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PLC Communication

Interface Specification

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Confidential

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Contents

1. Aim

This document lists and describes interfaces of the PLC Modem and EVCC (also called High-level Communication Channel). In this document, these interfaces are conceptually exposed to a “Charge Service Manager” which represents the Connectivity System or the HEVC depending of the context. It is not the role of the RSC team to define whether an interface is exposed to the Connectivity System or to the HEVC.

The finale ECU for B10 neo is called PLC Unit and contains: PLC Modem + EVCC + Connectivity System.

The aim of this document is to help the Connectivity System team to known the interfaces exposed by the PLC Modem and the EVCC, in order to do the matching with the CAN interface exposed with the HEVC (and any other EV ECU).

2. Conventions for Message Description

Each message description is following the same specific pattern:

<process>_XXX.{indication|request|response}

This pattern can be interpreted as described below:

- <process>: identifies the process (similar to process used in requirement ids)
  - GEN for generic
  - IEC1 for the link with IEC 61851-1 module
  - MATCHING for the Matching process
  - D-LINK for the Data Link specified in [ISO-2] and [ISO-3]
  - HLC for the High Level Communication
  - SEC for the HLC security requirements
- XXX: message identifier
- Direction:
  - request: coming from a higher layer
  - indication: to be sent to the higher layers
  - response: response to a request or an indication

Example: *EMC_ADD-PROFILE.request* identifies a request to “Add Profile” received by the PLC Modem (“.request”) about EMC requirements (“EMC”).

3. PLC Modem

3.1 IEC1_BCB-TOGGLE.indication

Primitive	IEC1_BCB-TOGGLE.indication	
Related Systems	PLC Modem → Charge System Manager	
Description	Request a BCB-Toggle used during the Matching process. It may also be used, but not in B10 neo, to wake-up the counterpart PLC Modem during a communication pause.	
Parameters	Parameter Description	
	TransitionDuration	Duration of a BC or CB transition: between 200ms and 400ms
	NbOfToggles	[1-3]: number of toggles to be applied

3.2 MATCHING.request

Primitive	MATCHING.request
Related Systems	Charge System Manager → PLC Modem
Description	The Charge Service Manager requests the PLC Modem to trigger the Matching process.
Parameters	No parameter

3.3 MATCHING_RESET.request

Primitive	MATCHING_RESET.request
Related Systems	Charge System Manager → PLC Modem
Description	The Charge Service Manager requests the PLC Modem to reset its internal retry counters and retry timers, and stored Logical Networks parameters if any (used to pause a communication).
Parameters	No parameter

3.4 MATCHING_STATE.indication

Primitive	MATCHING_STATE.indication	
Related Systems	PLC Modem → Charge System Manager	
Description	The PLC Modem indicates its current Matching state	
Parameters	Parameter Description	
	MatchingState	• 0: Unmatched • 1: Matching in progress • 2: Matched without Validation • 3: Matched with successful Validation • 4: Matched with skipped Validation

3.5 D-LINK Messages defined in [ISO-3] and [ISO-2]

- Error request (D-LINK_ERROR.request)
- Terminate request (D-LINK_TERMINATE.request)
- Pause request (D-LINK_PAUSE.request)
- Link status indication
    - Link establishment indication (D-LINK_READY.indication(DLINKSTATUS=Link established)

- Missing link indication (D-LINK_READY.indication(DLINKSTATUS=No link))

3.6 Not used for B10 neo

3.6.1 IEC1_CHARGE-TYPE.request

Primitive	IEC1_CHARGE-TYPE.request	
Related Systems	Charge System Manager → PLC Modem	
Description	Indication of a change in the actual authorised type of charge management: BC or HLC-C.	
Parameters	Parameter Description	
	Type	• 0 = BC and HLC-C supported (10%-100% of PWM) • 1 = HLC-C only (5% of PWM)

3.6.2 IEC1_STATE.request

Primitive	IEC1_STATE.request	
Related Systems	Charge System Manager → PLC Modem	
Description	Indication of a change in the current CP and PWM state	
Parameters	Parameter Description	
	CPState	Current CP state • A • B • C • D • E • F
	PWMValue	Current PWM value • 0 to 100%

