# RW BLE Host Error Code

Interface Specification
RW-BLE-HOST-ERR-CODE-IS
Version 11.2
2021-03-09

## Revision History

| Version | Date | Revision Description | Author |
|---------|------|----------------------|--------|
| 1.0 | 2012-12-13 | Added error codes | KY/FBE |
| 2.0 | 2013-03-10 | Update error codes table | FBE |
| 7.00 | 2014-06-30 | BLE 4.1 HL Error Codes | FBE |
| 7.01 | 2015-01-06 | Add new error code for L2CAP LE Credit Based Connection | FBE |
| 8.00 | 2015-06-29 | Update Error codes for BLE 4.2 | FBE |
| 8.01 | 2015-10-26 | Add some new error codes for Audio Mode 0 | FBE |
| 8.02 | 2016-04-15 | New error code for LE Credit Based Connection | FBE |
| 8.02 | 2016-12-12 | New error code for LE Credit Based Connection | FBE |
| 9.0 | 2017-03-09 | Update for BLE 5 | LT |
| 10.0 | 2018-10-24 | Update for BLE 5.1 | FBE |
| 11.0 | 2019-11-27 | Update for 5.2 | FBE |
| 11.1 | 2020-01-17 | Update versions to 5.2 number | FBE |
| 11.2 | 2021-03-09 | Add new GAP error code | FBE |

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# 1   Abbreviations

| Abbreviation | Original Terminology |
|---|---|
| API | Application Programming Interface |
| ATT | Attribute |
| BLE | Bluetooth Low Energy |
| GAP | Generic Access Profile |
| GATT | Generic Attribute Profile |
| SMP | Security Manager Protocol |
| RW | RivieraWaves |

## 2   Document Overview

This document describes the non-standard error code interface of the RW BLE Host implementation.

These error codes can be triggered by any host task such as GAP, GATT, SMP, ATT or profiles

# 3 Error Code List

| Value | Error | Description |
|-------|-------|-------------|
| 0x0000 | GAP_ERR_NO_ERROR | No error |
| **ATT Error Codes** | | |
| 0x0001 | ATT_ERR_INVALID_HANDLE | Handle is invalid |
| 0x0002 | ATT_ERR_READ_NOT_PERMITTED | Read permission disabled |
| 0x0003 | ATT_ERR_WRITE_NOT_PERMITTED | Write permission disabled |
| 0x0004 | ATT_ERR_INVALID_PDU | Incorrect PDU |
| 0x0005 | ATT_ERR_INSUFF_AUTHEN | Authentication privilege not enough |
| 0x0006 | ATT_ERR_REQUEST_NOT_SUPPORTED | Request not supported or not understood |
| 0x0007 | ATT_ERR_INVALID_OFFSET | Incorrect offset value |
| 0x0008 | ATT_ERR_INSUFF_AUTHOR | Authorization privilege not enough |
| 0x0009 | ATT_ERR_PREPARE_QUEUE_FULL | Capacity queue for reliable write reached |
| 0x000A | ATT_ERR_ATTRIBUTE_NOT_FOUND | Attribute requested not existing |
| 0x000B | ATT_ERR_ATTRIBUTE_NOT_LONG | Attribute requested not long |
| 0x000C | ATT_ERR_INSUFF_ENC_KEY_SIZE | Encryption size not sufficient |
| 0x000D | ATT_ERR_INVALID_ATTRIBUTE_VAL_LEN | Invalid length of the attribute value |
| 0x000E | ATT_ERR_UNLIKELY_ERR | Operation not fit to condition |
| 0x000F | ATT_ERR_INSUFF_ENC | Attribute requires encryption before operation |
| 0x0010 | ATT_UNSUPP_GRP_TYPE | Attribute grouping not supported |
| 0x0011 | ATT_INSUFF_RESOURCE | Resources not sufficient to complete the request |
| 0x0012 | ATT_ERR_DB_OUT_OF_SYNC | The server requests the client to rediscover the database. |
| 0x0013 | ATT_ERR_VALUE_NOT_ALLOWED | The attribute parameter value was not allowed. |
| 0x0080 | ATT_ERR_APP_ERROR | Application Error |
| **L2C Specific Error** | | |
| 0x0030 | L2CAP_ERR_CONNECTION_LOST | Message cannot be sent because connection lost. (disconnected) |
| 0x0031 | L2CAP_ERR_INVALID_MTU_EXCEED | MTU size exceed or invalid MTU proposed |
| 0x0032 | L2CAP_ERR_INVALID_MPS_EXCEED | MPS size exceed or invalid MPS proposed |
| 0x0033 | L2CAP_ERR_INVALID_CID | Invalid Channel ID |
| 0x0034 | L2CAP_ERR_INVALID_PDU | Invalid PDU |
| 0x0035 | L2CAP_ERR_UNACCEPTABLE_PARAM | Connection refused - unacceptable parameters |
| 0x0036 | L2CAP_ERR_INSUFF_AUTHEN | Connection refused - insufficient authentication |
| 0x0037 | L2CAP_ERR_INSUFF_AUTHOR | Connection refused - insufficient authorization |
| 0x0038 | L2CAP_ERR_INSUFF_ENC_KEY_SIZE | Connection refused - insufficient encryption key size |
| 0x0039 | L2CAP_ERR_INSUFF_ENC | Connection Refused - insufficient encryption |
| 0x003A | L2CAP_ERR_SPSM_NOT_SUPP | Connection refused - SPSM not supported |
| 0x003B | L2CAP_ERR_INSUFF_CREDIT | No more credit |
| 0x003C | L2CAP_ERR_NOT_UNDERSTOOD | Command not understood by peer device |

