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ULE Alliance Standard

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

Home Area Network-Functionality (HAN-FUN) Profiles



Keywords

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Contents

Intellectual Property Rights	5
Foreword.....	5
1 Scope	6
2 References	6
3 Abbreviations	6
4 Introduction	7
4.1 HF-PRL Versioning	9
4.2 Recommendations	9
5 HF Profiles	10
5.1 Home Control Profiles	13
5.1.1 Simple On-Off Switchable	13
5.1.1.1 Functional Interfaces	13
5.1.2 Simple On-Off Switch	13
5.1.2.1 Functional Interfaces	13
5.1.3 Simple Level Controllable	13
5.1.3.1 Functional Interfaces	13
5.1.4 Simple Level Control	14
5.1.4.1 Functional Interfaces	14
5.1.5 Simple Level Controllable Switchable	14
5.1.5.1 Functional Interfaces	14
5.1.6 Simple Level Control Switch	14
5.1.6.1 Functional Interfaces	14
5.1.7 AC Outlet	15
5.1.7.1 Functional Interfaces	15
5.1.8 AC Outlet with Simple Power Metering	15
5.1.8.1 Functional Interfaces	15
5.1.9 Simple Light	15
5.1.9.1 Functional Interfaces	15
5.1.10 Dimmable Light	16
5.1.10.1 Functional Interfaces	16
5.1.11 Dimmer Switch	16
5.1.11.1 Functional Interfaces	16
5.1.12 Simple Door Lock	16
5.1.12.1 Functional Interfaces	16
5.1.13 Simple Door Bell	17
5.1.13.1 Functional Interfaces	17
5.1.13.2 Alert Information	17
5.1.14 Simple Power Meter	17
5.1.14.1 Functional Interfaces	17
5.1.15 Simple Temperature Sensor	18
5.1.15.1 Functional Interfaces	18
5.1.16 Simple Humidity Sensor	18
5.1.16.1 Functional Interfaces	18
5.1.17 Simple Air Pressure Sensor	18
5.1.17.1 Functional Interfaces	18
5.1.18 Simple Button	19
5.1.18.1 Functional Interfaces	19
5.1.19 Controllable Thermostat	19
5.1.19.1 Functional Interfaces	19
5.1.20 Simple Led	19
5.1.20.1 Functional Interfaces	19
5.1.21 Environment Monitor	20
5.1.21.1 Functional Interfaces	20
5.1.22 Colour Bulb	20
5.1.22.1 Functional Interfaces	20

5.1.23	Dimmable Colour Bulb	20
5.1.23.1	Functional Interfaces	20
5.1.24	Tracker	21
5.1.24.1	Functional Interfaces	21
5.1.25	Simple Keypad	21
5.1.25.1	Functional Interfaces	21
5.2	Security Profiles	21
5.2.1	Simple Detector	21
5.2.1.1	Functional Interfaces	21
5.2.1.2	Alert Information	21
5.2.2	Door Open/Close Detector	22
5.2.2.1	Functional Interfaces	22
5.2.2.2	Alert Information	22
5.2.3	Window Open/Close Detector	23
5.2.3.1	Functional Interfaces	23
5.2.3.2	Alert Information	23
5.2.4	Motion Detector	23
5.2.4.1	Functional Interfaces	23
5.2.4.2	Alert Information	24
5.2.5	Smoke Detector	24
5.2.5.1	Functional Interfaces	24
5.2.5.2	Alert Information	24
5.2.6	Gas Detector	25
5.2.6.1	Functional Interfaces	25
5.2.6.2	Alert Information	25
5.2.7	Flood Detector	26
5.2.7.1	Functional Interfaces	26
5.2.7.2	Alert Information	26
5.2.8	Glass Break Detector	26
5.2.8.1	Functional Interfaces	26
5.2.8.2	Alert Information	27
5.2.9	Vibration Detector	27
5.2.9.1	Functional Interfaces	27
5.2.9.2	Alert Information	27
5.2.10	Simple Light Sensor	28
5.2.10.1	Functional Interfaces	28
5.2.11	Siren	28
5.2.11.1	Functional Interfaces	28
5.2.12	Alertable	28
5.2.12.1	Functional Interfaces	28
5.3	Homecare Profiles	29
5.3.1	Simple Pendant	29
5.3.1.1	Functional Interfaces	29
5.3.1.2	Alert Information	29
5.4	Application Profiles	30
5.4.1	UI Lock	30
5.4.1.1	Functional Interfaces	30
5.4.2	User Interface	30
5.4.2.1	Functional Interfaces	30
5.4.3	Generic Application Logic	30
5.4.3.1	Functional Interfaces	30

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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) 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 specifies HAN-FUN Profiles, for the various applications supported by HAN-FUN. Profiles are built on top of interfaces (see HF-Interface document, [REF 4]).

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 Abbreviations

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

AC	Alternate Current
CO	Carbon Monoxide
DECT	Digital Enhanced Cordless Telecommunications
DFS	DECT Forum Standard
HAN	Home Area Network
HAN-FUN (HF)	Home Area Network Functional
HF-IFL	HAN-FUN-Interface Library
HF-PRF	HAN-FUN-Profile
ID	Identifier
LED	Light Emitting Diode
LSB	Least Significant Byte
MSB	Most Significant Byte
UID	Unique Identifier
WG	Working Group
XML	Extensible Mark-up Language

4 Introduction

A profile is a collection of interfaces which define a specific functionality for an application. Profiles achieve this by describing the behaviour and which mandatory HF interfaces and services an application has to implement. In addition, when applicable, a profile defines how information must be stored and interpreted on the relevant interfaces.

