Minutes of the 38th meeting of WG8 Task Force 2

held at: Hotel Monteleone
214 Royal Street
New Orleans, Louisiana
USA

on: 24th and 25th September 2012

Participants:

Pascal ROUX	Convener
Reinhard MEINDL	Austria
Erich REISENHOFER	Austria
Michael STARK	Austria
Li GENG	China
Wenli LIU	China
Yuejun YU	China
Hao ZHOU	China
Pierre BENET	France
Franck BRICOUT	France
Jean-Paul CARUANA	France
Stéphane JOBARD	France
Michael HEGENBARTH	Germany
Florian PETERS	Germany
Peter RAGGAM	Germany
Uwe SCHNABEL	Germany
Hemy ITAY	Israel
Kenichi NAKAMURA	Japan
Hiroo SHIMIZU	Japan
Amos WAMBUA	Kenya
Maksimiljan STIGLIC	Slovenia
Chris STANFORD	UK
Terry SCHINDLER	USA

OPENING OF THE MEETING

1. The convener opened the thirty-eighth meeting of WG8 Task Force 2 by welcoming all the participants. He expressed special thanks to INCITS and the many sponsors for the organisation 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 on the WG8 website.

ADOPTION OF THE AGENDA

4. The agenda (document TF2 N752) was agreed with no addition.

APPROVAL OF THE LAST MEETING MINUTES

5. The minutes of the thirty-seventh TF2 meeting in Graz (document TF2 N748) were approved.

REVIEW OF AVAILABLE DOCUMENTS

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

TF2 N747	Calling Notice for the WG8/TF2 and WG8 meetings New Orleans, USA – 24th to 28th September 2012	(WG8 Secretariat)
TF2 N748	Minutes of the 37th meeting of WG8/TF2 Graz, Austria – 16th, 17th and 18th April 2011	(TF2 convener)
TF2 N749	Agenda of the 38th meeting of WG8/TF2 New Orleans, USA – 24th and 25th September 2012	(TF2 convener)
TF2 N750	RFU issues regarding ISO/IEC 14443-3 and 14443-4	(EMVCo)
TF2 N751	Agenda of the 38th meeting of WG8/TF2 (revision 1) New Orleans, USA – 24th and 25th September 2012	(TF2 convener)
TF2 N752	Agenda of the 38th meeting of WG8/TF2 (revision 2) New Orleans, USA – 24th and 25th September 2012	(TF2 convener)
TF2 N753	Analysis on the usage of RFU specifications in ISO/IEC 14443-3 and 14443-4	(Infineon)
TF2 N754	PICC Response Phase Drift Analysis and Measurement	(NXP)
TF2 N755	Current Structure of ISO/IEC 14443-2	(G&D)

TF2 N756	New structure for PICC to PCD communication in ISO/IEC 14443-2 including active transmission modes	(G&D, HID, Infineon)
TF2 N757	WD ISO/IEC 10373-6:2011/Amd.x — Identification cards — Test methods — Part 6: Proximity cards — AMENDMENT x: Frame with error correction	(Infineon)
TF2 N758	10373-6/FDAM1 — Additional PICC classes measurement proposal	(Micropross)

FRAME ERROR DETECTION AND CORRECTION – TEST METHODS

7. The document TF2 N757 was presented by Erich Reisenhofer. This proposed working draft was reviewed and edited, with the addition of scenarios with bit errors, and needs to be finalised.

8. For the PICC to PCD direction in Type B, the framing options may be negotiated both during bit rate negotiation using S(PARAMETERS) and during frame negotiation using S(PARAMETERS). The possible conflicts were discussed and it was agreed that there is no reason to look for another solution. Each time a framing option is negotiated, it will override the previous one. A clarification of possible use of framing options depending on type, bit rate, frame type and direction was summarized in the table below, to be added if possible as an informative annex in the amendment to ISO/IEC 14443-4:

Possible use of framing options:

Type	Bit rate	Standard frame		Frame with error correction	
		PCD to PICC	**PICC to PCD**	**PCD to PICC**	**PICC to PCD**
A	**<= fc/16**	No [a]	No [a]	No [a]	No [a]
	> fc/16	No [b]	No [a]	Yes	No [a]
B	**<= fc/16**	No [b]	Yes	Yes	Yes
	> fc/16	No [b]	Yes	Yes	Yes

[a] The frame format does not include SOF, EOF, start bits and stop bits.
[b] The standard frame PCD to PICC needs start bits and stop bits in case of long series of '00' or 'FF' bytes.

