

TETRA Interoperability Certificate

**Motorola Solutions, Dimetra IP R9.0, SwMI –
Motorola Solutions, ST7000, Terminal**

Krakow, September 2017

Latest Certified SwMI SW Release:	R9.0	Latest Certified Terminal SW Release:	MR16.5
Latest Certified SwMI HW Release:	Dimetra IP R9.0	Latest Certified Terminal HW Release:	PTM412DE

ISCTI (Istituto Superiore delle Comunicazioni e delle Tecnologie dell'Informazione) certifies, that the Motorola Solutions, Dimetra IP R9.0, SwMI and the Motorola Solutions, ST7000, 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.

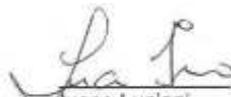
This certificate has been issued following a multiple test session between Motorola Solutions and Motorola Solutions on September 2017. Detailed test results are listed in the Test Report associated to this Certificate. Details and explanation about the procedure used to provide verdicts are in the TIC process TPD001-01.

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v1

Certified features

TTR001-01:Core	
Registration	Certified
Group Management	Certified
Group call	Certified
Individual call	Certified
Status messages	-
Pre-emptive Priority Call	Certified
Emergency Call	Certified
Cell Re-selection	Certified
PSTN interconnect	Certified
MS-ISDN Numbering	-
In Call Signalling	-
Subscriber Class Procedures	Certified
Common Secondary Control Channels	Certified
BS Fallback Operation	Certified
Energy Economy Mode	Certified
Transmit Inhibit	Certified
Mixed band operation	Certified
TTR001-04:Auth	
SwMI Initiated (non-mutual) Authentication	Certified
SwMI Initiated Authentication made Mutual by MS	Certified
TEI Query	-
TTR001-11:AIE	
Security Class 2 Air Interface Encryption	Certified
Security Class 3 Air Interface Encryption	Certified
Security Class 3G Air Interface Encryption	Certified
Management of CMG and GSKO	Certified

Key Status demand	Certified
Change of Security Class for Fallback operation	Certified
Change of Security Class (other than for Fallback operation)	-
Key Management for Secure Direct Mode Operation	Certified
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' results depend on a set of sub-features, 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 blue background and the associated sub-features (or second level features) have a white background.

The outcome assigned to a 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 or sub-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 or sub-feature

The verdict associated to the feature or sub-feature gives also indication about the method used to test that feature or sub-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 or sub-feature have been executed
Spot	Only a selection of the mandatory test cases associated to the feature or sub-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 or sub-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 (see the previous item) has been applied at this session on the verdicts from the referenced (previous) session where the spot testing method (see

	above) had been applied.
Witnessed	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
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 TCCA web site (<https://tcca.info/interoperability/interoperability-certificates-and-test-reports/>).

The feature results are shown in the tables below.

Information on equipment under test and document references

Test Session Date/Place	Motorola Solutions, Krakow, September 2017			
SwMI Type	Dimetra IP R9.0			
SwMI HW Release	Dimetra IP R9.0			
SwMI SW Release	R9.0			
Terminal Type	ST7000			
Terminal HW Release	PTM412DE			
Terminal SW Release	MR16.5			
TIP Specs and TIP Compliance Test Plans				
Core	TTR001-01 v6.2.2 IOP001-01 v3.2.1 TIC-RT001-01 v271			
Auth	TTR001-04 v3.0.0 IOP001-04 v2.0.0 TIC-RT001-04 v230			
AIE	TTR001-11 v3.1.0 IOP001-11 v3.1.0 TIC-RT001-11 v331			
ED	TTR001-13 v2.1.0 IOP001-13 v1.0.0 TIC-RT001-13 v151			

Feature compliance report

Test Session	Motorola Solutions, September 2017 Krakow			
Core - Fully Witnessed Testing				
Registration	PASSED Complete 5_pass_of_5			
Initial registration	PASSED Complete 2_pass_of_2			
SwMI initiated location updating	PASSED Complete 2_pass_of_2			
LA timer based Periodic location updating	Not Supported			
De-registration	PASSED Complete 1_pass_of_1			
Group Management	PASSED Complete 11_pass_of_11			
Single group attachment	PASSED Complete 5_pass_of_5			
Multiple group attachment	PASSED Complete 4_pass_of_4			
MS initiated group detachment	PASSED Complete 2_pass_of_2			
SwMI initiated group management	Not Supported			
Group call	PASSED Complete 9_pass_of_9			
Normal group call	PASSED Complete 3_pass_of_3			
Late entry	PASSED Complete 1_pass_of_1			

Priority Group scanning	PASSED Complete 3_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	PASSED Complete 7_pass_of_7			
Simplex individual call	PASSED Complete 3_pass_of_3			
Duplex individual call	PASSED Complete 2_pass_of_2			
Call setup modifications	Not Supported			
Resource Queuing based on Call Priority	PASSED Complete 2_pass_of_2			
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 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			
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	PASSED Complete 16_pass_of_16			
Undeclared	PASSED Complete 1_pass_of_1			
Unannounced	PASSED Complete 7_pass_of_7			
Announced - with Call Restoration	PASSED Complete 8_pass_of_8			
Announced - without Call Restoration	Not Supported			
Expedited	Not Supported			
Graceful Service Degradation Mode (GSDM)	Not Supported			
PSTN interconnect	PASSED Complete 3_pass_of_3			
TETRA Originated Call	PASSED Complete 2_pass_of_2			
PSTN Originated Call	PASSED Complete 1_pass_of_1			
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	PASSED Complete 6_pass_of_6			
Cell Selection based on Subscriber Class	PASSED Complete 3_pass_of_3			
Subscriber Class Delivery during Location	Not Supported			

