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| --- |
| ***ToR TTF T008 (Ref. Body DECT)*** |
| Version: 1.2 |
| Author: Dr. Günter Kleindl – Date: 2020-08-24 |
| Last updated by: ETSI Secretariat – Date: 2020-12-17 |
| page 1 of |

Terms of Reference –Testing Task Force Proposal

TTF T008 (Ref. Body DECT)

Radio conformance test specifications for DECT-2020 NR

Summary information

|  |  |  |  |
| --- | --- | --- | --- |
| Approval status | Approved by Ref. Body. TC DECT meeting#87, 8.9.2020 | | **YES** |
| Reference Body | Ref. Body DECT | | |
| ETSI Funding | **Maximum budget : 124 000 (120 000 + 4 000 travel) EUR** | | |
| Minimum of 4 ETSI Members Support | **YES** | | |
| Time scale | **From** | 2021-02-08 | |
| **To** | 2021-12-31 or 2022-04-30 | |
| Work Items | * DTS-DECT-00366 / TS 103 776 * DEN-DECT-0359-2 / EN 301 406-2 | | |
| TTF Roadmap reference |  | | |

Part I –TTF Technical Proposal

# Rationale & Objectives

## Rationale

DECT-2020 New radio (NR) is a new radio interface under development at TC DECT intended for short/mid range license exempt operation. DECT-2020 NR is based on Orthogonal Frequency Division Multiplex (OFDM), incorporating space diversity (Multiple Input Multiple Output (MIMO)) and has been submitted to ITU-R as an IMT-2020 candidate technology.

Compared to other OFDM interfaces, DECT-2020 has the characteristic of being specifically designed from the beginning for operation over license exempt spectrum and, at the same time, incorporating several technical advantages over technologies from the IEEE 802.11 family. The new radio interface is intended to operate over the DECT band and is designed for coexistence with traditional DECT devices.

The normative standards (TS) for DECT-2020 release 1 have been developed by TC DECT during years 2019 and 2020 and have been recently published in July 2020 as TS 103 636 parts 1 to 4. Industry players can now work of the production of the first commercial products.

DECT-2020 release 1 is intended to operate over the 1 880 1 900 MHz band, under license-exempt regimen, sharing the band with legacy DECT products.

In order to place products in the market under this schema, the production of a detailed radio test specification and the Harmonized standard (EN) under RED directive for DECT-2020 are compulsory.

The radio test specification and the Harmonized standard (EN) under RED directive are complex new specifications that should be designed specifically for the new technology and should also pay attention to aspects of coexistence in the same band with existing DECT devices.

The result of the TTF will be a consolidated and updated set of radio conformance specifications for both DECT and DECT-2020 technologies.

The TTF will potentially impact millions of DECT-2020 devices under production in the next years.

The whole technical team of DECT-2020 is fully focused on the production of further normative standards for DECT-2020 and other IMT related tasks. Test standards are required to be developed by a dedicated task force of experts.

## Objectives of the work to be executed

The objective of the proposed TTF is the production of two deliverables, related to the new technology DECT-2020 NR

The TTF is structured under one task.

Task 1: Production of the radio test specification (deliverable D1) and the Harmonized EN (deliverable D2) for DECT-2020 New Radio interface (new deliverables).

* This is the main part of the TTF and will require the production of two completely new deliverables.
* It is required to place the new DECT-2020 products on the market under the desired license exempt regime.
* Specific aspects of RED directive and of the coexistence between legacy DECT and DECT-2020 products sharing the band will be studied and taken into account.

The details of the tasks and deliverables to be produced are provided in Part II.

## 

## Previous funded activities in the same domain

No TTF funding has been requested for test specifications of DECT-2020. This is the first request.

The following STF funding was allocated for DECT-2020, early stages:

-STF 537 (2017) with an allocation of 91 k € (57 k € for DECT-2020 PHY layer and 34 k € for a study of URLLC use cases).

-STF 564 (2018) with an allocation of 115 k € (90 k € for DECT-2020 study of MAC and higher layers phase 1 and 25 k € for security).

