



**SLOVENSKI STANDARD**  
**SIST EN 301 126-2-4 V1.1.1:2003**  
**01-december-2003**

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Fixed Radio Systems; Conformance testing; Part 2-4: Point-to-Multipoint equipment; Test procedures for FH-CDMA systems

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# ETSI EN 301 126-2-4 V1.1.1 (2000-11)

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*European Standard (Telecommunications series)*

**Fixed Radio Systems;  
Conformance testing;  
Part 2-4: Point-to-Multipoint equipment;  
Test procedures for FH-CDMA systems**

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F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° 7803/88

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## Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Transmission and Multiplexing (TM).

The present document is part 2-4 of a multi-part deliverable covering the Fixed Radio Systems; Conformance testing, as identified below:

Part 1: "Point-to-point equipment - Definitions, general requirements and test procedures";

Part 2-1: "Point-to-Multipoint equipment; Definitions and general requirements";

Part 2-2: "Point-to-Multipoint equipment; Test procedures for FDMA systems";

Part 2-3: "Point-to-Multipoint equipment; Test procedures for TDMA systems";

**Part 2-4: "Point-to-Multipoint equipment; Test procedures for FH-CDMA systems";**

Part 2-5: "Point-to-Multipoint equipment; Test procedures for DS-SS-CDMA systems";

Part 3-1: "Point-to-Point antennas - Definitions, general requirements and test procedures";

Part 3-2: "Point-to-Multipoint antennas - Definitions, general requirements and test procedures".

The present document defines harmonized test methods for the conformance testing of point-to-multipoint fixed radio systems applying frequency hopping code division multiple access method (FH-CDMA). It should be noted that this part 2-4 can only be applied in conjunction with part 2-1.

EN 301 126-2-1 [1] defines the type approval testing requirements (definitions and general requirements) for radio specific parameters required directly by the relevant EN/ETS for point-to-multipoint systems. Annex A of part 2-1 contains the supplier declaration, annex B contains the test report format.

Parts 2-2, 2-3 and 2-5 contain the appropriate test procedures for the other access methods.

It is recommended that where a clarification of a test procedure or an agreed test procedure is required, this should be described on the final page of the test report titled "Additional information supplementary to the test report".

### National transposition dates

Date of adoption of this EN:	24 November 2000
Date of latest announcement of this EN (doa):	28 February 2001
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 August 2001
Date of withdrawal of any conflicting National Standard (dow):	31 August 2001

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# 1 Scope

The present document details standardized test procedures for conformance testing of equipment for Point-to-Multipoint (P-MP) digital radio relay systems applying frequency hopping code division multiple access method (FH-CDMA).

Standardized procedures are required in order to fulfil CEPT/ERC/DEC/(97)10 [1] on the mutual recognition, within CEPT, of the results of conformance tests on equipment carried out in individual CEPT Countries. Furthermore the procedures described in the present document are relevant to be able to fulfil the Conformance assessment procedure described in Chapter II of the R&TTE Directive 1999/5/EC [2] in order to demonstrate the compliance of the DRRS with the relevant essential requirements identified in Article 3.2 of the R&TTE Directive.

The present document is intended to be applied in conjunction with EN 301 126-2-1 [1] and in conjunction with the individual equipment ENs/ETSS describing FH-CDMA methods and will enable commonality of test results, irrespective of the Accredited Laboratory carrying out the test.

The conformance tests described in the present document are those related to radio specific parameters required directly by the relevant radio relay ENs/ETSS. Conformance tests to other boundary EN/ETS (e.g. those for system input/output interfaces and related base band process) are outside the scope of the present document.

