

Glucometer APIs

Approved Version 1.0 – 24 Jul 2018

Open Mobile Alliance OMA-TS-Glucometer_APIs-V1_0-20180724-A

Use of this document is subject to all of the terms and conditions of the Use Agreement located at http://www.openmobilealliance.org/UseAgreement.html.

Unless this document is clearly designated as an approved specification, this document is a work in process, is not an approved Open Mobile AllianceTM specification, and is subject to revision or removal without notice.

You may use this document or any part of the document for internal or educational purposes only, provided you do not modify, edit or take out of context the information in this document in any manner. Information contained in this document may be used, at your sole risk, for any purposes. You may not use this document in any other manner without the prior written permission of the Open Mobile Alliance. The Open Mobile Alliance authorizes you to copy this document, provided that you retain all copyright and other proprietary notices contained in the original materials on any copies of the materials and that you comply strictly with these terms. This copyright permission does not constitute an endorsement of the products or services. The Open Mobile Alliance assumes no responsibility for errors or omissions in this document.

Each Open Mobile Alliance member has agreed to use reasonable endeavours to inform the Open Mobile Alliance in a timely manner of Essential IPR as it becomes aware that the Essential IPR is related to the prepared or published specification. However, the members do not have an obligation to conduct IPR searches. The declared Essential IPR is publicly available to members and non-members of the Open Mobile Alliance and may be found on the "OMA IPR Declarations" list at http://www.openmobilealliance.org/ipr.html. The Open Mobile Alliance has not conducted an independent IPR review of this document and the information contained herein, and makes no representations or warranties regarding third party IPR, including without limitation patents, copyrights or trade secret rights. This document may contain inventions for which you must obtain licenses from third parties before making, using or selling the inventions. Defined terms above are set forth in the schedule to the Open Mobile Alliance Application Form.

NO REPRESENTATIONS OR WARRANTIES (WHETHER EXPRESS OR IMPLIED) ARE MADE BY THE OPEN MOBILE ALLIANCE OR ANY OPEN MOBILE ALLIANCE MEMBER OR ITS AFFILIATES REGARDING ANY OF THE IPR'S REPRESENTED ON THE "OMA IPR DECLARATIONS" LIST, INCLUDING, BUT NOT LIMITED TO THE ACCURACY, COMPLETENESS, VALIDITY OR RELEVANCE OF THE INFORMATION OR WHETHER OR NOT SUCH RIGHTS ARE ESSENTIAL OR NON-ESSENTIAL.

THE OPEN MOBILE ALLIANCE IS NOT LIABLE FOR AND HEREBY DISCLAIMS ANY DIRECT, INDIRECT, PUNITIVE, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE USE OF DOCUMENTS AND THE INFORMATION CONTAINED IN THE DOCUMENTS.

© 2018 Open Mobile Alliance All Rights Reserved.

Used with the permission of the Open Mobile Alliance under the terms set forth above.

Contents

1. SCOPE	4
2. REFERENCES	
2.1 NORMATIVE REFERENCES	
2.2 INFORMATIVE REFERENCES	
3. TERMINOLOGY AND CONVENTIONS	
3.1 CONVENTIONS	
4. INTRODUCTION	
4.1 VERSION 1.0	
5. TECHNICAL SPECIFICATIONS	9
5.1 THE SERVICE DISCOVERY ON THE GOTAPI-4 INTERFACE	9
5.2 One-shot measuring API	
5.2.1 Request for one-shot measuring on the GotAPI-1 Interface	
5.2.2 Request for one-shot measuring on the GotAPI-4 Interface	12
5.2.3 Response for one-shot measuring on the GotAPI-4 Interface	
5.2.4 Response for one-shot measuring on the GotAPI-1 Interface	26
5.3 ASYNCHRONOUS MESSAGING API	
5.3.1 Request for asynchronous messaging on the GotAPI-1 Interface	
5.3.2 Request for asynchronous messaging on the GotAPI-4 Interface	
5.3.3 Response for asynchronous messaging on the GotAPI-4 Interface	
5.3.4 Response for asynchronous messaging on the GotAPI-1 Interface	
5.3.5 Asynchronous message from the Plug-In to the GotAPI Server on the GotAPI-4 Interafce	
5.3.6 Asynchronous message from the GotAPI Server to the application on the GotAPI-5 Inter	
5.3.7 Stop request from the application to the GotAPI Server on the GotAPI-1 Interface	
5.3.8 Stop request from the GotAPI Server to the Plug-In on the GotAPI-4 Interface	
5.3.9 Stop response from the Plug-In to the GotAPI Server on the GotAPI-4 Interface	
5.3.10 Stop response from the GotAPI Server to the application on the GotAPI-1 Interface	
APPENDIX A. CHANGE HISTORY (INFORMATIVE)	
A.1 APPROVED VERSION HISTORY	65
Figures	
Figure 1: Message flow of the Service Discovery	9
Figure 2: Message flow of the One-shot measuring API	11
Figure 3: Message Flow of the Asynchronous messaging API	35

Tables

No table of figures entries found.

1. Scope

Glucose concentration is one of the essential vital signs of health measurements. Glucose concentration measurements are critical for those patients dealing with diabetes or pre-diabetes.

The GotAPI provides a multi-purpose web-based framework to enable interwork of applications and external devices such as Glucometers (glucose meter). The GotAPI consists of the GotAPI Server and the Extension Plug-Ins. A smartphone application communicates with a specified Extension Plug-In through the GotAPI Server using Web technologies

In the GotAPI framework, Extension Plug-Ins interact with Glucometer, and expose interfaces to the GotAPI Server. Thanks to the Extension Plug-Ins, smartphone applications can interact with many kinds of Glucometers using the consistent APIs specified in this specification.

This is the technical specification part of the Glucometer Device WebAPIs whose requirements and architecture are defined in a separate document [DWAPI-PCH].

2. References

2.1 Normative References

[DWAPI-PCH] Device WebAPI-PCH

OMA-ER-Device_WebAPIs-V1_0-20160419-C <u>URL:http://www.openmobilealliance.org/</u>

[EventSource] "Server-Sent Events", Worldwide Web Consortium (W3C), <u>URL:http://dev.w3.org/html5/eventsource/</u>

(latest working draft)

[GotAPI 1.1] Generic Open Terminal API Framework (GotAPI), Candidate Version 1.1 – 15 Dec 2015

URL:http://www.openmobilealliance.org/

[HTTP/1.1] "Hypertext Transfer Protocol -- HTTP/1.1", Internet Engineering Task Force (IETF),

URL:http://tools.ietf.org/search/rfc2616

[HTTP/2.0] "Hypertext Transfer Protocol version 2.0", Internet Engineering Task Force (IETF),

URL:http://tools.ietf.org/search/draft-ietf-httpbis-http2-09 (latest working draft)

[JSON-RPC] "JSON-RPC 2.0 Specification", JSON-RPC Working Group, <u>URL:http://www.jsonrpc.org/specification</u>

[RFC2119] "Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997,

URL:http://www.ietf.org/rfc/rfc2119.txt

[SCRRULES] "SCR Rules and Procedures", Open Mobile Alliance™, OMA-ORG-SCR_Rules_and_Procedures,

URL:http://www.openmobilealliance.org/

[WebSocket] "The WebSocket API, Worldwide Web Consortium (W3C), <u>URL:http://dev.w3.org/html5/websockets/</u>

(latest working draft)

2.2 Informative References

[OMADICT] "Dictionary for OMA Specifications", Version 2.9, Open Mobile AllianceTM,

OMA-ORG-Dictionary-V2.9, <u>URL:http://www.openmobilealliance.org/</u>

[OMNA] "OMA Naming Authority". Open Mobile Alliance™.

URL:http://www.openmobilealliance.org/tech/omna.aspx

3. Terminology and Conventions

3.1 Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

All sections and appendixes, except "Scope" and "Introduction", are normative, unless they are explicitly indicated to be informative.

A node that collects and transmits personal health data to an associated manager. Agent

API Patterns Design guidelines and requirements for definition of APIs

Web applications executing under a Web browser as Web runtime environment. **Browser Context**

An API providing access to UDP protocol based networking. **Datagram**

Device A physical device implementing either an Agent or manager role.

ECMAScript Use definition from [OMADICT].

Glucometer A medical device for determining the approximate concentration of glucose in the blood

Hybrid Native/Web App An application designed to execute under the native OS / middleware environment of a device, and that

use native APIs for the execution of web content in addition to native code.

JavaScript Use definition from [OMADICT].

A node receiving data from one or more agent systems. Examples of managers include a cellular phone, Manager

health appliance, set top box, or computer system.

An application designed to execute under the native OS / middleware environment of a device. Native App

Personal Health Device A device used in personal health applications.

Socket An API providing access to TCP protocol based networking.

Uniform Resource

Identifier

Use definition from [OMADICT].

User Agent Use definition from [OMADICT].

Web The World Wide Web, a content and application framework based upon hypertext and related

technologies, e.g. XML, JavaScript/ECMAScript, CSS, etc.

Web Application An application designed using Web technologies (e.g. HTML, CSS, and Javascript).

Web IDL An IDL language for Web application APIs

Web Runtime Application

A client-side Web application that is executed in Web runtime environments.

Web Runtime

Client software that supports the execution of Web applications (e.g. browsers or widget engines). **Environment**

WebSocket An API providing networking services per the WebSocket standard [WebSocket].

Widget Context Web applications installed and executing under a W3C Widget [W3C-Widgets] engine as Web runtime

environment.

Widget Engine Software which supports the execution of Web applications running outside a browser context, e.g. with

the same functional capabilities as browsers but without the user interface functions provided by a

browser, including window frames, menus, toolbars and scroll bars.

3.2 Abbreviations

API Application Programming Interface

EventSource The EventSource API (Server-Sent Events)

HTTP HyperText Transfer Protocol

IDL Interface Definition Language

JSON JavaScript Object Notation

MIME Multipurpose Internet Mail Extensions

OMA Open Mobile Alliance

REST REpresentational State Transfer

RPC Remote Procedure Call

SCR Static Conformance Requirements

TS Technical Specification

UA User Agent
UE User Equipment

URI Uniform Resource Identifier
URL Uniform Resource Locator
W3C World Wide Web Consortium

WRAPI The OMA Web Runtime API enabler

XML eXtensible Markup Language
XSD XML Schema Definition

4. Introduction

This is the technical specification part of the Glucometer Device WebAPIs whose requirements and architecture are defined in a separate document [DWAPI-PCH]. The architectural aspects of these APIs are defined in the AD section of [DWAPI-PCH]. This specification must adhere to the GotAPI 1.1 specification. APIs for Glucometer Plug-Ins are specified together in this specification.

Glucometers supported by this plug in specification are expected to be able to report the concentration of glucose in the blood. Glucose, or the concentration of blood sugar in the blood, is the primary source of energy for the body's cells. The descriptions of the measurements reported by the Glucometer Plug-Ins follow the IEEE 11073-10417 Device Specialization – Glucose Meter specification.

Glucometers are typically accessed by one-shot messages, where measurement data is transferred from a Glucometer to an application in one transaction. Glucometers are most frequently used off line. The device typically would be what one calls a storage device; thus the number of measurements could be very large and they may transfer multiple data in a 1-shot message. The number of data stored in Glucometers is typically less than 25. However, some Glucometers may be able to persistently store data and may transfer a larger number of data than 25.

