

DIN EN IEC 61804-5



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Ersatz für
DIN EN 61804-5:2016-04
Siehe Anwendungsbeginn

**Geräte und Geräteintegration in Unternehmenssysteme –
Funktionsbausteine für die Prozessautomation und elektronische
Gerätebeschreibungssprache –
Teil 5: Bibliothek vorgefertigter Unterprogramme
(IEC 61804-5:2020);
Englische Fassung EN IEC 61804-5:2020**

Devices and intergration in enterprise systems –
Function blocks (FB) for process control and electronic device description
language (EDDL) –
Part 5: EDDL Builtin library
(IEC 61804-5:2020);
English version EN IEC 61804-5:2020

Les dispositifs et leur intégration dans les systèmes de l'entreprise –
Blocs fonctionnels (FB) pour les procédés industriels et le langage de description
électronique de produit (EDDL) –
Partie 5: Bibliothèque de Builtin EDDL
(IEC 61804-5:2020);
Version anglaise EN IEC 61804-5:2020

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DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE

Anwendungsbeginn

Anwendungsbeginn für die von CENELEC am 2020-07-29 angenommene Europäische Norm als DIN-Norm ist 2021-08-01.

Für DIN EN 61804-5:2016-04 besteht eine Übergangsfrist bis 2023-07-29.

Nationales Vorwort

Vorausgegangener Norm-Entwurf: E DIN EN IEC 61804-5:2021-03.

Für dieses Dokument ist das nationale Arbeitsgremium DKE/K 956 „Industrielle Kommunikation“ der DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik in DIN und VDE (www.dke.de) zuständig.

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Zukünftige Normen dieser Reihe werden den neuen, allgemeinen Titel tragen, wie oben angegeben. Titel bestehender Normen dieser Reihe werden zum Zeitpunkt der nächsten Ausgabe aktualisiert.

Für den Fall einer undatierten Verweisung im normativen Text (Verweisung auf ein Dokument ohne Angabe des Ausgabedatums und ohne Hinweis auf eine Abschnittsnummer, eine Tabelle, ein Bild usw.) bezieht sich die Verweisung auf die jeweils aktuellste Ausgabe des in Bezug genommenen Dokuments.

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Der Zusammenhang der zitierten Dokumente mit den entsprechenden deutschen Dokumenten ergibt sich, soweit ein Zusammenhang besteht, grundsätzlich über die Nummer der entsprechenden IEC-Publikation. Beispiel: IEC 60068 ist als EN 60068 als Europäische Norm durch CENELEC übernommen und als DIN EN 60068 ins Deutsche Normenwerk aufgenommen.

Das Präsidium des DIN hat mit Präsidialbeschluss 1/2004 festgelegt, dass DIN-Normen, deren Inhalt sich auf internationale Arbeitsergebnisse der Informationsverarbeitung gründet, unter bestimmten Bedingungen allein in englischer Sprache veröffentlicht werden dürfen. Diese Bedingungen sind für die vorliegende Norm erfüllt.

Da sich die Benutzer der vorliegenden Norm der englischen Sprache als Fachsprache bedienen, wird die Englische Fassung der EN IEC 61804-5 veröffentlicht. Zu deren Einleitung, Abschnitt 1, der den Anwendungsbereich festlegt und Abschnitt 3, der die Begriffe, Abkürzungen und Akronyme festlegt, wurde eine Übersetzung angefertigt und als informativer Nationaler Anhang NA der vorliegenden Norm hinzugefügt. Für die meisten der verwendeten Begriffe existieren keine gebräuchlichen deutschen Benennungen, da sich die deutschen Anwender in der Regel ebenfalls der englischen Benennungen bedienen. Diese Norm steht nicht in unmittelbarem Zusammenhang mit Rechtsvorschriften und ist nicht als Sicherheitsnorm anzusehen.

Das Original-Dokument enthält Tabellen und Bilder in Farbe, die in der Papierversion in einer Graustufen-Darstellung wiedergegeben werden. Elektronische Versionen dieses Dokuments enthalten die Tabellen und die Bilder in der originalen Farbdarstellung.

Änderungen

Gegenüber DIN EN 61804-5:2016-04 wurden folgende Änderungen vorgenommen:

- a) die Kommunikationsprofile ISA100 und GPE wurden hinzugefügt.
- b) Die folgenden Builtins wurden abgelehnt:
 - ABORT_ON_NO_DEVICE;
 - IGNORE_NO_DEVICE;
 - RETRY_ON_NO_DEVICE;
 - XMTR_ABORT_ON_NO_DEVICE;
 - XMTR_IGNORE_NO_DEVICE;
 - XMTR_RETRY_ON_NO_DEVICE;
 - get_status_code_string.

Frühere Ausgaben

DIN EN 61804-5: 2016-04

Nationaler Anhang NA (informativ)

Auszugsweise Übersetzung

Reihenfolge und Inhalt der folgenden Abschnitte sind identisch mit denen in den jeweiligen Abschnitten der Englischen Fassung.

Einleitung

Dieser Teil der IEC 61804

- enthält eine Liste von Builtins, die innerhalb von EDDL-Methoden verwendet werden können;
- definiert die Funktionalität und Parameter für jeden Builtin;
- beschreibt, wie EDDL-Variablen innerhalb von EDDL-Methoden referenziert werden können;

Die EDDL-Funktionen sind für jede der Kommunikationstechnologien durch das Profil begrenzt. Die Beschreibungen in diesem Teil der IEC 61804 beziehen sich auf diese Merkmale im Allgemeinen und nicht alle Kommunikationstechnologien unterstützen alle beschriebenen Merkmale. Die Profildefinitionen in der Übersicht dieses Teils und in der IEC 61804-3 werden referenziert, um die von jeder Kommunikationstechnologie unterstützten Merkmale zu verstehen.

1 Anwendungsbereich

Dieser Teil der IEC 61804 beschreibt die EDDL Built-in Bibliothek und stellt die Profile der verschiedenen Feldbusse zur Verfügung.

3 Begriffe, Akronyme und Abkürzungen

3.1 Begriffe

Für die Anwendung dieses Dokuments gelten die Begriffe nach IEC 61804-3 und die folgenden Begriffe.

ISO und IEC stellen terminologische Datenbanken für die Verwendung in der Normung unter den folgenden Adressen bereit:

- IEC Electropedia: verfügbar unter <http://www.electropedia.org/>
- ISO Online Browsing Platform: verfügbar unter <http://www.iso.org/obp>

3.1.1

Methoden-Variable

en: method-variable

Variable mit Gültigkeitsbereich innerhalb einer Methode

3.2 Akronyme und Abkürzungen

CP	Kommunikationsprofil
CPF	Kommunikationsprofilfamilie
CS	Kommunikationsserver
DD	Gerätebeschreibung en: Device Description
EDD	elektronische Gerätebeschreibung en: Electronic Device Description
EDDL	elektronische Gerätebeschreibungssprache en: Electronic Device Description Language
FF	Foundation-Fieldbus
GPE	Allgemeine Protokollerweiterung en: Generic Protocol Extension
HART	HART® Communication Foundation
I/O	Eingabe/Ausgabe en: Input/Output
ID	Bezeichner en: identifier
ISA100	ISA100_Wireless™
PB	PROFIBUS
PI	PROFIBUS & PROFINET ³ International
PN	PROFINET
PNO	PROFIBUS Nutzerorganisation

– Leerseite –

English Version

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Geräte und Geräteintegration in Unternehmenssysteme –
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elektronische Gerätebeschreibungssprache - Teil 5:
Bibliothek vorgefertigter Unterprogramme
(IEC 61804-5:2020)

This European Standard was approved by CENELEC on 2020-07-29. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 65E/634/CDV, future edition 2 of IEC 61804-5, prepared by SC 65E "Devices and integration in enterprise systems" of IEC/TC 65 "Industrial-process measurement, control and automation" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61804-5:2020.

The following dates are fixed:

- latest date by which the document has to be implemented at national level (dop) 2021-04-29
by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2023-07-29
document have to be withdrawn

This document supersedes EN 61804-5:2015 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 61804-5:2020 was approved by CENELEC as a European Standard without any modification.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61804-3	2020	Devices and integration in enterprise systems – Function blocks (FB) for process control and electronic device description language (EDDL) – Part 3: EDDL syntax and semantics	EN IEC 61804-3	2020
ISO/IEC 9899	–	Information technology – Programming languages – C	–	–
IEEE 754	–	IEEE Standard for Floating-Point Arithmetic	–	–

CONTENTS

European foreword	8
Annex ZA (normative) Normative references to international publications with their corresponding European publications	9
INTRODUCTION	31
1 Scope.....	32
2 Normative references	32
3 Terms, definitions, acronyms and abbreviated terms	32
3.1 Terms and definitions	32
3.2 Acronyms and abbreviated terms.....	32
4 Conventions for builtin descriptions.....	33
5 Builtin categories	34
5.1 Overview.....	34
5.2 User interface builtins	46
5.3 Communication builtins	47
5.4 Action builtins	49
6 EDDL builtin library	53
6.1 General	53
6.2 User interface builtins	53
6.2.1 Builtin ACKNOWLEDGE	53
6.2.2 Builtin acknowledge	54
6.2.3 Builtin DELAY	55
6.2.4 Builtin delay	55
6.2.5 Builtin delayfor	56
6.2.6 Builtin delayfor2	57
6.2.7 Builtin DISPLAY	59
6.2.8 Builtin display.....	59
6.2.9 Builtin display_bitenum.....	60
6.2.10 Builtin display_builtin_error.....	60
6.2.11 Builtin display_comm_error	61
6.2.12 Builtin display_comm_status	62
6.2.13 Builtin display_device_status.....	62
6.2.14 Builtin display_dynamics	63
6.2.15 Builtin display_dynamics2	64
6.2.16 Builtin display_message	65
6.2.17 Builtin display_message2	66
6.2.18 Builtin display_response_code	68
6.2.19 Builtin display_response_status	69
6.2.20 Builtin display_xmtr_status	69

6.2.21	Builtin edit_device_value	70
6.2.22	Builtin edit_device_value2	71
6.2.23	Builtin edit_local_value	73
6.2.24	Builtin edit_local_value2	74
6.2.25	Builtin get_acknowledgement	75
6.2.26	Builtin get_acknowledgement2	76
6.2.27	Builtin GET_DEV_VAR_VALUE	78
6.2.28	Builtin get_dev_var_value	78
6.2.29	Builtin GET_LOCAL_VAR_VALUE	79
6.2.30	Builtin get_local_var_value	80
6.2.31	Builtin Menu	81
6.2.32	Builtin MenuDisplay (version A)	81
6.2.33	Builtin MenuDisplay (version B)	83
6.2.34	Builtin PUT_MESSAGE	84
6.2.35	Builtin put_message	85
6.2.36	Builtin SELECT_FROM_LIST	86
6.2.37	Builtin select_from_list	87
6.2.38	Builtin select_from_menu	88
6.2.39	Builtin select_from_menu2	89
6.2.40	Prompt string formats	91
6.3	Communication builtins	92
6.3.1	Builtin abort_on_all_comm_errors	92
6.3.2	Builtin ABORT_ON_ALL_COMM_STATUS	93
6.3.3	Builtin ABORT_ON_ALL_DEVICE_STATUS	93
6.3.4	Builtin ABORT_ON_ALL_RESPONSE_CODES	94
6.3.5	Builtin abort_on_all_response_codes	94
6.3.6	Builtin ABORT_ON_COMM_ERROR	95
6.3.7	Builtin abort_on_comm_error	95
6.3.8	Builtin ABORT_ON_COMM_STATUS	96
6.3.9	Builtin ABORT_ON_DEVICE_STATUS	97
6.3.10	Builtin ABORT_ON_NO_DEVICE (deprecated)	97
6.3.11	Builtin ABORT_ON_RESPONSE_CODE	98
6.3.12	Builtin abort_on_response_code	99
6.3.13	Builtin ext_send_command	99
6.3.14	Builtin ext_send_command_trans	100
6.3.15	Builtin fail_on_all_comm_errors	101
6.3.16	Builtin fail_on_all_response_codes	102
6.3.17	Builtin fail_on_comm_error	102
6.3.18	Builtin fail_on_response_code	103

