



#### **TETRA Interoperability Certificate**

# Hytera Mobilfunk GmbH, ACCESSNET-T IP, SwMI — Motorola, MTM5400, Terminal

#### Bad Münder, January 2013

Latest Certified SwMI	PV 08.04.00	Latest Certified Terminal	MR10.6.3
SW Release:		SW Release:	
Latest Certified SwMI	PV 08.04.00	Latest Certified Terminal	MT953C
HW Release:		HW Release:	

ISCTI (Istituto Superiore delle Comunicazioni e delle Tecnologie dell'Informazione) certifies, that the Hytera Mobilfunk GmbH, ACCESSNET-T IP, SwMI and the Motorola MTM5400, 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 Hytera Mobilfunk GmbH and Motorola on January 2013. 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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Date of issue

29 May 2013

v 2

v 2





### **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	Certified
In Call Signalling	Certified
Subscriber Class Procedures	Partial
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	-





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	Certified
TEI Query	-
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	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
Call Waiting	-
Tetra Association TTR001-13:ED	
Enable and temporary disable of an MS	Certified
	-





Permanent disable of an MS	Certified		
Tetra Association TTR001-14:TKD			
Delivery of Authentication Data	Certified		
Delivery of SCK	Certified		
Delivery method	Certified		
Tetra Association TTR001-19:LIP			
Location Information Protocol	Certified		
Tetra Association TTR001-20:CF			
Call Forwarding Unconditional	Certified		
Call Forwarding Conditional	Certified		
Call Forwarding Information Displayed	-		





### 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 outcomes 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 light blue background.

The outcome assigned to a sub-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.
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.





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 "TPD001-01 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 the associated Test Report
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 the associated Test Report
Regression on spot	The regression method has been applied on the verdicts based on the spot testing method
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	Hytera Mobilfunk GmbH, Bad Münder, January 2013		
SwMI Type	ACCESSNET-T IP		
SwMI HW Release	PV 08.04.00		
SwMI SW Release	PV 08.04.00		
Terminal Type	MTM5400		
Terminal HW Release	MT953C		
Terminal SW Release	MR10.6.3		
TIP Specs and TIP Compliance Test Plans			
Core	TTR001-01 v6.0.0 IOP001-01 v3.0.0 TIC-RT001-01 v2.5.4		



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SDS	TTR001-02	v2.1.1		
	IOP001-02	v2.0.0		
	TIC-RT001-02	v2.1.2		
	110 111001 02	VZ.1.Z		
DGNA	TTR001-03	v2.0.0		
BOIT	IOP001-03	v2.0.1		
	TIC-RT001-03	v2.2.1		
Auth	TTR001-04	v3.0.0		
Autii	IOP001-04			
		v2.0.0		
	TIC-RT001-04	v2.2.3		
AL	TTR001-09	v2.0.0		
AL				
	IOP001-09	v1.1.0		
	TIC-RT001-09	v1.2.2		
E2EE	TTR001-10	v2.0.0		
LZLL	IOP001-10			
		v1.1.4		
	TIC-RT001-10	v1.2.2		
AIE	TTR001-11	v3.0.3		
AIL	IOP001-11	v3.0.2		
	TIC-RT001-11	v3.2.1		
SI	TTR001-12	v1.0.0		
5.	IOP001-12	v1.0.0		
	TIC-RT001-12	v1.2.7		
ED	TTR001-13	v2.0.0		
	IOP001-13	v1.0.0		
	TIC-RT001-13			
	110-81001-13	v1.4.6		
TKD	TTR001-14	v1.0.3		
	IOP001-14	v1.0.0		
	TIC-RT001-14	v.1.1.6		
LIP	TTR001-19	v1.0.0		
	IOP001-19	v1.0.0		
	TIC-RT001-19	v1.0.5		
	110-11001-19	۷۲.0.5		
CF	TTR001-20	v1.0.1	 	
	IOP001-20	v1.0.0		
	TIC-RT001-20	v1.0.7		





## Feature compliance report

Test Session	Hytera Mobilfunk GmbH Bad Münder January 2013		
	Core		
Registration	PASSED Complete 4_pass_of_4		
ITSI attach	PASSED Complete 1_pass_of_1		
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 13_pass_of_13		
Single group attachment	PASSED Complete 6_pass_of_6		
Multiple group attachment	PASSED Complete 5_pass_of_5		
MS initiated group detachment	PASSED Complete 2_pass_of_2		
SwMI initiated group management	PASSED Complete 1_pass_of_1		
Group call	PASSED Complete 10_pass_of_10		
Normal group call	PASSED Complete 4_pass_of_4		
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 11_pass_of_11		
Simplex individual call	PASSED Complete 4_pass_of_4		
Duplex individual call	PASSED Complete 2_pass_of_2		
Call setup modifications	PASSED Complete 3_pass_of_3		
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 4_pass_of_4		
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 1_pass_of_1		
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		





