



IST doc.10

TETRA SwMI Interoperability Certificate

November 2002

MOTOROLA

Manufacturer	Infrastructure	Software/Hardware Release No.	Dates of testing
Motorola	Dimetra IP R5.0	ZC SW: ZC_APP_ZCTE_R05.00.11.07 NM SW: DMNM-R11.00.09.07 EBTS SW: TSC_PR3_APP-E05.30.63 BRC_APP-E05.20.50	4-22 November 2002

ISCTI (Istituto Superiore delle Comunicazioni e delle Tecnologie dell'Informazione) has witnessed that the MOTOROLA infrastructure is operating in accordance with:

TETRA Interoperability Profile:

TIP v2 Core - TTR 001 ver 2.1.1, March 2000
TIP v3 SDS - TTR 001-2 ver 1.0.1, August 2001
TIP v3 DGNA - TTR 001-3 ver 1.0.3, May 2001
TIP v3 Authentication - TTR 001-4 ver 1.0.0, November 2000
TIP v3 PD - TTR 001-5 ver 1.0.0, November 2000

The test results for the tested features can be found in the tables of this certificate.

Authorised IOP test engineer

Radio Office Manager

(Ivano Luciani)

(Ing. A. La Padula)

ISCTI has made every effort to ensure that tests have been made correctly, and in accordance with the relevant TIPs. ISCTI has no liability for the test results, or towards the manufacturers.

ISCTI
V.le America 201
00144 Rome, Italy

Tlf. +39 06 5444 2663
Fax +39 06 5410904

E-mail: Web-

site: <http://www.comunicazioni.it>



Information about the equipment used for testing

Testing during the November 2002 IOP Test Session:

The tests were performed using the following terminals:

Manufacturer	Terminal Type	Software/Hardware Release No.
Motorola	MTH500	SW: V&D, SDS, DGNA, Packet Data tests, MR1.2 clear software used: R70.03.10; Air Interface Encryption tests, MR1.2 TEA2 software used: R72.03.10; Authentication tests, MR2.0 clear software used: D70.21.12b. HW: FLF8000A
Motorola	MTP700	SW: V&D, SDS, DGNA, Packet Data tests, MR1.2 clear software used: R76.03.10; Air Interface Encryption tests, MR1.2 TEA2 software used: R78.03.10; Authentication tests, MR2.0 clear software used: D76.21.12b. HW: PMUE1825A
Motorola	MTM700	SW: V&D, SDS, DGNA, Packet Data tests, MR1.2 clear software used: R73.03.10; Air Interface Encryption tests, MR1.2 TEA2 software used: R75.03.10; Authentication tests, MR2.0 clear software used: D73.21.12b. HW: PMUE1840A
Nokia	THR 850	SW: TP311.02-5 HW: THR-3
Niros	Titan 4106	SW: 1.51:31a:1 HW: V3 build 3 mod number 30
Sepura	SRP 2000	SW: 32V022 HW: IPNF10226E9A5HI
Sepura	SRM 1000	SW: 31V004 HW: IPN480051F06IOS
Cleartone	CM9000P	SW: TMPO 36G4C HW: 1.5
Teltronic	MDT400	SW: 040010 HW: 00030100

ISCTI has made every effort to ensure that tests have been made correctly, and in accordance with the relevant TIPs. ISCTI has no liability for the test results, or towards the manufacturers.

ISCTI
V.le America 201
00144 Rome, Italy

Tlf. +39 06 5444 2663
Fax +39 06 5410904

E-mail: Web- site: <http://www.comunicazioni.it>



Additional information about the test performed

The tests were performed in the 380-400 MHz band. The SwMI was operating with the following configuration:

MCC	238
MNC	01
Colour code	41
LA20 carrier frequency (BS Tx)	393.6125 MHz
LA21 carrier frequency (BS Tx)	393.5375 MHz
LA30 carrier frequency (BS Tx)	421.075 MHz
LA31 carrier frequency (BS Tx)	421.175 MHz
PSTN gateway	43488011
Subscriber classes	FFFF ₁₆

Test Results

The test results are shown in the tables below.

Test results and the certificates from previous IOP test session are available on TETRA MoU web site (<http://www.tetramou.com/interoperability>).

