MasterLocktt API

Version: 1.0

The Master Lock API allows for a lifecycle with the smart and other participants the clients and locks with each other over a TCP/IP connection.

- Port Number: 2 (0000)
- All integer values are encoded in little endian byte order.

Message Header

Message Format

Message Identifier (2 Bytes)	Message Type	Payload
0 (0000)	1 byte	0 bytes

Message Types

Client -> Server

- **0x01 Ping**: Client requests an acknowledge from the server.
- **0x02 Acknowledge**: Client acknowledges the last message received from the server.
- **0x03 Acknowledge - Can stay**: Client sends a negative response to a request.
- **0x04 Acknowledge - Can not stay**: Client sends a negative response to a request.
- **0x05 Handshake**: Initiate a handshake.

Server -> Client

- **0x01 Ping Request**: Server requests an acknowledge from the client.
- **0x02 Acknowledge**: Server acknowledges the last message received from the client.
- **0x03 Acknowledge - Can stay**: Client sends a negative response to a request.
- **0x04 Acknowledge - Can not stay**: Client sends a negative response to a request.
- **0x05 Handshake**: Initiate a handshake.

Connection Initialization (Handshake)

Handshake Procedure

- After the TCP connection is established, the server sends a **Handshake challenge message** of the following form:

Message Header			Payload
Length	Type	Length	Challenge
4 bytes	1 byte	1 byte	20 bytes

- The client responds with a **Handshake response message** of the following form:

Message Header			Payload Fields	
Length	Type	Length	Hash	Challenge
4 bytes	1 byte	1 byte	20 bytes	20 bytes

- The server responds with a **Handshake result message** of the following form:

Message Header			Payload Fields
Length	Type	Length	Result
4 bytes	1 byte	1 byte	1 byte

- The challenge-response handshake is complete, the server and client are now authenticated and can begin exchanging messages.
- The server and client must now initiate a keepalive exchange.

Keepalive Procedure

- After the TCP connection is established, the server sends a **Handshake challenge message** of the following form:

Message Header			Payload
Length	Type	Length	Challenge
4 bytes	1 byte	1 byte	20 bytes

- The client responds with a **Handshake response message** of the following form:

Message Header			Payload Fields	
Length	Type	Length	Hash	Challenge
4 bytes	1 byte	1 byte	20 bytes	20 bytes

- The server responds with a **Handshake result message** of the following form:

Message Header			Payload Fields
Length	Type	Length	Result
4 bytes	1 byte	1 byte	1 byte

- The client and server are now authenticated and can begin exchanging messages.
- The client and server must now initiate a keepalive exchange.

Protocol Versions

The following protocol versions are supported:

Major Version	Minor Version
0x01	0x00

Device IDs

- The device ID consists of 16 random bytes (0 through and all 255 bytes).
- The device ID is stored in the Bluetooth Low Energy Public Address field of the Bluetooth Low Energy Advertisement.

Signature

- The signature is calculated from the CRC-16-Ccitt-Kermit, and then appended with zeroes to form a 20 byte signature.
- Example signature: `0x0000000000000000000000000000000000000000`

Handshake Error Codes

Value	Description
0x00	Handshake error response not received or not UTF-8 encoded when in the first handshake
0x01	Primary Bluetooth Device of the supplied primary account is supposed to be an iOS device, but is not
0x02	Primary Bluetooth Device of the supplied primary account is supposed to be an Android device, but is not
0x03	Signature is invalid

Message Codes

All valid signature in notification messages have the following format:

Message Header			Payload
Length	Type	Length	Signature
4 bytes	1 byte	1 byte	20 bytes

The following message codes are defined:

Data Request Client -> Server (Message Type 0x41)

