Referenced Components and Variables

1. **Controller Components**

This section gives an overview of the 'Controller' components, which are introduced in OCPP 2.0. A controller component can be recognized by the 'Ctrlr' suffix and is responsible for the configuration of a certain functionality. Most of the 'Referenced' components that are described in this document, are 'Controller' components.

The table below contains a summary of all Controller components, for more details, please refer to Part 2 - Appendices.

|  |  |
| --- | --- |
| **Controller Component** | **Description** |
| AlignedDataCtrlr | Responsible for configuration relating to the reporting of clock-aligned meter data. |
| AuthCacheCtrlr | Responsible for configuration relating to the use of a local cache for authorization for Charging Station use. |
| AuthCtrlr | Responsible for configuration relating to the use of authorization for Charging Station use. |
| CHAdeMOCtrlr | Responsible for configuration relating to the CHAdeMO controller |
| ClockCtrlr | Provides a means to configure management of time tracking by Charging Station. |
| CustomizationCtrlr | Responsible for configuration relating to custom vendor-specific implementations, using the DataTransfer message and CustomData extensions. |
| DeviceDataCtrlr | Responsible for configuration relating to the exchange and storage of Charging Station device model data. |
| DisplayMessageCtrlr | Responsible for configuration relating to the display of messages to Charging Station users. |
| ISO15118Ctrlr | Responsible for configuration relating to the ISO 15118 controller |
| LocalAuthListCtrlr | Responsible for configuration relating to the use of local authorization lists for Charging Station use. |
| MonitoringCtrlr | Responsible for configuration relating to the exchange of monitoring event data. |
| OCPPCommCtrlr | Responsible for configuration relating to information exchange between Charging Station and CSMS. |
| ReservationCtrlr | Responsible for configuration relating to reservations. |
| SampledDataCtrlr | Responsible for configuration relating to the reporting of sampled meter data. |
| SecurityCtrlr | Responsible for configuration relating to security of communications between Charging Station and CSMS. |
| SmartChargingCtrlr | Responsible for configuration relating to Smart Charging. |
| TariffCostCtrlr | Responsible for configuration relating to tariff and cost display. |
| TxCtrlr | Responsible for configuration relating to transaction characteristics and behaviour. |

Every Controller component has an 'Enabled' variable. This variable can be used to enable/disable a certain functionality. Any data in the charging station is not part of the controller component, so when disabling a functionality, any relating data stored in the

Charging Station will not be changed or removed.

For example: if ReservationCtrlr is disabled when there is an active reservation, the EVSE will become available, but the reservation entries will still be there – they are just not used. If afterwards ReservationCtrlr is enabled again, the reservation entries will become active again as long as they have not expired and no transaction is in progress. If a transaction has started in the mean time, that transaction remains active. The reservation is then considered expired.

1. **Referenced Components and Variables**

Below follows a list of all Component Variable combinations with a role standardized in this specification. These Configuration Variables replace the Configuration Keys from OCPP 1.x

The list is split by functionality: General, Security, Authorization, Local Authorization List Management related, Authorization Cache, Transaction, Metering, Reservation, Smart Charging, Tariff & Cost, Diagnostics, Display Message and Charging Infrastructure related.

A required Configuration Variable mentioned under a particular function block only has to be supported by the Charging Station if it supports that functional block.

Requirements for all the Configuration Variables in this document:

* + All variables that are writable SHALL have the VariableAttribute field: *persistence* = true, and SHALL thus be stored in a persistent way.
  + Any fields not defined SHALL be left empty.
  + Any field marked with a \* (Asterisk) can be of any possible value.
  + When the AttributeType is NOT given, the CSMS and Charging Station SHALL assume the AttributeType to be Actual.

**NOTE**

See *'OCPP 2.0 Part 4 - JSON over Websockets implementation guide'* for a number of Configuration Variables that are specific to controlling the JSON/Websocket behavior.

# General

* + 1. ActiveNetworkProfile

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | OCPPCommCtrlr | |
| **Variable** | **variableName** | ActiveNetworkProfile | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **Description** | Indicates the configuration profile the station uses at that moment to connect to the network. This configuration variable only has to be implemented when NetworkConnectionProfile is implemented. | | |

* + 1. AllowNewSessionsPendingFirmwareUpdate

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | ChargingStation | |
| **Variable** | **variableName** | AllowNewSessionsPendingFirmwareUpdate | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Indicates whether new sessions can be started on EVSEs, while Charging Station is waiting for all EVSEs to  become Available in order to start a pending firmware update.  When a firmware update is waiting to be installed and this variable exists and has the value *true*, then, the Charging Station will not set free EVSEs to Unavailable, pending the update. This means that it may take longer until there is a point in time when all EVSEs of the Charging Station are free and it can perform the firmware update. | | |

* + 1. DefaultMessageTimeout

|  |  |  |
| --- | --- | --- |
| **Required** | yes | |
| **Component** | **componentName** | OCPPCommCtrlr |

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **variableName** | MessageTimeout | |
| **variableInstance** | Default | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **unit** | seconds |
| **dataType** | integer |
| **Description** | The purpose of the message timeout is to be able to consider a request message as not sent and continue with other tasks when the message did not arrive due to communication errors or software failure. The message timeout setting in a Charging Station can be configured in the messageTimeout field in the *NetworkConnectionProfile*. | | |

* + 1. FileTransferProtocols

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | OCPPCommCtrlr | |
| **Variable** | **variableName** | FileTransferProtocols | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | MemberList |
| **Description** | List of supported file transfer protocols.  Possible values: FTP, FTPS, HTTP, HTTPS, SFTP. | | |

* + 1. HeartbeatInterval

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | OCPPCommCtrlr | |
| **Variable** | **variableName** | HeartbeatInterval | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **unit** | seconds |
| **dataType** | integer |
| **Description** | Interval of inactivity (no OCPP exchanges) with CSMS after which the Charging Station should send HeartbeatRequest. | | |

* + 1. NetworkConfigurationPriority

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | OCPPCommCtrlr | |
| **Variable** | **variableName** | NetworkConfigurationPriority | |
| **variableAttributes** | **attributeType** | Actual |
| **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | SequenceList |
| **valueList** | List of possible values |
| **Description** | A comma separated ordered list of the priority of the possible Network Connection Profiles. The list of possible available profile slots for the network configuration profiles SHALL be reported, via the valueList characteristic of this Variable. | | |

* + 1. NetworkProfileConnectionAttempts

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | OCPPCommCtrlr | |
| **Variable** | **variableName** | NetworkProfileConnectionAttempts | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | integer |

Specifies the number of connection attempts the Charging Station executes before switching to a different profile.