Tables indicate whether or not tests addressing a specific requirement of the TIP specification have been performed, whether or not the requirement is applicable for the SwMI, and the result of the test if executed. Each entry of the table may take one of seven values:

- : No test performed.
- N/A: Not applicable for the SwMI
- NTPA: No Test Plan/case Available
- No : Not supported by Terminal
- P : Pass
- F : Fail
- I : Inconclusive

No test performed (-) is assigned in case of no test case performed during the IOP session.

The test results have been derived from examining the behaviour of a live system. The verdicts indicated are based on the log evaluation of the information exchange between the SwMI and the terminals indicated in the following tables. The verdicts reflect the fact that at the time of the IOP testing it was/was not possible to demonstrate a behaviour that was in accordance with the related requirement.

ISCTI has made every effort to ensure that tests have been made correctly, and in accordance with the relevant TIPs. ISCTI has no liability for the test results, or towards the manufacturers.

ISCTI
V.le America 201
00144 Rome, Italy

Tlf. +39 06 5444 2663
Fax +39 06 5410904

E-mail: Web- site: <http://www.comunicazioni.it>



Table 1: Test performed CORE TIP V2

Motorola SwMI	Motorola MTH500	Motorola MTP700	Motorola MTP700	Nokia THR850	NiROS Titan 4106	Sapura SRP 2000	Sapura SRM 1000	Cleartone CM9000P	Teltronic MDT400
6 Registration									
6.1 ITSI attach	No	No	No	P	P	P	P	P	P
6.2 ITSI attach including group attachment	P	P	P	No	P	No	No	P	No
6.3 Roaming location updating	P	P	P	P	-	P	P	P	P
6.4 De-registration	P	-	P	P	P	P	P	P	P
7 Individual call									
7.1 Call setup									
7.1.1 Hook signalling Semi-duplex	-	-	P	-	-	P	P	P	P
7.1.1 Hook signalling Semi-duplex, Queuing	P	P	P	-	-	P	P	P	P
7.1.1 Hook signalling Duplex	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7.1.2 Direct through-connect Semi-duplex	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7.1.2 Direct through-connect Semi-duplex, queuing	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7.1.2 Direct through-connect Duplex	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No
7.1.3 Call setup Modifications									
7.1.3.1.1 By SwMI, Direct to Hook	-	-	-	P	P	-	-	-	-
7.1.3.1.2 By SwMI, Hook to Direct	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7.1.3.2 By called Party (7.1.3.2.3 Core 3)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7.2 Transmission control									
7.2.1 End of transmission, Hook signalling	-	-	P	P	P	P	P	P	P
7.2.1 End of transmission, Direct call	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7.2.2 Request to transmit, Hook signalling	-	-	P	P	P	P	P	P	P
7.2.2 Request to transmit, Direct call	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7.2.3 Request for speech item, Hook signalling	-	-	P	P	P	P	P	P	P
7.2.3 Pre emptive speech item request	-	-	P	P	P	No	No	P	P
7.3 Call maintenance	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7.4 Call disconnection (by calling party- simplex)	-	-	P	P	P	P	P	P	P
7.4 Call disconnection (by calling party - duplex)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7.5 Emergency individual call	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7.5.1 Emergency speech item request	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7.5.2 Emergency individual call modification	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8 Group management									
8.4 MS Attachment of the selected group	-	-	P	P	P	P	P	-	P
8.4 MS Attachment of the selected group (Rejection)	P	P	P	P	P	P	P	P	P
8.4 MS Attachment of the Null group	P	-	P	P	P	P	P	P	P
8.4 MS Change of the selected group	P	-	P	P	P	P	P	P	P
8.5 Multiple group attachment	No	No	No	P	-	-	-	-	-
8.5 Multiple group attachment, failure	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8.6 MS initiated detachment	No	No	No	-	P	No	No	No	-
8.7 SwMI initiated group attachment and detachment									

ISCTI has made every effort to ensure that tests have been made correctly, and in accordance with the relevant TIPs. ISCTI has no liability for the test results, or towards the manufacturers.

