

TETRA Interoperability Certificate

Trunked Mode Operation

**Motorola Solutions, DIMETRA X Core – SwMI
Airbus Defence and Space, TH1n – Terminal**

Test Session #192, hosted by Motorola Solutions in Krakow, May 2023

Latest Certified SwMI SW Release:	R9.2.0	Latest Certified MS SW Release:	9.00-6
Latest Certified SwMI HW Release:	DIMETRA X Core R9.2.0	Latest Certified MS HW Release:	RC-47

ISCTI (Istituto Superiore delle Comunicazioni e delle Tecnologie dell'Informazione) certifies, that the Motorola Solutions DIMETRA X Core SwMI and the Airbus Defence and Space TH1n 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 (TPD001-01).

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 Airbus Defence and Space in May 2023. 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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Certified features

Tetra Association TTR001-01: Core	
Registration	Certified
Group Management	Certified
Group call	Certified
Individual call	Certified
Status messages	Certified
Pre-emptive Priority Call	Certified
Emergency Call	Certified
Cell Re-selection	Certified
PSTN interconnect	Certified
MS-ISDN Numbering	-
In Call Signalling	Certified
Subscriber Class Procedures	Certified
Common Secondary Control Channels	Certified
BS Fallback Operation	Certified
Energy Economy Mode	Certified
Transmit Inhibit	Certified
Mixed band operation	Certified
Tetra Association TTR001-02: SDS	
SDS Type 1, 2 or 3	-
SDS-TL	Certified
Store and Forward	Certified
Multipart SDS	-
Tetra Association TTR001-03: DGNA	
Support for individually addressed DGNA	Certified
Support for group addressed DGNA	Certified
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 using "Authentication downlink"	-
HW, SW version, TEI and/or Model number	-

Tetra Association TTR001-09: AL	
Ambience Listening	Certified
Interaction with Transmit Inhibit	Certified
Tetra Association TTR001-10: E2EE	
E2EE Voice Call	Certified
E2EE Short Data	Certified
Tetra Association TTR001-11: AIE	
Security Class 2 Air Interface Encryption	Certified
Security Class 3 Air Interface Encryption	Certified
Security Class 3G Air Interface Encryption	-
Management of CMG and GSKO	-
Key Status demand	-
Change of Security Class for Fallback operation	Certified
Change of Security Class (other than for Fallback operation)	Certified
Key Management for Secure Direct Mode Operation	-
Tetra Association TTR001-12: SI	
MS initiated Service Interaction	Certified
SwMI initiated Service Interaction	Certified
Call Waiting	Certified
Tetra Association TTR001-13: ED	
Enable and temporary disable of an MS	Certified
Permanent disable of an MS	Certified
Tetra Association TTR001-17: RUA	
Radio User Assignment	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' 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 tables on the following page list HW and SW releases of SwMI and Terminal under test 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://tandcca.com/interoperability/interoperability-certificates-and-test-reports/>).

The feature results are shown in the tables below.

Information on equipment under test

SwMI Manufacturer	Motorola Solutions
SwMI Model	DIMETRA X Core
SwMI HW Release	DIMETRA X Core R9.2.0
SwMI SW Release	R9.2.0
MS Manufacturer	Airbus Defence and Space
MS Model	TH1n
MS HW Release	RC-47
MS SW Release	9.00-6

Document references

Core	TTR001-01	v6.4.0
	IOP001-01	v3.4.0
	TIC-RT001-01	v279
SDS	TTR001-02	v2.1.3
	IOP001-02	v2.2.0
	TIC-RT001-02	v225
DGNA	TTR001-03	v2.2.0
	IOP001-03	v2.3.0
	TIC-RT001-03	v235
AUTH	TTR001-04	v3.2.0
	IOP001-04	v2.1.0
	TIC-RT001-04	v234
AL	TTR001-09	v2.1.0
	IOP001-09	v1.2.0
	TIC-RT001-09	v132
E2EE	TTR001-10	v2.1.0
	IOP001-10	v1.3.0
	TIC-RT001-10-1	v133
AIE	TTR001-11	v3.2.0
	IOP001-11	v3.2.0
	TIC-RT001-11	v337
SI	TTR001-12	v1.1.0
	IOP001-12	v1.0.0
	TIC-RT001-12	v137
ED	TTR001-13	v2.1.0
	IOP001-13	v1.0.0
	TIC-RT001-13	v153
RUA	TTR001-17	v1.1.0
	IOP001-17	v1.0.0
	TIC-RT001-17	v117
LIP	TTR001-19	v1.1.0
	IOP001-19	v1.3.0
	TIC-RT001-19	v118

Feature compliance report

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 detachment	Not Supported
SwMI initiated group attachment	Not Supported
Group call	PASSED Complete 10_pass_of_10
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	PASSED Complete 1_pass_of_1
Limited coverage notification	Not Supported

