User's Manual

Bluetooth® Low Energy Protocol Stack

API Reference Manual: BLP

Renesas MCU

Target Device

RL78/G1D

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General Precautions in the Handling of MPU/MCU Products

The following usage notes are applicable to all MPU/MCU products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Handling of Unused Pins

   Handle unused pins in accordance with the directions given under Handling of Unused Pins in the manual.

   — The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible. Unused pins should be handled as described under Handling of Unused Pins in the manual.

2. Processing at Power-on

   The state of the product is undefined at the moment when power is supplied.

   — The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the moment when power is supplied.
   In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the moment when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the moment when power is supplied until the power reaches the level at which resetting has been specified.

3. Prohibition of Access to Reserved Addresses

   Access to reserved addresses is prohibited.

   — The reserved addresses are provided for the possible future expansion of functions. Do not access these addresses; the correct operation of LSI is not guaranteed if they are accessed.

4. Clock Signals

   After applying a reset, only release the reset line after the operating clock signal has become stable. When switching the clock signal during program execution, wait until the target clock signal has stabilized.

   — When the clock signal is generated with an external resonator (or from an external oscillator) during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Moreover, when switching to a clock signal produced with an external resonator (or by an external oscillator) while program execution is in progress, wait until the target clock signal is stable.

5. Differences between Products

   Before changing from one product to another, i.e. to a product with a different part number, confirm that the change will not lead to problems.

   — The characteristics of an MPU or MCU in the same group but having a different part number may differ in terms of the internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

How to Use This Manual

1. Purpose and Target Readers

This manual describes the API (Application Program Interface) of the Blood Pressure profile (BLP) of the Bluetooth Low Energy protocol stack (BLE software), which is used to develop Bluetooth applications that incorporate the Renesas Bluetooth low energy microcontroller RL78/G1D. It is intended for users designing application systems incorporating this software. A basic knowledge of microcontrollers and Bluetooth low energy is necessary in order to use this manual.

Related documents

The related documents indicated in this publication may include preliminary versions. However, preliminary versions are not marked as such.

Document Name	Document No.
Bluetooth Low Energy Protocol Stack	
User's Manual	R01UW0095E
API Reference Manual: Basics	R01UW0088E
API Reference Manual: FMP	R01UW0089E
API Reference Manual: PXP	R01UW0090E
API Reference Manual: HTP	R01UW0091E
API Reference Manual: BLP	This manual
API Reference Manual: HOGP	R01UW0093E
API Reference Manual: ScPP	R01UW0094E
API Reference Manual: HRP	R01UW0097E
API Reference Manual: CSCP	R01UW0098E
API Reference Manual: CPP	R01UW0099E
API Reference Manual: GLP	R01UW0103E
API Reference Manual: TIP	R01UW0106E
API Reference Manual: RSCP	R01UW0107E
API Reference Manual: ANP	R01UW0108E
API Reference Manual: PASP	R01UW0109E
API Reference Manual: LNP	R01UW0113E
Application Note: Sample Program	R01AN1375E
Application Note: rBLE Command Specification	R01AN1376E

List of Abbreviations and Acronyms

Abbreviation	Full Form	Remark
ANP	Alert Notification Profile	
ANS	Alert Notification Service	
API	Application Programming Interface	
ATT	Attribute Protocol	
BAS	Battery Service	
BB	Base Band	
BD_ADDR	Bluetooth Device Address	
BLE	Bluetooth low energy	
BLP	Blood Pressure Profile	
BLS	Blood Pressure Service	
CPP	Cycling Power Profile	
CPS	Cycling Power Service	
CSCP	Cycling Speed and Cadence Profile	
CSCS	Cycling Speed and Cadence Service	
CSRK	Connection Signature Resolving Key	
CTS	Current Time Service	
DIS	Device Information Service	
EDIV	Encrypted Diversifier	
FMP	Find Me Profile	
GAP	Generic Access Profile	
GATT	Generic Attribute Profile	
GLP	Glucose Profile	
GLS	Glucose Service	
HCI	Host Controller Interface	
HID	Human Interface Device	
HIDS	HID Service	
HOGP	HID over GATT Profile	
HRP	Heart Rate Profile	
HRS	Heart Rate Service	
HTP	Health Thermometer Profile	
HTS	Health Thermometer Service	
IAS	Immediate Alert Service	
IRK	Identity Resolving Key	
L2CAP	Logical Link Control and Adaptation Protocol	
LE	Low Energy	

Abbreviation	Full Form	Remark
LL	Link Layer	
LLS	Link Loss Service	
LNP	Location and Navigation Profile	
LNS	Location and Navigation Service	
LTK	Long Term Key	
MCU	Micro Controller Unit	
MITM	Man-in-the-middle	
MTU	Maximum Transmission Unit	
NDCS	Next DST Change Service	
OOB	Out of Band	
OS	Operating System	
PASP	Phone Alert Status Profile	
PASS	Phone Alert Status Service	
PXP	Proximity Profile	
RF	Radio Frequency	
RSCP	Running Speed and Cadence Profile	
RSCS	Running Speed and Cadence Service	
RSSI	Received Signal Strength Indication	
RTUS	Reference Time Update Service	
ScPP	Scan Parameters Profile	
ScPS	Scan Parameters Service	
SM	Security Manager	
SMP	Security Manager Protocol	
STK	Short Term Key	
TIP	Time Profile	
TK	Temporary Key	
TPS	Tx Power Service	
UART	Universal Asynchronous Receiver Transmitter	
UUID	Universal Unique Identifier	

Abbreviation	Full Form	Remark
APP	Application	
CSI	Clocked Serial Interface	
IIC	Inter-Integrated Circuit	
RSCIP	Renesas Serial Communication Interface Protocol	
VS	Vendor Specific	

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1. Overview

This manual describes the API (Application Program Interface) of the Blood Pressure profile (BLP) of the Bluetooth Low Energy protocol stack (BLE software), which is used to develop Bluetooth applications that incorporate Renesas Bluetooth low energy microcontroller RL78/G1D.

For details about the organization and features of BLE software, see the Bluetooth Low Energy Protocol Stack User's Manual.

2. Common Definitions

This section describes the definitions common to the API of each profile.

2.1 Service Definitions

This section describes the common definitions of services used by the API of multiple profiles.