A profile is instantiated by a conceptual entity that resides inside a HF device, the unit. A unit, in addition to the mandatory interfaces defined by the instantiated profile can implement up to 126 optional interfaces. In turn, up to 254 (0xFE) units, either implementing the same type or not, can reside in a single HF device.

Profiles have sixteen bit unique identifiers (UIDs), which can be used to know the minimum provided functionality by any given unit.

Registration of a unit and its interfaces is done when the device registers itself (see Device Management service in HF-Protocol document [REF 2]) with the network's concentrator. A device should declare all implemented units and all optional interfaces in each unit; all undeclared units/interfaces will not be discoverable from the HF Concentrator, nor would they be able to benefit from some HF core services.

Units have a fixed pre-defined identifier (ID) that allows addressing messages to it. This unit ID combined with the unique HF device address produce an unique unit address, allowing units to communicate with each other independently of being in the same device or not. The Unit ID 0xFF is a special reserved ID.

Any HF device has Unit with ID 0x00 (U'0) reserved for HF core interfaces (see HF-Service document [REF 3]). In addition to any other units the device may implement, it is always required to have U'0 which must implement the interfaces summarized in Table 1 and may implement the ones summarized in Table 2. These tables apply to all HF devices except the network's concentrator (D'0:U'0) which is detailed in the HF-Service document [REF 3].

Table 1 - List of Mandatory Interfaces for a Device's Unit 0

Service Interfaces		
UID	Name	Description
0x0001	Device Management	Fundamental service responsible for device registration and discovery.
0x0005	Device Information	Fundamental service that defines information that any HF device can/must provide.
0x0006	Attribute Reporting	Service that allows a unit to receive automatic notifications about other units or device's attributes whenever an event triggers. This is the preferred method for any device to report information.

Table 2 - List of Optional Interfaces for a Device's Unit 0

Service Interfaces		
UID	Name	Description
0x0002	Bind Management	Service that allows for the creation of logical communication links between devices.
0x0003	Group Management	Service that allows for the creation of logical groups for message broadcasts.
0x0004	Identify	Service that provides a simple method of identifying devices without the hassle of looking and matching serial numbers.

Service Interfaces		
UID	Name	Description
0x0007	Batch Program Management	Service that allows the creation of batch programs. Batch programs are an aggregation of several actions that can be triggered into execution at any time and in a repeatable manner.
0x0008	Event Scheduling	Service that allows the creation of time based triggers that will invoke batch programs.
0x0009	Weekly Scheduling	Service that allows for the creation of weekly based triggers that will invoke batch programs.
0x000A	Group Table	Service that allows for a device to route group messages to the correct unit.
0x0101	Tamper Alert	Use when device wants to indicate it is being tampered with.
0x0102	Time	Use when device is required to maintain time referenced to UTC.
0x0110	Power	Use when device wants to inform upon the power supplies it has and their characteristics.
0x0111	RSSI	Use when device wants to indicate the RSSI
0x0115	Keep Alive	Use when device wants to indicate it is alive.
0x0400	SUOTA	Interface for SW upgrade over the air

As an example, consider Figure 1 that shows two HF devices, each implementing two units besides U'0 (not shown). Device A allows a user to turn on or off an AC outlet and to control the light intensity of a lamp or LED. To achieve this, it instantiates the *AC Outlet* and the *Dimmable Light* profiles. Device B instantiates only the *AC Outlet* profile on both its units, allowing a user to turn on or off two AC outlets either independently or together.

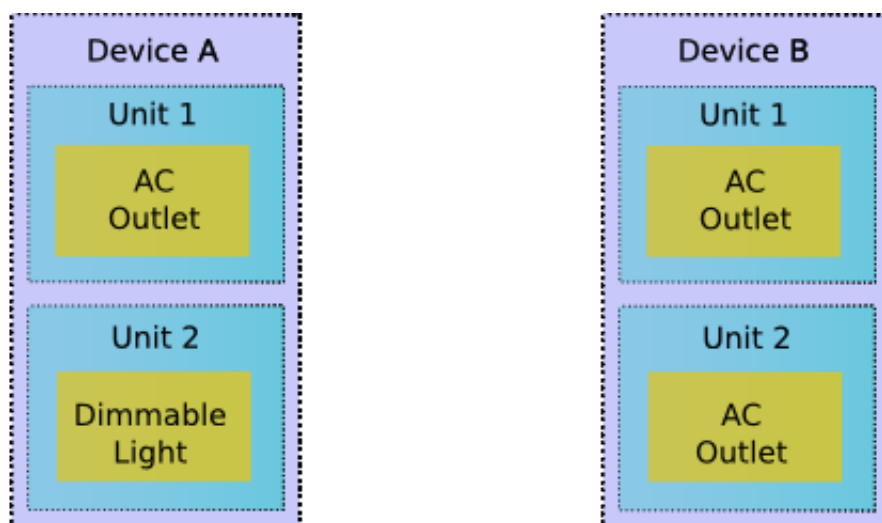


Figure 1 – Simplified Example of Two HF Devices

4.1 HF-PRL Versioning

The HF-PRL will be continuously extended to support more profiles, but once a HF-PRL document is released the profiles it contains will not be changed in a later revision. If an existing profile needs to be extended in functionality, a new profile needs to be created. This ensures on-going support for a profile and the continued operation, without requiring any update, of any system implementing a specific profile. Furthermore, a profile document release will always refer to the same collection of profiles.

4.2 Recommendations

If an optional feature is implemented it must be implemented according the standard and not in a proprietary way.

