

## TETRA Interoperability Certificate

### Motorola Solutions, Dimetra IP R8.2, SwMI – Unimo, PT1500GD, Terminal

Krakow, April 2014

Latest Certified SwMI SW Release:	8.2	Latest Certified Terminal SW Release:	R9.3.2
Latest Certified SwMI HW Release:	Dimetra IP R8.2	Latest Certified Terminal HW Release:	PT1500GD R0B

ISCTI (Istituto Superiore delle Comunicazioni e delle Tecnologie dell'Informazione) certifies, that the Motorola Solutions, Dimetra IP R8.2, SwMI and the Unimo, PT1500GD, 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.

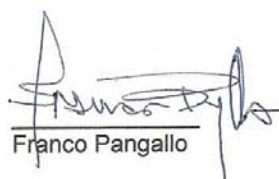
The table lists all the available TETRA interoperability profiles, and summarizes the main functionalities of every profile according to the TETRA interoperability requirement tables.

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 fully witnessed multi test session between Motorola Solutions and Unimo on April 2014. 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.

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**Date of issue**

**8 October 2014**

**v 1**

## Certified features

<b>Tetra Association TTR001-01:Core</b>	
<b>Registration</b>	Partial
<b>Group Management</b>	Partial
<b>Group call</b>	Partial
<b>Individual call</b>	-
<b>Status messages</b>	-
<b>Pre-emptive Priority Call</b>	-
<b>Emergency Call</b>	Certified
<b>Cell Re-selection</b>	-
<b>PSTN interconnect</b>	-
<b>MS-ISDN Numbering</b>	-
<b>In Call Signalling</b>	-
<b>Subscriber Class Procedures</b>	Partial
<b>Common Secondary Control Channels</b>	-
<b>BS Fallback Operation</b>	Partial
<b>Energy Economy Mode</b>	-
<b>Transmit Inhibit</b>	-
<b>Mixed band operation</b>	-
<b>Tetra Association TTR001-03:DGNA</b>	
<b>Support for individually addressed DGNA</b>	Certified
<b>Support for group addressed DGNA</b>	-
<b>Tolerance of unsupported DGNA functions</b>	Certified

<b>Tetra Association TTR001-04:Auth</b>	
<b>SwMI Initiated (non-mutual) Authentication</b>	Certified
<b>SwMI Initiated Authentication made Mutual by MS</b>	Certified
<b>TEI Query</b>	-
<b>Tetra Association TTR001-09:AL</b>	
<b>Ambience Listening</b>	Certified
<b>Interaction with Transmit Inhibit</b>	-
<b>Tetra Association TTR001-11:AIE</b>	
<b>Security Class 2 Air Interface Encryption</b>	Certified
<b>Security Class 3 Air Interface Encryption</b>	Certified
<b>Security Class 3G Air Interface Encryption</b>	-
<b>Change of CMG and GSKO</b>	-
<b>Key Status demand</b>	-
<b>Change of Security Class for Fallback operation</b>	-
<b>Change of Security Class (other than for Fallback operation)</b>	-
<b>Key Management for Secure Direct Mode Operation</b>	-
<b>Tetra Association TTR001-13:ED</b>	
<b>Enable and temporary disable of an MS</b>	Certified
<b>Permanent disable of an MS</b>	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 light blue background.

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

Outcome	Definition
<b>Certified</b>	All required tests have been performed and passed
<b>Partial</b>	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
<b>Passed</b>	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.
<b>Incomplete</b>	Not all Mandated tests (as per TIC-RT indication) have been executed
<b>Failed</b>	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
<b>Complete</b>	All mandated tests associated to the feature have been executed
<b>Spot</b>	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
<b>Regression</b>	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
<b>Regression on spot</b>	The regression method has been applied on the verdicts based on the spot testing method
<b>Witnessed</b>	The TIP heading lines in the Feature Compliance Report indicate whether each TIP is partially or fully witnessed by the Certification Body. Additionally, for a partially-witnessed TIP, the number of witnessed test cases that passed is shown for each the feature and sub-feature. There may have been some un-witnessed passed tests and they will 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
<b>Not supported</b>	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	Motorola Solutions Krakow April 2014			
SwMI Type	Dimetra IP R8.2			
SwMI HW Release	Dimetra IP R8.2			
SwMI SW Release	8,2			
Terminal Type	PT1500GD			
Terminal HW Release	PT1500GD R0B			
Terminal SW Release	R9.3.2			
TIP Specs and TIP Compliance Test Plans				
Core	TTR001-01 v6.0.0 IOP001-01 v3.0.0 TIC-RT001-01 v260			

DGNA	TTR001-03 v2.0.0 IOP001-03 v2.0.1 TIC-RT001-03 v222			
Auth	TTR001-04 v3.0.0 IOP001-04 v2.0.0 TIC-RT001-04 v223			
AL	TTR001-09 v2.0.0 IOP001-09 v1.1.0 TIC-RT001-09 v122			
AIE	TTR001-11 v3.0.3 IOP001-11 v3.0.2 TIC-RT001-11 v325			
ED	TTR001-13 v2.0.0 IOP001-13 v1.0.0 TIC-RT001-13 v146			

