SEC
Smart Energy Code

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Smart Energy Code

MP170

‘Firmware updates to Point to Point Alt HAN Devices’

Modification Report

Version 0.5

19 January 2022

Corporate member of Plain English Campaign
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About this document

This document is a draft Modification Report. It currently sets out the background, issue, and progression timetable for this modification, along with any relevant discussions, views and conclusions. This document will be updated as this modification progresses.

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This document also has four annexes:

- **Annex A** contains the business requirements for the solution.
- **Annex B** contains the redlined changes to the Smart Energy Code (SEC) required to deliver the Proposed Solution.
- **Annex C** contains the full Data Communications Company (DCC) Preliminary Assessment response.
- **Annex D** contains the full responses received to the Refinement Consultation.

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1. Summary

This proposal has been raised by David Jones from AltHANCo.

The Alternative Home Area Network (Alt HAN) solution is being developed to address situations where one, or both, of the gas meter or In Home Display (IHD) are out of range of the Communications Hub, using Point to Point (P2P) Devices.

Over-The-Air (OTA) firmware updates are used to deploy updates that either fix faults or provide new functionality to certain Devices. The SEC and its subsidiary documents facilitate OTA firmware updates to meters and the Gas Proxy Function (GPF) which is part of the Communications Hub. It also supports OTA updates for other Device types such as Prepayment Meter Interface Devices (PPMIDs) and HAN Connected Auxiliary Load Control Switches (HCALCS) but has no provision for Alt HAN P2P Devices.

This means that any new firmware functionality that is developed to deploy security updates or improve the service to consumers can only be deployed by physical onsite exchanges. The result is higher costs, longer deployment timescales, and more inconvenience to the consumer than if an OTA firmware update was available to fix the issue.

The Proposed Solution will re-use the existing functionality for PPMID OTA firmware updates. The Preliminary Assessment indicates the costs for the Design, Build and Pre-Integration Testing (PIT) will be £636,500. If approved, this modification will target the next SEC Release that includes a DCC User Interface Specification (DUIS) uplift, which is currently November 2023.

This modification affects all Suppliers and the DCC. It will be progressed as a Self-Governance Modification.

2. Issue

What are the current arrangements?

What is Alt HAN?

In most cases, a standard smart metering installation will include Gas Smart Metering Equipment (GSME), Electricity Smart Metering Equipment (ESME), an IHD and a Communications Hub. All Devices must be within the expected proximity to the Communications Hub for the Home Area Network (HAN) to be able to connect them. Achieving a HAN in some premises such as blocks of flats (Multi Dwelling Units (MDUs)) has additional challenges and the Alt HAN solution is being developed to address these concerns. The Alt HAN solution is required when the GSME or the IHD are out of range of the Communications Hub and the ESME.

Alt HAN P2P Devices

Alt HAN P2P Devices are being developed that will offer a solution in situations where one, or both, of the gas meter or IHD are out of range and act as a Range Extender. AltHANCo uses four different P2P device types (B1, B2, B3, B4), known as ‘bridges’, and these are configured in different ways depending on the set up of the premises. There will be either two or three Devices at each premise to

provide a solution. This will depend on whether it is the IHD or the GSME that is out of range, whether they are close together, and whether the GSME has a nearby electricity source.

Each bridge will then join the network and act as a Range Extender, to broaden the HAN. It is envisaged that the Alt HAN P2P Devices will join the network by Service Requests specified in the DUIS.

Over-The-Air firmware updates

OTA firmware updates to meters and the GPF (which is part of the Communications Hub) are currently carried out via the DCC infrastructure. They are used to deploy updates that either fix faults with Devices or provide new functionality to a Device. Without the use of OTA firmware updates, the only way to remedy these would be by a site visit.

There are already defined processes in the SEC and its subsidiary documents to facilitate OTA firmware updates to Communications Hubs, ESMEs and GSMEs. Following the implementation of SECMP0007 'Firmware updates to IHDs and PPMIDs' this will also be possible for PPMIDs and HCALCSs. However, there is no capability to carry out OTA firmware updates for Alt HAN P2P Devices.

SECMP0007 implementation

SECMP0007 documentation changes and Data Service Provider (DSP) elements were 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.

What is the issue?

The SEC does not currently support firmware updates to Alt HAN P2P Devices.

Without the ability to perform a remote firmware upgrade, new innovations and functionality to improve the service to consumers will not be cost effective. Additionally, if a security defect is identified then an OTA firmware update to fix the defect would be quicker than a site visit and thus reduces the length of time that a consumer's premise is a security risk.

What is the impact this is having?

Mitigating against risk

OTA firmware updates enable the User to remedy faults on a Device without the need for a site visit. There is a risk that an Alt HAN P2P Device may lose its ability to communicate if there is a ZigBee stack upgrade that needs to be applied to fix a security related issue. This would lead to a mass recall of Alt HAN P2P Devices if there was no remote firmware update capability.

The costs associated with either of these events would vary depending on the stage of the rollout that it occurred, but high-level estimations are provided below. These figures were produced by AltHANCo based on initial projections and will evolve as this modification is refined.

Estimated costs of recall events without OTA firmware update capability			
Risk	**Detail**	**High-Level Estimate**	**Likelihood**
Mass Recall Event	Low Impact (early stage in rollout: Jun 22)	£25m	Low
	High Impact (end of rollout: Mar 25)	£112m	Very Low
Partial Recall Event	Low Impact (10% of Solutions)	£6m	Low – Medium
	High Impact (25% of Solutions)	£22m	Low

This highlights a significant impact should there be an issue that requires either a partial or a mass recall. If the capability for an OTA firmware update was available, then it is envisaged that these issues could be addressed remotely and in a much shorter timeframe than Device replacement.

Delivering future change

Smart Metering requirements continue to change as the Smart Metering Implementation Programme (SMIP) evolves. OTA firmware updates are needed to support and deliver innovative advancements within the Alt HAN and DCC ecosystems. If OTA firmware updates are not possible this would limit the opportunity for future innovation for Alt HAN P2P Devices as well as other Devices that would rely on them. Additionally, developments in security features would not be able to be rolled out without a Device being physically exchanged via site visit.

Impact on consumers

If OTA firmware updates are not possible then any changes needed will rely on site visits to consumer premises. This is an inconvenience to consumers to accommodate an onsite visit, and additional cost to industry Parties. Consumers may be unable to receive an improved service that could be developed where the benefits may outweigh the costs of an OTA firmware update but not a mass rollout.

In addition, essential security or functionality updates to ensure Alt HAN P2P Devices are 'fixed' will not be able to take place remotely but will require site visits.

Site visits and Device exchange will create a negative impact on the environment and additional costs.

3. Solution

The Proposed Solution will re-use the OTA functionality that was developed as part of SECMP0007. To do this, the Alt HAN P2P Devices will join the HAN as if it were a PPMID. The Communications Hub will not be able to differentiate between a genuine PPMID and an Alt HAN P2P Device but the DSP, and therefore Service Users, will be able to. To facilitate this, the DUIS will be updated to include a new "PPMID Variant" field that will be mapped to existing Service Requests used for PPMID firmware updates.

Service Users will use the existing SRVs for updating and reading firmware on PPMIDs and receive the same Alerts in response, but there will be additional data item to differentiate between a genuine PPMID and an Alt HAN P2P Device.

4. Impacts

This section summarises the expected impacts that would arise from the implementation of this modification.

SEC Parties

SEC Party Categories impacted			
✓	Large Suppliers	✓	Small Suppliers
	Electricity Network Operators		Gas Network Operators
	Other SEC Parties	✓	DCC

Supplier Parties

Suppliers are responsible for the procurement, installation and maintenance of Smart Metering Equipment Technical Specifications (SMETS) 2 Devices in consumers' premises. They have a responsibility to ensure Devices are operating correctly and efficiently. Therefore, a fit for purpose OTA firmware management process covering all mandated Devices would support Suppliers in delivering their obligation consistently.

DCC System

The DSP and CSPs are both impacted by this modification. There will be a minor impact to the CSPs, and they will need to test and monitor the increased traffic from Service Requests. This is not expected to be of a particularly high volume. The DSP will need to make some changes to existing Service Requests and Alerts to differentiate between a genuine PPMID and an Alt HAN P2P Device acting as a PPMID. There will also be changes required to ensure Users can differentiate the difference between the PPMID and Alt HAN Devices.

The DCC has also noted an impact on its Technical Operation Centre (TOC), needed to create new reports for stakeholders, as well as on its Parse & Corelate (P&C) software to be updated due to changes in the DUIS schema.

There is no impact to SMETS1 Service Providers.

The expected impacts on DCC Systems can be found in the DCC Preliminary Assessment response in Annex C.

SEC and subsidiary documents

The following parts of the SEC will be impacted:

- Appendix AD 'DCC User Interface Specification'
- Schedule 11 'TS Applicability Tables'

The changes to the SEC required to deliver the proposed solution can be found in Annex B.

Technical specification versions

These changes will be applied to the next sub-Version of the following Technical Specification series at the time the modification is implemented:

- DUIS v5.x

These changes will be applied to any new Principal Versions of these documents that subsequently become effective on or before the implementation date.

Consumers

Consumers who will require an Alt HAN solution will be positively impacted by this modification. Being able to deliver firmware updates means that new functionality and security fixes will be able to be rolled out to consumers faster and with less inconvenience. This will also save on costs which could have been passed onto the consumer.

Other industry Codes

This modification will not have an impact on any other Industry Codes.

Greenhouse gas emissions

If this modification is not implemented, the inability to update the firmware on a Device may lead to additional otherwise unnecessary replacement of functional Devices. The disposal of these Devices may then have a detrimental impact on greenhouse gases.

5. Costs

DCC costs

The estimated DCC implementation costs for Design, Build and PIT are £636,500. The breakdown of these costs are as follows:

Breakdown of DCC implementation costs	
Activity	**Cost**
Design, Build and Pre-Integration Testing (PIT)	£636,500

Breakdown of DCC implementation costs	
Activity	**Cost**
Systems Integration Testing (SIT)	TBC
User Integration Testing (UIT)	TBC
Implement to Live	TBC
Application Support	TBC

More information can be found in the DCC Preliminary Assessment response in Annex C.

SECAS costs

The estimated the Smart Energy Code Administrator and Secretariat (SECAS) implementation cost to implement this as a stand-alone modification is one day of effort, amounting to approximately £600. This cost will be reassessed when combining this modification in a scheduled SEC Release. The activities needed to be undertaken for this are:

- Updating the SEC and releasing the new version to the industry.

SEC Party costs

Responses from the Refinement Consultation identified some Supplier Parties could incur costs up to £100k, mainly to implement new triage and internal processes. The full responses to the Refinement Consultation can be found in Annex D.

6. Implementation approach

Recommended implementation approach

SECAS is recommending an implementation date of:

- **2 November 2023** (November 2023 SEC Release) if a decision to approve is received on or before 2 May 2023; or
- **7 November 2024** (November 2024 SEC Release) if a decision to approve is received after 2 May 2023 but on or before 6 May 2024.

DUIS uplifts are targeted to only have one uplift per year with the next scheduled uplift as part of the June 2022 SEC Release. It is not possible for this modification to target June 2022. The following DUIS uplift is currently scheduled for November 2023, although is subject to change. Therefore, SECAS recommends that this modification be implemented in the next scheduled release that includes a DUIS uplift.

7. Assessment of the proposal

Observations on the issue

One Change Sub-Committee (CSC) member noted that OTA updates to the Alt HAN P2P Devices would be a necessity going forwards.

The CSC noted that SECMP0007 was not yet implemented at that time, and parts of the solution, namely the Communications Hub firmware upgrade to facilitate this, were not scheduled to be implemented for another two years. Rollout would need guidance from Parties to ensure Devices could be capable of receiving updates in time for implementation. The Proposer has already been in contact with the Department for Business, Energy & Industrial Strategy (BEIS) and the DCC with regards to the solution.

The Alt HAN Device (Bridge 1) is currently being redesigned to allow installation directly to the Electricity Distribution Network which has delayed the rollout. The Proposer stated that mass rollout of Devices had been delayed for 12 months to Spring 2023 and therefore changes implemented for this modification would be more likely to have been delivered before the mass rollout of Devices. Any Device installed prior to the DCC changes for OTA firmware upgrades would not be capable of receiving these upgrades OTA. The Proposer continued that this is a known risk and is being managed by the Alt HAN programme.

Solution development

Request for information

A request for information (RFI) was issued to SEC Parties to gain further information from industry to help scope the business requirements and potential solution options. Responses to the RFI indicated Suppliers need to be able to confirm that firmware updates were successful, and that they need to be able to read the current firmware version on the Device. Some Parties noted that their answers were dependent on the costs for implementing a solution. A Working Group member queried whether the costs should be separated for each requirement to assess whether each one should be included in a solution. The DCC advised that it wouldn't be able to split out costs for each requirement. Working Group members noted that it must be clear whether a full solution should be used, or whether a reduced solution that is cheaper would be more appropriate. The Working Group stated that this is only possible to be discussed if costs can be apportioned to individual elements of the solution.

Should SMKI credentials be replaceable on Alt HAN P2P Devices?

The Security Sub-Committee (SSC) was presented with this question, and they supported the requirement that Smart Metering Key Infrastructure (SMKI) credentials should be replaceable, but not as part of a business-as-usual process. SSC members noted that the security requirements of Consumer Access Devices (CADs) were a risk that was being monitored. Therefore, SSC members suggested that Alt HAN P2P Devices should mirror the security requirements set out for PPMIDs.