Payload Name	Message Length	Payload Format	Description
Serial Number	0x01	Unsigned Char	Serial No. (Serial Type)
Schedule Count(optional)	0x01	Unsigned Char	Schedule Count (Serial Type)
Schedule Index(optional)	0x01	Unsigned Char	Schedule Index (Serial Type)
Operating Hours Count(optional)	0x01	Unsigned Char	Operating Hours Count (Serial Type)
Operating Hours Index(optional)	0x01	Unsigned Char	Operating Hours Index (Serial Type)
Log Index	0x04	Unsigned Long	Log Index (Serial Type)
Log Count	0x04	Unsigned Long	Log Count (Serial Type)
Log Flags	0x01	Unsigned Char	Log Flags (LogFlags_Clear(0x01), Log Flags_Reverse(0x02))
Log Mask	0x04	Unsigned Long	Log Mask
Log Offset	0x04	Unsigned Long	Log Offset
Keypad	0x01	Unsigned Char	Keypad (Serial Type)
Firmware Version	0x02	Unsigned Short	Firmware Version (Serial Type)
Hardware Version	0x02	Unsigned Short	Hardware Version (Serial Type)
Battery Voltage	0x02	Unsigned Short	Battery Voltage (Serial Type)
Battery Type	0x01	Unsigned Char	Battery Type (Serial Type)
Accessory Type	0x01	Unsigned Char	Accessory Type (Serial Type)
Accessory Value	0x02	Unsigned Short	Accessory Value (Serial Type)
Manufacturer Data	0x14	Char[20]	Manufacturer Data (Serial Type)

Data Request Server -> Client (Message Type 0x41)

Payload Name	Message Length	Payload Format	Description
Manufacturer Data	0x14	Char[20]	Manufacturer Data (Serial Type)

Notifications Server -> Client (Message Type 0x43)

Notification Name	Message Length	Payload Format	Description
Manufacturer Data	0x14	Char[20]	Manufacturer Data (Serial Type)

Notifications Server -> Client (Message Type 0x43)

Notification Name	Message Length	Payload Format	Description
Serial Number(optional)	0x01	Unsigned Char	Serial No. (Serial Type) **optional**
Schedule Count(optional)	0x01	Unsigned Char	Schedule Count (Serial Type) **optional**
Schedule Index(optional)	0x01	Unsigned Char	Schedule Index (Serial Type) **optional**
Operating Hours Count(optional)	0x01	Unsigned Char	Operating Hours Count (Serial Type) **optional**
Operating Hours Index(optional)	0x01	Unsigned Char	Operating Hours Index (Serial Type) **optional**

Acknowledge

An acknowledge message in response to a data request has the following format:

Message Header			Payload
Length	Type	Length	0 bytes
4 bytes	1 byte	1 byte	

Negative Acknowledge

A negative acknowledge message in response to a data request has the following format:

Message Header			Payload
Length	Type	Length	0 bytes
4 bytes	1 byte	1 byte	

Error Codes

Value	Description
0	The message was not recognized or protocol error
1	The message was not expected
2	The message was an invalid format

Device Types

Identifier	Description	Bluetooth Name Prefix
0x01	Combo	Master Key
0x02	Speed Manager	Speed Key
0x03	Speed Key	Speed Key
0x04	Mobile Bluetooth	Operating Hours Key
0x05	Mobile Bluetooth	Mobile Key
0x06	Storage	Key
0x07	Lock Box	Lock Box

View ID

Reserved by a connected client only. Which set the application.

Range

`0x0000-0xffff`

List Type

Identifier	Description
0x00	Log entries with serial number
0x01	Log entries with series index

Full data data format

`[<length><value>]+`

Only IsWhs with vector clock format

`[Full entry Type*:entry Length*:[*:entry ID:]+]+`

Clip Command

```
// Clear counts, entry, or if optional filter clips by entry
// Response: [<Clip Command>:<Clip Command Length>:<Clip Command Data>]+
// <Clip Command>: 0x01(Clear Counts), 0x02(Clear Entry), 0x03(Clear All Clips)
// <Clip Command Length>: 0x00(Clear Counts), 0x04(Clear Entry), 0x00(Clear All Clips)
// <Clip Command Data>: <Clip Counter>(Clear Counts), <Entry ID>(Clear Entry), Nothing(Clear All Clips)
// <Clip Counter>: 0x00(Clear Counts)
// <Entry ID>: 0x00000000-0xffffffff(Clear Entry)
```

