

CONTENTS

	<i>Page</i>
1	Scope 1
2	Normative references 2
2.1	Identical Recommendations International Standards 2
2.2	Paired Recommendations International Standards equivalent in technical content..... 2
2.3	Additional references 2
3	Conformance 3
4	Abbreviations 4
5	Conventions 5
6	Conformance 5
7	BIP architecture 7
7.1	BIP-enabled frameworks 7
7.2	BIP messages 8
7.3	BIP endpoints..... 8
7.4	BIP links 9
7.5	Transport protocol bindings 10
7.6	Creation and destruction of BIP links 10
8	Remote GUI event notifications 11
9	Examples of possible system configurations 12
10	BIR format..... 15
11	Identification of BIP endpoints, applications, and BSPs 15
12	Overview of BIP exchanges..... 16
12.1	Security and privacy provisions 16
12.2	Application invocation of functions on a remote BSP..... 16
12.3	Application invocation of functions with no associated BIP message..... 18
12.4	Event notifications 18
13	General provisions 18
14	BIP message syntax 21
15	BioAPI and BIP types 24
15.1	Integers 24
15.2	Character strings 25
15.3	Uniform resource identifiers designating BIP endpoints..... 25
15.4	Type BioAPI_BFP_LIST_ELEMENT 26
15.5	Type BioAPI_BFP_SCHEMA 26
15.6	Type BioAPI_BIR 28
15.7	Type BioAPI_BIR_ARRAY_POPULATION 28
15.8	Type BioAPI_BIR_BIOMETRIC_DATA_FORMAT 29
15.9	Type BioAPI_BIR_BIOMETRIC_PRODUCT_ID 29
15.10	Type BioAPI_BIR_BIOMETRIC_TYPE 29
15.11	Type BioAPI_BIR_DATA_TYPE 30
15.12	Type BioAPI_BIR_HANDLE 31
15.13	Type BioAPI_BIR_HEADER 31
15.14	Type BioAPI_BIR_PURPOSE 32
15.15	Type BioAPI_BIR_SECURITY_BLOCK_FORMAT 33
15.16	Type BioAPI_BIR_SUBTYPE 33
15.17	Type BioAPI_BIR_SUBTYPE_MASK 34
15.18	Type BioAPI_BOOL 35
15.19	Type BioAPI_BSP_SCHEMA 35
15.20	Type BioAPI_CANDIDATE 37
15.21	Type BioAPI_CATEGORY 38

	<i>Page</i>
15.22	Type <code>BioAPI_DATA</code> 38
15.23	Type <code>BioAPI_DATE</code> 39
15.24	Type <code>BioAPI_DB_ACCESS_TYPE</code> 39
15.25	Type <code>BioAPI_DB_MARKER_HANDLE</code> 40
15.26	Type <code>BioAPI_DB_HANDLE</code> 40
15.27	Type <code>BioAPI_DBBIR_ID</code> 40
15.28	Type <code>BioAPI_DTG</code> 41
15.29	Type <code>BioAPI_ERROR_INFO</code> 41
15.30	Type <code>BioAPI_EVENT</code> 41
15.31	Type <code>BioAPI_EVENT_MASK</code> 42
15.32	Type <code>BioAPI_FMR</code> 42
15.33	Type <code>BioAPI_FRAMEWORK_SCHEMA</code> 42
15.34	Type <code>BioAPI_GUI_BITMAP</code> 43
15.35	Type <code>BioAPI_GUI_BITMAP_ARRAY</code> 44
15.36	Type <code>BioAPI_GUI_EVENT_SUBSCRIPTION</code> 44
15.37	Type <code>BioAPI_GUI_MOMENT</code> 45
15.38	Type <code>BioAPI_GUI_ENROLL_TYPE</code> 45
15.39	Type <code>BioAPI_GUI_OPERATION</code> 45
15.40	Type <code>BioAPI_GUI_RESPONSE</code> 46
15.41	Type <code>BioAPI_GUI_SUBOPERATION</code> 47
15.42	Type <code>BioAPI_HANDLE</code> 48
15.43	Type <code>BioAPI_IDENTIFY_POPULATION</code> 48
15.44	Type <code>BioAPI_IDENTIFY_POPULATION_TYPE</code> 49
15.45	Type <code>BioAPI_INDICATOR_STATUS</code> 49
15.46	Type <code>BioAPI_INPUT_BIR</code> 50
15.47	Type <code>BioAPI_INPUT_BIR_FORM</code> 50
15.48	Type <code>BioAPI_OPERATIONS_MASK</code> 51
15.49	Type <code>BioAPI_OPTIONS_MASK</code> 52
15.50	Type <code>BioAPI_POWER_MODE</code> 53
15.51	Type <code>BioAPI_QUALITY</code> 53
15.52	Type <code>BioAPI_RETURN</code> 53
15.53	Type <code>BioAPI_STRING</code> 53
15.54	Type <code>BioAPI_TIME</code> 54
15.55	Type <code>BioAPI_UNIT_ID</code> 54
15.56	Type <code>BioAPI_UNIT_LIST_ELEMENT</code> 55
15.57	Type <code>BioAPI_UNIT_SCHEMA</code> 55
15.58	Type <code>BioAPI_UUID</code> 56
15.59	Type <code>BioAPI_VERSION</code> 56
16	Functions defined in BioAPI and corresponding BIP messages..... 57
16.1	Function <code>BioAPI_Init</code> 57
16.2	Function <code>BioAPI_InitEndpoint</code> 58
16.3	Function <code>BioAPI_Terminate</code> 58
16.4	Function <code>BioAPI_LinkToEndpoint</code> 59
16.5	Function <code>BioAPI_UnlinkFromEndpoint</code> 62
16.6	Function <code>BioAPI_EnumFrameworks</code> 63
16.7	Function <code>BioAPI_EnumBSPs</code> 63
16.8	Function <code>BioAPI_EnumBFPs</code> 64
16.9	Function <code>BioAPI_BSPLoad</code> 65
16.10	Function <code>BioAPI_BSPUnload</code> 67
16.11	Function <code>BioAPI_QueryUnits</code> 69
16.12	Function <code>BioAPI_QueryBFPs</code> 70
16.13	Function <code>BioAPI_BSPAttach</code> 72
16.14	Function <code>BioAPI_BSPDetach</code> 75