Responses to the RFI were not unanimous as to whether Suppliers should be able to replace any SMKI credentials on Alt HAN P2P Devices. At the Working Group, the Proposer clarified that this requirement should have been aimed at whether SMKI credentials should be replaceable in general, not specifically by Suppliers. A Working Group member highlighted that this changed the question substantially and that would have resulted in a decision in favour of the requirement.

Joining the HAN as a PPMID or a CAD

During the design of the Alt HAN P2P Device consideration was made as to how OTA functionality could be delivered. AltHANCo came up with two options for consideration.

- Option 1 – Alt HAN P2P Devices join the HAN as a PPMID
- Option 2 – Alt HAN P2P Devices join the HAN as a CAD

Alt HAN P2P Devices were initially being designed as Type 2 Devices and were expected to join the HAN as a CAD. An alternative would be for the Alt HAN P2P Devices to join the HAN as a PPMID and be a Type 1 Device. This would be expected to minimise Communications Hub firmware development by utilising the SECMP0007 functionality.

The Technical Architecture and Business Architecture Sub-Committee (TABASC) Chair raised a concern that Service Users would have issues from an operational perspective if they were not able to identify a real CAD or PPMID from an Alt HAN P2P Device. They suggested that the Devices implement firmware update functionality as laid out for PPMIDs and should be identified in the Smart Metering Inventory (SMI) as an Alt-HAN Device, as Type 1 options in Communications Hub Technical Specifications (CHTS).

A Working Group member observed that there could be further implications of treating an Alt HAN Device as a PPMID, stating that the Devices would not meet certain criteria that are required of PPMIDs that is detailed within the SMETS. They suggested that the Alt HAN Device should be defined within the SMETS or should utilise Wi-Fi as opposed to updating across over the Smart Metering Network. The Proposer countered that this had been considered as part of the Device development and was not a viable option for them.

The Proposer argued that this option would require CSP changes at great cost to industry. The DCC suggested that the Alt HAN P2P Devices could be tagged as part of a Great Britain Companion Specifications (GBCS), to show that they are not genuine PPMIDs, as part of the pre-notification process. Suppliers could access this information via a Service Request; this is currently an option for PPMIDs.

The TABASC Chair questioned whether the CAD option would result in changing firmware capability in the DSP. The DCC advised that the DSP will need to change whichever solution is implemented.

The DCC was asked to consider both options and document the constraints of each approach within the Preliminary Assessment. The Preliminary Assessment stated that the solution for the Alt HAN P2P Devices to re-use the functionality brought in by PPMIDs would provide a more cost-effective solution. This option would mean the Communications Hub would not be able to distinguish between a PPMID and an Alt HAN P2P Device, and that a change would be required within the DSP systems to enable the HAN to distinguish between the two Devices.

SSC members noted that a clear distinction between PPMIDs and Alt HAN P2P Devices was crucial. It would be particularly important for personnel without technical knowledge, such as those that may work directly with consumers within a call centre. The DCC advised that a clear flag would have to be placed on Alt HAN Devices in the SMI. This will be detailed within the Full Impact Assessment.

The TABASC challenged the proposed costs associated with this relatively minor change. These will be challenged as part of the Full Impact Assessment.

The Preliminary Assessment also highlighted that to develop the solution of treating the Alt HAN P2P Devices as a CAD would be more complex, more expensive and have a longer implementation timescale.

The TABASC agreed that although the technical merits of the PPMID option did meet the business requirements, it did not meet the architectural principles for smart metering and therefore was not endorsed by the TABASC as a long-term solution. However, the Chair also acknowledged that due to the time constraints of the rollout of Alt HAN Devices, Option 1 did provide a short-term solution.

The TABASC requested that a longer-term approach be developed based on the architectural principles of smart metering, recognising the opportunities present in the re-procurement of both DSP and CSP solutions. This will be taken forward separately to this modification.

A Working Group member also commented that the DCC costs should not be considered in isolation. They highlighted that any changes to the Alt HAN P2P Devices will have different design and development costs, and these should be considered along with the DCC costs. The Proposer advised that they were currently impact assessing this on their own Devices, and although they could not share specifics, confirmed joining the HAN as a PPMID was also lower cost on their Device development.

The Proposer noted that there will be a constraint 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.

Central Products List and Commercial Product Assurance

A Working Group member questioned whether the Alt HAN P2P Device would need to go through Commercial Product Assurance (CPA) certification as part of joining the Central Products List (CPL). This had previously been discussed with the SSC when the Devices were being designed as a CAD and it was determined that the Alt HAN P2P Devices would not require CPA Certification. However, since that SSC discussion the solution has been developed with the Device re-designed to join the HAN as a PPMID and therefore the SSC's view may change. It was suggested that as PPMIDs do not require CPA certification, the Alt HAN P2P Device should also not need this if they join the HAN appearing as a PPMID. SECAS advised this would be clarified with the SSC.

The Proposer noted that they would expect AltHANCo to make the required CPL submission with their contact details included for Parties to help identify issues. This would also help identify the Devices on the CPL. SECAS noted that SEC Parties may find that it would be easier to differentiate Alt HAN P2P Devices from genuine PPMIDs on the CPL if there were additional fields to identify them, such as if the 'PPMID Variant' field was included. If so, this would require additional changes to Appendix Z 'CPL Requirements'. SECAS will explore this further with SEC Parties

Battery powered Devices

One Working Group member noted that the Alt HAN P2P Devices were not alike, and one of the Alt HAN P2P Devices relies on battery power. They questioned whether this battery powered Alt HAN Device should be able to process firmware updates without losing power and affecting the Alt HAN. It is important that any firmware update for that Device should not impact the other Devices on the HAN.

They also questioned the priority of the Alt HAN P2P Device, in relation to situations where multiple OTAs were to be carried out across several Devices. The Proposer advised that the intent would be for the Alt HAN P2P Device to mirror the priority and Service Level Agreements (SLAs) that have been defined for a PPMID. The Proposer also added a business requirement to minimise impacts to other Devices on the Alt HAN as part of the design of the Device.

Legal text

One respondent queried whether AltHANCo should be able to rollout the firmware upgrades itself or whether changes in the SEC could be required for this to happen. They continued that AltHANCo may wish to provide more support for its services that could benefit industry. The Proposer stated that AltHANCo is not a DCC User. Its interactions with the DCC are set out currently in SEC Section Z 'Alt HAN Arrangements' and the onus is on Suppliers to rollout firmware, as set out in the SEC already. The DCC currently provides AltHANCo with monthly reports that are not defined within the SEC and the expectation would be that this report is added to that reporting suite without the need for legal text changes.

Any changes to the Alt HAN arrangements would be a broader discussion than just this modification and could be picked up directly with Parties outside of this process.

Support for Change

Working Group and TABASC members both voiced their support for the principle of the modification, stating that OTA firmware updates would be necessary for all Devices.

A Working Group member stated that they were a strong supporter of the modification suggesting OTA upgrade capability was imperative. They noted that Alt HAN P2P Devices are integral to the SMIP and are not peripheral in the way that IHDs are. They highlighted a potential future situation whereby the SSC may need to request security changes to Devices. Without OTA firmware upgrade capability, this could lead to all those Devices needing physical replacement.

Refinement Consultation responses indicated support for the modification but noted this would be dependent on the benefits delivering more than the cost of the solution.

Views against the General SEC Objectives

Proposer's views

The Proposer believes that this modification will better facilitate SEC Objective (a)[1] and (h)[2]. The Proposed Solution will provide for a fit for purpose, efficient and effective process for updating firmware Alt HAN P2P Devices. It would additionally allow Energy Suppliers to avoid unnecessary costs relating to replacement of Devices and site visits thus helping to ensuring the sustainability of Devices for the longer term. It would also better facilitate SEC Objective (c)[3] by ensuring the

[1] To facilitate the efficient provision, installation, and operation, as well as interoperability, of Smart Metering Systems at Energy Consumers' premises within Great Britain.

[2] To facilitate the establishment and operation of the Alternative Home Area Network (Alt HAN) arrangements.

[3] To facilitate energy consumers' management of their use of electricity and gas through the provision of appropriate information via smart metering systems.

maximum life of Devices and avoids replacement allowing continued access to smart benefits for consumers.

Industry views

Respondents from the Refinement Consultation agreed that the modification better facilitated SEC Objective (a), provided consumer benefits with protection from post install defects and a reduction of site visits. This would reduce consumer inconvenience and costs that could be passed on.

Views against the consumer areas

Improved safety and reliability

Consumers will be positively impacted by the ability to deliver OTA upgrades to Alt HAN P2P Devices to deliver additional functionality and remedy possible defects on equipment.

Lower bills than would otherwise be the case

It would be expected that by reducing the potential for Device replacement then this should positively impact consumers bills as those costs will not be absorbed.

Reduced environmental damage

Devices that have faults that can be fixed by OTA updates would not need to be exchanged and disposed of, thereby having a positive effect on the environment.

Improved quality of service

If implemented, this would be impacted positively be remotely fixing issues for consumers in a more efficient manner.

Benefits for society as a whole

If implemented, this modification will have a neutral impact against this consumer area.

Appendix 1: Progression timetable

The Refinement Consultation findings were discussed with the Working Group and the Preliminary Assessment with the TABASC. This modification will be presented to the Change Board on 26 January 2022 to request a DCC Impact Assessment.

Timetable	
Event/Action	**Date**
Draft Proposal raised	16 Jun 2021

Timetable	
Event/Action	**Date**
Presented to CSC for initial comment	29 Jun 2021
Request for information	6 Jul – 23 Jul 2021
Presented to CSC for final comment and conversion to a Modification Proposal	27 Jul 2021
Business Requirements discussed with Security Sub-Committee (SSC)	28 Jul 2021
Business Requirements discussed with Working Group	4 Aug 2021
Business Requirements discussed with the Technical Architecture and Business Architecture Sub-Committee (TABASC)	5 Aug 2021
DCC Preliminary Assessment requested	13 Aug 2021
DCC Preliminary Assessment returned	30 Sep 2021
Modification discussed with SSC	27 Oct 2021
Modification discussed with Working Group	3 Nov 2021
Modification discussed with TABASC	4 Nov 2021
Refinement Consultation	7 Dec – 4 Jan 2022
Modification discussed with Working Group	5 Jan 2022
Impact Assessment costs approved by Change Board	26 Jan 2022
Impact Assessment requested	27 Jan 2022
Impact Assessment returned	24 Mar 2022
Impact Assessment discussed with Working Group	4 May 2022
Impact Assessment discussed with TABASC	5 May 2022
Modification Report approved by CSC	17 May 2022
Modification Report Consultation	18 May 2022 – 7 Jun 2022
Change Board vote	22 Jun 2022

Appendix 2: Glossary

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

Glossary	
Acronym	**Full term**
Alt HAN	Alternative Home Area Network
BEIS	Department for Business, Energy & Industrial Strategy
CAD	Consumer Access Device
CHTS	Communications Hub Technical Specifications
CPA	Commercial Products Assurance
CPL	Central Products List

Glossary	
Acronym	**Full term**
CSC	Change Sub-Committee
CSP	Communications Service Provider
DCC	Data Communications Company
DSP	Data Services Provider
DUIS	DCC User Interface Specification
ESME	Electricity Smart Metering Equipment
GBCS	Great Britain Companion Specifications
GPF	Gas Proxy Function
GSME	Gas Smart Metering Equipment
HAN	Home Area Network
HCALCS	HAN Connected Auxiliary Load Control Switches
IHD	In-Home Display
MDU	Multi Dwelling Unit
OTA	Over The Air
P&C	Parse & Corelate
P2P	Point To Point
PIT	Pre-Integration Testing
PPMID	Prepayment Meter Interface Device
RFI	Request for information
SEC	Smart Energy Code
SEC	Smart Energy Code Administrator and Secretariat
SIT	System Integration Testing
SLA	Service Level Agreement
SMETS	Smart Metering Equipment Technical Specifications
SMI	Smart Metering Inventory
SMIP	Smart Metering Implementation Programme
SMKI	Smart Metering Key Infrastructure
SSC	Security Sub-Committee
TABASC	Technical Architecture and Business Architecture Sub-Committee
TCSO	Trust Centre Swap Out
TOC	Technical Operation Centre
UIT	User Integration Testing

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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	*Pending*	*Pending*	*Pending*	*Pending*

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

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

Annex B

Legal text – version 0.1

About this document

This document contains the redlined changes to the SEC that would be required to deliver this Modification Proposal.

This document contains the changes required to deliver the Proposed Solution.

Appendix AD 'DCC User Interface Specification'

These changes have been redlined against Appendix AD 'DCC User Interface Specification' version 5.0.

