

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Low-voltage switchgear and controlgear – Controller-device interfaces (CDIs) –
Part 2: Actuator sensor interface (AS-i)

Appareillage à basse tension – Interfaces appareil de commande-appareil (CDI) –
Partie 2: Interface capteur-actionneur (AS-i)

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Part 2: Actuator sensor interface (AS-i)**

**Appareillage à basse tension – Interfaces appareil de commande-appareil (CDI) –
Partie 2: Interface capteur-actionneur (AS-i)**

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CONTENTS

FOREWORD.....	7
1 Scope and object.....	9
2 Normative references	9
3 Terms, definitions, symbols and abbreviations.....	11
4 Classification.....	18
4.1 Overview.....	18
4.2 Components and interfaces.....	19
5 Characteristics	21
5.1 Overview.....	21
5.2 Signal characteristics	21
5.3 Power and data distribution	23
5.4 AS-i topology and other components	25
5.5 Communication	27
5.6 AS-i single transactions.....	30
5.7 AS-i combined transactions.....	42
5.8 AS-i error detection	59
6 Product information	60
6.1 Instructions for installation, operation and maintenance	60
6.2 Profiles.....	60
6.3 Marking.....	61
7 Normal service, mounting and transport conditions.....	62
7.1 Normal service conditions	62
7.2 Conditions during transport and storage	62
7.3 Mounting	63
8 Constructional and performance requirements.....	63
8.1 AS-i transmission medium	63
8.2 AS-i power supply	66
8.3 AS-i repeater and other components	68
8.4 AS-i slave.....	69
8.5 AS-i master	85
8.6 Electromagnetic compatibility (EMC)	89
9 Tests.....	90
9.1 Kinds of tests	90
9.2 Test of transmission medium.....	91
9.3 Test of the AS-i power supply.....	92
9.4 Test of an AS-i repeater and other components.....	98
9.5 Test of an AS-i slave	106
9.6 Test of a AS-i master.....	120
Annex A (normative) Slave profiles	135
Annex B (normative) Master profiles	213
Figure 1 – AS-i components and interfaces.....	19
Figure 2 – Transmission coding	21
Figure 3 – Receiver requirements	23
Figure 4 – AS-i power supply	24

Figure 5 – Equivalent schematic of symmetrization and decoupling circuit	25
Figure 6 – Model of the AS-i transmission medium.....	26
Figure 7 – Transactions	28
Figure 8 – Master and slave pause as viewed from master/slave point of view.....	28
Figure 9 – Representation of the master pause.....	29
Figure 10 – Structure of a master request.....	31
Figure 11 – Structure of a slave response.....	34
Figure 12 – Structure of a data exchange request (top: standard address mode; bottom: extended address mode).....	34
Figure 13 – Structure of the slave response (Data_Exchange).....	35
Figure 14 – Structure of the Write_Parameter request (top: standard addressing mode; bottom: extended addressing mode).....	35
Figure 15 – Structure of the slave response (Write_Parameter).....	35
Figure 16 – Structure of the Address_Assignment request.....	36
Figure 17 – Structure of the slave response (Address_Assignment).....	36
Figure 18 – Structure of the Write_Extended_ID-Code_1 request	36
Figure 19 – Structure of the slave response (Write_Extended_ID-Code_1).....	36
Figure 20 – Structure of the Reset_Slave request (top: standard addressing mode; bottom: extended addressing mode).....	37
Figure 21 – Structure of the slave response (Reset_Slave).....	37
Figure 22 – Structure of the Delete_Address request (top: standard addressing mode; bottom: extended addressing mode).....	37
Figure 23 – Structure of the slave response (Delete_Address).....	37
Figure 24 – Structure of the Read_I/O_Configuration request (top: standard addressing mode; bottom: extended addressing mode).....	38
Figure 25 – Structure of the slave response (Read_I/O_Configuration).....	38
Figure 26 – Structure of Read_Identification_Code request (top: standard addressing mode; bottom: extended addressing mode).....	39
Figure 27 – Structure of the slave response (Read_Identification_Code).....	39
Figure 28 – Structure of Read_Extended_ID-Code_1/2 Request (top: standard addressing mode; bottom: extended addressing mode).....	40
Figure 29 – Structure of the slave response Read_Extended_ID-Code_1/2.....	40
Figure 30 – Structure of Read_Status request (top: standard addressing mode; bottom: extended addressing mode).....	41
Figure 31 – Structure of the slave response (Read_Status).....	41
Figure 32 – Structure of R1 request (top: standard addressing mode; bottom: extended addressing mode).....	41
Figure 33 – Structure of the slave response (R1).....	41
Figure 34 – Structure of the Broadcast (Reset) request.....	42
Figure 35 – Definition of the I/O data bits in combined transaction type 1	43
Figure 36 – Definition of the parameter bits in combined transaction type 1	43
Figure 37 – Function sequence to Read ID, Read Diagnosis, Read Parameter in combined transaction type 1	46
Figure 38 – Function sequence to Write Parameter in combined transaction type 1	47