**Description**

* + 1. OfflineThreshold

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | OCPPCommCtrlr | |
| **Variable** | **variableName** | OfflineThreshold | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **unit** | seconds |
| **dataType** | integer |
| **Description** | When the offline period of a Charging Station exceeds the OfflineThreshold it is recommended to send a StatusNotificationRequest for all its Connectors. | | |

* + 1. QueueAllMessages

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | OCPPCommCtrlr | |
| **Variable** | **variableName** | QueueAllMessages | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | When this variable is set to *true*, the Charging Station will queue all message until they are delivered to the CSMS. When set to *false* the Charging Station will only queue Transaction related messages as required in: E04.FR.01.  and other requirements  When this variable is the to *true*, and the Charging Station is running low on memory, the Charging Station SHALL drop TransactionEvent messages last, and when dropping measurements/meter data, the Charging Station SHALL drop intermediate values first (1st value, 3th value, 5th etc), not start dropping values from the beginning or  and of the measurements/meter data. Default = false | | |

* + 1. MessageAttemptsTransactionEvent

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | OCPPCommCtrlr | |
| **Variable** | **variableName** | MessageAttempts | |
| **variableInstance** | TransactionEvent | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | integer |
| **Description** | How often the Charging Station should try to submit a TransactionEventRequest message when the CSMS fails to process it. | | |

* + 1. MessageAttemptIntervalTransactionEvent

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | OCPPCommCtrlr | |
| **Variable** | **variableName** | MessageAttemptInterval | |
| **variableInstance** | TransactionEvent | |
| **variableAttributes** | **attributeType** | Actual |
| **mutability** | ReadWrite |
| **variableCharacteristics** | **unit** | seconds |
| **dataType** | integer |
| **Description** | How long the Charging Station should wait before resubmitting a TransactionEventRequest message that the CSMS failed to process. | | |

* + 1. UnlockOnEVSideDisconnect

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | OCPPCommCtrlr | |
| **Variable** | **variableName** | UnlockOnEVSideDisconnect | |
| **evse** | \* | |
| **variableAttributes** | **mutability** | ReadWrite/ReadOnly |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | When set to *true*, the Charging Station SHALL unlock the cable on Charging Station side when the cable is unplugged at the EV. For an EVSE with a fixed cable the mutability SHALL be ReadOnly and the actual value SHALL be false. | | |

* + 1. WebSocketPingInterval

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | OCPPCommCtrlr | |
| **Variable** | **variableName** | WebSocketPingInterval | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **unit** | seconds |
| **dataType** | integer |
| **Description** | Only relevant for websocket implementations. 0 disables client side websocket Ping/Pong. In this case there is either no ping/pong or the server initiates the ping and client responds with Pong. Positive values are interpreted as number of seconds between pings. Negative values are not allowed. SetConfiguration is expected to return a *Rejected* result. | | |

* + 1. ResetRetries

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | OCPPCommCtrlr | |
| **Variable** | **variableName** | ResetRetries | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | integer |
| **Description** | Number of times to retry a reset of the Charging Station when a reset was unsuccessful. | | |

* + 1. ItemsPerMessageGetReport

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | DeviceDataCtrlr | |
| **Variable** | **variableName** | ItemsPerMessage | |
| **variableInstance** | GetReport | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **Description** | Maximum number of ComponentVariable entries that can be sent in one getReportRequest message. | | |

* + 1. ItemsPerMessageGetVariables

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | DeviceDataCtrlr | |
| **Variable** | **variableName** | ItemsPerMessage | |
| **variableInstance** | GetVariables | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |

Maximum number of GetVariableData objects in GetVariablesRequest.

**Description**

* + 1. BytesPerMessageGetReport

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | DeviceDataCtrlr | |
| **Variable** | **variableName** | BytesPerMessage | |
| **variableInstance** | GetReport | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **Description** | Message Size (in bytes) - puts constraint on getReportRequest message size. | | |

* + 1. BytesPerMessageGetVariables

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | DeviceDataCtrlr | |
| **Variable** | **variableName** | BytesPerMessage | |
| **variableInstance** | GetVariables | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **Description** | Message Size (in bytes) - puts constraint on GetVariablesRequest message size. | | |

* + 1. ConfigurationValueSize

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | DeviceDataCtrlr | |
| **Variable** | **variableName** | ConfigurationValueSize | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **maxLimit** | 1000 |
| **Description** | This Configuration Variable can be used to limit the following fields: SetVariableData.attributeValue and VariableCharacteristics.valueList. The max size of these values will always remain equal. | | |

* + 1. ReportingValueSize

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | DeviceDataCtrlr | |
| **Variable** | **variableName** | ReportingValueSize | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **maxLimit** | 2500 |
| **Description** | This Configuration Variable can be used to limit the following fields: GetVariableResult.attributeValue, VariableAttribute.value and EventData.actualValue. The max size of these values will always remain equal. | | |

* + 1. ItemsPerMessageSetVariables

|  |  |  |
| --- | --- | --- |
| **Required** | yes | |
| **Component** | **componentName** | DeviceDataCtrlr |

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **variableName** | ItemsPerMessage | |
| **variableInstance** | SetVariables | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **Description** | Maximum number of SetVariableData objects in SetVariablesRequest. | | |

* + 1. BytesPerMessageSetVariables

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | DeviceDataCtrlr | |
| **Variable** | **variableName** | BytesPerMessage | |
| **variableInstance** | SetVariables | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **Description** | Message Size (in bytes) - puts constraint on SetVariablesRequest message size. | | |

* + 1. DateTime

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | ClockCtrlr | |
| **Variable** | **variableName** | DateTime | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | DateTime |
| **Description** | Contains the current date and time. | | |

* + 1. NtpSource

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | ClockCtrlr | |
| **Variable** | **variableName** | NtpSource | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | OptionList |
| **valuesList** | DHCP, manual |
| **Description** | When an NTP client is implemented, this variable can be used to configure the client: Use the NTP server provided via DHCP, or use the manually configured NTP server. | | |

* + 1. NtpServerUri

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | ClockCtrlr | |
| **Variable** | **variableName** | NtpServerUri | |
| **variableInstance** | Single digit, multiple servers allowed, primary NtpServer has instance '1', the secondary has instance '2'. etc | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | string |
| **Description** | When an NTP client is implemented, this variable can be used to configure the client: This contains the address of the NTP server.  Multiple NTP servers can be configured. These can be back-up NTP servers. If the NTP client supports it, it can also connect to multiple NTP servers simultaneous to get a more reliable time source. | | |

* + 1. TimeOffset

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | ClockCtrlr | |
| **Variable** | **variableName** | TimeOffset | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | string |
| **Description** | Configured current local time offset in the format: "+01:00", "-02:00" etc.  When a TimeOffset is used, it is advised not to implement: TimeZone. If a Charging Station has implemented both  TimeOffset and TimeZone it is RECOMMENDED to not use both at the same time.  The time offset is for display purposes. | | |