Amend Section 3.8.104 as follows:

3.8.104 Read Inventory

3.8.104.1 Service Description

Service Request Name	ReadInventory	
Service Reference	8.2	
Service Reference Variant	8.2	
Eligible Users	Import Supplier (IS) Export Supplier (ES) Gas Supplier (GS) Registered Supplier Agent (RSA) Electricity Distributor (ED) Gas Transporter (GT) Other User (OU)	
Security Classification	Non Critical	
BusinessTargetID - **Device Type applicable to this request**	DCC Access Control Broker	
Can be future dated?	No	
On Demand?	No	
Capable of being DCC Scheduled?	No	
Command Variants applicable to this Request (Only one populated)	8 – DCC Only	
Common Header Data Items	See clause 3.4.1.1	
Data Items Specific to this Service Request	See Specific Data Items Below	
Possible responses from this Service Request	These are the possible responses applicable to this Service Request. Please see clause 3.5 for more details on processing patterns • Response to a Non-Device Service Request Also see Response Section below for details specific to this request	
Response Codes possible from this Service Request	See clause 3.5.10 for Common Response Codes	
GBCS Cross Reference	Electricity	Gas
GBCS MessageCode	N/A	N/A
GBCS Use Case	N/A	N/A

3.8.104.2 Specific Data Items for this Request

ReadInventory Definition

Data Item	Description / Values	Type	Mandatory	Default	Units
UPRN	Unique Property Reference Number	sr:UPRN (Restriction of xs:positiveInteger (totalDigits = 12))	No	None	N/A
DeviceID	Device ID of a device in the premises	sr:EUI (See clause 3.10.1.3)	No	None	N/A
MPxN	MPAN or MPRN associated to a Device in the premises	sr:ImportMPxN (Restriction of xs:string (minLength =1 maxLength = 13))	No	None	N/A
PropertyFilter	PostCode and Address identifier that uniquely identify an address	sr:PropertyFilter	No	None	N/A

Table 225: ReadInventory (sr:ReadInventory) data items

PropertyFilter Definition

Data Item	Description / Values	Type	Mandatory	Default	Units
PostCode	Post Code of Metering Point This search criteria is case insensitive	sr:PostCode (Restriction of xs:string (minLength = 6 maxLength = 8))	Yes	None	N/A
AddressIdentifier	Address Identifier (house number or house name), that combined with the Post Code, allows the identification of the premises This search criteria is case insensitive	sr:AddressIdentifier (Restriction of xs:string (maxLength = 30))	Yes	None	N/A

Table 226: PropertyFilter (sr:PropertyFilter) data items

3.8.104.3 Specific Validation for this Request

See clause 3.2.5 for general validation applied to all Requests and clause 3.10.2 for Device Existence validation.

For this Request, the general Authorisation Checks as defined below shall not be carried out.

- a Response Code of E4 as defined in clause 3.2.4 “Verify that the User, in the User Role defined in the Service Request is a Eligible User for the Device” or
- a Response Code of E5 as defined in clause 3.2.4 “Verify that the Service Request or Signed Pre-Command is applicable to the Device status”

Response Code	Response Code Description
E080201	The Request does not uniquely identify a Premises
E080202	The Premises do not contain any Devices

3.8.104.4 Specific Data Items in the Response

This Service Response is defined in the XSD ResponseMessage DSPInventory XML element, which contains the DSP Inventory details applicable to a single premises or Device.

The DCC shall return the following data items which are specific to this Service Response:

Data Item	Description / Values	Type	Mandatory	Defaul t	Units
Device	Minimum 1 and maximum 17 Devices	sr:Device maxOccurs = 17	Yes	None	N/A
Per Device (complex type sr:Device) found at that Smart Metering System:					
DeviceID	Device ID of a Device in the Smart Metering System	sr:EUI (See clause 3.10.1.3)	Yes	None	N/A
DeviceType	The Type of device Valid set: • ESME • GSME • GPF • CHF • HCALCS • PPMID • IHD • CAD	sr:DeviceType (Restriction of xs:string (Enumeration))	Yes	None	N/A
DeviceStatus	An indicator giving the status of the device Valid set: • Pending • Whitelisted • InstalledNotCommissioned • Commissioned • Decommissioned • Withdrawn • Suspended • Recovery • Recovered Device Status is not applicable to Type 2 Devices, i.e. IHD and CAD	sr:DeviceStatus (Restriction of xs:string (Enumeration))	Device Type = Type 2(IHD, CAD): N/A Otherwise: Yes	None	N/A

Data Item	Description / Values	Type	Mandatory	Defaul t	Units
DeviceManufacturer	The name of the Device's Manufacturer With the exception of IHD and CAD: • The Device Manufacturer is the <device_model_manufacturer_identifier> from the CPL and presented in the format XXXX where each X is one of the characters 0 to 9 or A to F • This data item matches the value on the CPL For IHD and CAD this data item is free text	sr:DeviceManufacturer (Restriction of xs:string (maxLength = 30))	Yes	None	N/A
DeviceModel	The specific model of the device, as used by the manufacturer. With the exception of IHD and CAD: • The Device Model is the concatenation of <device_model .model_identifier>< device_model .hardware_version.version>< device_model .hardware_version.revision> from the CPL and presented in the format XXXXXXXX where each X is one of the characters 0 to 9 or A to F Where: • the first 4 characters are the model identifier • the next 2 characters are the hardware version.version • the final 2 characters are the hardware version.revision • This data item matches the value on the CPL For IHD and CAD this data item is free text	sr:DeviceModel (Restricyion of xs:string (maxLength = 30))	Yes	None	N/A

Data Item	Description / Values	Type	Mandatory	Defaul t	Units
SMETSCHTSVersio n	The version of SMETS or CHTS that the device complies with. This should align with the SMETS_CHTS version version_number value contained on the CPL.	sr:SMETSCHYSVersi on (Restriction of xs:string (minLength = 1, maxLength = 20))	Device Type = CAD: N/A Otherwise: Yes	None	N/A
DeviceFirmwareVers ion	The operational version of Firmware of the Device The Firmware version as held in the CPL and presented in the format XXXXXXXX where each X is one of the characters 0 to 9 or A to F. This data item matches the value on the CPLA The binary value shall be four octets in length and shall correspond to the File Version field in the ZSE OTA Header structure.	Restriction of xs:string (minLength = 1, maxLength = 8)	Device includes Firmware: Yes Otherwise: N/A	None	N/A
DeviceFirmwareVers ionStatus	The status of the Firmware Version Valid set: • Active • Cancelled • Expired • Withdrawn The status displayed in DeviceFirmwareVersionStatus maps to the status on the Central Products List as per the Data Item values to CPL values Mapping table below:	sr:FirmwareVersionSt atus (Restriction of xs:string (Enumeration))	Device includes Firmware: Yes Otherwise: N/A	None	N/A
CPLStatus	The CPL Assurance Certificate Status Valid set: • Active • Cancelled • Expired • Withdrawn The status displayed in CPL Staus maps to the status on the Central Products List as per the Data Item values to CPL values Mapping table below:	sr:CPLStatus (Restriction of xs:string (Enumeration))	Device includes Firmware: Yes Otherwise: N/A	None	N/A

Data Item	Description / Values	Type	Mandatory	Defaul t	Units
DateCommissioned	Where applicable, the date when the Device was commissioned	xs:date	Device Type = IHD,CAD: N/A Device has been commission ed: Yes Otherwise: No	None	UTC Date
ImportMPxN	The reference number identifying an import electricity or a gas metering point	sr:ImportMPxN Restriction of xs:string (minLength = 1, maxLength = 13)	Device Type = ESME, GSME: No Otherwise: N/A	None	N/A
SecondaryImportMP AN	The reference number identifying a Twin Element Import electricity secondary metering point	sr:MPAN Restriction of xs:string (minLength = 13, maxLength = 13)	Device Type = ESME and ESME Variant = B: No Otherwise: N/A	None	N/A
ExportMPAN	The reference number identifying an export electricity metering point	sr:MPAN Restriction of xs:string (minLength = 13, maxLength = 13)	Device Type = ESME and includes Export capability: No Otherwise: N/A	None	N/A
ESMEVariant	See Table 5 for mapping and valid set. Values including F or G are not applicable to Devices prior to GBCS v4.0	sr:ESMEVariant Restriction of xs:string (Enumeration)	Device Type = ESME Yes Otherwise: N/A	None	N/A

Data Item	Description / Values	Type	Mandatory	Defaul t	Units
PPMIDVariant	Se Table 229a for mapping and valid set.	sr:PPMIDVariant Restriction of xs:string (Enumeration)	Device Type = PPMID Yes Otherwise: N/A	None	N/A
UPRN	Unique Property Reference Number	sr:URPN (Restriction of xs:positiveInteger (totalDigits = 12))	No	None	N/A
PropertyFilter	Post Code and Address Identifier that uniquely identifies an address	sr:PropertyFilter	No	None	N/A
CSPRegion	The CSP Region the Smart Meter System is associated with Valid set: • North • Central • South • Unknown	sr:CSPRegion (Restriction of xs:string (Enumeration))	No	None	N/A
DeviceGBCSVersion	The operational version of GBCS as recorded in the SMI for the Device. The version number format will align with the CPL. For example 1.0 or 2.0	xs:string	Device includes Firmware: Yes Otherwise: N/A	None	N/A
HANVariant	The Device's HAN Variant. Valid Set: • Single Band (2.4GHz only) • Dual Band (868MHz and 2.4GHz) • Unknown HAN Variant (The CPL CHF Device Manufacturer and Device Model define its HAN Variant and the DCC Systems hold this relationship. When a CH is pre-notified to the DCC, its CHF HAN Variant is set based on its Device Manufacturer and Device Model)	xs:string	DeviceType = CHF: Yes Otherwise: N/A	None	N/A

Table 227: Device (sr:Device) data items

Data Item values to CPL values mapping.

Status value on the Central Products List (CPL)	DeviceFirmwareVersionStatus value	CPLStatus value
Current	Active	Active
Removed	Cancelled	Cancelled
No value defined	Expired (not currently used)	Expired (not currently used)
No value defined	Withdrawn (not currently used)	Withdrawn (not currently used)

Table 228: Data Item values to CPL values Mapping

DUIS device type values to CPL values mapping.

Central Products List (CPL) device type	DUIS device type	DUIS ESMEVariant Valid set
Single Element Electricity Metering Equipment	ESME	• A. Single Element ESME • AD. Single Element ESME with ALCS • ADE. Single Element ESME with ALCS and Boost Function • ADF. Single Element ESME with ALCS and APC • ADEF. Single Element ESME with ALCS, Boost Function and APC • AEF. Single Element ESME with Boost Function and APC • AF. Single Element ESME with APC • AG. SAPC • AEG. SAPC with Boost Function • ADG. SAPC with ALCS • ADEG. SAPC with ALCS and Boost Function [1]
Twin Element Electricity Metering Equipment	ESME	• B. Twin Element ESME • BD. Twin Element ESME with ALCS • BDE. Twin Element ESME with ALCS and Boost Function • BF. Twin Element ESME with APC • BDF. Twin Element ESME with ALCS and APC • BDEF. Twin Element ESME with ALCS, Boost Function and APC • BEF. Twin Element ESME with Boost Function and APC
Polyphase Element Electricity Metering Equipment	ESME	• C. Polyphase ESME • CD. Polyphase ESME with ALCS • CDE. Polyphase ESME with ALCS and Boost Function • CDEF. Polyphase with ALCS, Boost Function and APC • CF. Polyphase with APC • CDF. Polyphase with ALCS and APC • CEF. Polyphase with Boost Function and APC
Gas Smart Meter	GSME	N/A
Prepayment Interface Device	PPMID	N/A
HAN Connected Auxiliary Load Control Switch	HCALCS	N/A

[1] 'SAPC is defined in SMETS2 Section 9 Part G1; an ALCS forming part of an SAPC is defined in SMETS2 Section 9 Part G2 and a Boost Function forming part of an SAPC is defined in SMETS2 Section 9 Part G3.

Table 229: Device type to CPL values mapping

DUIS PPMID device type values to CPL values mapping.

