# TETRA ASSOCIATION

ISCTI

## TETRA Interoperability Certificate

**Rohill, TetraNode, SwMI**
**Unimo, MU-1000, Terminal**

**Hoogeveen, May 2010**

| | | | |
|---|---|---|---|
| **Latest Certified SwMI SW Release:** | R 3.0 | **Latest Certified Terminal SW Release:** | Stack Version 8.7.2 MMI Version: V4.0.0 |
| **Latest Certified SwMI HW Release:** | R 2.2 | **Latest Certified Terminal HW Release:** | Osiris H014 |

ISCOM (Istituto Superiore della Comunicazioni e delle Tecnologie dell'Informazione) certifies, that the Rohill, TetraNode, SwMI and the Unimo, MU-1000, 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 | - |
| Emergency Call | Certified |
| Cell Re-selection | - |
| PSTN interconnect | Certified |
| MS-ISDN Numbering | - |
| In Call Signalling | Certified |
| Subscriber Class Procedures | Certified |
| Common Secondary Control Channels | - |
| BS Fallback Operation | Certified |
| Energy Economy Mode | - |
| Transmit Inhibit | - |
| **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 | Certified |

| 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 | - |
| **Tetra Association TTR001-09:AL** | |
| Ambience Listening | Certified |
| Interaction with Transmit Inhibit | - |
| **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 | - |
| Change of CMG and GSKO | - |
| Key Status demand | - |
| Change of Security Class for Fallback operation | Partial |
| Change of Security Class (other than for Fallback operation) | - |
| Key Management for Secure Direct Mode Operation | - |
| **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.

TetraNode

| R 2.2 | Definition |
|---|---|
| **R 3.0** | All required tests have been performed and passed |
| **MU-1000** | Not all the required tests have been performed but none have failed |
| **Osiris H014** | 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 |

Stack Version 8.7.2 MMI Version: V4.0.0

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** | **Rohill, Hoogeveen, May 2010** | | | |
| **SwMI Type** | TetraNode | | | |
| **SwMI HW Release** | R 2.2 | | | |
| **SwMI SW Release** | R 3.0 | | | |
| **Terminal Type** | MU-1000 | | | |
| **Terminal HW Release** | Osiris H014 | | | |
| **Terminal SW Release** | Stack Version 8.7.2 MMI Version: V4.0.0 | | | |
| **TIP Specs and TIP Compliance Test Plans** | | | | |
| **Core** | TTR001-01 v5.0.0<br>IOP001-01 v2.6.0<br>TIC-RT001-01 v242 | | | |
| **SDS** | TTR001-02 v2.0.1<br>IOP001-02 v2.0.0<br>TIC-RT001-02 v210 | | | |
| **DGNA** | TTR001-03 v2.0.0<br>IOP001-03 v2.0.1<br>TIC-RT001-03 v216 | | | |
| **Auth** | TTR001-04 v3.0.0<br>IOP001-04 v2.0.0<br>TIC-RT001-04 v219 | | | |

| | | | | |
|---|---|---|---|---|
| **PD** | TTR001-05 v2.0.0<br>IOP001-05 v2.0.0<br>TIC-RT001-05 v225 | | | |
| **AL** | TTR001-09 v2.0.0<br>IOP001-09 v1.1.0<br>TIC-RT001-09 v118 | | | |
| **AIE** | TTR001-11 v3.0.0<br>IOP001-11 v3.0.0<br>TIC-RT001-11 v3015 | | | |
| **ED** | TTR001-13 v2.0.0<br>IOP001-13 v1.0.0<br>TIC-RT001-13 v140 | | | |

## Feature compliance report

| | | | | |
|---|---|---|---|---|
| **Test Session** | **Rohill, Hoogeveen, May 2010** | | | |
| **Core** | | | | |
| Registration | PASSED Complete 3_pass_of_3 | | | |
| ITSI attach | PASSED Complete 2_pass_of_2 | | | |
| SwMI initiated location updating | Not Supported | | | |
| LA timer based Periodic location updating | Not Supported | | | |
| De-registration | PASSED Complete 1_pass_of_1 | | | |
| Group Management | PASSED Complete 11_pass_of_11 | | | |
| Single group attachment | PASSED Complete 5_pass_of_5 | | | |
| Multiple group attachment | PASSED Complete 4_pass_of_4 | | | |
| MS initiated group detachment | PASSED Complete 2_pass_of_2 | | | |

