



IST doc.10 rev.1

TETRA Terminal Interoperability Certificate

January 2004

SEPURA

Manufacturer	Type	Software/Hardware Release No.	Period of testing
Sapura	SRM 2000	SW: 080000500340 HW: 2PN100349ENH5A3	4-6/02/ 2004

ISCTI (Istituto Superiore delle Comunicazioni e delle Tecnologie dell'Informazione) has witnessed that the Sepura SRM 2000 Terminal is operating in accordance with:

TETRA Interoperability Profile:

TETRA MoU, TTR001-01, Core, Ver. 3.0.13, June 2001

TETRA MoU, TTR001-02, SDS, Ver. 1.0.1, August 2001

TETRA MoU, TTR001-04, Authentication, 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

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Radio Office Manager

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Information on the equipments used for testing in the Jan. 2004 IOP Test Session

The tests were performed using the following SwMI:

Manufacturer	Type	Software/Hardware Release No.
Teltronic	Nebula	SW: Rel.3.07 HW: Rel.00.03.01.07

Additional information about the test performed

The tests were performed in the LA1 and LA2 sites. The SwMI was operating with the following configuration:

MCC	214
MNC	13
Colour code	47
LA1 carrier frequency (BS Tx)	394,575 MHz
LA2 carrier frequency (BS Tx)	396,425 MHz
PSTN gateway telephone number	16777184
Subscriber classes	FFFF ₁₆

Note: TIP compliance testing focuses on functionality on the OSI model layers two, three and higher and therefore is frequency band independent.



IOP Test Plans used for testing

The following Test Plans were used in the Test Session:

TETRA MoU, IOP001-01, Core, Ver. 1.1.0

TETRA MoU, IOP001-02, SDS, Ver. 1.1.0

TETRA MoU, IOP001-04, Authentication, Ver. 1.1.0

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
No	Not supported by Terminal
NTPA	No Test Plan/case Available
P	Pass
F	Fail
I	Inconclusive

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 are in accordance with the relevant TIPs. ISCTI has no liability for the test results, or towards the manufacturers.



Teltronic SwMI		Sepura SRM2000
CORE TTR001-01		
6	Registration	
6.1	ITSI attach ITSI attach without group attachment – 1.1	P
6.2	ITSI attach including group attachment ITSI attach including group attachment – 1.2	No
6.2	ITSI attach including group attachment MS initiated Multiple group attachment during MS registration – 2.2.1	No
6.3	Roaming & periodic location updating Cell re-selection without communication activity – 7.1.1	P
6.4	SwMI initiated location updating SwMI initiated location updating without group reporting – 1.3.1	N/A
6.4	SwMI initiated location updating SwMI initiated location updating with group reporting – 1.3.2	N/A
6.5	De-registration De-registration – 1.4	P
7	Individual call	
7.1	Call set-up	
7.1.1	Hook signalling Individual hook call set-up – 4.1.1	P
7.1.1	Hook signalling Individual call set-up, resource queuing – 4.1.3	P
7.1.1	Hook signalling Duplex call set-up – 4.2.1	P
7.1.1	Hook signalling Duplex call set-up, resource queuing – 4.2.2	P
7.1.1	Hook signalling MS-ISDN Individual call – 9.1	N/A
7.1.2	Direct through-connect Individual call set-up, resource queuing – 4.1.3	P
7.1.2	Direct through-connect MS-ISDN Individual call – 9.1	N/A
7.1.2	Direct through-connect Individual direct call set-up – 4.1.2	P
7.1.3	Call set-up Modifications	
7.1.3.1.4	'Point to point' to 'point to multipoint' Emergency call set-up, P2P to P2MP call modification – 6.2.2	N/A
7.1.3.2.1	Direct to hook Call set-up Modification by called party, Direct to hook – 4.3.1	P2
7.1.3.2.3	Duplex to simplex Call set-up modification by Called Party, duplex to semiduplex – 4.3.2	No
7.2	Transmission control	
7.2.1	End of transmission Individual hook call set-up – 4.1.1	P
7.2.1	End of transmission Individual direct call set-up – 4.1.2	P
7.2.2	Request to transmit Individual hook call set-up – 4.1.1	P
7.2.2	Request to transmit MS-ISDN Individual call – 9.1	N/A
7.2.2	Request to transmit Individual direct call set-up – 4.1.2	P
7.2.3	Request to transmit (in the presence of an active talker) Pre-emptive speech item request, non pre-emptive transmission request queuing – 4.1.4	No
7.2.3	Request to transmit (in the presence of an active talker) Pre-emptive speech item request, non pre-emptive transmission request rejection – 4.1.5	N/A
7.2.3	Request to transmit (in the presence of the an active talker) MS-ISDN Individual call – 9.1	N/A
7.3	Call Maintenance Queuing during Individual call restoration, Transmitting – 7.3.4.1	N/A
7.3	Call Maintenance Queuing during Individual call restoration, Receiving. (Announced Type 3) – 7.3.4.2	N/A



