



**BONRIX EMBEDDED
INNOVATIONS**

3.5 inch Digital QR - Dynamic QR SoundBox Display

Model: BEI-DQR-222-USB + BLE

Instruction: Connect your port (COM1, COM2... ..) with Baud Rate: 230400 using with your serial port terminal.

Follow this link for serial port test utility:

http://www.embedded-innovations.com/Downloads/DesktopSoftware/3.5_inch_usb_jpeg_image_processor.exe

Step 1: Home Screen:

The screenshot shows the 'Home' window of a serial port test utility. The interface includes several control panels: a top panel with 'Keep Aspect Ratio' (unchecked), 'browse Image', 'Reset', and 'Picture Size' (320 x 480); a middle panel with 'Zoom Level' (0.1), 'Move Pixel' controls (right, left, down, up) each set to 5, and 'Color Hex' (#FFFFFF) with a 'Black' button; a bottom-left panel with 'Com Port' (COM3), 'Baud Rate' (921600), 'Refresh Port', 'Connect', 'Dis Connect', 'Wait For Acknowledgments' (unchecked), 'Chunk' (2000), 'Delay Millisecond' (10), 'Send', 'Send Chunk', 'Play audio after upload' (unchecked), 'Audio Name', 'Upload Audio', 'Upload Audio Chunk', and 'Clear Log'; and a large empty rectangular area on the right side of the window.

Step 2: Select port:

Select Your **Com Port** And Click on **Connect** button.



BONRIX EMBEDDED
INNOVATIONS

Home

Keep Aspect Ratio browse Image Reset Picture Size 320 480

Zoom Level 0.1 Move Pixel → 5 Move Pixel ← 5 Move Pixel ↓ 5 Move Pixel ↑

Zoom In Zoom Out → ← ↓ ↑

1

Com Port : COM176 Baud Rate : 230400

Refresh Port Connect Dis Connect

Wait For Acknowledgments

Chunk : 2000 Delay Millisecond : 10

Send Send Chunk Play audio after upload Audio Name Upload Audio Upload Audio Chunk

Clear Log

Step 3: Select Image:

First Select **Keep Aspect Ratio** And then Click on **browser Image** to select your Image.

Home

Keep Aspect Ratio browse Image Reset Picture Size 320 480

Zoom Level 0.1 Move Pixel → 5 Move Pixel ← 5 Move Pixel ↓ 5 Move Pixel ↑ 5 Color Hex #FFFFFF Black White

Zoom In Zoom Out → ← ↓ ↑

1

Com Port : COM187 Baud Rate : 230400

Refresh Port Connect Dis Connect

Wait For Acknowledgments

Chunk : 2000 Delay Millisecond : 10

Send Send Chunk Play audio after upload Audio Name Upload Audio Upload Audio Chunk

