SCA11H OPERATION MODES

SCA11H

Doc. No. 1324 Rev. 1

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1 Introduction

SCA11H contains operation modes for
1. configuration
2. local communication
3. cloud communication

2 Configuration mode

In configuration mode SCA11H creates its own network with the name muRata_CFG_XXXXXX. In this mode device runs web server and can be configured using WEB browser.

Following configurations and settings can be made

1. Communication – local vs cloud
2. BCG measurement related settings
3. Network settings
4. BCG-calibration
5. Sensor node management – HTTP Authentication account, FW upgrade, WiFi country code etc.

Once completed, device will boot to one of the operation modes: local or cloud communication.

Please refer to [1.] SCA11H Installation Guide for details.

2.1 Device management

Sensor node can be calibrated and maintained using the HTTP API described in [3.] SCA11H Hostless WLAN HTTP API Specification. HTTP authentication is needed for access control.

3 Local communication mode

3.1 Data communication

In local communication mode SCA11H sensor node works as TCP/IP-server and writes output data in ASCII-format in the defined IP-address port 8080.

3.1.1 BCG data

Sensor node reports at 1 Hz rate the following parameters:

Time, HR, RR, SV, HRV, Signal Strength, Status, B2B, B2B', B2B''.

Parameter description is in the Table 1 below.

Table 1 BCG output parameters

Variable	Unit	Description
Time		System timestamp
HR	1/min	Heart rate
RR	1/min	Respiration rate
SV	arbitrary unit	Relative stroke volume

HRV	ms	Simplified heart rate variability
Signal Strength	arbitrary unit	Measured signal strength indication
Status		0 = low signal 1 = ok signal 2 = high signal 3 = (close to) overload 4 = (close to) max HR
B2B	ms	Beat-to-beat time
B2B'	ms	Beat-to-beat time*
B2B''	ms	Beat-to-beat time*

*These parameters are non-zero if two/three beats have been detected during one second. Further information can be found in [2.] BCG Measurement in Beds.

Example data is shown below.

```
10,53,8,76,105,1765,0,950,0,0
11,53,8,78,105,2092,1,1268,0,0
12,53,8,83,82,2121,1,1042,0,0
13,53,8,85,52,1997,1,1058,0,0
14,54,8,86,30,1748,0,1061,0,0
15,55,11,76,64,2501,1,872,0,0
16,55,11,76,64,2080,1,872,0,0
17,55,11,67,97,2369,1,952,1279,0
18,55,11,80,93,2801,1,1218,0,0
```

3.1.2 Raw acceleration data

Sensor node reports raw acceleration data with 1 kHz interval. The raw acceleration data is defined as Table 2.

Table 2 Raw acceleration data

Data type	Unit	Description
S16	LSB	Raw acceleration data approx.. 14900 LSB/g

Example data is shown below.

```
0248,024a,0249,0248,0245,
```

3.2 Device discovery

Simple Service Discovery Protocol SSDP is used. Sensor node's discovery is according to the process below.
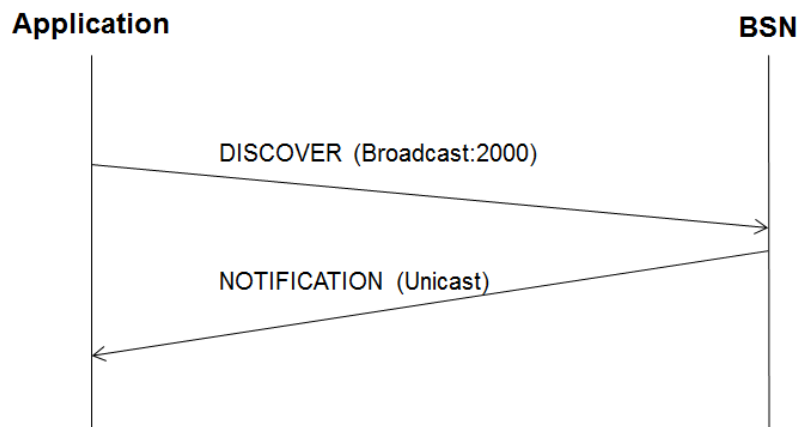
Figure 1 Device discovery

1. Application sends "DISCOVER" packet to broadcast:2000(255.255.255.255:2000) using UDP Packet format in UDP payload:
{"type":"SCS-DISCOVER","hostname":"Host-SCS"}

2. BSN receives "DISCOVER" request then sends "NOTIFICATION" to Application. Packet format in UDP payload:
{"type":"SCS-NOTIFY","hostname":"BSN-5CF8A15D8714","ip":"192.168.0.100","mac":"5CF8A15D8714"}

3. Application extracts IP-address info from the received "NOTIFICATION" response.

3.3 Device management

According to section 2.1

4 Cloud communication mode

4.1 Data communication

In cloud communication mode SCA11H sends BCG processed data to cloud server according to the defined settings [1.] and [4.] SCA11H cloud server interface specification.
During calibration via HTTP API, client can receive BCG data from the defined TCP/IP-address on port 8080. A message is sent by BCG to the cloud server indicating start of calibration [4.].

4.2 Device discovery

According to section 3.2.

4.3 Device management

According to section 2.1

5   References

[1.] SCA11H Installation Guide
[2.] BCG Measurement in Beds
[3.] Product Specification 1424 SCA11H Hostless WLAN HTTP API Specification ENG
[4.] Product Specification 1325 SCA11H cloud server interface specification ENG

6   Document Change Control

Rev.	Date	Change Description
1	24-Aug-15	Document moved to new control system and template, section 2.1 added, references updated.