* + 1. NextTimeOffsetTransitionDateTime

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | ClockCtrlr | |
| **Variable** | **variableName** | NextTimeOffsetTransitionDateTime | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | DateTime |
| **Description** | Date time of the next time offset transition. On this date time, the clock displayed to the EV driver will be given the  new offset as configured via 'TimeOffsetNextTransition'.  This can be used to manually configure the next start or end of a daylight saving time period. | | |

* + 1. TimeOffsetNextTransition

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | ClockCtrlr | |
| **Variable** | **variableName** | TimeOffset | |
| **variableInstance** | NextTransition | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | string |
| **Description** | Next local time offset in the format: "+01:00", "-02:00" etc.  New offset that will be set on the next time offset transition as configured via  'NextTimeOffsetTransitionDateTime'.  This can be used to manually configure the offset for the start or end of the daylight saving time period. | | |

* + 1. TimeSource

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | ClockCtrlr | |
| **Variable** | **variableName** | TimeSource | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | SequenceList |
| **valuesList** | List of all implemented time sources. Possible values: Heartbeat, NTP, GPS, RealTimeClock, MobileNetwork, RadioTimeTransmitter |

Via this variable, the Charging Station provides the CSMS with the option to configure a clock source, if more than 1 are implemented.

By providing a list of possible sources, the CSO can configure fallback sources. Example:

"NTP,Heartbeat" means, use NTP, but when none of the NTP servers responses, use time synchronization via

Heartbeat.

NOTE: RadioTimeTransmitter: At various locations around the globe, low-frequency radio transmitters provide accurate local time information e.g. DCF77 in Germany, MSF in the United Kingdom, JJY in Japan etc. Such a radio time clock can be used as a time source for a Charging Station. The Charging Station shall convert the broadcasted time to UTC. For this TimeZone, TimeOffset, 'NextTimeOffsetTransitionDateTime' and 'TimeOffsetNextTransition' can be used.

**Description**

* + 1. TimeZone

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | ClockCtrlr | |
| **Variable** | **variableName** | TimeZone | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | string |
| **Description** | Configured current local time zone in the format: "Europe/Oslo", "Asia/Singapore" etc.  When a time zone is used, it is advised not to implement: TimeOffset. If a Charging Station has implemented both TimeOffset and TimeZone it is RECOMMENDED to not use both at the same time.  The time zone is for display purposes. | | |

# Security related

* + 1. BasicAuthPassword

The basic authentication password is used for HTTP Basic Authentication. The configuration value is write-only, so that it cannot be accidentally stored in plaintext by the CSMS when it reads out all configuration values.

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | SecurityCtrlr | |
| **Variable** | **variableName** | BasicAuthPassword | |
| **variableAttributes** | **mutability** | WriteOnly |
| **variableCharacteristics** | **dataType** | identifierString |
| **maxLimit** | 40 (Max length of the BasicAuthPassword) |
| **Description** | The basic authentication password is used for HTTP Basic Authentication. The password SHALL be a randomly chosen identifierString with a sufficiently high entropy, consisting of minimum 16 and maximum 40 characters (alpha-numeric characters and the special characters allowed by identifierString). The password SHALL be sent as a UTF-8 encoded string (NOT encoded into octet string or base64). This configuration variable is write-only, so  that it cannot be accidentally stored in plaintext by the CSMS when it reads out all configuration variables. This configuration variable is required unless only "security profile 3 - TLS with client side certificates" is implemented. | | |

* + 1. Identity

|  |  |  |
| --- | --- | --- |
| **Required** | no | |
| **Component** | **componentName** | SecurityCtrlr |

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **variableName** | Identity | |
| **variableAttributes** | **mutability** | ReadOnly or ReadWrite |
| **variableCharacteristics** | **dataType** | identifierString |
| **maxLimit** | 48 (Charging Station Identity) |
| **Description** | The Charging Station identity. identity is an identifierString, however because this value is also used as the basic  authentication username, the colon character ':' SHALL not be used.  Maximum length was chosen to ensure compatibility with EVSE ID from [EMI3-BO] "Part 2: business objects". | | |

* + 1. OrganizationName

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | SecurityCtrlr | |
| **Variable** | **variableName** | OrganizationName | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | string |
| **Description** | This configuration variable is used to set the organization name of the CSO or an organization trusted by the CSO. This organization name is used to specify the subject field in the client certificate. | | |

* + 1. CertificateEntries

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | SecurityCtrlr | |
| **Variable** | **variableName** | CertificateEntries | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **maxLimit** | Maximum number of Certificates installed at any time. |
| **Description** | Amount of Certificates currently installed on the Charging Station. | | |

* + 1. SecurityProfile

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | SecurityCtrlr | |
| **Variable** | **variableName** | SecurityProfile | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **Description** | This configuration variable is used to report the security profile used by the Charging Station. | | |

* + 1. AdditionalRootCertificateCheck

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | SecurityCtrlr | |
| **Variable** | **variableName** | AdditionalRootCertificateCheck | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | boolean |

When set to true, only one certificate (plus a temporarily fallback certificate) of certificateType CSMSRootCertificate is allowed to be installed at a time. When installing a new CSMS Root certificate, the new certificate SHALL replace the old one AND the new CSMS Root Certificate MUST be signed by the old CSMS Root

Certificate it is replacing.

This configuration variable is required unless only "security profile 1 - Unsecured Transport with Basic Authentication" is implemented. Please note that security profile 1 SHOULD only be used in trusted networks.

*Note: When using this additional security mechanism please be aware that the Charging Station needs to perform a full certificate chain verification when the new CSMS Root certificate is being installed. However, once the old CSMS Root certificate is set as the fallback certificate, the Charging Station needs to perform a partial certificate chain verification when verifying the server certificate during the TLS handshake. Otherwise the verification will fail once the old CSMS Root (fallback) certificate is either expired or removed.*

**Description**

* + 1. MaxCertificateChainSize

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | SecurityCtrlr | |
| **Variable** | **variableName** | MaxCertificateChainSize | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **maxLimit** | 10000 |
| **Description** | This configuration variable can be used to limit the size of the 'certificateChain' field from the CertificateSignedRequest PDU. This value SHOULD NOT be set too small. The smaller this value, the less security architectures the Charging Station will support. It is RECOMMENDED to set at least a size of 5600. This will allow the Charging Station to support most security architectures. | | |

# Authorization related

* + 1. AuthEnabled

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | AuthCtrlr | |
| **Variable** | **variableName** | Enabled | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | If set to FALSE, then authorization is switched off. Transactions are still possible, but no authorization will take place. This implies, that the value of idToken in transaction events SHALL be NoAuthorization | | |

