

# 8.5 System

## System

The system tab includes various properties, configurations, and settings of the system and contains the following pages:

SYSTEM	ADMINISTRATION	SOFTWARE	STARTUP	SCHEDULED TASKS	MOUNT POINTS	BOARD	CERTIFICATE STORAGE
LED CONFIGURATION	TIME SYNC	BACKUP / FLASH FIRMWARE	REBOOT				

- SYSTEM: properties and settings of the system.
- ADMINISTRATION: settings of the administration for various services.
- SOFTWARE: settings of the packages.
- STARTUP: process management.
- SCHEDULED TASKS: settings of the scheduled tasks.
- MOUNT POINTS: settings for the mount points.
- BOARD: board configuration.
- CERTIFICATE STORAGE: certificate management panel.
- LED CONFIGURATION: settings for the LEDs.
- TIME SYNC: time synchronization of WCC Lite
- BACKUP/FLASH FIRMWARE: management of the configuration files and firmware image upgrade.
- REBOOT: device reboot page.

## System

Basic aspects of the device can be configured. These include time settings, hostname, system event logging settings, language and theme selection.

## System Properties

### General Settings

SYSTEM PROPERTIES

General Settings

Logging

Language and Style

Local Time

Tue Jul 11 13:37:50 2023

Sync with browser

\*It is not advisable to synchronise time from web browser

Hostname

wcc-lite

Timezone

UTC

The general settings of the WCC Lite device are defined as follows:  
Local Time: Current local time.  
Hostname: The label that is used to identify the device in the network.  
Timezone: A region of the globe that observes a uniform standard time. The time zone number indicates the number of hours by which the time is shifted ahead of or behind UTC – Coordinated Universal Time. Some zones are, however, shifted by 30 or 45 minutes.

### Logging

SYSTEM PROPERTIES

General Settings

Logging

Language and Style

System log buffer size

16

16

kiB

External system log server

0.0.0.0

External system log server port

514

External system log server protocol

UDP

Write system log to file

/root/syslog

Log output level

Debug

Cron Log Level

Normal

Logging settings of the WCC Lite device are defined as follows:

System log buffer size: The number of records that are recorded before writing these data to the disk.

External system log server: IP address of the server.

External system log server port: An endpoint of communication with the server.

External system log server protocol: A standard that defines how to establish and maintain a network connection: UDP - User Datagram Protocol, TCP - Transmission Control Protocol.

Write system log to file: The name of the file with the path to it.

Log output level: Log output messages can be grouped by their importance to the user. Levels are described in the table below.

Log output level	Description
Emergency	System is unusable
Alert	Action must be taken immediately
Critical	Critical conditions
Error	Error conditions
Warning	Potentially hazardous conditions
Notice	Normal conditions that might need action
Info	Information messages
Debug	Debugging messages

Cron Log Level: Cron has three output levels to choose from when writing to its logs. Possible options are described in the table below.

Cron log level	Description
Debug	Debugging messages
Normal	General administrative messages
Warning	Potentially hazardous conditions

## Language and styles

SYSTEM PROPERTIES	
General Settings	Logging
Language and Style	
Language	auto
Design	Wcc

Language and Style settings are defined as follows:  
Language: The language of the Web interface of the device.  
Design: The theme of the Web interface of the device.

## Administration

### Administrator Password

PASSWORD INSTANCE	
Password	<input type="password"/>
Confirmation	<input type="password"/>

The administrator password can be changed. To change it the combination of digits and letters of the alphabet should be entered and then confirmed in the confirmation field by typing in again.