PSTN interconnect	PASSED Complete 6_pass_of_6		
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 2_pass_of_2		
MS-ISDN Numbering	PASSED Complete 4_pass_of_4		
MS ISDN - Voice Call	PASSED Complete 2_pass_of_2		
MS-ISDN Status	PASSED Complete 2_pass_of_2		
In Call Signalling	PASSED Complete 5_pass_of_5		
Slow Signalling on Traffic Channel (SACCH)	PASSED Complete 2_pass_of_2		
Fast Signalling on Traffic Channel (FACCH)	PASSED Complete 3_pass_of_3		
Subscriber Class Procedures	Incomplete 4_pass_of_9		
Cell Selection based on Subscriber Class	Incomplete 1_pass_of_3		
Subscriber Class Delivery during Location Update	Incomplete 1_pass_of_3		
Use of Preferred Subscriber Classes	Incomplete 2_pass_of_3		
Common Secondary Control Channels	PASSED Complete 6_pass_of_6		
One C-SCCH per cell	PASSED Complete 3_pass_of_3		
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 12_pass_of_12		
Switch to/from BS Fallback Operation	PASSED Complete 2_pass_of_2		
Roaming with BS Fallback Operation	PASSED Complete 2_pass_of_2		
Services with BS Fallback Operation	PASSED Complete 8_pass_of_8		
Energy Economy Mode			





Energy Economy Mode Operation	Not Supported		
Transmit Inhibit	PASSED Complete 5_pass_of_5		
TXI Activation & De-Activation without Status message	PASSED Complete 1_pass_of_1		
TXI Activation & De-Activation with Status message	PASSED Complete 3_pass_of_3		
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	e (SDS)	
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 7_pass_of_7		
Individually Addressed	PASSED Complete 1_pass_of_1		
Group Addressed	PASSED Complete 2_pass_of_2		
Using MS-ISDN dialling	PASSED Complete 2_pass_of_2		
Using UCS2 coding scheme	PASSED Complete 2_pass_of_2		
Using 7-bit coding scheme	PASSED Complete 1_pass_of_1		
Store and Forward			
Individually Addressed	Not Supported		
Group Addressed	Not Supported		





Dynamic	c Group Number Ass	ignment (DGNA)	
Support for individually addressed DGNA	PASSED Complete 12_pass_of_12		
Support for individually addressed DGNA assignment without attachment	PASSED Complete 3_pass_of_3		
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 3_pass_of_3		
Support for individually addressed DGNA assignment with rejected attachment	PASSED Complete  1_pass_of_1		
Support for individually addressed assigment for pre-programmed group	PASSED Complete 5_pass_of_5		
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	on			
SwMI Initiated (non-mutual)	PASSED Complete				
Authentication	3_pass_of_3				
Attach with authentication	PASSED Complete				
Attach with authentication	1_pass_of_1			+	
Roaming with authentication	PASSED Complete				
Roaming with authentication	1_pass_of_1				
SwMI rejects MS during	PASSED Complete				
authentication	1_pass_of_1				
MS rejects SwMI during authentication	Not Supported				
SwMI Initiated Authentication	PASSED Complete				
made Mutual by MS	2_pass_of_2				
Attack with authorities	PASSED Complete				
Attach with authentication	1_pass_of_1				
Describe with such subjection	PASSED Complete				
Roaming with authentication	1_pass_of_1				
TEI Query					
TEI Query Operation	Not Supported				
TE.	TETRA Ambience Listening (SS-AL)				
Ambience Listening	PASSED Complete 2_pass_of_2				
SS-AL Call Setup	PASSED Complete 1_pass_of_1				
MS initiated SS-AL disconnection	PASSED Complete 1_pass_of_1				
No Indication to affected user	PASSED Complete 2_pass_of_2				
Interaction with Transmit Inhibit					
AL can override TxI	Not Supported				
AL cannot override TxI	Not Supported				
	End to End Encry	ption			
FOFF Voice Coll	PASSED Complete				
E2EE Voice Call	6_pass_of_6				





In dividual (DOD) and	PASSED Complete		
Individual (P2P) call	4_pass_of_4		
Consum (DOMD) and	PASSED Complete		
Group (P2MP) call	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 Encry	ption	
Security Class 2 Air Interface	PASSED Complete		
Encryption	11_pass_of_11		
Location Updating and AI	PASSED Complete		
Signalling Protection	4_pass_of_4		
TM-SCK provisioning during			
location updating	Not Supported		
Communications between parties	PASSED Complete		
using encryption	2_pass_of_2		
Communications between clear	PASSED Complete		
and encrypted parties	3_pass_of_3		
Communications between			
encrypted parties on a channel	PASSED Complete		
designated to operate in clear	2_pass_of_2		
OTAR and Change of TM-SCK	Not Supported		
Packet Data with Class 2 Air	Not Our		
Interface Encryption	Not Supported		
Security Class 3 Air Interface	PASSED Complete		
Encryption	10_pass_of_10		
Location Updating and AI	PASSED Complete		
Signalling Protection	3_pass_of_3		
DCK Forwarding at MS request	Not Supported		
DCK Forwarding by SwMI (without MS request)	Not Supported		





