Product change notification (PCN)

Title / short description	Firmware update for CHARX control modular
Affected article category	Charging technology for electromobility
Change category	Function, Software modification
Change number	CXW230140-01
Reason for PCN/PDN Revision	Firmware update

Purpose/objective of the change

Firmware function extension and debugging

Detailed description of the change

Please refer to the attached Release Notes documents for details of the change.
The firmware is available in the download area of the e-shop under the corresponding product pages.

Identifying characteristics

The firmware version will be increased. The firmware version is not printed on the item and can only be read from the module. The V/C item revision will increase and is printed on the packaging.

Start of Production (SOP)	-	**Last Time Delivery (LTD)**	-
Effective date (EOP)	2024-01-31	**End of Service (EOSR)**	-
End of Sales (EOS)	-		

Short-term change (< 6 months) or discontinuation (< 12 months), due to:

- ☒ Software / Firmware Bugfix
- ☐ Short-term delivery stop by supplier
- ☐ Short-term recall by supplier
- ☐ Force majeure
- ☐ Product improvement with customer benefits
- ☐ Others

Attachments

- Preliminary CHARX SEC-xxxx Release Notes 1.5.pdf
- Preliminary Change Notes CHARX calibration law 1.5.pdf
- Material_list.csv
- PCN-CXW230140-01_DE
- PCN-CXW230140-01_EN

2023-12-8 VDMA24903_1.0

Phoenix Contact GmbH & Co. KG
Flachsmarktstraße 8
32825 Blomberg, DE

Tel.: +49 (0) 5235 3-00
Fax: +49 (0) 5235 3-41200
E-Mail: info@phoenixcontact.com

phoenixcontact.com

Material list

Item		Hardware / Firmware		Substitute item	
Item no.	Type	old	new	Item no.	Type
1139034	CHARX SEC-1000	1.4.4	1.5.0		
1139022	CHARX SEC-3000	1.4.2	1.5.0		
1139018	CHARX SEC-3050	1.4.2	1.5.0		
1139012	CHARX SEC-3100	1.4.2	1.5.0		
1138965	CHARX SEC-3150	1.4.2	1.5.0		

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phoenixcontact.com

CHARX control modular

PRELIMINARY CHANGE NOTES

This document applies to the following articles

Article	Article-No.
CHARX SEC-3150	1138965
CHARX SEC-3100	1139012
CHARX SEC-3050	1139018
CHARX SEC-3000	1139022
CHARX SEC-1000	1139034

1. General Remarks

This document describes the changes on the software of the charge controller **CHARX control modular** in the product life cycle.

The actual controller software files can be downloaded at the product web site, e.g. phoenixcontact.net/product/1138965.

The firmware can be updated manually via the web-based management of the controller, for details please read the manual, available at phoenixcontact.net/product/1138965.

Alternatively, the software can be updated remotely from a backend system via mobile communication and the Open Charge Point Protocol OCPP. In this case, please supply your backend operator with the respective software file.

The charge controller CHARX SEC-1000 can be updated via the CHARX SEC-1000 Configurator software, available for download at phoenixcontact.net/product/1139034.

In case multiple charging controller are connected in one client server system, the software will be automatically distributed to the connected server controller and connected extension modules.

The software of the charging controller is composed of several modules, which can be updated separately, or within one full system update.

Please note: Data volume for full system update

A full system update requires a data volume of > 100MB per update. To avoid unnecessary mobile communication costs, it is recommended to check the release notes, if a full system update is necessary.

2. Table of Content

3. Overview of the software modules

Table 3.1: Software modules running on the CHARX control modular controller

Application	Function
System Monitor	Supply of actual system data
Controller Agent	Interface between different charging controller on the backplane bus and the ethernet network
OCPP 1.6	OCPP 1.6J Backend-Communication
Modbus Client	Connection to energy meter via Modbus TCP
Modbus Server	Provides the Modbus TCP interface for remote control and monitoring of the charging controller
JupiCore	Data collection and handling between charging points and application software
Load-Management	Local load management and current distribution
Webserver	Web-based Management of the charging controller
Base module FW	Firmware of the charging interface
Eichrecht-Agent	Central Agent for calibration law

4. Overview of the released software revisions

Table 4.1: Release overview for the full system releases and application specific SW releases

System	System Monitor	Controller Agent	OCPP 1.6	Modbus Client	Modbus Server	JupiCore	Load-Mgmt	Web-Server	Base Module FW	Eichrecht-Agent
1.0.1	1.0.5	1.0.6	1.0.8	1.0.0	1.0.2	1.0.5	1.1.6	1.0.22	1.0.7	
1.1.2	1.0.6	1.1.0	1.1.2	1.0.0	1.0.2	1.1.0	1.1.13	1.1.1	1.0.9	
1.1.5	1.0.8	1.1.1 _RC1	1.1.9	1.0.0	1.0.3 _RC2	1.1.1	1.1.14	1.1.5	1.0.9	
1.1.11	1.0.9 _RC4	1.1.1 _RC3	1.1.16 _RC1	1.0.0	1.0.2	1.1.2 _RC2	1.1.15 _RC5	1.1.7 _RC5	1.0.9	
1.2.0	1.2	1.2	1.2	1.2	1.0.2	1.2	1.2	1.2	1.2	
1.2.1	1.2.0	1.2.1	1.2.0	1.2.0	1.0.3 RC5	1.2.1	1.2.1	1.2.1	1.2.1	
1.2.3	1.2.0	1.2.2	1.2.0	1.2.0	1.0.3 RC6	1.2.1	1.2.3	1.2.1	1.2.1	
1.3.0	1.3.0	1.3.3	1.3.3	1.2.0	1.3.0	1.3.1	1.3.1	1.3.1	1.3.2	
1.3.2	1.3.0	1.3.3	1.3.3	1.2.0	1.3.0	1.3.1	1.3.1	1.3.1	1.3.2	
1.4.1	1.4.1	1.4.1	1.4.1	1.2.0	1.3.0	1.4.1	1.4.1	1.4.1	1.4.1	1.0.29
1.4.2	1.4.2	1.4.2	1.4.2	1.4.2	1.4.2	1.4.2	1.4.2	1.4.2	1.4.4	1.0.30
1.5.0	1.5.0	1.5.0	1.5.0	1.5.0	1.5.0	1.5.0	1.5.0	1.5.0	1.5.0	1.0.34

*RC# = Release Candidate which was deployed

The system releases are released as complete packages with all software modules available at that time, according to the table above. Interim versions of certain applications are only published without integration into a full system release.

The release notes and descriptions for software modules relevant for calibration law can be found in the calibration law documentation package under “Downloads” on the product website at phoenixcontact.net/product/1138965.

5. Release Notes by Application

5.1 System

	System - V1.1.2
Dependencies to other SW Modules	
Installation Remarks	Can only be installed via raucb-file only, includes the other services as well
New Functions	• Updated OpenSSL to 1.1.2 • Updated RAUC to 1.5.1 • Added ISO 15118 functions (eg. EVCC-ID publishing) • Added functions in OCPP to improve RFID card handling • Automatic Logout at the websites / changed user management
Corrected Failures and Optimizations	• Improved boot time • Improved cellular network connection handling (also available via sig-file) • Improved CPU usage publishing • Several Fixes of the Controller Agent improving charging stability [FIX] • Improved stability of Backend connection in case of poor reception • Loadmngmnt. current redistribution and reactivating paused cars [FIX] • Improved website stability in case of missing information from agents For more information, please have a look at the different agent versions
Known Limitations	

	System - V1.1.5 Inofficial release for quick Fixes
Dependencies to other SW Modules	Can only be installed via raucb-file only
Corrected Failures and Optimizations	Improved Parts for Backend Connection • System reinitializes after exceptions at websocket connection [FIX] • delete RFID authorization after connection timeout • Bootnotification trigger direct at valid websocket connection • Improve websocket connection timeout handling [FIX] • Add trigger events for condition >Backend Online/Offline<

	System - V1.1.11 Inofficial release for quick Fixes
Dependencies to other SW Modules	Can only be installed via raucb-file only
Corrected Failures and Optimizations	Improved Parts for Modem reconnection in case of bad cellular reception • reduce exception count for restart system from 50 to 25 • Additional SIM (error-)information from Modem into logging

	System - V1.2.0
Dependencies to other SW Modules	
Installation Remarks	Can be installed via raucb-file only, includes the other services as well
New Functions	Installed applications are also installed on connected client modules
Corrected Failures and Optimizations	• Improved boot time, Improved loading time for websites • The propagation of raucb-updates to client modules caused issues in some systems For more information, please see single Agent information
Known Limitations	

	System - V1.2.3
Dependencies to other SW Modules	
Installation Remarks	Can be installed via raucb-file only, includes the other services as well
New Functions	
Corrected Failures and Optimizations	• Configuring the network interface from DHCP to a static IP could lead to problems causing the device to still be on the DHCP-address. For more information, please see single Agent information
Known Limitations	

