

DMO TETRA Interoperability Certificate

Direct Mode Operation Repeater

Piciorgros, DMO-1B, DMO Repeater

Remotely Witnessed Session

London - UK, May 2021

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|--|-------------|
| Latest Certified Repeater SW Release: | V4.51/V4.53 |
| Latest Certified Repeater HW Release: | V4 |

ISCTI (Istituto Superiore delle Comunicazioni e delle Tecnologie dell'Informazione) certifies that the Piciorgros, DMO-1B 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 Airbus TH1n, 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 May 2021. **Certification Body was not present at the host lab during the session, but witnessed testing remotely.** 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.

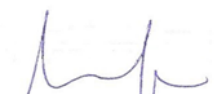
NOTE: the Piciorgros, DMO-1B Repeater was tested as Repeater Type 1B only.

IOP test engineer




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Date of issue:
Date 10 Sep 2021
V1

Certified features

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

| | | | |
|--|------------------------|--|--|
| DMO Test Session London - UK, May 2021 Piciorgros, DMO-1B | Airbus TH1n | | |
| TTR002-03 DMO Repeater | | | |
| Presence Signal | Certified | | |
| DM-MS authorization | Certified | | |
| Group Call | Certified | | |
| Individual Call | --- | | |
| Call Maintenance | Certified | | |
| Status messages | Certified | | |
| SDS TL | Certified | | |
| TTR002-05 DMO AIE - Rep | | | |
| DMO AIE Encryption - via Repeater Type 1A | | | |
| DMO AIE Encryption - via Repeater Type 1B | | | |

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 |
|------------------|--|
| Certified | All required tests have been performed and passed. |
| Partial | 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).

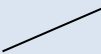
| Verdict | Definition |
|-------------------|---|
| Passed | All mandated tests or steps of tests linked to this functionality (as per TIC-RT indication) are compliant with the TIP specification relevant to this feature. |
| Incomplete | Not all Mandated tests (as per TIC-RT indication) have been executed. |
| 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 annex B. |
| Regression | 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 |
| 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-feature cannot be tested. The following table describes meaning of the used abbreviation:

| Indication | Definition |
|---|---|
| Not supported | 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 TCCA 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

| Test Session Place/Date | London - UK May 2021 |
|--------------------------|-------------------------|
| Repeater Type | Piciorgros, DMO-1B |
| Repeater HW release | V4 |
| Repeater SW release | V4.51/V4.53 |
| DM Terminal 1 Type | Airbus TH1n |
| DM Terminal 1 HW release | RC-47 |
| DM Terminal 1 SW release | 8.41-9 |
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| TIP Specs and TIP Compliance Test Plans | |
|--|---|
| Repeater | TTR002-03_v130_DRep1 IOP002-03_v130_DRep1 TIC-RT002-03_v121_DRep1 |
| DAIE -Rep | TTR002-05_v100_DAIE IOP002-05_v110_DAIE TIC-RT002-05-3_v113_DAIE-Rep1 |

Feature compliance report

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|--|--|--|--|
| DMO Test Session London - UK, May 2021 Piciorgros, DMO-1B | Airbus TH1n | | |
| TTR002-03 Repeater – fully remotely witnessed testing | | | |
| Presence Signal – Type 1B Repeater | PASSED Complete 5_pass_of_5 | | |
| Presence Signal on free channel | PASSED Complete 1_pass_of_1 | | |
| Presence Signal on occupied channel | PASSED Complete 4_pass_of_4 | | |
| DM-MS authorization - Type 1B Repeater | PASSED Complete 1_pass_of_1 | | |
| Usage Restriction Type | PASSED Complete 1_pass_of_1 | | |
| Validity Time | Not_Supported | | |
| Group call - Type 1B Repeater | PASSED Complete 4_pass_of_4 | | |
| Intra-MNI Group Calls | PASSED Complete 2_pass_of_2 | | |
| Inter-MNI Group Calls | PASSED Complete 2_pass_of_2 | | |
| Use as parallel DM-MS for Group Call | Not_Supported | | |
| Individual Call - Type 1B Repeater | | | |
| Individual Call with Presence Check | Not_Supported | | |
| Individual call without Presence Check | Not_Supported | | |
| Call Maintenance - Type 1B Repeater | PASSED Complete 13_pass_of_13 | | |
| Changeover | PASSED Complete 2_pass_of_2 | | |
| Pre-emption | Not_Supported | | |
| Procedures in Occupation | PASSED Complete 5_pass_of_5 | | |

| DMO Test Session London - UK, May 2021 Piciorgros, DMO-1B | Airbus TH1n | | |
|--|--|--|--|
| Procedures in Reservation | PASSED Complete 6_pass_of_6 | | |
| Status Messages - Type 1B Repeater | PASSED Complete 12_pass_of_12 | | |
| Intra-MNI Status Calls | PASSED Complete 4_pass_of_4 | | |
| Individual Status Calls | PASSED Complete 2_pass_of_2 | | |
| Group Status call | PASSED Complete 2_pass_of_2 | | |
| Status sent in a Voice Call | Not_Supported | | |
| Status sent out of a Call | PASSED Complete 4_pass_of_4 | | |
| Use as parallel DM-MS for Status | Not_Supported | | |
| SDS TL - Type 1B Repeater | PASSED Complete 6_pass_of_6 | | |
| Group Addressed Intra-MNI SDS-TL | PASSED Complete 2_pass_of_2 | | |
| Open TSI Addressed SDS-TL | Not_Supported | | |
| Individually Addressed intra-MNI SDS-TL | PASSED Complete 2_pass_of_2 | | |
| Individually Addressed inter-MNI SDS-TL | Not_Supported | | |
| Multipart SDS-TL | PASSED Complete 2_pass_of_2 | | |
| Use as parallel DM-MS for SDS-TL | Not_Supported | | |

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