Central Products List (CPL) device type	DUIS device type	DUIS PPMIDVariant Valid set
Single Element Electricity Metering Equipment	ESME	N/A
Twin Element Electricity Metering Equipment	ESME	N/A
Polyphase Element Electricity Metering Equipment	ESME	N/A
Gas Smart Meter	GSME	N/A
Prepayment Interface Device	PPMID	• PPMID • AltHAN Bridge 1 • AltHAN Bridge 2 • AltHAN Bridge 3 • AltHAN Bridge 4
HAN Connected Auxiliary Load Control Switch	HCALCS	N/A

Table 229a: PPMID type to CPL values mapping

Amend Section 3.8.106 as follows:

3.8.106.1 Update Inventory

3.8.106.1 Service Description

Service Request Name	UpdateInventory
Service Reference	8.4
Service Reference Variant	8.4
Eligible Users	Import Supplier (IS) Export Supplier (ES) Gas Supplier (GS) Registered Supplier Agent (RSA) Electricity Distributor (ED) Gas Transporter (GT) Other User (OU) Where a Device has a status of 'Pending' only the User who added the Device to the Smart Metering Inventory may either update the details of that Device; or delete that Device from the Smart Metering Inventory. For

	Devices with SMI Statuses other than 'Pending', only the Responsible Supplier may amend the SMI Status of that Device.	
Security Classification	Non Critical	
BusinessTargetID - **Device Type applicable to this request**	DCC Access Control Broker	
Can be future dated?	No	
On Demand?	No	
Capable of being DCC Scheduled?	No	
Command Variants applicable to this Request (Only one populated)	8 – DCC Only	
Common Header Data Items	See clause 3.4.1.1	
Data Items Specific to this Service Request	See Specific Data Items Below	
Possible responses from this Service Request	These are the possible responses applicable to this Service Request. Please see clause 3.5. for more details on processing patterns • Acknowledgement Also see Response Section below for details specific to this request	
Response Codes possible from this Service Request	See clause 3.5.10 for Common Response Codes	
GBCS Cross Reference	Electricity	Gas
GBCS MessageCode	N/A	N/A
GBCS Use Case	N/A	N/A

3.8.106.2 *Specific Data Items for this Request*

UpdateInventory Definition

Data Item	Description / Values	Type	Mandatory	Default	Units
DeviceID	Device ID of the Device to be updated (status or details) or deleted.	sr:EUI (See clause 3.10.1.3)	Yes	None	N/A
UpdateDeviceStatusExceptCH	An indicator giving the status to be recorded for the Device (Not applicable to CHF, GPF or Type 2 Devices) Valid set • Pending • InstalledNotCommissioned	sr:UpdateDeviceStatusExceptCH Restriction of xs:string (Enumeration)	One and only one of these items must be set	None	N/A
UpdateDeviceStatusCH	An indicator giving the SMI Status to be recorded for the CHF and its associated GPF Valid set • Commissioned • InstalledNotCommissioned • Withdrawn	sr:UpdateDeviceStatusCH Restriction of xs:string (Enumeration)		None	N/A
UpdateDeviceDetails	Details to be updated, for a Device in a status of 'Pending'	sr:UpdateDeviceDetails		None	N/A
DeleteDevice	Device, in a status of 'Pending', is to be deleted	sr:DeleteDevice		None	N/A
UpdateMPxN	The MPxN to be associated with the device within the Smart Metering Inventory to be updated	sr:UpdateMPxN		None	N/A

Table 231: UpdateInventory (sr:UpdateInventory) data items

UpdateDeviceDetails Definition

Data Item	Description / Values	Type	Mandatory	Default	Units
DeviceManufacturer	The name of the Device's manufacturer With the exception of IHD and CAD: • The Device Manufacturer is the <device_model_manufacturer_identifier> from the CPL and presented in the format XXXX where each X is one of the characters 0 to 9 or A to F • This data item should match the value on the CPL For IHD and CAD this data item is free text	sr:DeviceManufacturer (Restriction of xs:string (maxLength = 30))	At least one data item must be set	None	N/A

DeviceModel	The model of the D With the exception of IHD and CAD: • The Device Model is the concatenation of <device_model .model_identifier><device_model .hardware_version.version><device_model .hardware_version.revision> from the CPL and presented in the format XXXXXXXX where each X is one of the characters 0 to 9 or A to F Where: • the first 4 characters are the model identifier • the next 2 characters are the hardware version.version • the final 2 characters are the hardware version.revision • This data item matches the value on the CPL For IHD and CAD this data item is free text evice	sr:DeviceModel (Restriction of xs:string (maxLength = 30))	At least one data item must be set	None	N/A
SMETSCHTS Version	The version of SMETS or CHTS that the Device complies with. This should align with the SMETS_CHTS version version_number value contained on the CPL.	sr:SMETSCHTSVersion (Restriction of xs:string (minLength = 1, maxLength = 20))	At least one data item must be set	None	N/A
FirmwareVersion	The operational version of Firmware of the Device The Firmware version as held in the CPL and presented in the format XXXXXXXX where each X is one of the characters 0 to 9 or A to F. This data item should match the value on the CPL The value shall be four octets in length	sr:FirmwareVersion Restriction of xs:string (minLength = 1, maxLength = 8)	At least one data item must be set	None	N/A
ESMEVariant	See Table 5 for mapping and valid set. Values including F or G are not applicable to Devices prior to GBCS v4.0	sr:ESMEVariant Restriction of xs:string (Enumeration)	At least one data item must be set	None	N/A

PPMIDVariant	See Table 229a for mapping and valid set.	sr:PPMIDVariant Restriction of xs:string (Enumeration)	At least one data item must be set	None	N/A

Table 232: UpdateDeviceDetails (sr:UpdateDeviceDetails) data items

UpdateMPxN Definition

Data Item	Description / Values	Type	Mandatory	Default	Units
ImportMPxN	The primary MPAN or MPRN for the device	sr:ImportMPxN (restriction on xs:String, minimum length = 1, maximum length = 13)	No The UpdateMPxN element is a choice so it must contain only one of these 3 elements	None	N/A
SecondaryImportMPAN	The Secondary MPAN for the device - only applicable to twin element meters	sr:MPAN (restriction on xs:String, minimum length = 13, maximum length = 13)		None	N/A
ExportMPAN	The Export MPAN for the device	sr:MPAN (restriction on xs:String, minimum length = 13, maximum length = 13)		None	N/A

Table 233: UpdateMPxN (sr:UpdateMPxN) data items

3.8.106.3 Specific Validation for this Request

See clause 3.2.5 for general validation applied to all Requests and clause 3.10.2 for Device Existence validation.

Response Code	Response Code Description
E080405	The Device Status is not applicable to the Device Type
E080406	The Device Status transition is not valid
E080407	The Device ID does not exist in the Smart Metering Inventory or its status is not 'Pending'
E080408	The Request does not include any details to be updated
E080409	The Device Type / Manufacturer / Model / Firmware Version data resulting from the changes specified by the User does not match the DCC list of equipment that has been approved for use
E080410	The User is not authorised to execute the Service Request to update the detail specified
E080411	Request to update Device Status not applicable to the Device Type
E080412	The Device Status transition is not valid
E080413	The requested MPxN update isn't suitable for the specified Device.
E080414	The Device Status does not allow the MPxN to be updated. The Device Status must be one of "Whitelisted", "Installed Not Commissioned" or "Commissioned" if the MPxN update is to succeed.
E080415	The User is not the Registered Supplier Party for the new MPxN specified within the UpdateMPxN part of the Service Request.

3.8.106.4 Additional DCC System Processing

When a User sends an Update Inventory Service Request to the DCC in respect of a Communications Hub, the DeviceId specified within the Service Request shall be that of the Communications Hub Function and not the Gas Proxy Function.

Note that where a Device has an SMI Status of 'Recovered' the Device's SMI Status immediately prior to it having the SMI Status of 'Recovery' shall be used in validation.

This Service Request can be used by Users to perform the following four functions;

1. Update Device details within the Smart Metering Inventory provided via Pre-Notification

    a. This functionality of the Service Request is available to all the Eligible User Roles associated with this Service Request.

    b. Only the User who originally added the Device to the Smart Metering Inventory may update these device details whilst the Devie has a status of 'Pending'.

    c. For Devices that have SMI Status values, only Devices in a status of 'Pending' can be updated.

    d. Type 2 (IHD and CAD) Devices can be updated at any time.

    e. Update most of the Device details that were initially provided to the DCC via Service Request 12.2 – Device Pre-notification (see clause 3.8.122)

    f. It isn't possible to update a Device ID (including the GPF Device ID associated to a CHF). If it has been entered in error it has to be deleted via this Service Request and re-added via Service Request 12.2 – Device Pre-notification (see clause 3.8.122).

    g. It isn't possible to update a Device Type. If it has been entered in error it has to be deleted via this Service Request and re-added via Service Request 12.2 – Device Pre-notification (see clause 3.8.122).

    h. Any updates to the details shared between a CHF and a GPF will be applied to both. The Device ID in the Service Request has to be that of the CHF.

2. Delete Device details from the Smart Metering Inventory provided via Pre-Notification which have not been installed.

    a. This functionality of the Service Request is available to all the Eligible User Roles associated with this Service Request.

    b. Only the User who originally added the Device to the Smart Metering Inventory may delete these device details.

c. For Devices that have SMI Status values, only Devices in a status of 'Pending' can be deleted.

d. Type 2 (IHD and CAD) Devices can be deleted at any time.

e. Deleting a CHF will also delete its associated GPF.

3. Update SMI Status within the Smart Metering Inventory

a. This functionality of the Service Request is ONLY available to the Eligible User Roles of Import Supplier and Gas Supplier who are the Responsible Supplier to the Device being updated.

b. Different options exist for which device SMI Status values can be updated by Users depending on Device type. Functionality allows,

i. Update the Device status for all Device Types, other than the CHF and the GPF and where the old and new status apply to the Device Type

1. From 'Pending' to 'InstalledNotCommissioned'

2. From 'Whitelisted' to 'Pending'

c. Update the Device SMI Status for a CHF (and its associated GPF)

i. To support the Install & Leave process and / or Install & Commission after Decommissioning or Withdrawal:

1. From 'Pending' to 'InstalledNotCommissioned' (GPF from 'Pending' to 'InstalledNotCommissioned')

2. From 'InstalledNotCommissioned' to 'Commissioned' (GPF no status transition)

3. From 'Pending' to 'Commissioned' (GPF from 'Pending' to 'InstalledNotCommissioned')

ii. From 'Commissioned' to 'Withdrawn' (GPF from 'Commissioned' to 'Withdrawn' or from 'Installed Not Commissioned' to 'Withdrawn'). This is the equivalent of Service Request 8.5 – Service Opt Out (see clause 3.8.102) for other Device Types. On successful completion of the Service Request, the DCC Systems will:

1. automatically delete all active DSP Schedules on all Devices in the CHF Whitelist. For each deleted DSP Schedule a DCC Alert N37 will be sent to the User that owned it.

2. automatically cancel all Future Dated (DSP) requests not yet sent to the Device for that CHF and all the Devices in its Whitelist. For each cancelled request a DCC Alert N36 will be sent to the sender of the Future Dated request.

4) Update MPxN associated with the Device (or add a new association) within the Smart Metering Inventory

a. This functionality of the Service Request shall ONLY be available to either:
   a. the Registered Supplier Party for the MPxN of the type specified in UpdateMPxN, as recorded in the Smart Metering Inventory against the DeviceID; or
   b. where no such MPxN is recorded in the Smart Metering Inventory against the DeviceID, any Supplier Party
b. The new MPxN must be consistent with the type of Device, for example if the Secondary MPAN is updated then the device must be a twin element ESME.
c. ONLY a single MPxN association change be changed per Service Request call
d. If the MPxN is successfully updated in the Smart Metering Inventory, then a DCC Alert N16 is sent to the Meter's Network Operator.

3.8.106.5 Additional Information

Where a User wishes to decommission a Device and re-use the Device at another premise then the User must not use the Update Inventory Service Request to perform this activity. Instead, a Service Request 8.3 Decommission Device (see clause 3.8.100) should be used to update the Device's SMI Status to 'Decommissioned' followed by a subsequent Service Request 12.2 Device Pre-notification (see clause 3.8.122) to update the Device's SMI Status to 'Pending'. The Device can then be commissioned as per normal process.

Amend Section 3.8.109 as follows:

3.8.109 Join Service (Critical)

3.8.109.1 Service Description

Service Request Name	JoinService(Critical)
Service Reference	8.7
Service Reference Variant	8.7.1
Eligible Users	Import Supplier (IS) Gas Supplier (GS)

Security Classification	Critical		
BusinessTargetID - **Device Type applicable to this request**	Electricity Smart Meter (ESME) Gas Smart Meter (GSME) HAN Connected Auxiliary Load Control Switch (HCALCS)		
Can be future dated?	No		
On Demand?	Yes		
Capable of being DCC Scheduled?	No		
Command Variants applicable to this Request (Only one populated)	For Service Request 4 – Transform For Signed Pre-Commands, choice of 5 – Send (Critical) 6 – Return for local delivery (Critical) 7 – Send and Return for local delivery (Critical)		
Common Header Data Items	See clause 3.4.1.1		
Data Items Specific to this Service Request	See Specific Data Items Below		
Possible responses from this Service Request	These are the possible responses applicable to this Service Request. Please see clause 3.5 for more details on processing patterns • Acknowledgement • Response to Transform Request - PreCommand Format • Service Response from Device – GBCSPayload Format • Response to a Command for Local Delivery Request – LocalCommand Format		
Response Codes possible from this Service Request	See clause 3.5.10 for Common Response Codes		
GBCS Cross Reference	ESME join to HCALCS or PPMID	HCALCS join to ESME	GSME join to PPMID
GBCS MessageCode	0x000D	0x00AB	0x00AF
GBCS Use Case	CS03A1	CS03A2	CS03C

3.8.109.2 Specific Data Items for this Request

JoinServiceCritical Definition

Data Item	Description / Values	Type	Mandatory	Default	Units
OtherDeviceID	Device ID of the Device to be joined to (paired with) the BusinessTargetID Device	sr:EUI (See clause 3.10.1.3)	Yes	None	N/A

Table 239: JoinServiceCritical (sr:JoinOrUnjoinDevice) data items

3.8.109.3 Specific Validation for this Request

See clause 3.2.5 for general validation applied to all Requests and clause 3.10.2 for 'Other Device' Existence validation.

Response Code	Response Code Description
E080702	The 'Other Device' Type is not valid for this Join Service

3.8.109.4 Additional DCC System Processing

Where a GSME is to be joined to a PPMID then the DCC shall add the Key Agreement Certificate (currently in use by the PPMID specified within the Service Request) to the Pre-Command to be sent back to the User. The Key Agreement Certificate shall be retrieved by the DCC from the Public Key Repository where the "In Use" flag is set.

Upon successful execution of a JoinService(Critical) Service Request to join a HCALC or a PPMID Device, and where the associated Communication Hub Function and the associated Electricity Smart Meter or Gas Smart Meter SMI Status are 'Commissioned', the DCC shall update the Smart Metering Inventory and set the SMI Status of the HCALC or PPMID to 'Commissioned'.

