Supplementary information to
A850-2020

Contents

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1   General Information

This document provides supplementary information for setting up the new A850-2020.

It is written in a style of a HowTo to answer specific questions to setup the system.

It is not replacing the operating manual which is part of the equipment.

This information are also available on our wiki web-page.

2   Changes Firmware (quick info)

- HTTPS is automatically enabled after startup
- HTTP Port is disabled at the first startup, can be activated and port set in the Operating configuration
- Supports OPEN JAVA (Amazon Corretto)
- Launch Configurator is changed to download local startup with bundled Open Java (Amazon Corretto) or Java 8 (local startup batch file required - Please check the "How-to" information)
- Log is continuously in debug mode
- The root login for the command line interface (Console or SSH) is separated from the root login for A850 Configurator
- The upgrade does not require a reboot, reboot button is changed to upgrade button, wait for response and success message
- The GUI can import a complete A76x local downloaded file into the A850-2020
- Automatic daily backup of the configuration, 10-day history (can be found in the directory `/mnt/sd/backup/confman`)
- The SSH is automatically started on port 22 to allow to connect via any SSH connection

3   Changes Hardware

- Higher performance (see manual)
- Increase of RAM and Disk (see manual, 16 GB instead of 1 GB)
- Increase of data storage (768 Files instead of 168)
- Only 1 USB port
- Serial modem Connector is removed

4   Discontinued Functions

- Mobile applications
- FTP
- Telnet
- PPP Dialup
- SSH Tunnel Service
- GSM RTU dial up
- IP connection via serial connection
- DynDns

5   FAQ

5.1 How much data can be stored at the A850-2020?

General Info

The amount of data stored on the Micro SD-Card depends on the settings for the database parameter Database Interval and Database Values.

On the Micro SD-Card are 672 data containers. The A850-2020 is storing the data into these containers based on the parameter for interval and values. If the collected data in the temporary memory, which is stored in the RAM, reaches either the limit of the interval or the maximum number of data points the data will be flushed/moved into one of the containers on the Micro SD-Card.

If max size of one database container is about 1.6 MB. This would be ~ 1.1 GB in total for 672 containers on the Micro SD-Card.

At a setting of 14400 seconds of the database interval (storing the data every hour from the RAM to the Micro SD-Card), the A850-2020 can hold 28 days of data.

Database values

- 10000 values are ~ 128 KB of data on the MicroSD card

- 20000 values are ~ 255 KB of data on the MicroSD card

- 240000 values are ~1524 KB of data on the MicroSD card

6   How to …

6.1   How-to set the root password for the A850-2020 operating system?

Caution: Please save the root password for the operating system on a secure location. This root password cannot be reset easily.

6.1.1   General information about the root password

The root password for the operating system (OS) is required for all kind of system connections such as terminal connection (SSH or serial), WinSCP.

6.1.2   How-to set the root password

The login for terminal connection such as serial console or SSH and WinSCP is root.
The default password is root.
Please change the password for root and keep the information on a known good location.

To change the root password:

1.   Login via the serial console interface or SSH.
2.   Change to the OS.
3.   Use the command `/usr/bin/passwd` and follow the instruction.
4.   The system password for root is now set.

INFO: This does not change the password for root of your A850-2020 application configuration. To change the password for root of the configuration use the A850-2020 GUI. If you forgot the root password for the A850 application, use the information from here: Reset root password for the A850 application

5.   Use the command `exit` and disconnect.

6.2   How-to login to root account on A850-2020 application?

• The default login for the A850-2020 configuration is "root" and the password is "root".
• The system login for the command line interface (Console, operating system) is "root" and the password is "root".

6.3   How-to set date and time on the A850-2020?

6.3.1   General Info and Recommendation

NTP

We recommend enabling the NTP (Network Time Protocol) function. Your IT might help you to find the correct NTP server for your network.