# Feature compliance report

Test Session	Motorola Solutions Krakow April 2014			
<b>Core</b>				
Registration	Incomplete 0_pass_of_4			
ITSI attach	Incomplete 0_pass_of_2			
SwMI initiated location updating	Incomplete 0_pass_of_1			
LA timer based Periodic location updating	Not Supported			
De-registration	Incomplete 0_pass_of_1			
Group Management	Incomplete 0_pass_of_11			
Single group attachment	Incomplete 0_pass_of_5			
Multiple group attachment	Incomplete 0_pass_of_4			
MS initiated group detachment	Incomplete 0_pass_of_2			
SwMI initiated group management	Not Supported			
Group call	Incomplete 3_pass_of_9			
Normal group call	Incomplete 0_pass_of_3			
Late entry	Incomplete 0_pass_of_1			
Priority Group scanning	Incomplete 1_pass_of_3			
Call setup modifications	PASSED Complete 1_pass_of_1			
Resource Queuing based on Call Priority	PASSED Complete 1_pass_of_1			
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				
Pre-emption of Resources	Not Supported			
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			
Call disconnection by non-call owner	Not Supported			
Cell Re-selection	FAILED Complete 5_pass_of_6			
Undeclared	PASSED Complete 1_pass_of_1			
Unannounced	PASSED Complete 2_pass_of_2			
Announced - with Call Restoration	FAILED Complete 2_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	Incomplete 0_pass_of_2			
Cell Selection based on Subscriber Class	Incomplete 0_pass_of_2			
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	Incomplete 6_pass_of_8			
Switch to/from BS Fallback Operation	Incomplete 1_pass_of_2			
Roaming with BS Fallback Operation	PASSED Complete 2_pass_of_2			

Services with BS Fallback Operation	Incomplete 3_pass_of_4			
Energy Economy Mode				
Energy Economy Mode Operation	Not Supported			
Transmit Inhibit				
TXI Activation & De-Activation	Not Supported			
TXI Activation & De-Activation with TxI Status available to the Dispatcher	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			
<b>Dynamic Group Number Assignment (DGNA)</b>				
Support for individually addressed DGNA	PASSED Spot 2_pass_of_6			
Support for individually addressed DGNA assignment without attachment	PASSED Spot 2_pass_of_4			
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	Not Supported			

Support for individually addressed assignment for pre-programmed group	PASSED Spot 2_pass_of_4			
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	Spot 0_pass_of_1			
MS tolerance of unsupported individual addressed DGNA signalling	Not Supported			
MS tolerance of unsupported group addressed DGNA signalling	Spot 0_pass_of_1			
<b>Authentication</b>				
SwMI Initiated (non-mutual) Authentication	Spot 0_pass_of_3			
Attach with authentication	Spot 0_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 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			
<b>TETRA Ambience Listening (SS-AL)</b>				
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			
<b>Air Interface Encryption</b>				
Security Class 2 Air Interface Encryption	PASSED Spot 1_pass_of_8			
Location Updating and AI Signalling Protection	Spot 0_pass_of_4			
TM-SCK provisioning during location updating	Not Supported			
Communications between parties using encryption	PASSED Complete 1_pass_of_1			
Communications between clear and encrypted parties	Spot 0_pass_of_1			
Communications between encrypted parties on a channel designated to operate in clear	Not Supported			
OTAR of TM-SCK	Not Supported			
Change of TM-SCK	Spot 0_pass_of_2			
Packet Data with Class 2 Air	Not Supported			

Interface Encryption				
Security Class 3 Air Interface Encryption	PASSED Spot 7_pass_of_13			
Clear Location Updating and AI Signalling Protection	PASSED Spot 1_pass_of_3			
Encrypted Location Updating and AI Signalling Protection	PASSED Spot 3_pass_of_4			
DCK Forwarding at MS request	Not Supported			
DCK Forwarding by SwMI (without MS request)	Not Supported			
DCK Retrieval	PASSED Spot 3_pass_of_4			
CCK provisioning during location updating	PASSED Spot 1_pass_of_3			
Communications between parties using encryption	PASSED Complete 1_pass_of_1			
Communications between clear and encrypted parties	Spot 0_pass_of_1			
Communications between encrypted parties on a channel designated to operate in clear	Not Supported			
OTAR of CCK	PASSED Spot 1_pass_of_2			
Change of CCK	PASSED Spot 2_pass_of_4			
Packet Data with Class 3 Air Interface Encryption	Not Supported			
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 of GCK	Not Supported			
Change of GCK	Not Supported			
Management 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 of DM-SCK	Not Supported			
Change of DM-SCK	Not Supported			
<b>Enable Disable</b>				
Enable and temporary disable of an MS	PASSED Spot 2_pass_of_4			
Enable and temporary disable of an MS without authentication	PASSED Spot 1_pass_of_2			
Enable and temporary disable of an MS with authentication	Not Supported			
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	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			