

Fieldbus —

Part 2: Specification for 31.25 kbit/s Physical layer profile

ICS 25.040.40; 35.100.10

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The preparation of this Draft for Development was entrusted to Technical Committee AMT/7, Monitoring and control aspects of advanced manufacturing technology, upon which the following bodies were represented:

- ABB Kent plc
- Cegelec Industrial Controls Ltd.
- Department of Trade and Industry
- Fisher-Rosemount Ltd.
- Foxboro Great Britain
- Institution of Electrical Engineers
- Measurement Technology Ltd.
- Process Automation and Computer Systems Ltd.
- Schneider Ltd.
- Siemens Automation plc

This Draft for Development, having been prepared under the direction of the Advanced Manufacturing Technology Assembly, was published under the authority of the Standards Board and comes into effect on 15 October 1996

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The following BSI reference relates to the work on this Draft for Development:
Committee reference AMT/7

ISBN 0 580 26703 2

Amendments issued since publication

Amd. No.	Date	Comments

Contents

	Page
Committees responsible	Inside front cover
Foreword	iv
0 Introduction	1
1 Scope	1
2 Reference documents	1
3 Device types	1
4 <i>Type 111</i> device profile — standard-power signaling, bus powered, I.S.	2
4.1 Signal polarity	3
4.2 Open circuit output level	3
4.3 Receive filters	3
4.4 I.S. parameters	3
4.5 Labeling	4
4.6 Conformance Testing	4
5 <i>Type 112</i> device profile — standard power signaling, separately powered, I.S.	4
5.1 Signal polarity	5
5.2 Open circuit output level	5
5.3 Receive filters	5
5.4 I.S. parameters	5
5.5 Labeling	6
5.6 Conformance testing	6
6 <i>Type 113</i> device profile — standard-power signaling, bus powered, non I.S.	6
6.1 Signal polarity	7
6.2 Open circuit output level	7
6.3 Receive filters	7
6.4 Labeling	7
6.5 Conformance testing	7
7 <i>Type 114</i> device profile — standard-power signaling, separately powered, non I.S.	8
7.1 Signal polarity	9
7.2 Open circuit output level	9
7.3 Receive filters	9
7.4 Labeling	9
7.5 Conformance testing	9
8 <i>Type 121</i> device profile — low-power signaling, bus powered, I.S.	9
8.1 Receive filters	11
8.2 I.S. Parameters	11
8.3 Labeling	11
8.4 Conformance Testing	11
9 <i>Type 122</i> device profile — low-power signaling, separately powered, I.S.	11
9.1 Receive filters	13
9.2 I.S. Parameters	13
9.3 Labeling	13
9.4 Conformance Testing	13
10 <i>Type 123</i> device profile — low-power signaling, bus powered, non I.S.	13
10.1 Receive filters	15