Declaration of enumerated type for alert level

```
enum RBLE_SVC_ALT_LVL_enum {
   RBLE_SVC_ALERT_NONE = 0x00,              No alert
   RBLE_SVC_ALERT_MILD,                     Mild alert
   RBLE_SVC_ALERT_HIGH                      High alert
};
```

Declaration of enumerated type for PnP ID characteristic vendor ID field

```
enum RBLE_SVC_PNP_VENDOR_ID_enum {
   RBLE_SVC_SIG_ASSIGNED_ID = 0x01,         Vendor ID assigned by Bluetooth SIG
   RBLE_SVC_USB_ASSIGNED_ID                 Vendor ID assigned by USB Implementer’s
                                            Forum
};
```

Declaration of enumerated type for Name Space field of Characteristic Presentation Format descriptor

```
enum RBLE_SVC_PRESEN_NAMESPASE_enum {
   RBLE_SVC_NAMESPACE_SIG = 0x01,           Defined by Bluetooth SIG
};
```

Declaration of enumerated type for security level of Service

```
enum RBLE_SVC_SEC_LVL_enum {
   RBLE_SVC_SEC_NONE = 0x01,              No security
   RBLE_SVC_SEC_UNAUTH = 0x02,            Require unauthenticated pairing
   RBLE_SVC_SEC_AUTH = 0x04,              Require authenticated pairing
   RBLE_SVC_SEC_AUTZ = 0x08,              Require authorization
   RBLE_SVC_SEC_ENC = 0x10                Require encryption
};
```

Declaration of enumerated type for connection types

```
enum RBLE_PRF_CON_enum {
    RBLE_PRF_CON_DISCOVERY = 0x00,          Configuration connection performed
                                           when connecting for the first time
    RBLE_PRF_CON_NORMAL                     Normal connection performed when
                                           connecting for the second and
                                           subsequent times
};
```

Declaration of enumerated type for client configuration characteristic value

```
enum RBLE_PRF_CLIENT_CONFIG_enum {
    RBLE_PRF_STOP_NTFIND = 0x00,                Stop notification or indication of
                                                characteristic value.
    RBLE_PRF_START_NTF,                         Start notification of
                                                characteristic value.
    RBLE_PRF_START_IND                          Start indication of
                                                characteristic value.
};
```

Declaration of enumerated type for server configuration characteristic value

```
enum RBLE_PRF_SERVER_CONFIG_enum {
    RBLE_PRF_STOP_BRD = 0x00,                   Stop broadcast of characteristic value.
    RBLE_PRF_START_BRD                          Start broadcast of characteristic value.
};
```

2.2 Status Definitions

This section describes the status definitions used by the API of each profile.

- Declaration of enumerated type for rBLE status

```
enum RBLE_STATUS_enum {
    RBLE_OK                          = 0x00,    Normal operation
    RBLE_PRF_ERR_INVALID_PARAM       = 0x90,    Invalid parameter specified for
                                                setting or acquiring a characteristic
                                                value
    RBLE_PRF_ERR_INEXISTENT_HDL,                Invalid handle specified for setting
                                                or acquiring a characteristic value
    RBLE_PRF_ERR_STOP_DISC_CHAR_MISSING,        The characteristic value is missing.
    RBLE_PRF_ERR_MULTIPLE_IAS,                  Multiple IASs exist.
    RBLE_PRF_ERR_INCORRECT_PROP,                Incorrect property
    RBLE_PRF_ERR_MULTIPLE_CHAR,                 Multiple characteristic values exist.
    RBLE_PRF_ERR_NOT_WRITABLE,                  Writing is not permitted.
    RBLE_PRF_ERR_NOT_READABLE,                  Reading is not permitted.
    RBLE_PRF_ERR_REQ_DISALLOWED,                Requesting is not permitted.
    RBLE_PRF_ERR_NTF_DISABLED,                  Notification is disabled.
    RBLE_PRF_ERR_IND_DISABLED,                  Indication is disabled.
    RBLE_PRF_ERR_ATT_NOT_SUPPORTED,             The characteristic value is not
                                                supported.
};
```

Note: Statuses other than the above are described in *API Reference Manual: Basics*.

3. Blood Pressure Profile

This section describes the API of the Blood Pressure profile. The Blood Pressure profile is used to enable a device to obtain blood pressure measurement data from a blood pressure sensor.

3.1 Definitions

This section describes the definitions used by the API of the Blood Pressure profile.

- Declaration of enumerated type for BLP event types

```
enum RBLE_BLP_EVENT_TYPE_enum {
    RBLE_BLP_EVENT_SENSOR_ENABLE_COMP = 0x01,        Sensor enable completion event
                                                     (Parameter: sensor_enable)
    RBLE_BLP_EVENT_SENSOR_DISABLE_COMP,              Sensor disable completion event
                                                     (Parameter: sensor_disable)
    RBLE_BLP_EVENT_SENSOR_ERROR_IND,                 Sensor error indication event
                                                     (Parameter: error_ind)
    RBLE_BLP_EVENT_SENSOR_SEND_MEASUREMENTS_COMP,
                                                     Measured value send completion
                                                     event
                                                     (Parameter: send_measurements)
    RBLE_BLP_EVENT_SENSOR_CFG_INDNTF_IND,            Sensor characteristic
                                                     configuration change indication
                                                     event
                                                     (Parameter: blps_cfg_indntf_ind)
    RBLE_BLP_EVENT_SENSOR_COMMAND_DISALLOWED_IND,
                                                     Command disallowed indication
                                                     event
                                                     (Parameter: cmd_disallowed_ind)
    RBLE_BLP_EVENT_COLLECTOR_ENABLE_COMP = 0x81,
                                                     Collector enable completion event
                                                     (Parameter: collector_enable)
    RBLE_BLP_EVENT_COLLECTOR_DISABLE_COMP,           Collector disable completion
                                                     event
                                                     (Parameter: collector_disable)
    RBLE_BLP_EVENT_COLLECTOR_ERROR_IND,              Collector error indication event
                                                     (Parameter: error_ind)
    RBLE_BLP_EVENT_COLLECTOR_MEASUREMENTS_IND,       Collector measured value
                                                     indication event
                                                     (Parameter: measurements_ind)
    RBLE_BLP_EVENT_COLLECTOR_READ_CHAR_RESPONSE,
                                                     Characteristic value read request
                                                     response event
                                                     (Parameter: rd_char_resp)
    RBLE_BLP_EVENT_COLLECTOR_WRITE_CHAR_RESPONSE,
                                                     Characteristic value write
                                                     request response event
                                                     (Parameter: wr_char_resp)
```

```
    RBLE_BLP_EVENT_COLLECTOR_COMMAND_DISALLOWED_IND
                                                    Command disallowed indication
                                                    event
                                                    (Parameter: cmd_disallowed_ind)
};
```

- Declaration of data type for BLP event types

```
typedef uint8_t RBLE_BLP_EVENT_TYPE;
```

- Declaration of data type for BLP Sensor event callback function

```
typedef void ( *RBLE_BLPS_EVENT_HANDLER )( RBLE_BLPS_EVENT *event );
```

- Declaration of data type for BLP Collector event callback function

```
typedef void ( *RBLE_BLPC_EVENT_HANDLER )( RBLE_BLPC_EVENT *event );
```

