

## DMO TETRA Interoperability Certificate

### Sepura, SC2020, DMO Repeater

Cambridge, February 2017

Latest Certified Repeater SW Release:	1738 001 08522
Latest Certified Repeater HW Release:	TP01STW

ISCTI (Istituto Superiore delle Comunicazioni e delle Tecnologie dell'Informazione) certifies that the Sepura SC2020 DMO Repeater has been subject to interoperability testing for the features listed in the "Certified features" tables of this certificate with the following DMO Terminals Sepura STP9000, Sepura SRG3900, Sepura SC2020, in accordance with the TETRA Interoperability Profiles, TIP compliance Test Plan and related TETRA interoperability requirement tables.

The certificate features of each DM Terminal acting as master during testing is highlighted in light blue.

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 fully witnessed single test session on February 2017. 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.

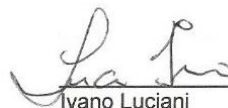
**NOTE:** the SC2020 Repeater was tested as Repeater Type 1A only

**IOP test engineer**



Massimo Proietti

**Head of the Procedure**



Ivano Luciani

**Radio Office Manager**

Giuseppe Pierri



## Certified features

Note: The DM-MSA under test is highlighted in light blue background.

<b>DMO Test Session Cambridge, February 2017 Sepura SC2020</b>	<b>Sapura STP9000</b>	<b>Sapura SRG3900</b>	<b>Sapura SC2020</b>
<b>TTR002-03 DMO Repeater</b>			
<b>Presence Signal</b>	Partial	Partial	Partial
<b>DM-MS authorization</b>	Partial	Partial	Partial
<b>Group Call</b>	Partial	Partial	-
<b>Individual Call</b>	Partial	Partial	Partial
<b>Call Maintenance</b>	Partial	Partial	Partial
<b>Status messages</b>	Partial	Partial	-
<b>SDS TL</b>	Partial	Partial	-
<b>TTR002-05 DMO AIE - Rep</b>			
<b>DMO AIE Encryption - via Repeater Type 1A</b>	Partial	Partial	Partial

<b>DMO Test Session Cambridge, February 2017 Sepura SC2020</b>	<b>Sepura STP9000</b>	<b>Sepura SRG3900</b>	<b>Sepura SC2020</b>
<b>TTR002-03 DMO Repeater</b>			
<b>Presence Signal</b>	Partial	Partial	Partial
<b>DM-MS authorization</b>	Partial	Partial	Partial
<b>Group Call</b>	Partial	Partial	-
<b>Individual Call</b>	Partial	Partial	Partial
<b>Call Maintenance</b>	Partial	Partial	Partial
<b>Status messages</b>	Partial	Partial	-
<b>SDS TL</b>	Partial	Partial	-
<b>TTR002-05 DMO AIE - Rep</b>			
<b>DMO AIE Encryption - via Repeater Type 1A</b>	Partial	Partial	Partial

<b>DMO Test Session Cambridge, February 2017 Sepura SC2020</b>	<b>Sepura STP9000</b>	<b>Sepura SRG3900</b>	<b>Sepura SC2020</b>
<b>TTR002-03 DMO Repeater</b>			
<b>Presence Signal</b>	Partial	Partial	Partial
<b>DM-MS authorization</b>	Partial	Partial	Partial
<b>Group Call</b>	Partial	Partial	-
<b>Individual Call</b>	Partial	Partial	Partial
<b>Call Maintenance</b>	Partial	Partial	Partial
<b>Status messages</b>	Partial	Partial	-
<b>SDS TL</b>	Partial	Partial	-
<b>TTR002-05 DMO AIE - Rep</b>			
<b>DMO AIE Encryption - via Repeater Type 1A</b>	Partial	Partial	Partial

## 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 certified DM Terminal acting as master during testing is highlighted in light blue. The main features are indicated with grey background and the associated sub-features (or second level features) have white background.

The outcome assigned to a sub-feature as shown on page 2, is derived by the Feature compliance report tables.

Outcome	Definition
<b>Certified</b>	All required tests have been performed and passed.
<b>Partial</b>	Not all the required test cases 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 is the result of the 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).