	System - V1.3.0
Dependencies to other SW Modules	
Installation Remarks	Can be installed via raucb-file only, includes the other services as well
New Functions	• Allows connection with CHARX 4.3” LCD Display
Corrected Failures and Optimizations	• Fixed a bug which can cause the devices to not appear with a UID in the field For more information, please see single Agent information
Known Limitations	

	System - V1.3.2
Dependencies to other SW Modules	
Installation Remarks	Can be installed via raucb-file only, includes the other services as well
New Functions	
Corrected Failures and Optimizations	• Fixed bug causing IP doubling in ev2000 subnet (which caused client controllers to toggle the availability). • Fixed time synchronisation between EV2000 and EV3000 • Fixed USB Suspend, which caused the modem to be not available, which caused long offline situations of several days (at least sporadically with old modem 7692, not seen with new modem 7620) • Better recognition of modem connection loss • Fixed theoretical bug of not using idledisconnect and defaultRoute, which might cause customer applications to not get internet access via Eth0. • Fixes an error where under certain circumstances the modem is no longer accessible
Known Limitations	

	System - V1.4.1
Dependencies to other SW Modules	
Installation Remarks	Can be installed via raucb-file only, includes the other services as well
New Functions	• Allows use of Eichrecht Features • Allows use of CHARX RFID/NFC-PCB • Allows Export and Import of complete charging park configurations • Persistent logging of system logs • Log rotation of system logs For more information, please see single Agent information
Corrected Failures and Optimizations	• Fixed potentially unlimited growth of dhcp lease files • Fixed an issue were configuration files of SystemConfigManager could get corrupted and thus reinitialized due to massive parameter changes using the REST API or due to writes during poweroff
Known Limitations	

	System - V1.4.2
Dependencies to other SW Modules	
Installation Remarks	Can be installed via raucb-file only, includes the other services as well
New Functions	
Corrected Failures and Optimizations	• Automatic reset of interface in case Modem is not responding
Known Limitations	• Upgrade from a release <= V1.2.1 to a latest release may lead to unconfigured charging points

	System - V1.5.0
Dependencies to other SW Modules	
Installation Remarks	Can be installed via raucb-file only, includes the other services as well
New Functions	• Support of star topology (changes in Jupicore, System Monitor, System Config Manager, Website and Modbus Server)
Corrected Failures and Optimizations	• Fix NTFS formatted SD cards not getting unmounted on eject
Known Limitations	

5.2 System Monitor

	System Monitor - V1.0.6
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Changed polling interval of system parameters from 15 to 10 seconds • Publish CPU usage by user, system and idle • DatetimeMonitor: Current time is published in ISO 8601 format
Known Limitations	

	System Monitor - V1.0.7
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Information will be published via MQTT with retain flag set
Known Limitations	

	System Monitor - V1.0.8
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• ModemMonitor: Publishing of extended error report
Corrected Failures and Optimizations	
Known Limitations	

	System Monitor - V1.2.0
Dependencies to other SW Modules	
Installation Remarks	
New Functions	ModemMonitor: • Support of new RC7620 modem device • Added logging of KPIs to system monitors log file SystemMonitor: • Publishing of installed packages list • Publishing of file system disk space usage • Publishing of file usage in data folder • Added logging of KPIs to system monitors log file
Corrected Failures and Optimizations	
Known Limitations	

	System Monitor - V1.3.0
Dependencies to other SW Modules	
Installation Remarks	
New Functions	Publish mqtt topics with build information.
Corrected Failures and Optimizations	• Fixed throwing an exception, when OPKG package is only installed half • System Monitor stalling when the modem was deactivated
Known Limitations	

	System Monitor - V1.4.1
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• Publish mqtt topics with build information • Periodic logging of network interface status • Configurable/changed log intervals for SystemMonitor • Added /data listing in log download
Corrected Failures and Optimizations	• Fixed throwing an exception, when OPKG package is only installed half • System Monitor stalling when the modem was deactivated
Known Limitations	

	System Monitor - V1.4.2
Dependencies to other SW Modules	
Installation Remarks	No changes
New Functions	
Corrected Failures and Optimizations	
Known Limitations	

	System Monitor - V1.5.0
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Supports more than one neighbour in the neighbourhood detection, to support star topology
Known Limitations	

5.3 Controller Agent

	Controller Agent - 1.1.0
Dependencies to other SW Modules	
Installation Remarks	Includes Controller-Firmware V1.0.9
New Functions	

Corrected Failures and Optimizations	• ISO 15118:
	  ○ MeteringReceiptReq crashes on reception [FIX]
	  ○ Forwarding of ISO 15118 messages to EV3000 crashes CA-Agent [FIX]
	  ○ Composing of ChargeParameterReq erroneous [FIX]
	  ○ Parsing of PowerDeliveryReq erroneous [FIX]
	  ○ Improved logging of ChargeParameterReq
	  ○ SECC discovery was stopped after BCB toggling [FIX]
	  ○ Check of V2G header in EXI response [FIX]
	  ○ Tracing in EXI decoder [FIX]
	  ○ TCP connection was not opened after charging pause [FIX]
	  ○ ContractSignatureCertChain was not given properly to JC [FIX]
	  ○ Minor bug fixes
	• Fixed faulty comparison of IP addresses on setups with many EV3000 devices

Known Limitations	

	Controller Agent - 1.2.0
Dependencies to other SW Modules	
Installation Remarks	Includes Controller-Firmware V1.1.0 Pull up Version to 1.2.0
New Functions	
Corrected Failures and Optimizations	• Updated CANopenNode-Stack • Fixed issue with CR in strings parameter
Known Limitations	

	Controller Agent - 1.2.1
Dependencies to other SW Modules	
Installation Remarks	Includes Controller-Firmware V1.2.1
New Functions	
Corrected Failures and Optimizations	
Known Limitations	

	Controller Agent - 1.2.2
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	Under specific circumstances, the Controller Agent was restarted multiple times due to a bad status check
Known Limitations	

	Controller Agent - 1.3.0
Dependencies to other SW Modules	
Installation Remarks	Includes Controller-Firmware V1.3.0
New Functions	
Corrected Failures and Optimizations	• Add read permission to log files for customer software version • Discovers multiple EV2000 clients without delay of 60 seconds
Known Limitations	

	Controller Agent - 1.3.3
Dependencies to other SW Modules	
Installation Remarks	Includes Controller-Firmware V1.3.0
New Functions	
Corrected Failures and Optimizations	• Add read permission to log files for ‘others’ • Discovers multiple EV2000 clients without delay of 60 seconds • Fixed occurring NaN message at EEM157EE
Known Limitations	

	Controller Agent - 1.4.1
Dependencies to other SW Modules	
Installation Remarks	Includes Controller-Firmware V1.4.0
New Functions	
Corrected Failures and Optimizations	• Add configuration parameter CanNetworkAutoAddressing to disable automatic can addressing • Fix behavior, where not all charge points where found • Improved stability due to optimization in CANOpen communication (CAN slave went to pre-operational state) • Improved logging in case of network slaves
Known Limitations	

	Controller Agent - 1.4.2
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Change trace level from INFO to DEBUG for message “Service discovery request from [IP=…]" • Process code line of controller firmware exception into log messages, if FatalError occurs • Minor performance improvement
Known Limitations	

	Controller Agent - 1.5.0
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Fixed a problem with detection of client charging controllers connected via ethernet • Fixed wrong assignment of digital outputs
Known Limitations	

5.4 OCPP 1.6

	OCPP 1.6 - V1.0.9
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Internal MeterInterval time is changed in case of OCPP-ChangeConfiguration of MeterSampleInterval Internal time is available after reboot
Known Limitations	

	OCPP 1.6 - v1.0.10
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• Logging level changeable from OCPP-Backend side and WEB side with new config key into the OCPP customer key list • Minor changes into logging function to reduce messages from not configured charging points
Corrected Failures and Optimizations	• OCPP - SendLocalList without uid data tags deleted the internal LocalAuthorizationList
Known Limitations	

	OCPP 1.6 - v1.0.11
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• OCPP - ClearChargingProfiles without payload data at request deleted all saved charging profiles
Known Limitations	

	OCPP 1.6 - v1.0.12
Dependencies to other SW Modules	WebServer 1.0.24 or higher
Installation Remarks	
New Functions	• BackendURL includes now chargeBoxId (WebServer V1.0.24)
Corrected Failures and Optimizations	• OpenSSL Crypthography parameter set • Bootnotification sent without `chargeBoxSerialNumber"` deleted parameter at webserver • Minor Websocket (re)connection improvement
Known Limitations	

	OCPP 1.6 - v1.0.13
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Delay after try to (re)connect websocket connection • Logging of unplanned incoming messages without exceptions
Known Limitations	

