

## Minutes of the 43rd meeting of WG8 Task Force 2

held at: Institut de Microtechnique - Neuchâtel (IMT)  
71, rue de la Maladière  
CH-2000 Neuchâtel  
Switzerland  
on: 8<sup>th</sup> and 9<sup>th</sup> April 2014

### Participants:

|                       |                    |            |
|-----------------------|--------------------|------------|
| Pascal ROUX           | Convener           |            |
| Josef GRUBER          | Austria            | (Observer) |
| Reinhard MEINDL       | Austria            |            |
| Erich REISENHOFER     | Austria            |            |
| Michael STARK         | Austria            |            |
| Franck BRICOUT        | France             |            |
| Jean-Paul CARUANA     | France             |            |
| Stéphane JOBARD       | France             |            |
| Erwan LE FER          | France             |            |
| Jean-Luc MERIDIANO    | France             |            |
| Romain PALMADE        | France             |            |
| Klaus FINKENZELLER    | Germany            |            |
| Michael HEGENBARTH    | Germany            |            |
| Florian PETERS        | Germany            |            |
| Hemy ITAY             | Israel             |            |
| Yoshiaki KANEKO       | Japan              |            |
| Kenichi NAKAMURA      | Japan              |            |
| Hiroo SHIMIZU         | Japan              |            |
| Maksimiljan STIGLIC   | Slovenia           |            |
| Jose Luis GEIJO-PEREZ | Switzerland        |            |
| Emeric PIERRE         | Switzerland        |            |
| Chris STANFORD        | UK                 |            |
| Ryan BOUDREAU         | USA                |            |
| David MAIN            | EMVCo/Visa liaison |            |

## OPENING OF THE MEETING

1. The convener opened the forty-third meeting of WG8 Task Force 2 by welcoming all the participants. He expressed special thanks to EM Microelectronic Marin, Melexis and SNV for the organization of this meeting.

## ROLL CALL

2. During the roll call, the convener asked all the participants to introduce themselves and to indicate their affiliations.

## REVIEW OF THE MEMBERSHIP LIST

3. An attendance register was circulated during the meeting. The TF2 membership is mentioned in the document WG8 SD2. The regular delegates are requested to register as TF2 members (through their national bodies) to get access to the TF2 documents.

## ADOPTION OF THE AGENDA

4. The agenda (document TF2 N835) was agreed with the following additions:
  - Type B CID,
  - Default tolerances,
  - Consideration on ISO/IEC 10373-6 tests.

## APPROVAL OF THE LAST MEETING MINUTES

5. The minutes of the forty-second TF2 meeting in Kochel am See (document TF2 N832) were approved.

## REVIEW OF AVAILABLE DOCUMENTS

6. The documents submitted before, during and just after this meeting were as follows:

|          |                                                                                                                                                                                                                                                    |                   |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| TF2 N832 | Minutes of the 42 <sup>nd</sup> meeting of WG8/TF2<br>Kochel am See, Germany – 28 <sup>th</sup> , 29 <sup>th</sup> and 30 <sup>th</sup> January 2014                                                                                               | (TF2 convener)    |
| TF2 N833 | WD ISO/IEC 14443-2/PDAM6 — Identification cards —<br>Contactless integrated circuit cards - Proximity cards —<br>Part 2: Radio frequency power and signal interface<br>AMENDMENT 6:<br>Parameters supporting active and passive PICC transmissions | (Project editor)  |
| TF2 N834 | Calling Notice for the 43 <sup>rd</sup> meeting of WG8/TF2<br>Neuchâtel, Switzerland – 7 <sup>th</sup> and 8 <sup>th</sup> April 2014                                                                                                              | (WG8 Secretariat) |
| TF2 N835 | Agenda of the 43 <sup>rd</sup> meeting of WG8/TF2<br>Neuchâtel, Switzerland – 7 <sup>th</sup> and 8 <sup>th</sup> April 2014                                                                                                                       | (TF2 convener)    |
| TF2 N836 | Considerations on 10373-6 tests for NFC devices                                                                                                                                                                                                    | (Novo Nordisk)    |

