TETRA ASSOCIATION

ISCTI

TETRA Interoperability Certificate

Cassidian, Tetra System Rel 6.0, SwMI – Teltronic, TRM-300, Terminal

Helsinki, February 2011

Latest Certified SwMI SW Release:	6.0	**Latest Certified Terminal SW Release:**	v07
Latest Certified SwMI HW Release:	M98F (DXTip)	**Latest Certified Terminal HW Release:**	CCP30.03

ISCTI (Istituto Superiore delle Comunicazioni e delle Tecnologie dell'Informazione) certifies, that the Cassidian, Tetra System Rel 6.0, SwMI and the Teltronic, TRM-300, terminal have been subject to interoperability testing for the "certified" features listed on second page of this certificate, in accordance with the TETRA Interoperability Profiles, TIP compliance Test Plan and related TETRA interoperability requirement tables.

The table lists all the available TETRA interoperability profiles, and summarizes the main functionalities of every profile according to the TETRA interoperability requirement tables.

A feature is **"Certified"** when it has been successfully tested during the last test session with one of the testing method described in the TETRA process document part 1 (TPD001).

A breakdown into the feature details is given in the Feature Compliance Overview section of this certificate.

Detailed test results and explanation about the procedure used to provide verdicts are listed in the Test Report associated to this Certificate.

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v 02

Certified features

Tetra Association TTR001-01:Core	
Registration	Certified
Group Management	Certified
Group call	-
Individual call	-
Status messages	Certified
Pre-emptive Priority Call	-
Emergency Call	-
Cell Re-selection	Certified
PSTN interconnect	-
MS-ISDN Numbering	Certified
In Call Signalling	-
Subscriber Class Procedures	Certified
Common Secondary Control Channels	Certified
BS Fallback Operation	Certified
Energy Economy Mode	-
Transmit Inhibit	Certified
Mixed band operation	Certified
Tetra Association TTR001-02:SDS	
SDS Type 1, 2 or 3	Certified
SDS-TL	Certified
Store and Forward	-
Tetra Association TTR001-03:DGNA	
Support for individually addressed DGNA	Certified
Support for group addressed DGNA	-
Tolerance of unsupported DGNA functions	-
Tetra Association TTR001-04:Auth	

SwMI Initiated (non-mutual) Authentication	Certified
SwMI Initiated Authentication made Mutual by MS	Certified
TEI Query	-
Tetra Association TTR001-05:PD	
Context Management	Certified
Single Slot Packet Data	Certified
Multi Slot Packet Data	-
TEDS	-
Mixed band operation	Certified
Tetra Association TTR001-11:AIE	
Security Class 2 Air Interface Encryption	-
Security Class 3 Air Interface Encryption	Certified
Security Class 3G Air Interface Encryption	-
Change of CMG and GSKO	-
Key Status demand	-
Change of Security Class for Fallback operation	Certified
Change of Security Class (other than for Fallback operation)	-
Key Management for Secure Direct Mode Operation	-
Tetra Association TTR001-13:ED	
Enable and temporary disable of an MS	Certified
Permanent disable of an MS	Certified
Tetra Association TTR001-19:LIP	
Location Information Protocol	Certified

Feature Compliance Overview

The first pages of this certificate provide an indication about the main interoperable TETRA features for each TIP specification (as described in the TIC-RT). The main interoperable TETRA features result depend on a set of sub-feature, the verdicts associated to each sub-feature are directly derived from the analysis of the performed test cases.
The results associated to each feature and sub-feature are shown in the "Feature compliance report" table below. The main features are indicated with grey background and the associated sub-features (or second level features) have white background.

The verdict assigned to a sub-feature as shown on page 2, is derived by the Feature compliance report tables.