| | | |
|---|---|---|
| 0x003D | L2CAP_ERR_CREDIT_ERROR | Credit error, invalid number of credit received |
| 0x003E | L2CAP_ERR_CID_ALREADY_ALLOC | Channel identifier already allocated |
| 0x003F | L2CAP_ERR_UNKNOWN_PDU | Unknown PDU |

**GAP Error Codes**

| | | |
|---|---|---|
| 0x0040 | GAP_ERR_INVALID_PARAM | Invalid parameters set |
| 0x0041 | GAP_ERR_PROTOCOL_PROBLEM | Problem with protocol exchange, get unexpected response |
| 0x0042 | GAP_ERR_NOT_SUPPORTED | Request not supported by software configuration |
| 0x0043 | GAP_ERR_COMMAND_DISALLOWED | Request not allowed in current state. |
| 0x0044 | GAP_ERR_CANCELED | Requested operation canceled. |
| 0x0045 | GAP_ERR_TIMEOUT | Requested operation timeout. |
| 0x0046 | GAP_ERR_DISCONNECTED | Link connection lost during operation. |
| 0x0047 | GAP_ERR_NOT_FOUND | Search algorithm finished, but no result found |
| 0x0048 | GAP_ERR_REJECTED | Request rejected by peer device |
| 0x0049 | GAP_ERR_PRIVACY_CFG_PB | Problem with privacy configuration |
| 0x004A | GAP_ERR_ADV_DATA_INVALID | Duplicate or invalid advertising data |
| 0x004B | GAP_ERR_INSUFF_RESOURCES | Insufficient resources |
| 0x004C | GAP_ERR_UNEXPECTED | Unexpected Error |
| 0x004D | GAP_ERR_MISMATCH | Feature mismatch |
| 0x004E | GAP_ERR_INVALID_BUFFER | Buffer cannot be used due to invalid header or tail length |
| 0x004F | GAP_ERR_BUSY | Request cannot be performed because an on-going procedure blocks it |