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# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

- [1] ETSI EN 301 126-2-1: "Fixed Radio Systems; Conformance testing; Part 2-1: Point-to-Multipoint equipment; Definitions and general requirements".
- [2] Directive 1999/5/EC of the European Parliament and of the council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.
- [3] EN 60 835: "Methods of Measurement for Equipment used in Digital Microwave Radio Transmission Systems".
- [4] CEPT/ERC Recommendation 74-01: "Spurious emissions".
- [5] CEPT/ERC/DEC(97)10 ERC Decision of 30 June 1997 on the mutual recognition of conformity assessment procedures including marking of radio equipment and radio terminal equipment.





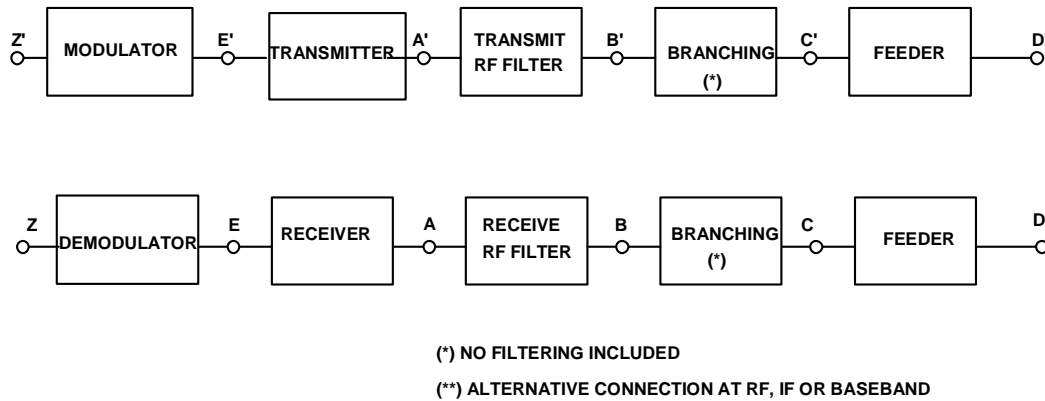


Figure 2: RF System block diagram

#### 4.1.1 System configuration

P-MP equipment is designed to operate as an access system connected to a network node (e.g. local switch) and user terminal equipment's (figure 1). The individual conformance tests are made in a single link direction (figure 2) but for certain tests, e.g. for equipment to set up signalling, both forward and reverse links have to operate, the minimum equipment arrangement for tests with only one subscriber is shown in figure 3, where the forward and return RF paths are separated by a pair of duplexers and separate attenuators are inserted in each path. In the absence of any more specific instructions from the supplier it is suggested that the links are operated at threshold (RSL) + n dB where n is half of the link dynamic range except when the receiver is being tested. The other receiver(s) should continue to be operated at threshold (RSL) + n dB.

Calibrated splitters or directional couplers will be inserted at points A, B, C and D (figure 3) as required for the individual tests, either to provide test points or sources of interfering signals.

