ISCTI

TETRA Interoperability Certificate

Airbus D&S , Tetra System Rel 7.0, SwMI – Selex-ES, VS4000, Terminal

Helsinki, June 2015

Latest Certified SwMI SW Release:	Rel7.0	**Latest Certified Terminal SW Release:**	2.1
Latest Certified SwMI HW Release:	M98F (DXTip)	**Latest Certified Terminal HW Release:**	774 -1030/01

ISCTI (Istituto Superiore delle Comunicazioni e delle Tecnologie dell'Informazione) certifies, that the Airbus D&S , Tetra System Rel 7.0, SwMI and the Selex-ES, VS4000, 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 single test session between Airbus D&S and Selex-ES on June 2015. 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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v 1

Certified features

Tetra Association TTR001-01:Core	
Registration	Certified
Group Management	Certified
Group call	Certified
Individual call	Partial
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	-
Transmit Inhibit	Certified
Mixed band operation	-
Tetra Association TTR001-02:SDS	
SDS Type 1, 2 or 3	Certified
SDS-TL	Certified
Store and Forward	-
Multipart SDS	-
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	

SwMI Initiated (non-mutual) Authentication	Certified
SwMI Initiated Authentication made Mutual by MS	-
TEI Query	-
Tetra Association TTR001-05:PD	
Context Management	Certified
Single Slot Packet Data	Certified
Multi Slot Packet Data	-
TEDS	Certified
Mixed band operation	-
Tetra Association TTR001-09:AL	
Ambience Listening	Certified
Interaction with Transmit Inhibit	-
Tetra Association TTR001-10:E2EE	
E2EE Voice Call	Certified
Tetra Association TTR001-11:AIE	
Security Class 2 Air Interface Encryption	Certified
Security Class 3 Air Interface Encryption	Partial
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)	-
Key Management for Secure Direct Mode Operation	-
Tetra Association TTR001-12:SI	
MS initiated Service Interaction	Certified
SwMI initiated Service Interaction	Certified
Call Waiting	-
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' 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 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	**Airbus D&S , Helsinki, June 2015**			
SwMI Type	Tetra System Rel 7.0			
SwMI HW Release	M98F (DXTip)			
SwMI SW Release	Rel7.0			
Terminal Type	VS4000			
Terminal HW Release	774 -1030/01			
Terminal SW Release	2.1			
TIP Specs and TIP Compliance Test Plans				
Core	TTR001-01 v6.1.1 IOP001-01 v3.1.0 TIC-RT001-01 v2.6.3			
SDS	TTR001-02 v2.1.3 IOP001-02 v2.0.0 TIC-RT001-02 v2.1.5			

DGNA	TTR001-03 v2.0.0 IOP001-03 v2.0.1 TIC-RT001-03 v2.2.3			
Auth	TTR001-04 v3.0.0 IOP001-04 v2.0.0 TIC-RT001-04 v2.2.6			
PD	TTR001-05 v3.0.0 IOP001-05 v4.0.0 TIC-RT001-05 v4.0.0			
AL	TTR001-09 v2.0.0 IOP001-09 v1.1.0 TIC-RT001-09 v1.2.3			
E2EE	TTR001-10 v2.0.0 IOP001-10 v1.1.0 TIC-RT001-10 v1.2.3			
AIE	TTR001-11 v3.0.3 IOP001-11 v3.0.2 TIC-RT001-11 v3.2.6			
SI	TTR001-12 v1.1.0 IOP001-12 v1.0.0 TIC-RT001-12 v1.2.9			
ED	TTR001-13 v2.0.0 IOP001-13 v1.0.0 TIC-RT001-13 v1.4.7			

Feature compliance report

Test Session	Airbus D&S Helsinki June 2015			
Core - Fully Witnessed Testing				
Registration	PASSED Complete 5_pass_of_5			
Initial registration	PASSED Complete 3_pass_of_3			
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 14_pass_of_14			
Single group attachment	PASSED Complete 7_pass_of_7			
Multiple group attachment	PASSED Complete 6_pass_of_6			
MS initiated group detachment	PASSED Complete 1_pass_of_1			
SwMI initiated group management	PASSED Complete 2_pass_of_2			