	OCPP 1.6 - v1.0.14
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Syntax at OCPP (GetConfiguration) Response was wrong [FIX] • App LED was not connected to system variable [FIX] • Actualization of system variable from connection state missing [FIX] • Improve handling of StopTransaction; RemoteStop • Handling of charging transaction at RemoteReset function [FIX]
Known Limitations	

	OCPP 1.6 - v1.0.15
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	GlobalMaxCurrent: • MaxCurrent changes has effect to charging station parameter [FIX]
Known Limitations	

	OCPP 1.6 - v1.0.16
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• RC Version without exception at comparing versions of agent [FIX] • Delete OCPP telegram syntax validation and block sending messages while disconnected • minor changes at exception handling at communication class • reduce logging at modem debugging
Known Limitations	

	OCPP 1.6 - v1.0.17
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• Presenting RFID a second time to finish charging process; • Add PresentingRFIDEndCharging key to OCPP custom configuration to enable/disable function
Corrected Failures and Optimizations	
Known Limitations	

	OCPP 1.6 - v1.1.0
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Refactoring Websocket connection; refactoring Task handling; • shutdown routine [FIX] • problem with availability status at startup [FIX] • reading values from JupiCore at startup; • minor fixes into handling of APP-LED; • minor changes in logging
Known Limitations	

	OCPP 1.6 - v1.1.1
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• DateTime Format into OCPP telegram date renew "yyyy.MM.ddThh.mm.ssZ" • MQTT topics with valid json data strings
Corrected Failures and Optimizations	• Second RFID authorize release charging process • KeepAlive interval from agent default 5 sec
Known Limitations	

	OCPP 1.6 - v1.1.2
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• consume_handler was running endlessly (and did not register the connection loss) [FIX] • introduce timeout for connect() in one case connect() did not return [FIX]

	OCPP 1.6 - v1.1.3
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• HeartbeatInterval at Bootnotification not limited to least 60 seconds • ICCID with checksum at BootNotification
Corrected Failures and Optimizations	• System reinitializes after exceptions at websocket connection [FIX] • delete RFID authorization after connection timeout • GetConfiguration with key:[] supported
Known Limitations	

	OCPP 1.6 - v1.1.4
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• Locking/Unlocking action triggered from OCPP agent
Corrected Failures and Optimizations	• Store/reload OCPP Configuration key/value with data type boolean
Known Limitations	

	OCPP 1.6 - v1.1.5
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• Add trigger event "Bootnotification" to ocpp "trigger message"
Corrected Failures and Optimizations	• Bootnotification trigger direct at valid websocket connection
Known Limitations	

	OCPP 1.6 - v1.1.7
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• Add DataTransfer functionality for changing ChargePointConfiguration • Add trigger events for condition >Backend Online/Offline<
Corrected Failures and Optimizations	

	OCPP 1.6 - v1.1.9
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• BootNotification was not sent for ICCIDs with less than 20 digits [FIX] • Improve websocket connection timeout handling [FIX] • Ignoring related RFID reader at >FreeMode< function
Known Limitations	

	OCPP 1.6 - v1.1.10
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• StatusNotification status F if digital_input_message for status F is configured
Corrected Failures and Optimizations	• Changes regarding elapsed parking time with no car [FIX] • No double status notification in error case [FIX]
Known Limitations	

	OCPP 1.6 - v1.1.11
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• change user_text variable [FIX] • Clean update folder after update/in case of an error [FIX] • Reboot system after raucb update. OCPP-Agent restart after ipk.sig file update “InstallationFailed” FirmwareStatusNotification in case of errors
Known Limitations	

	OCPP 1.6 - v1.1.12
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• Additional SIM (error-)information from Modem into logging
Corrected Failures and Optimizations	
Known Limitations	

	OCPP 1.6 - v1.1.13
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Separate WebsocketPingTimeout at Websocket.connect() • reduce exception count for restart system from 50 to 25 • delete unused ModemRestartTimeout
Known Limitations	

	OCPP 1.6 - v1.1.14
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• SendLocalList Response with Accepted state
Known Limitations	

	OCPP 1.6 - v1.1.15
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• No ConnectionTimeOut without connected vehicle [FIX]
Known Limitations	

	OCPP 1.6 - v1.1.16
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Reboot behavior respects now update types (ocpp-ipkg,ipkg,raucb)
Known Limitations	

	OCPP 1.6 - v1.1.17
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Reboot after update switched unavailable connectors to available [FIX]
Known Limitations	

	OCPP 1.6 - v1.1.18
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Handle old JupiCoreVersion without exception. • Additional information log at invalid Software-Update
Known Limitations	

	OCPP 1.6 - v1.1.19
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Disable option for Websocket ping function
Known Limitations	

	OCPP 1.6 - v1.1.20 // --> v1.2.0
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• NewBackendURL function restart agent after changing
Known Limitations	

	OCPP 1.6 - v1.2.1
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• state change from "communication error" to "no error" is now sent to backend. • Queuing of messages at offline mode; Add resend function in error case; send StatusNotification of all connectors after going online ; reduce logging text at meter Heartbeat; refactor ReservationID parameter StartTransaction; Feature of time synchronize • Switch state from >preparing< to >suspendedEV< at starting of charge sequence after charging release without reaction from car; State >finishing< at ending of a charge sequence • MeterStop value into Stoptransaction as int (not String) value
Known Limitations	

	OCPP 1.6 - v1.3.0
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• Reboot-All (3000er+2000er) with OCPP Reset[type:Hard]
Corrected Failures and Optimizations	• ftp connect now works with included port number in url • If external trigger now requests MeterValue while no charging is ongoing, no transactionID will be transmitted. • Avoid sending of duplicate status notifications • Send GetConfiguration parameter with correct data type • Expand MeterValuesSampledData value; Fix Metervalue Payload bug • Expand MeterValuesSampledData with Current.Offered and Temperature • Expand type validation; Fix GetConfiguration error at CSL type after new type validation. • Avoid intermediate bootNotification in case of disconnection • Fixed timeout error during ‘copy diagnostics’ • StopNotification after RemoteUnlock and finishing • Fix connection_time_out notification • Avoid StatusNotification "Preparing" in case B1 with released charging (state A1-B1-B2-C2) • No ‘finishing’ in state A (only in state B) • Switch to ‘Preparing’ in case of a testsetting, after connection_timeout (RFID and Cable only) and in case of connecting a new car. Change faulted state to available state in case of authorization timeout. • Change faulted state to finishing state in case of connection timeout
Known Limitations	

	OCPP 1.6 - v1.3.3
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Fix startup behaviors with connected car(s) in different use cases
Known Limitations	

	OCPP 1.6 - v1.4.1
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• Support for “Eichrecht” • Export-Import functionality of configuration • IEC 61851 state “E” ends charging processes
Corrected Failures and Optimizations	• Fix with empty folder at GetDiagnostics • MeterValueSampleInterval = 0 disables sending MeterValues • Optimize StatusNotification at changes from B2 to B1 • Fix for empty configuration sections into DataTransfer command • Fix problem with MeterValueSampleData / sending no values • Fix GetDiagnostic download behavior at retries=0 • Changes of Log-Level now saved and taken over at runtime • In case of HardReset switch all connectors to unavailable before reset. • Fix behavior at Trigger StatusNotification of con_id=0 • Fix data storage problems at GetDiagnostics • Fix data storage problems at handling OCPP messages
Known Limitations	• Status Notifications after finishing charging sequence partly not according to OCPP specifications • Only limited support for OCPP charging profiles • Only Locking / Unlocking by EV Connect / Disconnect, Downgrade to OCPP SW version 1.3.3 possible

	OCPP 1.6 - v1.4.2
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	general bug fixes in field "Status Notification", "Simplified Charging", "Reserve", "Lock/Unlock", "Case_B / Case_C charging points", "MeterValues", "Reboot behavoir" fixes in detail: • Resend function for duplicated TransactionIds • Changing LockingMode at requests during runtime • Fix bug in sending notification after going (first time) online • Fix error at set backend status >offline< • Add datetime check at Reserve request • Fix problems with RFID - timeout and Connection - timeout • Fix handling of multiple vehicles/pending releases • Fix handling B1 in Charge-State • Fix bug at using FirmwareUpdate payload information • Fix problems with missing/wrong StatusNotification in state C1 in charging and at changes between B2/C2 state • Fix Problem with Stoptransaction(id) • Case_c selection option implement • Send StatusNotification for conID=0 after going online • Avoid unlock at recharge function • Deactivation of meter_timer in case of fault_state • Fix start after reserving • Fix restart after Finishing problem, fix for error handling by ReserveNow • Fix for handling second RFID auth by UnlockConnectorOnEVSideDisconnect • Restart charging from finishing state • Add RemoteStop at SuspendedEV state • Fix switch availability/scheduled/unavailability • Add case_c query in state machine • Connection-timeout jump to finishing in case of PP!=0; cancel timer in case of switching other CP to charging • Validate meter start / stop value before sending. Meter_start set to 0 at communication_error • Rescan of rfid in eichrecht mode detected at related reader • SimplifiedMode: activate charging in case of a valid authorization • StatusNotification in case of "NO_ERRORS" • Restart meter_value_timer after error disappeared, restart after change interval from 0 to x during running session