5 HF Profiles

This chapter describes all profiles defined in HF.

Each profile has text explaining its behaviour, assumptions and consequences, as well as tables that summarize which interfaces and/or services must/should be implemented. Furthermore, whenever there may be ambiguity regarding data storage and/or interpretation, there is a detailed description to resolve any misunderstanding.

Some profiles may be denoted as “simple” and other may not, there can even be two profiles whose name only distinction is the “simple” keyword (however, they UID will always be unique). The “simple” keyword is used to denote profiles that provide the most basic functionalities required to comply with the task they propose to achieve, making them most suitable for highly resource constrained devices. Profiles without the “simple” keyword may be more suitable to accommodate complex behaviours.

For a complete listing of the available HF profiles with their unique identifiers (UIDs), see Table 3.

Table 3 - Listing of All Profiles Defined in HF

Profiles		
UID	Name	Description
Home Control Profiles		
0x0100	Simple OnOff Switchable	Allows a unit to receive and interpret on/off requests. This unit will be acting upon some physical “switch”.
0x0101	Simple On-Off Switch	Allows a unit to send on/off requests.
0x0102	Simple Level Controllable	Allows a unit to receive and interpret requests for adjustment of some quantity.
0x0103	Simple Level Control	Allows a unit to send level adjustment requests.
0x0104	Simple Level Controllable Switchable	Allows a unit to receive and interpret both on/off and level control requests.
0x0105	Simple Level Control switch	Allows a unit to send both on/off and level control requests.
0x0106	AC Outlet	Allows a unit to receive and interpret on/off requests. This unit will be acting upon some physical AC switch.
0x0107	AC Outlet with Simple Power Metering	Allows a unit to receive and interpret on/off requests. This unit will be acting upon some physical AC switch. This unit is also able to do and provide simple measurements over electric quantities.
0x0108	Simple Light	Allows a unit to receive and interpret on/off requests. This unit will be acting upon some physical Light switch.
0x0109	Dimmable Light	Allows a unit to receive and interpret both on/off and level control requests. This unit will be acting upon some dimmable light switch.
0x010A	Dimmer Switch	Allows a unit to send both on/off and level control requests. This unit will be acting upon some dimmable light switch.
0x010B	Simple Door Lock	Allows a unit to receive and interpret on (lock)/off (unlock) requests. This unit will be acting upon some physical Door Lock switch.

Profiles		
UID	Name	Description
0x010C	Simple Door Bell	Allows a unit to send an alert whenever a door bell button is pushed.
0x010D	Simple Power Meter	Allows a unit to do and provide measurements over electric quantities.
0x010E	Simple Temperature Sensor	Allows a unit to provide temperature readings.
0x010F	Simple Humidity Sensor	Allows a unit to provide humidity readings.
0x0110	Simple Air Pressure Sensor	Allows a unit to provide air pressure readings.
0x0111	Simple Button	Allows a unit to identify several types of button presses and send notifications when they occur.
0x0112	Controllable Thermostat	Allows a unit to control the temperature of an indoor area, either by cooling or heating it.
0x0113	Simple Led	Allows a unit to be able to make some visual effects with a led.
0x0114	Environment Monitor	Allows a unit to provide environment measurements, namely temperature, humidity and air pressure.
0x0115	Colour Bulb	Unit Type for Colour Bulb
0x0116	Dimmable Colour Bulb	Unit Type for Dimmable Colour Bulb
0x0117	Tracker	Unit Type for Tracker
0x0118	Simple Keypad	Unit Type for Simple Keypad
Security Profiles		
0x0200	Simple Detector	Use for a generic detector that senses and sends an alert.
0x0201	Door Open Close Detector	Use for an open/close door detector that senses and sends an alert.
0x0202	Window Open Close Detector	Use for an open/close window detector that senses and sends an alert.
0x0203	Motion Detector	Use for a motion detector that senses and sends an alert.
0x0204	Smoke Detector	Use for a smoke detector that senses and sends an alert.
0x0205	Gas Detector	Use for a carbon monoxide detector that senses and sends an alert.
0x0206	Flood Detector	Use for a flood detector that senses and sends an alert.
0x0207	Glass Break Detector	Use for a glass break detector that senses and sends an alert.
0x0208	Vibration Detector	Use for a vibration detector that senses and sends an alert.
0x0209	Simple Light Sensor	Allows a unit to provide light readings

Profiles		
UID	Name	Description
0x0280	Siren	Allows a unit to receive and interpret on/off requests. This unit will be acting upon some physical siren that will sound an alert.
0x0281	Alertable	Allows a unit to receive alerts.
Homecare Profiles		
0x0300	Simple Pendant	Allows a unit to send on/off requests. This unit will trigger an alert, much like a panic button.
Application Profiles		
0x0401	UI Lock	Allows a unit to lock/unlock a user interface.
0x0410	User Interface	User Interface unit (e.g. keypad, remote control)
0x0411	Generic Application Logic	Application logic unit, (e.g. can be at the concentrator, Portal, user controller)
Proprietary Profiles		
0xFF00 – 0xFFFF	Proprietary	Use an ID from within the specified range to identify a proprietary profile.

5.1 Home Control Profiles

5.1.1 Simple On-Off Switchable

The Simple On-Off Switchable specifies a profile that receives a command to turn on/off some physical bi-stable actuator attached to the device.

A device implementing Simple On-Off Switchable must be able to create, at least one Event (of COV type) report in Attribute Reporting service (see HF-Service [REF 3] for details), for the State (0x01) attribute from On-Off interface.