6.3.19	Builtin get_more_status	104
6.3.20	Builtin IGNORE_ALL_COMM_STATUS	104
6.3.21	Builtin IGNORE_ALL_DEVICE_STATUS	105
6.3.22	Builtin IGNORE_ALL_RESPONSE_CODES	106
6.3.23	Builtin IGNORE_COMM_ERROR	106
6.3.24	Builtin IGNORE_COMM_STATUS	107
6.3.25	Builtin IGNORE_DEVICE_STATUS	107
6.3.26	Builtin IGNORE_NO_DEVICE (deprecated)	108
6.3.27	Builtin IGNORE_RESPONSE_CODE	108
6.3.28	Builtin read_value	109
6.3.29	Builtin read_value2	110
6.3.30	Builtin ReadCommand	111
6.3.31	Builtin retry_on_all_comm_errors	111
6.3.32	Builtin RETRY_ON_ALL_COMM_STATUS	112
6.3.33	Builtin RETRY_ON_ALL_DEVICE_STATUS	112
6.3.34	Builtin RETRY_ON_ALL_RESPONSE_CODES	113
6.3.35	Builtin retry_on_all_response_codes	113
6.3.36	Builtin RETRY_ON_COMM_ERROR	114
6.3.37	Builtin retry_on_comm_error	114
6.3.38	Builtin RETRY_ON_COMM_STATUS	115
6.3.39	Builtin RETRY_ON_DEVICE_STATUS	116
6.3.40	Builtin RETRY_ON_NO_DEVICE (deprecated)	116
6.3.41	Builtin RETRY_ON_RESPONSE_CODE	117
6.3.42	Builtin retry_on_response_code	117
6.3.43	Builtin send	118
6.3.44	Builtin send_all_values	119
6.3.45	Builtin send_command	119
6.3.46	Builtin send_command_trans	120
6.3.47	Builtin send_trans	121
6.3.48	Builtin send_value	121
6.3.49	Builtin send_value2	122
6.3.50	Builtin SET_NUMBER_OF_RETRIES	123
6.3.51	Builtin WriteCommand	124
6.3.52	Builtin XMTR_ABORT_ON_ALL_COMM_STATUS	124
6.3.53	Builtin XMTR_ABORT_ON_ALL_DATA	125
6.3.54	Builtin XMTR_ABORT_ON_ALL_DEVICE_STATUS	125
6.3.55	Builtin XMTR_ABORT_ON_ALL_RESPONSE_CODES	126
6.3.56	Builtin XMTR_ABORT_ON_COMM_ERROR	126
6.3.57	Builtin XMTR_ABORT_ON_COMM_STATUS	127

6.3.58	Builtin XMTR_ABORT_ON_DATA	127
6.3.59	Builtin XMTR_ABORT_ON_DEVICE_STATUS	128
6.3.60	Builtin XMTR_ABORT_ON_NO_DEVICE (deprecated)	128
6.3.61	Builtin XMTR_ABORT_ON_RESPONSE_CODE	129
6.3.62	Builtin XMTR_IGNORE_ALL_COMM_STATUS	129
6.3.63	Builtin XMTR_IGNORE_ALL_DATA	130
6.3.64	Builtin XMTR_IGNORE_ALL_DEVICE_STATUS	130
6.3.65	Builtin XMTR_IGNORE_ALL_RESPONSE_CODES	131
6.3.66	Builtin XMTR_IGNORE_COMM_ERROR	131
6.3.67	Builtin XMTR_IGNORE_COMM_STATUS	132
6.3.68	Builtin XMTR_IGNORE_DATA	133
6.3.69	Builtin XMTR_IGNORE_DEVICE_STATUS	133
6.3.70	Builtin XMTR_IGNORE_NO_DEVICE (deprecated)	134
6.3.71	Builtin XMTR_IGNORE_RESPONSE_CODE	134
6.3.72	Builtin XMTR_RETRY_ON_ALL_COMM_STATUS	135
6.3.73	Builtin XMTR_RETRY_ON_ALL_DATA	135
6.3.74	Builtin XMTR_RETRY_ON_ALL_DEVICE_STATUS	136
6.3.75	Builtin XMTR_RETRY_ON_ALL_RESPONSE_CODES	136
6.3.76	Builtin XMTR_RETRY_ON_COMM_ERROR	137
6.3.77	Builtin XMTR_RETRY_ON_COMM_STATUS	137
6.3.78	Builtin XMTR_RETRY_ON_DATA	138
6.3.79	Builtin XMTR_RETRY_ON_DEVICE_STATUS	138
6.3.80	Builtin XMTR_RETRY_ON_NO_DEVICE (deprecated)	139
6.3.81	Builtin XMTR_RETRY_ON_RESPONSE_CODE	139
6.4	Action builtins	140
6.4.1	Builtin fgetval	140
6.4.2	Builtin fsetval	141
6.4.3	Builtin get_date	141
6.4.4	Builtin get_double	142
6.4.5	Builtin get_float	143
6.4.6	Builtin get_signed	143
6.4.7	Builtin get_string	144
6.4.8	Builtin get_unsigned	145
6.4.9	Builtin igetval	145
6.4.10	Builtin isetval	146
6.4.11	Builtin isOffline	146
6.4.12	Builtin lgetval	147
6.4.13	Builtin lsetval	147
6.4.14	Builtin put_date	148

6.4.15	Builtin put_double	148
6.4.16	Builtin put_float	149
6.4.17	Builtin put_signed	150
6.4.18	Builtin put_string	150
6.4.19	Builtin put_unsigned	151
6.4.20	Builtin sgetval	151
6.4.21	Builtin ssetval.....	152
6.5	Variable access builtins	153
6.5.1	Builtin assign	153
6.5.2	Builtin assign_double.....	153
6.5.3	Builtin assign_float.....	154
6.5.4	Builtin assign_int.....	155
6.5.5	Builtin assign_var	155
6.5.6	Builtin assign2	156
6.5.7	Builtin dassign	157
6.5.8	Builtin fassign	157
6.5.9	Builtin float_value	158
6.5.10	Builtin fvar_value	158
6.5.11	Builtin get_date_value	159
6.5.12	Builtin get_date_value2	160
6.5.13	Builtin get_double_value	161
6.5.14	Builtin get_double_value2	161
6.5.15	Builtin get_float_value	162
6.5.16	Builtin get_float_value2	163
6.5.17	Builtin get_signed_value.....	164
6.5.18	Builtin get_signed_value2.....	165
6.5.19	Builtin get_string_value	166
6.5.20	Builtin get_string_value2	167
6.5.21	Builtin get_unsigned_value.....	168
6.5.22	Builtin get_unsigned_value2.....	169
6.5.23	Builtin iassign.....	170
6.5.24	Builtin int_value	170
6.5.25	Builtin ivar_value	171
6.5.26	Builtin lassign.....	171
6.5.27	Builtin long_value	171
6.5.28	Builtin lvar_value	172
6.5.29	Builtin put_date_value	172
6.5.30	Builtin put_date_value2	173
6.5.31	Builtin put_double_value	174

6.5.32	Builtin put_double_value2	175
6.5.33	Builtin put_float_value	176
6.5.34	Builtin put_float_value2	177
6.5.35	Builtin put_signed_value	178
6.5.36	Builtin put_signed_value2	178
6.5.37	Builtin put_string_value	179
6.5.38	Builtin put_string_value2	180
6.5.39	Builtin put_unsigned_value	181
6.5.40	Builtin put_unsigned_value2	182
6.5.41	Builtin ret_double_value	183
6.5.42	Builtin ret_double_value2	184
6.5.43	Builtin ret_float_value	184
6.5.44	Builtin ret_float_value2	185
6.5.45	Builtin ret_signed_value	186
6.5.46	Builtin ret_signed_value2	186
6.5.47	Builtin ret_unsigned_value	187
6.5.48	Builtin ret_unsigned_value2	187
6.5.49	Builtin vassign	188
6.6	Normal termination builtins	189
6.6.1	Builtin discard_on_exit	189
6.6.2	Builtin save_on_exit	190
6.6.3	Builtin save_values	190
6.6.4	Builtin send_on_exit	191
6.7	Abnormal termination builtins	192
6.7.1	Builtin abort	192
6.7.2	Builtin add_abort_method (version A)	192
6.7.3	Builtin add_abort_method (version B)	193
6.7.4	Builtin method_abort	194
6.7.5	Builtin pop_abort_method	194
6.7.6	Builtin process_abort	195
6.7.7	Builtin push_abort_method	195
6.7.8	Builtin remove_abort_method (version A)	196
6.7.9	Builtin remove_abort_method (version B)	196
6.7.10	Builtin remove_all_abort_methods	197
6.8	String builtins	197
6.8.1	Builtin atof	197
6.8.2	Builtin atoi	198
6.8.3	Builtin BUILD_MESSAGE	198
6.8.4	Builtin dictionary_string	199

6.8.5	Builtin float	199
6.8.6	Builtin get_comm_error_string	200
6.8.7	Builtin get_dictionary_string	200
6.8.8	Builtin get_enum_string	201
6.8.9	Builtin get_response_code_string	202
6.8.10	Builtin get_rspcode_string	203
6.8.11	Builtin get_rspcode_string_by_id	203
6.8.12	Builtin get_status_code_string (deprecated)	204
6.8.13	Builtin get_status_string	204
6.8.14	Builtin get_stddict_string	205
6.8.15	Builtin get_variable_string	206
6.8.16	Builtin itoa (version A)	206
6.8.17	Builtin itoa (version B)	207
6.8.18	Builtin strleft	207
6.8.19	Builtin strcmp	208
6.8.20	Builtin strlen	208
6.8.21	Builtin strlwr	209
6.8.22	Builtin strmid	209
6.8.23	Builtin strright	210
6.8.24	Builtin strstr	210
6.8.25	Builtin strtrim	211
6.8.26	Builtin strupr	212
6.8.27	Builtin trunc	212
6.9	Date time builtins	213
6.9.1	Builtin AddTime	213
6.9.2	Builtin DATE_AND_TIME_VALUE_to_string	213
6.9.3	Builtin Date_to_DayOfMonth	214
6.9.4	Builtin DATE_to_days	214
6.9.5	Builtin Date_to_Month	215
6.9.6	Builtin DATE_to_string	215
6.9.7	Builtin Date_To_Time	216
6.9.8	Builtin Date_to_Year	216
6.9.9	Builtin days_to_DATE	217
6.9.10	Builtin DELAY_TIME	217
6.9.11	Builtin DiffTime	217
6.9.12	Builtin From_DATE_AND_TIME_VALUE	218
6.9.13	Builtin From_TIME_VALUE	218
6.9.14	Builtin GetCurrentDate	219
6.9.15	Builtin GetCurrentDateAndTime	219

