense if you have connected also other devices besides your dialup modem to your phone line, e.g. a FAX or an answering machine);
- Pin - allows you to enter a PIN if this is necessary for activating your modem (if no PIN is required, leave this field blank);
- Log all calls - allows you to determine if you want your dialup calls to be registered in the Logs;

- Log all polls - allows you to determine if you want your dialup requests to be registered in the Logs.

Dialup status

Figure 136. Dialup modem - Dialup status

Provides information about the status of the dialup connection:

- Detected - shows if a modem is connected correctly or not;
- Connected - shows if a connection via the modem exists;
- Pin set - shows that your modem requires a PIN code;
- Number of RTUs - shows how many RTUs can be reached via this dialup connection:

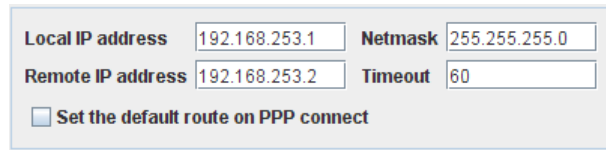
Job dependent settings

Figure 137. Dialup modem - Job dependent settings

- Allow send SMS - by clicking this checkbox, you determine that your modem may transmit SMSs (This selection makes sense only if your phone provider supports SMS);
- Allow dial-in - by clicking this checkbox, you permit that connections may be established for incoming calls;
- Allow PPP dialup - by clicking this checkbox, you permit that the modem may be used for PPP Dialup networking.

PPP parameter

If you allow dial-in, you have to enter the information specified below into the respective fields:



Local IP address	192.168.253.1	Netmask	255.255.255.0
Remote IP address	192.168.253.2	Timeout	60
<input type="checkbox"/> Set the default route on PPP connect			

Figure 138. Dialup modem - PPP parameter

- Local IP address - enter the IP address your A850 has to use for the PPP connection;
- Remote IP address - enter the IP address the remote station has to use for the PPP connection;
- Netmask - enter which network mask is to be used for the IP addresses (specifies the netmask aka "subnet mask" associated with the network IP address);
- Timeout - enter the amount of time (in minutes) after which your A850 should interrupt a PPP connection;
- Set the default route on PPP connect - defines the PPP connection determined here as default in the dialup modem.

Note: Usually, the PPP connection determined in PPP Dialup is defined as default.

Wireless Modems

Most RTU types contact the A850 by a wireless connection; this requires a Wireless Modem A440 to be connected to the A850.

Note: The firmware version of the Wireless Modem A440 must be a least 3.0!

The following RTU types can be reached via an A440:

- A730 as router only,
- A720,
- A723,
- A724,
- A725,
- A726,
- A731,
- A732,
- A733,

- A740.

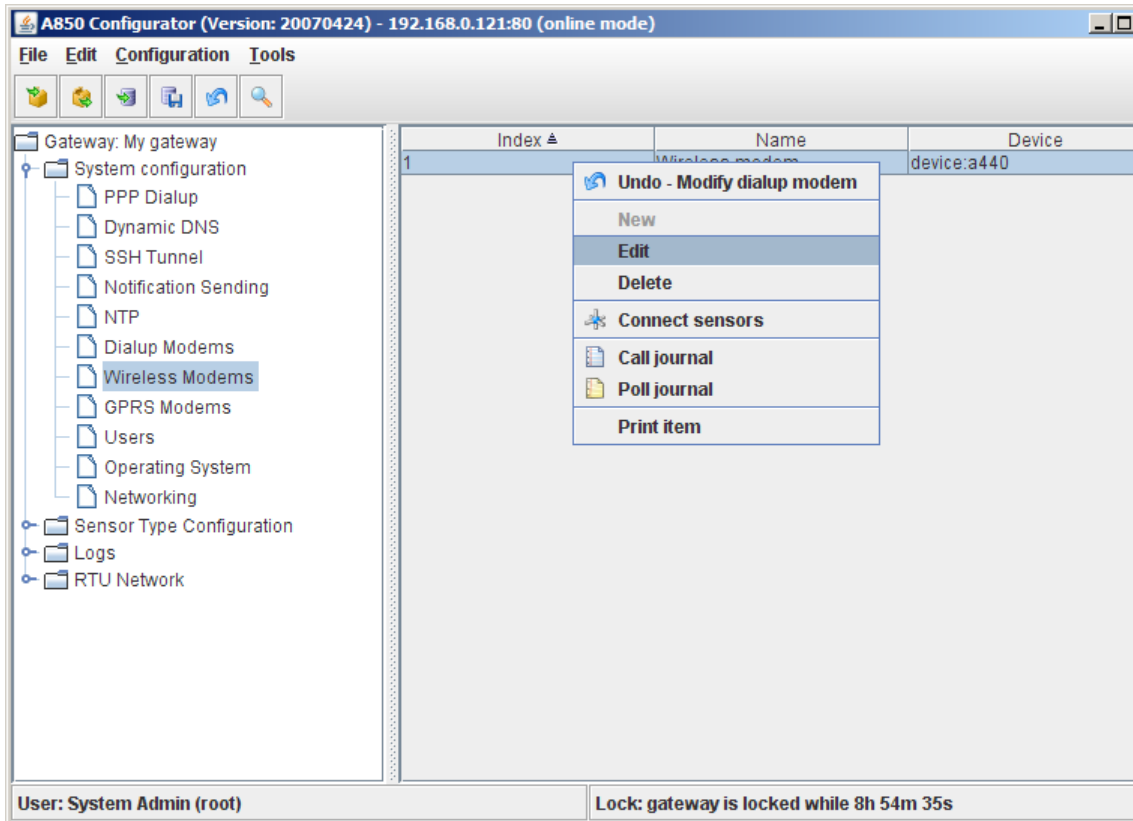


Figure 139. Wireless Modem Selection

The choices offered by the “Wireless Modem Selection” context menu are:

- “New” - allowing to add a new Wireless Modem and to define the configuration (this feature is currently not yet available);
- “Edit” - allowing to define a Wireless Modem configuration;
- “Delete” - allowing to delete a previously defined Wireless Modem configuration;

- "Connect sensors" - if internal sensors (e.g. for measuring voltage, temperature etc.) are built in into the A440, you can enter here the respective information (see chapter 4, "Logs");
- "Call journal" - The call journal contains a list of the last outgoing phone calls (see chapter 4, "Logs");
- "Poll journal" - The poll journal contains a list of the last RTU data polls (in this context, "polling" means that the Gateway contacts an RTU and polls for new measurement data; see chapter 4, "Logs");
- "Print item" - see a print preview of the determined Wireless Modem configuration in a formsheet processed for the printer and start the printout on your default printer.

Note: Menu items "Undo" or "Redo": see "Popup Context Menu" in chapter 2.

Double-clicking the folder "Wireless Modems" in the "Table view" allows you to check the selected Wireless Modem configuration.

The following selections, entries or displays, respectively, are provided in the “Wireless Modem Window”:

Name	Wireless modem		
Device	A440 interface		
Serial number	36065		
RTU type	A440		
Version	0.0		
<input checked="" type="checkbox"/> detected	<input type="checkbox"/> synchronized	Number of RTUs	4
Code	36065	Radio frequency	440012500
Radio channel spacing	12500		
Radio error rate packets	5 50	Radio error rates	0:0
Node ID	4	First sensor index	19
<input type="checkbox"/> Notification on reset	<input type="checkbox"/> Log all polls	Resets	0
Uptime	0		
RSSI	0		
Last ping	1/1/70 1:00 AM	Last time sync	1/1/70 1:00 AM
Slot interval	900		
First slot	1/1/70 1:00 AM	Ping interval	900
		Last slot	1/1/70 1:00 AM

Figure 140. Wireless Modem Window

- Device Parameter - for entering information concerning the Wireless Modem;
- Modem status - to achieve information about the status of the wireless connection;
- Radio Parameter - to enter the radio parameter to be used.

Note: If your Wireless Modem was already detected and recognized in the course of the first configuration performed by the console command interface, the respective parameters are already registered here by default. Normally, these parameters are not to be changed except if you have defi-

nite reasons to determine other parameters (e.g., another radio frequency for the communication with your RTUs).

- Modem-Type dependent settings - allow to determine if notifications or logging, respectively, should take place, to define the interval for slots (the slot interval specifies how often internal sensor values are stored) and to define ping intervals (a ping is an action which is intended to reveal the arrival time of a message from one computer to another).

Device parameter

The screenshot shows a configuration form for a Wireless Modem. It contains the following fields:

Name	Wireless modem
Device	A440 interface
Serial number	36065
RTU type	A440
Version	0.0

Figure 141. Wireless Modem - Device parameter

- Name - for giving each Wireless Modem an unique name;
- Device - as a Wireless Modem can be connected to the serial “Radio Modem” connection or directly via USB connection as well as indirectly via an USB hub, the corresponding connection is to be selected here;

Note: This is a feature reserved for new types of Wireless Modems which may become available in the future. The A440 can be connected only via the A440 interface.

The screenshot shows a dropdown menu for the Device parameter. The menu is open, showing the following options:

- A440 interface
- A440 interface
- Modem interface
- USB hub 1 port 1
- USB hub 1 port 2
- USB hub 1 port 3
- USB hub 1 port 4
- USB hub 1 port 5
- USB hub 1 port 6

Figure 142. Wireless Modem - Device parameter - Device

- Serial number - enter the serial number of your A440 unless it has already been detected automatically in the course of the console command configuration;
- RTU type - allows you to define the type of the Wireless Modem (under the aspects considered here, the Wireless Modem can be looked the same way at as any other RTU);

Note: This is a feature reserved for new types of Wireless Modems which may become available in the future. At present, only the A440 can be selected.

- Version - allows to display the version number of your Wireless Modem

Note: For being suitable for the operation with the A850, the A440 has to be at least of "Version 2.0".

Modem status

The image shows a horizontal control bar for the 'Wireless Modem status' window. It contains three elements: a checked checkbox labeled 'detected', an unchecked checkbox labeled 'synchronized', and a text input field labeled 'Number of RTUs' with the value '4' entered.

Figure 143. Wireless Modem - Modem status

The “Wireless Modem Status” window area gives you the following information about the status of the wireless connection:

- Detected - shows if the modem is properly connected or not;
- Synchronized - shows if a modem is properly synchronized or not;
- Number of RTUs - shows how many RTUs can be reached via this Wireless Modem connection.

Radio parameter

Code	<input type="text" value="36065"/>	Radio frequency	<input type="text" value="440012500"/>
Radio channel spacing	<input type="text" value="12500"/>		
Radio error rate packets	<input type="text" value="5"/> <input type="text" value="50"/>	Radio error rates	<input type="text" value="0;0"/>
Node ID	<input type="text" value="4"/>	First sensor index	<input type="text" value="19"/>

Figure 144. Wireless Modem - Radio parameter

The following radio parameters of the Wireless Modem are to be set here:

- Code - enter the code by which your Wireless Modem can be addressed. By default, the code is identical to the serial number of the modem;

Note: Using the defined code, the A440 can be addressed by means of direct commands.

- Radio frequency - enter the frequency which is to be used for communication between the Wireless Modem and the RTUs;



CAUTION The A440 transmits within the ISM band, do not change the frequency of your device without reason: apart from the fact it may not communicate in the network anymore, you may also violate the applicable radiocommunications laws in your country. Depending on the destination country, some models may also return an error message.

- Radio channel spacing - to enter the spacing (in Hertz) among the respective channels; it is usual to work with a channel spacing of 12,5 kHz;
- Radio error rate packets - enter the permissible error rates for the data transmission (minimum and maximum error rate);

Note: If the error rate exceeds the permissible range of values, an error rate notification is sent;

- Radio error rates - displays the actual radio error rates of the Wireless Modem;

- Node ID - allows to define or to modify a node ID for the Wireless Modem;

Note: The node ID is always assigned automatically by the A850, but can be changed by the field "Node ID".

- First sensor index - displays the index of the first sensor connected to the Wireless Modem.

Modem-Type dependent settings

<input type="checkbox"/> Notification on reset		<input type="checkbox"/> Log all polls	
Uptime	<input type="text" value="0"/>	Resets	<input type="text" value="0"/>
RSSI	<input type="text" value="0"/>	Power output	<input type="text" value="0"/>
Last ping	<input type="text" value="01.01.70 01:00"/>	Last time sync	<input type="text" value="01.01.70 01:00"/>
Slot interval	<input type="text" value="900"/>	Ping interval	<input type="text" value="900"/>
First slot	<input type="text" value="01.01.70 01:00"/>	Last slot	<input type="text" value="01.01.70 01:00"/>

Figure 145. Wireless Modem - Modem-Type dependent settings

- Notification on reset - if the checkbox is marked, a notification is sent in case of a reset of the Wireless Modem;
- Log all polls - if the checkbox is marked, all polls will be registered in the poll journal;
- Uptime - displays the up time of the Wireless Modem after the last configuration in hours;
- Resets - displays the number of resets of the Wireless Modem after the last configuration in hours;
- RSSI - displays the actual RSSI (Received Signal Strength Indication, a measurement of the received radio signal strength) in dB;
- Power output - displays the actual power output of the Wireless Modem in mW;
- Last ping - displays the time of the last connection of your Wireless Modem for requesting the status of a RTU;
- Last time sync - displays the point in time when the last time synchronization of the Wireless Modem took place;

- Slot interval - interval for saving data from the internal sensors of the respective Wireless Modem, in seconds (minimum is 60 seconds, maximum is 10800 seconds and the default is 900seconds, or 15 minutes);
- Ping interval - the interval within a status request from the Wireless Modem should be made (minimum is 60 seconds, maximum is 10800 seconds and the default is 900seconds, or 15 minutes);
- First slot - displays the time stamp of the oldest data of the Wireless Modem after the last configuration;
- Last slot - displays the time stamp of the newest data of the Wireless Modem after the last configuration.

GPRS Modems

In case of a GPRS modem, there is no real hardware installed on the A850. Instead, the gateway listens on a specified port for TCP connections from GPRS based RTUs, leaving the interfacing between GPRS and the TCP network to the GPRS phone providers.

Note: as long as you don't get your own private access point by your GPRS provider, the A850 gateway must be accessible from the internet, either directly or by using an SSH server as proxy..

The time being, only RTUs of the type A733GSM can be reached via a GPRS modem.

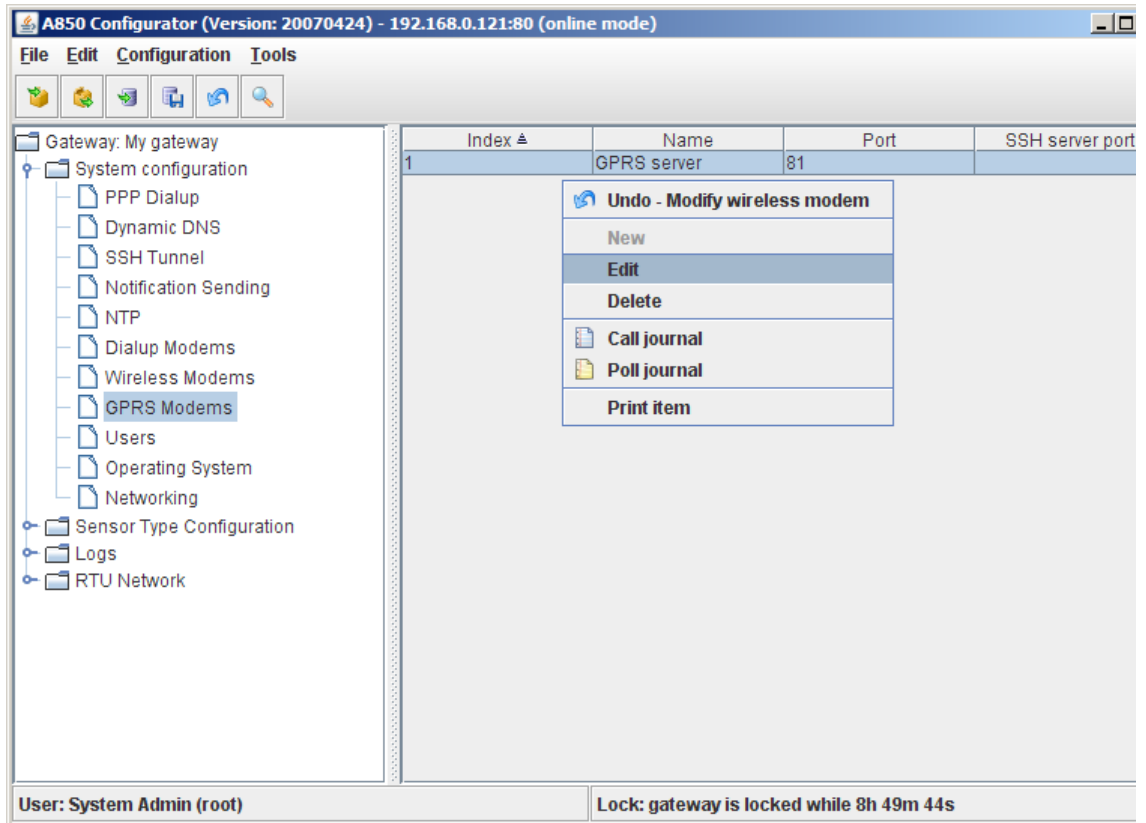


Figure 146. GPRS Modem Selection

The “GPRS Modems” context menu offers the following choices:

- “New” - allowing to add a new GPRS modem and to define the configuration (this feature is currently not yet available);
- “Edit” - allowing to define a GPRS modem configuration;
- “Delete” - allowing to delete a previously defined GPRS modem configuration;
- “Call journal” - The call journal contains a list of the last incoming TCP connections (see chapter 4, “Logs”);
- “Poll journal” - The poll journal contains a list of the last RTU data polls (in this context, “polling” means that the Gateway contacts an RTU and polls for new measurement data; see chapter 4, “Logs”);

- Print item” - see a print preview of the determined GPRS modem configuration in a formsheet processed for the printer and start the printout on your default printer.

Note: Menu items “Undo” or “Redo”: see “Popup Context Menu” in chapter 2.

Double-clicking the folder “GPRS Modems” in the “Table view” allows you to check the selected GPRS modem configuration.

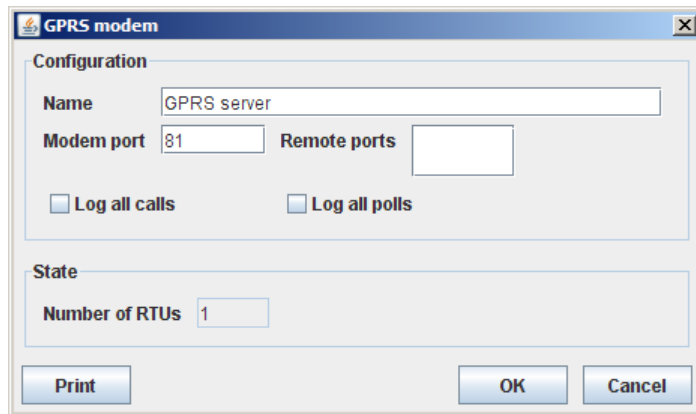


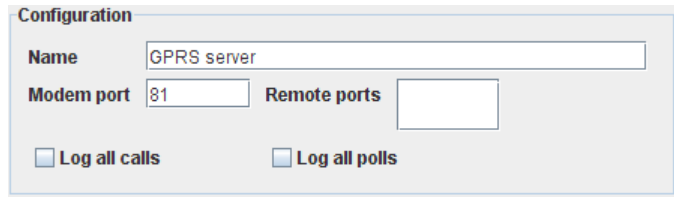
Figure 147. GPRS modem Window

The following window areas are provided in the “GPRS Modem Window”:

- Configuration - for entering the information required for your GPRS modem;
- State - to achieve information about the status of the GPRS connection.

Note: If your GPRS modem was already entered in the course of the first configuration performed by the console command interface, the respective parameters are already registered here by default.

Configuration



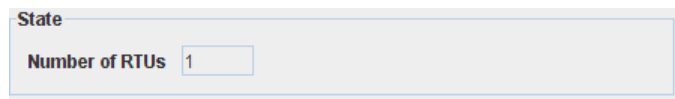
The screenshot shows a configuration window titled "Configuration". It contains the following fields and options:

- Name:** A text input field containing "GPRS server".
- Modem port:** A text input field containing "81".
- Remote ports:** An empty text input field.
- Log all calls:** An unchecked checkbox.
- Log all polls:** An unchecked checkbox.

Figure 148. GPRS modem - Configuration

- Name - if you use several GPRS modems, you have to choose here for each modem an unique name;
- Modem port - allows you to determine the modem port which is to be used for the connection;
- Remote ports - allows you to determine the modem ports on the SSH servers if the A850 can be reached from the internet through an SSH tunnel;
- Log all calls - allows you to determine if you want your dialup calls to be registered in the Logs;
- Log all polls - allows you to determine if you want your dialup requests to be registered in the Logs.

State



The screenshot shows a state window titled "State". It contains the following field:

- Number of RTUs:** A text input field containing "1".

Figure 149. GPRS modem - State

- Number of RTUs - shows how many RTUs can be reached via this GPRS modem connection.

Users

“Users” allows to define all users intended to work with your A850.

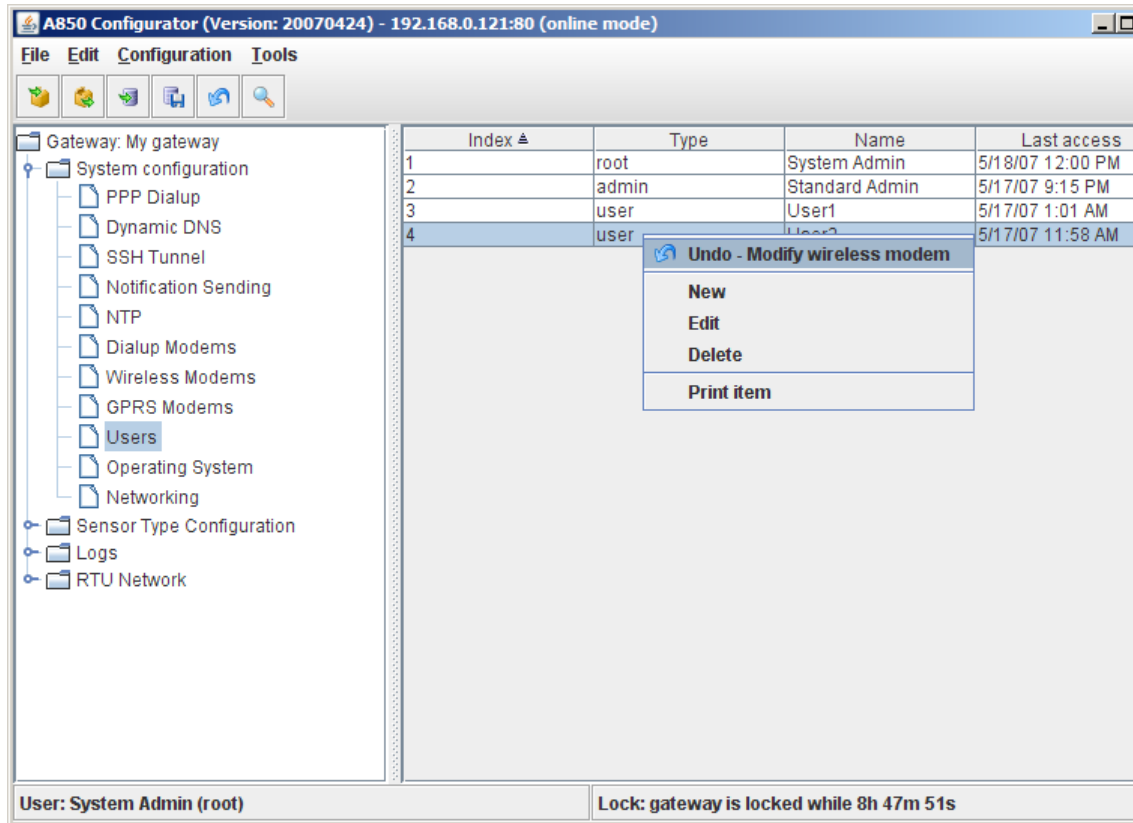


Figure 150. Users Selection

The A850 will support up to 100 users with different user permissions:

- one “system administrator” (user “root”) who is granted the rights to configure the A850 hardware;

Note: As default, only the system administrator (user “root”) is configured.

- multiple “user administrator” level users granted the rights to configure the RTU network (including gateway and A440 parameters), as well as to grant RTU access permissions to “ordinary users”;

Note: In the course of the console dialogue within expert setup, for the purpose of giving an example in this manual, a user "adv" has been set up as first "user administrator";

- multiple "ordinary users" which may query and configure only RTUs and sensors for which they have access permissions.

Note: As default, only the user "root" is configured.

The choices offered by the "Users Selection" context menu are:

- "New" - allowing to add a new user and to define the user details;
- "Edit" - allowing to modify the user details of an existing user;
- "Delete" - allowing to delete an existing user;

Note: The System administrator "root" can't be removed by use of the function "Delete".

- "Print item" - see a print preview of the marked user in a formsheet processed for the printer and start the printout on your default printer.

Note: Menu items "Undo" or "Redo": see "Popup Context Menu" in chapter 2.

Double-clicking the user selected in the "Table view" allows you to check the user details.

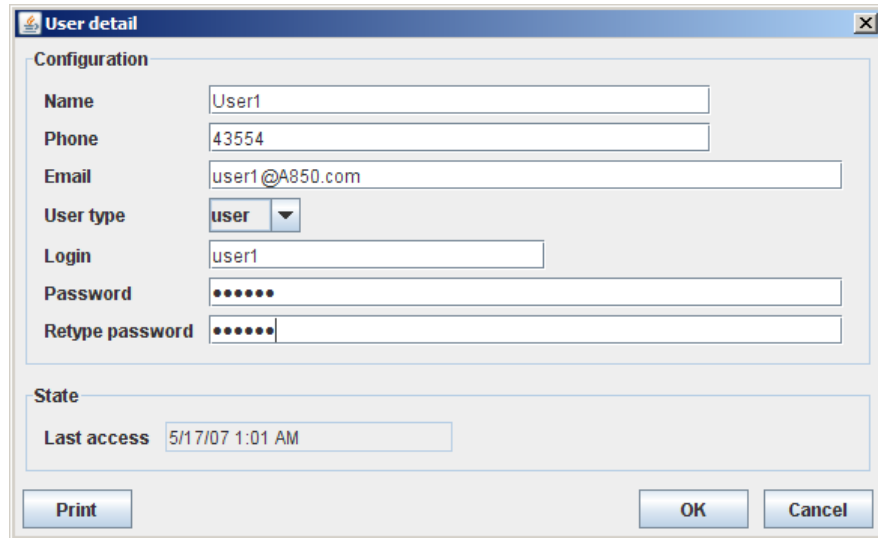
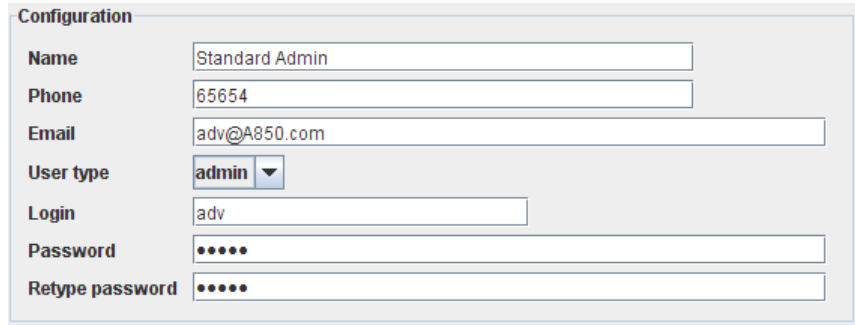


Figure 151. User detail Window

The following window areas are provided in the "User Detail" window:

- Configuration - for entering the information of the account, e.g. the login name as well as the password;
- State - to achieve information about the status of the user at the moment of the last login of the user.

Configuration



Configuration

Name: Standard Admin

Phone: 65654

Email: adv@A850.com

User type: admin

Login: adv

Password: •••••

Retype password: •••••

Figure 152. User detail - Configuration

- Name - enter the user name;
- Phone - enter the user's phone number;
- Email - enter the user's email address;
- User type - select the type of the user (for the system administrator, the type must be "root"; user administrators are to be assigned the type "admin" and ordinary users the type "user");



User type: root

Login: root

User type: user

Login: admin

User type: user

Figure 153. User detail - Configuration - User type

Note: The user type of the system administrator ("root") cannot be changed. The user "root" can also not be deleted; it is possible to work with an A850 where only the user "root" is installed as only user, and on the other hand, only one system administrator (the user "root") can be defined for one A850. The definition of the user "root" is done while performing the console commands "Quick Setup" or "Expert Setup", respectively.

- Login - allows you to determine the login name of the user;
- Password - allows you to enter a password for the user (when assigning a password to the user, pay attention to appropriate security);

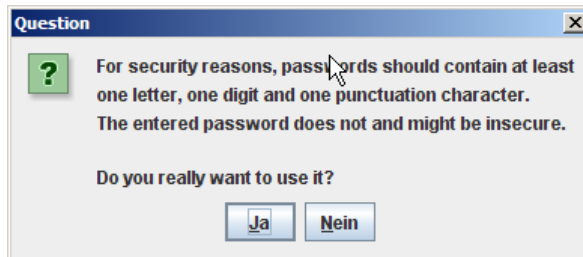


Figure 154. Question for Insecure Password Choice

Note: The password for the user "root" must always be a combination of letters, digits and special characters.

- Retype password - retype the password for verification to make sure that your first password entry did not contain a typing error.

State

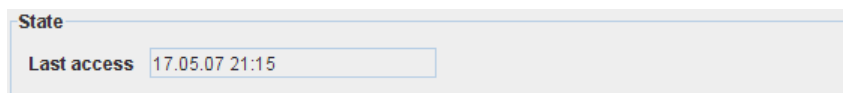


Figure 155. User detail - State

- Last access - shows the time of the last login of the user. If this field is left empty, the respective user has yet not logged in.

Operating System

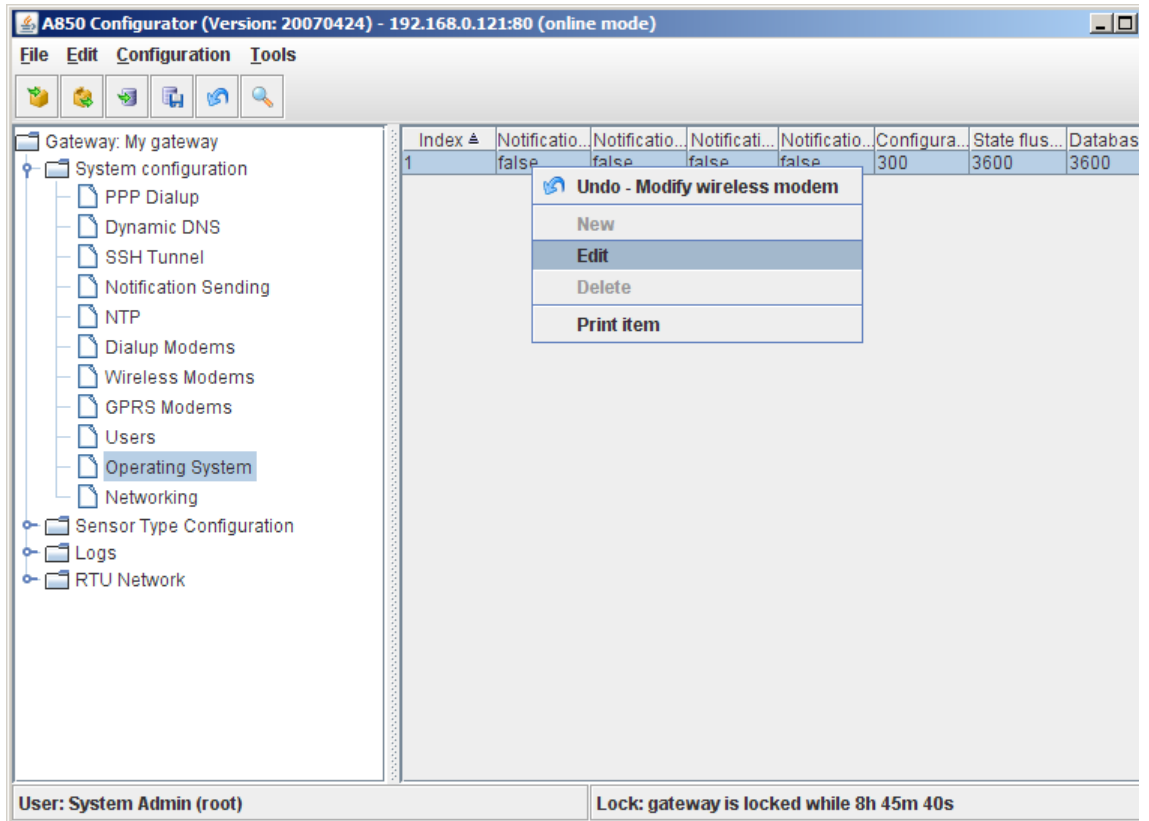


Figure 156. Operating System Selection

The choices offered by the “Operating System Selection” context menu are:

- “Edit” - to make settings concerning your Operating System, to determine at which events notifications should be sent,
- “Print item” - see a print preview of the Operating System details in a formsheet processed for the printer and start the printout on your default printer.

Note: The greyed-out context menu items “New” and “Delete” are not available.

Note: Menu items "Undo" or "Redo": see "Popup Context Menu" in chapter 2.

Double-clicking the "Table view" results in the Operating System details being displayed.

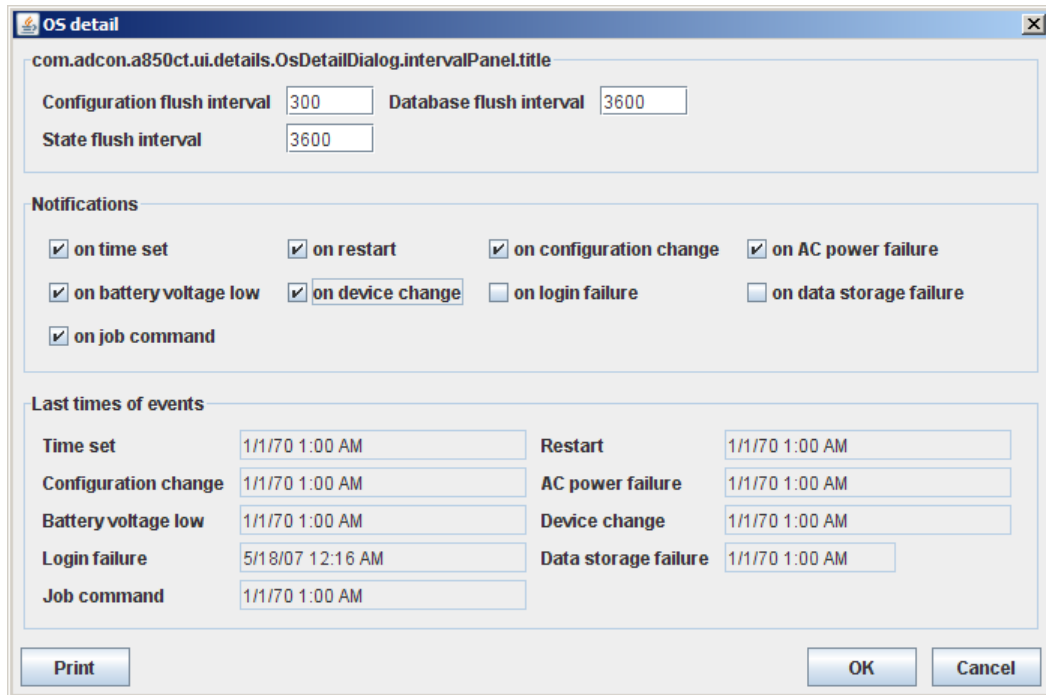


Figure 157. OS detail Window

The "Operating System detail" Window provides the following window areas:

- Flush interval - the function "Flush" creates an image of certain data of the A850 and saves it in settable intervals on the flash memory;
- Notifications - allows you to choose at what events notifications which will be forwarded to the recipients determined in "Notification sending" should occur;
- Last time events - shows the time of the last event out of the group of events triggering notifications.