	Page
10.2 Labeling	15
10.3 Conformance Testing	15
11 <i>Type 124</i> device profile — low-power signaling, separately powered, non I.S.	15
11.1 Receive filters	16
11.2 Labeling	16
11.3 Conformance Testing	16
12 Accessories for 31.25 kbit/s networks	16
12.1 Power supply profile	17
12.2 Intrinsic Safety barrier profile	18
12.3 Galvanic isolator profile	19
12.4 Terminator profile	20
13 Cable specifications	21
Table 1 — 31.25 kbit/s device types	2
Table 2 — Device profile for Type 111 31.25 kbit/s devices, standard-power signaling, bus powered, I.S.	2
Table 3 — Type 111 31.25 kbit/s MAU specifications, standard-power signaling, bus powered, I.S.	3
Table 4 — Recommended I.S. parameters for Type 111 devices, standard-power signaling, bus powered, I.S.	3
Table 5 — Device profile for Type 112 31.25 kbit/s devices, standard-power signaling, separately powered I.S.	4
Table 6 — Type 112 31.25 kbit/s MAU specifications, standard-power signaling, separately powered, I.S.	5
Table 7 — Recommended I.S. parameters for Type 112 devices, standard-power signaling, separately powered, I.S.	5
Table 8 — Device profile for Type 113 31.25 kbit/s devices, standard-power signaling, bus powered, non I.S.	6
Table 9 — Type 113 31.25 kbit/s MAU specifications, standard-power signaling, bus powered, non I.S.	7
Table 10 — Device profile for Type 114 31.25 kbit/s devices, standard-power signaling, separately powered, non I.S.	8
Table 11 — Type 114 31.25 kbit/s MAU specifications, standard-power signaling, separately powered, non I.S.	9
Table 12 — Device profile for Type 121 31.25 kbit/s devices, low-power signaling, bus powered, I.S.	10
Table 13 — Type 121 31.25 kbit/s MAU specifications, low-power signaling, bus powered, I.S.	10
Table 14 — Recommended I.S. Parameters for Type 121 devices, low-power signaling, bus powered, I.S.	11
Table 15 — Device profile for Type 122 31.25 kbit/s devices, low-power signaling, separately powered, I.S.	12
Table 16 — Type 122 31.25 kbit/s MAU specifications, low-power signaling, separately powered, I.S.	12
Table 17 — Recommended I.S. parameters for Type 122 devices, low-power signaling, separately powered, I.S.	13
Table 18 — Device profile for Type 123 31.25 kbit/s devices, low-power signaling, bus powered, non I.S.	14
Table 19 — Type 123 31.25 kbit/s MAU specifications, low-power signaling, bus powered, non I.S.	14

	Page
Table 20 — Device profile for Type 124 31.25 kbit/s devices, low-power signaling, separately powered, non I.S.	15
Table 21 — Type 124 31.25 kbit/s MAU specifications, low-power signaling, separately powered, non I.S.	16
Table 22 — Power supply profile types	17
Table 23 — Power supply profile, relevant sub-clauses from clause 22	17
Table 24 — Power distribution requirements, relevant sections from sub-clause 22.6	18
Table 25 — Recommended output voltage and I.S. parameters for power supplies	18
Table 26 — Intrinsic Safety barrier profile, relevant sub-clauses from Clause 22	18
Table 27 — Recommended I.S. parameters for intrinsic safety barriers	19
Table 28 — Galvanic isolator profile, relevant sub-clauses from Clause 22	19
Table 29 — Recommended I.S. parameters for galvanic isolators	20
Table 30 — Terminator profile, relevant sub-clauses from Clause 22	20
Table 31 — Recommended I.S. parameters for terminator profile	20

Foreword

This part of DD 238 has been prepared by Technical Committee, AMT/7.

Portions of this document are owned by Fieldbus Foundation and are being used with their expressed written permission.

This publication contains the following parts:

— *Part 1: Guide to system architecture;*

(Equivalent to FF-800 Revision 1.0¹⁾)

— *Part 2: Specification for 31.25 kbit/s Physical layer profile;*

(Equivalent to FF-816 Revision 1.0¹⁾)

— *Part 3: Specification for Data link layer services subset;*

(Equivalent to FF-821 Revision 1.0¹⁾)

— *Part 4: Specification for Data link protocol;*

(Equivalent to FF-822 Revision 1.0¹⁾)

— *Part 5: Specification for Fieldbus access sublayer (Services and protocol);*

(Equivalent to FF-875 Revision 1.0¹⁾)

— *Part 6: Fieldbus Message Specification;*

(Equivalent to FF-870 Revision 1.0¹⁾)

— *Part 7: Fieldbus management;*

— *Section 7:1 Specification for System management;*

(Equivalent to FF-880 Revision 1.0¹⁾)

— *Section 7:2 Specification for Network management;*

(Equivalent to FF-801 Revision 1.0¹⁾)

This Draft for Development is not to be regarded as a British Standard.

It is being issued in the Draft for Development series of publications and is of a provisional nature because the subject matter is still under development requiring wider exposure. It should be applied on this provisional basis, so that information and experience of its practical application may be obtained.

