

# ISO/IEC 19784-1:2018-04 (E)

## Information technology - Biometric application programming interface - Part 1: BioAPI specification

---

<b>Contents</b>		<b>Page</b>
Foreword .....		viii
Introduction .....		ix
1	Scope .....	1
2	Normative references .....	2
3	Terms and definitions .....	2
4	Symbols and abbreviated terms .....	8
5	Conformance .....	8
6	The BioAPI architecture .....	9
6.1	The full BioAPI API/SPI Architectural Model .....	9
6.2	The framework-free BioAPI Architectural Model .....	10
6.3	The BioAPI BSP Architectural Model .....	10
6.4	The component registry .....	12
6.5	BSP and BFP Installation and De-installation .....	13
6.6	BSP Load and BioAPI Unit Attachment .....	14
6.7	Controlling BioAPI Units .....	15
6.8	BIR Structure and Handling .....	15
6.8.1	BIR Structure .....	15
6.8.2	BIR Data Handling .....	16
7	BioAPI types and macros .....	17
7.1	BioAPI .....	17
7.2	BioAPI_ACBio_PARAMETERS (BioAPI 2.2) .....	17
7.3	BioAPI_ASN1_BIR (BioAPI 2.2) .....	17
7.4	BioAPI_ASN1_ENCODED (BioAPI 2.2) .....	18
7.5	BioAPI_BFP_LIST_ELEMENT .....	18
7.6	BioAPI_BFP_SCHEMA .....	18
7.7	BioAPI_BIR .....	19
7.8	BioAPI_BIR_ARRAY_POPULATION .....	19
7.9	BioAPI_BIR_BIOMETRIC_DATA_FORMAT .....	20
7.10	BioAPI_BIR_BIOMETRIC_PRODUCT_ID .....	20
7.11	BioAPI_BIR_BIOMETRIC_TYPE (BioAPI 2.0) .....	20
7.12	BioAPI_BIR_BIOMETRIC_TYPE (BioAPI 2.1) .....	21
7.13	BioAPI_BIR_DATA_TYPE .....	22
7.14	BioAPI_BIR_HANDLE .....	23
7.15	BioAPI_BIR_HEADER .....	23
7.16	BioAPI_BIR_PURPOSE .....	24
7.17	BioAPI_BIR_SECURITY_BLOCK_FORMAT .....	25
7.18	BioAPI_BIR_SUBTYPE (BioAPI 2.0) .....	25
7.19	BioAPI_BIR_SUBTYPE (BioAPI 2.1) .....	26
7.20	BioAPI_BIR_SUBTYPE_MASK (BioAPI 2.1) .....	27
7.21	BioAPI_BOOL .....	28
7.22	BioAPI_BSP_SCHEMA (BioAPI 2.0) .....	28
7.23	BioAPI_BSP_SCHEMA (BioAPI 2.1) .....	30
7.24	BioAPI_CANDIDATE .....	32

