Alfen NG9xx series Release notes

Release notes version 4.10.0

Document version 1.3 Final

September 24, 2020

Table of contents Page

1 Introduction

These release notes accompany the 4.10.0 firmware release for Alfen Charging Equipment based on NG9xx-platform.

Release 4.10.0 introduces several bug fixes and serviceability improvements. The main added feature in this release is the HTTPS secure connection between charger and service installer.

This firmware release needs the latest version of the service installer 3.4.10 to function properly. This firmware release is accompanied by a new release of our Service Installer Application. Therefore it is recommended to upgrade to the latest version, available on Alfen website: www.alfen.com/downloads and navigate to section ‘Applications’.

2 New features

1.1 HTTPS webserver

The communication between the ACE Service Installer and the NG9xx is now encrypted using TLS 1.2. The usage of HTTPS will introduce a new safety level in the communication while being connected to the CHARGER to configure or monitor it.
This requires the usage of the Ace Service Installer that also supports this, which supports it from version 3.4.10. Older versions won't be able to connect to the charging station.

1.2 Custom register mapping serial Modbus external meters

For the serial Modbus we introduced the same flexibility for users as with the Modbus over TCP/IP. Through the service installer custom registers can be added. This functionality is not available for back-ends.

For custom modbus registers the following properties has been added to the webserver:

- **wordOrder:** Modbus register mapping word order:
0: Least significant word first.
1: Most significant word first.
Only effects values with 2 words or more.

- **updateTime**: Modbus register mapping update time in milliseconds.

- **readTimeout**: Modbus register mapping read timeout in milliseconds. Only effects serial modbus in custom register mode.

For serial custom modbus the following properties has been added to the webserver:

- **baudrate**: Modbus register mapping serial communication.

- **parity**: Modbus register mapping parity using serial Modbus:
0: None
1: Even
2: Odd

- **address**: Modbus register mapping slaveAddress using serial modbus.

3 Improvements

- Modbus TCP/IP meters now support negative value's. For configurable registers the meter is required to have a signed power measurement for each phase.
- Added price-per-minute to the current pricing info block on the display.
- Reduced the high-pitched tone produced by the dual-screen power supply.
- Still allow the use of charging schedules while firmware update is downloaded but still in transaction.
- Removed logline "taskMaster.c:6611:Socket #0: next metervalue in xxx seconds" when no central meter is configured.
- Changed the minimum ping pong interval from 60 to 30.
- Change the minimal change for maxcurrent from 0.01A to 0.1A if the EMS updates this via modbus TCP slave.
- Added extra logging for updating and adding TransactionStart/TransactionStop records.
- Allow firmware updates when the charger is in an error condition. For this, the ongoing transaction must be stopped first. Remaining bug: It is still impossible to stop a charge session when the power meter is disconnected during a transaction.
- Implement a check on languages we know and reject the new OCPP config-key when unknown language is received.
- Prevent an assert during downloading the firmware file from a FTP server when the internal memory is not initialized yet. The charger used to reboot on this, now the charger will report "download failed" and the download has to be resend from the CSMS.
- Increased the size of the logo on the display.
- Increased lwip thread stack size.
- Improved stability, by removing unnecessary assert in OCPP message heartbeat.
- Add P1 support for IDIS meters such as the single phase fluvius meter and allow charging when energy is delivered, for example by PV. Note that a 3 phase IDIS meter is supported now, but delivery on 3 phases is not. Only single phase PV is supported. Delivering on 3 phases will result in slower charging of the EV since the CHARGER cannot see that this power is delivered and thus assumed it is consumed by the house, thus limiting the charging speed.
- Updated the mDNS implementation of the firmware. The NG9xx devices are now better discoverable using the standard bonjour and zeroconf protocols. Our Alfen devices are now detectable under "_alfen.tcp". The main problem was that our NG9xx devices did not respond to the generic service request: "_services._dns-sd._udp", that has now been fixed.
- Added a configuration parameter that keeps track of the last charger configuration change. The intention is that the installer/App will write this value, the CHARGER does not change this. Therefore, it's not changed when a configuration change is initiated from the CSMS.
- Added more checks on the display chip to determine if the display is flipped.
- Set the Default high temperature limit changed according to the maximum temperature of the hardware derating table.

