



Alfen NG9xx series Release notes

Release notes version 4.12.0
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1 Introduction

Firmware release **4.12.0** is a release that incorporates a number of general improvements, stability improvements, security improvements, bug fixes and some new features.

2 New features

2.1 Security improvements

Several security improvements are included in this release.

- **Removed legacy cipher suite AES128-SHA (which used CBC and SHA-1). OCPP Charging Station Management Systems (CSMS) will no longer be able to connect using this cipher suite.**

The following cipher suites are still available for use:

- AES256-GCM-SHA384
- AES128-GCM-SHA256
- AES256-SHA256
- Made the entire firmware upgrade module more robust against possible errors. The size of the firmware is now validated as well (before and during downloading of the payload).
- Fixed an issue that could cause the charging station to crash upon receipt of certain invalid OCPP messages. Some extra validation checks were added for parameters obtained from incoming OCPP messages.
- The expiry dates of the entire CSMS certificate chain (from root certificate, installed in the charging station, all the way through CSMS endpoint certificate) are now validated.
- Implemented additional protection against stack smashing.

2.2 3 phase charger on 1 phase installation

Charge 1 phase if installation is 1 phase, even when the charging station is capable of charging 3 phases. The charging station checks on the first meter value from the Modbus meter which phases have a voltage, if there is only a voltage > 80 on L1-N and not on L2-N and L3-N, it's a single phase installation.

The following logline will be printed:

```
2020-10-27T09:05:02.621Z:USER:taskModbus.c:802:Meter #2: first meter update, Multiple phase installation
```

Or in case of a single phase installation:

```
2020-10-27T09:05:02.621Z:USER:taskModbus.c:802:Meter #2: first meter update, Single phase installation.
```

Consequence of this detection is that the maximum current state on the display during a charging session can be reduced to the number of phases.

2.3 OCPP 2.0.1

Compared to OCPP 2.0 with all errata, the release of OCPP 2.0.1 was accompanied with breaking changes in the json schema.

These changes are now implemented, so the OCPP 2.0 functionality is now conform the OCPP 2.0.1 json schema.

These changes also resulted in an update of the OCPP 1.6 Security Whitepaper (edition 2) and these changes are also implemented.

3 Improvements

Before a metervalue is queued for sending to the backoffice, the corresponding transactionId is retrieved from the database. This used to be done by comparing timestamps, however this was not a suitable search method in all situations. Especially for Eichrecht transactions this could be an issue because the timestamp of the startTransaction could be a few seconds off due to the IVU adapter delays. This is solved by using a different search method: this is now based on the order in the database. A metervalue should be after the startTransaction. Hence, we now remember the transactionId's that are found in the database until we reach the metervalue we are retrieving it for. Since this is a change in the database, this could potentially cause issues. It should not occur anymore that the transactionId of a metervalue message is -1, unless the order of the database is incorrect.

When a firmware update file is sent by for instance Postman, the layout of the multipart HTTPS messages is different from the data sent by our own ACE Service Installer. By fixing some parts of the code, the firmware is now able to handle firmware files that are sent using common REST API methods.

Made some modifications that improved responses of the WebServer interface in certain cases

The periodic connection check now takes the max of the currently defined hour and the heartbeat interval, since the heartbeat interval can be greater than one hour.

The periodic connection check now takes websocket pings also into account, this used to be only ICMP pings. Some back offices have the heartbeat interval at 24h, therefore the 24h reset is changed to 24 hour + 5 minutes for extra robustness.

4 Back-end communication changes

- Added MaxAllowedPhases to Device model and webserver. This variable can have the value 1 for allowing only 1 phase charging or 3 for allowing 3 phase charging. Default value is 3. A invalid value will result in restore to default. If this is set the 1 the number of used phases will be forced to 1. If MaxAllowedPhases is restored to 3 the number of used phases will not be restored to 3. This can be controlled with charging profiles.
- When changing the connectivity setting, it would be enforced immediately. This is changed such that the flag RebootRequired is set and changing of the setting will only be enforced after the charging station reboots.

Property	Description	Values	Access
Added			
MaxAllowedPhases	Maximum number of phases that the CP is allowed to charge on.	1 or 3	RW
Modified			
Network	Any changes made to network connection type are now activated after a reboot instead of immediately.		
Removed			

5 Errorcode changes

No changes

6 Minor changes

- Improved handling of situations where display has to recover. This also fixes a very rare crash.
- Added a forced cable unlock after 30 seconds if the cable hasn't been removed (possible because the lock is stuck). This is retried again using an exponential back-off timer till a maximum of 240 seconds between each retry.
- When the P1 wire was unplugged, it took 6 minutes before the safecurent was executed. This is now reduced to 2 minutes.
- Fixed OCPP 1.6 RemoteStartTransaction in accordance with OCTT.
- We now skip the reconnect phase and it's timeout and go directly to the transaction summary screen.
- Plug&Charge requires DisconnectAction "abort unlock", otherwise the transaction actually never stops or locks the cable indefinitely. This setting is now also validated during boot of the charging station.
- Added some small delays between modem commands to prevent strange characters in responses from the modem.
- Fixed "isAuthorising" on Giro-e timeouts or errors. The following scenarios are fixed(either with cable connected or charging station is set as fixed cable):
 - timeout on PreAuthorize (disconnect WAN and swipe giro-e card 1st time)
 - timeout on confirmation, swipe giro-e card and wait until pop-up times out
 - error response from giro-e backoffice (swipe giro-e card 1st time and giro-e backoffice responds with error, charging station might need to be temporarily removed from giro-e sandbox server).
- Fixed socket connection state on Schuko/Type-E when charging is started. When authorize/start charging with NFC card on socket/connector 2, the display of socket/connector 1 will stay idle (previous bug it would stay on please wait).
- The StatusNotification handling will now properly transmit a new StatusNotification even if it was only the 'info' or 'vendorErrorCode' field that changed. This ensures that certain informational StatusNotifications are transmitted.
- Fixed Type-E/Schuko max current per connector. The connector 1.2 Max current was used where the connector 2.2 should have been used.

7 Roll-out heads up

- With the single phase installation detection implementation, this could mean that customers will see a different maximum current on their display. This is a correction since their charging station was not able to supply the previous maximum current anyway.
- Changes are made to the periodic connection check, for some CPO's this will result in a less often periodic connection check
- Backoffice security cipher suite using SHA-1 is removed.
- Certificates in the CSMS certificate chain are now checked on expiry date, so if a certificate has expired, the back office connection cannot be setup anymore.
- Optional feature, depending on configuration. Following a successful charging session and after a predefined time an orange LED will light up to indicate that the charge cable can be unplugged.
- Optional feature, depending on configuration. Following a successful charging session and after a predefined time the station will unlock the charging cable.

8 Revision control

Date	Version	Description / status
2020-Nov-11	1.0	Initial version
2020-Nov-17	1.1	Added more information
2020-Nov-23	1.2	Fixed some things and added more details regarding the security improvements
2020-Nov-20	1.21	Prepared external document
2020-Dec-15	1.3	Adjusted external document version