(continued on next page)

Known Limitations	• Client status unequal “running” leads to “ChargePointErrorCode = othererror” and “ChargePointInfo = "ChargePoint not running. State now: {controller_status}” status notifications • Delayed status notifications under certain circumstances • Temporarily wrong or missing status notifications after installing a new rauc • 2x status notification “preparing” after reboot; not all status notifications “unavailable” send before reboot • After finish of charging process, status switches to “Preparing” or “SuspendedEV” under certain circumstances

	OCPP 1.6 - v1.5.0
Dependencies to other SW Modules	
Installation Remarks	
New Functions	Supporting Local Authorization • Authorization Cache functionality • Local Authorization List • LocalPreAuthorize • AllowOfflineTxForUnknownId / MaxEnergyOnInvalidId / StopTransactionOnInvalidId
Corrected Failures and Optimizations	• Fixed problem with RemoteStart in finishing state • Fixed StopTransaction after PowerLoss • Fixed second RFID event in state preparing • GetConfiguration data type issue with CSL values ; Add CallError messages in case of an exception during sending messages • Enumeration issue by receiving DataTransfer • STOP_REASON “REBOOT” and “EVDISCONNECTED” added • optimize timestamp function by resending stop transactions • Fix missing authorization with freemode - tag after connecting car • Fixed response to RemoteStartTransaction • Fixed response to DataTransfer • Fixed problem that start meter value was lower then last stop meter value under certain circumstances • Fixed problem with ConfigurationKeys not sent as string
Known Limitations	

5.5 Modbus Client

5.6 Modbus Server

	Modbus Server – V1.0.3
Dependencies to other SW Modules	General dependency to Bundle 1.2
Installation Remarks	
New Functions	• General adjustments of register order • Added registers for status of DI and DO • Added placeholder for SOC (not yet available)
Corrected Failures and Optimizations	• Current Setting was not adjustable via Modbus
Known Limitations	

	Modbus Server – V1.2.0
Dependencies to other SW Modules	General dependency to Bundle 1.2
Installation Remarks	
New Functions	• General adjustments of register order • Added registers for status of DI and DO • Added placeholder for SOC (not yet available)
Corrected Failures and Optimizations	• Current Setting was not adjustable via Modbus [FIX]
Known Limitations	In large compounds of controllers, the register order can change after a power loss

	Modbus Server V1.3.0
Dependencies to other SW Modules	General dependency to at least Bundle 1.3
Installation Remarks	
New Functions	• General adjustments of register order • Added registers for status of DI and DO Added placeholder for SOC (not yet available)
Corrected Failures and Optimizations	Current Setting was not adjustable via Modbus [FIX]
Known Limitations	• Modbus Registers cannot be set directly yet • Register 167 cannot be written

	Modbus Server V1.4.2
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• Configurable Modbus start registers
Corrected Failures and Optimizations	• Improved performance when accessing watchdog time • Automatic addressing added for ev2000 clients • Register 114 shows correct number of devices
Known Limitations	• Register 167 cannot be written • Modbus server stops when switching from manual addressing to automatic addressing • Automatic addressing is deactivated for all and especially new clients in case a manual address is set for at least one client

	Modbus Server V1.5.0
Dependencies to other SW Modules	General dependency on release 1.5
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Fixed problem where Modbus server stopped working when changing register assignment from manual back to automatic
Known Limitations	• No automatic assignment of registers when using star topology

5.7 JupiCore

	JupiCore - V1.1.0
Dependencies to other SW Modules	Controller Agent
Installation Remarks	
New Functions	Pull up Version to 1.2.0
Corrected Failures and Optimizations	**ISO 15118:** • Authorization timeout for EIM set to 5 minutes • MeteringReceiptReq is not requested, when metering value is not available. MeteringReceiptReq is requested also when serial number of Meter is not available. [FIX] • Minor bug fixes [FIX] • EVCC-ID is published on MQTT in upper case now • ChargeParameterDiscoveryReq was not sent after charging pause [FIX] • If TCP connection was closed during charging session pause, PWM was not kept to 5%, if configured [FIX] **Rfid-Whitelist:** Set default limit in REST request from 20 to 500 and increased request timeout from 5 to 60 seconds **RFID-Whitelist**: Charging can be started via EVCC-ID matching from local Whitelist. **General:** ExternalStatus is set to 'DISABLED', when release mode 'OCPP_CONTROL' is un-configured **General:** Extended EnergyMeterType list
Known Limitations	

	JupiCore - V1.1.1
Dependencies to other SW Modules	Controller Agent
Installation Remarks	
New Functions	• Added *backend_connection_status* to control interface • Fixed CR in RFID-Tag parameter • Added *digital_input_strings* to charging point configuration interface
Corrected Failures and Optimizations	
Known Limitations	

	JupiCore - V1.2.1
Dependencies to other SW Modules	Controller Agent 1.2.1
Installation Remarks	
New Functions	• Extended error status codes by **ERR_STATE_MANUAL_CABLE_CHECK_REQUIRED**
Corrected Failures and Optimizations	• Improved restart mechanism of Controller-Agent • ISO-15118: Charge release can be disabled during charging pause without any impact.
Known Limitations	

	JupiCore - V1.3.0
Dependencies to other SW Modules	Controller Agent
Installation Remarks	
New Functions	• Added ‘case_c’ property to charging point configuration
Corrected Failures and Optimizations	
Known Limitations	

	JupiCore - V1.3.1
Dependencies to other SW Modules	Controller Agent
Installation Remarks	
New Functions	• Added ‘case_c’ property to charging point configuration
Corrected Failures and Optimizations	• Jupicore is more fault-tolerant regarding database migration, when switching test-versions back and forth.
Known Limitations	

	JupiCore - V1.4.1
Dependencies to other SW Modules	Controller Agent
Installation Remarks	
New Functions	• Supports CHARX RFID/NFC reader • Supports IO Basemodule • Supports energy meter Carlo Gavazzi EM111 • Supports RFID reader Netronix UW-XEU1 • Import/ Export of Charge Points • Publish “eichrecht-status” over mqtt
Corrected Failures and Optimizations	• Jupicore is more fault-tolerant regarding database migration, when switching test-versions back and forth • Add logging of database import • If enabled, ISO 15118 communication starts in state B2
Known Limitations	

	JupiCore - V1.4.2
Dependencies to other SW Modules	Controller Agent
Installation Remarks	
New Functions	• Controller Agent is being restarted by JupiCore in case Controller Agent is not responding
Corrected Failures and Optimizations	
Known Limitations	

	JupiCore - V1.5.0
Dependencies to other SW Modules	• Controller Agent, SystemConfigManager and System Monitor of V1.5.0
Installation Remarks	
New Functions	• Jupicore now handles the topology and supports star topology
Corrected Failures and Optimizations	• Fix incomplete subscription when connection is lost during subscription progress to the ControllerAgent
Known Limitations	

5.8 Load Management

	Load Management - V1.1.7
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Starting charging process with initial minimum charging current at a new connected car
Known Limitations	

	Load Management - V1.1.8
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• OPENSSL CRYPTOGRAPHY parameter set
Known Limitations	

	Load Management - V1.1.9
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Round current values at Loadmanagement WEB-Page to avoid float values with too many digits [FIX] • Export configuration of application at startup to MQTT topics • KeepAlive interval is now 5 seconds
Known Limitations	

	Load Management - V1.1.10
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• KeepAlive interval refer to Configuration File setting
Known Limitations	

	Load Management - V1.1.11
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• ChargingRelease to reactivate paused charging processes [FIX]
Known Limitations	

	Load Management - V1.1.12
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• Update makefile (python version)
Corrected Failures and Optimizations	
Known Limitations	

	Load Management - V1.1.13
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• waiting time increase for detect max charge current
Corrected Failures and Optimizations	
Known Limitations	

	Load Management - V1.1.15 → 1.2.0
Dependencies to other SW Modules	
Installation Remarks	
New Functions	Pull up Version to 1.2.0
Corrected Failures and Optimizations	
Known Limitations	

	Load Management - V1.2.1
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Tesla Model S: Increased default value of **ElectricVehicleCurrentMaxOffset** from 1.0A to 2.0A. • Supervision-Energy-Meter: Fixed several issues • memory issues • Shutdown issue of charging point, when to less current is available for serving all charging points • Current offered to EV kept on minimum current, when charging continued after charging pause • Current exceeds configured maximum current of the load circuit • EV was only offered the minimum current for charging. Improved/Fixed the distribution of charging on different phases.
Known Limitations	