7.25	BioAPI_CATEGORY .....	32
7.26	BioAPI_DATA .....	32
7.27	BioAPI_DATE .....	32
7.28	BioAPI_DB_ACCESS_TYPE .....	33
7.29	BioAPI_DB_MARKER_HANDLE .....	33
7.30	BioAPI_DB_HANDLE .....	33
7.31	BioAPI_DBBIR_ID .....	33
7.32	BioAPI_DTG .....	34
7.33	BioAPI_ENCRYPTION_ALG (BioAPI 2.2) .....	34
7.34	BioAPI_ENCRYPTION_INFO (BioAPI 2.2) .....	34
7.35	BioAPI_ERROR_INFO (BioAPI 2.1) .....	34
7.36	BioAPI_EVENT .....	35
7.37	BioAPI_EVENT_MASK .....	35
7.38	BioAPI_EventHandler .....	35
7.39	BioAPI_FMR .....	36
7.40	BioAPI_FRAMEWORK_SCHEMA .....	36
7.41	BioAPI_GUI_BITMAP (BioAPI 2.0) .....	37
7.42	BioAPI_GUI_BITMAP (BioAPI 2.1) .....	37
7.43	BioAPI_GUI_BITMAP_ARRAY (BioAPI 2.1) .....	38
7.44	BioAPI_GUI_ENROLL_TYPE (BioAPI 2.1) .....	38
7.45	BioAPI_GUI_EVENT_SUBSCRIPTION (BioAPI 2.1) .....	39
7.46	BioAPI_GUI_MESSAGE (BioAPI 2.0) .....	39
7.47	BioAPI_GUI_MOMENT (BioAPI 2.1) .....	40
7.48	BioAPI_GUI_OPERATION (BioAPI 2.1) .....	41
7.49	BioAPI_GUI_PROGRESS (BioAPI 2.0) .....	41
7.50	BioAPI_GUI_PROGRESS (BioAPI 2.1) .....	42
7.51	BioAPI_GUI_RESPONSE (BioAPI 2.0) .....	42
7.52	BioAPI_GUI_RESPONSE (BioAPI 2.1) .....	42
7.53	BioAPI_GUI_STATE (BioAPI 2.0) .....	44
7.54	BioAPI_GUI_STATE_CALLBACK (BioAPI 2.0) .....	44
7.55	BioAPI_GUI_STREAMING_CALLBACK (BioAPI 2.0) .....	45
7.56	BioAPI_GUI_SUBOPERATION (BioAPI 2.1) .....	46
7.57	BioAPI_HANDLE .....	47
7.58	BioAPI_HASH_ALG (BioAPI 2.2) .....	47
7.59	BioAPI_IDENTIFY_POPULATION .....	47
7.60	BioAPI_IDENTIFY_POPULATION_TYPE .....	47
7.61	BioAPI_INDICATOR_STATUS .....	48
7.62	BioAPI_INPUT_BIR .....	48
7.63	BioAPI_INPUT_BIR_FORM .....	48
7.64	BioAPI_INSTALL_ACTION .....	48
7.65	BioAPI_INSTALL_ERROR .....	48
7.66	BioAPI_KEY_INFO (BioAPI 2.2) .....	49
7.67	BioAPI_KEY_TRANSPORT (BioAPI 2.2) .....	49
7.68	BioAPI_MAC_ALG (BioAPI 2.2) .....	49
7.69	BioAPI_MAC_INFO (BioAPI 2.2) .....	49
7.70	BioAPI_OPERATIONS_MASK .....	50
7.71	BioAPI_OPTIONS_MASK .....	50
7.72	BioAPI_POWER_MODE .....	52
7.73	BioAPI_QUALITY .....	52
7.74	BioAPI_RETURN .....	53
7.75	BioAPI_SECURITY_OPTIONS_MASK (BioAPI 2.2) .....	53
7.76	BioAPI_SECURITY_PROFILE (BioAPI 2.2) .....	53
7.77	BioAPI_DIGITAL_SIGNATURE_ALG (BioAPI 2.2) .....	54
7.78	BioAPI_STRING .....	55
7.79	BioAPI_TIME .....	55
7.80	BioAPI_UNIT_ID .....	55
7.81	BioAPI_UNIT_LIST_ELEMENT .....	55
7.82	BioAPI_UNIT_SCHEMA .....	55
7.83	BioAPI_UNIT_SCHEMA (BioAPI 2.2) .....	57
7.84	BioAPI_UUID .....	58
7.85	BioAPI_VERSION .....	58