- Declaration of enumerated type for blood pressure service/device information service characteristic codes

```
enum RBLE_BLPC_RD_CHAR_CODE_enum {
    RBLE_BLPC_RD_BLS_BM_CFG = 0x00,             Measurement result indication
    RBLE_BLPC_RD_BLS_IC_CFG,                    Intermediate cuff pressure
                                                information notification
    RBLE_BLPC_RD_BLS_BF,                        Blood pressure feature
    RBLE_BLPC_RD_DIS_MANUF,                     Blood pressure sensor system ID
    RBLE_BLPC_RD_DIS_MODEL,                     Blood pressure sensor model
                                                number
    RBLE_BLPC_RD_DIS_SERNB,                     Blood pressure sensor serial
                                                number
    RBLE_BLPC_RD_DIS_HWREV,                     Blood pressure sensor firmware
                                                revision
    RBLE_BLPC_RD_DIS_FWREV,                     Blood pressure sensor hardware
                                                revision
    RBLE_BLPC_RD_DIS_SWREV,                     Blood pressure sensor software
                                                revision
    RBLE_BLPC_RD_DIS_SYSID,                     Blood pressure sensor
                                                manufacturer name
    RBLE_BLPC_RD_DIS_IEEE,                      Blood pressure sensor IEEE
                                                certification information
};
```

- Declaration of enumerated type for blood pressure service characteristic value settings

```
enum RBLE_BLPC_WR_CHAR_CODE_enum {
    RBLE_BLPC_BLDPRS_MEAS_CODE = 0x01,          Measurement result indication
                                                setting
    RBLE_BLPC_INTERM_CUFPRS_CODE                Intermediate cuff pressure
                                                information notification setting
};
```

- Blood pressure service characteristic information structures

```
typedef struct RBLE_BLP_SENSOR_PARAM_t{
    uint16_t     bldprs_meas_ind_en;          Measurement result indication
                                              configuration value
    uint16_t     interm_cufprs_ntf_en;        Intermediate cuff pressure information
                                              notification configuration value
}RBLE_BLP_SENSOR_PARAM;
```

- Blood pressure measurement information structures

```
typedef struct RBLE_BLP_MEASUREMENTS_INFO_t {
    uint8_t          flag_stable_meas;          Measurement-in-progress flag
    uint8_t          flags;                     Data field flag
    int16_t          press_val_field1;          Systolic blood pressure value/
                                                Cuff pressure
    int16_t          press_val_field2;          Diastolic blood pressure value/
                                                Subfield 1
    int16_t          press_val_field3;          Average blood pressure/Subfield 2
    RBLE_DATE_TIME stamp;                       Time stamp
    int16_t          rate;                      Heart rate
    uint8_t          id;                        User ID
    uint8_t          reserved;                  Reserved
    uint16_t         meas_sts;                  Measurement status
}RBLE_BLP_MEASUREMENTS_INFO;
```

- Blood pressure service content structures

```
typedef struct RBLE_BLS_CONTENT_t{
    uint16_t        shdl;                       Blood pressure service start handle
    uint16_t        ehdl;                       Blood pressure service end handle
    uint16_t        bldprs_meas_char_hdl;       Blood pressure measurement
                                                characteristic handle
    uint16_t        bldprs_meas_val_hdl;        Blood pressure measurement
                                                characteristic value handle
    uint16_t        bldprs_meas_cfg_hdl;        Blood pressure measurement client
                                                characteristic configuration
                                                descriptor handle
    uint8_t         bldprs_meas_prop;           Blood pressure measurement
                                                characteristic property
    uint8_t         reserved;                   Reserved
    uint16_t        interm_cufprs_char_hdl;     Intermediate cuff pressure
                                                characteristic handle
    uint16_t        interm_cufprs_val_hdl;      Intermediate cuff pressure
                                                characteristic value handle
    uint16_t        interm_cufprs_cfg_hdl;      Intermediate cuff pressure client
                                                characteristic configuration
                                                descriptor handle
    uint8_t         interm_cufprs_prop;         Intermediate cuff pressure
                                                characteristic property
    uint8_t         reserved2;                  Reserved
    uint16_t        bldprs_feat_char_hdl;       Blood pressure feature
                                                characteristic handle
    uint16_t        bldprs_feat_val_hdl;        Blood pressure feature
                                                characteristic value handle
    uint8_t         bldprs_feat_prop;           Blood pressure feature
                                                characteristic property
    uint8_t         reserved3;                  Reserved
}RBLE_BLS_CONTENT;
```

- BLP Sensor event parameter structures

```
typedef struct RBLE_BLPS_EVENT_t {
    RBLE_BLP_EVENT_TYPE             type;           BLP event type
    uint8_t                         reserved;       Reserved
    union Event_Bls_Parameter_u {
        Generic event
        RBLE_STATUS                 status;         Status

        Sensor enable completion event
        struct RBLE_BLP_Sensor_Enable_t{
            RBLE_STATUS             status;         Status
            uint8_t                 reserved;       Reserved
            uint16_t                conhdl;         Connection handle
        }sensor_enable;
```

```
        Sensor disable completion event
        struct RBLE_BLP_Sensor_Disable_t{
            uint16_t                conhdl;          Connection handle
            RBLE_BLP_SENSOR_PARAM   sensor_info;     Blood pressure service
                                                     information
        }sensor_disable;

        Sensor error indication event
        struct RBLE_BLP_Sensor_Error_Ind_t{
            uint16_t                conhdl;          Connection handle
            RBLE_STATUS             status;          Status
        }error_ind;

        Sensor measured value send completion event
        struct RBLE_BLP_Sensor_Send_Measurements_t{
            uint16_t                conhdl;          Connection handle
            RBLE_STATUS             status;          Status
        }send_measurements;

        Sensor characteristic configuration change indication event
        struct RBLE_BLP_Sensor_Cfg_Indntf_Ind_t{
            uint16_t                conhdl;          Connection handle
            uint8_t                 char_code;       Status
            uint8_t                 reserved;        Reserved
            uint16_t                cfg_val;         Configuration
                                                     characteristic value
        }blps_cfg_indntf_ind;

        Sensor command disallowed indication event
        struct RBLE_BLP_Sensor_Command_Disallowed_Ind_t{
            RBLE_STATUS             status;          Status
            uint8_t                 reserved;        Reserved
            uint16_t                opcode;          Opcode
        }cmd_disallowed_ind;
    } param;
} RBLE_BLPS_EVENT;
```