Flush interval

com.adcon.a850ct.ui.details.OsDetailDialog.intervalPanel.title

Configuration flush interval Database flush interval

State flush interval

Figure 158. OS detail - Flush interval

A flush interval can be selected for the following data:

- Configuration - enter the Configuration flush interval in seconds;
- Database - enter the Database flush interval in seconds;
- State - enter the State flush interval in seconds.

Note: The flush intervals are preset by default values which represent intervals related to practice so that these values should not be changed.

Notifications

Notifications

on time set on restart on configuration change on AC power failure

on battery voltage low on device change on login failure on data storage failure

on job command

Figure 159. OS detail - Notifications

Notifications may be demanded in case of the following events:

- on time set,
- on restart,
- on a configuration change,
- on AC power failure,
- on low battery voltage,

- on change of a device,
- on login failure,
- on data storage failure,
- on “start job” commands.

Last times events

Last times of events			
Time set	1/1/70 1:00 AM	Restart	1/1/70 1:00 AM
Configuration change	1/1/70 1:00 AM	AC power failure	1/1/70 1:00 AM
Battery voltage low	1/1/70 1:00 AM	Device change	1/1/70 1:00 AM
Login failure	5/18/07 12:16 AM	Data storage failure	1/1/70 1:00 AM
Job command	1/1/70 1:00 AM		

Figure 160. OS detail - Last times events

Shows the time of the last event out of the group of events to which a notification has been demanded.

Note: If no corresponding events with correlated notifications took place, the time of the event will either be displayed as “01.01.70 01:00” or the field will be left blank.

Networking

Networking allows you to setup the network mode of your A850 and also network parameters for other devices in your LAN.

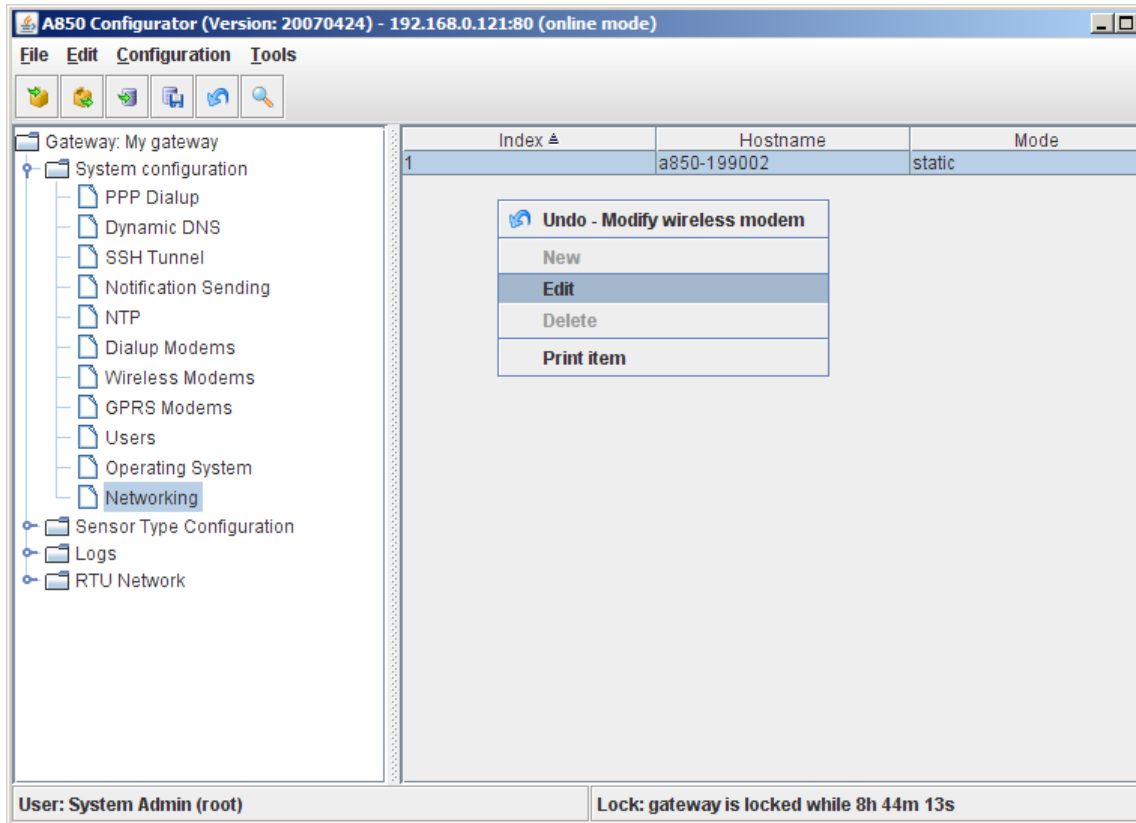


Figure 161. Networking Selection

The choices offered by the “Networking Selection” context menu are:

- “Edit” - to make settings concerning your network configuration;
- “Print item” - see a print preview of the network details in a formsheet processed for the printer and start the printout on your default printer.

Note: The greyed-out context menu items “New” and “Delete” are not available.

Note: Menu items “Undo” or “Redo”: see “Popup Context Menu” in chapter 2.

Double-clicking the "Table view" results in the network details being displayed.

The screenshot shows a window titled "Network detail" with a close button in the top right corner. The window is divided into several sections:

- Ethernet Settings:** Includes fields for Host name (a850-199002), Mode (dhcp server), IP address (192.168.0.121), Netmask (255.255.255.0), Router (192.168.0.1), and Broadcast address (192.168.0.255). There is also a checkbox for "Off on power failure".
- Console Settings:** Includes fields for Console local address (192.168.0.11) and Console remote address (192.168.0.12).
- DHCP Settings:** Includes fields for Range start (192.168.0.1), Range end (192.168.0.120), Minimum lease time (3600), Maximum lease time (86400), and Default lease time (21600).
- Primary DNS Server:** Includes a field for IP address (192.168.0.1).
- Secondary DNS Server:** Includes a field for IP address (192.168.0.1).

At the bottom of the window are three buttons: "Print", "OK", and "Cancel".

Figure 162. Network detail Window

The following entry possibilities are provided in the Network detail window:

- Ethernet Settings - to enter information about the mode of the A850 in your network;
- Console Settings - to determine the IP addresses for an access to your console via the network;
- DHCP Settings - to enter definitions required for the use and function of your A850 as a DHCP server;

- Primary DNS Server - to determine which DNS server in your internet/intranet is primarily available;
- Secondary DNS Server - to determine which DNS server in your internet/intranet is alternatively available.

Ethernet Settings

Figure 163. Network detail - Ethernet Settings

- Host name - enter a designation which will be a unique identifier for your A850;
- Mode - The A850 can work as well by itself as DHCP server (DHCP = Dynamic Host Configuration Protocol, dynamic assignment of IP addresses to other IP-based devices within the LAN) as well as also as DHCP client (in this case, the dynamic assignment of an IP address to the A850 is performed by another DHCP server).

Figure 164. Network detail - Ethernet Settings - Mode


- dhcp client - an IP address is assigned to the A850 by a DHCP server while a DHCP server must exist within your LAN;
- off - no IP address is assigned to the A850 so that the A850 cannot be used within a LAN;

- dhcp server - the A850 acts as a DHCP server for other devices within the LAN;

Note: Use the A850 as a DHCP server only if there is no other active DHCP server within your LAN.

- static - the A850 works with fixed (static) IP address which you have to set according to the topology of your network. If the topology of your network should be changed, it may become necessary that you also change manually the static IP address;
- IP address - enter the IP address of your A850;
- Netmask - enter the network mask (a bitmask which separates an IP address in a network part and a device part);
- Router - enter the IP address of your default gateway which is acting as a router;
- Broadcast address - enter the IP address for your broadcasts (transmission of information to all subscribers of a net).

Console Settings



Console Settings	
Console local address	192.168.0.11
Console remote address	192.168.0.12

Figure 165. Network detail - Console Settings

- Console local address - determine which IP address your A850 has to use for serial direct link via the console interface;
- Console remote address - determine which IP address the remote PC has to use for serial direct link with your A850 via the console interface.

DHCP Settings



DHCP Settings			
Range start	192.168.0.1	Range end	192.168.0.120
Minimum lease time	3600	Maximum lease time	86400
Default lease time	21600		

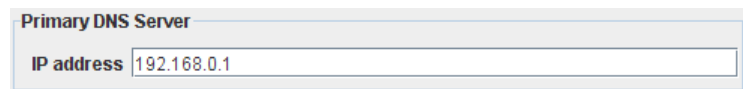
Figure 166. Network detail - DHCP Settings

If you did select for the A850 as mode “dhcp server”, you have to determine the following DHCP settings:

- Range start and Range end - specifies the IP address range which the DHCP server can allocate to other devices within the LAN;
- Minimum lease time - determines the duration for which an allocated IP address remains valid, at least;
- Maximum lease time - determines the duration for which an allocated IP address remains valid, at most;
- Default lease time - determines the duration for which an allocated IP address usually remains valid.

Note: If the determined lease time has run out, the DHCP server allocates anew an IP address which, though, can differ from a former address.

Primary DNS Server



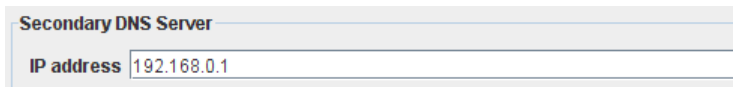
Primary DNS Server	
IP address	192.168.0.1

Figure 167. Network detail - Primary DNS Server

If you want to use a DNS server (DNS = Domain Name System = a distributed data bank which administrates the namespace within the internet and notifies you about the corresponding IP address of a name), enter the IP address of your DNS server.

- IP address - enter the IP address at which your DNS server can be reached.

Secondary DNS Server



The image shows a screenshot of a configuration window titled "Secondary DNS Server". Inside the window, there is a text input field labeled "IP address" which contains the value "192.168.0.1".

Figure 168. Network detail - Secondary DNS Server

Allows you in analogy to “Primary DNS Server” to disclose an alternative DNS server.

- IP address - enter the IP address at which your alternative DNS server can be reached.

Gateway Detail

Gateway details can be reached via the context menu associated with “Gateway: My gateway”. Within “Gateway detail”, configuration settings as well as status information about the Gateway itself are available.

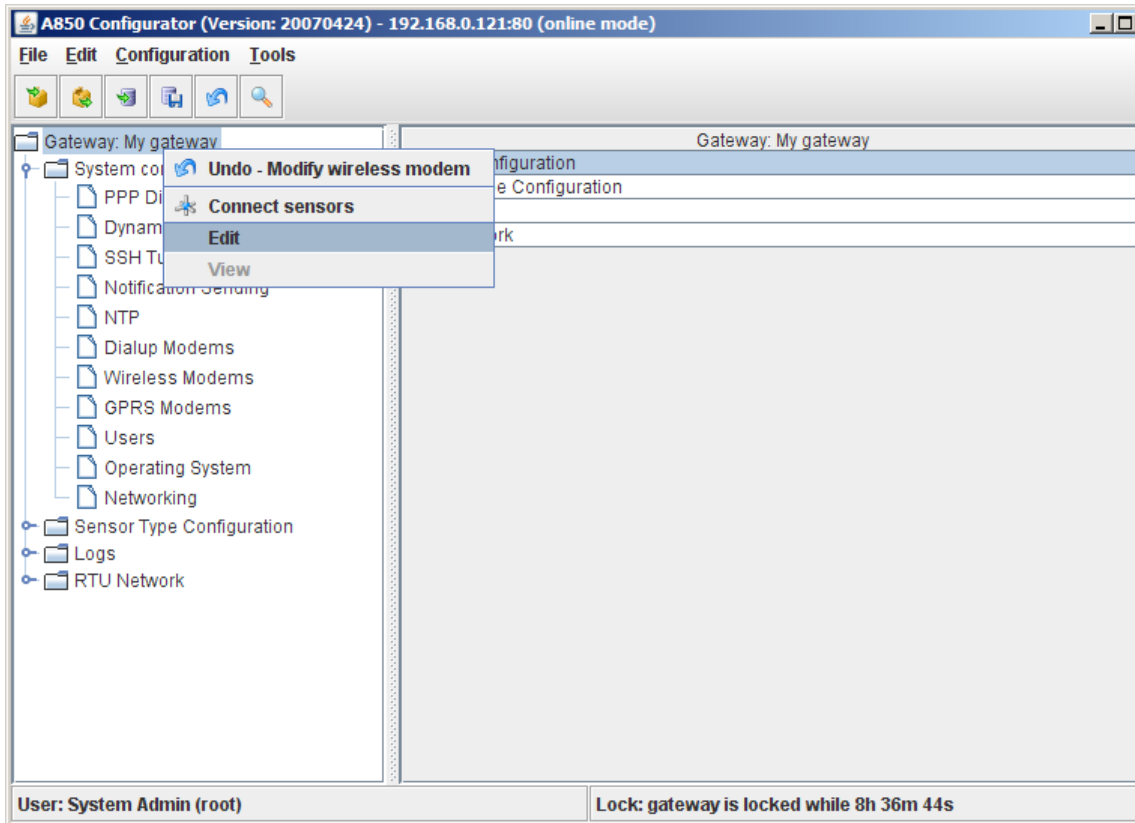


Figure 169. Gateway Detail Selection

The choices offered by the “Gateway Detail Selection” context menu are:

- “Connect sensors” - if internal sensors are built in into the A850, you can disclose them here (see chapter 4, “Logs”);
- “Edit” - to open the Gateway detail window and to make configuration settings;
- “View” - to check in detail the selected configuration of the Gateway.

Note: Menu items “Undo” or “Redo”: see “Popup Context Menu” in chapter 2.

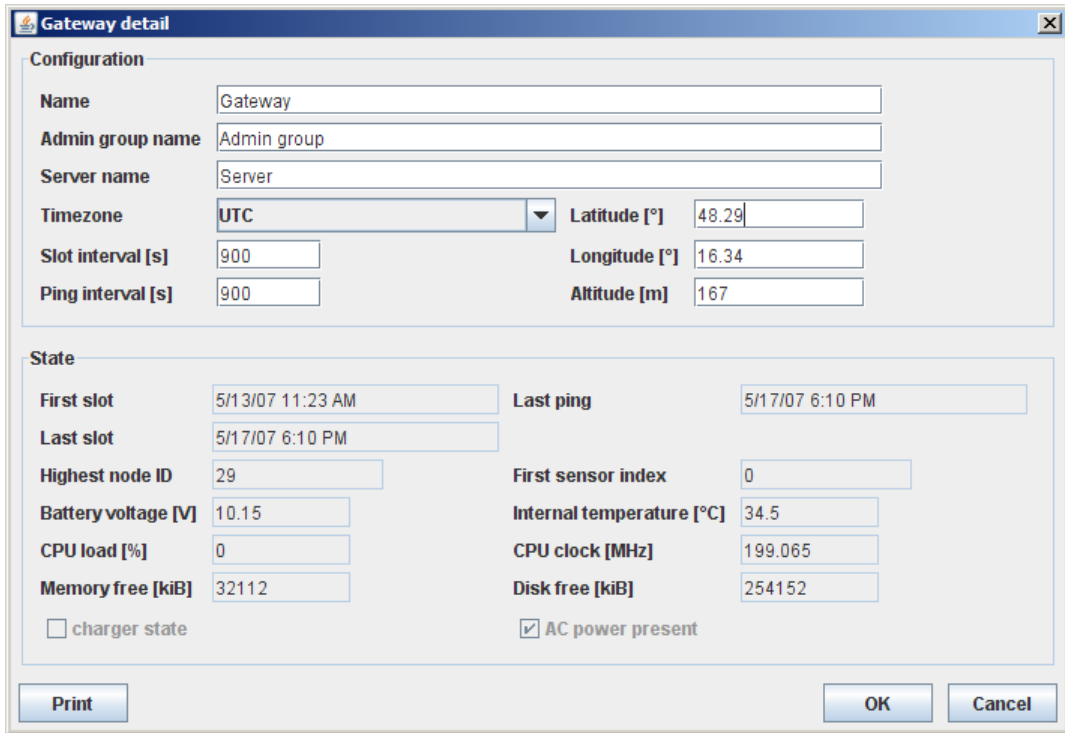


Figure 170. Gateway detail Window

The "Gateway Detail Window" provides the following window areas:

- Configuration - determine supplemental information for your A850 regarding LAN connectivity, time zone, location and timing;

Note: This information is required for use in conjunction with the Advantage software.

- State - information about the status of the A850 at the moment of specific events.

Configuration

Configuration			
Name	<input type="text" value="ADCON DEMO-A850"/>		
Admin group name	<input type="text" value="Admin group"/>		
Timezone	<input type="text" value="Europe/Vienna"/>	Latitude [°]	<input type="text" value="48.29"/>
Slot interval [s]	<input type="text" value="900"/>	Longitude [°]	<input type="text" value="16.34"/>
Ping interval [s]	<input type="text" value="900"/>	Altitude [m]	<input type="text" value="167"/>

Figure 171. Gateway detail - Configuration

- Name - enter a unique name for your Gateway which identifies your A850 at the Addvantage Server;
- Admin group name - if necessary, the name of the Admin group can be changed here;

Note: The new Adcon addUPI OPC Server supports all OPC clients using the OPC - DA interface. Data collected by an addUPI Server (A850 Telemetry Gateway or addVANTAGE Pro Server) is passed on to the OPC client through the addUPI-OPC Server. This makes the Adcon network fully transparent to any industrial SCADA system.

- Timezone - allows you to enter the timezone pertinent to the time that you entered in "time configuration";

Timezone
UTC
Pacific/Tahiti
Pacific/Tarawa
Pacific/Tongatapu
Pacific/Truk
Pacific/Wake
Pacific/Wallis
UTC
WET

Figure 172. Gateway detail - Configuration - Timezone

- Slot interval - interval for saving data from the internal sensors of the A850, in seconds (minimum is 60 seconds, maximum is 10800 seconds and the default is 900seconds, or 15 minutes);

- Ping interval - the interval within the status data of the A850 is stored (minimum is 60 seconds, maximum is 10800 seconds and the default is 900seconds, or 15 minutes);
- Latitude [°] - declaration of the latitude of the location of the A850 (in degrees);
- Longitude [°] - declaration of the longitude of the location of the A850 (in degrees);
- Altitude [m] - declaration of the altitude of the location of the A850 (in meters).

State

State			
First slot	5/13/07 11:23 AM	Last ping	5/17/07 6:10 PM
Last slot	5/17/07 6:10 PM		
Highest node ID	29	First sensor index	0
Battery voltage [V]	10.15	Internal temperature [°C]	34.5
CPU load [%]	0	CPU clock [MHz]	199.065
Memory free [kiB]	32112	Disk free [kiB]	254152
<input type="checkbox"/> charger state		<input checked="" type="checkbox"/> AC power present	

Figure 173. Gateway detail - State

- First slot - displays the time stamp of the oldest data of the gateway of your A850 after the last refresh;
- Last slot - displays the time stamp of the newest data of the gateway of your A850 after the last refresh;
- Last ping - displays the timestamp of the status data of the A850;
- Last poll - displays the timestamp of the newest sensor data of the A850;
- Highest node ID - when RTUs are defined, each RTU will be assigned automatically an unique ID. These IDs are numbered consecutively, and here, the highest number of a RTU ID in your RTU net is displayed;

- First sensor index - displays the index of the first sensor in the sensor types table for the A850;
- Battery voltage [V] - displays the actual supply voltage of the A850;
- Internal temperature [°C] - displays the actual internal temperature inside the A850;
- CPU load [%] - displays the actual load of the CPU of the A850 (in percent);
- CPU clock [MHz] - displays the actual clock frequency of the CPU of the A850;

Note: From energy savings reasons, the clock frequency will be matched optimally to the respective conditions (e.g. clock frequency depending on supply by AC or by battery);

- Memory free [kiB] - displays the amount of free RAM in KiloByte;
- Disk free [kiB] - displays the amount of free storage capacity on the flash disk of the A850;
- Charger state - displays whether the internal battery is charged;
- AC power present - displays whether AC power is present.

Chapter 4. Using the Gateway

This chapter summarizes all administrative settings which are required for the use of the A850 in a RTU network.

Please keep in mind that only the system administrator (i.e. the user named "root", by default) has the right to make all the settings for the use of the Gateway. As a basic principle, all other users have the right to view these settings, but no rights to make changes. The only exception to this rule is connected with the point "RTU Network" in the tree window (see below) which includes the functionality to give other user groups limited capabilities to make some settings of the configuration of the RTUs.

Sensor Connections

The addIT RTUs are equipped with cable attachments called connectors. The connector type determines how the respective RTU communicates with the attached sensor(s).

The following table shows which possibilities to connect sensors or sensor systems (LC, OC, SDI) are offered by the different Adcon RTUs.

Sensor Class/ RTU Type	Analog Input	Pulse Counter	Digital I/O	Internal Input	Logical Channel	Output Channel	SDI-12 Bus
A440	-	-	-	1	-	-	-
A720	6	2	2	1	-	-	-
A723	6	2	2	1	-	-	1
A724	6	2	2	1	-	-	-

Sensor Class/ RTU Type	Analog Input	Pulse Counter	Digital I/O	Internal Input	Logical Channel	Output Channel	SDI-12 Bus
A725	-	-	-	1	-	-	1
A726	3	1	1	1	-	-	1
A731	-	-	-	1	-	-	-
A732	6	2	2	1	-	-	1
A733	12	4	4	1	-	-	1
A733GSM	12	4	4	1	-	-	1
A740	-	-	-	1	1	1	-

Table 2. Number of Sensor Connection on the RTUs

Note: In the A740, the sensor connectors are combined as LC and OC sensors.

The I/O connectors depicted below show the principle of the connection possibilities of sensors.

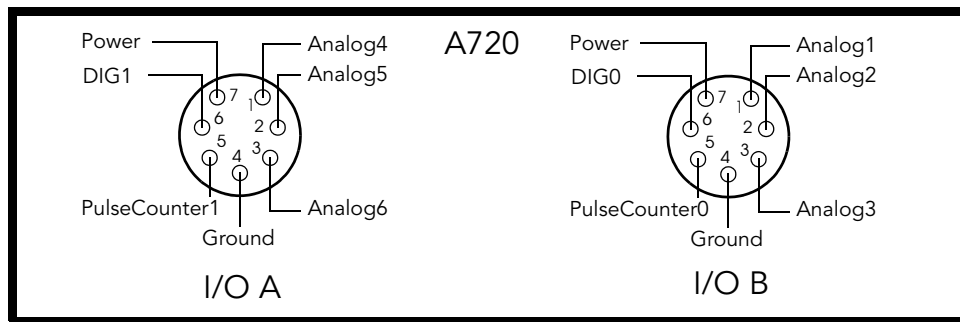


Figure 174. A720 Connector Inputs

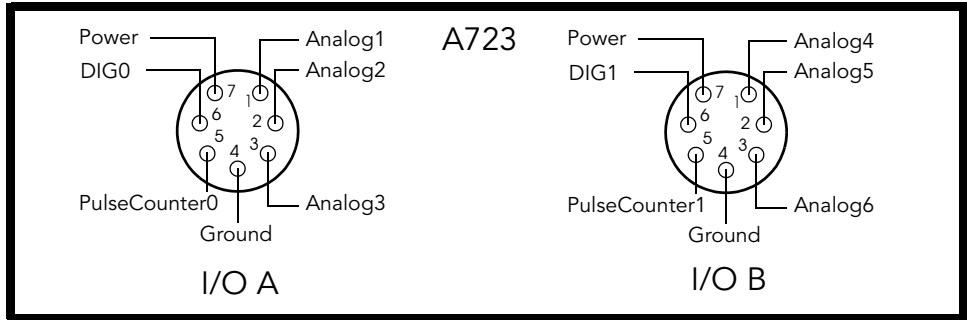


Figure 175. A723 Connector Inputs

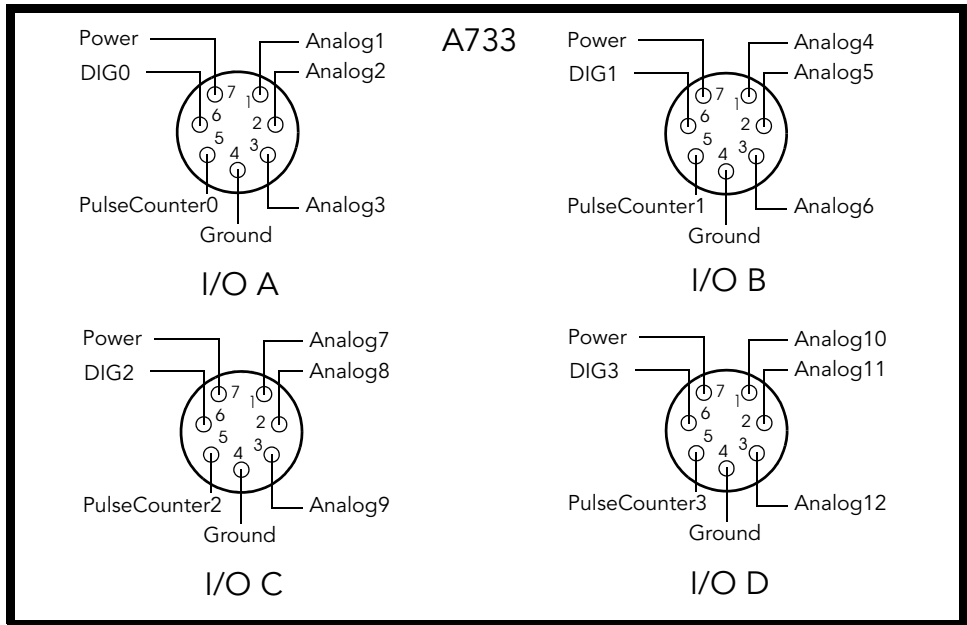


Figure 176. A733 Connector Inputs

Note: Detailed information about the connections of other RTUs is contained in the respective user guides.

Analog Input

The analog input is provided for connecting analog sensors delivering a voltage of 0 - 2.5V or a current of 4 - 20 mA converted to a voltage to the analog pins of the connectors.

Note: The "4 - 20mA" setting assumes that you use the Adcon A502 current-to-voltage converter which converts a current of 4 - 20mA to a voltage of 0.4 - 2.0V. If you want to use a different converter, you have to select "0 - 2.5V" as sensor type and manually calculate the proper "conversion range" settings to reflect the physical values the sensor would have for converted voltages within the range of 0 and 2.5V.

Pulse Counter

This type of sensor can be used, e.g., to measure the rotation speed of an engine or to count the hits on a target.

Digital I/O

A digital I/O allows to connect digital sensors as well as digitally controlled actuators.

Digital sensors deliver measurements in form of binary data streams to the digital pin of the connector.

Digital actuators are driven by binary data streams provided by the digital pin of the connector. An actuator is a mechanical or electrical device for moving or controlling a mechanism or system. The actuator is usually a physical mechanism but also refers to an artificial agent.

Internal Input

Most RTUs, the Wireless Modems and the Gateways are (or can be) equipped with built-in sensors ("internal sensors"). These sensors serve especially the purpose to watch the battery or supply voltage as well as the internal temperature of the respective devices. By default, the actual values of these sensors do not correspond to the definitions displayed in the "State information" windows. If, however, the output of these sensors is to be recorded, it is necessary to define these internal sensors as separate sensor types. By that, the measurements can be evaluated as those from any other sensor.

Note: To find out which internal sensors your devices are equipped with, please refer to the user manuals of the respective devices.

Logical Channels and Output Channels

Logical channels and output channel are used at the A740 RTU. The A740 provides programmable sensor connections which are combined as LC and OC connections.

Logical channels are used for analog/digital sensors.

Output channels are used for analog/digital actuators.

For details see the A740 user manual.

SDI-12 Bus

The abbreviation "SDI-12" is an acronym for "Serial Data Interface with 1.200 baud". This standard communications protocol was developed particularly to interface battery powered recording devices with micro-processor based sensors designed for environmental monitoring. Unlike RS-232/RS-485 devices which usually require proprietary drivers for communication, the SDI-12 protocol ensures compatibility between all sensors and loggers featuring such an interface. If you want to learn more about SDI-12, visit the website of the SDI-12 Support Group , "<http://www.sdi-12.org/>".

The SDI-12 bus built into the A740 addNODE or usable with an adapter on A723 addITs and A733 addWAVEs is enjoying increasing popularity with manufacturers of low power sensors, particularly in the field of water quality monitoring. Many manufacturers of multi-parameter probes, like Hydrolab, YSI and Greenspan, already offer SDI-12 compatible probes.

Note: The A506 SDI-12 Adapter makes A723 addITs and A733 addWAVEs SDI-compatible. If you have SDI-12 sensors, attach the SDI-12 adapter and the respective sensors. For more details about installing the SDI-12 adapter and SDI-12 sensors, consult the corresponding users manuals.

Actuator Connections

AddIT RTUs can also be used to control actuators and to switch on or off pumps, valves, or other similar devices. You can connect actuators to digital, OC and SDI connector pins.

Note: Detailed information is contained in the user manuals of the respective RTUs.

Sensor Type Configuration

A sensor type determines the attributes of a class of sensors which can be connected to a RTU for delivering specific measurement data. As the output of a sensor depends not only on the magnitude of the measured variable, but also on the physical properties and technology of the respective sensor, a conversion table (also referred to as "linearization table") is used to represent the output of the sensor as required for processing and further interpretation. A conversion table may be valid for a singular sensor or for a whole class of sensors (i.e., for a sensor type).

Several sensors (usually of different types) may be packed together into a single device which will be designated as "combo sensor".

The sensor type configuration is required to determine the types of sensors and conversion tables which can be used in the RTU network. For Adcon sensors, type data and conversion tables are already preprogrammed in your A850 at your disposal to allow a quick connection of your RTUs. Detailed information about all sensors available from Adcon can be achieved from Adcon's website "http://www.adcon.at/english/produkte_sensoren_en.html".

Adding Custom Sensors

If you need to connect sensor types to your RTUs which are not predefined Adcon standard sensor types, you must first define your sensors in the "Sensor Type Configuration".

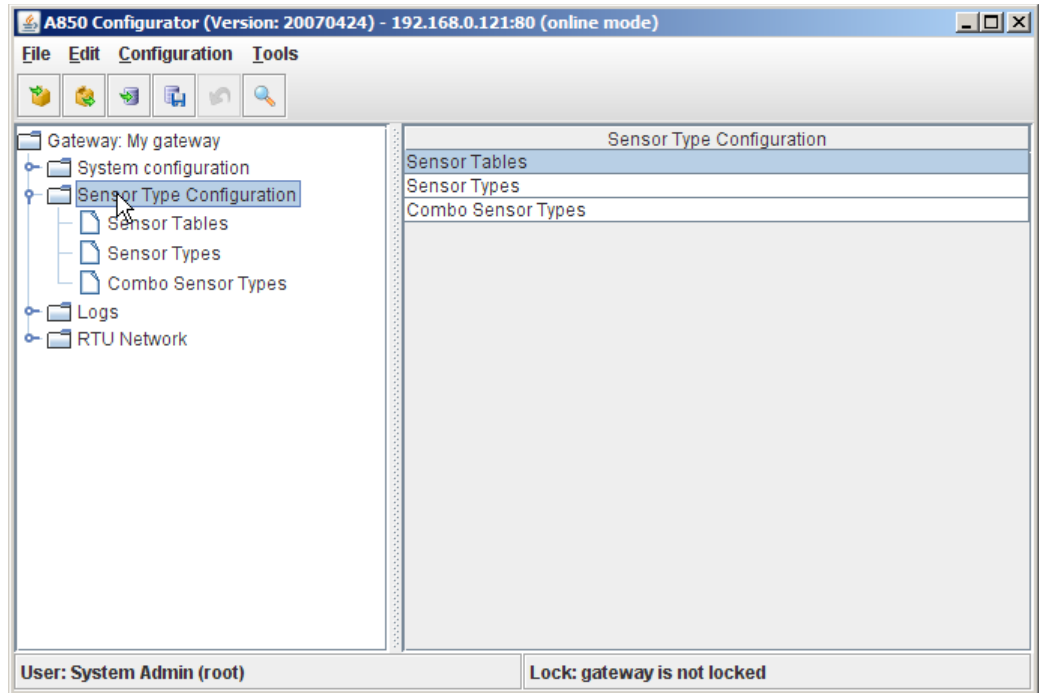


Figure 177. Sensor Type Configuration

Sensor Tables

For sensors that either do not provide output voltages depending linearly on the measured variable, or that provide output voltages which must be converted into discrete output values, you have to define appropriate tables for conversion/linearization. Each sensor output voltage value becomes an input value of the table; a conversion table may contain from 2 to 256 input values and also from 2 to 256 output values. Of course, the numbers of input and output values must match, each table input and its corresponding output value specifying a data point on the conversion diagram.

For example, the leaf wetness sensor outputs a voltage (which has a certain non-linearity), but the leaf wetness value is expressed in discrete values of 1 to 10 .SFU. units.

Note: Interpolation is used for values between the specified data points.

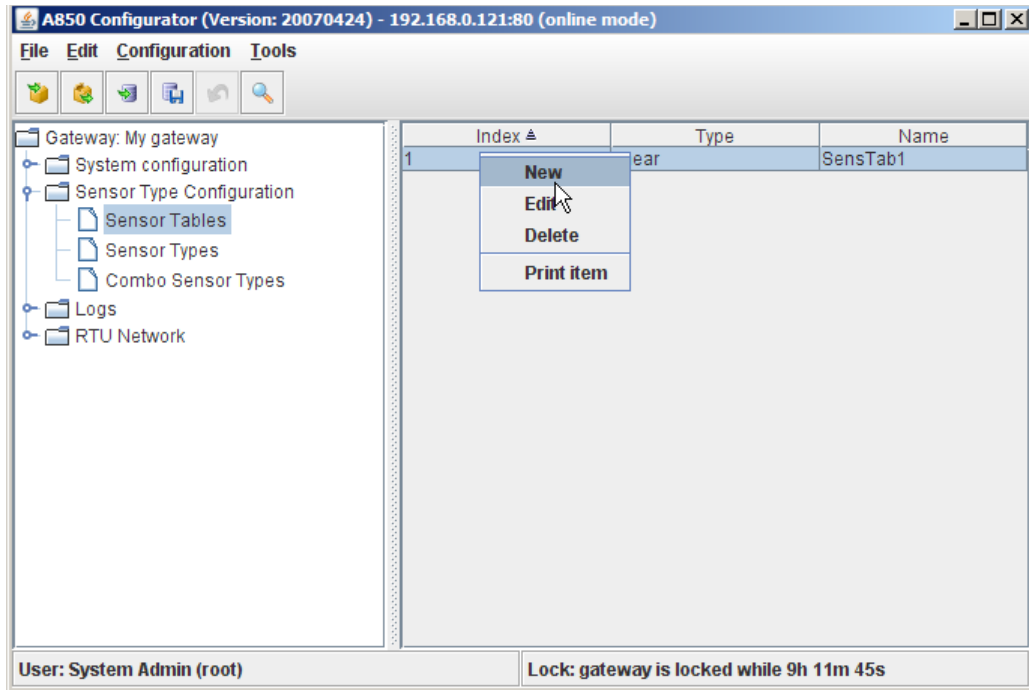


Figure 178. Sensor Tables Selection

The selections offered by the "Sensor Tables" context menu are:

- "New" - allows you to add a new sensor table;
- "Edit" - allows you to modify an existing sensor table;
- "Delete" - allows you to delete a previously defined sensor table;
- "Print item" - allows you to see a print preview of the respective sensor table in a formsheet processed for the printer and to start the printout on your default printer.

Note: Menu items "Undo" or "Redo": see "Pop-up Context Menu" in chapter 2.

Double-clicking the sensor table in the "Table view" allows you to check the selected sensor table.