**i** It is advised not to use the default password.

### Password policy

PASSWORD POLICY INSTANCE	
Enable Password Policy	<input type="checkbox"/>
<b>i</b> Enable or disable password policy	
Minimum Password Length	<input type="text" value="6"/>
Minimum Number of Upper Case Letters	<input type="text" value="0"/>
Minimum Number of Lower Case Letters	<input type="text" value="0"/>
Minimum Number of Digits	<input type="text" value="0"/>
Minimum Number of Special Characters	<input type="text" value="0"/>
Check for Similiar Characters	<input type="checkbox"/>
<b>i</b> Enable or disable repeated character check in password	

Users can configure a password policy for future password changes to create a safer password. Here password requirements can be made such as minimum password length, minimum number of upper or lower case letters, digits and special characters. By ticking the box for checking similar characters, a new password will be required not to have repeated characters.


### SSH Access


WCC Lite has a compact secure shell (SSH) server named Dropbear. Multiple options are available to be changed via the WCC Lite web interface, ranging from automatic firewall rules to authentication flexibility.


DROPBEAR INSTANCE


Delete

**Interface**


☐ gsm: 

☐ lan: 


☐ wan: 

☐ wan6: 


☒ unspecified

 Listen only on the given interface or, if unspecified, on all


**Port** 22

 Specifies the listening port of this Dropbear instance


**Password authentication** ☒

 Allow SSH password authentication

**Allow root logins with password** ☒

 Allow the root user to login with password

**Gateway ports** ☐

 Allow remote hosts to connect to local SSH forwarded ports

Add

Dropbear options are defined as follows:

Interface: Listen only on the given interface or on all, in unspecified.

Port: Specifies the listening port of this interface.

Password authentication: Allow SSH password authentication.

Allow root logins with password: Allow the root user to log in with the password.

Gateway ports: Allow remote hosts to connect to local SSH forwarded ports.

## SSH-keys

SSH-KEYS

Here you can paste public SSH-Keys (one per line) for SSH public-key authentication.

SSH keys can be added via the WCC Lite web interface. They might be helpful if the user logs into the device frequently and does not want to always have to write his credentials.

## Login Attempt limiter

 This feature is available from firmware version 1.9.1

**LIMITER CONFIGURE**

Enable

☐

?

Enable or disable the limiter.

Attempt Count

?

Attempt count before banning.

Attempt Period

?

Attempt period which attempt counts must happen.

Ban length

?

Ban length once attempts hit threshold.

Enforce a limit of invalid access attempts and deny access from a virtual port for a set time.

## RADIUS Client

**RADIUS SERVER CONFIGURE**

Add or Remove RADIUS client configuration

Enable	Hostname / IP	Timeout	Shared secret
This section contains no values yet			

Add

RADIUS client redirects user authorization to a remote server, which controls users and their access. A user can add multiple RADIUS clients by clicking add and entering the information required.

## HTTPS certificate

**CERTIFICATE**

Certificate file

WCC Lite by default is shipped with a default certificate for HTTPS connection. This certificate only enables connecting to the device via a web interface and might cause warnings from a web browser. To eliminate them, the user can use his certificate to secure access to the web interface.

Users can use certificates uploaded to a certificate storage. It should be noted that only valid certificates with \*.pem extension can be used. The certificate to be used is validated every time the device is restarted.

If validation fails, a default certificate is used. This is done to prevent users from losing device access via the web interface.

For the new certificate to come into effect user should restart the device.

## Software

Individual packages can be installed via the WCC Lite web interface. They can either be installed using a web link or selected from the pre-defined feeds.

Actions

Configuration

No package lists available

Update lists

Free space: 100% (1.77 GB)

Download and install package:

OK

Filter:

Find package

Various options can be selected when installing packages, however, default ones should work well enough and it's advised only to change them for advanced users.