**GATT Error Codes**

| | | |
|---|---|---|
| 0x0050 | GATT_ERR_INVALID_ATT_LEN | Problem with ATTC protocol response |
| 0x0051 | GATT_ERR_INVALID_TYPE_IN_SVC_SEARCH | Error in service search |
| 0x0052 | GATT_ERR_WRITE | Invalid write data |
| 0x0053 | GATT_ERR_SIGNED_WRITE | Signed write error |
| 0x0054 | GATT_ERR_ATT_CLIENT_MISSING | No attribute client defined |
| 0x0055 | GATT_ERR_ATT_SERVER_MISSING | No attribute server defined |
| 0x0056 | GATT_ERR_INVALID_PERM | Permission set in service/attribute are invalid |
| 0x0057 | GATT_ERR_ATT_BEARER_CLOSE | The Attribute bearer is closed |
| 0x0058 | GATT_ERR_NO_MORE_BEARER | No more Attribute bearer available |

**SMP Protocol Errors detected on local device**

| | | |
|---|---|---|
| 0x0061 | SMP_ERROR_LOC_PASSKEY_ENTRY_FAILED | The user input of passkey failed, for example, the user cancelled the operation. |
| 0x0062 | SMP_ERROR_LOC_OOB_NOT_AVAILABLE | The OOB Data is not available. |
| 0x0063 | SMP_ERROR_LOC_AUTH_REQ | The pairing procedure cannot be performed as authentication requirements cannot be met due to IO capabilities of one or both devices. |
| 0x0064 | SMP_ERROR_LOC_CONF_VAL_FAILED | The confirm value does not match the calculated confirm value. |
| 0x0065 | SMP_ERROR_LOC_PAIRING_NOT_SUPP | Pairing is not supported by the device. |

| 0x0066 | SMP_ERROR_LOC_ENC_KEY_SIZE | The resultant encryption key size is insufficient for the security requirements of this device. |
|---|---|---|
| 0x0067 | SMP_ERROR_LOC_CMD_NOT_SUPPORTED | The SMP command received is not supported on this device. |
| 0x0068 | SMP_ERROR_LOC_UNSPECIFIED_REASON | Pairing failed due to an unspecified reason. |
| 0x0069 | SMP_ERROR_LOC_REPEATED_ATTEMPTS | Pairing or Authentication procedure is disallowed because too little time has elapsed since last pairing request or security request. |
| 0x006A | SMP_ERROR_LOC_INVALID_PARAM | The command length is invalid or a parameter is outside of the specified range. |
| 0x006B | SMP_ERROR_LOC_DHKEY_CHECK_FAILED | Indicates to the remote device that the DHKey Check value received doesn't match the one calculated by the local device. |
| 0x006C | SMP_ERROR_LOC_NUMERIC_COMPARISON_FAILED | Indicates that the confirm values in the numeric comparison protocol do not match. |
| 0x006D | SMP_ERROR_LOC_BREDR_PAIRING_IN_PROGRESS | Indicates that the pairing over the LE transport failed due to a Pairing Request sent over the BR/EDR transport in process. |
| 0x006E | SMP_ERROR_LOC_CROSS_TRANSPORT_KEY_GENERATION_NOT_ALLOWED | Indicates that the BR/EDR Link Key generated on the BR/EDR transport cannot be used to derive and distribute keys for the LE transport. |
| | **SMP Protocol Errors detected by remote device** | |
| 0x0071 | SMP_ERROR_REM_PASSKEY_ENTRY_FAILED | The user input of passkey failed, for example, the user cancelled the operation. |
| 0x0072 | SMP_ERROR_REM_OOB_NOT_AVAILABLE | The OOB Data is not available. |
| 0x0073 | SMP_ERROR_REM_AUTH_REQ | The pairing procedure cannot be performed as authentication requirements cannot be met due to IO capabilities of one or both devices. |
| 0x0074 | SMP_ERROR_REM_CONF_VAL_FAILED | The confirm value does not match the calculated confirm value. |
| 0x0075 | SMP_ERROR_REM_PAIRING_NOT_SUPP | Pairing is not supported by the device. |
| 0x0076 | SMP_ERROR_REM_ENC_KEY_SIZE | The resultant encryption key size is insufficient for the security requirements of this device. |
| 0x0077 | SMP_ERROR_REM_CMD_NOT_SUPPORTED | The SMP command received is not supported on this device. |
| 0x0078 | SMP_ERROR_REM_UNSPECIFIED_REASON | Pairing failed due to an unspecified reason. |
| 0x0079 | SMP_ERROR_REM_REPEATED_ATTEMPTS | Pairing or Authentication procedure is disallowed because too little time has elapsed since last pairing request or security request. |
| 0x007A | SMP_ERROR_REM_INVALID_PARAM | The command length is invalid or a parameter is outside of the specified range. |
| 0x007B | SMP_ERROR_REM_DHKEY_CHECK_FAILED | Indicates to the remote device that the DHKey Check value received doesn't match the one calculated by the local device. |
| 0x007C | SMP_ERROR_REM_NUMERIC_COMPARISON_FAILED | Indicates that the confirm values in the numeric comparison protocol do not match. |
| 0x007D | SMP_ERROR_REM_BREDR_PAIRING_IN_PROGRESS | Indicates that the pairing over the LE transport failed due to a Pairing Request sent over the BR/EDR transport in process. |
| 0x007E | SMP_ERROR_REM_CROSS_TRANSPORT_KEY_GENERATION_NOT_ALLOWED | Indicates that the BR/EDR Link Key generated on the BR/EDR transport cannot be used to derive and distribute keys for the LE transport. |
| | **SMP Errors triggered by local device** | |