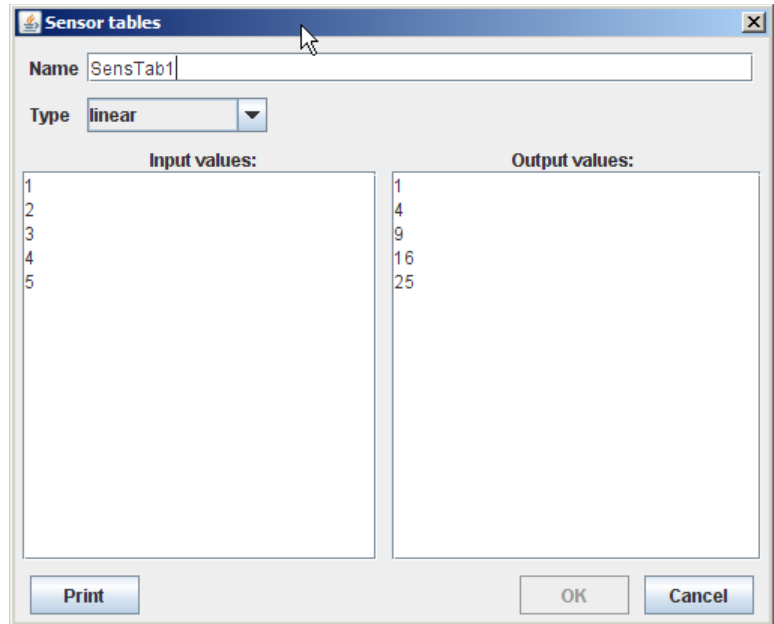


Figure 179. Sensor tables

The “Sensor tables” window provides the following window areas:

- Name - allows you to enter a unique name for each conversion table to be determined; later, in the Sensor Type window, the conversion of the data of a sensor (also referred to as “the linearization of a sensor”) can be performed under this name;
- Type - allows you to select the type of interpolation to be used:

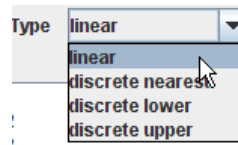


Figure 180. Type of Interpolation

- linear - a linear interpolation is used, i.e. an intermediate value is calculated according to the ratio of the distances to the neighboring values contained in the table;

- discrete nearest - in any case, the nearest discrete value contained in the table will be used;
- discrete lower - in any case, the nearest lower discrete value contained in the table will be used;
- discrete upper - in any case, the nearest higher discrete value contained in the table will be used.
- Input values / Output values - allows you to enter the corresponding pairs of values of the conversion table:

Input values:		Output values:	
1		1	
2		4	
3		9	
4	I	16	
5		25	

Figure 181. Conversion Table

- Input values: - enter the values delivered by a particular sensor which correspond to the values of physical units defined by you as output values;
- Output values: - enter the values of the physical units as which you want your A850 to interpret the respective input values.

Sensor Types

The "Sensor Type Selection" window allows you to define the sensor types which you intend to use with your RTUs; i.e. each type of sensor has to be declared only once in this window to allow you to use it in your RTU network.

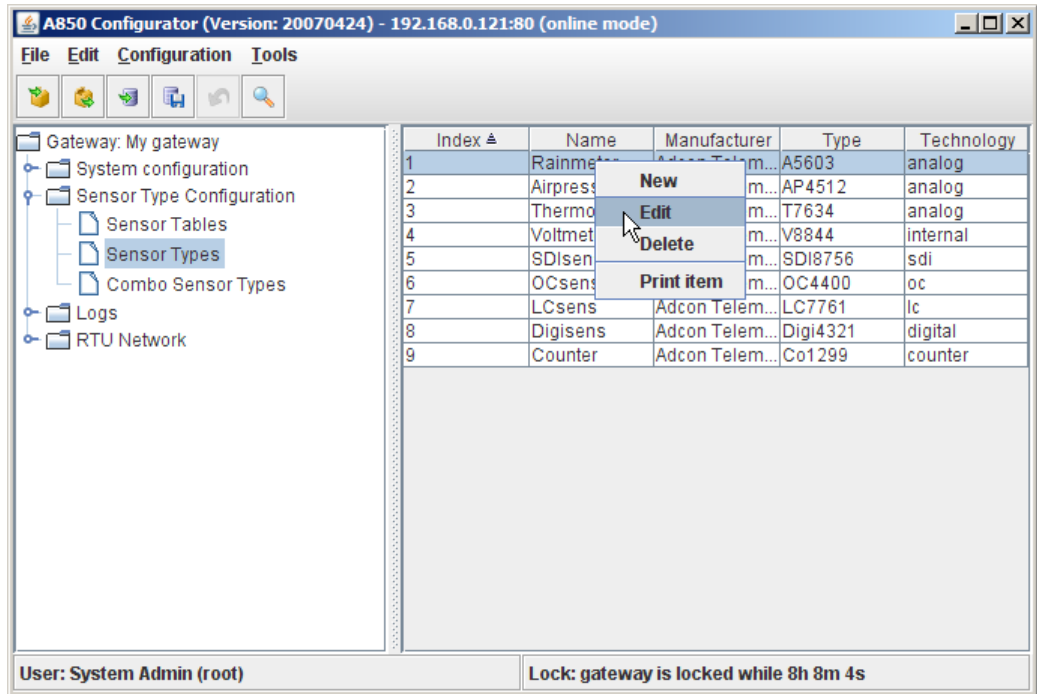


Figure 182. Sensor Types Selection

The selections offered by the "Sensor Types" context menu are:

- "New" - allows you to add a new sensor type;
- "Edit" - allows you to modify an existing sensor type;
- "Delete" - allows you to delete a previously defined sensor type;
- "Print item" - allows you to see a print preview of the respective sensor type in a formsheet processed for the printer and to start the printout on your default printer.

Note: Menu items "Undo" or "Redo": see "Pop-up Context Menu" in chapter 2.

Double-clicking the sensor type in the "Table view" allows you to check the selected sensor type.

Depending on the technology of a sensor type, different sensor type windows will be displayed.

Analog sensor types

The “Sensor type” window provides the following window areas for analog sensor types:

- Common settings - for entering the common definitions of the sensor type, especially determining its technology;
- Analog sensor settings - for determining the cabling and the sensor supply time;
- Analog sensor sampling method - for determining the sampling methods to be used, as well as to set up a default method;
- Conversion settings - for determining the method of conversion of input values to output values or to define a sensor table for conversion, respectively.

Sensor type

Common settings

Name: Wind Speed

Manufacturer: Acme Inc.

Type: WS100

Engineering unit: Velocity (km/h)

Icon: WINDSPEED

Technology: analog

Analog sensor settings

Cabling: 1

Sensor supply time: 2

Analog sensor sampling methods

minimum maximum sum arithmetic average

circular average first sample last sample

Default sampling method: maximum

Conversion settings

Sensor table: none

Linear input value: 0 min 2.5 max

Linear output value: 0 min 120 max

Verifier: 0 min 100 max

Display scale: 0 min 100 max

Print OK Cancel

Figure 183. Sensor type Window - Analog

Common settings

The screenshot shows a 'Common settings' dialog box with the following fields and values:

- Name: Wind Speed
- Manufacturer: Acme Inc.
- Type: WS100
- Engineering unit: Velocity (mi/h)
- Icon: WINDSPEED
- Technology: analog

Figure 184. Sensor type - Common settings - Analog

- Name - enter a unique name for each sensor type;
- Manufacturer - enter the name of the manufacturer of the sensor;
- Type - enter the type designation of the sensor;
- Engineering unit - specify in which measuring unit the sensor data are to be delivered.

The screenshot shows the 'Engineering unit' dropdown menu with the following items:

- Velocity (mi/h) (selected)
- Velocity (micrometer/day)
- Velocity (micrometer/hour)
- Volume (UK fluid ounce)
- Volume (UK gallon)
- Volume (UK gill)
- Volume (UK pint)
- Volume (UK quart)

Figure 185. Sensor type - Common settings - Engineering unit - Analog

- Icon - choose a symbol to represent the sensor type; later, this symbol will be displayed for every sensor connection to a RTU;

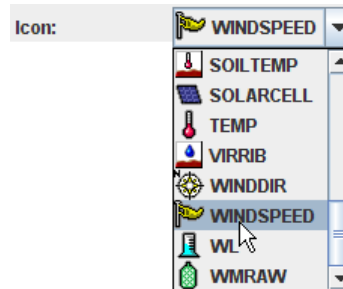


Figure 186. Sensor type - Common settings - Icon - Analog

Note: If you cannot find a suitable engineering unit or icon for your sensor, ask your Adcon Telemetry distributor for support.

- Technology - make the appropriate selection in the combo box "Technology" (in this case, "analog"):

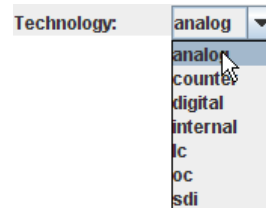


Figure 187. Sensor type - Common settings - Technology - Analog

Analog sensor settings

Analog sensor settings

Cabling

Sensor supply time

Figure 188. Sensor type - Analog sensor settings

- Cabling - the pin of the connector of the RTU the sensor cable is connected with (for a description of the connectors, refer to the addIT and addWAVE user manuals);



Figure 189. Sensor type - Analog sensor settings - Cabling

- Sensor supply time - the delay allowed for the sensors to settle after power has been applied to them (the default value is 2 seconds) so that the sampling of accurate measurements can begin.

Analog sensor sampling methods

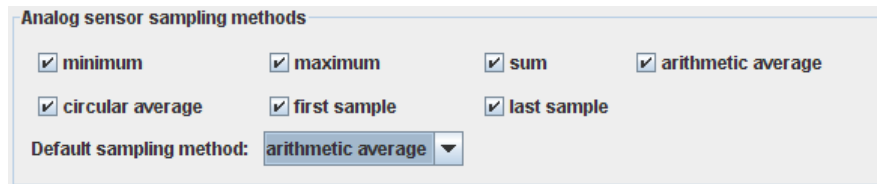


Figure 190. Sensor type - Analog sensor sampling methods

Determination of the sampling methods permitted for the sensor type and selection of the sampling method to be used.

Allowed sampling methods - check all check boxes for sampling methods that are allowed for this sensor type:

- minimum - set sampling method to minimum, i.e. the specified analog channel is instructed to store the lowest sampled value;
- maximum - set sampling method to maximum, i.e. the specified analog channel is instructed to store the highest sampled value;
- sum - set sampling method to sum, i.e. the specified analog channel is instructed to store the sum of all sampled values;
- arithmetic average - set sampling method to arithmetic average, i.e. the specified analog channel is instructed to store the arithmetic average of all sampled values;
- circular average - set sampling method to circular average, i.e. the specified analog channel is instructed to store the circular average of all sampled values;

- first sample - set sampling method to first, i.e. only the first sampled value is stored in each slot;
- last sample - set sampling method to last, i.e. only the last sampled value is stored in each slot.

Select default sampling method:

- Default sampling method: - select which of the methods mentioned above has to be used for this sensor type.

Note: Select only a valid sampling method as default sampling method, i.e. a sampling method explicitly permitted for the sensor type.

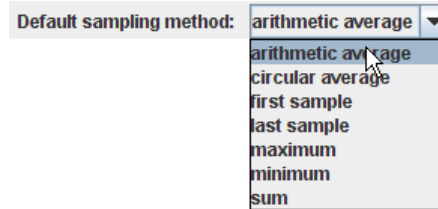


Figure 191. Sensor type - Analog sensor settings - Default sampling method

Conversion settings

Conversion settings					
Sensor table:	none				
Linear input value	0	min	2.5	max	
Linear output value	0	min	1.20	max	
Verifier	0	min	100	max	
Display scale	0	min	100	max	

Figure 192. Sensor type - Conversion settings - Analog

- Sensor table - if you want to use a non-linear sensor, select one of the sensor tables already defined in the menu item

“Sensor Tables” for conversion/linearization; if you intend to use a linear sensor, select “none”;

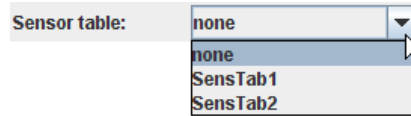


Figure 193. Sensor type - Conversion settings - Sensor table - Analog

Note: If a sensor table is entered for a non-linear sensor, the following entries for Linear input value refer to the output values of the linearization table and not to the voltage measured on the analog pin!

- Linear input value - entry of the minimum and maximum value of the range within which the sensor delivers measurements;

Note: Due to its linear characteristic, a linear sensor is by default exactly defined by only two input values, the minimum and the maximum. The range for analog sensors is 0 - 2.5 Volts.

- Linear output value - entry of the minimum and maximum value of the linear output range which has to correspond to the linear input value range, in the engineering units which have been selected;

Note: For example, in Fig. 189, the input range of 0 - 2,5 Volts corresponds to the output range of 0 - 120 km/h wind speed.

- Verifier - entry of the minimum and maximum value within which valid sensor measurement results can be expected. If the values are outside the preset thresholds, an invalid sensor value will be notified;
- Display scale - enter the minimum and maximum value for scaling which should to be displayed on the trend graph “Sensor data graphic”.

Counter sensor types

The “Sensor type” window provides the following window areas for counter sensor types:

- Common settings - for entering the common definitions of the sensor type, especially determining its technology;

- Conversion settings - for determining the method of conversion of input values to output values or to define a sensor table for conversion, respectively.

The screenshot shows a software window titled "Sensor type" with a close button (X) in the top right corner. The window is divided into two main sections: "Common settings" and "Conversion settings".

Common settings:

- Name:** Revolution Meter
- Manufacturer:** Adcon Telemetry GmbH
- Type:** Silicon Inc
- Engineering unit:** Number of revolutions (1/s)
- Icon:** A dropdown menu showing a waveform icon and the text "DEFAULT". A mouse cursor is pointing at the dropdown arrow.
- Technology:** counter

Conversion settings:

- Sensor table:** none
- Linear input value:** 0 (input) min 50 (input) max
- Linear output value:** 0 (input) min 50 (input) max
- Verifier:** 0 (input) min 100 (input) max
- Display scale:** 0 (input) min 100 (input) max

At the bottom of the window, there are three buttons: "Print" on the left, and "OK" and "Cancel" on the right.

Figure 194. Sensor type Window - Counter

Common settings

Common settings

Name: Revolution Meter

Manufacturer: Adcon Telemetry GmbH

Type: Silicon Inc

Engineering unit: Number of revolutions (1/s)

Icon: DEFAULT

Technology: counter

Figure 195. Sensor type - Common settings - Counter

- Name - enter a unique name for each sensor type;
- Manufacturer - enter the name of the manufacturer of the sensor;
- Type - enter the type designation of the sensor;
- Engineering unit - specify in which measuring unit the sensor data are to be delivered;

Engineering unit: Number of revolutions (1/s)

Momentum of inertia (kg*quare meter)

Number of eggs

Number of flowers

Number of fruits

Number of insects

Number of items

Number of revolutions (1/s)

Plane angle(degree)

Figure 196. Sensor type - Common settings - Engineering unit - Counter

- Icon - select a symbol to represent the sensor type; later, this symbol will be displayed for every sensor connection to a RTU;

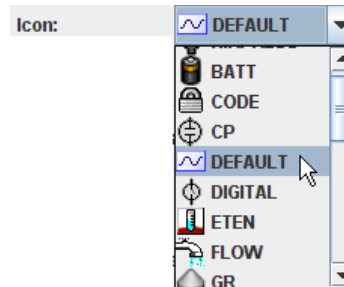


Figure 197. Sensor type - Common settings - Icon - Counter

- Technology - make the appropriate selection in the pulldown menu "Technology" (in this case, "counter"):

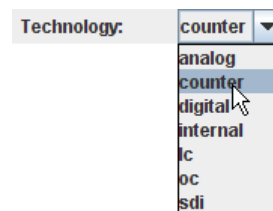


Figure 198. Sensor type - Common settings - Technology - Counter

Conversion settings

Conversion settings

Sensor table:

Linear input value: min max

Linear output value: min max

Verifier: min max

Display scale: min max

Figure 199. Sensor type - Conversion settings - Counter

- Sensor table - if you want to use a non-linear sensor, select one of the sensor tables already defined in the menu item

“Sensor Tables” for conversion/linearization; if you intend to use a linear sensor, select “none”;

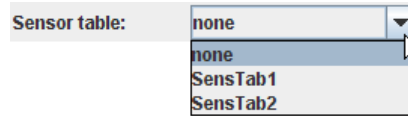


Figure 200. Sensor type - Conversion settings - Sensor table - Counter

Note: If a sensor table is entered for a non-linear sensor, the following entries for Linear input value refer to the output values of the linearization table and not to the voltage measured on the analog pin!

- Linear input value - entry of the minimum and maximum value of the range within which the sensor delivers measurements;

Note: Due to its linear characteristic, a linear sensor is by default exactly defined by only two input values, the minimum and the maximum. The resolution of the pulse counter is 16 bits.

- Linear output value - entry of the minimum and maximum value of the linear output range which has to correspond to the linear input value range, in the engineering units which have been selected;
- Verifier - entry of the minimum and maximum value within which valid sensor measurement results can be expected. If the values are outside the preset thresholds, an invalid sensor value will be notified;
- Display scale - enter the minimum and maximum value for scaling which should to be displayed on the trend graph “Sensor data graphic”.

Digital sensor types

The “Sensor type” window provides the following window areas for digital sensor types:

- Common settings - for entering the common definitions of the sensor type, especially determining its technology;
- Digital sensor settings - for determining if the “digital sensor” is really a sensor or, instead, an actuator;

- Conversion settings - for determining the method of conversion of input values to output values or to define a sensor table for conversion, respectively.

Sensor type

Common settings

Name: Leafwetness

Manufacturer: Adcon Telemetry GmbH

Type: LWM-3412

Engineering unit: Units of leafwetness (U)

Icon: LW

Technology: digital

Digital sensor settings

pin is output

Conversion settings

Sensor table: none

Linear input value	0	min	1	max
Linear output value	0	min	1	max
Verifier	0	min	100	max
Display scale	0	min	250	max

Print OK Cancel

Figure 201. Sensor type Window - Digital

Common settings

Common settings

Name: Leafwetness

Manufacturer: Adcon Telemetry GmbH

Type: LWM-3412

Engineering unit: Units of leafwetness (U)

Icon: LW

Technology: digital

Figure 202. Sensor type - Common settings - Digital

- Name - enter a unique name for each sensor type;
- Manufacturer - enter the name of the manufacturer of the sensor;
- Type - enter the type designation of the sensor;
- Engineering unit - specify in which measuring unit the sensor data are to be delivered;

Engineering unit: Units of leafwetness (U)

Time (millisecond)

Time (minute)

Time (nanosecond)

Time (picosecond)

Time (second)

Total dissolved solids (TDS)

Turbidity (NTU - nephelometric turbidity unit)

Units of leafwetness (U)

Figure 203. Sensor type - Common settings - Engineering unit - Digital

- Icon - select a symbol to represent the sensor type; later, this symbol will be displayed for every sensor connection to a RTU;

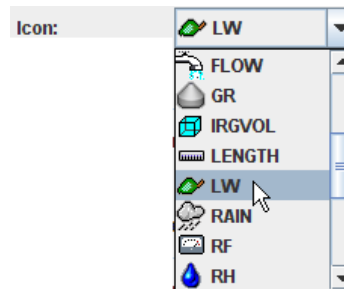


Figure 204. Sensor type - Common settings - Icon - Digital

- Technology - make the appropriate selection in the pulldown menu "Technology" (in this case, "digital"):

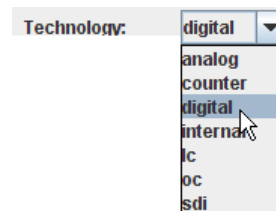


Figure 205. Sensor type - Common settings - Technology - Digital

Digital sensor settings

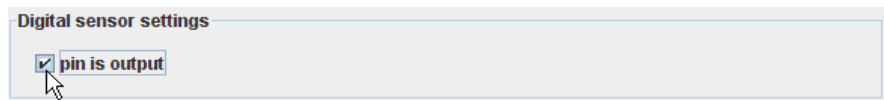


Figure 206. Sensor type - Digital sensor settings

- Pin is output - if, instead of a digital sensor, a digital actuator has to be used, this check box must be marked so that the pin will automatically be switched to output.

Note: Detailed information about the use of digital actuators and the digital output can be found in the respective RTU user manuals.

Conversion settings

Conversion settings				
Sensor table:	none			
Linear input value	0	min	1	max
Linear output value	0	min	1	max
Verifier	0	min	100	max
Display scale	0	min	250	max

Figure 207. Sensor type - Conversion settings - Digital

- Sensor table - if you want to use a non-linear sensor, select one of the sensor tables already defined in the menu item "Sensor Tables" for conversion/linearization; if you intend to use a linear sensor, select "none";

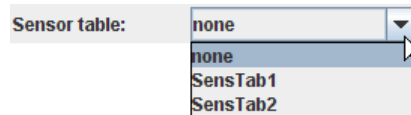


Figure 208. Sensor type - Conversion settings - Sensor table - Digital

Note: If a sensor table is entered for a non-linear sensor, the following entries for Linear input value refer to the output values of the linearization table and not to the voltage measured on the analog pin!

- Linear input value - entry of the minimum and maximum value of the range within which the sensor delivers measurements;

Note: Due to its linear characteristic, a linear sensor is by default exactly defined by only two input values, the minimum and the maximum. The range for digital sensors is 0 - 1 Units.

- Linear output value - entry of the minimum and maximum value of the linear output range which has to correspond to the linear input value range, in the engineering units which have been selected;
- Verifier - entry of the minimum and maximum value within which valid sensor measurement results can be expected. If

the values are outside the preset thresholds, an invalid sensor value will be notified;

- Display scale - enter the minimum and maximum value for scaling which should to be displayed on the trend graph "Sensor data graphic".

Internal sensor types

The "Sensor type" window provides the following window areas for internal sensor types:

- Common settings - for entering the common definitions of the sensor type, especially determining its technology;
- Internal sensor settings - for determining the type of the internal sensor;
- Conversion settings - for determining the method of conversion of input values to output values or to define a sensor table for conversion, respectively.

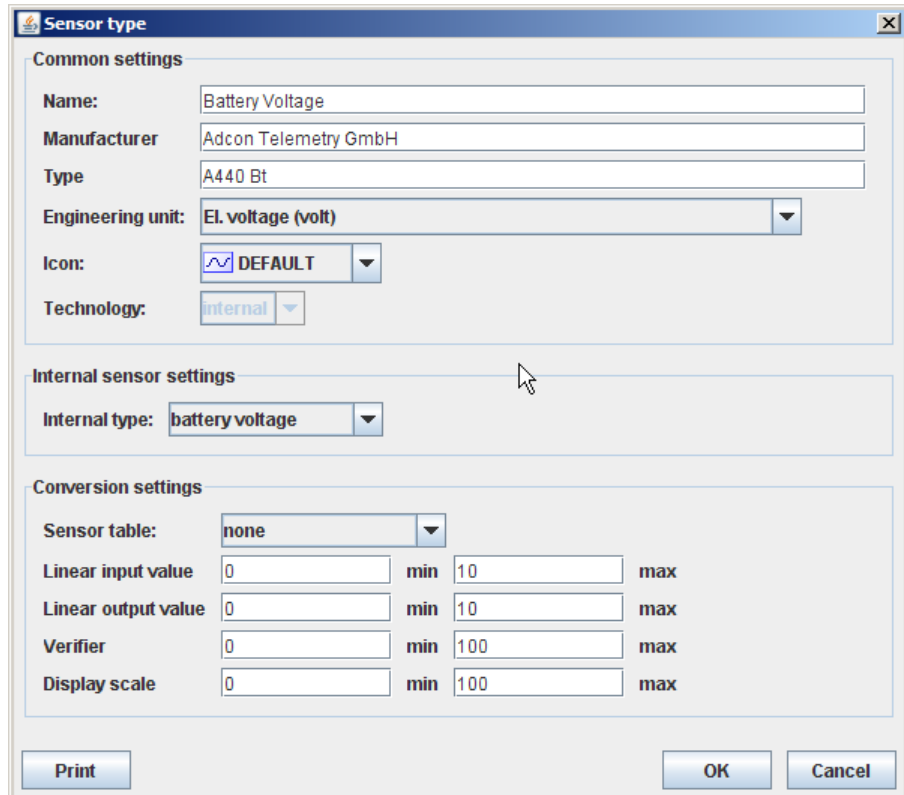


Figure 209. Sensor type Window - Internal

Common settings

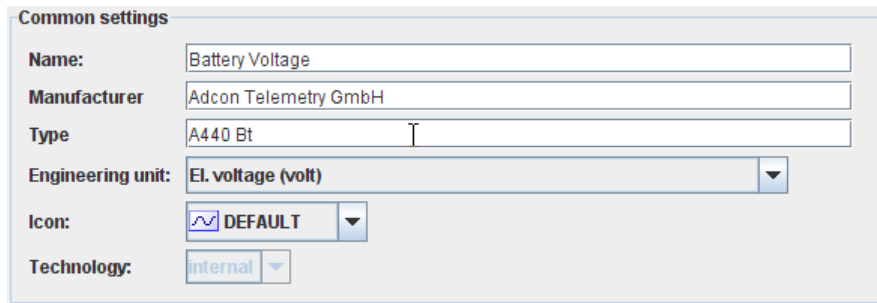


Figure 210. Sensor type - Common settings - Internal

- Name - enter a unique name for each sensor type;
- Manufacturer - enter the name of the manufacturer of the sensor;
- Type - enter the type designation of the sensor;
- Engineering unit - specify in which measuring unit the sensor data are to be delivered;
- Icon - select a symbol to represent the sensor type; later, this symbol will be displayed for every sensor connection to a RTU;
- Technology - make the appropriate selection in the pulldown menu "Technology" (in this case, "internal"):

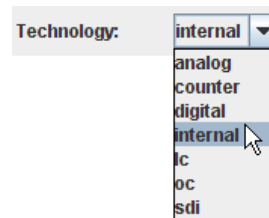


Figure 211. Sensor type - Common settings - Technology - Internal

Internal sensor settings

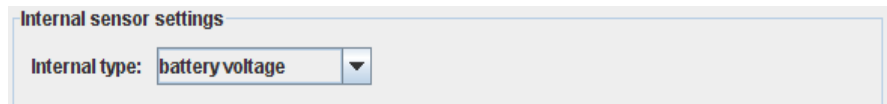


Figure 212. Sensor type - Internal sensor settings

- Internal type - select an appropriate internal sensor type from the selection list:

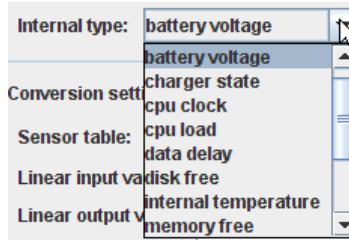


Figure 213. Sensor type - Internal sensor settings - Internal type

Conversion settings

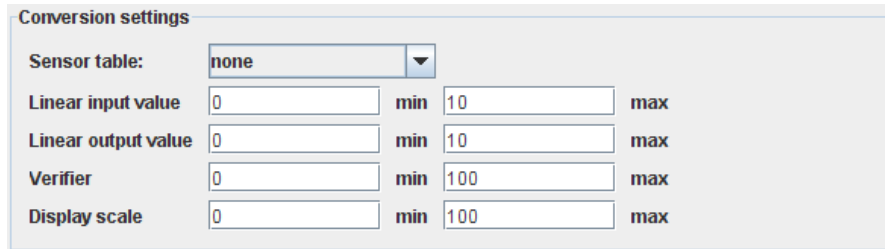


Figure 214. Sensor type - Conversion settings - Internal

- Sensor table - if you want to use a non-linear sensor, select one of the sensor tables already defined in the menu item "Sensor Tables" for conversion/linearization; if you intend to use a linear sensor, select "none";

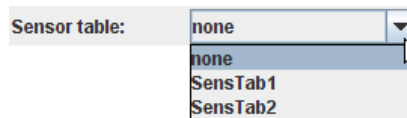


Figure 215. Sensor type - Conversion settings - Sensor table - Internal

Note: If a sensor table is entered for a non-linear sensor, the following entries for Linear input value refer to the output values of the linearization table and not to the voltage measured on the analog pin!

- Linear input value - entry of the minimum and maximum value of the range within which the sensor delivers measurements;

Note: Due to its linear characteristic, a linear sensor is by default exactly defined by only two input values, the minimum and the maximum. The range for Internal sensors is 0 - 1 Units, by default.

- Linear output value - entry of the minimum and maximum value of the linear output range which has to correspond to the linear input value range, in the engineering units which have been selected;
- Verifier - entry of the minimum and maximum value within which valid sensor measurement results can be expected. If the values are outside the preset thresholds, an invalid sensor value will be notified;
- Display scale - enter the minimum and maximum value for scaling which should to be displayed on the trend graph "Sensor data graphic".

LC sensor types

The "Sensor type" window provides the following window areas for LC sensor types:

- Common settings - for entering the common definitions of the sensor type, especially determining its technology;
- Sensor settings - for determining the logical channel of the LC sensor;
- Conversion settings - for determining the method of conversion of input values to output values or to define a sensor table for conversion, respectively.

Sensor type [X]

Common settings

Name: Leafwetnessmeter

Manufacturer: Adcon Telemetry GmbH

Type: HM422

Engineering unit: Units of leafwetness (U)

Icon: LW

Technology: lc

Sensor settings

Logical channel: 0

Conversion settings

Sensor table: SensTab1

Linear input value	0	min	1	max
Linear output value	0	min	1	max
Verifier	0	min	100	max
Display scale	0	min	100	max

Print OK Cancel

Figure 216. Sensor type Window - LC

Common settings

Common settings

Name: Leafwetnessmeter

Manufacturer: Adcon Telemetry GmbH

Type: HM422

Engineering unit: Units of leafwetness (U)

Icon: LW

Technology: lc

Figure 217. Sensor type - Common settings - LC

- Name - enter a unique name for each sensor type;
- Manufacturer - enter the name of the manufacturer of the sensor;
- Type - enter the type designation of the sensor;
- Engineering unit - specify in which measuring unit the sensor data are to be delivered;
- Icon - select a symbol to represent the sensor type; later, this symbol will be displayed for every sensor connection to a RTU;
- Technology - make the appropriate selection in the pulldown menu "Technology" (in this case, "lc"):
-

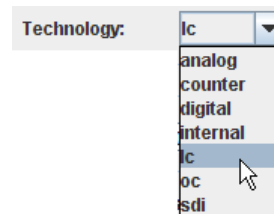
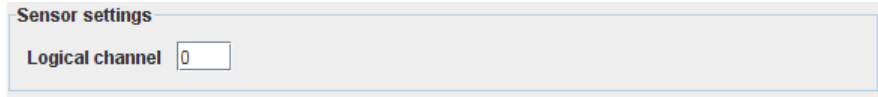


Figure 218. Sensor type - Common settings - Technology - LC

Sensor settings



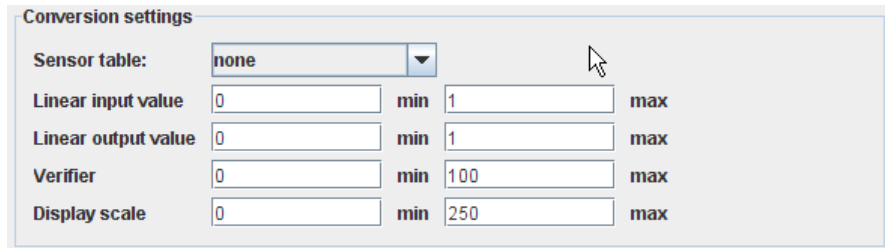
Sensor settings

Logical channel

Figure 219. Sensor type - Sensor settings - LC

- Logical channel - enter the logical channel of the LC sensor.

Conversion settings



Conversion settings

Sensor table:

Linear input value min max

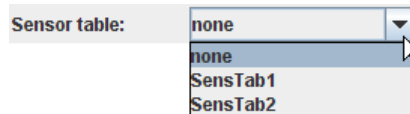
Linear output value min max

Verifier min max

Display scale min max

Figure 220. Sensor type - Conversion settings - LC

- Sensor table - if you want to use a non-linear sensor, select one of the sensor tables already defined in the menu item "Sensor Tables" for conversion/linearization; if you intend to use a linear sensor, select "none";



Sensor table:

- none
- SensTab1
- SensTab2

Figure 221. Sensor type - Conversion settings - Sensor table - LC

Note: If a sensor table is entered for a non-linear sensor, the following entries for Linear input value refer to the output values of the linearization table and not to the voltage measured on the analog pin!

- Linear input value - entry of the minimum and maximum value of the range within which the sensor delivers measurements;

Note: Due to its linear characteristic, a linear sensor is by default exactly defined by only two input values, the minimum and the maximum. The range for LC sensors is 0 - 1 Units, by default.

- Linear output value - entry of the minimum and maximum value of the linear output range which has to correspond to the linear input value range, in the engineering units which have been selected;
- Verifier - entry of the minimum and maximum value within which valid sensor measurement results can be expected. If the values are outside the preset thresholds, an invalid sensor value will be notified;
- Display scale - enter the minimum and maximum value for scaling which should to be displayed on the trend graph "Sensor data graphic".

OC sensor types

The "Sensor type" window provides the following window areas for OC sensor types:

- Common settings - for entering the common definitions of the sensor type, especially determining its technology;
- Output settings - for determining the output channel of the OC sensor;
- Conversion settings - for determining the method of conversion of input values to output values or to define a sensor table for conversion, respectively.

Sensor type

Common settings

Name: Speed Regulator

Manufacturer: Speeding Inc.

Type: SR-3312

Engineering unit: Velocity (km/h)

Icon: DEFAULT

Technology: oc

Output settings

Output channel: 1

Conversion settings

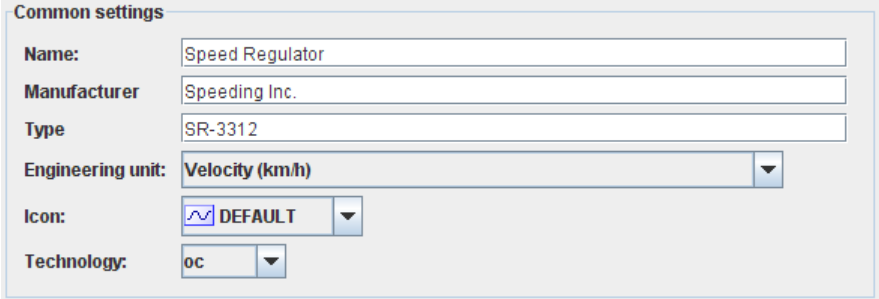
Sensor table: none

Linear input value	0	min	1	max
Linear output value	0	min	5	max
Verifier	0	min	100	max
Display scale	0	min	100	max

Print OK Cancel

Figure 222. Sensor type Window - OC

Common settings



The screenshot shows a 'Common settings' dialog box with the following fields:

- Name:** Speed Regulator
- Manufacturer:** Speeding Inc.
- Type:** SR-3312
- Engineering unit:** Velocity (km/h)
- Icon:** A dropdown menu showing a waveform icon and the text 'DEFAULT'.
- Technology:** oc

Figure 223. Sensor type - Common settings - OC

- Name - enter a unique name for each sensor type;
- Manufacturer - enter the name of the manufacturer of the sensor;
- Type - enter the type designation of the sensor;
- Engineering unit - specify in which measuring unit the sensor data are to be delivered;
- Icon - select a symbol to represent the sensor type; later, this symbol will be displayed for every sensor connection to a RTU;
- Technology - select the appropriate kind of sensor technology (in this case, "oc"):

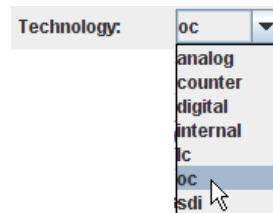
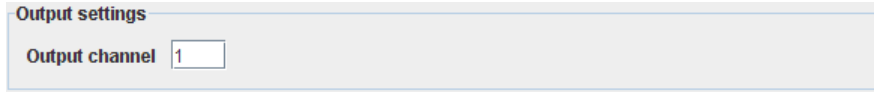


Figure 224. Sensor type - Common settings - Technology - OC

Output settings



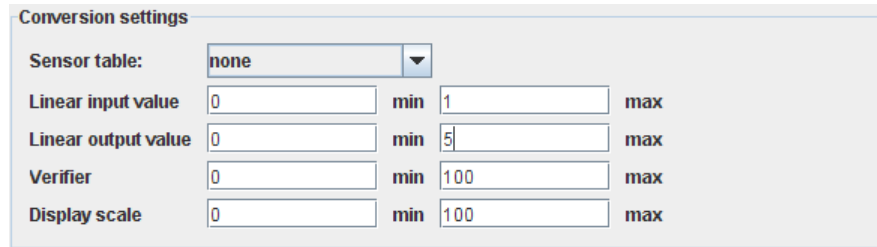
Output settings

Output channel

Figure 225. Sensor type - Output settings - OC

- Output channel - enter the output channel for the OC sensor.