Actions

Configuration

```
dest root /
dest ram /tmp
lists_dir ext /var/opkg-lists
option overlay_root /overlay
option check_signature 1
```

Submit

Reset

Feeds from which packages are listed for the update are defined in the Open PacKaGe management (OPKG) configuration that can be changed easily from the user interface.

```
src/gz designated_driver_base http://downloads.openwrt.org/snapshots/trunk/ar71xx/generic/packages/base
src/gz designated_driver_kernel http://downloads.openwrt.org/snapshots/trunk/ar71xx/generic/packages/kernel
src/gz designated_driver_telephony http://downloads.openwrt.org/snapshots/trunk/ar71xx/generic/packages/telephony
src/gz designated_driver_elseta http://downloads.openwrt.org/snapshots/trunk/ar71xx/generic/packages/elseta
src/gz designated_driver_packages http://downloads.openwrt.org/snapshots/trunk/ar71xx/generic/packages/packages
src/gz designated_driver_routing http://downloads.openwrt.org/snapshots/trunk/ar71xx/generic/packages/routing
src/gz designated_driver_luci http://downloads.openwrt.org/snapshots/trunk/ar71xx/generic/packages/luci
src/gz designated_driver_management http://downloads.openwrt.org/snapshots/trunk/ar71xx/generic/packages/management
# src/gz designated_driver_targets http://downloads.openwrt.org/snapshots/trunk/ar71xx/generic/packages/targets
```

Submit

Reset

Specific distribution feeds can also be added for special cases if standard ones do not fit the needs.

```
# add your custom package feeds here
#
# src/gz example_feed_name http://www.example.com/path/to/files
```

Submit

Reset

## Status

Installed packages		Available packages
	Package name	Version
Remove	4diac-forte	1.11.0-2020-06-16
Remove	base-files	169-v1.8.3-14-g52ff730
Remove	bc	1.06.95-1
Remove	beardropper	1.0.0
Remove	blkid	2.28-1
Remove	block-mount	2016-07-24-add7dc21f..01d
Remove	boost	1.65.1-2
Remove	boost-atomic	1.65.1-2
Remove	boost-chrono	1.65.1-2
Remove	boost-filesystem	1.65.1-2
Remove	boost-program_options	1.65.1-2
Remove	boost-system	1.65.1-2
Remove	boost-thread	1.65.1-2
Remove	busybox	1.24.2-3
Remove	ca-certificates	20210119-1
Remove	chat	2.4.7-9
Remove	comgt	0.32-27
Remove	comgt-ncm	0.32-27
Remove	curl	7.50.0-1
Remove	data-export	1.1.2-2024-07-04
Remove	dnsmasq	2.78-1
Remove	dropbear	e20180719-1
Remove	e2fsprogs	1.43.1-2
Remove	elseta-chronosd	1.0.2-2022-04-13
Remove	elseta-chrony	4.1-2
Remove	elseta-dlms	1.0.7-2022-09-06
Remove	elseta-dnp3	2.4.1-2024-05-24
Remove	elseta-events-log	1.3.0-2024-04-25
Remove	elseta-excel-util	1.9.1-2024-05-28
Remove	elseta-gsmc	1.1.16-2024-08-02
Remove	elseta-iec10x	1.12.3-2024-07-15

The installed packages tab indicates every installed package in alphabetical order. Users can also remove certain packages by clicking the Remove button on the left.


Installed packages		Available packages	
A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P
Q	R	S	T
U	V	W	X
Y	Z	#	
	Package name	Version	Size (.ipk) Description
Install	base-files	169-v1.8.3-14-g52ff730	0
Install	bc	1.06.95-1	0
Install	beardropper	1.0.0	0
Install	blkid	2.28-1	0
Install	block-mount	2016-07-24-addd7dc21f..01d	0
Install	boost	1.65.1-2	0
Install	boost-atomic	1.65.1-2	0
Install	boost-chrono	1.65.1-2	0
Install	boost-filesystem	1.65.1-2	0
Install	boost-program_options	1.65.1-2	0
Install	boost-system	1.65.1-2	0
Install	boost-thread	1.65.1-2	0
Install	busybox	1.24.2-3	0

In this tab, the user can search for a package by the first letter of its name. Those packages are available but not installed, so the user can choose to install them by clicking on the Install button on the left.

# Startup

All of the processes that have init.d scripts can optionally be enabled or disabled. This can be very useful if the user intends to use only part of the processes.