6.9.16	Builtin GetCurrentTime.....	220
6.9.17	Builtin GET_TICK_COUNT	220
6.9.18	Builtin Make_Time.....	221
6.9.19	Builtin seconds_to_TIME_VALUE.....	221
6.9.20	Builtin seconds_to_TIME_VALUE8.....	222
6.9.21	Builtin Time_To_Date.....	222
6.9.22	Builtin TIME_VALUE_to_Hour	223
6.9.23	Builtin TIME_VALUE_to_Minute	223
6.9.24	Builtin TIME_VALUE_to_Second.....	224
6.9.25	Builtin TIME_VALUE_to_seconds.....	224
6.9.26	Builtin TIME_VALUE_to_string	225
6.9.27	Builtin timet_to_string	226
6.9.28	Builtin timet_to_TIME_VALUE	226
6.9.29	Builtin timet_To_TIME_VALUE	227
6.9.30	Builtin timet_to_TIME_VALUE8	227
6.9.31	Builtin To_Date.....	228
6.9.32	Builtin To_Date_and_Time.....	228
6.9.33	Builtin To_Time	229
6.9.34	Builtin To_TIME_VALUE	229
6.9.35	Builtin To_TIME_VALUE8.....	230
6.10	Diagnostic builtins	230
6.10.1	Builtin get_comm_error	230
6.10.2	Builtin get_dds_error	231
6.10.3	Builtin get_response_code	232
6.11	Math builtins	233
6.11.1	Builtin abs.....	233
6.11.2	Builtin acos	233
6.11.3	Builtin asin	234
6.11.4	Builtin atan.....	234
6.11.5	Builtin ByteToDouble.....	235
6.11.6	Builtin ByteToFloat	235
6.11.7	Builtin ByteToLong	236
6.11.8	Builtin ByteToShort.....	236
6.11.9	Builtin cbrt.....	236
6.11.10	Builtin ceil	237
6.11.11	Builtin cos	237
6.11.12	Builtin cosh	238
6.11.13	Builtin DoubleToByte.....	238
6.11.14	Builtin drand	239

6.11.15Builtin dseed	240
6.11.16Builtin exp	240
6.11.17Builtin FloatToByte	241
6.11.18Builtin floor	241
6.11.19Builtin fmod	242
6.11.20Builtin fpclassify	242
6.11.21Builtin is_NaN	243
6.11.22Builtin log	244
6.11.23Builtin log10	244
6.11.24Builtin log2	244
6.11.25Builtin LongToByte	245
6.11.26Builtin nan	245
6.11.27Builtin NaN_value	246
6.11.28Builtin nanf	247
6.11.29Builtin pow	247
6.11.30Builtin round	248
6.11.31Builtin ShortToByte	248
6.11.32Builtin sin	249
6.11.33Builtin sinh	249
6.11.34Builtin sqrt	250
6.11.35Builtin tan	250
6.11.36Builtin tanh	251
6.12 List builtins	251
6.12.1 Builtin get_date_lelem	251
6.12.2 Builtin get_date_lelem2	252
6.12.3 Builtin get_double_lelem	253
6.12.4 Builtin get_double_lelem2	254
6.12.5 Builtin get_float_lelem	255
6.12.6 Builtin get_float_lelem2	256
6.12.7 Builtin get_signed_lelem	257
6.12.8 Builtin get_signed_lelem2	258
6.12.9 Builtin get_string_lelem	258
6.12.10Builtin get_string_lelem2	259
6.12.11Builtin get_unsigned_lelem	260
6.12.12Builtin get_unsigned_lelem2	261
6.12.13Builtin ListDeleteElementAt (version A)	262
6.12.14Builtin ListDeleteElementAt (version B)	263
6.12.15Builtin ListDeleteElementAt2	263
6.12.16Builtin ListInsert (version A)	264

6.12.17 Builtin ListInsert (version B)	265
6.12.18 Builtin ListInsert2	266
6.13 Translation builtins	266
6.13.1 Builtin DICT_ID	266
6.13.2 Builtin get_block_instance_by_object_index	267
6.13.3 Builtin get_block_instance_by_tag	268
6.13.4 Builtin get_block_instance_count	269
6.13.5 Builtin get_resolve_status	269
6.13.6 Builtin ITEM_ID	270
6.13.7 Builtin MEMBER_ID	270
6.13.8 Builtin ObjectReference	271
6.13.9 Builtin resolve_array_ref	272
6.13.10 Builtin resolve_array_ref2	273
6.13.11 Builtin resolve_block_ref	274
6.13.12 Builtin resolve_block_ref2	274
6.13.13 Builtin resolve_list_ref	275
6.13.14 Builtin resolve_local_ref	276
6.13.15 Builtin resolve_local_ref2	276
6.13.16 Builtin resolve_param_list_ref	277
6.13.17 Builtin resolve_param_ref	278
6.13.18 Builtin resolve_param_ref2	278
6.13.19 Builtin resolve_record_ref	279
6.13.20 Builtin resolve_record_ref2	280
6.13.21 Builtin VARID	281
6.14 Block transfer builtins	281
6.14.1 Builtin abortTransferPort	281
6.14.2 Builtin closeTransferPort	282
6.14.3 Builtin fGetByte	282
6.14.4 Builtin get_transfer_status	283
6.14.5 Builtin openTransferPort	283
6.14.6 Builtin readItemFromDevice	284
6.14.7 Builtin writeItemToDevice	285
6.15 File builtins	285
6.15.1 Builtin browseIdentity	285
6.15.2 Builtin re_read_file	286
6.15.3 Builtin re_write_file	286
6.16 Identification builtins	287
6.16.1 Builtin GET_DD_REVISION	287
6.16.2 Builtin GET_DEVICE_REVISION	287

6.16.3	Builtin GET_DEVICE_TYPE	288
6.16.4	Builtin GET_MANUFACTURER	288
6.17	Development support builtins	288
6.17.1	Builtin _ERROR	288
6.17.2	Builtin _TRACE	289
6.17.3	Builtin _WARNING	290
6.17.4	Builtin LOG_MESSAGE	290
6.18	DDL references	291
6.18.1	Direct referencing of VARIABLES	291
6.18.2	Accessing standard dictionary strings	292
6.18.3	String support using DD_STRING	292
6.18.4	Referencing DD item attributes	292
6.19	Method functions	293
7	Builtins return codes	295

Figure 1	– A sample METHOD	294
----------	-------------------------	-----

Figure 2	– DD_STRING parameters passed by reference	294
----------	--	-----

Table 1	– Format for the builtin overview table	33
Table 2	– Contents of the builtin overview table	33
Table 3	– Format for the builtins lexical element tables	33
Table 4	– Contents of the lexical element table	34
Table 5	– Builtin overview	34
Table 6	– Usage of builtins	45
Table 7	– User interface builtins	46
Table 8	– Communication builtins	47
Table 9	– Action builtins	50
Table 10	– Builtin ACKNOWLEDGE	54
Table 11	– Builtin acknowledge	54
Table 12	– Builtin DELAY	55
Table 13	– Builtin delay	56
Table 14	– Builtin delayfor	56
Table 15	– Builtin delayfor2	58
Table 16	– Builtin DISPLAY	59
Table 17	– Builtin display	60
Table 18	– Builtin display_bitenum	60
Table 19	– Builtin display_builtin_error	61
Table 20	– Builtin display_comm_error	62
Table 21	– Builtin display_comm_status	62

Table 22 – Builtin display_device_status	63
Table 23 – Builtin display_dynamics	64
Table 24 – Builtin display_dynamics2	65
Table 25 – Builtin display_message	66
Table 26 – Builtin display_message2	67
Table 27 – Builtin display_response_code	68
Table 28 – Builtin display_response_status	69
Table 29 – Builtin display_xmtr_status	70
Table 30 – Builtin edit_device_value	70
Table 31 – Builtin edit_device_value2	72
Table 32 – Builtin edit_local_value	73
Table 33 – Builtin edit_local_value2	75
Table 34 – Builtin get_acknowledgement	76
Table 35 – Builtin get_acknowledgement2	77
Table 36 – Builtin GET_DEV_VAR_VALUE	78
Table 37 – Builtin get_dev_var_value	79
Table 38 – Builtin GET_LOCAL_VAR_VALUE	80
Table 39 – Builtin get_local_var_value	80
Table 40 – Builtin Menu	81
Table 41 – Builtin MenuDisplay	82
Table 42 – Builtin MenuDisplay	83
Table 43 – Builtin PUT_MESSAGE	85
Table 44 – Builtin put_message	86
Table 45 – Builtin SELECT_FROM_LIST	87
Table 46 – Builtin select_from_list	88
Table 47 – Builtin select_from_menu	89
Table 48 – Builtin select_from_menu2	90
Table 49 – Format options	92
Table 50 – Builtin abort_on_all_comm_errors	92
Table 51 – Builtin ABORT_ON_ALL_COMM_STATUS	93
Table 52 – Builtin ABORT_ON_ALL_DEVICE_STATUS	94
Table 53 – Builtin ABORT_ON_ALL_RESPONSE_CODES	94
Table 54 – Builtin abort_on_all_response_codes	95
Table 55 – Builtin ABORT_ON_COMM_ERROR	95
Table 56 – Builtin abort_on_comm_error	96
Table 57 – Builtin ABORT_ON_COMM_STATUS	96
Table 58 – Builtin ABORT_ON_DEVICE_STATUS	97
Table 59 – Builtin ABORT_ON_NO_DEVICE	98
Table 60 – Available abort and retry masks	98

Table 61 – Builtin ABORT_ON_RESPONSE_CODE.....	99
Table 62 – Builtin abort_on_response_code	99
Table 63 – Builtin ext_send_command.....	100
Table 64 – Builtin ext_send_command_trans	101
Table 65 – Builtin fail_on_all_comm_errors	102
Table 66 – Builtin fail_on_all_response_codes	102
Table 67 – Builtin fail_on_comm_error	103
Table 68 – Builtin fail_on_response_code.....	103
Table 69 – Builtin get_more_status	104
Table 70 – Builtin IGNORE_ALL_COMM_STATUS.....	105
Table 71 – Builtin IGNORE_ALL_DEVICE_STATUS.....	105
Table 72 – Builtin IGNORE_ALL_RESPONSE_CODES	106
Table 73 – Builtin IGNORE_COMM_ERROR	107
Table 74 – Builtin IGNORE_COMM_STATUS	107
Table 75 – Builtin IGNORE_DEVICE_STATUS	108
Table 76 – Builtin IGNORE_NO_DEVICE	108
Table 77 – Builtin IGNORE_RESPONSE_CODE	109
Table 78 – Builtin read_value	109
Table 79 – Builtin read_value2	110
Table 80 – Builtin ReadCommand.....	111
Table 81 – Builtin retry_on_all_comm_errors.....	111
Table 82 – Builtin RETRY_ON_ALL_COMM_STATUS	112
Table 83 – Builtin RETRY_ON_ALL_DEVICE_STATUS	113
Table 84 – Builtin RETRY_ON_ALL_RESPONSE_CODES	113
Table 85 – Builtin retry_on_all_response_codes.....	114
Table 86 – Builtin RETRY_ON_COMM_ERROR.....	114
Table 87 – Builtin retry_on_comm_error	115
Table 88 – Builtin RETRY_ON_COMM_STATUS.....	115
Table 89 – Builtin RETRY_ON_DEVICE_STATUS.....	116
Table 90 – Builtin RETRY_ON_NO_DEVICE	117
Table 91 – Builtin RETRY_ON_RESPONSE_CODE.....	117
Table 92 – Builtin retry_on_response_code	118
Table 93 – Builtin send	119
Table 94 – Builtin send_all_values	119
Table 95 – Builtin send_command	120
Table 96 – Builtin send_command_trans	120
Table 97 – Builtin send_trans	121
Table 98 – Builtin send_value.....	122
Table 99 – Builtin send_value2.....	123

