

Biometric Attendance Mgmt. System (BAMS) Developer Manual

1 Introduction

Biometric Attendance Management System (BAMS) is with simple and hassle free GPRS/Wi-Fi interface, it is easy to integrate into any kind of existing applications includes static application and cloud applications, it is widely used for remotely accessible attendance systems.

2 Product Image



3 Communication flow between Web server and Biometric GPRS/Wi-Fi Device





4 GPRS/Wi-Fi HTTP GET Communication Protocol for pushing records

Create a web page,
For example: demo.appstime.in/attendance?

4.1 Request from Attendance Device to Server

Demo.appstime.in/attendance?\$SID&MID&RFID&DOT,RFID&DOT,RFID&DOT,RFID&DOT,RFID&DOT,RFID&DOT,RFID&DOT,RFID&DOT,RFID&DOT,RFID&DOT*

Where

website.com/rfid/attendance.aspx?	-	Web Host URL
\$	-	Start of data
SID= XXXXX	-	Org ID (5 digits)
&	-	Field Differentiator
MID= XX	-	Machine ID (2 digits)
&		
RFID= XXXXXXXX XX	-	Card ID (10 numeric digits User ID)
&		
DOT=DDMMYYYYHHMMSS-		Date of Transaction (14 digits)
,	-	End of one record
*	-	End of data

If one record to upload in one go:

[demo.appstime.in/attendance?\\$999999&99&0008478100&27122013113700*](http://demo.appstime.in/attendance?$999999&99&0008478100&27122013113700*)

If two records to upload in one go:

[demo.appstime.in/attendance?\\$999999&99&0008478100&27122013113700,0008478200&27122013113700*](http://demo.appstime.in/attendance?$999999&99&0008478100&27122013113700,0008478200&27122013113700*)

When 10 Records to upload in one go:

[demo.appstime.in/attendance?\\$999999&99&0008478100&27122013113700,1234567100&27122013113700,1234567200&27122013113700,123456700&27122013113700,1234567200&27122013113700,1234567100&27122013113700,1234567100&27122013113700,1234567200&27122013113700,1234567100&27122013113700,1234567200&27122013113700,1234567100&27122013113700,1234567200&27122013113700*](http://demo.appstime.in/attendance?$999999&99&0008478100&27122013113700,1234567100&27122013113700,1234567200&27122013113700,123456700&27122013113700,1234567200&27122013113700,1234567100&27122013113700,1234567100&27122013113700,1234567200&27122013113700,1234567100&27122013113700,1234567200&27122013113700*)

At web server, query the string and insert data values into database tables.

Example (.Net): **Request.QueryString**



4.2 Server Acknowledgement to Attendance Device

As soon as the data received by the web server it should acknowledge to the Device as mentioned below

\$RFID=0#

Example (.Net): **Response.Write("\$RFID=0#")**

5 GPRS/Wi-Fi HTTP POST Json Communication for pushing Records

5.1 Request comes from Attendance Device to Server

xxxxxx.com/attservice? - Web Host URL

NOTE: User Can change the API name as per the implementation in the webserver.

The following is a json communication request from device to server as part of the post body

POST /attservice? HTTP/1.1

Host: xxxxxx.com

Content-Type: application/json; charset=utf-8

Content-Length: length

```
{
  "MachineID":"1234567",
  "Attendance":[
    {
      "PunchID" : "ID1",
      "PunchTime" : "DDMMYYYYHHMMSS" ,
      "PunchStatus": "0"
    },
    {
      "PunchID" : "ID2",
      "PunchTime" : "DDMMYYYYHHMMSS"
      "PunchStatus": "1"
    },
    {
      "PunchID" : "ID3",
      "PunchTime" : "DDMMYYYYHHMMSS"
      "PunchStatus": "0"
    }
  ]
}
```



```
}  
]  
}
```

Where

MachineID_ is 7 digit numeric string
PunchID_is 1 to 24 digits numeric string
PunchTime_ is 14 digits date string (DDMMYYYYHHMMSS)
PunchStatus_ is 1 digit string (0 – for IN punch, 1 – for OUT punch)

NOTE: Device which doesn't support IN and OUT options,
Default punch is always IN type and the Application software should handle
first punch as IN type and last punch of the day is OUT type

5.2 Server Acknowledgement to Attendance Device

As soon as the data received by the web server it should acknowledge to the Device as mentioned below. Web service should respond with the following data irrespective of data is valid or not.

