TETRA ASSOCIATION

ISCTI

TETRA Interoperability Certificate

Teltronic, NEBULA, SwMI –
Motorola, MTP850Ex, Terminal

Zaragoza, March 2010

Latest Certified SwMI SW Release:	09.15.50	**Latest Certified Terminal SW Release:**	MR5.11.1
Latest Certified SwMI HW Release:	09.15.13.18	**Latest Certified Terminal HW Release:**	PT911BSEX

ISCOM (Istituto Superiore della Comunicazioni e delle Tecnologie dell'Informazione) certifies, that the Teltronic, NEBULA, SwMI and the Motorola, MTP850Ex, 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).
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 the 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	Certified
Emergency Call	Certified
Cell Re-selection	Certified
PSTN interconnect	Certified
MS-ISDN Numbering	-
In Call Signalling	Certified
Subscriber Class Procedures	-
Common Secondary Control Channels	Certified
BS Fallback Operation	Certified
Energy Economy Mode	-
Transmit Inhibit	Certified
Tetra Association TTR001-02:SDS	
SDS Type 1, 2 or 3	Certified
SDS-TL	Certified
Store and Forward	-
Tetra Association TTR001-03:DGNA	
Support for individually addressed DGNA	Certified
Support for group addressed DGNA	Partial
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	-
Tetra Association TTR001-05:PD	
Context Management	Certified
Single Slot Packet Data	Certified
Multi Slot Packet Data	Certified
Tetra Association TTR001-09:AL	
Ambience Listening	Certified
Interaction with Transmit Inhibit	Partial
Tetra Association TTR001-11:AIE	
Security Class 2 Air Interface Encryption	-
Security Class 3 Air Interface Encryption	Certified
Security Class 3G Air Interface Encryption	-
Change of CMG and GSKO	-
Key Status demand	-
Change of Security Class for Fallback operation	-
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
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 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
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 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
Passed (notex)	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
Time_limited	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
Complete	All mandated tests associated to the feature have been executed
Spot	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
Regression	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
Regression on spot	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
SwMI-nr MS-nr	The SwMI and MS do not support the minimum features required to verify these items.
SwMI-nr	The SwMI does not support the minimum features required to verify these items.
MS-nr	The MS does not support the minimum features required to verify these items.

ISCOM has made every effort to ensure that every result has been correctly evaluated in accordance with the relevant TIPs, Test Plans and TIC-RTs. ISCOM 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

Test Session Date/Place	**Teltronic, Zaragoza, March 2010**			
SwMI Type	NEBULA			
SwMI HW Release	09.15.13.18			
SwMI SW Release	09.15.50			
Terminal Type	MTP850EX			
Terminal HW Release	PT911BSEX			
Terminal SW Release	MR5.11.1			
TIP Specs and TIP Compliance Test Plans				
Core	TTR001-01 v5.1.1 IOP001-01 v2.6.0 TIC-RT001-01 v242			
SDS	TTR001-02 v2.1.0 IOP001-02 v2.0.0 TIC-RT001-02 v210			
DGNA	TTR001-03 v2.0.0 IOP001-03 v2.0.1 TIC-RT001-03 v216			
Auth	TTR001-04 v3.0.0 IOP001-04 v2.0.0 TIC-RT001-04 v219			
PD	TTR001-05 v3.0.0 IOP001-05 v2.0.0 TIC-RT001-05 v226			

AL	TTR001-09 v2.0.0 IOP001-09 v1.1.0 TIC-RT001-09 v118			
AIE	TTR001-11 v3.0.0 IOP001-11 v3.0.0 TIC-RT001-11 v3015			
SI	TTR001-12 v1.0.0 IOP001-12 v1.0.0 TIC-RT001-12 v119			
ED	TTR001-13 v2.0.0 IOP001-13 v1.0.0 TIC-RT001-13 v140			

Feature compliance report

Test Session	**Teltronic, Zaragoza, March 2010**			
Core				
Registration	Spot 0_pass_of_4			
ITSI attach	Spot 0_pass_of_2			
SwMI initiated location updating	Spot 0_pass_of_1			
LA timer based Periodic location updating	Not Supported			
De-registration	Spot 0_pass_of_1			
Group Management	PASSED Spot 1_pass_of_11			
Single group attachment	Spot 0_pass_of_5			
Multiple group attachment	PASSED Spot 1_pass_of_4			
MS initiated group detachment	Spot 0_pass_of_2			
SwMI initiated group management	Not Supported			
Group call	PASSED Spot 1_pass_of_11			
Normal group call	Spot 0_pass_of_4			
Late entry	Spot 0_pass_of_1			
Priority Group scanning	Spot 0_pass_of_3			
Call setup modifications	Spot 0_pass_of_1			
Resource Queuing based on Call Priority	PASSED Spot 1_pass_of_2			
Broadcast Call	Not Supported			
Limited coverage notification	Not Supported			