-There were no STF funds allocated from 2019 and 2020 budgets

## Consequences if not agreed

DECT-2020 release 1 is intended to operate over the 1 880 1 900 MHz band, under license-exempt regimen, sharing the band with legacy DECT products.

The normative standards (TS) for DECT-2020 release 1.0 have been recently published by ETSI (July 2020) as TS 103 636 parts 1 to 4. Industry players can now work of the production of the commercial products.

In order to place DECT-2020 products on the market under the desired license-exempt schema, the production of a detailed radio test specification and a Harmonized standard (EN) under RED directive for DECT-2020 are compulsory.

The TTF will potentially impact millions of DECT-2020 devices under production in the next years.

The whole technical team of DECT-2020 is fully focused on the production of further normative standards for DECT-2020 and other IMT related tasks under own effort. Test standards are required to be developed by a dedicated task force of experts.

# ETSI Members Support

|  |  |  |
| --- | --- | --- |
| **#** | **ETSI Member** | **Supporting delegate** |
| 1 | AVM Audiovisuelles Marketing und Computersysteme Berlin | Sven Trevisany |
| 2 | Dialog Semiconductor B.V. | Niels Schutten |
| 3 | DSPG Edinburgh Ltd | Heinz Thürauf |
| 4 | Federal Ministry of Economic Affairs and Energy | Bernd Wolf |
| 5 | OVE - Österreichischer Verband für Elektrotechnik | Guenter Kleindl |
| 6 | Sennheiser Electronic GmbH & Co. KG | Andreas Mueller |
| 7 | SHURE Europe GmbH | Ronnie MacPherson |
| 8 | Wireless Partners S.L.L. | Angel Boveda |
| 9 | Wirepas Oy | Juho Pirskanen |

# Deliverables

## Base documents

|  |  |  |
| --- | --- | --- |
| **Document** | **Title** | **Status** |
| ETSI EN 300 175 part 1 to 8 | Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI) | published |
| ETSI EN 300 176-1 | Digital Enhanced Cordless Telecommunications (DECT); Test specification ; part 1 : radio | published |
| ETSI EN 301 406 | Digital Enhanced Cordless Telecommunications (DECT); Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU | published |
| ETSI TS 103 636 parts 1 to 4 | DECT-2020 New Radio (NR) ; release 1 | published |
| ETSI EN 301 908-10 | Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS), Repeaters and User Equipment (UE) for IMT-2000 Third-Generation cellular networks; Part 10: Harmonised Standard for IMT-2000, FDMA/TDMA (DECT) for access to radio spectrum | published |

## New deliverables

|  |  |  |  |
| --- | --- | --- | --- |
| **Deliv.** | **Work Item code**  **Standard number** | **Working title** | **Expected date for publication** |
| D1 | DTS-DECT-00366  TS 103 776 | Digital Enhanced Cordless Telecommunications (DECT); DECT-2020 New radio (NR); test specification: radio |  |
| D2 | DEN-DECT-0359-2  EN 301 406-2 | Digital Enhanced Cordless Telecommunications (DECT); Harmonised Standard for access to radio spectrum; Part 2: DECT-2020 NR |  |

# Maximum budget

## Task summary/Manpower Budget

The work of the TTF is structured into three main tasks plus overall project management:

* Task 0 – Project management
* Task 1 – DECT-2020 NR radio conformance and HEN (deliverables D1 and D2, new deliverables)

Task 1 covers the production of the radio test specification (deliverable D1) and the Harmonized EN (deliverable D2) for DECT-2020 New Radio interface (new deliverables).

* This is the main part of the TTF and will require the production of two completely new deliverables.
* It is required to place the new DECT-2020 products in the market under the desired license exempt regime.
* Specific aspects of RED directive and of the coexistence between legacy DECT and DECT-2020 products sharing the band will be studied and taken into account.

