



TETRA Interoperability Certificate

Motorola, Dimetra IP, SwMI – Cassidian, THR9i, Terminal

Copenhagen, January 2011

Table with 4 columns: Latest Certified SwMI SW Release, 7.1, Latest Certified Terminal SW Release, 6.59-8, Latest Certified SwMI HW Release, 7.1, Latest Certified Terminal HW Release, RC-30

ISCTI (Istituto Superiore delle Comunicazioni e delle Tecnologie dell'Informazione) certifies, that the Motorola, Dimetra IP, SwMI and the Cassidian, THR9i, 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).

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 this Certificate.

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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	-
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	Partial
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
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	



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SwMI Initiated (non-mutual) Authentication	Certified
SwMI Initiated Authentication made Mutual by MS	Certified
TEI Query	-
<b>Tetra Association TTR001-05:PD</b>	
Context Management	Certified
Single Slot Packet Data	Certified
Multi Slot Packet Data	-
TEDS	-
Mixed band operation	Certified
<b>Tetra Association TTR001-09:AL</b>	
Ambience Listening	Certified
Interaction with Transmit Inhibit	Certified
<b>Tetra Association TTR001-10:E2EE</b>	
E2EE Voice Call	Certified
<b>Tetra Association TTR001-11:AIE</b>	
Security Class 2 Air Interface Encryption	Certified
Security Class 3 Air Interface Encryption	-
Security Class 3G Air Interface Encryption	-
Change 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	-
<b>Tetra Association TTR001-12:SI</b>	
MS initiated Service Interaction	Certified
SwMI initiated Service Interaction	Certified
<b>Tetra Association TTR001-13:ED</b>	
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
<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 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
<b>Passed (note x)</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. A note can be associated to this result, if further clarification on the behaviour of the equipment is needed
<b>Time_limited</b>	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
<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 annex A
<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 annex A
<b>Regression on spot</b>	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
<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 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



<b>Test Session Date/Place</b>	<b>Motorola Copenhagen January 2011</b>			
<b>SwMI Type</b>	Dimetra IP			
<b>SwMI HW Release</b>	7.1			
<b>SwMI SW Release</b>	7.1			
<b>Terminal Type</b>	THR9i			
<b>Terminal HW Release</b>	RC-30			
<b>Terminal SW Release</b>	6.59-8			
<b>TIP Specs and TIP Compliance Test Plans</b>				
<b>Core</b>	TTR001-01 v5.1.1 IOP001-01 v2.6.4 TIC-RT001-01 v250			
<b>SDS</b>	TTR001-02 v2.0.1 IOP001-02 v2.0.0 TIC-RT001-02 v211			
<b>DGNA</b>	TTR001-03 v2.0.0 IOP001-03 v2.0.1 TIC-RT001-03 v218			
<b>Auth</b>	TTR001-04 v3.0.0 IOP001-04 v2.0.0 TIC-RT001-04 v222			
<b>PD</b>	TTR001-05 v3.0.0 IOP001-05 v3.0.2 TIC-RT001-05 v300			
<b>AL</b>	TTR001-09 v2.0.0 IOP001-09 v1.1.0 TIC-RT001-09 v121			



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<b>E2EE</b>	TTR001-10 v2.0.0 IOP001-10 v1.1.0 TIC-RT001-10 v120			
<b>AIE</b>	TTR001-11 v3.0.0 IOP001-11 v3.0.0 TIC-RT001-11 v3018			
<b>SI</b>	TTR001-12 v1.0.0 IOP001-12 v1.0.0 TIC-RT001-12 v122			
<b>ED</b>	TTR001-13 v2.0.0 IOP001-13 v1.0.0 TIC-RT001-13 v143			



## Feature compliance report

Test Session	Motorola Copenhagen January 2011			
<b>Core</b>				
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 9_pass_of_9			
Single group attachment	PASSED Complete 4_pass_of_4			
Multiple group attachment	PASSED Complete 3_pass_of_3			
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			





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	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	PASSED Complete 1_pass_of_1			
Individual addressed Status transfer	Not Supported			
Group addressed Status transfer	PASSED Complete 1_pass_of_1			
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	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			



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Announced - without Call Restoration	Not Supported			
Expedited	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 4_pass_of_4			
Cell Selection based on Subscriber Class	PASSED Complete 1_pass_of_1			
Subscriber Class Delivery during Location Update	Not Supported			
Use of Preferred Subscriber Classes	PASSED Complete 3_pass_of_3			
Common Secondary Control Channels	PASSED Complete 7_pass_of_7			
One C-SCCH per cell	PASSED Complete 4_pass_of_4			
Two C-SCCH per cell	PASSED Complete 3_pass_of_3			
Three C-SCCH per cell	PASSED Complete 2_pass_of_2			
BS Fallback Operation	PASSED No_Equipment 7_pass_of_11			
Switch to/from BS Fallback Operation	PASSED Complete			