Alternatively, you might want to use the NTP Serves from www.ntppool.org

RTC

The A850-2020 comes with a build in RTC (Real time clock). This allows the system to start up even if the NTP server is not available (due to a network outage)

NOTE: It's the A850 which is responsible to synchronize the time, the RTC only helps on the startup and does not synchronize on its own.

Caution: Be careful on changing the date and time through the interface. This will also have an impact on RTUs in field.

6.3.2   Set the time via serial interface:

1. Login via the console or SSH connection (user root)

2. Use the enter key to change to the menu

3. At the main menu choose "T" for Set date and time

4. Choose your time zone, format is Continent/City (e.g. "Europe/Vienna"). If you do not know the time zone, delete the time zone with backspace and hit the "TAB" button. To filter, type he first letter (or more) and use the "TAB" button.

5. Use the enter key to save the changes.

6. Adapt the date and time.

7. Use the enter key to confirm the changes.

8. You might also now sync the Hardware clock by changing into the operating system and use the command `hwclock --systohc`

9. Done, now you might check the date and time using the command `date`

6.4   How-to reset the root password for the A850-2020 application?

NOTE: This information is for reset the root password for the A850 application.
This action requires the root password for the A850 Operating System.

To reset the root password for the A850-2020 application (Adcon RTU Network configuration):

1. Setup the terminal connection via SSH or serial communication
    (serial connection with 115200 baud rate).

2. Login with root (INFO: this is the root account for the Operating System).

3. Change to the operating system.

4. Stop the A850-2020 application with the command
    `systemctl stop oag2`

5. Wait till the application is stopped, the terminal output will show `#`.

6. Enter the command
    `passwd`
    and follow the instruction to reset the password for the A850 configuration.

7. Start the A850-2020 application with the command
    `systemctl start oag2`

 FAQ

Q: The start of the A850-2020 shows an error message and does not start
A: Please try to use the command reboot. If the A850-2020 application still
    does not startup, contact the support team.

6.5 How to do an initial setup for the A850-2020

6.5.1 General Information about the setup

- Default IP-Address is 192.168.1.1.
- Default communication Protocol is HTTPS (self-signed) https://192.168.1.1 .
- SSH connection is enabled on port 22.
- No other ports enabled.
- Serial Console connection is same as for A850,
  – baud rate 115200
  – data 8 bit
  – parity none
  – stop 1 bit
  – flow control none.
- Terminal settings CR for send and receive.
- Necessary Software
  – Internet Browser
  – Java 1.8 or alternative Open Java (Amazon Corretto 8).

6.5.2 Recommended Software

- Browser, Mozilla Firefox or Google Chrome
- Java, Java 1.8 or Amazon Corretto 8
- A850 local startup (see 6.5)
- Terminal Software, "TeraTerm" or "PUTTY" (Tools_Software)
- Secure Copy, WinSCP
- Command line download, WGET

NOTE: You might use portable versions, these are easier to be transferred to other computer systems and can be installed on an USB stick.

6.5.3 Necessary Hardware

- Serial communication cable, cable and USB to serial converter comes with the shipment, please check.
- Network cable, a short patch cable comes with the shipment, please check.

6.5.4 Initial Startup of A850-2020 operating system

NOTE: You might skip this, but do not forget to do it.

NOTE: The default configuration of the A850-2020 starts as a DHCP Server at https://192.168.1.1 **Keep in mind if connecting the A850 to the LAN!**

1. Establish a Terminal connection via serial or SSH connection.
2. For the SSH connection you can connect directly to the network interface.
3. Power the A850-2020 and check the terminal output, wait for the login information.
4. Login with the user root, the default password is root.
5. Set the root password for the operating system (see 6.1.2).
6. Done, no further action necessary.