- BLP Collector event parameter structures

```
typedef struct RBLE_BLPC_EVENT_t {
    RBLE_BLP_EVENT_TYPE            type;                 BLP event type
    uint8_t                        reserved;             Reserved
    union Event_Blc_Parameter_u {
        Generic event
        RBLE_STATUS                status;               Status

        Collector enable completion event
        struct RBLE_BLP_Collector_Enable_t{
            RBLE_STATUS            status;               Status
            uint8_t                reserved;             Reserved
            uint16_t               conhdl;               Connection handle
            RBLE_BLS_CONTENT       bls;                  Blood pressure service
                                                         content
            RBLE_DIS_CONTENT       dis;                  Device information service
                                                         content
        }collector_enable;

        Collector disable completion event
        struct RBLE_BLP_Collector_Disable_t{
            RBLE_STATUS            status;               Status
            uint8_t                reserved;             Reserved
            uint16_t               conhdl;               Connection handle
        }collector_disable;

        Collector error indication event
        struct RBLE_BLP_Collector_Error_Ind_t{
            RBLE_STATUS            status;               Status
            uint8_t                reserved;             Reserved
            uint16_t               conhdl;               Connection handle
        }error_ind;

        Collector blood pressure measurement information indication event
        struct RBLE_BLP_Collector_Measurements_Ind_t{
            uint16_t                    conhdl;          Connection handle
            RBLE_BLP_MEASUREMENTS_INFO  measurements_info;  Blood pressure
                                                            measurement
                                                            information
        }measurements_ind;

        Collector characteristic value read request response event
        struct RBLE_BLP_Collector_Read_Char_Response_t{
            uint16_t               conhdl;               Connection handle
            uint8_t                att_code;             Status
            RBLE_ATT_INFO_DATA     data;                 Acquired characteristic
                                                         data
```

```
        }rd_char_resp;

        Collector characteristic value write request response event
        struct RBLE_BLP_Collector_Write_Char_Response_t{
            uint16_t                conhdl;                Connection handle
            uint8_t                 att_code;              Status
        }wr_char_resp;

        Collector command disallowed indication event
        struct RBLE_BLP_Collector_Command_Disallowed_Ind_t{
            RBLE_STATUS             status;                Status
            uint8_t                 reserved;              Reserved
            uint16_t                opcode;                Opcode
        }cmd_disallowed_ind;
    } param;
} RBLE_BLPC_EVENT;
```

3.2 Functions

The following table shows the API functions defined for the BLP of rBLE and the following sections describe the API functions in detail.

Table 3-1 API Functions Used by the BLP

RBLE_BLP_Sensor_Enable	Enables the Sensor role.
RBLE_BLP_Sensor_Disable	Disables the Sensor role.
RBLE_BLP_Sensor_Send_Measurements	Sends the measured value.
RBLE_BLP_Collector_Enable	Enables the Collector role.
RBLE_BLP_Collector_Disable	Disables the Collector role.
RBLE_BLP_Collector_Read_Char	Reads the characteristic value.
RBLE_BLP_Collector_Write_Char	Writes the characteristic value.

3.2.1 RBLE_BLP_Sensor_Enable

RBLE_STATUS RBLE_BLP_Sensor_Enable(uint16_t conhdl, uint8_t sec_lvl, uint8_t con_type, RBLE_BLP_SENSOR_PARAM *param, RBLE_BLPS_EVENT_HANDLER call_back)				
This function enables the BLP Sensor role. If the measurement result indication and intermediate cuff pressure information notification setting has been specified from the Collector, set the indication/notification setting parameter to 0 to configure the connection. If this setting or information has been specified from the Sensor, perform a normal connection in accordance with the indication/notification setting parameter. The result is reported by using the Sensor role enable completion event RBLE_BLP_EVENT_SENSOR_ENABLE_COMP.				
Parameters:				
conhdl	Connection handle			
sec_lvl	Security level			
con_type	RBLE_PRF_CON_DISCOVERY	Configuration connection		
	RBLE_PRF_CON_NORMAL	Normal connection		
*param	*bldprs_meas_ind_en*	RBLE_PRF_STOP_NTFIND	Stop indication of the measurement result.	
		RBLE_PRF_START_IND	Start indication of the measurement result.	
	interm_cufprs_ntf_en	RBLE_PRF_STOP_NTFIND	Stop notification of the intermediate cuff pressure information.	
		RBLE_PRF_START_NTF	Start notification of the intermediate cuff pressure information.	
call_back	Specify the callback function that reports the BLP event.			
Return:				
RBLE_OK	Success			
RBLE_ERR	Error occurred in BLP Sensor role enable processing			
RBLE_PARAM_ERR	Invalid parameter			
RBLE_STATUS_ERROR	Not executable because the rBLE mode is other than RBLE_MODE_ACTIVE.			

3.2.2 RBLE_BLP_Sensor_Disable

RBLE_STATUS RBLE_BLP_Sensor_Disable(uint16_t conhdl)	
This function disables the BLP Sensor role. The result is reported by using the Sensor role disable completion event RBLE_BLP_EVENT_SENSOR_DISABLE_COMP.	
Parameters:	
conhdl	Connection handle
Return:	
RBLE_OK	Success
RBLE_STATUS_ERROR	Not executable because the rBLE mode is other than RBLE_MODE_ACTIVE.

3.2.3 RBLE_BLP_Sensor_Send_Measurements

RBLE_STATUS RBLE_BLP_Sensor_Send_Measurements(uint16_t conhdl,
RBLE_BLP_MEASUREMENTS_INFO *measurements_info)

This function sends the measured value data from the blood pressure sensor.
To send intermediate cuff pressure information from the blood pressure sensor, set flag_stable_meas to 0 and save the cuff pressure information in press_val_field1 before executing this function. To send the measurement result after the blood pressure sensor has completed measuring the cuff pressure, set flag_stable_meas to 1 and save the cuff pressure information in press_val_field1, press_val_field2, and press_val_field3 before executing this function.
The result is reported by using the Sensor role measured value send completion event RBLE_BLP_EVENT_SENSOR_SEND_MEASUREMENTS_COMP.

Parameters:

conhdl			Connection handle
**measurements_info*	*flag_stable_meas*		Flag indicating that measurement is in progress (0) or that measurement is not in progress (1)
	flags		Flag that defines whether there is a data field in the characteristic value or not
	press_val_field1		Measurement result: Systolic blood pressure value Measurement-in-progress: Cuff pressure
	press_val_field2		Measurement result: Diastolic blood pressure value Measurement-in-progress: Subfield 1 (normal value: 0x07FF)
	press_val_field3		Measurement result: Average blood pressure Measurement-in-progress: Subfield 2 (normal value: 0x07FF)
	stamp	*year*	Year
		month	Month
		day	Day
		hour	Hour
		min	Minute
		sec	Second
	rate		Heart rate
	id		User ID
	meas_sts		Measurement status

Return:

RBLE_OK	Success
RBLE_STATUS_ERROR	Not executable because the rBLE mode is other than RBLE_MODE_ACTIVE.

3.2.4 RBLE_BLP_Collector_Enable

RBLE_STATUS RBLE_BLP_Collector_Enable(uint16_t conhdl, uint8_t con_type, RBLE_BLS_CONTENT *bls, RBLE_DIS_CONTENT *dis, RBLE_BLPC_EVENT_HANDLER call_back)

This function enables the BLP Collector role and starts access to the services exposed by the BLP Sensor. The result is reported by using the Collector role enable completion event RBLE_BLP_EVENT_COLLECTOR_ENABLE_COMP.
When starting access to the service exposed by a BLP Sensor to be connected for the first time, set 0 to the parameter of the service to configure the connection and to discover the service for the Sensor. If the handle information about the discovered service is saved and is used when the Sensor is connected for a second or subsequent time, detecting the service is skipped, which enables a high-speed access to the service.
While the Collector role is enabled, the service exposed by only one BLP Sensor is accessible. To connect to more than one Sensor at the same time and access the services exposed by each Sensor, repeat enable/disable of the Collector role in order to switch access to them. At that time, perform normal connection by using the connection handle (which was obtained when connecting to each Sensor) and the handle information (which was saved when starting access to the service for the first time) as parameters.