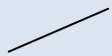
Verdict	Definition
<b>Passed</b>	All mandated tests or steps of tests linked to this functionality (as per TIC-RT indication) are compliant with the TIP specification relevant to this feature.
<b>Incomplete</b>	Not all Mandated tests (as per TIC-RT indication) have been executed.
<b>Failed</b>	At least 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
<b>Complete</b>	All mandated tests associated to the feature have been executed.
<b>Spot</b>	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 B.
<b>Regression</b>	Only a selection of the mandatory the test cases associated to the feature is 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
<b>Regression on spot</b>	The regression method has been applied on the verdicts based on the spot testing method.
<b>Witnessed</b>	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-feature cannot be tested. The following table describes meaning of the used abbreviation:

Indication	Definition
<b>Not supported</b>	The Repeater and/or MS do not support the minimum features required to verify these items
	The Result is not relevant (or needed) to verify the Repeater and/or MS features

ISCTI has made every effort to ensure that every result have 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 DM Terminals under test in the test session 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 (<https://tandcca.com/interoperability/interoperability-certificates-and-test-reports/>). The feature results are shown in the tables below.

## Information on equipment under test and document references

<b>Test Session Place/Date</b>	<b>Sepura, Cambridge February 2017</b>
<b>Repeater Type</b>	Sepura SC2020
<b>Repeater HW release</b>	TP01STW
<b>Repeater SW release</b>	1738 001 08522
<b>DM Terminal 1 Type</b>	Sepura STP9000
<b>DM Terminal 1 HW release</b>	PSYTW201T30WN00
<b>DM Terminal 1 SW release</b>	1738 001 02937
<b>DM Terminal 2 Type</b>	Sepura SRG3900
<b>DM Terminal 2 HW release</b>	MSUTW201T2C0G00
<b>DM Terminal 2 SW release</b>	1738 001 03577
<b>DM Terminal 3 Type</b>	Sepura SC2020
<b>DM Terminal 3 HW release</b>	TP01STW
<b>DM Terminal 3 SW release</b>	1738 001 08522
<b>TIP Specs and TIP Compliance Test Plans</b>	
<b>Repeater</b>	TTR002-03 v120 IOP002-03 v100 TIC-RT002-03 v116
<b>DAIE -Rep</b>	TTR002-05 v100 IOP002-05 v100 TIC-RT002-05-3 v109



## Feature compliance report

DMO Test Session Cambridge, February 2017 Sepura SC2020	Sepura STP9000	Sepura SRG3900	Sepura SC2020
<b>TTR002-03 Repeater – fully witnessed testing</b>			
<b>Presence Signal</b>	<b>Incomplete 3_pass_of_5</b>	<b>Incomplete 3_pass_of_5</b>	<b>Incomplete 1_pass_of_5</b>
Presence Signal on free channel	PASSED Complete 1_pass_of_1	PASSED Complete 1_pass_of_1	PASSED Complete 1_pass_of_1
Presence Signal on occupied channel	Incomplete 2_pass_of_4	Incomplete 2_pass_of_4	Incomplete 0_pass_of_4
<b>DM-MS authorization</b>	<b>Incomplete 5_pass_of_8</b>	<b>Incomplete 5_pass_of_8</b>	<b>Incomplete 5_pass_of_8</b>
Usage Restriction Type	Incomplete 4_pass_of_6	Incomplete 4_pass_of_6	Incomplete 4_pass_of_6
Validity Time	Incomplete 1_pass_of_2	Incomplete 1_pass_of_2	Incomplete 1_pass_of_2
<b>Group call</b>	<b>Incomplete 2_pass_of_4</b>	<b>Incomplete 2_pass_of_4</b>	<b>Incomplete 0_pass_of_4</b>
Intra-MNI Group Calls	Incomplete 1_pass_of_2	Incomplete 1_pass_of_2	Incomplete 0_pass_of_2
Inter-MNI Group Calls	Incomplete 1_pass_of_2	Incomplete 1_pass_of_2	Incomplete 0_pass_of_2
<b>Individual Call</b>	<b>Incomplete 3_pass_of_7</b>	<b>Incomplete 3_pass_of_7</b>	<b>Incomplete 1_pass_of_7</b>
Individual Call with Presence Check	Incomplete 3_pass_of_5	Incomplete 3_pass_of_5	Incomplete 1_pass_of_5
Individual call without Presence Check	Incomplete 0_pass_of_2	Incomplete 0_pass_of_2	Incomplete 0_pass_of_2
<b>Call Maintenance</b>	<b>Incomplete 12_pass_of_19</b>	<b>Incomplete 12_pass_of_19</b>	<b>Incomplete 5_pass_of_19</b>
Changeover	Incomplete 1_pass_of_2	Incomplete 1_pass_of_2	Incomplete 0_pass_of_2
Pre-emption	Incomplete 3_pass_of_6	Incomplete 3_pass_of_6	Incomplete 0_pass_of_6