HTTP/1.1 200 OK
Content-Type: Application/json; charset=utf-8
Content-Length: length

```
{  
    "DeviceResponse": 0  
}
```

DeviceStatus is 0 for success
DeviceStatus is 1 for error



6 GPRS/Wi-Fi HTTP GET Communication Protocol for Biometric Templates

Create a web page,

For example: attendance.silicontechlabs.com/rfid/attendance.aspx?

6.1 Biometric Template Upload Device Request

[website.com/rfid/attendance.aspx?\\$UPLOADBIO&SID&MID&STATUS&TEMPLATEINDEX&TOTALRECORDSLEFT&VALID&UID&BIO TEMPLATE*](http://website.com/rfid/attendance.aspx?$UPLOADBIO&SID&MID&STATUS&TEMPLATEINDEX&TOTALRECORDSLEFT&VALID&UID&BIO%20TEMPLATE*)

Where

website.com/rfid/attendance.aspx?	-	Web Host URL
\$	-	Start of data
SID= XXXXX	-	Org ID (5 digits)
&	-	Field Differentiator
MID= XX	-	Machine ID (2 digits)
&		
STATUS	-	status of the transaction (1 digit) (0 for pass and non zero for failed transaction)
TEMPLATEINDEX	-	Template Index (maximum of 4 digits) which will be starting from zero until maximum records minus one
TOTALRECORDSLEFT	-	Total Records Left after this record (maximum of 4 digits)
VALID	-	Biometric Validity (1 – valid 0 – invalid)
UID	-	UID (maximum of 16 digits)
TEMPLATE	-	Binary Template (maximum of 512 digits)
*	-	End of data

[attendance.silicontrace.com/rfid/attendance.aspx?\\$99999&99&0&0&28&1&0008478100&4E124582DEAC0A0CB6271220131137C8*](http://attendance.silicontrace.com/rfid/attendance.aspx?$99999&99&0&0&28&1&0008478100&4E124582DEAC0A0CB6271220131137C8*)

At web server, query the string and insert data values into database tables.

Example (.Net): **Request.QueryString**



6.2 *Server Acknowledgement to the above upload device bio request*

As soon as the data received by the web server it should acknowledge to the Device as mentioned below with request for next sequence number and this sequence number will be incremented for every response.

After receiving all the templates, server should respond with 65535 to indicate end of transfer.

\$GETMBIO, RECORDSEQ, #

E.g. \$GETMBIO, 1, #

Where

RECORD SEQ - sequence number of next record

If RECORDSEQ is 65535 it means that is the end of transfer

6.3 *Biometric Template download device request*

website.com/rfid/attendance.aspx\$DOWNLOADBIO&SID&MID&RECORDSEQ*

Where

website.com/rfid/attendance.aspx? - Web Host URL

\$ - Start of data

SID - Org ID (5 digits)

& - Field Differentiator

MID - Machine ID (2 digits)

& RECORD SEQ - sequence number of the template which will be starting from zero

* - End of data

attendance.silicontrace.com/rfid/attendance.aspx?\$99999&99&0*

At web server, query the string and insert data values into database tables.

Example (.Net): **Request.QueryString**



6.4 Server Acknowledgement to the above Download bio request

As soon as the data received by the web server it should send data to the Device as mentioned below

\$SENDMBIO, TEMPLATEINDEX, TOTALTEMPLATES, VALID, UID,
BioTemplate, #

E.g. \$SENDMBIO, 0, 10, 1, 8790330567, 4E1056C18B3450965A1, #

Where

website.com/rfid/attendance.aspx?	-	Web Host URL
\$	-	Start of data
SID= XXXXX	-	Org ID (5 digits)
&	-	Field Differentiator
MID= XX	-	Machine ID (2 digits)
&		
TEMPLATEINDEX	-	Template Index (maximum of 4 digits) which will be starting from zero
TOTAL TEMPLATES	-	Total Templates (maximum of 4 digits)
VALID	-	Biometric Validity (1 – valid 0 – invalid)
UID	-	UID (maximum of 16 digits)
TEMPLATE	-	Binary Template (maximum of 512 digits)
*	-	End of data