	2_pass_of_2			
Roaming with BS Fallback Operation	PASSED No_Equipment 2_pass_of_6			
Services with BS Fallback Operation	PASSED Complete 3_pass_of_3			
Energy Economy Mode	PASSED Complete 4_pass_of_4			
Energy Economy Mode Operation	PASSED Complete 4_pass_of_4			
Transmit Inhibit	PASSED Complete 5_pass_of_5			
TXI Activation & De-Activation without Status message	Not Supported			
TXI Activation & De-Activation with Status message	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 4_pass_of_4			
<b>Short Data Service (SDS)</b>				
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 9_pass_of_9			
Individually Addressed	PASSED Complete 2_pass_of_2			
Group Addressed	PASSED Complete 2_pass_of_2			
Using MS-ISDN dialling	Not Supported			



Using UCS2 coding scheme	PASSED Complete 4_pass_of_4			
Using 7-bit coding scheme	PASSED Complete 1_pass_of_1			
Store and Forward	PASSED Complete 4_pass_of_4			
Individually Addressed	PASSED Complete 4_pass_of_4			
Group Addressed	Not Supported			
<b>Dynamic Group Number Assignment (DGNA)</b>				
Support for individually addressed DGNA	PASSED Complete 6_pass_of_6			
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	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 Complete 4_pass_of_4			
Support for group addressed DGNA	FAILED Complete 3_pass_of_6			
Support for group addressed DGNA assignment	FAILED Complete 1_pass_of_3			
Management of 'group assignment lifetime'	FAILED Complete 1_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			
<b>Authentication</b>				
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			
<b>TETRA Packet Data</b>				
Context Management	PASSED Complete 11_pass_of_11			
Context Activation	PASSED Complete 7_pass_of_7			
User authentication	PASSED Complete 4_pass_of_4			
Single Slot Packet Data	PASSED Complete 9_pass_of_9			
Data Transfer	PASSED Complete 6_pass_of_6			
Cell re-selection	PASSED Complete 3_pass_of_3			
Multi Slot Packet Data				
Data Transfer	Not Supported			
TEDS				
TEDS with Context Activation	Not Supported			
TEDS Data Transmission	Not Supported			
TEDS Cell Reselection	Not Supported			
Mixed band operation	PASSED Complete 2_pass_of_2			
Mixed band operation, inter-cell	PASSED Complete 2_pass_of_2			
Mixed band operation, intra-cell	PASSED Complete			



	2_pass_of_2			
Mixed band operation, Full	PASSED Complete 2_pass_of_2			
<b>TETRA Ambience Listening (SS-AL)</b>				
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			
<b>End to End Encryption</b>				
E2EE Voice Call	PASSED Complete 6_pass_of_6			
Individual (P2P) call	PASSED Complete 4_pass_of_4			
Group (P2MP) call	PASSED Complete 2_pass_of_2			
Clear Voice Override (CVO)	Not Supported			
<b>Air Interface Encryption</b>				
Security Class 2 Air Interface Encryption	PASSED Complete 11_pass_of_11			
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			



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Communications between encrypted parties on a channel designated to operate in clear	PASSED Complete 2_pass_of_2			
OTAR and Change of TM-SCK	Not Supported			
Security Class 3 Air Interface Encryption	FAILED Complete 17_pass_of_18			
Location Updating and AI Signalling Protection	PASSED Complete 7_pass_of_7			
DCK Forwarding at MS request	Not Supported			
DCK Forwarding by SwMI (without MS request)	Not Supported			
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	PASSED Complete 2_pass_of_2			
OTAR and Change of CCK	FAILED Complete 3_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	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 and change of DM-SCK	Not Supported			
<b>Service Interaction</b>				
MS initiated Service Interaction	PASSED Complete 4_pass_of_4			
MS initiated Circuit Mode Call during another Circuit Mode Call	PASSED Complete 2_pass_of_2			
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 5_pass_of_5			
SwMI initiated Circuit Mode Call during another Circuit Mode Call	PASSED Complete 3_pass_of_3			
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			
<b>Enable Disable</b>				
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			






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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			



## Annex A: Statement of commonality – Mar 2010

<b>TETRA MoU</b> IOP Testing and Certification	
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### Commonality Declaration – Mar 2010

We: **Cassidian Finland Oy**

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declare that for IOP testing, the two following products are equivalent:

Product	Software Release	Hardware Release
THR9i	6.59-8	RC-30
THR8	6.59-8	RC-24

This declaration is made due to these two products having identical software code for implementing the upper and lower MAC, layer 2, and layer 3 protocols in accordance with EN 300 392-2 with reference to IOP testing, having only differences related to them supporting different hardware platforms.

We therefore request spot testing of the **THR8** during the official IOP test session at **Copenhagen** in **Mar 2011** with the **Dimetra-IP R7.1 SwMI**, where full testing of the **THR9i** will be performed.

Functionalities to be spot tested are listed in the relevant matrix.

For and on behalf of **Cassidian Finland Oy**

Authorised signatory:



Date.....

6.5.2011