Parameters:

conhdl	Connection handle	
con_type	RBLE_PRF_CON_DISCOVERY	Configuration connection performed when connecting for the first time
	RBLE_PRF_CON_NORMAL	Normal connection performed when connecting for the second and subsequent times
*bls	*shdl*	Blood pressure service start handle
	ehdl	Blood pressure service end handle
	bldprs_meas_char_hdl	Blood pressure measurement characteristic handle
	bldprs_meas_val_hdl	Blood pressure measurement characteristic value handle
	bldprs_meas_cfg_hdl	Blood pressure measurement client characteristic configuration descriptor handle
	bldprs_meas_prop	Blood pressure measurement characteristic property
	interm_cufprs_char_hdl	Intermediate cuff pressure characteristic handle
	interm_cufprs_val_hdl	Intermediate cuff pressure characteristic value handle
	interm_cufprs_cfg_hdl	Intermediate cuff pressure client characteristic configuration descriptor handle
	interm_cufprs_prop	Intermediate cuff pressure characteristic property
	bldprs_feat_char_hdl	Blood pressure feature characteristic handle
	bldprs_feat_val_hdl	Blood pressure feature characteristic value handle
	bldprs_feat_prop	Blood pressure feature characteristic property
*dis	*shdl*	Device information service start handle
	ehdl	Device information service end handle
	sys_id_char_hdl	System ID characteristic handle
	sys_id_val_hdl	System ID characteristic value handle
	sys_id_prop	System ID characteristic property
	model_nb_char_hdl	Model number characteristic handle
	model_nb_val_hdl	Model number characteristic value handle
	model_nb_prop	Model number characteristic property

		serial_nb_char_hdl	Serial number characteristic handle
		serial_nb_val_hdl	Serial number characteristic value handle
		serial_nb_prop	Serial number characteristic property
		fw_rev_char_hdl	Firmware revision characteristic handle
		fw_rev_val_hdl	Firmware revision characteristic value handle
		fw_rev_prop	Firmware revision characteristic property
		hw_rev_char_hdl	Hardware revision characteristic handle
		hw_rev_val_hdl	Hardware revision characteristic value handle
		hw_rev_prop	Hardware revision characteristic property
		sw_rev_char_hdl	Software revision characteristic handle
		sw_rev_val_hdl	Software revision characteristic value handle
		sw_rev_prop	Software revision characteristic property
		manuf_name_char_hdl	Manufacturer name characteristic handle
		manuf_name_val_hdl	Manufacturer name characteristic value handle
		manuf_name_prop	Manufacturer name characteristic property
		ieee_certif_char_hdl	IEEE certification characteristic handle
		ieee_certif_val_hdl	IEEE certification characteristic value handle
		ieee_certif_prop	IEEE certification characteristic property
	call_back	Specify the callback function that reports the BLP event.	

Return:

RBLE_OK	Success
RBLE_ERR	Error occurred in BLP Collector role enable processing
RBLE_PARAM_ERR	Invalid parameter
RBLE_STATUS_ERROR	Not executable because the rBLE mode is other than RBLE_MODE_ACTIVE.

3.2.5 RBLE_BLP_Collector_Disable

RBLE_STATUS RBLE_BLP_Collector_Disable(uint16_t conhdl)

This function disables the BLP Collector role and terminates access to the service exposed by the BLP Sensor.
The result is reported by using the Collector role disable completion event RBLE_BLP_EVENT_COLLECTOR_DISABLE_COMP.

Parameters:

conhdl	Connection handle

Return:

RBLE_OK	Success
RBLE_STATUS_ERROR	Not executable because the rBLE mode is other than RBLE_MODE_ACTIVE.

3.2.6 RBLE_BLP_Collector_Read_Char

RBLE_STATUS RBLE_BLP_Collector_Read_Char(uint16_t conhdl, uint8_t char_code)		
This function reads the characteristic value of the blood pressure service and the device information service. The result is reported by using the characteristic value read request response event RBLE_BLP_EVENT_COLLECTOR_READ_CHAR_RESPONSE.		
Parameters:		
conhdl	Connection handle	
char_code	RBLE_BLPC_RD_BLS_BM_CFG	Measurement result indication setting
	RBLE_BLPC_RD_BLS_IC_CFG	Intermediate cuff pressure information notification setting
	RBLE_BLPC_RD_BLS_BF	Blood pressure feature setting
	RBLE_BLPC_RD_DIS_SYSID	Blood pressure sensor system ID
	RBLE_BLPC_RD_DIS_MODEL	Blood pressure sensor model number
	RBLE_BLPC_RD_DIS_SERNB	Blood pressure sensor serial number
	RBLE_BLPC_RD_DIS_FWREV	Blood pressure sensor firmware revision
	RBLE_BLPC_RD_DIS_HWREV	Blood pressure sensor hardware revision
	RBLE_BLPC_RD_DIS_SWREV	Blood pressure sensor software revision
	RBLE_BLPC_RD_DIS_MANUF	Blood pressure sensor manufacturer name
	RBLE_BLPC_RD_DIS_IEEE	Blood pressure sensor IEEE certification information
Return:		
RBLE_OK	Success	
RBLE_STATUS_ERROR	Not executable because the rBLE mode is other than RBLE_MODE_ACTIVE.	

3.2.7 RBLE_BLP_Collector_Write_Char

RBLE_STATUS RBLE_BLP_Collector_Write_Char(uint16_t conhdl, uint8_t char_code, uint16_t cfg_val)		
This function writes the characteristic configuration descriptor of the blood pressure service and the device information service. The result is reported by using the characteristic value write request response event RBLE_BLP_EVENT_COLLECTOR_WRITE_CHAR_RESPONSE.		
Parameters:		
conhdl	Connection handle	
char_code	RBLE_BLPC_BLDPRS_MEAS_CODE	Measurement result indication setting
	RBLE_BLPC_INTERM_CUFPRS_CODE	Intermediate cuff pressure information notification setting
cfg_val	RBLE_PRF_STOP_NTFIND	Stop notification or indication.
	RBLE_PRF_START_NTF	Start notification.
	RBLE_PRF_START_IND	Start indication.
Return:		
RBLE_OK	Success	
RBLE_STATUS_ERROR	Not executable because the rBLE mode is other than RBLE_MODE_ACTIVE.	

3.3 Events

The following table shows the events defined for the BLP of rBLE and the following sections describe the events in detail.

