

MP082 '2.4GHz Channel Management'

Business requirements – version 0.4

About this document

This document contains the business requirements that support the solutions for this Modification Proposal. It sets out the requirements along with any assumptions and considerations. The 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
1	Where interference is deemed to be a cause for Home Area Network (HAN) Devices to go “dark”, a channel frequency change shall be enabled and allow the ability to trigger channel change remotely, or to allow automatic recovery (avoid site visit).
2	To preserve the battery life of battery powered HAN Devices, the absolute number of channel changes shall be limited.
3	Any changes would need to consider pre-existing HAN Devices to limit Devices from being stranded and inoperable.
4	To detect if nodes on the edge of the mesh network are having poor HAN connectivity and trigger a channel change accordingly.

2. Considerations and assumptions

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

2.1 General

This solution will be applied to Smart Metering Equipment Technical Specification (SMETS2) Devices.

2.2 Requirement 1: Where interference is deemed to be a cause for HAN Devices to go “dark”, a channel frequency change shall be enabled and allow the ability to trigger Channel change remotely, or to allow automatic recovery (avoid site visit).

It is assumed that an [automated / Service Request (SR)] delivery mechanism will be used to [instruct / enable] the Communication Hub to affect a channel frequency change.

If an SR is used this shall be a new critical or non-critical command created specifically for affecting a Channel Change.

If an automated mechanism is used, the Communications Hub shall make the channel frequency change based on an agreed set of parameters.

It is assumed in all circumstances, irrespective of delivery, that the Communication Hub will manage the activation of the channel change.

To reduce impacts to Energy Supplier Customers and reduce costs for Energy Supplier Parties, all channel changes will be actioned automatically, either locally by the Communications Hub or by the DSP, without Supplier intervention.

Site visits to effect a channel change are not considered viable.

2.3 Requirement 2: To preserve the battery life of battery powered HAN Devices, the absolute number of channel changes shall be limited

Battery operated Devices on the HAN, e.g., Gas Smart Metering Equipment (GSME) have a finite amount of power. To reduce the frequency of “waking” and processing instructions related to channel frequency changes, the number of times the Communications Hub will effect a channel change will be limited to once per 24-hour period.

2.4 Requirement 3: Any changes would need to consider pre-existing HAN Devices to limit Devices from being stranded and inoperable.

Thorough testing of the solution prior to implementation will need to include testing on Device types already installed on the HAN. Any solution that is implemented must ensure that Devices do not become stranded, keeping site visit costs to replace any such Devices to an absolute minimum.

2.5 Requirement 4: To detect any nodes on the edge of a mesh network are having poor HAN connectivity

The solution shall also be required to detect if Devices that are on the edge of the network, i.e., those that route messages through other nodes when communicating with the Communications Hub, are struggling to maintain connectivity with the HAN. When detecting such an event the Communications Hub shall trigger a channel change in a best effort attempt to restore connectivity across the entire HAN. The scenarios where this is most likely to happen is when a PPMID is talking directly to an ESME, or when using Alt-HAN devices.

3. Solution options

This section outlines the solution options for this Modification Proposal. It provides detailed information on the proposed solution for the business requirements contained in Section 1 of this document.

Solution Option 1 - Communication Hub selects channel by continuously monitoring

The Communications Hub performs internal assessment to select the best channel by continuously monitoring the HAN channel. No external triggers from Devices / Data Communications Company (DCC) users / Communications Service Provider (CSP) is supported.

The Communications Hub would only initiate changes based on Radio Frequency (RF) environment seen by the CH and HAN devices.

The number of channels changes would be restricted to once per 24-hour period to mitigate risks of draining battery powered HAN devices.

Changes to Great Britain Companion Specification (GBCS), Communications Hub Technical Specifications (CHTS) and Smart Metering Equipment Technical Specifications (SMETS) would be required.

The solution would require extensive testing to ensure that already installed HAN Devices are able to react to a change channel from the Communications Hub.

Solution Option 2 - Implement 2.4GHz Frequency Agility aligned to Sub-GHz Frequency Agility Solution

This solution requires changes to GBCS, CHTS, DCC User Interface Specification (DUIS) and SMETS but is the most complete solution from a functional perspective.

Although unlikely, there is a potential that the features needed to enable this functionality on the Communications Hub may also require Zigbee Alliance specification changes. This could take a considerable amount of time with no guarantee that the Zigbee Alliance would agree to such changes.

The number of channel changes would be restricted to once per 24-hour period to mitigate risks of draining batter powered HAN Devices.

The solution would require extensive testing to ensure that already installed HAN devices are able to react to a change channel from the Communications Hub.

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
CH	Communications Hub
CSP	Communications Service Provider
DCC	Data Communications Company
DUIS	DCC User Interface Specification
HAN	Home Area Network
GBCS	Great Britain Companion Specification
GSME	Gas Smart Metering Equipment
CHTS	Communication Hub Technical Specification
SMETS	Smart Metering Equipment Technical Specification