ISCTI
V.le America 201
00144 Rome, Italy

Tlf. +39 06 5444 2663
Fax +39 06 5410904



Motorola SwMI	Motorola MTH500	Motorola MTM700	Motorola MTP700	Nokia THR850	NIROS Titan 4106	Sepura SRP 2000	Sepura SRM 1000	Clearstone CM9000P	Teltronic MDT400
8.7.1 SwMI initiated detachment (5.4.1)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8.7.2 SwMI initiated attachment (5.4.1)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8.7.3 SwMI initiated group reporting	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8.7.4 SwMI initiated registration with group report request	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8.7.5 SwMI initiated registration without group report request	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA

Motorola SwMI	Motorola MTH500	Motorola MTM700	Motorola MTP700	Nokia THR850	NIROS Titan 4106	Sepura SRP 2000	Sepura SRM 1000	Clearstone CM9000P	Teltronic MDT400
9 Group call									
9.1 Call setup	P	-	P	P	P	P	P	P	P
9.1 Call setup (Queuing)	P	P	P	P	P	P	P	P	P
9.1.1 Call setup modifications, Point-to-multipoint to point-to-point	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
9.1.1 Call setup modifications, Call priority	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA
9.2.1 End of transmission	P	-	P	P	P	P	P	P	P
9.2.2 Request to transmit	P	-	P	P	P	P	P	P	P
9.2.3.Pre emptive speech item request	P	-	P	P	P	No	No	P	P
9.3 Call disconnection	P	P	P	P	P	P	P	P	P
9.4 Late entry	P	P	P	P	P	P	P	P	P
9.5 Emergency group call .									
9.5 Emergency group call (Setup to busy group)	-	-	P	P	-	P	P	P	P
9.5.1 Emergency resource pre-emption	-	-	P	P	-	P	P	P	P
9.5.2 Emergency group call modification	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10 Cell re-selection									
10.1 Undeclared cell re-selection	P	P	P	P	-	P	P	P	P
10.2 Unannounced cell re-selection with call restoration									
10.2.1 (Group call)	P	P	P	-	-	P	P	P	P
10.2.1 (Queuing, group call)	-	-	P	-	-	P	P(2)	P	F (1)
10.2.1 (individual call)	-	-	P	-	-	No	No	No	No
10.2.1 (Queuing, individual call)	-	-	P	-	-	No	No	No	No
10.2.2 Announced cell re-selection without preferred Neighbour selected with call restoration									
10.2.2 (Group call)	P	P	P	F (1)	-	P	P	P	-
10.2.2 (Queuing, group call)	-	-	P	-	-	-	-	-	-
10.2.2 (Pre-emption, group call)	-	-	P	-	-	P(1)	P(1)	P	-
10.2.2 (individual call, traffic) TX	-	-	P	F(1)	-	P	P	P	-
10.2.2 (individual call, traffic) Rx	No	No	No	P	-	P	P	P	-
10.2.2 (individual call, inactivity)	No	No	No	P	-	P	P	-	-
10.2.2 (Queuing, individual call, traffic) Tx	-	-	P	-	-	P	P	P	-

ISCTI has made every effort to ensure that tests have been made correctly, and in accordance with the relevant TIPs. ISCTI has no liability for the test results, or towards the manufacturers.

ISCTI
V.le America 201
00144 Rome, Italy

Tlf. +39 06 5444 2663
Fax +39 06 5410904



10.2.2 (Queuing, individual call, traffic) RX	No	No	No	-	-	P	P(2)	-	-
10.2.2 (Queuing, individual call, inactivity)	No	No	No	-	-	P	P(2)	P	-
11 Short data service									
11.1 Status messages (MS to dispatcher)	-	-	P	P	P	P	P	P	P
11.1 Status messages (MS to MS)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11.1 Status messages (Text messaging)	-	-	-	P	-	P	P	-	P
12 Telephone call									
12.2 Call Set-up									
12.2.1 MS Originated, Late Through-Connect	-	-	P	P	P	P	P	P	P
12.2.2 MS Originated, Early Through-Connect	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12.2.3 MS Originated, Call Queued	-	-	P	P	P	P	P	P	P
12.2.4 MS Terminated	-	-	P	P	P	P	P	P	P
12.3 Call Maintenance	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA
12.4 DTMF Over-dial	-	-	P	P	P	P	P	P	P
12.5 Disconnect Causes	-	-	P	P	P	P	P	P	P
12.6 Emergency telephone call	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA

ISCTI has made every effort to ensure that tests have been made correctly, and in accordance with the relevant TIPs. ISCTI has no liability for the test results, or towards the manufacturers.