The descriptions of the measurement of Glucometers reported by the Glucometer Plug-Ins follow the IEEE 11073-10417 specialization specification. Nonetheless, this does not mean that Glucometers that want to use the APIs must follow IEEE 11073-10417. The Glucometer WebAPIs specified in this document can be used for Glucometers that support IEEE 11073-10417 as well as those that do not support IEEE 11073-10417. In the latter case, however, the Glucometers must provide the Plug-Ins with the necessary information such that the Plug-Ins can fulfil their reporting requirements as specified in this document.

Glucometers need to be carried around with the individuals essentially all the time. Thus, most Glucometers store measurement data in non-volatile persistent storages. The data is uploaded as needed and an extra action is required to delete the data (temporarily stored data is auto deleted upon upload by spec). Consequently, at uploading, the number of measurements could be quite large. Uploading data from persistent storages typically requires initiation by the collector of the data and is not done by the device. 'Live' and temporarily stored data is typically uploaded unsolicited by the device as soon as a connection is established.

In addition to the glucose concentration, Glucometers may also report what is known as context measurements. For example, when the measurement was taken relative to eating; what state of health one was in; the intensity of exercise activity; the medication one is on (relative to glucose control), etc. Glucometers may also measure Hb1Ac (glycated hemoglobin) which measures the average levels of blood sugar levels over the last three or so months. Glucometers supported by this Plug-In specification are expected to be able to report the Glucose concentration in any of several possible blood samples (plasma, whole blood, arterial, capillary, etc.) and or a control solution. The Plug-Ins are also expected to report Hb1Ac measurements and certain context measurements if the device that is connected to the Plug-In supports them. The description of the measurements reported by the Plug-In follows the IEEE 11073-10417 Glucose specialization specification.

This document defines Glucometer API specifications for

- Service Discovery
- One-short measuring API
- Asynchronous measuring API

The architectural aspects of these APIs are defined in the AD section of [DWAPI-PCH]. This specification must adhere to the GotAPI 1.1 specification.

4.1 **Version 1.0**

Glucometer Device WebAPIs version 1.0 includes the functionality:

- Device Web API specifications for DWAPI-PCH, with device classes from the IEEE 11073-10417 Glucometer specialization based on the GotAPI 1.1 framework
- Device Web APIs for Service Discovery, One-shot measuring and asynchronous measuring
- Requirements and architecture documents [DWAPI-PCH]

5. Technical Specifications

This specification must adhere to the GotAPI 1.1 specification. This document specifies certain aspect of GotAPI 1.1 as the basis and introduces new elements that are necessary for Glucometer Devices supporting the IEEE 11073-10417 Glucometer specializations.

In order to increase readability, the specification described below uses the same tables as defined in GotAPI 1.1, describing the necessary features including those of the general procedures of any GotAPI 1.1 uses as well as those specific to the Glucometer APIs. Those specifications that are specific to the Glucometer APIs are colored in green in the following specifications in the following tables, in order to increase readability, to make identify distinction easily. Those rows that are not colored in green are merely copies from GotAPI 1.1 specification [GotAPI 1.1]

5.1 The Service Discovery on the GotAPI-4 Interface

Service Discovery API enables applications to discover available services as define in the Section 7.2.1[DWAPI-PCH]. Service Discovery API specification adheres to that of GotAPI 1.1.

Here is the Service Discovery based on what is defined in GotAPI 1.1. After the application obtains authorization for access to GotAPI-based APIs using the GotAPI-2 Interface, the application sends the Service Discovery request to the GotAPI Server. Then the GotAPI Server sends the Service Discovery request to all of the installed Extension Plug-Ins. The message flow of the Service Discovery is shown in Fig. 1.

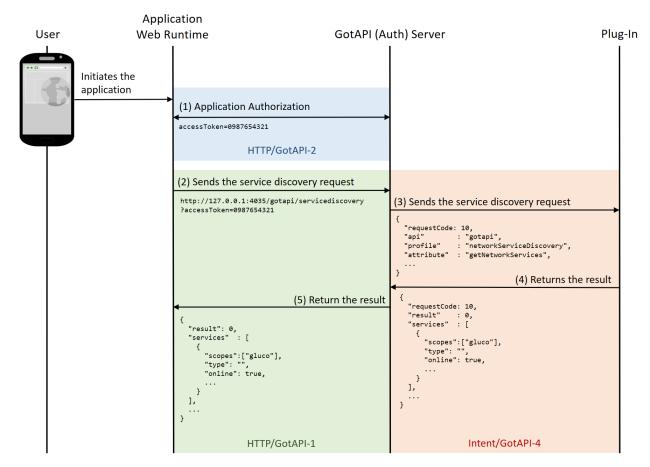


Figure 1: Message flow of the Service Discovery

The specific data in the message flows labelled (4) in the figure above are defined as follows. The other message flows SHALL be consistent to what are defined in the GotAPI 1.1 specification:

When the GotAPI Server receives the request of the Service Discovery API from an application, the GotAPI Server sends the Plug-In discovery request to the installed Plug-Ins as defined in the GotAPI specification. When the Plug-In receives the Plug-In discovery request from the GotAPI Server, the Plug-In SHALL return the message as follows:

Definition of the data object for the Plug-In discovery response

Name	Sub name	Туре	Definition of value	Mandatory/Optional
requestCode		int	The request code coming from the GotAPI Server.	Mandatory
result		int	If success, the value is 0, otherwise an integer other than 0, which indicates an error code. This specification doesn't define error codes.	Mandatory
services		Annav	This specification doesn't define error codes.	Mandatory
services		Array		Manuacory
	serviceId	String	The service identifier. The id could be "com.example.plugin".	Mandatory
	name	String	The name of the targeted device.	Mandatory
	manufacturer	String	The manufacturer of the targeted device.	Optional
	version	String	The version of the targeted device.	Optional
	type	String	This value represents the type of the network used to connect to the device. The value must be any one of "WiFi", "BLE", "NFC", "Bluetooth" or "USB".	Optional
	online	Boolean	If the service is available, this value SHALL be true. Otherwise (e.g. the Plug-In has not yet detected any devices or the Plug-In is not allowed to access to any devices), this value SHALL be false.	Mandatory
	scopes	Array	This value SHALL be an array including a string "bca" as an array element (["gluco",]).	Mandatory

The Plug-In MAY append additional data in the data object as needed.

This data object is sent to the Plug-Ins in an OS specific mechanism, e.g., Intents for Android.

Requirements for OS-specific response channel and data container

os	Description
Android	The GotAPI Server must use Explicit Intents for the response.
	The data object must be mapped to the Extra directly.

Example of the data object of the Android Explicit Intents

Name		Example of value	Note
Action		"org.deviceconnect.action.RESPONSE"	This value is defined by the GotAPI Server application.
Component		"org.deviceconnect"	This value is the package name of the GotAPI Server application.
Extra			
	requestCode	1	
	result	0	

```
services
              [Array Object]
                                                        This value is an example. Note that this is
                                                        "not" a JSON string. This value must be an
                                                        Array object whose content is the same as the
                                                        following JSON example:
                                                        {
                                                            "id": "org.example.plugin.12345",
                                                            "name": "Coolest Glucometer",
                                                            "manufacturer": "ABC Health Care Inc.",
                                                            "version": "3.0",
                                                            "type": "Bluetooth",
                                                            "online": true,
                                                            "scopes": ["gluco"]
                                                          },
                                                        ]
config
               "additional parameters"
                                                        This name-value pair is an additional data
                                                        which is not defined by this specification.
```

5.2 One-shot measuring API

One-shot API enables applications to receive measured data from targeted devices by one HTTP request/response transaction as define in the Section 7.2.2 [DWAPI-PCH]. One-shot measuring API specification adheres to that of GotAPI 1.1.

As defined by GotAPI 1.1, after the application obtains authorization to access GotAPI-based APIs using the GotAPI-2 Interface and completes the Service Discovery, the application can use the service (so called "One-shot measuring API") provided by the Plug-In through the GotAPI Server.

The One-shot measuring API offers a measurement result reported by the targeted device in response to a request. The message flow of this API is as shown blow.

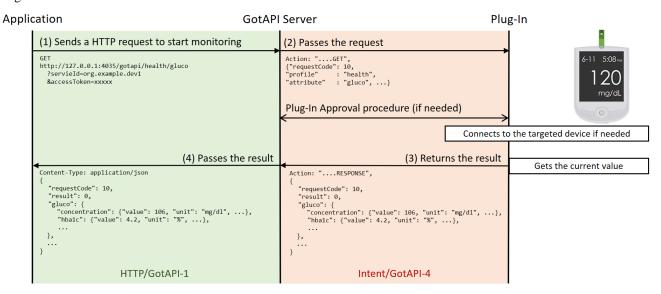


Figure 2: Message flow of the One-shot measuring API

This section defines the data object for all the message flows described in the figure above.

5.2.1 Request for one-shot measuring on the GotAPI-1 Interface

When the application uses the one-shot measuring it sends a request to the GotAPI Server on the GotAPI-1 Interface as follows:

Definition of the HTTP request

	Definitions
Method	HTTP PUT
Request URL	http://127.0.0.1:4035/gotapi/health/gluco
	https://127.0.0.1:4036/gotapi/health/gluco

Definition of the request parameters

Parameter name	Definition of value	Mandatory/Optional
serviceId	The identifier of the targeted service. This value is available from the Service Discovery API on the GotAPI-1 Interface.	Mandatory
accessToken	The access token obtained from the GotAPI Auth Server through the GotAPI-2 Interface.	Mandatory
nonce	A nonce generated by the application, which is described in the section "7.3.3.3 HMAC server authentication using trusted Application ID for the Server spoofing attack" in the GotAPI specification.	Optional

Example of the request URL

http://127.0.0.1:4035/gotapi/health/gluco?serviceId=abcdefg123&accessToken=0987654321&nonce=93b3a219347

5.2.2 Request for one-shot measuring on the GotAPI-4 Interface

When an application sends a request to the GotAPI Server on the GotAPI-1 Interface, the GotAPI Server passes the request to the Plug-In on the GotAPI-4 Interface. The request includes the data object as follows:

Definition of the data object for request

Name	Туре	Definition of value	Mandatory/Optional
method	String	This value SHALL be "GET".	Mandatory if the OS is not Android. Otherwise, optional.
			If the OS is Android, the "Action" value SHALL include this information as described below.
receiver	String	The address of the GotAPI Server application used by Plug-Ins. Generally, it is the application ID recognized by the OS, such as a package name.	Mandatory
requestCode	int	A request code identifying the request. This value could be any number but must MUST be an integer greater than 0, and unique for each open request, to ensure responses can be correlated.	Mandatory
serviceId	String	The identifier of the targeted Service. This value is provided by the application over the GotAPI-1 Interface.	Mandatory
api	String	The value must be "gotapi".	Mandatory
profile	String	The value must be "health".	Mandatory

attribute	String	The value must be "gluco"	Mandatory
clientId	String	The identifier of the application, which is generated by the Plug-In when the Plug-In Approval procedure defined in the GotAPI specification.	Mandatory
accessToken	String	The access token for the application, which is generated by the Plug-In when the Plug-In Approval procedure defined in the GotAPI specification.	Mandatory

This data object is sent to the Plug-Ins in an OS specific mechanism, e.g., Intents for Android.