Clear Log

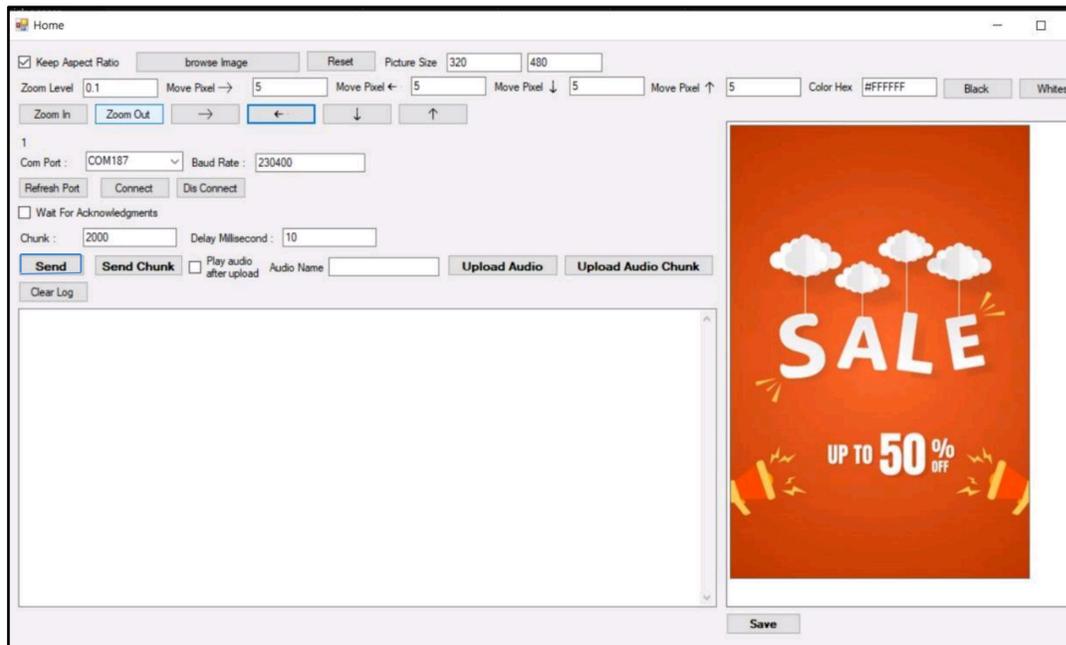
Save



**BONRIX EMBEDDED
INNOVATIONS**

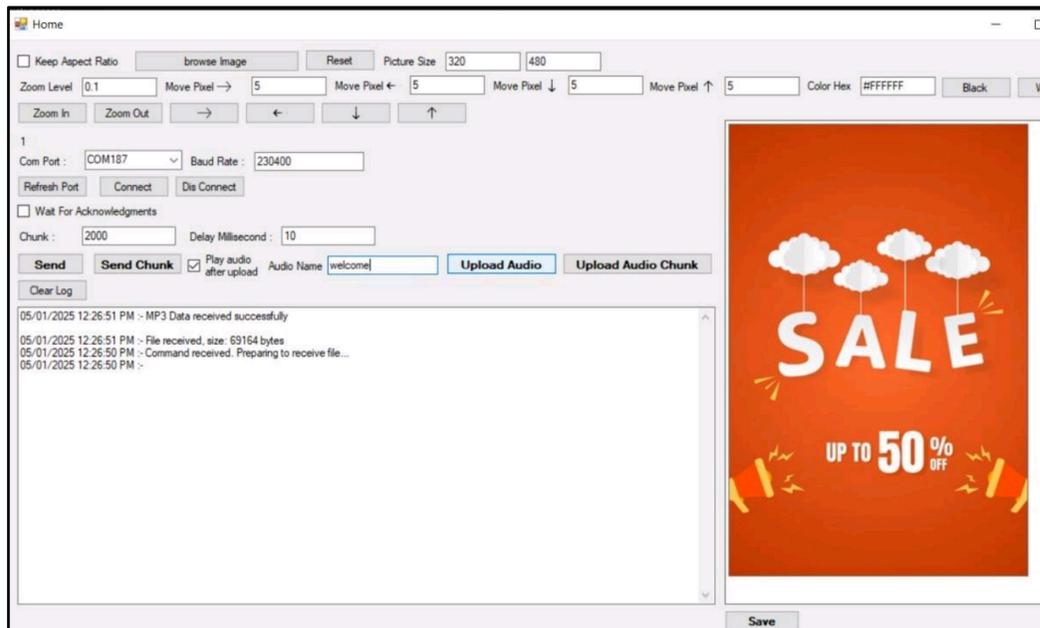
Step 5: Upload Image:

After selecting the image you can adjust your image using **Zoom In, Zoom Out, →, ←, ↑, ↓** Button and Click on **Send** button.



Step 6: Audio Upload:

Write audio file name and click on **Upload Audio**.





**BONRIX EMBEDDED
INNOVATIONS**

To Check Dynamic QR Code Scanner Display By Free Desktop Software

Instruction: Connect your port (COM1, COM2... ..) with Baud Rate: 230400 using with your serial port terminal.