A review of this Draft for Development will be carried out not later than 2 years after its publication. Notification of the start of the review period, with a request for the submission of comments from users of this Draft for Development, will be made in an announcement in the appropriate issue of *BSI Update*.

According to the replies received, the responsible BSI Committee will judge whether the Draft for Development can be converted into a British Standard or what other action should be taken.

Observations which it is felt should receive attention before the official call for comments will be welcomed.

These should be sent to the Secretary of BSI Technical Committee AMT/7 at BSI, 389 Chiswick High Road, London, W4 4AL, giving the document reference and clause number and proposing, where possible, an appropriate revision of the text.

¹⁾ Available from the Fieldbus Foundation, 9390 Research Boulevard, Suite II-250, Austin, Texas 78759, USA.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to vi, pages 1 to 21 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

0 Introduction

A fieldbus is a digital, serial, multidrop data bus for communication with industrial devices or systems. The Physical Layer provides for transparent transmission of data between Data Link Layer entities across physical connections.

The Physical Layer receives data from the Data Link Layer, adds preamble and delimiters, provides encoding and transmits the resulting physical signals to the wire medium. Signals are then received at one or more other devices, decoded and stripped of preamble and delimiters, before being passed to the Data Link Layer of the receiving device(s).

1 Scope

DD 238 references the IEC 1158-2 Physical Layer Standard for its Physical Layer definition. The intent of this document, the DD 238 31.25 kbit/s Physical Layer Profile Specification, is to apply the appropriate sections of the IEC 1158-2 standard by referencing the corresponding sections without changing any of the defined signaling and electrical parameters. The IEC 1158-2 standard takes precedence over this DD 238 profile in the event of any conflict of requirements.

The IEC 1158-2 standard defines as a minimum, the signaling and electrical properties of a fieldbus device's Physical Layer interface. If all manufacturers devices are designed to the IEC 1158-2 standard, then interoperability to the standard will be achieved. This profile also lists recommendations, which are not mandatory for implementation and/or not specified in the IEC 1158-2 document, but are included to achieve interoperability amongst DD 238 devices. The recommendations stated in this profile should be strongly considered when designing a DD 238 device.

Physical Layer conformance is tested to this DD 238 Profile. By definition, by complying to this DD 238 Profile, compliance will be met to the corresponding sections of the IEC 1158-2 standard. The recommended attributes stated in this Profile are not required test parameters of the DD 238 conformance tests and it is the responsibility of each device manufacturer to insure their device meets any additional design criteria for their products.

2 Reference documents

The following standard forms the basis for the device profiles specified in this document:

IEC 1158, *Fieldbus standard for use in industrial control systems*.

Part 2:1993, *Physical layer specification and service definition*.

IEC 1158-2:1993, Amendment 1 (1995)²⁾.

IEC 1158-2:1993, Draft Amendment 2 (65C/158/FDIS)³⁾.

IEC 1158-2:1993, Draft Amendment 3 (65C/155/CDV)⁴⁾.

3 Device types

A Fieldbus device is the physical entity connected to and communicating on the Fieldbus. The device is composed of at least one communication element. The Power supply, I.S. barrier, and galvanic isolator will be specified in other sections of this specification.

The 31.25 kbit/s devices are categorized based on being bus-powered or separately powered, I.S. or non I.S., and complying with the Clause 11 MAU Specification or with the Clause 22 Low-Power Signaling MAU Specification. The device types are identified in Table 1.

²⁾ Amendment 1 amended Annex A, and added new clauses 15, 16, 17 and 18 and new Annex D, Annex E and Annex F.

³⁾ Draft amendment 2 amends clauses 12 and 14, and adds new clause 21.

⁴⁾ Draft amendment 3 amends Annex B (referred to as Annex C in the draft amendment), and adds new clauses 18, 19, 20 and 22 (referred to as clause 24 in the draft amendment).