



EURIDIS ASSOCIATION

38 rue de Berri – 75008 Paris - France

Chairman : Patrick MORTEL

☎ 33 5 49 62 70 90

president@euridis.org

Secretary : Stanislas IWEINS

☎ 33 1 47 65 33 93

stanislas.iweins@edf.fr

Secretariat : Ghislaine FUXA

☎ 33 1 47 65 55 56

ghislaine.fuxa@edf.fr

Compliance with IEC 62056-31 Test specifications

REVIEWS

| Date | Review | Modification details |
|-------------|---------------|---|
| 06/11/2003 | Task 00 | Creation of temporary version during the meeting of 06/11/2003 |
| 08/01/2004 | Task 01 | Integration of readers' observations sent by e-mail |
| 27/01/2004 | Task 02 | Integration of the observations of those attending the meeting of 08/01/2004 and additional information. |
| 22/03/2004 | Task 03 | Supplement to the document and rereading carried out during the Technical Committee meeting on Thursday, 11 March 2004. |
| 27/06/07 | Gh. FUXA | New adress and coordinates – improvement speciment declaration of compliance |
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1. OBJECTIVES

The purpose of this document is to provide all those concerned by the design, manufacture, supply, purchase and operation of equipment claiming compliance with the standard IEC 62056_31 with Test Specifications corresponding to the minimum requirements recommended by the members of the EURIDIS Association to safely connect up to the bus.

The aim of performing all of the tests proposed is to ensure the smooth operation of communication and interoperability with the other equipment complying with the standard.

Equipment items meeting the requirements of this document will produce no disturbance or saturation of the bus and will respond only to the frames intended for them.

These Test Specifications concern the primary and secondary stations such as they are defined in [R01].

2. REFERENCE GUIDE

R01 International Standard IEC 62056-31 of May 2000
European Standard EN 62056-31 of May 2000

The protocol subject of the standard [R01] is commonly called EURIDIS in the present document.

3. LIMITATIONS

Your attention is drawn to the fact that the stringent and full application of this document does not wholly ensure good operation. On the one hand, only the communication protocol is concerned, the success of the tests in no way guaranteeing the proper applicative operation of the equipment and software of the products tested. On the other hand, compliance with this document does not exempt the suppliers and customers of the equipment certified as compliant from performing all prior tests in laboratories and tests in the field.

The utilisation of operating equipment in number is not dealt with in this document. Carrying out the tests described hereafter is the minimum requirement recommended by the Association to permit deployment under the appropriate conditions.

The extent of this document is limited to the EURIDIS part without remote energy supply and without implementing the DLMS protocol (Cf. §3 and §5 of [R01]).

4. PROCEDURE

4.1 METHODOLOGY

The manufacturer in his design process must make sure of the proper operation of his equipment, as well as of the compliance with the various standards implemented and local regulations.

The manufacturer must ensure that the communication protocol operates under the limit environmental conditions for which the product has been specified.

The manufacturer shall carry out all of the tests recommended in this document and must record them in a test report.

The manufacturer shall draw up a declaration on his honour attesting to compliance with the standard [R01]. A specimen declaration is provided in Appendix 1. This declaration must include the product profiles and specificities.

A declaration per type of product must be drawn up.

The manufacturer shall send his initialled declaration of compliance by post to the Secretariat of the Association.

The Secretariat of the Association will publish on the EURIDIS website the list of the equipment, the members of the Association, declared compliant, as well as the declaration.

The time required for publication on the Association's website is approximately 3 months after receipt of the declaration.

The manufacturer must keep his test report, for expert evaluation purposes, during the entire lifetime of the product.

In the event of any clearly identified anomaly, the EURIDIS Association reserves the right to request that additional investigations be carried out by the manufacturer or a third party.

Should the anomaly persist, the Association reserves the right to withdraw the incriminated equipment from the list of compliant equipment published on the website.

4.2 SAMPLES

All samples undergoing tests must originate from or be representative of series equipment.

These samples do not have to be kept at the end of the tests.

4.3 EURIDIS ASSOCIATION

Address and fax numbers

Association EURIDIS

38 rue e Berri – 75008 Paris - France

Fax : (+33) 01 47 65 55 56

E-Mail : mail@euridis.org

Website : WWW.EURIDIS.ORG

Any remarks, information and exchanges will have to be sent to the Association by electronic mail.

5. TEST EQUIPMENT

The measurement and test equipment required to carry out the tests must be regularly maintained and calibrated according to the prevailing rules.

In order to perform the tests recommended in this document, the user of the test specifications will have to equip himself with the means of simulation of primary or secondary stations depending on the type of equipment to be validated.