Verdict	Definition
Certified	All required tests have been performed and passed
Partial	Not all the required tests have been performed but none have failed
–	Feature cannot be certified e.g. it is not supported by at least one product, no tests were performed, or some tests were performed but at least one failed

The verdict assigned to a sub feature is the result of an analysis of the test case results listed in the Test Report. The verdict assigned to each sub-feature is derived from one or several test case results or test steps result, the TETRA Interoperability requirement tables (TIC-RTs) indicate the link between sub-features and test cases for the certified set of equipment capabilities (see Test Report)

Verdict	Definition
Passed (note x)	All mandated tests or steps of tests linked to this functionality (as per TIC-RT indication) are compliant with the TIP specification relevant to this feature. A note can be associated to this result, if further clarification on the behaviour of the equipment is needed
Time_limited	Not all Mandated tests (as per TIC-RT indication) have been executed (ran out of time)

The verdict associated to the feature gives also indication about the method used to test that feature. The allowed testing Methods are listed in the table below, a complete description of the procedures and constraints associated to each of them can be found in the "TPD001 TETRA Interoperability Certification Process Description" document.

Testing Method	Description
Complete	All mandated tests associated to the feature have been executed
Spot	Only a selection of the mandatory test cases associated to the feature has been executed during the test session. These tests are a subset of the tests performed on an equivalent software which has been "completely" tested against the same functionality on a different equipment, see manufacturer declaration in annex A
Regression	Only a selection of the mandatory test cases associated to the feature has been executed during the test session. These tests are a subset of the tests performed on a previous version of the same software which has been "completely" tested in a previous test session against the same functionality, see manufacturer definition in annex A
Regression on spot	The regression method has been applied on the verdicts based on the spot testing method

Depending on equipment capabilities declared by the manufacturer, some features or sub features cannot be tested. The following table describes meaning of the used abbreviation

Indication	Definition
Not Supported	The SwMI and/or MS do not support the minimum features required to verify these items.

ISCTI has made every effort to ensure that every result has been correctly evaluated in accordance with the relevant TIPs, Test Plans and TIC-RTs. ISCTI has no liability for the test results, or towards the manufacturers,

The table on the following page lists HW and SW releases of SwMI and Terminal under test in the last four test sessions and the used TIP specifications, Test Plans and TIC-RTs

This Certificate and Certificates from previous test sessions are available on the TETRA Association web site (http://www.tetra-association.com/tetramou.aspx?&id=2636).

The feature results are shown in the tables below

Information on equipment under test and document references

Test Session Date/Place	Cassidian Helsinki February 2011	EADS Helsinki October 2008		
SwMI Type	Tetra System Rel 6.0	TETRA System Rel 5.5		
SwMI HW Release	M98F (DXTip)	M98F(DXTip) Rel 5.5		
SwMI SW Release	6.0	W5 15.2-0		
Terminal Type	TRM-300	TRM-300		
Terminal HW Release	CCP30.03	CCP00.03		
Terminal SW Release	v07	V04.03.00		
TIP Specs and TIP Compliance Test Plans				
Core	TTR001-01 v5.1.1 IOP001-01 v2.6.4 TIC-RT001-01 v251	TTR001-01 v500 IOP001-01 v260 TIC-RT001-01 v233		
SDS	TTR001-02 v2.0.1 IOP001-02 v2.0.0 TIC-RT001-02 v211	TTR001-02 v201 IOP001-02 v200 TIC-RT001-02 v206		
DGNA	TTR001-03 v2.0.0 IOP001-03 v2.0.1 TIC-RT001-03 v218	TTR001-03 v200 IOP001-03 v201 TIC-RT001-03 v211		
Auth	TTR001-04 v3.0.0 IOP001-04 v2.0.0 TIC-RT001-04 v222	TTR001-04 v300 IOP001-04 v200 TIC-RT001-04 v216		
PD	TTR001-05 v3.0.0 IOP001-05 v3.0.2 TIC-RT001-05 v300	TTR001-05 v200 IOP001-05 v200 TIC-RT001-05 v224		

AIE	TTR001-11 v3.0.3 IOP001-11 v3.0.2 TIC-RT001-11 v316	TTR001-11 v300 IOP001-11 v300 TIC-RT001-11 v308		
ED	TTR001-13 v2.0.0 IOP001-13 v1.0.0 TIC-RT001-13 v145	Not Tested		
LIP	TTR001-19 v1.0.0 IOP001-19 v1.0.0 TIC-RT001-19 v102	Not Tested		