<b>DMO Test Session Cambridge, February 2017 Sepura SC2020</b>	<b>Sepura STP9000</b>	<b>Sepura SRG3900</b>	<b>Sepura SC2020</b>
Procedures in Occupation	Incomplete 5_pass_of_6	Incomplete 5_pass_of_6	Incomplete 4_pass_of_6
Procedures in Reservation	Incomplete 5_pass_of_7	Incomplete 5_pass_of_7	Incomplete 3_pass_of_7
<b>Status Messages</b>	<b>Incomplete 6_pass_of_14</b>	<b>Incomplete 6_pass_of_14</b>	<b>Incomplete 0_pass_of_14</b>
Intra-MNI Status Calls	Incomplete 6_pass_of_14	Incomplete 6_pass_of_14	Incomplete 0_pass_of_14
Individual Status Calls	Incomplete 1_pass_of_2	Incomplete 1_pass_of_2	Incomplete 0_pass_of_2
Group Status call	Incomplete 5_pass_of_12	Incomplete 5_pass_of_12	Incomplete 0_pass_of_12
Status sent in a Voice Call	Incomplete 3_pass_of_6	Incomplete 3_pass_of_6	Incomplete 0_pass_of_6
Status sent out of a Call	Incomplete 3_pass_of_8	Incomplete 3_pass_of_8	Incomplete 0_pass_of_8
<b>SDS TL</b>	<b>Incomplete 2_pass_of_4</b>	<b>Incomplete 2_pass_of_4</b>	<b>Incomplete 0_pass_of_4</b>
SDS-TL messages	Incomplete 2_pass_of_4	Incomplete 2_pass_of_4	Incomplete 0_pass_of_4
TTR002-05 (class 2) DMO AIE Encryption - via Repeater – fully witnessed testing			
<b>DMO AIE Encryption - via Repeater Type 1A</b>	<b>Incomplete 18_pass_of_20</b>	<b>Incomplete 2_pass_of_20</b>	<b>Incomplete 2_pass_of_20</b>
Encrypted Group Calls	PASSED Complete 8_pass_of_8	Incomplete 0_pass_of_8	Incomplete 0_pass_of_8
Encrypted Individual Calls	Incomplete 2_pass_of_4	Incomplete 0_pass_of_4	Incomplete 0_pass_of_4
Encrypted Status messages	PASSED Complete 2_pass_of_2	Incomplete 0_pass_of_2	Incomplete 0_pass_of_2
Pre-emption of encrypted activity	PASSED Complete 2_pass_of_2	Incomplete 0_pass_of_2	Incomplete 0_pass_of_2
Handling mismatched keys	PASSED Complete 4_pass_of_4	Incomplete 2_pass_of_4	Incomplete 2_pass_of_4

Note: The DM-MSA under test is highlighted in light blue background.

<b>DMO Test Session Cambridge, February 2017 Sepura SC2020</b>	<b>Sapura STP9000</b>	<b>Sapura SRG3900</b>	<b>Sapura SC2020</b>
<b>TTR002-03 Repeater – fully witnessed testing</b>			
<b>Presence Signal</b>	<b>Incomplete 3_pass_of_5</b>	<b>Incomplete 3_pass_of_5</b>	<b>Incomplete 1_pass_of_5</b>
Presence Signal on free channel	PASSED Complete 1_pass_of_1	PASSED Complete 1_pass_of_1	PASSED Complete 1_pass_of_1
Presence Signal on occupied channel	Incomplete 2_pass_of_4	Incomplete 2_pass_of_4	Incomplete 0_pass_of_4
<b>DM-MS authorization</b>	<b>Incomplete 5_pass_of_8</b>	<b>Incomplete 5_pass_of_8</b>	<b>Incomplete 5_pass_of_8</b>
Usage Restriction Type	Incomplete 4_pass_of_6	Incomplete 4_pass_of_6	Incomplete 4_pass_of_6
Validity Time	Incomplete 1_pass_of_2	Incomplete 1_pass_of_2	Incomplete 1_pass_of_2
<b>Group call</b>	<b>Incomplete 2_pass_of_4</b>	<b>Incomplete 2_pass_of_4</b>	<b>Incomplete 0_pass_of_4</b>
Intra-MNI Group Calls	Incomplete 1_pass_of_2	Incomplete 1_pass_of_2	Incomplete 0_pass_of_2
Inter-MNI Group Calls	Incomplete 1_pass_of_2	Incomplete 1_pass_of_2	Incomplete 0_pass_of_2
<b>Individual Call</b>	<b>Incomplete 3_pass_of_7</b>	<b>Incomplete 3_pass_of_7</b>	<b>Incomplete 1_pass_of_7</b>
Individual Call with Presence Check	Incomplete 3_pass_of_5	Incomplete 3_pass_of_5	Incomplete 1_pass_of_5
Individual call without Presence Check	Incomplete 0_pass_of_2	Incomplete 0_pass_of_2	Incomplete 0_pass_of_2
<b>Call Maintenance</b>	<b>Incomplete 12_pass_of_19</b>	<b>Incomplete 12_pass_of_19</b>	<b>Incomplete 5_pass_of_19</b>
Changeover	Incomplete 1_pass_of_2	Incomplete 1_pass_of_2	Incomplete 0_pass_of_2
Pre-emption	Incomplete 3_pass_of_6	Incomplete 3_pass_of_6	Incomplete 0_pass_of_6
Procedures in Occupation	Incomplete 5_pass_of_6	Incomplete 5_pass_of_6	Incomplete 4_pass_of_6
Procedures in Reservation	Incomplete	Incomplete	Incomplete