5.1.1.1 Functional Interfaces

Table 4 - Simple On-Off Switchable Interfaces

Name	Role	M/O
On-Off	Server	M

5.1.2 Simple On-Off Switch

The Simple On-Off Switch specifies a profile that sends a command to turn on/off some physical bi-stable actuator attached to the receiving device.

5.1.2.1 Functional Interfaces

Table 5 - Simple On-Off Switch Interfaces

Name	Role	M/O
On-Off	Client	M

5.1.3 Simple Level Controllable

The Simple Level Controllable specifies a profile that receives a command to adjust or set the value of some quantity, usually some controllable characteristic of the device.

5.1.3.1 Functional Interfaces

Table 6 - Simple Level Controllable Interfaces

Name	Role	M/O
Level Control	Server	M

5.1.4 Simple Level Control

The Simple Level Control specifies a profile that sends a command to adjust or set the value of some characteristic of the receiving device.

5.1.4.1 Functional Interfaces

Table 7 - Simple Level Control Interfaces

Name	Role	M/O
Level Control	Client	M

5.1.5 Simple Level Controllable Switchable

The Simple Level Controllable Switchable specifies a profile that receives commands either to adjust or set the value of some characteristic of the device or to simply turn that characteristic, or any other, “on” or “off”.

A device implementing Simple Level Controllable Switchable must be able to create, at least one Event (of COV type) report in Attribute Reporting service (see HF-Service [REF 3] for details), for the State (0x01) attribute from On-Off interface.

5.1.5.1 Functional Interfaces

Table 8 - Simple Level Controllable Switchable Interfaces

Name	Role	M/O
On-Off	Server	M
Level Control	Server	M

5.1.6 Simple Level Control Switch

The Simple Level Control Switch specifies a profile that sends commands either to adjust or set the value of some characteristic of the receiving device or to simply turn that characteristic, or any other, “on” or “off”.

5.1.6.1 Functional Interfaces

Table 9 - Simple Level Control Switch Interfaces

Name	Role	M/O
On-Off	Client	M
Level Control	Client	M

5.1.7 AC Outlet

The AC Outlet specifies a profile that receives a command to turn on/off some physical bi-stable AC actuator attached to the device.

A device implementing AC Outlet must be able to create, at least one Event (of COV type) report in Attribute Reporting service (see HF-Service [REF 3] for details), for the State (0x01) attribute from On-Off interface.

5.1.7.1 Functional Interfaces

Table 10 - AC Outlet Interfaces

Name	Role	M/O
On-Off	Server	M

5.1.8 AC Outlet with Simple Power Metering

The AC Outlet with Simple Power Metering specifies a profile that receives a command to turn on/off some physical bi-stable AC actuator attached to the device. It is also capable of doing and providing simple measurements over electric quantities.

A device implementing AC Outlet with Simple Power Metering must be able to create, at least one Event (of COV type) report in Attribute Reporting service (see HF-Service [REF 3] for details), for the State (0x01) attribute from On-Off interface.

5.1.8.1 Functional Interfaces

Table 11 - AC Outlet with Simple Power Metering Interfaces

Name	Role	M/O
On-Off	Server	M
Simple Power Metering	Server	M

5.1.9 Simple Light

The Simple Light specifies a profile that receives a command to turn on/off some physical bi-stable Light actuator attached to the device.

A device implementing Simple Light must be able to create, at least one Event (of COV type) report in Attribute Reporting service (see HF-Service [REF 3] for details), for the State (0x01) attribute from On-Off interface.

5.1.9.1 Functional Interfaces

Table 12 - Simple Light Interfaces

Name	Role	M/O
On-Off	Server	M

5.1.10 Dimmable Light

The Dimmable Light specifies a profile that receives a command to either turn on, off or toggle a light. In addition the luminance level of the light can be set.

A device implementing Dimmable Light must be able to create, at least one Event (of COV type) report in Attribute Reporting service (see HF-Service [REF 3] for details), for the State (0x01) attribute from On-Off interface.

5.1.10.1 Functional Interfaces

Table 13 - Dimmable Light Interfaces

Name	Role	M/O
On-Off	Server	M
Level Control	Server	M

5.1.11 Dimmer Switch

The Dimmer Switch specifies a profile that sends a command to either turn on, off or toggle a light in the receiving device. In addition the luminance level of the light can be set.

5.1.11.1 Functional Interfaces

Table 14 - Dimmer Switch Interfaces

Name	Role	M/O
On-Off	Client	M
Level Control	Client	M

5.1.12 Simple Door Lock

The Simple Door Lock specifies a profile that receives a command to turn on (lock)/off (unlock) some controllable electronic door lock.

A device implementing Simple Door Lock must be able to create, at least one Event (of COV type) report in Attribute Reporting service (see HF-Service [REF 3] for details), for the State (0x01) attribute from On-Off interface.

5.1.12.1 Functional Interfaces

Table 15 - Simple Door Lock Interfaces

Name	Role	M/O
On-Off	Server	M

5.1.13 Simple Door Bell

The Simple Door Bell specifies a profile that sends an alert whenever a door bell button is pushed. The alert message is sent as soon as the button is pushed; furthermore the current alert state can always be obtained by issuing a *Get Attribute Request* over the interface's attributes. See HF-Protocol [REF 2] and HF-Interface [REF 4] documents for more details.