4 Back-end communication changes

- Prevented OCPP transaction messages with future timestamp.
- Fixed various issues regarding faults that caused incorrect StatusNotifications to be sent to the back office.
- Added write only configuration key ForceFirmwareRollback. Set this item to the build number of the current firmware version to force a manual rollback. If the rollback fails, the CHARGER will reboot the current version again. This is only possible if firmware exist on the other memory bank for the CHARGER. This could be overwritten in the case of non-firmware updates such as inserting a logo.
- Fixed OCPP 1.6 GetCompositeSchedule request with charging rate unit "W".
  OCPP 1.6 GetCompositeSchedule now has the exact same behavior as OCPP 1.5 GetCompositeSchedule, we do not accept "W" for the chargingRateUnit (we only accept "A").
- Fixed an issue where an internal power supply error would not send a StatusNotification to the back office.
- The following back office configuration keys have been removed:
  MBTCPCentral-ConnectionType
  MBTCPSmart-ConnectionType
  These could previously be configured to switch between TCP/IP, UDP and RTU for central and smart meters. However, the module that makes use of these configuration keys didn't support RTU and should not have supported UDP.
- The CHARGER now resends a firmwareStatusNotification if failed during boot, for example when the back office connection was not setup yet when it tried to send it due to a slow GPRS connection setup.
- Fixed UnlockConnector response according to OCTT(test case 031).
- Fixed Triggermessage response (with invalid connectorId) according to OCTT(test case 055).
- No longer generate a security event when a WAMP error is received as reply from the back office.
- Now don't send measurands that aren't measured. And added RegisterMeterValuesIncludePhases for backoffice configuration. When set to true, ocpp meter values will include each individual phase. When set to false (default), ocpp meter values not automatically include each phase.
- If the AuthorizationMethod is changed from Plug&Charge to RFID via the backoffice, then the PlugAndChargeIdentifier is cleared.
- Changed configuration key name for OCPP 1.6 from Phases3to1 to ConnectorSwitch3to1PhaseSupported. This was an unintentional regression that was caused by the implementation of OCPP 2.0.1.
- Fixed OCPP 1.6 StopTransaction return value on invalid parameters.

Property	Description	Values	Access
Added			
ForceFirmwareRollback	Manually force a firmware rollback by setting this configuration key to the current firmware version build number. **NOTE: Only use this if absolutely necessary, firmware rollbacks can cause database issues and undefined behavior regarding Transactions.**	Firmware version number (i.e. 4.6.0-3142)	W
RegisterMeterValuesIncludePhases	Include individual phase measurands in the metervalue message	True or False Default: False	RW
Modified			
WebSocketPingInterval	Changed minimum from 60 to 30		
Language	Now only accepted if provided with a valid supported language		
Removed			
MBTCPCentral-ConnectionType			
MBTCPSmart-ConnectionType			

5 Errorcode changes

- Changed display error text for error 106 to "Please check installation or call for support" in all languages.

6 Revision control

Date	Version	Description / status	Author
2020-Aug-06	1.0	Initial version	T. Nederlof
2020-Aug-13	1.1	Minor changes	R. Löhlefink
2020-Sept-3	1.2	PM adaption	M. Sieben
2020-Sept-24	1.3 FINAL	PM adaption	J.Pynenburg

7 Appendix A: List of improvements

The tables below show the changes between release **4.8.0** and the release **4.10.0**, including references to the Alfen issue tracking system.

Solved issues:

Issue #	Summary
LA-2341	Smartmeter communication error makes updating impossible
LA-2519	CLONE - ChangeConfiguration.conf = accepted but is actually not accepted
LA-2662	High-pitched tone from dual-screen power supply
LA-2820	RCD resolved statusnotification still has status faulted
LA-3119	Socomec E27 does not start charging on sunny day
LA-3334	Minor improvement
LA-3485	Authorizing on a double socket when one cable already attached and authorized blocks first authorization
LA-3550	Spam logging "Socket #X: no schedule"
LA-3552	Transactions in db with date in far-future after timestamp-update
LA-3574	Logging Socket #0: next metervalue sometimes useless
LA-3663	New feature to force a rollback in case Update ok, new Firmware uploading is not possible any more
LA-3676	Improve default setting for High temperature alarm
LA-3680	Assert in FTP download of update firmware
LA-3699	assert msg: add_valuedetail_to_object()
LA-3702	ocpp 1.6 getcompositeschedule incorrect behavior with chargingRateUnit "W"
LA-3732	Display drawing misses pixels on right and bottom
LA-3741	comFaults StatusNotification problems
LA-3759	Watchdog crash in modem when no reception
LA-3768	Detecting IP conflict between wired and GPRS
LA-3784	lwip stackoverflow, lwip size might be small.
LA-3793	changeUserInterfaceModeTimed is unsafe and doesn't work for station errors
LA-3815	Assert in device model initialisation.
LA-3854	Warning in ocpp_20.c
LA-3856	Many configuration keys can no longer be set
LA-3860	Bug where NFC reset Pin is is on the same pin as the RCD reset pin
LA-3870	Do not log voltages if they are not available
LA-3873	Set minimum pingpong interval to 30 seconds
LA-3887	Internal 12 V fault can currently never be reached
LA-3889	Change display message error code 106 (internal RCD AC tripped)
LA-3891	comFaults temperature error reports without info and no resolution message
LA-3896	Use time base pricing info field

LA-3942	Assert when reboot while waiting for heartbeat reply
LA-3971	EMS creates spam logging when updating max currents slightly
LA-3996	Prevent integer overflow on addition during chargingProfile duration calculation
LA-3999	Minor improvement
LA-4036	Card authorizes wrong socket and stays on "please wait"
LA-4044	unrecoverable boot loop: p1_uart assertion
LA-4072	Improve logging for adding and updating transaction items
LA-1722	Restore corrupted firstItem/lastItem for Transaction database (order-dependent)
LA-2170	Fixed cable stuck in recover from outage display state
LA-2622	Implement HTTPS webserver with TLS v1.2
LA-3252	Display stays upside down after display recovery
LA-3446	Watchdog bites on mobile network connection
LA-3560	[Main] Configurable modbus registers for modbus over RS485
LA-3617	Support 1-phase load balancing for Fluvius P1 meter (with PV)
LA-3776	Show transaction summary when sessions ends on EV side
LA-3821	ocpp 1.6 stoptransaction, wrong return value when invalid parameters are filled
LA-3838	Sessie starten op beide sockets met een pas
LA-3849	Update firmware results in rollback but charging station doesn't report InstallationFailed
LA-3886	Clarify which maximum current is limiting the charging process
LA-3935	Some registers of the SOCOMEC countis E27 have incorrect scaling.
LA-3974	OCT test 031 Unlock Connector – Unknown Connector failed.
LA-3995	Add commissioning/Config updated parameter to the webserver
LA-4000	CLONE - 4.7.1 reports Energy.Active.Import.Register for all possible measurand phases
LA-4018	MDNS messages need to be compliant with the Standard.
LA-4041	FTP password exposed when escape character are used.
LA-4047	Clear Plug&Charge identifier when authorization method set to RFID via CSMS
LA-4062	Test case 055 of OCTT fails
LA-4083	Logo is overwritten in display by disclaimer and price per kWh.
LA-4113	Crash during update of client cert chain
LA-4145	Remove Modbus Master (client) UDP from the code
LA-4146	Reduce amount of traced allocations in heap_trace.c
LA-4147	Disable LOG_MEM functionality that isn't fully enabled anyway
LA-4152	Make the Excel-based Device Model easier to review
LA-4159	No cable connect timeout when plug&charge
LA-4195	Error response from CSMS generates a SecurityEvent
LA-4231	uBlox Sara-R412 reveals weakness in modem-ppp-lwip-tcpip stack
LA-4256	Minor improvement
LA-4258	Recovering from PowerOutage (configured to Idlle) with Fixed cable makes further charging imposible
LA-4265	Only the 1st prop of HTTPS POST properties message is processed
LA-4272	'ConnectorSwitch3to1PhaseSupported' changed to 'Phases3to1' in 4.8.0

LA-4275	Crash after changing ALB from P1 to TCPIP meter with Installer 3.4.10
LA-4256	Installer has lots of problems like freezing behaviour/ communication loss since security is added
LA-4258	Recovering from PowerOutage (configured to Idlle) with Fixed cable makes further charging imposible
LA-4284	NG9xx - webserver communication/stability issues since HTTPS