7.86	GUI Events .....	58
7.86.1	BioAPI_GUI_SELECT_EVENT_HANDLER (BioAPI 2.1) .....	59
7.86.2	BioAPI_GUI_STATE_EVENT_HANDLER (BioAPI 2.1) .....	61
7.86.3	BioAPI_GUI_PROGRESS_EVENT_HANDLER (BioAPI 2.1) .....	63
8	BioAPI functions .....	65
8.1	Component Management Functions .....	65
8.1.1	BioAPI_Init .....	65
8.1.2	BioAPI_Terminate .....	66
8.1.3	BioAPI_GetFrameworkInfo .....	66
8.1.4	BioAPI_EnumBSPs .....	67
8.1.5	BioAPI_BSPLoad .....	67
8.1.6	BioAPI_BSPUnload .....	69
8.1.7	BioAPI_BSPAttach .....	70
8.1.8	BioAPI_BSPAttachSecure (BioAPI 2.2) .....	71
8.1.9	BioAPI_BSPDetach .....	73
8.1.10	BioAPI_QueryUnits .....	74
8.1.11	BioAPI_EnumBFPs .....	75
8.1.12	BioAPI_QueryBFPs .....	76
8.1.13	BioAPI_ControlUnit .....	77
8.1.14	BioAPI_Control (BioAPI 2.1) .....	77
8.1.15	BioAPI_Transform (BioAPI 2.1) .....	78
8.1.16	BioAPI_LinkToEndpoint (BioAPI 2.1) .....	80
8.1.17	BioAPI_UnlinkFromEndpoint (BioAPI 2.1) .....	80
8.1.18	BioAPI_EnumFrameworks (BioAPI 2.1) .....	81
8.2	Data Handle Operations .....	82
8.2.1	BioAPI_FreeBIRHandle .....	82
8.2.2	BioAPI_GetBIRFromHandle .....	82
8.2.3	BioAPI_GetHeaderFromHandle .....	83
8.3	Callback and Event Operations .....	83
8.3.1	BioAPI_EnableEvents .....	83
8.3.2	BioAPI_SetGUICallbacks (BioAPI 2.0) .....	84
8.3.3	BioAPI_NotifyGUIProgressEvent (BioAPI 2.1) .....	85
8.3.4	BioAPI_NotifyGUISelectEvent (BioAPI 2.1) .....	86
8.3.5	BioAPI_NotifyGUIStateEvent (BioAPI 2.1) .....	87
8.3.6	BioAPI_QueryGUIEventSubscriptions (BioAPI 2.1) .....	88
8.3.7	BioAPI_RedirectGUIEvents (BioAPI 2.1) .....	89
8.3.8	BioAPI_SubscribeToGUIEvents (BioAPI 2.1) .....	91
8.3.9	BioAPI_UnredirectGUIEvents (BioAPI 2.1) .....	93
8.3.10	BioAPI_UnsubscribeFromGUIEvents (BioAPI 2.1) .....	94
8.3.11	BioAPI_EnableEventNotifications (BioAPI 2.1) .....	95
8.4	Biometric Operations .....	95
8.4.1	BioAPI_Capture .....	95
8.4.2	BioAPI_CreateTemplate .....	97
8.4.3	BioAPI_Process .....	99
8.4.4	BioAPI_ProcessWithAuxBIR (BioAPI2.0 and BioAPI2.1) .....	100
8.4.5	BioAPI_ProcessUsingAuxBIRs (BioAPI 2.2) .....	101
8.4.6	BioAPI_VerifyMatch .....	102
8.4.7	BioAPI_VerifyMatchUsingAuxBIRs (BioAPI 2.2) .....	104
8.4.8	BioAPI_IdentifyMatch .....	106
8.4.9	BioAPI_Decide (BioAPI 2.2) .....	109
8.4.10	BioAPI_Fuse (BioAPI 2.2) .....	110
8.4.11	BioAPI_Enroll .....	111
8.4.12	BioAPI_Verify .....	113
8.4.13	BioAPI_Identify .....	115
8.4.14	BioAPI_Import .....	118
8.4.15	BioAPI_Export (BioAPI 2.2) .....	119
8.4.16	BioAPI_PresetIdentifyPopulation .....	120
8.5	Database Operations .....	121
8.5.1	BioAPI_DbOpen .....	121
8.5.2	BioAPI_DbClose .....	122
8.5.3	BioAPI_DbCreate .....	122