If the 'Other Device' is a PPMID and the PPMIDVariant recorded in the Smart Meter Intentory is different from PPMIDVariant 'PPMID', a Response Code of E080702 shall be returned to the User.

Amend Section 3.8.110 as follows:

3.8.110 Join Service (Non-Critical)

3.8.110.1 Service Description

Service Request Name	JoinService(Non-Critical)
Service Reference	8.7
Service Reference Variant	8.7.2
Eligible Users	Import Supplier (IS) Gas Supplier (GS)

	Other User (OU) (Type 2 CAD Only) 1) The only Devices that Other Users may join are Type 2 Devices that are not IHDs 2) Where a Gas Proxy Function is to be joined to a Gas Smart Meter, any Gas Supplier or Import Supplier who is a Responsible Supplier for any Device which is associated with the same Communications Hub Function as the Gas Proxy Function may request this Join Service Request.				
Security Classification	Non Critical				
BusinessTargetID - **Device Type applicable to this request**	Electricity Smart Meter (ESME) Gas Smart Meter (GSME) Gas Proxy Function (GPF) PrePayment Interface Device (PPMID)				
Can be future dated?	No				
On Demand?	Yes				
Capable of being DCC Scheduled?	No				
Command Variants applicable to this Request (Only one populated)	1 – Send (Non-Critical) 2 – Return for local delivery (Non-Critical) 3 – Send and Return for local delivery (Non-Critical)				
Common Header Data Items	See clause 3.4.1.1				
Data Items Specific to this Service Request	See Specific Data Items Below				
Possible responses from this Service Request	These are the possible responses applicable to this Service Request. Please see clause 3.5 for more details on processing patterns • Acknowledgement • Service Response from Device – GBCSPayload Format • Response to a Command for Local Delivery – LocalCommand Format Also see Response Section below for details specific to this request				
Response Codes possible from this Service Request	See clause 3.5.10 for Common Response Codes				
GBCS Cross Reference	ESME join to Type 2 device	GSME join to GPF	PPMID join to ESME	PPMID join to GSME	GPF join to PPMID or Type 2 device
GBCS MessageCode	0x000E	0x000E	0x00AB	0x00AF	0x000E
GBCS Use Case	CS03B	CS03B	CS03A2	CS03C	CS03B

3.8.110.2 Specific Data Items for this Request

JoinServiceNonCritical Definition

Data Item	Description / Values	Type	Mandatory	Default	Units
OtherDeviceID	Device ID of the Device to be joined to (paired with) the BusinessTargetID Device.	sr:EUI (See clause 3.10.1.3)	Yes	None	N/A

Table 240: JoinServiceNonCritical (sr:JoinOrUnjoinDevice) data items

3.8.110.3 Specific Validation for this Request

See clause 3.2.5 for general validation applied to all Requests and clause 3.10.2 for 'Other Device' Existence validation.

Response Code	Response Code Description
E080721	The 'Other Device' Type is not valid for this Join Service
E080722	The User Role is not authorised to Join this Device Type
E080723	The User is not authorised to Join these Gas Smart Meter / Gas Proxy Function

3.8.110.4 Additional DCC System Processing

Where a PPMID is to be joined to a GSME then the DCC shall add the Key Agreement Certificate (currently in use by the GSME specified within the Service Request) to the Command. The Key Agreement Certificate shall be retrieved by the DCC from the Public Key Repository where the "In Use" flag is set.

Upon successful execution of a JoinService(Non-Critical) Service Request for a Gas Proxy Function (GPF) Device, and where the associated Communication Hub Function and the associated Gas Smart Meter SMI Status are 'Commissioned', the DCC shall update the Smart Metering Inventory and set the SMI Status of Gas Proxy Function (GPF) to 'Commissioned'.

If the BusinessTargetID Device Type is a PPMID and the PPMIDVariant recorded in the Smart Meter Intentory is different from PPMIDVariant 'PPMID', a Response Code of E080721 shall be returned to the User.

Amend Section 3.8.128 as follows:

3.8.128 Device Pre-notification

3.8.128.1 Service Description

Service Request Name	DevicePrenotification	
Service Reference	12.2	
Service Reference Variant	12.2	
Eligible Users	Import Supplier (IS) Export Supplier (ES) Gas Supplier (GS) Registered Supplier Agent (RSA) Electricity Distributor (ED) Gas Transporter (GT) Other User (OU)	
Security Classification	Non Critical	
BusinessTargetID - **Device Type applicable to this request**	DCC Access Control Broker	
Can be future dated?	No	
On Demand?	No	
Capable of being DCC Scheduled?	No	
Command Variants applicable to this request (Only one populated)	8 - DCC Only	
Common Header Data Items	See clause 3.4.1.1	
Data Items Specific to this Service Request	See Specific Data Items Below	
Possible responses from this Service Request	These are the possible responses applicable to this Service Request. Please see clause 3.5 for more details on processing patterns • Acknowledgement Also see Response Section below for details specific to this request	
Response Codes possible from this Service Request	See clause 3.5.10 for Common Response Codes	
GBCS Cross Reference	Electricity	Gas
GBCS MessageCode	N/A	N/A
GBCS Use Case	N/A	N/A

3.8.128.2 Specific Data Items for this Request

DevicePrenotification Definition

Data Item	Description / Allowable values	Type	Mandatory	Default	Units
DeviceID	A unique ID for the Device	sr:EUI (See clause 3.10.1.3)	Yes	None	N/A
DeviceManufacturer	The name of the Device's manufacturer. With the exception of IHD and CAD: • The Device Manufacturer is the <device_model_manufacturer_identifier> from the CPL and presented in the format XXXX where each X is one of the characters 0 to 9 or A to F • This data item should be aligned with the value on the CPL otherwise a validation error is raised, see E120203. Note that the DUIS data item removes the colon punctuation that exists in the CPL definition between octet values. For IHD and CAD this data item is free text and is not validated by the DCC.	sr:DeviceManufacturer (Restriction of xs:string (maxLength = 30))	Yes	None	N/A

Data Item	Description / Allowable values	Type	Mandatory	Default	Units
DeviceModel	The specific model of the Device, as used by the manufacturer. With the exception of IHD and CAD: • The Device Model is the concatenation of <device_model .model_identifier> < device_model .hardware_version.version>< device_model .hardware_version.revision> from the CPL and presented in the format XXXXXXXX where each X is one of the characters 0 to 9 or A to F Where: • the first 4 characters are the model identifier • the next 2 characters are the hardware version.version • the final 2 characters are the hardware version.revision • This data item must be aligned with the value on the CPL otherwise a validation error is raised, see E120203. Note that the DUIS data item removes the colon punctuation that exists in the CPL definition between octet values. For IHD and CAD this data item is free text and is not validated by the DCC.	sr:DeviceModel (Restriction of xs:string (maxLength = 30))	Yes	None	N/A

Data Item	Description / Allowable values	Type	Mandatory	Default	Units
DeviceType	The Type of Device Valid set: • ESME • GSME • CHF • HCALCS • PPMID • IHD • CAD With the exception of IHD and CAD, which are not validated by the DCC, this data item must be aligned with the value on the Central Products List otherwise a validation error is raised, see E120203. See Table below for mapping between XML enumeration valid set values and CPL values.	sr:DeviceType (Restriction of xs:string (Enumeration))	Yes	None	N/A
SMETSCHTSVersion	The version of SMETS or CHTS that the Device complies with e.g. V1.58 This should align with the SMETS_CHTS version version_number value contained on the CPL.	sr:SMETSCHTSVersion (Restriction of xs:string (minLength = 1, maxLength = 20))	Device Type = CAD: N/A Otherwise: Yes	None	N/A
FirmwareVersion	The operational version of Firmware of the Device The Firmware version as held in the CPL and presented in the format XXXXXXXX where each X is one of the characters 0 to 9 or A to FA This data item must be aligned with the value on the Central Products List otherwise a validation error is raised, see E120203. Note that the DUIS data item removes the colon punctuation that exists in the CPL definition between octet values.	sr:FirmwareVersion (Restriction of xs:string (minLength = 1, maxLength = 8))	All Devices except Type 2: Yes Type 2: N/A	None	N/A

Data Item	Description / Allowable values	Type	Mandatory	Default	Units
ESMEVariant	See Table 5 for mapping and valid set. Values including F or G are not applicable to Devices prior to GBCS v4.0	sr:ESMEVariant Restriction of xs:string (Enumeration)	DeviceType = ESME: Yes Otherwise: N/A	None	N/A
AssociatedGPFDeviceID	A unique ID for the Gas Proxy Function Device associated with the Communications Hub Function	sr:EUI (See clause 3.10.1.3)	DeviceType = CommunicationsHubFunction: Yes Otherwise: N/A	None	N/A
PPMIDVariant	See Table 229a for mapping and valid set.	sr:PPMIDVariant Restriction of xs:string (Enumeration)	DeviceType = PPMID: Yes Otherwise: N/A	None	N/A

Table 261: DevicePrenotification (sr DevicePrenotification) data items

3.8.128.3 Specific Validation for this Request

See clause 3.2.5 for general validation applied to all Requests.

For this Request, the general Authorisation Checks as defined below shall not be carried out.

- a Response Code of E4 as defined in clause 3.2.4 "Verify that the User, in the User Role defined in the Service Request is a Eligible User for the Device" or
- a Response Code of E5 as defined in clause 3.2.4 "Verify that the Service Request or Signed Pre-Command is applicable to the Device status"

Response Code	Response Code Description
E120201	The Device ID already existed in Smart Metering Inventory and its Status was not 'Decommissioned' or 'Withdrawn'
E120203	The Device Type / Manufacturer / Model / Firmware Version data specified by the User do not match the values contained on the Central Products List (CPL) that have been approved for use.
E120204	Not all the applicable optional data items are included in the Request or not applicable data items are included in the Request

E120207	This Device Type (GPF) can't be Pre-notified

Additional Obligations

A User must ensure that all Devices that are required to be displayed via the Smart Metering Inventory and/or required to be connected into the Home Area Network (HAN) must have an associated Device Pre-notification Service Request sent to the DCC.

The DCC shall ensure that the Communication Hub Function and Gas Proxy Function Devices are pre-notified and associated details are updated into the Smart Metering Inventory on behalf of Users.

Additional DCC System Processing

Upon successful execution of a DevicePrenotification Service Request, the DCC shall update the Smart Metering Inventory and set the SMI Status of the DeviceId to 'Pending' where the Device Type is one that has an SMI Status recorded within the Smart Metering Inventory.

Data Communications Company

SEC Modification Proposal, SECMP0170, DCC CR4435

Firmware updates to Point to Point Alt HAN Devices

Preliminary Impact Assessment (PIA)

Version:	**1.0**
Date:	**30th September 2021**
Author:	**DCC**
Classification:	**DCC PUBLIC**

Data Communications Company

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1 Executive Summary

The Change Board are asked to approve the following:

- Total cost to complete the Full Impact Assessment of £86,007.
- The timescales to complete the Full Impact Assessment of 40 working days.
- ROM costs for MP170 (using DCC recommended Option 1 solution approach), up to the end of Pre-Integration Testing (PIT) of up to £636,500.

Problem Statement and Solution

Point to Point (P2P) Alt HAN Devices are being developed that will act as a range extender to offer a solution in situations where one, or both, of the gas meter (GSME) or In Home Display (IHD)/ Prepayment Metering Interface Device (PPMID) are out of range of the Home Area Network (HAN).

The SEC does not currently support remote firmware updates to Alt HAN P2P Devices.

Without the ability to perform a remote firmware upgrade, new innovations and functionality to improve the service to consumers will not be cost effective. Additionally, if a security defect is identified then an Over-the-Air (OTA) firmware update to fix the defect would be quicker and cheaper than a site visit and thus reduces the length of time that a consumer's premise is a security risk.

The objective of this Modification is to introduce support for OTA firmware updates for the Alt HAN P2P Devices within DCC Total Systems.

Modification Benefits

Following are the benefits of providing remote firmware updates to Alt HAN P2P Devices.

- Risk mitigation - OTA firmware updates enable the User to remedy faults, fix security issues without a site visit which can avoid partial/mass recall of Alt HAN P2P Devices.
- Delivering future change – OTA firmware updates are also needed to support and deliver innovative advancements within the Alt HAN and DCC ecosystems. If OTA firmware updates are not possible, this would limit the opportunity for future innovation for Alt HAN P2P Devices as well as other Devices that would rely on them.
- Reduces Impact on Consumers – Without OTA firmware updates, any changes needed will rely on Engineer's site visits to consumer premises which is inconvenience to consumers and incur additional cost to industry Parties.

2 Document History

2.1 Revision History

Revision Date	Revision	Summary of Changes
29/09/2021	0.1	Initial version, for DCC internal review
30/09/2021	0.2	Updated following DCC internal review
30/09/2021	0.3	Updated following further DCC internal review
30/09/2021	1.0	For SECAS review

2.2 Associated Documents

This document is associated with the following documents:

Ref	Title and Originator's Reference	Source	Issue Date
1	DP170 Modification Report	SECAS	17/06/2021
2.	MP170 Business Requirements v0.3	SECAS	17/08/2021

References are shown in this format, [1].

