Contents

[BLE Connection and Authentication 2](#_Toc192421804)

[Sending the Default Passkey 2](#_Toc192421805)

[Setting a New Passkey 3](#_Toc192421806)

[Sending Wi-Fi SSID and Password 4](#_Toc192421807)

[Sending Wi-Fi SSID 4](#_Toc192421808)

[Sending Wi-Fi Password 4](#_Toc192421809)

[Receiving Feedback: 4](#_Toc192421810)

[Command Format: 4](#_Toc192421811)

[Wi-Fi Connection Feedback: 5](#_Toc192421812)

[Command Format: 5](#_Toc192421813)

[Example: 5](#_Toc192421814)

[Disconnecting from BLE 5](#_Toc192421815)

[Command Format: 5](#_Toc192421816)

[Example: 6](#_Toc192421817)

[Enroll 6](#_Toc192421818)

[Enrolment Request 6](#_Toc192421819)

[Command Format: 6](#_Toc192421820)

[Enrolment Acknowledgment 6](#_Toc192421821)

[Done Acknowledgment 6](#_Toc192421822)

[Error/Status Responses 7](#_Toc192421823)

**Device Configuration Over BLE**

# BLE Connection and Authentication

Before configuring the device, the user must establish a BLE connection and authenticate by sending a passkey.

## Sending the Default Passkey

After connecting via BLE, the user must send the default passkey (123456789) to proceed with the setup.

**Command Format:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x4D | 0x00 | CMD Transaction No | Data Len | 0x50 | Passkey |

* 4D 00 → Command identifier for passkey authentication.
* CMD Transaction No → Unique transaction number (increments from 00 to FF after each transaction).
* Data Len → Length of the passkey data.
* 0x50 → Authentication request identifier.
* Passkey → Default Passkey (0123456789)

**Example:** If the transaction number is 05, and the passkey is 123456789:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0x4D | 0x00 | 0x05 | 0x0A | 0x50 | 0x01 | 0x02 | 0x03 | 0x04 | 0x05 | 0x06 | 0x07 | 0x08 | 0x09 |

**Response:**

**Command Format:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **0x**4D | **0x**04 | Feedback Transaction No | Len | 0x41 | 0x50 |

* 4D 04 → Command identifier for feedback.
* Feedback Transaction No → Independent transaction number (increments from 0 to 255).
* Len → Length of the response data.
* 0x41 0x50 → Confirmation bytes indicating the password has been accepted.

**Example:** Feedback for transaction number **00**:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x4D | 0x04 | 0x00 | 0x02 | 0x41 | 0x50 |

## Setting a New Passkey

Once authenticated, the user can update the passkey for future connections.

**Sending a New Passkey**

To set a new passkey, the user must send the updated value using the following command:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x4D | 0x00 | CMD Transaction No | Data Len | 0x53 | Passkey |

* 4D 00 → Command identifier for passkey update.
* CMD Transaction No → Unique transaction number.
* Data Len → Length of the new passkey data.
* 0x53 → Identifier for setting a new passkey.
* New Passkey → The new passkey set by the user.

**Example:**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0x4D | 0x00 | 0x06 | 0x0A | 0x53 | 0x09 | 0x08 | 0x07 | 0x06 | 0x05 | 0x04 | 0x03 | 0x02 | 0x01 |

If the transaction number is 06, and the new passkey is 987654321

**Response:**

**Command Format:**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **0x**4D | **0x**04 | Feedback Transaction No | Len | 0x41 | 0x50 | 0x53 | 0x53 |

* 4D 04 → Command identifier for feedback.
* Feedback Transaction No → Independent transaction number (increments from 0 to 255).
* Len → Length of the response data.
* 0x41 0x50 0x53 0x53 → Confirmation bytes indicating the password has been accepted.

**Example:** Feedback for transaction number **01**:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **0x**4D | **0x**04 | 0x01 | 0x04 | 0x41 | 0x50 | 0x53 | 0x53 |

# Sending Wi-Fi SSID and Password

## Sending Wi-Fi SSID

**To send the Wi-Fi SSID to the device, the following command is used:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **0x09** | **0x00** | **CMD Transaction No** | **Data Len** | **SSID** |

* 09 00 → Command identifier for Wi-Fi SSID.
* CMD Transaction No → Unique transaction number.
* Data Len → Length of the SSID data.
* SSID → The Wi-Fi SSID to be sent.

**Example:** To send SSID **“myssid”** with transaction number **07**:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0x09 | 0x00 | 0x07 | 0x06 | myssid |

## Sending Wi-Fi Password

To send the Wi-Fi password to the device, the following command is used:

**Command Format:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **0x0D** | **0x00** | CMD Transaction No | **Data len** | **Pass** |

* 0D 00 → Command identifier for Wi-Fi password.
* CMD Transaction No → Unique transaction number.
* Data Len → Length of the password data.
* PASS → The Wi-Fi password to be sent.

**Example:** To send password **“mypassword”** with transaction number **08**:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 0x0D | 0x00 | 0x08 | 0x0A | mypassword |

## Receiving Feedback:

Once the password is received, the device sends feedback with an independent transaction number:

### Command Format:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **0x**4D | **0x**04 | Feedback Transaction No | Len | 0x74 | 0x72 | 0x79 |

* 4D 04 → Command identifier for feedback.
* Feedback Transaction No → Independent transaction number (increments from 0 to 255).
* Len → Length of the response data.
* 0x74 0x72 0x79 → Confirmation bytes indicating the password has been accepted.