* + 1. AdditionalInfoItemsPerMessage

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | AuthCtrlr | |
| **Variable** | **variableName** | AdditionalInfoItemsPerMessage | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **Description** | Maximum number of AdditionalInfo items that can be sent in one message. This configuration variable only has to be implemented when AdditionalInfo is implemented. | | |

* + 1. OfflineTxForUnknownIdEnabled

|  |  |  |
| --- | --- | --- |
| **Required** | no | |
| **Component** | **componentName** | AuthCtrlr |

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **variableName** | OfflineTxForUnknownIdEnabled | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | If this key exists, the Charging Station supports Unknown Offline Authorization. If this key reports a value of *true*, Unknown Offline Authorization is enabled. | | |

* + 1. AuthorizeRemoteStart

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | AuthCtrlr | |
| **Variable** | **variableName** | AuthorizeRemoteStart | |
| **variableAttributes** | **mutability** | ReadOnly or ReadWrite. Choice is up to Charging Station implementation. |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Whether a remote request to start a transaction in the form of RequestStartTransactionRequest message should be authorized beforehand like a local action to start a transaction. | | |

* + 1. LocalAuthorizeOffline

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | AuthCtrlr | |
| **Variable** | **variableName** | LocalAuthorizeOffline | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Whether the Charging Station, when *Offline*, will start a transaction for locally-authorized identifiers. | | |

* + 1. LocalPreAuthorize

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | AuthCtrlr | |
| **Variable** | **variableName** | LocalPreAuthorize | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Whether the Charging Station, when online, will start a transaction for locally-authorized identifiers without waiting for or requesting an AuthorizeResponse from the CSMS. | | |

* + 1. MasterPassGroupId

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | AuthCtrlr | |
| **Variable** | **variableName** | MasterPassGroupId | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | string |
| **maxLimit** | 36 (The maximum string length of MasterPassGroupId) |
| **Description** | IdTokens that have this id as groupId belong to the Master Pass Group. Meaning they can stop any ongoing transaction, but cannot start transactions. This can, for example, be used by law enforcement personal to stop any ongoing transaction when an EV has to be towed away. | | |

# Authorization Cache related

* + 1. AuthCacheEnabled

**NOTE** When the value of this variable is changed, the content of the authorization cache should not be altered.

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | AuthCacheCtrlr | |
| **Variable** | **variableName** | Enabled | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | If this variable exists and reports a value of *true*, Authorization Cache is enabled. | | |

* + 1. AuthCacheAvailable

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | AuthCacheCtrlr | |
| **Variable** | **variableName** | Available | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | If this variable exists and reports a value of *true*, Authorization Cache is supported, but not necessarily enabled. | | |

* + 1. AuthCacheLifeTime

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | AuthCacheCtrlr | |
| **Variable** | **variableName** | LifeTime | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **unit** | Seconds |
| **dataType** | integer |
| **Description** | Indicates how long it takes until a token expires in the authorization cache since it is last used. | | |

* + 1. AuthCacheStorage

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | AuthCacheCtrlr | |
| **Variable** | **variableName** | Storage | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **maxLimit** | The maximum number of bytes |
| **Description** | Indicates the number of bytes currently used by the Authorization Cache. MaxLimit indicates the maximum number of bytes that can be used by the Authorization Cache. | | |

* + 1. AuthCachePolicy

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | AuthCacheCtrlr | |
| **Variable** | **variableName** | Policy | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | OptionList |
| **valuesList** | LRU, LFU, FIFO, CUSTOM |
| **Description** | Cache Entry Replacement Policy: least recently used, least frequently used, first in first out, other custom mechanism. | | |

# Local Authorization List Management related

* + 1. LocalAuthListEnabled

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | LocalAuthListCtrlr | |
| **Variable** | **variableName** | Enabled | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | If this variable exists and reports a value of *true*, Local Authorization List is enabled. | | |

* + 1. LocalAuthListEntries

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | when LocalAuthListAvailable is *true* | | |
| **Component** | **componentName** | LocalAuthListCtrlr | |
| **Variable** | **variableName** | Entries | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **maxLimit** | The maximum number of IdTokens that can be stored in the Local Authorization List. |
| **Description** | Amount of IdTokens currently in the Local Authorization List.  The maxLimit of this variable SHALL be provided to report the maximum number of IdTokens that can be stored in the Local Authorization List. | | |

* + 1. LocalAuthListAvailable

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | LocalAuthListCtrlr | |
| **Variable** | **variableName** | Available | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | If this variable exists and reports a value of *true*, Local Authorization List is supported. | | |

* + 1. ItemsPerMessageSendLocalList

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | when LocalAuthListAvailable is *true* | | |
| **Component** | **componentName** | LocalAuthListCtrlr | |
| **Variable** | **variableName** | ItemsPerMessage | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |

* + 1. BytesPerMessageSendLocalList

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | when LocalAuthListAvailable is *true* | | |
| **Component** | **componentName** | LocalAuthListCtrlr | |
| **Variable** | **variableName** | BytesPerMessage | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |

* + 1. LocalAuthListStorage

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | LocalAuthListCtrlr | |
| **Variable** | **variableName** | Storage | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **maxLimit** | The maximum number of bytes |
| **Description** | Indicates the number of bytes currently used by the Local Authorization List. MaxLimit indicates the maximum number of bytes that can be used by the Local Authorization List. | | |

# Transaction related

* + 1. EVConnectionTimeOut

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | TxCtrlr | |
| **Variable** | **variableName** | EVConnectionTimeOut | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **unit** | seconds |
| **dataType** | integer |
| **Description** | Interval from between "starting" of a transaction until incipient transaction is automatically canceled, due to failure of EV driver to (correctly) insert the charging cable connector(s) into the appropriate socket(s). The Charging Station SHALL go back to the original state, probably: 'Available'. "Starting" might be the swiping of the RFID, pressing a start button, a RequestStartTransactionRequest being received etc. | | |

* + 1. StopTxOnEVSideDisconnect

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | TxCtrlr | |
| **Variable** | **variableName** | StopTxOnEVSideDisconnect | |
| **variableAttributes** | **mutability** | ReadWrite or ReadOnly, depending on Charging Station implementation. |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | When set to *true*, the Charging Station SHALL deauthorize the transaction when the cable is unplugged from the EV. | | |

* + 1. TxBeforeAcceptedEnabled

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | TxCtrlr | |
| **Variable** | **variableName** | TxBeforeAcceptedEnabled | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | With this configuration variable the Charging Station can be configured to allow charging before having received a BootNotificationResponse with RegistrationStatus: Accepted. See: Transactions before being accepted by a CSMS. | | |

* + 1. TxStartPoint

|  |  |  |
| --- | --- | --- |
| **Required** | yes | |
| **Component** | **componentName** | TxCtrlr |