Table 100 – Builtin SET_NUMBER_OF_RETRIES	123
Table 101 – Builtin WriteCommand.....	124
Table 102 – Builtin XMTR_ABORT_ON_ALL_COMM_STATUS	124
Table 103 – Builtin XMTR_ABORT_ON_ALL_DATA	125
Table 104 – Builtin XMTR_ABORT_ON_ALL_DEVICE_STATUS	125
Table 105 – Builtin XMTR_ABORT_ON_ALL_RESPONSE_CODES	126
Table 106 – Builtin XMTR_ABORT_ON_COMM_ERROR.....	126
Table 107 – Builtin XMTR_ABORT_ON_COMM_STATUS.....	127
Table 108 – Builtin XMTR_ABORT_ON_DATA.....	128
Table 109 – Builtin XMTR_ABORT_ON_DEVICE_STATUS.....	128
Table 110 – Builtin XMTR_ABORT_ON_NO_DEVICE.....	129
Table 111 – Builtin XMTR_ABORT_ON_RESPONSE_CODE.....	129
Table 112 – Builtin XMTR_IGNORE_ALL_COMM_STATUS	130
Table 113 – Builtin XMTR_IGNORE_ALL_DATA	130
Table 114 – Builtin XMTR_IGNORE_ALL_DEVICE_STATUS	131
Table 115 – Builtin XMTR_IGNORE_ALL_RESPONSE_CODES.....	131
Table 116 – Builtin XMTR_IGNORE_COMM_ERROR.....	132
Table 117 – Builtin XMTR_IGNORE_COMM_STATUS	132
Table 118 – Builtin XMTR_IGNORE_DATA.....	133
Table 119 – Builtin XMTR_IGNORE_DEVICE_STATUS	134
Table 120 – Builtin XMTR_IGNORE_NO_DEVICE	134
Table 121 – Builtin XMTR_IGNORE_RESPONSE_CODE.....	135
Table 122 – Builtin XMTR_RETRY_ON_ALL_COMM_STATUS.....	135
Table 123 – Builtin XMTR_RETRY_ON_ALL_DATA.....	136
Table 124 – Builtin XMTR_RETRY_ON_ALL_DEVICE_STATUS.....	136
Table 125 – Builtin XMTR_RETRY_ON_ALL_RESPONSE_CODES	137
Table 126 – Builtin XMTR_RETRY_ON_COMM_ERROR	137
Table 127 – Builtin XMTR_RETRY_ON_COMM_STATUS.....	138
Table 128 – Builtin XMTR_RETRY_ON_DATA	138
Table 129 – Builtin XMTR_RETRY_ON_DEVICE_STATUS.....	139
Table 130 – Builtin XMTR_RETRY_ON_NO_DEVICE.....	139
Table 131 – Builtin XMTR_RETRY_ON_RESPONSE_CODE	140
Table 132 – Builtin fgetval	140
Table 133 – Builtin fsetval	141
Table 134 – Builtin get_date.....	142
Table 135 – Builtin get_double.....	142
Table 136 – Builtin get_float.....	143
Table 137 – Builtin get_signed	144
Table 138 – Builtin get_string.....	144

Table 139 – Builtin get_unsigned	145
Table 140 – Builtin igetval.....	146
Table 141 – Builtin isetval.....	146
Table 142 – Builtin isOffline	146
Table 143 – Builtin lgetval.....	147
Table 144 – Builtin lsetval.....	147
Table 145 – Builtin put_date.....	148
Table 146 – Builtin put_double	149
Table 147 – Builtin put_float	149
Table 148 – Builtin put_signed	150
Table 149 – Builtin put_string	151
Table 150 – Builtin put_unsigned	151
Table 151 – Builtin sgetval.....	152
Table 152 – Builtin ssetval.....	152
Table 153 – Builtin assign.....	153
Table 154 – Builtin assign_double.....	154
Table 155 – Builtin assign_float.....	154
Table 156 – Builtin assign_int.....	155
Table 157 – Builtin assign_var.....	155
Table 158 – Builtin assign2.....	156
Table 159 – Builtin dassign.....	157
Table 160 – Builtin fassign.....	158
Table 161 – Builtin float_value.....	158
Table 162 – Builtin fvar_value	159
Table 163 – Builtin get_date_value	159
Table 164 – Builtin get_date_value2	160
Table 165 – Builtin get_double_value	161
Table 166 – Builtin get_double_value2	162
Table 167 – Builtin get_float_value.....	163
Table 168 – Builtin get_float_value2.....	164
Table 169 – builtin get_signed_value	164
Table 170 – Builtin get_signed_value2.....	165
Table 171 – Builtin get_string_value.....	166
Table 172 – Builtin get_string_value2	167
Table 173 – Builtin get_unsigned_value.....	168
Table 174 – Builtin get_unsigned_value2.....	169
Table 175 – Builtin iassign.....	170
Table 176 – Builtin int_value.....	170
Table 177 – Builtin ivar_value.....	171

Table 178 – Builtin lassign.....	171
Table 179 – Builtin long_value	172
Table 180 – Builtin lvar_value	172
Table 181 – Builtin put_date_value	173
Table 182 – Builtin put_date_value2	174
Table 183 – Builtin put_double_value	175
Table 184 – Builtin put_double_value2	176
Table 185 – Builtin put_float_value	176
Table 186 – Builtin put_float_value2	177
Table 187 – Builtin put_signed_value	178
Table 188 – Builtin put_signed_value2	179
Table 189 – Builtin put_string_value	180
Table 190 – Builtin put_string_value2	181
Table 191 – Builtin put_unsigned_value	182
Table 192 – Builtin put_unsigned_value2	183
Table 193 – Builtin ret_double_value	183
Table 194 – Builtin ret_double_value2	184
Table 195 – Builtin ret_float_value	185
Table 196 – Builtin ret_float_value2	185
Table 197 – Builtin ret_signed_value	186
Table 198 – Builtin ret_signed_value2	186
Table 199 – Builtin ret_unsigned_value	187
Table 200 – Builtin ret_unsigned_value2	188
Table 201 – Builtin vassign.....	188
Table 202 – Builtin discard_on_exit	189
Table 203 – Builtin save_on_exit	190
Table 204 – Builtin save_values.....	191
Table 205 – Builtin send_on_exit	192
Table 206 – Builtin abort.....	192
Table 207 – Builtin add_abort_method	193
Table 208 – Builtin add_abort_method	193
Table 209 – Builtin method_abort	194
Table 210 – Builtin pop_abort_method	195
Table 211 – Builtin process_abort.....	195
Table 212 – Builtin push_abort_method.....	195
Table 213 – Builtin remove_abort_method	196
Table 214 – Builtin remove_abort_method	196
Table 215 – Builtin remove_all_abort_methods.....	197
Table 216 – Builtin atof.....	197

Table 217 – Builtin atoi	198
Table 218 – Builtin BUILD_MESSAGE.....	198
Table 219 – Builtin dictionary_string.....	199
Table 220 – Builtin ftoa	199
Table 221 – Builtin get_comm_error_string.....	200
Table 222 – Builtin get_dictionary_string.....	201
Table 223 – Builtin get_enum_string	201
Table 224 – Builtin get_response_code_string	202
Table 225 – Builtin get_rspcode_string	203
Table 226 – Builtin get_rspcode_string_by_id.....	203
Table 227 – Builtin get_status_code_string.....	204
Table 228 – Builtin get_status_string.....	205
Table 229 – Builtin get_stddict_string.....	205
Table 230 – Builtin get_variable_string	206
Table 231 – Builtin itoa (version A).....	206
Table 232 – Builtin itoa (version B).....	207
Table 233 – Builtin strleft	207
Table 234 – Builtin strcmp	208
Table 235 – Builtin strlen	208
Table 236 – Builtin strlwr	209
Table 237 – Builtin strmid	210
Table 238 – Builtin strright	210
Table 239 – Builtin strstr	211
Table 240 – Builtin strtrim	211
Table 241 – Builtinstrupr.....	212
Table 242 – Builtin trunc	212
Table 243 – Builtin AddTime.....	213
Table 244 – Builtin DATE_AND_TIME_VALUE_to_string	214
Table 245 – Builtin Date_to_DayOfMonth	214
Table 246 – Builtin DATE_to_days.....	215
Table 247 – Builtin Date_to_Month	215
Table 248 – Builtin DATE_to_string.....	216
Table 249 – Builtin Date_To_Time	216
Table 250 – Builtin Date_to_Year.....	216
Table 251 – Builtin days_to_DATE.....	217
Table 252 – Builtin DELAY_TIME.....	217
Table 253 – Builtin DiffTime.....	218
Table 254 – Builtin From_DATE_AND_TIME_VALUE.....	218
Table 255 – Builtin From_TIME_VALUE	219

Table 256 – Builtin GetCurrentDate	219
Table 257 – Builtin GetCurrentDateAndTime	219
Table 258 – Builtin GetCurrentTime	220
Table 259 – Builtin GET_TICK_COUNT	220
Table 260 – Builtin Make_Time	221
Table 261 – Builtin seconds_to_TIME_VALUE	222
Table 262 – Builtin seconds_to_TIME_VALUE	222
Table 263 – Builtin Time_To_Date	222
Table 264 – Builtin TIME_VALUE_to_Hour	223
Table 265 – Builtin TIME_VALUE_to_Minute	223
Table 266 – Builtin TIME_VALUE_to_Second	224
Table 267 – Builtin TIME_VALUE_to_seconds	225
Table 268 – Builtin TIME_VALUE_to_string	225
Table 269 – Builtin timet_to_string	226
Table 270 – Builtin timet_to_TIME_VALUE	227
Table 271 – Builtin timet_To_TIME_VALUE	227
Table 272 – Builtin timet_to_TIME_VALUE8	227
Table 273 – Builtin To_Date	228
Table 274 – Builtin To_Date_and_Time	228
Table 275 – Builtin To_Time	229
Table 276 – Builtin To_TIME_VALUE	229
Table 277 – Builtin To_TIME_VALUE8	230
Table 278 – Builtin get_comm_error	231
Table 279 – Builtin get_ddds_error	231
Table 280 – Builtin get_response_code	232
Table 281 – Builtin abs	233
Table 282 – Builtin acos	233
Table 283 – Builtin asin	234
Table 284 – Builtin atan	234
Table 285 – Builtin ByteToDouble	235
Table 286 – Builtin ByteToFloat	235
Table 287 – Builtin ByteToLong	236
Table 288 – Builtin ByteToShort	236
Table 289 – Builtin cbrt	237
Table 290 – Builtin ceil	237
Table 291 – Builtin cos	238
Table 292 – Builtin cosh	238
Table 293 – Builtin DoubleToByte	239
Table 294 – Builtin drand	239

Table 295 – Builtin dseed	240
Table 296 – Builtin exp	240
Table 297 – Builtin FloatToByte.....	241
Table 298 – Builtin floor	241
Table 299 – Builtin fmod	242
Table 300 – Builtin fpclassify	243
Table 301 – Builtin is_NaN	243
Table 302 – Builtin log	244
Table 303 – Builtin log10	244
Table 304 – Builtin log2	245
Table 305 – Builtin LongToByte.....	245
Table 306 – Builtin nan	246
Table 307 – Builtin NaN_value	246
Table 308 – Builtin nanf	247
Table 309 – Builtin pow	248
Table 310 – Builtin round	248
Table 311 – Builtin ShortToByte	249
Table 312 – Builtin sin	249
Table 313 – Builtin sinh	249
Table 314 – Builtin sqrt	250
Table 315 – Builtin tan	250
Table 316 – Builtin tanh	251
Table 317 – Builtin get_date_lelem	252
Table 318 – Builtin get_date_lelem2	253
Table 319 – Builtin get_double_lelem	254
Table 320 – Builtin get_double_lelem2	255
Table 321 – Builtin get_float_lelem.....	256
Table 322 – Builtin get_float_lelem2.....	256
Table 323 – Builtin get_signed_lelem.....	257
Table 324 – Builtin get_signed_lelem2.....	258
Table 325 – Builtin get_string_lelem.....	259
Table 326 – Builtin get_string_lelem2	260
Table 327 – Builtin get_unsigned_lelem.....	261
Table 328 – Builtin get_unsigned_lelem2.....	262
Table 329 – Builtin ListDeleteElementAt	263
Table 330 – Builtin ListDeleteElementAt	263
Table 331 – Builtin ListDeleteElementAt2	264
Table 332 – Builtin ListInsert	265
Table 333 – Builtin ListInsert	265