Requirements for OS-specific request channel and data container

os	Description
Android	The GotAPI Server must use Explicit Intents for the request.
	The data object must be mapped to the Extra directly.

Example of the data object of the Android Explicit Intents

Name		Example of value	Note
Action		org.deviceconnect.action. GET	This value is defined by the GotAPI Server application. But the last part SHALL be "GET".
Component		org.example.plugin	This value is the package name of the Plug-In application.
Extra			
	receiver	org.deviceconnect	
	requestCode	10	
	servcieId	dev1.example.org	
	api	gotapi	
	profile	health	
	attribute	gluco	
	clientId	1234567890	
	accessToken	0987654321	

5.2.3 Response for one-shot measuring on the GotAPI-4 Interface

When the Plug-In receives the request, it SHALL respond to the GotAPI Server as follows:

Definition of the data object for the response

	the data object for	the response			
Name			Туре	Definition of value	Mandatory/Opt ional
method			String	This value SHALL be "RESPONSE".	Mandatory if the OS is not Android. Otherwise, optional. If the OS is
					Android, the "Action" value SHALL include this information as described below.
requestCode			int	The request code coming from the GotAPI Server.	Mandatory
result			int	If success, the value is 0, otherwise an integer greater than 0, which indicates an error code.	Mandatory
				This specification doesn't define error codes.	
gluco					Mandatory
	device		Object		Mandatory
		productName	String	The product name of the targeted device.	Mandatory
				If the Plug-In cannot obtain this information from the targeted device, it SHALL create a name for the device using an arbitrary algorithm. The algorithm is up to the Plug-In implementation, and this specification does not define any algorithms.	
		manufacturerName	String	The manufacturer name of the targeted device.	Mandatory
				If the Plug-In cannot obtain this information from the targeted device, this value SHALL be an empty string.	
		modelNumber	String	The model number of the targeted device.	Mandatory
				If the Plug-In cannot obtain this information from the targeted device, this value SHALL be an empty string.	
		firmwareRevision	String	The firmware revision of the targeted device.	Mandatory
				If the Plug-In cannot obtain this information from the targeted device, this value SHALL be an empty string.	

	serialNumber	String	The serial number of the targeted device.	Mandatory
			If the Plug-In cannot obtain this information from the targeted device, this value SHALL be an empty string.	
	softwareRevision	String	The software revision of the targeted device.	Mandatory
			If the Plug-In cannot obtain this information from the targeted device, this value SHALL be an empty string.	
	hardwareRevision	String	The hardware revision of the targeted device.	Mandatory
			If the Plug-In cannot obtain this information from the targeted device, this value SHALL be an empty string.	
	partNumber	String	The part number of the targeted device.	Mandatory
			If the Plug-In cannot obtain this information from the targeted device, this value SHALL be an empty string.	
	protocolRevision	String	The protocol revision of the targeted device.	Mandatory
			If the Plug-In cannot obtain this information from the targeted device, this value SHALL be an empty string.	
	systemId	String	The system id of the targeted device.	Mandatory
			This value SHALL be a 16-character HEX string without a '0x' prefix (e.g. "ABCDEF0123456789").	
			If the Plug-In cannot obtain this information from the targeted device, this value SHALL be "0000000000000000" (a string of 16 '0' characters).	
	batteryLevel	Float	The battery level of the targeted device. This value must be a float number in a range from 0.0 to 1.0.	Mandatory
			The value 0.0 represents that the targeted device is completely out of charge. The value 1.0 represents that the targeted device is fully charged.	
			Even if the targeted device reports this value in percent in a range from 1 to 100, the Plug-In SHALL convert it to a float number in a range from 0.0 to 1.0.	
			If the Plug-In can't obtain battery level from the targeted device, this value SHALL be -1.0.	
conce	entration			Mandatory
	value	Float	This value represents the concentration measured by the targeted device.	Mandatory

	mderFloat	String	This value represents the concentration measured by the targetd device, which is a hexadecimal string of an MDER FLOAT, such as "0000006A", which means 106 mg/dl if the value of "unit" is " mg/dl".	Mandatory
	type	String	This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "Glucose concentration". If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	typeCode	String	This value represents the TYPE attribute, which is expressed by a code such as "160368" (This code means "Glucose concentration"). If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	unit	String	This value represents the unit of the reported concentration, which is expressed by a human readable string such as "mg/dl".	Mandatory
	unitCode	String	This value represents the unit of the reported concentration, which is expressed by a code such as "264274" (This code means "mg/dl").	Mandatory
	timeStamp	int	This value represents the measurement time when the mesurement was done. If the measurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying operating system.	Mandatory
	timeStampString	String	This value represents the same time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400"	Mandatory
hba1c				Mandatory if the device reports HbA1c. Otherwise, this SHALL NOT exist.
	value	Float	This value represents the HbA1c measured by the targeted device.	Mandatory
	mderFloat	String	This value represents the HbA1c measured by the targetd device, which is a hexadecimal string of an MDER FLOAT, such as "FF00002A", which means 4.2 % if the value of "unit" is "%".	Mandatory

	type		String	This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "HbA1c level".	Mandatory
				If the Plug-In can't obtain the type, this value SHALL be an empty string.	
	typeCo	ode	String	This value represents the TYPE attribute, which is expressed by a code such as "160220" (This code means "HbA1c level"). If the Plug-In can't obtain the type,	Mandatory
				this value SHALL be an empty string.	
	unit		String	This value represents the unit of the reported HbAlc, which is expressed by a human readable string such as "%".	Mandatory
	unitCo	ode	String	This value represents the unit of the reported HbA1c, which is expressed by a code such as "262688" (This code means "%").	Mandatory
	timeS	tamp	int	This value represents the measurement time when the mesurement was done. If the measurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying operating system.	Mandatory
	timeS	tampString	String	This value represents the same time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400"	Mandatory
cont	extExercise				Mandatory if the device reports context exercise. Otherwise, this SHALL NOT exist.
	value		Float	This value represents the context exercise measured by the targeted device.	Mandatory
	mderF.	loat	String	This value represents the context exercise measured by the targetd device, which is a hexadecimal string of an MDER FLOAT, such as "FF00002A", which means 50 % if the value of "unit" is "%".	Mandatory
	type		String	This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "context exercise".	Mandatory
				If the Plug-In can't obtain the type, this value SHALL be an empty string.	

	typeCode	String	This value represents the TYPE attribute, which is expressed by a code such as "160220" (This code means "context exercise"). If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	unit	String	This value represents the unit of the reported context exercise, which is expressed by a human readable string such as "%".	Mandatory
	unitCode	String	This value represents the unit of the reported context exercise, which is expressed by a code such as "262688" (This code means "%").	Mandatory
	timeStamp	int	This value represents the measurement time when the mesurement was done. If the measurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying operating system.	Mandatory
	timeStampString	String	This value represents the same time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400"	Mandatory
contextMedicati on		Object		Mandatory if the device reports context medication. Otherwise, this SHALL NOT exist.
	value	Float	This value represents the context medication measured by the targeted device.	Mandatory
	mderFloat	String	This value represents the context medication measured by the targetd device, which is a hexadecimal string of an MDER FLOAT, such as "FF00002A", which means 10 % if the value of "unit" is "mg/dL".	Mandatory
	type	String	This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "context medication". If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	typeCode	String	This value represents the TYPE attribute, which is expressed by a code such as "160220" (This code means "context medication"). If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory

	unit	String	This value represents the unit of the reported context medication, which is expressed by a human readable string such as "mg/dL".	Mandatory
	unitCode	String	This value represents the unit of the reported context medication, which is expressed by a code such as "160220" (This code means "mg/dL").	Mandatory
	timeStamp	int	This value represents the measurement time when the mesurement was done. If the measurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying operating system.	Mandatory
	timeStampString	String	This value represents the same time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400"	Mandatory
contextCarbohyd rates		Object		Mandatory if the device reports context carbohydrates . Otherwise, this SHALL NOT exist.
	value	Float	This value represents the context carbohydrates measured by the targeted device.	Mandatory
	mderFloat	String	This value represents the context carbohydrates measured by the targetd device, which is a hexadecimal string of an MDER FLOAT, such as "00000020", which means 32 g if the value of "unit" is "g".	Mandatory
	type	String	This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "Breakfast Carbohydrates". If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	typeCode	String	This value represents the TYPE attribute, which is expressed by a code such as "8417768" (This code means "Breakfast Carbohydrates"). If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	unit	String	This value represents the unit of the reported context carbohydrates, which is expressed by a human readable string such as "g".	Mandatory

	unitCode	String	This value represents the unit of the reported context carbohydrates, which is expressed by a code such as "263908" (This code means "g").	Mandatory
	timeStamp	int	This value represents the measurement time when the mesurement was done. If the measurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying operating system.	Mandatory
	timeStampString	String	This value represents the same time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400"	Mandatory
contextMeal		Object		Mandatory if the device reports context meal. Otherwise, this SHALL NOT exist.
	value	String	This value represents the context meal measured by the targeted device, such as "Casual".	Mandatory
	code	String	This value represents the Enum- Observed-Value-Simple-OID, which is expressed by a code such as "8417880" (This code means "Casual").	Mandatory
	type	String	This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "Context Meal". If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	typeCode	String	This value represents the TYPE attribute, which is expressed by a code such as "8417864" (This code means "Context Meal"). If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	timeStamp	int	This value represents the measurement time when the mesurement was done. If the measurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying operating system.	Mandatory

	timeStampString	String	This value represents the same time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400"	Mandatory
contextLocation		Object		Mandatory if the device reports context sample location. Otherwise, this SHALL NOT exist.
	value	String	This value represents the context sample location measured by the targeted device, such as "Finger".	Mandatory
	code	String	This value represents the Enum- Observed-Value-Simple-OID, which is expressed by a code such as "8417880" (This code means "Finger").	Mandatory
	type	String	This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "Context Sample Location". If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	typeCode	String	This value represents the TYPE attribute, which is expressed by a code such as "8417768" (This code means "Context Sample Location"). If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	timeStamp	int	This value represents the measurement time when the mesurement was done. If the measurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying operating system.	Mandatory
	timeStampString	String	This value represents the same time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400"	Mandatory
contextTester		Object		Mandatory if the device reports context tester. Otherwise, this SHALL NOT exist.
	value	String	This value represents the context tester measured by the targeted device, such as "Self".	Mandatory

	code	String	This value represents the Enum- Observed-Value-Simple-OID, which is expressed by a code such as "8417880" (This code means "Self").	Mandatory
	type	String	This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "Context Tester". If the Plug-In can't obtain the type,	Mandatory
			this value SHALL be an empty string.	
	typeCode	String	This value represents the TYPE attribute, which is expressed by a code such as "8417768" (This code means "Context Tester").	Mandatory
			If the Plug-In can't obtain the type, this value SHALL be an empty string.	
	timeStamp	int	This value represents the measurement time when the mesurement was done. If the measurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying operating system.	Mandatory
	timeStampString	String	This value represents the same time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400"	Mandatory
contextHealth		Object		Mandatory if the device reports context health. Otherwise, this SHALL NOT exist.
	value	String	This value represents the context health measured by the targeted device, such as "Minor".	Mandatory
	code	String	This value represents the Enum- Observed-Value-Simple-OID, which is expressed by a code such as "8417880" (This code means "Minor").	Mandatory
	type	String	This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "Context Health".	Mandatory
			If the Plug-In can't obtain the type, this value SHALL be an empty string.	

typeCode	String	This value represents the TYPE attribute, which is expressed by a code such as " 8417880" (This code means "Context Health"). If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
timeStamp	int	This value represents the measurement time when the mesurement was done. If the measurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying operating system.	Mandatory
timeStampString	String	This value represents the same time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400"	Mandatory

The Plug-In MAY append additional data in the data object as needed.