The budged estimate for the three tasks is provided in the following table:

|  |  |
| --- | --- |
| **Task short description** | Budget (EUR) |
|
| Task 0: Project management | 6 000 |
| Task 1: DECT-2020 NR radio conformance and HEN (deliverables D1 and D2, new deliverables) | 114 000 |
| **TOTAL** | 120 000 |

Several subtasks have been envisioned for better describing the progress of the work. They are used for calculating the time effort at milestones and are described in section 6.3.

The tasks, subtasks and overall timing have been designed to allow some degree of work optimization by parallel execution. It will also allow continuous progress of the work filling the gaps resulting of time windows for ENAP and EC expert consultations processes

## Travel budget

Travel budget to cover participation of the TTF leader in up to five TC DECT or external meetings.

|  |  |
| --- | --- |
| **Event** | Budget (EUR) |
|
| TC DECT or external meeting #1 | 800 |
| TC DECT or external meeting #2 | 800 |
| TC DECT or external meeting #3 | 800 |
| TC DECT or external meeting #4 | 800 |
| TC DECT or external meeting #5 | 800 |
| **TOTAL** | **4 000** |

Part II – Details on TTF Technical Proposal

# Tasks, Technical Bodies and other stakeholders

## Organization of the work

The work will be steered by the TC DECT chairman, the URLLC WG chairman and the URLLC WG members. TTF leader is expected to participate regularly in all DECT F2F and e-meetings. There will be about five TC DECT meetings and about 20 online meetings during TTF schedule.

Task 1 requires perfect understanding of DECT-2020 NR interface (specification TS 103 636 parts 1 to 4), as well as on DECT radio test specifications and Harmonized ENs.

## Other interested ETSI Technical Bodies

TC ERM

* The TTF includes the production of three Harmonized ENs under RED directive (two updates and one new HEN). ERM will participate in the WI approval process.

3GPP

* DECT-2020 has been presented to ITU-R as a component of a combined SRIT with 3GPP NR, where DECT-2020 acts as a complementary technology.

## Other stakeholders

ITU-R WP 5D due to the IMT-2020 submission process

Part III: Execution of Work

# Work plan, time scale and resources

## Task description

The work of the TTF is structured into one main task plus overall project management:

Several subtasks have been envisioned for better describing the progress of the work. They are used for calculating the time effort at milestones and are described in section 6.3.

The tasks, subtasks and overall timing have been designed to allow some degree of work optimization by parallel execution. It is also allows continuous progress of the work filling the gaps resulting of time windows for ENAP and EC expert consultations processes

### Task 0 – Project management

|  |  |
| --- | --- |
| **Task 0** | **Project management** |
| **Objectives** | * Planning, organisation, and preparation of TTF meetings * On-going reporting * Participation at TC meetings * Planning interaction with EC HEN consultants * Main interface with EC HEN consultants * Delivery of the TTF reports |
| **Input** | * This ToR * Information from the preparatory meeting * Outcome of all tasks of the TTF |
| **Output** | * Progress reports * Final report |
| **Interactions** | * With the TC by regular reporting and participation in all TC plenary meetings and conference calls * With the EC HEN consultants |
| **Resources required** | * One of the TTF experts will provide the project management * Costs: 6 000 EUR |

### Task 1 – DECT-2020 NR radio conformance and HEN (deliverables D1 and D2, new deliverables)

|  |  |
| --- | --- |
| **Task 0** | **Project management** |
| **Objectives** | * This is the major task of the TTF and consist on the production of the first set of radio test specifications for the new technology DECT-2020. * Two deliverables will be produced, an Harmonized EN (HEN) plus a Technical Specification (TS) |
| **Input** | * The complete set of DECT-2020 specifications (TS 103 636 parts 1 to 4) and related TRs. * The existing legacy DECT radio test specifications and HEN. |
| **Output** | * A new HEN for DECT-2020 (that will be numbered as EN 301 406-2) * A new radio test specification for DECT-2020 (TS) |
| **Interactions** | * With the TC by regular reporting and participation in all TC plenary meetings and conference calls * With the EC HEN consultants for the HEN |
| **Resources required** | * One or more experts, part or full time. This task requires full knowledge and involvement in the production of the new specification for DECT-2020 (TS 103 636 parts 1 to 4) and related TRs produced by TC DECT on the field. Due to the proposed structure of the HEN and band sharing with legacy DECT, knowledge of legacy DECT and related test specification is also required. * Costs: 114 000 EUR |