Figure 39 – Behaviour of the slave receiving a complete parameter string from the master in combined transaction type 1	48
Figure 40 – Definition of the I/O data bits in combined transaction type 2	49
Figure 41 – Typical combined transaction type 2 signals as viewed by an oscilloscope (both data channels run idle)	50
Figure 42 – Typical combined transaction type 2 signals (the master transmits the byte 10101011 _{Bin} , the slave transmits 01110101 _{Bin}):.....	51
Figure 43 – Definition of the I/O data bits in combined transaction type 3 (4I/4O)	52
Figure 44 – Definition and state diagram of the slave for combined transaction type 3	53
Figure 45 – Definition of the I/O data bits in combined transaction type 4	55
Figure 46 – AS-i standard cable for field installation	63
Figure 47 – AS-i cabinet cable	64
Figure 48 – Equivalent schematic of decoupling circuit	68
Figure 49 – Decoupling circuit using a transformer	68
Figure 50 – Typical timing diagram for bidirectional input/outputs (D1, .. D3 = voltage level at respective data port).....	70
Figure 51 – Main state diagram of an AS-i slave	73
Figure 52 – Equivalent circuit of a slave for frequencies in the range of 50 kHz to 300 kHz	81
Figure 53 – A slave with C3 to compensate for $Z_1 = Z_2$	82
Figure 54 – Status indication on slaves	84
Figure 55 – Structure of an AS-i master	86
Figure 56 – Impedances of the master	87
Figure 57 – Equivalent circuit of a master for frequencies in the range of 50 kHz to 300 kHz	87
Figure 58 – Transmission control state machine	88
Figure 59 – AS-i interfaces	91
Figure 60 – Test circuit for impedance measurement	92
Figure 61 – Adjustable current sink (test circuit: NT_MODSENKE).....	93
Figure 62 – Indicator (test circuit NT_IMPSYM)	93
Figure 63 – Display (part of test circuit NT_IMPSYM)	94
Figure 64 – Test set-up for symmetry measurement.....	94
Figure 65 – Test circuit for noise emission	96
Figure 66 – Filter A (low-pass filter 0 Hz to 10 kHz)	96
Figure 67 – Filter B (bandpass filter 10 kHz to 500 kHz)	96
Figure 68 – Test circuit for start-up behaviour.....	97
Figure 69 – Measurement set-up for impedance measurement	99
Figure 70 – Test circuit for symmetry measurement	101
Figure 71 – Test circuit (detail 1)	102
Figure 72 – Test circuit (detail 2)	102
Figure 73 – Bandpass (10 kHz ... 500 kHz).....	102
Figure 74 – Procedure for symmetry test	103
Figure 75 – Test circuit for interoperability in AS-i networks.....	104
Figure 76 – Additional test circuit 1 for repeater.....	105
Figure 77 – Additional test circuit 2 for repeater.....	105