This data object is sent to the GotAPI Server in an OS specific mechanism, e.g., Intents for Android.

Requirements for OS-specific response channel and data container

os	Description
Android	The GotAPI Server must use Explicit Intents for the request.
	The data object must be mapped to the Extra directly.

Example of the data object of the Android Intents

Name				Example of value	Note
Action				org.deviceconnect.action.RESPONS E	This value is defined by the GotAPI Server application. But the last part SHALL be "RESPONSE".
Componen t				org.deviceconnect	This value is the package name of the GotAPI Server application.
Extra					
	requestCod e			10	
	result			0	
	gluco				
		device			
			productName	ABC Glucometer Pro	

manufacturerNam ABC Inc. modelNumber TP-001		I	
			ABC Inc.
		modelNumber	TP-001
SoftwareRevisio rev.1.0 rev.1.0 rev.1.0 rev.1.0 rev.1.0 rev.1.0 rev.1.0 rev.1.0 rev.3.1 rev.3.			rev.1.001.003
n		serialNumber	01234-5678-9ABCD-EF01
			rev.2.000.000
protocolRevisio rev.3.1			rev.1.0
n systemId ABCDEF0123456789 batteryLevel 0.5		partNumber	002
batteryLevel 0.5		1 -	rev.3.1
concentration value 106		systemId	ABCDEFØ123456789
value		batteryLevel	0.5
mderFloat	concentration		
type Glucose concentration typeCode 160368 unit mg/dl unitCode 264274 timeStamp 1431856940275 timeStampString 20150517100220.000-0000 hbalc value 4.2 mderFloat FF00002A type HbAlc level typeCode 160220 unit % unitCode 262688 timeStamp 1431856940275 timeStamp 1431856940275 timeStamp 20150517100220.000-0000 contextExercise value 50 mderFloat FF00002A		value	106
typeCode 160368 unit mg/dl unitCode 264274 timeStamp 1431856940275 timeStampString 20150517100220.000-0000 hbalc value 4.2 mderFloat FF00002A type HbAlc level typeCode 160220 unit % unitCode 262688 timeStamp 1431856940275 timeStamp 1431856940275 timeStamp 20150517100220.000-0000 contextExercise value 50 mderFloat FF00002A		mderFloat	0000006A
unit mg/dl		type	Glucose concentration
unitCode 264274		typeCode	160368
timeStamp 1431856940275 timeStampString 20150517100220.000-0000 hba1c value 4.2 mderFloat FF00002A type HbA1c level typeCode 160220 unit % unitCode 262688 timeStamp 1431856940275 timeStamp 20150517100220.000-0000 contextExercise value 50 mderFloat FF00002A		unit	mg/dl
timeStampString 20150517100220.000-0000 hba1c value		unitCode	264274
hbalc value 4.2		timeStamp	1431856940275
value 4.2 mderFloat FF00002A type HbA1c level typeCode 160220 unit % unitCode 262688 timeStamp 1431856940275 timeStampString 20150517100220.000-0000 contextExercise value mderFloat FF00002A		timeStampString	20150517100220.000-0000
mderFloat FF00002A type HbA1c level typeCode 160220 unit % unitCode 262688 timeStamp 1431856940275 timeStampString 20150517100220.000-0000 contextExercise value mderFloat FF00002A	hba1c		
type HbA1c level typeCode 160220 unit % unitCode 262688 timeStamp 1431856940275 timeStampString 20150517100220.000-0000 contextExercise value 50 mderFloat FF00002A		value	4.2
typeCode 160220 unit		mderFloat	FF00002A
unit % unitCode 262688 timeStamp 1431856940275 timeStampString 20150517100220.000-0000 contextExercise value wderFloat FF00002A		type	HbA1c level
unitCode 262688 timeStamp 1431856940275 timeStampString 20150517100220.000-0000 contextExercise value mderFloat FF00002A		typeCode	160220
timeStamp 1431856940275 timeStampString 20150517100220.000-0000 contextExercise value 50 mderFloat FF00002A		unit	%
timeStampString 20150517100220.000-0000 contextExercise		unitCode	262688
contextExercise value 50 mderFloat FF00002A		timeStamp	1431856940275
value 50 mderFloat FF00002A		timeStampString	20150517100220.000-0000
mderFloat FF00002A	contextExercise		
		value	50
type context exercise		mderFloat	FF00002A
		type	context exercise

		I	
		typeCode	160220
		unit	%
		unitCode	262688
		timeStamp	1431856940275
		timeStampString	20150517100220.000-0000
	contextMedication		
		value	10
		mderFloat	FF00002A
		type	context medication
		typeCode	160220
		unit	mg/dL
		unitCode	160220
		timeStamp	1431856940275
		timeStampString	20150517100220.000-0000
	contextCarbohydrate s		
		value	32
		mderFloat	0000020
		type	Breakfast Carbohydrates
		typeCode	8417768
		unit	g
		unitCode	263908
		timeStamp	1431856940275
		timeStampString	20150517100220.000-0000
	contextMeal		
		value	Casual
		code	8417880
		type	Context Meal
		typeCode	8417864
		timeStamp	1431856940275
		timeStampString	20150517100220.000-0000
	contextLocation		
		value	Finger
		code	8417880
		type	Context Sample Location
			· · · · · · · · · · · · · · · · · · ·

		typeCode	8417768
		timeStamp	1431856940275
		timeStampString	20150517100220.000-0000
	contextTester		
		value	Self
		code	8417880
		type	Context Tester
		typeCode	8417768
		timeStamp	1431856940275
		timeStampString	20150517100220.000-0000
	contextHealth		
		value	Minor
		code	8417880
		type	Context Health
		typeCode	8417880
		timeStamp	1431856940275
		timeStampString	20150517100220.000-0000

Editor's note:

The extra data of Android is just a key-value structure. How should such structured data above be expressed? JSON string? intent.putExtra("gluco", "{\"deviceProductName\":\"ABC Glucometer Pro\", ...}");

5.2.4 Response for one-shot measuring on the GotAPI-1 Interface

When GotAPI Server receives the response from the Plug-In, the GotAPI Server passes it to the application as follows:

Definition of the HTTP response

	Definitions
MIME-Type	application/json
HTTP status	200 OK

Definition of the data object for the response

Name	Туре	Defi	inition of value	Mandatory/Optional
product	Stri		name of the GotAPI Server (e.g. Connect")	Mandatory
version	Stri		version of the GotAPI Server g. "1.0").	Mandatory

result			Number	If success, the value is 0, otherwise an integer greater than 0, which indicates an error code. This specification doesn't define error codes.	Mandatory
gluco					Mandatory
	device		Object		Mandatory
		productName	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		manufacturerName	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		modelNumber	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		firmwareRevision	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		serialNumber	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		softwareRevision	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		hardwareRevision	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		partNumber	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		protocolRevision	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		systemId	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		batteryLevel	Number	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	concentration				Mandatory
		value	Float	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		mderFloat	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		type	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory

	T.			
	typeCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	unit	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	unitCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStamp	int	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStampString	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
hba1c				Mandatory if the device reports HbA1c. Otherwise, this SHALL NOT exist.
	value	Float	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	mderFloat	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	type	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	typeCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	unit	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	unitCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStamp	int	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStampString	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
contextExercise		Object		Mandatory if the device reports context exercise. Otherwise, this SHALL NOT exist.
	value	Float	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory

	mderFloat	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	type	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	typeCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	unit	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	unitCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStamp	int	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStampString	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
contextMedication		Object		Mandatory if the device reports context medication. Otherwise, this SHALL NOT exist.
	value	Float	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	mderFloat	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	type	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	typeCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	unit	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	unitCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStamp	int	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStampString	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory

contextCarbohydrates		Object		Mandatory if the device reports context carbohydrates. Otherwise, this SHALL NOT exist.
	value	Float	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	mderFloat	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	type	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	typeCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	unit	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	unitCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStamp	int	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStampString	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
contextMeal		0bject		Mandatory if the device reports context meal. Otherwise, this SHALL NOT exist.
	value	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	code	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	type	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	typeCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStamp	int	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStampString	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory

contextLocation		Object		Mandatory if the device reports context sample location. Otherwise, this SHALL NOT exist.
	value	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	code	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	type	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	typeCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStamp	int	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStampString	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
contextTester		0bject		Mandatory if the device reports context tester. Otherwise, this SHALL NOT exist.
	value	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	code	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	type	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	typeCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStamp	int	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStampString	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
contextHealth		Object		Mandatory if the device reports context health. Otherwise, this SHALL NOT exist.

	value	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	code	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	type	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	typeCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStamp	int	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStampString	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
hmac		String	An HMAC generated for the counter measure against the GotAPI Server spoofing attack. If the application includes a key for HMAC calculation in the API request, the GotAPI Server adds this value in the API response. Evaluating whether the HMAC is identical to the result of calculation of HMAC from the key, the application can ensure that the response is genuine.	Mandatory if the application provide a key to the GotAPI Server

The GotAPI Server SHALL serialize the data structure above as a JSON formatted stream (i.e. JSON string).