Export Type

Identifier	Description
0x00	Log Entries
0x01	Clips by Serial
0x02	Entry by Serial
0x03	Operating Hours
0x04	Operating Hours by Serial
0x05	Log Entries by Serial

Export Configuration

0x01,0000000xxxxxxxxx,0000000xxxxxxxxx,0000000xxxxxxxxx

```
"keypadlocksetting": [<Serial>:<Entry ID of Longer Storage Entry>]+ // all present report data bit 0x1 in the ack response is payload
"keypadlocksetting": [<Serial>:<Entry ID of Longer Storage Entry>]+ // all present report data bit 0x2 in the ack response is payload
"keypadlock": <Serial>:[ // Repeating on the report data if only report data requests this field
  "<Serial>",
  "<Serial>",
  ...
]
```

Common Formats

The following are the formats that can be used on special entry formats, but are chosen in the data formats below.

Project

```
{
  "name": "<string>",
  "type": "<type>",
  "version": "<version>",
  "features": [
    "<feature>",
    ...
  ]
  "lock": "<string_reference>" or "<array>"
}
```

Customer

```
{
  "name": "<string>",
  "email": "<string>",
  "phone": "<string>",
  "address": "<string>"
}
```

Projecting

```
{
  "name": "<string>",
  "type": "<type>",
  "version": "<version>",
  "projecting": "<array_of_IDs>"
}
```

Schedule

```
{
  "name": "<string>",
  "type": "<type>",
  "version": "<version>",
  "schedule": "<array_of_IDs>"
}
```

Lock

```
{
  "name": "<string>",
  "type": "<type>",
  "version": "<version>",
  "lock": "<array_of_IDs>",
  "lockstatusfunction": "<if set encode>"
}
```

Event

```
{
  "name": "<string>",
  "type": "<type>",
  "version": "<version>",
  "event": "<array_of_IDs>",
  "eventtypes": "<array_of_IDs>",
  "eventtypeexclusions": "<array_of_IDs>",
  "eventtypeinclusions": "<array_of_IDs>",
  "eventtypeexclusionsfunction": "<if set encode>",
  "eventtypeinclusionsfunction": "<if set encode>",
  "eventtypeexclusionsfunction": "<if set encode>",
  "eventtypeinclusionsfunction": "<if set encode>",
  "eventtypeexclusionsfunction": "<if set encode>",
  "eventtypeinclusionsfunction": "<if set encode>",
}
```

Data

```
{
  "name": "<string>",
  "type": "<type>",
  "version": "<version>",
  "data": "<array_of_IDs>",
  "dataexclusions": "<array_of_IDs>",
  "datainclusions": "<array_of_IDs>",
  "dataexclusionsfunction": "<if set encode>",
  "datainclusionsfunction": "<if set encode>",
  "dataexclusionsfunction": "<if set encode>",
  "datainclusionsfunction": "<if set encode>",
}
```

Tabs

```
{
  "name": "<string>",
  "type": "<type>",
  "version": "<version>",
  "tabs": "<array_of_IDs>",
  "tabexclusions": "<array_of_IDs>",
  "tabinclusions": "<array_of_IDs>",
  "tabexclusionsfunction": "<if set encode>",
  "tabinclusionsfunction": "<if set encode>",
}
```

Script Paragraph

```
{
  "name": "<string>",
  "type": "<type>",
  "version": "<version>",
  "scriptparagraph": "<array_of_IDs>",
}
```

Script Paragraph Element

```
{
  "name": "<string>",
  "type": "<type>",
  "version": "<version>",
  "element": {
    "<element_type>": {
      "<element>": <>,
      ...
    }
  }
}
```

Data Formats

The following are the formats (as used in the data part of the log entries in messages)

Wales Clip

```
{
  "name": "<string>",
  "type": "<type>",
  "version": "<version>",
  "clip": {
    "<event_id>": {
      "<event_id>": {
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