Conversion settings



Conversion settings

Sensor table:

Linear input value min max

Linear output value min max

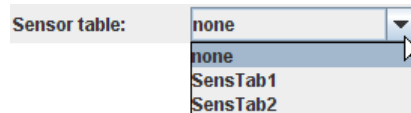
Verifier min max

Display scale min max

Figure 226. Sensor type - Conversion settings - OC

- Sensor table - if you want to use a non-linear sensor, select one of the sensor tables already defined in the menu item "Sensor Tables" for conversion/linearization; if you intend to use a linear sensor, select "none";

-



Sensor table:

- none
- SensTab1
- SensTab2

Figure 227. Sensor type - Conversion settings - Sensor table - OC

Note: If a sensor table is entered for a non-linear sensor, the following entries for Linear input value refer to the output values of the linearization table and not to the voltage measured on the analog pin!

- Linear input value - entry of the minimum and maximum value of the range within which the sensor delivers measurements;

Note: Due to its linear characteristic, a linear sensor is by default exactly defined by only two input values, the minimum and the maximum. The range for OC sensors is 0 - 1 Units, by default.

- Linear output value - entry of the minimum and maximum value of the linear output range which has to correspond to the linear input value range, in the engineering units which have been selected;
- Verifier - entry of the minimum and maximum value within which valid sensor measurement results can be expected. If the values are outside the preset thresholds, an invalid sensor value will be notified;
- Display scale - enter the minimum and maximum value for scaling which should to be displayed on the trend graph "Sensor data graphic".

SDI sensor types

The "Sensor type" window provides the following window areas for SDI sensor types:

- Common settings - for entering the common definitions of the sensor type, especially determining its technology;
- SDI sensor settings - for determining the control of the SDI sensor;
- Conversion settings - for determining the method of conversion of input values to output values or to define a sensor table for conversion, respectively.

The screenshot shows a software window titled "Sensor type" with a close button (X) in the top right corner. The window is divided into three main sections: "Common settings", "SDI sensor settings", and "Conversion settings".

Common settings

- Name: Temperature
- Manufacturer: Vaisala Oy
- Type: WX-845100
- Engineering unit: Temperature (celsius)
- Icon: TEMP (with a thermometer icon)
- Technology: sdi

SDI sensor settings

- Address: 0
- Method: 0
- Index: 2
- Use CRC

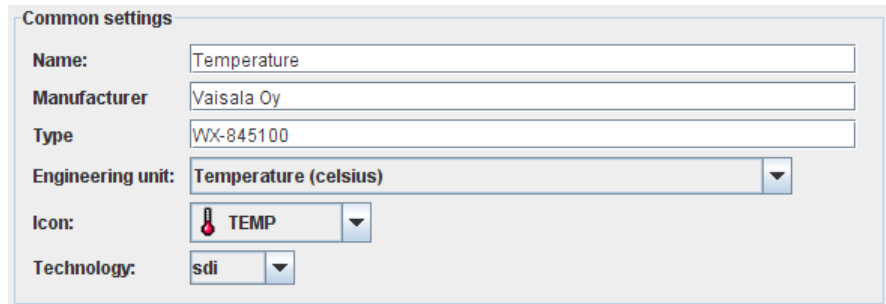
Conversion settings

- Sensor table: none
- Linear input value: 0 min 1 max
- Linear output value: 0 min 1 max
- Verifier: 0 min 100 max
- Display scale: -20 min 40 max

At the bottom of the window, there are three buttons: "Print", "OK", and "Cancel".

Figure 228. Sensor type Window - SDI

Common settings



The screenshot shows a 'Common settings' dialog box with the following fields:

- Name:** Temperature
- Manufacturer:** Vaisala Oy
- Type:** WX-845100
- Engineering unit:** Temperature (celsius)
- Icon:** TEMP (with a thermometer icon)
- Technology:** sdi

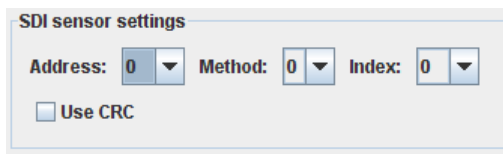
Figure 229. Sensor type - Common settings - SDI

- Name - enter a unique name for each sensor type;
- Manufacturer - enter the name of the manufacturer of the sensor;
- Type - enter the type designation of the sensor;
- Engineering unit - specify in which measuring unit the sensor data are to be delivered;
- Icon - select a symbol to represent the sensor type; later, this symbol will be displayed for every sensor connection to a RTU;
- Technology - make the appropriate selection in the pulldown menu "Technology" (in this case, "sdi"):



Figure 230. Sensor type - Common settings - Technology - SDI

SDI sensor settings



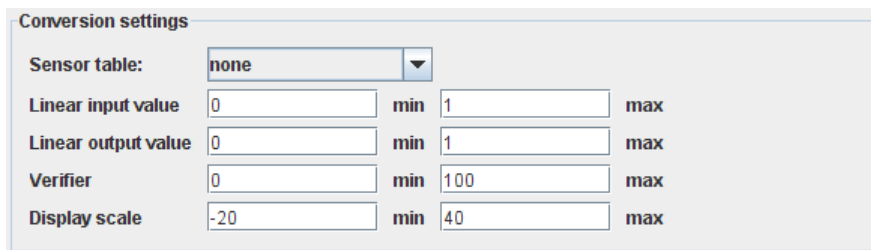
The image shows a dialog box titled "SDI sensor settings". It contains three dropdown menus: "Address:" with the value "0", "Method:" with the value "0", and "Index:" with the value "0". Below these is a checkbox labeled "Use CRC" which is currently unchecked.

Figure 231. Sensor type - SDI sensor settings

- Address: - select the address of the SDI sensor;
- Method: - select the methode des SDI sensors;
- Index: - select the index des SDI sensors;
- Use CRC: - check the box for using a CRC (Cyclic Redundancy Check) for the control of the SDI communication.

Note: If you want to learn more about SDI-12, visit the the website of the SDI-12 Support Group at "<http://www.sdi-12.org/>".

Conversion settings



The image shows a dialog box titled "Conversion settings". It contains a dropdown menu for "Sensor table:" with the value "none". Below this are four rows of input fields, each with a "min" and "max" label. The first row is "Linear input value" with "0" in the min field and "1" in the max field. The second row is "Linear output value" with "0" in the min field and "1" in the max field. The third row is "Verifier" with "0" in the min field and "100" in the max field. The fourth row is "Display scale" with "-20" in the min field and "40" in the max field.

Figure 232. Sensor type - Conversion settings - SDI

- Sensor table - if you want to use a non-linear sensor, select one of the sensor tables already defined in the menu item "Sensor Tables" for conversion/linearization; if you intend to use a linear sensor, select "none";

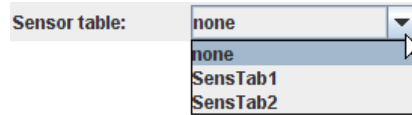


Figure 233. Sensor type - Conversion settings - Sensor table - SDI

Note: If a sensor table is entered for a non-linear sensor, the following entries for Linear input value refer to the output values of the linearization table and not to the voltage measured on the analog pin!

- Linear input value - entry of the minimum and maximum value of the range within which the sensor delivers measurements;

Note: Due to its linear characteristic, a linear sensor is by default exactly defined by only two input values, the minimum and the maximum. The range for SDI sensors is 0 - 1 Units, by default.

- Linear output value - entry of the minimum and maximum value of the linear output range which has to correspond to the linear input value range, in the engineering units which have been selected;
- Verifier - entry of the minimum and maximum value within which valid sensor measurement results can be expected. If the values are outside the preset thresholds, an invalid sensor value will be notified;
- Display scale - enter the minimum and maximum value for scaling which should to be displayed on the trend graph "Sensor data graphic".

Combo Sensor Types

A combo sensor type consists of several (at least two) "normal" sensors and may have its own name, manufacturer and subclass (i.e., the name of each individual sensor type within the combo sensor). For example, an sensor of type "SEN-R" for binder type connectors provides a temperature sensor which uses pin 1 and a relative humidity sensor which uses pin 2; thus, this combo sensor

provides the same functionality as a discrete temperature sensor, a discrete relative humidity sensor and a Y-cable.

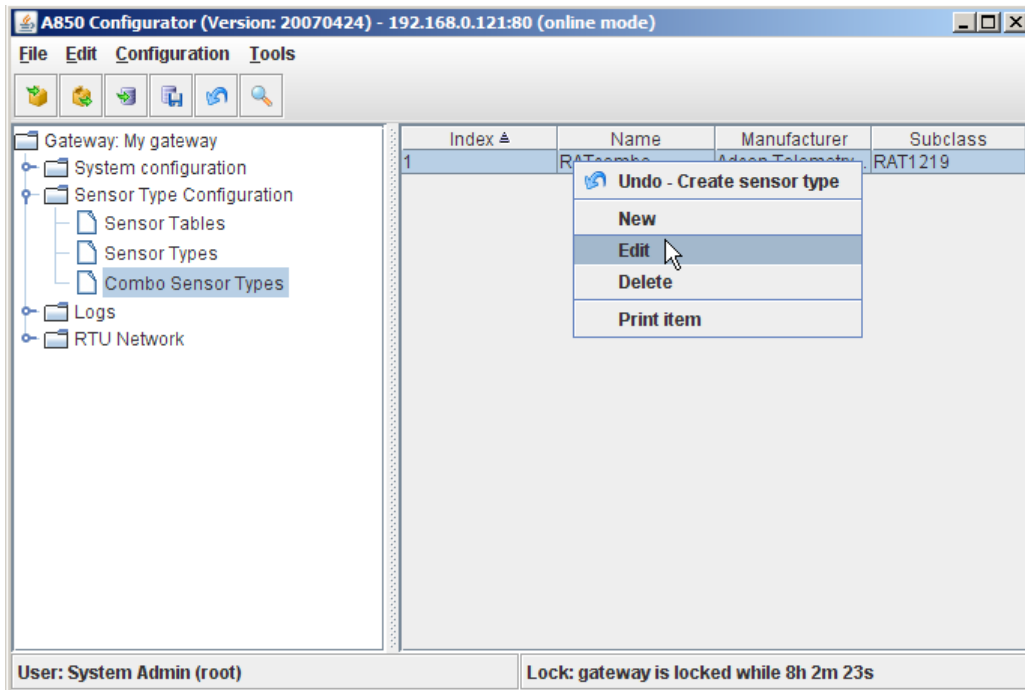


Figure 234. Combo Sensor Types Selection

The selections offered by the "Combo Sensor Types" context menu are:

- "New" - allows you to add a new combo sensor type;
- "Edit" - allows you to modify an existing combo sensor type;
- "Delete" - allows you to delete a previously defined combo sensor type;
- "Print item" - allows you to see a print preview of the respective combo sensor type in a formsheet processed for the printer and to start the printout on your default printer.

Note: Menu items "Undo" or "Redo": see "Pop-up Context Menu" in chapter 2.

Double-clicking the combo sensor type in the "Table view" allows you to check the selected combo sensor type.

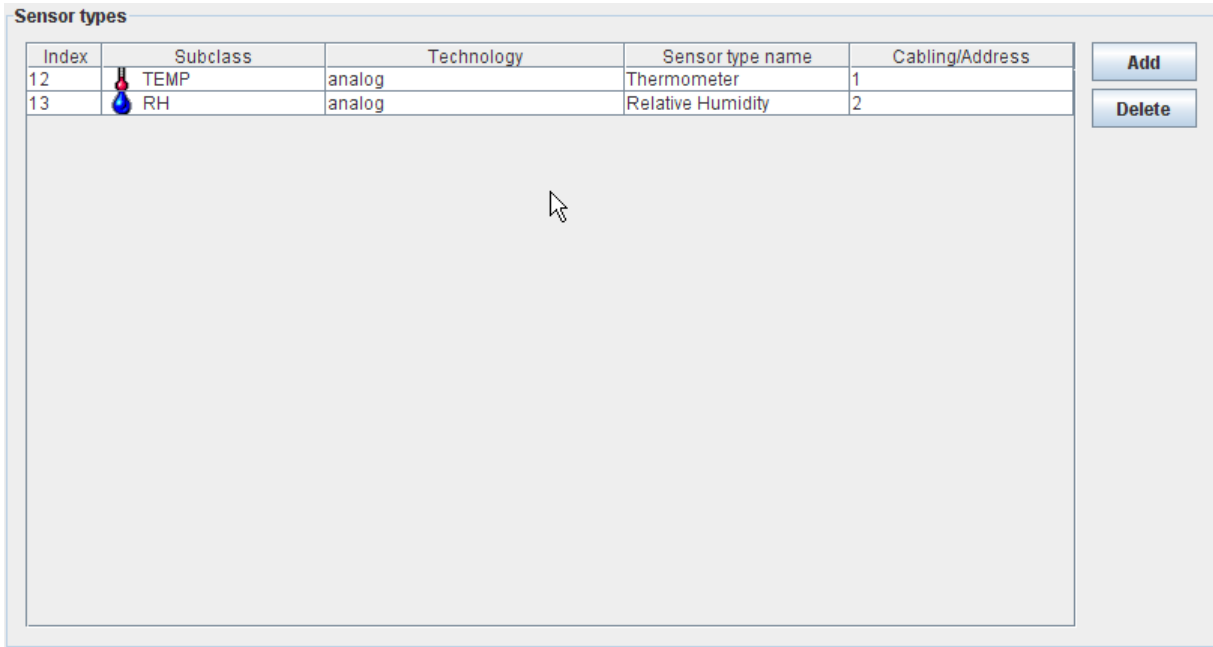
The "Combo sensor type" window provides the following window areas for combo sensor types:

Index	Subclass	Technology	Sensor type name	Cabling/Address
12	TEMP	analog	Thermometer	1
13	RH	analog	Relative Humidity	2

Figure 235. Combo sensor type Window

- Name - enter a unique name for each Combo sensor type;
- Manufacturer - enter the name of the manufacturer of the Combo sensor;
- Subclass - enter the subclass of each individual sensor.

Sensor types



Index	Subclass	Technology	Sensor type name	Cabling/Address
12	TEMP	analog	Thermometer	1
13	RH	analog	Relative Humidity	2

Figure 236. Combo sensor type - Sensor types

- Add - the button "Add" allows you to open the window "Select sensor type", to mark individual sensor types and to combine them to a Combo sensor type by clicking the button OK;
- Delete - the button "Delete" allows you to open the window "Select sensor type", to mark individual sensor types combined into a Combo sensor type and to remove them from the respective Combo sensor type by clicking the button "OK".

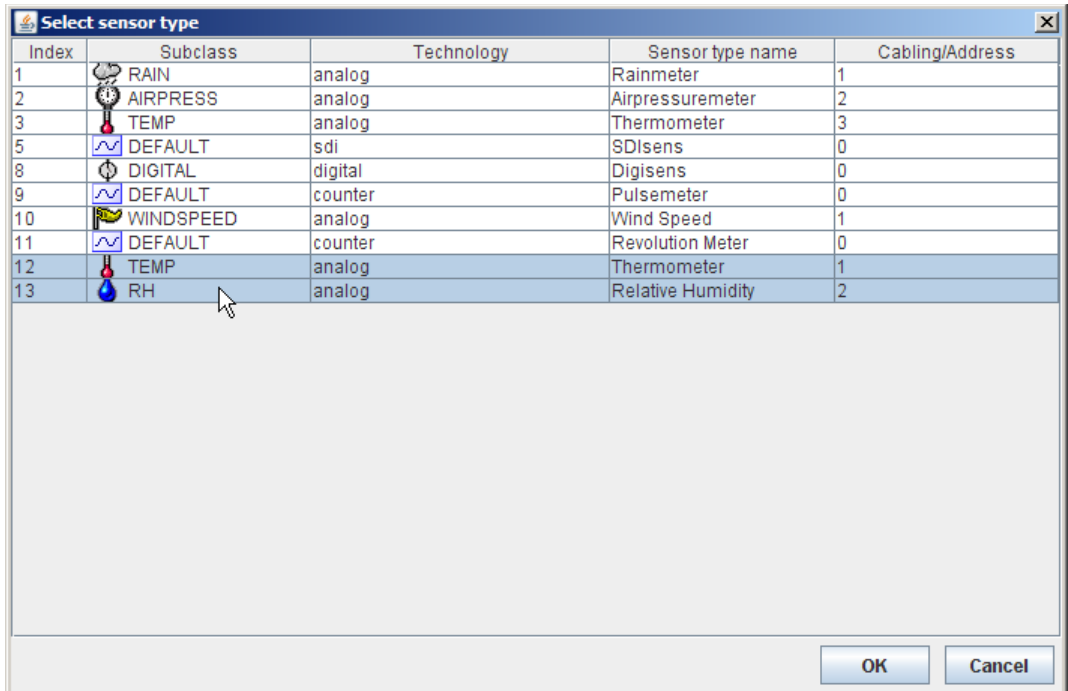


Figure 237. Combo sensor type - Sensor types - Select sensor type

Logs

There are two ways to display the log files of the system. While the whole journal can be displayed by a selection within the main menu, the popup menu related to modems and RTUs offers to display the subset of entries of the log file related to the actual modem or RTU, respectively.

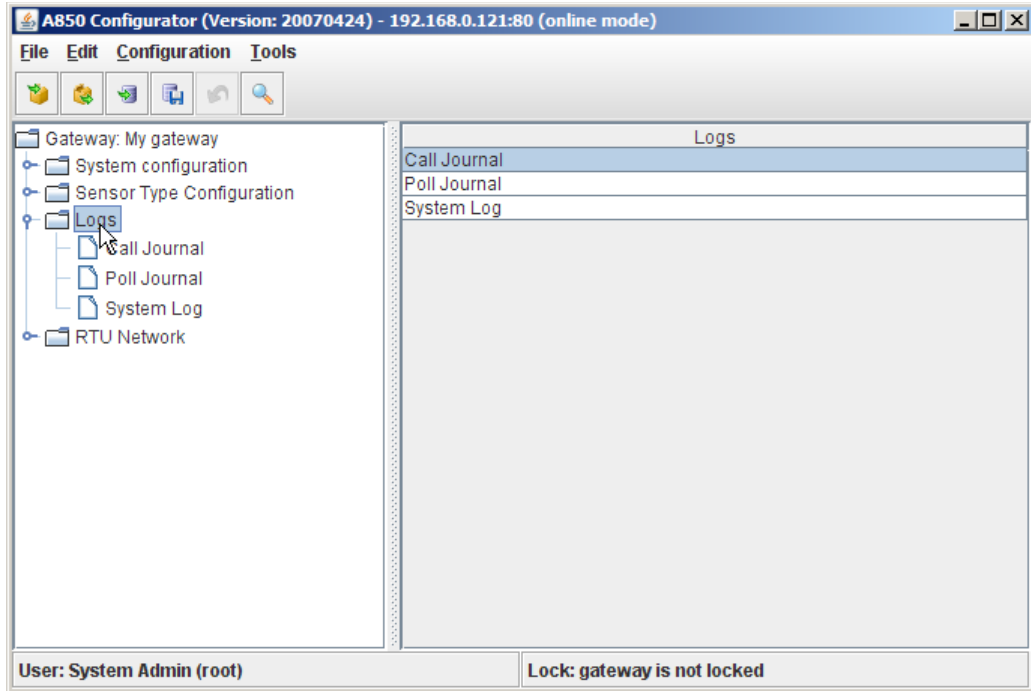


Figure 238. Logs Selection

Call Journal

The call journal contains a list of the last outgoing phone calls.

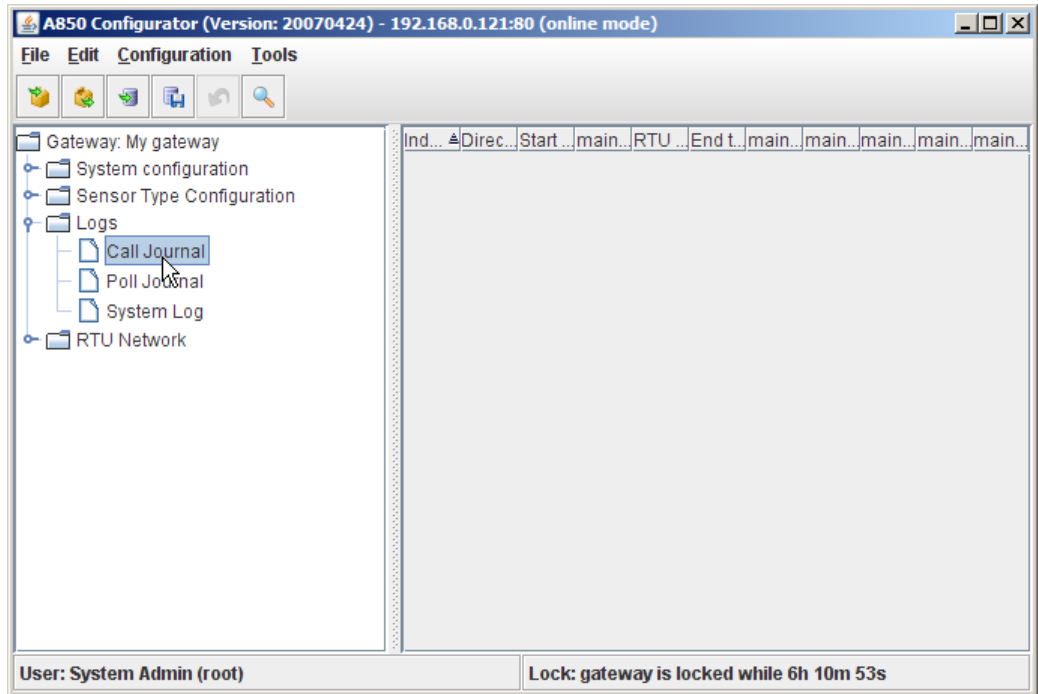


Figure 239. Call Journal Table

Poll Journal

The poll journal contains a list with the data polls (poll = the gateway contacts the RTUs and requests new measurement data) of all connected RTUs.

Index	Packets	Start time	mai...	RTU...	End t...	mai...	mainf...	mainf...
322	0	6/14/07 6:30 PM			6/14...			
323	0	6/14/07 6:30 PM			6/14...			
324	0	6/14/07 6:30 PM			6/14...			
325	0	6/14/07 10:30 ...			6/14...			
326	0	6/14/07 10:30 ...			6/14...			
327	0	6/14/07 10:30 ...			6/14...			
328	0	6/15/07 1:00 AM			6/15...			
329	0	6/15/07 1:00 AM			6/15...			
330	0	6/15/07 1:00 AM			6/15...			
331	0	6/15/07 3:00 AM			6/15...			
332	0	6/15/07 3:00 AM			6/15...			
333	0	6/15/07 3:00 AM			6/15...			
334	0	6/15/07 5:30 AM			6/15...			
335	0	6/15/07 5:30 AM			6/15...			
336	0	6/15/07 5:30 AM			6/15...			
337	0	6/15/07 9:30 AM			6/15...			
338	0	6/15/07 9:30 AM			6/15...			
339	0	6/15/07 9:30 AM			6/15...			
340	0	6/15/07 12:00 ...			6/15...			
341	0	6/15/07 12:00 ...			6/15...			
342	0	6/15/07 12:00 ...			6/15...			

User: System Admin (root) Lock: gateway is locked while 6h 10m 12s

Figure 240. Poll Journal Table

System Log

“System Log” allows you to query the parameters of the A850. The query can be delimited specifically by query options.

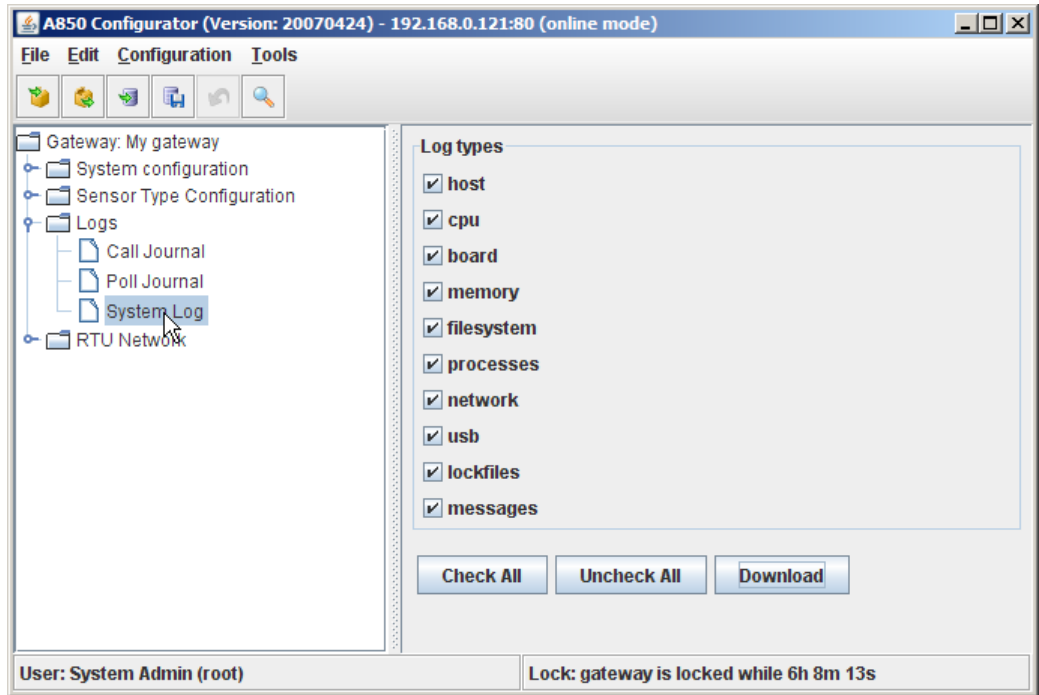


Figure 241. System Log Selection

Log types

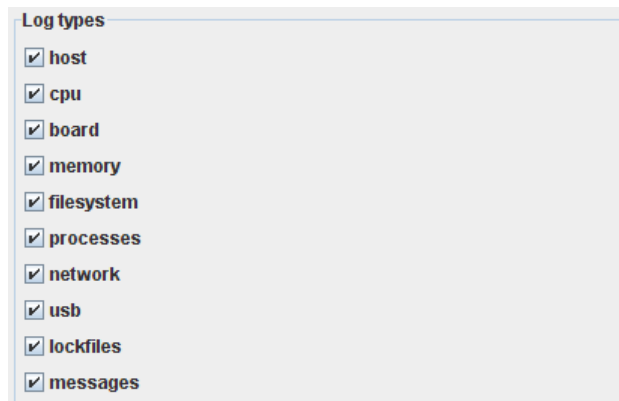


Figure 242. System Log - Log types

The check boxes depicted above allow you to select which information about your A850 you want to display or to save, respectively:

- host - fundamental information about the A850,
- cpu - CPU configuration of the A850,
- board - hardware configuration of the A850,
- memory - memory configuration of the A850,
- filesystem - file system configuration of the A850,
- processes - processes running on the A850,
- network - status of the network of the A850,
- usb - USB configuration of the A850,
- lockfiles - list of the lockfiles of the A850,
- messages - summary of the messages of the A850.

Log types Buttons

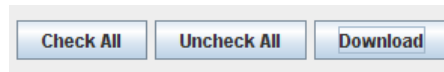


Figure 243. System Log - Log types Buttons

- Check All - by clicking this button, you can simplify the choice and select all of the Log types to be queried;
- Uncheck All - by clicking this button, you can simplify the choice and deselect all of the Log types;
- Download - if this button is clicked, the "System Log" window opens automatically and the result of the corresponding query is displayed in the "System Log" window.

System Log Windows

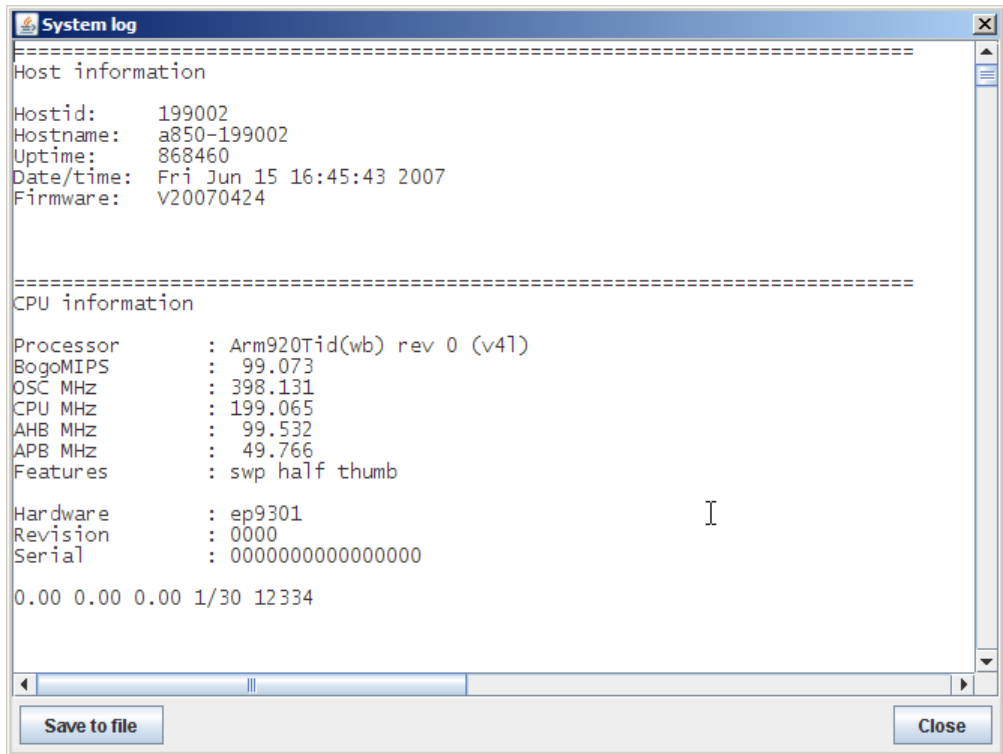


Figure 244. System Log Window

The System Log Window displays the result of your query.

System log Buttons

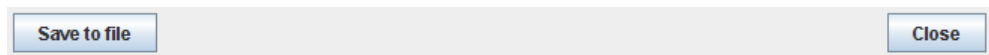


Figure 245. System Log - Log types Buttons

- Save to file - The result of the System Log can be saved into a file on your local PC by clicking this button;
- Close - the window disappears if this button is clicked.

RTU Network Configuration

The RTU Network Configuration represents the network of the physical Remote Telemetry Units (RTUs) distributed within a certain geographical area.

The RTU Network Configuration comprises a reference of each physical RTU grouped by arbitrary RTU groups displaying the information about the sensors or combo sensors connected.

Definition of RTU Groups

The existing RTUs can be departmentalized in one or several RTU groups. Thereby, a logical structuring of the RTU network can be achieved.

All functions and settings pertaining to the RTUs are combined in the RTU Network. This comprises:

- the departmentalization of the RTU network in RTU groups,
- the determination of existing or planned RTUs, respectively,
- the connection of sensor types to RTUs,
- the determination of RTU routes,
- the readout of RTU or sensor data, respectively,
- the assignment of data to RTUs or sensors, respectively,
- the query of the Call Journal or Poll Journal for singular RTUs.

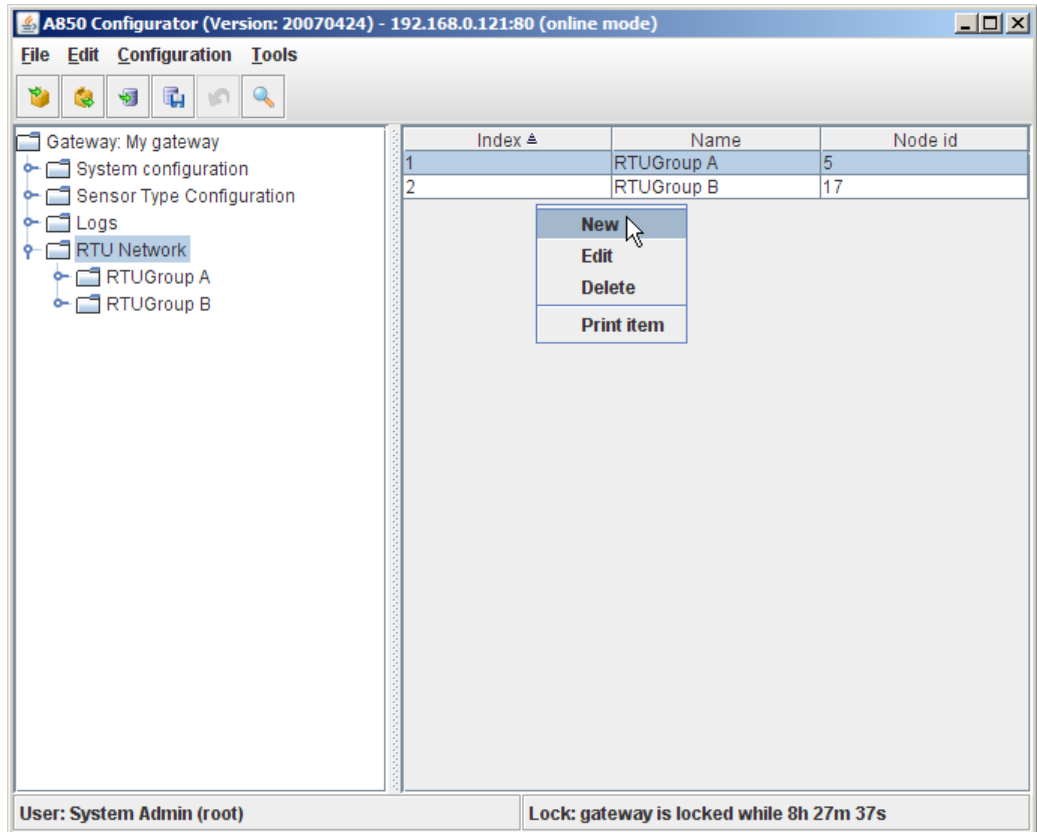


Figure 246. RTU Group Selection

The selections offered by the “RTU Group” context menu are:

- “New” - allows you to add a new RTU group;
- “Edit” - allows you to modify an existing RTU group;
- “Delete” - allows you to delete a previously defined RTU group;

Note: A RTU group can be deleted only if all RTUs belonging to this RTU group as well as all sensors connected to them are deleted in advance.

- “Print item” - allows you to see a print preview of the respective RTU group in a formsheet processed for the printer and to start the printout on your default printer.

Note: Menu items "Undo" or "Redo": see "Pop-up Context Menu" in chapter 2.

Double-clicking the RTU group in the "Table view" allows you to check the selected RTU group.

By appropriate selection of a RTU group, you enter a "RTU group" detail window where user's access rights are defined as follows:

The system administrator (user "root") and all administrator level (aka "admin") users can grant access rights for every RTU group. In order to display all the rights granted the users for a special group, a table is used where each possible access right is represented by a check box control. If the check box of a right in the row of the user is selected, the user has the right to perform the action.

Username	Configuration read access	Configuration write access	Data read access	Data write access	Direct access
System Admin	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Standard Admin	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
User1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
user3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 247. RTU Group Window

While the users "root" and "admin" have access to all tables of the RTU network, the access to the RTUs, their routes and their sensors for all "ordinary" users is limited.

All RTU groups, RTUs, routes and sensors for which a user has no read access rights granted will be hidden for this user.

All RTU groups, RTUs, routes and sensors for which a user has no write access rights granted are read-only for this user. The RTU groups define default values for polling data from RTUs and access privileges for "ordinary" users.

All RTU groups, RTUs, routes and sensors for which a user has no configuration read access rights granted are hidden for this user by the GUI.

Note: For example, they may not be shown in the RTU network tree or in any table view.

Definition of RTUs

A Remote Telemetry Unit (RTU) includes one or more sensors to measure specific conditions of the environment in which it is placed (e.g. temperature, humidity or the current level of a river) and a unit to transmit the measured data. A network of RTUs can be placed within large areas to observe the conditions from different points. The receiving person bases specific reactions on the measured data, e.g. a farmer starts to water his fields if the measured rain fall was too less, or he begins to carry out precautions if the measured level of a river reaches a critical height.

The management of the RTUs within such a network is a task to be performed by a Telemetry Gateway like the A850.

In order to define a RTU, to connect a sensor, to make a change or to pass an order, a click with the right button of the mouse is to be made while the pointer marks a RTU or RTU group, respectively, whereupon the following context menu will appear:

RTU Context Menu

The RTU Context Menu allows to select and to execute all actions related to RTUs, according to the respective descriptions referred to in the following overview.

