

Document History

Rev.	SW	Changes	Author(s)
A	1.6p5	<ul style="list-style-type: none">• Initialization of this document history.• Updated blink codes which are used as of 1.6p3.	Mull 2020-08-20

1 Scope

This document describes the station indications, the local setup of a station, and the related web administration interface of the Charge Point Software delivered with the ABL Single Board Computer SBC.

The Charge Point Software implements a smart controller for the ABL charging products like wall-boxes and charging stations. Wallboxes, charging stations and poles will be denoted as units in the following. From the point of view of the Charge Point Software, there are no major differences in setup and operation.

Intended for back-end operators, there is also an integration manual describing the detailed feature set, the supported products, the behavior regarding the charging operations, and the OCPP interface.

This document applies to software release 1.1. Details on the software release history can be found in the release notes.

2 Status Indication

This section describes the status indications using LEDs of the ABL Single Board Computer SBC3 and the related GSM terminal implemented by the Charge Point Software.

2.1 SBC3 Status LEDs

2.1.1 Notation


The following table describes the symbols used for the LED activity in this section. For indicating the various states three colored LEDs are used: yellow, red, and green. Thus the symbols will be used in colored variants, below.

Display:	State:
	constantly off
	constantly on
	blinking slow (1 Hz)
	blinking with medium speed (2,5 Hz)
	blinking fast (5 Hz)
	blinking in heart-beat mode (2 short pulses followed by a pause)
	short pulse, blinking slow (1 Hz)

2.1.2 System Startup

During the startup phase the combination of the states of the three LEDs is relevant. The following table describes the possible states.



Display:	State:
	boot loader active
	boot loader performing flash update
	boot loader starts kernel
	Kernel has started

	Init has started




2.1.3 Normal Operation

With the last state of the above table init has started and normal operation of the system begins. As of this event the LEDs are used individually for indicating the states of multiple sub-systems. That is, during normal operation, each LED represents an information not related to the other LEDs. The combined state of all LEDs for normal operation in the absence of errors and special events intentionally resembles to the final system startup state "Init has started". In the following tables, for each LED, states are listed ordered with decreasing priority.




Green LED: System and bus manager state

Display:	State:
	Bus manager started/wake-up call
	Bus manager auto probing
	Normal operation

Yellow LED: Application state

Display:	State:
	JVM launching application
	Web admin access (displayed for 10s after page load/update)
	Application starting pppd
	Application ready
	Application entered


Red LED: Connectivity and errors




Display:	State:
	System error (EVSE, Meter, RFIDM)
	Performing software update (download and application part)
	No network connectivity
	No backend connectivity
	No error

2.2 GSM Terminal LED

The GSM terminal has only one green LED, although it has three plastic LED lenses. The following table describes the indications used with this single LED.

Green LED: GSM state

Display:	State:
	Constantly on: SIM card error or SIM card missing
	Blinking fast (5 Hz): Initialisation of modem

	Blinking (2,5 Hz): Initialisation of connectivity
	Blinking (1 Hz): Not registered / network search
	Blinking slow (one pulse every 3 seconds): Registered, full service

3 Setup and Integration

3.1 Contacting the Web Administration Interface

In order to set up parameters or to perform diagnostics locally follow the listed steps to contact the web administration interface of the SBC:

1. Power up the SBC. The SBC needs about two minutes to complete startup. Only after this initialization period the web administration interface becomes accessible.
2. Connect your computer to the SBC via an ethernet connection; e.g. by directly using a network cable or an ethernet hub.
3. Try to open <http://169.254.1.1:8300/> in your web browser.
4. In some cases you need to configure the network adapter in your computer with the parameters listed below. The exact steps depend on the operating system you are using. Afterwards, repeat step 2.
 - Network: 169.254.0.0
 - Netmask: 255.255.0.0
 - Address: 169.254.1.2
5. Your browser shall now display the web administration interface as depicted in screenshot 1 in the next section.