| 0x0020 | SMP_ERROR_ADDR_RESOLV_FAIL | The provided resolvable address has not been resolved. |
|---|---|---|
| 0x0021 | SMP_ERROR_SIGN_VERIF_FAIL | The Signature Verification Failed |
| 0x0022 | SMP_ERROR_ENC_KEY_MISSING | The encryption procedure failed because the slave device didn't find the LTK needed to start an encryption session. |
| 0x0023 | SMP_ERROR_ENC_NOT_SUPPORTED | The encryption procedure failed because the slave device doesn't support the encryption feature. |
| 0x0024 | SMP_ERROR_ENC_TIMEOUT | A timeout has occurred during the start encryption session. |

**Profile error codes**

| 0x0080 | PRF_APP_ERROR | Application Error |
|---|---|---|
| 0x0081 | PRF_ERR_INVALID_PARAM | Invalid parameter in request |
| 0x0082 | PRF_ERR_INEXISTENT_HDL | Nonexistent handle for sending a read/write characteristic request |
| 0x0083 | PRF_ERR_STOP_DISC_CHAR_MISSING | Discovery stopped due to missing attribute according to specification |
| 0x0084 | PRF_ERR_MULTIPLE_SVC | Too many SVC instances found -> protocol violation |
| 0x0085 | PRF_ERR_STOP_DISC_WRONG_CHAR_PROP | Discovery stopped due to found attribute with incorrect properties |
| 0x0086 | PRF_ERR_MULTIPLE_CHAR | Too many Char. instances found-> protocol violation |
| 0x0087 | PRF_ERR_NOT_WRITABLE | Attribute write not allowed |
| 0x0088 | PRF_ERR_NOT_READABLE | Attribute read not allowed |
| 0x0089 | PRF_ERR_REQ_DISALLOWED | Request not allowed |
| 0x008A | PRF_ERR_NTF_DISABLED | Notification Not Enabled |
| 0x008B | PRF_ERR_IND_DISABLED | Indication Not Enabled |
| 0x008C | PRF_ERR_FEATURE_NOT_SUPPORTED | Feature not supported by profile |
| 0x008D | PRF_ERR_UNEXPECTED_LEN | Read value has an unexpected length |
| 0x008E | PRF_ERR_DISCONNECTED | Disconnection occurs |
| 0x008F | PRF_ERR_PROC_TIMEOUT | Procedure Timeout |
| 0x00FD | PRF_CCCD_IMPR_CONFIGURED | Client characteristic configuration improperly configured |
| 0x00FE | PRF_PROC_IN_PROGRESS | Procedure already in progress |
| 0x00FF | PRF_OUT_OF_RANGE | Out of Range |

