SMART SHOT TIMER

BLE API VERSION 3.2

The device advertises 128-bit UUID of main Service – 7520FFFF-14D2-4CDA-8B6B-697C554C9311 and name – SG-SST4XYYYYY

where **X** is a model identifier:

‘A’ for SG Timer Sport

‘B’ for SG Timer GO

YYYYY – is the device serial number

Below is an example of a device scan by the nRF Connect application:

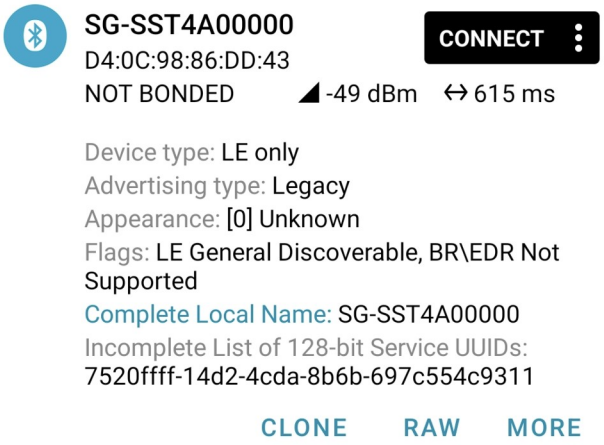

Table 1 – BLE Attribute Table

Name	Type	UUID	Properties
MAIN	Service	7520**FFFF**-14D2-4CDA-8B6B-697C554C9311	–
COMMAND	Characteristic	7520**0000**-14D2-4CDA-8B6B-697C554C9311	W, N
EVENT	Characteristic	7520**0001**-14D2-4CDA-8B6B-697C554C9311	N
SAVED_SESSION_ID_LIST	Characteristic	7520**0002**-14D2-4CDA-8B6B-697C554C9311	R,W
RESERVED	Characteristic	7520**0003**-14D2-4CDA-8B6B-697C554C9311	R
SHOT_LIST	Characteristic	7520**0004**-14D2-4CDA-8B6B-697C554C9311	R, W
PAR_SETUP	Characteristic	7520**0005**-14D2-4CDA-8B6B-697C554C9311	R, W
UNIX_TIME	Characteristic	7520**0006**-14D2-4CDA-8B6B-697C554C9311	R, W
API_VERSION	Characteristic	7520**FFFE**-14D2-4CDA-8B6B-697C554C9311	R

Notes:

R – Read

W – Write

N – Notify

I – Indicate

All multibyte values in any characteristic are represented in Big Endian format

1. **MAIN**

   Main Service of the application

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1.1 COMMAND

Characteristic is used to execute commands

The general format of any command is given below

Field size	1	1	n
Field name	len	cmd_id	cmd_data

len – number of bytes following the current byte
cmd_id – id of the command. See Command Table
cmd_data – command data. See Command Table

After command is received the response is sent by characteristic notification

The general format of any command response is given below

Field size	1	1	1
Field name	len	cmd_id	resp_code

len – number of bytes following the current byte
cmd_id – id of the command. See Command Table
resp_code – code of the response. See Response Codes

Commands can be send consecutively one by one without waiting for a response to every command. Responses (as well as commands) can be easily parsed in the byte stream due to the packet size in the first byte.

Table 2 – Command Table

Command Name	Command ID
SESSION_START	0x00
SESSION_SUSPEND	0x01
SESSION_RESUME	0x02
SESSION_STOP	0x03

Response Codes:

0x00 – Success

0x01 – Error

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1.1.1 SESSION_START

Command is used to start RO session

Field size	1	1
Field name	len	cmd_id

len – number of bytes following the current byte
cmd_id – id of the command. See Command Table

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1.1.2 SESSION_SUSPEND

Command is used to suspend the current RO session

Field size	1	1
Field name	len	cmd_id

len – number of bytes following the current byte
cmd_id – id of the command. See Command Table

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1.1.3 SESSION_RESUME

Command is used to resume the current RO session

Field size	1	1
Field name	len	cmd_id

len – number of bytes following the current byte
cmd_id – id of the command. See Command Table

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1.1.4 SESSION_STOP

Command is used to stop the current RO session

Field size	1	1
Field name	len	cmd_id

len – number of bytes following the current byte
cmd_id – id of the command. See Command Table

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1.2 EVENT

The characteristic is used to notifying of events that occur with the device.