Follow this link for serial port test utility:

<http://www.embedded-innovations.com/Downloads/DesktopSoftware/QrDisplayFree.msi>

Step 1: Home Screen:

Qr Display Free Home

Setting Report

Enter Amount

Generate Qr

Welcome Screen

Report

Last Order Id :-

Image Size KB :- 18.00

Steps to Scan and Pay

STEP 1
Open BHIM UPI app

STEP 2
Tap on Pay/Scan

STEP 3
Scan QR Code

Start Ad Stop Ad

Today

Success ₹ Pending ₹ Fail ₹ Other ₹

Success Count Pending Count Fail Count Other Count

All Time

Success ₹ Pending ₹ Fail ₹ Other ₹

Success Count Pending Count Fail Count Other Count

Refresh Re-Generate Copy Message Success Fail Export Delete Delete All 0 To 0

Apply Date From Thursday, May 1, To Thursday, May 1, Search X Stop Refresh << >> Refresh All Time

Id	Date	PosId	InvoiceId	VPA	UPIString	Number	Amt	Status	TXID	Message	QrTxnId	BankRRN	ReqID	Res
----	------	-------	-----------	-----	-----------	--------	-----	--------	------	---------	---------	---------	-------	-----

Developed By :- BONRIX SOFTWARE SYSTEMS Phone No :- 9426045500,6352445500,7624045500 Version :- 1.2.9.0

Step 2: Settings:

1) Go to **VPA Settings** and add the Details

Qr Display Free Home

Setting Report

VPA Settings Set Display

Generate Qr

Welcome Screen

Report

Last Order Id :-



BONRIX EMBEDDED
INNOVATIONS

The screenshot shows a window titled "VPASettings" with the following fields and values:

- Enter VPA:
- Enter VPN:
- Select Qr String:
- Final Qr String:

Buttons: Save, Close

2) Now Click on **Set Display**

Select **Display type 3.5 inch USB JPEG Display**

Select **Com Port** And **Baud rate** : 230400

Check mark on **Play Audio**

Click on **Save**

The screenshot shows the "Qr Display Free Home" interface with the following elements:

- Setting | Report
- VPA Settings
- Set Display (highlighted)
- Amount:
- Generate Qr
- Welcome Screen
- Report
- Last Order Id :-

The screenshot shows a window titled "Set Display" with the following settings:

- Select Display: Save
- Com Port: Refresh
- Baud Rate: 921600
- Chunk:
- Delay in Millisecond:
- Image Size KB: set -1 to ignore file size
- Play Audio
- Open Volume



**BONRIX EMBEDDED
INNOVATIONS**

Step 3: Welcome Screen:

The screenshot shows the 'Welcome Screen' of the application. It features a central panel titled 'Steps to Scan and Pay' with three steps: STEP 1: Open BHIM UPI app, STEP 2: Tap on Pay/Scan, and STEP 3: Scan QR Code. To the left, there are buttons for 'Enter Amount', 'Generate Qr', 'Welcome Screen', and 'Report'. To the right, there is a summary table for transactions.

Category	Success ₹	Pending ₹	Fail ₹	Other ₹
Today	10	0	10	0
All Time				

At the bottom, there is a table with columns: Id, Date, PosId, InvoiceId, VPA, UPIString, Number, Amt, Status, TXID, Message, QrTxId, BankRRR, ReqID, Res, StatusChk, CallbackF.

Step 4: QR Code:

→ Enter Your Amount And Click on
Generate QR

The screenshot shows the 'QR Code' generation interface. The 'Enter Amount' field contains '10'. The 'Generate Qr' button is highlighted. To the right, a QR code is displayed with the text 'To Pay ₹ 10' and the BHIM logo. A 'Check Status' dialog box is open, showing 'Amount :- 10' and 'Last Order Id :- AJEB638582947157219592IRJPT'. The dialog has three buttons: 'Success' (green), 'Fail' (red), and 'Pending' (blue).