2.3 Document Information

The Proposer for this Modification is David Jones of AltHANCo. The proposal was submitted in June 2021. Following the Working Group meeting, the business requirements were discussed at the Technical Architecture and Busines Architecture Sub-Committee (TABASC) and the Preliminary Impact Assessment (PIA) was requested of DCC on 13th August 2021. This is issued as DCC CR 4435.

3 Context and Requirements

In this section, the context of the Modification, assumptions, and the requirements are stated.

The requirements have been provided by SECAS, the Proposer and the Working Group.

3.1 Current Arrangements

The Alternative Home Area Network (Alt HAN) solution is being developed to address situations where one, or both, of the gas meter or In Home Display (IHD)/Prepayment Metering Interface Device (PPMID) are out of range of the Communications Hub (Comms Hub), using Alt HAN Point to Point (P2P) Devices.

AltHANCo. uses four different P2P Device Types (B1, B2, B3, B4) known as 'bridges' - these acts as range extender and are configured in different ways depending on the set up of the premises. There will be either two or three P2P Devices at each premise to provide a solution – this is dependent on a number of factors:

- Whether it is the IHD or GSME that is out of range of the HAN;
- Whether the IHD and GSME are close together;
- Whether the GSME has a nearby electricity source.

Each bridge joins the ZigBee network as a range extender to transfer traffic. This is achieved via whitelist functionality and performed by Service Users by sending existing DCC User Interface Specification (DUIS) Service Requests.

3.2 What is the issue?

The SEC does not currently support firmware updates to Alt HAN P2P Devices. Without the ability to perform a remote firmware upgrade new innovations and functionality to improve the service to consumers will not be cost effective. Additionally, if a security defect is identified then an OTA firmware update to fix the defect would be quicker than a site visit and thus limits the length of time that a consumer's premise is a security risk.

3.3 Impact of the issue

Risk mitigation - OTA firmware updates enable the User to remedy faults on a Device without the need for a site visit. There is a risk that an Alt HAN P2P Device may lose its ability to communicate if there is a ZigBee stack upgrade that needs to be applied to fix a security related issue. This would lead to a mass recall of Alt HAN P2P Devices if there was not a remote firmware update capability.

The costs associated with either of these events would vary depending on the stage of the rollout but highlighted as significant should there be an issue that requires either a partial or a mass recall. If the capability for an OTA firmware update is available, then it is envisaged that these issues could be addressed remotely and in a much shorter timeframe than Device replacement.

Future changes - Smart Metering requirements continue to change as the Smart Metering Implementation Programme (SMIP) evolves. OTA firmware updates are needed to support and deliver innovative advancements within the Alt HAN and DCC ecosystems. If OTA firmware updates are not

possible this would limit the opportunity for future innovation for Alt HAN P2P Devices as well as other Devices that would rely on them. Additionally, developments in security features would not be able to be rolled out without a Device being physically exchanged via site visit.

Impact on Consumers - If OTA firmware updates are not possible then any changes needed will rely on site visits to consumer premises. This is an inconvenience to consumers to accommodate an onsite visit and additional cost to Industry Parties.

3.4 Business Requirements

After the discussion of this proposal in different fora such as Working Group (WG), Technical Architecture and Business Architecture and Sub-Committee (TABASC), the following list of business requirements are identified.

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

4 Description of Solution

The following sections give an overview of the high-level outline solution created to support the PIA discussion and associated PIA responses from DCC and its Service Providers, along with considerations of design assumptions with the solution.

4.1 High Level Architecture

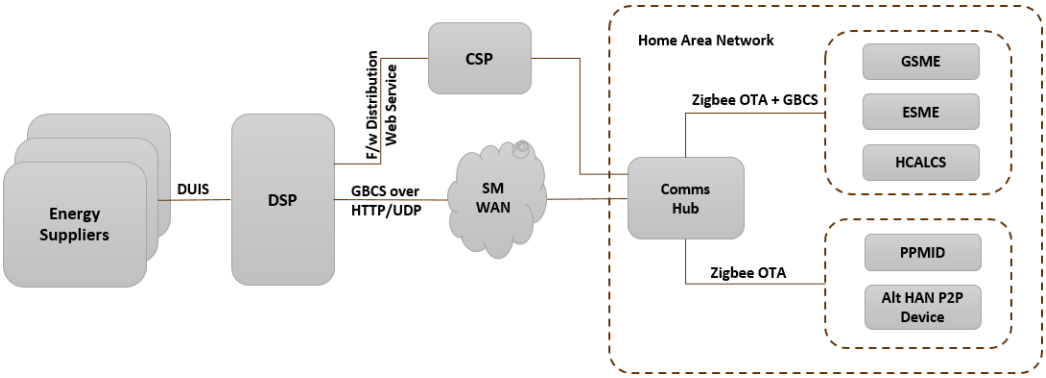
The objective of this Modification is to add support for OTA firmware updates to the Alt HAN P2P Devices for SMETS2+ Devices. Two solution options are proposed.

- **Option 1**, where the Alt HAN P2P Device is considered as a Prepayment Metering Interface Device (PPMID), and;
- **Option 2**, where the Alt HAN P2P Device acts as if it were a Consumer Access Device (CAD).

4.1.1 Option 1: Alt HAN P2P Device is considered as a Prepayment Metering Interface Device (PPMID)

In this approach, assumption is that the Alt HAN P2P Devices will be treated in the same way as PPMIDs by the Comms Hubs. Comms Hub allows up to six Type 1 Devices (PPMID or HCALCS) and this approach reuses SECMP0007 capability and avoids the need for making any changes to the Comms Hub firmware. Changes to Comms Hub firmware typically are expensive and time consuming.

The diagram below shows an end-to-end view of the OTA firmware delivery and the mechanisms used to communicate between different systems.



Identifying P2P Devices differently

DCC Total Systems will build the capability to differentiate the Alt HAN P2P Devices from the regular PPMID Devices. To support this, the existing SMETS Variant Type attribute (available to ESME Devices for recording ESME Variant) will also be made available to PPMID Devices for recording the 'Alt HAN Device Variant' information. There are four main types of Alt HAN P2P Devices (also known as bridges) namely B1, B2, B3 and B4 and for each type there will be a unique 'Alt HAN Device Variant' value.

Device Management

DCC Total Systems rely on 'Alt HAN Device Variant' information to identify an Alt HAN P2P Device and the same needs to be provided as part of device pre-notification using SRV 12.2. While it would be possible to include the Alt HAN Device Variant information in the Central

Product List (CPL) record, DSP will use only the data received via SRV 12.2 as the mechanism to identify an Alt HAN P2P Device.

After an Alt HAN P2P Device has been successfully pre-notified, the Service Users may update (SRV 8.4 Update Inventory) and read (SRV 8.2 Read Inventory) the Alt HAN P2P Device information stored in the Smart Metering Inventory (SMI). The Service Users will also be able to view the Alt HAN P2P Device information using the Self-Service Interface (SSI). No changes are required to the format of CPL to allow Alt HAN P2P Devices.

Some of the Service Requests that are applicable to PPMIDs will not be applicable to Alt HAN P2P Devices and Service Users shall not be allowed to submit those such as SRV 8.7.2 – Join Service (Non-Critical) and SRV8.8.2 – Unjoin Service (Non-Critical). New validation check will be introduced to enforce this for AltHAN P2P Devices. The existing DSP internal credentials management mechanism used for managing the certificates in PPMIDs will also be applicable to the Alt HAN P2P Devices.

Firmware Distribution Management

The OTA firmware update for Alt HAN P2P Devices will make use of the same method used for updating the firmware of PPMIDs. The Service Users will send firmware images using the existing Service Request 11.4 - Update PPMID Firmware. DCC Total Systems will determine the Device Type using the data held in SMI.

DCC Total Systems will process the received request that contains the firmware image and the list of devices, and forward that to the Communication Service Providers (CSPs) along with the corresponding Comms Hub identifiers. DSP will make use of the existing Web Service interface at CSP SMWAN Gateway to deliver the firmware image to the CSPs. DSP will mark the Device Type of the Alt HAN P2P Devices as PPMID for the subsequent processing.

The CSPs will deliver the firmware image to the corresponding Comms Hubs and the Comms Hubs will in turn deliver it to the target device within the HAN using the ZigBee OTA delivery currently used for PPMIDs. Although the Alt HAN P2P Devices are a different type of Device, they are joined to a HAN as though they are PPMIDs and therefore a Comms Hub will not be able to differentiate Alt HAN P2P Devices from a PPMID.

DCC Total Systems tracks the progress of the firmware update request at a device level. If a firmware update request is already in progress for a given Alt HAN P2P Device, any further firmware update requests will be blocked and the Service Users will be notified using the already existing functionality.

The Device Alerts received from the Alt HAN P2P Devices will be delivered to the Service Users using the DCC Alert N39, as with PPMIDs.

Service Users will be able to read the version of an Alt HAN P2P Device firmware by using the Service Request 11.2 Read Firmware Version. If the SRV 11.2 is targeted at an Alt HAN P2P Device, then DCC Total Systems will employ the URP (Unknown Remote Party) pattern to process this, as with the PPMIDs.

If the Response to SRV11.2 contains a version of firmware different to the version in SMI, the SMI will be updated with the new version subject to the rules applicable for the other Devices. Therefore, Service Users could use SRV11.2 also as a vehicle for updating the firmware version of PPMIDs in the SMI.

It is assumed that the Alt HAN P2P Device will implement the existing GBCS Use Case CS08 (*Read PPMID Firmware Version*) and the 0x8F8B Alert, which are currently implemented by the PPMID.

Summary

- Alt HAN P2P Devices will be treated like PPMIDs for processing within DCC Total Systems. The Alt HAN Device Variant information will be used to differentiate an Alt HAN P2P Device from a real PPMID.
- Service Requests 12.2, 8.4 and 8.2 will be modified to include the Alt HAN Device Variant information.
- Service Users will be able to use SRV 11.4 to send the firmware update requests for Alt HAN P2P Device. No changes are needed to this Service Request definition.
- Service Users will receive notifications at different stages of processing across DSP, CSP and the Comms Hubs.
- Service Users will be able to use SRV 11.2 to read the firmware version of Alt HAN P2P Device as well.
- The existing DCC Alert N39 will be used to notify the firmware activation of Alt HAN P2P Device.
- No changes required on Comms Hub firmware.
- Additional volume for CSPs to support firmware download and associated services to AltHAN P2P Devices.

4.1.1.1 Impact on DSP

DUIS, DUGIDS

DUIS and DUGIDS require updates to describe the changes to the behaviour of the impacted Services Requests 12.2, 8.4 and 8.2. DUIS XML Schema will need to be updated to revise the definition of SRVs 12.2, 8.4 and 8.2.

Request Management

Request Management will need changes to support the changes to the Service Request processing described above.

Data Management / Data Model

Data Model will need changes to support the additional values of the existing SMETS Variant attribute to identify an Alt HAN P2P Device.

SSI

SSI will be amended to present the real device type of an Alt HAN P2P Device when queried by a Service User.

ESI Reports

The ESI Reports ESI-034 and ESI-034i will need to be updated to be updated describe the revised usage of the field SMETS Variant Type.

CPL

No change is expected to the structure of the CPL for this Option 1.

Transform

No changes are expected to the Transform libraries for this Option 1.

Anomaly Detection

No changes are required within the Anomaly Detection component. Anomaly Detection volume thresholds for SR11.4 will need to account for the new and added volume of Alt HAN P2P Devices as well.

CSP SMWAN Gateway

No changes are required to the CSP SMWAN Gateway.

CSP Management Gateway

No changes are required to the CSP Management Gateway.

4.1.1.2 Impact on CSP Central & South

For Option 1, CSP-Central & South would be impacted in the following areas:

- Technical analysis is required to assess system requirements based on the increase in volumes of firmware downloads.
- PIT activity
  - Setup of PIT environments to support testing of increased volumes of firmware downloads.
  - PIT Performance and IT regression testing of the end-to-end use cases associated with P2P device firmware downloads.
  - Technical support for test phases up to completion of PIT, including test case reviews, problem resolution and test sign-off activities.
  - Additional support activities from the service management team for the Alt HAN devices, covering ongoing monitoring of the firmware download activities and the generation of the PM 2.2 monthly performance measures for firmware downloads.
- Design, use case and performance measure documentation updates to support these changes

4.1.1.3 Impact on CSP North

For Option 1, CSP-N would be impacted as follows:

- Technical analysis required to assess impact on message motorway (SMWAN) based on the volume increase of firmware download.

- Impact on PIT environments for performance and regression testing of the end-to-end use cases associated with P2P device firmware downloads.

4.1.1.4 Impact on Critical Software

Critical software identified Parse & Corelate software needs to be updated due to the change in DUIS schema.

4.1.1.5 Impact on DCC TOC

DCC Technical Operation Centre (TOC) will need to create new reports for stakeholders on firmware distribution to AltHAN P2P devices.

4.1.2 Option 2: Alt HAN P2P Device is considered as a Consumer Access Device (CAD)

DCC and Service Provider recognised Option 1 as the primary/preferred solution option and is believed to be better in terms of cost effectiveness. However, the Business Proposer and SECAS have also requested DCC to provide a complexity analysis (in relation to the primary solution) for an alternative solution option, where an Alt HAN P2P Device will be treated as a CAD.