3.2 The Web Administration Interface

The web administration interface is a small web server running on the SBC which can be operated with a standard web browser. Its main purpose is to setup parameters and to check if all components of the Charge Point work properly.

3.2.1 Entry Page

The entry page of the web administration interface is the **Overview** tab (screenshot 1). This page provides general information about the state of the unit and the Charge Point software.

Depending on the state, the connectors will be colored green (no charging), yellow (plugged, but not charging), blue (charging) or red (faulted). Hovering over them with the cursor will give more details about the state of the individual connector. Table 1 provides the full list of the states.

The row "Hardware State" and "Connectivity State" provide self-explaining information about the hardware health and the state of the (mobile) connection between the unit and the back-end including information about the modem.

If the unit can reach and register itself at the configured back-end, the Connection State should be green, as shown in the screenshot below.

ABL Charge Point Administration

Overview

Configuration

Devices

Diagnosis

Logs

Maintenance

Charge Point Overview

System State

Outlet State:



1 2

Hardware State:

Hardware is fine.

Connectivity State:

Connection to network and backend established. Fine.

Station Data

Chargebox ID: pole2
Model: 3P4400
Serial number of ChargePoint: 3P440000069
Serial number of Controller: 808829000178

System Data








Systemsoftware Version: 1.1rc2
System Time: 2017/07/26 11:53:17 UTC
System Uptime: 2:40
IP-Adresses: 172.31.0.61 (ppp0)
169.254.1.1 (eth0)
172.16.81.135 (eth0)
127.0.0.1 (lo)
Last accesses: 172.16.1.25 - 2017/07/26 11:52:59 UTC
172.16.80.201 - 2017/07/26 11:24:24 UTC
172.16.81.112 - 2017/07/26 11:52:33 UTC

Page loaded at: 2017/07/26 11:53:17 UTC acc. to operating system's time; This page reloads every 120 seconds.

Copyright 2017 ABL, <http://www.abl.de>, info@abl.de

Screenshot 1: Entry page of the web administration interface

Table 1: Description of the states and their corresponding icons

Icon:	State:	Description:
	MISCONFIGURED	Invalid configuration
	UNKNOWN	Status unknown
	NOT PRESENT	Device not present
	A	Waiting for EV
	B1	EV connected, waiting for authorization
	B2	EV connected and authorized
	C2	Charging
	E	Charging point disabled or temporarily not available
	F	Error

3.2.2 Configuration Page

The tab **Configuration** (see screenshot 2a and 2b) offers the possibility to view and change basic parameters of the charge point.

In order to edit the connection-, backend- and occp-related properties, click on the edit button of the section.

Configuration Overview

Key Properties

Model: 3P4400 (Rev. 1)

Serial number of ChargePoint: 3P4400123467

Access Point Properties

Access Point Name: m2m.cda.vodafone.de

Username: abl@abl.de

Password: abl

OCPP Properties

OCPP Version: 1.5

Central System Address: http://172.30.1.3:8082/steve/CentralSystemService

Transport is via SOAP unencrypted

ChargeBox Id: CB1337j

ChargeBox Port: 7890

ChargeBox Address: /ChargePoint

Screenshot 2a: Configuration page - top part

The following parameters can be edited:

- The Access Point Name (APN) and the (optional) user name and password of the mobile connection may be set by filling the text fields next to the corresponding variable names.
- The ChargeBox-ID can be defined; it identifies the whole charge point on the OCPP level.
- The desired Central System Address has to be inserted.
- The OCPP version to be used for communication may be selected in a drop-down menu. (Currently 1.5 or 1.6)
- The port of the SBC, open for communicating with the backend can be changed to a number between 1000 and 10000. The default of this port is 7890. Please keep in mind, that port 8300 is assigned to the WebAdmin interface.
- The Address of the SBC for communication can also be adjusted. The custom address should start with a "/". The default is "/ChargePoint".

When all settings are entered, click "Save". Then, the SBC needs a restart, so that the new configuration takes effect. Therefore, visit the maintenance page and click the button for a soft reboot.