**Example:** Feedback for transaction number **00**:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 0x4D | 0x04 | 0x00 | 0x03 | 0x74 | 0x72 | 0x79 |

## Wi-Fi Connection Feedback:

After a successful connection to Wi-Fi, the device sends a feedback message to acknowledge the connection.

### Command Format:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 0x4D | 0x04 | Transaction No | Len | x77 | 0x63 | 0x73 |

* 4D 04 → Command identifier for Wi-Fi connection acknowledgment.
* Transaction No → Independent transaction number (increments from 0 to 255 for each transaction).
* Len → Length of the acknowledgment data (usually 0x03 for this type of feedback).
* 0x77 0x63 0x73 → Confirmation bytes indicating a successful Wi-Fi connection.

Example: Acknowledgment for transaction number **02**:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 0x4D | 0x04 | 0x02 | 0x03 | 0x77 | 0x63 | 0x73 |

# Disconnecting from BLE

To disconnect from the BLE device, the following command is sent:

## Command Format:

|  |  |  |  |
| --- | --- | --- | --- |
| 0x20 | 0x00 | CMD Transaction No | 0x00 |

* 20 00 → Command identifier for BLE disconnection.
* CMD Transaction No → Unique transaction number (increments from 00 to FF for each transaction).
* 00 → The disconnection signal (indicating BLE disconnection).

Example: If the transaction number is **05**:

|  |  |  |  |
| --- | --- | --- | --- |
| 0x20 | 0x00 | 0x05 | 0x00 |

# Enroll

## Enrolment Request

### Command Format:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **0x**63 | **0x**6D | **0x**64 | **0x**65 | **0x**6E | **0x**72 | **0x**6F | 0x6C | 0x20 | Name | 0x20 | 2byte crc |

* 63 6D 64 65 6E 72 6F 6C → Command identifier for enrolment.
* Name → The name of the person being enrolled (e.g., Sozib).
* CRC value (2 bytes) for the person’s name and command.

**Example Command:** To enrol **Sozib** with CRC value **00 DB**:

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0x63 | 0x64 | 0x6D | 0x65 | 0x6E | 0x72 | 0x6F | 0x6C | 0x20 | Sozib | 0x20 | 0x00 | 0xDB |

## Enrolment Acknowledgment

### Done Acknowledgment

Once the enrolment request is successfully processed, the device sends an acknowledgment with the person name and a unique person ID:

**Command Format:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 0x41 | 0x45 | 0x20 | Person Name | 0x20 | Person ID |

* 41 45 44 → Acknowledgment identifier.
* Person Name → The name of the person being enrolled (e.g., Sozib).
* Person ID → A unique 2-byte person ID (e.g., 00 01).

**Example Acknowledgment:** For **Sozib** and person ID **00 01**:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 0x41 | 0x45 | 0x44 | 0x20 | Sozib | 0x20 | 0x00 | 0x01 |

### Error/Status Responses

Enrolment Duplicate: The system sends this response when the person already exists.

**Response:**

|  |  |  |
| --- | --- | --- |
| 0x4E | 0x44 | 0x50 |

Name CRC Error: This response occurs if there is a CRC error in the received name.

**Response:**

|  |  |  |  |
| --- | --- | --- | --- |
| **0x**4E | **0x**4E | **0x**44 | **0x**45 |

Enrolment Timeout: This response occurs if the enrolment request times out.

**Response:**

|  |  |  |  |
| --- | --- | --- | --- |
| **0x**4E | **0x**45 | **0x**54 | 0x4F |

## Image Upload Request

To initiate an image upload request for a person, the following command is used:

### Command Format:

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0x75 | 0x75 | 0x6C | 0x6F | 0x61 | 0x64 | 0x69 | 0x6D | 0x61 | 0x67 | 0x65 | 0x20 | ID |

* 75 70 6C 6F 61 64 69 6D 61 67 65 → Command identifier for image upload request.
* Person ID → Unique 2-byte id for the person.

Example Command: For **Person ID = 0x0001**:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0x75 | 0x75 | 0x6C | 0x6F | 0x61 | 0x64 | 0x69 | 0x6D | 0x61 | 0x67 | 0x65 | 0x20 | 0x00 | 0x01 |

### Sending Image Info

Before uploading image data, the following command is sent to provide image details:

#### Payload Format:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Image\_Length | **0x20** | Image\_Height | **0x20** | Image\_Width | **0x20** | **Name** | **0x20** | Total Chunks |

* Image Length (2 bytes) → Size of the image data in bytes.
* Image Height (1 byte) → Height of the image.
* Image Width (1 byte) → Width of the image.
* Person Name → Name associated with the image.
* Person ID (2 bytes) → Unique id for the person.
* Total Chunks (1 byte) → Number of chunks the image will be divided into for transmission.

### Sending Image Data Chunk

Each image is sent in chunks using the following command format:

**Command Format:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Person ID | 0x20 | Chunk No | 0x20 | Image Chunk CRC | 0x20 | Image Data (RGB565) |

* Person ID (2 bytes) → Unique identifier for the person.
* Chunk No (1 byte) → The chunk number (increments for each chunk).
* Image Chunk CRC (2 bytes) → CRC value for the image chunk.
* Image Data → Image data in RGB565 format.

**Example Command:**

For **Person ID = 00 01**, **Chunk No = 01**, **Image Chunk CRC = 00 25**, and RGB565 image data:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0x00 | 0x01 | 0x20 | 0x01 | 0x20 | 0x00 | 0x25 | 0x20 | RGB565 |