5.1.13.1 Functional Interfaces

Table 16 - Simple Door Bell Interfaces

Name	Role	M/O
Alert	Server	M

5.1.13.2 Alert Information

Information on the alert interface is organized as follows, where octet 1 is the MSB and octet 4 is the LSB:

Table 17 - Simple Door Bell Alert Information

8	7	6	5	4	3	2	1	Octet
x	x	x	x	x	x	x	x	1
x	x	x	x	x	x	x	x	2
x	x	x	x	x	x	x	x	3
x	x	x	x	x	x	x	Simple Door Bell State	4

The meaning of each bit is as follows:

Octet 1 bits 8-1: Proprietary bits, to be used for manufacturer specific indications

Octet 2 bits 8-1: Proprietary bits, to be used for manufacturer specific indications

Octet 3 bits 8-1: Reserved for future features

Octet 4 bits 8-2: Reserved for future features

Octet 4 bit 1: "Simple Door Bell State", this bit is set to "1" if someone pressed the doorbell or set to "0" otherwise

5.1.14 Simple Power Meter

The Simple Power Meter specifies a profile that is able to do and provide measurements over electric quantities.

5.1.14.1 Functional Interfaces

Table 18 - Simple Power Meter Functional Interfaces

Name	Role	M/O
Simple Power Metering	Server	M

5.1.15 Simple Temperature Sensor

The Simple Temperature Sensor specifies a profile that is able to provide temperature readings.

A device implementing Simple Temperature Sensor must be able to create, at least one Periodic and Event (of LT and HT types) report in Attribute Reporting service (see HF-Service [REF 3] for details), for the Measured Temperature (0x01) attribute.

5.1.15.1 Functional Interfaces

Table 19 - Simple Temperature Sensor Functional Interfaces

Name	Role	M/O
Simple Temperature	Server	M

5.1.16 Simple Humidity Sensor

The Simple Humidity Sensor specifies a profile that is able to provide humidity readings.

A device implementing Simple Humidity Sensor must be able to create, at least one Periodic and Event (of LT and HT types) report in Attribute Reporting service (see HF-Service [REF 3] for details), for the Measured Humidity (0x01) attribute.

5.1.16.1 Functional Interfaces

Table 20 - Simple Humidity Sensor Functional Interfaces

Name	Role	M/O
Simple Humidity	Server	M

5.1.17 Simple Air Pressure Sensor

The Simple Air Pressure Sensor specifies a profile that is able to provide air pressure readings.

A device implementing Simple Air Pressure Sensor must be able to create, at least one Periodic report in Attribute Reporting service (see HF-Service [REF 3] for details), for the Measured Air Pressure (0x01) attribute.

5.1.17.1 Functional Interfaces

Table 21 - Simple Air Pressure Sensor Functional Interfaces

Name	Role	M/O
Simple Air Pressure	Server	M

5.1.18 Simple Button

The Simple Button specifies a profile that is able to identify several types of button presses (short press, long press, extra-long press and double press) and send notifications when they occur.

5.1.18.1 Functional Interfaces

Table 22 - Simple Button Functional Interfaces

Name	Role	M/O
Simple Button	Server	M

5.1.19 Controllable Thermostat

The Controllable Thermostat specifies a profile that is able to control the temperature of an indoor area, either by cooling or heating it.

A device implementing this profile must be able to create, at least one Event (of COV type) report in Attribute Reporting service (see HF-Service [REF 3] for details), for the Operating Mode (0x02) attribute and, if implemented one same report for the Fan Mode (0x03) attribute. In addition the device may find it useful to implement the Batch Program Management service and the Event Scheduling service and/or the Weekly scheduling service. See HF-Service [REF 3] for more details.

5.1.19.1 Functional Interfaces

Table 23 - Simple Button Functional Interfaces

Name	Role	M/O
On-Off	Server	M
Simple Thermostat	Server	M

5.1.20 Simple Led

The Simple Led specifies a profile that is able to make some visual effects (blink, fade, breath) with a led.

5.1.20.1 Functional Interfaces

Table 24 - Simple Button Functional Interfaces

Name	Role	M/O
Simple Visual Control	Server	M

5.1.21 Environment Monitor

The Environment Monitor specifies a profile that is able to monitor the environment by providing measurements of temperature, humidity and optionally air pressure.

5.1.21.1 Functional Interfaces

Table 25 - Simple Button Functional Interfaces

Name	Role	M/O
Simple Temperature	Server	M
Simple Humidity	Server	M
Simple Air Pressure	Server	O

5.1.22 Colour Bulb

This profile is intended to be used in light bulb devices that support changing the colour of the light emitted.

The On-Off interface allows for the bulb to be turned ON and OFF.

The Colour interface allows changing the colour.

5.1.22.1 Functional Interfaces

Table 26 – Colour Bulb Interfaces

Name	Role	M/O
On-Off	Server	M
Colour Control	Server	M

5.1.23 Dimmable Colour Bulb

This profile is intended to be used in light bulb devices that support changing the colour of the light emitted and also the intensity of light emitted.

The On-Off interface allows for the bulb to be turned ON and OFF.

The Level Control interface allows for dimming the Bulb (changing the intensity)

The Colour interface allows changing colours.

5.1.23.1 Functional Interfaces

Table 27 – Dimmable Colour Bulb Interfaces

Name	Role	M/O
On-Off	Server	M
Colour Control	Server	M
Level Control	Server	M

5.1.24 Tracker

This profile is intended to be used in tracker devices.

Tracker device simply sends periodically messages and if messages do not arrive in time base/cloud concludes the device is out of range. For example a tracker on a pet and pet left the home, etc.

5.1.24.1 Functional Interfaces

This profile does not mandate any specific interface.

Devices that contain a unit that implements this profile are required to either implement the Keep Alive interface or at least one of any other type of periodic report (such as RSSI periodic report).

5.1.25 Simple Keypad

This profile is intended to be used in keypad or keyfob devices.