The settings for authorization behavior and transaction behavior as well as the Log Level displayed on the bottom part of the page (screenshot 2b) can be set via OCPP by the backend. See the Integration manual for further information and explanation of the parameters.

The key properties (serial number, model) and the properties of the loadbalancer can only be changed by ABL-certified installers. They are usually set at the factory site when the Charge Point unit is assembled.

Authorization Properties

Lock early:	no
Free Charging:	yes
Free Charging when offline:	no
Shorten UUIDs:	yes
UID for Free Charging:	0000000000000000
Local Preauthorization:	yes
Local Authorization if offline:	yes

Transaction Manager Properties

PowerTimeout:	0 sec
How to handle new transaction:	Enable charging with ID for free charging
How to handle old transaction:	Reenable charging with previous UserID
How to handle expired transaction:	Enable charging with ID for free charging

LoadBalancer Properties

Type:	No Loadsetter activated
Max. Current:	16 A
Bus-Ids for PF:	none (enter e.g. 1,7,13; only for systems with priority function)

Additional Properties

Log Level:	TRACE
Comments:	

After changing the configuration above, the system needs to be rebooted (soft or hard). A reboot can be performed on the maintenance page.

Page loaded at: 2017/07/26 12:13:14 UTC acc. to operating system's time;
Copyright 2017 ABL, <http://www.abl.de>, info@abl.de

Screenshot 2b: Configuration page - bottom part

3.2.3 Loadbalancing (for ABL-certified installers)

The section for the load balancer has been removed. The content is now available in two versions:

- an internal powerpoint presentation for the writers of the multilingual technical manual, the service department and the sales department from ABL

- a multilingual PDF handbook for ABL-certified installers

3.2.4 Certificates Page

This page shows the available and installed certificates and certificate requests in the system. Since version 1.3 the WebSocket protocol supports TLS encrypted connections.

ABL Charge Point Administration

Overview Configuration Devices Products **Certificates** Diagnosis Logs Maintenance

Certificates Overview

Certificate signing Requests

Id	Subject	Action
cb-csr	DE / ABL / Chargebox 808829000033	Download Download Post Production CSR
cp-csr	DE / ABL / Chargepoint 3W221500123	Download

Chargepoint / Chargebox (Client) Certificates

Id	Subject	Issuer	Action
cb-self-crt	DE / ABL / Chargebox 808829000033	DE / ABL / Chargebox 808829000033	Built In Download Delete

Central-System (Server) Certificates

Id	Subject	Action
cs-abl	DE / ABL Sursum Bayerische Elektrozubehoer GmbH & Co. KG / server15.abl.lokal	Delete
cs-nttdata	imob-qa.nttdata-emea.com	Delete

Upload certificate(s): No file selected.

Page loaded at: 2018/04/04 14:32:00 UTC acc. to operating system's time;
Copyright 2017 ABL, <http://www.abl.de>, info@abl.de

Screenshot 4a: Certificates page

This page has three parts (see screenshot 4a):

- **Certificate Signing Requests:** Certificate signing requests are generated by the SBC itself. They can be downloaded by the owner of the station in order to get signed by either the authority center related to the owner (use simple Download buttons) or by ABL (use Download Post Production CSR button). As a result a new charge point certificate is created which can then be stored back onto the SBC.
- **Stored Client Certificates:** This section lists the chargepoint (alias chargebox) certificates. This is a storage for the certificates used by the SBC to authenticate itself with the central system server.
- **Trusted Server Certificates:** This section lists the central system certificates. This is a storage for certificates in which the SBC trusts regarding the server side. When this list is empty the SBC will not be able to connect to any backend server.

The button "Upload" permits to upload a certificate to the SBC: This can be either a new client certificate (in response to a CSR) or server certificate (when integrating the SBC into an infrastructure).