	Load Management - V1.2.4
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• If an EV reduces its energy demand, the LMM offers more energy every 10 minutes, if possible. This shall handle the case, that the EV wants to increase its energy demand after a period. If the additional energy is not taken by the EV, the offered energy will be adjusted again.
Corrected Failures and Optimizations	• Sets available energy to 0, when supervision energy meter values are not valid, e.g. NaN
Known Limitations	

	Load Management - V1.3.1
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• If an EV reduces its energy demand, the LM offers more energy every 10 minutes, if possible, to the EV. This shall handle the case, that the EV wants to increase its energy demand after a period of time. If the additional energy is not taken by the EV, the offered energy will be adjusted again
Corrected Failures and Optimizations	• Sets available energy to 0, when supervision energy meter values are not valid, e.g. NaN. • CHANGED: Decreased threshold from 0.3 to 0.2 • CHANGED: If phases of EV charging could not be determined, 3-phase charging is supposed • Now detects EV state change from E/F to B as “EV connected”
Known Limitations	• Some MQTT data from different charging points might not be shown in the loadmanagement (no car recognized)

	Load Management - V1.4.1
Dependencies to other SW Modules	
Installation Remarks	
New Functions	
Corrected Failures and Optimizations	• Improved re-connect to Mqtt-Broker on disconnect • Increased log file quota • Ignores small energy measurements when no EV is not connected to the charging-point • Several performance optimizations • CP current is set to maximum current and watchdog timer is switched off, when CP is being removed from load circuit
Known Limitations	• Re-calculation not working when only one vehicle is connected

	Load Management - V1.4.2
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• Adjustable current reduction threshold
Corrected Failures and Optimizations	• Fixed: No energy was assigned to EV after plug-in under certain circumstances
Known Limitations	

	Load Management - V1.5.0
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• Current reduction is removed when measured EV current consumption is increasing again by 2 A • Cascaded fuses supported
Corrected Failures and Optimizations	• Logging improved • Default Log-Level changed from DEBUG to INFO • Fixed active load management in Status B1 under certain circumstances
Known Limitations	

5.9 Webserver

	Webserver – V1.1.1
Dependencies to other SW Modules	• Jupicore 1.0.11 for new energy meter WM3M4C • Jupicore 1.0.10 for the EVCC-ID whitelist feature • Blinker library (contained in Full System Release 1.1)
Installation Remarks	• Full System Release 1.1 (contains Website 1.1.1) contains the "Blinker" library, needed by the website. This means: Any website update (via ipk package update) on a Full System Release 1.0 will cause the Website to fail during startup
New Functions	• Detect and display WebSocket connection errors between website and controller (“no live data available”). • Added button to restart the modem • Improved and secured User Management incl. new Token management and automatic logout • Added OCPP status and fixed validation of some OCPP variables • Added ISKRA WM3M4C energy meter (>= Jupicore 1.0.11) • Browser logs are now included in the normal package you get via "Download logs" • EVCC-IDs can be added (in addition to RFIDs) to the whitelist (>= Jupicore 1.0.10)
Corrected Failures and Optimizations	• More input validations, incl. new EVSE validation • Prevent browser caching of Rest calls between website and controller (this should prevent incorrectly displaying a website if the controller is already unplugged or not reachable within the network) • Do not treat initial application state as running in System - Status • Fixed some checkboxes in OCPP - Server variables, which were not read-only. • Various RFID whitelist improvements • Fixed MQTT data handling within the website, which caused exceptions or empty screens • Adjusted energy meter names for EEM-350 and EEM-EM357 • Enhanced logging in general • Modem PIN check: numeric values only
Known Limitations	• When you open the website for the first time after a reboot, the initial application states in “System – Status" might still be wrong. Press reload (F5) to fix this.

	Webserver – V1.1.8
Dependencies to other SW Modules	• Jupicore >= 1.1.1
Installation Remarks	• Full System Release 1.1 (contains Website 1.1.1) contains the "Blinker" library, needed by the website. This means: Any website update (via ipk package update) on a Full System Release 1.0 will cause the Website to fail during startup

New Functions	• "System -> Software" Update enhanced: Dedicated feedback on what to do next, depending on the type of installed package
	• "Event Actions"
	  ○ LEDs indicate current status of inputs/outputs
	  ○ Add new event actions for backend online/offline combinations (EV-1964)
	  ○ add OCPP Message field aka digital_input_messages (EV-2058)
	  ○
	• Energy Meters added:
	  ○ INEPRO-380
	  ○ EEM-EM357-EE
	• Chargepoint configuration:
	  ○ Deletion of unsupported locking_mode=ON_CHARGING_RELEASED ("On charging release"/"Bei Ladefreigabe")
	  ○ Allow choice of RFID reader also in case of Modbus control
	  ○ Add Checkbox for Jupicore parameter RfidChargeEnabledBackupUsage (EV-1601)
	• "System -> Status": show more information
	• "System -> Modem": add 'extended_error_report'

Corrected Failures and Optimizations	• Event Actions
	  ○ added missing translations
	  ○ show all configuration parameteres (like action_timer etc.) in table overview
	  ○ enable on-the-fly language change for drop-down menus
	• "System -> Status" and "Charging Point -> Status" will now load if expected MQTT topcis are missing
	• "System -> Status" calculation of appliation states is quicker and fail-safe
	• Fix restart of Webserver itself after an update

Known Limitations	• When you open the website for the first time after a reboot, the initial application states in “System – Status" might still be wrong. Press reload (F5) to fix this.

	Webserver – V1.2.0
Dependencies to other SW Modules	
Installation Remarks	
New Functions (in addition to Webserver 1.1.8)	• Support EEM-AM157-70, Inepro and Carlo Gavazzi Energy meters
Corrected Failures and Optimizations	• Fixed switching between ev3000 to ev2000 • Fixed rare case of 0 byte database (only seen during production)
Known Limitations	

	Webserver – V1.2.1
Dependencies to other SW Modules	
Installation Remarks	
New Functions (in addition to Webserver 1.2.0)	• Operator can change phase rotation (no manufacturer required anymore) • Support EEM-EM157-E • New error translations for required cable check (if locking state cannot be achieved)
Corrected Failures and Optimizations	• Fix for digital_input_messages (introduced in Webserver 1.1.8), which prevented saving other settings as operator
Known Limitations	

	Webserver – V1.3.0
Dependencies to other SW Modules	
Installation Remarks	
New Functions (in addition to Webserver 1.2.0)	• Navigation bar on the left for better handling • “Modem Ping” available for testing the modem settings. • Warnings if OCPP settings are incomplete
Corrected Failures and Optimizations	• Overall performance improvements, pages are loading significantly faster • Layout adjustments • Rework of date/time setting • Hints for Websocket connection loss and automatic reconnect improved. • Hints for Login timeout
Known Limitations	

	Webserver – V1.3.1
Dependencies to other SW Modules	General dependency to raucb 1.3.0
Installation Remarks	
New Functions (in addition to Webserver 1.2.0)	• Navigation bar on the left • “Modem Ping” available for testing the modem settings. • Warnings if OCPP settings are incomplete • “Status”-”Reboot System” will reboot all Clients (ev2000) and all basemodules, too.
Corrected Failures and Optimizations	• Overall performance improvements, many pages are loading significantly faster • Layout adjustments • Rework of date/time setting • Hints for Websocket connection loss and automatic reconnect improved. • Hints for Login timeout • Clients and basemodules are now always sorted in their physical order (Dashboard, Navigation bar, Charging Point Overview) • Sockets renamed • when “use credentials” was disabled, password and user was not deleted under the hood. Some SIM cards had trouble with this.
Known Limitations	

	Webserver – V1.4.1
Dependencies to other SW Modules	General dependency to raucb 1.4.0
Installation Remarks	
New Functions (in addition to Webserver 1.3.1)	• Export / Import for all the complete charging park (incl. OCPP, Network, etc) • Support CHARX RFID/NFC Board • Developer Mode page • Re-ordered navigation bar
Corrected Failures and Optimizations	• New Event Actions layout • Layout: More compact and uniform layout; notifications improved • New Dashboard look if nothing is configured • Calibration Law Page / Eichrecht Page
Known Limitations	• Update via browser randomly gets stuck or fails. If it is stuck, reboot the device and try again. If it is reported as failed it may be a “false negative”, therefore wait for 3 minutes and reboot and check the version again. Retry if necessary • Configuration of CHARX RFID/NFC PCB settings not part of charging point configuration. Import/export not possible • Import of RFID whitelist not working