The Simple Keypad interface allows the device to convey the key that was pressed.

5.1.25.1 Functional Interfaces

Table 28 – Simple Keypad Interfaces

Name	Role	M/O
Simple Keypad	Server	M

5.2 Security Profiles

5.2.1 Simple Detector

The Simple Detector specifies a profile that sends an alert when some generic condition is detected. The alert message is sent as soon as the detection occurs; furthermore, the current state of the detection can always be obtained by issuing a *Get Attribute Request* over the interface's attributes. See HF-Protocol [REF 2] and HF-Interface [REF 4] documents for more details.

5.2.1.1 Functional Interfaces

Table 29 - Simple Detector Interfaces

Name	Role	M/O
Alert	Server	M

5.2.1.2 Alert Information

Information on the alert interface is organized as follows, where octet 1 is the MSB and octet 4 is the LSB:

Table 30 - Simple Detector Alert Information

8	7	6	5	4	3	2	1	Octet
x	x	x	x	x	x	x	x	1
x	x	x	x	x	x	x	x	2
x	x	x	x	x	x	x	x	3
x	x	x	x	x	x	x	Detection	4

The meaning of each bit is as follows:

- Octet 1 bits 8-1: Proprietary bits, to be used for manufacturer specific indications
- Octet 2 bits 8-1: Proprietary bits, to be used for manufacturer specific indications
- Octet 3 bits 8-1: Reserved for future features
- Octet 4 bits 8-2: Reserved for future features
- Octet 4 bit 1: “Detection”, this bit is set to “1” when something is detected, otherwise it is set to “0”

5.2.2 Door Open/Close Detector

The Door Open/Close Detector specifies a profile that sends an alert when it detects that a door opened or closed. The alert message is sent as soon as the door state changes; furthermore the current door state can always be obtained by issuing a *Get Attribute Request* over the interface’s attributes. See HF-Protocol [REF 2] and HF-Interface [REF 4] documents for more details.

5.2.2.1 Functional Interfaces

Table 31 - Door Open/Close Detector Interfaces

Name	Role	M/O
Alert	Server	M

5.2.2.2 Alert Information

Information on the alert interface is organized as follows, where octet 1 is the MSB and octet 4 is the LSB:

Table 32 - Door Open/Close Detector Alert Information

8	7	6	5	4	3	2	1	Octet
x	x	x	x	x	x	x	x	1
x	x	x	x	x	x	x	x	2
x	x	x	x	x	x	x	x	3
x	x	x	x	x	x	x	Door State	4

The meaning of each bit is as follows:

- Octet 1 bits 8-1: Proprietary bits, to be used for manufacturer specific indications
- Octet 2 bits 8-1: Proprietary bits, to be used for manufacturer specific indications
- Octet 3 bits 8-1: Reserved for future features
- Octet 4 bits 8-2: Reserved for future features
- Octet 4 bit 1: “Door State”, this bit is set to “1” if the door is open or set to “0” if the door is closed

5.2.3 Window Open/Close Detector

The Window Open/Close Detector specifies a profile that sends an alert when it detects that a window opened or closed. The alert message is sent as soon as the window state changes; furthermore the current window state can always be obtained by issuing a *Get Attribute Request* over the interface's attributes. See HF-Protocol [REF 2] and HF-Interface [REF 4] documents for more details.

5.2.3.1 Functional Interfaces

Table 33 - Window Open/Close Detector Interfaces

Name	Role	M/O
Alert	Server	M

5.2.3.2 Alert Information

Information on the alert interface is organized as follows, where octet 1 is the MSB and octet 4 is the LSB:

Table 34 - Window Open/Close Detector Alert Information

8	7	6	5	4	3	2	1	Octet
x	x	x	x	x	x	x	x	1
x	x	x	x	x	x	x	x	2
x	x	x	x	x	x	x	x	3
x	x	x	x	x	x	x	Window State	4

The meaning of each bit is as follows:

Octet 1 bits 8-1: Proprietary bits, to be used for manufacturer specific indications

Octet 2 bits 8-1: Proprietary bits, to be used for manufacturer specific indications

Octet 3 bits 8-1: Reserved for future features

Octet 4 bits 8-2: Reserved for future features

Octet 4 bit 1: "Window State", this bit is set to "1" if the window is open or set to "0" if the window is closed

5.2.4 Motion Detector

The Motion Detector specifies a profile that sends an alert when it detects motion. The alert message is sent as soon as motion is detected; furthermore the current detection state can always be obtained by issuing a *Get Attribute Request* over the interface's attributes. See HF-Protocol [REF 2] and HF-Interface [REF 4] documents for more details.

5.2.4.1 Functional Interfaces

Table 35 - Motion Detector Interfaces

Name	Role	M/O
Alert	Server	M

5.2.4.2 Alert Information

Information on the alert interface is organized as follows, where octet 1 is the MSB and octet 4 is the LSB:

Table 36 - Motion Detector Alert Information

8	7	6	5	4	3	2	1	Octet
x	x	x	x	x	x	x	x	1
x	x	x	x	x	x	x	x	2
x	x	x	x	x	x	x	x	3
x	x	x	x	x	x	x	Detection	4

The meaning of each bit is as follows:

Octet 1 bits 8-1: Proprietary bits, to be used for manufacturer specific indications

Octet 2 bits 8-1: Proprietary bits, to be used for manufacturer specific indications

Octet 3 bits 8-1: Reserved for future features

Octet 4 bits 8-2: Reserved for future features

Octet 4 bit 1: "Detection", this bit is set to "1" when motion is detected, otherwise it is set to "0"

5.2.5 Smoke Detector

The Smoke Detector specifies a profile that sends an alert when it detects smoke. The alert message is sent as soon as smoke is detected; furthermore the current detection state can always be obtained by issuing a *Get Attribute Request* over the interface's attributes. See HF-Protocol [REF 2] and HF-Interface [REF 4] documents for more details.

