

Edition 04/2024

SOFTWARE MANUAL

SICHARGE

SICHARGE D

8EM5907-0AA00-4AA6.03

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SICHARGE

Software Manual for SICHARGE D

Application Manual

04/2024
A5E51587381-AC

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Siemens Aktiengesellschaft
Digital Industries
Postfach 48 48
90026 NÜRNBERG
GERMANY

A5E51587381-AC
Ⓟ 06/2024 Subject to change

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Introduction

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1.1 About this software manual

This manual provides a detailed overview of the OCPP functionality of the HPC charging station SICHARGE D. The target group primarily includes operators (CPO), commissioning engineers and service providers for charging infrastructure (EMSP).

For specific instructions on setting up the communications of SICHARGE D and the Dispenser as well as on commissioning and configuration of payment terminals and load management systems (ELMS), consult the relevant operating instructions.

SICHARGE D technical documentation topic page

The topic page provides you a direct route to the technical documentation of your SICHARGE D. You can find the topic page here on the Internet (https://www.siemens.com/sicharge-d-manuals).

Validity of the documentation

This manual is valid for the SICHARGE D hardware configuration as of **firmware level v3.2.8**.

1.2 Open-source software

Open-source software is used in the firmware of the product described. The open source software is provided free of charge. We are liable for the product described, including the open-source software contained in it, pursuant to the conditions applicable to the product. Siemens accepts no liability for the use of the open-source software over and above the intended program sequence, or for any faults caused by modifications to the software.

For legal reasons, we are obliged to publish the original text of the license conditions and copyright notices. We make the open source software readme available in these ways:

- On the Siemens homepage (https://support.industry.siemens.com/cs/de/de/view/109796318/en) for download
- On the touch screen of the charging station. To do this, open the front door with the charging station switched on.

Safety instructions 2

2.1 Industrial Security

Siemens AG offers products and solutions with Industrial Security functions that support the secure operation of plants, systems, machines and networks.

Implement and maintain the industrial security concept

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. This includes replacing the supplied DIN lock cylinders that are part of a universal locking system.

Systems, machines, and components should only be connected to the enterprise network or the Internet if and to the extent that it is necessary and with appropriate security measures in place (e.g. using firewalls and network segmentation).

Through suitable configuration of the charging station and OCPP backend, the operator must ensure that only secure RFID cards can be used for authorization. At least OCPP 1.6J+ must be used for secure communication between charging station and OCPP backend.

In addition, the recommendations of Siemens regarding appropriate protective measures should be observed. For more information about industrial security, please visit: (http://www.siemens.com/industrialsecurity)

Only use current product versions

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that updates be applied as soon as they are available and that the latest hardware and software versions be used. Using versions that are obsolete or are no longer supported can increase the risk of cyber threats.

OCPP configurations

3

This section serves as an OCPP implementation guide for SICHARGE D. It describes the communication between SICHARGE D and the CSMS selected by the operator.

OCPP (Open Charge Point Protocol) is a high level protocol for communication between charging stations and a central management or administration system for operating a network of charging stations, where the operator and owner of the charging station do not have to be the same.

OCPP is used by the majority of charging station manufacturers and management systems worldwide. SICHARGE D currently meets the specification according to OCPP-J 1.6. Full details of this protocol can be found here (https://www.openchargealliance.org/downloads/).

Siemens is constantly expanding the range of functions in the field of OCPP. Any required updates could be performed Over-the-Air through firmware updates.

The OCCP communication is configured using the Sifinity Control application. You can find more information in the relevant operating instructions.

3.1 OCPP Profile and Messages

The OCPP interface is used to manage SICHARGE D in a CSMS. The functions that can be used by the CSMS depend on the respective version implemented on both sides. The range of functions differs here fundamentally from Siemens' own SCB or Sifinity Control as the case may be.

Compatibility between the respective software versions (charging station and CSMS) should be checked during initial setup and after the relevant updates have been applied. To do this, please contact Siemens Support.

