TEMPO

MEETING ROOM DISPLAY TABLET

USER GUIDE

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1 Product Description

1.1 Overview

Tempo is a LoRaWAN-enabled interactive signboard. The Digital Sign features 6” E Ink screen with capacitive touch, Front light, RGB LED indicators, an Accelerometer and a Battery monitor. Table 1 presents the Meeting Room Display Tablet models.

Table 1: Meeting Room Display Tablet Models

Product Code	Description	RF Region	Tx Band (MHz)	Rx Band (MHz)
T0006086	MODULE, DIGITAL SIGNAGE, BATTERY POWERED, NA	US915	923-928	902-915
T0006093	MODULE, DIGITAL SIGNAGE, EXTERNALLY POWERED, NA	US915	923-928	902-915
T0006749	MODULE, DIGITAL SIGNAGE, BATTERY POWERED, EU	EU868	863-870	863-870
T0006750	MODULE, DIGITAL SIGNAGE, EXTERNALLY POWERED, EU	EU868	863-870	863-870

The main features of the Meeting Room Display Tablet (Tablet) are as follows:

- **6” E Ink screen**: 1024(H) x 758(V) pixels with 16 levels of gray.
- **Touch screen**: Capacitive touch screen.
- **Front light**: Uniform front lighting for low light environment.
- **LED:** Configurable RGB LEDs indicate the room status that is visible from a distance.
- **LoRa:** Air interface capable of long-range at low power.
- **Battery Powered (option):** Powered by 4xAA, up to 1-year battery life.
- **Externally Powered (option):** 5V DC or PoE (48V) powering option.
- **Easy Installation:** a removable wall mount plate simplifies the installation and alignment of the Tablet.
- **Safety Screw:** Hidden screw on the top that requires a special tool to unlock ensuring the devices safety.
- **Hidden Cables:** If powering the device externally there are grooves to hide the cables leaving a clean finish.

- **Landscape or Portrait mode[1]:** The device can be mounted in horizontal or vertical orientation.
- **Battery Monitor:** Monitors the battery level and provides a low battery warning for timely replacement.
- **Deep Sleep mode:** Accelerometer allows the device to save power when the Tablet is not in use and wake up when a Double tap is detected on the screen.

Figure 1-1 illustrates the Meeting Room Display Tablet.

Figure 1-1: Meeting Room Display Tablet

1.2 Specifications

The Meeting Room Display Tablet specifications are listed in Table 2.

[1] Portrait mode is not supported in current version of firmware

Table 2: Meeting Room Display Tablet Specifications

Attribute	Specification
Use Environment	Indoor only
Enclosure	Plastic, IP30
Operating Temperature	5°C to 40°C
Storage Temperature	-25°C to 70°C
Operating Relative Humidity	5% to 95%, condensing
Size	4.5 (L) x 6 (W) x 1(H) inch
Weight	340g(0.75lb) with batteries 280g(0.62lb) without batteries
Display	Size: 6-inch E Ink screen (3:4) Resolution: 1024(H) x 758(V) pixels Color: 16 levels of gray (monochrome) Front light
Touchscreen	Capacitive touchscreen ± 5 mm accuracy
Power Source	**Externally powered Option:** -DC 5V -PoE 48VDC (IEEE 802.3af Mode A or B or 4-pair Mode) **Battery powered option:** -4x AA Lithium Batteries -Front light and RGB LEDs not supported
Power Consumption	3 W maximum
Battery Lifetime	1-year battery life for typical use case[2]
Network technology/Frequency band	LoRaWAN in several variants: US915, EU868
Air Interface	LoRa
Maximum Tx Power	15 dBm
LED	4 uniformly illuminated LED bars (RGB) Green: Available Red: Occupied
Ethernet	PoE RJ45
USB Micro B	USB2.0 Debug port
Temperature Measurement Accuracy	$< \pm 5°C$

1.3 Physical Interfaces

Figure 1-2 and Figure 1-3 illustrates the customer-accessible interfaces of the Tablet. All models share the same layout; however, some functions are not available in some models. The externally

[2] Active 10 hour/ week day (280 Rx packets, 15 Tx packets at 15dBm, 15 screen updates), in Deep sleep otherwise

powered model shown in Figure 1-2 has RGB LEDs on the corners while the battery-powered version shown in Figure 1-3 cannot use the LEDs.