Start priority	Initscript	Enable/Disable	Start	Restart	Stop
0	sysfixtime	Enabled	Start	Restart	Stop
10	boot	Enabled	Start	Restart	Stop
10	gsm-init	Enabled	Start	Restart	Stop
10	system	Enabled	Start	Restart	Stop
11	svcsd	Enabled	Start	Restart	Stop

 Users should not disable processes that are essential for device operation as it can render the device unusable.

```
# Put your custom commands here that should be executed once
# the system init finished. By default this file does nothing.

exit 0
```

Submit

Reset

Users can optionally run scripts and programs on device startup by putting them into a `/etc/rc.local` file. This file can be updated from the WCC Web interface.

## Scheduled tasks

```
MAILTO=info@elseta.com
0 18 1-15 * * du -h --max-depth=1 /
```

Various tasks can be scheduled with the system crontab. New tasks can be included by creating and saving new rules conforming to cron rules. WCC Lite accepts full cron configuration functionality.

The example in the pictures shows how to execute the disk usage command to get the directory sizes every 6 p.m. on the 1st through the 15th of each month. E-mail is sent to the specified email address.

## Mount points

### Global settings



GLOBAL SETTINGS

Generate Config

Generate Config

Find all currently attached filesystems and swap and replace configuration with defaults based on what was detected

Anonymous Swap

Mount swap not specifically configured

Anonymous Mount

Mount filesystems not specifically configured

Automount Swap

Automatically mount swap on hotplug

Automount Filesystem

Automatically mount filesystems on hotplug

Check filesystems before mount

Automatically check filesystem for errors before mounting

File system mount point configuration window.

Generate Config: Find all currently attached filesystems and swap and replace configuration with defaults based on what was detected.

Anonymous Swap: Mount swap not specifically configured.

Anonymous Mount: Mount filesystems not specifically configured.

Automount Swap: Automatically mount swap on hotplug.

Automount Filesystem: Automatically mount filesystems on hotplug.

Check filesystems before mount: Automatically check the filesystem for errors before mounting.

## Mounted file systems

MOUNTED FILE SYSTEMS				
Filesystem	Mount Point	Available	Used	Unmount
/dev/root	/rom	0.00 B / 12.75 MB	100% (12.75 MB)	
tmpfs	/tmp	28.36 MB / 29.48 MB	4% (1.13 MB)	
/dev/sda3	/overlay	833.27 MB / 898.37 MB	0% (2.64 MB)	
overlayfs:/overlay	/	833.27 MB / 898.37 MB	0% (2.64 MB)	
tmpfs	/dev	512.00 KB / 512.00 KB	0% (0.00 B)	
/dev/sda1	/data	935.69 MB / 1.36 GB	2% (16.31 MB)	Unmount
/dev/sda1	/tmp/cache/cloud-logs	935.69 MB / 1.36 GB	2% (16.31 MB)	Unmount
/dev/sda1	/tmp/cache/cloud-alarms	935.69 MB / 1.36 GB	2% (16.31 MB)	Unmount
/dev/sda1	/tmp/lib/redis	935.69 MB / 1.36 GB	2% (16.31 MB)	Unmount

List of mounted file systems, some of which can be dismounted manually.

## Mount points

**MOUNT POINTS**

Mount Points define at which point a memory device will be attached to the filesystem

Enabled	Device	Mount Point	Filesystem	Options	Root	Check
<input type="checkbox"/>	UUID: 44e3cc6c-139b-410c-86b1-db099c5887c5 (not present)	/mnt/sda1	?	defaults	no	no
<input type="checkbox"/>	UUID: cc85fea3-836c-4ddc-9828-f35147f21318 (not present)	/mnt/sda2	?	defaults	no	no
<input type="checkbox"/>	UUID: 1f1c6431-d632-4e11-9c12-3c913d3986e7 (not present)	/mnt/sda3	?	defaults	no	no
<input type="checkbox"/>	Label: overlay (/dev/sda3, 929 MB)	/overlay	ext4	defaults	overlay	no

Add

EditDelete

EditDelete

EditDelete

EditDelete

List of mount points which can be enabled, disabled or deleted.

