

TETRA Interoperability Certificate

**Teltronic, NEBULA, SwMI –
Unimo, PT1500, Terminal**

Zaragoza, September 2012

Latest Certified SwMI SW Release:	12.20.50	Latest Certified Terminal SW Release:	R9.3.0
Latest Certified SwMI HW Release:	12.20.18.23	Latest Certified Terminal HW Release:	PT1500 R0D

ISCTI (Istituto Superiore delle Comunicazioni e delle Tecnologie dell'Informazione) certifies, that the Teltronic, NEBULA, SwMI and the Unimo, PT1500, 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 (TPD001-01).

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

This certificate has been issued following a multiple test session between Teltronic and Unimo on September 2012. Detailed test results are listed in the Test Report associated to this Certificate. Details and explanation about the procedure used to provide verdicts are in the TIC process TPD001-01.

IOP test engineer


Massimo Proietti

Radio Office Manager

Giuseppe Pierri


ISCTI - V.le America 201, 00144 Rome, Italy
Ph.: +39 06 5444 2663, Fax: +39 06 5410904
e-mail: tetra_ctc.iscom@mise.gov.it
Web: www.mise.gov.it

Date of issue

4 March 2013

v 1

Certified features

Tetra Association TTR001-01:Core	
Registration	Certified
Group Management	Partial
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	-
Mixed band operation	-
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	-
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 outcomes 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 outcome assigned to a sub-feature as shown on page 2, is derived by the Feature compliance report tables.

Outcome	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 outcome is derived from the verdict assigned to a sub feature which 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	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.
Incomplete	Not all Mandated tests (as per TIC-RT indication) have been executed
Failed	At least one of mandated test or steps of tests linked to this functionality failed to match the TIP specification relevant to this feature.

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 "TPD001-01 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 the associated Test Report
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 the associated Test Report
Regression on spot	The regression method has been applied on the verdicts based on the spot testing method
Witnessed	The CB has witnessed that the identified number of tests were successfully passed. Other tests have been found to be successful based on the log file evaluation.

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 + Critical Communications Association web site (<http://www.tandcca.com/interop/page/12476>).

The feature results are shown in the tables below.

Information on equipment under test and document references

Test Session Date/Place	Teltronic, Zaragoza, September 2012			
SwMI Type	NEBULA			
SwMI HW Release	12.20.18.23			
SwMI SW Release	12.20.50			
Terminal Type	PT1500			
Terminal HW Release	PT1500 R0D			
Terminal SW Release	R9.3.0			
TIP Specs and TIP Compliance Test Plans				
Core	TTR001-01 v6.0.0 IOP001-01 v3.0.0 TIC-RT001-01 v2.5.4			
Auth	TTR001-04 v3.0.0 IOP001-04 v2.0.0 TIC-RT001-04 v2.2.3			
AL	TTR001-09 v2.0.0 IOP001-09 v1.1.0 TIC-RT001-09 v1.2.2			
AIE	TTR001-11 v3.0.3 IOP001-11 v3.0.2 TIC-RT001-11 v3.2.0			

ED	TTR001-13	v2.0.0			
	IOP001-13	v1.0.0			
	TIC-RT001-13	v1.4.6			

Feature compliance report

Test Session	Teltronic Zaragoza September 2012			
Core				
Registration	PASSED Spot 1_pass_of_4			
ITSI attach	PASSED Spot 1_pass_of_2			
SwMI initiated location updating	Spot 0_pass_of_1			
LA timer based Periodic location updating	Not Supported			
De-registration	Spot 0_pass_of_1			
Group Management	Spot Incomplete 1_pass_of_11			
Single group attachment	PASSED Spot 1_pass_of_5			
Multiple group attachment	Spot 0_pass_of_4			
MS initiated group detachment	Spot Incomplete 0_pass_of_2			
SwMI initiated group management	Not Supported			
Group call	PASSED Spot 3_pass_of_11			
Normal group call	PASSED Spot 1_pass_of_4			
Late entry	Spot 0_pass_of_1			
Priority Group scanning	PASSED Spot 1_pass_of_3			
Call setup modifications	Spot 0_pass_of_1			
Resource Queuing based on Call Priority	PASSED Spot 1_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 Spot 1_pass_of_3			
Pre-emption of Resources	PASSED Complete 1_pass_of_1			
Pre-emption of Busy Users	Spot 0_pass_of_2			
Emergency Call	PASSED Spot 2_pass_of_3			
Pre-emption of Resources	PASSED Spot 1_pass_of_2			
Pre-emption of Busy Users	PASSED Complete 1_pass_of_1			
Call setup modifications	Not Supported			
Call disconnection by non-call owner	Not Supported			
Cell Re-selection	PASSED Spot 3_pass_of_6			
Undeclared	Spot 0_pass_of_1			
Unannounced	Spot 0_pass_of_2			
Announced - with Call Restoration	PASSED Complete 3_pass_of_3			
Announced - without Call Restoration	Not Supported			
Expedited	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 Spot 2_pass_of_6			
Switch to/from BS Fallback Operation	Not Supported			
Roaming with BS Fallback Operation	Spot 0_pass_of_1			
Services with BS Fallback Operation	PASSED Spot 2_pass_of_5			
Energy Economy Mode				
Energy Economy Mode Operation	Not Supported			

Transmit Inhibit				
TXI Activation & De-Activation without Status message	Not Supported			
TXI Activation & De-Activation with Status message	Not Supported			
Receipt of group addressed service during TXI	Not Supported			
Mixed band operation				
Mixed band operation, inter-cell	Not Supported			
Mixed band operation, intra-cell	Not Supported			
Mixed band operation, Full	Not Supported			
Authentication				
SwMI Initiated (non-mutual) Authentication	PASSED Spot 1_pass_of_3			
Attach with authentication	PASSED Complete 1_pass_of_1			
Roaming with authentication	Spot 0_pass_of_1			
SwMI rejects MS during authentication	Spot 0_pass_of_1			
MS rejects SwMI during authentication	Not Supported			
SwMI Initiated Authentication made Mutual by MS	PASSED Spot 1_pass_of_2			
Attach with authentication	Spot 0_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				
AL can override TxI	Not Supported			

AL cannot override TxI	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			
Packet Data with Class 2 Air Interface Encryption	Not Supported			
Security Class 3 Air Interface Encryption	PASSED Spot 5_pass_of_14			
Location Updating and AI Signalling Protection	PASSED Spot 2_pass_of_8			
DCK Forwarding at MS request	PASSED Spot 1_pass_of_3			
DCK Forwarding by SwMI (without MS request)	Not Supported			
DCK Retrieval	Not Supported			
CCK provisioning during location updating	PASSED Spot 2_pass_of_4			
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 Spot 1_pass_of_4			
Packet Data with Class 3 Air Interface Encryption	PASSED Complete 1_pass_of_1			
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 Spot 3_pass_of_6			
Enable and temporary disable of an MS without authentication	Spot 0_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 Spot 1_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	Not Supported			
Permanent disable of an MS	Spot 0_pass_of_2			
Permanent disable of an MS with authentication	Spot 0_pass_of_1			
Permanently Disabled MS cannot send air interface signalling	Spot 0_pass_of_1			