Table 3-2 Events Defined for the BLP

RBLE_BLP_EVENT_SENSOR_ENABLE_COMP	Sensor role enable completion event
RBLE_BLP_EVENT_SENSOR_DISABLE_COMP	Sensor role disable completion event
RBLE_BLP_EVENT_SENSOR_ERROR_IND	Sensor role error indication event
RBLE_BLP_EVENT_SENSOR_SEND_MEASUREMENTS_COMP	Measured value send completion event
RBLE_BLP_EVENT_SENSOR_CFG_INDNTF_IND	Characteristic value indication event
RBLE_BLP_EVENT_SENSOR_COMMAND_DISALLOWED_IND	Sensor role command disallowed indication event
RBLE_BLP_EVENT_COLLECTOR_ENABLE_COMP	Collector role enable completion event
RBLE_BLP_EVENT_COLLECTOR_DISABLE_COMP	Collector role disable completion event
RBLE_BLP_EVENT_COLLECTOR_ERROR_IND	Collector role error indication event
RBLE_BLP_EVENT_COLLECTOR_MEASUREMENTS_IND	Measured value indication event
RBLE_BLP_EVENT_COLLECTOR_READ_CHAR_RESPONSE	Characteristic value read request response event
RBLE_BLP_EVENT_COLLECTOR_WRITE_CHAR_RESPONSE	Characteristic value write request response event
RBLE_BLP_EVENT_COLLECTOR_COMMAND_DISALLOWED_IND	Collector role command disallowed indication event

3.3.1 RBLE_BLP_EVENT_SENSOR_ENABLE_COMP

RBLE_BLP_EVENT_SENSOR_ENABLE_COMP		
This event reports the result of enabling the BLP Sensor role (RBLE_BLP_Sensor_Role_Enable).		
Parameters:		
	status	Result of enabling the Sensor role (See *2.2* and *Bluetooth Low Energy Protocol Stack API Reference Manual: Basics, 3.2, Declaration of enumerated type for rBLE status*.)
	conhdl	Connection handle

3.3.2 RBLE_BLP_EVENT_SENSOR_DISABLE_COMP

RBLE_BLP_EVENT_SENSOR_DISABLE_COMP				
This event reports the result of disabling the BLP Sensor role (RBLE_BLP_Sensor_Role_Disable).				
Parameters:				
	conhdl	Connection handle		
	sensor_info	*bldprs_meas_ind_en*	RBLE_PRF_STOP_NTFIND	Stop notification/indication of the measurement result.
			RBLE_PRF_START_IND	Start indication of the measurement result.
		interm_cufprs_ntf_en	RBLE_PRF_STOP_NTFIND	Stop notification/indication of the intermediate cuff pressure information.
			RBLE_PRF_START_NTF	Start notification of the intermediate cuff pressure information.

3.3.3 RBLE_BLP_EVENT_SENSOR_ERROR_IND

RBLE_BLP_EVENT_SENSOR_ERROR_IND		
This event indicates an error code unique to the BLP Sensor role.		
Parameters:		
	conhdl	Connection handle
	status	Error code (See *2.2* and *Bluetooth Low Energy Protocol Stack API Reference Manual: Basics, 3.2, Declaration of enumerated type for rBLE status*.)

3.3.4 RBLE_BLP_EVENT_SENSOR_SEND_MEASUREMENTS_COMP

RBLE_BLP_EVENT_SENSOR_SEND_MEASUREMENTS_COMP		
This event reports completion of sending the measured value (RBLE_BLP_Sensor_Send_Measurements).		
Parameters:		
	conhdl	Connection handle
	status	Measured value send completion result (See *2.2* and *Bluetooth Low Energy Protocol Stack API Reference Manual: Basics, 3.2, Declaration of enumerated type for rBLE status*.)

3.3.5 RBLE_BLP_EVENT_SENSOR_CFG_INDNTF_IND

RBLE_BLP_EVENT_SENSOR_CFG_INDNTF_IND			
This event reports that the value of the client characteristic configuration descriptor of the blood pressure service has been written.			
Parameters:			
	conhdl	Connection handle	
	char_code	RBLE_BLPC_BLDPRS_MEAS_CODE	Measurement result indication setting
		RBLE_BLPC_INTERM_CUFPRS_CODE	Intermediate cuff pressure information notification setting
	cfg_val	RBLE_PRF_STOP_NTFIND	Stop notification or indication.
		RBLE_PRF_START_NTF	Start notification.
		RBLE_PRF_START_IND	Start indication.

3.3.6 RBLE_BLP_EVENT_SENSOR_COMMAND_DISALLOWED_IND

RBLE_BLP_EVENT_SENSOR_COMMAND_DISALLOWED_IND			
This event indicates the error that occurs when a command executed by the Sensor role cannot be accepted.			
Parameters:			
	status	Result of command execution (See *2.2* and *Bluetooth Low Energy Protocol Stack API Reference Manual: Basics, 3.2, Declaration of enumerated type for rBLE status*.)	
	opcode	RBLE_CMD_BLP_SENSOR_ENABLE	Sensor enable command
		RBLE_CMD_BLP_SENSOR_DISABLE	Sensor disable command
		RBLE_CMD_BLP_SENSOR_SEND_MEASUREMENTS	Measured data send command

3.3.7 RBLE_BLP_EVENT_COLLECTOR_ENABLE_COMP

RBLE_BLP_EVENT_COLLECTOR_ENABLE_COMP		
This event reports the result of enabling the BLP Collector role (RBLE_BLP_Collector_Role_Enable). Save the obtained handle information about the discovered service, to enable a high-speed access to the service without service detection when restarting access to the service.		
Parameters:		
status	Result of enabling the Collector role (See *2.2* and *Bluetooth Low Energy Protocol Stack API Reference Manual: Basics, 3.2, Declaration of enumerated type for rBLE status*.)	
conhdl	Connection handle	
bls	*shdl*	Blood pressure service start handle
	ehdl	Blood pressure service end handle
	bldprs_meas_char_hdl	Blood pressure measurement characteristic handle
	bldprs_meas_val_hdl	Blood pressure measurement characteristic value handle
	bldprs_meas_cfg_hdl	Blood pressure measurement client characteristic configuration descriptor handle
	bldprs_meas_prop	Blood pressure measurement characteristic property
	interm_cufprs_char_hdl	Intermediate cuff pressure characteristic handle
	interm_cufprs_val_hdl	Intermediate cuff pressure characteristic value handle
	interm_cufprs_cfg_hdl	Intermediate cuff pressure client characteristic configuration descriptor handle
	interm_cufprs_prop	Intermediate cuff pressure characteristic property
	bldprs_feat_char_hdl	Blood pressure feature characteristic handle
	bldprs_feat_val_hdl	Blood pressure feature characteristic value handle
	bldprs_feat_prop	Blood pressure feature characteristic property
dis	*shdl*	Start handle
	ehdl	End handle
	sys_id_char_hdl	System ID characteristic handle
	sys_id_val_hdl	System ID characteristic value handle
	sys_id_prop	System ID characteristic property
	model_nb_char_hdl	Model number characteristic handle
	model_nb_val_hdl	Model number characteristic value handle
	model_nb_prop	Model number characteristic property
	serial_nb_char_hdl	Serial number characteristic handle
	serial_nb_val_hdl	Serial number characteristic value handle
	serial_nb_prop	Serial number characteristic property
	fw_rev_char_hdl	Firmware revision characteristic handle
	fw_rev_val_hdl	Firmware revision characteristic value handle
	fw_rev_prop	Firmware revision characteristic property
	hw_rev_char_hdl	Hardware revision characteristic handle
	hw_rev_val_hdl	Hardware revision characteristic value handle
	hw_rev_prop	Hardware revision characteristic property
	sw_rev_char_hdl	Software revision characteristic handle
	sw_rev_val_hdl	Software revision characteristic value handle
	sw_rev_prop	Software revision characteristic property
	manuf_name_char_hdl	Manufacturer name characteristic handle

		manuf_name_val_hdl	Manufacturer name characteristic value handle
		manuf_name_prop	Manufacturer name characteristic property
		ieee_certif_char_hdl	IEEE certification characteristic handle
		ieee_certif_val_hdl	IEEE certification characteristic value handle
		ieee_certif_prop	IEEE certification characteristic property