## Swap

The swap section is used to describe the virtual memory that can be used if there’s a lack of main memory. WCC Lite does not use any virtual memory by default.

**SWAP**

If your physical memory is insufficient unused data can be temporarily swapped to a swap-device resulting in a higher amount of usable RAM. Be aware that swapping data is a very slow process as the swap-device cannot be accessed with the high datarates of the RAM.

Enabled	Device
This section contains no values yet	

Add

It should be noted that virtual memory might do a lot of reading and writing operations. As WCC Lite uses an SD card as an additional flash memory, it is highly advised to not use a swap to reduce wearing.

## Board

**BOARD CONFIGURATION**

Port 1 modeRS-485

Save & ApplySaveReset

Here a user can configure PORT1 as RS-485 or RS-232.

## Certificate storage

CERTIFICATES

Below is a list of succesfully uploaded certificates and their properties

File name	Valid from	Valid until	Issuer	Subject
This section contains no values yet				

Choose File

No file chosen

Upload

Save & Apply

Save

Reset

This section is intended to upload certificate files and view information about them.

## LED configuration

WCC Lite has three LEDs that can be configured: WAN, LAN and WLAN. All of the LEDs have a default configuration which should fit most of the cases.

Delete

Name

WLAN

LED Name

wcc-lite:blue:wlan

Default state

☐

Trigger

netdev

Device

wlan0

Trigger Mode

☒ Link On
☒ Transmit
☒ Receive

Add

Save & Apply

Save

Reset

All possible LED configuration options: Name: Name of the LED configuration.

LED Name: Colour and location of the LED. These can be changed, however, normally they should be left unchanged.

Default state of the LED: On/Off.

Trigger: One of the various triggers can be assigned to an LED to change its state. Possible values are shown in the table below.

Table. Possible trigger for an LED:

Trigger type	Description
none	No blinking function assigned to the LED
defaulton	LED always stays on
timer	Blinking according to a predefined timer pattern
heartbeat	Simulating actual heartbeats
nand-disk	Flashed as data is written to flash memory
netdev	Flashes according to link status and send/receive activity
phy0rx, phy0tx, phy0radio, phy0tpt, phy0assoc	Flashed on WiFi activity events
usbdev	Turned on when the USB device is connected. Applicable for modems

Device: Network interface which is going to be tracked.

## Time sync

TIMESYNC	
Enable	<input checked="" type="checkbox"/>
Timeout	<input type="text" value="600"/>
NTP	
Enable	<input checked="" type="checkbox"/>
Priority	<input type="text" value="1"/>
Provide NTP server	<input type="checkbox"/>
NTP server candidates	<div><div>0.openwrt.pool.ntp.org</div><div>1.openwrt.pool.ntp.org</div><div>2.openwrt.pool.ntp.org</div><div>3.openwrt.pool.ntp.org</div></div>
IEC101	
Enable	<input checked="" type="checkbox"/>
Priority	<input type="text" value="2"/>
DNP3	
Enable	<input checked="" type="checkbox"/>
Priority	<input type="text" value="3"/>
IEC104	
Enable	<input checked="" type="checkbox"/>
Priority	<input type="text" value="4"/>
<div><div>Save &amp; Apply</div><div>Save</div><div>Reset</div></div>	

This service syncs WCC Lite time with the protocols shown. Here user can also select priority levels of protocols which sync with WCC Lite.

## Time synchronization configuration


The time synchronization configuration allows users to set protocol priorities when multiple protocols are connected to WCC Lite. The TIMESYNC function also enables users to define a timeout period.

Based on the assigned priorities, each protocol attempts to synchronize WCC Lite, starting with the highest priority -1. If synchronization is unsuccessful within the defined timeout, the next protocol in the priority list is used.

