

MP170 'Firmware updates to Point to Point Alt HAN Devices'

Annex A

Business requirements – version 0.3

About this document

This document contains the business requirements that support the solution for this Modification Proposal. It sets out the requirements along with any assumptions and considerations. The Data Communications Company (DCC) will use this information to provide an assessment of the requirements that help shape the complete solution.

1. Business requirements

This section contains the functional business requirements. Based on these requirements a full solution will be developed.

Business Requirements		
Ref.	Requirement	Impacted Party
1	AltHANCo shall be able to develop and assure firmware upgrades for Alternative Home Area Network (Alt HAN) Point to Point (P2P) Devices.	AltHANCo
2	Energy Suppliers shall be able to deploy Over-The-Air (OTA) firmware upgrades for Alt HAN P2P Devices over the Smart Metering System.	DCC/ Suppliers
3	Energy Suppliers shall keep AltHANCo up to date following any Alt HAN P2P Device firmware upgrades.	DCC/ Suppliers
4	DCC shall provide AltHANCo with reports on deployed firmware versions.	DCC
5	The DCC shall be able to maintain records on firmware deployments and current firmware versions of Alt HAN P2P Devices.	DCC
6	Energy Suppliers shall be able to confirm that Firmware upgrades for Alt HAN P2P Devices have been successful.	DCC/ Suppliers
7	Energy Suppliers shall be able to read the current Firmware version on Alt HAN P2P Devices.	DCC/ Suppliers
8	Energy Suppliers shall be able to replace any Smart Metering Key Infrastructure (SMKI) credentials on Alt HAN P2P Devices.	DCC/ Suppliers
9	Alt HAN P2P Devices shall be resilient to the deployment of firmware to other Alt HAN P2P Devices in any order of deployment within a Home Area Network (HAN).	AltHANCo
10	Alt HAN P2P Devices shall minimise the impact to other Devices on the HAN.	AltHANCo
11	DCC and Energy Suppliers shall be able to distinguish Alt HAN P2P Devices from other Devices	DCC/Suppliers
12	The DCC shall ensure that only known Firmware images are sent to Alt HAN P2P Devices	DCC/AltHANCo

2. Considerations and assumptions

This section contains the considerations and assumptions for each business requirement.

2.1 General

2.1.1 Alt HAN P2P Devices

This solution will be applied to Alt HAN P2P Devices only.

Alt HAN P2P Devices are not currently deployed but are being developed and have a limited number of installations in field trials.

Alt HAN P2P Devices consist of four different products that make up three Alt HAN solutions. Each of the four products require their own firmware Image. There will always be at least two of the products connected to the HAN where it is required and, in most cases, there wouldn't be more than three products.

The size of each Image should be bound by the same rules as for Prepayment Meter Interface Devices (PPMIDs) and Home Area Network (HAN) Connected Auxiliary Load Control Switches (HCALCS) i.e. no more than 750KB.

2.1.2 Link with SECMP0007

It is hoped that the solution to implement OTA firmware updates for Alt HAN P2P Devices can utilise some of the functionality that will be implemented as part of [SECMP0007 'Firmware updates to IHDs and PPMIDs'](#), specifically for the PPMID solution.

SECMP0007 is awaiting implementation and the functionality will be delivered in three parts. The initial Smart Energy Code (SEC) documentation changes and Data Services Provider (DSP) system changes will be implemented on 4 November 2021 (November 2021 SEC Release). The Communication Services Provider (CSP) system changes will then be delivered in the June 2022 SEC Release. Finally, the subsequent Communications Hub firmware updates will be rolled out as soon as they are available. It is expected that this will be during Q4 2022.

PPMIDs and HCALCSs can only have firmware updates applied OTA once the associated Communications Hub has its firmware updated to reflect the SECMP0007 solution.

2.1.3 Device image and download priority

Alt HAN P2P Devices shall mirror the existing download and image storage priorities that are being implemented as part of SECMP0007 for PPMIDs. Alt HAN P2P Devices shall mirror the image storage location specified for PPMIDs in SECMP0007.

2.1.4 Non-functional requirements

The following non-functional requirements may be considered as part this SEC Modification.

1. NF1 – Frequency of Firmware Download – up to twice per Device per year.
2. NF2 – Expected total number of Alt HAN P2P Devices and expected number of Alt HAN P2P Devices that are battery powered (Bridge 4 Devices) are listed in the table below.

Expected Number of Alt HAN P2P Devices in the field				
Timeframe	Bridge 1	Bridge 2	Bridge 3	Bridge 4
Jun 2021 – Mar 2025	<i>Pending</i>	<i>Pending</i>	<i>Pending</i>	<i>Pending</i>

2.2 Requirement 1: AltHANCo shall be able to develop and assure firmware upgrades for Alt HAN P2P Devices.

This requirement is expected to be a non-DCC impacting requirement.