<b>DMO Test Session Cambridge, February 2017 Sepura SC2020</b>	<b>Sepura STP9000</b>	<b>Sepura SRG3900</b>	<b>Sepura SC2020</b>
	5_pass_of_7	5_pass_of_7	3_pass_of_7
<b>Status Messages</b>	<b>Incomplete 6_pass_of_14</b>	<b>Incomplete 6_pass_of_14</b>	<b>Incomplete 0_pass_of_14</b>
Intra-MNI Status Calls	Incomplete 6_pass_of_14	Incomplete 6_pass_of_14	Incomplete 0_pass_of_14
Individual Status Calls	Incomplete 1_pass_of_2	Incomplete 1_pass_of_2	Incomplete 0_pass_of_2
Group Status call	Incomplete 5_pass_of_12	Incomplete 5_pass_of_12	Incomplete 0_pass_of_12
Status sent in a Voice Call	Incomplete 3_pass_of_6	Incomplete 3_pass_of_6	Incomplete 0_pass_of_6
Status sent out of a Call	Incomplete 3_pass_of_8	Incomplete 3_pass_of_8	Incomplete 0_pass_of_8
<b>SDS TL</b>	<b>Incomplete 2_pass_of_4</b>	<b>Incomplete 2_pass_of_4</b>	<b>Incomplete 0_pass_of_4</b>
SDS-TL messages	Incomplete 2_pass_of_4	Incomplete 2_pass_of_4	Incomplete 0_pass_of_4
<b>TTR002-05 (class 2) DMO AIE Encryption - via Repeater – fully witnessed testing</b>			
<b>DMO AIE Encryption - via Repeater Type 1A</b>	<b>Incomplete 18_pass_of_20</b>	<b>Incomplete 2_pass_of_20</b>	<b>Incomplete 2_pass_of_20</b>
Encrypted Group Calls	PASSED Complete 8_pass_of_8	Incomplete 0_pass_of_8	Incomplete 0_pass_of_8
Encrypted Individual Calls	Incomplete 2_pass_of_4	Incomplete 0_pass_of_4	Incomplete 0_pass_of_4
Encrypted Status messages	PASSED Complete 2_pass_of_2	Incomplete 0_pass_of_2	Incomplete 0_pass_of_2
Pre-emption of encrypted activity	PASSED Complete 2_pass_of_2	Incomplete 0_pass_of_2	Incomplete 0_pass_of_2
Handling mismatched keys	PASSED Complete 4_pass_of_4	Incomplete 2_pass_of_4	Incomplete 2_pass_of_4

Note: The DM-MSA under test is highlighted in light blue background.