ISCTI
V.le America 201
00144 Rome, Italy

Tlf. +39 06 5444 2663
Fax +39 06 5410904

E-mail: Web- site: <http://www.comunicazioni.it>



Table 2: Test performed SDS TIP V3

Motorola SwMI	Motorola MTH500	Motorola MTM700	Motorola MTP700	Nokia THR850	NiROS Titan 4106	Sepura SRP 2000	Sepura SRM 1000	Cleartone CM9000P	Teltronic MDT-400
7 User defined data type 1, 2 and 3									
7 Type 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7 Type 2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7 Type 3	No	No	No	N/A	N/A	No	No	N/A	N/A
8 User defined data type 4									
8 User defined data type 4 without SDS-TL	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8.1.2 MS to MS, Standard Report	P	P	P	P	P	P	P	P	P
8.1.2 MS to MS, Standard Report with Store and Forward	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8.1.3 MS to MS, Short Report	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8.2 Text messaging									
8.2.1.4 No acknowledgement requested	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8.2.2 MS to MS, Short report	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 3: Test performed DGNA TIP V3

Motorola SwMI	Motorola MTH500	Motorola MTM700	Motorola MTP700	Nokia THR850	Sepura SRP 2000	Sepura SRM 1000	Cleartone CM9000P	Teltronic MDT-400
7 SS-DGNA not supported								
7.4 General Reject of SS-DGNA ¹	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA
7.5 SS-DGNA specific functions not supported by MS (5.1)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7.5 SS-DGNA specific functions not supported by SwMI (5.2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8 Supported SS-DGNA functions								
8.1 Group assignment								
8.1.1 Assignment of a group without attachment (5.3)	P	P	P	P	P	P	P	P
8.1.2 assignment of an always-scanned group (CoU=8)	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA
8.1.2 MS required to attach group with CoU # 5 or 8 after next ITSI attach	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA
8.1.2 MS NOT allowed to attach group with CoU # 5 or 8 after next ITSI attach	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA
8.1.2 MS NOT allowed to attach group with CoU # 5 or 8 after next ITSI attach (Single Group Mode MS)	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA
8.1.2 MS required re-attach that group with CoU=5 after next ITSI location update	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA

ISCTI has made every effort to ensure that tests have been made correctly, and in accordance with the relevant TIPs. ISCTI has no liability for the test results, or towards the manufacturers.

ISCTI
V.le America 201
00144 Rome, Italy

Tlf. +39 06 5444 2663
Fax +39 06 5410904



8.1.2 MS required to attach that group with CoU=5 after next ITSI attach	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA
8.1.2 MS NOT allowed to attach that group with CoU=5 after next ITSI attach (5.5)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8.1.2 Assignment of a group which is already in the MS group database (pre-programmed) (5.6)	P	P	P	P	No	No	P	P
8.2 Group de-assignment (5.7)	P	P	P	P	P	P	P	P

Table 4: Test performed AUTHENTICATION TIP V3

Motorola SwMI	Motorola MTH500	Motorola MTM700	Motorola MTP700	Nokia THR850	Sepura SRP 2000	Sepura SRM 1000	Clearstone CM9000P	Teltronic MDT-400
7 Authentication functions								
7.1 MS initiated location updating with authentication, success (5.1)	P	P	P	P	P	P	P	P
7.1 MS initiated location updating with authentication, failure (5.2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7.2 SwMI initiated location updating with authentication, roaming (5.3)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7.2 SwMI initiated location updating with authentication, success	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA
7.2 SwMI initiated location updating with authentication, failure	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA

Table 5: Test performed PACKET DATA TIP V3

Motorola SwMI	Motorola MTH500	Motorola MTM700	Motorola MTP700	Nokia THR850	Clearstone CM9000P	Teltronic MDT-400
7 Information flow						
7.1 Context Activation (Test case Number index)						
7.1.1 TE IPCP Initiated, Static Address (TE supplied) (5.1)	P	-	P	P	P	P
7.1.2 TE IPCP Initiated, Dynamic Address (5.2)	P	-	P	P	P	P
7.1.6 Provisioning Reject (5.3)	P	-	P	P	P	P
7.2 Context Deactivation						
7.2.1 MS initiated deactivation (5.5)	P	-	P	P	P	P
7.2.2 SwMI initiated deactivation (5.4)	P	-	P	P	P	-

ISCTI has made every effort to ensure that tests have been made correctly, and in accordance with the relevant TIPs. ISCTI has no liability for the test results, or towards the manufacturers.