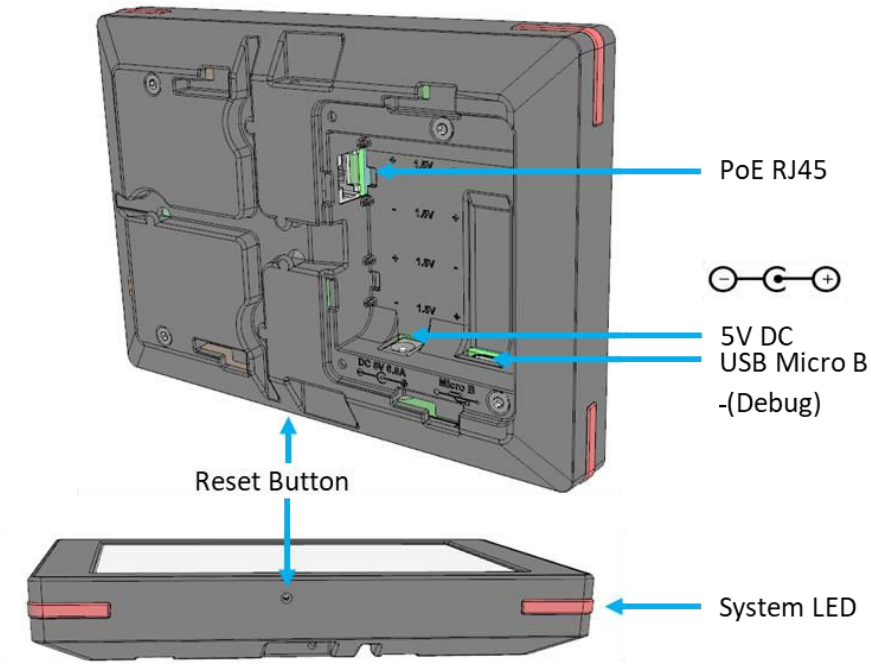

Figure 1-2: The Tablet (external) interface layout.

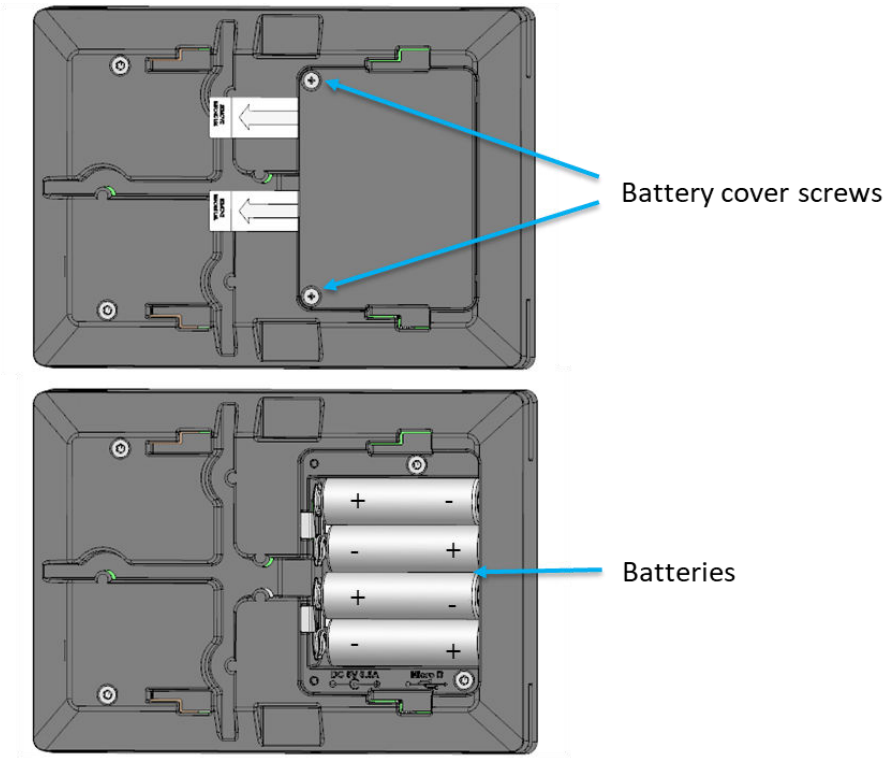

Figure 1-3: The Tablet (Battery) interface layout.