3.3.8 RBLE_BLP_EVENT_COLLECTOR_DISABLE_COMP

RBLE_BLP_EVENT_COLLECTOR_DISABLE_COMP		
This event reports the result of disabling the BLP Collector role (RBLE_BLP_Collector_Role_Disable).		
Parameters:		
	status	Result of disabling the Collector role (See *2.2* and *Bluetooth Low Energy Protocol Stack API Reference Manual: Basics, 3.2, Declaration of enumerated type for rBLE status*.)
	conhdl	Connection handle

3.3.9 RBLE_BLP_EVENT_COLLECTOR_ERROR_IND

RBLE_BLP_EVENT_COLLECTOR_ERROR_IND		
This event indicates an error code unique to the BLP Collector role.		
Parameters:		
	status	Error code (See *2.2* and *Bluetooth Low Energy Protocol Stack API Reference Manual: Basics, 3.2, Declaration of enumerated type for rBLE status*.)
	conhdl	Connection handle

3.3.10 RBLE_BLP_EVENT_COLLECTOR_MEASUREMENTS_IND

RBLE_BLP_EVENT_COLLECTOR_MEASUREMENTS_IND			
This event indicates the measured value sent from the Sensor. When sending intermediate cuff pressure information, the cuff pressure information is indicated with flag_stable_meas set to 0 and then saved in press_val_field1. When sending the cuff pressure information after measurement is complete, the cuff pressure information is indicated with flag_stable_meas set to 1 and then saved in press_val_field1, press_val_field2, and press_val_field3.			
Parameters:			
conhdl	Connection handle		
measurements_info	*flag_stable_meas*		Flag indicating that measurement is in progress (0) or that measurement is not in progress (1)
	flags		Flag that defines whether there is a data field in the characteristic value or not
	press_val_field1		Measurement result: Systolic blood pressure value Measurement-in-progress: Cuff pressure
	press_val_field2		Measurement result: Diastolic blood pressure value Measurement-in-progress: Subfield 1 (normal value: 0x07FF)
	press_val_field3		Measurement result: Average blood pressure Measurement-in-progress: Subfield 2 (normal value: 0x07FF)
	stamp	*year*	Year
		month	Month
		day	Day
		hour	Hour
		min	Minute
		sec	Second
	rate		Heart rate
	id		User ID
	meas_sts		Measurement status

3.3.11 RBLE_BLP_EVENT_COLLECTOR_READ_CHAR_RESPONSE

RBLE_BLP_EVENT_COLLECTOR_READ_CHAR_RESPONSE			
This event indicates the response to the characteristic value acquisition request (RBLE_BLP_Collector_Read_Char). Read out the acquired data in accordance with the contents of the request.			
Parameters:			
conhdl	Connection handle		
att_code	0x00	Characteristic value successfully acquired	
	Other than 0x00	Error occurred when acquiring characteristic value	
data	*each_len*		Length of each result
	len		Data length
	data[RBLE_ATTM_MAX_VALUE]		Read characteristic data

3.3.12 RBLE_BLP_EVENT_COLLECTOR_WRITE_CHAR_RESPONSE

RBLE_BLP_EVENT_COLLECTOR_WRITE_CHAR_RESPONSE			
This event indicates the response to the characteristic value write request (RBLE_BLP_Collector_Write_Char).			
Parameters:			
	conhdl	Connection handle	
	att_code	0x00	Characteristic value successfully written
		Other than 0x00	Error occurred when writing characteristic value

3.3.13 RBLE_BLP_EVENT_COLLECTOR_COMMAND_DISALLOWED_IND

RBLE_BLP_EVENT_COLLECTOR_COMMAND_DISALLOWED_IND			
This event indicates the error that occurs when a command executed by the Collector role cannot be accepted.			
Parameters:			
	status	Result of command execution (See *2.2* and *Bluetooth Low Energy Protocol Stack API Reference Manual: Basics, 3.2, Declaration of enumerated type for rBLE status*.)	
	opcode	RBLE_CMD_BLP_COLLECTOR_ENABLE	Collector enable command
		RBLE_CMD_BLP_COLLECTOR_DISABLE	Collector disable command
		RBLE_CMD_BLP_COLLECTOR_READ_CHAR	Characteristic read command
		RBLE_CMD_BLP_COLLECTOR_WRITE_CHAR	Characteristic write command