Step 5: Successful:

Setting Report

Enter Amount
10

Generate Qr

Welcome Screen

Report

Last Order Id :-
AJEB638582947157219592IRJPT

 Payment Successful
₹ 10
AJEB638582947157219592IRJPT

 Thank you for using BHIM UPI

Step 6: Failed:

Setting Report

Enter Amount
10

Generate Qr

Welcome Screen

Report

Last Order Id :-
OVDA638582948002930273UOUFK

 Payment Failed
₹ 10
OVDA638582948002930273UOUFK

 Thank you for using BHIM UPI

DQR-222 BLE Dynamic QR Code Display

Programmer's Operation Guide

Overview

The DQR-222 BLE Display enables you to:

- **Send text commands** (show different QR/payment screens, control settings)
- **Transfer JPEG images** (dynamic QR/image display)
- **Transfer MP3 audio files** (play audio on the device)

Communication is via **BLE (Bluetooth Low Energy)** using specified UUIDs and command protocols.

1. BLE Connection and UUIDs

Device Name: `Bonrix-DQR-222`

Service UUIDs:

- **Write UUID:** `87654321-4321-4321-4321-cba987654321` (send commands/data here)
- **Notify UUID:** `98765432-1234-1234-1234-123456789abc` (receive notifications/events here)

Use a BLE library (like [Bleak for Python](#)) to:

- Scan for the device
- Connect to the device
- Start notifications
- Send commands/data to the write UUID

2. Text Commands (Operation Commands)

These are **string-based commands** (usually with parameters, separated by `**`, and ending with `\n`). You send these to the Write UUID. The device responds over the Notify UUID.

A. UI & QR Code Display Commands

Command Key	Command Format	Purpose
1	WelcomeScreen**<UPI_ID>\n	Show Welcome screen with UPI
2	DisplayFailQRCodeScreen**<MOBILE>**<ORDERID>**<DATE>\n	Show Failure QR screen
3	DisplaySuccessQRCodeScreen**<MOBILE>**<ORDERID>**<DATE>\n	Show Success QR screen
4	DisplayCancelQRCodeScreen**<MOBILE>**<ORDERID>**<DATE>\n	Show Cancelled QR screen
5	DisplayQRCodeScreen**<QR_PAY_URL>**<AMOUNT>**<UPI_ID>\n	Show Payment QR screen

Example for QR Pay Screen:

```
cmd = "DisplayQRCodeScreen**upi://pay?
pa=xxxx@upi&pn=Bonrix&cu=INR&am=10&pn=Bonrix%20Software**10**7418529631@icici\n" await
client.write_gatt_char(WRITE_UUID, cmd.encode(), response=True)
```

B. File Management and Playback

Command	Usage/Example	Purpose
play**<MP3_FILENAME>\n	play**audio1.mp3\n	Play specified MP3
delete**mp3**<MP3_FILENAME>\n	delete**mp3**audio1.mp3\n	Delete MP3 file
delete**images**<JPEG_FILENAME>\n	delete**images**image1.jpg\n	Delete JPEG file
fileinfomp3\n	fileinfomp3\n	Get MP3 files list
fileinfo\n	fileinfo\n	Get JPEG files list

Note: Device responds with file info as JSON. End markers like `end_of_fileinfo` or `end_of_fileinfomp3` signal completion.

C. Volume & Settings

Command	Usage	Purpose
setvolume**<N>\n	setvolume**10\n	Set volume (1–21)

Command	Usage	Purpose
<code>getvolume\n</code>	<code>getvolume\n</code>	Query current volume
<code>+ or -</code>	<code>+ / -</code>	Manual volume up/down
<code>freesize\n</code>	<code>freesize\n</code>	Get free space info
<code>startrotation\n</code>	<code>startrotation\n</code>	Start rotation (if supported)
<code>stoprotation\n</code>	<code>stoprotation\n</code>	Stop rotation
<code>settimer <sec>\n</code>	<code>settimer 60\n</code>	Set timer in seconds

3. JPEG and MP3 File Transfer

There are **two modes** for uploading files: **SPIFFS (Flash Storage)** and **RAM Mode (temporary, not persistent)**.