**LL Error codes conveyed to upper layer**

| 0x0091 | LL_ERR_UNKNOWN_HCI_COMMAND | Unknown HCI Command |
|---|---|---|
| 0x0092 | LL_ERR_UNKNOWN_CONNECTION_ID | Unknown Connection Identifier |
| 0x0093 | LL_ERR_HARDWARE_FAILURE | Hardware Failure |
| 0x0094 | LL_ERR_PAGE_TIMEOUT | BT Page Timeout |
| 0x0095 | LL_ERR_AUTH_FAILURE | Authentication failure |
| 0x0096 | LL_ERR_PIN_MISSING | Pin code missing |
| 0x0097 | LL_ERR_MEMORY_CAPA_EXCEED | Memory capacity exceed |
| 0x0098 | LL_ERR_CON_TIMEOUT | Connection Timeout |
| 0x0099 | LL_ERR_CON_LIMIT_EXCEED | Connection limit Exceed |

| 0x009A | LL_ERR_SYNC_CON_LIMIT_DEV_EXCEED | Synchronous Connection limit exceed |
|--------|----------------------------------|-------------------------------------|
| 0x009B | LL_ERR_ACL_CON_EXISTS | ACL Connection exits |
| 0x009C | LL_ERR_COMMAND_DISALLOWED | Command Disallowed |
| 0x009D | LL_ERR_CONN_REJ_LIMITED_RESOURCES | Connection rejected due to limited resources |
| 0x009E | LL_ERR_CONN_REJ_SECURITY_REASONS | Connection rejected due to security reason |
| 0x009F | LL_ERR_CONN_REJ_UNACCEPTABLE_BDADDR | Connection rejected due to unacceptable BD Addr |
| 0x00A0 | LL_ERR_CONN_ACCEPT_TIMEOUT_EXCEED | Connection rejected due to Accept connection timeout |
| 0x00A1 | LL_ERR_UNSUPPORTED | Not Supported |
| 0x00A2 | LL_ERR_INVALID_HCI_PARAM | invalid parameters |
| 0x00A3 | LL_ERR_REMOTE_USER_TERM_CON | Remote user terminate connection |
| 0x00A4 | LL_ERR_REMOTE_DEV_TERM_LOW_RESOURCES | Remote device terminate connection due to low resources |
| 0x00A5 | LL_ERR_REMOTE_DEV_POWER_OFF | Remote device terminate connection due to power off |
| 0x00A6 | LL_ERR_CON_TERM_BY_LOCAL_HOST | Connection terminated by local host |
| 0x00A7 | LL_ERR_REPEATED_ATTEMPTS | Repeated attempts |
| 0x00A8 | LL_ERR_PAIRING_NOT_ALLOWED | Pairing not Allowed |
| 0x00A9 | LL_ERR_UNKNOWN_LMP_PDU | Unknown PDU Error |
| 0x00AA | LL_ERR_UNSUPPORTED_REMOTE_FEATURE | Unsupported remote feature |
| 0x00AB | LL_ERR_SCO_OFFSET_REJECTED | Sco Offset rejected |
| 0x00AC | LL_ERR_SCO_INTERVAL_REJECTED | SCO Interval Rejected |
| 0x00AD | LL_ERR_SCO_AIR_MODE_REJECTED | SCO air mode Rejected |
| 0x00AE | LL_ERR_INVALID_LMP_PARAM | Invalid LMP parameters |
| 0x00AF | LL_ERR_UNSPECIFIED_ERROR | Unspecified error |
| 0x00B0 | LL_ERR_UNSUPPORTED_LMP_PARAM_VALUE | Unsupported LMP Parameter value |
| 0x00B1 | LL_ERR_ROLE_CHANGE_NOT_ALLOWED | Role Change Not allowed |
| 0x00B2 | LL_ERR_LMP_RSP_TIMEOUT | LMP Response timeout |
| 0x00B3 | LL_ERR_LMP_COLLISION | LMP Collision |
| 0x00B4 | LL_ERR_LMP_PDU_NOT_ALLOWED | LMP Pdu not allowed |
| 0x00B5 | LL_ERR_ENC_MODE_NOT_ACCEPT | Encryption mode not accepted |
| 0x00B6 | LL_ERR_LINK_KEY_CANT_CHANGE | Link Key Cannot be changed |
| 0x00B7 | LL_ERR_QOS_NOT_SUPPORTED | Quality of Service not supported |
| 0x00B8 | LL_ERR_INSTANT_PASSED | Error, instant passed |
| 0x00B9 | LL_ERR_PAIRING_WITH_UNIT_KEY_NOT_SUP | Pairing with unit key not supported |
| 0x00BA | LL_ERR_DIFF_TRANSACTION_COLLISION | Transaction collision |
| 0x00BC | LL_ERR_QOS_UNACCEPTABLE_PARAM | Unacceptable parameters |
| 0x00BD | LL_ERR_QOS_REJECTED | Quality of Service rejected |
| 0x00BE | LL_ERR_CHANNEL_CLASS_NOT_SUP | Channel class not supported |
| 0x00BF | LL_ERR_INSUFFICIENT_SECURITY | Insufficient security |
| 0x00C0 | LL_ERR_PARAM_OUT_OF_MAND_RANGE | Parameters out of mandatory range |
| 0x00C2 | LL_ERR_ROLE_SWITCH_PEND | Role switch pending |