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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	Not Supported		
operation			
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 Interact	tion	
	PASSED Complete		
MS initiated Service Interaction	3_pass_of_3		
MS initiated Circuit Mode Call	PASSED Complete		
during another Circuit Mode Call	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		
Cuttlinitiated Coming Interesting	PASSED Complete		
SwMI initiated Service Interaction	8_pass_of_8		
SwMI initiated Circuit Mode Call	PASSED Complete		
during another Circuit Mode Call	8_pass_of_8		





SwMI initiated Circuit Mode Call	Not Supported		
during Packet Mode Transfer	Not Supported		
SwMI initiated Packet Mode Transfer during Circuit Mode Call	Not Supported		
Call Waiting			
Call Waiting in Individual Call	Not Composted		
	Not Supported		
Call Waiting in Group Call	Not Supported		
	Enable Disab	le	
Enable and temporary disable of	PASSED Complete		
an MS	19_pass_of_19		
Enable and temporary disable of	PASSED Complete		
an MS without authentication	6_pass_of_6		
Enable and temporary disable of	PASSED Complete		
an MS with authentication	6_pass_of_6		
Registration of a temporary	PASSED Complete		
disabled MS	2_pass_of_2		
Rejection of applicable invalid	PASSED Complete		
enable/disable requests	4_pass_of_4		
Removable SIMs do not affect the			
subscriber or equipment that has	Not Supported		
been enabled/disabled			
Disabling of an MS during a call or	PASSED Complete		
while on the PDCH	1_pass_of_1		
	PASSED Complete		
Permanent disable of an MS	4_pass_of_4		
Permanent disable of an MS with	PASSED Complete		
authentication	3_pass_of_3		
Permanently Disabled MS cannot	PASSED Complete		
send air interface signalling	1_pass_of_1		
	Key Delivery	1	
Delivery of Authentication Data	PASSED Complete 2_pass_of_2		
Authentication Key Delivery	PASSED Complete		
	1_pass_of_1		ш





ITSI Delivery	PASSED Complete 1_pass_of_1		
Delivery of SCK	PASSED Complete  2_pass_of_2		
SCK Delivery to SCK delivery	Not Supported		
SCK Delivery to SwMI	PASSED Complete		
, , , , , ,	1_pass_of_1		
SCK Delivery to SCK loading	PASSED Complete		
,	1_pass_of_1		
Delivery method	PASSED Complete		
	3_pass_of_3		
Plain text on physical media	PASSED Complete		
, , , , , , , , , , , , , , , , , , ,	3_pass_of_3		
Encrypted text on physical media	Not Supported		
Electronic transfer	Not Supported		
	LIP		
Location Information Protocol	PASSED Complete		
Location information i fotocol	11_pass_of_11		
LIP over SDS	PASSED Complete		
	6_pass_of_6		
LIP over Packet Data	Not Supported		
Time based reporting	PASSED Complete 4_pass_of_4		
Distance based reporting - NOT TESTABLE	Not Supported		
Reporting using Long reports	PASSED Complete		
	1_pass_of_1		
Reporting Enable & Disable	PASSED Complete 1_pass_of_1		
Temporary reporting control	Not Supported		
Trigger modification	Not Supported		
Immediate Location Reporting	PASSED Complete 1_pass_of_1		
Reporting Lifetimes	Not Supported		





Error Reporting	PASSED Complete 2_pass_of_2		
	Call Forwardi	ng	
Call Forwarding Unconditional	PASSED Complete 3_pass_of_3		
Call Forwarding Unconditional Individual Call	PASSED Complete  1_pass_of_1		
Call Forwarding Unconditional SDS	PASSED Complete  1_pass_of_1		
Call Forwarding Unconditional Status	PASSED Complete 1_pass_of_1		
Call Forwarding Conditional	PASSED Complete 3_pass_of_3		
Call Forwarding Conditional Individual Call	PASSED Complete 3_pass_of_3		
Call Forwarding Information Displayed			
Call Forwarding Information Displayed	Not Supported		





#### **Annex A**

List of Revisions of the Certificate			
Date	Ver.	Modification	
23 May 2013	1	First published version	
29 May 2013	2	updating: - corrected the number of Test Cases results of "group call" sub- features in Core feature compliance report.	

**IOP Test Engineer** 

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