Group call	PASSED Complete 11_pass_of_11			
Normal group call	PASSED Complete 5_pass_of_5			
Late entry	PASSED Complete 1_pass_of_1			
Priority Group scanning	PASSED Complete 3_pass_of_3			
Call setup modifications	Not Supported			
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	Incomplete 8_pass_of_9			
Simplex individual call	PASSED Complete 3_pass_of_3			
Duplex individual call	PASSED Complete 2_pass_of_2			
Call setup modifications	Incomplete 1_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 4_pass_of_4			
Individual addressed Status transfer	PASSED Complete 1_pass_of_1			
Group addressed Status transfer	PASSED Complete 3_pass_of_3			
Pre-emptive Priority Call	PASSED Complete 6_pass_of_6			
Pre-emption of Resources	PASSED Complete 2_pass_of_2			
Pre-emption of Busy Users	PASSED Complete 4_pass_of_4			
Emergency Call	PASSED Complete 5_pass_of_5			
Pre-emption of Resources	PASSED Complete 2_pass_of_2			
Pre-emption of Busy Users	PASSED Complete 1_pass_of_1			
Call setup modifications	PASSED Complete 2_pass_of_2			
Call disconnection by non-call owner	Not Supported			
Cell Re-selection	PASSED Complete 15_pass_of_15			
Undeclared	PASSED Complete 1_pass_of_1			
Unannounced	PASSED Complete 3_pass_of_3			

Announced - with Call Restoration	PASSED Complete 11_pass_of_11			
Announced - without Call Restoration	Not Supported			
Expedited	Not Supported			
PSTN interconnect	PASSED Complete 5_pass_of_5			
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	PASSED Complete 1_pass_of_1			
MS-ISDN Numbering				
MS ISDN - Voice Call	Not Supported			
MS-ISDN Status	Not Supported			
In Call Signalling	PASSED Complete 8_pass_of_8			
Slow Signalling on Traffic Channel (SACCH)	PASSED Complete 4_pass_of_4			
Fast Signalling on Traffic Channel (FACCH)	PASSED Complete 4_pass_of_4			
Subscriber Class Procedures	PASSED Complete 7_pass_of_7			
Cell Selection based on Subscriber Class	PASSED Complete 2_pass_of_2			
Subscriber Class Delivery during Location Update	PASSED Complete 2_pass_of_2			

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 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 1_pass_of_1			
Services with BS Fallback Operation	PASSED Complete 6_pass_of_6			
Ignore a cell in Fallback Operation	Not Supported			
User selectable Fallback behaviour	Not Supported			
Energy Economy Mode				
Energy Economy Mode Operation	Not Supported			
Transmit Inhibit	PASSED Complete 4_pass_of_4			
TXI Activation & De-Activation	PASSED Complete 3_pass_of_3			

TXI Activation & De-Activation with TxI Status available to the Dispatcher	Not Supported			
Receipt of group addressed service during TXI	PASSED Complete 1_pass_of_1			
Mixed band operation				
Mixed band operation, inter-cell	Not Supported			
Mixed band operation, intra-cell	Not Supported			
Mixed band operation, Full	Not Supported			
Short Data Service (SDS) - Fully Witnessed Testing				
SDS Type 1, 2 or 3	PASSED Complete 3_pass_of_3			
SDS Type 1	PASSED Complete 1_pass_of_1			
SDS Type 2	PASSED Complete 1_pass_of_1			
SDS Type 3	PASSED Complete 1_pass_of_1			
SDS-TL	PASSED Complete 3_pass_of_3			
Individually Addressed	PASSED Complete 1_pass_of_1			
Group Addressed	PASSED Complete 2_pass_of_2			
Using MS-ISDN dialling	Not Supported			
Using UCS2 coding scheme	Not Supported			
Using 7-bit coding scheme	Not Supported			

Using 8-bit Latin 1 coding scheme	PASSED Complete 1_pass_of_1			
Using 8-bit Latin 5 coding scheme	Complete			
Using 8-bit Latin 9 coding scheme	Complete			
Store and Forward				
Individually Addressed	Not Supported			
Group Addressed	Not Supported			
Multipart SDS				
Multipart SDS	Not Supported			
Dynamic Group Number Assignment (DGNA) - Fully Witnessed Testing				
Support for individually addressed DGNA	PASSED Complete 6_pass_of_6			
Support for individually addressed DGNA assignment without attachment	Not Supported			
Support for individually addressed DGNA assignment with attachment as selected group	PASSED Complete 3_pass_of_3			
Support for individually addressed DGNA assignment with attachment as scanned group	PASSED Complete 2_pass_of_2			
Support for individually addressed DGNA assignment with rejected attachment	PASSED Complete 1_pass_of_1			
Support for individually addressed assigment for pre-programmed group	Not Supported			
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				
MS tolerance of unsupported individual addressed DGNA signalling	Not Supported			
MS tolerance of unsupported group addressed DGNA signalling	Not Supported			