Individual call	PASSED Complete 10_pass_of_10
Simplex individual call	PASSED Complete 4_pass_of_4
Duplex individual call	PASSED Complete 2_pass_of_2
Call setup modifications	PASSED Complete 2_pass_of_2
Resource Queuing based on Call Priority	PASSED Complete 2_pass_of_2
Indication of imminent call disconnection	Not Supported
Status messages	PASSED Complete 2_pass_of_2
Individual addressed Status transfer	PASSED Complete 1_pass_of_1
Group addressed Status transfer	PASSED Complete 1_pass_of_1
Pre-emptive Priority Call	PASSED Complete 2_pass_of_2
Pre-emption of Resources	Not Supported
Pre-emption of Busy Users	PASSED Complete 2_pass_of_2
Emergency Call	PASSED Complete 3_pass_of_3
Pre-emption of Resources	PASSED Complete 2_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 Complete 16_pass_of_16
Undeclared	PASSED Complete 1_pass_of_1
Unannounced	PASSED Complete 3_pass_of_3
Announced - with Call Restoration	PASSED Complete 12_pass_of_12
Announced - without Call Restoration	Not Supported
Expedited	Not Supported

Graceful Service Degradation Mode (GSDM)	Not Supported
Single-site operation	Not Supported
PSTN interconnect	PASSED Complete 4_pass_of_4
TETRA Originated Call	PASSED Complete 2_pass_of_2
PSTN Originated Call	PASSED Complete 1_pass_of_1
DTMF over-dial	PASSED Complete 1_pass_of_1
Emergency Telephone Calls	Not Supported
MS-ISDN Numbering	
MS ISDN - Voice Call	Not Supported
MS-ISDN Status	Not Supported
In Call Signalling	PASSED Complete 5_pass_of_5
Slow Signalling on Traffic Channel (SACCH)	PASSED Complete 4_pass_of_4
Fast Signalling on Traffic Channel (FACCH)	PASSED Complete 1_pass_of_1
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 Update	Not Supported
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
Roaming to and from a cell in BS Fallback operation offering some services	Not Supported
Services with BS Fallback Operation	PASSED Complete 5_pass_of_5
Ignore a cell in Fallback Operation	Not Supported
User selectable Fallback behaviour	Not Supported
Energy Economy Mode	PASSED Complete 5_pass_of_5
Energy Economy Mode Operation	PASSED Complete 5_pass_of_5
Transmit Inhibit	PASSED Complete 9_pass_of_9
TXI Activation & De-Activation	PASSED Complete 4_pass_of_4
TXI Activation & De-Activation with TxI Status available to the Dispatcher	PASSED Complete 4_pass_of_4
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
SDS - Fully Witnessed Testing	
SDS Type 1, 2 or 3	
SDS Type 1	Not Supported
SDS Type 2	Not Supported
SDS Type 3	Not Supported
SDS-TL	PASSED Complete 14_pass_of_14
Individually Addressed	PASSED Complete 3_pass_of_3
Group Addressed	PASSED Complete 3_pass_of_3
Using MS-ISDN dialling	Not Supported

SDS Reception	PASSED Complete 7_pass_of_7
Using UCS2 coding scheme	PASSED Complete 2_pass_of_2
Using 7-bit coding scheme	PASSED Complete 2_pass_of_2
Using 8-bit Latin 1 coding scheme	PASSED Complete 2_pass_of_2
Using 8-bit Latin/Cyrillic coding scheme	Not Supported
Using 8-bit Latin 9 coding scheme	PASSED Complete 2_pass_of_2
Store and Forward	PASSED Complete 3_pass_of_3
Individually Addressed	PASSED Complete 3_pass_of_3
Group Addressed	Not Supported
Multipart SDS	
Multipart SDS	Not Supported
DGNA - Fully Witnessed Testing	
Support for individually addressed DGNA	PASSED Complete 19_pass_of_19
Support for individually addressed DGNA assignment without attachment	PASSED Complete 4_pass_of_4
Support for individually addressed DGNA assignment with attachment as selected group	PASSED Complete 2_pass_of_2
Support for individually addressed DGNA assignment with attachment as scanned group	PASSED Complete 3_pass_of_3
Support for individually addressed DGNA assignment with rejected attachment	PASSED Complete 1_pass_of_1
Support for individually addressed assignment for pre-programmed group	PASSED Complete 5_pass_of_5
Support for assigning multiple DGNA groups	PASSED Complete 3_pass_of_3
Support for assigning multiple pre-programmed groups	PASSED Complete 2_pass_of_2
Support for removing multiple DGNA groups	PASSED Complete 1_pass_of_1
Support for retaining DGNA groups over a power cycle	PASSED Complete 2_pass_of_2