|          |                                                                                                                                                        |                  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| TF2 N837 | Liaison statement with regard to Type B CID                                                                                                            | (EMVCo)          |
| TF2 N838 | Phase drift analysis tool software                                                                                                                     | (Project editor) |
| TF2 N839 | S(PARAMETER) usage clarification -<br>The fundamental change of the smart card world due to<br>the introduction of S-Parameters                        | (NXP)            |
| TF2 N840 | WD ISO/IEC 10373-6/Amd.x — Identification cards —<br>Test methods — Part 6: Proximity cards —<br>AMENDMENT x:<br>Active and passive PICC transmissions | (Project editor) |
| TF2 N841 | Default tolerances                                                                                                                                     | (Micropross)     |
| TF2 N842 | Active Reference PICC power supply, over voltage protection                                                                                            | (Infineon)       |
| TF2 N843 | Application profile for the contactless interface of eMRTDs<br>and associated readers in ICAO 9303 part 10 v2                                          | (Germany)        |
| TF2 N844 | Class 6 PICC Load Modulation Amplitude                                                                                                                 | (Novo Nordisk)   |
| TF2 N845 | ISO/IEC 14443 Frame Delay Time misalignment                                                                                                            | (Novo Nordisk)   |
| TF2 N846 | PCD heating up instability                                                                                                                             | (Novo Nordisk)   |
| TF2 N847 | Resonance frequency test method                                                                                                                        | (Novo Nordisk)   |
| TF2 N848 | PICCs Resonance Measurement                                                                                                                            | (OTI)            |
| TF2 N849 | Phase drift analysis evaluation                                                                                                                        | (AMS)            |
| TF2 N850 | WD ISO/IEC 14443-1 — Identification cards —<br>Contactless integrated circuit cards —<br>Proximity cards — Part 1: Physical characteristics            | (Project editor) |

TF2 contributions should be submitted at least 2 weeks before TF2 meetings so that delegates can study them in advance.

#### PICCS WITH EXTERNAL POWER SUPPLY

7. The document TF2 N833 (proposed text for 2<sup>nd</sup> CD amendment to ISO/IEC 14443-2:2010) was reviewed. This document corresponds to the text agreed during previous TF2 meeting, with some additional minor corrections. This text is considered stable, and should be balloted as soon as corresponding test methods are ready for CD ballot.
8. The document TF2 N838 was presented by Michael Stark. The phase drift analysis tool was updated to take into account latest modifications of the document TF2 N833 and was tested with success.

The scripts of this tool are currently written in MATLAB<sup>®</sup> language. They may or may not be translated in C language before publication as:

- the normative description of the tool contains all necessary information,
- the program is in an informative subclause,
- automatic MATLAB to C translation tools usually give a non-optimized program,
- manual translation and verification is a time consuming process.

9. The document TF2 N840 (new WD amendment to ISO/IEC 10373-6) was presented by the project editor. The Reference PICC resonance frequency affects the ( $f_c+f_s$ ) amplitude / ( $f_c-f_s$ ) amplitude

ratio, which is useful when testing PCD reception. However, the Reference PICC quality factor may be very low when active transmission is used and the ratio variations may be limited. TF2 agreed that tests with resonance frequencies of 12 and 15 MHz should be mandatory while tests with resonance frequencies of 10 and 17 MHz should be optional.

**Action 1** The project editor will distribute an updated working draft of this amendment.

- 10.** The document TF2 N849 was presented by Maksimiljan Stiglic. Noise adds to load modulation amplitude in the phase drift analysis measurement setup, which increases the measured phase drift. When the load modulation amplitude is low, the measured phase drift can be up to three times higher than the real PICC phase drift.

The current filtering is the 4<sup>th</sup> order Butterworth type band pass filter with center frequency of 13,56 MHz and 15 MHz 3-dB bandwidth used in the PCD modulation index and waveform analysis tool for PCD bit rates bit rates of  $fc/8$ ,  $fc/4$  and  $fc/2$ . This filtering may not be sufficient for low PICC to PCD bit rates but seems suited to PICC to PCD bit rate of  $fc/2$ .

Besides, the noise floor precondition test defined for EMD tests had not been checked before this measurement.

**Action 2** Test a phase drift analysis tool filtering depending on the PICC to PCD bit rate.

**Action 3** Check the relevance of the EMD noise floor precondition test for phase drift measurements.

- 11.** The document TF2 N842 was presented by Josef Gruber. The currently proposed active Reference PICC circuitry uses 4 different power supply voltages. As two of them deliver a relatively low current, regulators could be added to use only a two-voltage power supply. Another solution is to use a three-voltage power supply to avoid a 19 V \* 20 mA dissipation.