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **variableName** | TxStartPoint | |
| **variableAttributes** | **mutability** | ReadOnly or ReadWrite. Choice is up to Charging Station implementation. |
| **variableCharacteristics** | **dataType** | MemberList |
| **valueList** | See TxStartStopPoint values for allowed values. It is not required to implement all possible values. |
| **Description** | Defines when the Charging Station starts a new transaction: first transactioneventRequest: eventType = Started. When any event in the given list occurs, the Charging Station SHALL start a transaction.  The Charging Station SHALL only send the Started event once for every transaction.  It is advised to put all events that should be part of a transaction in the list, in case the start event never occurs. Because the possible events don’t always have to come in the same order it is possible to provide a list of events. Which ever comes first will then cause a transaction to be started. For example: EVConnected, Authorized would mean that a transaction is started when an EV is detected (Cable is connected), or when an EV Driver swipes his RFID card en the CSMS successfully authorizes the ID for charging. | | |

## TxStartStopPoint values

The values allowed for the TxStartPoint and TxStopPoint variables.

|  |  |
| --- | --- |
| **Value** | **Description** |
| **ParkingBayOccupancy** | An object (probably an EV) is detected in the parking/charging bay. |
| **EVConnected** | Both ends of the Charging Cable are connected (if this can be detected, otherwise detection of a cable being plugged in to the socket), or for wireless: initial communication between EVSE and EV is established. |
| **Authorized** | Driver or EV is authorized, this can also be some form of anonymous authorization like a start button. |
| **DataSigned** | Signed data is received from the energy meter which is required by some legislation. There are countries that require signed metering data before a billable transaction can be started. |
| **PowerPathClosed** | All preconditions are met, power can flow. In case of a wired charger, the cable is properly connected, driver is authorized, power relay is closed etc. This does not mean that the EV is read to charge it’s battery, it might, for example, be to warm. |
| **EnergyTransfer** | Energy is being transferred between EV and EVSE. |

* + 1. TxStopPoint

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | TxCtrlr | |
| **Variable** | **variableName** | TxStopPoint | |
| **variableAttributes** | **mutability** | ReadOnly or ReadWrite. Choice is up to Charging Station implementation. |
| **variableCharacteristics** | **dataType** | MemberList |
| **valueList** | See TxStartStopPoint values for allowed values. It is not required to implement all possible values. |
| **Description** | Defines when the Charging Station ends a transaction: last transactioneventRequest: eventType = Ended. When any event in the given list is no longer valid, the Charging Station SHALL end the transaction.  The Charging Station SHALL only send the Ended event once for every transaction. | | |

* + 1. MaxEnergyOnInvalidId

|  |  |  |
| --- | --- | --- |
| **Required** | no | |
| **Component** | **componentName** | TxCtrlr |

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **variableName** | MaxEnergyOnInvalidId | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **unit** | Wh |
| **dataType** | integer |
| **Description** | Maximum amount of energy in Wh delivered when an identifier is deauthorized by the CSMS after start of a transaction. | | |

* + 1. StopTxOnInvalidId

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | TxCtrlr | |
| **Variable** | **variableName** | StopTxOnInvalidId | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | whether the Charging Station will deauthorize an ongoing transaction when it receives a non- *Accepted*  authorization status in TransactionEventResponse for this transaction. | | |

# Metering related

* + 1. SampledDataEnabled

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | SampledDataCtrlr | |
| **Variable** | **variableName** | Enabled | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | If this variable reports a value of *true*, Sampled Data is enabled. | | |

* + 1. SampledDataAvailable

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | SampledDataCtrlr | |
| **Variable** | **variableName** | Available | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | If this variable reports a value of *true*, Sampled Data is supported. | | |

* + 1. SampledDataSignReadings

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | SampledDataCtrlr | |
| **Variable** | **variableName** | SignReadings | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | If set to *true*, the Charging Station SHALL include signed meter values in the TransactionEventRequest to the CSMS. When a Charging Station does not support signed meter values it SHALL NOT report this variable. | | |

* + 1. SampledDataTxEndedMeasurands

|  |  |  |
| --- | --- | --- |
| **Required** | yes | |
| **Component** | **componentName** | SampledDataCtrlr |

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **variableName** | TxEndedMeasurands | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | MemberList |
| **maxLimit** | The maximum length of the CSV formatted string, to be defined by the implementer. |
| **Description** | Sampled measurands to be included in the *meterValues* element of TransactionEventRequest (eventType =  Ended), every SampledDataTxEndedInterval seconds from the start of the transaction.  The Charging Station reports the list of supported Measurands in VariableCharacteristicsType.valuesList of this variable. This way the CSMS knows which Measurands it can put in the TxEndedSampledData.  When left empty, no sampled measurands SHALL be put into the TransactionEventRequest (eventType = Ended). | | |

* + 1. SampledDataTxEndedInterval

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | SampledDataCtrlr | |
| **Variable** | **variableName** | TxEndedInterval | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **unit** | seconds |
| **dataType** | integer |
| **Description** | Interval between sampling of metering (or other) data, intended to be transmitted in the TransactionEventRequest (eventType = Ended) message. For transaction data (evseId>0), samples are acquired and transmitted only in the  TransactionEventRequest (eventType = Ended) message.  A value of "0" (numeric zero), by convention, is to be interpreted to mean that only the values taken at the *start* and  *end* of a transaction should be transmitted (no intermediate values). | | |

* + 1. SampledDataTxStartedMeasurands

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | SampledDataCtrlr | |
| **Variable** | **variableName** | TxStartedMeasurands | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | MemberList |
| **maxLimit** | The maximum length of the CSV formatted string, to be defined by the implementer. |
| **Description** | Sampled measurand(s) to be taken at the start of any transaction to be included in the meterValues field of the  first TransactionEventRequest message send at the start of a transaction (eventType = Started).  The Charging Station reports the list of supported Measurands in VariableCharacteristicsType.valuesList of this variable. This way the CSMS knows which Measurands it can put in the SampledDataTxStartedMeasurands.  If the Charging Station has a meter, recommended to use as default: "Energy.Active.Import.Register" | | |

* + 1. SampledDataTxUpdatedMeasurands

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | SampledDataCtrlr | |
| **Variable** | **variableName** | TxUpdatedMeasurands | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | MemberList |
| **maxLimit** | The maximum length of the CSV formatted string, to be defined by the implementer. |

Sampled measurands to be included in the *meterValues* element of every TransactionEventRequest (eventType =

Updated), every SampledDataTxUpdatedInterval seconds from the start of the transaction.

The Charging Station reports the list of supported Measurands in VariableCharacteristicsType.valuesList of this variable. This way the CSMS knows which Measurands it can put in the SampledDataTxUpdatedMeasurands.