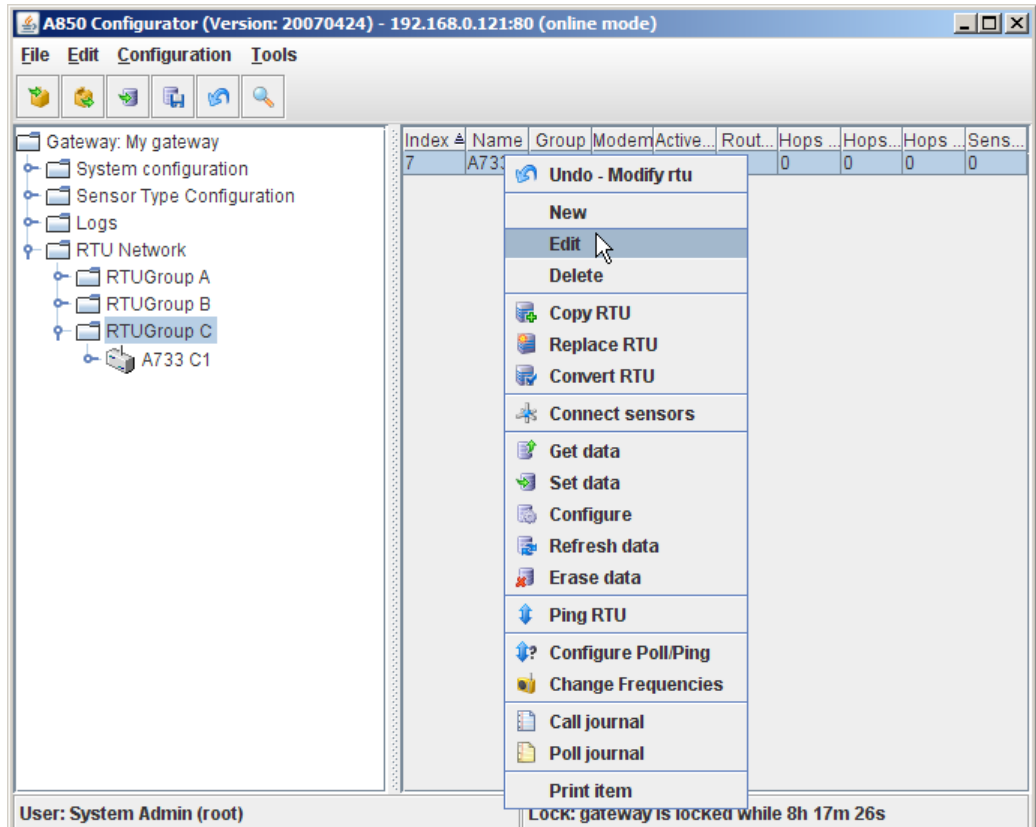


Figure 248. RTU Context Menu

The choices offered by the RTU context menu are:

RTU Configuration:

- "New" - allowing to add a new RTU and to define the RTU details, see description "RTU Data";
- "Edit" - allowing to modify the RTU details of an existing RTU, see description "RTU Data";
- "Delete" - allowing to delete an existing RTU, see description "RTU Data";

RTU Administration:

- “Copy RTU” - see description “Copy RTU”;
- “Replace RTU” - see description “Replace RTU”;
- “Convert RTU” - see description “Convert RTU”.

Sensor Administration:

- “Connect sensors” - see description “Connect sensors”.

RTU Data Management:

- “Get data” - see description “Get data”;
- “Set data” - see description “Set data”;
- “Configure” - see description “Configure”;
- “Refresh data” - see description “Refresh data”;
- “Erase data” - see description “Erase data”.

RTU Status Management:

- “Ping RTU” - see description “Ping RTU”.

RTU Communication Management:

- “Configure Poll/Ping” - see description “Configure Poll/Ping”;
- “Change frequencies” - see description “Change frequencies”.

RTU Logs:

- “Call journal” - The call journal contains a list of the last outgoing phone calls (see chapter 4, “Logs”);
- “Poll journal” - The poll journal contains a list of the last RTU data polls (in this context, “polling” means that the Gateway contacts an RTU and polls for new measurement data; see chapter 4, “Logs”);

RTU Printing:

- “Print item” - see a print preview of the marked RTU in a formsheet processed for the printer and start the printout on your default printer.

Note: Menu items “Undo” or “Redo”: see “Pop-up Context Menu” in chapter 2.

RTU Configuration

The Context Menu “RTU Configuration” allows to enter detailed determinations required for the integration of a new RTU or for the modification of an already existing RTU, as well as routing determinations. Furthermore, the actual status of a RTU can be queried.

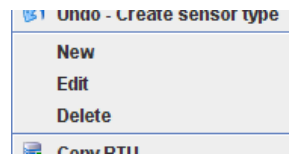


Figure 249. RTU Context Menu - RTU Configuration

- “New” - allowing to add a new RTU and to define the RTU details, see description “RTU Data”;
- “Edit” - allowing to modify the RTU details of an existing RTU, see description “RTU Data”;
- “Delete” - allowing to delete an existing RTU, see description “RTU Data”.

The RTU Window allows to select three detailed windows:

- Data - this window provides the available information about the configuration of the selected RTU;
- State information - this window provides the available information about the status of the selected RTU;
- Routing - this window shows the RTU information related to the route.

RTU - Data

The screenshot shows the 'RTU - Data' configuration window. It features a title bar with the 'RTU' icon and three tabs: 'Data', 'State information', and 'Routing'. The 'Data' tab is selected. The window is organized into several sections:

- Main Settings:** Includes fields for Name (A723 A1), Type (A723), Serial Nr (28330), Code (28330), Timezone (UTC), Node ID (6), Group (RTUGroup A), Version (0.0), Modem type (wireless), Modem (Wireless modem), and checkboxes for 'active' and 'master'.
- Polling:** Includes a 'Poll mode' dropdown (interval), a 'Poll interval [s]' text box (900), a 'Ping interval [s]' text box (21600), a 'Poll priority' dropdown (normal), a 'Poll on power fail' checkbox, 'Poll packets ok' (20) and 'Poll packets delayed' (40) text boxes, and 'Max. delay [s]' (21600) with 'Notification on delay' and 'Notification on RTU reset' checkboxes.
- Maintenance:** Includes 'Install.date' and 'Maint.date' (both 13/05/2007), 'Install.date battery' and 'Maint.date battery' (both 13/05/2007), 'Capacity' (3000), and 'Type Id' (Unknown).
- Location:** Includes 'Latitude' (47,8), 'Longitude' (16,22), and 'Altitude' (0).
- Other settings:** Includes 'Radio error rate packets' with a sub-section for 5 and 25.

At the bottom of the window are buttons for 'Print', 'OK', and 'Cancel'.

Figure 250. RTU - Data Window

The "RTU - Data" detail window allows to configure singular RTUs and provides the following window areas:

- Main settings - containing name, type, serial number, code, timezone, node ID, RTU type affiliation to a RTU group and modem reference;
- Polling - possibility to change the polling configuration and the ping configuration of the RTU;

- Maintenance - possibility to enter information related to installation and maintenance of RTU or battery, respectively;
- Location - possibility to enter the coordinates of the location of the RTU;
- Other Settings - possibility to enter the parameters required for the calculation of the radio error rate.

Main Settings

Main Settings					
Name	A723 A1	Type	A723	Serial Nr	28330
Code	28330	Timezone	UTC	Node ID	6
Group	RTUGroup A	Version	0.0	Modem type	wireless
Modem	Wireless modem	<input checked="" type="checkbox"/> active	<input checked="" type="checkbox"/> master		

Figure 251. RTU - Data - Main settings

- Name - enter a unique name for the RTU;
- Type - enter the type designation of the RTU:

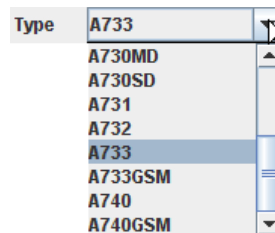


Figure 252. RTU - Data - Main settings - Type

- Serial Nr - enter the serial number of the RTU;

Note: The serial number can be found on the identification plate of the RTU and on the RTU packaging.

- Code - unique code of the RTU for addressing;

Note: Usually, the code corresponds to the serial number.

- Timezone - allows you to enter the timezone for the RTU:

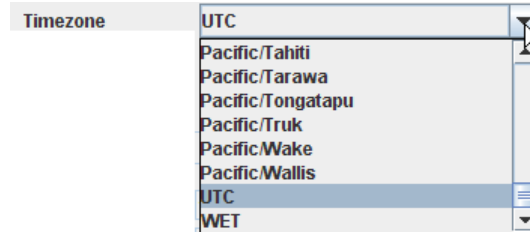


Figure 253. RTU - Data - Main settings - Timezone

- Node ID - unique identification of the RTU.

Note: The node ID is allocated automatically by the A850, but can be altered.

- Group - selection of the RTU group to which the RTU is to be assigned:

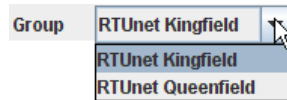


Figure 254. RTU - Data - Main settings - Group

Note: All defined RTU groups are offered for selection.

- Version - displays the version number of the RTU;
- Modem type - selection of the modem type;

Note: Only those modem types are at the user's disposal which can be employed with the respective RTU type.

- Modem - selection of the modem of the A850 with which the RTU communicates;
- active - determination if the RTU is active or not;

Note: RTUs which are not active will not be regarded when a poll or a ping is performed, respectively.

- master - determination if the A850 is the master of the RTU (and thus responsible for time synchronization, configuration and forwarding of notifications)

Polling

Polling

Poll mode: **interval**

Poll interval [s]: 900

Ping interval [s]: 21600

Poll priority: **normal** Poll on power fail Poll packets ok: 20 Poll packets delayed: 40

Max. delay [s]: 21600 Notification on delay Notification on RTU reset

Figure 255. RTU - Data - Polling

- Poll mode - choice of the sort of polling for the selected RTUs:

Poll mode: **interval**

interval

times

Figure 256. RTU - Data - Polling - Mode

- Poll interval [s] - a polling is performed periodically according to the fixed interval:

Poll mode: **interval**

Poll interval [s]: 900

Figure 257. RTU - Data - Polling - Mode - Interval

- time setting buttons - a polling is performed at fixed times; the determination of a time is performed by clicking the respective time setting buttons:

Poll mode											
times ▼											
00:00	00:30	01:00	01:30	02:00	02:30	03:00	03:30	04:00	04:30	05:00	05:30
06:00	06:30	07:00	07:30	08:00	08:30	09:00	09:30	10:00	10:30	11:00	11:30
12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30	17:00	17:30
18:00	18:30	19:00	19:30	20:00	20:30	21:00	21:30	22:00	22:30	23:00	23:30

Figure 258. RTU - Data - Polling - Mode - Times

- Ping intervals [s] - a ping is performed periodically with the fixed interval for the selected RTUs;
- Poll priority - selection of the poll priority to control the polling traffic of several RTUs and in case of large amounts of data:

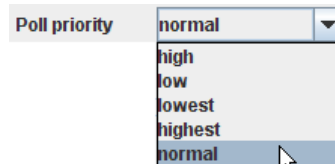


Figure 259. RTU - Data - Polling - Poll priority

- Poll on power fail - determination if polling may also be active during a power failure of the primary power supply;
- Poll packets ok - determine how many packets to transfer at each poll if the RTU data is not delayed;
- Poll packets delayed - determination how many packets to transfer at each poll if the RTU data is delayed;
- Max. delay [s] - determines how much the RTU data may be delayed; if that delay is exceeded after polling the RTU, a notification is sent (if notification on delay is enabled);
- Notification on delay - determination if a notification shall be performed on delay;
- Notification on RTU reset - determination if a notification shall be performed on reset.

Maintenance

Maintenance					
Install.date	<input type="text" value="13/05/2007"/>	Maint.date	<input type="text" value="13/05/2007"/>		
Install.date battery	<input type="text" value="13/05/2007"/>	Maint.date battery	<input type="text" value="13/05/2007"/>	Capacity	<input type="text" value="3000"/>
				Type Id	<input type="text" value="Unknown"/>

Figure 260. RTU - Data - Maintenance

- Install.date - entry of the date of the first installation the RTU;
- Maint.date - entry of the date of the last maintenance of the RTU;
- Install.date battery - entry of the date of the installation of the battery of the RTU;
- Maint.date battery - entry of the date of the last battery check of the RTU;
- Capacity - entry of the value of the capacity of the battery in mAh;
- Type Id - selection of the battery type used, as far as known.

Type Id	<input type="text" value="NiMH 3300 mAh"/>
	<input type="text" value="NiCd 1000 mAh"/>
	<input type="text" value="NiCd 2800 mAh"/>
	<input type="text" value="NiCd 3000 mAh"/>
	<input type="text" value="NiMH 1600 mAh"/>
	<input type="text" value="NiMH 3300 mAh"/>
	<input type="text" value="Unknown"/>

Figure 261. RTU - Data - Maintenance - Type ID


Location

Location					
Latitude	<input type="text" value="47,8"/>	Longitude	<input type="text" value="16,22"/>	Altitude	<input type="text" value="0"/>

Figure 262. RTU - Data - Location

- Latitude [°] - declaration of the latitude of the location of the RTU (in degrees);
- Longitude [°] - declaration of the longitude of the location of the RTU (in degrees);
- Altitude [m] - declaration of the altitude of the location of the RTU (in meters).

Other Settings



Other settings

Radio error rate packets 5
25

Figure 263. RTU - Data - Other settings

- Radio error rate packets - determination of the number of packets used for calculation of the short-term and long-term radio error rate.

RTU - State Information

The “State information” detail window” displays operational information about the RTU.

The screenshot shows the 'RTU' window with three tabs: 'Data', 'State information', and 'Routing'. The 'State information' tab is active and displays the following data:

RTU information			
Battery voltage	0	Battery charge on at	0
Battery charge off at	0	Int. temperature	0
Uptime	0	Reset count	0
Slot interval	0	Samples/slot	0
Sensor supply time	0		

Connection information			
Radio error rates	0;0	Data delays	0
IP Address	0.0.0.0	Port	0
Last connect	1/1/70 1:00 AM	Last route change	1/1/70 1:00 AM

Scheduling information			
First slot	1/1/70 1:00 AM	Last slot	1/1/70 1:00 AM
Last poll	1/1/70 1:00 AM	Next poll	1/1/70 1:00 AM
Last ping	1/1/70 1:00 AM	Next ping	1/1/70 1:00 AM
Last timesync	1/1/70 1:00 AM	Next timesync	1/1/70 1:00 AM
Last configure	1/1/70 1:00 AM	Next configure	1/1/70 1:00 AM
Last refresh	1/1/70 1:00 AM	Next refresh	1/1/70 1:00 AM
		Last LC	0
		<input type="checkbox"/> Poll requested	
		<input type="checkbox"/> Ping requested	
		<input type="checkbox"/> Timesync requested	
		<input checked="" type="checkbox"/> Configure requested	
		<input checked="" type="checkbox"/> Refresh requested	

Buttons: Print, OK, Cancel

Figure 264. RTU - State information Window

The "State information" detail window provides the following window areas:

- RTU information - displays general information about the status of the RTU;
- Connection information - displays information about the connection status of the RTU;
- Scheduling information - displays information about the scheduling status of the RTU.

RTU Information

The “RTU information” detail window provides the following window areas:

The screenshot shows a window titled "RTU information" with a light blue border. Inside, there are nine fields arranged in a 3x3 grid. Each field consists of a label on the left and a text input box on the right. The labels and their corresponding input values are: "Battery voltage" (0), "Battery charge on at" (0), "Battery charge off at" (0), "Int. temperature" (0), "Uptime" (0), "Reset count" (0), "Slot interval" (0), "Samples/slot" (0), and "Sensor supply time" (0).

Figure 265. RTU - State information - RTU information

- Battery voltage - displays the battery voltage (only if the RTU is equipped with an internal battery sensor);

Note: Battery voltage sensors can be connected to all A7X3 type RTUs and to the A850.

- Battery charge on at - displays the time when a (still running) charging procedure of the internal battery was started;
- Battery charge off at - displays the time when the last charging procedure of the internal battery was ended;
- Int.temperature - displays the internal temperature of the RTU;

Note: Internal temperature sensors can be connected to all A7X3 type RTUs and to the A850.

- Uptime - displays the time of the last power up;
- Reset count - displays the number of RTU resets
- Slot interval - interval for saving data from the sensors of the respective RTU, in seconds (minimum is 60 seconds, maximum is 10800 seconds and the default is 900seconds, or 15 minutes);
- Samples/slot - displays the number of samples of the actual slot;
- Sensor supply time - displays the sensor supply time which is the delay allowed for the sensors to settle after applying power to them so that the measurements delivered by these sensors will be within the sensor’s accuracy specifications so that the sampling can be started (default time is 2 seconds).

Connection Information

Connection information			
Radio error rates	0;0	Data delays	0
IP Address	0.0.0.0	Port	0
Last connect	1/1/70 1:00 AM	Last route change	1/1/70 1:00 AM

Figure 266. RTU - State information - Connection information

- Radio error rates - displays the actual radio error rates;

Note: Radio error rate sensors can be connected to all RTUs and to all Wireless Modems.

- Data delays - displays the average data delays;
- IP Address - displays the IP address of the RTU;

Note: Only for GPRS RTUs.

- Port - displays the port number assigned to the IP address;

Note: Only for GPRS RTUs.

- Last connect - displays the time of the last connection with the RTU;
- Last route change - displays the time of the last change of the route to the RTU.

Scheduling Information

Scheduling information					
First slot	1/1/70 1:00 AM	Last slot	1/1/70 1:00 AM	Last LC	0
Last poll	1/1/70 1:00 AM	Next poll	1/1/70 1:00 AM	<input type="checkbox"/> Poll requested	
Last ping	1/1/70 1:00 AM	Next ping	1/1/70 1:00 AM	<input type="checkbox"/> Ping requested	
Last timesync	1/1/70 1:00 AM	Next timesync	1/1/70 1:00 AM	<input type="checkbox"/> Timesync requested	
Last configure	1/1/70 1:00 AM	Next configure	1/1/70 1:00 AM	<input checked="" type="checkbox"/> Configure requested	
Last refresh	1/1/70 1:00 AM	Next refresh	1/1/70 1:00 AM	<input checked="" type="checkbox"/> Refresh requested	

Figure 267. RTU - State information - Scheduling information

- First slot - displays the time the first (oldest) slot was sent from the RTU;
- Last slot - displays time the last (newest) slot was sent from the RTU;
- Last LC - displays the last (newest) LC data for A740 type RTU;
- Last poll - displays the last time a poll was performed by the RTU;
- Next poll - displays the next time a poll is to be performed by the RTU;
- Poll requested - tells whether a poll of the RTU was requested;
- Last ping - displays the last time a ping of the RTU was performed;
- Next ping - displays the next time a ping of the RTU has to be performed;
- Ping requested - tells whether a ping of the RTU was requested;
- Last timesync - displays the last time a time synchronization of the RTU was performed;
- Next timesync - displays the next time a time synchronization of RTU is to be performed;
- Timesync requested - tells whether setting the time of the RTU was requested;
- Last configure - displays the last time the configuration of the RTU was changed;

- Next configure - displays the next time the (update or change of the) configuration of the RTU is to be performed;
- Configure requested - tells whether a configuraton update of the RTU was requested;
- Last refresh - displays the last time a refresh of the RTU was performed;
- Next refresh - displays the next time a refresh of the RTU is to be performed;
- Refresh requested - tells whether a measurement value refresh of the RTU was requested.

RTU - Routing

Routing increases the possible distances between the A850 and the RTUs because the transmission of the information uses other RTUs as relay stations instead of having to go straight from sender to addressee. To make this possible, the corresponding routing information has to be entered into the concerned RTUs.

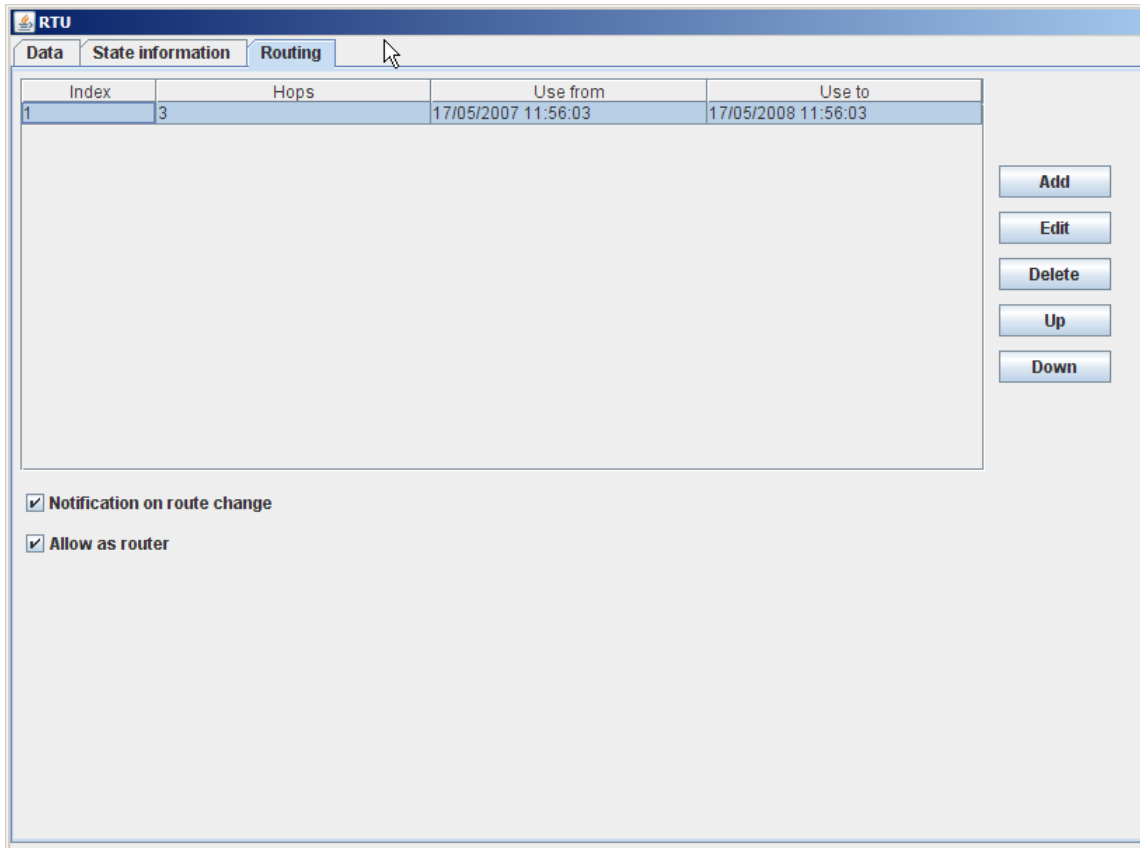


Figure 268. RTU - Routing Window

The "Routing" detail window provides the following window areas:

- Routing Table - list of the RTUs required for routing;
- Routing Buttons - buttons to manage the RTU in routing table;
- Routing Additional Settings - check boxes for RTU routing administration.

Routing Table

Index	Hops	Use from	Use to
1	3	17/05/2007 11:56:03	17/05/2008 11:56:03

Figure 269. RTU - Routing Table

- Index - current number in the routing table;
- Hops - number of the hops required to reach the RTU concerned;
- Use from - time to start using the route;
- Use to - time to end using the route.

Routing Buttons

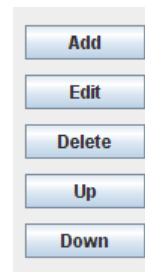


Figure 270. RTU - Routing Buttons

- "Add" button - allows to enter an additional router by use of the "Route detail" window;
- "Edit" button - allows to modify an existing router by use of the "Route detail" window;
- "Delete" button - allows to delete an existing router from the routing order;
- "Up" button - allows to change the routing order by shifting singular routers upwards;

- “Down” button - allows to change the routing order by shifting singular routers downwards;

Routing - Additional Settings

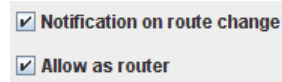


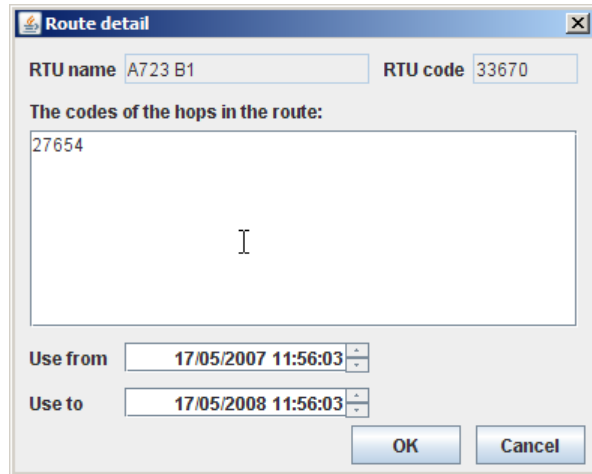
Figure 271. RTU - Routing - Additional Settings

- “Notification on route change” check box - triggers a notification being sent on route change;
- “Allow as router” check box - defines if the selected RTU itself is allowed to work as a router.

Note: Not all types of RTUs are suitable to work as routers. Thus, if routing using a certain RTU is not possible, this pertinent possibility of choice does also not exist.

Route detail

The “Route detail” window opens when either the “Add” button or the “Edit” button is clicked.



The screenshot shows a 'Route detail' dialog box. It has a title bar with a close button. The dialog contains the following fields and controls:

- RTU name:** A723 B1
- RTU code:** 33670
- The codes of the hops in the route:** A text area containing the value 27654.
- Use from:** 17/05/2007 11:56:03
- Use to:** 17/05/2008 11:56:03
- Buttons:** OK and Cancel.

Figure 272. Route Detail Window

- RTU name - displays the RTU to be reached by routing;
- RTU code - displays the code of the RTU to be reached by routing;
- The codes of the hops in this route - entry of the codes of all RTUs which should serve as routers for the RTU to be reached by routing;
- Use from - entry of the time to start the routing;
- Use to - entry of the time to end the routing.

After pressing the "OK" button, the routing information is stored.

RTU Administration

Via the context menu area "RTU Administration", the details of the integration of a new RTU, of a modification of an existing RTU and routing determinations are met; furthermore, the actual status of a RTU can be queried.

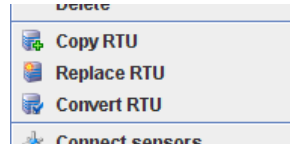


Figure 273. RTU Context Menu - RTU Administration

- "Copy RTU" - see description "Copy RTU";
- "Replace RTU" - see description "Replace RTU";
- "Convert RTU" - see description "Convert RTU".

Copy RTU



Figure 274. RTU Context Menu - RTU Administration - Copy RTU

If several RTUs of the same type are to be used, it is possible to use the data of an already completely configured RTU for copying. It is possible to make one copy or several copies from such a RTU. These copies will be saved after in the same RTU group the copied RTU belongs to.

- To use this feature, select the RTU to be copied and select "Copy RTU" in the RTU context menu.

RTU name: A723 Ki1

Code: 28330 Serial number: 28330

Number of copies to create: 4 Apply

#	Name	Code	Serial number	Copy routes
1	New RTU #1	28331	28331	<input checked="" type="checkbox"/>

OK Cancel

Figure 275. Copy RTU Window

- RTU name - displays the name of the RTU to be copied;
- Code - displays the code of the RTU to be copied;
- Serial number - displays the serial number of the RTU to be copied;
- Number of copies to create - choose the number of copies to be made from a certain RTU;
- "Apply" button - allows to save the appropriate number of copies in the RTU table.

RTU table

The lower part of the “Copy RTU” window contains the table of the copies of the selected RTU:

#	Name	Code	Serial number	Copy routes
1	New RTU #1	28331	28331	<input checked="" type="checkbox"/>
2	New RTU #2	28332	28332	<input checked="" type="checkbox"/>
3	New RTU #3	28333	28333	<input type="checkbox"/>
4	New RTU #4	28334	28334	<input type="checkbox"/>

Figure 276. Copy RTU - RTU table

The list of the saved RTU copies contains the following information:

- # - current number of the copy;
- Name - name of the new RTU;
- Code - unique code of the new RTU for addressing it;
- Serial number - enter the real serial number of the new RTU;
- Copy routes - the routing information of the original RTU will be copied if this check box is marked.

Note: Name, code and serial number of the copies have to be replaced by the actual terms of the copied RTUs, in the corresponding fields of the copied RTUs.

Replace RTU

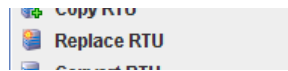


Figure 277. RTU Context Menu - RTU Administration - Replace RTU

“Replace” allows you to transmit information within your RTU network from an existing RTU (the source RTU) to another RTU (the destination RTU).

Select destination RTU

- Select the destination RTU within your RTU network to be replaced and then select “Replace RTU” in the RTU context menu.

Select source RTU

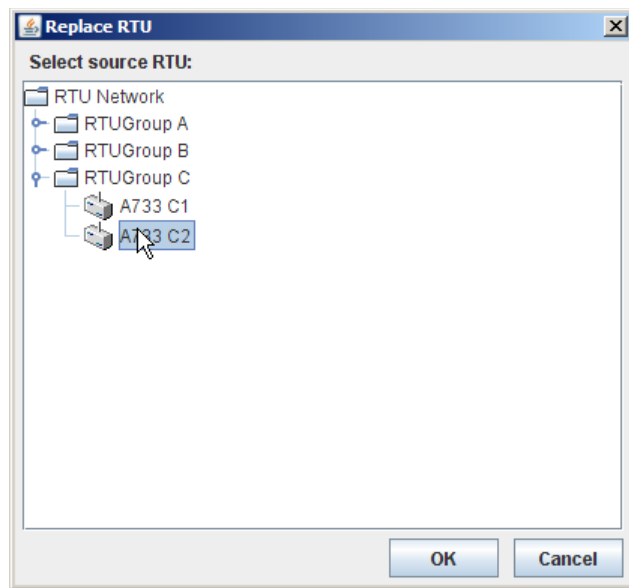


Figure 278. Replace RTU Window

- Select the source RTU within your RTU network from which you want the RTU information to be taken over;
- after you give a confirmation by clicking the OK button, the information of the selected source RTU will be taken over to the RTU selected in the tree window or in the table window (destination RTU).

Note: By this, all the information within the destination RTU is totally overwritten by the information from the source RTU. Of course, source RTU and destination RTU have to be different from each other.

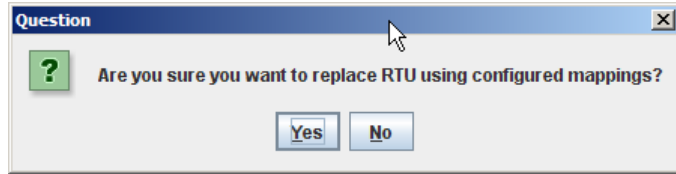


Figure 279. Replace RTU Question

After the confirmation made by clicking the “OK” button, there will be still the security query pictured above to be answered before the RTU replacement is performed.

Convert RTU

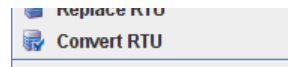


Figure 280. RTU Context Menu - RTU Administration - Convert RTU

“Convert RTU” allows you to change the RTU type from an existing RTU to another RTU type without having to enter all information anew. Thus, if you have to replace a RTU type by another, you can take over information from your previous RTU type as far as this information is applicable to the new type.

- Select the RTU to be converted and then select “Convert RTU” in the RTU context menu.

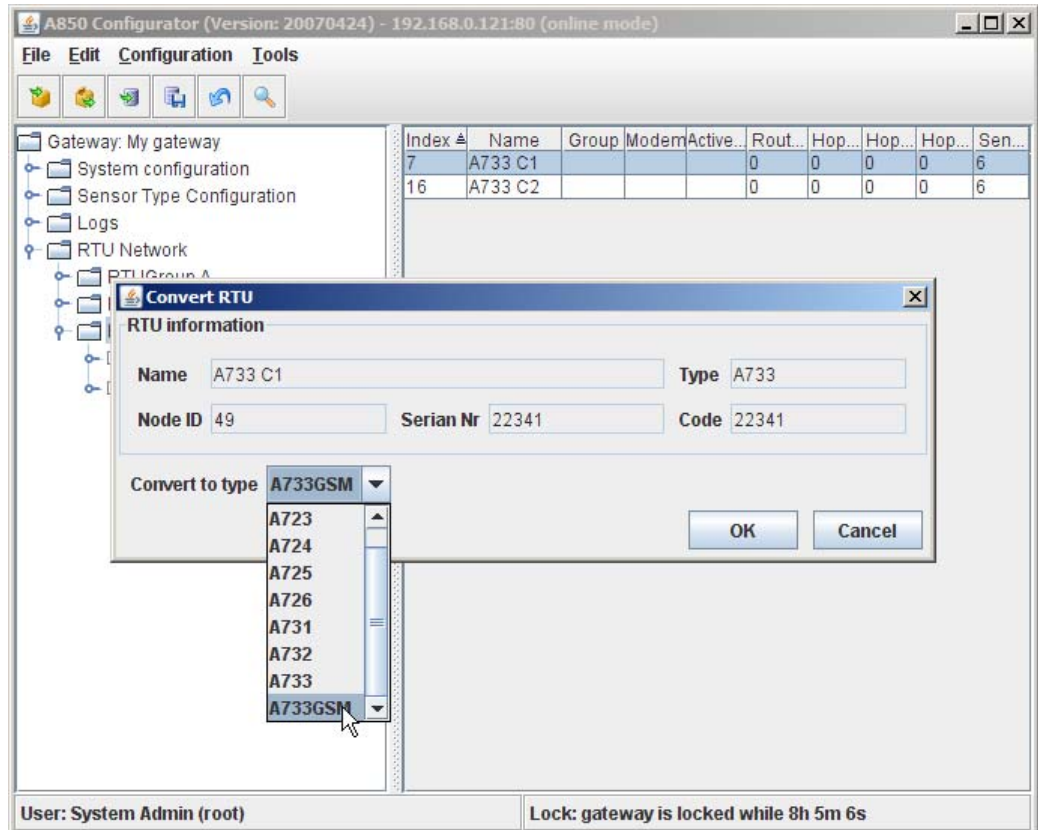


Figure 281. Convert RTU Window

RTU information

- Name - display the name of the RTU to be converted;
- Type - display the previous type of the RTU to be converted;
- Node ID - display the node ID of the RTU to be converted;
- Serial Nr - display the serial number of the RTU to be converted;
- Code - display the code of the RTU to be converted.

Convert to type

- Convert to type - selection of the future type in which you want your actual RTU to be converted:

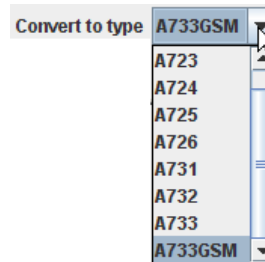


Figure 282. Convert RTU - Convert to type

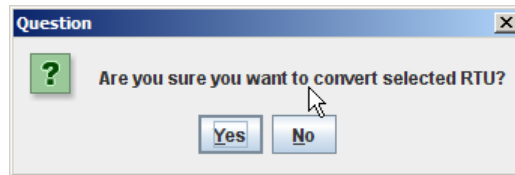


Figure 283. Convert RTU Question

After the confirmation made by clicking the "OK" button, there will be still the security query pictured above to be answered before the conversion is performed.

Sensor Administration

Via the context menu area “Sensor Administration”, the details for the assignment of sensors as well as for the modification of existing sensor assignments to RTUs can be determined.