This Option will require a number of changes and a very high-level view of the changes is provided below.

a. Requires all the changes described in the Option 1 section *"Identifying P2P Devices differently"* with the difference of Alt HAN P2P Device being treated as a CAD instead of a PPMID.
b. Requires changes to CPL to allow Alt HAN P2P Devices to be included as CAD Devices.
c. Requires extending the Access Control Broker (ACB) certificate management to include the Alt HAN P2P Device (CAD).
d. Requires changes to the Service Request processing of SRV12.2 and SRV8.4 in order to treat the Alt HAN P2P Devices as different types of CAD Devices.
e. Requires a separate Service Request for distribution of firmware images (equivalent of SRV11.4).
f. Requires a new DCC Alert to deliver the Device Alerts from Comm Hubs (on behalf of the Alt HAN P2P Devices) to the Service Users.
g. The existing processing and validation rules treat CAD as Type2 Devices. The Alt HAN P2P Devices will be Type1 CAD Devices and therefore the existing implementation will require updates to separate the behaviour. This may demand modelling the Alt HAN P2P Devices as a separate Device Type within DSP and present them as CAD to the external users.
h. Comms Hub firmware update is required to ensure the Comms Hub can manage firmware updates for Alt HAN devices, which will be managed differently from PPMIDs.

i. Changes in SMWAN Gateway to support firmware download to a Type 2 Device.
j. Changes in multiple internal systems of both CSPs to support firmware download to a Type 2 Device.

Please note that a detailed analysis of this Option 2 is required to be conducted as part of the FIA process, if this option is chosen over the preferred solution – Option 1.

5 Impact on DCC Systems, Processes and People

This section describes the impact of SECMP0170 solution Option 1 on DCC Services and Interfaces that impact Users and/or Parties.

5.1 System Components

Change in system components are highlighted in Section 4.1.1.

5.2 Security Impact

The implementation will be security assured during the implementation phase. This includes reviewing designs, test artefacts and providing consultancy to the implementation and test teams.

A more detailed security impact will be carried out as part of the Full Impact Assessment.

5.3 Technical Specifications

For Option 1, there will be changes in DUIS and corresponding changes in DUGIDS for the changes in DUIS. The DUIS Guidance document also needs to be updated.

For Option 2, changes are expected in DUIS, DUGIDS, GBCS and SMWAN Gateway specifications.

5.4 Integration Impact

An appropriate level of Systems Integration and User Integration Testing (SIT and UIT) will be carried out prior to progressing the release of this change to the Production environment, but this is not included in the PIA.

5.5 Infrastructure Impact

There will be no change to the infrastructure design as a result of this change using Option 1. Additional processing and storage will be required; however, they are not sufficiently large to warrant the procurement of additional compute power or storage.

The change does not impact the DSP resilience or DR implementation. It will be necessary to deploy the revised DUIS schema to Data Power devices.

This Modification does not impact DSP resilience or Disaster Recovery implementation.

CSP's PIT environment update might be required to support increased volume of firmware download. Details of any infrastructure uplift and associated impact on Application Support will be established in the FIA.

5.6 Service Impact

A detailed service impact will be completed as part of the Full Impact Assessment.

5.7 Safety Impact

No impact is expected, but a full Safety Impact Assessment will be carried out as part of the production of the FIA.

5.8 Contract Schedules

Service Providers have indicated changes may be required in number of Contract schedules based on the solution option selected and these will be detailed during the FIA.

6 Implementation Timescales and Approach

This Modification is expected to be implemented in a future SEC Release. Design, Build, and PIT for Option 1 is expected to take about three months to complete after the CAN is signed.

Details of the implementation will be finalised in the FIA.

6.1 Implementation Approach

Implementation of this change is assumed to follow a hybrid of agile and waterfall methodology. The release lifecycle duration will be confirmed as part of the FIA.

6.2 Testing and Acceptance

It is assumed that the change will be implemented and tested as part of a major release and will include release based regression testing in SIT and UIT.

7 Costs and Charges

The table below details the cost of delivering the changes and Services required to implement this Modification Proposal.

The scope of supply under this PIA includes design, development (build), system testing, and performance testing within the PIT environments.

The Rough Order of Magnitude cost (ROM) shown below describes indicative costs to implement the functional and non-functional requirements as assumed above. The price is not an offer open to acceptance. It should be noted that the change has not been subject to the same level of analysis that would be performed as part of a Full Impact Assessment and as such there may be elements missing from the solution or the solution may be subject to a material change during discussions with the DCC. As a result, the final offer price may result in a variation.

7.1 Design, Build and Testing Cost Impact

The table below details the cost of delivering the changes and Services required to implement this Modification. For a PIA, only the Design, Build and PIT indicative costs are supplied.

£	Design, Build and PIT	
	Option 1	Option 2
Firmware updates to Point to Point Alt HAN Devices	£636,500	High

Based on the existing requirements, the total fixed price cost of Option 1 for a Full Impact Assessment by all Service Providers is £86,007 and would be expected to be completed in 40 working days. The fixed price FIA cost of solution Option 2 is significantly higher than Option 1 and expected to take longer time to complete.

8 Risk, Assumptions, Issues, and Dependencies

In the following sections, Risks, Assumptions, Issues, and Dependencies have been identified. Two clarifications are also requested.

Further RAID may be established as part of the Working Group reviews and the FIA.

8.1 Risks

None at this time.

8.2 Issues

None at this time.

8.3 Dependencies

Ref.	Area	Dependency	Impact
MP170-DD01	IA	The solution Option 1 is dependent on the full delivery of SECMP007.	High
MP170-DD02	IA	SECAS and the Working Group are to advise on which option they will be progressing prior to commencement of the FIA.	High

8.1 Assumptions

Ref.	Area	Assumption	Impact
MP170-AS01	IA	It is assumed that the Alt HAN P2P Device will implement the existing GBCS Use Case CS08 (Read PPMID Firmware Version) and the 0x8F8B Alert, which are currently implemented by the PPMID.	High
MP170-AS02	IA	Managing separate ADT thresholds for Alt HAN P2P Devices is excluded from the scope of solution Option 1.	Low
MP170-AS03	IA	Systems Integrator activity is assumed to be part of release costs and as such is not included in this Impact Assessment.	Low
MP170-AS04	IA	CSPs are not required to differentiate between PPMIDs and Alt HAN devices for Option 1 in its systems and therefore for CSP, this Modification are centred around managing the volume increases of firmware downloads.	High
MP170-AS05	IA	DCC's ROM for this Modification is based on the volumetric information (in terms of number of P2P Devices and frequency of firmware download per year per device) provided along with the Business Requirement as in [1]. These will be reviewed as part of the FIA.	High

Appendix A: Glossary

The table below provides definitions of the terms used in this document.

Acronym	Definition
ADT	Anomaly Detection Threshold
AltHAN	Alternative Home Area Network
AltHANCo.	Alt HAN Company
CAD	Consumer Access Device
CAN	Contract Amendment Note
CPL	Central Product List
CR	DCC Change Request
CSC	Change Sub-Committee
CSP	Communication Service Provider
DCC	Data Communications Company
DSP	Data Service Provider
DUGIDS	DCC User Gateway Interface Design Specification
DUIS	DCC User Interface Specification
ESME	Electricity Smart Metering Equipment
FIA	Full Impact Assessment
GBCS	Great Britain Companion Specification
GSME	Gas Smart Metering Equipment
HAN	Home Area Network
IHD	In Home Display
HCALCS	HAN Connected Auxiliary Load Control Switch
OTA	Over the Air
P2P	Point to Point
PIA	Preliminary Impact Assessment
PIT	Pre-Integration Testing
PPMID	Prepayment Metering Interface Device
ROM	Rough Order of Magnitude (cost)
SEC	Smart Energy Code
SECAS	Smart Energy Code Administrator and Secretariat
SIT	Systems Integration Testing
SMETS	Smart Metering Equipment Technical Specification
SMI	Smart Metering Inventory
SMIP	Smart Metering Implementation Programme
SMWAN	Smart Metering Wider Area Network
SP	Service Provider
SR	Service Request

SRV	Service Request Variant
TABASC	Technical Architecture and Business Architecture and Sub-Committee
UIT	User Integration Testing

SEC
Smart Energy Code

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

Annex D

Refinement Consultation responses

About this document

This document contains the full collated responses received to the MP170 Refinement Consultation.

Question 1: Do you agree that the solution put forward will effectively resolve the identified issue?

Question 1				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
OVO	Large Supplier	Yes	We believe the ability to update all smart devices OTA is essential both for security of supply and security of the network.	-
Shell Energy	Large Supplier	No	The proposed solution is written with respect to whether the requirements in Annex A are DCC impacting. Where a requirement is not DCC impacting then the solution is not described that meets the requirement. Therefore, it is not possible to know if the solution meets the requirements. However, we believe that where the requirement is indicated as not impacting DCC then this would be for Suppliers and AltHANCo to clarify and resolve. We are supportive of the proposed solution but believe that the framing of the modification and supporting documentation should be more widely scoped and described as a modification to support the Alt HAN solution more generally rather than limited to firmware upgrades.	That is correct, where requirements do not impact on DCC it would be up to the relevant SEC Party to implement a solution. AltHANCo are happy to support and discuss any specific processes. This modification is specifically related to the Over-The-Air (OTA) firmware upgrades requested for Alt HAN Devices and SEC processes to support this. Separately any processes Alt HAN would undertake in advance of this with Relevant Suppliers would be captured within Alt HAN Governance (and agreed with the Alt HAN Forum). Any suggested changes to

Question 1				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
			We also take this opportunity to comment on the completeness or relevance of the requirements more generally, as part of this refinement consultation. 1. We question why Requirement Ref.3 is required if Requirement Ref.4 is met by the DCC. Ref 4. has an efficiency advantage of providing a single firmware report across the entire installed Alt HAN devices to Alt HAN Co, rather than dependent on the entirety of all suppliers providing timely reporting for a complete position to be known at any one point in time by Alt HAN Co. 2. Further to Requirement Ref.4, an additional requirement on AltHANCo would be to update its Alt HAN Inventory (AHI) on the basis of the DCC report (and allow for such updating within its OSP interfaces and processes) where its shows a discrepancy with existing firmware position held in the AHI (assuming that the firmware version is an attribute maintained in the AHI). 3. There is an implied high-level requirement that should be added to the Annex A Business requirements table (Ref 1.5 between existing Ref 1 and Ref 2.) “Alt HAN to make firmware images and release notes available and securely for both	this scope can be raised directly with AltHANCo for discussion. 1. The Proposer believes that there would be benefit in having both reports to ensure the accuracy of the data. This can be explored further if Suppliers feel strongly that one report is not necessary. 2. The reporting would allow discrepancies within the submissions to be investigated and updated accordingly. This would be done in conjunction with Suppliers. 3. AltHANCo will make release notes and firmware images available to Relevant Suppliers/SEC Parties.

Question 1				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
			test and production environments to Suppliers or their managed service providers." Impacted Party: AltHANCo/Suppliers". Again the secure distribution of firmware information could be the responsibility of the AltHANCo's OSP to meet this requirement. 4. Requirement Ref 9 is described as non-DCC impacting, but we would ask whether the Requirement 4 DCC report should be structured in such a way to aid uploading and further firmware reporting, including 'out of sync' issues, by Alt HAN Co (and its OSP). So, could impact DCC. For example, report details should include the P2P devices details such as status, device ID, manufacturer, model and current active firmware version, and the new PPMID model variant, (as held by SMI, and as retrieved via SRV8.2) associated with the Comms Hub and linked to a MPAN/MPRN pair (where gas is supplied, else MPAN only). Alt HAN Co would then be able to identify 'out of synch' instances of firmware across P2P devices at specific installations, to aid Suppliers in firmware deployment assistance, as well as for any specific triage issues, recognising that being out of synch may be due to being missed in the firmware roll out; firmware upgrade	4. Requirement 9 was aimed to ensure that the Devices themselves will operate correctly on different firmware versions.

Question 1				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
			still in progress; WAN or HAN or CH comms, device, or firmware updating issues. Further consideration, on linking various DCC reports, not just SMI, but also performance issues, to Alt HAN device and firmware issues may produce more requirements on DCC (part of this could be indicated in Annex C Section 4.1.1.5 Impact on DCC TOC, but the requirements are unclear). We are also not clear, from the Annex C DCC PIA, if the ESI reports cited (under Section 4.1.1.1) and the changes to these to incorporate the SMETS Variant Type (Alt HAN Device Variant) would be sufficient. Finally, we note that Annex A Section 3.2.2. (Acting as a PPMID) states "DCC to document any constraints such as this [loss of Alt HAN service following TCSO] as part of their assessment given the expectation that this option would minimise DCC development effort within the CSP solution." However, we see no reference to such constraints or issues, albeit at a high level at this preliminary stage, in the Annex C Preliminary Assessment by DCC. Therefore, it is not possible to be confident that the solution "will effectively resolve the identified issue ".	The specific data items within the DCC reporting requirements are not yet defined. The DCC confirmed in a subsequent Working Group that there is no solution to this issue.
AltHanCo	Other	Yes	Modifying the SEC to support remote firmware updates to Alt HAN P2P devices would allow necessary security and functional upgrades to be made and defects to be	-

Question 1				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
			remedied using over-the-air (OTA) functionality, allowing for a time sensitive solution which mitigates costs for device replacement.	
Utilita Energy Limited	Large Supplier	Yes	Whilst we agree the solution would provide the ability to update P2P Alt HAN Devices, we do have some concerns with the cost of this modification which are discussed in further detail in response to Q9.	-
British Gas	Large Supplier	Yes	This is a “must have” for the industry, and the approach seems sensible.	-
E.ON UK	Large Supplier	Yes	This route forward would accommodate OTA to the Alt-HAN devices	-

Question 2: Do you agree that the legal text will deliver MP170?