2 Operating Instructions

2.1 Included Product and Installation Material

The following items are shipped with each Tablet:

- Tempo Meeting Room Display Tablet
- 5V AC-DC power adapter (optional)
- Four AA batteries (optional)
- Wall mount plate
- Security/Lock screw (T6)
- Product Manual

NOTE: to ensure safe installation and maintenance, please read Safety Precautions.

2.2 Equipment Required for Installation

The following tools are required to install Tempo:

1) Screwdriver
2) 4x M4 Screws (Choose screw type based on the mounting surface)
3) Spirit level
4) T6 Torx driver for the security/lock screw

2.3 Unpacking and Inspection

The following should be considered during the unpacking of a new Tempo:

- Inspect the shipping carton and report any significant damage to TEKTELIC.
- Unpacking should be conducted in a clean and dry location.
- Do not discard the shipping box or inserts as they will be required if a unit is returned for repair.

2.4 Commissioning

The steps for commissioning Tempo are managed through a versatile Application that provides an interface that guides the user through the steps to commission the Tablet and allocating it to a meeting room. Please refer to the Tempo Application user guide for detailed instructions on commissioning the Tablet.

2.5 Power Up/Down Procedure

- Battery-powered version of the Tablet is shipped with the batteries installed along with pull tabs that prevent the Tablet from turning on during shipment.
- Once the Tablet is configured on the Application, turn on the Tablet by removing the battery pull tabs or providing external power depending on the model.

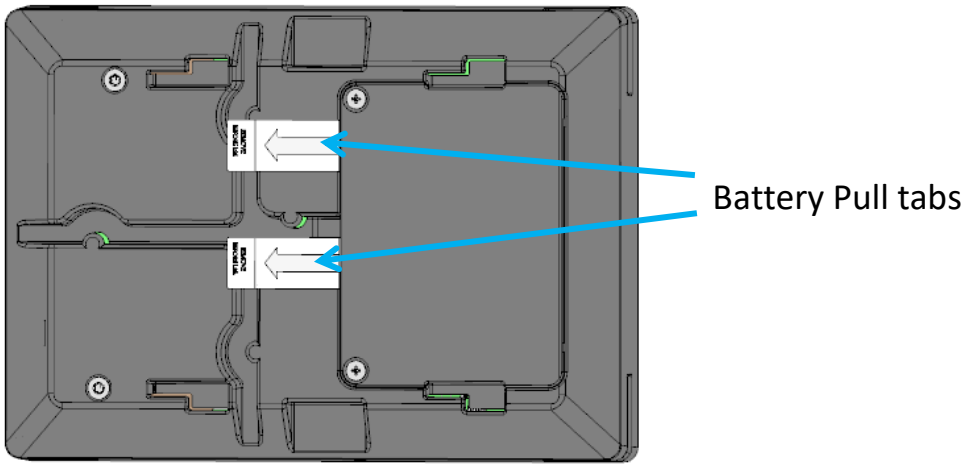

Figure 2-1: The Tablet (Battery) interface layout.

- To turn off the Tablet the batteries or external power must be removed. The unit must remain un-powered for 1 minute to completely reset.
- The reset switch of the Tablet is accessible through a pin hole in the bottom side of the Tablet as shown in Figure 1-2.

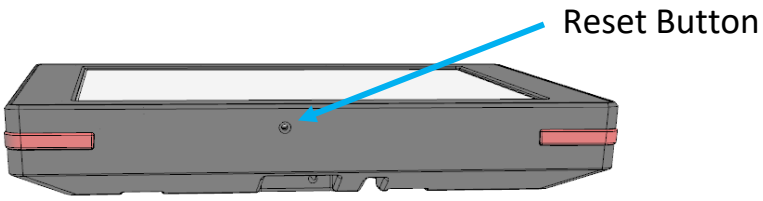

Figure 2-2: Reset Button

2.6 Default Configuration

The default configuration on the Tablet is:

- Report the battery voltage every 1 (one) hour.
- For Class A mode operation query room status every 10 minutes.