Feature compliance report

Test Session	Cassidian Helsinki February 2011	EADS Helsinki October 2008		
Core				
Registration	PASSED Spot 1_pass_of_3	PASSED Spot 2_pass_of_3		
ITSI attach	Spot 0_pass_of_1	PASSED Complete 1_pass_of_1		
SwMI initiated location updating	PASSED Complete 1_pass_of_1	Spot 0_pass_of_1		
LA timer based Periodic location updating	Not Supported	Not supported		
De-registration	Spot 0_pass_of_1	PASSED Complete 1_pass_of_1		
Group Management	PASSED Spot 3_pass_of_11	FAILED Spot 4_pass_of_9		
Single group attachment	PASSED Spot 1_pass_of_4	PASSED Complete 2_pass_of_2		
Multiple group attachment	PASSED Spot 1_pass_of_6	PASSED Spot 1_pass_of_4		
MS initiated group detachment	PASSED Spot 1_pass_of_2	PASSED Complete 1_pass_of_1		
SwMI initiated group management	PASSED Complete 1_pass_of_1	FAILED Complete 0_pass_of_2		
Group call				
Normal group call	Not Supported	Not Supported		
Late entry	Not Supported	Not Supported		
Priority Group scanning	Not Supported	Not Supported		
Call setup modifications	Not Supported	Not Supported		
Resource Queuing based on Call Priority	Not Supported	Not Supported		
Broadcast Call	Not Supported	-		

Limited coverage notification	Not Supported	-		
Individual call				
Simplex individual call	Not Supported	Not Supported		
Duplex individual call	Not Supported	Not Supported		
Call setup modifications	Not Supported	Not Supported		
Resource Queuing based on Call Priority	Not Supported	Not Supported		
Indication of imminent call disconnection	Not Supported	Not Supported		
Status messages	PASSED Spot 1_pass_of_4	PASSED Spot 2_pass_of_4		
Individual addressed Status transfer	Spot 0_pass_of_1	PASSED Complete 1_pass_of_1		
Group addressed Status transfer	PASSED Spot 1_pass_of_3	PASSED Spot 1_pass_of_3		
Pre-emptive Priority Call				
Pre-emption of Resources	Not Supported	Not Supported		
Pre-emption of Busy Users	Not Supported	Not Supported		
Emergency Call				
Pre-emption of Resources	Not Supported	Not Supported		
Pre-emption of Busy Users	Not Supported	Not Supported		
Call setup modifications	Not Supported	Not Supported		
Call disconnection by non-call owner	Not Supported	-		
Cell Re-selection	PASSED Complete 1_pass_of_1	PASSED Complete		
Undeclared	PASSED Complete 1_pass_of_1	PASSED Complete		
Unannounced	Not Supported	Not supported		
Announced - with Call Restoration	Not Supported	Not supported		
Announced - without Call Restoration	Not Supported	Not supported		
Expedited	Not Supported	-		
PSTN interconnect				
TETRA Originated Call	Not Supported	Not Supported		
PSTN Originated Call	Not Supported	Not Supported		
DTMF over-dial	Not Supported	Not Supported		
Emergency Telephone Calls	Not Supported	Not Supported		
MS-ISDN Numbering	PASSED Spot 1_pass_of_2	PASSED Complete		
MS ISDN - Voice Call	Not Supported	Not supported		
MS-ISDN Status	PASSED Spot 1_pass_of_2	PASSED Complete		
In Call Signalling				
Slow Signalling on Traffic Channel (SACCH)	Not Supported	Not Supported		