2.3 Requirement 2: Energy Suppliers shall be able to deploy OTA firmware upgrades for Alt HAN P2P Devices over the Smart Metering System.

It is a licence condition for Suppliers to keep firmware up to date for Smart Devices. The Service Providers questioned if the firmware updates to each product on the HAN would be sent via one request. The Proposer recommends that an individual request would need be made for each Device on the HAN.

2.4 Requirement 3: Energy Suppliers shall keep AltHANCo up to date following any Alt HAN P2P Device firmware upgrades.

Energy Suppliers need to be able to report on the firmware versions and OTA success/failed deployment. This will be carried out via an interface directly between Energy Suppliers and AltHANCo which will be developed outside of the DCC systems. This requirement is expected to be a non-DCC impacting requirement.

2.5 Requirement 4: DCC shall provide AltHANCo with reports on deployed firmware versions.

The DCC must be able to report on the deployment of firmware and make that report available to AltHANCo as required.

2.6 Requirement 5: The DCC shall be able to maintain records on firmware deployments and current firmware versions of Alt HAN P2P Devices.

For this requirement, Energy Suppliers and the DCC must be able to identify the current firmware version on Alt HAN P2P Devices and record any attempts to upgrade these devices. Energy Suppliers shall obtain consistent information on this via all available interfaces.

2.7 Requirement 6: Energy Suppliers shall be able to confirm that Firmware upgrades for Alt HAN P2P Devices have been successful.

Suppliers will need Alerts notifying them once the firmware has been activated. The P2P Device itself could generate this Alert, as with PPMIDs, but this would require it to have Access Control Broker (ACB) Certificates. An alternative is for the Communications Hub to generate Alert, but this would likely incur more development and cost. The DCC shall use this information to update their inventory.

2.8 Requirement 7: Energy Suppliers shall be able to read the current Firmware version on Alt HAN P2P Devices.

A requirement of SECMP0007 enables Service Users to read the current firmware version of a Device via SR11.2 'Read Firmware Version'. This requirement drives similar additional complexity as the previous requirement via support for Great Britain Companion Specification (GBCS)/SMKI message processing. The DCC shall use this information to update their inventory.

2.9 Requirement 8: Authorised Parties shall be able to replace any SMKI credentials on Alt HAN P2P Devices.

The previous two requirements determine that the Alt HAN P2P Devices will be required to support GBCS/SMKI message processing, so there are additional security requirements.

If the SMKI security credentials on the Device are compromised, then action is required to mitigate the security risk. This is done by either replacing the security credentials on the Device or replacing the Device itself. The process to replace the security credentials could be carried out remotely by an Authorised Party if the SMKI credentials are compromised. There is not a requirement for the SMKI credentials to be replaced on a regular basis as part of a business-as-usual process.

2.10 Requirement 9: Alt HAN P2P Devices shall be resilient to the deployment of firmware to other Alt HAN P2P Devices in any order of deployment within a HAN.

Each P2P Device will require its own individual request to update firmware, there is a possibility that the firmware version for each of the P2P Devices could fall out of sync. The P2P Devices do not need to be synchronised. This allows for a delay when sending the requests. This requirement is expected to be a non-DCC impacting requirement.

2.11 Requirement 10: Alt HAN P2P Devices shall minimise the impact to other Devices on the HAN.

Each P2P Device will require its own individual request to update firmware. Any OTA firmware update for an Alt HAN Device shall minimise the impact to other Devices that are connected via Alt HAN P2P Devices. This requirement is expected to be a non-DCC impacting requirement.

2.12 Requirement 11: DCC and Energy Suppliers shall be able to distinguish Alt HAN P2P Devices from other Devices

For this requirement, Energy Suppliers and the DCC must be able to differentiate between Alt HAN P2P Devices and other Devices. Should a solution be developed whereby the P2P Devices are joined as a PPMID, then the DCC must also be able to differentiate between the P2P Devices and a genuine PPMID.

2.13 Requirement 12: The DCC shall ensure that only known Firmware images are sent to Alt HAN P2P Devices

For this requirement, the DCC must be able to assure that any Firmware images sent to Alt HAN P2P Devices have been pre-approved via the Central Products List (CPL) process.

3. Solution options

This section outlines the solution options for this Modification Proposal. It sets out the rationale for the potential variants of the proposed solution for the business requirements contained in Section 1 of this document.

3.1 General

The DCC and its Service Providers are requested to assess the requirements and devise a solution, whilst considering the Proposers suggestion below. During the development of the Alt HAN solution and this modification, AltHANCo has engaged with the DCC and its Service Providers. It is envisaged that there could be significant cost savings if the P2P Devices act as PPMIDs. Therefore, to see the benefit of this option, it is requested to have a Preliminary Assessment against both options below to enable industry to view the cost differences.