Basically, the OCPPimplementation for SICHARGE D follows the OCPP-J 1.6 standard (download the specification from (https://www.openchargealliance.org/downloads/)). Siemens also uses the testing tool issued by the Open Charge Alliance (OCA) to verify implementation.

The following Messages with the associated functions are supported by the charging station.

Table 3- 1 Core

Message	Function
Authorize	Query authorizations for starting or ending a charging process
BootNotification	The charging station sends information after a start or reboot
ChangeAvailability	Change availability of the charging station or charging port
ChangeConfiguration	Make change to configured parameters
ClearCache	Clear authentication cache

Message	Function
DataTransfer	The charging station can be expanded by functionalities that are not defined in the OCPP. These must be implemented as special adaptations to your system, for example, California Pricing Model, OCPP-Reception Integration for Payment Terminals. Also see the table Additional Data Transfer Messages.
GetConfiguration	View configured parameters
Heartbeat	Charging station sends heartbeat
MeterValues	Charging station sends configurable list of measured values
RemoteStartTransaction	Start a charging process via remote access
RemoteStopTransaction	End a charging process via remote access
Reset	Initiate restart of charging station
StartTransaction	Notification on the start of a charging process
StatusNotification	Status transmission of the charging station or charging port
StopTransaction	Notification about the end of a charging process
UnlockConnector	Unlocking the charging cable on the charging station side, only supported for the optional AC socket

Table 3- 2 Local Auth List Management

Message	Function
GetLocalListVersion	Output of the version of the authorization list saved locally in the charging station
SendLocalListVersion	Update or overwrite the local authentication list

Table 3- 3 Reservation

Message	Function
CancelReservation	Delete reservation of a charging port
ReserveNow	Reserve charging port

Table 3- 4 Remote Trigger

Message	Function
TriggerMessage	Requests re-sending of a message. All messages in accordance with OCPP-J 1.6 (except FirmwareStatusNotification) are supported.

Table 3- 5 Smart Charging

Message	Function
ClearChargingProfile	Deleting one or more profiles
GetCompositeSchedule	Querying of the configured performance profiles for a period
SetChargingProfile	Transferring the desired charge limits

Table 3- 6 Firmware Management

Message	Function
DiagnosticsStatusNotification	Transfers the upload status of the diagnostics files
GetDiagnostics	CSMS requests diagnostics information in the form of log files (CSV) from the charger

Table 3- 7 Zusätzliche DataTransfer Nachrichten

VendorId	MessageId	Initiator	Function
TariffInformation	SetDefaultPrice	CSMS	Setting the default price display
TariffInformation	GetDefaultPrice	CSMS	Querying the current default price display
TariffInformation	SetUserPrice	CSMS	Price information to be displayed for the customer
AdhocPayment	RunningCost	CSMS	Currently accumulated costs during the charging process
AdhocPayment	FinalCost	CSMS	Transferring the costs for the charging process
generalConfiguration	setMeterConfiguration	Charger	Transferring the meter information after the successful booting process
CardTxReport	-	Charger	Transferring the data of a successful credit card transaction for generating the electronic payment voucher

Other functions may be added with updates.

3.2 OCPP parameters

Parameters	Default value	Access	Remarks
AllowOfflineTxForUnknownId	false	RW	
AuthorizationCacheEnabled	true	RW	
AuthorizationKey		R	
AuthorizeRemoteTxRequests	false	R or RW	
ChargeProfileMaxStackLevel	10	R	
ChargingScheduleAllowedChargingRateUnit	Power	R	
ChargingScheduleMaxPeriods	100	R	
ClockAlignedDataInterval	0	RW	
ConnectionTimeOut	90	RW	
ConnectorSwitch3to1PhaseSupported	false	R	
ConnectorPhaseRotation	0.Unknown 1.Unknown 2.Unknown	RW	Fixed value
GetConfigurationMaxKeys	100	R	
HeartbeatInterval	60	RW	
LightIntensity	100	RW	
LocalAuthorizeOffline	false	RW	
LocalPreAuthorize	false	RW	
MaxChargingProfilesInstalled	100	R	