5.2.5.1 Functional Interfaces

Table 37 - Smoke Detector Interfaces

Name	Role	M/O
Alert	Server	M

5.2.5.2 Alert Information

Information on the alert interface is organized as follows, where octet 1 is the MSB and octet 4 is the LSB:

Table 38 - Smoke Detector Alert Information

8	7	6	5	4	3	2	1	Octet
x	x	x	x	x	x	x	x	1
x	x	x	x	x	x	x	x	2
x	x	x	x	x	x	x	x	3
x	x	x	x	x	x	x	Detection	4

The meaning of each bit is as follows:

- Octet 1 bits 8-1: Proprietary bits, to be used for manufacturer specific indications
- Octet 2 bits 8-1: Proprietary bits, to be used for manufacturer specific indications
- Octet 3 bits 8-1: Reserved for future features
- Octet 4 bits 8-2: Reserved for future features
- Octet 4 bit 1: “Detection”, this bit is set to “1” while smoke is detected, otherwise it is set to “0”

5.2.6 Gas Detector

The Gas Detector specifies a profile that sends an alert when it detects a health dangerous gas. Currently it alerts for carbon monoxide (CO). The alert message is sent as soon as gas is detected; furthermore the current detection state can always be obtained by issuing a *Get Attribute Request* over the interface’s attributes. See HF-Protocol [REF 2] and HF-Interface [REF 4] documents for more details.

5.2.6.1 Functional Interfaces

Table 39 - CO Detector Interfaces

Name	Role	M/O
Alert	Server	M

5.2.6.2 Alert Information

Information on the alert interface is organized as follows, where octet 1 is the MSB and octet 4 is the LSB:

Table 40 - CO Detector Alert Information

8	7	6	5	4	3	2	1	Octet
x	x	x	x	x	x	x	x	1
x	x	x	x	x	x	x	x	2
x	x	x	x	x	x	x	x	3
x	x	x	x	x	x	x	CO Detected	4

The meaning of each bit is as follows:

- Octet 1 bits 8-1: Proprietary bits, to be used for manufacturer specific indications
- Octet 2 bits 8-1: Proprietary bits, to be used for manufacturer specific indications
- Octet 3 bits 8-1: Reserved for future features
- Octet 4 bits 8-2: Reserved for future features
- Octet 4 bit 1: “CO Detected”, this bit is set to “1” when CO is detected; otherwise it is set to “0”

5.2.7 Flood Detector

The Flood Detector specifies a profile that sends an alert when it detects a flood. The alert message is sent as soon as a flood is detected; furthermore the current detection state can always be obtained by issuing a *Get Attribute Request* over the interface's attributes. See HF-Protocol [REF 2] and HF-Interface [REF 4] documents for more details.

5.2.7.1 Functional Interfaces

Table 41 - Flood Detector Interfaces

Name	Role	M/O
Alert	Server	M

5.2.7.2 Alert Information

Information on the alert interface is organized as follows, where octet 1 is the MSB and octet 4 is the LSB:

Table 42 - Flood Detector Alert Information

8	7	6	5	4	3	2	1	Octet
x	x	X	x	x	x	x	x	1
x	x	X	x	x	x	x	x	2
x	x	X	x	x	x	x	x	3
x	x	X	x	x	x	x	Detection	4

The meaning of each bit is as follows:

- Octet 1 bits 8-1: Proprietary bits, to be used for manufacturer specific indications
- Octet 2 bits 8-1: Proprietary bits, to be used for manufacturer specific indications
- Octet 3 bits 8-1: Reserved for future features
- Octet 4 bits 8-2: Reserved for future features
- Octet 4 bit 1: "Detection", this bit is set to "1" when a flood is detected, otherwise it is set to "0"

5.2.8 Glass Break Detector

The Glass Break Detector specifies a profile that sends an alert when it detects a glass was broken. The alert message is sent as soon as a glass breaks; furthermore the current glass state can always be obtained by issuing a *Get Attribute Request* over the interface's attributes. See HF-Protocol [REF 2] and HF-Interface [REF 4] documents for more details.

5.2.8.1 Functional Interfaces

Table 43 – Glass Break Detector Interfaces

Name	Role	M/O
Alert	Server	M

5.2.8.2 Alert Information

Information on the alert interface is organized as follows, where octet 1 is the MSB and octet 4 is the LSB:

Table 44 – Glass Break Detector Alert Information

8	7	6	5	4	3	2	1	Octet
x	x	X	x	x	X	X	x	1
x	x	X	x	x	X	X	x	2
x	x	X	x	x	x	X	x	3
x	x	X	x	x	x	X	Glass State	4

The meaning of each bit is as follows:

Octet 1 bits 8-1: Proprietary bits, to be used for manufacturer specific indications

Octet 2 bits 8-1: Proprietary bits, to be used for manufacturer specific indications

Octet 3 bits 8-1: Reserved for future features

Octet 4 bits 8-2: Reserved for future features

Octet 4 bit 1: “Glass State”, this bit is set to “1” if the glass is broken or set to “0” if the glass is unbroken

5.2.9 Vibration Detector

The Vibration Detector specifies a profile that sends an alert when it detects vibrations. The alert message is sent as soon as a vibration is detected; furthermore the current detection state can always be obtained by issuing a *Get Attribute Request* over the interface’s attributes. See HF-Protocol [REF 2] and HF-Interface [REF 4] documents for more details.