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|---|---|---|---|---|
| SwMI initiated group management | Not Supported | | | |
| Group call | PASSED<br>Complete<br>11_pass_of_11 | | | |
| Normal group call | PASSED<br>Complete<br>4_pass_of_4 | | | |
| Late entry | PASSED<br>Complete<br>1_pass_of_1 | | | |
| Priority Group scanning | PASSED<br>Complete<br>3_pass_of_3 | | | |
| Call setup modifications | PASSED<br>Complete<br>1_pass_of_1 | | | |
| Resource Queuing based on Call Priority | PASSED<br>Complete<br>2_pass_of_2 | | | |
| Broadcast Call | Not Supported | | | |
| Limited coverage notification | Not Supported | | | |
| Individual call | PASSED<br>Complete<br>12_pass_of_12 | | | |
| Simplex individual call | PASSED<br>Complete<br>4_pass_of_4 | | | |
| Duplex individual call | PASSED<br>Complete<br>2_pass_of_2 | | | |
| Call setup modifications | PASSED<br>Complete<br>2_pass_of_2 | | | |

| | | | | |
|---|---|---|---|---|
| Resource Queuing based on Call Priority | PASSED Complete 4_pass_of_4 | | | |
| 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 | FAILED Complete 5_pass_of_6 | | | |
| Pre-emption of Resources | PASSED Complete 2_pass_of_2 | | | |
| Pre-emption of Busy Users | FAILED Complete 3_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 | | | |

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|---|---|---|---|---|
| Cell Re-selection | FAILED Complete 14_pass_of_15 | | | |
| Undeclared | PASSED Complete 1_pass_of_1 | | | |
| Unannounced | FAILED Complete 2_pass_of_3 | | | |
| Announced - with Call Restoration | PASSED Complete 11_pass_of_11 | | | |
| Announced - without Call Restoration | 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 | | | | |
| MS ISDN - Voice Call | Not Supported | | | |
| MS-ISDN Status | Not Supported | | | |

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|---|---|---|---|---|
| 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 2_pass_of_2 | | | |
| Cell Selection based on Subscriber Class | PASSED Complete 1_pass_of_1 | | | |
| Subscriber Class Delivery during Location Update | PASSED Complete 1_pass_of_1 | | | |
| Use of Preferred Subscriber Classes | Not Supported | | | |
| Common Secondary Control Channels | | | | |
| One C-SCCH per cell | Not Supported | | | |
| Two C-SCCH per cell | Not Supported | | | |
| Three C-SCCH per cell | Not Supported | | | |
| BS Fallback Operation | PASSED Complete 11_pass_of_11 | | | |
| Switch to/from BS Fallback Operation | PASSED Complete 2_pass_of_2 | | | |
| Roaming with BS Fallback Operation | PASSED Complete 1_pass_of_1 | | | |

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|---|---|---|---|---|
| Services with BS Fallback Operation | PASSED Complete 8_pass_of_8 | | | |
| Energy Economy Mode | | | | |
| Energy Economy Mode Operation | Not Supported | | | |
| Transmit Inhibit | | | | |
| TXI Activation & De-Activation without Status message | Not Supported | | | |
| TXI Activation & De-Activation with Status message | Not Supported | | | |
| Receipt of group addressed service during TXI | Not Supported | | | |
| **Short Data Service (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 5_pass_of_5 | | | |
| Individually Addressed | PASSED Complete 1_pass_of_1 | | | |
| Group Addressed | PASSED Complete | | | |