<b>DMO Test Session Cambridge, February 2017 Sepura SC2020</b>	<b>Sepura STP9000</b>	<b>Sepura SRG3900</b>	<b>Sepura SC2020</b>
<b>TTR002-03 Repeater – fully witnessed testing</b>			
<b>Presence Signal</b>	<b>Incomplete 3_pass_of_5</b>	<b>Incomplete 3_pass_of_5</b>	<b>Incomplete 1_pass_of_5</b>
Presence Signal on free channel	PASSED Complete 1_pass_of_1	PASSED Complete 1_pass_of_1	PASSED Complete 1_pass_of_1
Presence Signal on occupied channel	Incomplete 2_pass_of_4	Incomplete 2_pass_of_4	Incomplete 0_pass_of_4
<b>DM-MS authorization</b>	<b>Incomplete 5_pass_of_8</b>	<b>Incomplete 5_pass_of_8</b>	<b>Incomplete 5_pass_of_8</b>
Usage Restriction Type	Incomplete 4_pass_of_6	Incomplete 4_pass_of_6	Incomplete 4_pass_of_6
Validity Time	Incomplete 1_pass_of_2	Incomplete 1_pass_of_2	Incomplete 1_pass_of_2
<b>Group call</b>	<b>Incomplete 2_pass_of_4</b>	<b>Incomplete 2_pass_of_4</b>	<b>Incomplete 0_pass_of_4</b>
Intra-MNI Group Calls	Incomplete 1_pass_of_2	Incomplete 1_pass_of_2	Incomplete 0_pass_of_2
Inter-MNI Group Calls	Incomplete 1_pass_of_2	Incomplete 1_pass_of_2	Incomplete 0_pass_of_2
<b>Individual Call</b>	<b>Incomplete 3_pass_of_7</b>	<b>Incomplete 3_pass_of_7</b>	<b>Incomplete 1_pass_of_7</b>
Individual Call with Presence Check	Incomplete 3_pass_of_5	Incomplete 3_pass_of_5	Incomplete 1_pass_of_5
Individual call without Presence Check	Incomplete 0_pass_of_2	Incomplete 0_pass_of_2	Incomplete 0_pass_of_2
<b>Call Maintenance</b>	<b>Incomplete 12_pass_of_19</b>	<b>Incomplete 12_pass_of_19</b>	<b>Incomplete 5_pass_of_19</b>
Changeover	Incomplete 1_pass_of_2	Incomplete 1_pass_of_2	Incomplete 0_pass_of_2
Pre-emption	Incomplete 3_pass_of_6	Incomplete 3_pass_of_6	Incomplete 0_pass_of_6
Procedures in Occupation	Incomplete 5_pass_of_6	Incomplete 5_pass_of_6	Incomplete 4_pass_of_6
Procedures in Reservation	Incomplete 5_pass_of_7	Incomplete 5_pass_of_7	Incomplete 3_pass_of_7

<b>DMO Test Session Cambridge, February 2017 Sepura SC2020</b>	<b>Sepura STP9000</b>	<b>Sepura SRG3900</b>	<b>Sepura SC2020</b>
<b>Status Messages</b>	<b>Incomplete 6_pass_of_14</b>	<b>Incomplete 6_pass_of_14</b>	<b>Incomplete 0_pass_of_14</b>
Intra-MNI Status Calls	Incomplete 6_pass_of_14	Incomplete 6_pass_of_14	Incomplete 0_pass_of_14
Individual Status Calls	Incomplete 1_pass_of_2	Incomplete 1_pass_of_2	Incomplete 0_pass_of_2
Group Status call	Incomplete 5_pass_of_12	Incomplete 5_pass_of_12	Incomplete 0_pass_of_12
Status sent in a Voice Call	Incomplete 3_pass_of_6	Incomplete 3_pass_of_6	Incomplete 0_pass_of_6
Status sent out of a Call	Incomplete 3_pass_of_8	Incomplete 3_pass_of_8	Incomplete 0_pass_of_8
<b>SDS TL</b>	<b>Incomplete 2_pass_of_4</b>	<b>Incomplete 2_pass_of_4</b>	<b>Incomplete 0_pass_of_4</b>
SDS-TL messages	Incomplete 2_pass_of_4	Incomplete 2_pass_of_4	Incomplete 0_pass_of_4
<b>DMO AIE Encryption - via Repeater Type 1A</b>	<b>Incomplete 18_pass_of_20</b>	<b>Incomplete 2_pass_of_20</b>	<b>Incomplete 2_pass_of_20</b>
Encrypted Group Calls	PASSED Complete 8_pass_of_8	Incomplete 0_pass_of_8	Incomplete 0_pass_of_8
Encrypted Individual Calls	Incomplete 2_pass_of_4	Incomplete 0_pass_of_4	Incomplete 0_pass_of_4
Encrypted Status messages	PASSED Complete 2_pass_of_2	Incomplete 0_pass_of_2	Incomplete 0_pass_of_2
Pre-emption of encrypted activity	PASSED Complete 2_pass_of_2	Incomplete 0_pass_of_2	Incomplete 0_pass_of_2
Handling mismatched keys	PASSED Complete 4_pass_of_4	Incomplete 2_pass_of_4	Incomplete 2_pass_of_4

Note: The DM-MSA under test is highlighted in light blue background.