ISCTI
V.le America 201
00144 Rome, Italy

Tlf. +39 06 5444 2663
Fax +39 06 5410904

Motorola SwMI	Motorola MTH500	Motorola MTM700	Motorola MTP700	Nokia THR850	Clearstone CM9000P	Teltronic MDT400
7.3 PDCH Access						
7.3.1 MS Initiated Access on the MCCH (5.6)	P	P	P	P	P	-
7.3.1 MS Initiated Access on the MCCH (Roaming without Data transmission, STANDBY state) (5.13)	P	-	P	P	P	-
7.3.2 SwMI Initiated Access on the MCCH (5.8)	P	P	P	P	P	-
7.3.3 MS Initiated Access Reject (5.10)	P	P	P	P	P	-
7.4 SN Data transfer						
7.4 SN Data transfer (5.7 and 5.9)	P	P	P	P	P	P
7.5 End of Data						
7.5.1 Normal (5.6-5.9 and 5.13)	P	P	P	P	P	P
7.5.2 MS timer Expired	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA
7.5.3 MS channel change	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA
7.6 Advanced Link Set-up						
7.6.1 MS initiated AL Set-up (5.6 and 5.8)	P	P	P	P	P	-
7.6.2 MS initiated AL Reset	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA
7.6.3 SwMI initiated AL Reset	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA
7.7 Advanced Link Data Transfer						
7.7.1 Normal Downlink (5.8 and 5.9)	P	P	P	P	P	P
7.7.2 Downlink, Lost Segment	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA
7.7.3 Downlink, Lost Segment and AR	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA
7.7.4 Normal Up link (5.6 and 5.7)	P	P	P	P	P	P
7.8 Advanced Link Disconnection						
7.8.1 MS initiated context deactivation	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA
7.8.2 SwMI initiated context deactivation	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA
7.10 Link Reconnect						
7.10.1 BS Data	NTPA	NTPA	NTPA	NTPA	NTPA	NTPA
7.10.2 MS Data (Roaming during Data transmission, READY state) (5.11)	No	No	No	No	P	-
7.10.2 MS Data (Roaming without Data transmission, READY state) (5.12)	-	-	-	-	-	-

ISCTI has made every effort to ensure that tests have been made correctly, and in accordance with the relevant TIPs. ISCTI has no liability for the test results, or towards the manufacturers.

ISCTI
V.le America 201
00144 Rome, Italy

Tlf. +39 06 5444 2663
Fax +39 06 5410904



Comments:

SEPURA

SRM 1000 - SRP 2000

1 - Motorola SwMI uses the 'traffic usage marker' on the AACH to the call that was pre-empted to free the resource to let this call continue.

2 - The SRM1000 is not fast enough, and so did not respond (with the BL-ACK) to the D-RESTORE-ACK in the granted slot. The SwMI sends a repeated D-RESTORE-ACK which the MS (which has already accommodated the changed Call-Id) now sees as an invalid call. The MS sends a U-DISCONNECT to the (now old) call. The MS subsequently behaves correctly for all call signalling for the new call Id.

NOKIA

1 - Nokia has to renew PTT to return in the first cell.

TELTRONIC

1 –The mobile fails the unannounced cell re-selection because sends U-PREPARE PDU in the first cell.

ISCTI has made every effort to ensure that tests have been made correctly, and in accordance with the relevant TIPs. ISCTI has no liability for the test results, or towards the manufacturers.

ISCTI
V.le America 201
00144 Rome, Italy

Tlf. +39 06 5444 2663
Fax +39 06 5410904

E-mail: Web- site: <http://www.comunicazioni.it>