Fast Signalling on Traffic Channel (FACCH)	Not Supported	Not Supported		
Subscriber Class Procedures	PASSED Spot 1_pass_of_3	FAILED Complete 2_pass_of_3		
Cell Selection based on Subscriber Class	PASSED Spot 1_pass_of_2	PASSED Complete 2_pass_of_2		
Subscriber Class Delivery during Location Update	Spot 0_pass_of_1	FAILED Complete 0_pass_of_1		
Use of Preferred Subscriber Classes	Not Supported	Not supported		
Common Secondary Control Channels	PASSED Spot 1_pass_of_7			
One C-SCCH per cell	Spot 0_pass_of_4	Not Supported		
Two C-SCCH per cell	PASSED Spot 1_pass_of_3	Not Supported		
Three C-SCCH per cell	Spot 0_pass_of_2	Not Supported		
BS Fallback Operation	PASSED Spot 1_pass_of_6	PASSED Complete		
Switch to/from BS Fallback Operation	PASSED Spot 1_pass_of_2	PASSED Complete		
Roaming with BS Fallback Operation	Spot 0_pass_of_2	PASSED Complete		
Services with BS Fallback Operation	Spot 0_pass_of_2	PASSED Complete		
Energy Economy Mode				
Energy Economy Mode Operation	Not Supported	Not Supported		
Transmit Inhibit	PASSED Spot 1_pass_of_7			
TXI Activation & De-Activation without Status message	Spot 0_pass_of_2	Not Supported		
TXI Activation & De-Activation with Status message	PASSED Spot 1_pass_of_3	Not Supported		
Receipt of group addressed service during TXI	Spot 0_pass_of_2	Not Supported		
Mixed band operation	PASSED Complete 1_pass_of_1			
Mixed band operation, inter-cell	PASSED Complete 1_pass_of_1	-		
Mixed band operation, intra-cell	Not Supported	-		
Mixed band operation, Full	PASSED Complete 1_pass_of_1	-		

Short Data Service (SDS)				
SDS Type 1, 2 or 3	PASSED Spot 1_pass_of_3	Spot 0_pass_of_3		
SDS Type 1	Spot 0_pass_of_1	Spot 0_pass_of_1		
SDS Type 2	Spot 0_pass_of_1	Spot 0_pass_of_1		
SDS Type 3	PASSED Complete 1_pass_of_1	Spot 0_pass_of_1		
SDS-TL	PASSED Spot 3_pass_of_8	PASSED Spot 2_pass_of_6		
Individually Addressed	PASSED Complete 1_pass_of_1	PASSED Complete 1_pass_of_1		
Group Addressed	Spot 0_pass_of_2	Spot 0_pass_of_2		
Using MS-ISDN dialling	PASSED Spot 1_pass_of_3	PASSED Spot 1_pass_of_3		
Using UCS2 coding scheme	PASSED Spot 1_pass_of_2	Not supported		
Using 7-bit coding scheme	PASSED Spot 1_pass_of_2	PASSED Spot 0_pass_of_1		
Store and Forward				
Individually Addressed	Not Supported	Not Supported		
Group Addressed	Not Supported	Not Supported		
DGNA				
Support for individually addressed DGNA	PASSED Spot 1_pass_of_4	PASSED Spot 1_pass_of_4		
Support for individually addressed DGNA assignment without attachment	Not Supported	Not supported		
Support for individually addressed DGNA assignment with attachment as selected group	Not Supported	Not supported		
Support for individually addressed DGNA assignment with attachment as scanned group	PASSED Spot 1_pass_of_3	PASSED Spot 1_pass_of_3		
Support for individually addressed DGNA assignment with rejected attachment	Spot 0_pass_of_1	Spot 0_pass_of_1		
Support for individually addressed assigment for pre-programmed group	Not Supported	Not supported		
Support for group addressed DGNA				
Support for group addressed DGNA assignment	Not Supported	Not Supported		