6. TESTS FOR A PRIMARY STATION

6.1 PHYSICAL TESTS

The load input impedances required for the tests must be within a tolerance of $\pm 1\%$ (according to the note of §5).

The diagrams to be used to measure the various parameters are those given in §5 of [R01].

6.1.1 GENERAL Characteristics

Measurement of the general characteristics in accordance with § 5.2.1 of [R01].

Modulation rate

The modulation rate of 1200 baud must be $\pm 1\%$.

Carrier

The carrier frequency must be equal to 50 kHz $\pm 3\%$.

Characteristics of the signal transmitted

The characteristics of the signal transmitted must be defined with respect to the envelope of the carrier in accordance with figure 5 of [R01].

6.1.2 Primary station TRANSMITTER Test

All of the measurements defined in §5.5 of [R01] have to be performed.

6.1.3 Primary station RECEIVER Test

All of the measurements defined in §5.6 of [R01] have to be performed.

6.2 FUNCTIONAL TESTS

6.2.1 Physical level

The time measurements are described hereafter in § 6.3 under the heading "Time compliance tests".

For the primary station, all status transitions have to be checked in accordance with table n° 5 § 3.1.5 of [R01].

6.2.2 Data link layer

6.2.2.1 Static tests

The syntactic inspection of the different frame fields transmitted has to be performed:

- Number of bytes,
- Secondary address,
- Primary address,
- Command field,
- Data,
- CRC16.

It is necessary to carry out the syntactic inspection of the different frame fields received and to check the reactions of the product in accordance with the status transitions defined in table n° 12 § 3.2.5 of [R01].

The frame fields are as follows:

| Fields | Contents |
|----------|--|
| N | Total number of bytes |
| ADS | Specific physical address of the secondary station |
| ADP | Physical address of the primary station |
| COM | Command code |
| ZA1, ZA2 | Authentication fields |
| TAB | Reference of the selected data |
| DATA | Data message from the application |
| CRC | Check fields |

6.2.2.2 Dynamic tests

For the primary stations, the dynamic check of the various transitions has to be carried out in accordance with the status transitions defined in table n° 12 § 3.2.5 of [R01].

6.2.3 Application level

All of the services used by the product, among the list set out below, must be checked:

- Remote data reading,
- Remote data programming,
- Remote point-to-point transfer,
- Broadcast remote transfer,
- Bus initialisation,
- Calling up of forgotten stations.

The dynamic check of the status transitions must be carried out in accordance with table n° 18 § 3.3.4 of [R01].

6.3 TIME COMPLIANCE TESTS

All of the signal times specified in the standard must be checked.

The times to be measured are set out in table 2 under § 3.1.2 of [R01].

Appendix B shows the acceptable tolerances with respect to the values of this table.

Do not check the specific elements of the remotely supplied station.

6.4 COMMUNICATION / INTEROPERABILITY TESTS

Carefully check that the Wake-Up Call (AGT) is generated correctly (right type).

The tests with secondary stations or equipment and sub-units must be performed with approved equipment.

6.4.1 ADP management:

The primary station must check the ADP assigned to it.

Choice of ADPs: the ADPs are assigned by the Association; the list of ADPs used is published by the Association on its website.

Any requests for new ADPs must be sent by e-mail to the Association – In the meantime, ADP n° 0 can be used.

6.5 SPECIAL POINTS AND CRITICAL POINTS

6.5.1 deviation BETWEEN new standard / old standard IEC 1142

Attention is drawn to the old standard equipment which has the following limitations:

- Compulsory Wake-Up Call (AGT) on a reading / programming sequence
- Limitation to 5 of the number of readings per call.

A programming must necessarily be preceded by a wake-up call.

To maintain compatibility with the old standard (IEC 1142), a Wake-Up Call (AGT) must be made before proceeding with a reading + programming sequence.

6.6 ENDURANCE TESTS

N.B.: Some tests must be performed on a minimum number of exchanges.

The frame repetition rate measurement (cf. §5.6 paragraphs h,i,j) has to be carried out on a minimum number of 100,000 exchanges.

7. TESTS FOR A SECONDARY STATION

7.1 PHYSICAL TESTS

The load input impedances required for the tests must be within a tolerance of $\pm 1\%$ (according to the note in §5).

The diagrams to be used to measure the various parameters are those given in §5 of [R01].

7.1.1 GENERAL Characteristics

Measurement of the general characteristics in accordance with § 5.2.1 of [R01].

Modulation rate

The modulation rate of 1200 baud must be $\pm 1\%$.

Carrier

The carrier frequency must be equal to 50 kHz $\pm 3\%$

Characteristics of the signal transmitted

The characteristics of the signal transmitted must be defined with respect to the envelope of the carrier in accordance with figure 5 of [R01].

