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ULE Alliance Standard

Digital Enhanced Cordless Telecommunications (DECT); Ultra Low Energy (ULE);

Home Area Network-Functionality (HAN-FUN) Overview

Keywords

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Foreword

This document has been produced by the ULE Alliance TWG.

The information in the present document is believed to be correct at the time of publication. However, Home Area Network Functional (HAN-FUN, or HF) may rapidly evolve, and consequently, it is possible that some of the information contained in the present document may become incomplete.

The present document is part of a multi-part deliverable covering the HF protocol as identified below:

HF-Overview [REF 1]: Overview

HF-Protocol [REF 2]: Protocol Specification

HF-Service [REF 3]: Core Services & Interfaces

HF-Interface [REF 4]: Interface Library

HF-Profile [REF 5]: Profiles

HF-ULE-Interworking [REF 6]: HF &ULE Interworking

1 Scope

The present document gives an introduction and overview of the complete Digital Enhanced Cordless Telecommunications (DECT) Ultra Low Energy (ULE) Home Area Network Functional (HAN-FUN, or HF) standard.

The present document contains an abstract of the other documents that define parts of the HF standard, including a general description and its objectives.

The present document also provides a definition of all technical terms included on all HF related documents.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

Referenced documents:

[1] ETSI EN 300 175-1: "Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview".

http://www.etsi.org/deliver/etsi_en/300100_300199/30017501/02.02.01_60/en_30017501v020201p.pdf

3 Definitions and Abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

- *Italic* is used to indicate the name designation of attributes and commands.
- Device addresses are indicated as **D'xxxx**, where xxxx is a hexadecimal number up to four digits. This provides a compact notation for a HF device address.
- Group addresses are indicated as **G'xxxx** and have the same notation definitions as a device address.
- Unit IDs are indicated as **U'xx**, where xx is a hexadecimal number up to two digits. This provides a compact notation for a unit's ID.
- Fully qualified HF network addresses are indicated as **D'xxxx:U'xx**. This compact notation is a combination of the previous two definitions.
- **SRC**, compact form to denote Source. Usually precedes a field name, indicating that field belongs to the sender of some information.
- **DST**, compact form to denote Destination. Usually precedes a field name, indicating that field belongs to the receiver of some information.
- **D'0** or **HF Concentrator**: main network device, responsible for network creation, ensuring message delivery and ensuring correct operation of network fundamental services.
- **HF Device**: any member of an HF network other than D'0. It can implement up to 255 functionalities.

- **Units**: conceptual entity inside a HF device that instantiates the functionality of a specific application.
- **U'0:** mandatory management unit, present in all HF devices, ensures correct operation of network's fundamental services.
- **Interface**: conceptual entity inside a unit that defines a collection of commands and attributes, allowing for units to understand one another and thus achieving interoperability.
- **Profile**: describes the behaviour of a specific application.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

CAT-iq	Cordless Advanced Technology - Internet and Quality
CMD	Command
COV	Change of Value
DECT	Digital Enhanced Cordless Telecommunications
DFS	DECT Forum Standard
EMC	Equipment Manufacturer Code
GUI	Graphical User Interface
GAP	Generic Access Profile
HAN	Home Area Network
HAN-FUN (HF)	Home Area Network Functional
HF-IFL	HAN-FUN Interface Library
HF-PRF	HAN-FUN Profiles
HT	High Threshold
ID	Identifier
IPUI	International Portable User Identifier
LED	Light Emitting Diode
LT	Low Threshold
LSB	Least Significant Byte
MSB	Most Significant Byte
OTA	Over-the-Air
PDU	Protocol Data Unit
PP	Portable Part
RFPI	Radio Fixed Part Identity
SDU	Service Data Unit
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier
ULE	Ultra-Low Energy
WG	Working Group
XML	Extensible Mark-up Language

4 HF Structure

The present multi-document deliverable consists of five documents briefly described in sections 4.1 to 4.5.

4.1 HF-Overview

This document [REF 1] contains an introduction of the complete HF standard. It includes an abstract of each of the other documents and a vocabulary of terms.

4.2 HF-Protocol

The HF-Protocol document [REF 2] specifies the HF network's topology and the entities that may be present on it. It also specifies DECT ULE specificities for when used has a transport layer for the HF standard. In addition, the HF message format and available message types and their responses are specified.

4.3 HF-Service

The HF-Service document [REF 3] specifies a set of services (and corresponding interfaces) that are either fundamental for the correct operation of a HF network or provide advanced network features that may be useful on certain applications. In addition it defines the behaviour that the mandatory management unit (U'0) must have in the case of a HF Concentrator and the case of any other HF device.

4.4 HF-Interface

The HF-Interface document [REF 4] specifies a set of functional interfaces that serve as building blocks for the application profiles, allowing for interoperability between a wide range of devices.

4.5 HF-Profile

The HF-Profile document [REF 5] specifies the functionality of several applications, while defining which interfaces each application should implement to achieve that functionality and maintain interoperability with other applications.

4.6 HF-ULE-Interworking

The HF-ULE-Interworking document [REF 6] specifies how the HF application layer should interoperate with the DECT ULE transport layer.

5 HF Objectives

The HF standard has grown out of the need to provide interoperable control over ubiquitous applications within HANs.

The HF standard is designed to support applications from areas like home automation, security, smart energy and health. An application layer standard, it can be used with several different transport layers, but assumes certain network topologies. It is optimized for operating over a DECT ULE Transport layer without hampering other transport layers such as TCP/IP.

Although one of HF's major objectives is to achieve interoperability between several different vendors, it incorporates options for manufacturers to achieve innovation and product differentiation.

6 HF Release

A HF release is a multi-document deliverable identified by a single *Release Version* number. In each release individual documents may or may not contain changes. A change in an individual document will increase its version number accordingly. Consult Table 1 for a correspondence between a *Release Version* number and the version of each individual document.

Table 1 – Individual document versions for HF release v1.4.0.

Release Version v1.4.0	
Overview[1] **Document Version**	v1.4.0
Protocol Document Version	v1.2.1
Service Document Version	v2.0.0
Interface Document Version	v1.4.0
Profile Document Version	v1.4.0
HF-ULE-Interworking Document Version	v2.0.0

[1] By definition the version of the Overview document will always match that of the Release.

Annex:

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Version: 23 January 2014

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