3.4 Message Sequence Chart

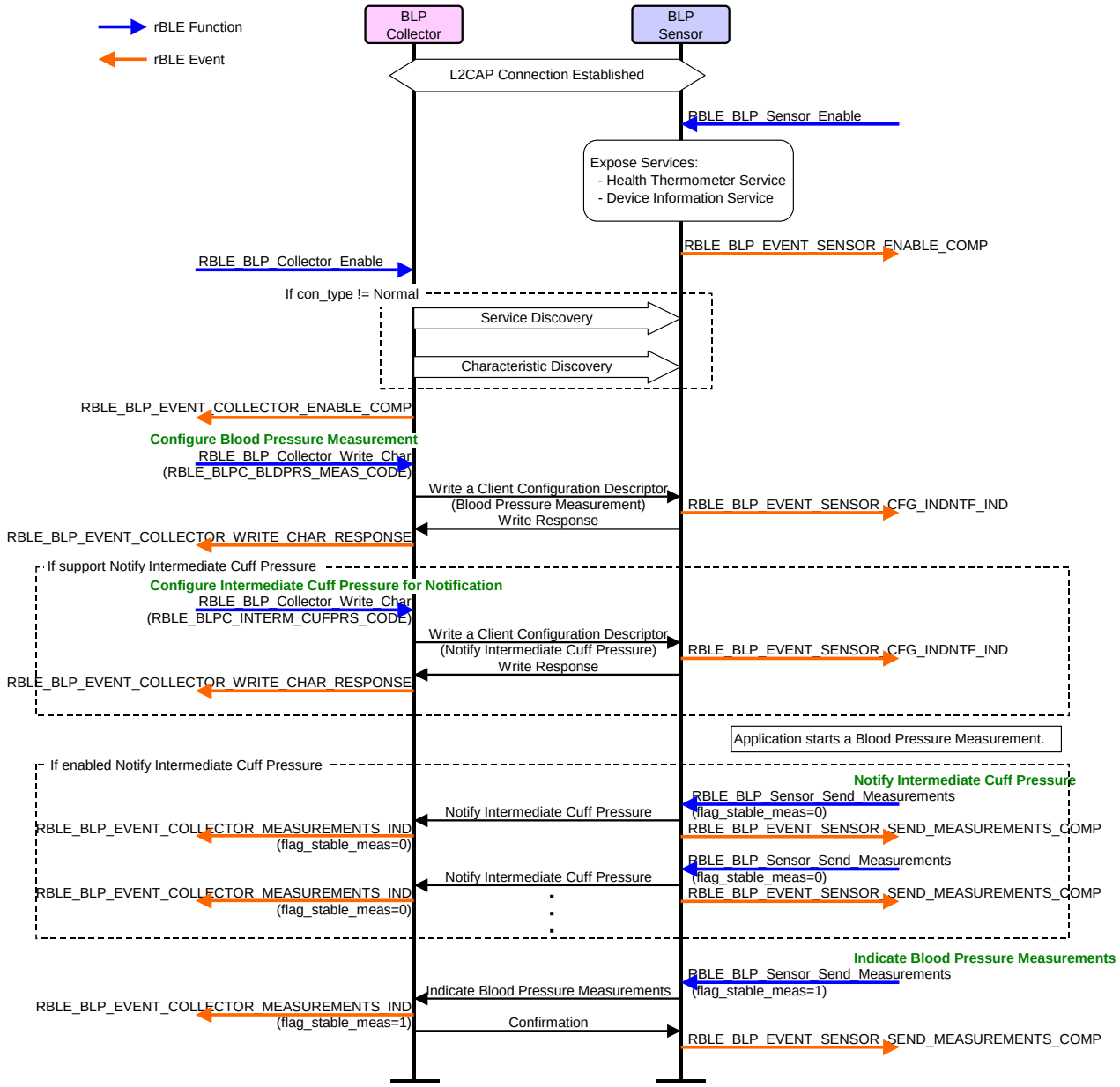

Figure 3-1 Example of Use Case In Which BLP Is Implemented by Using rBLE API

4. Notes

Appendix A How to Read Definition Tables

This section shows how to read the tables that describes the rBLE API functions and events shown in this document.

A.1 How to Read Function Definition Tables

The following contents are included in the function definition tables:

The Parameters area describes the parameters specified for the function.
The italicized character strings on the left are the parameters of the function.
The meaning of each parameter is described on the far right following the variables.

The italicized character string(s) next to each parameter indicate the member(s) of the parameter (structure).

The values that can be specified for the parameter might be described between the parameter name and its description.

The function definition is shown at the top of the table in the row with the light green background. This area shows the function prototype.				
The operation of the function and the event reported after executing the function are described in this area.				
Parameters:				
	Parameter 1	Description of parameter 1		
	Parameter 2	*Member 1*	Value 1 that can be specified for member 1	Description of value 1 that can be specified for member 1
			Value 1 that can be specified for member 2	Description of value 1 that can be specified for member 2
		Member 2	Description of member 2	
Return:				
	Value 1 that might be returned	Description of value 1 that might be returned		
	Value 2 that might be returned	Description of value 2 that might be returned		

The Return area describes the values returned for the function.
The leftmost row shows the value that might be returned, and the next row describes the return value.

A.2 How to Read Event Definition Tables

The following contents are included in the event definition tables:

The Parameters area describes the parameters specified for the event.
The italicized character strings on the left show the parameters of the event parameter structure. The meaning of each parameter is described on the far right.

The italicized character string(s) next to each parameter indicate the member(s) of the parameter (structure).

The event definition is shown at the top of the table in the row with the orange background. This area shows the event type.			
The information reported by the event is described in this area.			
Parameters:			
	Parameter 1	Description of parameter 1	
	Parameter 2	*Member 1*	Description of member 1
		Member 2	Description of member 2
		Member 3	Description of member 3
	Parameter 3	Value 1 that can be specified for parameter 3	Description of value 1 that can be specified for parameter 3
		Value 2 that can be specified for parameter 3	Description of value 2 that can be specified for parameter 3

The values that can be specified for the parameter might be shown between the parameter name and its description.

Appendix B Referenced Documents

1. Bluetooth Core Specification v4.0, Bluetooth SIG
2. Find Me Profile Specification v1.0, Bluetooth SIG
3. Immediate Alert Service Specification v1.0, Bluetooth SIG
4. Proximity Profile Specification v1.0, Bluetooth SIG
5. Link Loss Service Specification v1.0, Bluetooth SIG
6. Tx Power Service Specification v1.0, Bluetooth SIG
7. Health Thermometer Profile Specification v1.0, Bluetooth SIG
8. Health Thermometer Service Specification v1.0, Bluetooth SIG
9. Device Information Service Specification v1.1, Bluetooth SIG
10. Blood Pressure Profile Specification v1.0, Bluetooth SIG
11. Blood Pressure Service Specification v1.0, Bluetooth SIG
12. HID over GATT Profile Specification v1.0, Bluetooth SIG
13. HID Service Specification v1.0, Bluetooth SIG
14. Battery Service Specification v1.0, Bluetooth SIG
15. Scan Parameters Profile Specification v1.0, Bluetooth SIG
16. Scan Parameters Service Specification v1.0, Bluetooth SIG
17. Bluetooth SIG Assigned Numbers https://www.bluetooth.org/Technical/AssignedNumbers/home.htm
18. Services & Characteristics UUID http://developer.bluetooth.org/gatt/Pages/default.aspx
19. Personal Health Devices Transcoding White Paper v1.2, Bluetooth SIG

Appendix C Terminology

Term	Description
Service	A service is provided from a GATT server to a GATT client. The GATT server exposes some characteristics as the interface. The service prescribes how to access the exposed characteristics.
Profile	A profile enables implementation of a use case by using one or more services. The services used are defined in the specifications of each profile.
Characteristic	A characteristic is a value used to identify services. The characteristics to be exposed and their formats are defined by each service.
Role	Each device takes the role prescribed by the profile or service in order to implement the specified use case.
Client Characteristic Configuration Descriptor	A descriptor is used to control notifications or indications of characteristic values that include the client characteristic configuration descriptor sent from the GATT server.
Connection Handle	The handle determined by the controller stack and is used to identify connection with a remote device. The valid handle range is between 0x0000 and 0x0EFF.

REVISION HISTORY	Bluetooth Low Energy Protocol Stack API Reference Manual: BLP

Rev.	Date	Description	
		Page	Summary
1.00	Feb 15, 2013	---	First Edition issued
1.01	Mar 27, 2013	---	The description about the high-speed access to the service for a second or subsequent time is added.
1.02	Jun 28, 2013	---	Bookmark is added.
1.03	Sep 19, 2014	2 5 ---	The common definitions of profile are added. Definitions of client configuration characteristic value and connection type are deleted. Parameter description is changed to use the common definitions of profile.
1.04	Apr 17, 2015	2	The service definitions are updated.

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