Table 334 – Builtin ListInsert2	266
Table 335 – Builtin DICT_ID	267
Table 336 – Builtin get_block_instance_by_object_index.....	267
Table 337 – Builtin get_block_instance_by_tag	268
Table 338 – Builtin get_block_instance_count	269
Table 339 – Builtin get_resolve_status	270
Table 340 – Builtin ITEM_ID.....	270
Table 341 – Builtin MEMBER_ID	271
Table 342 – Builtin ObjectReference.....	271
Table 343 – Builtin resolve_array_ref.....	272
Table 344 – Builtin resolve_array_ref2.....	273
Table 345 – Builtin resolve_block_ref	274
Table 346 – Builtin resolve_block_ref2	275
Table 347 – Builtin resolve_list_ref	275
Table 348 – Builtin resolve_local_ref	276
Table 349 – Builtin resolve_local_ref2	277
Table 350 – Builtin resolve_param_list_ref	277
Table 351 – Builtin resolve_param_ref.....	278
Table 352 – Builtin resolve_param_ref2.....	279
Table 353 – Builtin resolve_record_ref.....	279
Table 354 – Builtin resolve_record_ref2.....	280
Table 355 – Builtin VARID	281
Table 356 – Builtin abortTransferPort	281
Table 357 – Builtin closeTransferPort	282
Table 358 – Builtin fGetByte.....	282
Table 359 – Builtin get_transfer_status.....	283
Table 360 – Builtin openTransferPort.....	284
Table 361 – Builtin readItemFromDevice	284
Table 362 – Builtin writeItemToDevice	285
Table 363 – Builtin browselIdentity	286
Table 364 – Builtin re_read_file.....	286
Table 365 – Builtin re_write_file	287
Table 366 – Builtin GET_DD_REVISION	287
Table 367 – Builtin GET_DEVICE_REVISION.....	287
Table 368 – Builtin GET_DEVICE_TYPE	288
Table 369 – Builtin GET_MANUFACTURER	288
Table 370 – Builtin _ERROR.....	289
Table 371 – Builtin _TRACE	289
Table 372 – Builtin _WARNING	290

Table 373 – Builtin LOG_MESSAGE..... 291

Table 374 – Referencable EDD item attributes 293

Table 375 – Contents of the return codes description table 295

Table 376 – Return code descriptions 295

Table 377 – Return code descriptions 296

INTRODUCTION

This part of IEC 61804

- contains a list of builtins that can be used inside of EDDL methods;
- defines the functionality and parameters for each builtin;
- describes how EDDL variables can be referenced from inside EDDL methods;

EDDL features are limited by profile for each of the communication technologies. The descriptions in this part of IEC 61804 refer to these features in a general sense and not all communication technologies will support all of the features described. The profile definitions in the overview of this part and in IEC 61804-3 are referred to in order to understand the features supported by each communication technology.

DEVICES AND INTEGRATION IN ENTERPRISE SYSTEMS – FUNCTION BLOCKS (FB) FOR PROCESS CONTROL AND ELECTRONIC DEVICE DESCRIPTION LANGUAGE (EDDL) –

Part 5: EDDL Builtin library

1 Scope

This part of IEC 61804 specifies the EDDL builtin library and provides the profiles of the various fieldbuses.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 61804-3:2020, *Devices and integration in enterprise systems – Function blocks (FB) for process control and electronic device description language (EDDL) – Part 3: EDDL syntax and semantics*

ISO/IEC 9899, *Information technology – Programming Languages – C*

IEEE 754, *IEEE Standard for Binary Floating-Point Arithmetic*

3 Terms, definitions, acronyms and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61804-3 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1.2

method-variable

variable with scope within a method

3.2 Acronyms and abbreviated terms

CP	Communication Profile
CPF	Communication Profile Family
CS	Communication Server
DD	Device Description
EDD	Electronic Device Description
EDDL	Electronic Device Description Language
FF	Foundation Fieldbus
GPE	Generic Protocol Extension
HART	HART® Communication Foundation
I/O	Input/output
ID	Identifier

ISA100	ISA100_Wireless™
PB	PROFIBUS
PI	PROFIBUS & PROFINET ³ International
PN	PROFINET
PNO	PROFIBUS Nutzerorganisation

4 Conventions for builtin descriptions

The following conventions apply for the builtin overview.

- Table 1 defines the format for the builtin overview table.
- Table 2 defines the contents of the columns of Table 1.
- EDDL basic constructs and attributes referenced in this document are written in upper case letters.

Table 1 – Format for the builtin overview table

Reference	Builtin	Communication profiles

Table 2 – Contents of the builtin overview table

Column	Text	Meaning
Reference		Reference to the respective subclause that specifies the builtin.
Builtin		Name of the builtin.
Communication profiles	✓	The builtin is supported by the respective Communication profile.
	x	The builtin is not supported by the respective Communication profile.
	d	The usage of the builtin is deprecated.

The following conventions apply for the builtin definitions.

- Table 3 defines the format for the builtins lexical element tables.
- Table 4 defines the contents of the columns of Table 3.
- EDDL basic constructs and attributes referenced in this document are written in upper case letters.

Table 3 – Format for the builtins lexical element tables

Parameter name	Type	Direction	Usage	Description

Table 4 – Contents of the lexical element table

Column	Text	Meaning
Parameter name	<name>	The name of the formal parameter.
	"<return>"	The return value of the builtin.
Type	data type	Abstract data type (basic or derived) of the formal parameter.
Direction	I	An input parameter.
	O	An output parameter is implicitly passed by reference so that the called builtin function can modify the value. The return value of a builtin is passed by value, if any.
	I/O	An input output parameter is implicitly passed by reference so that the called builtin function can modify the value.
	—	There is no returned value (VOID).
Usage	m	Formal parameter is mandatory.
	o	Formal parameter is optional.
	c	Formal parameter is conditional.
	—	There is no returned value (VOID).
Description	<text>	Descriptive text for the parameter.
	—	There is no returned value (VOID).

5 Builtin categories

5.1 Overview

Table 5 provides an alphabetical overview of the EDDL builtin library and specify the profile per communication technology.

Table 5 – Builtin overview

Reference	Builtin	Communication profiles						
		CS	FF	GPE	HART	ISA100	PB	PN
6.17.1	_ERROR	✓	✓	✓	✓	✓	✓	✓
6.17.2	_TRACE	✓	✓	✓	✓	✓	✓	✓
6.17.3	_WARNING	✓	✓	✓	✓	✓	✓	✓
6.7.1	abort	✓	✗	✓	✓	✗	✓	✓
6.3.1	abort_on_all_comm_errors	✗	✓	✗	✗	✓	✗	✗
6.3.2	ABORT_ON_ALL_COMM_STATUS	✗	✗	✗	✓	✗	✗	✗
6.3.3	ABORT_ON_ALL_DEVICE_STATUS	✗	✗	✗	✓	✗	✗	✗
6.3.4	ABORT_ON_ALL_RESPONSE_CODES	✗	✗	✗	✓	✗	✗	✗
6.3.5	abort_on_all_response_codes	✗	✓	✗	✗	✓	✗	✗
6.3.6	ABORT_ON_COMM_ERROR	✗	✗	✗	✓	✗	✗	✗

Reference	Builtin	Communication profiles						
		CS	FF	GPE	HART	ISA100	PB	PN
6.3.7	abort_on_comm_error	x	✓	x	x	✓	x	x
6.3.8	ABORT_ON_COMM_STATUS	x	x	x	✓	x	x	x
6.3.9	ABORT_ON_DEVICE_STATUS	x	x	x	✓	x	x	x
6.3.10	ABORT_ON_NO_DEVICE (deprecated)	x	x	x	d	x	x	x
6.3.11	ABORT_ON_RESPONSE_CODE	x	x	x	✓	x	x	x
6.3.12	abort_on_response_code	x	✓	x	x	✓	x	x
6.14.1	abortTransferPort	x	x	x	✓	x	x	x
6.11.1	abs	✓	✓	✓	✓	✓	✓	✓
6.2.1	ACKNOWLEDGE	✓	x	✓	✓	x	✓	✓
6.2.2	acknowledge	✓	x	✓	✓	x	✓	✓
6.11.2	acos	✓	✓	✓	✓	✓	✓	✓
6.7.2	add_abort_method (version A)	✓	x	✓	✓	x	✓	✓
6.7.3	add_abort_method (version B)	x	✓	x	x	✓	x	x
6.9.1	AddTime	✓	✓	✓	✓	✓	✓	✓
6.11.3	asin	✓	✓	✓	✓	✓	✓	✓
6.5.1	assign	x	✓	x	x	✓	x	x
6.5.2	assign_double	✓	x	✓	✓	x	✓	✓
6.5.3	assign_float	✓	x	✓	✓	x	✓	✓
6.5.4	assign_int	✓	x	✓	✓	x	✓	✓
6.5.5	assign_var	✓	x	✓	✓	x	✓	✓
6.5.6	assign2	x	✓	x	x	✓	x	x
6.11.4	atan	✓	✓	✓	✓	✓	✓	✓
6.8.1	atof	✓	x	✓	✓	x	✓	✓
6.8.2	atoi	✓	x	✓	✓	x	✓	✓
6.15.1	browseIdentity	x	x	x	✓	x	x	x
6.8.3	BUILD_MESSAGE	✓	✓	✓	✓	✓	✓	✓
6.11.5	ByteToDouble	✓	x	✓	x	x	✓	✓
6.11.6	ByteToFloat	✓	x	✓	x	x	✓	✓
6.11.7	ByteToLong	✓	x	✓	x	x	✓	✓
6.11.8	ByteToShort	✓	x	✓	x	x	✓	✓
6.11.9	cbrt	✓	✓	✓	✓	✓	✓	✓
6.11.10	ceil	✓	✓	✓	✓	✓	✓	✓
6.14.2	closeTransferPort	x	x	x	✓	x	x	x
6.11.11	cos	✓	✓	✓	✓	✓	✓	✓