	Webserver – V1.4.2
Dependencies to other SW Modules	
Installation Remarks	
New Functions	• Adjustable Modbus start registers • Adjustable current reduction threshold for load management
Corrected Failures and Optimizations	• Improved performance with closed website • Fixed: Wrong message appeared that update failed, although it worked fine • Website: fix password change for special characters
Known Limitations	• Import of RFID whitelist not working (Import/Export) • Configuration of CHARX RFID/NFC PCB settings not part of charging point configuration. Import/export not possible • Event action “EV connected” cannot be selected

	Webserver – V1.5.0
Dependencies to other SW Modules	General dependency on release 1.5
Installation Remarks	
New Functions	• Website supports star topology; all charging points are displayed if star topology is being used • OCPP: Backend URL syntax check disabled • Loadmanagement: High Level Fuse implemented in dependency of High Level Measuring Device
Corrected Failures and Optimizations	
Known Limitations	

5.10 Base Module Firmware

	Base Module Firmware - 1.0.9
Dependencies to other SW Modules	Delivered via ControllerAgent 1.1.0, Needs Webserver and Jupicore >= 1.1.0 to set new MeterTypes
Installation Remarks	Basemodule Firmware is always delivered via ControllerAgent, which means, you need to install the ControllerAgent which automatically installs the new Basemodule Firmware
New Functions	• Supports MeterType Carlo Gavazzi EM340 • Supports MeterType ISKRA WM3M4(C)
Corrected Failures and Optimizations	• Not stopping the charging process while reading RFID-card anymore
Known Limitations	

	Base Module Firmware - V1.1.X
Dependencies to other SW Modules	Delivered via ControllerAgent 1.2.0, Needs Webserver and Jupicore >= 1.2.0 to set new MeterTypes
Installation Remarks	Basemodule Firmware is always delivered via ControllerAgent, which means, you need to install the ControllerAgent which automatically installs the new Basemodule Firmware.
New Functions	• Supports MeterType Carlo Gavazzi 340 and Inepro PRO380 • Supports MeterType Phoenix Contact EEM357-EE • Extended EventActions for backend connection status
Corrected Failures and Optimizations	
Known Limitations	

	Base Module Firmware - V1.2.0
Dependencies to other SW Modules	Delivered via ControllerAgent 1.2.0, Needs Webserver and Jupicore >= 1.2.0 to set new MeterTypes
Installation Remarks	Basemodule Firmware is always delivered via ControllerAgent, which means, you need to install the ControllerAgent which automatically installs the new Basemodule Firmware.
New Functions	• Supports MeterType Phoenix Contact AM157-70
Corrected Failures and Optimizations	• Corrected an Issue which caused the diode-check to not raise an error with missing diodes • A negative power factor from the EEM357 was not displayed correctly
Known Limitations	

	Base Module Firmware - V1.2.1
Dependencies to other SW Modules	Delivered via ControllerAgent 1.2.1, Needs Webserver >= 1.2.1 to set new MeterType
Installation Remarks	Basemodule Firmware is always delivered via ControllerAgent, which means, you need to install the ControllerAgent which automatically installs the new Basemodule Firmware.
New Functions	• Supports MeterType Phoenix Contact EEM157-EE • On unsuccessful locking, the controller will try 4 additional times to lock the cable until it needs to be replugged • Supports ReaderType QU950 with the setting to DE950
Corrected Failures and Optimizations	A bug which led to identifying the serial number wrong on the EEM357-EE has been removed
Known Limitations	

	Base Module Firmware - V1.3.0
Dependencies to other SW Modules	Delivered via ControllerAgent 1.3.0, Needs Webserver >= 1.3.0 to set signed meter readings
Installation Remarks	Basemodule Firmware is always delivered via ControllerAgent ControllerAgent automatically installs the new Basemodule Firmware
New Functions	• Reads the signed energy meter values from ISKRA WM3M4C
Corrected Failures and Optimizations	
Known Limitations	

	Base Module Firmware - V1.3.1
Dependencies to other SW Modules	Delivered via ControllerAgent 1.3.1
Installation Remarks	Basemodule Firmware is always delivered via ControllerAgent, which means, you need to install the ControllerAgent which automatically installs the new Basemodule Firmware.
New Functions	
Corrected Failures and Optimizations	CP-Values did not reliably use the intended switch points and hysteresis between States A, B and C
Known Limitations	

	Base Module Firmware - V1.3.2
Dependencies to other SW Modules	Delivered via ControllerAgent 1.3.3
Installation Remarks	Basemodule Firmware is always delivered via ControllerAgent, which means, you need to install the ControllerAgent which automatically installs the new Basemodule Firmware.
New Functions	
Corrected Failures and Optimizations	Meter values did not always get read out properly, leading to NaN-Values on the MQTT-data
Known Limitations	

	Base Module Firmware - V1.4.1
Dependencies to other SW Modules	Delivered via ControllerAgent 1.4.0
Installation Remarks	Basemodule Firmware is always delivered via ControllerAgent, which means, you need to install the ControllerAgent which automatically installs the new Basemodule Firmware.
New Functions	• Supports CHARX RFID/NFC reader • Supports IO Basemodule • Supports energy meter Carlo Gavazzi EM111 • Supports RFID reader Netronix UW-XEU1
Corrected Failures and Optimizations	• Enable 5% PWM in state B2, if ISO 15118 communication is enabled • Fixed: Status flag of relay (OPEN/CLOSE) was not synchronized with real operation
Known Limitations	

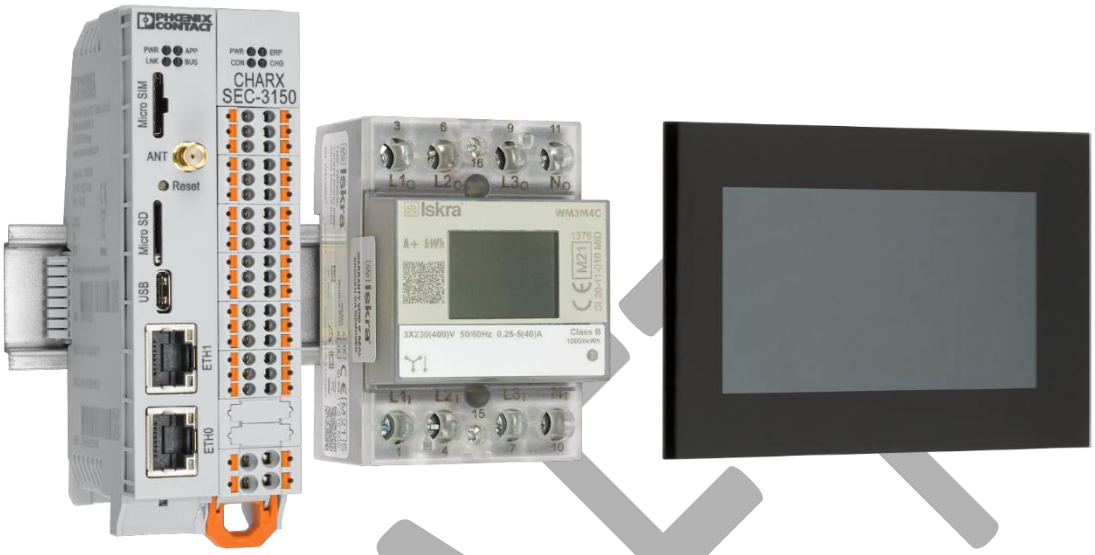
	Base Module Firmware - V1.4.2
Dependencies to other SW Modules	Delivered via ControllerAgent 1.4.1
Installation Remarks	Basemodule Firmware is always delivered via ControllerAgent, which means, you need to install the ControllerAgent which automatically installs the new Basemodule Firmware.
New Functions	
Corrected Failures and Optimizations	• Fixed: Not starting to read data from Carlo Gavazzi EM111 • Changed baud rate from 2400 to 9600 baud for EEM157-EE
Known Limitations	

	Base Module Firmware - V1.4.4
Dependencies to other SW Modules	Delivered via ControllerAgent 1.4.2
Installation Remarks	Basemodule Firmware is always delivered via ControllerAgent, which means, you need to install the ControllerAgent which automatically installs the new Basemodule Firmware.
New Functions	
Corrected Failures and Optimizations	• Basemodule is being restarted and information is being sent to Controller Agent in case of a system fault • Fixed: Duali DE950 NFC reader • Fixed: high PWM current changes due to temperature derating • Fixed: No reaction on RFID denied / accepted when using OCPP
Known Limitations	• Downgrade only manually possible • Digital outputs do not work as expected under certain circumstances

	Base Module Firmware - V1.5.0
Dependencies to other SW Modules	Delivered via ControllerAgent 1.5.0
Installation Remarks	Basemodule Firmware is always delivered via ControllerAgent, which means, you need to install the ControllerAgent which automatically installs the new Basemodule Firmware.
New Functions	
Corrected Failures and Optimizations	• ERR_STATE_NO_AVAILABLE_CURRENT is not handled as an error anymore • Fixed EventActions based on IEC State E • Increase the 'no operation loop' until a restart is performed to 60 seconds; Reset exception counter after 5 minutes • Problem fixed that controllers show “zzzzzz” as UID after an update • Problem fixed that under certain circumstances a charging point status stayed at “C2” when a vehicle got disconnected
Known Limitations	• Downgrade only manually possible

CHARX control modular

PRELIMINARY CALIBRATION LAW CHANGE NOTES



This document applies to the following articles

Article	Article-No.
CHARX SEC-3150	1138965
CHARX SEC-3100	1139012
CHARX SEC-3050	1139018
CHARX SEC-3000	1139022
ISKRA WM3M4C ENERGYMETER	1429603
CHARX 4,3 LCD DISPLAY	1486197

1. General Remarks

This document describes the changes of the calibration law software and hardware for the charge controller **CHARX control modular** in the product life cycle.