Example of the response

```
{
 "product"
                      : "ABCConnect",
 "version"
                      : "1.0",
 "requestCode"
                      : 10,
 "result"
                      : 0,
  "gluco"
                      : {
    "device": {
     "productName" : "ABC Glucometer Pro",
     "manufacturerName" : "ABC Inc.",
     "modelNumber" : "TP-001",
     "firmwareRevision" : "rev.1.001.003",
     "serialNumber"
                      : "01234-5678-9ABCD-EF01",
     "softwareRevision" : "rev.2.000.000",
     "hardwareRevision" : "rev.1.0",
     "partNumber" : "002",
     "protocolRevision" : "rev.3.1",
     "systemId"
                   : "ABCDEF0123456789",
     "batteryLevel"
                       : 0.5
   },
    "concentration": {
     "value"
                       : 106,
```

```
"mderFloat"
                : "0000006A",
  "type"
                  : "Glucose concentration",
  "typeCode"
                 : "160368",
  "unit"
                  : "mg/dl",
  "unitCode"
                 : "264274",
 "timeStamp" : 1431856940275,
  "timeStampString" : "20150517100220.000-0000
},
"hba1c": {
  "value"
                   : 4.2,
  "mderFloat"
                 : "FF00002A",
                  : "HbA1c level",
  "type"
  "typeCode"
                  : "160220",
                  : "%",
  "unit"
  "unitCode"
                 : "262688",
  "timeStamp"
                  : 1431856940275,
  "timeStampString" : "20150517100220.000-0000"
},
"contextExercise": {
  "value"
              : 50,
  "mderFloat"
                 : "FF00002A",
  "type"
                 : "context exercise",
                 : "160220",
  "typeCode"
  "unit"
                  : "%",
  "unitCode"
                 : "262688",
 "timeStamp" : 1431856940275,
  "timeStampString" : "20150517100220.000-0000"
},
"contextMedication": {
  "value"
          : 10,
  "mderFloat"
                 : "FF00002A",
  "type"
                  : "context medication",
                  : "160220",
  "typeCode"
  "unit"
                  : "mg/dL",
                  : "160220",
  "unitCode"
  "timeStamp" : 1431856940275,
  "timeStampString" : "20150517100220.000-0000"
},
"contextCarbohydrates: {
 "value"
  "mderFloat" : "00000020",
  "type"
                  : "Breakfast Carbohydrates",
  "typeCode"
                 : "8417768",
  "unit"
                  : "g",
  "unitCode"
                 : "263908",
  "timeStamp" : 1431856940275,
  "timeStampString" : "20150517100220.000-0000"
},
"contextMeal: {
  "value"
                   : "Casual",
  "code"
                  : "8417880",
  "type"
                   : "Context Meal",
  "typeCode"
                   : "8417864",
```

```
"timeStamp"
                   : 1431856940275,
      "timeStampString" : "20150517100220.000-0000"
    },
    "contextLocation: {
      "value"
                         : "Finger",
      "code" : "8417880",
"type" : "Context Sampl
"typeCode" : "8417768",
"timeStamp" : 1431856940275,
      "code"
                        : "8417880",
                         : "Context Sample Location",
      "timeStampString" : "20150517100220.000-0000"
    },
    "contextTester: {
      "value"
                          : "Self",
      "code"
                         : "8417880"
      "type"
                         : "Context Tester",
      "typeCode"
                          : "8417768",
      "timeStamp" : 1431856940275,
      "timeStampString" : "20150517100220.000-0000"
    },
    "contextHealth: {
      "value"
                         : "Minor",
      "code"
                         : "8417880"
                        : "Context Health",
      "type"
      "typeCode"
                         : "8417880",
      "timeStamp"
                          : 1431856940275,
      "timeStampString" : "20150517100220.000-0000"
  },
  "hmac"
                          : "0123456789"
}
```

5.3 Asynchronous messaging API

Asynchronous messaging API enables applications to receive measured data from the targeted device asynchronously using WebSocket as define in the Section 7.2.3 [DWAPI-PCH]. Asynchronous messaging API specification adheres to that of GotAPI 1.1.

As defined by GotAPI 1.1, after the application obtains authorization to access GotAPI-based APIs using the GotAPI-2 Interface and completes the Service Discovery, the application can use the service (so called "Asynchronous messaging API") provided by the Plug-In through the GotAPI Server.

The asynchronous messaging API offers a series of measurement values reported by the targeted device to an application in real time as the measurement values become available. The timing when and the reasons why such measurement values become available is determined by the Plug-Ins and connected devices, and is out of the scope of this specification.

This API uses WebSocket protocol to handle asynchronous event messages. The message flow of this API is shown blow:

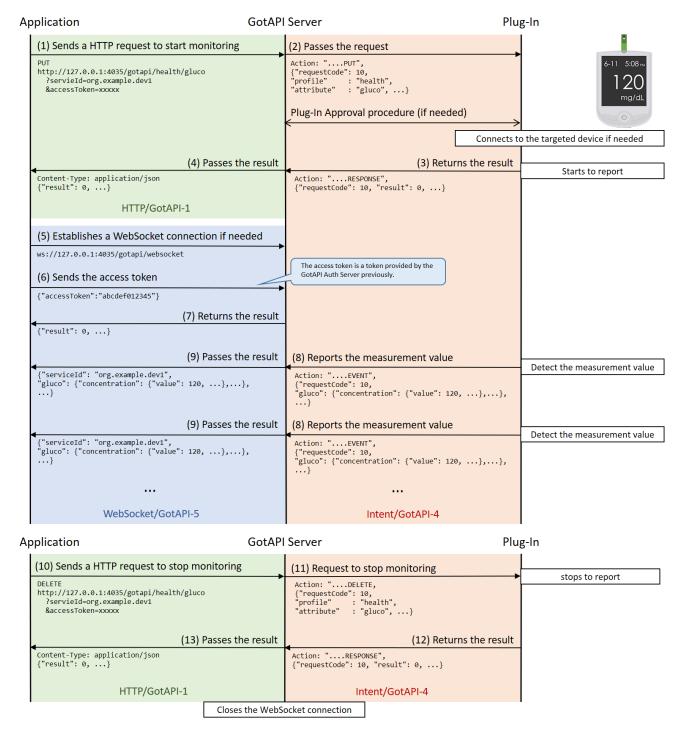


Figure 3: Message Flow of the Asynchronous messaging API

This section defines the data object for the message flows labelled from (1) to (4) and from (8) to (13) described in the figure above.

5.3.1 Request for asynchronous messaging on the GotAPI-1 Interface

When the application uses the API in order to receive asynchronous messages, it sends a request to the GotAPI Server on the GotAPI-1 Interface as follows:

Definition of the HTTP request

	Definitions
Method	НТТР РИТ
Request URL	http://127.0.0.1:4035/gotapi/health/gluco
	https://127.0.0.1:4036/gotapi/health/gluco

Definition of the request parameters

Parameter name	Definition of value	Mandatory/Optional
serviceId	The identifier of the targeted service. This value is available from the Service Discovery API on the GotAPI-1 Interface.	Mandatory
accessToken	The access token obtained from the GotAPI Auth Server through the GotAPI-2 Interface.	Mandatory
nonce	A nonce generated by the application, which is described in the section "7.3.3.3 HMAC server authentication using trusted Application ID for the Server spoofing attack" in the GotAPI specification.	Optional

Example of the request URL

http://127.0.0.1:4035/gotapi/health/gluco?serviceId=abcdefg123&accessToken=0987654321&nonce=93b3a219347

5.3.2 Request for asynchronous messaging on the GotAPI-4 Interface

When an application sends a request to the GotAPI Server on the GotAPI-1 Interface, the GotAPI Server passes the request to the Plug-In on the GotAPI-4 Interface. The request includes the data object as follows:

Definition of the data object for request

Name	Туре	Definition of value	Mandatory/Optional
method	String	This value SHALL be "PUT".	Mandatory if the OS is not Android. Otherwise, optional.
			If the OS is Android, the "Action" value SHALL include this information as described below.
receiver	String	The address of the GotAPI Server application used by Plug-Ins. Generally, it is the application ID recognized by the OS, such as a package name.	Mandatory
requestCode	int	A request code identifying the request. This value could be any number but must MUST be an integer greater than 0, and unique for each open request, to ensure responses can be correlated.	Mandatory
serviceId	String	The identifier of the targeted Service. This value is provided by the application over the GotAPI-1 Interface.	Mandatory
api	String	The value must be "gotapi".	Mandatory
profile	String	The value must be "health".	Mandatory
attribute	String	The value must be "gluco"	Mandatory
clientId	String	The identifier of the application, which is generated by the Plug-In when the Plug-In Approval procedure defined in the GotAPI specification.	Mandatory

accessToken String The access token for the application, which is generated by the Plug-In when the Plug-In Approval procedure defined in the GotAPI specification. Mandatory

This data object is sent to the Plug-Ins in an OS specific mechanism, e.g., Intents for Android.

Requirements for OS-specific request channel and data container

os	Description
Android	The GotAPI Server must use Explicit Intents for the request.
	The data object must be mapped to the Extra directly.

Example of the data object of the Android Explicit Intents

Name		Example of value	Note
Action		org.deviceconnect.action.PUT	This value is defined by the GotAPI Server application. But the last part SHALL be "PUT".
Component		org.example.plugin	This value is the package name of the Plug-In application.
Extra			
	receiver	org.deviceconnect	
	requestCode	10	
	servcieId	dev1.example.org	
	api	gotapi	
	profile	health	
	attribute	gluco	
	clientId	1234567890	
	accessToken	0987654321	

5.3.3 Response for asynchronous messaging on the GotAPI-4 Interface

When the Plug-In receives the request, it SHALL respond to the GotAPI Server as follows:

Definition of the data object for the response

Name			Туре	Definition of value	Mandatory/Option al
method			String	This value SHALL be "RESPONSE".	Mandatory if the OS is not Android. Otherwise, optional.
					If the OS is Android, the "Action" value SHALL include this information as described below.
requestCode			Number	The request code coming from the GotAPI Server.	Mandatory
result			Number	If success, the value is 0, otherwise an integer greater than 0, which indicates an error code.	Mandatory
				This specification doesn't define error codes.	
gluco					Mandatory
	device		Object		Mandatory
		productName	String	The product name of the targeted device. If the Plug-In cannot obtain this information from the targeted device, it SHALL create a name for the device using an arbitrary algorithm. The algorithm is up to the Plug-In implementation, and this specification does not define any algorithms.	Mandatory
		manufacturerName	String	The manufacturer name of the targeted device. If the Plug-In cannot obtain this information from the targeted device, this value SHALL be an empty string.	Mandatory
		mode1Number	String	The model number of the targeted device. If the Plug-In cannot obtain this information from the targeted device, this value SHALL be an empty string.	Mandatory
		firmwareRevision	String	The firmware revision of the targeted device. If the Plug-In cannot obtain this information from the targeted device, this value SHALL be an empty string.	Mandatory
		serialNumber	String	The serial number of the targeted device. If the Plug-In cannot obtain this information from the targeted device, this value SHALL be an empty string.	Mandatory

	softwareRevision	String	The software revision of the targeted device. If the Plug-In cannot obtain this information from the targeted device, this value SHALL be an empty string.	Mandatory
	hardwareRevision	String	The hardware revision of the targeted device. If the Plug-In cannot obtain this information from the targeted device, this value SHALL be an empty string.	Mandatory
	partNumber	String	The part number of the targeted device. If the Plug-In cannot obtain this information from the targeted device, this value SHALL be an empty string.	Mandatory
	protocolRevision	String	The protocol revision of the targeted device. If the Plug-In cannot obtain this information from the targeted device, this value SHALL be an empty string.	Mandatory
	systemId	String	The system id of the targeted device. This value SHALL be a 16-character HEX string without a '0x' prefix (e.g. "ABCDEF0123456789"). If the Plug-In cannot obtain this information from the targeted device, this value SHALL be "0000000000000000" (a string of 16 '0' characters).	Mandatory

The Plug-In MAY append additional data in the data object as needed.

This data object is sent to the GotAPI Server in an OS specific mechanism, e.g., Intents for Android.

Requirements for OS-specific response channel and data container

os	Description
Android	The GotAPI Server must use Explicit Intents for the request.
	The data object must be mapped to the Extra directly.