PICCS WITH EXTERNAL POWER SUPPLY

9. The document TF2 N754 (based on previous document TF2 N738) was presented by Michael Stark. The proposed phase drift limit is ± 30° as existing passive PICCs have a slight phase variation (movement, start of the load modulation…). The proposed limit for the bits positions is ± 0,1 etu.

The measurement method should use the test PCD assembly calibration coil as a synchronous reference to measure the PICC phase drift and bit position. The Discrete Fourier and the Hilbert transformations methods can be used for theoretical signals but the Hilbert transformation does not seem as robust and accurate as the DFT for real PICC signals.

10. The document TF2 N755 was presented by Peter Raggam on behalf of Klaus Finkenzeller. A new arrangement of the subclauses order is proposed to define the active load modulation. This new arrangement was not agreed by TF2.

11. The document TF2 N756 was presented by Peter Raggam and the proposed requirements were discussed in detail.

The initial phase of an "active" PICC field should look like the one of a passive PICC. A value of $90° \pm 30°$ or $90° \pm 60°$ or $90° \pm 90°$ (physical principle of passive PICC) was proposed.

Taking into account the $90° \pm 90°$ limit and the proposed $\pm 30°$ phase drift, the following consensus was agreed by TF2 regarding the field generated by the PICC.

- the instantaneous amplitude and phase of the field generated by the PICC will be measured during the whole frame, when the PICC is transmitting (half bits in OOK-Manchester, full bits in BPSK-NRZ), both during state 1 (called "loaded state" in published ISO/IEC 14443) and state 2 of the subcarrier

  NOTE 1   State 1 is the first half and state 2 is the second half of a (non-inverted) subcarrier period

  NOTE 2   State 2 phase is considered only if state 2 amplitude is at least 0,1 times the LMA limit

- during the whole frame:

  - the amplitude of the field generated by the PICC during state 1 of the subcarrier shall always be above 0,3 times the PICC LMA limit once converted in mV by the DFT program

  - the phase of the field generated by the PICC during state 1 of the subcarrier shall always be both:

    - between -180° and 0° relative to the operating field generated by the PCD

    - between 30° and +30° relative to the initial phase of the field generated by the PICC

  - the PICC LMA shall be above the limit defined in 14443-2 and shall not exceed 100 mV

- a warning will indicate that the -180° to 0° limit comes from physical limitations of passive PICCs and may be removed in future revisions of the standard

- when the subcarrier starts (e.g. TR1 or first bit or SOC period), it shall start with state 1.

12. The following actions were agreed:

Action 1 Contributions to propose attenuation factors (Kin and Kout) fur µSD and other formats

Action 2 Contributions about the proposed maximum PICC load modulation limit (100 mV):

- Should this limit be consistent with other contactless specifications (e.g. EMVCo)?

- Should this limit depend on the field strength?

- Which problems are expected in PCDs?

- What is the necessary dynamics for mobile phones? (as each mobile phone has a different attenuation, which increases the dynamics and may require a high enough limit)

13. The test methods for PICC active modulation were not discussed for lack of time and are postponed to next TF2 meeting.

Action 3 Contributions to propose test methods for PICC active modulation

IMPROVEMENT OF PICC AND PCD TESTS IN ISO/IEC 10373-6, ANNEXES G AND H

14. Although the working draft document was partly ready for discussion, this topic could not be discussed for lack of time.

   Action 4 The working draft document will be finalised by Stéphane Jobard.

RFU VALUES AND MEANINGS IN WG8 STANDARDS

15. The document TF2 N750 was quickly reviewed by TF2 and the document TF2 N753 was not presented for lack of time. Discussions on RFU values and meanings will continue during next TF2 meeting.