Reference	Builtin	Communication profiles						
		CS	FF	GPE	HART	ISA100	PB	PN
6.11.12	cosh	✓	✓	✓	✓	✓	✓	✓
6.5.7	dassign	✓	✗	✓	✓	✗	✓	✓
6.9.2	DATE_AND_TIME_VALUE_to_string	✓	✗	✓	✓	✗	✓	✓
6.9.3	Date_to_DayOfMonth	✓	✗	✓	✓	✗	✓	✓
6.9.4	DATE_to_days	✓	✗	✓	✓	✗	✓	✓
6.9.5	Date_to_Month	✓	✗	✓	✓	✗	✓	✓
6.9.6	DATE_to_string	✓	✗	✓	✓	✗	✓	✓
6.9.7	Date_To_Time	✓	✗	✓	✓	✗	✓	✓
6.9.8	Date_to_Year	✓	✗	✓	✓	✗	✓	✓
6.9.9	days_to_DATE	✓	✗	✓	✓	✗	✓	✓
6.2.3	DELAY	✓	✗	✓	✓	✗	✓	✓
6.2.4	delay	✓	✗	✓	✓	✗	✓	✓
6.9.10	DELAY_TIME	✓	✗	✓	✓	✗	✓	✓
6.2.5	delayfor	✗	✓	✗	✗	✓	✗	✗
6.2.6	delayfor2	✗	✓	✗	✗	✓	✗	✗
6.13.1	DICT_ID	✗	✓	✗	✗	✓	✗	✗
6.8.4	dictionary_string	✓	✗	✓	✓	✗	✓	✓
6.9.11	DiffTime	✓	✓	✓	✓	✓	✓	✓
6.6.1	discard_on_exit	✓	✓	✓	✓	✓	✓	✓
6.2.7	DISPLAY	✓	✗	✓	✓	✗	✓	✓
6.2.8	display	✓	✗	✓	✓	✗	✓	✓
6.2.9	display_bitenum	✓	✗	✓	✗	✗	✓	✓
6.2.10	display_builtin_error	✗	✓	✗	✗	✓	✗	✗
6.2.11	display_comm_error	✗	✓	✗	✗	✓	✗	✗
6.2.12	display_comm_status	✗	✗	✗	✓	✗	✗	✗
6.2.13	display_device_status	✗	✗	✗	✓	✗	✗	✗
6.2.14	display_dynamics	✗	✓	✗	✗	✓	✗	✗
6.2.15	display_dynamics2	✗	✓	✗	✗	✓	✗	✗
6.2.16	display_message	✗	✓	✗	✗	✓	✗	✗
6.2.17	display_message2	✗	✓	✗	✗	✓	✗	✗
6.2.18	display_response_code	✗	✓	✗	✗	✓	✗	✗
6.2.19	display_response_status	✗	✗	✗	✓	✗	✗	✗
6.2.20	display_xmtr_status	✗	✗	✗	✓	✗	✗	✗
6.11.13	DoubleToByte	✓	✗	✓	✗	✗	✓	✓

Reference	Builtin	Communication profiles						
		CS	FF	GPE	HART	ISA100	PB	PN
6.11.14	drand	✓	✓	✓	✓	✓	✓	✓
6.11.15	dseed	✓	✓	✓	✓	✓	✓	✓
6.2.21	edit_device_value	✗	✓	✗	✗	✓	✗	✗
6.2.22	edit_device_value2	✗	✓	✗	✗	✓	✗	✗
6.2.23	edit_local_value	✗	✓	✗	✗	✓	✗	✗
6.2.24	edit_local_value2	✗	✓	✗	✗	✓	✗	✗
6.11.16	exp	✓	✓	✓	✓	✓	✓	✓
6.3.13	ext_send_command	✗	✗	✗	✓	✗	✗	✗
6.3.14	ext_send_command_trans	✗	✗	✗	✓	✗	✗	✗
6.3.15	fail_on_all_comm_errors	✗	✓	✗	✗	✓	✗	✗
6.3.16	fail_on_all_response_codes	✗	✓	✗	✗	✓	✗	✗
6.3.17	fail_on_comm_error	✗	✓	✗	✗	✓	✗	✗
6.3.18	fail_on_response_code	✗	✓	✗	✗	✓	✗	✗
6.5.8	fassign	✓	✗	✓	✓	✗	✓	✓
6.14.2	fGetByte	✗	✗	✗	✓	✗	✗	✗
6.4.1	fgetval	✓	✗	✓	✓	✗	✓	✓
6.5.9	float_value	✓	✗	✓	✓	✗	✓	✓
6.11.17	FloatToByte	✓	✗	✓	✗	✗	✓	✓
6.11.18	floor	✓	✓	✓	✓	✓	✓	✓
6.11.19	fmod	✓	✓	✓	✓	✓	✓	✓
6.11.20	fpclassify	✓	✓	✓	✓	✓	✓	✓
6.9.12	From_DATE_AND_TIME_VALUE	✓	✗	✓	✓	✗	✓	✓
6.9.13	From_TIME_VALUE	✓	✗	✓	✓	✗	✓	✓
6.4.2	fsetval	✓	✗	✓	✓	✗	✓	✓
6.8.5	ftoa	✓	✗	✓	✗	✗	✓	✓
6.5.10	fvar_value	✓	✗	✓	✓	✗	✓	✓
6.2.25	get_acknowledgement	✗	✓	✗	✗	✓	✗	✗
6.2.26	get_acknowledgement2	✗	✓	✗	✗	✓	✗	✗
6.13.2	get_block_instance_by_object_index	✗	✓	✗	✗	✓	✗	✗
6.13.3	get_block_instance_by_tag	✗	✓	✗	✗	✓	✗	✗
6.13.4	get_block_instance_count	✗	✓	✗	✗	✓	✗	✗
6.10.1	get_comm_error	✗	✓	✗	✗	✓	✗	✗
6.8.6	get_comm_error_string	✗	✓	✗	✗	✓	✗	✗
6.4.3	get_date	✗	✓	✗	✗	✓	✗	✗

Reference	Builtin	Communication profiles						
		CS	FF	GPE	HART	ISA100	PB	PN
6.12.1	get_date_lelem	x	✓	x	x	✓	x	x
6.12.2	get_date_lelem2	x	✓	x	x	✓	x	x
6.5.11	get_date_value	x	✓	x	x	✓	x	x
6.5.12	get_date_value2	x	✓	x	x	✓	x	x
6.16.1	GET_DD_REVISION	✓	x	✓	x	x	✓	✓
6.10.2	get_dds_error	x	✓	x	x	✓	x	x
6.2.27	GET_DEV_VAR_VALUE	✓	x	✓	✓	x	✓	✓
6.2.28	get_dev_var_value	✓	x	✓	✓	x	✓	✓
6.16.2	GET_DEVICE_REVISION	✓	x	✓	x	x	✓	✓
6.16.3	GET_DEVICE_TYPE	✓	x	✓	x	x	✓	✓
6.8.7	get_dictionary_string	✓	x	✓	✓	x	✓	✓
6.4.4	get_double	x	✓	x	x	✓	x	x
6.12.3	get_double_lelem	x	✓	x	x	✓	x	x
6.12.4	get_double_lelem2	x	✓	x	x	✓	x	x
6.5.13	get_double_value	x	✓	x	x	✓	x	x
6.5.14	get_double_value2	x	✓	x	x	✓	x	x
6.8.8	get_enum_string	✓	x	✓	✓	x	✓	✓
6.4.5	get_float	x	✓	x	x	✓	x	x
6.12.5	get_float_lelem	x	✓	x	x	✓	x	x
6.12.6	get_float_lelem2	x	✓	x	x	✓	x	x
6.5.15	get_float_value	x	✓	x	x	✓	x	x
6.5.16	get_float_value2	x	✓	x	x	✓	x	x
6.2.29	GET_LOCAL_VAR_VALUE	✓	x	✓	✓	x	✓	✓
6.2.30	get_local_var_value	✓	x	✓	✓	x	✓	✓
6.16.4	GET_MANUFACTURER	✓	x	✓	✓	x	✓	✓
6.3.19	get_more_status	x	x	x	✓	x	x	x
6.13.5	get_resolve_status	x	✓	x	x	✓	x	x
6.10.3	get_response_code	x	✓	x	x	✓	x	x
6.8.9	get_response_code_string	x	✓	x	x	✓	x	x
6.8.10	get_rspcode_string	x	x	x	✓	x	x	x
6.8.11	get_rspcode_string_by_id	✓	x	✓	x	x	✓	✓
6.4.6	get_signed	x	✓	x	x	✓	x	x
6.12.7	get_signed_lelem	x	✓	x	x	✓	x	x
6.12.8	get_signed_lelem2	x	✓	x	x	✓	x	x

Reference	Builtin	Communication profiles						
		CS	FF	GPE	HART	ISA100	PB	PN
6.5.17	get_signed_value	x	✓	x	x	✓	x	x
6.5.18	get_signed_value2	x	✓	x	x	✓	x	x
6.8.12	get_status_code_string(deprecated)	x	x	x	d	x	x	x
6.8.13	get_status_string	x	✓	x	x	✓	x	x
6.8.14	get_stddict_string	x	✓	x	x	✓	x	x
6.4.7	get_string	x	✓	x	x	✓	x	x
6.12.9	get_string_lelem	x	✓	x	x	✓	x	x
6.12.10	get_string_lelem2	x	✓	x	x	✓	x	x
6.5.19	get_string_value	x	✓	x	x	✓	x	x
6.5.20	get_string_value2	x	✓	x	x	✓	x	x
6.9.17	GET_TICK_COUNT	✓	x	✓	x	x	✓	✓
6.14.4	get_transfer_status	x	x	x	✓	x	x	x
6.4.8	get_unsigned	x	✓	x	x	✓	x	x
6.12.11	get_unsigned_lelem	x	✓	x	x	✓	x	x
6.12.12	get_unsigned_lelem2	x	✓	x	x	✓	x	x
6.5.21	get_unsigned_value	x	✓	x	x	✓	x	x
6.5.22	get_unsigned_value2	x	✓	x	x	✓	x	x
6.8.15	get_variable_string	✓	x	✓	x	x	✓	✓
6.9.14	GetCurrentDate	✓	✓	✓	x	✓	✓	✓
6.9.15	GetCurrentDateAndTime	✓	✓	✓	x	✓	✓	✓
6.9.16	GetCurrentTime	✓	✓	✓	✓	✓	✓	✓
6.5.23	iassign	✓	x	✓	✓	x	✓	✓
6.4.9	igetval	✓	x	✓	✓	x	✓	✓
6.3.20	IGNORE_ALL_COMM_STATUS	x	x	x	✓	x	x	x
6.3.21	IGNORE_ALL_DEVICE_STATUS	x	x	x	✓	x	x	x
6.3.22	IGNORE_ALL_RESPONSE_CODES	x	x	x	✓	x	x	x
6.3.23	IGNORE_COMM_ERROR	x	x	x	✓	x	x	x
6.3.24	IGNORE_COMM_STATUS	x	x	x	✓	x	x	x
6.3.25	IGNORE_DEVICE_STATUS	x	x	x	✓	x	x	x
6.3.26	IGNORE_NO_DEVICE (deprecated)	x	x	x	d	x	x	x
6.3.27	IGNORE_RESPONSE_CODE	x	x	x	✓	x	x	x
6.5.24	int_value	✓	x	✓	✓	x	✓	✓
6.11.21	is_NaN	✓	✓	✓	x	✓	✓	✓
6.4.10	isetval	✓	x	✓	✓	x	✓	✓