Management of 'group assignment lifetime'	Not Supported	Not Supported		
Support for group addressed DGNA deassignment	Not Supported	Not Supported		
Tolerance of unsupported DGNA functions				
MS tolerance of unsupported individual addressed DGNA signalling	Not Supported	Not Supported		
MS tolerance of unsupported group addressed DGNA signalling	Not Supported	Not Supported		
Authentication				
SwMI Initiated (non-mutual) Authentication	PASSED Spot 1_pass_of_3	Spot 0_pass_of_3		
Attach with authentication	Spot 0_pass_of_1	Spot 0_pass_of_1		
Roaming with authentication	PASSED Complete 1_pass_of_1	Spot 0_pass_of_1		
SwMI rejects MS during authentication	Spot 0_pass_of_1	Spot 0_pass_of_1		
MS rejects SwMI during authentication	Not Supported	Not supported		
SwMI Initiated Authentication made Mutual by MS	PASSED Spot 1_pass_of_2	PASSED Complete		
Attach with authentication	Spot 0_pass_of_1	PASSED Complete		
Roaming with authentication	PASSED Complete 1_pass_of_1	PASSED Complete		
TEI Query				
TEI Query Operation	Not Supported	Not Supported		
TETRA Packet Data				
Context Management	PASSED Spot 2_pass_of_9	PASSED Spot 3_pass_of_9		
Context Activation	PASSED Spot 1_pass_of_7	PASSED Spot 2_pass_of_7		
User authentication	PASSED Spot 1_pass_of_2	PASSED Spot 1_pass_of_2		
Single Slot Packet Data	PASSED Spot 4_pass_of_10	PASSED Spot 4_pass_of_10		
Data Transfer	PASSED Spot 2_pass_of_7	PASSED Spot 2_pass_of_7		
Cell re-selection	PASSED Spot 2_pass_of_3	PASSED Spot 2_pass_of_3		

Multi Slot Packet Data				
Data Transfer	Not Supported	Not Supported		
TEDS				
TEDS with Context Activation	Not Supported	-		
TEDS Data Transmission	Not Supported	-		
TEDS Cell Reselection	Not Supported	-		
Mixed band operation	PASSED Complete 3_pass_of_3			
Mixed band operation, inter-cell	PASSED Complete 3_pass_of_3	-		
Mixed band operation, intra-cell	Not Supported	-		
Mixed band operation, Full	Not Supported	-		
Air Interface Encryption				
Security Class 2 Air Interface Encryption				
Location Updating and AI Signalling Protection	Not Supported	Not Supported		
TM-SCK provisioning during location updating	Not Supported	Not Supported		
Communications between parties using encryption	Not Supported	Not Supported		
Communications between clear and encrypted parties	Not Supported	Not Supported		
Communications between encrypted parties on a channel designated to operate in clear	Not Supported	Not Supported		
OTAR and Change of TM-SCK	Not Supported	Not Supported		
Packet Data with Class 2 Air Interface Encryption	Not Supported	Not Supported		
Security Class 3 Air Interface Encryption	PASSED Spot 1_pass_of_6	Time_Limited 6_pass_of_7		
Location Updating and AI Signalling Protection	PASSED Spot 1_pass_of_5	Time_Limited 4_pass_of_5		
DCK Forwarding at MS request	Spot 0_pass_of_2	PASSED Complete 2_pass_of_2		
DCK Forwarding by SwMI (without MS request)	Not Supported	Not supported		
DCK Retrieval	Not Supported	Not supported		
CCK provisioning during location updating	PASSED Spot 1_pass_of_3	PASSED Complete 3_pass_of_3		
Communications between parties using encryption	Not Supported	Not supported		