6.5.5 Adcon Telemetry Gateway A850-2020 application setup

NOTE: The default configuration of the A850-2020 starts as a DHCP Server at https://192.168.1.1 **Keep in mind if connecting the A850 to the LAN!**

NOTE: The A850-2020 application oag2 is compatible to the A850 Adcon Telemetry Gateway, all documents for the graphical user interface of the A850 are still valid

1. After the A850-2020 is started, the A850-2020 acts as an DHCP Server on https://192.168.1.1

2. Setup the local startup for the graphical user interface of the A850-2020 application "oag2 (see 6.6).

3. At the login dialog box login in with the default login details for root (password is root).

4. Lock the configuration.

5. Change into the TAB Users and change the password for root.

6. Create additional administrative user(s) for your regular work on the Adcon Telemetry Network and co-workers and "addUPI" application (addVANTAGE-Pro).

7. Save the configuration.

   - Change to the TAB Operating System and adapt the parameter, for the ports of the "https/http/SSH" you might contact your local IT for further support.
     - Database Interval (3600 to 86400), you might change to 3600 since the A850-2020 supports up to 672 database containers (= 28 Days data storage)
     - Database Values (10000 to 240000), you might change to 240000
     - HTTPS
     - HTTP
     - SSH

8. Change to the Tab Networking and except the parameter for the network, you might contact your local IT for further support.

9. You can now save the configuration and change the network connection but keep in mind that you might have to restart the A850-2020 due to changes in IP and port.

6.6 How-to create the local startup for A850-2020 Graphical User Interface?

6.6.1 General Information

The configuration of the A850-2020 can only be started with the local GUI startup. It supports JAVA, Amazon Corretto or the bundled version of Amazon Corretto.

6.6.2 Create the local GUI startup using the download from A850-2020
Local GUI startup with installed Java or Amazon Corretto

Note: To get to the gateways welcome page the A850 2020 starts with the default IP address 192.168.1.1 on the HTTPS port (443) if you have not changed the settings.

Note: You can create a script file(.bat) when you right click on any empty field/directory > New > Text document. You need to rename the .txt file and replace the ending ".txt" with ".bat" (example: A850start.bat).

1. Click on the Download Configurator button on the Welcome page of the A850.

2. Save the file.

3. Unzip the file.

4. Move or copy the content of `oag2config_0.0.1-1\var\www\java` to a more useful folder (e.g. "C:\adconapps\A850").

5. Create a script file (e.g. "a850gui.bat") and use the line
   `java -jar a850gui.jar -host:0.0.0.0 -port:80`
   and replace the host and port to match with your A850 settings and save the file.

6. Copy the script file to the directory "oag2config_0.0.1-1\var\www\java" from here you need to start the .bat file you have created to startup the A850 configurator.

7. You can now start the GUI with a double click on the script file.

8. When you are at the login window of the gateway please choose the correct Host protocol HTTP or HTTPS(in case you are using port 443 which is also set by default).

9. Login to the gateway with your credentials

Local GUI startup from alternative download for installed JAVA

NOTE: The download can also be used for A850 with FW 3.7.1 or higher.

1. Download the compressed file
   http://register.adcon.at/a850_local_startup_java/a850.zip

2. Unzip the file to a folder on your local disk (e.g. "C:\adconapps\a850").

3. Edit the file _a850-192.168.1.1_for_java.bat and adapt the IP and port settings for your A850.

4. You can now start the GUI with a double click on the script file.

Local GUI startup from alternative download with bundled Amazon Corretto (~190 MB)

1. Download the compressed file
   http://register.adcon.at/a850_local_startup_corretto/a850.zip

2. Unzip the file to your local disk (e.g. "C:\adconapps\A850").

3. Edit the file "_a850-192.168.1.1_for_amazon-corretto.bat" and adapt the settings for your A850 and the path if you choose a different folder.

4. You can now start the GUI with a double click on the script file.

6.7 How-to Start / Stop / Reboot / Shutdown A850-2020 system?

Caution: . Do not use any other commands on the A850-2020 operating system unless our support team sends you a special instruction.