6.5 Biometric Template Upload One Bio Request

website.com/rfid/attendance.aspx?\$UPLOADBIO&SID&MID&STATUS&0&0&1&
UID&BIOTEMPLATE*

Where

website.com/rfid/attendance.aspx?	-	Web Host URL
\$	-	Start of data
SID= XXXXX	-	Org ID (5 digits)
&	-	Field Differentiator
MID= XX	-	Machine ID (2 digits)
&		
STATUS	-	status of the transaction (1 digit) (0 for pass and non zero for failed transaction)
UID	-	UID (maximum of 16 digits)
TEMPLATE	-	Binary Template (maximum of 512 digits)



* - End of data

[attendance.silicontrace.com/rfid/attendance.aspx?\\$99999&99&0&0&28&1&0008478100&4E124582DEAC0A0CB6271220131137C8*](http://attendance.silicontrace.com/rfid/attendance.aspx?$99999&99&0&0&28&1&0008478100&4E124582DEAC0A0CB6271220131137C8*)

At web server, query the string and insert data values into database tables.

Example (.Net): **Request.QueryString**

6.6 *Server Acknowledgement to above bio request*

As soon as the data received by the web server it should acknowledge to the Device as mentioned below with request for next sequence number and this sequence number will be incremented for every response.

After receiving all the templates, server should respond with 65535 to indicate end of transfer.

\$GETMBIO, RECORDSEQ, #

E.g. \$GETMBIO, 65535, #

Where

RECORD SEQ - sequence number of next record

If RECORDSEQ is 65535 it means that is the end of transfer

6.7 *Biometric Template download One Bio request*

website.com/rfid/attendance.aspx\$DOWNLOADONEBIO&SID&MID&RECORDSEQ&UID*

Where

website.com/rfid/attendance.aspx? - Web Host URL

\$ - Start of data

SID - Org ID (5 digits)

& - Field Differentiator

MID - Machine ID (2 digits)

& RECORD SEQ - sequence number of the template which will be starting from zero

UID - UID of the template to be downloaded from server



* - End of data

attendance.silicontrace.com/rfid/attendance.aspx?\$99999&99&0&8790330567*

At web server, query the string and insert data values into database tables.

Example (.Net): **Request.QueryString**

6.8 Server Acknowledgement to the above bio request

As soon as the data received by the web server it should send data to the Device as mentioned below

\$SENDMBIO, TEMPLATEINDEX, TOTALTEMPLATES, VALID, UID,
BioTemplate, #

E.g. \$SENDMBIO, 0, 1, 1, 8790330567, 4E1056C18B3450965A1, #

Where

website.com/rfid/attendance.aspx?	-	Web Host URL
\$	-	Start of data
SID= XXXXX	-	Org ID (5 digits)
&	-	Field Differentiator
MID= XX	-	Machine ID (2 digits)
&		
TEMPLATEINDEX	-	Template Index (maximum of 4 digits) which
will be starting from zero		
TOTAL TEMPLATES	-	Total Templates (maximum of 4 digits)
VALID	-	Biometric Validity (1 – valid 0 – invalid)
UID	-	UID (maximum of 16 digits)
TEMPLATE	-	Binary Template (maximum of 512 digits)
*	-	End of data



7 GPRS/Wi-Fi HTTP GET Communication Protocol for RFID Enrollments

Create a web page,

For example: attendance.silicontechlabs.com/rfid/attendance.aspx?