2.7 Reconfiguration

Tempo supports a range of Over-the-Air (OTA) configuration options. Specific technical details are available in the Technical Reference Manual. All configuration commands need to be sent OTA during a Tablet's downlink windows.

2.8 LED Behavior

Room Status LED (on externally powered variant)

All 4 LED bars turn green when the room is available for booking and turns red when the room is occupied.

System LED

The System LED shares the light pipe with the right bottom corner RGB LED. During the boot and join procedure:

- The System LED will blink continuously during normal boot up and join procedure.
- Once the Tablet receives the first status downlink from the BNA the System LED turns off and the bottom RGB LED reflects the status of the room.

2.9 Mounting

Tempo features a removable mounting plate that simplifies the installation and leveling of the Tablet. Once the mount plate is installed the Tablet slides onto the four hooks on the plate. The Tablet can be mounted in Landscape or Portrait [3]mode.

NOTE: The mounting surface must be capable of holding > 15 kg [33 lbs].

Mounting the wall plate

- Thread the Ethernet and/or Power cables through the rectangular opening in the wall plate. Ensure that the lock screw feature marked as "C" in Figure 2-3 is facing away from the mounting surface.
- Secure the mount plate on the mounting surface using 4 x M4 screws in locations A or B as shown in the Figure 2-3.
    - Double-sided adhesive tape could be used when mounting on glass
- The slots provided on the mounting plate allows for adjustment to level the mounting plate.

[3] Portrait mode is not supported in current version of firmware

- Using a spirit level, ensure that the mounting plate is plumb and tight all the screws.

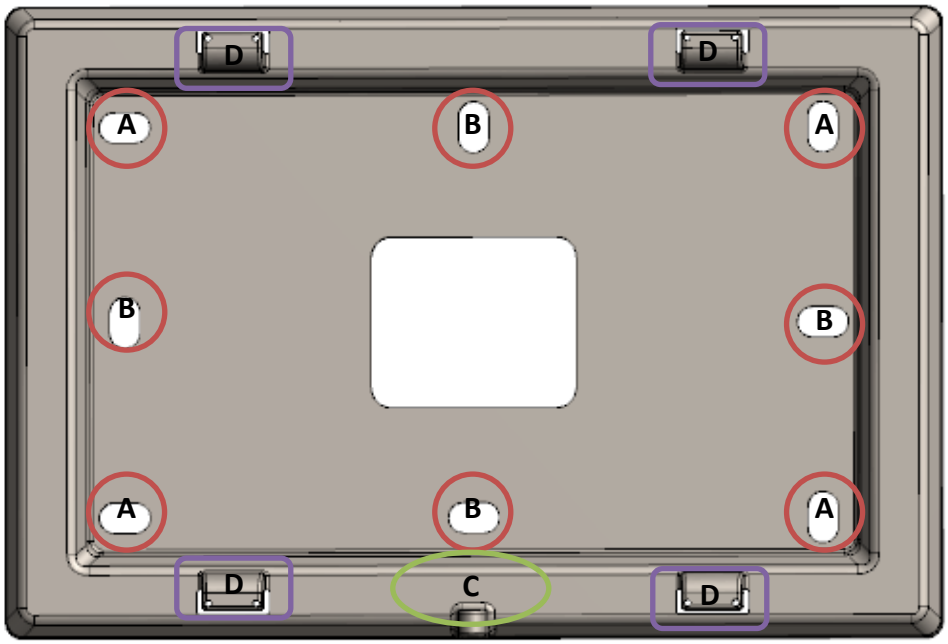

Figure 2-3: Wall mount plate.

Connect cables

- With the externally powered version, connect the necessary cables to the Tablet (Ethernet, 5V DC and Debug USB port are accessible under the battery cover).
- No cables are required on the battery-powered version.
- Cables can be routed through the channels on the back of the Tablet.