If the first protocol successfully synchronizes WCC Lite, the timeout is reset, and the first protocol retains its priority. If the first protocol fails, the system moves to the second protocol. In this case, both the first and second protocols remain available for synchronization.

This process continues through the priority list. If synchronization reaches the last protocol on the list, all four protocols will be available to synchronize WCC Lite.

WCC Lite has an NTP client to synchronize dates and times with external sources. It is not the only source for synchronization, it can also be done using methods defined in IEC-60870-5 protocols.

 Please take care choosing a time sync method. If both NTP and IEC 60870-5 protocol slave interface time sync methods are activated simultaneously, they can interfere if there is a time difference. We strongly recommend using a single-time sync method to prevent time interference.

Time synchronization options are defined as:

Enable NTP client: The local time of the device will sync with external time servers.


Provide NTP server: Turn the device into a local NTP server.

NTP server candidates: The network time protocol servers.

## Backup/flash firmware

Software update allows to upgrade of the software running in WCC Lite. It is recommended to keep the device up to date to receive the latest features and stability fixes.

Backup archives contain complete WCC Lite configuration that can be restored at any time. A file will be downloaded by your browser when creating a backup. This file can be later uploaded to the web page to restore configuration.

 The generated backup archive should only be applied to the same firmware version it was generated. Applying backup to a different firmware version might render some parts of the operating system unstable or even unusable

**Actions** **Configuration**

**BACKUP / RESTORE**

Click "Generate archive" to download a tar archive of the current configuration files. To reset the firmware to its initial state, click "Perform reset" (only possible with squashfs images).

Download backup: **Generate archive**

Reset to defaults: **Perform reset**

Get System Diagnostic Report: **Generate archive**

To restore configuration files, you can upload a previously generated backup archive here.

Restore backup:  No file chosen **Upload archive...**

**FLASH NEW FIRMWARE IMAGE**


Upload a sysupgrade-compatible image here to replace the running firmware. Check "Keep settings" to retain the current configuration (requires a compatible firmware image).


Keep settings: ☐

Keep only network settings: ☐


Allow unsigned firmware: ☐

Image:  No file chosen **Flash image...**

 Since version 1.8.3, users can save network settings before upgrading the firmware, such as firewall settings, traffic rules, interfaces etc. To do so, before upgrading firmware, the "Keep only network settings:" box should be checked.

 Since version 1.10 all firmware files are signed and have different file extensions. If there is a need to downgrade a firmware version from 1.10, the *Allow unsigned firmware* box should be checked.

A user can choose to keep existing settings after an upgrade. Marking the Keep Settings checkbox preserves files listed in `/etc/sysupgrade.conf` and `/lib/upgrade/keep.d/`. It is advised to do a clean install and use backup files to restore settings later if a user intends to make a major system upgrade.

 Uploading firmware images, to preserve RAM, will stop all Protocol HUB processes. After upload, you will have 2 minutes to proceed with firmware flash or to cancel it. After 2 minutes, the firmware file will be deleted and Protocol HUB processes will be restarted.

Actions

Configuration

This is a list of shell glob patterns for matching files and directories to include during sysupgrade. Modified files in /etc/config/ and certain other configurations are automatically preserved.

Show current backup file list

Open list...

```
## This file contains files and directories that should
## be preserved during an upgrade.

# /etc/example.conf
# /etc/openvpn/
```

Submit

Reset

A file name /etc/sysupgrade.conf can be updated via the WCC Web interface. To preserve additional files user should add them to the backup file and press Submit. To get the whole list of files that would be backed up press Open list... It is advised to check it before doing a backup or an upgrade while keeping settings.

# Reboot

SYSTEM

ADMINISTRATION

SOFTWARE

STARTUP

SCHEDULED TASKS

MOUNT POINTS

LED CONFIGURATION

BACKUP / FLASH FIRMWARE

REBOOT

Reboot

Reboots the operating system of your device

Perform reboot

This reboots the operating system of the device.