Support for group addressed DGNA	PASSED Complete 5_pass_of_5
Support for group addressed DGNA assignment	PASSED Complete 2_pass_of_2
Management of 'group assignment lifetime'	PASSED Complete 2_pass_of_2
Support for group addressed DGNA deassignment	PASSED Complete 1_pass_of_1
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
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 using "Authentication downlink"	
TEI Query using "Authentication downlink" Operation	Not Supported
HW, SW version, TEI and/or Model number	
Transfer of HW, SW version, TEI and/or Model number	Not Supported
AL - Fully Witnessed Testing	
Ambience Listening	PASSED Complete 5_pass_of_5
SS-AL Call Setup	PASSED Complete 2_pass_of_2

MS initiated SS-AL disconnection	PASSED Complete 3_pass_of_3
No Indication to affected user	PASSED Complete 5_pass_of_5
Interaction with Transmit Inhibit	PASSED Complete 1_pass_of_1
AL can override TxI	Not Supported
AL cannot override TxI	PASSED Complete 1_pass_of_1
E2EE - Fully Witnessed Testing	
E2EE Voice Call	PASSED Complete 8_pass_of_8
Individual (P2P) call	PASSED Complete 4_pass_of_4
Group (P2MP) call	PASSED Complete 2_pass_of_2
Clear Voice Override (CVO): Acceptance	PASSED Complete 1_pass_of_1
Clear Voice Override (CVO): User Initiated	Not Supported
Clear Voice Override (CVO): Automatic	Not Supported
OTAK key delivery	PASSED Complete 1_pass_of_1
E2EE Short Data	PASSED Complete 10_pass_of_10
Short Data	PASSED Complete 10_pass_of_10
Multipart Short Data	Not Supported
Short Data Reception	PASSED Complete 6_pass_of_6
Multipart Short Data Reception	Not Supported
AIE - Fully Witnessed Testing	
Security Class 2 Air Interface Encryption	PASSED Complete 14_pass_of_14
Location Updating and AI Signalling Protection	PASSED Complete 4_pass_of_4
TM-SCK provisioning during location updating	Not Supported
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	PASSED Complete 2_pass_of_2
OTAR of TM-SCK	Not Supported
Change of TM-SCK	PASSED Complete 2_pass_of_2
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 21_pass_of_21
Clear Location Updating and AI Signalling Protection	PASSED Complete 4_pass_of_4
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 4_pass_of_4
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	PASSED Complete 2_pass_of_2
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	
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	PASSED Complete 5_pass_of_5
Seamless change to Security Class 2 for BS Fallback operation	PASSED Complete 5_pass_of_5
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)	PASSED Complete 2_pass_of_2
Change between Security Class 3 and Security Class 3G	Not Supported
Change between Security Class 2 and Security Class 3	PASSED Complete 2_pass_of_2
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
SI - Fully Witnessed Testing	
MS initiated Service Interaction	PASSED Complete 7_pass_of_7
MS initiated Circuit Mode Call during another Circuit Mode Call	PASSED Complete 5_pass_of_5
MS initiated Circuit Mode Call during Packet Mode Transfer	PASSED Complete 2_pass_of_2
MS initiated Packet Mode Transfer during Circuit Mode Call	Not Supported
SwMI initiated Service Interaction	PASSED Complete 7_pass_of_7
SwMI initiated Circuit Mode Call during another Circuit Mode Call	PASSED Complete 5_pass_of_5

SwMI initiated Circuit Mode Call during Packet Mode Transfer	PASSED Complete 2_pass_of_2
SwMI initiated Packet Mode Transfer during Circuit Mode Call	Not Supported
Call Waiting	PASSED Complete 3_pass_of_3
Call Waiting in Individual Call	PASSED Complete 3_pass_of_3
Call Waiting in Group Call	Not Supported
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
RUA - Fully Witnessed Testing	
Radio User Assignment	PASSED Complete 13_pass_of_13
Radio User Assignment at Location Updating	PASSED Complete 6_pass_of_6
Dispatcher initiated Radio User Assignment	PASSED Complete 2_pass_of_2
Radio User Dis-assignment	PASSED Complete 5_pass_of_5

LIP - Fully Witnessed Testing	
Location Information Protocol	PASSED Complete 25_pass_of_25
LIP over SDS	PASSED Complete 13_pass_of_13
LIP over Packet Data	Not Supported
Time based reporting	PASSED Complete 5_pass_of_5
Distance based reporting - NOT TESTABLE	Not Supported
Reporting using Short reports	PASSED Complete 2_pass_of_2
Reporting using Long reports	PASSED Complete 2_pass_of_2
Reporting Enable & Disable	PASSED Complete 2_pass_of_2
User control of Reporting	PASSED Complete 1_pass_of_1
Temporary reporting control	PASSED Complete 1_pass_of_1
Trigger modification	PASSED Complete 4_pass_of_4
Control of Basic Location Parameters	PASSED Complete 1_pass_of_1
Immediate Location Reporting	PASSED Complete 1_pass_of_1
Reporting Lifetimes	Not Supported
Error Reporting using Long Reports	PASSED Complete 1_pass_of_1
Error Reporting using Short Reports	Not Supported
Positioning on Individual Call Setup	Not Supported