Any current constraints that the DCC identify as part of their solution proposal that may limit Device behaviour in relation to Energy Supplier scenarios should be documented.

3.2 Alt HAN P2P Device type

The following options shall be considered as part of the Modification Refinement process relating to how Alt HAN P2P Devices shall join the HAN via the existing Service Requests.

3.2.1 Consumer Access Device (CAD)

Alt HAN P2P Devices are currently Type 2 Devices. They join the HAN via the CCS01 command as a CAD. It is understood that to carry out an OTA firmware update the Communications Hub will check the Device type prior to delivering firmware. If Alt HAN P2P Devices continue to join the HAN as CADs, it is expected that Communications Hub firmware change will be needed to support this process.

3.2.2 Acting as a PPMID

Currently, the P2P Device is a Type 2 Device and acts as a CAD. An alternative is for the Alt HAN P2P Devices to join the HAN as a PPMID and be a Type 1 Device. This is expected to minimise Communications Hub firmware development by utilising the SECMP0007 functionality.

The P2P Devices would utilise the same Communications Hub memory block as PPMIDs and HCALCSs which is the Gas Smart Metering Equipment (GSME) block. It was also assumed that P2P Devices would share the same priority level as PPMIDs and HCALCSs, with each being able to overwrite each other.

This option would require consideration of DCC User Interface Specification (DUIS) updates to support DSP differentiation between PPMIDs and Alt HAN P2P Devices that appear as PPMIDs. All information in regards the Alt HAN Device must be presented consistently to Energy Suppliers will also need to be able to identify Alt HAN P2P Devices separately from genuine PPMIDs.

It is noted that there could be issues in relation to how the Communications Hub treats non-PPMID Devices joining the HAN as PPMIDs. It is understood from development of this proposal that the Communications Hubs should have the required capacity for all Alt HAN P2P Devices acting as PPMIDs, in addition to any other HAN Devices.

The Proposer notes that there may also be constraints with the Alt HAN P2P Device joining the HAN as a PPMID in scenarios where there is a Trust Centre Swap Out (TCSO). In this scenario the Communications Hub would re-classify the Alt HAN Device as an IHD. This is due to there being no availability of a Zigbee tunnelling cluster as the Alt HAN Device does not have this capability. If this happened, the Alt HAN Device would not be able to receive OTA firmware updates. DCC to document any constraints such as this as part of their assessment given the expectation that this option would minimise DCC development effort within the CSP solution.

3.3 Management and delivery of firmware version and download status

The following options shall be considered as part of the Modification Refinement process relating to whether Alt HAN P2P Devices shall support requirements 6 and 7 or whether the DCC solution shall deliver these requirements without any additional functionality within Alt HAN P2P Devices.

In both cases the additional firmware download status reporting delivered in SECMP0007 is expected to be used. The functionality where options are to be considered is limited to:

- Creation of an alert over the Smart Metering Wide Area Network (SMWAN) to indicate whether the Alt HAN Device has successfully applied the firmware;
- Responding to requests from Energy Suppliers to confirm the current version of firmware on any Alt HAN P2P Devices on the HAN.

3.3.1 Alt HAN Device managed firmware reporting

In this option, the Alt HAN Device shall be capable of generating suitable GBCS compliant messages to meet the above functionality. This will mirror the functionality that the PPMID will be capable of as part of SECMP0007 and as part of the current solution, namely:

- Creation of an alert sent to the DSP notifying the result of the firmware upgrade process
- Responding to the current check firmware version command.

3.3.2 DCC delivered firmware reporting

In this option, the DCC solution (likely the Communications Hub) will manage the processes above on behalf of the Alt HAN P2P Devices. In this case, there will be no need for Alt HAN P2P Devices to support the creation and processing of GBCS messages nor the installation of SMKI credentials.

4. Glossary

This table lists all the acronyms used in this document and the full term they are an abbreviation for.

Glossary	
Acronym	Full term
ACB	Access Control Broker
Alt HAN	Alternative Home Area Network
CAD	Consumer Access Device
CPL	Central Products List
CSP	Communication Services Provider
DCC	Data Communications Company
DUIS	DCC User Interface Specification
DSP	Data Services Provider
GBCS	Great Britain Companion Specification
GSME	Gas Smart Metering Equipment
HAN	Home Area Network
HCALCS	Home Area Network Connected Auxiliary Load Control Switches
IHD	In Home Display
OTA	Over-The-Air
P2P	Point to Point
PPMID	Prepayment Meter Interface Device
SEC	Smart Energy Code
SMKI	Smart Metering Key Infrastructure
SMWAN	Smart Metering Wide Area Network
SR	Service Reference
TCSO	Trust Centre Swap Out