Teltronic SwMI		Sepura SRM2000
7.3	Call Maintenance Queuing during Individual call restoration, Receiving (Unannounced) – 7.3.4.3	N/A
7.3	Call Maintenance Queuing during Individual call restoration, Communication inactivity. (Announced Type 3) – 7.3.5.1	N/A
7.3	Call Maintenance Queuing during Individual call restoration, Communication inactivity (Unannounced) – 7.3.5.2	N/A
7.3	Call Maintenance Queuing during Duplex call restoration (Announced type 3) – 7.4.2	N/A
7.4	Call disconnection Individual hook call set-up – 4.1.1	P
7.4	Call disconnection Individual direct call set-up – 4.1.2	P
7.4	Call disconnection Duplex call set-up – 4.2.1	P
7.5	Emergency individual call Emergency individual call. Resource pre-emption – 6.2.1	P
7.5.1	Emergency speech item request Emergency individual call. Resource pre-emption – 6.2.1	P
7.5.2	Emergency individual call modification Emergency call set-up, P2P to P2MP call modification – 6.2.2	N/A
8 Group management		
8.1	General Requirements Status to scanned group – 5.1.2.3	P
8.2.5	Class of usage values 101₂, 011₂, 010₂, High, normal, low priority scanned Status to scanned group – 5.1.2.3	P
8.2.7	Selected group and SwMI initiated attachment/detachments SwMI initiated Temporary 1 group detachment and re-attachment of selected group – 2.4.2	N/A
8.2.7	Selected group and SwMI initiated attachment/detachments SwMI initiated Temporary 1 group detachment and re-attachment of the non-selected group – 2.4.3	N/A
8.4	Attachment of the selected group MS initiated single group attachment of the selected group by an MS, which can operate without a selected group, attachment accepted – 2.1.1	P
8.4	Attachment of the selected group MS initiated single group attachment of the selected group, by an MS, which can operate without a selected group, rejection – 2.1.3	P
8.4	Attachment of the selected group Null group attachment as the selected group – 2.1.5	No
8.4	Attachment of the selected group Change of selected group – 2.1.6	P
8.5	Multiple group attachment MS initiated single group attachment of other than selected group, attachment accepted – 2.1.2	P
8.5	Multiple group attachment MS initiated single group attachment of other than selected group, rejection – 2.1.4	P
8.5	Multiple group attachment MS initiated Multiple group attachment, rejection of some of the attached groups – 2.2.5	P
8.5	Multiple group attachment MS initiated Multiple group attachment with attachment to selected group – 2.2.2	P
8.5	Multiple group attachment MS initiated Multiple group attachment during MS registration – 2.2.1	P
8.5	Multiple group attachment Ms initiated Multiple group attachment with no selected group – 2.2.3	P
8.5	Multiple group attachment MS initiated Multiple group attachment, only the attachment of the selected group is accepted – 2.2.4	N/A
8.6	MS initiated detachment MS initiated group detachment of the selected group – 2.3.1	No