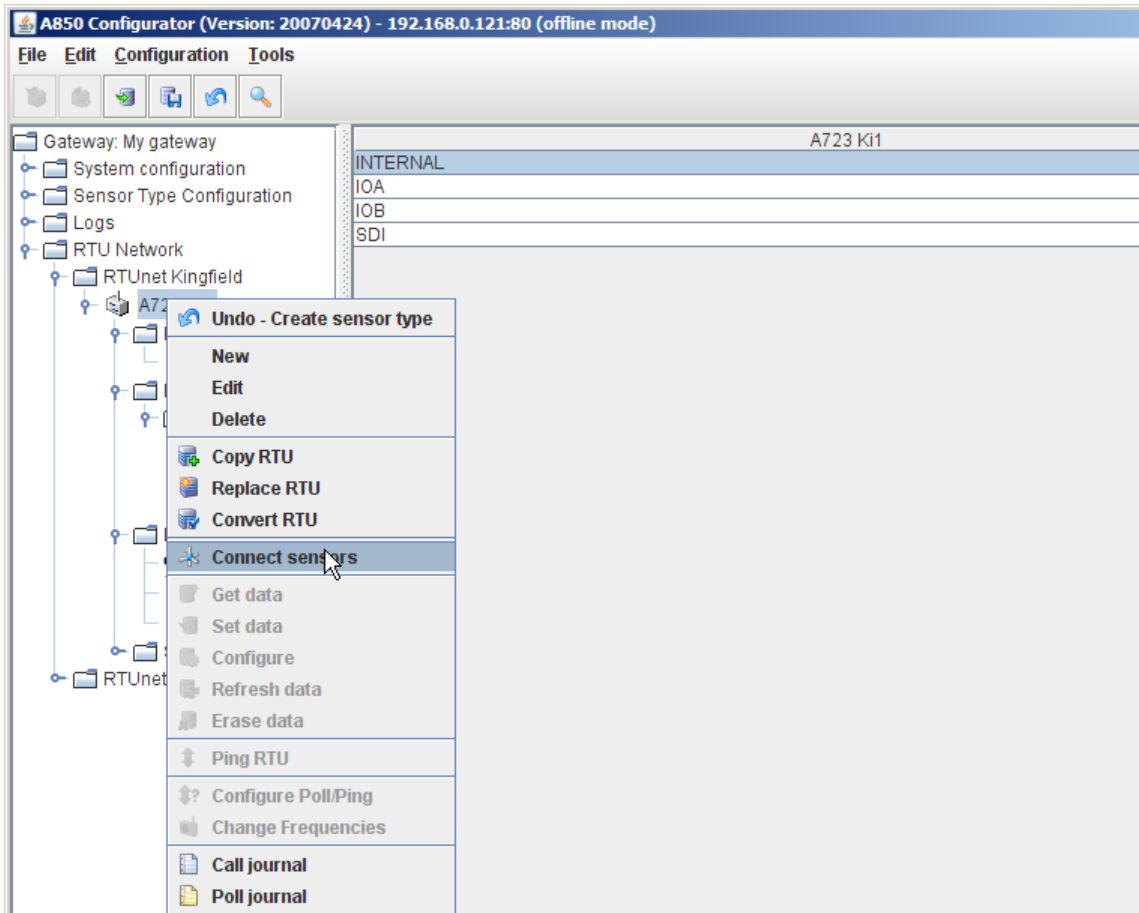


Figure 284. RTU Context Menu - Sensor Administration

- “Connect sensors” - see description “Connect sensors”.

Connect sensors



Figure 285. RTU Context Menu - Sensor Administration - Connect sensors

The "Connect sensors" interface supports the assignment of available I/O ports to sensors. The user can select one or more RTUs or one or more provided I/O connectors of different RTUs displayed by the tree view of the main window and invoke the "Connect sensors" interface from the respective context menu.

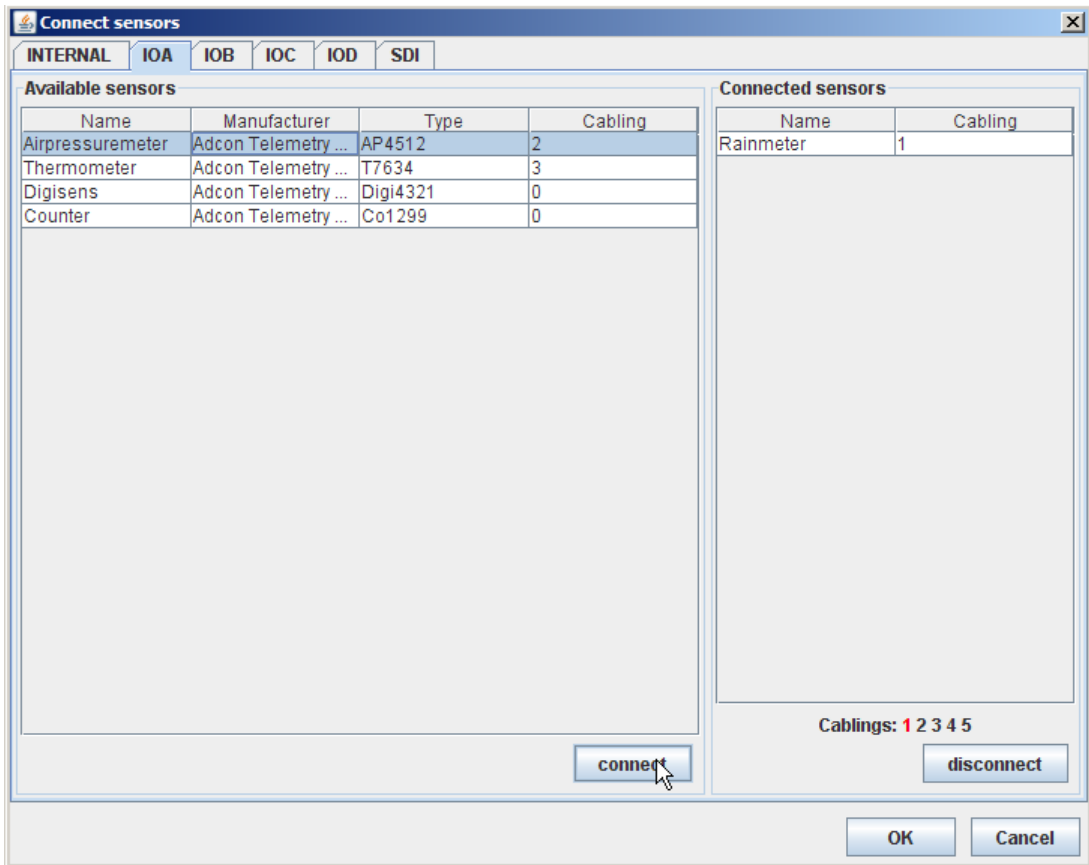


Figure 286. Connect sensors Window

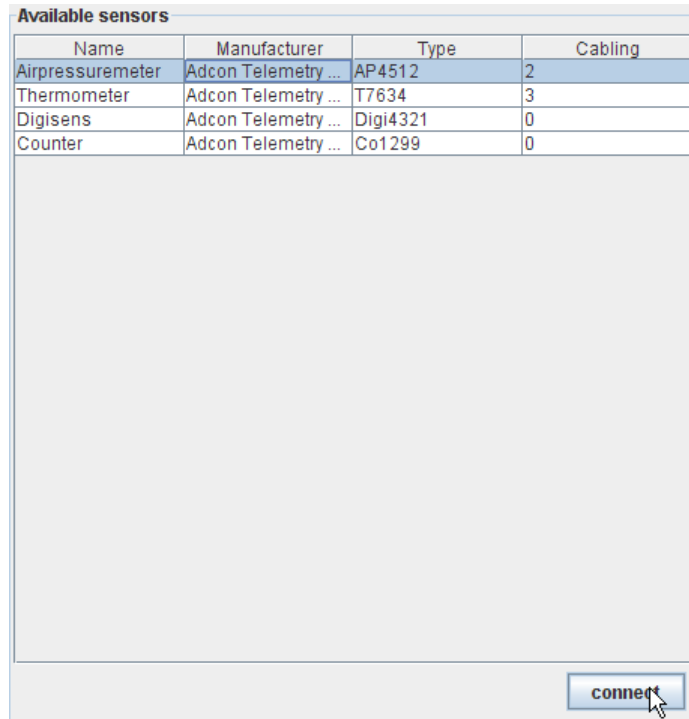
The “Connect sensors” window shows all available I/O ports of the selected RTU as tabs.

According to the sensor type technology to be connected, the assignment of the different sensor type technologies to the I/O-ports is to be made as follows:

- analog - available at the ports IOA, IOB, IOC and IOD;
- counter - available at the ports IOA, IOB, IOC and IOD;
- digital - available at the ports IOA, IOB, IOC and IOD;
- internal - available at the ports IOA, IOB, IOC and IOD;
- lc - available at the port LC;
- oc - available at the port OC;
- sdi - available at the port SDI.

Available sensors

Available sensors table - displays all available sensor types corresponding to the respective port in a list whereby the following sensor type information is shown:



Name	Manufacturer	Type	Cabling
Airpressuremeter	Adcon Telemetry ...	AP4512	2
Thermometer	Adcon Telemetry ...	T7634	3
Digitsens	Adcon Telemetry ...	Digi4321	0
Counter	Adcon Telemetry ...	Co1299	0

Figure 287. Connect sensors - Available sensors

- Name - names of the available sensor types,
- Manufacturer - names of the manufacturers of the sensor types,
- Type - type designations of the sensors,
- Index - index of the sensors if these are internal, LC or OC,

Note: For each available index, only one sensor corresponding to the index can be accepted.

- Cabling - cabling of the sensors for IOA, IOB, IOC and IOD,

Note: For each available cabling, only one sensor corresponding to the cabling can be accepted.

- Address - bus address of the sensors (only for SDI sensors),

Note: For each available address, only one sensor corresponding to the address can be accepted.

- "Connect" button - after marking an available sensor type, this sensor type can be taken over in the "Connected sensors" table by clicking the "Connect" button.

Note: After having been taken over in the "Connected sensors" table, all sensor types which can't be connected anymore due to their index, cabling or address, respectively, will not be displayed anymore in the table.

Connected sensors

Connected sensors table - displays all sensor types in a list which have already been assigned to the respective port, whereby the following sensor type information is shown:

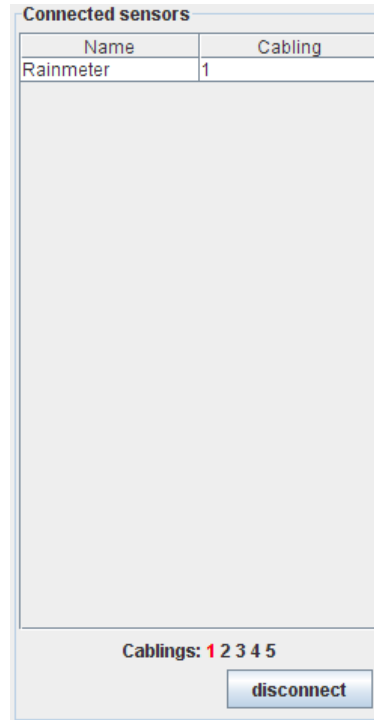


Figure 288. Connect sensors - Connected sensors

- Name - name of the connected sensor type;
- Index - index of the sensors if these are internal, LC or OC;
- Cabling - cabling of the sensors if these are connected to IOA, IOB, IOC or IOD;
- Address - bus address of the sensors if these are SDI sensors.
- "Disconnect" button - after marking a connected sensor type, this sensor type can be disconnected and taken over in the "Disconnected sensors table" by clicking this button.

Note: If sensor types are taken over in the "Disconnected sensors table", all available sensor types which have not been shown anymore due to unavailability of connection possibilities corresponding their index, cabling or address, respectively, will be displayed again in the table as appropriate indexes,

cablings and addresses become again available by the removal of the disconnected sensor types.

The screenshot shows the A850 Configurator software interface. The title bar indicates the version is 20070424 and the connection is online at 192.168.0.121:80. The interface is divided into a tree view on the left and a table on the right.

The tree view shows the following structure:

- Gateway: My gateway
 - System configuration
 - Sensor Type Configuration
 - Sensor Tables
 - Sensor Types
 - Combo Sensor Types
 - Logs
 - RTU Network
 - RTUGroup A
 - A723 A1
 - INTERNAL
 - Thermometer
 - Airpressuremeter
 - Digisens
 - Rainmeter
 - IOB
 - SDI
 - RTUGroup B

The table on the right displays the following data:

Index	Name	Node id	Cabling/Addr...	mainframe.ta...
22	Thermometer	31	3	
23	Airpressure...	32	2	
37	Digisens	45	0	
38	Rainmeter	46	1	

The status bar at the bottom shows the user is System Admin (root) and the gateway is locked while 8h 13m 17s.

Figure 289. Connected Sensors Table

By clicking a sensor port of a RTU in the tree window, the connected sensors will be displayed in the tree window as well as in the table window.

RTU Data Management

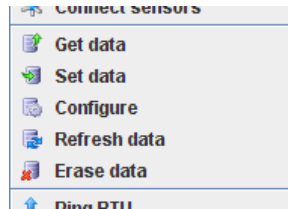


Figure 290. RTU Context Menu - RTU Data Management

The RTU Data Management context menu gives access to the following selection possibilities:

- "Get data" - see description "Get data",
- "Set data" - see description "Set data",
- "Configure" - see description "Configure",
- "Refresh data" - see description "Refresh data",
- "Erase data" - see description "Erase data".

Get data

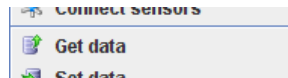


Figure 291. RTU Context Menu - RTU Data Management - Get Data

"Get Data" allows you to read all sensor data from a selected RTU or from a selected sensor, respectively, and to display the sensor data in a table or diagram:

- Sensors data - Table,
- Sensors data - Graphic.

Sensors data - Table

The Sensors data table displays the read out values of the respective sensors in form of a list. Thereby, each connected or selected

sensor, respectively, is assigned a column in the list. Please notify that in the column "Slot", the index of the slot will be shown while the further columns show the values of the sensors corresponding to this slot.

Slot	Voltmeter	Rainmeter	Airpressuremeter	Thermometer	Digisens	SDIsens1
1	60.572939	767.213242	38.735845	603.384288	180.874473	933.755360
2	10.390889	1,344.100436	338.036453	814.219386	383.297915	509.290314
3	5.405446	1,016.936772	346.349571	785.985718	1,016.126170	421.412021
4	78.003631	1,547.710470	283.645223	360.042825	11.528281	80.238748
5	1.442718	4.390072	36.912763	80.559124	714.686945	383.901967
6	69.228734	891.852484	293.789793	1,281.051727	537.846484	971.476935
7	36.095565	294.889914	219.207495	163.198058	400.134175	959.316067
8	20.165694	888.264665	159.841991	1,008.284297	124.864500	1,366.013430
9	23.536450	851.282373	357.735902	985.259744	686.345850	400.302361
10	32.374598	1,075.973805	4.300941	846.419504	327.327853	391.362344
11	27.894183	1,379.861368	56.735780	1,372.937520	58.477891	872.314545
12	85.342132	121.681423	276.633810	453.115078	600.238487	124.912876
13	45.470436	219.892470	363.605697	116.778129	426.237231	426.054555
14	84.229730	641.557090	163.798300	1,636.646206	170.527518	933.106027
15	73.567299	1,472.153774	279.534537	312.215806	310.820677	747.501782
16	73.273176	1,401.247758	172.997506	348.927430	864.622597	477.756756
17	75.042750	369.017220	84.606850	521.482304	591.020238	408.286340
18	76.244925	1,378.899050	250.537636	70.395224	604.353796	1,296.577420
19	44.803056	1,429.968456	147.454988	1,220.150478	131.870877	1,298.827196
20	66.025511	1,139.777161	190.491824	203.718680	60.642463	1,374.166299
21	56.599824	598.256944	213.335606	741.136979	886.495598	947.210187
22	48.263194	852.289546	122.200683	978.653767	753.824926	467.959848
23	84.757865	210.771810	32.477101	1,379.989956	1,042.405882	1,430.020109
24	2.818352	1,462.723341	212.664009	334.138383	1,000.680584	717.776468
25	56.882626	388.972578	108.798486	1,266.435477	553.882115	187.511017

Figure 292. Sensor Data - Table

- "Refresh" button - clicking the "Refresh" button actualizes the sensor values;
- Begin date - shows the date and time of the start of the represented measuring data acquisition;
- Max slots - defines how many slots with measurements are to be maximally shown in the list;
- "Close" button - closes the displayed table.

Sensors data - Graphic

The "Sensors data Graphic" window shows the read out values of the respective sensors in form of a diagram. Thereby, for each connected or selected sensor, respectively, a value graph in distinctive color is shown. The horizontal axis represents the measuring date and time while the vertical axis represents the measured value in an appropriate unit.

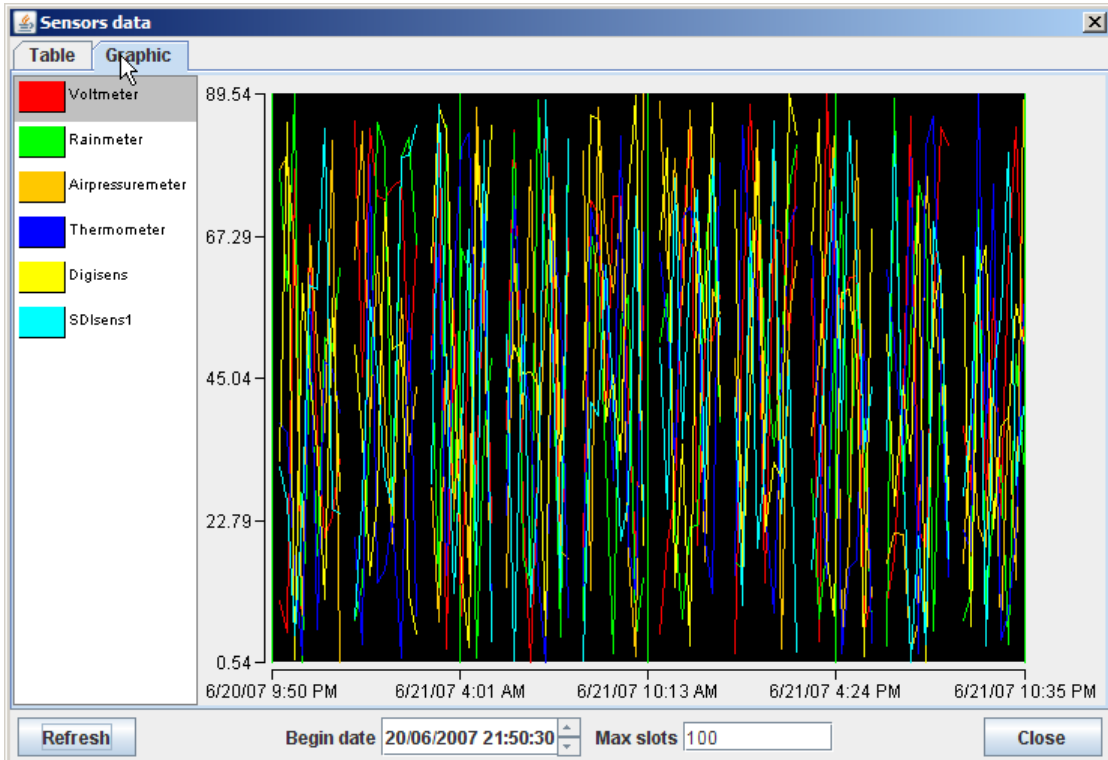


Figure 293. Sensors Data Graphic Window

- "Refresh" button - clicking the "Refresh" button actualizes the sensor values;
- Begin date - shows the date and time of the start of the represented measuring data acquisition;
- Max slots - defines how many slots with measurements are to be maximally shown in the list;
- "Close" button - closes the displayed graphic.

Set data



Figure 294. RTU Context Menu - RTU Data Management - Set Data

“Set data” allows to send data sets prepared in advance to sensors working as actuators:

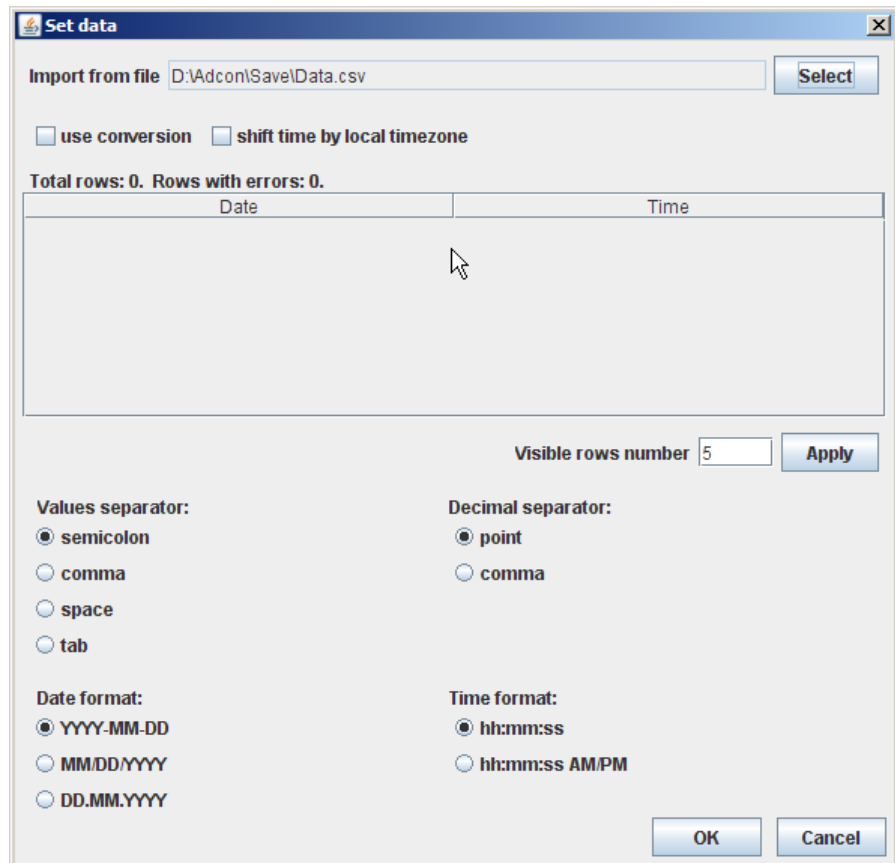


Figure 295. Set data window

Data fetched from a file in CSV format (spreadsheet conversion format) on the local PC can be imported into several sensors working as actuators. If one or more RTUs are selected to invoke the “Set data” function, all sensors connected to these RTUs are used.

When importing sensor data from a file, the user has to enter the following information about the file format:

- The column separator (“;” or “,” or space or tab),
- The decimal point character (“.” or “,”),
- The date format for the first column (“YYYY-MM-DD”, “DD.MM.YYYY” or “MM/DD/YYYY”),

Note: If the actual file contains only two-digit years, the century has to be set according to an epoch value of 70 (70..99 means 1970..1999, 0..69 means 2000..2069).

- The time format for the second column (“hh:mm:ss” or “hh:mm:ss AM/PM”).

Configure

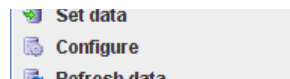


Figure 296. RTU Context Menu - RTU Data Management - Configure

“Configure” is used to send a “Refresh data” command to the selected RTUs or selected sensors. After issuing the periodical refresh data command (defined by the setting “Refresh interval”) in the “Configuration update”, a table containing the refresh state of all RTUs and sensors will be monitored.

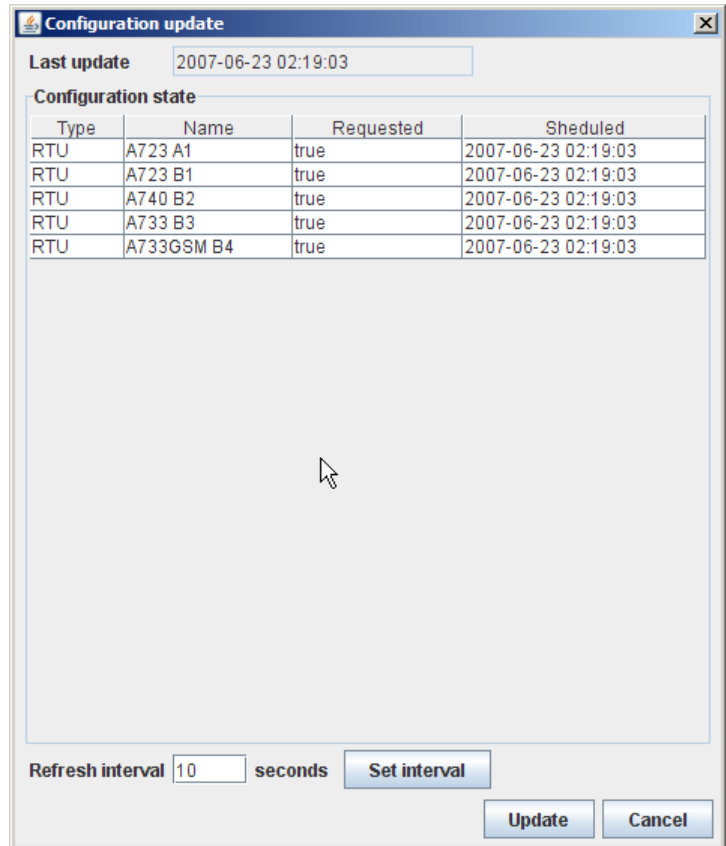


Figure 297. Configuration update window

- Last update - displays the time of the last configuration update of the selected RTU.

Configuration state

The selection “Configuration state” provides a list of the selected RTUs containing:

- Type - displays the type of the device, possible types are “RTU” and “Sensor”;
- Name - name of the selected RTU or sensor;

- Requested - status for the scheduled refresh data command update of the selected RTU or sensor:
 - "true" a request is scheduled,
 - "false" a request is not scheduled;
- Scheduled - time schedule for the next request for a configuration update of the selected RTU or sensor.

Refresh

- "Refresh interval" - entry of a value determining the refresh interval for the selected RTUs or sensors (in seconds);
- "Set interval" button - confirm the entry of the refresh interval for the selected RTUs or sensors;
- "Update" button - start the execution of the refreshing of data with respective interval.

Refresh data

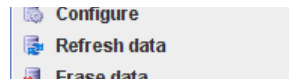


Figure 298. RTU Context Menu - RTU Data Management - Refresh Data

A "Refresh data" request is initiated to the Gateway to request actual sensor data directly from selected sensors or from the sensors of selected RTUs.

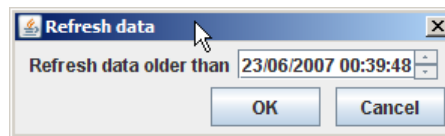


Figure 299. Refresh data window

- Refresh data older than - enter the date and time to define the time when a refresh data command for the selected RTUs or sensors, respectively, should be executed if elder data to be refreshed are available.

Erase data

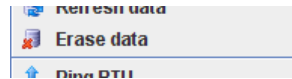


Figure 300. RTU Context Menu - RTU Data Management - Erase Data

Delete the data of the sensors of one or more selected RTUs.

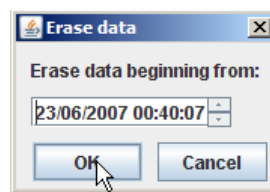


Figure 301. Erase data window

- Erase data beginning from- enter the date and time (timestamp) from where elder data of the selected RTUs or sensors, respectively, should be deleted.

RTU Status Management

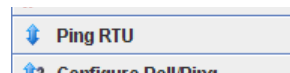


Figure 302. RTU Context Menu - RTU Status Management

Ping RTU

A ping to one or more selected RTU checks the availability of these RTUs. If a ping to a RTU is successful, the status of these RTUs will also be updated.

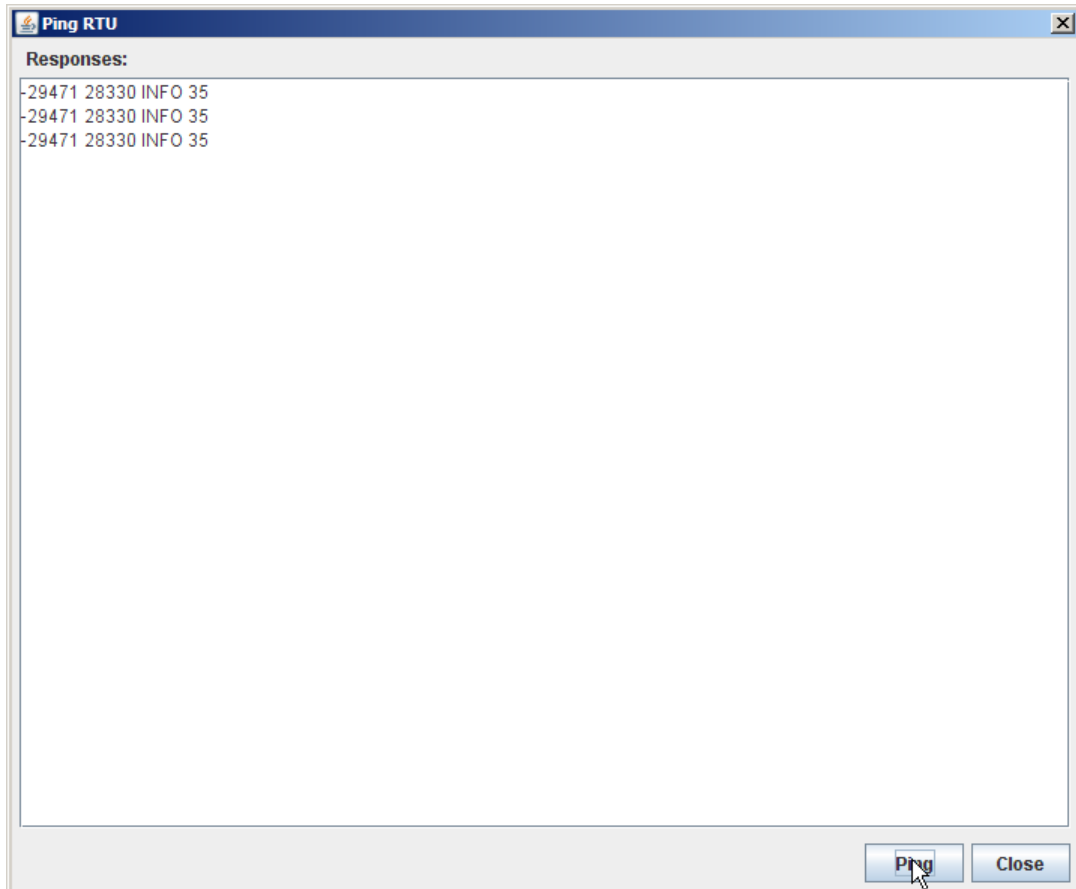


Figure 303. Ping RTU window

Responses table

Within this context, responses are to be understood as reactions on pings sended to selected RTUs. The responses will be listed in the "Responses table". The following dialogue buttons are available:

- "Ping" button - sended a ping to the selected RTUs,
- "Close" button - closes the "Ping RTU" window.

RTU Communication Management

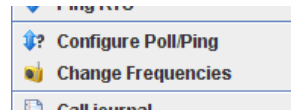


Figure 304. RTU Context Menu - RTU Communication Management

The "RTU Communication Management" allows to make the following selections:

- "Configure Poll/Ping" - see description "Configure Poll/Ping";
- "Change frequencies" - see description "Change frequencies".

Configure Poll/Ping

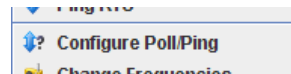


Figure 305. RTU Context Menu - RTU Communication Management - Configure Poll/Ping

The "poll and ping times configuration" determines the interval or times when a poll or the interval when a ping to one or more RTUs must occur.



Figure 306. Poll and ping times configuration Window

Poll configuration



Figure 307. Poll and ping times configuration - Poll configuration

- Poll mode - in this combo box, the time of establishment of a polling is determined, featuring the following selections:
 - interval - to force a polling to be established at certain regular intervals (the interval in seconds has to be put into the field "Interval [s]");

Poll configuration

Poll mode **interval**

Poll interval [s]

Figure 308. Poll and ping times configuration - Poll configuration - Poll mode - interval

- Poll interval [s] - a polling is performed periodically with the defined interval;
- times - to force a polling to be established at specific times:

Polling

Poll mode **times**

00:00	00:30	01:00	01:30	02:00	02:30	03:00	03:30	04:00	04:30	05:00	05:30
06:00	06:30	07:00	07:30	08:00	08:30	09:00	09:30	10:00	10:30	11:00	11:30
12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30	17:00	17:30
18:00	18:30	19:00	19:30	20:00	20:30	21:00	21:30	22:00	22:30	23:00	23:30

Figure 309. Poll and ping times configuration - Poll configuration - Poll mode - times

- time buttons - a polling is performed at the listed times which have been determined before by use of the respective time buttons.

Ping configuration

Ping configuration

Ping interval [s]

Figure 310. Poll and ping times configuration - Ping configuration

- Ping intervals [s] - a ping is sent periodically to the selected RTUs and the period is defined by the ping interval.

Change Frequencies

Note: This function is not yet implemented!

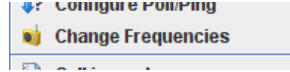


Figure 311. RTU Context Menu - RTU Communication Management - Change Frequencies

The frequencies of all RTUs connected to a Wireless Modem will be changed.

Note: The frequency change starts in each route at the most distant RTU.

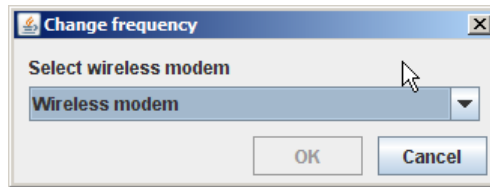


Figure 312. Change frequency window

Select Wireless modem

This window gives access to the following selections:

- Wireless modem - selection of the respective Wireless modem for which the frequency is to be changed;
- Radio frequency - enter the frequency which is to be used for communication between the Wireless Modem and the RTUs.

Note: If the frequency of a Wireless Modem is changed, the frequencies of all RTUs communicating with it will also be changed to this frequency.

RTU Logs



Figure 313. RTU Context Menu - RTU Logs

- "Call journal" - see description "Call journal";
- "Poll journal" - see description "Poll journal".

Call journal

This call journal contains a list of the last outgoing/incoming connections to/from the selected RTU.

Note: In comparison to this call journal, the call journal in the tree window contains a list of all the polls performed by the A850.