7.1.2 Secondary station TRANSMITTER Test

All of the measurements defined in §5.7 of [R01] have to be performed.

7.1.3 Secondary station receiver test

All of the measurements defined in §5.8 of [R01] have to be performed.

7.2 FUNCTIONAL TESTS

7.2.1 PHYSICAL LEVEL

The time measurements are described hereafter in § 7.3 under the heading "Time compliance tests".

For the secondary station, all status transitions have to be checked in accordance with table n° 7 § 3.1.5 of [R01].

7.2.2 Data link layer

7.2.2.1 Static tests

The syntactic inspection of the different frame fields transmitted has to be performed:

- Number of bytes,
- Secondary address,
- Primary address,
- Command field,
- Data,
- CRC16.

It is necessary to carry out the syntactic inspection of the different frame fields received and to check the reactions of the product in accordance with the status transitions defined in table n° 13 § 3.2.5 of [R01].

The frame fields are as follows:

| Fields | Contents |
|----------|--|
| N | Total number of bytes |
| ADS | Specific physical address of the secondary station |
| ADP | Physical address of the primary station |
| COM | Command code |
| ZA1, ZA2 | Authentication fields |
| TAB | Reference of the selected data |
| DATA | Data message from the application |
| CRC | Check fields |

7.2.2.2 Dynamic tests

For the secondary stations, the dynamic check of the different transitions must be carried out in accordance with the status transitions defined in table n° 13 § 3.2.5 of [R01].

7.2.3 application level

All of the services used by the product, among the list set out below, must be checked:

- Remote data reading,
- Remote data programming,
- Remote point-to-point transfer,
- Broadcast remote transfer,
- Bus initialisation,
- Calling up of forgotten stations.

Requirements: basic commands – the device must be able to respond to any basic commands.

The dynamic check of the status transitions must be carried out in accordance with table n° 19 § 3.3.4 of [R01].

The authentication functions must be checked, even if they are not used.

7.3 TIME COMPLIANCE TESTS

All of the signal times specified in the standard must be checked.

The times to be measured are set out in table 3 under § 3.1.2 of [R01].

Appendix B of [R01] shows the acceptable tolerances with respect to the values of this table.

Do not check the specific elements of the remotely supplied station.

7.4 COMMUNICATION / INTEROPERABILITY TESTS

The secondary station tests must be carried out with approved equipment.

The secondary stations must respond to the ADS which are specific to them.

7.4.1 ADS MANAGEMENT

To ensure compatibility, the ADS ranges will be given by the Association according to the following coding:

| 6 fixed digits | | | 6 variable digits | | |
|---------------------|------|------|-------------------|--|--|
| Manufacturer's code | Year | Type | | | |

The ADS assigned, as well as the structure of the number, are set out in a document available on the Association's site in the "Members" page.

7.5 SPECIAL POINTS AND CRITICAL POINTS

Disturbances: a device must not speak if it has not received a command to do so.

A standard device must not respond to a non-energised station call.

The secondary stations must be able to carry on with reading / programming sequences without requiring a wake-up call.

There must be no limitation in the number of readings.

7.6 ENDURANCE TESTS

N.B.: Some tests must be performed on a minimum number of exchanges.

The frame repetition rate measurement (cf. §5.8 paragraphs h,i,j) has to be carried out on a minimum number of 100,000 exchanges.

8. SPECIFIC EQUIPMENT AND SUB / UNITS

This section concerns those products which partially carry out the protocol, such as cables, fixed sockets and connecting parts.

These items of equipment shall comply with that part of the standard for which they were designed.

They must be tested and checked with other products listed on the site or products mentioned as a reference in the field (for example, equipment in operation at EDF for several years).

9. APPENDICES

9.1 APPENDIX 1 – SPECIMENT DECLARATION OF COMPLIANCE



EURIDIS Association

38 rue de Berri – 75008 Paris - FRANCE

Fax : (+33) 01 47 65 55 56

E-Mail : mail@euridis.org Site Internet : WWW.EURIDIS.ORG

Reference

DECLARATION OF COMPLIANCE – IEC 62056-31

Declaring party:

We hereby declare that the product:

Sub-units concerned:

Meets the provisions of the Standard IEC 62056-31:

and complies with the following standard (s) or other normative document (s):

Additional information:

Specific manufacturer code:

Type of device:

Primary station :

ADS range assigned:

Secondary station :

ADP assigned:

Main use:

Facilities implemented :

Drawn up by :

Date :

Initials :

Quality:

Edition of Standard :

Edition of test specifications :