Testing Methodology Document

Motorola Deep Connect Device

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# Test 1: DTMF Testing

## Objective:

To verify if the DTMF module is correctly converting audio signals into electrical signals that represent the corresponding buttons (1 to 9, 0, \*, #) on a walkie-talkie.

## Test Procedure:

## Setup:

* Ensure the Deep Connect device is powered on and properly connected.
* Ensure that all the necessary audio connections to the walkie talkie are set-up properly.

## Testing Steps:

* Press the PTT (Push-To-Talk) button on the user walkie-talkie.
* Sequentially press each button (1 to 9, 0, \*, #) on the walkie-talkie.
* Observe the display of the Deep Connect device.

## Expected Result:

The display should correctly show the corresponding number or symbol for each button pressed on the walkie-talkie.

## Troubleshooting:

If the display does not show the correct button:

* + Check the DTMF module connections and ensure they are soldered properly.
  + Ensure that there is continuity between the level shifter and the DTMF module.
  + Check the connection between Micro controller ESP 32 WROOM and level shifter and ensure continuity.
  + Test the continuity of the speaker line of walkie talkie.
  + If the issue persists, replace the DTMF module with a new one and repeat the test.

# Test 2: Sound Quality Testing

## Objective:

To verify if the Deep Connect device is providing proper sound quality without noise during communication between a phone and a walkie-talkie.

## Test Procedure:

## Setup:

* Ensure the Deep Connect device is powered on and properly connected.
* Install the Deep Connect app on the user phone and login with the credentials provided.

## 2. Testing Steps:

* Make a call from the phone to the walkie-talkie using the Deep Connect app.
* Listen to the sound quality on both the phone and the walkie-talkie during the call.
* Observe any noise or distortion in the sound.

## Expected Result:

The sound should be clear and free of any noise or distortion on both the phone and the walkie-talkie.

## Troubleshooting:

If there is noise or poor sound quality:

* Check the continuity of the wires transferring sound signals between the phone and the walkie-talkie.
* Ensure the wires are properly attached to the terminals.
* Replace any faulty wires and repeat the test.

# Test 3: Relay Switching Functionality

## Objective:

To verify if the relay in the Deep Connect device is correctly toggling the PTT (Push-To-Talk) button on the walkie-talkie via BLE (Bluetooth Low Energy).

## Test Procedure:

## Setup:

* Ensure the Deep Connect device is powered on and properly connected.
* Ensure BLE connection is established between the phone and the PCB.

## 2. Testing Steps:

* Send a command via BLE to toggle the PTT button on the walkie-talkie.
* Observe the relay to check if it is switching the PTT button on the walkie-talkie.

## 3. Expected Result:

The relay should toggle the PTT button on the walkie-talkie as per the commands sent via BLE.

## 4. Troubleshooting:

First Failure Case:

* Check the state of the DIP switches.
* DIP switch 1 should be in the OFF state.
* DIP switch 2 should be in the ON state.

Second Failure Case:

* + Ensure the module attached to K1 is tested for continuity with the PTT button.
  + Check whether the module attached to K1 is receiving the appropriate voltage.
  + Replace any faulty components and repeat the test.

# Conclusion:

# *In summary, the three tests conducted for the Deep Connect device ensure its key functionalities operate as intended:*

# ***DTMF Module Functionality:***

# *Verified that the DTMF module accurately converts audio signals to electrical signals corresponding to the walkie-talkie buttons (1 to 9, 0, \*, #). Any issues were resolved by checking connections, adjusting the volume, or replacing the module.*

# ***Sound Quality Testing:***

# *Confirmed that the device provides clear sound quality without noise during communication between a phone and a walkie-talkie. Troubleshooting involved checking and securing the quality of the wires or replacing faulty ones.*

# ***Relay Switching Functionality:***

# *Ensured the relay correctly toggles the PTT button on the walkie-talkie via BLE commands. Issues were addressed by checking the DIP switch settings, verifying the relay attached to K1, and ensuring the relay receives appropriate voltage.*

# *These tests collectively validate the functionality and reliability of the Deep Connect device, ensuring it meets the required performance standards.*