Figure 78 – Test circuit	106
Figure 79 – Test circuit decoupling network	107
Figure 80 – Test circuit	108
Figure 81 – Test circuit decoupling network	108
Figure 82 – Test circuit (equivalent of 10 m AS-i line)	108
Figure 83 – Test circuit (bandpass 10 kHz to 500 kHz)	109
Figure 84 – Test circuit	110
Figure 85 – Constant current source	110
Figure 86 – Test circuit	112
Figure 87 – Test circuit	114
Figure 88 – Test circuit (detail 1)	114
Figure 89 – Test circuit (detail 2)	115
Figure 90 – Procedure for symmetry test	116
Figure 91 – Test circuit AS-i network	117
Figure 92 – Test circuit for safety related slaves	118
Figure 93 – Test circuit for current consumption test.....	120
Figure 94 – Decoupling network, ammeter and power supply	120
Figure 95 – Test circuit noise emission AS-i master	121
Figure 96 – Decoupling network.....	122
Figure 97 – Bandpass 10 kHz to 500 kHz.....	122
Figure 98 – Equivalent circuit of the 10 m AS-i line.....	122
Figure 99 – Test circuit impedance measurement.....	125
Figure 100 – Master connection for symmetry measurement.....	126
Figure 101 – Test circuit symmetry measurement of the AS-i master	127
Figure 102 – Bandpass 10 kHz to 500 kHz.....	127
Figure 103 – Procedure for symmetry test.....	128
Figure 104 – Test circuit – On-delay	129
Figure 105 – Oscillogram on-delay (example)	129
Figure 106 – Block circuit diagram current consumption measurement of the AS-i master	130
Figure 107 – Constant current source with trigger output (KONST_I)	130
Figure 108 – Oscillogram current consumption (example).....	130
Figure 109 – Test circuit for checking start-up operation	131
Figure 110 – Test circuit for checking normal operation	132
Figure 111 – Test circuit	134
Figure A.1 – Definition of the extended ID2 code bits for S-7.3	180
Figure A.2 – Definition of the extended ID2 code bits for S-7.4	184
Figure A.3 – Data structure of the ID string (S-7.4)	189
Figure A.4 – Data structure of the diagnostic string (S-7.4).....	193
Figure A.5 – Data structure of the parameter string (S-7.4).....	194
Figure A.6 – Definition of the extended ID1 code bits for S-7.A.8 and S-7.A.9.....	204
Figure A.7 – Connection of mechanical switches	211

Table 1 – AS-i power supply specifications	24
Table 2 – Symmetrization and decoupling circuit specifications	25
Table 3 – Bit strings of the master requests	31
Table 4 – Master requests (standard addressing mode)	32
Table 5 – Master requests in the extended addressing mode	33
Table 6 – Bit strings of the slave responses	34
Table 7 – I/O Codes (IN = Input; OUT = Output; TRI = Tristate; I/O = Input/Output or Bidirectional (B))	39
Table 8 – List of combined transaction types	42
Table 9 – Data transfer from slave to master in combined transaction type 1	44
Table 10 – Data transfer from master to slave in combined transaction type 1	44
Table 11 – Definition of serial clock and data in combined transaction type 2	50
Table 12 – Data transfer in combined transaction type 2	50
Table 13 – Definition of the ID2 code in combined transaction type 5	56
Table 14 – Input states of safety related input slaves	59
Table 15 – Connection and wiring identification	61
Table 16 – AS-i power supply marking	62
Table 17 – Environmental conditions (minimum conditions)	66
Table 18 – General requirements for an AS-i power supply	67
Table 19 – Physical and logical ports of an AS-i slave	70
Table 20 – Limits for R, L and C of the equivalent circuit of a slave	82
Table 21 – Limits for R, L and C of the equivalent circuit of a master	87
Table A.1 – Overview of existing slave profiles for standard slaves	137
Table A.2 – List of existing profiles for standard slaves	137
Table A.3 – Overview of existing slave profiles with extended address	138
Table A.4 – List of existing profiles for slaves in extended address mode (ID=A)	138
Table A.5 – Profile catalogue of S-7.D profiles	158
Table A.6 – Overview of data of S-7.D profiles	158
Table A.7 – Profile catalogue of S-7.E profile	163
Table A.8 – Overview of data of S-7.E profiles	163
Table A.9 – Commands for combined transaction type 2	197
Table A.10 – Acyclic write service request (Type 2)	198
Table A.11 – Acyclic read service request (Type 2)	198
Table A.12 – Acyclic write service response (Type 2)	198
Table A.13 – Acyclic read service response (Type 2)	198
Table A.14 – List of index 0 (mandatory): ID object (R)	199
Table A.15 – List of index 1 (mandatory): diagnosis object (R)	199

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 IEC 62026-2:2008
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –
CONTROLLER-DEVICE INTERFACES (CDIs) –****Part 2: Actuator sensor interface (AS-i)**

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International Standard IEC 62026-2 has been prepared by subcommittee 17B: Low-voltage switchgear and controlgear, of IEC technical committee 17: Switchgear and controlgear.