Individual call	PASSED Spot 3_pass_of_12			
Simplex individual call	Spot 0_pass_of_4			
Duplex individual call	PASSED Spot 1_pass_of_2			
Call setup modifications	Spot 0_pass_of_2			
Resource Queuing based on Call Priority	PASSED Spot 2_pass_of_4			
Indication of imminent call disconnection	Not Supported			
Status messages	Spot 0_pass_of_4			
Individual addressed Status transfer	Spot 0_pass_of_1			
Group addressed Status transfer	Spot 0_pass_of_3			
Pre-emptive Priority Call	PASSED Spot 2_pass_of_6			
Pre-emption of Resources	Spot 0_pass_of_2			
Pre-emption of Busy Users	PASSED Spot 2_pass_of_4			
Emergency Call	PASSED Spot 1_pass_of_3			
Pre-emption of Resources	PASSED Spot 1_pass_of_2			
Pre-emption of Busy Users	Spot 0_pass_of_1			
Call setup modifications	Not Supported			
Cell Re-selection	PASSED Spot 6_pass_of_15			
Undeclared	Spot 0_pass_of_1			
Unannounced	PASSED Spot 2_pass_of_7			
Announced - with Call Restoration	PASSED Spot 4_pass_of_7			
Announced - without Call Restoration	Not Supported			
PSTN interconnect	PASSED Spot 1_pass_of_4			
TETRA Originated Call	PASSED Spot 1_pass_of_2			
PSTN Originated Call	Spot 0_pass_of_1			
DTMF over-dial	Not Supported			

Emergency Telephone Calls	Spot 0_pass_of_1			
MS-ISDN Numbering				
MS ISDN - Voice Call	Not Supported			
MS-ISDN Status	Not Supported			
In Call Signalling	PASSED Spot 1_pass_of_7			
Slow Signalling on Traffic Channel (SACCH)	PASSED Spot 1_pass_of_4			
Fast Signalling on Traffic Channel (FACCH)	Spot 0_pass_of_3			
Subscriber Class Procedures				
Cell Selection based on Subscriber Class	Not Supported			
Subscriber Class Delivery during Location Update	Not Supported			
Use of Preferred Subscriber Classes	Not Supported			
Common Secondary Control Channels	PASSED Spot 1_pass_of_7			
One C-SCCH per cell	Spot 0_pass_of_4			
Two C-SCCH per cell	PASSED Spot 1_pass_of_3			
Three C-SCCH per cell	PASSED Spot 1_pass_of_2			
BS Fallback Operation	PASSED Spot 2_pass_of_9			
Switch to/from BS Fallback Operation	Not Supported			
Roaming with BS Fallback Operation	PASSED Complete 1_pass_of_1			
Services with BS Fallback Operation	PASSED Spot 1_pass_of_8			
Energy Economy Mode				
Energy Economy Mode Operation	Not Supported			
Transmit Inhibit	PASSED Spot 1_pass_of_5			
TXI Activation & De-Activation without Status message	PASSED Complete 1_pass_of_1			
TXI Activation & De-Activation with Status message	Spot 0_pass_of_3			

Receipt of group addressed service during TXI	Spot 0_pass_of_1			
Short Data Service (SDS)				
SDS Type 1, 2 or 3	Spot 0_pass_of_3			
SDS Type 1	Spot 0_pass_of_1			
SDS Type 2	Spot 0_pass_of_1			
SDS Type 3	Spot 0_pass_of_1			
SDS-TL	PASSED Spot 2_pass_of_5			
Individually Addressed	PASSED Complete 1_pass_of_1			
Group Addressed	Spot 0_pass_of_2			
Using MS-ISDN dialling	Not Supported			
Using UCS2 coding scheme	PASSED Spot 1_pass_of_2			
Using 7-bit coding scheme	Not Supported			
Store and Forward				
Individually Addressed	Not Supported			
Group Addressed	Not Supported			
Dynamic Group Number Assignment (DGNA)				
Support for individually addressed DGNA	PASSED Spot 2_pass_of_9			
Support for individually addressed DGNA assignment without attachment	Not Supported			
Support for individually addressed DGNA assignment with attachment as selected group	PASSED Spot 1_pass_of_3			
Support for individually addressed DGNA assignment with attachment as scanned group	PASSED Spot 1_pass_of_3			
Support for individually addressed DGNA assignment with rejected attachment	Spot 0_pass_of_1			
Support for individually addressed assignment for pre-programmed group	Spot 0_pass_of_3			
Support for group addressed DGNA	Spot Time_Limited 1_pass_of_7			

Support for group addressed DGNA assignment	Spot 0_pass_of_4			
Management of 'group assignment lifetime'	Time_Limited 1_pass_of_2			
Support for group addressed DGNA deassignment	Time_Limited 0_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			
Authentication				
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 Spot 1_pass_of_2			
Attach with authentication	PASSED Complete 1_pass_of_1			
Roaming with authentication	Spot 0_pass_of_1			
TEI Query				
TEI Query Operation	Not Supported			
TETRA Packet Data				
Context Management	PASSED Spot 1_pass_of_9			
Context Activation	PASSED Spot 1_pass_of_7			
User authentication	Spot 0_pass_of_2			
Single Slot Packet Data	PASSED Spot 2_pass_of_10			
Data Transfer	PASSED Spot 1_pass_of_7			
Cell re-selection	PASSED Spot 1_pass_of_3			
Multi Slot Packet Data	PASSED Spot 1_pass_of_2			