Question 2				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
OVO	Large Supplier	Yes	We believe the legal text will deliver the change but are not clear on whether this will mean the device would be required to go through CPA. Either way we support the change but if CPA is required for Alt-HAN equipment it would require a change to how Alt-HAN equipment is pre-notified to DCC which Alt-HAN Co. would need to be conscious of.	As PPMIDs do not require CPA certification it is envisaged that the Alt HAN Devices will also not need this. For the avoidance of doubt this will be clarified by the Security Sub-Committee.
Shell Energy	Large Supplier	No	We believe that Annex B sets out the required changes to Appendix AD. However, we would like to clarify if the SEC legal text outside of the Appendix AD changes allows for the delivery and operation of the requirements, particularly regarding interactions directly between DCC and Alt HAN Co, such as the provision of reports, or service support and communication of issues, outages, incidents, etc. Are these adequately described in SEC, with obligations and expectations clearly set out regarding these interactions between DCC and Alt HAN Co, even if limited to Alt HAN device firmware issues?	The DCC currently provides AltHANCo with monthly reports that are not defined within the SEC and the expectation would be that this report is added to that reporting suite without the need for legal text changes.
AltHanCo	Other	Yes	The text reflects the necessary changes that are required to ensure the Alt HAN devices are recognised as distinct devices and can be targeted for OTA upgrades using existing functionality.	-

Question 2				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
Utilita Energy Limited	Large Supplier	Yes	No comments on legal text.	-
British Gas	Large Supplier	Yes	Yes – seems appropriate, and I assume it has been prepared by the relevant specialist lawyers.	-
E.ON UK	Large Supplier	Yes	The legal text seems to cover the requirements	-

Question 3: Do you agree with the proposed implementation approach?

Question 3				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
OVO	Large Supplier	Yes	-	
Shell Energy	Large Supplier	No	The approach to implementation does not address the potential issue where the required DCC changes are implemented after some Alt HAN Devices have been installed. We have assumed that this is feasible technically, as Alt HAN Devices could be entered onto CPL, and installed and commissioned as PPMIDs to existing Communication Hubs, without the proposed changes? We are also aware that the Alt HAN programme is replanning its development and mobilisation programme, with changes to its JIP milestones to be notified early in 2022, which may mean Alt HAN installs after the later release date of November 2024. However, if the DCC changes should be delayed and Alt HAN delivers earlier, what are the consequences? For example, Alt HAN installations before the proposed DCC changes, may require amendments / updates to the SMI entries for these earlier installations with the changes, such as "PPMID variant" being added. It may prudent therefore to set out such requirements, to a sufficient level of detail,	AltHANCo has confirmed that it is intended that Devices would be developed with the OTA capability in alignment with the implementation of the DCC changes to deliver the upgrades. However, if they join the HAN as a CAD before the DCC changes are implemented, then they will not be able to receive OTA upgrades. AltHANCo will provide guidance on these situations when Devices are approaching rollout.

Question 3				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
			for such a contingency, to allow inclusion in the DCC and wider stakeholder impact assessments. We would also note that there may be a typo in the dates shown for implementation date of **07 November 2024**, where decision to approve is "received after 2 May 2022 but on or before 6 May 2023", should read "received after 2 May 2023 but on or before 6 May 2024".	Thank you for noting this. The Modification Report has been updated with this correction.
AltHanCo	Other	Yes	Having discussed with DCC, its service providers and SEC groups, we believe this is the most pragmatic and cost-effective solution available.	
Utilita Energy Limited	Large Supplier	N/A	If the cost of this modification could be fully justified then we would be in favour of this modification. The Bridge 1 Alt HAN Device is currently being re-designed. Delivery of a FW update solution could run in conjunction to this redesign activity, reducing the total costs associated with Alt HAN Device development. If ambiguity on a FW update solution to P2P Devices remains whilst Bridge 1 undergoes redesign, the device could be subject to requiring further development later to facilitate FW updates, which would cost industry more money.	The Bridge 1 Device is being redesigned to allow it to be connected to the Distribution Network, as opposed to after the meter. They are currently being designed to receive OTA firmware upgrades and join the HAN as a PPMID.
British Gas	Large Supplier	Yes	Seems appropriate.	-
E.ON UK	Large Supplier	Yes	Option 1 is the preferred approach.	-

Question 3				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
			Option 2 requires much greater change to a variety of systems leading to increased cost and potential delay to implementation.	

Question 4: Will there be any impact on your organisation to implement MP170?

Question 4				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
OVO	Large Supplier	Yes	MP170 will have a beneficial impact on our organisation. Should any high severity defects be found in the Alt HAN devices, an OTA firmware fix will remove the need for a costly and intrusive site visit to our consumers' premises to replace the current device with a new version. This mod will also protect the reputation of SMIP as a whole: having to replace devices would only damage the programme's reputation in the eyes of consumers and indeed the media. In addition, the ability to continue to develop new functionality and distribute it without costly site visits may prove to be most beneficial over the lifetime of the devices.	-
Shell Energy	Large Supplier	Yes	Changes include: DCC Adaptor and UI changes to manage and display PPMID Variants attribute; Firmware management and report changes to include Alt HAN Devices; Triage and back-office process and report changes to reference Alt HAN device status. Changes to third party systems, reports and processes are subject to change requests which would need to be raised. The 6 months' notice of change provided by the Mod Report Appendix 1: Progression Timetable, could be	-

Question 4				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
			sufficient, though this would be subject to other activities being planned for the same release period.	
AltHanCo	Other	Yes	Energy Suppliers (on behalf of whom Alt HAN operates) will be directly impacted since MP170 is designed to upgrade Alt HAN devices. Alt HAN will plan its implementation activities in accordance with MP170 implementation timescales. We will develop processes that will ensure the OTA upgrade is planned with Energy Suppliers. We will develop processes that will ensure the OTA upgrade is planned with Energy Suppliers.	-
Utilita Energy Limited	Large Supplier	Yes	This modification will require an update to systems and processes for us to notify, identify and differentiate between genuine PPMIDs and Alt HAN Devices which appear as PPMIDs.	-
British Gas	Large Supplier	Yes	At present our processes only work for updating meters remotely, and we will need to extend this to cover these pieces of equipment too. The effort would be subject to a broader internal impact assessment – low/medium effort expected.	-
E.ON UK	Large Supplier	Yes	Details are not known at this time.	-

Question 5: Will your organisation incur any costs in implementing MP170?

Question 5				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
OVO	Large Supplier	No costs	-	-
Shell Energy	Large Supplier	Less than £100k	Assumption is that third party adaptor changes would, as a minimum, be incorporated as part of their normal budgeted product changes, already recovered via their fees.	-
AltHanCo	Other	Yes	There are costs associated with adapting the Alt HAN devices to receive OTA via DCC utilising DCC's solution requirements which will need to be approved by the Forum. By implementing MP170, Energy Suppliers will realise cost savings compared to the alternative of replacing devices or requiring site visits to deploy firmware upgrades.	-
Utilita Energy Limited	Large Supplier	Less than £100k	Costs will arise from development and testing of the solution.	-
British Gas	Large Supplier	Yes	Cost would be confirmed by an internal impact assessment.	-
E.ON UK	Large Supplier	Less than £100k	Details are not known at this time.	-

Question 6: How long from the point of approval would your organisation need to implement MP170?

Question 6				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
OVO	Large Supplier	0	-	-
Shell Energy	Large Supplier	6 months minimum; 9 months preferred	Typical Product roadmap planning cycle timescales and prioritisation lead-in times for the estimated medium level change across internal and external systems.	-
AltHanCo	Other	Alt HAN would apply the functionality to devices in time for the Full rollout of the Alt HAN solution.	The Alt HAN devices will be upgradeable when the DCC systems take effect.	-
Utilita Energy Limited	Large Supplier	~6 months.	We would need this amount of time to develop the solution, make changes, mainly with pre-notification of Devices, then to test the solution works. We expect this to take around 6 months.	-

Question 6				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
British Gas	Large Supplier	Up to 3 months TBC (depending on active backlog at the time)	Educated estimate – would need confirming by internal impact assessment.	-
E.ON UK	Large Supplier	6 months	System changes to exploit the new functionality would take approximately 6 months to fulfil and test.	-

Question 7: Do you believe that MP170 would better facilitate the General SEC Objectives?

Question 7				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
OVO	Large Supplier	Yes	-	-
Shell Energy	Large Supplier	Yes	Though with further refinement of MP170 as our earlier comments this can be improved upon.	-
AltHanCo	Other	Yes	MP170 will facilitate several of the General SEC Objectives, namely: h) facilitate the establishment and operation of the Alternative Home Area Network (Alt HAN) arrangements; The ability to upgrade Alt HAN devices OTA ensures the maximum life of devices and avoids replacement should upgrades be required. a) Facilitate the efficient provision, installation, operation and interoperability of smart metering systems at energy consumers' premises within Great Britain; and The ability to upgrade Alt HAN devices OTA ensures the maximum life of devices and avoids replacement should upgrades be required. c) Facilitate energy consumers' management of their use of electricity and gas through the	-

Question 7				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
			provision of appropriate information via smart metering systems. The ability to upgrade Alt HAN devices OTA ensures the maximum life of devices and avoids replacement allowing continued access to smart benefits for energy consumers.	
Utilita Energy Limited	Large Supplier	Yes	SEC objective A – the modification allows updating of Alt HAN P2P Device firmware remotely to address any potential issues, which would otherwise require site visit for replacement. This equates to cost, time and operational efficiencies in the management of Smart Metering Systems	-
British Gas	Large Supplier	Yes	We agree that this modification will better facilitate SEC Objective “a”.	-
E.ON UK	Large Supplier	Yes	Facilitates SEC Objective (a) in line with the proposer’s comments	-

Question 8: Do you believe there will be any impacts on or benefits to consumers if MP170 is implemented?

Question 8				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
OVO	Large Supplier	Yes	The consumer will be better protected should any firmware defects be discovered post-installation in the Alt HAN devices. The ability to supply functional and security fixes OTA will benefit the consumer. In addition, the ability to remotely fix defects in the Alt HAN devices will remove the inconvenience of a visit to replace existing installed kit. Finally, consumers could also benefit from continued firmware development and improvement, without the need for site visits.	-
Shell Energy	Large Supplier	Yes	We agree with the comments regarding this area noted in the mod report.	-
AltHanCo	Other	Yes	Consumers will be positively impacted since MP170 would limit the need for site visits for the deployment of firmware upgrades which often cause disruption, while allowing consumers to benefit from security fixes and new innovative upgrades in more a timely manner. In addition, consumers would indirectly benefit from MP170 because without this modification, higher cost of deploying firmware upgrades may ultimately be passed on to the consumer.	-

Question 8				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
Utilita Energy Limited	Large Supplier	Yes	Reduces the need for site visits to address issues which could be resolved OTA	-
British Gas	Large Supplier	Yes	It will remove the requirement for customer home visits when an update is required.	-
E.ON UK	Large Supplier	Yes	Providing this OTA update capability would benefit customers with increased functionality/security without a physical visit, and provide longevity of the customer solution.	-

Question 9: Noting the costs and benefits of this modification, do you believe MP170 should be approved?

Question 9				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
OVO	Large Supplier	Yes	-	-
Shell Energy	Large Supplier	No	We believe that further refinement, clarifications, and improvements addressing the comments raised are required.	The Proposer has noted your comments and will provide further clarification in addition to the above responses as required.
AltHanCo	Other	Yes	The benefits of this modification to Energy Suppliers from a cost savings, time efficiency and risk mitigation perspective coupled with the benefits to consumers from reduced inconvenience outweigh the minimal costs associated with making this modification.	-
Utilita Energy Limited	Large Supplier	-	We note the benefits that would arise from having an OTA solution in place. However, the DCC costs for implementing this modification appear excessive. Much of the functionality required for this solution already exists, and cost of change appears to be largely related to an ability to differentiate between genuine PPMIDs and Alt HAN Devices appearing as PPMIDs. It is difficult to justify a spend of £636,000 up to PIT for what appears to be a relatively minimal change. We would welcome more clarity on these costs and the DCC	The DCC Impact Assessment will give a clearer indication of cost and these will be robustly challenged as part of the process.

Question 9				
Respondent	**Category**	**Response**	**Rationale**	**SECAS Response**
			challenging its Service Providers costs to ensure industry is receiving value for money.	
British Gas	Large Supplier	Yes	"Must Have" for industry	-
E.ON UK	Large Supplier	Yes	In line with responses above. However, it was not clear what the additional CSP costs would be (if any).	CSP costs will be clearly defined in the DCC Impact Assessment.

Question 10: Please provide any further comments you may have

Question 10			
Respondent	**Category**	**Comments**	**SECAS Response**
OVO	Large Supplier	No further comments	-
Shell Energy	Large Supplier	None.	-
AltHanCo	Other	-	-
Utilita Energy Limited	Large Supplier	No further comments	-
British Gas	Large Supplier	-	-
E.ON UK	Large Supplier	N/A	-