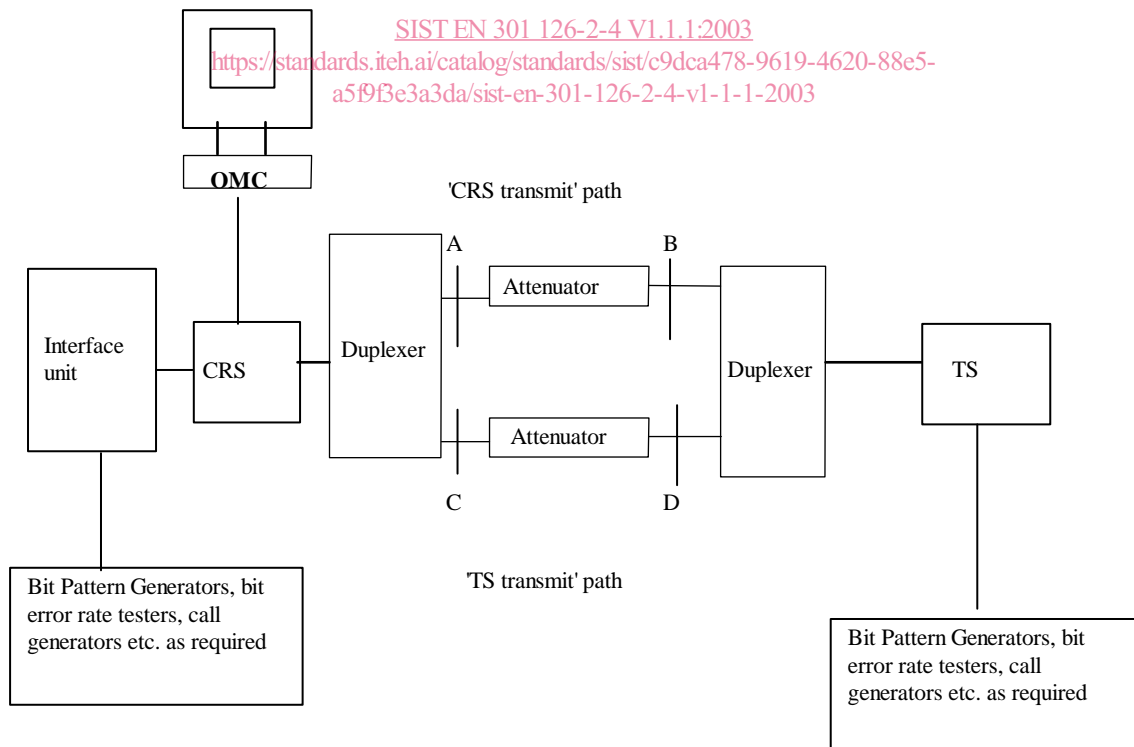


Figure 3: Test configuration for a single Terminal Station

NOTE 1: Calibrated splitters or directional couplers will be inserted at points A, B, C and D as required for the individual tests, either as test points or as sources of interfering signals.

NOTE 2: When measuring the TS transmitter to demonstrate that it meets the emission mask and spurious emissions limits, the splitter network will have only one TS connected and this network may be removed.

NOTE 3: The P-MP systems to be tested are duplex systems and features such as time/frequency synchronization and APC require both paths to be functioning correctly. To ensure that the results of measurements on either the forward or return paths, e.g. receiver RSL, are not influenced by conditions in the other path it may be necessary to provide lower attenuation, or raise the transmitter power, in this other path. In the absence of any more specific instructions from the supplier it is suggested that this other path is operated at threshold (RSL) + n dB.

All the test procedures, presented in the following sub-sections below, shall apply to both CRS(s) and TS(s), unless otherwise stated. Unless otherwise stated, all essential requirements (ER) tests shall be undertaken at the nominal and extremes of power supply and environmental parameters and at maximum output power. RF power, spectrum and frequency measurements shall be undertaken at low, medium and high frequencies within the declared range of frequencies. These RF frequencies may be selected by remote control or otherwise.

Central or remote stations incorporating integral antennas shall be provided with an appropriate coaxial or waveguide transition by the supplier in order to facilitate the measurements described.

For tests where the simultaneous use of several TSs is necessary, then an arrangement similar to that shown figure 4 is required. To enable communication the traffic load may be simulated and facilities such as remote loop back may be used to route traffic through the system.