If the Charging Station has a meter, recommended to use as default: "Energy.Active.Import.Register"

**Description**

* + 1. SampledDataTxUpdatedInterval

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **component Name** | SampledDataCtrlr | |
| **Variable** | **variableName** | TxUpdatedInterval | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **unit** | seconds |
| **dataType** | integer |
| **Description** | Interval between sampling of metering (or other) data, intended to be transmitted via TransactionEventRequest (eventType = Updated) messages. For transaction data (evseId>0), samples are acquired and transmitted  periodically at this interval from the start of the charging transaction.  A value of "0" (numeric zero), by convention, is to be interpreted to mean that no sampled data should be transmitted during the transaction. | | |

* + 1. AlignedDataEnabled

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | AlignedDataCtrlr | |
| **Variable** | **variableName** | Enabled | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | If this variable reports a value of *true*, Aligned Data is enabled. | | |

* + 1. AlignedDataAvailable

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | AlignedDataCtrlr | |
| **Variable** | **variableName** | Available | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | If this variable reports a value of *true*, Aligned Data is supported. | | |

* + 1. AlignedDataMeasurands

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | AlignedDataCtrlr | |
| **Variable** | **variableName** | Measurands | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | MemberList |
| **maxLimit** | The maximum length of the CSV formatted string, to be defined by the implementer. |
| **Description** | Clock-aligned measurand(s) to be included in MeterValuesRequest, every AlignedDataInterval seconds. For all the allowed values see: Measurand.  The Charging Station reports the list of supported Measurands in VariableCharacteristicsType.valuesList of this  variable. This way the CSMS knows which Measurands it can put in the AlignedDataMeasurands. | | |

* + 1. AlignedDataInterval

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | AlignedDataCtrlr | |
| **Variable** | **variableName** | Interval | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **unit** | seconds |
| **dataType** | integer |
| **Description** | Size (in seconds) of the clock-aligned data interval, intended to be transmitted in the MeterValuesRequest message. This is the size (in seconds) of the set of evenly spaced aggregation intervals per day, starting at 00:00:00 (midnight). For example, a value of 900 (15 minutes) indicates that every day should be broken into 96  15-minute intervals.  When clock aligned data is being transmitted, the interval in question is identified by the start time and (optional) duration interval value, represented according to the ISO8601 standard. All "per-period" data (e.g. energy readings) should be accumulated (for "flow" type measurands such as energy), or averaged (for other values) across the entire interval (or partial interval, at the beginning or end of a transaction), and transmitted (if so enabled) at the  end of each interval, bearing the interval start time timestamp.  A value of "0" (numeric zero), by convention, is to be interpreted to mean that no clock-aligned data should be transmitted. | | |

* + 1. AlignedDataSendDuringIdle

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | AlignedDataCtrlr | |
| **Variable** | **variableName** | SendDuringIdle | |
| **evse** | \* | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | If set to *true*, the Charging Station SHALL NOT send clock aligned meter values when a transaction is ongoing. When an EVSE is specified, it SHALL stop sending the clock aligned meter values for this EVSE when it has an ongoing transaction. When no EVSE is specified, it SHALL stop sending the clock aligned meter values when any transaction is ongoing on this Charging Station. | | |

* + 1. AlignedDataSignReadings

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | AlignedDataCtrlr | |
| **Variable** | **variableName** | SignReadings | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | If set to *true*, the Charging Station SHALL include signed meter values in the SampledValueType in the MeterValuesRequest to the CSMS. When a Charging Station does not support signed meter values it SHALL NOT report this variable. | | |

* + 1. AlignedDataTxEndedMeasurands

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | AlignedDataCtrlr | |
| **Variable** | **variableName** | TxEndedMeasurands | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | MemberList |
| **maxLimit** | The maximum length of the CSV formatted string, to be defined by the implementer. |

Clock-aligned periodic measurand(s) to be included in the *meterValues* element of TransactionEventRequest

(eventType = Ended) for every AlignedDataTxEndedInterval of the transaction.

The Charging Station reports the list of supported Measurands in VariableCharacteristicsType.valuesList of this variable. This way the CSMS knows which Measurands it can put in the TxEndedAlignedData.

When left empty, no Clock-aligned measurands SHALL be put into the TransactionEventRequest (eventType = Ended).

**Description**

* + 1. AlignedDataTxEndedInterval

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | AlignedDataCtrlr | |
| **Variable** | **variableName** | TxEndedInterval | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **unit** | seconds |
| **dataType** | integer |
| **Description** | Size (in seconds) of the clock-aligned data interval, intended to be transmitted in the TransactionEventRequest (eventType = Ended) message. This is the size (in seconds) of the set of evenly spaced aggregation intervals per day, starting at 00:00:00 (midnight). For example, a value of 900 (15 minutes) indicates that every day should be  broken into 96 15-minute intervals.  When clock aligned data is being collected, the interval in question is identified by the start time and (optional) duration interval value, represented according to the ISO8601 standard. All "per-period" data (e.g. energy readings) should be accumulated (for "flow" type measurands such as energy), or averaged (for other values) across the entire interval (or partial interval, at the beginning or end of a transaction), and transmitted (if so enabled) at the  end of the transaction in 1 TransactionEventRequest (eventType = Ended) message.  + A value of "0" (numeric zero), by convention, is to be interpreted to mean that only the values taken at the *start*  and *end* of a transaction should be transmitted (no intermediate values). | | |

* + 1. PublicKeyWithSignedMeterValue

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | OCPPCommCtrlr | |
| **Variable** | **variableName** | PublicKeyWithSignedMeterValue | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | OptionList |
| **valueList** | Never,OncePerTransaction,EveryMeterValue |
| **Description** | This Configuration Variable can be used to configure whether a public key needs to be sent with a signed meter value. | | |

# Reservation related

* + 1. ReservationEnabled

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | ReservationCtrlr | |
| **Variable** | **variableName** | Enabled | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Whether Reservation is enabled. | | |

* + 1. ReservationAvailable

|  |  |  |
| --- | --- | --- |
| **Required** | no | |
| **Component** | **componentName** | ReservationCtrlr |

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **variableName** | Available | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Whether Reservation is supported. | | |

* + 1. ReservationNonEvseSpecific

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | ReservationCtrlr | |
| **Variable** | **variableName** | NonEvseSpecific | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | If this configuration variable is present and set to *true*: Charging Station supports Reservation where EVSE id is not specified. | | |

# Smart Charging related

* + 1. SmartChargingEnabled

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | SmartChargingCtrlr | |
| **Variable** | **variableName** | Enabled | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Whether Smart Charging is enabled. | | |

* + 1. SmartChargingAvailable

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | SmartChargingCtrlr | |
| **Variable** | **variableName** | Available | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Whether Smart Charging is supported. | | |