7.1 RFID Template Upload All Request

[website.com/rfid/attendance.aspx?\\$UPLOADRF&SID&MID&STATUS&RFINDEX
&TOTALRECORDSLEFT&VALID&UID&RFID*](http://website.com/rfid/attendance.aspx?$UPLOADRF&SID&MID&STATUS&RFINDEX&TOTALRECORDSLEFT&VALID&UID&RFID*)

Where

website.com/rfid/attendance.aspx?	-	Web Host URL
\$	-	Start of data
SID= XXXXX	-	Org ID (5 digits)
&	-	Field Differentiator
MID= XX	-	Machine ID (2 digits)
&		
STATUS	-	status of the transaction (1 digit) (0 for pass and non zero for failed transaction)
RFIDINDEX	-	Template Index (maximum of 4 digits)
TOTALRECORDSLEFT	-	Total Records Left after this record (maximum of 4 digits)
VALID	-	Biometric Validity (1 – valid 0 – invalid)
UID	-	UID (maximum of 16 digits)
RFID	-	RFID (10 digits)
*	-	End of data

[attendance.silicontrace.com/rfid/attendance.aspx?\\$99999&99&0&0&28&1&000847
8100&0003451294*](http://attendance.silicontrace.com/rfid/attendance.aspx?$99999&99&0&0&28&1&0008478100&0003451294*)

At web server, query the string and insert data values into database tables.

Example (.Net): **Request.QueryString**

7.2 Server Acknowledgement to the above Upload Request

As soon as the data received by the web server it should acknowledge to the Device as mentioned below with next record sequence number and this sequence number will be incremented for every time when we send the response.

After receiving the all the templates, server should respond with 65535 to indicate end of transfer.



\$GETMRFID, RECORDSEQ, #

E.g. \$GETMRFID, 1, #

Where

RECORD SEQ - sequence number of next record
If RECORDSEQ is 65535 it means that is the end of transfer

7.3 RFID Template download All Request

website.com/rfid/attendance.aspx\$DOWNLOADR&SID&MID&RECORDSEQ*

Where

website.com/rfid/attendance.aspx?	-	Web Host URL
\$	-	Start of data
SID	-	Org ID (5 digits)
&	-	Field Differentiator
MID	-	Machine ID (2 digits)
& RECORD SEQ	-	sequence number of the template
*	-	End of data

attendance.silicontrace.com/rfid/attendance.aspx?\$99999&99&0*

At web server, query the string and insert data values into database tables.

Example (.Net): **Request.QueryString**

7.4 Server Acknowledgement to the above download request

As soon as the data received by the web server it should acknowledge to the Device as mentioned below

\$SENDMRF, TEMPLATEINDEX, TOTALTEMPLATES, VALID, UID, RFID, #

E.g. \$SENDMBIO, 0, 10, 1, 8790330567, 0005928520, #

Where

website.com/rfid/attendance.aspx?	-	Web Host URL
\$	-	Start of data
SID= XXXXX	-	Org ID (5 digits)



&	-	Field Differentiator
MID= XX	-	Machine ID (2 digits)
&		
TEMPLATEINDEX	-	Template Index (maximum of 4 digits)
TOTAL TEMPLATES	-	Total Templates (maximum of 4 digits)
VALID	-	Biometric Validity (1 – valid 0 – invalid)
UID	-	UID (maximum of 16 digits)
RFID	-	RFID (10 digits)
*	-	End of data

7.5 RFID Template Upload One Request

website.com/rfid/attendance.aspx?\$UPLOADRF&SID&MID&STATUS&0&0&1&UID&RFID*

Where

website.com/rfid/attendance.aspx?	-	Web Host URL
\$	-	Start of data
SID= XXXXX	-	Org ID (5 digits)
&	-	Field Differentiator
MID= XX	-	Machine ID (2 digits)
&		
STATUS	-	status of the transaction (1 digit) (0 for pass and non zero for failed transaction)
RFIDINDEX	-	0
TOTALRECORDSLEFT	-	0
VALID	-	1
UID	-	UID (maximum of 16 digits)
RFID	-	RFID (10 digits)
*	-	End of data

attendance.silicontrace.com/rfid/attendance.aspx?\$99999&99&0&0&0&1&0008478100&0003451294*

At web server, query the string and insert data values into database tables.