6.7.1 Start

Plug in the main power supply cable, the A850-2020 will start up the operating system (Debian Buster IoT, V4.19.165-bone58) and start the application A850-2020 (oag2). After the application A850-2020 (oag2) finished loading the LED status shows PWR on and USR might blink from time to time.

6.7.2 Start / Stop the application A850-2020

NOTE: This is only necessary for certain debug actions. The application is started automatically after the OS booted and stopped automatically if necessary, e.g. if upgrade is applied or reboot.

The application will stop, writes the collected sensor data to the local database and disable login via "addupi". You still will be able to communicate via the serial interface as well as via the SSH connection (WinSCP, CLI via SSH).

NOTE: Telnet is no longer supported.

The welcome page and other static pages are available but not active.

Stop the application A850-2020

1. Login through the serial console (115200 baud) with the OS-user "root".
2. Change into the operating system.
3. Use the command
   ```
   systemctl stop oag2
   ```

Start the application A850-2020

1. Login through the serial console (115200 baud) with the OS-User "root".
2. Change into the operating system.
3. Use the command
   ```
   systemctl start oag2
   ```

6.7.3 Reboot the A850-2020

Reboot via command line interface

1. Login through the serial console (115200 baud) with the OS-User root.
2. Choose R for "R ... Reboot the gateway".
3. The A850-2020 application is logging out the user root and rebooting.
4. Alternative use the operating shell and use the command reboot.

Reboot via button

NOTE: The function of the "RESET" button has changed to a soft reboot. The system does not reset.

6.7.4 Shutdown / Power Off the A850-2020

NOTE: The hard shut down known from A850, remove main power and press reset button won't work anymore, the A850-2020 will restart!

In some cases, it will be necessary to completely shut down the A850-2020, e.g. to put the A850-2020 back on stock or prepare for transport.

1. Disconnect the main power supply cable from the A850-2020.
2. Login to the A850-2020 system with the User account "root".
3. At the main menu change into the OS.

4. Use the command
   ```
   shutdown 1
   ```
5. The A850-2020 will now do a controlled stop, after 1 minute, of the application and stop.
6. After the A850-2020 is stopped it will switch off completely.

6.8 How-to get the debug output of the A850-2020 log messages?

NOTE: The output of the debug logs might be necessary for analyzing Adcon Telemetry issue or A850-2020 system issues.

To get the debug output of the log messages:

1. Open a terminal connection (serial console or SSH) to the A850-2020.
2. Login with the root account.
3. In the main menu change into the Operating System.
4. Enable the log to file function in your terminal program.
5. Use the command
   ```
   tail /var/log/syslog -f
   ```
6. You are now able to see details about the A850-2020 application as well as system messages
   ```
   To stop the output, use CTRL+C
   ```
7. To get the minimal output of the log messages use the command
   ```
   tail /var/log/messages -f
   ```

FAQ

Q: Which software can be used for the terminal session?
A: You might use "PUTTY" or "TeraTerm", both are open source and free of charge.

Q: Can I get only the basic information of the log output?
A: Yes, in the main menu, choose Logging and select "T ... System log (continuous)".

Q: Can I filter the log output?
A: Yes, add the option `|grep {FILTER-OPTION}`, e.g. `|grep 55555` to filter for the RTU ID 55555.

6.9 How-to A850-2020 interpret debug menu system log?

6.9.1 General information

- Y ... System log (once) .... shows the content of the log message file.
- G ... System log (continuous) ...... shows the actual log messages (to stop, use CTRL+C).
- The interpretation for both outputs of the log messages is identically.