Besides, the active modulation was successfully tested to produce similar results as passive modulation.

- 12.** Michael Stark then reminded the problems mentioned in the document TF2 N827 concerning the currently proposed active Reference PICC circuitry:

- the maximum load modulation amplitude (110 mV) cannot be produced in a high PCD field strength,
- Reference PICC resonance frequency and quality factor are significantly changed,
- there is a constant bias of 38 mA in the PICC antenna,
- R2 value at  $H_{min}$  is significantly changed and moved out of the defined range,
- the GND of passive circuitry is negative due to active circuitry.

The necessity to combine passive and active circuitry on the same Reference PICC was again discussed. If possible, the constant load of passive PICCs (using diodes) should be emulated by the new Reference PICC.

**Action 4** Improve the active Reference PICC circuitry to resolve the problems mentioned in the document TF2 N827 and to provide some constant loading emulating real passive PICCs.

13. It was therefore agreed that the WD amendment to ISO/IEC 10373-6 is not good enough to be balloted and that the proposed text for 2<sup>nd</sup> CD amendment to ISO/IEC 14443-2 should not be balloted without associated test methods.

#### **EMD REQUIREMENTS FOR CLASSES 2, 3, 4, 5 AND 6**

14. For classes 2 and 3, France proposed to use the same limit as for class 1, because the load modulation amplitude limits are similar and the same test PCD assembly is used, probably giving the same measurement noise. This proposal is the same as the one included in the document TF2 N791.

However, it was pointed out that, a PCD having a small antenna (e.g. "Class 2" size) will get more EMD from a "Class 2" PICC than from a "Class 1" PICC. Anyway, any PCD must pass EMD tests with all Reference PICCs.

Another possibility for classes 2 and 3 is to define a lower limit as the test PCD assembly will get less EMD from classes 2 and 3 PICCs using the same chip (thanks to a lower coupling with the sense coil). But it is important to know if the noise floor is compatible with this lower limit, even if the loading effect of Reference PICCs 2 and 3 on test PCD assembly 1 is lower.

**Action 5** Check the noise floor precondition test for classes 2 and 3, and compare noise floor measurements with Reference PICCs 1, 2 and 3.

15. For classes 4, 5 and 6, France proposed to keep a factor of approximately 10 between load modulation amplitude limits and EMD limits. This proposal is not the same as the one included in the document TF2 N791 which recommends higher EMD limits.

Similarly, it is important to know if the noise floor (measured with test PCD assembly 2) is compatible with these proposed limits.

**Action 6** Measure the noise floor with Reference PICCs 4, 5 and 6 on test PCD assembly 2 using the same equipment (oscilloscope, generator...) as with Reference PICCs 1, 2 and 3 on test PCD assembly 1.

**Action 7** A project editor is still needed for an amendment on this topic.

#### **TEST PLAN INCLUDING ALL PCD AND PICC REQUIREMENTS DEFINED IN ISO/IEC 14443**

16. Stéphane Jobard prepared a very first working draft of the test plan, using each "shall" relative to PCD requirements. He will distribute a more complete working draft before end of August 2014 for review during next TF2 meeting.

**Action 8** Stéphane Jobard will distribute a test plan working draft before end of August 2014.

#### **APPLICATION PROFILE TR-9303 - ISO/IEC 18745-2**

17. The document TF2 N843 was presented by Florian Peters. All new requirements in this document (especially EMD requirements) were discussed at length. Some interoperability tests may be needed before inclusion of new requirements in an applicable standard. The document will be reviewed during next WG8 before submission to WG3, probably by end of September.

## S(PARAMETER) USAGE CLARIFICATION

18. The document TF2 N839 was presented by Michael Stark. All clarifications were discussed and most of them were unanimously agreed, although some delegates were not convinced about a parameter change in the middle of chaining or if a new error needs to be defined.

**Action 9** A draft amendment to ISO/IEC 14443-4 (or a draft revision of this standard) for these clarifications will be prepared by a project editor (probably Reinhard Meindl).