Example (.Net): **Request.QueryString**



7.6 Server Acknowledgement to the above upload request

As soon as the data received by the web server it should acknowledge to the Device as mentioned below with next record sequence number and this sequence number will be incremented for every time when we send the response.

After receiving the all the templates, server should respond with 65535 to indicate end of transfer.

\$GETMRFID, RECORDSEQ, #

E.g. \$GETMRFID, 65535, #

Where

RECORD SEQ - sequence number of next record

If RECORDSEQ is 65535 is means that is the end of transfer

7.7 RFID Template download one request

website.com/rfid/attendance.aspx\$DOWNLOADONERF&SID&MID&RECORDSEQ&UID*

Where

website.com/rfid/attendance.aspx? - Web Host URL

\$ - Start of data

SID - Org ID (5 digits)

& - Field Differentiator

MID - Machine ID (2 digits)

& RECORD SEQ - sequence number of the template

UID - UID to be downloaded from server

* - End of data

attendance.silicontrace.com/rfid/attendance.aspx?\$99999&99&0&8790330567*

At web server, query the string and insert data values into database tables.

Example (.Net): **Request.QueryString**



7.8 Server Acknowledgement to the above download request

As soon as the data received by the web server it should acknowledge to the Device as mentioned below

\$SENDMRF, TEMPLATEINDEX, TOTALTEMPLATES, VALID, UID, RFID, #

E.g. \$SENDMRF, 0, 1, 1, 8790330567, 0005928520, #

Where

website.com/rfid/attendance.aspx?	-	Web Host URL
\$	-	Start of data
SID= XXXXX	-	Org ID (5 digits)
&	-	Field Differentiator
MID= XX	-	Machine ID (2 digits)
&		
TEMPLATEINDEX	-	0
TOTAL TEMPLATES	-	1
VALID	-	1
UID	-	UID (maximum of 16 digits)
RFID	-	RFID (10 digits)
*	-	End of data

8 Keypad Interface

- Pres Menu Button on the device
- Enter the default Password “1234”
- Press OK
- Enter the below commands to do the settings as required

*000OK	-	Change the Admin ID
*001OK	-	Change the Machine ID
*002OK	-	Enable the UI for Upload and Download Templates
*777OK	-	Reset to STL Factory Settings including flash erase
*801OK	-	Exit Type of Reader Enabled
*802OK	-	Entry Type of Reader Enabled (Default)
*888OK	-	To Enter into SMS configuration mode (Enter into this mode before sending SMS for device configuration)
*999OK	-	Come out of SMS configuration Mode
*578OK	-	Exit RFID Feature Enabled
*579OK	-	Exit RFID Feature Disabled
*580OK	-	Delete All Records



*563OK	-	SSL Enabled
*564OK	-	SSL Disabled
*566OK	-	Delete All Enrolled Biometric Templates
*576OK	-	Delete All Enrolled RFID Templates
*590OK	-	Reset to STL Factory Defaults without erasing flash
*100OK	-	Get Device Serial Number
*101OK	-	Firmware Version
*500OK	-	To set the Idea APN
*501OK	-	To set the Airtel APN
*502OK	-	To set the Vodafone APN
*503OK	-	To set the Uninor APN
*504OK	-	To set the Bsnl APN
*505OK	-	To set the Aircel APN
*506OK	-	To set the Tata APN
*507OK	-	To set the Reliance APN

9 Device Settings through SMS

- Please insert the SIM in to device and power on device, before inserting the SIM make sure the SIM is working and provided with SMS and GPRS balance.
- Sometimes, device may miss SMS settings, if you don't get any response in 5 min time, please try send the same setting again.
- Send second setting after receiving the response for first.

9.1 Configuration Settings

➤ Register Mobile Number:

*555#005#Your Mobile Number# to the mobile number of the Device

Send the above command from your mobile to the Device Mobile Number and Your mobile will be registered and then onwards device will respond to your mobile only.

Ex: *555#005#+919642893089#

Wait for two minutes

*555#005#Mobile Number#



Ex: *555#005#+919642893089#

First SMS response goes to previous number and

Second SMS response goes to present number.