Reference	Builtin	Communication profiles						
		CS	FF	GPE	HART	ISA100	PB	PN
6.4.11	isOffline	✓	✓	✓	✓	✓	✓	✓
6.13.6	ITEM_ID	✗	✓	✗	✗	✓	✗	✗
6.8.16	itoa (version A)	✓	✗	✓	✗	✗	✓	✓
6.8.17	itoa (version B)	✗	✗	✗	✓	✗	✗	✗
6.5.25	ivar_value	✓	✗	✓	✓	✗	✓	✓
6.5.26	lassign	✓	✗	✓	✗	✗	✓	✓
6.4.12	lgetval	✓	✗	✓	✗	✗	✓	✓
6.12.13	ListDeleteElementAt (version A)	✓	✗	✓	✓	✗	✓	✓
6.12.14	ListDeleteElementAt (version B)	✗	✓	✗	✗	✓	✗	✗
6.12.15	ListDeleteElementAt2	✗	✓	✗	✗	✓	✗	✗
6.12.16	ListInsert (version A)	✓	✗	✓	✓	✗	✓	✓
6.12.17	ListInsert (version B)	✗	✓	✗	✗	✓	✗	✗
6.12.18	ListInsert2	✗	✓	✗	✗	✓	✗	✗
6.11.22	log	✓	✓	✓	✓	✓	✓	✓
6.17.4	LOG_MESSAGE	✓	✗	✓	✓	✗	✓	✓
6.11.23	log10	✓	✓	✓	✓	✓	✓	✓
6.11.24	log2	✓	✓	✓	✓	✓	✓	✓
6.5.27	long_value	✓	✗	✓	✗	✗	✓	✓
6.11.25	LongToByte	✓	✗	✓	✗	✗	✓	✓
6.4.13	lsetval	✓	✗	✓	✗	✗	✓	✓
6.5.28	lvar_value	✓	✗	✓	✗	✗	✓	✓
6.9.18	Make_Time	✓	✓	✓	✓	✓	✓	✓
6.13.7	MEMBER_ID	✗	✓	✗	✗	✓	✗	✗
6.2.31	Menu	✓	✗	✓	✓	✗	✓	✓
6.2.32	MenuDisplay (version A)	✓	✗	✓	✓	✗	✓	✓
6.2.33	MenuDisplay (version B)	✗	✓	✗	✗	✓	✗	✗
6.7.4	method_abort	✗	✓	✗	✗	✓	✗	✗
6.11.26	nan	✓	✓	✓	✓	✓	✓	✓
6.11.27	NaN_value	✓	✓	✓	✗	✓	✓	✓
6.11.28	nanf	✓	✓	✓	✓	✓	✓	✓
6.13.8	ObjectReference	✓	✗	✓	✗	✗	✓	✓
6.14.5	openTransferPort	✗	✗	✗	✓	✗	✗	✗
6.7.5	pop_abort_method	✓	✗	✓	✓	✗	✓	✓
6.11.29	pow	✓	✓	✓	✓	✓	✓	✓

Reference	Builtin	Communication profiles						
		CS	FF	GPE	HART	ISA100	PB	PN
6.7.6	process_abort	✓	✗	✓	✓	✗	✓	✓
6.7.7	push_abort_method	✓	✗	✓	✓	✗	✓	✓
6.4.14	put_date	✗	✓	✗	✗	✓	✗	✗
6.5.29	put_date_value	✗	✓	✗	✗	✓	✗	✗
6.5.30	put_date_value2	✗	✓	✗	✗	✓	✗	✗
6.4.15	put_double	✗	✓	✗	✗	✓	✗	✗
6.5.31	put_double_value	✗	✓	✗	✗	✓	✗	✗
6.5.32	put_double_value2	✗	✓	✗	✗	✓	✗	✗
6.4.16	put_float	✗	✓	✗	✗	✓	✗	✗
6.5.33	put_float_value	✗	✓	✗	✗	✓	✗	✗
6.5.34	put_float_value2	✗	✓	✗	✗	✓	✗	✗
6.2.34	PUT_MESSAGE	✓	✗	✓	✓	✗	✓	✓
6.2.35	put_message	✓	✗	✓	✓	✗	✓	✓
6.4.17	put_signed	✗	✓	✗	✗	✓	✗	✗
6.5.35	put_signed_value	✗	✓	✗	✗	✓	✗	✗
6.5.36	put_signed_value2	✗	✓	✗	✗	✓	✗	✗
6.4.18	put_string	✗	✓	✗	✗	✓	✗	✗
6.5.37	put_string_value	✗	✓	✗	✗	✓	✗	✗
6.5.38	put_string_value2	✗	✓	✗	✗	✓	✗	✗
6.4.19	put_unsigned	✗	✓	✗	✗	✓	✗	✗
6.5.39	put_unsigned_value	✗	✓	✗	✗	✓	✗	✗
6.5.40	put_unsigned_value2	✗	✓	✗	✗	✓	✗	✗
6.15.2	re_read_file	✗	✗	✗	✓	✗	✗	✗
6.15.3	re_write_file	✗	✗	✗	✓	✗	✗	✗
6.3.28	read_value	✗	✓	✗	✗	✓	✗	✗
6.3.29	read_value2	✗	✓	✗	✗	✓	✗	✗
6.3.30	ReadCommand	✓	✗	✓	✗	✗	✓	✓
6.14.6	readItemFromDevice	✗	✗	✗	✓	✗	✗	✗
6.7.8	remove_abort_method (version A)	✓	✗	✓	✓	✗	✓	✓
6.7.9	remove_abort_method (version B)	✗	✓	✗	✗	✓	✗	✗
6.7.10	remove_all_abort_methods	✓	✓	✓	✓	✓	✓	✓
6.13.9	resolve_array_ref	✗	✓	✗	✗	✓	✗	✗
6.13.10	resolve_array_ref2	✗	✓	✗	✗	✓	✗	✗
6.13.11	resolve_block_ref	✗	✓	✗	✗	✓	✗	✗

Reference	Builtin	Communication profiles						
		CS	FF	GPE	HART	ISA100	PB	PN
6.13.12	resolve_block_ref2	x	✓	x	x	✓	x	x
6.13.13	resolve_list_ref	x	✓	x	x	✓	x	x
6.13.14	resolve_local_ref	x	✓	x	x	✓	x	x
6.13.15	resolve_local_ref2	x	✓	x	x	✓	x	x
6.13.16	resolve_param_list_ref	x	✓	x	x	✓	x	x
6.13.17	resolve_param_ref	x	✓	x	x	✓	x	x
6.13.18	resolve_param_ref2	x	✓	x	x	✓	x	x
6.13.19	resolve_record_ref	x	✓	x	x	✓	x	x
6.13.20	resolve_record_ref2	x	✓	x	x	✓	x	x
6.5.41	ret_double_value	x	✓	x	x	✓	x	x
6.5.42	ret_double_value2	x	✓	x	x	✓	x	x
6.5.43	ret_float_value	x	✓	x	x	✓	x	x
6.5.44	ret_float_value2	x	✓	x	x	✓	x	x
6.5.45	ret_signed_value	x	✓	x	x	✓	x	x
6.5.46	ret_signed_value2	x	✓	x	x	✓	x	x
6.5.47	ret_unsigned_value	x	✓	x	x	✓	x	x
6.5.48	ret_unsigned_value2	x	✓	x	x	✓	x	x
6.3.31	retry_on_all_comm_errors	x	✓	x	x	✓	x	x
6.3.32	RETRY_ON_ALL_COMM_STATUS	x	x	x	✓	x	x	x
6.3.33	RETRY_ON_ALL_DEVICE_STATUS	x	x	x	✓	x	x	x
6.3.34	RETRY_ON_ALL_RESPONSE_CODES	x	x	x	✓	x	x	x
6.3.35	retry_on_all_response_codes	x	✓	x	x	✓	x	x
6.3.36	RETRY_ON_COMM_ERROR	x	x	x	✓	x	x	x
6.3.37	retry_on_comm_error	x	✓	x	x	✓	x	x
6.3.38	RETRY_ON_COMM_STATUS	x	x	x	✓	x	x	x
6.3.39	RETRY_ON_DEVICE_STATUS	x	x	x	✓	x	x	x
6.3.40	RETRY_ON_NO_DEVICE (deprecated)	d	x	d	d	x	d	d
6.3.41	RETRY_ON_RESPONSE_CODE	x	x	x	✓	x	x	x
6.3.42	retry_on_response_code	x	✓	x	x	✓	x	x
6.11.30	round	✓	✓	✓	✓	✓	✓	✓
6.6.2	save_on_exit	✓	✓	✓	x	✓	✓	✓
6.6.3	save_values	✓	x	✓	✓	x	✓	✓
6.9.19	seconds_to_TIME_VALUE	✓	x	✓	✓	x	✓	✓
6.9.20	seconds_to_TIME_VALUE8	✓	✓	✓	x	✓	✓	✓

Reference	Builtin	Communication profiles						
		CS	FF	GPE	HART	ISA100	PB	PN
6.2.36	SELECT_FROM_LIST	✓	✗	✓	✓	✗	✓	✓
6.2.37	select_from_list	✓	✗	✓	✓	✗	✓	✓
6.2.38	select_from_menu	✗	✓	✗	✗	✓	✗	✗
6.2.39	select_from_menu2	✗	✓	✗	✗	✓	✗	✗
6.3.43	send	✗	✗	✗	✓	✗	✗	✗
6.3.44	send_all_values	✗	✓	✗	✗	✓	✗	✗
6.3.45	send_command	✗	✗	✗	✓	✗	✗	✗
6.3.46	send_command_trans	✗	✗	✗	✓	✗	✗	✗
6.6.4	send_on_exit	✓	✓	✓	✗	✓	✓	✓
6.3.47	send_trans	✗	✗	✗	✓	✗	✗	✗
6.3.48	send_value	✗	✓	✗	✗	✓	✗	✗
6.3.49	send_value2	✗	✓	✗	✗	✓	✗	✗
6.3.50	SET_NUMBER_OF_RETRIES	✓	✗	✓	✓	✗	✓	✓
6.4.20	sgetval	✓	✗	✓	✓	✗	✓	✓
6.11.31	ShortToByte	✓	✗	✓	✗	✗	✓	✓
6.11.32	sin	✓	✓	✓	✓	✓	✓	✓
6.11.33	sinh	✓	✓	✓	✓	✓	✓	✓
6.11.34	sqrt	✓	✓	✓	✓	✓	✓	✓
6.4.21	ssetval	✓	✗	✓	✓	✗	✓	✓
6.8.19	strcmp	✓	✓	✓	✓	✓	✓	✓
6.8.18	strleft	✓	✓	✓	✗	✓	✓	✓
6.8.20	strlen	✓	✓	✓	✓	✓	✓	✓
6.8.21	strlwr	✓	✓	✓	✓	✓	✓	✓
6.8.22	strmid	✓	✓	✓	✓	✓	✓	✓
6.8.23	strright	✓	✓	✓	✗	✓	✓	✓
6.8.24	strstr	✓	✓	✓	✓	✓	✓	✓
6.8.25	strtrim	✓	✓	✓	✓	✓	✓	✓
6.8.26	strupr	✓	✓	✓	✓	✓	✓	✓
6.11.35	tan	✓	✓	✓	✓	✓	✓	✓
6.11.36	tanh	✓	✓	✓	✓	✓	✓	✓
6.9.21	Time_To_Date	✓	✗	✓	✓	✗	✓	✓
6.9.22	TIME_VALUE_to_Hour	✓	✓	✓	✓	✓	✓	✓
6.9.23	TIME_VALUE_to_Minute	✓	✓	✓	✓	✓	✓	✓
6.9.24	TIME_VALUE_to_Second	✓	✓	✓	✓	✓	✓	✓