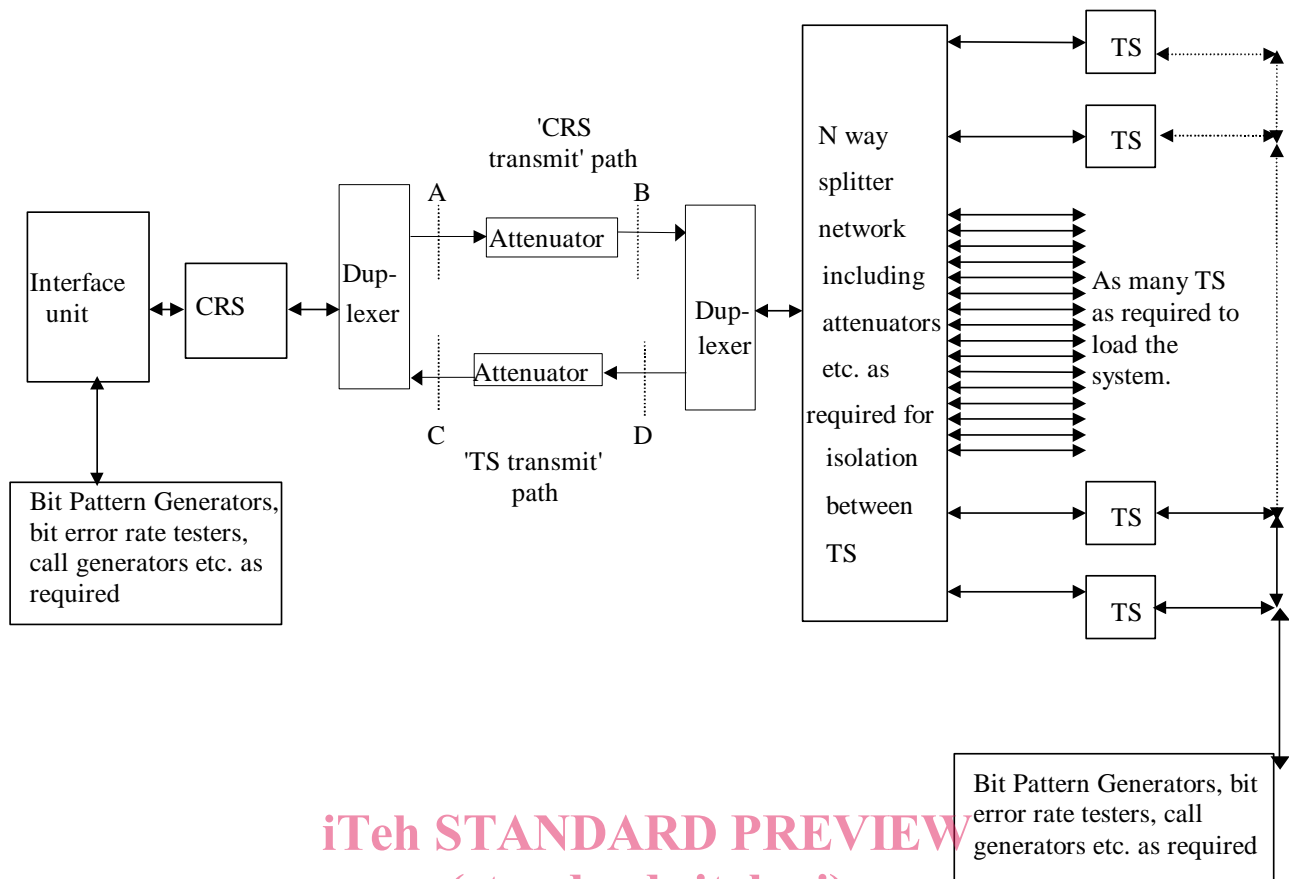
This arrangement ensures that the system operates in a normal manner similar to its configuration for measurements such as transmitter mask and RSL.

For systems where it is necessary to simulate traffic load an arrangement similar to figure 4 will be necessary. The traffic load is simulated and facilities such as remote loop back may be used to route traffic through the system. In general the same test pattern may be used on all of the inputs since it will be normal for the data to be either scrambled or encrypted before passing over the air interface.

This is to ensure that the system is operating in a normal operating configuration for measurements such as Transmitter mask and RSL.

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NOTE: TDD systems may only require a single path with one attenuator.

**Figure 4: Test configuration for multiple terminal stations**

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For systems where separate links are required for different hopping sequences the configuration of figure 5 may be needed. In this case a CRS is linked to one or several TSs.

NOTE: See appropriate notes below figure 3.