Parameters	Default value	Access	Remarks
MeterValuesAlignedData	""	RW	Supported values: • Energy.Active.Import.Register
MeterValuesAlignedDataMaxLength	1	R	
MeterValuesSampledData	"SoC, Power.Offered, Current.Offered"	RW	Supported values: • Current.Import • Current.Offered • Energy.Active.Import.Interval • Energy.Active.Import.Register • Energy.Reactive.Import.Register • Frequency • Power.Active.Import • Power.Factor • Power.Offered • Power.Reactive.Import • SoC • Temperature • Voltage
MeterValuesSampledDataMaxLength	13	R	
MeterValueSampleInterval	0	RW	
MinimumStatusDuration	1	RW	
NumberOfConnectors	3	R	
ResetRetries	0	RW	Has no effect owing to the design of the CP
StopTransactionOnEVSideDisconnect	true	RW	no other value is supported
StopTransactionOnInvalidId	true	RW	
StopTxnAlignedData	""	RW	Supported values: • Energy.Active.Import.Register
StopTxnAlignedDataMaxLength	1	R	
StopTxnSampledData	"SoC, Ener- gy.Active.Import.Interval"	RW	Supported values: • y.Reactive.Import.Register
StopTxnSampledDataMaxLength	4	R	
SupportedFeatureProfiles	"Core, LocalAuthListManagement ,Reservation,SmartCharging ,RemoteTrigger"	R	
SupportedFeatureProfilesMaxLength	4	R	
TransactionMessageAttempts	1	RW	
TransactionMessageRetryInterval	1	RW	
UnlockConnectorOnEVSideDisconnect	true	RW	Always unlocks the plug on the electric vehicle side
WebSocketPingInterval	30	RW	
LocalAuthListEnabled	false	RW	
LocalAuthListMaxLength	100	R	
SendLocalListMaxLength	100	R	
ReserveConnectorZeroSupported		R	

Additional OCPP parameters

A detailed explanation for commissioning the payment terminals and implementation of the "California Pricing" via OCPP can be found in the document "Payment Terminals for SICHARGE D (https://support.industry.siemens.com/cs/de/en/view/109814747)" with the article number 8EM5907-0AA00-7AA4.

As regards retrofitting, you can find the installation instructions in the document with the article number 8EM5907-0AA00-4AA1.

Parameters	Default value	Access	Remarks
ConnectionTimeOutCountdown	10[s]	RW	Additional parameters for indicating when the timeout is reached
PaymentCurrency	EUR	RW	Currency for the credit card payment
PaymentTXMaxAmount	5000	RW	Maximum amount for the credit card payment in the lowest unit of the currency, for example, EUR cent
PaymentDefaultLanguage	EN	RW	Default display language for messages of the credit card terminal, alternatively, if the selected language is not available on the credit card terminal.
PaymentCardIdTagPrefix	EMVS*	RW	Prefix for idTag for the commands Authorize and StartTransaction
DisplayTariffInformation	none	RW	none - No tariff information default - Tariff information from SetDefaultPrice user - Tariff information from SetUserPrice
AllowOfflineTxForUnknownVehicleId	false	RW	If AUTOCHARGE is configured, and the charging unit is offline, all the unknown EVCCIDs are accepted, similar to the case with AllowOfflineTxForUnknownId.
StopAutoChargeOnHMI	false	RW	If false, a stop on the HMI is not possible. If true, a stop is possible without authentication.
SendCardTxReport	false	RW	false - No card TX report true - Card TX report transmitted after a partial cancellation
CardTxReportType	default	RW	Default or unknown value - reference card Transaction report format
NonAuthorizedTag	""	RW	IdTag that is used for StartTransaction if the outlet is free of charge

3.3 Whitelist handling

By default, the charging station is always online and connected to a CSMS via mobile wireless or Ethernet. If this is not the case, e.g. due to disruption of the mobile wireless network, the charging station automatically switches to an offline mode via OCPP when configured to do so.