3.6.3 IEC1_CP-STATE.indication

Primitive	IEC1_CP-STATE.indication	
Related Systems	PLC Modem → Charge System Manager	
Description	Request a change of CP state	
Parameters	Parameter Description	
	CPState	Current CP state • B: request to change from the current state to state B • C: request to change from a current state B to state C

4. EVCC

4.1 HLC_PAUSE.request

Primitive	HLC_PAUSE.request
Related Systems	Charge System Manager → EVCC
Description	The Charge Service Manager requests the EVCC to pause the charging session. This will result in a pause request using [ISO-2] communication, and a D-LINK_PAUSE.request to the PLC Modem.
Parameters	No parameter

4.2 HLC_STOP.request

Primitive	H LC_STOP.request
Related Systems	Charge System Manager → EVCC
Description	The Charge Service Manager requests the EVCC to stop the charging session. This will result in a stop request using [ISO-2] communication, and a D-LINK_TERMINATE.request to the PLC Modem.
Parameters	No parameter

4.3 HLC_EMERGENCY_STOP.request

Primitive	H LC_EMERGENCY_STOP.request
Related Systems	Charge System Manager → EVCC
Description	The Charge Service Manager requests the EVCC to stop the charging session. This will result in a stop request using [ISO-2] communication, and a D-LINK_TERMINATE.request to the PLC Modem.
Parameters	No parameter

4.4 HLC_RENEGOTIATE.request

Primitive	H LC_RENEGOTIATE.request
Related Systems	Charge System Manager → EVCC
Description	The Charge Service Manager requests the EVCC to trigger the renegotiation process as defined in [ISO-2].
Parameters	No parameter

4.5 HLC_RESET.request

Primitive	HLC_RESET.request
Related Systems	Charge System Manager → EVCC
Description	The Charge Service Manager requests the EVCC to reset information about previous charging session. If a charging session was in pause, it will not be resumed anymore.
Parameters	No parameter

4.6 HLC_READY.indication

Primitive	HLC_READY.indication	
Related Systems	EVCC → Charge System Manager	
Description	Inform the Charge Service Manager that the HLC-C has started and provide information about the type of connexion.	
Parameters	Parameter Description	
	State	• 0 = “Not secured” • 1 = “Secured”

4.7 HLC_NOT-READY.indication

Primitive	HLC_NOT-READY.indication	
Related Systems	EVCC → Charge System Manager	
Description	Inform the Charge Service Manager that the HLC-C is not started and provide information if it failed.	
Parameters	Parameter Description	
	State	• 0 = “Ok, not started” • 1 = “SDP Timeout” • 2 = “TLS Timeout” • 3 = “V2G Setup Timeout” • 4 = “TLS Not Supported” • 5 = “ISO-2 Version Not Supported” • 6 = “V2G Setup Failed” • 7 = “Ok, paused”

4.8 SEC_EV_DATE_TIME.request

Primitive	SEC_EV_DATE_TIME.request	
Related Systems	Charge System Manager → EVCC	
Description	The Charge Service Manager provides date time data to the EVCC for X.509 certificate validation.	
Parameters	Parameter Description	
	DateTime	Date time ISO 8601

4.9 SEC_SETUP-TLS-PAIRING-MODE.request

Primitive	SEC_SETUP-TLS-PAIRING-MODE.request
Related Systems	Charge System Manager → EVCC
Description	The Charge Service Manager requests the EVCC to trigger a TLS pairing mode with the EVSE.
Parameters	No parameter

4.10 Not used for B10 neo

4.10.1 HLC_SET-CHARGE-MODE.request

Primitive	HLC_SET-CHARGE-MODE.request	
Related Systems	Charge System Manager → EVCC	
Description	The Charge Service Manager requests the EVCC to change its V2G application message to AC or DC.	
Parameters	Parameter Description	
	Mode	• 0 = “AC” • 1 = “DC”