Teltronic SwMI		Sepura SRM2000
8.6	MS initiated detachment MS initiated group detachment of the selected group and an attached group – 2.3.2	No
8.7	SwMI initiated group attachment and detachment	
8.7.1	SwMI initiated detachment SwMI initiated group detachment with another value than Temporary 1 detachment and attachment – 2.4.1	N/A
8.7.1	SwMI initiated detachment SwMI initiated Temporary 1 group detachment and re-attachment of selected group – 2.4.2	N/A
8.7.1	SwMI initiated detachment SwMI initiated Temporary 1 group detachment and re-attachment of the non-selected group – 2.4.3	N/A
8.7.2	SwMI initiated attachment SwMI initiated group detachment with another value than Temporary 1 detachment and attachment – 2.4.1	N/A
8.7.2	SwMI initiated attachment SwMI initiated Temporary 1 group detachment and re-attachment of the non-selected group – 2.4.3	N/A
8.7.2	SwMI initiated attachment SwMI initiated Temporary 1 group detachment and re-attachment of selected group – 2.4.2	N/A
8.7.4	SwMI initiated location updating with group report request SwMI initiated location updating with group reporting – 1.3.2	N/A
8.7.5	SwMI initiated registration without group report request SwMI initiated location updating without group reporting – 1.3.1	N/A
9	Group call	
9.1	Call set-up Normal Group call – 3.1	P
9.1	Call set-up Group Call set-up, resource queuing – 3.3	P
9.1	Call set-up MS-ISDN group call – 9.2	N/A
9.1	Call set-up Group scanning – 3.8	P
9.1.2	Call set-up modifications Group call-SwMI changes requested call priority – 3.7	N/A
9.2.1	End of transmission Normal Group call – 3.1	P
9.2.1	End of transmission Group scanning – 3.8	P
9.2.2	Request to transmit Normal Group call – 3.1	P
9.2.2	Request to transmit MS-ISDN group call – 9.2	N/A
9.2.2	Request to transmit Pre-emptive speech item request, non pre-emptive transmission request queuing – 3.4	No
9.2.2	Request to transmit Group scanning – 3.8	P
9.2.2	Request to transmit Pre-emptive speech item request, non pre-emptive transmission request rejection – 3.5	N/A
9.3	Call disconnection Normal Group call – 3.1	P
9.3	Call disconnection Group call disconnection by call owner MS – 3.6	P
9.4	Late entry Late entry – 3.2	P
9.5	Emergency group call	
9.5	Emergency group call Emergency call set-up to busy group, speech item interruption – 6.1.1	P
9.5	Emergency group call Emergency group call resource pre-emption – 6.1.2	P
9.5	Emergency group call Pre-emption during group call restoration. Transmitting (Announced Type 3) – 7.2.5	N/A
9.5.1	Emergency speech item request Emergency call set-up to busy group speech item interruption – 6.1.1	P
9.5.2	Emergency group call modification Emergency call set-up, P2MP to P2P call modification – 6.1.3	N/A



Teltronic SwMI		Sepura SRM2000
10	Cell re-selection	
10.1	Undeclared cell re-selection Cell re-selection without communication activity – 7.1.1	P
10.2	Cell re-selection with call restoration	
10.2.1	Unannounced cell re-selection Group call restoration, Receiving (Unannounced) – 7.2.2	P
10.2.1	Unannounced cell re-selection Queuing during Group call restoration, Receiving (Unannounced) – 7.2.4	F1
10.2.1	Unannounced cell re-selection Queuing during Individual call restoration, Receiving (Unannounced) – 7.3.4.3	P
10.2.1	Unannounced cell re-selection Queuing during individual call restoration, Communication inactivity (Unannounced) – 7.3.5.2	P
10.2.1	Unannounced cell re-selection Individual call restoration, Receiving (Unannounced) – 7.3.2.2	P
10.2.1	Unannounced cell re-selection Individual call restoration, Communication inactivity (Unannounced) – 7.3.3.2	P
10.2.2	Announced cell re-selection Type without Preferred Neighbour Selected Group call restoration, Transmitting. (Announced Type 3) – 7.2.1	P
10.2.2	Announced cell re-selection Type without Preferred Neighbour Selected Queuing during group call restoration, Transmitting (Announced type 3) – 7.2.3	F2
10.2.2	Announced cell re-selection Type without Preferred Neighbour Selected Pre-emption during group call restoration. Transmitting. (Announced type 3) – 7.2.5	N/A
10.2.2	Announced cell re-selection Type without Preferred Neighbour Selected Individual call restoration, Transmitting party – 7.3.1	P
10.2.2	Announced cell re-selection Type without Preferred Neighbour Selected Individual call restoration. Receiving (Announced Type 3) – 7.3.2.1	P
10.2.2	Announced cell re-selection Type without Preferred Neighbour Selected Queuing during Individual call restoration, Communication inactivity. (Announced Type 3) – 7.3.5.1	P
10.2.2	Announced cell re-selection Type without Preferred Neighbour Selected Queuing during individual call restoration, Transmitting – 7.3.4.1	P
10.2.2	Announced cell re-selection Type without Preferred Neighbour Selected Queuing during Individual call restoration, Receiving (Announced Type 3) – 7.3.4.2	P
10.2.2	Announced cell re-selection Type without Preferred Neighbour Selected Individual call restoration, Communication inactivity (Announced Type 3) – 7.3.3.1	P
10.2.2	Announced cell re-selection Type without Preferred Neighbour Selected Duplex call restoration (Announced Type 3) – 7.4.1	P
10.2.2	Announced cell re-selection Type without Preferred Neighbour Selected Queuing during Duplex call restoration (Announced Type 3) – 7.4.2	P
10.2.3	Announced cell re-selection Type with Preferred Neighbour Selected Group call announced cell-reselection with preferred neighbour selected and with call restoration, Transmitting – 7.2.7	N/A