Index	Direction	Start time	End time	RTU code	RTU result	Modem result	Gateway result
326	outgoing	31.08.07 14:00	31.08.07 14:00	26137	ok	ok	ok
328	outgoing	01.09.07 08:00	01.09.07 08:01	26137	ok	ok	ok
329	outgoing	01.09.07 10:00	01.09.07 10:00	26137	ok	ok	ok
330	outgoing	01.09.07 12:00	01.09.07 12:00	26137	ok	ok	ok
331	outgoing	01.09.07 14:00	01.09.07 14:00	26137	ok	ok	ok
332	outgoing	02.09.07 08:00	02.09.07 08:00	26137	ok	ok	ok
333	outgoing	02.09.07 10:00	02.09.07 10:00	26137	ok	ok	ok
334	outgoing	02.09.07 12:00	02.09.07 12:00	26137	ok	ok	ok
335	outgoing	02.09.07 14:00	02.09.07 14:00	26137	ok	ok	ok
336	outgoing	03.09.07 08:00	03.09.07 08:00	26137	ok	ok	ok
337	outgoing	03.09.07 10:00	03.09.07 10:00	26137	ok	ok	ok
338	outgoing	03.09.07 12:00	03.09.07 12:00	26137	ok	ok	ok
339	outgoing	03.09.07 14:00	03.09.07 14:00	26137	ok	ok	ok
340	outgoing	04.09.07 08:00	04.09.07 08:01	26137	ok	ok	ok
341	outgoing	04.09.07 10:00	04.09.07 10:00	26137	ok	ok	ok
342	outgoing	04.09.07 12:00	04.09.07 12:00	26137	ok	ok	ok
343	outgoing	04.09.07 14:00	04.09.07 14:00	26137	ok	ok	ok
344	outgoing	05.09.07 08:00	05.09.07 08:01	26137	ok	ok	ok
345	outgoing	05.09.07 10:00	05.09.07 10:00	26137	ok	ok	ok
346	outgoing	05.09.07 12:00	05.09.07 12:00	26137	ok	ok	ok
347	outgoing	05.09.07 14:00	05.09.07 14:00	26137	ok	ok	ok
348	outgoing	06.09.07 08:00	06.09.07 08:00	26137	ok	ok	ok
349	outgoing	06.09.07 08:05	06.09.07 08:05	26137	ok	busy	ok
350	outgoing	06.09.07 08:10	06.09.07 08:11	26137	ok	ok	ok
351	outgoing	06.09.07 10:00	06.09.07 10:00	26137	ok	ok	ok
352	outgoing	06.09.07 12:00	06.09.07 12:00	26137	ok	ok	ok
353	outgoing	06.09.07 14:00	06.09.07 14:00	26137	ok	ok	ok
354	outgoing	07.09.07 08:00	07.09.07 08:01	26137	ok	ok	ok
355	outgoing	07.09.07 10:00	07.09.07 10:00	26137	ok	ok	ok
356	outgoing	07.09.07 12:00	07.09.07 12:00	26137	ok	ok	ok
357	outgoing	07.09.07 14:00	07.09.07 14:00	26137	ok	ok	ok
358	outgoing	08.09.07 08:00	08.09.07 08:00	26137	ok	ok	ok
359	outgoing	08.09.07 10:00	08.09.07 10:00	26137	ok	ok	ok
360	outgoing	08.09.07 12:00	08.09.07 12:00	26137	ok	ok	ok
361	outgoing	08.09.07 14:00	08.09.07 14:00	26137	ok	ok	ok
362	outgoing	09.09.07 08:00	09.09.07 08:01	26137	ok	ok	ok
363	outgoing	09.09.07 10:00	09.09.07 10:00	26137	ok	ok	ok

Figure 314. Call Journal Window of RTU (GSM-Type)

Call journal								
Index	Direction	Start time	End time	RTU code	RTU result	Modem result	Gateway result	
312	incoming	29.08.07 15:53	29.08.07 15:54	34993	ok	hangup	ok	
313	incoming	29.08.07 15:54	29.08.07 15:58	34993	ok	hangup	ok	
314	incoming	29.08.07 15:58	29.08.07 16:04	34993	ok	hangup	ok	
315	incoming	29.08.07 16:05	29.08.07 17:16	34993	ok	hangup	ok	
318	incoming	29.08.07 17:16	30.08.07 11:10	34993	ok	hangup	ok	
319	incoming	30.08.07 11:10	30.08.07 11:11	34993	ok	hangup	ok	
320	incoming	30.08.07 11:11	30.08.07 11:20	34993	ok	hangup	ok	
327	incoming	30.08.07 11:44	31.08.07 15:59	34993	ok	hangup	ok	
1105	incoming	13.04.07 16:30	14.04.07 08:59	34993	ok	hangup	ok	
1107	incoming	14.04.07 09:33	14.04.07 10:10	34993	ok	hangup	ok	
1112	incoming	14.04.07 10:45	15.04.07 09:03	34993	ok	hangup	ok	
1113	incoming	15.04.07 09:32	15.04.07 09:55	34993	ok	hangup	ok	
1118	incoming	15.04.07 10:45	16.04.07 09:12	34993	ok	hangup	ok	
1161	incoming	16.04.07 09:45	16.04.07 13:09	34993	ok	ok	shutdown	
1164	incoming	16.04.07 13:15	17.04.07 09:01	34993	ok	hangup	ok	
1165	incoming	17.04.07 09:30	17.04.07 09:53	34993	ok	hangup	ok	
1171	incoming	17.04.07 10:45	17.04.07 20:15	34993	ok	hangup	ok	
1179	incoming	17.04.07 20:15	19.04.07 08:36	34993	ok	hangup	ok	
1180	incoming	19.04.07 09:01	19.04.07 09:38	34993	ok	hangup	ok	

Figure 315. Call Journal Window of RTU (GPRS-Type)

Poll journal

The poll journal contains a list of the data polls (poll = the gateway contacts the RTUs and polls for new measurement data) of the selected RTU.

Note: In comparison to this poll journal, the poll journal in the tree window contains a list of all the polls performed by the A850.

Poll journal									
Index	Packets	Start time	RTU code	Data delay	RTU result	Modem result	Gateway result		
1232	5	20.09.07 07:13	17457	26	ok	ok	ok		
1204	5	20.09.07 07:08	17457	18	ok	ok	ok		
1192	6	20.09.07 07:02	17457	2	ok	ok	ok		
1168	5	20.09.07 06:57	17457	54	ok	ok	ok		
1140	5	20.09.07 06:52	17457	21	ok	ok	ok		
1133	5	20.09.07 06:46	17457	15	ok	ok	ok		
1102	6	20.09.07 06:41	17457	7	ok	ok	ok		
1078	6	20.09.07 06:36	17457	53	ok	ok	ok		
1076	0	20.09.07 06:35	17457	344	rcvbusy	ok	ok		
1068	5	20.09.07 06:30	17457	42	ok	ok	ok		
1037	5	20.09.07 06:25	17457	35	ok	ok	ok		
1018	5	20.09.07 06:20	17457	23	ok	ok	ok		
1006	6	20.09.07 06:14	17457	12	ok	ok	ok		
999	1	20.09.07 06:13	17457	303	radiotimeout	ok	ok		
973	5	20.09.07 06:08	17457	52	ok	ok	ok		
957	5	20.09.07 06:03	17457	41	ok	ok	ok		
938	5	20.09.07 05:58	17457	35	ok	ok	ok		
912	5	20.09.07 05:53	17457	21	ok	ok	ok		
896	6	20.09.07 05:47	17457	12	ok	ok	ok		
877	5	20.09.07 05:42	17457	58	ok	ok	ok		
851	5	20.09.07 05:37	17457	49	ok	ok	ok		
836	5	20.09.07 05:32	17457	39	ok	ok	ok		
819	6	20.09.07 05:27	17457	32	ok	ok	ok		
783	5	20.09.07 05:21	17457	33	ok	ok	ok		
776	6	20.09.07 05:16	17457	17	ok	ok	ok		
744	6	20.09.07 05:10	17457	61	ok	ok	ok		
741	0	20.09.07 05:09	17457	351	rcvbusy	ok	ok		
718	5	20.09.07 05:04	17457	43	ok	ok	ok		
707	6	20.09.07 04:59	17457	25	ok	ok	ok		
700	0	20.09.07 04:58	17457	316	rcvbusy	ok	ok		
675	6	20.09.07 04:52	17457	12	ok	ok	ok		
658	5	20.09.07 04:47	17457	52	ok	ok	ok		
1294	5	20.09.07 04:42	17457	39	ok	ok	ok		
291	5	20.09.07 04:37	17457	33	ok	ok	ok		
8	6	20.09.07 04:32	17457	19	ok	ok	ok		
616	5	20.09.07 04:26	17457	34	ok	ok	ok		
595	5	20.09.07 04:21	17457	27	ok	ok	ok		

Figure 316. Poll Journal Window of a RTU

RTU Printing

- Print item " - see a print preview of the marked RTU in a formsheet processed for the printer and start the printout on your default printer.

IO Port Configuration

IO Port Context Menu

In the IO Port Context Menu, all actions related to individual I/O ports of one or more RTUs can be selected. The possible actions are described below.

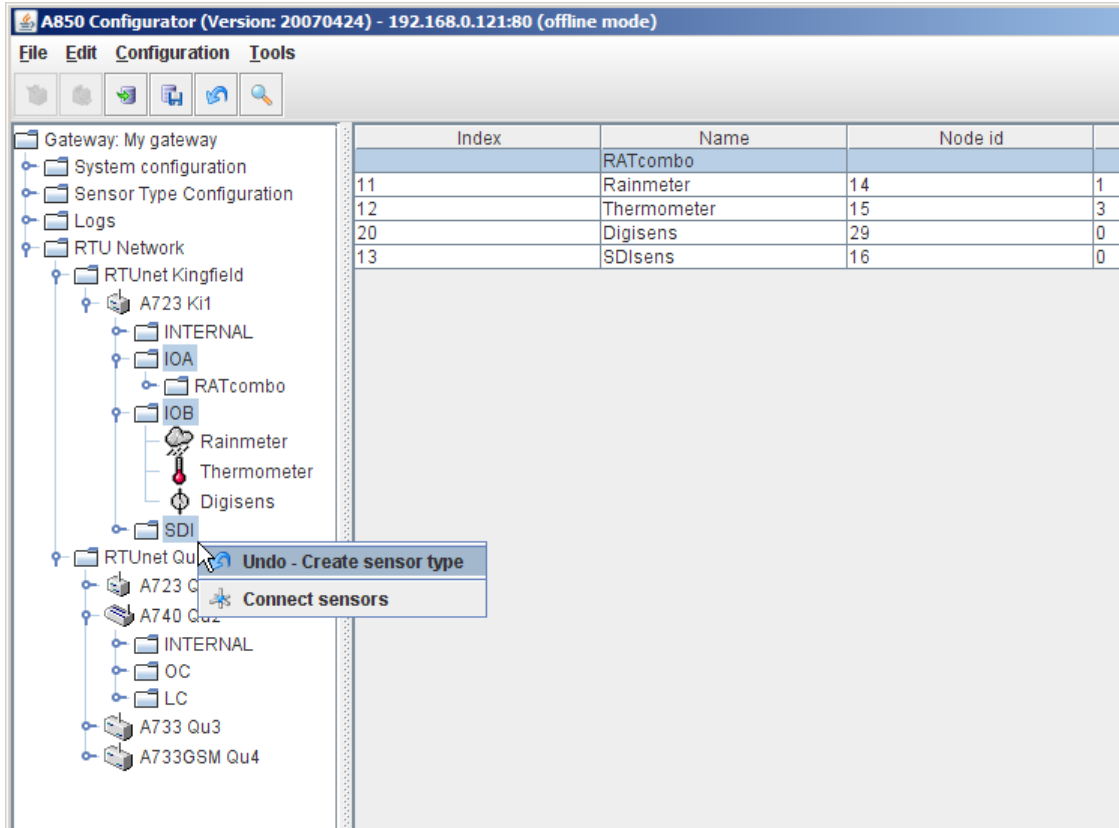


Figure 317. IO Port Context Menu

The choices offered by the IO Port context menu are:

- Menu items "Undo" or "Redo": see "Pop-up Context Menu" in chapter 2;
- "Connect sensors" - see description "Connect sensors"; the "Connect sensors" window shows only the selected I/O port of the selected RTU type represented as tabs.

Sensor Configuration

Sensor Context Menu

The Sensor Context Menu allows to select all actions related to sensors asind alle aktionen die im zusammenhang mit sensoren diettaced to RTUs. The possible actions are described below.

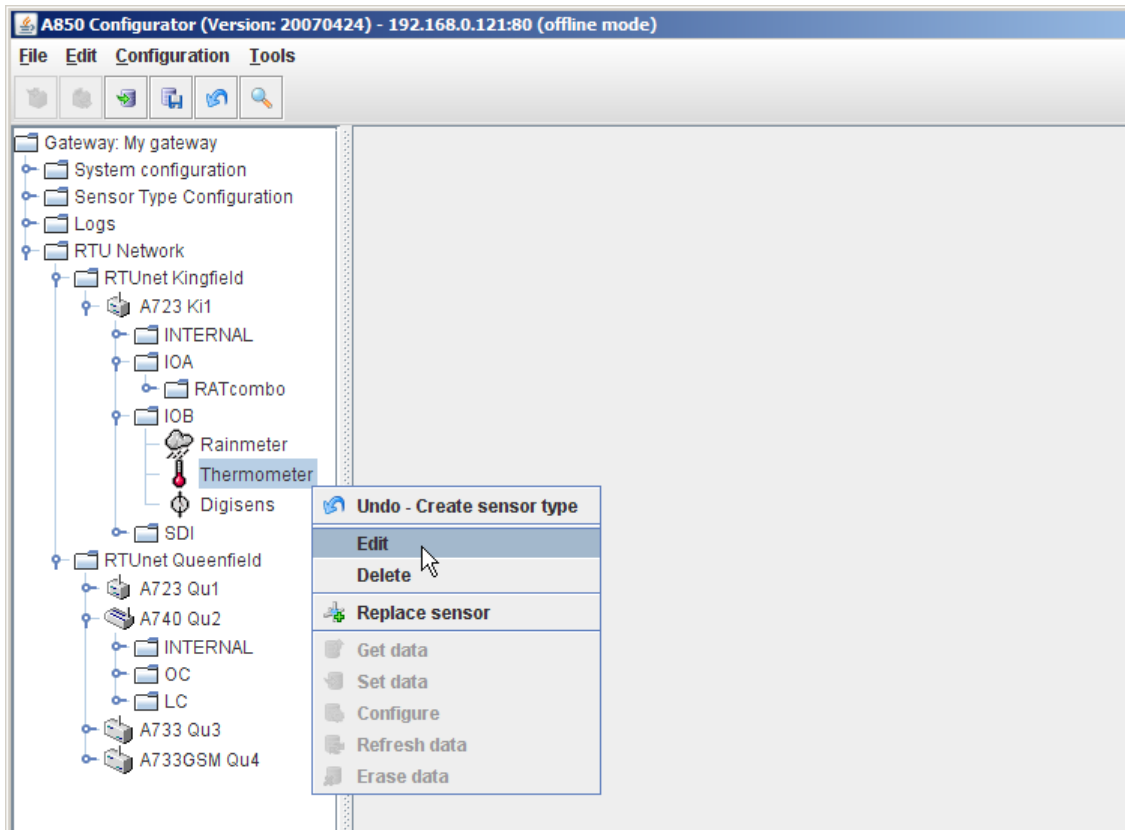


Figure 318. Sensor Context Menu

The choices offered by the Sensor context menu are:

Sensor Configuration:

- "Edit" - allowing to modify the sensor details of an existing sensor, see description "Sensor details";
- "Delete" - allowing to delete the selected sensor;

Sensor Administration:

- "Replace sensor" - see description "Replace sensor";

Sensor Data Management:

The possibilities offered by the Sensor Data Management are almost identical to these offered by the RTU Data Management, the most significant difference being the fact that not the data of all sensors of a RTU, but only the data of the selected sensor are regarded:

- "Get data" - see description "Get data",
- "Set data" - see description "Set data",
- "Configure" - see description "Configure",
- "Refresh data" - see description "Refresh data",
- "Erase data" -see description "Erase data".

Sensor details

The screenshot shows a 'Sensor details' window with the following fields and values:

- Name: Thermometer
- RTU name: A723 Ki1
- RTU code: 28330
- Sensor type: Thermometer
- Manufacturer: Adcon Telemetry GmbH
- EUnit: Temperature (celsius)
- Node ID: 15
- Installation date: 16/05/2007
- Maintenance date: 16/05/2007
- active
- Raw: Sampling method: arithmetic average, Cabling: 3
- Calibration: Sensor value: 0, min: 2.5, max: max; Physical value: 0, min: 2.5, max: max
- Newest slot: Interval: 0, Offset: 0; Value: 0, State: valid; Timestamp: 01.01.70 01:00
- Refresh requested
- Refresh needed
- Configure requested
- Configure needed
- Buttons: Print, OK, Cancel

Figure 319. Sensor details Window

Common details

Name	Thermometer		
RTU name	A723 Ki1	RTU code	28330
Sensor type	Thermometer		
Manufacturer	Adcon Telemetry GmbH	EUnit	Temperature (celsius)
Node ID	15		
Installation date	16/05/2007	Maintenance date	16/05/2007
<input checked="" type="checkbox"/> active			

Figure 320. Sensor details - Common details

- Name - displays the name defined for this sensor which can be modified;
- RTU name - displays the name of the RTU where the sensor is attached;
- RTU code - displays the code of the RTU where the sensor is attached;
- Sensor type - displays the type defined for this sensor in the "Sensor Type Configuration";
- EUnit - displays the engineering unit defined for this sensor in the "Sensor Type Configuration";
- Node ID - allows to enter or change the node ID concerned;
- Installation date - displays the date when the sensor was installed;
- Maintenance date - displays the date the sensor was maintained the last time;
- active:
 - if "active" is checked, the sensor values will be saved in the database;
 - if "active" is not checked, the sensor values will be ignored.

Special sensor settings

Depending on the type of the sensor, special entries are possible via this menu.

Note: No special entries are provided for internal sensors.

Different window areas are displayed for internal, LC, OC and SDI sensors:

Raw

Allows entries for analog, counter and digital sensors:



Raw

Sampling method arithmetic average ▼ Cabling 3 ▼

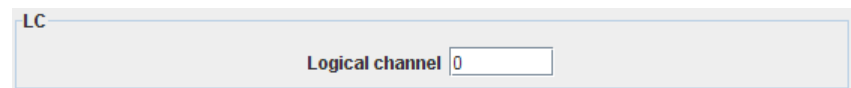
Figure 321. Sensor details - Raw

- Sampling method: - select which method has to be used for this sensor;
- Cabling - the pin of the connector of the RTU the sensor cable is connected with (for a description of the connectors, refer to the addIT and addWAVE user manuals).

Note: The default cabling for each sensor type is defined in "Sensor Type Configuration".

LC

Allows entries for logical channel sensors:



LC

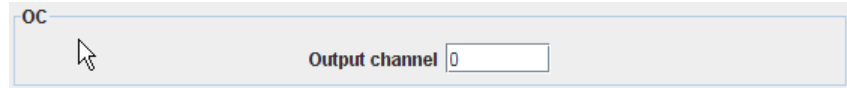
Logical channel 0

Figure 322. Sensor details - LC

- Logical channel - enter the logical channel of the LC sensor.

OC

Allows entries for output channel sensors:



OC

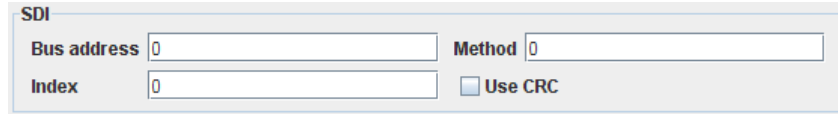
Output channel 0

Figure 323. Sensor details - OC

- Output channel - enter the output channel for the OC sensor

SDI

Allows entries for SDI sensors:



SDI

Bus address 0 Method 0

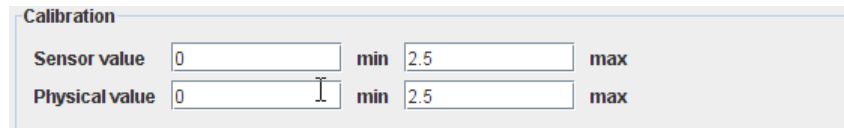
Index 0 Use CRC

Figure 324. Sensor details - SDI

- Bus address - enter the address of the SDI sensor;
- Method - enter the method of the SDI sensor;
- Index - enter the index of the SDI sensor;
- Use CRC - check the box for using a CRC (Cyclic Redundancy Check) for controlling the SDI communication.

Note: If you want to learn more about SDI-12, visit the the website of the SDI-12 Support Group, "<http://www.sdi-12.org/>".

Calibration



Calibration

Sensor value 0 min 2.5 max

Physical value 0 min 2.5 max

Figure 325. Sensor details - Calibration

- Sensor value - enter the minimum and maximum value of the range within which the sensor delivers measurements;

Note: The default range of the sensor value is defined in "Sensor Type configuration" in the field "Linear input value".

- Physical value - enter the minimum and maximum of the linear output value range which corresponds the linear input values in the selected range.

Note: The default range of the physical value is defined in "Sensor Type configuration" in the field "Linear output value".

Newest slot

Newest slot			
Interval	0	Offset	0
Value	0	State	valid
Timestamp	01.01.70 01:00		

Figure 326. Sensor details - Newest slot

- Interval - displays the measurement interval of the newest slot;
- Offset - displays the offset between save and measurement timestamp of the newest slot;
- Value - displays the measurement value of newest slot;
- State - displays the state of newest slot value:
 - valid - valid and complete value;
 - partial - valid, but incomplete value (some samples missing);
 - missing - missing value (all samples missing);
 - invalid - invalid (sensor or cabling problem).
- Timestamp - displays the timestamp when the newest slot was saved.

Requests

<input type="checkbox"/> Refresh requested	<input type="checkbox"/> Refresh needed
<input checked="" type="checkbox"/> Configure requested	<input type="checkbox"/> Configure needed

Figure 327. Sensor details - Requests

- Refresh requested - tells whether a measurement value refresh of the sensor was requested;
- Refresh needed - tells whether a measurement value refresh of the sensor is needed;
- Configure requested - tells whether a configuraton update of the sensor was requested;
- Configure needed - tells whether a configuration update of the sensor is needed.

Replace sensor

“Replace” allows you to transmit information within your RTU network from an existing sensor (the source sensor) to another sensor (the destination sensor).

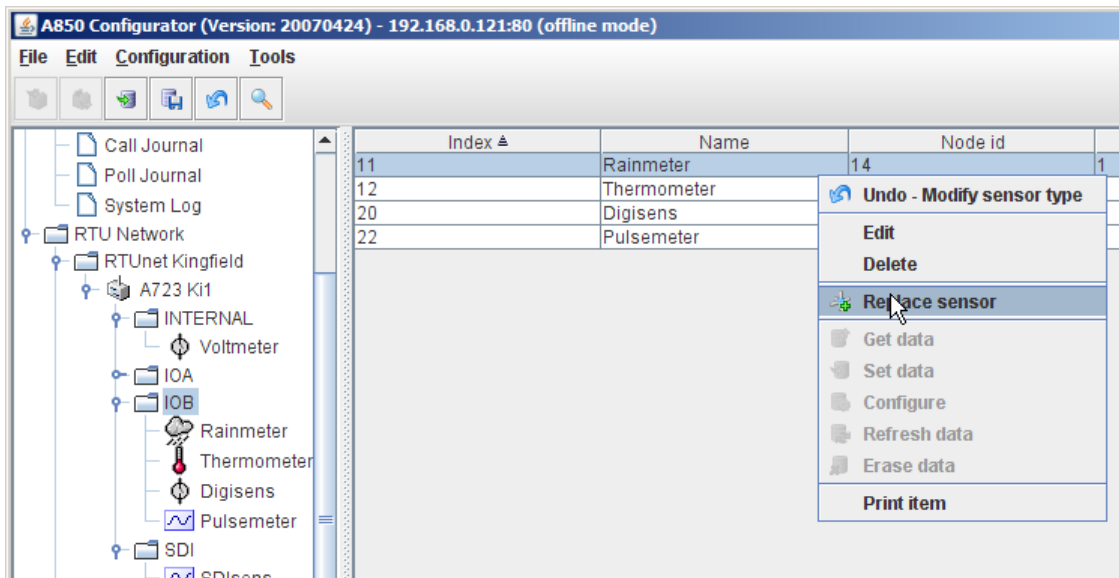


Figure 328. Sensor Context Menu - Replace Sensor

Select destination sensor

- Enter the table view of an I/O port or go directly in the tree view to a sensor which you want to replace by another and select “Replace sensor” in the Sensor Context Menu.

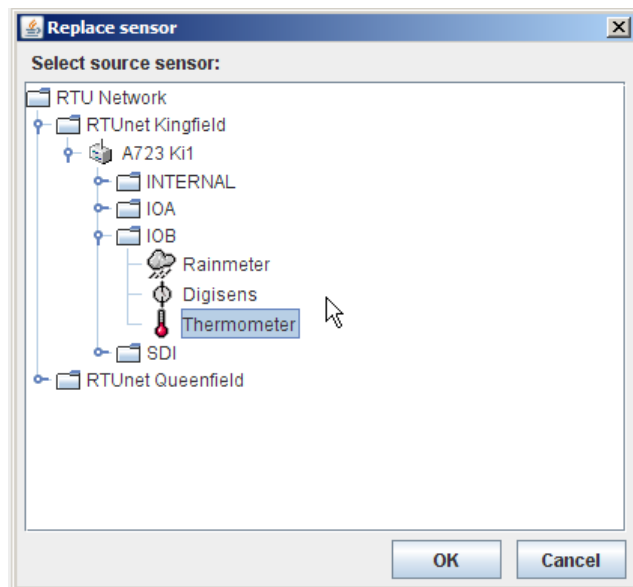
Select source sensor

Figure 329. Replace sensor Window

- Select the source sensor within your RTU network from which you want the sensor information to be taken over;
- after a confirmation given by clicking the OK button, the information of the selected source sensor will be taken over to the sensor selected in the tree window or in the table window (destination sensor).

Note: By this, all the information within the destination sensor is totally overwritten by the information from the source sensor. Of course, source sensor and destination sensor have to be different from each other.

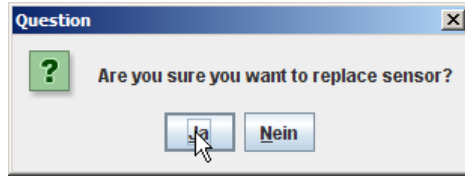


Figure 330. Replace Sensor Question

After the confirmation made by clicking the “OK” button, there will be still the security query pictured above to be answered before the replacement of the sensor is performed.

Chapter 5. Console Commands

The console commands serve as means for the basic configuration of the A850 which is a prerequisite for being able in to work in succession with the Gateway via the Graphical User Interface (GUI).

The console commands are executed through the command line interface with a menu driven application which allows the user to perform various maintenance and debugging tasks. Thereby, the available feasibilities for settings via the command line interface depend from the type of logged-in user (system administrator, standard administrator or user without administrator rights, respectively) and from the type of connection (local or remote).

The following feasibilities for settings are available to the user "root" via the local serial connection "CONSOLE" on the rear side of the A850 (Fig. 3):

- reset the gateway to factory defaults (removing the current configuration and database),
- generate a basic configuration with an empty database by entering a few basic data like a new root password, operating mode and parameters of the network, the serial numbers of the wireless modems that are connected, whether a GSM or GPRS modem should be used etc.,
- import an existing configuration by downloading a file using the feature X/Y/Z-MODEM,
- export the configuration by uploading a file using the feature X/Y/Z-MODEM,
- erase the configuration,
- upgrade the Gateway firmware
- generate keys and certificates for encrypted protocols (HTTPS, SSH).

The following possibilities for settings are available to the user "root" via the local serial connection "CONSOLE" on the rear side of the A850 (Fig. 3) as well as via remote connection (network or modem connection):

- set the system time,
- reboot the Gateway,

Note: there is no difference between reboot and halt - if the AC power is on, the Gateway will reboot after 8 seconds because of the watchdog reset, and if the AC power is off, the Gateway will turn itself off on reboot/reset.

- drop out to a command shell.

The following possibilities for settings are available to all users (e.g., "root", "adv" or "yourname") via the local serial connection "CONSOLE" on the rear side of the A850 (Fig. 3) as well as via remote connection (network or modem connection):

- display licensing information,
- display debugging information,
- request a callback (only if there is a valid configuration),

Note: The configuration capabilities of the setup program only allow to generate a basic configuration with standard settings. Further configuration is done using the GUI.

Establishing Console Connection

For establishing the fundamental configuration of the A850, the A850 has to be connected to the serial interface of a PC. For that purpose, a serial RS232 cable has to be connected to the "CONSOLE" connection of the A850 (Fig. 3) and to the connection for the serial interface of the PC (usually designated as port "COM" or "COM1").

First, ensure the power supply of the Gateway by connecting the mains plug to an AC source; the LED PWR must light to show that AC is present.

Note: it is also possible to operate the gateway using only its battery. However, in this case, the gateway should only be used

if the PWR LED indicates that the battery is at least 75% full (see Chapter 2 for details).

As next step, a terminal emulation program has to be started on the PC. Under Windows XP, the program "HyperTerminal" or the Freeware program PuTTY are available.

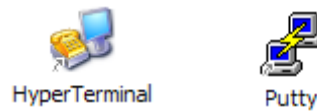


Figure 330. HyperTerminal and PuTTY Icon

HyperTerminal Configuration

This program is to be configured as follows:

Input of a connection name: enter A850 in the field "Name" and confirm by clicking the "OK" button.

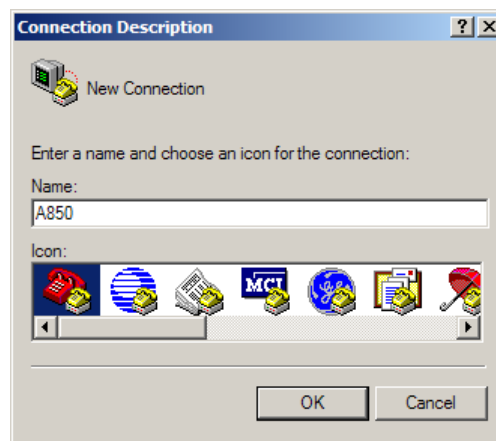


Figure 331. Hyper Terminal Connection Description

As next step, select the designation of the COM interface of the PC to which your A850 is connected and confirm by clicking the "OK" button:



Figure 332. HyperTerminal Connect To

Then select the appropriate port settings according to Fig. 221 and confirm by clicking the "OK" button:

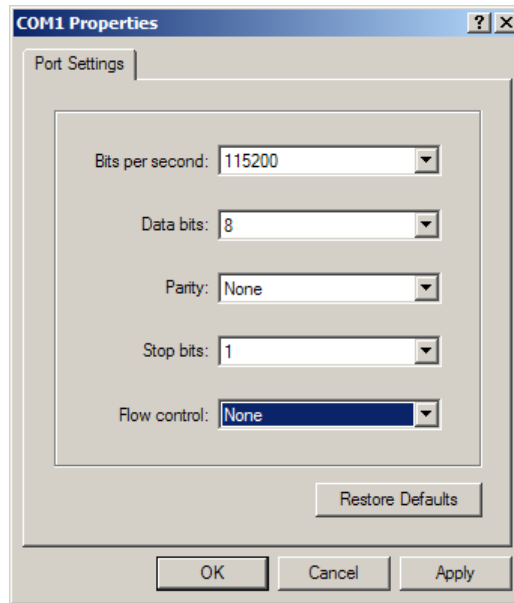


Figure 333. HyperTerminal Port Settings

Now, a HyperTerminal connection to your A850 will be build up.

By this, you should have established now the HyperTerminal connection. In order to login, press the RETURN key and the following screen will appear:

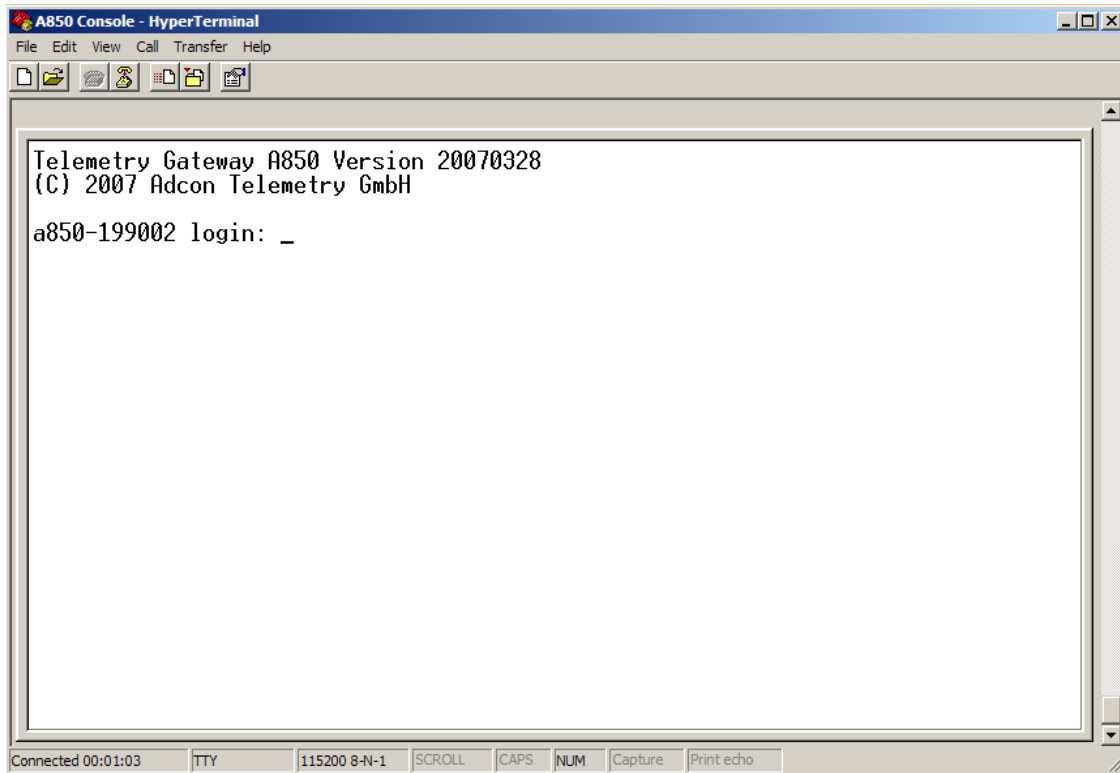


Figure 334. A850 Console Login via Hyper Terminal

After logging in, you will be able to execute the console commands described below in "Console Command Details".

PuTTY Configuration

As already indicated above, alternatively, the Freeware PuTTY can be used which is specially suited for remote connections to your A850 because it supports TelNet as well as SSH connections.

For a local connection to the A850, select the following parameters for PuTTY configuration:

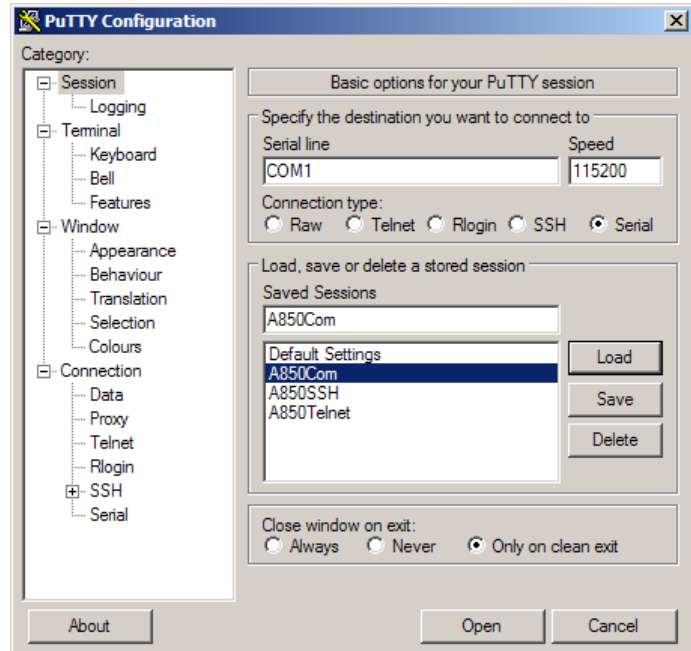


Figure 335. PuTTY Configuration for Local Connection

For an insecure remote connection (TelNet connection) to the A850, make the following PuTTY configuration parameter selection:

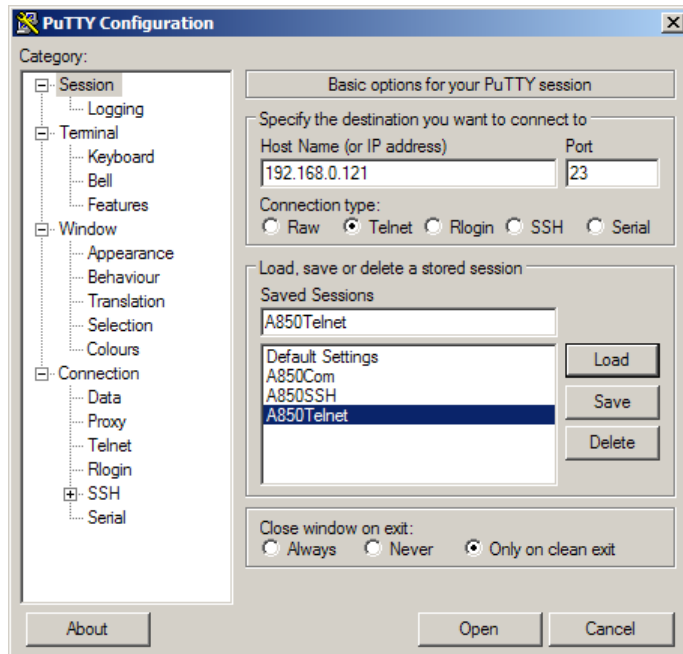


Figure 336. PuTTY Configuration for Remote Connection - TelNet

For a secure remote connection (SSH connection) to the A850, make the following PuTTY configuration parameter selection:

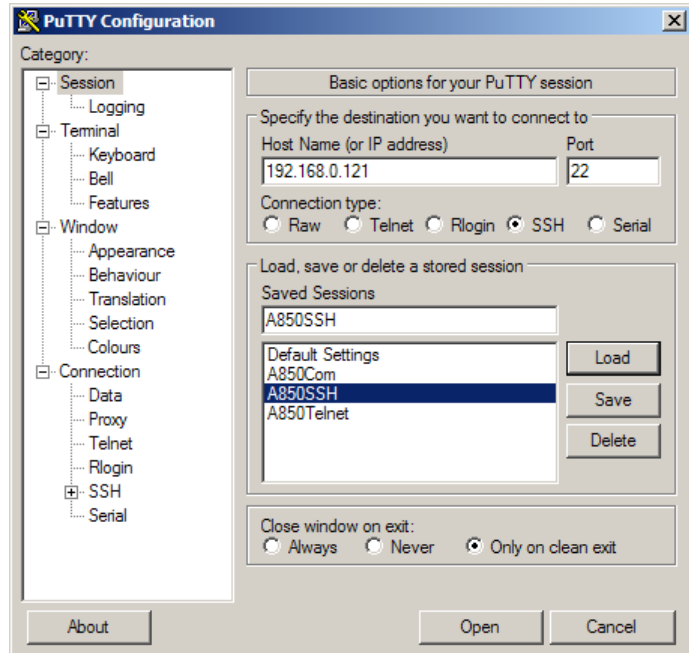


Figure 337. PuTTY Configuration Remote Connection - SSH

Note: In case of remote connections, you have to put in the IP address selected by you for the A850, or, via internet, you can also put in the corresponding domain name, respectively.