DEFINITION OF PCD HMAX TEST IN ISO/IEC 10373-6

16. The document TF2 N758 was presented by Pascal Roux on behalf of Olivier Conet. It is proposed that the PCD H_{max} test use the six Reference PICCs, each one having the minimum possible loading effect, to guarantee that any real PICC will not be exposed to a field strength higher than H_{max}. in the PCD operating volume.

Two proposals were discussed for the PCD H_{max} test:
   - either loaded tests (e.g. with Reference PICCs tuned to 19 MHz and adjusted to 3 V),
   - or unloaded tests (with calibration coils).

The first proposal (used today with "Class 1") is not totally safe as some PICCs may have a lower loading effect. The second proposal is safer but has the disadvantage of reducing the PCD operating volume by reducing the maximum allowed field strength, depending on the PCD antenna Q factor.

The following PCD H_{max} test method proposal, to be repeated with each Reference PICC, was agreed by TF2:
   - measurement of the loaded PCD maximum field strength test, with the Reference PICC (adjusted to 3 V @ 19 MHz),
   - each loaded PCD maximum field strength shall not exceed the limit defined in ISO/IEC 14443-2 for the corresponding Reference PICC,
   - measurement of the ratio between the loaded and the unloaded PCD maximum field strength:
      - either with a small pickup coil placed very close to the PCD antenna to see the influence of the Reference PICC when placed at the loaded PCD maximum field strength position,
      - or with the pickup coil of the Reference PICC to see the influence of the disconnection of the main coil of the Reference PICC (a mean to disconnect the main coil is then needed),
   - each ratio between loaded and unloaded PCD maximum field strength shall not exceed a value to be defined (e.g. 1,5).

Action 5 Measure the worst case ratio between loaded and unloaded maximum PCD field strength with each Reference PICC (by either method defined above to see the maximum influence of the 6 Reference PICCs when placed in the operating volume)

The corresponding PICC H_{max} test method proposal was agreed by TF2:

- measurement of the PICC minimum loading effect at H_{max} (by substitution with the corresponding Reference PICC, like the H_{min} loading effect test):

   - if the PICC loading effect if larger than or equal to the corresponding Reference PICC loading effect then no additional PICC test is needed (i.e. PICC H_{max} is the value defined in ISO/IEC 14443-2 for the PICC class and corresponds to PCD "loaded H_{max}"),

   - else the PICC shall be tested from PICC H_{min} to an extended PICC H_{max} (the extended PICC H_{max} depends on the PICC loading effect by a simple linear formula to be defined

Action 6 Check if the extended PICC H_{max} formula should be linear by testing some PCDs with Reference PICCs having different loads between 3 V and no load, and placed in the maximum coupling position

Action 7 Propose a formula to extend the load modulation and EMD requirements (one option is to extend the existing formulas; another option is to use the value corresponding to H_{max} in the "H_{max} - Extended H_{max}" field strength range)

17. The tolerance on R2 values for H_{min} defined in Table 3 of ISO/IEC 10373-6:2011/Amd.1:2012 may be too strict.

Action 8 Check R2 value for the 6 Reference PICCs, especially Reference PICC 6

TEST PLAN INCLUDING ALL PCD AND PICCS REQUIREMENTS DEFINED IN ISO/IEC 14443

18. TF2 agreed to work on this topic with the goal to write either a technical report or an annex to ISO/IEC 10373-6. It is expected that this generic test plan will be referenced by the eMRTD test plan and other applicative test plans.

Action 9 Contributions to progress on this topic and finalize the test plan during next TF2 meeting

PATENTS

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

ACTIONS FOR NEXT MEETING

20. See 12, 13, 14, 16, 17 and 18.

NEXT TF2 MEETINGS

21. The thirty-ninth meeting will be held in Paris, France, in January 2013, on Monday 28th, Tuesday 29th and Wednesday 30th.

The fortieth meeting will be held in Tokyo, Japan, in June 2013, from Monday 3rd.

The forty-first meeting will be held in Singapore, in September 2013, from Monday 23rd.

Distribution: WG8 and TF2 members

Pascal ROUX