* + 1. ACPhaseSwitchingSupported

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | SmartChargingCtrlr | |
| **Variable** | **variableName** | ACPhaseSwitchingSupported | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | This variable can be used to indicate an on-load/in-transaction capability. If defined and true, this EVSE supports the selection of which phase to use for 1 phase AC charging. | | |

* + 1. ChargingProfileMaxStackLevel

|  |  |  |
| --- | --- | --- |
| **Required** | yes | |
| **Component** | **componentName** | SmartChargingCtrlr |

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **variableName** | ProfileStackLevel | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **Description** | Max StackLevel of a ChargingProfile. The number defined also indicates the max allowed number of installed charging schedules per Charging Profile Purposes. | | |

* + 1. ChargingScheduleChargingRateUnit

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | SmartChargingCtrlr | |
| **Variable** | **variableName** | RateUnit | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | MemberList |
| **Description** | A list of supported quantities for use in a ChargingSchedule. Allowed values: 'A' and 'W' | | |

* + 1. PeriodsPerSchedule

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | SmartChargingCtrlr | |
| **Variable** | **variableName** | PeriodsPerSchedule | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **Description** | Maximum number of periods that may be defined per ChargingSchedule. | | |

* + 1. ExternalControlSignalsEnabled

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | SmartChargingCtrlr | |
| **Variable** | **variableName** | ExternalControlSignalsEnabled | |
| **variableAttributes** | **mutability** | ReadOnly or ReadWrite. Choice is up to Charging Station implementation. |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Indicates whether a Charging Station should respond to external control signals that influence charging. | | |

* + 1. NotifyChargingLimitWithSchedules

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | SmartChargingCtrlr | |
| **Variable** | **variableName** | NotifyChargingLimitWithSchedules | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Indicates if the Charging Station should include the externally set charging limit/schedule in the message when it sends a NotifyChargingLimitRequest message. This might increase the data usage significantly, especially when an external system sends new profiles/limits with a short interval. Default is false when omitted. | | |

* + 1. Phases3to1

|  |  |  |
| --- | --- | --- |
| **Required** | no | |
| **Component** | **componentName** | SmartChargingCtrlr |

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **variableName** | Phases3to1 | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | If defined and true, this Charging Station supports switching from 3 to 1 phase during a transaction. | | |

* + 1. ChargingProfileEntries

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | SmartChargingCtrlr | |
| **Variable** | **variableName** | Entries | |
| **VariableInstance** | ChargingProfiles | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **maxLimit** | Maximum number of Charging profiles installed at any time. |
| **Description** | Amount of Charging profiles currently installed on the Charging Station. | | |

* + 1. LimitChangeSignificance

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | SmartChargingCtrlr | |
| **Variable** | **variableName** | LimitChangeSignificance | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | decimal |
| **Description** | If at the Charging Station side a change in the limit in a ChargingProfile is lower than this percentage, the Charging Station MAY skip sending a NotifyChargingLimitRequest or a TransactionEventRequest message to the CSMS. It is RECOMMENDED to set this key to a low value. See Smart Charging signals to a Charging Station from multiple actors. | | |

# Tariff & Cost related

* + 1. TariffEnabled

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | TariffCostCtrlr | |
| **Variable** | **variableName** | Enabled | |
| **variableInstance** | Tariff | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Whether Tariff is enabled. | | |

* + 1. TariffAvailable

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | TariffCostCtrlr | |
| **Variable** | **variableName** | Available | |
| **variableInstance** | Tariff | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Whether Tariff is supported. | | |

* + 1. TariffFallbackMessage

Required for Charging Stations supporting Tariff Information.

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | TariffCostCtrlr | |
| **Variable** | **variableName** | TariffFallbackMessage | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | string |
| **maxLimit** | 255 |
| **Description** | Message (and/or tariff information) to be shown to an EV Driver when there is no driver specific tariff information available. | | |

* + 1. CostEnabled

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | TariffCostCtrlr | |
| **Variable** | **variableName** | Enabled | |
| **variableInstance** | Cost | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Whether Cost is enabled. | | |

* + 1. CostAvailable

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | TariffCostCtrlr | |
| **Variable** | **variableName** | Available | |
| **variableInstance** | Cost | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Whether Cost is supported. | | |

* + 1. TotalCostFallbackMessage

Required for Charging Stations supporting Tariff Information.

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | TariffCostCtrlr | |
| **Variable** | **variableName** | TotalCostFallbackMessage | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | string |
| **maxLimit** | 255 |
| **Description** | Message to be shown to an EV Driver when the Charging Station cannot retrieve the cost for a transaction at the end of the transaction. | | |

* + 1. Currency

Required for Charging Stations supporting Tariff Information.

|  |  |  |
| --- | --- | --- |
| **Required** | yes | |
| **Component** | **componentName** | TariffCostCtrlr |

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **variableName** | Currency | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | string |
| **maxLimit** | 3 |
| **Description** | Currency used by this Charging Station in a ISO 4217 [ISO4217] formatted currency code. | | |

# Diagnostics related

* + 1. MonitoringEnabled

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | MonitoringCtrlr | |
| **Variable** | **variableName** | Enabled | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Whether Monitoring is enabled. | | |

* + 1. MonitoringAvailable

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | MonitoringCtrlr | |
| **Variable** | **variableName** | Available | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Whether Monitoring is supported. | | |

* + 1. ItemsPerMessageClearVariableMonitoring

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | MonitoringCtrlr | |
| **Variable** | **variableName** | ItemsPerMessage | |
| **variableInstance** | ClearVariableMonitoring | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **Description** | Maximum number of IDs in a ClearVariableMonitoringRequest. | | |

* + 1. ItemsPerMessageSetVariableMonitoring

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | MonitoringCtrlr | |
| **Variable** | **variableName** | ItemsPerMessage | |
| **variableInstance** | SetVariableMonitoring | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **Description** | Maximum number of setMonitoringData elements that can be sent in one setVariableMonitoringRequest message. | | |

* + 1. BytesPerMessageClearVariableMonitoring

no

**Required**

|  |  |  |  |
| --- | --- | --- | --- |
| **Component** | **componentName** | MonitoringCtrlr | |
| **Variable** | **variableName** | BytesPerMessage | |
| **variableInstance** | ClearVariableMonitoring | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **Description** | Message Size (in bytes) - puts constraint on ClearVariableMonitoringRequest message size. | | |

* + 1. BytesPerMessageSetVariableMonitoring

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | MonitoringCtrlr | |
| **Variable** | **variableName** | BytesPerMessage | |
| **variableInstance** | SetVariableMonitoring | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **Description** | Message Size (in bytes) - puts constraint on setVariableMonitoringRequest message size. | | |