Reference	Builtin	Communication profiles						
		CS	FF	GPE	HART	ISA100	PB	PN
6.9.25	TIME_VALUE_to_seconds	✓	✓	✓	✓	✓	✓	✓
6.9.26	TIME_VALUE_to_string	✓	✓	✓	✓	✓	✓	✓
6.9.27	timet_to_string	✓	✓	✓	✓	✓	✓	✓
6.9.28	timet_to_TIME_VALUE	✓	✗	✓	✗	✗	✓	✓
6.9.29	timet_To_TIME_VALUE	✗	✗	✗	✓	✗	✗	✗
6.9.30	timet_to_TIME_VALUE8	✓	✓	✓	✗	✓	✓	✓
6.9.31	To_Date	✓	✗	✓	✓	✗	✓	✓
6.9.32	To_Date_and_Time	✓	✗	✓	✗	✗	✓	✓
6.9.33	To_Time	✓	✗	✓	✓	✗	✓	✓
6.9.34	To_TIME_VALUE	✓	✗	✓	✓	✗	✓	✓
6.9.35	To_TIME_VALUE8	✓	✓	✓	✗	✓	✓	✓
6.8.27	trunc	✓	✓	✓	✓	✓	✓	✓
6.13.21	VARID	✓	✗	✓	✓	✗	✓	✓
6.5.49	vassign	✓	✗	✓	✓	✗	✓	✓
6.3.51	WriteCommand	✓	✗	✓	✗	✗	✓	✓
6.14.7	writelItemToDevice	✗	✗	✗	✓	✗	✗	✗
6.3.52	XMTR_ABORT_ON_ALL_COMM_STATUS	✗	✗	✗	✓	✗	✗	✗
6.3.53	XMTR_ABORT_ON_ALL_DATA	✗	✗	✗	✓	✗	✗	✗
6.3.54	XMTR_ABORT_ON_ALL_DEVICE_STATUS	✗	✗	✗	✓	✗	✗	✗
6.3.55	XMTR_ABORT_ON_ALL_RESPONSE_CODES	✗	✗	✗	✓	✗	✗	✗
6.3.56	XMTR_ABORT_ON_COMM_ERROR	✗	✗	✗	✓	✗	✗	✗
6.3.57	XMTR_ABORT_ON_COMM_STATUS	✗	✗	✗	✓	✗	✗	✗
6.3.58	XMTR_ABORT_ON_DATA	✗	✗	✗	✓	✗	✗	✗
6.3.59	XMTR_ABORT_ON_DEVICE_STATUS	✗	✗	✗	✓	✗	✗	✗
6.3.60	XMTR_ABORT_ON_NO_DEVICE (deprecated)	✗	✗	✗	d	✗	✗	✗
6.3.61	XMTR_ABORT_ON_RESPONSE_CODE	✗	✗	✗	✓	✗	✗	✗
6.3.62	XMTR_IGNORE_ALL_COMM_STATUS	✗	✗	✗	✓	✗	✗	✗
6.3.63	XMTR_IGNORE_ALL_DATA	✗	✗	✗	✓	✗	✗	✗
6.3.64	XMTR_IGNORE_ALL_DEVICE_STATUS	✗	✗	✗	✓	✗	✗	✗
6.3.65	XMTR_IGNORE_ALL_RESPONSE_CODES	✗	✗	✗	✓	✗	✗	✗
6.3.66	XMTR_IGNORE_COMM_ERROR	✗	✗	✗	✓	✗	✗	✗
6.3.67	XMTR_IGNORE_COMM_STATUS	✗	✗	✗	✓	✗	✗	✗
6.3.68	XMTR_IGNORE_DATA	✗	✗	✗	✓	✗	✗	✗
6.3.69	XMTR_IGNORE_DEVICE_STATUS	✗	✗	✗	✓	✗	✗	✗

Reference	Builtin	Communication profiles						
		CS	FF	GPE	HART	ISA100	PB	PN
6.3.70	XMTR_IGNORE_NO_DEVICE (deprecated)	x	x	x	d	x	x	x
6.3.71	XMTR_IGNORE_RESPONSE_CODE	x	x	x	✓	x	x	x
6.3.72	XMTR_RETRY_ON_ALL_COMM_STATUS	x	x	x	✓	x	x	x
6.3.73	XMTR_RETRY_ON_ALL_DATA	x	x	x	✓	x	x	x
6.3.74	XMTR_RETRY_ON_ALL_DEVICE_STATUS	x	x	x	✓	x	x	x
6.3.75	XMTR_RETRY_ON_ALL_RESPONSE_CODES	x	x	x	✓	x	x	x
6.3.76	XMTR_RETRY_ON_COMM_ERROR	x	x	x	✓	x	x	x
6.3.77	XMTR_RETRY_ON_COMM_STATUS	x	x	x	✓	x	x	x
6.3.78	XMTR_RETRY_ON_DATA	x	x	x	✓	x	x	x
6.3.79	XMTR_RETRY_ON_DEVICE_STATUS	x	x	x	✓	x	x	x
6.3.80	XMTR_RETRY_ON_NO_DEVICE (deprecated)	x	x	x	d	x	x	x
6.3.81	XMTR_RETRY_ON_RESPONSE_CODE	x	x	x	✓	x	x	x

There are the following special categories of builtins:

- User interface builtins;
- Communication builtins;
- Action builtins.

Table 6 shows restrictions to the usage of builtins, depending on their category.

Table 6 – Usage of builtins

Builtin usage	User interface builtins	Communication builtins	Action builtins
Methods referenced in user interface menus	Allowed	Allowed	Not allowed
PRE_EDIT_ACTIONS	Allowed	Not recommended	Allowed ^a
POST_EDIT_ACTIONS	Allowed	Not recommended	Allowed ^a
REFRESH_ACTIONS	Not recommended	GRAPH and CHART: allowed Others: not recommended	Allowed ^a
PRE_READ_ACTIONS	Not recommended	Allowed	Allowed ^a
POST_READ_ACTIONS	Not recommended	Allowed	Allowed ^a
PRE_WRITE_ACTIONS	Not recommended	Allowed	Allowed ^a
POST_WRITE_ACTIONS	Not recommended	Allowed	Allowed ^a
INIT_ACTIONS	Not recommended	Allowed	Not allowed
EXIT_ACTIONS	Not recommended	Allowed	Not allowed
^a Shall only be used for actions called from a VARIABLE.			

5.2 User interface builtins

User interface builtins display information and in addition some of them require interaction from the user. The list of user interface builtins are listed in Table 7.

Table 7 – User interface builtins

Builtin name
ACKNOWLEDGE
acknowledge
DELAY
delay
delayfor
delayfor2
DISPLAY
display
display_bitenum
display_builtin_error
display_comm_error
display_comm_status
display_device_status
display_dynamics
display_dynamics2
display_message
display_message2
display_response_code
display_response_status
display_xmtr_status
edit_device_value
edit_device_value2
edit_local_value
edit_local_value2
get_acknowledgement2
get_acknowledgement
GET_DEV_VAR_VALUE
get_dev_var_value
GET_LOCAL_VAR_VALUE
get_local_var_value
Menu
MenuDisplay (version A)
MenuDisplay (version B)

Builtin name
PUT_MESSAGE
put_message
SELECT_FROM_LIST
select_from_list
select_from_menu
select_from_menu2

5.3 Communication builtins

The communication builtins allow methods to communicate with the device or to control the communication with the device. The list of communication builtins is listed in Table 8.

Table 8 – Communication builtins

Builtin name
abort_on_all_comm_errors
ABORT_ON_ALL_COMM_STATUS
ABORT_ON_ALL_DEVICE_STATUS
ABORT_ON_ALL_RESPONSE_CODES
abort_on_all_response_codes
ABORT_ON_COMM_ERROR
abort_on_comm_error
ABORT_ON_COMM_STATUS
ABORT_ON_DEVICE_STATUS
ABORT_ON_NO_DEVICE
ABORT_ON_RESPONSE_CODE
abort_on_response_code
ext_send_command
ext_send_command_trans
fail_on_all_comm_errors
fail_on_all_response_codes
fail_on_comm_error
fail_on_response_code
get_more_status
IGNORE_ALL_COMM_STATUS
IGNORE_ALL_DEVICE_STATUS
IGNORE_ALL_RESPONSE_CODES
IGNORE_COMM_ERROR
IGNORE_COMM_STATUS

Builtin name
IGNORE_DEVICE_STATUS
IGNORE_NO_DEVICE
IGNORE_RESPONSE_CODE
read_value
read_value2
ReadCommand
retry_on_all_comm_errors
RETRY_ON_ALL_COMM_STATUS
RETRY_ON_ALL_DEVICE_STATUS
RETRY_ON_ALL_RESPONSE_CODES
retry_on_all_response_codes
RETRY_ON_COMM_ERROR
retry_on_comm_error
RETRY_ON_COMM_STATUS
RETRY_ON_DEVICE_STATUS
RETRY_ON_NO_DEVICE
RETRY_ON_RESPONSE_CODE
retry_on_response_code
send
send_all_values
send_command
send_command_trans
send_trans
send_value
send_value2
SET_NUMBER_OF_RETRIES
WriteCommand
XMTR_ABORT_ON_ALL_COMM_STATUS
XMTR_ABORT_ON_ALL_DATA
XMTR_ABORT_ON_ALL_DEVICE_STATUS
XMTR_ABORT_ON_ALL_RESPONSE_CODES
XMTR_ABORT_ON_COMM_ERROR
XMTR_ABORT_ON_COMM_STATUS
XMTR_ABORT_ON_DATA
XMTR_ABORT_ON_DEVICE_STATUS
XMTR_ABORT_ON_NO_DEVICE
XMTR_ABORT_ON_RESPONSE_CODE

Builtin name
XMTR_IGNORE_ALL_COMM_STATUS
XMTR_IGNORE_ALL_DATA
XMTR_IGNORE_ALL_DEVICE_STATUS
XMTR_IGNORE_ALL_RESPONSE_CODES
XMTR_IGNORE_COMM_ERROR
XMTR_IGNORE_COMM_STATUS
XMTR_IGNORE_DATA
XMTR_IGNORE_DEVICE_STATUS
XMTR_IGNORE_NO_DEVICE
XMTR_IGNORE_RESPONSE_CODE
XMTR_RETRY_ON_ALL_COMM_STATUS
XMTR_RETRY_ON_ALL_DATA
XMTR_RETRY_ON_ALL_DEVICE_STATUS
XMTR_RETRY_ON_ALL_RESPONSE_CODE
XMTR_RETRY_ON_ALL_RESPONSE_CODES
XMTR_RETRY_ON_COMM_ERROR
XMTR_RETRY_ON_COMM_STATUS
XMTR_RETRY_ON_DATA
XMTR_RETRY_ON_DEVICE_STATUS
XMTR_RETRY_ON_NO_DEVICE
XMTR_RETRY_ON_RESPONSE_CODE

5.4 Action builtins

The action builtins shall only be used for actions called from a VARIABLE. They allow for accessing the value of the variable from which the action was called. The list of action builtins is listed in Table 9.

Table 9 – Action builtins

Reference	Builtin name	Allowed data type for action variable	Allowed actions from which the builtin can be called
6.4.1	fgetval	FLOAT, DOUBLE	PRE_EDIT_ACTIONS POST_EDIT_ACTIONS PRE_READ_ACTIONS POST_READ_ACTIONS PRE_WRITE_ACTIONS POST_WRITE_ACTIONS REFRESH_ACTIONS POST_RQSTUPDATE_ACTIONS POST_USERCHANGE_ACTIONS
6.4.2	fsetval	FLOAT, DOUBLE	PRE_EDIT_ACTIONS POST_EDIT_ACTIONS PRE_READ_ACTIONS POST_READ_ACTIONS PRE_WRITE_ACTIONS POST_WRITE_ACTIONS REFRESH_ACTIONS POST_RQSTUPDATE_ACTIONS POST_USERCHANGE_ACTIONS
6.4.3	get_date	DATE_AND_TIME, TIME_VALUE	PRE_EDIT_ACTIONS POST_EDIT_ACTIONS POST_READ_ACTIONS PRE_WRITE_ACTIONS
6.4.4	get_double	DOUBLE	PRE_EDIT_ACTIONS POST_EDIT_ACTIONS POST_READ_ACTIONS PRE_WRITE_ACTIONS
6.4.5	get_float	FLOAT	PRE_EDIT_ACTIONS POST_EDIT_ACTIONS POST_READ_ACTIONS PRE_WRITE_ACTIONS
6.4.6	get_signed	INTEGER	PRE_EDIT_ACTIONS POST_EDIT_ACTIONS POST_READ_ACTIONS PRE_WRITE_ACTIONS