Communications between clear and encrypted parties	Not Supported	Not supported		
Communications between encrypted parties on a channel designated to operate in clear	Not Supported	PASSED Complete 2_pass_of_2		
OTAR and Change of CCK	Not Supported	Not supported		
Packet Data with Class 3 Air Interface Encryption	Spot 0_pass_of_1	-		
Security Class 3G Air Interface Encryption				
GCK Key Association setting	Not Supported	Not Supported		
Communications between parties using encryption	Not Supported	Not Supported		
Communications between clear and encrypted parties	Not Supported	Not Supported		
OTAR and Change of GCK	Not Supported	Not Supported		
Change of CMG and GSKO				
OTAR and change of CMG and GSKO	Not Supported	Not Supported		
Key Status demand				
SCK Key Status demand	Not Supported	Not Supported		
GCK Key Status demand	Not Supported	Not Supported		
GSKO Key Status demand	Not Supported	Not Supported		
Change of Security Class for Fallback operation	PASSED Spot 1_pass_of_3			
Seamless change to Security Class 2 for BS Fallback operation	Not Supported	Not Supported		
Non-seamless change to Security Class 2 for BS Fallback operation	PASSED Spot 1_pass_of_3	Not Supported		
Provisioning of TM-SCK for fallback to Security Class 2 operation	Not Supported	Not Supported		
Change to Security Class 1 for BS Fallback operation	Not Supported	Not Supported		
Change of Security Class (other than for Fallback operation)				
Change between Security Class 3 and Security Class 3G	Not Supported	Not Supported		
Change between Security Class 2 and Security Class 3	Not Supported	Not Supported		
Change from Security Class 3G to Security Class 2	Not Supported	Not Supported		
Key Management for Secure Direct Mode Operation				
OTAR and change of DM-SCK	Not Supported	Not Supported		

Enable Disable				
Enable and temporary disable of an MS	PASSED Spot 2_pass_of_5			
Enable and temporary disable of an MS without authentication	Not Supported	-		
Enable and temporary disable of an MS with authentication	PASSED Spot 1_pass_of_2	-		
Registration of a temporary disabled MS	Spot 0_pass_of_2	-		
Rejection of applicable invalid enable/disable requests	Not Supported	-		
Removable SIMs do not affect the subscriber or equipment that has been enabled/disabled	Not Supported	-		
Disabling of an MS during a call or while on the PDCH	PASSED Complete 1_pass_of_1	-		
Permanent disable of an MS	PASSED Spot 1_pass_of_2			
Permanent disable of an MS with authentication	PASSED Complete 1_pass_of_1	-		
Permanently Disabled MS cannot send air interface signalling	Spot 0_pass_of_1	-		
LIP				
Location Information Protocol	PASSED Spot 4_pass_of_12			
LIP over SDS	PASSED Spot 2_pass_of_7	-		
LIP over Packet Data	Not Supported	-		
Time based reporting	PASSED Spot 1_pass_of_3	-		
Distance based reporting - NOT TESTABLE	Not Supported	-		
Reporting using Long reports	Not Supported	-		
Reporting Enable & Disable	PASSED Spot 1_pass_of_2	-		
Temporary reporting control	PASSED Complete 1_pass_of_1	-		
Trigger modification	Not Supported	-		
Immediate Location Reporting	Spot 0_pass_of_1	-		

Reporting Lifetimes	Not Supported	-		
Error Reporting	Spot 0_pass_of_1	-		

Annex A

SoC Spot test request TRM-300

TETRA MoU
IOP Testing and Certification

Statement of Commonality – 23/12/10

Reference identifier	Software Release	Hardware Release
HTT-500	v07	CCP00.03

The following products are equivalent with the reference for TETRA IOP testing purposes:

Product identifier	Software Release	Hardware Release
TRM-300	v07	CCP30.03

We declare that the products behaviour is equivalent with the reference and they will reach same test results as the reference. We acknowledge the shared liability of the incurred cost should the results show otherwise.

We therefore request spot testing of the above mentioned products during the official IOP test session at Helsinki, February'2011, Cassidian, where full testing of the reference will be performed.

Functionalities to be spot tested are listed in the relevant TIC-RT declaration.

For and on behalf of

Reference
Teltronic S.A.U.

Products
Teltronic S.A.U.

Authorised signatories: David Gómez
Date and place: Zaragoza, 23/12/10

Guidance information for the TETRA Certification body

The reference and the products are common in following terms

<Products are equal to the reference for the protocol stack, the radio application software and the hardware; differences are in the casing, the display and keypad, the RF hardware and the antenna>

Annex B

List of Revisions of the Certificate

Date	Ver.	Modification
3 August 2011	1	First published version
5 September 2011	2	updating: - change regarding the version number of the LIP TIC-RT reported in TIP summary.

IOP Test Engineer

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