* + 1. OfflineMonitoringEventQueuingSeverity

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | MonitoringCtrlr | |
| **Variable** | **variableName** | OfflineQueuingSeverity | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | integer |
| **Description** | When set and the Charging Station is *offline*, the Charging Station shall queue any notifyEventRequest messages triggered by a monitor with a severity number equal to or lower than the severity configured here. Value ranging from 0 (Emergency) to 9 (Debug). | | |

# Display Message related

* + 1. DisplayMessageEnabled

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | DisplayMessageCtrlr | |
| **Variable** | **variableName** | Enabled | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Whether Display Message is enabled. | | |

* + 1. DisplayMessageAvailable

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | DisplayMessageCtrlr | |
| **Variable** | **variableName** | Available | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Whether Display Message is supported. | | |

* + 1. NumberOfDisplayMessages

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | DisplayMessageCtrlr | |
| **Variable** | **variableName** | DisplayMessages | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **maxLimit** | Maximum number of different messages that can configured in this Charging Station simultaneous, via SetDisplayMessageRequest. |
| **Description** | Amount of different messages that are currently configured in this Charging Station, via SetDisplayMessageRequest | | |

* + 1. DisplayMessageSupportedFormats

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | DisplayMessageCtrlr | |
| **Variable** | **variableName** | SupportedFormats | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | MemberList |
| **Description** | List of message formats supported by this Charging Station. Possible values: MessageFormat. | | |

* + 1. DisplayMessageSupportedPriorities

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | DisplayMessageCtrlr | |
| **Variable** | **variableName** | SupportedPriorities | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | MemberList |
| **Description** | List of the priorities supported by this Charging Station. Possible values: MessagePriority. | | |

* + 1. CustomImplementationEnabled

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | CustomizationCtrlr | |
| **Variable** | **variableName** | CustomImplementationEnabled | |
| **variableInstance** | <VendorId> | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | This standard configuration variable can be used to enable/disable custom implementations that the Charging Station supports.  It is recommended to first check if the custom behavior is able to be implemented using the device model, otherwise DataTransfer message(s) and/or CustomData fields can be used. | | |

# Charging Infrastructure related

* + 1. Available

yes

**Required**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **componentName** | ChargingStation | |
| EVSE | |
| Connector | |
| **evse** | \* (*for EVSE and Connector*) | |
| **Variable** | **variableName** | Available | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | When *true* the Component exists and is locally configured/wired for use, but may not be (remotely) Enabled. This variable is required on any Component that can be reported by the Charging Station. As a minimum it shall exist on ChargingStation, EVSE and Connector. | | |
| **Note** | If any other variables are reported for a Component, then reporting *Available* does not add much value and may be omitted. However, the variable needs to exist, because it can be queried for by a GetCustomReport request for all Components that are 'available'. | | |

* + 1. AvailabilityState

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Components** | **componentName** | ChargingStation | |
| EVSE | |
| **evse** | \* (*for EVSE*) | |
| **Variable** | **variableName** | AvailabilityState | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | optionList |
| **valuesList** | Available, Occupied, Reserved, Unavailable, Faulted |
| **Description** | This variable reports current availability state for the ChargingStation and EVSE. If a Connector has its own availability state independent of the EVSE, then this variable may be used to report the Connector’s availability state. As such it replicates ConnectorStatus values reported in StatusNotification messages. | | |

* + 1. AllowReset

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | EVSE | |
| **evse** | \* | |
| **Variable** | **variableName** | AllowReset | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | boolean |
| **Description** | Component can be reset. Can be used to announce that an EVSE can be reset individually. | | |

* + 1. ConnectorType

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | Connector | |
| **evse** | \* | |
| **Variable** | **variableName** | ConnectorType | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | string |
| **Description** | Value of the type of connector as defined by ConnectorEnumType in "Part 2 - Specification". | | |

* + 1. PhaseRotation

no

**Required**

|  |  |  |  |
| --- | --- | --- | --- |
| **Component** | **componentName** | \* | |
| **evse** | \* | |
| **Variable** | **variableName** | PhaseRotation | |
| **variableAttributes** | **mutability** | ReadOnly or ReadWrite. |
| **variableCharacteristics** | **dataType** | String |
| **Description** | This variable describes the phase rotation of a Component relative to its parent Component, using a three letter string consisting of the letters: R, S, T and x.  The letter 'R' can be identified as phase 1 (L1), 'S' as phase 2 (L2), 'T' as phase 3 (L3). The lower case 'x' is used to designate a phase that is not connected.  An empty string means that phase rotation is not applicable or not known.  Certain measurands, like voltage and current, are reported with a phase relative to the grid connection. In order to support this, all components in the chain from Connector to ElectricalFeed need to have a value for  PhaseRotation.  Some examples:  "" (unknown)  "RST" (Standard Reference Phasing) "RTS" (Reversed Reference Phasing) "SRT" (Reversed 240 degree rotation) "STR" (Standard 120 degree rotation) "TRS" (Standard 240 degree rotation) "TSR" (Reversed 120 degree rotation) "RSx" (Two phases connected)  "Rxx" (One phase connected) | | |

* + 1. SupplyPhases

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Components** | **componentName** | ChargingStation | |
| EVSE | |
| Connector | |
| **evse** | \* (*for EVSE and Connector*) | |
| **Variable** | **variableName** | SupplyPhases | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | integer |
| **Description** | Number of alternating current phases connected/available. 1 or 3 for AC, 0 means DC (no alternating phases). Null value indicates that the number of phases (e.g. in use) is unknown. | | |

* + 1. Power

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes (*maxLimit only*) | | |
| **Component** | **componentName** | EVSE | |
| **evse** | \* | |
| **Variable** | **variableName** | Power | |
| **variableAttributes** | **mutability** | ReadOnly |
| **variableCharacteristics** | **dataType** | decimal |
| **maxLimit** | decimal |
| **Description** | The variableCharacteristic *maxLimit*, that holds the maximum power that this EVSE can provide, is required. The  *Actual* value of the instantaneous (real) power is desired, but not required. | | |

# ISO 15118 Related

* + 1. CentralContractValidationAllowed

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | no | | |
| **Component** | **componentName** | ISO15118Ctrlr | |
| **Variable** | **variableName** | CentralContractValidationAllowed | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | Boolean |
| **Description** | If this variable exists and has the value *true*, then Charging Station can provide a contract certificate that it cannot validate, to the CSMS for validation as part of the AuthorizeRequest. | | |

* + 1. ContractValidationOffline

|  |  |  |  |
| --- | --- | --- | --- |
| **Required** | yes | | |
| **Component** | **componentName** | ISO15118Ctrlr | |
| **Variable** | **variableName** | ContractValidationOffline | |
| **variableAttributes** | **mutability** | ReadWrite |
| **variableCharacteristics** | **dataType** | Boolean |
| **Description** | If this variable is *true*, then Charging Station will try to validate a contract certificate when it is offline. | | |