➤ **Set Host Name and URL: (Maximum of 140 chars)**

*555#001#Web Host URL#portnumber#

Ex:

1. *555#001#attendance.silicontechlabs.com/rfid/attendance.aspx?#80#
Port 80 represents the HTTP communication
2. *555#001#attendance.silicontechlabs.com:6758/rfid/attendance.aspx?#80#
Port 80 represents the HTTP communication and web server is listening on the port number 6758
3. *555#001#187.203.23.45:5698/rfid/attendance.aspx?#80#
Port 80 represents the HTTP communication and web server is listening on the port number 5698 and IP address 187.203.23.45
4. *555#001#187.203.23.45#6234#
Port 6234 represents the TCP/IP communication and Server is listening on the port number 6234 and IP address 187.203.23.45

➤ **Set APN Name: (Maximum of 30 chars)**

*555#002#APN of telecom provider#

Ex: *555#002#internet#

➤ **Set Org ID (5 digits) and Machine ID (2 digits)**

*555#007#xxxxxyy# (Ex: *555#007#9999988#)

➤ **Set Company Name (Maximum of 16 chars)**

*555#003#Company Name# (Ex: *555#003#Silicon Techlabs#)

➤ **Set Date Time**

*555#004#DDMMYYYYHHMMSS#



Ex: *555#004#22032014061050#

➤ **Set Push Data Interval**

*555#006#DataIntervalFrequency (in Seconds) # (Ex: *555#006#30#)

➤ **Enable/Disable the multiple records sending in one request**

*555#008#01# - Enable multiple records

*555#008#00# - Disable sending multiple records

➤ **Enable Web Service Mode**

*555#010#01# - Enable Soap web service

NOTE:

WebService Operation Name: **MachineData**

MachineData operation is fixed and implementers should use the same operation name in their implementations

*555#010#00# - Disable Soap service and Enable HTTP GET

➤ **Enable Exit Only type of Reader**

*555#013#01# - Enable Exit only Type of Reader

*555#013#00# - Disable Exit only type of Reader (i.e. Enable Entry only type of Reader)

➤ **Weigand Exit RFID**

*555#016#01# - Enable the Weigand Exit RFID

*555#016#00# - Disable the Weigand Exit RFID

➤ **SSL Enable/Disable**

*555#017#01# - Enable SSL

*555#017#00# - Disable SSL



- SSL Enable/Disable RTC Auto Update
 - *555#027#01# - Enable Time Auto update from Network
 - *555#027#00# - Disable Time Auto update from network
- SSL Enable/Disable PHP Service
 - *555#031#01# - Enable Sending one record at a time for PHP Server
 - *555#031#00# - Disable Sending one record at a time(Default sends 10 records at a time)
- SSL Enable/Disable Same UID for multiple finger
 - *555#032#01# - Enable Same UID for multiple fingers
 - *555#032#00# - Disable Same UID for multiple fingers (i.e. Enable one finger one UID only)

- **Delete the records** *666#001#
- **Reset the Device** *666#002#
- **Set Device to Factory Mode** *999#001#
- **Delete ALL Biometric Templates** *999#008#
- **Delete ALL RF Templates** *999#009#
- **Upload Biometric Templates** *789#001#
- **Download Biometric Templates** *987#001#
- **Upload RFID Templates** *567#001#
- **Download RFID Templates** *765#001#



9.2 Get Configuration Settings

➤	Get Host URL:	*111#001#
➤	Get APN:	*111#002#
➤	Get Company Name:	*111#003#
➤	Get Current Records Count:	*111#004#
➤	Get Current Date &Time:	*111#005#
➤	Get Org ID and Machine ID:	*111#006#
➤	Get Multiple Records Enable	*111#007#
➤	Get Push Data Interval:	*111#008#
➤	Get Firmware version:	*111#009#
➤	Get Registered Phone Number:	*111#010#
➤	Get IMEI number of the device:	*111#011#
➤	Get the status of web service	*111#012#
➤	Get the status of Exit only Reader	*111#013#
➤	Get the status of Exit Weigand Reader	*111#014#