## Milestones

Milestone A – Progress Report A

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **A** | Progress in task 1. Deliverable D2 reached a mature draft (between stable and final draft) and is ready to be sent to EC for initial assessment. Progress Report A | 2021-03-31 |
| Reference Body Deliverable | Progress in task 1. Deliverable D2 reached a mature draft (between stable and final draft) and is ready to be sent to EC for initial assessment to the EC experts |
| ETSI Deliverable | Progress Report A approved by Reference Body |

Milestone B – Progress Report B

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **B** | Progress in task 1. Final draft of deliverable D2 to be approved by TC DECT and ready to be sent for ENAP. Progress Report B | 2021-06-30 |
| Reference Body Deliverable | Progress in task 1.  Final draft of deliverable D2 to be approved by TC DECT and to be sent to ENAP. |
| ETSI Deliverable | Progress Report B approved by Reference Body |

Milestone C – Progress Report C

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **C** | Progress in task 2. Stable draft of deliverable D1. Progress Report C | 2021-09-30 |
| Reference Body Deliverable | Stable draft of deliverable D1 |
| ETSI Deliverable | Progress Report C approved by Reference Body |

Milestone D – Deliverable D1 approved

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **D** | Deliverable D1 approved. | 2021-12-31 |
| Reference Body Deliverable | Final draft of deliverable D1 approved by TC DECT. |
| ETSI Deliverable | Final draft of deliverable D1 approved by Reference Body |

Milestone E1 – Completion of all tasks - Final Report

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **E1** | D2 published after a successful ENAP - Final report. | 2021-12-31 |
| Reference Body Deliverable | Deliverable D2 published after successful ENAP  Final Report |
| ETSI Deliverable | Final Report approved by TC DECT |

Milestone E2 – If D2 ENAP unsuccessful - Final Report

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **E2** | If ENAP of D2 is unsuccessful, revised D2 approved by TC DECT to be sent on vote - Final report. | 2022-01-26 |
| Reference Body Deliverable | Revised D2 approved in case of unsuccessful ENAP and sent on National Vote  Revised D2 approved by TC DECT. |
| ETSI Deliverable | Final Report approved by TC DECT |

Milestone Z – Publication of the Deliverables, TTF Closed

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **F** | Publication of the Deliverables D1 and D2. TTF Closed | 2022-04-30 |
| Reference Body Deliverable |  |
| ETSI Deliverable | D1 and D2 published |

## Task summary

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Code** | **Task / Milestone** | Target Date | | Estimated Cost (EUR) |
| From | To |
|  | Start of work | 08-02-2021 | |  |
| T0 | Task 0 (project management) | 08-02-21 | 30-04-22 | 6 000 |
| T1.1 | Task 1 (from start of work to milestone A) | 08-02-21 | 31-03-21 | 34 000 |
| Milestone A | D2 mature draft (between stable and final draft) ready to be sent to EC for initial assessment.  Progress Report A approved by TC DECT | 31-03-2021 | |  |
| T1.2 | Task 1 (from milestone A to milestone B) | 01-04-21 | 30-06-21 | 35 000 |
| Milestone B | D2 final draft approved by TC DECT to be sent on ENAP  Progress Report B approved by TC DECT | 30-06-2021 | |  |
| T1.3 | Task 1 (from milestone B to milestone C) | 01-07-21 | 30-09-21 | 24 000 |
| Milestone C | Stable draft of D1.  Progress Report C approved by TC DECT | 30-09-2021 | |  |
| T1.4 | Task 1 (from milestone C to milestone D) | 01-10-21 | 30-04-22 | 21 000 |
| Milestone D | D1 final draft approved by TC DECT. | 31-12-2021 | |  |
| Milestone E1 | D2 published after a successful ENAP  Final Report approved by TC DECT | 31-12-2021 | |  |
| Milestone E2 | If ENAP of D2 is unsuccessful, revised D2 approved by TC DECT to be sent on National Vote  Final Report approved by TC DECT | 26-01-2022 | |  |
| Milestone  F | All Deliverables published, TTF closed | 30-04-2022 | |  |
|  | | | | **120 000** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Task/ Mil.** | **F** | **M** | **A** | **M** | **J** | **J** | **A** | **S** | **O** | **N** | **D** |  | **J** | **F** | **M** | **A** |
| T0 | X | X | X | X | X | X | X | X | X | X | X |  | X | X | X | X |
| T1.1 | X | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MA |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T1.2 |  |  | X | X | X |  |  |  |  |  |  |  |  |  |  |  |
| MB |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |
| T1.3 |  |  |  |  |  | X | X | X |  |  |  |  |  |  |  |  |
| MC |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |
| T1.4 |  |  |  |  |  |  |  |  | X | X | X |  | X | X | X | X |
| MD |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |
| ME1 |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |
| ME2 |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |
| MF |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |

# Expertise required

## Team structure

Up to 2 participants to ensure the following mix of competences:

|  |  |
| --- | --- |
| **Priority** | **Qualifications and competences** |
| High | Authority expert knowledge of traditional DECT (legacy DECT) radio interface and the previous history of radio test (EN 300 176-1) and harmonized EN (EN 301 406) specifications. It requires knowledge of Red and previous history of interaction with EC experts regarding the EN 301 406 deliverable |
| High | Knowledge of the previous history of radio test (EN 300 176-1) and harmonized EN (EN 301 406) specifications, including knowledge of RED and previous history of interaction with EC experts regarding the EN 301 406 deliverable |
| High | Authority expert knowledge of DECT-2020 and involvement in the production of the new specification for DECT-2020 (TS 103 636 parts 1 to 4) and related TRs. |

Part IV: TTF performance evaluation criteria

# Performance Indicators

|  |  |
| --- | --- |
| **Select relevant Performance indicators applicable for these ToR (X)** | |
| Contribution from ETSI Members to TTF work | |
| Direct financial contribution (co-funding) |  |
| Support to the TTF work (e.g., provision of test–beds, organization of workshops, events) |  |
| Steering Group meetings (number of meetings / participants / duration) | X |
| Number of delegates directly involved in the review of the deliverables | X |
| Contributions/comments received from the Reference Bodies |  |
| Contributions/comments received from other Reference Bodies |  |
|  |  |
| **Contribution from the TTF to ETSI work** | |
| Contributions to Reference Body meetings (number of documents / meetings / participants) | X |
| Contributions to other Reference Bodies |  |
| Presentations in workshops, conferences, stakeholder meetings |  |
|  |  |
| **Liaison with other stakeholders** | |
| Stakeholder participation in the project (category, business area) | X |
| Cooperation with other standardization bodies |  |
| Potential interest of new members to join ETSI |  |
| Liaison to identify requirements and raise awareness on ETSI deliverables |  |
| Comments received on drafts (e.g. on WEB site, mailing lists, etc.) |  |
|  |  |
| **Quality of deliverables** | |
| Approval of deliverables according to schedule | X |
| Respect of time scale, with reference to start/end dates in the approved ToR | X |
| Comments from Quality review by Reference Body | X |
| Comments from Quality review by ETSI Secretariat | X |
|  |  |

# Document history

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Date** | **Author** | **Status** | **Comments** |
| 0.1 | 2020-08-24 | Dr. Günter Kleindl | For Remote Consensus |  |
| 0.2 | 2020-09-08 | Dr. Günter Kleindl | Approved |  |
| 1.0 | 2020-10-22 | Dr. Günter Kleindl | Approved | Updated before CfE publication, original tasks 1 and 2.removed. |
| 1.1 | 2020-11-12 | Ultan Mulligan |  | Editorial updates: deliverable and task renumbering, adjustment of budget to bring HS development earlier as per DECT request |
| 1.2 | 2020-12-17 | ETSI Secretariat | Board Approved | Update before CL publication |