A. Upload JPEG to SPIFFS

1. **Send command:** `sending <filename> <filesize>\n`
2. **Wait briefly.**
3. **Send file content** in chunks (default: 512 bytes; each BLE packet ≤ 244 bytes).
4. Device stores JPEG in `/images`.

Sample Python Flow

```
start_cmd = f"sending myimage.jpg 11245\n" await client.write_gatt_char(WRITE_UUID,
start_cmd.encode(), response=True) # Then send JPEG file in 244-byte chunks via BLE to the same
characteristic.
```

B. Upload MP3 to SPIFFS

1. **Send command:** `sendingaudio <filename> <filesize>\n`
2. **Wait briefly.**
3. **Send MP3 content** in chunks (same as above).
4. Device stores MP3 in `/mp3files`.

C. RAM Mode JPEG Upload

1. **Send command:** `ssf <filename> <filesize>\n`
2. **Send JPEG file data** (device processes as temp/RAM image).

D. RAM Mode MP3 Upload

1. **Send command:** `ssa <filename> <filesize>\n`
2. **Send MP3 file data** (device processes as temp/RAM audio).

Chunked Data Transfer Protocol

- Always send the "start" command first (as above), then stream the file bytes in **small BLE packets** (≤ 244 bytes per write).
- For large files, break the data into 512-byte chunks and then further into BLE-sized packets (244 bytes).
- Use small delay between writes (`await asyncio.sleep(0.01)`).

4. How to Send Commands and Files

A. Sending a Text Command

```

async def send_command(client, command): message_bytes = (command + '\n').encode('utf-8') for i
in range(0, len(message_bytes), 20): chunk = message_bytes[i:i+20] await
client.write_gatt_char(WRITE_UUID, chunk, response=True) await asyncio.sleep(0.02)

```

B. Uploading a File (Generic Algorithm)

```

async def upload_file(client, start_cmd, file_path): await client.write_gatt_char(WRITE_UUID,
start_cmd.encode(), response=True) await asyncio.sleep(0.1) with open(file_path, "rb") as f:
while True: chunk = f.read(512) if not chunk: break for i in range(0, len(chunk), 244): packet =
chunk[i:i+244] await client.write_gatt_char(WRITE_UUID, packet, response=False) await
asyncio.sleep(0)

```

Upload Command Formats:

- For JPEG to SPIFFS: `start_cmd = f"sending {filename} {filesize}\n"`
- For MP3 to SPIFFS: `start_cmd = f"sendingaudio {filename} {filesize}\n"`
- For JPEG RAM: `start_cmd = f"ssf {filename} {filesize}\n"`
- For MP3 RAM: `start_cmd = f"ssa {filename} {filesize}\n"`

5. BLE Notification Handling

- Listen for notifications from the device for responses, file lists, JSON info, or transfer completion markers.
- The device may return JSON-formatted data (e.g., file lists), which should be parsed by the client.

6. Example: Show QR Code and Upload JPEG

```

# Show QR code await send_command(client, "DisplayQRCodeScreen**upi://pay?
pa=123@upi&am=10**10**123@upi") # Upload JPEG image filename = "qr_image.jpg" filesize =
os.path.getsize(filename) start_cmd = f"sending {filename} {filesize}\n" await
upload_file(client, start_cmd, filename)

```

7. Complete Command Reference

Screen/UI Commands

- `WelcomeScreen**<UPI_ID>\n`
- `DisplayFailQRCodeScreen**<MOBILE>**<ORDERID>**<DATE>\n`
- `DisplaySuccessQRCodeScreen**<MOBILE>**<ORDERID>**<DATE>\n`
- `DisplayCancelQRCodeScreen**<MOBILE>**<ORDERID>**<DATE>\n`
- `DisplayQRCodeScreen**<QR_PAY_URL>**<AMOUNT>**<UPI_ID>\n`