## TYPE B CID

19. The document TF2 N837 was presented by David Main. The five questions were reviewed and given the following answers:

- Question 1: If the PICC did not advertise support for CID in its ATQB is it permitted to consider an ATTRIB command containing a CID<>0 as a protocol error? Or must it ignore the CID and return a CID of 0 in the ATTRIB response?

TF2 answer: It is a "protocol" error to be defined in ISO/IEC 14443-3 with the corresponding PICC response (no PICC response and no change of PICC state).

- Question 2: If the PICC did not advertise support for CID in its ATQB and it receives an ATTRIB command using CID=15 is it required to consider it a protocol error? Or must it ignore the CID and return a CID of 0 in the ATTRIB response?

TF2 answer: It is a "protocol" error to be defined in ISO/IEC 14443-3 with the corresponding PICC response (no PICC response and no change of PICC state).

- Question 3: If the PICC did advertise support for CID in its ATQB and the PCD specifies a valid CID (<> 0 & <> 15) in the ATTRIB command is the PICC permitted to return a CID of 0 in the ATTRIB response? If the PCD receives an ATTRIB response with CID = 0 should it treat the response as a protocol error?

TF2 answer: The PICC shall return the same CID; else the PCD shall treat the response as a protocol error.

- Question 4: If the PCD receives an ATTRIB response containing CID=15 should it consider it a protocol error?

TF2 answer: Yes, it is a protocol error as the CID returned is different from the CID sent.

- Question 5: If the PICC's ATTRIB response contains a CID value not equal to the CID specified in the ATTRIB command should it be treated as a protocol error?

TF2 answer: Yes it is a protocol error.

**Action 10** Clarifications on type B CID management to be included in either a new amendment or corrigendum of ISO/IEC 14443-3, or in ISO/IEC 14443-3:2011/DAM4 (Handling rules of RFU bits) currently under ballot.

**Action 11** Check whether a similar clarification on type A CID management is necessary.

## DEFAULT TOLERANCES

20. The document TF2 N841 was presented by Erwan Le Fer. It was agreed that the tolerances proposed in ISO/IEC 10373-6:2011/PDAM8 (Extension of PICC and PCD test methods) only apply when waveforms are generated with the test PCD assembly to test PICC reception. The accuracy of test tools used by test labs and the verdict to give when the test result is within the test tools error margin are already covered by ISO/IEC 17025 and need not be redefined by TF2.
21. Besides, the tolerance on timings proposed in ISO/IEC 10373-6:2011/PDAM8 (i.e.  $\pm 1/f_c$ ) may not be small enough when high bit rates waveforms are generated.

It was also acknowledged that ranges of R2 values for Reference PICCs 2 to 6 are missing for the alternating field test at  $4/3 H_{\max}$  in ISO/IEC 10373-6, 6.1.1.2.

**Action 12** Contributions to propose smaller tolerances on timings (probably depending on bit rate) when high bit rates waveforms are generated.

**Action 13** Contributions from as many experts as possible to give the actual R2 values of their Reference PICCs 2 to 6 calibrated for the alternating field test at  $4/3 H_{\max}$  so that a range can be defined during next TF2 and added in ISO/IEC 10373-6:2011/DAM8.

## CONSIDERATION ON ISO/IEC 10373-6 TESTS

22. Several technical contributions on this topic (documents TF2 N836, N844, N845, N846 and N847) were received but could not be addressed for lack of time. They are therefore postponed to next TF2 meeting.

## PATENTS

23. No patent was declared by any participant on topics which were presented and discussed during this TF2 meeting.

## ACTIONS FOR NEXT MEETING

24. See 9, 10, 12, 14, 15, 16, 18, 19 and 21.

## NEXT TF2 MEETINGS

25. The forty-fourth meeting will be held in Salamanca, Spain, in September 2014, on Tuesday 23<sup>rd</sup>, Wednesday 24<sup>th</sup> and Thursday 25<sup>th</sup>.
26. The forty-fifth meeting will be held in Hiroshima, Japan, in February 2015, on Monday 23<sup>rd</sup> and Tuesday 24<sup>th</sup>.
27. The forty-sixth meeting will be held in Vienna, Austria, in September 2015, on Monday 21<sup>st</sup> and Tuesday 22<sup>nd</sup>.

Distribution: WG8 and TF2 members  
Pascal ROUX