| 0x00C4 | LL_ERR_RESERVED_SLOT_VIOLATION | Reserved slot violation |
|--------|-------------------------------|-------------------------|
| 0x00C5 | LL_ERR_ROLE_SWITCH_FAIL | Role Switch fail |
| 0x00C6 | LL_ERR_EIR_TOO_LARGE | Error, EIR too large |
| 0x00C7 | LL_ERR_SP_NOT_SUPPORTED_HOST | Simple pairing not supported by host |
| 0x00C8 | LL_ERR_HOST_BUSY_PAIRING | Host pairing is busy |
| 0x00CA | LL_ERR_CONTROLLER_BUSY | Controller is busy |
| 0x00CB | LL_ERR_UNACCEPTABLE_CONN_INT | Unacceptable connection initialization |
| 0x00CC | LL_ERR_DIRECT_ADV_TO | Direct Advertising Timeout |
| 0x00CD | LL_ERR_TERMINATED_MIC_FAILURE | Connection Terminated due to a MIC failure |
| 0x00CE | LL_ERR_CONN_FAILED_TO_BE_EST | Connection failed to be established |
| 0x00CF | LL_ERR_MAC_CONN_FAILED | MAC Connection Failed |
| 0x00D0 | LL_ERR_CCA_REJ_USE_CLOCK_DRAG | Coarse Clock Adjustment Rejected but Will Try to Adjust Using Clock Dragging |
| 0x00D1 | LL_ERR_TYPE0_SUBMAP_NOT_DEFINED | Type0 Submap Not Defined |
| 0x00D2 | LL_ERR_UNKNOWN_ADVERTISING_ID | Unknown Advertising Identifier |
| 0x00D3 | LL_ERR_LIMIT_REACHED | Limit Reached |
| 0x00D4 | LL_ERR_OPERATION_CANCELED_BY_HOST | Operation Cancelled by Host |
| 0x00D5 | LL_ERR_PKT_TOO_LONG | Packet Too Long |

**Table 1: Host Stack Error Codes**