Example of the data object of the Android Intents

Name			Example of value	Note
Action			org.deviceconnect.action.RESPONSE	This value is defined by the GotAPI Server application. But the last part SHALL be "RESPONSE".
Component			org.deviceconnect	This value is the package name of the GotAPI Server application.
Extra				
	requestCode		10	
_	result		0	
	gluco			

device			
	productName	ABC Glucometer Pro	
	manufacturerName	ABC Inc.	
	modelNumber	TP-001	
	firmwareRevision	rev.1.001.003	
	serialNumber	01234-5678-9ABCD-EF01	
	softwareRevision	rev.2.000.000	
	hardwareRevision	rev.1.0	
	partNumber	002	
	protocolRevision	rev.3.1	
	systemId	ABCDEF0123456789	

Editor's note:

The extra data of Android is just a key-value structure. How should such structured data above be expressed? JSON string? intent.putExtra ("gluco", "{\"deviceProductName\":\"ABC Glucometer Pro\", ...}");

5.3.4 Response for asynchronous messaging on the GotAPI-1 Interface

When GotAPI Server receives the response from the Plug-In, the GotAPI Server passes it to the application as follows:

Definition of the HTTP response

	Definitions
MIME-Type	application/json
HTTP status	200 OK

Definition of the data object for the response

Name			Туре	Definition of value	Mandatory/Optional
product			String	The name of the GotAPI Server (e.g. "ABConnect")	Mandatory
version			String	The version of the GotAPI Server (e.g. "1.0").	Mandatory
result			Number	If success, the value is 0, otherwise an integer greater than 0, which indicates an error code. This specification doesn't define error codes.	Mandatory
gluco			Object		Mandatory
	device		Object		Mandatory
		productName	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		manufacturerName	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory

	modelNumber	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	firmwareRevision	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	serialNumber	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	softwareRevision	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	hardwareRevision	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	partNumber	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	protocolRevision	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	systemId	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
hmac		String	An HMAC generated for the counter measure against the GotAPI Server spoofing attack. If the application includes a key for HMAC calculation in the API request, the GotAPI Server adds this value in the API response. Evaluating whether the HMAC is identical to the result of calculation of HMAC from the key, the application can ensure that the response is genuine.	Mandatory if the application provide a key to the GotAPI Server

The GotAPI Server SHALL serialize the data structure above as a JSON formatted stream (i.e. JSON string).

Example of the response

```
"product"
             : "ABCConnect",
"version" : "1.0",
"requestCode" : 10,
"result"
             : 0,
"gluco" : {
  "device": {
    "productName"
                    : "ABC Glucometer Pro",
    "manufacturerName" : "ABC Inc.",
    "modelNumber" : "TP-001",
    "firmwareRevision" : "rev.1.001.003",
    "serialNumber" : "01234-5678-9ABCD-EF01",
    "softwareRevision" : "rev.2.000.000",
    "hardwareRevision" : "rev.1.0",
    "partNumber" : "002",
    "protocolRevision" : "rev.3.1",
    "systemId"
                  : "ABCDEF0123456789"
 }
},
"hmac"
             : "0123456789"
```

5.3.5 Asynchronous message from the Plug-In to the GotAPI Server on the GotAPI-4 Interafce

The Plug-In sends an asynchronous message as follows:

Definition of the data object for request

Name			Туре	Definition of value	Mandatory/Optional
method			String	This value SHALL be "EVENT".	Mandatory if the OS is not Android. Otherwise, optional.
					If the OS is Android, the "Action" value SHALL include this information as described below.
requestCode			int	The request code coming from the GotAPI Server.	Mandatory
result			Number	If success, the value is 0, otherwise an integer greater than 0, which indicates an error code.	Mandatory
				This specification doesn't define error codes.	
gluco			Object		Mandatory
	device		Object		Mandatory
		batteryLevel	Float	The battery level of the targeted deivce. This value must be a float number in a range from 0.0 to 1.0.	Mandatory
				The value 0.0 represents that the targeted deivce is completely out of charge. The value 1.0 represents that the targeted deivce is fully charged.	
				Even if the targeted deivce reports this value in percent in a range from 1 to 100, the Plug-In SHALL convert it to a float number in a range from 0.0 to 1.0.	
				If the Plug-In can't obtain battery level from the targeted deivce, this value SHALL be - 1.0.	
	concentration				Mandatory
		value	Float	This value represents the concentration measured by the targeted device.	Mandatory

	mderFloat	String	This value represents the concentration measured by the targetd device, which is a hexadecimal string of an MDER FLOAT, such as "0000006A", which means 106 mg/dl if the value of "unit" is " mg/dl".	Mandatory
	type	String	This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "Glucose concentration". If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	typeCode	String	This value represents the TYPE attribute, which is expressed by a code such as "160368" (This code means "Glucose concentration"). If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	unit	String	This value represents the unit of the reported concentration, which is expressed by a human readable string such as "mg/dl".	Mandatory
	unitCode	String	This value represents the unit of the reported concentration, which is expressed by a code such as "264274" (This code means "mg/d1").	Mandatory
	timeStamp	int	This value represents the measurement time when the mesurement was done. If the measurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying operating system.	Mandatory
	timeStampString	String	This value represents the same time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400"	Mandatory
hba1c				Mandatory if the device reports HbA1c. Otherwise, this SHALL NOT exist.
	value	Float	This value represents the HbA1c measured by the targeted device.	Mandatory

	mderFloat	String	This value represents the HbA1c measured by the targetd device, which is a hexadecimal string of an MDER FLOAT, such as "FF00002A", which means 4.2 % if the value of "unit" is "%".	Mandatory
	type	String	This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "HbA1c level". If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	typeCode	String	This value represents the TYPE attribute, which is expressed by a code such as "160220" (This code means "HbA1c level"). If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	unit	String	This value represents the unit of the reported HbA1c, which is expressed by a human readable string such as "%".	Mandatory
	unitCode	String	This value represents the unit of the reported HbA1c, which is expressed by a code such as "262688" (This code means "%").	Mandatory
	timeStamp	int	This value represents the measurement time when the mesurement was done. If the measurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying operating system.	Mandatory
	timeStampString	String	This value represents the same time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400"	Mandatory
contextExercise				Mandatory if the device reports context exercise. Otherwise, this SHALL NOT exist.
	value	Float	This value represents the context exercise measured by the targeted device.	Mandatory

	mderFloat	String	This value represents the context exercise measured by the targetd device, which is a hexadecimal string of an MDER FLOAT, such as "FF00002A", which means 50 % if the value of "unit" is "%".	Mandatory
	type	String	This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "context exercise". If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	typeCode	String	This value represents the TYPE attribute, which is expressed by a code such as "160220" (This code means "context exercise"). If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	unit	String	This value represents the unit of the reported context exercise, which is expressed by a human readable string such as "%".	Mandatory
	unitCode	String	This value represents the unit of the reported context exercise, which is expressed by a code such as "262688" (This code means "%").	Mandatory
	timeStamp	int	This value represents the measurement time when the mesurement was done. If the measurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying operating system.	Mandatory
	timeStampString	String	This value represents the same time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400"	Mandatory
contextMedication		Object		Mandatory if the device reports context medication. Otherwise, this SHALL NOT exist.
	value	Float	This value represents the context medication measured by the targeted device.	Mandatory

	mderFloat	String	This value represents the context medication measured by the targetd device, which is a hexadecimal string of an MDER FLOAT, such as "FF00002A", which means 10 % if the value of "unit" is "mg/dL".	Mandatory
	type	String	This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "context medication". If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	typeCode	String	This value represents the TYPE attribute, which is expressed by a code such as "160220" (This code means "context medication"). If the Plug-In can't obtain the	Mandatory
			type, this value SHALL be an empty string.	
	unit	String	This value represents the unit of the reported context medication, which is expressed by a human readable string such as "mg/dL".	Mandatory
	unitCode	String	This value represents the unit of the reported context medication, which is expressed by a code such as "160220" (This code means "mg/dL").	Mandatory
	timeStamp	int	This value represents the measurement time when the mesurement was done. If the measurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying operating system.	Mandatory
	timeStampString	String	This value represents the same time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400"	Mandatory
contextCarbohydrates		Object		Mandatory if the device reports context carbohydrates. Otherwise, this SHALL NOT exist.
	value	Float	This value represents the context carbohydrates measured by the targeted device.	Mandatory

	I			
	mderFloat	String	This value represents the context carbohydrates measured by the targetd device, which is a hexadecimal string of an MDER FLOAT, such as "00000020", which means 32 g if the value of "unit" is "g".	Mandatory
	type	String	This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "Breakfast Carbohydrates". If the Plug-In can't obtain the	Mandatory
			type, this value SHALL be an empty string.	
	typeCode	String	This value represents the TYPE attribute, which is expressed by a code such as "8417768" (This code means "Breakfast Carbohydrates").	Mandatory
			If the Plug-In can't obtain the type, this value SHALL be an empty string.	
	unit	String	This value represents the unit of the reported context carbohydrates, which is expressed by a human readable string such as "g".	Mandatory
	unitCode	String	This value represents the unit of the reported context carbohydrates, which is expressed by a code such as "263908" (This code means "g").	Mandatory
	timeStamp	int	This value represents the measurement time when the mesurement was done. If the measurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying operating system.	Mandatory
	timeStampString	String	This value represents the same time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400"	Mandatory
contextMeal		Object		Mandatory if the device reports context meal. Otherwise, this SHALL NOT exist.
	value	String	This value represents the context meal measured by the targeted device, such as "Casual".	Mandatory

	code	String	This value represents the Enum- Observed-Value-Simple-OID, which is expressed by a code such as "8417880" (This code means "Casual").	Mandatory
	type	String	This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "Context Meal". If the Plug-In can't obtain the type, this value SHALL be an	Mandatory
			empty string.	
	typeCode	String	This value represents the TYPE attribute, which is expressed by a code such as "8417864" (This code means "Context Meal").	Mandatory
			If the Plug-In can't obtain the type, this value SHALL be an empty string.	
	timeStamp	int	This value represents the measurement time when the mesurement was done. If the measurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying operating system.	Mandatory
	timeStampString	String	This value represents the same time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400"	Mandatory
contextLocation		Object		Mandatory if the device reports context sample location. Otherwise, this SHALL NOT exist.
	value	String	This value represents the context sample location measured by the targeted device, such as "Finger".	Mandatory
	code	String	This value represents the Enum- Observed-Value-Simple-OID, which is expressed by a code such as "8417880" (This code means "Finger").	Mandatory