Teltronic SwMI		Sepura SRM2000
10.2.3	Announced cell re-selection Type with Preferred Neighbour Selected Individual call, Announced cell re-selection with Preferred Neighbour Selected and with Call Restoration Transmitting – 7.3.6	N/A
10.3	Cell re-selection without call restoration	
10.3.1	Announced Type with Preferred Neighbour Selected and without Forward Registration Group call, Announced cell re-selection without Call Restoration, (Seamless Hand-over) without Forward Registration Transmitting – 7.2.6	N/A
10.3.1	Announced Type with Preferred Neighbour Selected and without Forward Registration Duplex call, Announced cell-re-selection without Call Restoration (Seamless Handover), without Forward Registration – 7.4.3	N/A
10.3.2	Announced Type with Preferred Neighbour Selected and with Forward Registration Individual call, Announced cell re-selection without Call Restoration with Forward Registration, Transmitting – 7.3.7	N/A
10.3.2	Announced Type with Preferred Neighbour Selected and with Forward Registration Group call, Announced cell re-selection without Call Restoration with Forward Registration, Transmitting – 7.2.8	N/A
11	Short data service	
11.1.1	Service Overview MS-ISDN addressed individual Status message – 9.3	N/A
11.1.1	Service Overview MS-ISDN addressed group Status message – 9.4	N/A
11.1.3.1	MS to Wireline Dispatcher with Status Acknowledge Status transfer to Dispatcher – 5.1.2.2	N/A
11.1.3.2	MS to MS/Group with General Status Acknowledge Status transfer to group – 5.1.2.1	P
11.1.3.2	MS to MS/Group with General Status Acknowledge Individual addressed status transfer – 5.1.1	P
11.1.3.2	MS to MS/Group with General Status Acknowledge Status to scanned group - 5.1.2.3	P
11.1.3.2	MS to MS/Group with General Status Acknowledge MS-ISDN addressed group Status message – 9.4	N/A
11.1.3.2	MS to MS/Group with General Status Acknowledge MS-ISDN addressed individual Status message – 9.3	N/A
12	Telephone call	
12.2	Call Set-up	
12.1	Gateway addresses TETRA-originated call set-up – 8.1	P
12.2.1	MS Originated, Late Through-Connect TETRA-originated call set-up – 8.1	P
12.2.2	MS Originated, Early Through-Connect TETRA-originated call set-up – 8.1	P
12.2.3	MS Originated, Call Queued TETRA-originated call set-up queuing – 8.2	P1
12.2.4	MS terminated PSTN originated call – 8.3	P
12.4	DTMF Over dial TETRA-originated successful DTMF over-dial – 8.4	P
12.4	DTMF Over dial TETRA-originated unsuccessful DTMF over-dial – 8.5	N/A
12.5	Disconnect Causes TETRA-originated call set-up – 8.1	P



