TETRA ASSOCIATION

ISCTI

TETRA Interoperability Certificate

Teltronic, NEBULA, SwMI –
Motorola, TCR1000, Terminal

Zaragoza, March 2010

Latest Certified SwMI SW Release:	09.15.50	**Latest Certified Terminal SW Release:**	MR9.6.3
Latest Certified SwMI HW Release:	09.15.13.18	**Latest Certified Terminal HW Release:**	PT919S

ISCOM (Istituto Superiore della Comunicazioni e delle Tecnologie dell'Informazione) certifies, that the Teltronic, NEBULA, SwMI and the Motorola, TCR1000, terminal have been subject to interoperability testing for the "certified" features listed on the second page of this certificate. In accordance with the TETRA Interoperability Profiles, TIP compliance Test Plan and the related TETRA interoperability requirement tables.
The table lists all the available TETRA interoperability profiles, and summarises 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 the Certificate.

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Certified features

Tetra Association TTR001-01:Core	
Registration	Certified
Group Management	Certified
Group call	Certified
Individual call	-
Status messages	-
Pre-emptive Priority Call	Certified
Emergency Call	Certified
Cell Re-selection	Certified
PSTN interconnect	-
MS-ISDN Numbering	-
In Call Signalling	-
Subscriber Class Procedures	-
Common Secondary Control Channels	-
BS Fallback Operation	Certified
Energy Economy Mode	-
Transmit Inhibit	Certified
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 TTR001-09:AL	
Ambience Listening	Certified

Interaction with Transmit Inhibit	Partial
Tetra Association TTR001-10:E2EE	
E2EE Voice Call	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	-
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

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 (notex)	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
SwMI-nr MS-nr	The SwMI and MS do not support the minimum features required to verify these items.
SwMI-nr	The SwMI does not support the minimum features required to verify these items.
MS-nr	The MS does not support the minimum features required to verify these items.

ISCOM has made every effort to ensure that every result has been correctly evaluated in accordance with the relevant TIPs, Test Plans and TIC-RTs. ISCOM 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	**Teltronic, Zaragoza, March 2010**			
SwMI Type	NEBULA			
SwMI HW Release	09.15.13.18			
SwMI SW Release	09.15.50			
Terminal Type	TCR1000			
Terminal HW Release	PT919S			
Terminal SW Release	MR9.6.3			
TIP Specs and TIP Compliance Test Plans				
Core	TTR001-01 v5.1.1 IOP001-01 v2.6.0 TIC-RT001-01 v242			
DGNA	TTR001-03 v2.0.0 IOP001-03 v2.0.1 TIC-RT001-03 v216			
Auth	TTR001-04 v3.0.0 IOP001-04 v2.0.0 TIC-RT001-04 v219			
AL	TTR001-09 v2.0.0 IOP001-09 v1.1.0 TIC-RT001-09 v118			

E2EE	TTR001-10 v2.0.0 IOP001-10 v1.1.0 TIC-RT001-10 v117			
AIE	TTR001-11 v3.0.0 IOP001-11 v3.0.0 TIC-RT001-11 v3015			
ED	TTR001-13 v2.0.0 IOP001-13 v1.0.0 TIC-RT001-13 v140			

Feature compliance report

Test Session	**Teltronic, Zaragoza, March 2010**			
Core				
Registration	PASSED Complete 3_pass_of_3			
ITSI attach	PASSED Complete 1_pass_of_1			
SwMI initiated location updating	PASSED Complete 1_pass_of_1			
LA timer based Periodic location updating	Not Supported			
De-registration	PASSED Complete 1_pass_of_1			
Group Management	PASSED Complete 3_pass_of_3			
Single group attachment	PASSED Complete 2_pass_of_2			
Multiple group attachment	Not Supported			
MS initiated group detachment	PASSED Complete 1_pass_of_1			
SwMI initiated group management	Not Supported			
Group call	PASSED Complete 8_pass_of_8			
Normal group call	PASSED Complete 4_pass_of_4			
Late entry	PASSED Complete 1_pass_of_1			
Priority Group scanning	Not Supported			