type String This value represents the TVPE attribute as a human readable string and as its 32-bit MOC code such as "Context Sample Location". If the Plug-In can't obtain the type, this value SHALL be an empty string. This value represents the TVPE attribute, which is expressed by a code such as "Gantzet Sample Location". If the Plug-In can't obtain the type, this value HALL be an empty string. This value represents the Interest Sample Location". If the Plug-In can't obtain the type, this value SHALL be an empty string. This value represents the measurement time when the measurement was done. If the measurement time when the Plug-In SHALL convert it to a unix time stamp in milliseconis value to the unix time when the Plug-In SHALL convert it to a unix time stamp in milliseconis value from the Plug-In based on the clock of the underlying operating system. TimeStampString String This value represents the same time stamp as "timeStamp." The format is "MYVMWODDHEWMS.sss/HMFM", such as "20158904135813.220-0400" This value represents the foundation of the clock of the underlying operating system. Value String This value represents the fundation of the clock of the underlying operating system. This value represents the fundation of the property of the device reports of the property of the device reports of the property of the system of the property of the device reports of the property of the property of the device reports of the property of the fundation of the property o	I	I	I		
typeCode String This value represents the TVPE accessed by a code such as "8417768" (This code means "Context Sample Location"). If the Plug-In can't obtain the type, this value SHALL be an empty string. In this value represents the measurement time when the mesurement take done. If the measurement time when the mesurement walue from the targeted device, the Plug-In SHALL convert it to a unix time stamp milliscond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying operating system. TimeStampString String timeStampString String This value represents the same time stamp as "timeStamp" the footh is "YNPMONNEMPSS.sss/" "20150504135813.220-0400" ContextTester Object ContextTester Object This value represents the context tester measured by the targeted device, such as "Self". This value represents the Enumobase value simple-OID, which is expressed by a code such as "3417880" (This code means "Self"). This value represents the TVPE attribute as a human readable string and as its 32-bit MON. Mandatory Mandatory Mandatory Mandatory Mandatory This value represents the TVPE attribute as a human readable string and as its 32-bit MON. This value represents the TVPE attribute as a human readable string and as its 32-bit MON. This value represents the TVPE attribute as a human readable string and as its 32-bit MON. This value represents the TVPE attribute as a human readable string and as its 32-bit MON. This value represents the TVPE attribute as a human readable string and as its 32-bit MON. This value represents the TVPE attribute as a human readable string and as its 32-bit MON. This value represents the TVPE attribute as a human readable string and as its 32-bit MON. This value represents the TVPE attribute as a human readable string and as its 32-bit MON.		type	String	attribute as a human readable string and as its 32-bit MDC code such as "Context Sample Location". If the Plug-In can't obtain the	Mandatory
attribute, which is expressed by a code such as "8417768" (This code means "Context Sample Location"). If the Plug-In can't obtain the type, this value SHALL be an empty string. timeStamp int This value represents the measurement time when the measurement time when the measurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In pased on the clock of the underlying operating system. timeStampString String This value represents the same time stamp as "timeStamp". The format is "YnyMODHHMYSS.sss+/-HHWM", such as "20150504135813.220-0400" ContextTester Object ContextTester Object This value represents the context tester measured by the context tester. Otherwise, this SHALL NOT exist. This value represents the Enum-Observed-Value-Simple-OID, which is expressed by a code such as "Self". type String This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "Context Tester". If the Plug-In can't obtain the type, this value SHALL be an					
timeStamp int This value represents the measurement time when the measurement time when the measurement time is reported from the targeted device, the Plug-In SARLL convert it to a unix time stamp in millisecton d. Otherwise, the Plug-In hased on the clock of the underlying operating system. This value represents the same time stamp as "timeStampstring operating system. This value represents the same time stamp as "timeStamp". The format is "YYYYMPDDHHMMSS.sss+/-HHWM", such as "20150504135813.220-0400" ContextTester Object value String This value represents the device reports context tester. Otherwise, this SHALL NOT exist. Value String This value represents the context tester measured by the targeted device, such as "Self". Code String This value represents the Enumobserved-Value-Simple-OID, which is expressed by a code such as "8417880" (This code means "Self"). Type String This value represents the Enumobserved-Value-Simple-OID, which is expressed by a code such as "8417880" (This code means "Self"). This value represents the Enumobserved-Value-Simple-OID, which had so "8417880" (This code means "851780"). This value represents the Enumobserved-Value-Simple-OID, which had so "851780". This value represents the Enumobserved-Value-Simple-OID, which had so "851780". This value represents the Enumobserved-Value-Simple-OID, which had so "851780". This value represents the Enumobserved-Value-Simple-OID, which had so "851780". This value represents the Enumobserved-Value-Simple-OID, which had be seen the server and the present of the Enumobserved-Value-Simple-OID, which had be seen the server and the present of the Enumobserved-Value-Simple-OID, which had be seen the server and the present of the Enumobser and the Enumob		typeCode	String	attribute, which is expressed by a code such as "8417768" (This code means "Context Sample	Mandatory
measurement time when the mesurement was done. If the measurement was done. If the measurement time is reported from the targeted device, the Plug. In SHALL convervit to a unix time stamp in millisecond. Otherwise, the Plug. In set this value to the unix time when the Plug. In receives the measurement value from the Plug. In based on the clock of the underlying operating system. This value represents the same time stamp as "timeStamp" In format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400" ContextTester				type, this value SHALL be an	
time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400" ContextTester Object Object This value represents the context tester. Otherwise, this SHALL NOT exist. Value String This value represents the context tester measured by the targeted device, such as "Self". Code String This value represents the Enum-Observed-Value-Simple-OID, which is expressed by a code such as "8417880" (This code means "Self"). Type String This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "Context Tester". If the Plug-In can't obtain the type, this value SHALL be an		timeStamp	int	measurement time when the mesurement was done. If the measurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying	Mandatory
device reports context tester. Otherwise, this SHALL NOT exist. value String This value represents the context tester measured by the targeted device, such as "Self". code String This value represents the Enum-Observed-Value-Simple-OID, which is expressed by a code such as "8417880" (This code means "Self"). type String This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "Context Tester". If the Plug-In can't obtain the type, this value SHALL be an		timeStampString	String	time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as	Mandatory
context tester measured by the targeted device, such as "Self". Code String This value represents the Enum-Observed-Value-Simple-OID, which is expressed by a code such as "8417880" (This code means "Self"). Type String String This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "Context Tester". If the Plug-In can't obtain the type, this value SHALL be an	contextTester		Object		device reports context tester. Otherwise, this
Observed-Value-Simple-OID, which is expressed by a code such as "8417880" (This code means "Self"). type String This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "Context Tester". If the Plug-In can't obtain the type, this value SHALL be an		value	String	context tester measured by the	Mandatory
attribute as a human readable string and as its 32-bit MDC code such as "Context Tester". If the Plug-In can't obtain the type, this value SHALL be an		code	String	Observed-Value-Simple-OID, which is expressed by a code such as "8417880" (This code means	Mandatory
		type	String	attribute as a human readable string and as its 32-bit MDC code such as "Context Tester". If the Plug-In can't obtain the	Mandatory

				l
	typeCode	String	This value represents the TYPE attribute, which is expressed by a code such as "8417768" (This code means "Context Tester"). If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	timeStamp	int	This value represents the measurement time when the mesurement was done. If the measurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying operating system.	Mandatory
	timeStampString	String	This value represents the same time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400"	Mandatory
contextHealth		0bject		Mandatory if the device reports context health. Otherwise, this SHALL NOT exist.
	value	String	This value represents the context health measured by the targeted device, such as "Minor".	Mandatory
	code	String	This value represents the Enum- Observed-Value-Simple-OID, which is expressed by a code such as "8417880" (This code means "Minor").	Mandatory
	type	String	This value represents the TYPE attribute as a human readable string and as its 32-bit MDC code such as "Context Health". If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory
	typeCode	String	This value represents the TYPE attribute, which is expressed by a code such as "8417880" (This code means "Context Health"). If the Plug-In can't obtain the type, this value SHALL be an empty string.	Mandatory

timeStamp	int	This value represents the measurement time when the mesurement time is reported from the targeted device, the Plug-In SHALL convert it to a unix time stamp in millisecond. Otherwise, the Plug-In set this value to the unix time when the Plug-In receives the measurement value from the Plug-In based on the clock of the underlying operating system.	Mandatory
timeStampString	String	This value represents the same time stamp as "timeStamp". The format is "YYYYMMDDHHMMSS.sss+/-HHMM", such as "20150504135813.220-0400"	Mandatory

The Plug-In MAY append additional data in the data object as needed.

This data object is sent to the Plug-Ins in an OS specific mechanism, e.g., Intents for Android.

Requirements for OS-specific request channel and data container

os	Description
Android	The GotAPI Server must use Explicit Intents for the request.
	The data object must be mapped to the Extra directly.

Example of the data object of the Android Explicit Intents

Name	Extra key name		Example of value	Note
Action			org.deviceconnect.action.EVE NT	This value is defined by the GotAPI Server application. But the last part SHALL be "EVENT".
Component			org.example.plugin	This value is the package name of the Plug-In application.
Extra				
	requestCode		10	
	result		0	
	gluco			
		device		
			deviceBatteryLevel	0.5
		concentration		
			value	106
			mderFloat	0000006A
			type	Glucose concentration
			typeCode	160368
			unit	mg/dl
			unitCode	264274

	timeStamp	1431856940275
	timeStampString	20150517100220.000-0000
hba1c		
	value	4.2
	mderFloat	FF00002A
	type	HbA1c level
	typeCode	160220
	unit	%
	unitCode	262688
	timeStamp	1431856940275
	timeStampString	20150517100220.000-0000
contextExercise		
	value	50
	mderFloat	FF00002A
	type	context exercise
	typeCode	160220
	unit	%
	unitCode	262688
	timeStamp	1431856940275
	timeStampString	20150517100220.000-0000
contextMedicati on		
	value	10
	mderFloat	FF00002A
	type	context medication
	typeCode	160220
	unit	mg/dL
	unitCode	160220
	timeStamp	1431856940275
	timeStampString	20150517100220.000-0000
contextCarbohyd rates		
	value	32
	mderFloat	00000020
	type	Breakfast Carbohydrates
	typeCode	8417768

	unit	g
	unitCode	263908
	timeStamp	1431856940275
	timeStampString	20150517100220.000-0000
contextMe	al	
	value	Casual
	code	8417880
	type	Context Meal
	typeCode	8417864
	timeStamp	1431856940275
	timeStampString	20150517100220.000-0000
contextLo	cation	
	value	Finger
	code	8417880
	type	Context Sample Location
	typeCode	8417768
	timeStamp	1431856940275
	timeStampString	20150517100220.000-0000
contextTe	ster	
	value	Self
	code	8417880
	type	Context Tester
	typeCode	8417768
	timeStamp	1431856940275
	timeStampString	20150517100220.000-0000
contextHe	alth	
	value	Minor
	code	8417880
	type	Context Health
	typeCode	8417880
	timeStamp	1431856940275
	timeStampString	20150517100220.000-0000

Editor's note:

The extra data of Android is just a key-value structure. How should such structured data above be expressed? JSON string? intent.putExtra("gluco", "{\"deviceProductName\":\"ABC Glucometer Pro\", ...}");

5.3.6 Asynchronous message from the GotAPI Server to the application on the GotAPI-5 Interface

When the GotAPI Server receives an asynchronous message from the Plug-In, the GotAPI Server passes it to the application on the GotAPI-5 Interface. The format of the data is a JSON string as follows:

Definition of the data object

Name	Sub name		Туре	Definition of value	Mandatory/Optional
serviceId			String	The identifier of the targeted Service. This value is provided by the application when the application send the originated API request on the GotAPI-1 Interface.	Mandatory
gluco			Object		Mandatory
	device		0bject		Mandatory
		batteryLevel	Number	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	concentration				Mandatory
		value	Float	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		mderFloat	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		type	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		typeCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		unit	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		unitCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		timeStamp	int	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		timeStampString	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory

ht	ba1c				Mandatory if the device reports HbA1c. Otherwise, this SHALL NOT exist.
		value	Float	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		mderFloat	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		type	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		typeCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		unit	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		unitCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		timeStamp	int	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		timeStampString	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
cc	ontextExercise		Object		Mandatory if the device reports context exercise. Otherwise, this SHALL NOT exist.
		value	Float	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		mderFloat	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		type	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		typeCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		unit	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		unitCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory

		timeStamp	int	This value SHALL be the same as	Mandatory
		Camp		what the GotAPI Server received from the Plug-In.	
		timeStampString	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
cont	textMedication		Object		Mandatory if the device reports context medication. Otherwise, this SHALL NOT exist.
		value	Float	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		mderFloat	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		type	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		typeCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		unit	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		unitCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		timeStamp	int	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		timeStampString	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
cont	textCarbohydrates		Object		Mandatory if the device reports context carbohydrates. Otherwise, this SHALL NOT exist.
		value	Float	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		mderFloat	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		type	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		typeCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory

	unit	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	unitCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStamp	int	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStampString	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
contextMeal		0bject		Mandatory if the device reports context meal. Otherwise, this SHALL NOT exist.
	value	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	code	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	type	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	typeCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStamp	int	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	timeStampString	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
contextLocation		Object		Mandatory if the device reports context sample location. Otherwise, this SHALL NOT exist.
	value	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	code	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	type	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
	typeCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory

		timeStamp	int	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		timeStampString	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
con	ntextTester		Object		Mandatory if the device reports context tester. Otherwise, this SHALL NOT exist.
		value	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		code	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		type	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		typeCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		timeStamp	int	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		timeStampString	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
con	ntextHealth		Object		Mandatory if the device reports context health. Otherwise, this SHALL NOT exist.
		value	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		code	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		type	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		typeCode	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		timeStamp	int	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory
		timeStampString	String	This value SHALL be the same as what the GotAPI Server received from the Plug-In.	Mandatory

hmac		String	An HMAC generated for the counter measure against the GotAPI Server spoofing attack. If the application includes a key for HMAC calculation in the API request, the GotAPI Server adds this value in the API response. Evaluating whether the HMAC is identical to the result of calculation of HMAC from the key, the application can ensure that the response is genuine.	Mandatory if the application provide a key to the GotAPI Server
------	--	--------	--	---

Example of the JSON string

```
"serviceId" : 0,
"gluco" : {
  "device": {
   "batteryLevel" : 0.5
 },
  "concentration": {
                 : 106,
   "value"
   "mderFloat"
                   : "0000006A",
                    : "Glucose concentration",
   "type"
                  : "160368",
   "typeCode"
   "unit"
                     : "mg/dl",
   "unitCode" : "264274",
"timeStamp" : 1431856940275,
   "timeStampString" : "20150517100220.000-0000
 },
  "hba1c": {
   "value"
                     : 4.2,
   "mderFloat"
                    : "FF00002A",
   "type"
                     : "HbA1c level",
                     : "160220",
   "typeCode"
   "unit"
                     : "%",
                     : "262688",
   "unitCode"
   "timeStamp"
                     : 1431856940275,
   "timeStampString" : "20150517100220.000-0000"
 },
  "contextExercise": {
   "value" : 50,
"mderFloat" : "FF00002A",
   "type"
                     : "context exercise",
   "typeCode"
                    : "160220",
   "unit"
                     : "%",
   "unitCode"
                    : "262688",
   "timeStamp" : 1431856940275,
   "timeStampString" : "20150517100220.000-0000"
 },
  "contextMedication": {
   "value"
                      : 10,
                    : "FF00002A",
   "mderFloat"
   "type"
                      : "context medication",
    "typeCode"
                     : "160220",
```

```
"unit"
                        : "mg/dL",
      "unitCode"
                        : "160220",
      "timeStamp"
                       : 1431856940275,
      "timeStampString" : "20150517100220.000-0000"
    },
    "contextCarbohydrates: {
     "value" : 32,
"mderFloat" : "00000020",
                      : "Breakfast Carbohydrates",
      "type"
      "typeCode"
                      : "8417768",
      "unit"
                       : "g",
                      : "263908",
      "unitCode"
                  : 1431856940275,
      "timeStamp"
      "timeStampString" : "20150517100220.000-0000"
    },
    "contextMeal: {
      "value"
                      : "Casual",
                      : "8417880",
      "code"
                      : "Context Meal",
      "type"
                     : "8417864",
      "typeCode"
      "timeStamp"
                      : 1431856940275,
      "timeStampString" : "20150517100220.000-0000"
   },
    "contextLocation: {
      "value"
                       : "Finger",
     "code"
                      : "8417880",
                       : "Context Sample Location",
      "type"
      "typeCode"
                      : "8417768",
     "timeStamp" : 1431856940275,
      "timeStampString" : "20150517100220.000-0000"
   },
    "contextTester: {
                     : "Self",
      "value"
      "code"
                      : "8417880",
                      : "Context Tester",
      "type"
      "typeCode"
                       : "8417768",
      "timeStamp"
                      : 1431856940275,
      "timeStampString" : "20150517100220.000-0000"
   },
    "contextHealth: {
                   : "Minor",
     "value"
      "code"
                      : "8417880",
                      : "Context Health",
      "type"
      "typeCode"
                      : "8417880",
      "timeStamp"
                       : 1431856940275,
      "timeStampString" : "20150517100220.000-0000"
  },
  "hmac"
                        : "0123456789"
}
```

5.3.7 Stop request from the application to the GotAPI Server on the GotAPI-1 Interface

When the application wants to stop receiving asynchronous messages, it sends a request to the GotAPI Server on the GotAPI-1 Interface as follows:

Definition of the HTTP request

	Definitions
Method	HTTP DELETE
Request URL	http://127.0.0.1:4035/gotapi/health/gluco
	https://127.0.0.1:4036/gotapi/health/gluco

Definition of the request parameters

Parameter name	Definition of value	Mandatory/Optional
serviceId	The identifier of the targeted service. This value is available from the Service Discovery API on the GotAPI-1 Interface.	Mandatory
accessToken	The access token obtained from the GotAPI Auth Server through the GotAPI-2 Interface.	Mandatory
nonce	A nonce generated by the application, which is described in the section "7.3.3.3 HMAC server authentication using trusted Application ID for the Server spoofing attack" in the GotAPI specification.	Optional

Example of the request URL

http://127.0.0.1:4035/gotapi/health/gluco?serviceId=abcdefg123&accessToken=0987654321&nonce=93b3a219347

5.3.8 Stop request from the GotAPI Server to the Plug-In on the GotAPI-4 Interface

When the GotAPI Server receives a stop request from the application on the GotAPI-1 Interface, the GotAPI Server sends a stop request to the Plug-in on the GotAPI-4 Interface. The request includes the data object as follows:

Definition of the data object for request

Name	Туре	Definition of value	Mandatory/Optional
method	String	This value SHALL be "DELETE".	Mandatory if the OS is not Android. Otherwise, optional.
			If the OS is Android, the "Action" value SHALL include this information as described below.
receiver	String	The address of the GotAPI Server application used by Plug-Ins. Generally, it is the application ID recognized by the OS, such as a package name.	Mandatory
requestCode	int	A request code identifying the request. This value could be any number but must MUST be an integer greater than 0, and unique for each open request, to ensure responses can be correlated.	Mandatory
serviceId	String	The identifier of the targeted Service. This value is provided by the application over the GotAPI-1 Interface.	Mandatory

api	String	The value must be "gotapi".	Mandatory
profile	String	The value must be "health".	Mandatory
attribute	String	The value must be "gluco"	Mandatory
clientId	String	The identifier of the application, which is generated by the Plug-In when the Plug-In Approval procedure defined in the GotAPI specification.	Mandatory
accessToken	String	The access token for the application, which is generated by the Plug-In when the Plug-In Approval procedure defined in the GotAPI specification.	Mandatory

This data object is sent to the Plug-Ins in an OS specific mechanism, e.g., Intents for Android.

Requirements for OS-specific request channel and data container

os	Description
Android	The GotAPI Server must use Explicit Intents for the request.
	The data object must be mapped to the Extra directly.

Example of the data object of the Android Explicit Intents

Name		Example of value	Note
Action		org.deviceconnect.action.DELETE	This value is defined by the GotAPI Server application. But the last part SHALL be "DELETE".
Component		org.example.plugin	This value is the package name of the Plug-In application.
Extra			
	receiver	org.deviceconnect	
	requestCode	10	
	servcieId	dev1.example.org	
	api	gotapi	
	profile	health	
	attribute	gluco	
	clientId	1234567890	
	accessToken	0987654321	

5.3.9 Stop response from the Plug-In to the GotAPI Server on the GotAPI-4 Interface

When the Plug-In receives the stop request, it SHALL respond as follows:

Definition of the data object for the response

Name	Туре	Definition of value	Mandatory/Optional
method	String	This value SHALL be "RESPONSE".	Mandatory if the OS is not Android. Otherwise, optional.
			If the OS is Android, the "Action" value SHALL include this information as described below.
requestCode	Number	The request code coming from the GotAPI Server.	Mandatory
result	Number	If success, the value is 0, otherwise an integer greater than 0, which indicates an error code. This specification doesn't define error codes.	Mandatory

The Plug-In MAY append additional data in the data object as needed.

This data object is sent to the GotAPI Server in an OS specific mechanism, e.g., Intents for Android.

Requirements for OS-specific response channel and data container

os	Description	
Android	The GotAPI Server must use Explicit Intents for the request.	
	The data object must be mapped to the Extra directly.	

Example of the data object of the Android Intents

Name	Sub name	Example of value	Note
Action		org.deviceconnect.action.RESPONSE	This value is defined by the GotAPI Server application. But the last part SHALL be "RESPONSE".
Component		org.deviceconnect	This value is the package name of the GotAPI Server application.
Extra			
	requestCode	10	
	result	0	

5.3.10 Stop response from the GotAPI Server to the application on the GotAPI-1 Interface

When the GotAPI Server receives the stop response, the GotAPI Server passes the response to the application follows:

Definition of the HTTP response

	Definitions
MIME-Type	application/json
HTTP status	200 OK

Definition of the data object for the response

Name	Туре	Definition of value	Mandatory/Optional
product	String	The name of the GotAPI Server (e.g. "ABConnect") Mandatory	
version	String	The version of the GotAPI Server (e.g. "1.0"). Mandatory	
result	Number	If success, the value is 0, otherwise an integer greater than 0, which indicates an error code. This specification doesn't define error codes.	Mandatory
hmac	String	An HMAC generated for the counter measure against the GotAPI Server spoofing attack. If the application includes a key for HMAC calculation in the API request, the GotAPI Server adds this value in the API response. Evaluating whether the HMAC is identical to the result of calculation of HMAC from the key, the application can ensure that the response is genuine.	Mandatory if the application provide a key to the GotAPI Server

The GotAPI Server SHALL serialize the data structure above as a JSON formatted stream (i.e. JSON string), then send it to the originating application on the GotAPI-5 (WebSocket connection).

Example of the response

```
{
   "product": "ABCConnect",
   "version": "1.0",
   "result" : 0,
   "hmac" : "0123456789"
}
```

Appendix A. Change History

(Informative)

A.1 Approved Version History

Reference	Date	Description
OMA-TS-Glucometer_APIs-V1_0-20180724-	24 Jul 2018	Status changed to Approved by CD
A		Doc Ref # OMA-CD-2018-0005-INP_DWAPI_V1_0_ERP_for_final_Approval