The controller software files can be downloaded at the product web site, e.g. phoenixcontact.net/product/1138965.

The firmware can be updated manually via the web-based management of the controller, for details please read the manual, available at phoenixcontact.net/product/1138965.

Alternatively, the software can be updated remotely from a backend system via mobile communication and the Open Charge Point Protocol OCPP. In this case, please supply your backend operator with the respective software file.

In case multiple charging controller are connected in one client server system, the software will be automatically distributed to the connected server controller and connected extension modules.

The software of the charging controller is composed of several modules, which can be updated separately, or within one full system update.

Please note: Data volume for full system update

A full system update requires a data volume of > 100MB per update. To avoid unnecessary mobile communication costs, it is recommended to check the release notes, if a full system update is necessary.

Please note: Update of calibration law relevant software

Please clarify in advance the consequences of an update of calibration law relevant software. It may result in loss of conformity.

Please note: Coupling after software update

Coupling of controller, display and energy meter is required after an update of the software relevant for calibration law.

Please note: Update of the display

In case of an update for the display is available, the display will be updated after the update process of the controller is finished. During the update, the display will not display anything. This can take up to 10 minutes. Please do not power off the charging station during this time.

2. Table of Content

3. Overview of Software Modules – not relevant for calibration law

Table 3.1: Software modules not relevant for calibration law

System Release	Initial	1.4.1	1.4.2	1.5.0
System Monitor	1.3.0	1.4.1	1.4.2	1.5.0
Controller Agent	V1.3.4_RC4	1.4.1	1.4.2	1.5.0
OCPP 1.6 Agent	V1.4.0_RC4	1.4.1	1.4.2	1.5.0
Modbus Client	1.2.0	1.2.0	1.4.2	1.5.0
Modbus Server	V1.3.0_RC2	1.3.0	1.4.2	1.5.0
JupiCore	V1.3.2_RC5	1.4.1	1.4.2	1.5.0
Loadmanagement	V1.3.2_RC1	1.4.1	1.4.2	1.5.0
Webserver	V1.4.0_RC5	1.4.1	1.4.2	1.5.0

*RC# = Release Candidate which was deployed

The release notes and descriptions for software modules not relevant for calibration law can be found under “Downloads” on the product website at phoenixcontact.net/product/1138965.

4. Overview of Software Modules – relevant for calibration law

Table 4.1: Software modules relevant for calibration law

System Release	Initial	1.4.1	1.4.2	1.5.0
rauc	1.5.1	1.5.1	1.5.1	1.5.1
linux_kernel	4.14.93	4.14.93	4.14.93	4.14.93
secure_agent_host	1.0.9	1.0.12	1.0.13	1.0.15
secure_agent_ta	1.0.10	1.0.13	1.0.15	1.0.16
eichrecht_agent	1.0.23	1.0.29	1.0.30	1.0.34
optee	3.11	3.11	3.11	3.11
display/sw_ver	1.0.10	1.0.11	1.0.13	1.0.17

*RC# = Release Candidate which was deployed

The system releases are released as complete packages with all software modules available at that time, according to the tables above. Interim versions of certain applications are only published without integration into a full system release.

The following software modules are also relevant for calibration law but independent from system releases since they run on other devices:

Table 4.2: Software modules relevant for calibration law not part of system releases

System	Initial version	Current version
Energy measuring device Iskra, main firmware	2.05	2.05
Energy measuring device Iskra, measuring module firmware	2.05	2.05
display/boot_ver	1.1.0	1.2.1
Transparency software	1.0.1	1.0.1
Live-Medium	1.0.1	1.0.1

5. Overview of Hardware Revisions – relevant for calibration law

Table 5.1: Hardware revisions relevant for calibration law

Device	Initial revision	Current revision
ISKRA WM3M4C ENERGYMETER	Please see the type designation on the energy meter	
CHARX 4,3 LCD DISPLAY	V00	V00
CHARX SEC-3000	1.03.02	1.04.04
CHARX SEC-3050	1.03.03	1.04.05
CHARX SEC-3100	1.03.02	1.06.04
CHARX SEC-3150	1.03.03	1.06.05

6. Software Change Notes by Application

6.1 rauc

	rauc	
Version	1.5.1	
Change description	Initial version	
checksum	4608f42ffde1d09dc166384815aff1b995de de2552a75e85b0dfb0fa547ffd19	SHA256 Hash

6.2 linux_kernel

	linux_kernel	
Version	4.14.93	
Change description	Initial version	
checksum	49e365ba3634fba0d7d8bd16369818f3e633 170aa6c4266ddad64b7ff80f896d	SHA256 Hash

6.3 secure_agent_host

	secure_agent_host	
Version	1.0.9	
Change description	Initial version	
checksum	95B5C14C380FCA4BAF64B2E975BA92E1	MD5 Hash

	secure_agent_host	
Version	1.0.12	
Change description	1. Prepared for extended topology support. Up to 12 charge points are supported in free combination of backplane bus and via Ethernet coupled charging points in a future release. 2. Improved application restart handling 3. Increased buffer size for file transfer from secure storage to Linux file system (4kB -> 5kB).	
checksum	5D4D62CCC403CD9D3BA2A92BB8D8BD17	MD5 Hash
Impact analysis	1. Both interfaces are already evaluated within the certification. There are no changes regarding the concept for data integrity and authenticity. 2. All restarts of calibration law relevant functionality are already logged. The improvement avoids delays at application restart. No effect on the normal operation of the secure_agent_host. 3. A safety margin was added to the buffer for the measurement file transfer. No functional change.	

	secure_agent_host	
Version	1.0.13	
Change description	1. Improvement in the coupling functionality of charging points.	
checksum	1A0DFAE4872A992ABD5BB4D16A373D92	MD5 Hash
Impact analysis	1. Not coupled charging points can easily be identified.	

	secure_agent_host	
Version	1.0.15	
Change description	1. Implemented storage cleanup functionality. 2. Improved SD card export function. 3. Improvement of the coupling functionality of charging points.	
checksum	Tbd	MD5 Hash
Impact analysis	1. The controller checks the available space to store data from a new charging process. Typically, the storage of the controller offers enough space for all charging processes which are carried out in the course of the operating time. In the unlikely event that there is no more storage space available, the controller checks for the oldest data records and removes them if necessary. 2. The error or success message is shown on the display after the SD card export function is performed. 3. If an energy meter has not been successfully coupled, no charging process may be started. This is ensured via the secure_agent_host.	

6.4 secure_agent_ta

	secure_agent_ta	
Version	1.0.10	
Change description	Initial version	
checksum	90315BDC15EF9867AD0B56E52D8C6F23	MD5 Hash

	secure_agent_ta	
Version	1.0.13	
Change description	1. Limited the event log entries within the measurement files with respect to the maximum file size. A message is added to check the global calibration law event log with the charge point operator for completeness. 2. Performance Improvement. The measurement file in the secure storage isn't signed after adding an event log entry but before transfer from the secure storage into the Linux filesystem. 3. Increased buffer size for file transfer from secure storage to Linux file system (4kB -> 5kB).	
checksum	0019407B445EA7131FE36A2AF282F3B2	MD5 Hash
Impact analysis	1. All validation measures and their logging into the calibration law relevant event log aren't changed. Only the additional logging of these events into the measurement file are limited to the maximum file size. Otherwise, the measurement file wouldn't be accessible anymore. 2. Within the secure storage the measurement file is already protected by the measures of OP-TEE. Before leaving the secure storage a digital signature for integrity and authenticity check are necessary. This is guaranteed by the actual implementation. 3. A safety margin was added to the buffer for the measurement file transfer. No functional change.	

	secure_agent_ta	
Version	1.0.15	
Change description	1. Generation of an ELA notification in case of a power down during ongoing charging sessions.	
checksum	F9825DE89E9FEBBEC61FFDFE259D65BE	MD5 Hash
Impact analysis	1. The event of power loss during a charging process and the generation of ELA notifications in this case are additional and have no impact on already existing ELA notifications.	

	secure_agent_ta	
Version	1.0.16	
Change description	1. Fixed unreported validation errors.	
checksum	Tbd	MD5 Hash
Impact analysis	1. A specific validation error due to incorrect SIGNATURE in the energy data, which was not previously handled, is now properly handled. After detecting this error, an ELA notification with failure in validation process is generated. An event log entry is stored in the log book.	