	<i>Page</i>
16.15	Function <code>BioAPI_EnableEvents</code> 76
16.16	Function <code>BioAPI_EnableEventNotifications</code> 77
16.17	Function <code>BioAPI_ControlUnit</code> 79
16.18	Function <code>BioAPI_Control</code> 80
16.19	Function <code>BioAPI_FreeBIRHandle</code> 81
16.20	Function <code>BioAPI_GetBIRFromHandle</code> 82
16.21	Function <code>BioAPI_GetHeaderFromHandle</code> 83
16.22	Function <code>BioAPI_SubscribeToGUIEvents</code> 84
16.23	Function <code>BioAPI_UnsubscribeFromGUIEvents</code> 88
16.24	Function <code>BioAPI_QueryGUIEventSubscriptions</code> 92
16.25	Function <code>BioAPI_NotifyGUISelectEvent</code> 94
16.26	Function <code>BioAPI_NotifyGUIStateEvent</code> 96
16.27	Function <code>BioAPI_NotifyGUIProgressEvent</code> 99
16.28	Function <code>BioAPI_RedirectGUIEvents</code> 101
16.29	Function <code>BioAPI_UnredirectGUIEvents</code> 102
16.30	Function <code>BioAPI_Capture</code> 104
16.31	Function <code>BioAPI_CreateTemplate</code> 105
16.32	Function <code>BioAPI_Process</code> 106
16.33	Function <code>BioAPI_ProcessWithAuxBIR</code> 107
16.34	Function <code>BioAPI_VerifyMatch</code> 109
16.35	Function <code>BioAPI_IdentifyMatch</code> 110
16.36	Function <code>BioAPI_Enroll</code> 112
16.37	Function <code>BioAPI_Verify</code> 113
16.38	Function <code>BioAPI_Identify</code> 115
16.39	Function <code>BioAPI_Import</code> 116
16.40	Function <code>BioAPI_PresetIdentifyPopulation</code> 118
16.41	Function <code>BioAPI_Transform</code> 118
16.42	Function <code>BioAPI_DbOpen</code> 120
16.43	Function <code>BioAPI_DbClose</code> 121
16.44	Function <code>BioAPI_DbCreate</code> 122
16.45	Function <code>BioAPI_DbDelete</code> 123
16.46	Function <code>BioAPI_DbSetMarker</code> 124
16.47	Function <code>BioAPI_DbFreeMarker</code> 124
16.48	Function <code>BioAPI_DbStoreBIR</code> 125
16.49	Function <code>BioAPI_DbGetBIR</code> 126
16.50	Function <code>BioAPI_DbGetNextBIR</code> 127
16.51	Function <code>BioAPI_DbDeleteBIR</code> 128
16.52	Function <code>BioAPI_CalibrateSensor</code> 129
16.53	Function <code>BioAPI_SetPowerMode</code> 130
16.54	Function <code>BioAPI_SetIndicatorStatus</code> 131
16.55	Function <code>BioAPI_GetIndicatorStatus</code> 132
16.56	Function <code>BioAPI_GetLastErrorInfo</code> 133
16.57	Function <code>BioAPI_Cancel</code> 133
16.58	Function <code>BioAPI_Free</code> 134
16.59	Function <code>BioAPI_RegisterBSP</code> 134
16.60	Function <code>BioAPI_UnregisterBSP</code> 136
16.61	Function <code>BioAPI_RegisterBFP</code> 138
16.62	Function <code>BioAPI_UnregisterBFP</code> 140
17	Callback functions defined in BioAPI and corresponding BIP messages 142
17.1	Callback function <code>BioAPI_EVENT_HANDLER</code> 142
17.2	Callback function <code>BioAPI_GUI_SELECT_EVENT_HANDLER</code> 144
17.3	Callback function <code>BioAPI_GUI_STATE_EVENT_HANDLER</code> 148
17.4	Callback function <code>BioAPI_GUI_PROGRESS_EVENT_HANDLER</code> 152