Call setup modifications	PASSED Complete 1_pass_of_1			
Resource Queuing based on Call Priority	PASSED Complete 2_pass_of_2			
Broadcast Call	Not Supported			
Limited coverage notification	Not Supported			
Individual call				
Simplex individual call	Not Supported			
Duplex individual call	Not Supported			
Call setup modifications	Not Supported			
Resource Queuing based on Call Priority	Not Supported			
Indication of imminent call disconnection	Not Supported			
Status messages				
Individual addressed Status transfer	Not Supported			
Group addressed Status transfer	Not Supported			
Pre-emptive Priority Call	PASSED Complete 1_pass_of_1			
Pre-emption of Resources	PASSED Complete 1_pass_of_1			
Pre-emption of Busy Users	Not Supported			
Emergency Call	PASSED Complete 2_pass_of_2			
Pre-emption of Resources	PASSED Complete 1_pass_of_1			
Pre-emption of Busy Users	PASSED Complete 1_pass_of_1			
Call setup modifications	Not Supported			
Cell Re-selection	PASSED Complete 6_pass_of_6			
Undeclared	PASSED Complete 1_pass_of_1			

Unannounced	PASSED Complete 2_pass_of_2			
Announced - with Call Restoration	PASSED Complete 3_pass_of_3			
Announced - without Call Restoration	Not Supported			
PSTN interconnect				
TETRA Originated Call	Not Supported			
PSTN Originated Call	Not Supported			
DTMF over-dial	Not Supported			
Emergency Telephone Calls	Not Supported			
MS-ISDN Numbering				
MS ISDN - Voice Call	Not Supported			
MS-ISDN Status	Not Supported			
In Call Signalling				
Slow Signalling on Traffic Channel (SACCH)	Not Supported			
Fast Signalling on Traffic Channel (FACCH)	Not Supported			
Subscriber Class Procedures				
Cell Selection based on Subscriber Class	Not Supported			
Subscriber Class Delivery during Location Update	Not Supported			
Use of Preferred Subscriber Classes	Not Supported			
Common Secondary Control Channels				
One C-SCCH per cell	Not Supported			
Two C-SCCH per cell	Not Supported			
Three C-SCCH per cell	Not Supported			
BS Fallback Operation	PASSED Complete 4_pass_of_4			
Switch to/from BS Fallback Operation	Not Supported			

Roaming with BS Fallback Operation	PASSED Complete 1_pass_of_1			
Services with BS Fallback Operation	PASSED Complete 3_pass_of_3			
Energy Economy Mode				
Energy Economy Mode Operation	Not Supported			
Transmit Inhibit	PASSED Complete 5_pass_of_5			
TXI Activation & De-Activation without Status message	PASSED Complete 1_pass_of_1			
TXI Activation & De-Activation with Status message	PASSED Complete 3_pass_of_3			
Receipt of group addressed service during TXI	PASSED Complete 1_pass_of_1			
Dynamic Group Number Assignment (DGNA)				
Support for individually addressed DGNA	PASSED Complete 1_pass_of_1			
Support for individually addressed DGNA assignment without attachment	Not Supported			
Support for individually addressed DGNA assignment with attachment as selected group	Not Supported			
Support for individually addressed DGNA assignment with attachment as scanned group	Not Supported			
Support for individually addressed DGNA assignment with rejected attachment	PASSED Complete 1_pass_of_1			
Support for individually addressed assignment for pre-programmed group	Not Supported			
Support for group addressed DGNA				
Support for group addressed DGNA assignment	Not Supported			
Management of 'group assignment lifetime'	Not Supported			
Support for group addressed DGNA deassignment	Not Supported			
Tolerance of unsupported DGNA functions				
MS tolerance of unsupported individual addressed DGNA signalling	Not Supported			