Update				
Use of Subscriber Class Preference Levels	PASSED Complete 3_pass_of_3			
Common Secondary Control Channels	PASSED Complete 7_pass_of_7			
One C-SCCH per cell	PASSED Complete 5_pass_of_5			
Two C-SCCH per cell	PASSED Complete 2_pass_of_2			
Three C-SCCH per cell	PASSED Complete 2_pass_of_2			
BS Fallback Operation	PASSED Complete 9_pass_of_9			
Switch to/from BS Fallback Operation	PASSED Complete 2_pass_of_2			
Roaming to avoid a cell in BS Fallback Operation	PASSED Complete 2_pass_of_2			
Services with BS Fallback Operation	PASSED Complete 4_pass_of_4			
Ignore a cell in Fallback Operation	PASSED Complete 1_pass_of_1			
User selectable Fallback behaviour	Not Supported			
Energy Economy Mode	PASSED Complete 3_pass_of_3			
Energy Economy Mode Operation	PASSED Complete 3_pass_of_3			
Transmit Inhibit	PASSED Complete 8_pass_of_8			
TXI Activation & De-Activation	PASSED Complete 4_pass_of_4			
TXI Activation & De-Activation with TxI Status available to the Dispatcher	PASSED Complete 3_pass_of_3			
Receipt of group addressed service during TXI	PASSED Complete			

	1_pass_of_1			
Mixed band operation	PASSED Complete 4_pass_of_4			
Mixed band operation, inter-cell	PASSED Complete 4_pass_of_4			
Mixed band operation, intra-cell	PASSED Complete 3_pass_of_3			
Mixed band operation, Full	PASSED Complete 3_pass_of_3			
Auth - Fully Witnessed Testing				
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			
AIE - Fully Witnessed Testing				
Security Class 2 Air Interface Encryption	PASSED Complete 17_pass_of_17			
Location Updating and AI Signalling Protection	PASSED Complete 7_pass_of_7			

TM-SCK provisioning during location updating	PASSED Complete 2_pass_of_2			
Communications between parties using encryption	PASSED Complete 2_pass_of_2			
Communications between clear and encrypted parties	PASSED Complete 3_pass_of_3			
Communications between encrypted parties on a channel designated to operate in clear	Not Supported			
OTAR of TM-SCK	PASSED Complete 2_pass_of_2			
Change of TM-SCK	PASSED Complete 4_pass_of_4			
Packet Data with Class 2 Air Interface Encryption	PASSED Complete 1_pass_of_1			
Tolerance of SwMI not supporting SCK-OTAR	Not Supported			
Security Class 3 Air Interface Encryption	PASSED Complete 18_pass_of_18			
Clear Location Updating and AI Signalling Protection	PASSED Complete 3_pass_of_3			
Encrypted Location Updating and AI Signalling Protection	PASSED Complete 5_pass_of_5			
DCK Forwarding at MS request	Not Supported			
DCK Forwarding by SwMI (without MS request)	PASSED Complete 1_pass_of_1			
DCK Retrieval	PASSED Complete 4_pass_of_4			
CCK provisioning during location updating	PASSED Complete 3_pass_of_3			
Communications between parties using encryption	PASSED Complete 2_pass_of_2			
Communications between clear and encrypted parties	PASSED Complete 3_pass_of_3			

Communications between encrypted parties on a channel designated to operate in clear	Not Supported			
OTAR of CCK	PASSED Complete 2_pass_of_2			
Change of CCK	PASSED Complete 4_pass_of_4			
Packet Data with Class 3 Air Interface Encryption	PASSED Complete 1_pass_of_1			
Security Class 3G Air Interface Encryption	PASSED Complete 9_pass_of_9			
GCK Key Association setting	PASSED Complete 3_pass_of_3			
Communications between parties using encryption	PASSED Complete 2_pass_of_2			
Communications between clear and encrypted parties	PASSED Complete 1_pass_of_1			
OTAR of GCK	PASSED Complete 2_pass_of_2			
Change of GCK	PASSED Complete 3_pass_of_3			
Management of CMG and GSKO	PASSED Complete 5_pass_of_5			
OTAR and change of CMG and GSKO	PASSED Complete 5_pass_of_5			
Key Status demand	PASSED Complete 4_pass_of_4			
SCK Key Status demand	PASSED Complete 2_pass_of_2			
GCK Key Status demand	PASSED Complete 1_pass_of_1			
GSKO Key Status demand	PASSED Complete 1_pass_of_1			
Change of Security Class for Fallback operation	PASSED Complete			

	12_pass_of_12			
Seamless change to Security Class 2 for BS Fallback operation	PASSED Complete 10_pass_of_10			
Non-seamless change to Security Class 2 for BS Fallback operation	Not Supported			
Provisioning of TM-SCK for fallback to Security Class 2 operation	PASSED Complete 2_pass_of_2			
Change to Security Class 1 for BS Fallback operation	Not Supported			
Change of Security Class (other than for Fallback operation)	FAILED Complete 4_pass_of_5			
Change between Security Class 3 and Security Class 3G	FAILED Complete 1_pass_of_2			
Change between Security Class 2 and Security Class 3	PASSED Complete 2_pass_of_2			
Change from Security Class 3G to Security Class 2	PASSED Complete 1_pass_of_1			
Key Management for Secure Direct Mode Operation	PASSED Complete 3_pass_of_3			
OTAR of DM-SCK	PASSED Complete 3_pass_of_3			
Change of DM-SCK	PASSED Complete 2_pass_of_2			
ED - Fully Witnessed Testing				
Enable and temporary disable of an MS	PASSED Complete 8_pass_of_8			
Enable and temporary disable of an MS without authentication	PASSED Complete 2_pass_of_2			
Enable and temporary disable of an MS with authentication	Not Supported			
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	PASSED Complete 1_pass_of_1			
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			