5.2.9.1 Functional Interfaces

Table 45 - Vibration Detector Interfaces

Name	Role	M/O
Alert	Server	M

5.2.9.2 Alert Information

Information on the alert interface is organized as follows, where octet 1 is the MSB and octet 4 is the LSB:

Table 46 - Vibration Detector Alert Information

8	7	6	5	4	3	2	1	Octet
x	x	x	x	x	x	X	x	1
x	x	x	x	x	x	X	x	2
x	x	x	x	x	x	X	x	3
x	x	x	x	x	x	X	Detection	4

The meaning of each bit is as follows:

- Octet 1 bits 8-1: Proprietary bits, to be used for manufacturer specific indications
- Octet 2 bits 8-1: Proprietary bits, to be used for manufacturer specific indications
- Octet 3 bits 8-1: Reserved for future features
- Octet 4 bits 8-2: Reserved for future features
- Octet 4 bit 1: “Detection”, this bit is set to “1” when vibrations are detected; otherwise it is set to “0”

5.2.10 Simple Light Sensor

The Simple Light Sensor specifies a Profile that is able to provide light readings.

A device implementing Simple Light Sensor profile must be able to create, at least one Periodic report in Attribute Reporting service (see HF-Service [REF 3] for details), for the Measured Light (0x01) attribute.

5.2.10.1 Functional Interfaces

Table 47 – Simple Light Sensor Functional Interfaces

Name	Role	M/O
Simple Light Sensor	Server	M

5.2.11 Siren

The Siren specifies a profile that receives a command to start or stop an audible alert signal. The current alert state can always be obtained by issuing a *Get Attribute Request* over the interface’s attributes. See HF-Protocol [REF 2] and HF-Interface [REF 4] documents for more details.

A device implementing Simple Siren must be able to create, at least one Event (of COV type) report in Attribute Reporting service (see HF-Service [REF 3] for details), for the State (0x01) attribute from On-Off interface.

5.2.11.1 Functional Interfaces

Table 48 – Siren Interfaces

Name	Role	M/O
On-Off	Server	M

5.2.12 Alertable

The Alertable specifies a generic profile that is capable of receiving alerts. The specific meaning of an alert is defined by the profiles that implement the Alert interface as the Server role (for example, detectors).

5.2.12.1 Functional Interfaces

Table 49 - Alertable Interfaces

Name	Role	M/O
Alert	Client	M

5.3 Homecare Profiles

5.3.1 Simple Pendant

The Simple Pendant specifies a profile that sends an alert triggered by some condition, for example, when a button is pushed, similarly to a panic button. The alert message is sent as soon as it is triggered.

5.3.1.1 Functional Interfaces

Table 50 – Simple Pendant Interfaces

Name	Role	M/O
Alert	Server	M

The Alert Interface used here has a one-shot alert, since the condition that triggers the message sending does not persist. As a consequence, the *State* attribute is never set; however, the *Enable* attribute can still be used to suppress message sending according to the bits meaning in 5.3.1.2.

5.3.1.2 Alert Information

Information on the alert interface is organized as follows, where octet 1 is the MSB and octet 4 is the LSB:

Table 51 – Simple Pendant Alert Information

8	7	6	5	4	3	2	1	Octet
x	x	x	x	x	x	X	x	1
x	x	x	x	x	x	X	x	2
x	x	x	x	x	x	X	x	3
x	x	x	x	x	x	X	Panic Alert	4

The meaning of each bit is as follows:

Octet 1 bits 8-1: Proprietary bits, to be used for manufacturer specific indications

Octet 2 bits 8-1: Proprietary bits, to be used for manufacturer specific indications

Octet 3 bits 8-1: Reserved for future features

Octet 4 bits 8-2: Reserved for future features

Octet 4 bit 1: “Panic Alert”, this bit is set to “1” if the alert was manually triggered by the user, otherwise it is set to “0”

5.4 Application Profiles

5.4.1 UI Lock

The UI Lock specifies a profile that allows for a device possessing a user interface (UI) to lock/unlock it, preventing that changes can be made to a system through that interface. For example, parents/companies not wanting the children/employees to change the temperature of a room.

5.4.1.1 Functional Interfaces

Table 52 – User Interface Interfaces

Name	Role	M/O
On-Off	Server	M

5.4.2 User Interface

This profile can be used by any application that essentially provides a user interface, for example, keypad, remote control, touch display, simple display etc. It does not impose any specific interfaces, thus allowing for any number of them to be implemented as client role in order to control or provide information on any number of HF devices. It must, however, implement U'0 mandatory interfaces (Table 1) as indicated in 4.

Note that any undeclared interface, upon the HF registration procedure, cannot benefit from the Bind Service. See HF-Service [REF 3] document for more details.

5.4.2.1 Functional Interfaces

Table 53 – User Interface Interfaces

Name	Role	M/O
Any	Client	O

5.4.3 Generic Application Logic

This profile can be used by any application that requires controlling or providing information on any number of different HF devices. Usually useful in a concentrator, user portal, remote control, etc. It does not impose any specific interfaces, thus allowing for any number of them to be implemented as client role. It has however to implement U'0 mandatory interfaces (Table 1) as indicated in 4.

Note that any undeclared, upon the HF registration procedure, interface cannot benefit from the Bind Service. See HF-Service [REF 3] document for more details.

5.4.3.1 Functional Interfaces

Table 54 – Generic Application Logic Interfaces

Name	Role	M/O
Any	Client	O

Annex:

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