This second edition of IEC 62026-2 cancels and replaces the first edition published in 2000. This second edition constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

- doubling the number of slaves from 31 to 62 by introduction of sub-addresses;
- introduction of AS-I safety system.

This bilingual version, published in 2009-11, corresponds to the English version.

The text of this standard is based on the third edition and the following documents:

FDIS	Report on voting
17B/1579/FDIS	17B/1584/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

The French version of this standard has not been voted upon.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62026 series, under the general title *Low-voltage switchgear and controlgear – Controller-device interfaces (CDIs)*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under “<http://webstore.iec.ch>” in the data related to the specific publication. At this date, the publication will be

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LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR – CONTROLLER-DEVICE INTERFACES (CDIs) –

Part 2: Actuator sensor interface (AS-i)

1 Scope and object

This part of IEC 62026 specifies a method for communication between a single control device and switching elements, and establishes a system for the interoperability of components with the specified communication interfaces. The complete system is called “Actuator Sensor interface (AS-i)”.

This standard describes a method for connecting switching elements, such as low-voltage switchgear and controlgear, standardized within IEC 60947, and controlling devices. The method may also be applied for connecting other devices and elements.

Where inputs and outputs I/O are described in this standard, their meaning is regarding the master, the meaning regarding the application is the opposite.

The object of this standard is to specify the following requirements for control circuit devices and switching elements:

- requirements for a transmission system and for interfaces between a slave, a master and electromechanical structures;
- requirements for a complete interoperability of different devices within any network, when meeting this standard;
- requirements for an interchangeability of devices within a network, when fulfilling the profiles of this standard;
- normal service conditions for the slaves, electromechanical devices and master;
- constructional and performance requirements;
- tests to verify conformance to requirements.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-2-6:1995, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-27:1987, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60204-1:2005, *Safety of machinery – Electrical equipment of machines – Part 1: General requirements*

IEC 60227-2:1997, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V – Part 2: Test methods*
Amendment 1 (2003)

IEC 60228:2004, *Conductors of insulated cables*

- IEC 60304:1982, *Standard colours for insulation for low-frequency cables and wires*
- IEC 60352-6:1997, *Solderless connections – Part 6: Insulation piercing connections – General requirements, test methods and practical guidance*
- IEC 60364-4-41:2005, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock*
- IEC 60529:1989, *Degrees of protection provided by enclosures (IP code)*
Amendment 1 (1999)
- IEC 60947-1:2007, *Low-voltage switchgear and controlgear – Part 1: General rules*
- IEC 60947-4-1:2000, *Low-voltage switchgear and controlgear – Part 4-1: Contactors and motor-starters – Electromechanical contactors and motor-starters*
Amendment 1 (2002)
Amendment 2 (2005)
- IEC 60947-4-2:1999, *Low-voltage switchgear and controlgear – Part 4-2: Contactors and motor-starters – AC semiconductor motor controllers and starters*
Amendment 1 (2001)
Amendment 2 (2006)
- IEC 60947-5-2:1997, *Low-voltage switchgear and controlgear – Part 5-2: Control circuit devices and switching elements – Proximity switches*
Amendment 1 (1999)
Amendment 2 (2003)
- IEC 61000-4-2:1995, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*
Amendment 1 (1998)
Amendment 2 (2000)
- IEC 61000-4-3:2006, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*
- IEC 61000-4-4:2004, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*
- IEC 61131-2:2007, *Programmable controllers – Part 2: Equipment requirements and tests*
- IEC 61140:2001, *Protection against electric shock – Common aspects for installation and equipment*
Amendment 1 (2004)
- IEC 61508 (all parts), *Functional safety of electrical/electronic/programmable electronic safety-related systems*
- IEC 61800-2:1998, *Adjustable speed electrical power drive systems – Part 2: General requirements – Rating specifications for low-voltage adjustable frequency a.c. power drive systems*
- IEC/TS 61915:2003, *Low-voltage switchgear and controlgear – Principles for the development of device profiles for networked industrial devices*

IEC 62026-1:2007, *Low-voltage switchgear and controlgear – Controller-device interfaces (CDIs) – Part 1: General rules*

CISPR 11:2003, *Industrial, scientific and medical (ISM) radio-frequency equipment – Electromagnetic disturbance characteristics – Limits and methods of measurement*

Amendment 1 (2004)

Amendment 2 (2006)

3 Terms, definitions, symbols and abbreviations

For the purposes of this document, the terms, definitions, symbols and abbreviations given in IEC 62026-1 as well as the following apply.