8.5.4	BioAPI_DbDelete .....	123
8.5.5	BioAPI_DbSetMarker .....	124
8.5.6	BioAPI_DbFreeMarker .....	124
8.5.7	BioAPI_DbStoreBIR .....	125
8.5.8	BioAPI_DbGetBIR .....	126
8.5.9	BioAPI_DbGetNextBIR .....	127
8.5.10	BioAPI_DbDeleteBIR .....	128
8.6	BioAPI Unit operations .....	128
8.6.1	BioAPI_SetPowerMode .....	128
8.6.2	BioAPI_SetIndicatorStatus .....	129
8.6.3	BioAPI_GetIndicatorStatus .....	130
8.6.4	BioAPI_CalibrateSensor .....	130
8.7	Utility Functions .....	131
8.7.1	BioAPI_Cancel .....	131
8.7.2	BioAPI_Free .....	131
9	BioAPI Service Provider Interface .....	132
9.1	Summary .....	132
9.2	Type Definitions for Biometric Service Providers .....	132
9.2.1	BioSPI_EventHandler .....	132
9.2.2	BioSPI_BFP_ENUMERATION_HANDLER .....	133
9.2.3	BioSPI_MEMORY_FREE_HANDLER .....	134
9.2.4	BioSPI_GUI_PROGRESS_EVENT_HANDLER (BioAPI 2.1) .....	135
9.2.5	BioSPI_GUI_SELECT_EVENT_HANDLER (BioAPI 2.1) .....	136
9.2.6	BioSPI_GUI_STATE_EVENT_HANDLER (BioAPI 2.1) .....	137
9.3	Biometric Service Provider Operations .....	137
9.3.1	SPI Component Management Operations .....	137
9.3.2	SPI Data Handle Operations .....	143
9.3.3	SPI Callback and Event Operations .....	143
9.3.4	SPI Biometric Operations .....	145
9.3.5	SPI Database Operations .....	148
9.3.6	SPI BioAPI Unit operations .....	150
9.3.7	SPI Utility Functions .....	151
10	Component registry interface .....	151
10.1	BioAPI Registry Schema .....	152
10.1.1	Framework Schema .....	152
10.1.2	BSP Schema .....	152
10.1.3	BFP Schema .....	154
10.2	Component registry functions .....	155
10.2.1	BioAPI_Util_InstallBSP .....	155
10.2.2	BioAPI_Util_InstallBFP .....	156
10.2.3	BioAPI_RegisterBSP (BioAPI 2.1) .....	156
10.2.4	BioAPI_UnregisterBSP (BioAPI 2.1) .....	157
10.2.5	ioAPI_RegisterBFP (BioAPI 2.1) .....	158
10.2.6	BioAPI_UnregisterBFP (BioAPI 2.1) .....	159
10.2.7	BioAPI_GetLastErrorInfo (BioAPI 2.1) .....	159
11	BioAPI error handling .....	160
11.1	Error Values and Error Codes Scheme .....	160
11.2	Error Codes and Error Value Enumeration .....	160
11.2.1	BioAPI Error Value Constants .....	160
11.2.2	Implementation-Specific Error Codes .....	160
11.2.3	General Error Codes .....	161
11.2.4	Component Management Error Codes .....	162
11.2.5	Database Error Values .....	163
11.2.6	Location Error Values .....	163
11.2.7	Quality Error Codes .....	165
11.2.8	Security Error Codes (BioAPI 2.2) .....	166
Annex A	(normative) Conformance .....	168

<b>Annex B (normative) CBEFF Patron Format Specification: BioAPI patron format .....</b>	<b>185</b>
<b>Annex C (informative) Specification overview .....</b>	<b>191</b>
<b>Annex D (informative) Calling sequence examples and sample code .....</b>	<b>214</b>
<b>Annex E (normative) ASN.1 specification of BioAPI_BIR (BioAPI2.2) .....</b>	<b>232</b>
<b>Bibliography .....</b>	<b>234</b>