	<i>Page</i>	
18	Conceptual tables	156
18.1	The MasterEndpoints conceptual table	156
18.2	The VisibleEndpoints conceptual table	158
18.3	The VisibleBSPRegistrations conceptual table	158
18.4	The VisibleBFPPRegistrations conceptual table	161
18.5	The RunningBSPLocalReferences conceptual table	163
18.6	The RunningBSPRemoteReferences conceptual table	164
18.7	The UnitEventNotificationDisablers conceptual table	165
18.8	The AttachSessionLocalReferences conceptual table	166
18.9	The AttachSessionRemoteReferences conceptual table	168
18.10	The GUIEventLocalSubscriptions conceptual table	169
18.11	The GUIEventRemoteSubscriptions conceptual table	171
18.12	The GUIEventRedirectors conceptual table	172
18.13	The ApplicationOwnedMemoryBlocks conceptual table	173
19	Converting between a C pointer variable and a corresponding ASN.1 component (1)	174
20	Converting between a C pointer variable and a corresponding ASN.1 component (2)	174
21	Converting between a C pointer variable and a corresponding ASN.1 component (3)	175
22	Initializing and checking a C pointer variable having no corresponding ASN.1 component	175
23	Determining a hosting endpoint and a BSP product UUID from a BSP UUID	175
24	Determining a hosting endpoint and an original BSP handle from a local BSP handle	176
25	Converting BSP UUIDs	176
26	Converting BSP handles	176
27	Processing an incoming function call by exchanging a request/response BIP message pair with a slave endpoint	176
28	Processing an incoming request BIP message via an internal BioAPI function call	177
29	Notifying a unit event to zero or more subscribers	177
30	Notifying a GUI select event to a subscriber	178
31	Notifying a GUI state event to a subscriber	180
32	Notifying a GUI progress event to a subscriber	181
33	Handling unconvertible C values	183
Annex A	– Specification of the TCP/IP binding	184
A.1	General	184
A.2	Transport-level message	184
A.3	TCP/IP connection between two BIP endpoints	185
A.4	Role of endpoint	185
A.5	Closing the connection on errors	186
A.6	Transport of BIP messages	186
A.7	Usage of IRIs	186
Annex B	– Specification of discovery and announcement in TCP/IP binding	187
B.1	General	187
B.2	The PnP mechanisms	187
B.3	Address and name setting in IPv4	187
B.4	The network configuration function in IPv4	188
B.5	Address and name setting in IPv6	189
B.6	The network configuration function in IPv6	189
B.7	Discovery and announcement	190
B.8	Service discovery	191
B.9	Service requests via broadcast (IPv4)	191
B.10	Service requests via multicast (IPv4 or IPv6)	191
B.11	Receiving service announcement packets	192

	<i>Page</i>
B.12	Format of discovery and announcement messages 193
B.13	Service announcement 194
B.14	Reset and restart 194
B.15	Timing of the exchange of messages over a link channel..... 194
B.16	Security of the exchange of messages over a link channel 194
Annex C	– Specification of the SOAP/HTTP binding..... 195
C.1	General provisions 195
C.2	Security considerations with SOAP/HTTP binding (tutorial) 195
C.3	Schema header 196
C.4	Global elements 196
C.5	Types..... 200
C.6	Parameters of request BIP messages 212
C.7	Parameters of response BIP messages 223
C.8	Parameters of notification BIP messages..... 231
C.9	Parameters of acknowledgement BIP messages..... 233
C.10	Closure of the schema 233
C.11	Example 233
Annex D	– Clarification of minimal requirements for simple systems..... 244
D.1	A simple system with a single fixed biometric device 244
D.2	A simple system with a single database of BIRs 244
Annex E	– Possible scenarios involving the use of the BioAPI interworking protocol..... 245
E.1	Access to a central national database for security and health administration 245
E.2	Registration of individuals at a point of entry, or a local registration centre..... 245
E.3	Theme-park access 245
Annex F	– Formal ASN.1 modules 246
Annex G	– Bibliography..... 270