File Management Commands

- `fileinfo\n` → JPEG list
- `fileinfomp3\n` → MP3 list
- `delete**images**<JPEG_FILENAME>\n`
- `delete**mp3**<MP3_FILENAME>\n`
- `play**<MP3_FILENAME>\n`

Volume & Settings Commands

- `setvolume**<N>\n`
- `getvolume\n`
- `+ or -` (volume up/down)
- `freesize\n`
- `startrotation\n`
- `stoprotation\n`
- `settimer <sec>\n`

File Upload Commands

SPIFFS/Flash Storage:

- JPEG: `sending <filename> <filesize>\n` + file data
- MP3: `sendingaudio <filename> <filesize>\n` + file data

RAM Storage:

- JPEG: `ssf <filename> <filesize>\n` + file data
- MP3: `ssa <filename> <filesize>\n` + file data

Programmer Checklist

1. **Scan and Connect:** Use BLE scanner to find `Bonrix-DQR-222`.
2. **Start Notify:** Begin listening on Notify UUID.

3. **Send Commands:** Use proper command format for screen control, file ops, volume, etc.
4. **File Transfer:** For images/audio, always send the command first, then stream file data in small packets.
5. **Handle Responses:** Parse notifications (including JSON) for status or data.
6. **Clean Disconnect:** Always end with disconnect and stop notification cleanly.

8. Summary Operation Table

Operation	Command/Method	Data Flow
Show Welcome	<code>WelcomeScreen**<UPI_ID>\n</code>	Command only
Show Fail QR	<code>DisplayFailQRCodeScreen**MOBILE**ORDERID**DATE</code>	Command only
Show Success QR	<code>DisplaySuccessQRCodeScreen**MOBILE**ORDERID**DATE</code>	Command only
Show Pay QR	<code>DisplayQRCodeScreen**URL**AMOUNT**UPI_ID\n</code>	Command only
Play MP3	<code>play**FILENAME\n</code>	Command only
Delete MP3	<code>delete**mp3**FILENAME\n</code>	Command only
Delete JPEG	<code>delete**images**FILENAME\n</code>	Command only
List JPEG files	<code>fileinfo\n</code>	Command, then parse JSON from Notify
List MP3 files	<code>fileinfomp3\n</code>	Command, then parse JSON from Notify
Set Volume	<code>setvolume**N\n</code>	Command only
Get Volume	<code>getvolume\n</code>	Command only, response via Notify
Upload JPEG	<code>sending FILENAME SIZE\n</code> + file chunks	Command + binary data
Upload MP3	<code>sendingaudio FILENAME SIZE\n</code> + file chunks	Command + binary data
RAM JPEG Upload	<code>ssf FILENAME SIZE\n</code> + file chunks	Command + binary data
RAM MP3 Upload	<code>ssa FILENAME SIZE\n</code> + file chunks	Command + binary data



Programming Tips

- ◆ Always end commands with `\n`.
- ◆ Always break up large files into BLE-safe packet sizes (≤ 244 bytes).
- ◆ Listen for notifications to handle device replies, especially for file uploads and listings.

- ◆ **For UI/QR commands, parameters are**



ADDRESS

BonrixEmbedded Innovations

A-701 Dev Aurum Commercial,
Nr. Anand Nagar Cross Road,
Prahlad Nagar, Satellite,
Ahmedabad, Gujarat 380015

Contact On :+91-9409745500,+91-9429045500
info@embedded-innovations.com
embeddedinnovations.bonrix@gmail.com

Visit Us On

WEBSITE: <http://www.embedded-innovations.com/>

FACEBOOK: <https://www.facebook.com/BonrixEmbeddedInnovations/>

TWITTER: <https://twitter.com/BonrixEmbedded>

INSTAGRAM: <https://www.instagram.com/BonrixEmbeddedInnovations/>

LINKEDIN: <https://www.linkedin.com/company/bonrix-embedded-innovations/>

YOUTUBE: <https://www.youtube.com/@Bonrix-Embedded-Innovations>