The supported events are summarized in the table below

Table 3 – Events Table

Event Name	Event ID
SESSION_STARTED	0x00
SESSION_SUSPENDED	0x01
SESSION_RESUMED	0x02
SESSION_STOPPED	0x03
SHOT_DETECTED	0x04
SESSION_SET_BEGIN	0x05

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1.2.1 SESSION_STARTED

Event is sent by timer when RO session has been started

Field size	1	1	4	2
Field name	len	event_id	sess_id	start_delay

len – number of bytes following the current byte
event_id – id of the event. See Events Table
sess_id – id of started session (unix time stamp)
start_delay – start delay of started session in units of 0.1 second

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1.2.2 SESSION_SUSPENDED

Event is sent by timer when RO session has been suspended

Field size	1	1	4	2
Field name	len	event_id	sess_id	total_shots

len – number of bytes following the current byte
sess_id – id of the session (unix time stamp)

total_shots – number of shots detected

event_id – id of the event. See Events Table

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1.2.3 SESSION_RESUMED

Event is sent by timer when RO session has been resumed

Field size	1	1	4	2
Field name	len	event_id	sess_id	total_shots

len – number of bytes following the current byte
sess_id – id of the session (unix time stamp)

total_shots – number of shots detected

event_id – id of the event. See Events Table

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1.2.4 SESSION_STOPPED

Event is sent by timer when RO session has been stopped

Field size	1	1	4	2
Field name	len	event_id	sess_id	total_shots

len – number of bytes following the current byte
sess_id – id of the session (unix time stamp)

total_shots – number of shots detected

event_id – id of the event. See Events Table

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1.2.5 SHOT_DETECTED

Event is sent by timer when shot has been detected (RO session only)

Field size	1	1	4	2	4
Field name	len	event_id	sess_id	shot_num	shot_time

len – number of bytes following the current byte
event_id – id of the event. See Events Table
sess_id – id of the session (unix time stamp)

shot_num – number of detected shot
shot_time – shot time in units of 1 millisecond

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1.2.6 SESSION_SET_BEGIN

Event is sent by timer when delay time ends and session set starts

Field size	1	1	4
Field name	len	event_id	sess_id

len – number of bytes following the current byte
event_id – id of the event. See Events Table
sess_id – id of the session (unix time stamp)

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1.3 SAVED_SESSION_ID_LIST

Characteristic is used to read saved session ids.

Characteristic write format is as follows

Field size	4
Field name	sess_id

sess_id – id of the session from which the session list will be started (unix time stamp). When this field is 0xFFFFFFFF then the last (newest) session id will be read

Characteristic read format is as follows

Field size	4
Field name	sess_id

sess_id – id of the session (unix time stamp)

Repeated readings from this characteristic must be performed to read all available saved session ids. Next reading after the last (oldest) session will give the 0xFFFFFFFF value which points to the end of the list. Next reading after this will give the first (oldest) session id (wraparound will occur).
Session ids reads in reverse order (from newest to oldest).

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1.4 SHOT_LIST

Characteristic is used to read the shots of the particular session.

Characteristic write format is as follows

Field size	4
Field name	sess_id

sess_id – id of the session from which the shots will be read (unix time stamp)

Characteristic read format is as follows

Field size	2	4
Field name	shot_number	shot_time

shot_number – shot number (starts from 0)
shot_time – shot time in units of 1 millisecond

Repeated readings from this characteristic must be performed to read all available shots. Next reading after the last shot will give the 0xFFFFFFFF value in **shot_time** which points to the end of the list. Next reading after this will give the first shot (wraparound will occur).
Writing the session id to this characteristic resets the shot number to zero, so that the first read after write will always give the first shot.

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1.5 PAR_SETUP

Characteristic is used to read and write PAR configuration of the RO session.

Characteristic read/write format is as follows

Field size	2	2	2
Field name	start_delay	time_limit	shot_limit

start_delay – start delay of started session in units of 0.1 second. If this value is 0xFFFF then random delay in range 1.0 – 4.0 seconds will be used

time_limit – session time limit in units of 0.1 second. If this value is 0 then time will be unlimited

shot_time – session shot limit. If this value is 0 then shots will be unlimited

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1.6 UNIX_TIME

Characteristic is used to read or write the device local time.

Characteristic read/write format is as follows

Field size	4
Field name	unix_time

unix_time – local time value in units of seconds that have elapsed since Unix Epoch

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1.7 API_VERSION

Characteristic is used to read the current version of API implemented into the timer firmware. Format is the non-terminated ASCII string. For example version 1.0 will read as:

HEX	0x31	0x3E	0x30
ASCII	'1'	'.'	'0'

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