Whitelist handling via OCPP for the SICHARGE D is currently carried out in accordance with the specifications for OCPP-J 1.6 (LocalAuthListMaxLength).

OCPP does not define a maximum of user cards listed in the Whitelist. The charging station currently supports 100 entries.

The Whitelist is managed via the CSMS. This is implemented for SICHARGE D according to the OCPP-Standard.

3.4 Load management via SmartCharging

The load management of one or more charging stations is mapped via OCPP in the SmartCharging profiles. The following values are pre-specified and can be queried, in accordance with the specifications, via GetConfiguration:

- ChargeProfileMaxStackLevel: 10
- ChargingScheduleAllowedChargingRateUnit: Power
- ChargingScheduleMaxPeriods: 100
- ConnectorSwitch3to1PhaseSupported: false
- MaxChargingProfilesInstalled: 100

The numberPhases property in ChargingSchedulePeriod and minChargingRate in ChargingSchedule are not considered.

3.5 Reservations

The OCPP implementation in SICHARGE D for reservations corresponds to the procedure stored in the Standard OCPP.

Reserving a charging outlet is possible with the "ReserveNow" command. This command reserves a single charging point or the entire charging station for a specific idTag for a definable period.

A reservation is either canceled when the idTag used reaches the expiration time or when the reservation is explicitly canceled.

Reserve Now (OCPP-J 1.6 – 5.13; excerpt)

A central CSMS can send a ReserveNow.req to a charging point to reserve it for a specific idTag.

Cancel Reservation (OCPP-J 1.6 – 5.1; excerpt)

To cancel a reservation, the CSMS sends a "CancelReservation.req" PDU command to the charging station. If the charging station has a reservation that matches the PDU requesting the reservationId, the charging station should respond with "Accepted", else the charging station responds with "Rejected".

3.6 Error messages

The CSMS of the operator is informed about changes in the status of the charging station. The CSMS is also thereby informed about critical error states such as an emergency stop, open doors, etc. The error codes are transmitted via the OCPP message StatusNotification to the CSMS.

The table below aids in troubleshooting. The list is continuously revised.

Name	**Description (Status "True")**
12VDC_Supply_TB18_FC23	Problem with TB18 or FC23
24VDC_Fuse_FC12_to_FC17	Actuation of one of the fuses FC12 to FC17
Mainbreaker_QA1	Main circuit breaker actuated
Income_Phaseloss	True, in case of a phase failure
DoorPositionSwitch_BG3_BG4	One or both doors is/are open, ShutSup:1
EmergencyStopButton_SF2	Emergency Stop switch has been pressed
SafetyRelay_QA26	Emergency Stop switch has been pressed
EVSE_TempUpperLimit	The internal EVSE temperature has exceeded the upper limit
PerformingCollaboratedReboot	Indicates a restart
PerformingCollaboratedShutdown	Indicates a shutdown
FailsafeMode_Active	The FailsafeMode is active. The charging unit is out of service.
Sicharge_PLC_CPU_KF1	Critical program error not detected
d-plc: doorOpen_BG201	Door of the dispenser is open
allOutletsUnavailable	There is no charging plug in operation at this time

List of abbreviations and explanation of terms

A

A.1 Abbreviation

Abbreviation

The following abbreviations are used in these instructions:

Abbreviation	Term
AC	Alternating Current
CAN	Controller Area Network
CCS	Combined Charging System
CPO	Charge Point Operator
CSMS	Charging Station Management System (OCPP Backend)
DC	Direct Current
EMSP	E-Mobility Service Provider
HMI	Human Machine Interface
HPC	High Power Charging
JSON	JavaScript Object Notation
NFC	Near Field Communication
OCA	Open Charge Alliance
OCPP	Open Charge Point Protocol
OTA	Over-the-air update
PDU	Protocol Data Unit
RFID	Radio Frequency Identification Device
SCB	SICHARGE Configuration Backend
SoC	State of Charge

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More information

https://www.siemens.com/emobility

Siemens Aktiengesellschaft
Smart Infrastructure
eMobility
Siemenspromenade 10
91058 Erlangen, Germany