Install the Tablet

- Take a note of the MAC-ID/ EUI shown on the label on the back of the Tablet.
- To install the Tablet, first align the hooks on the mounting plate to the slots on the back of the Tablet (See features marked as “D” in Figure 2-3 and Figure 2-4), then push the Tablet onto the plate. Slide the Tablet to fix the Tablet in place.

3 It is recommended to proceed with the commissioning steps detailed in Operating Instructions

3.1 Included Product and Installation Material

The following items are shipped with each Tablet:

- Tempo Meeting Room Display Tablet
- 5V AC-DC power adapter (optional)
- Four AA batteries (optional)
- Wall mount plate
- Security/Lock screw (T6)
- Product Manual

3.2 Equipment Required for Installation

The following tools are required to install Tempo:

5) Screwdriver
6) 4x M4 Screws (Choose screw type based on the mounting surface)
7) Spirit level
8) T6 Torx driver for the security/lock screw

3.3 Unpacking and Inspection

The following should be considered during the unpacking of a new Tempo:

- Inspect the shipping carton and report any significant damage to TEKTELIC.
- Unpacking should be conducted in a clean and dry location.
- Do not discard the shipping box or inserts as they will be required if a unit is returned for repair.
- Commissioning before completing the final step of securing the Tablet with the lock screw.

Secure the Tablet using the lock screw

- With the battery powered version, ensure that the battery shipment tabs are pulled out before securing the Tablet.

- A T6 Torx screw is provided for the security lock. Tighten the lock screw using hand to secure the Tablet.

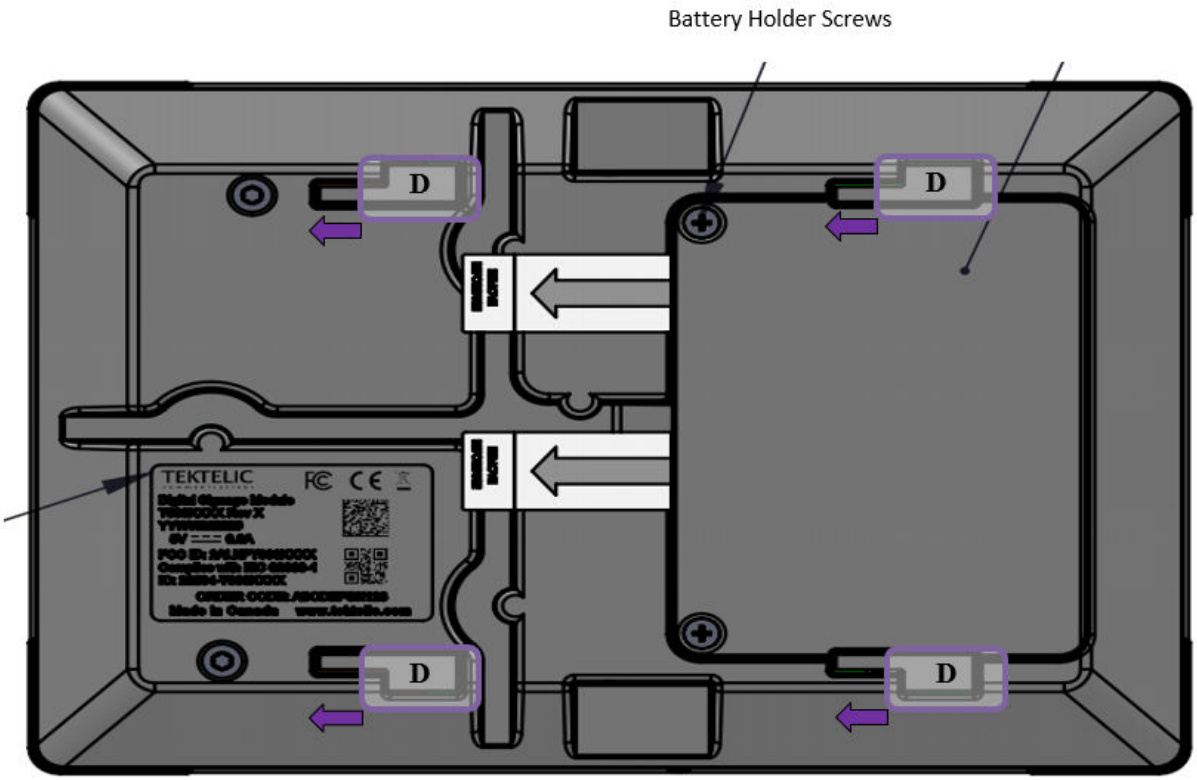

Figure 2-4: Tablet back side

3.4 Battery Replacement

The following tools are required to install the Meeting Room Display Tablet:

1) A Philips Screwdriver (#2)
2) 4x AA batteries (LiFES2 – Energizer, part number: L91)

Steps for replacing the batteries are as follows:

- Removed the battery cover by removing two philips screws shown in Figure 1-3

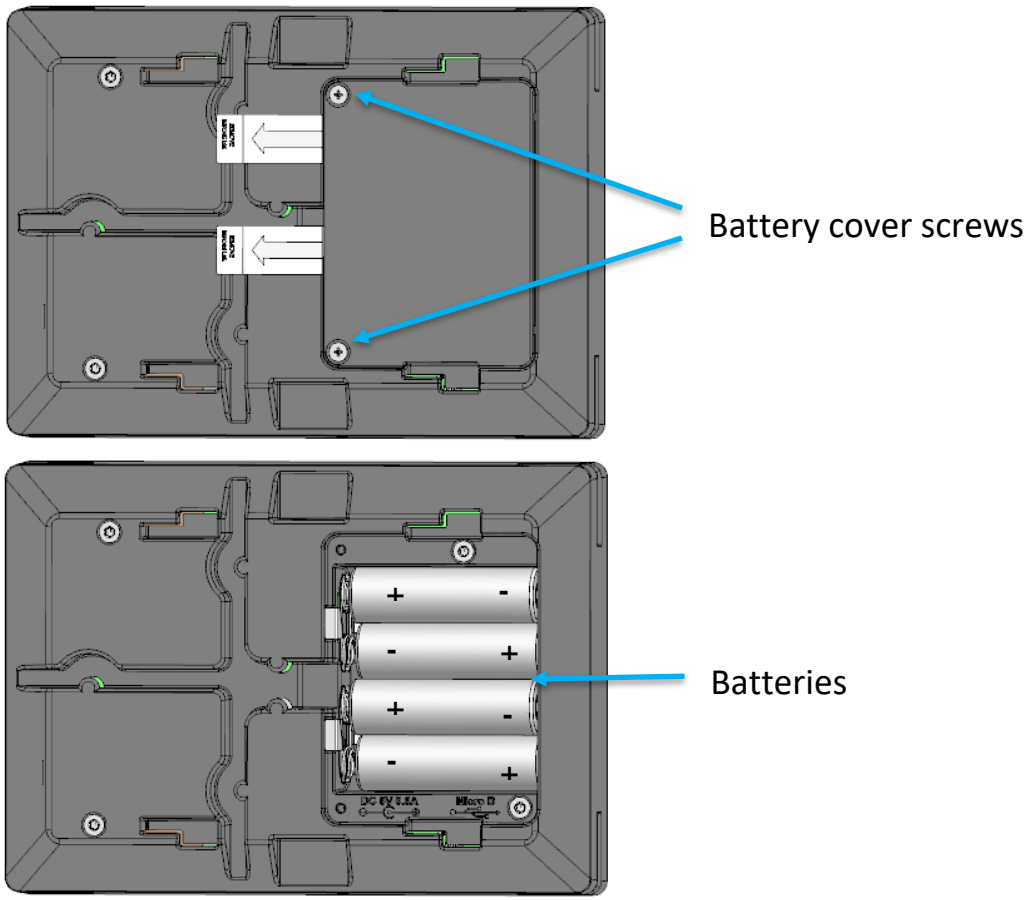

Figure 2-5: Batteries

- Remove all the old batteries from the device.
- To turn off the device the batteries must be uninstalled and remain un-powered for 1 minute.
- Replace with all new batteries of the recommended type.
- Install the battery cover and philips screws to secure the batteries.
- See section 2.8 for LED behavior during boot-up.
- Recycle the used batteries when possible by dropping them off at a participating reatiler.