6.9.2 Examples of log messages

- Poll log output for an RTU Type S4 or 5 using XDATA
  ```
  Aug 17 16:15:16 beaglebone polld: polling RTU 51751 using XDATA
  Aug 17 16:15:18 beaglebone polld: poll succeeded for RTU 51751
  (1 packet, 293 bytes)
  ```

```
The poll for the RTU with the ID 51751 was successful, 1 packet
with 293 in total was transferred
```

- Poll failed for an GPRS RTU using XDATA

```
Aug 17 16:16:30 beaglebone polld: polling RTU 8654322 using XDATA
Aug 17 16:16:45 beaglebone polld: checking delay succeeded for RTU
4000
Aug 17 16:16:57 beaglebone polld: pinging wireless modem...
Aug 17 16:17:00 beaglebone polld: poll failed for RTU 8654322
(modem error): timeout (0 packets, 90 bytes)
Aug 17 16:17:19 beaglebone polld: checking delay succeeded for
RTU 856987
```

```
This RTU is an GPRS RTU, other log messages can happen due to the
parallel poll activity on each GPRS Port and wireless connector.
```

6.10 Special information for experts: How-to set system/hardware clock?

Caution: These hints are only for ADCON Experts for debugging actions.

System clock and hardware clock

- Show time of the hardware clock
  `hwclock --show`

- Sync the system clock to the hardware clock
  `hwclock --systohc`

- Sync the hardware clock to the system clock
  `hwclock --hctosys`

NOTE: The system clock is not reset during a reboot. After a shutdown, the system clock is
started with the time from the RTC module (hardware clock).

6.11 How-to reset the A850 to factory default, delete configuration, delete database?

Caution: This procedure will delete the configuration and remove the stored data and set the A850 back to factory default configuration.

6.11.1 General

The A850-2020 default network configuration is **192.168.1.1**, startup as **DHCP Server**.

SSH port is configured on **PORT 22**. HTTP port at default configuration is disabled, can be enabled via A850 Configurator. NO GPRS ports or wireless modems configured.

The default root password for A850-Configuration is "root".

The default login page is available on https://192.168.1.1

IMPORTANT: This will only clear the section configuration and data, the root password for the operating system will remain the same. If you forgot the root password for the operating system, contact your ADCON SUPPORT person.

Information

Before you reset the A850-2020 you might want to do a full backup.

1. Plug in an USB Stick
2. Login to the CLI via SSH or Console.
3. In the main menu change into M ... USB Drive.
   Use M to mount the USB. Use B to back up the complete content of the micro SD card to the USB drive.
4. After the copy is finished use U to unmount the USB drive. Done.

Alternatively use WGET for a full backup of configuration and database via the network interface.

Another option via the network interface is WinSCP, change into the directory **/mnt/sd** and copy the complete content to your local disk.

6.11.2 Reset the factory default

Via Command Line Interface, SSH or Console

1. Login to the A850-2020.
2. In the main menu change into the Operating system.
3. Use the command **systemctl stop oag2**.
4. Wait for the prompt.
5. Change into the directory of the mounted MicroSD **mnt/sd** using the command **cd /mnt/sd**
6. Use the command **rm * -r**.
7. Use the command **reboot** or use the command **exit** and use the menu option "Reboot".

Via WinSCP

1. connect to the A850 and login with root for the operating system.

2. change into the directory `mnt/sd`.

3. Delete the content in the directory.

4. Now force a reboot via the command line interface or use the reset button. You might have to unplug the main power for a few minutes to restart the A850-2020.

6.11.3 Remove configuration only via command line

1. Login to the A850-2020.

2. In the main menu change into the Operating system.

3. Use the command `systemctl stop oag2`.

4. Wait for the prompt.

5. Change into the configuration directory of the mounted MicroSD `mnt/sd/confman` using the command `cd /mnt/sd/confman`.

6. To delete the configuration, use the command `rm config*`.

7. Use the command `reboot` or use the command `ex it` and use the menu option "Reboot".

6.11.4 Remove database only via command line

1. Login to the A850-2020.

2. In the main menu change into the Operating system.

3. Use the command `systemctl stop oag2`.

4. To delete the database files, use the command `rm /mnt/sd/dbman/db*`.

5. Use the command `reboot` or use the command `exit` and use the menu option "Reboot".