MS tolerance of unsupported group addressed DGNA signalling	Not Supported			
Authentication				
SwMI Initiated (non-mutual) Authentication	PASSED Complete 3_pass_of_3			
Attach with authentication	PASSED Complete 1_pass_of_1			
Roaming with authentication	PASSED Complete 1_pass_of_1			
SwMI rejects MS during authentication	PASSED Complete 1_pass_of_1			
MS rejects SwMI during authentication	Not Supported			
SwMI Initiated Authentication made Mutual by MS	PASSED Complete 2_pass_of_2			
Attach with authentication	PASSED Complete 1_pass_of_1			
Roaming with authentication	PASSED Complete 1_pass_of_1			
TEI Query				
TEI Query Operation	Not Supported			
TETRA Ambience Listening (SS-AL)				
Ambience Listening	PASSED Complete 1_pass_of_1			
SS-AL Call Setup	PASSED Complete 1_pass_of_1			
MS initiated SS-AL disconnection	Not Supported			
No Indication to affected user	PASSED Complete 1_pass_of_1			
Interaction with Transmit Inhibit	Time_Limited 0_pass_of_1			
AL can override TxI	Not Supported			
AL cannot override TxI	Time_Limited 0_pass_of_1			

End to End Encryption				
E2EE Voice Call	PASSED Complete 2_pass_of_2			
Individual (P2P) call	Not Supported			
Group (P2MP) call	PASSED Complete 2_pass_of_2			
Clear Voice Override (CVO)	Not Supported			
Air Interface Encryption				
Security Class 2 Air Interface Encryption				
Location Updating and AI Signalling Protection	Not Supported			
TM-SCK provisioning during location updating	Not Supported			
Communications between parties using encryption	Not Supported			
Communications between clear and encrypted parties	Not Supported			
Communications between encrypted parties on a channel designated to operate in clear	Not Supported			
OTAR and Change of TM-SCK	Not Supported			
Security Class 3 Air Interface Encryption	PASSED Complete 11_pass_of_11			
Location Updating and AI Signalling Protection	PASSED Complete 6_pass_of_6			
DCK Forwarding at MS request	PASSED Complete 3_pass_of_3			
DCK Forwarding by SwMI (without MS request)	Not Supported			
DCK Retrieval	Not Supported			
CCK provisioning during location updating	PASSED Complete 3_pass_of_3			
Communications between parties using encryption	PASSED Complete 1_pass_of_1			
Communications between clear and encrypted parties	Not Supported			

Communications between encrypted parties on a channel designated to operate in clear	Not Supported			
OTAR and Change of CCK	PASSED Complete 4_pass_of_4			
Security Class 3G Air Interface Encryption				
GCK Key Association setting	Not Supported			
Communications between parties using encryption	Not Supported			
Communications between clear and encrypted parties	Not Supported			
OTAR and Change of GCK	Not Supported			
Change of CMG and GSKO				
OTAR and change of CMG and GSKO	Not Supported			
Key Status demand				
SCK Key Status demand	Not Supported			
GCK Key Status demand	Not Supported			
GSKO Key Status demand	Not Supported			
Change of Security Class for Fallback operation				
Seamless change to Security Class 2 for BS Fallback operation	Not Supported			
Non-seamless change to Security Class 2 for BS Fallback operation	Not Supported			
Provisioning of TM-SCK for fallback to Security Class 2 operation	Not Supported			
Change to Security Class 1 for BS Fallback operation	Not Supported			
Change of Security Class (other than for Fallback operation)				
Change between Security Class 3 and Security Class 3G	Not Supported			
Change between Security Class 2 and Security Class 3	Not Supported			
Change from Security Class 3G to Security Class 2	Not Supported			
Key Management for Secure Direct Mode Operation				
OTAR and change of DM-SCK	Not Supported			

Enable/Disable				
Enable and temporary disable of an MS	PASSED Complete 9_pass_of_9			
Enable and temporary disable of an MS without authentication	PASSED Complete 2_pass_of_2			
Enable and temporary disable of an MS with authentication	PASSED Complete 2_pass_of_2			
Registration of a temporary disabled MS	PASSED Complete 2_pass_of_2			
Rejection of applicable invalid enable/disable requests	PASSED Complete 3_pass_of_3			
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	Not Supported			
Permanent disable of an MS	PASSED Complete 2_pass_of_2			
Permanent disable of an MS with authentication	PASSED Complete 1_pass_of_1			
Permanently Disabled MS cannot send air interface signalling	PASSED Complete 1_pass_of_1			