By this, you should have established now the PuTTY connection, In order to login, press the RETURN key and the following screen will appear:

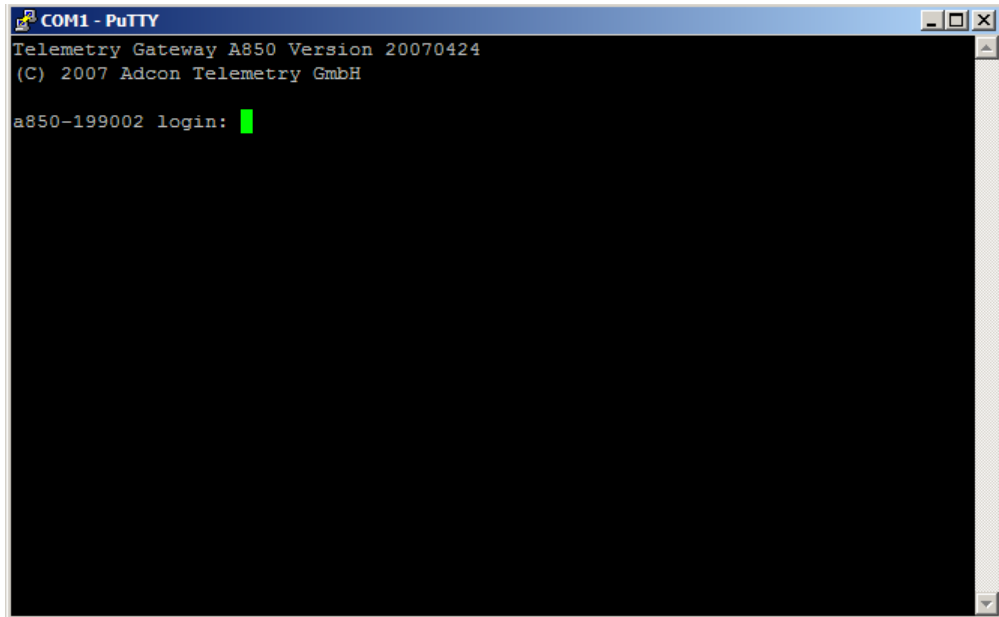


Figure 338. A850 Console Login via PuTTY

After logging in, you will be able to execute the console commands described below.

Console Commands details

Consecutively, you find the description of all viable console commands relevant to the user of the A850.

Note: Some of the settings which can be carried out via console commands can also be set or altered, respectively, at a later date via the GUI of the Configurator.

Console Login

For being able to execute console commands, you have to login first. After the successful login, the main menu becomes available.

Note: At the first login or after erasing the configuration of the A850, no password is disposable at the system administrator "root" so that a password has to be entered in succession in the menu item "Configuration".

The following main menu is at the disposal of the user "root" via the console connection:

```
-----Console Dialog Start-----  
  
Telemetry Gateway A850 Version 20070424  
(C) 2007 Adcon Telemetry GmbH  
  
a850-199002 login: root  
Password:  
  
Main menu  
  
U ... Upgrade the gateway...  
C ... Configuration...  
E ... Encryption...  
T ... Set date and time...  
L ... Licensing...  
D ... Debugging...  
P ... Callback PPP server  
W ... Who am I?  
O ... Operating-system shell  
X ... Exit  
  
Select menu option or press <Esc> to return:  
-----Console Dialog End-----
```

The following main menu is at the disposal of the user "root" via the LAN connection:

-----Console Dialog Start-----

Main menu

- U ... Upgrade the gateway...
- T ... Set date and time...
- L ... Licensing...
- D ... Debugging...
- P ... Callback PPP server
- W ... Who am I?
- O ... Operating-system shell
- X ... Exit

Select menu option or press <Esc> to return:

-----Console Dialog End-----

The following main menu is at the disposal of an "user administrator" (user "adv" as described in "Users" in chapter 3) via the console connection:

-----Console Dialog Start-----

Telemetry Gateway A850 Version 20070424
(C) 2007 Adcon Telemetry GmbH

a850-199002 login: adv
Password:

Main menu

- C ... Configuration...
- L ... Licensing...
- D ... Debugging...
- P ... Callback PPP server
- W ... Who am I?
- X ... Exit

Select menu option or press <Esc> to return:

-----Console Dialog End-----

The following main menu is at the disposal of the user "adv" via the LAN connection:

-----Console Dialog Start-----

Telemetry Gateway A850 Version 20070424

(C) 2007 Adcon Telemetry GmbH

a850-199002 login: adv

Password:

Main menu

C ... Configuration...

L ... Licensing...

D ... Debugging...

P ... Callback PPP server

W ... Who am I?

X ... Exit

Select menu option or press <Esc> to return:

-----Console Dialog End-----

The following main menu is at the disposal of an "ordinary user" (as specified in the description of user levels chapter 3, "Users") via the console connection:

-----Console Dialog Start-----

Telemetry Gateway A850 Version 20070424

(C) 2007 Adcon Telemetry GmbH

a850-199002 login: user

Password:

Main menu

```
L ... Licensing...  
W ... Who am I?  
X ... Exit
```

Select menu option or press <Esc> to return:

-----Console Dialog End-----

Upgrade the gateway

In this menu item, you will have the prospective opportunity to upgrade the firmware of your A850 to a newer version, depending from product improvements and possible customer demands. To find out if such an upgrade is available, contact your Adcon distributor or read up on it at www.adcon.at.

-----Console Dialog Start-----

Upgrade menu

```
U ... Upload a firmware image...  
L ... List uploaded firmware images...  
R ... Reboot the gateway  
T ... Set date and time...
```

Select menu option or press <Esc> to return: u

Upgrade upload menu

```
X ... X-Modem  
Y ... Y-Modem  
Z ... Z-Modem
```

Select menu option or press <Esc> to return: x

Preparing upload... done.

Start your X-Modem upload now!

x: ready to receive upload-1180486446.img

Note: Now, start your transmission program for sending the new firmware image file to the A850 and proceed according to the following figures.

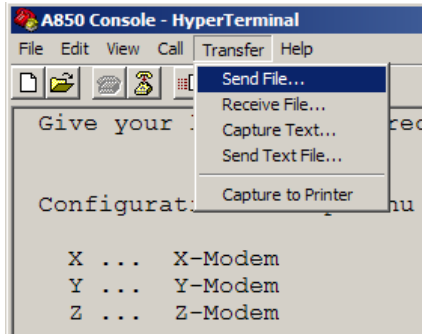


Figure 339. Select Transfer - Send File ...

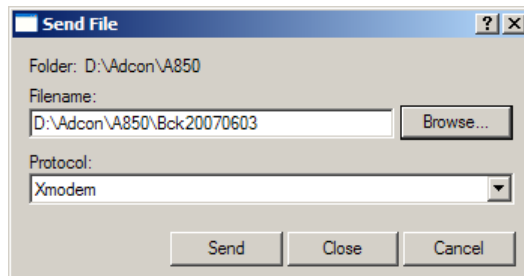


Figure 340. Browse or Select File Name for New Firmware Image File

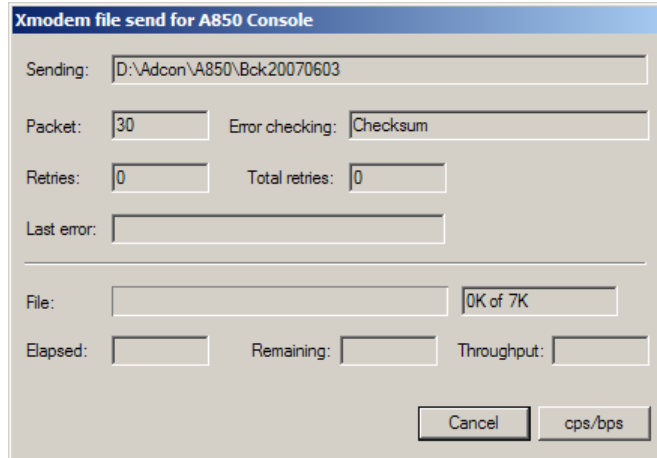


Figure 341. Send New Firmware Image File to the A850

Note: The transmission of the firmware image file should have been successfully executed if the “file send” window has disappeared again and no transmission error is displayed in the console dialogue.

Note: After a successful firmware upgrade, you have to reboot your A850 anew so that the new firmware will be activated. In any case, after a firmware upgrade, you have also to enter date and time anew; otherwise, please adhere to the upgrade instructions (“read me.txt”) accompanying your new firmware.

-----Console Dialog End-----

Configuration

Configuration Quick setup

In Quick setup, the setup of the A850 is performed only with the most important information, i.e. only the information is necessary which is required for the internal LAN operation of the A850 where the A850 independently establishes the IP addresses and activates its DCHCP server function.

Note: In order to ensure that no default password can be used which would thus endanger the security of the A850, it is

necessary to enter one password for each single user. A password has always to consist in a combination of letters, digits and special characters (e.g., "rf3312sa!")

|-----Console Dialog Start-----|

Configuration menu

```

Q ... Quick setup...
X ... Expert setup...
B ... Backup the gateway configuration...
R ... Restore the gateway configuration...
E ... Erase the gateway configuration

```

Select menu option or press <Esc> to return: q

This will erase the current gateway configuration and replace

it by a new configuration created depending on your input. If

you want to change the current configuration, you should use

the graphical user interface!

If you really want to configure the gateway, enter 'yes': yes

Setup dialog

Autodetecting wireless modem... (found)

Autodetecting modem... (not found)

Press <BS> to erase one character or <Ctrl-U> to erase the whole line

Press <Ctrl-B> to go back to the previous question or <Tab> for hints

Press <Esc> to cancel

Password for root: *****

Retype password for root: *****

```
Hostname: a850-199002
Wireless modem present: y
Wireless modem code: 36065
Wireless modem frequency: 440012500
Wireless modem channel spacing: 12500
Modem present: n y
Modem PIN:
GPRS modem present: y
User adv present: y
Password for adv: *****
Retype password for adv: *****
License present: n
```

Writing configuration file...

-----Console Dialog End-----

Configuration Expert setup

In Expert setup, the information required for Quick setup as well as additional routing parameters for the operation of the A850 in a LAN together with other devices.

-----Console Dialog Start-----

Configuration menu

```
Q ... Quick setup...
X ... Expert setup...
B ... Backup the gateway configuration...
R ... Restore the gateway configuration...
E ... Erase the gateway configuration
```

Select menu option or press <Esc> to return: x

This will erase the current gateway configuration and replace it by a new configuration created depending on your input. If

you want to change the current configuration, you should use

the graphical user interface!

If you really want to configure the gateway, enter 'yes': yes

Setup dialog

Autodetecting wireless modem... (found)

Autodetecting modem... (not found)

Press <BS> to erase one character or <Ctrl-U> to erase the whole line

Press <Ctrl-B> to go back to the previous question or <Tab> for hints

Press <Esc> to cancel

Password for root: *****

Retype password for root: *****

Hostname: a850-199002

IP address: 192.168.0.121

IP netmask: 255.255.255.0

IP broadcast address: 192.168.0.255

IP router address: 192.168.0.254

DNS server addresses (up to 2):

NTP server addresses (up to 2):

Start DHCP server: y n

Power down ethernet if AC fails: n

Console local IP address: 192.168.1.1

Console remote IP address: 192.168.1.2

Wireless modem present: y

Wireless modem code: 36065

Wireless modem frequency: 440012500

Wireless modem channel spacing: 12500

Modem present: n y

Modem PIN:

Modem dial-in allowed: y

```
Modem uses tone-dialling: y
Modem detects dialtone: n y
Modem baudrate: 115200
Modem local IP address: 192.168.2.1
Modem remote IP address: 192.168.2.2
GPRS modem present: y
GPRS modem port: 81
User adv present: y
Password for adv: *****
Retype password for adv: *****
License present: n
```

Writing configuration file...

-----Console Dialog End-----

Backup the Gateway Configuration

A backup saves the configuration available in the A850 in a file at the PC from where they can be brought back again at a later date by "Restore" into the A850. This is necessary e.g. in case of data loss or after an exchange of the A850.

Note: A backup of the A850 is also possible via the configurator GUI in "Configuration" and also via the A850 Telemetry Gateway web page by "Tools".

-----Console Dialog Start-----

Configuration menu

```
Q ... Quick setup...
X ... Expert setup...
H ... Generate HTTPD certificate...
S ... Generate SSHD keys...
B ... Backup the gateway configuration...
R ... Restore the gateway configuration...
E ... Erase the gateway configuration
```

Select menu option or press <Esc> to return: b

Configuration backup menu

X ... X-Modem

Y ... Y-Modem

Z ... Z-Modem

Select menu option or press <Esc> to return: x

Preparing backup...Start your X-Modem download now!

Give your local XMODEM receive command now.

Note: Here, you start your transmission program for reception of the A850 backup file.

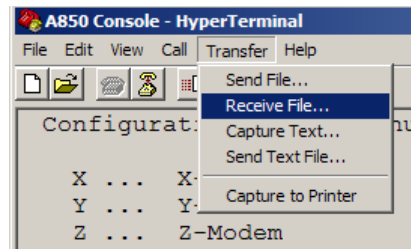


Figure 342. Select Transfer - Receive File ...

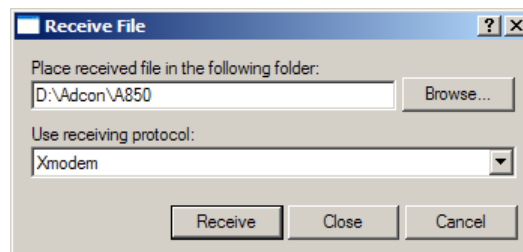


Figure 343. Choose folder for Backup File

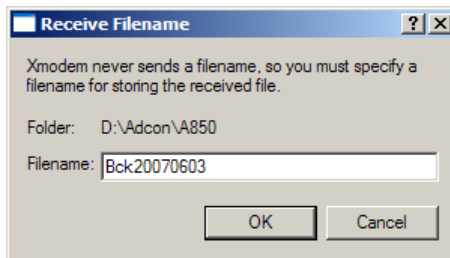


Figure 344. Select file name for Backup File

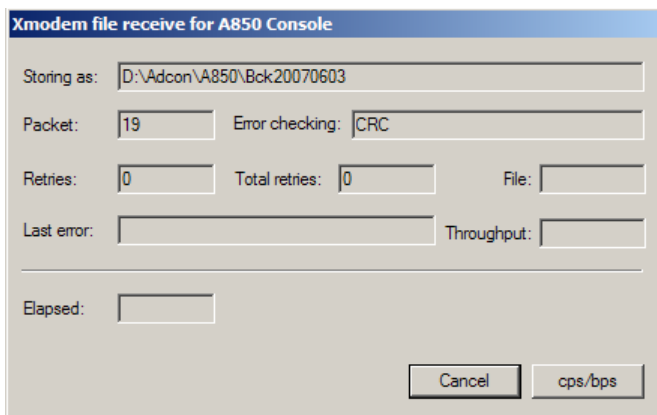


Figure 345. Receiving Backup File from A850

Note: Once the "file receive" window did disappear again without any data transmission error having been displayed in its console dialogue, the transmission of the backup file should have been executed successfully.

Configuration backup menu

- X ... X-Modem
- Y ... Y-Modem
- Z ... Z-Modem

Select menu option or press <Esc> to return

-----Console Dialog End-----

Restore the gateway configuration

Restore retrieves the data saved from the A850 in a file at the PC into the A850.

Note: A "Restore" of the A850 is also possible by the configurator GUI as described under "Configuration".

-----Console Dialogue Start-----

Configuration menu

```
Q ... Quick setup...
X ... Expert setup...
H ... Generate HTTPD certificate...
S ... Generate SSHD keys...
R ... Restore the gateway configuration...
```

Select menu option or press <Esc> to return: r

Configuration restore menu

```
X ... X-Modem
Y ... Y-Modem
Z ... Z-Modem
```

Select menu option or press <Esc> to return: x

Preparing backup...Start your X-Modem upload now!

rx: ready to receive confman.xml.gz

Note: Here you start your transmission program to send the A850 backup file back into the A850.

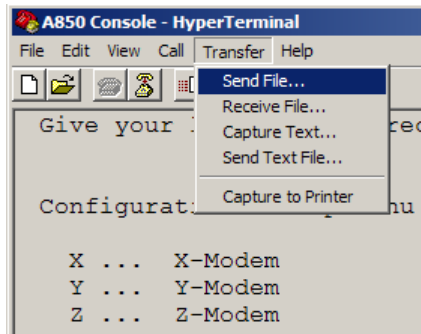


Figure 346. Select Transfer - Send File...

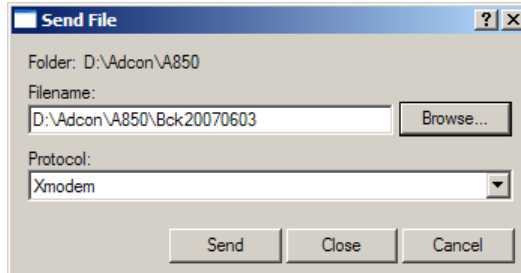


Figure 347. Select file name for Backup File to restore

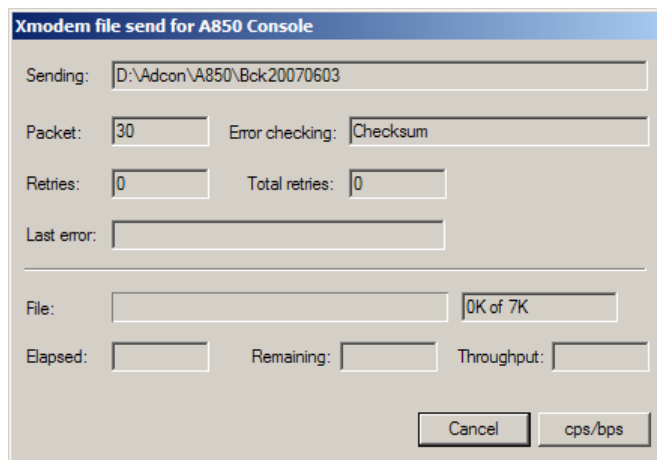


Figure 348. Send Backup File to A850

Note: Once the "file send window" did disappear again without any data transmission error having been displayed in its console dialogue, the transmission of the backup file should have been executed successfully.

```
Loading configuration file /tmp/restore/conf-  
man.xml.gz
```

```
Configuration restore menu
```

```
X ... X-Modem  
Y ... Y-Modem  
Z ... Z-Modem
```

```
Select menu option or press <Esc> to return:
```

```
-----Console Dialogue End-----
```

Erase the gateway configuration

In order to relegate your A850 in the initial state (as delivered) which implies to delete all configuration data and settings, you may erase all data from your A850 Gateway by "erase".

Note: if SSH keys and/or a HTTPS certificate was generated, it will not be automatically erased by erasing the configuration. You have to use the corresponding menu options in the encryption menu to do this!

```
-----Console Dialog Start-----
```

```
Configuration menu
```

```
Q ... Quick setup...  
X ... Expert setup...  
B ... Backup the gateway configuration...  
R ... Restore the gateway configuration...  
E ... Erase the gateway configuration
```

Select menu option or press <Esc> to return: e

If you really want to erase the gateway, enter 'yes': yes

Erased the gateway, logging out.

-----Console Dialog End-----

Encryption

HTTPD Encryption

In order to be able to establish secure communications with the A850 via the internet, this communications link has to be protected by means of HTTPD encryption so that an internet browser for https can communicate with the A850. To this, a HTTP key is generated at this point for encryption of the connection. The validity of this key can be restricted to a specified period of time. If you want to change the key or if its validity period has expired, HTTPD encryption is to be executed anew.

-----Console Dialog Start-----

Encryption menu

- H ... HTTPD encryption...
- S ... SSHD encryption...
- J ... Show the Java archive key...

Select menu option or press <Esc> to return: h

HTTPD encryption menu

- S ... Show HTTPD certificate...
- C ... Create HTTPD certificate...
- E ... Erase HTTPD certificate...

Select menu option or press <Esc> to return: s

Fingerprint:
F2:B2:6E:93:A6:06:5B:E3:61:B3:20:D8:D7:A2:EB:0B:
2B:E9:DC:BD

HTTPD encryption menu

S ... Show HTTPD certificate...
C ... Create HTTPD certificate...
E ... Erase HTTPD certificate...

Select menu option or press <Esc> to return: e

If you really want to erase the HTTPD certificate, enter 'yes': yes

Erasing HTTPD certificate...

HTTPD encryption menu

C ... Create HTTPD certificate...

Select menu option or press <Esc> to return: c

Setup dialog

Press <BS> to erase one character or <Ctrl-U> to erase the whole line

Press <Ctrl-B> to go back to the previous question or <Tab> for hints

Press <Esc> to cancel

Hostname: a850-199002

Country code: AT

Country name: Austria

```
City name: Vienna  
Company name: Sunflower  
Organizational unit name: ET  
Validity in days: 3650
```

```
Creating HTTPD certificate...
```

```
Will output 1024 bit certificate to '/tmp/  
httpd.cert'
```

```
Generating certificate, this may take a while...
```

```
Fingerprint:  
84:13:EB:A7:E8:84:D6:6B:52:E6:6B:CD:3D:3B:CE:D2:  
39:5A:65:32
```

-----Console Dialog End-----

SSHD Encryption

In order to be able to establish a secure communication with the A850 via a SSH connection or a SSH tunnel, the connection has to be protected by a SSHD encryption so that applications suited for SSH (i.e., PuTTY or similar programs) can communicate with the A850 via SSH. To that purpose, a SSH key for the encryption of the communication is generated here. If you want to change the key, you have to rerun SSHD encryption.

-----Console Dialog Start-----

```
Encryption menu
```

```
H ... HTTPD encryption...  
S ... SSHD encryption...  
J ... Show the Java archive key...
```

```
Select menu option or press <Esc> to return: s
```

```
SSHD encryption menu
```

```
S ... Show SSHD keys...  
C ... Create SSHD keys...
```

```
E ... Erase SSHD keys...
```

```
Select menu option or press <Esc> to return: s
```

```
DSS key fingerprint:
```

```
C9:E7:F3:E5:28:97:25:37:E8:C1:02:B1:FC:11:76:61
```

```
RSA key fingerprint:
```

```
89:C5:05:94:B2:30:42:99:54:BB:97:B1:5E:A0:B4:68
```

```
SSHD encryption menu
```

```
S ... Show SSHD keys...
```

```
C ... Create SSHD keys...
```

```
E ... Erase SSHD keys...
```

```
Select menu option or press <Esc> to return: e
```

```
If you really want to erase the SSHD keys, enter  
'yes': yes
```

```
Erasing SSHD keys...
```

```
SSHD encryption menu
```

```
C ... Create SSHD keys...
```

```
Select menu option or press <Esc> to return: c
```

```
Creating SSHD keys...
```

```
Will output 1024 bit dss secret key to '/tmp/  
sshd_dsskey'
```

```
Generating key, this may take a while...
```

```
Will output 1024 bit rsa secret key to '/tmp/  
sshd_rsakey'
```

Generating key, this may take a while...

DSS key fingerprint:
66:50:6C:07:C0:0E:D8:43:9E:2A:ED:5E:CA:B8:2C:BA
RSA key fingerprint:
B4:C4:C3:15:FB:EE:1D:FD:06:6E:FE:ED:53:96:1D:DD

-----Console Dialog End-----

Show the Java archive key

This command allows you to display the Java archive key. However, this feature is for information only and has no importance for the utilization of the A850.

-----Console Dialog Start-----

Encryption menu

H ... HTTPD encryption...
S ... SSHD encryption...
J ... Show the Java archive key...

Select menu option or press <Esc> to return: j

Java archive key fingerprint:
04:94:B9:9A:76:D0:05:29:BA:52:AA:74:1C:D1:8D:7E-

-----Console Dialog End-----

Set date and time

This command allows you to enter the actual date and time. This information is especially important as the encryption keys have to be generated on base of the actual time. Furthermore, the actual time serves for synchronizing with the other devices within your LAN via NTP service.

Note: In order to be independent from the location of the A850, enter the time always referenced to UTC ("Universal Time coordinated"). Otherwise or in making comparisons, keep in mind what happens at the changes between "normal" time and "Daylight Saving Time"! In any case, date and time

have always to be entered before the generation of the encryption keys can take place.

-----Console Dialogue Start-----

Timezone and time dialog

Press <BS> to erase one character or <Ctrl-U> to erase the whole line

Press <Ctrl-B> to go back to the previous question or <Tab> for hints

Press <Esc> to cancel

Timezone: UTC

Date and time: 2007-05-30 00:56:44

Setting time...

-----Console Dialogue End-----

Licensing

Here, you can read the license regulations referring to the respective software modules used in your A850. Reading the license regulations has no impact on the functions of the A850.

-----Console Dialogue Start-----

Licensing menu

S ... Summary

C ... GNU C Library license

D ... Dropbear license

O ... OpenSSL license

P ... PPP license

G ... Read the General Public License (GPL)

L ... Read the Lesser General Public License (LGPL)

A ... Read the Apache Software License (ASL)

Select menu option or press <Esc> to return:

-----Console Dialogue End-----

Debugging

The debugging commands allow you to readout specific information and to create also a file with the debugging information. This is especially helpful for Adcon's support if you should encounter problems with your A850 because it would help to localize any problems quicker and hence to help to solve the problem in a shorter time.

-----Console Dialogue Start-----

Debug menu

```
H ... Host information
C ... CPU state
B ... Board state
M ... Memory usage
D ... Disk usage
P ... Process list
N ... Network interfaces/routes
U ... USB and serial devices
L ... Lockfiles
R ... RAM database state
F ... FLASH database state
S ... System log
T ... System log (continuous)
O ... Download debug info
```

Select menu option or press <Esc> to return:

-----Console Dialogue End-----

Callback PPP server

If PPP dialup networking is configured, this command can be used to initiate a callback to the configured PPP server. The A850 will quit the CLI to close the current call, then initiate the callback.

-----Console Dialogue Start-----

Main menu

```
U ... Upgrade the gateway...
C ... Configuration...
E ... Encryption...
T ... Set date and time...
L ... Licensing...
D ... Debugging...
P ... Callback PPP server
W ... Who am I?
O ... Operating-system shell
X ... Exit
```

Select menu option or press <Esc> to return: p

Callback to server started, logging out.

-----Console Dialogue End-----

Who am I?

Here, you can get information about your user rights/privileges as well as about the actual time.

-----Console Dialogue Start-----

Main menu

```
U ... Upgrade the gateway...
C ... Configuration...
E ... Encryption...
T ... Set date and time...
L ... Licensing...
D ... Debugging...
P ... Callback PPP server
W ... Who am I?
```

```
O ... Operating-system shell  
X ... Exit
```

Select menu option or press <Esc> to return: w

```
You are root and have root privileges  
You are logged in on /dev/ttyAM1 (device:console)  
It is 2007-05-30 01:03:57 in timezone UTC.
```

-----Console Dialogue End-----

Operating-system shell

Here, you could leave the main menu and start to directly execute operating system (OS) commands. However, no such procedures are required for the regular operation of the A850 and the use of this feature makes only sense for experts or following advices from Adcon support, respectively.

Note: OS commands can change the complete behavior of your A850. Execute such commands only in case of a particular reason and based upon adequate experience.

-----Console Dialogue Start-----

Main menu

```
U ... Upgrade the gateway...  
C ... Configuration...  
E ... Encryption...  
T ... Set date and time...  
L ... Licensing...  
D ... Debugging...  
P ... Callback PPP server  
W ... Who am I?  
O ... Operating-system shell  
X ... Exit
```

Select menu option or press <Esc> to return: o

```
BusyBox v1.01 (2007.04.24-13:38+0000) Built-in
shell (ash)
```

```
Enter 'help' for a list of built-in commands.
```

```
# help
```

```
Built-in commands:
```

```
-----
```

```
  . : alias bg break cd chdir continue eval
exec exit export false fg hash help jobs let
local pwd read readonly return set shift times
trap true type ulimit umask unalias unset wait
```

```
# exit
```

```
-----Console Dialogue End-----
```

Exit

Exit allows you to leave the console dialog and causes you to be logged out. After that, you can close the HyperTerminal or PuTTY, respectively.

Note: For a new utilization of the console commands, follow once again the instructions given at the beginning of this chapter.

```
-----Console Dialogue Start-----
```

```
Main menu
```

```
U ... Upgrade the gateway...
C ... Configuration...
E ... Encryption...
T ... Set date and time...
L ... Licensing...
D ... Debugging...
P ... Callback PPP server
W ... Who am I?
O ... Operating-system shell
```

X ... Exit

Select menu option or press <Esc> to return: x

Press <Enter> for a login prompt

-----Console Dialogue End-----

Chapter 6. Appendix

Technical Data

Table 3. A850 Technical Data

Dimensions	182 x 260 x 52 (including standoffs)
Weight	1862g
Connectors	1 x 100Base-T Ethernet 1 x RS-232 (ext. modem) 1 x RS-232 (Console) 1 x RS485 (Radio Modem) 2 x USB 1.1 (ext. modems)
Analog Modem	external via USB or RS-232
CPU	Cirrus Logic 32-bit ARM
Memory	256MB Flash (CF), 32MB SDRAM
Operating System	Linux OS, Kernel 2.4
Power Supply	100-240V~, 15W max, integrated 8.4V NiMH battery with 4500mAh serves as uninterruptible power supply
Operating Conditions	-10°C to +55°C, RH 90% non condensing
Protection Class	IP50

The A850 Telemetry Gateway fulfills the specifications of following standards:

- EN 55022
- EN 55024

- EN 61000-3-2
- EN 61000-3-3
- FCC Part 15
- ICES-003
- EN 60950

Free and Open-Source Software

The A850 Telemetry Gateway contains third-party software packages which were made available to the public by their respective copyright owners under license terms which grant additional rights beyond mere usage of the software, such as the right to get, modify and redistribute the sourcecode of these packages.

These software packages are commonly called *Free and Open-Source Software* (FOSS). If you are interested in further informations and have Internet access, you might want to visit the following websites:

- The Free Software Foundation (<http://www.fsf.org/>)
- The Open Source Initiative (<http://www.opensource.org/>)

The sourcecode to these software packages and the toolchain needed to build the corresponding binaries are available as downloadable archives on Adcon's web site (<http://www.adcon.at>) or on digital storage media (contact Adcon's Support).

The FOSS software packages installed on the gateway are:

However, there are a few things you have to consider:

- Some software packages installed on the gateway are neither derived from nor licensed as FOSS like the bootloader, the data logging and retrieval software and the Configurator application. These packages are not available in source code form and may not be redistributed without explicit written permission of their respective copyright owners!
- Adcon provides support only for the A850 firmware packages distributed by Adcon running on the gateway hardware. Modified software or running the A850 firmware packages on other hardware is not supported by Adcon.
- Most software packages distributed with the gateway were modified by Adcon which means that they differ from the version available on the project's web sites. The authors of the original versions are not responsible for the packages distributed by Adcon and usually will not provide support for any packages other than those they distribute themselves.
- The software packages include disclaimers of liability in their license terms. Read them carefully, especially if you want to use, modify and/or distribute the software packages yourself.

The FOSS software packages installed on the gateway are:

Linux Kernel (<http://www.kernel.org>)

The kernel is the core of an operating system and provides basic resources (hardware drivers, task and memory management, ...) for the application that run on top of it. Further informations can be found on the following web sites: <http://www.arm.linux.org.uk/> (Linux port to the ARM processor architecture), <http://www.embeddedarm.com/linux/ARM.htm> (Linux port to the TS-7200 single board computer). Licensed under the terms of the GPL version 2.

GNU C Library (<http://www.gnu.org/software/libc/>)

The C library implements a large collection of standard API functions needed by the applications running on top of the operating system's kernel. Licensed under the terms of the LGPL with the following additional terms:

This file contains the copying permission notices for various files in the GNU C Library distribution that have copyright owners other than the Free Software Foundation. These notices all require that a copy of the notice be included in the accompanying documentation and be distributed with binary distributions of the code, so be sure to include this file along with any binary distributions derived from the GNU C Library.

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This package provides an NTP (network time protocol) server and client which supports devices with non-permanent network connections. Licensed under the terms of the GPL version 2.

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This package provides utilities to check and format data storage devices which use the FAT/VFAT filesystem. Licensed under the terms of the GPL version 2.

Dropbear (<http://matt.ucc.asn.au/dropbear/dropbear.html>)

Dropbear is a small SSH 2 server and client. This protocol is a replacement for the TELNET protocol and transmits data in encrypted form.

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loginrec.c

loginrec.h

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atomicio.c

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Expat (<http://expat.sourceforge.net/>)

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GazTek HTTP Daemon

This is a small, HTTP and HTTPS capable webserver. The original version only supports HTTP, support for HTTPS was added by Adcon. Licensed under the terms of the GPL version 2 or later.

Lrsz (<http://www.ohse.de/uwe/lrsz.html>)

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OpenSSL (<http://www.openssl.org/>)

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PPP (<http://ppp.samba.org/>)

This is an implementation of PPP (point-to-point protocol) which is used for Internet access over modem lines.

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Routines to compress and uncompress tcp packets (for transmission over low speed serial lines.

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Van Jacobson (van@helios.ee.lbl.gov), Dec 31, 1989:

- Initial distribution.

Modified June 1993 by Paul Mackerras, paulus@cs.anu.edu.au, so that the entire packet being decompressed doesn't have to be in contiguous memory (just the compressed header).

auth.c - PPP authentication and phase control.

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cbcp - Call Back Configuration Protocol.

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chap.c - Challenge Handshake Authentication Protocol.

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chap_ms.c - Microsoft MS-CHAP compatible implementation.

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eui64.c - EUI64 routines for IPv6CP.

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***Procps* (<http://procps.sourceforge.net/>)**

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***Putsms* (<http://www.meinemullemaus.de/software/smstools/index.html>)**

This package provides a utility to send an SMS using a GSM modem. Licensed under the terms of the GPL version 2 or later.

***Updatedd* (<http://www.philipp-benner.de/updatedd/>)**

This package provides a utility to update host entries on dynamic DNS servers. Licensed under the terms of the GPL version 2 or later.

***Util-linux* (<ftp://ftp.kernel.org/pub/linux/utils/util-linux/>)**

This package provides essential utilities for any Linux system. Licensed under the terms of the GPL.

***Zlib* (<http://www.zlib.net/>)**

This packages contains a library used to compress and uncompress data using the GZIP format.

zlib.h -- interface of the 'zlib' general purpose compression library
version 1.2.2, October 3rd, 2004

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Jean-loup Gailly jloup@gzip.org

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Zoneinfo (<http://www.twinsun.com/tz/tz-link.htm>)

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Java implementation of Crypt (<http://manticore.2y.net/Java/examples/>)

This implements the UNIX standard function "crypt" which is used to calculate password hashes. Licensed under the terms of the LGPL version 2 or later.

Concurrent programming classes (<http://g.oswego.edu/dl/classes/EDU/oswego/cs/dl/util/concurrent/intro.html>)

These utility classes help with concurrent Java programming. Note that the A850 only incorporates parts of this library. Released to the public domain.

Jakarta commons logging (<http://jakarta.apache.org/commons/logging/>)

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DOM for Java (<http://www.dom4j.org/>)

This library helps using XML, XPath and XSLT on the Java platform.

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