To activate the mode WebSocket protocol with TLS encrypted you need to:

- upload necessary trusted certificates (for the central system to be authenticated);
- set the parameter *Central System Address* on the page **Configuration** (see screenshot 4b). The prefix *wss://* indicates the secure connection.

ABL
Charge Point Administration

Overview
Configuration
Devices
Products
Certificates
Diagnosis
Logs
Maintenance

Configuration Overview

Key Properties

Model:	3W2215 (Rev. 1)
Serial number of ChargePoint:	3W221500123

Access Point Properties edit

Access Point Name:

Username:

Password:

OCPP Properties edit

OCPP Version:	1.5
Central System Address:	wss://server15.abl.lokal:8084/steve/websocket/CentralSystemService
	Transport is via WebSockets encrypted
ChargeBox Id:	CB-TLS-20171220
ChargeBox Port:	7890
ChargeBox Address:	/ChargePoint

Screenshot 4b: Setup of Central System Address for WebSocket TLS-encrypted protocol

3.2.5 Maintenance page

ABL Charge Point Administration

Overview Configuration Devices Products Certificates Diagnosis Logs **Maintenance**

System Maintenance

System Restart

Soft Reset: Restart application and drivers. The operating system will continue working. It may take up to 30 seconds, until the application can be accessed again.

[Soft reset](#)

Hard Reset: Restart complete system including operating system. It may take up to 120 seconds, until the application can be accessed again.

[Hard reset](#)

Software Update

The upload of the file itself can take several minutes - depending on the speed of your network. After a successful upload but before the update-process itself, a new page will be displayed.

Please choose the update file from your disk and click the Upload-button then.

[Browse...](#) No file selected. [Upload](#)

System Diagnosis

Set a start and end date for filtering the logging files. If the dates are empty all available logging files will be added.

Start date (yyyy-mm-dd):

End date (yyyy-mm-dd): [Generate](#)

Click the Generate-Button to start the acquisition of diagnostic data. As soon as the data is available, the Download-Button will become active.

[Download](#)

Screenshot 3d: Maintenance page

Via the Maintenance tab you can issue a soft or hard **reset** of the SBC. Just click on the button, next to the desired reset type.

Further on, you can upload an update file and start a **system update**. Click on "Browse..." to select a local update file, provided by ABL. By clicking "Upload" you will be redirected to a new page and the file is transferred to the SBC where the update process is initiated. Please make sure, that the connection between your computer and the SBC stays stable during the upload. The update process will take around 5 minutes. After this time please go back to the overview page and ensure that the software version has changed.

You can also request a diagnostic file from the chargepoint. This is the same mechanism like requesting diagnostic data via OCPP. You can choose a start and end date to limit the number of log files. If left empty, all available log files will be added. By clicking the "Generate" button, you will be redirected to a new page, telling you that the acquisition is running. After approximately 5 minutes the acquisition and packing of the files has finished and the "Download" button will become active. Now you can locally save the .zip file and send it to ABL.

<h1>ABL</h1>	SBC Charge Point Software	Version: 1.6p5 Date: 2020-08-20
	Technical Setup Manual	Dept.: R&D Software

for further analysis. The Download-button will only become active, if the diagnostic files are available for download. As long as the acquisition is running, it will be disabled.

3.2.6 Further pages

Since version 1.2 of the ChargePoint software, the tab **Products** (not displayed in the screenshots above) can be utilized by ABL-certified installers to configure master/slave group installations. Therefore, please refer to the general handbook for installers.

The tab **Diagnosis** provides information about the devices of the ChargeBox. The colored circle on the left of a device reflects its actual state. Hover over it with the cursor to get detailed information.

In the tab **Logs** you can see content of four different log files in ascending order.

Via the **Maintenance** tab you can issue a soft or hard reset of the SBC. Just click on the button, next to the desired reset type. Further on, you can upload an update file and start a system update. Click on "Browse..." to select a local update file, provided by ABL. By clicking "Upload", the file is transferred to the SBC and the update process is initiated. Please make sure, that the connection between your computer and the SBC stays stable during the upload.