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|---|---|---|---|---|
| | 2_pass_of_2 | | | |
| Using MS-ISDN dialling | Not Supported | | | |
| Using UCS2 coding scheme | PASSED<br>Complete<br>2_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<br>Complete<br>12_pass_of_12 | | | |
| Support for individually addressed DGNA assignment without attachment | PASSED<br>Complete<br>3_pass_of_3 | | | |
| Support for individually addressed DGNA assignment with attachment as selected group | PASSED<br>Complete<br>3_pass_of_3 | | | |
| Support for individually addressed DGNA assignment with attachment as scanned group | PASSED<br>Complete<br>3_pass_of_3 | | | |
| Support for individually addressed DGNA assignment with rejected attachment | PASSED<br>Complete<br>1_pass_of_1 | | | |
| Support for individually addressed assigment for pre-programmed group | PASSED<br>Complete<br>5_pass_of_5 | | | |
| Support for group addressed DGNA | | | | |
| Support for group addressed DGNA assignment | Not Supported | | | |

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|---|---|---|---|---|
| Management of 'group assignment lifetime' | Not Supported | | | |
| Support for group addressed DGNA deassignment | Not Supported | | | |
| Tolerance of unsupported DGNA functions | PASSED Complete 1_pass_of_1 | | | |
| MS tolerance of unsupported individual addressed DGNA signalling | Not Supported | | | |
| MS tolerance of unsupported group addressed DGNA signalling | PASSED Complete 1_pass_of_1 | | | |
| **Authentication** | | | | |
| 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 | PASSED Complete 2_pass_of_2 | | | |
| Attach with authentication | PASSED Complete 1_pass_of_1 | | | |
| Roaming with authentication | PASSED Complete | | | |

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|---|---|---|---|---|
| | 1_pass_of_1 | | | |
| TEI Query | | | | |
| TEI Query Operation | Not Supported | | | |
| **TETRA Packet Data** | | | | |
| Context Management | PASSED<br>Complete<br>11_pass_of_11 | | | |
| Context Activation | PASSED<br>Complete<br>7_pass_of_7 | | | |
| User authentication | PASSED<br>Complete<br>4_pass_of_4 | | | |
| Single Slot Packet Data | PASSED<br>Complete<br>9_pass_of_9 | | | |
| Data Transfer | PASSED<br>Complete<br>6_pass_of_6 | | | |
| Cell re-selection | PASSED<br>Complete<br>3_pass_of_3 | | | |
| Multi Slot Packet Data | | | | |
| Data Transfer | Not Supported | | | |
| **TETRA Ambience Listening (SS-AL)** | | | | |
| Ambience Listening | PASSED<br>Complete<br>5_pass_of_5 | | | |
| SS-AL Call Setup | PASSED<br>Complete<br>2_pass_of_2 | | | |

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|---|---|---|---|---|
| MS initiated SS-AL disconnection | PASSED Complete 3_pass_of_3 | | | |
| No Indication to affected user | PASSED Complete 5_pass_of_5 | | | |
| Interaction with Transmit Inhibit | | | | |
| AL can override TxI | Not Supported | | | |
| AL cannot override TxI | Not Supported | | | |
| **Air Interface Encryption** | | | | |
| Security Class 2 Air Interface Encryption | PASSED Complete 11_pass_of_11 | | | |
| Location Updating and AI Signalling Protection | PASSED Complete 4_pass_of_4 | | | |
| TM-SCK provisioning during location updating | Not Supported | | | |
| 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 and Change of TM-SCK | Not Supported | | | |
| Security Class 3 Air Interface Encryption | Time_Limited 16_pass_of_17 | | | |
| Location Updating and AI Signalling Protection | PASSED Complete 6_pass_of_6 | | | |

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|---|---|---|---|---|
| DCK Forwarding at MS request | Not Supported | | | |
| DCK Forwarding by SwMI (without MS request) | Not Supported | | | |
| DCK Retrieval | PASSED Complete 3_pass_of_3 | | | |
| CCK provisioning during location updating | PASSED Complete 3_pass_of_3 | | | |
| 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 and Change of CCK | Time_Limited 3_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 | Time_Limited 0_pass_of_1 | | | |
| 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 | Time_Limited 0_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 and change of DM-SCK | Not Supported | | | |
| **Enable Disable** | | | | |
| Enable and temporary disable of an MS | PASSED Complete 6_pass_of_6 | | | |
| Enable and temporary disable of an MS without authentication | PASSED Complete 2_pass_of_2 | | | |
| 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 | Not Supported | | | |
| 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 | | | |