Data Transfer	PASSED Spot 1_pass_of_2			
TETRA Ambience Listening (SS-AL)				
Ambience Listening	PASSED Spot 1_pass_of_5			
SS-AL Call Setup	Spot 0_pass_of_2			
MS initiated SS-AL disconnection	PASSED Spot 1_pass_of_3			
No Indication to affected user	PASSED Spot 1_pass_of_5			
Interaction with Transmit Inhibit	Time_Limited 0_pass_of_1			
AL can override TxI	Not Supported			
AL cannot override TxI	Time_Limited 0_pass_of_1			
Air Interface Encryption				
Security Class 2 Air Interface Encryption				
Location Updating and AI Signalling Protection	Not Supported			
TM-SCK provisioning during location updating	Not Supported			
Communications between parties using encryption	Not Supported			
Communications between clear and encrypted parties	Not Supported			
Communications between encrypted parties on a channel designated to operate in clear	Not Supported			
OTAR and Change of TM-SCK	Not Supported			
Security Class 3 Air Interface Encryption	PASSED Spot 4_pass_of_16			
Location Updating and AI Signalling Protection	PASSED Spot 4_pass_of_8			
DCK Forwarding at MS request	PASSED Spot 2_pass_of_3			
DCK Forwarding by SwMI (without MS request)	Not Supported			
DCK Retrieval	Not Supported			
CCK provisioning during location updating	PASSED Spot 2_pass_of_3			
Communications between parties using encryption	Spot 0_pass_of_2			
Communications between clear and encrypted parties	Spot 0_pass_of_2			

Communications between encrypted parties on a channel designated to operate in clear	Not Supported			
OTAR and Change of CCK	Spot 0_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				
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 and change of DM-SCK	Not Supported			

Service Interaction				
MS initiated Service Interaction	PASSED Spot 1_pass_of_5			
MS initiated Circuit Mode Call during another Circuit Mode Call	PASSED Spot 1_pass_of_3			
MS initiated Circuit Mode Call during Packet Mode Transfer	Spot 0_pass_of_2			
MS initiated Packet Mode Transfer during Circuit Mode Call	Not Supported			
SwMI initiated Service Interaction	PASSED Spot 3_pass_of_10			
SwMI initiated Circuit Mode Call during another Circuit Mode Call	PASSED Spot 2_pass_of_8			
SwMI initiated Circuit Mode Call during Packet Mode Transfer	PASSED Spot 1_pass_of_2			
SwMI initiated Packet Mode Transfer during Circuit Mode Call	Not Supported			
Enable-Disable				
Enable and temporary disable of an MS	PASSED Spot 2_pass_of_9			
Enable and temporary disable of an MS without authentication	Spot 0_pass_of_2			
Enable and temporary disable of an MS with authentication	PASSED Spot 1_pass_of_2			
Registration of a temporary disabled MS	Spot 0_pass_of_2			
Rejection of applicable invalid enable/disable requests	PASSED Spot 1_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	Not Supported			
Permanent disable of an MS	Spot 0_pass_of_2			
Permanent disable of an MS with authentication	Spot 0_pass_of_1			
Permanently Disabled MS cannot send air interface signalling	Spot 0_pass_of_1			

Annex A: Declaration (Spot)

TETRA MoU IOP Testing and Certification	

Statement of Commonality

Reference product	Software Release	Hardware Release
Motorola MTP850	MR5.11.1	PT911B

Motorola, Sydvestvej 15, DK2600 Glostrup, Denmark

Declare that for IOP testing, the following products are equivalent to the reference product:

Product	Software Release	Hardware Release
Motorola MTM800e	MR5.11.1	MT912M
Motorola MTH800	MR5.11.1	PT911FR
Motorola MTP850Ex	MR5.11.1	PT911BSEX
Motorola MTP810Ex	MR5.11.1	PT911BLEX
Motorola CEP400	MR5.11.1	PT911CF

This declaration is made due to these six 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.

The **MTM800e** does **not** support **Energy Economy** mode. This feature is primarily intended handheld devices where power consumption is crucial.

The **MTP850Ex** and **MTP810Ex** do **not** support **End to End Encryption** feature due to market differentiation.

The **CEP400** does **not** support **End to End Encryption, Air Interface Encryption, Packet Data and SDS Type 1, 2 and 3** features due to market differentiation.

We therefore request spot testing of the Motorola MTM800E, MTH800, MTP850Ex, MTP810Ex and CEP400 terminals during the official IOP test session at Teltronic, Zaragoza, from March 15th to April 30th, 2010, where full testing of the Motorola MTP850 terminal will be performed.

Functionalities to be spot tested are listed in the relevant TIC-RT declaration.

For and on behalf of Motorola

Authorised signatory:

June 24, 2010 .....

Ole Hammer