



BlueMod+S42M Read ESS Data Application Note

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DOCUMENTATION

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APPLICABILITY TABLE

PRODUCTS

■ ■ BLUEMOD+S42M/AI3ATH

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1. INTRODUCTION

1.1. Scope

This document describes the requirements to read sensor data on a BlueMod+S42M device from a BlueMod+S42 running Central firmware by using AT commands.

1.2. Audience

This document is intended for Telit customers, especially system integrators, about to implement Bluetooth modules in their application.

1.3. Contact Information, Support

For general contact, technical support services, technical questions and report documentation errors contact Telit Technical Support at:

- TS-SRD@telit.com

Alternatively, use:

<https://www.telit.com/contact-us>

For detailed information about where you can buy the Telit modules or for recommendations on accessories and components visit:

<https://www.telit.com>

Our aim is to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.

Telit appreciates feedback from the users of our information.

1.4. Text Conventions



Danger – This information **MUST** be followed or catastrophic equipment failure or bodily injury may occur.



Caution or Warning – Alerts the user to important points about integrating the module, if these points are not followed, the module and end user equipment may fail or malfunction.



Tip or Information – Provides advice and suggestions that may be useful when integrating the module.

All dates are in ISO 8601 format, i.e. YYYY-MM-DD.

1.5. Related Documents

- BlueMod+S42/Central AT Command Reference, 80512ST10771A

2. HARDWARE REQUIREMENTS

2.1. BlueMod+S42M

A BlueMod+S42M module that includes a three axis acceleration sensor (3A) and a temperature and humidity sensor (TH) running Peripheral firmware is required.

2.2. BlueMod+S42/Central

A BlueMod+S42 module running Central firmware is required.

3. SOFTWARE SETUP

In both devices (BlueMod+S42M and BlueMod+S42/Central) the UART speed is preconfigured to 115,200 bps.

On the BlueMod+S42/Central module it is recommended to connect the UART based hardware flow control lines RTS and CTS to the host controller. The hardware flow control cannot be disabled.

4. CONNECTION EXAMPLE TO READ “ESS” SERVICE DATA

This chapter describes the procedure to create a GATT connection from the BlueMod+S42/Central to the BlueMod+S42M module using AT commands.

For a detailed description of the AT commands please refer to the *BlueMod+S42/Central AT Command Reference*.

4.1. Initialize Both Devices

green host controller output
red module output

BlueMod+S42M:

```

AT&F1            host controller: load default setting
OK                module:            result message
AT&W            host controller: store value set
OK                module:            result message
AT+RESET        host controller: reset module

ATI99            host controller: read module firmware version
SBM0000 V1.00 Sensor Led P_S42M_V1.00_SENSOR_LED-0-g809f
OK
AT+BOAD         host controller: read Bluetooth address
008025D1D434
OK
  
```


BlueMod+S42/Central:

```

AT&F1      host controller: load default setting
OK         module:      result message
AT&W      host controller: store value set
OK         module:      result message
AT+RESET  host controller: reset module

ATI99      host controller: read module firmware version
SBS4604 V3.010 May 5 2017 10:53:46
OK
AT+BOAD   host controller: read Bluetooth address
00802554F6AA
OK

```

4.2. Create GATT Connection

BlueMod+S42/Central:

```

ATD008025D1D434,GATT
CONNECT GATT 0x10

```

4.3. READ GATT Service

BlueMod+S42/Central:

```

AT+LESRVD=0x10      (use connection handle of CONNECT GATT message)
UUID:1800           (Generic Access Service)
UUID:FEFB           (Terminal I/O Service, TIO)
UUID:181A           (Environmental Sensing Service, ESS)
UUID:180A           (device Information Service, DIS)
OK

```

4.4. READ ESS Service

The result of this service will report the unique characteristic handle value of each sensor.

BlueMod+S42/Central:

```

AT+LESRVD=0x10,u181A      (use conn.handle of CONNECT GATT message and service value)
UUID:181A
0x0015 PROP:0x02 UUID:2A6E      (UUID:2A6E=Temperature)
0x0017 PROP:0x02 UUID:2A6F      (UUID:2A6F=Humidity)
0x0019 PROP:0x0A UUID:00000000000000000000000000000000      (max. Temperature value)
0x001B PROP:0x0A UUID:00000000000000000000000000000000      (max. humidity value)
0x001D PROP:0x02 UUID:00000000000000000000000000000000      (3-axis: X-value)
0x001F PROP:0x02 UUID:00000000000000000000000000000000      (3-axis: Y-value)
0x0021 PROP:0x02 UUID:00000000000000000000000000000000      (3-axis: Z-value)
0x0023 PROP:0x0A UUID:00000000000000000000000000000000      (LED: on/off)
OK

```

4.5. Read Current Temperature Value

Characteristic handle 0x15 is used to read the current temperature value.

BlueMod+S42/Central:

```
AT+LEREAD=0x10,0x15
LEREAD:0x10,0x0015,AE09
OK
```

The result is a signed 16 Bit value.

The value / 100 is the current temperature value in Celsius.

Example: AE09 = 09AE = 2478 / 100 = 24.78 °C

4.6. Read Maximum Temperature Value

Characteristic handle 0x19 is used to read the maximum temperature value.

BlueMod+S42/Central:

```
AT+LEREAD=0x10,0x19
LEREAD:0x10,0x0019,BC09
OK
```

The result is a signed 16 Bit value.

The value / 100 is the current temperature value in Celsius.

The maximum value can be reset with the following command:

```
AT+LEWRITE=0x10,0x19,0000
OK
```

4.7. Read Current Humidity Value

Characteristic handle 0x17 is used to read the current humidity value.

BlueMod+S42/Central:

```
AT+LEREAD=0x10,0x17
LEREAD:0x10,0x0017,5C0F
OK
```

The result is a signed 16 Bit value.

The value / 100 is the relative humidity value in per cent [%].

Example: 5C0F = 0F5C = 3932 / 100 = 39.32 REL%

4.8. Read Maximum Humidity Value

Characteristic handle and 0x1B is used to read the maximum humidity value.

BlueMod+S42/Central:

```
AT+LEREAD=0x10,0x1B
LEREAD:0x10,0x001B,FD0F
OK
```

The result is a signed 16 Bit value.

The value / 100 is the relative humidity value in per cent [%].

The maximum value can be reset with the following command:

```
AT+LEWRITE=0x10,0x1B,0000
OK
```

4.9. Read Current Value of Three Axis Acceleration Sensor X,Y,Z

Characteristic handle 0x1D (X value), 0x1F (Y value), 0x21 (Z value) represents the acceleration sensor value.

BlueMod+S42/Central:

```
AT+LEREAD=0x10,0x1D
LEREAD:0x10,0x001D,D8FF
OK
```

```
AT+LEREAD=0x10,0x1F
LEREAD:0x10,0x001F,0D00
OK
```

```
AT+LEREAD=0x10,0x21
LEREAD:0x10,0x0021,9D0F
OK
```

The result is a signed 16 Bit value.

The value multiplied by 0.00025 is the “g” value.

5. DOCUMENT HISTORY

Revision	Date	Changes
0	2018-02-23	First issue



SUPPORT INQUIRIES

Link to www.telit.com and contact our technical support team for any questions related to technical issues.

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