3.1 Terms and definitions

Alphabetical index of definitions

	<i>Reference</i>
A	
Active slave	3.1.1
Actuator Sensor interface (AS-i)	3.1.2
Address	3.1.3
Address assignment	3.1.4
Analogue input data image (AIDI)	3.1.5
Analogue output data image (AODI)	3.1.6
AS-i cycle	3.1.7
AS-i input	3.1.8
AS-i line	3.1.9
AS-i master	3.1.10
AS-i network	3.1.11
AS-i output	3.1.12
AS-i power supply	3.1.13
AS-i slave	3.1.14
B	
Bit time (effective)	3.1.15
C	
Configuration data (CD)	3.1.16
Configuration data image (CDI)	3.1.17
Controller	3.1.18
Controller interface	3.1.19
D	
Data exchange phase	3.1.20
Decoupling circuit	3.1.21
Detection phase	3.1.22
E	
Earth fault detector	3.1.23
Execution control	3.1.24
Extended addressing mode	3.1.25
F	
Field devices	3.1.26
I	
I/O configuration (I/O code)	3.1.27
Identification code (ID code)	3.1.28
Input data image (IDI)	3.1.29

L

List of activated slaves (LAS)..... 3.1.30

List of detected slaves (LDS) 3.1.31

List of peripheral faults (LPF)..... 3.1.32

List of projected slaves (LPS) 3.1.33

M

Master 3.1.34

Master pause 3.1.35

Master request..... 3.1.36

N

Non-volatile stored data 3.1.37

O

Operation address 3.1.38

Output current limit 3.1.39

Output data image (ODI)..... 3.1.40

P

Parameter image (PI)..... 3.1.41

P-fault..... 3.1.42

R

Repeater..... 3.1.43

S

Select bit 3.1.44

Send pause 3.1.45

Slave 3.1.46

Slave pause 3.1.47

Slave response 3.1.48

Symmetrizing circuit..... 3.1.49

T

Transaction..... 3.1.50

Transmission control..... 3.1.51

V

Volatile stored data 3.1.52

Z

Zero address 3.1.53

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3.1.1

active slave

slave connected to the AS-i line and capable to communicate properly

3.1.2

Actuator Sensor interface (AS-i)

set of interfaces and serial communication method for the connection of low-voltage switchgear and controlgear, and other simple field devices with a controller

3.1.3**address**

numerical parameter out of the address space of the AS-i slaves which specifies a node of an AS-i network

NOTE Address 0 is reserved for slaves which have not had an address assigned.

3.1.4**address assignment**

replacement of the existing address of the AS-i slave with a new address

3.1.5**Analogue Input Data Image (AIDI)**

input data stored in the master, containing the latest actual copies of the received data from the inputs of all active slaves using combined transactions type 1 to 5

3.1.6**Analogue Output Data Image (AODI)**

output data stored in the master to be transmitted cyclically to the active slaves with outputs using combined transactions types 1 to 5

3.1.7**AS-i cycle**

set of up to 33 transactions

NOTE 1 A cycle may, in case of a detected communication failure, include one message retransmission.

NOTE 2 In the case of extended addressing mode, two cycles will be needed for data transfer of all slaves that are in extended addressing mode.

3.1.8**AS-i input**

physical or logical slave port providing an input from the process

3.1.9**AS-i line**

two-wire line for transferring information and power to the AS-i slaves and the AS-i master

3.1.10**AS-i master**

unit on the AS-i line that manages the communication between the slaves and the controller

3.1.11**AS-i network**

network composed of an AS-i control circuit, interfaces and switching elements, for example master, slaves, power supply, cable, taps, repeaters

3.1.12**AS-i output**

physical or logical slave port providing an output to the process

3.1.13**AS-i power supply**

special power supply combining a d.c. supply and a symmetrizing and decoupling circuit needed in an AS-i network

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