Authentication - 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				
Attach with authentication	Not Supported			
Roaming with authentication	Not Supported			
TEI Query				
TEI Query Operation	Not Supported			
Packet Data - Fully Witnessed Testing				
Context Management	PASSED Complete 7_pass_of_7			
Context Activation	PASSED Complete 7_pass_of_7			
User authentication	Not Supported			
Single Slot Packet Data	PASSED Complete 10_pass_of_10			
Data Transfer	PASSED Complete 7_pass_of_7			
Cell re-selection	PASSED Complete 3_pass_of_3			
Multi Slot Packet Data				
Data Transfer	Not Supported			
TEDS	PASSED Complete 15_pass_of_15			
TEDS with Context Activation	PASSED Complete 2_pass_of_2			

TEDS Data Transmission, using LLC Optimisation	PASSED Complete 6_pass_of_6			
TEDS Cell Reselection, using LLC Optimisation	PASSED Complete 7_pass_of_7			
Mixed band operation				
Mixed band operation, inter-cell	Not Supported			
Mixed band operation, intra-cell	Not Supported			
Mixed band operation, Full	Not Supported			
TETRA Ambience Listening (SS-AL) - Fully Witnessed Testing				
Ambience Listening	PASSED Complete 4_pass_of_4			
SS-AL Call Setup	PASSED Complete 2_pass_of_2			
MS initiated SS-AL disconnection	PASSED Complete 2_pass_of_2			
No Indication to affected user	PASSED Complete 4_pass_of_4			
Interaction with Transmit Inhibit				
AL can override TxI	Not Supported			
AL cannot override TxI	Not Supported			
End to End Encryption - Fully Witnessed Testing				
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): Acceptance	Not Supported			
Clear Voice Override (CVO): User Initiated	Not Supported			
Clear Voice Override (CVO): Automatic	Not Supported			
Air Interface Encryption - Fully Witnessed Testing				

Security Class 2 Air Interface Encryption	PASSED Complete 2_pass_of_2			
Location Updating and AI Signalling Protection	PASSED Complete 1_pass_of_1			
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	Not Supported			
Communications between encrypted parties on a channel designated to operate in clear	Not Supported			
OTAR of TM-SCK	Not Supported			
Change of TM-SCK	Not Supported			
Packet Data with Class 2 Air Interface Encryption	Not Supported			
Security Class 3 Air Interface Encryption	Incomplete 18_pass_of_19			
Clear Location Updating and AI Signalling Protection	PASSED Complete 7_pass_of_7			
Encrypted Location Updating and AI Signalling Protection	PASSED Complete 3_pass_of_3			
DCK Forwarding at MS request	PASSED Complete 3_pass_of_3			
DCK Forwarding by SwMI (without MS request)	Not Supported			
DCK Retrieval	Not Supported			
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	Not Supported			
Change of CCK	Incomplete 0_pass_of_1			

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 4_pass_of_4			
Seamless change to Security Class 2 for BS Fallback operation	Not Supported			
Non-seamless change to Security Class 2 for BS Fallback operation	PASSED Complete 3_pass_of_3			
Provisioning of TM-SCK for fallback to Security Class 2 operation	Not Supported			
Change to Security Class 1 for BS Fallback operation	PASSED Complete 1_pass_of_1			
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			

Service Interaction - Fully Witnessed Testing				
MS initiated Service Interaction	PASSED Complete 3_pass_of_3			
MS initiated Circuit Mode Call during another Circuit Mode Call	PASSED Complete 3_pass_of_3			
MS initiated Circuit Mode Call during Packet Mode Transfer	Not Supported			
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 4_pass_of_4			
SwMI initiated Circuit Mode Call during Packet Mode Transfer	PASSED Complete 1_pass_of_1			
SwMI initiated Packet Mode Transfer during Circuit Mode Call	Not Supported			
Call Waiting				
Call Waiting in Individual Call	Not Supported			
Call Waiting in Group Call	Not Supported			
Enable Disable - Fully Witnessed Testing				
Enable and temporary disable of an MS	PASSED Complete 9_pass_of_9			
Enable and temporary disable of an MS without authentication	Not Supported			
Enable and temporary disable of an MS with authentication	PASSED Complete 2_pass_of_2			
Registration of a temporary disabled MS	PASSED Complete 2_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	PASSED Complete 5_pass_of_5			

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			