Teltronic SwMI		Sepura SRM2000
12.5	Disconnect Causes TETRA-originated call set-up queuing – 8.2	P
12.5	Disconnect Cause PSTN originated call – 8.3	P
12.6	Emergency telephone call Emergency call to emergency number – 6.3.1	P
14	Layer 2 operation	
14.1.1.2	Traffic channel (TCH) Usage of SACCH during group call – 10.2	No
14.1.1.2	Traffic channel (TCH) Usage of SACCH during individual call – 10.4	No
14.1.1.4	Up-link FACCH and down-link TCH Usage of FACCH during group call – 10.1	No
14.1.1.4	Up-link FACCH and down-link TCH Usage of FACCH during individual call – 10.3	No
SDS TTR 001-02		
6	Service Overview	
6.1	Addressing MS-ISDN addressed individual SDS-TL message – 9.5 Core	N/A
6.1	Addressing MS-ISDN addressed group SDS-TL message – 9.6 Core	N/A
7	User defined data Type 1, 2 and 3	
7	User defined data Type 1, 2 and 3 Individual addressed SDS Type 1 transfer – 1.1.1	No
7	User defined data Type 1, 2 and 3 Individual addressed SDS Type 2 transfer – 1.2.1	No
7	User defined data Type 1, 2 and 3 Individual addressed SDS Type 3 transfer – 1.3.1	No
8	User defined data Type 4	
8.1	User defined data Type 4 SDS-TL message to scanned group (without acknowledgement) – 1.4.3	P
8.1.2	MS to MS, Standard Report Individual addressed text messaging using SDS-TL, (with acknowledgement) – 1.4.1	P
8.1.2	MS to MS, Standard Report Group addressed text messaging using SDS-TL, (without acknowledgement) – 1.4.2	P
8.1.2	MS to MS, Standard report MS-ISDN addressed individual SDS-TL message – 9.5 Core	N/A
8.1.2	MS to MS, Standard report Usage of FACCH during group call – 10.1 Core	No
8.1.2	MS to MS, Standard report MS-ISDN addressed group SDS-TL message – 9.6 Core	N/A
8.1.2	MS to MS, Standard report Usage of SACCH during group call – 10.2 Core	No
8.1.2	MS to MS, Standard report Usage of SACCH during individual call – 10.4 Core	No
8.1.2	MS to MS, Standard report Usage of FACCH during individual call – 10.3 Core	No
8.1.3	MS to MS, Short Report Individual addressed text messaging using SDS-TL, (with acknowledgement) – 1.4.1	P
8.1.3	MS to MS, Short Report Group addressed text messaging using SDS-TL, (without acknowledgement) – 1.4.2	-
8.1.3	MS to MS, Short report MS-ISDN addressed individual SDS-TL message – 9.5 Core	N/A



Teltronic SwMI		Sepura SRM2000
8.1.3	MS to MS, Short report Usage of FACCH during individual call – 10.3 Core	No
8.1.3	MS to MS, Short report Usage of SACCH during individual call – 10.4 Core	No
8.2	Text messaging	
8.2.1.2	Text Length MS-ISDN addressed individual SDS-TL message – 9.5 Core	N/A
8.2.1.2	Text Length MS-ISDN addressed group SDS-TL message – 9.6 Core	N/A
8.2.1.3	Data Coding Scheme MS-ISDN addressed individual SDS-TL message – 9.5 Core	N/A
8.2.1.3	Data Coding Scheme MS-ISDN addressed group SDS-TL message – 9.6 Core	N/A
8.2.1.4	PDU Contents Usage of FACCH during group call – 10.1 Core	No
8.2.1.4	PDU Contents MS-ISDN addressed individual SDS-TL message – 9.5 Core	N/A
8.2.1.4	PDU Contents Usage of SACCH during group call – 10.2 Core	No
8.2.1.4	PDU Contents MS-ISDN addressed group SDS-TL message – 9.6 Core	N/A
8.2.1.4	PDU contents Report Group addressed text messaging using SDS-TL, (without acknowledgement) – 1.4.2	P
8.2.1.4	PDU contents SDS-TL message to scanned group (without acknowledgement) – 1.4.3	P
AUTHENTICATION TTR 001-04		
7	Authentication functions	
7.1	SwMI initiated authentication Successful ITSI attach with authentication – 1.1.1	P
7.1	SwMI initiated authentication Rejected registration, authentication failure – 1.1.2	P
7.1	SwMI initiated authentication Successful roaming location update with authentication – 1.1.3	P
Comments:		

Sepura SRM 2000

- P1 PSTN subscriber receive the alert signalling after the resource become available, but does not receive any indication when the resources is queued, as it is stated in Expected result steps 1 and 2 of test case 8.2
- P2 The call has been modified by MS B (Teltronic MS)
- F1 SwMI sends D-TX GRANTED, but because MS has already moved to TCH (by D-SETUP) it is not seen. In this case the user experiences correct operational behaviour.
- F2 SwMI sends D-TX GRANTED, but because MS has already moved to TCH (by D-SETUP) it is not seen.