6.5 eichrecht_agent

	eichrecht_agent	
Version	1.0.23	
Change description	Initial version	
checksum	75FC05A7B648101EF9354BB5933666F6	MD5 Hash

	eichrecht_agent	
Version	1.0.29	
Change description	1. Prepared for extended topology support. Up to 12 charge points are supported in free combination of backplane bus and via Ethernet coupled charge points in a future release. 2. Added a calibration law relevant event log entry for a communication loss to a charging-controller. On detection of the communication loss a warning is logged. If the communication loss exceeds 60s an error is logged and the ongoing charging process for this charging point is made invalid. 3. Improved application restart handling	
checksum	FECB2E14777186D8DDCBBB218ABAA6C3	MD5 Hash
Impact analysis	1. Both interfaces are already evaluated within the certification. There are no changes regarding the concept for data integrity and authenticity. 2. Additional event log functionality added for protection of the user. 3. All restarts of calibration law relevant functionality are already logged. The improvement avoids delays at application restart. No effect on the normal operation of the eichrecht_agent.	

	eichrecht_agent	
Version	1.0.30	
Change description	1. Collaboration with the Eichrecht Secure Host to implement new pairing functionality. 2. Collaboration with the display application to remove the displayed MWE key after an update was installed.	
checksum	FF35217FBB15FD79AE888BD32266324A	MD5 Hash
Impact analysis	Collaboration of Eichrecht Agent with Secure host and Display application impacts as mentioned below. 1. Not coupled charging points can easily be identified. 2. The invalid MWE public key was still displayed after a software update. This was a bug and has been fixed in this release.	

	eichrecht_agent	
Version	1.0.34	
Change description	1. Collaboration with the Eichrecht Secure Host and display display software to improve the SD card export functionality. 2. Collaboration with the Eichrecht Secure Host for improved storage handling. 3. Improved the initialization process of the Eichrecht Agent. 4. Implemented the energy meter disconnection handling. 5. Collaboration with the Eichrecht Secure Host to improve the coupling functionality of charging points.	
checksum	Tbd	MD5 Hash
Impact analysis	1. The success or failure of the SD card export function is reported clearly visible to the display device. 2. In the rare case that the controller's memory cannot store any further loading processes, the eichrecht_agent checks the memory. If necessary, the oldest loading processes are identified and deleted so that new loading processes can be recorded. 3. Coupling is now successful for more than twelve charging point configurations stored in the CHARX controller. 4. If the energy meter remains disconnected for more than 60 seconds, the charging point will be set to faulty state. Any charging session in progress is automatically terminated. An ELA notification is generated to inform the user that a fault has occurred in the charging process. 5. Coupling is not performed for the charging point where the energy meter is not properly connected.	

6.6 optee

	optee	
Version	3.11	
Change description	Initial version	
checksum	229b543d9509421b06283069e95c1fd84d9408006b87a364db45a4ec2c8c7299	SHA256 Hash

6.7 display/sw_ver

	display/sw_ver	
Version	1.0.10	
Change description	Initial version	
checksum	1364879826	Ethernet CRC-32, polynomial

	display/sw_ver	
Version	1.0.11	
Change description	1. Extended topology support. Up to 12 charge points are supported in free combination of backplane bus and via Ethernet coupled charge points.	
checksum	2856109188	Ethernet CRC-32, polynomial
Impact analysis	1. All measures for data integrity and authenticity are unchanged. Just mandatory changes for the charge point selection screen and the communication timeout during coupling due the extended time for the additional charge points.	

	display/sw_ver	
Version	1.0.13	
Change description	1. Updating the software results in removal of the invalid MWE public key on the display that was used to perform the coupling before the new software was installed.	
checksum	2507525347	Ethernet CRC-32, polynomial
Impact analysis	1. The invalid MWE public key was still displayed after a software update. This was a bug and has been fixed in this release.	

	display/sw_ver	
Version	1.0.17	
Change description	1. Added support for two additional display languages (Polish and Czech). 2. Added error or success message for the SD card export functionality. 3. Improved coupling process of the charging points. 4. Improved displaying of event logs on Event Logs, ELA, and EPA screen.	
checksum	Tbd	Ethernet CRC-32, polynomial
Impact analysis	1. The end user can change the display language of the CHARX display to one of these four languages: a. German b. English c. Polish d. Czech 2. The success or failure of the SD card export function is reported clearly visible to the display device. 3. If the coupling process has failed on the eichrecht_agent, the display will not show invalid data to the end user. In previous releases, the display would show the previously coupled points and the MWE public key even if the coupling process failed on the eichrecht_agent. This has been fixed in this release. 4. Event log messages are now displayed on two lines. Previously, the event log message was displayed on one line and the rest of the text was truncated.	

6.8 Energy measuring device Iskra, main firmware

	Energy measuring device Iskra, main firmware	
Version	2.0.5	
Change description	Initial version	
checksum	EEC66478	-

6.9 Energy measuring device Iskra, measuring module firmware

	Energy measuring device Iskra, module firmware	
Version	2.0.5	
Change description	Initial version	
checksum	B5E6	-

6.10 display/boot_ver

	display/boot_ver	
Version	1.1.0	
Change description	Initial version	
checksum	3764852379	Ethernet CRC-32, polynomial

	display/boot_ver	
Version	1.2.1	
Change description	1. Reworked handshake between bootloader and updater. The display stays in bootloader mode until the correct programming is validated by reading back and comparison of the binary.	
checksum	1414283922	Ethernet CRC-32, polynomial
Impact analysis	1. No calibration law relevant changes during operation. Additional measures to ensure a stable and correct software update were introduced.	

6.11 Transparency software

	Transparency software	
Version	1.0.1	
Change description	Initial version	
checksum	b9a59ed1805144b2a4d32753b749d129	MD5 Hash

6.12 Live-Medium

	Live-Medium	
Version	1.0.1	
Change description	Initial version	
checksum	df2d5bf3ef9b8111a0e62ad0cb6ad35b	MD5 Hash

7. Hardware Change Notes by Device

7.1 CHARX 4,3 LCD DISPLAY

	CHARX 4,3 LCD DISPLAY
Revision	V00
Change description	Initial revision

7.2 CHARX SEC-3xx0

	CHARX SEC-3xx0
Revision	1.03.02 (CHARX SEC-3000)
	1.03.03 (CHARX SEC-3050)
	1.03.02 (CHARX SEC-3100)
	1.03.03 (CHARX SEC-3150)
Change description	Initial revision

	CHARX SEC-3xx0
Revision	1.04.02 (CHARX SEC-3000)
	1.04.03 (CHARX SEC-3050)
	1.04.02 (CHARX SEC-3100)
	1.04.03 (CHARX SEC-3150)
Change description	1. New cellular modem for variants CHARX SEC-31x0 2. Alternative TPM chip
Impact analysis	1. Cellular modem not relevant for calibration law. EMC tests were carried out to ensure no decrease in immunity and interference 2. Alternative TPM chip with minor differences; TPM chip not relevant for Eichrecht

	CHARX SEC-3xx0
Revision	1.04.02 (CHARX SEC-3000)
	1.04.03 (CHARX SEC-3050)
	1.06.02 (CHARX SEC-3100)
	1.06.03 (CHARX SEC-3150)
Change description	1. No changes
Impact analysis	1. Internal system adjustment, no changes in articles

	CHARX SEC-3xx0
Revision	1.04.04 (CHARX SEC-3000)
	1.04.05 (CHARX SEC-3050)
	1.06.04 (CHARX SEC-3100)
	1.06.05 (CHARX SEC-3150)
Change description	1. Stability improvements of RS-485 interfaces
Impact analysis	1. removal of a resistor – no impact on function

8. Known Issues and limitations

This chapter lists the known issues and limitations related to calibration law.

	System Release
Version	1.4.1
Known Issues	• CHARX RFID/NFC not working together with calibration law
Limitations	• Performance issues with more than 4 charging points

	System Release
Version	1.4.2
Known Issues	• CHARX RFID/NFC not working together with calibration law
Limitations	• Performance issues with 4 or more charging points • Reading of signature from energy meter fails sporadically which leads to invalid charging sessions • Charging sessions might not be stopped via Admin login in case more than one RFID reader is being used

	System Release
Version	1.5.0
Known Issues	
Limitations	• Performance issues with more than 4 charging points • Charging sessions might not be stopped via Admin login in case more than one RFID reader is being used • Cannot stop charging sessions via Admin login on website