4 Graphical User Interface

Tempo is equipped with a 6-inch EPD Touch Screen that enables users to book, extend, or finish a meeting. The Tablet displays the details of current and next meetings for the room. Features for rooms available for booking and occupied are discussed next.

4.1 Available

When the room is available for booking, Tablet uses a light background as shown in Figure 3-1. The LEDs light up with green color in the supported models. In the Available state the Tablet provides the following options:

- Displays the Next meeting information: Meeting *start time* and *booked by*
- Button to book a meeting now for a specified duration
    - Tablet makes the booking through a LoRa message to the Application. The Application ensures that the room is available for the specified duration and makes a booking in the configured calendar.
    - A confirmation message is displayed showing if the booking was successful or unsuccessful.

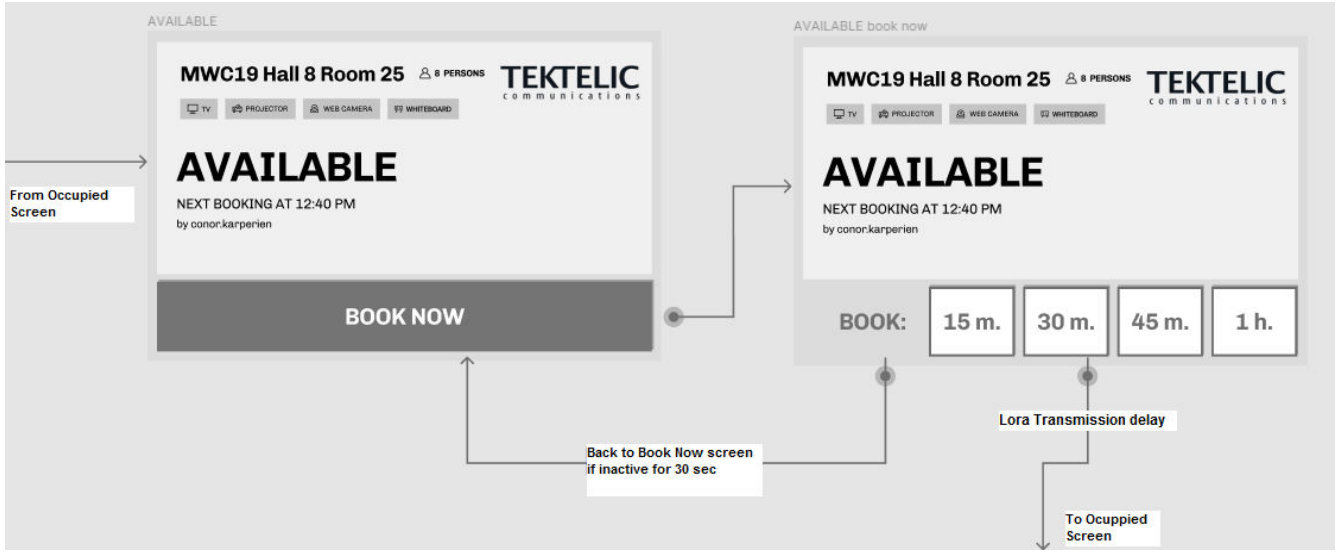

Figure 3-1: Room Available – User interface flow

4.2 Occupied

When the room is occupied, the Tablet uses a dark background as shown in Figure 3-2. The LEDs light up with red color in the supported models.

In the Occupied state the Tablet provides following options:

- Displays the current meeting information: Meeting '*end time'* and '*booked by* '
- Displays the Next meeting information: Meeting '*start time'* and '*booked by* '
- Button to finish the current meeting.
- Button to extend the current meeting for a specified duration.
    - There must be at least 10 minutes in between bookings to be allowed to extend the current meeting.
- Button to book a meeting for next available time.
    - Tablet makes the booking through a LoRa message to the Application. Application ensures that the room is available for the specified duration and makes a booking in the configured calendar.
    - A confirmation message is displayed showing if the booking was successful or unsuccessful.

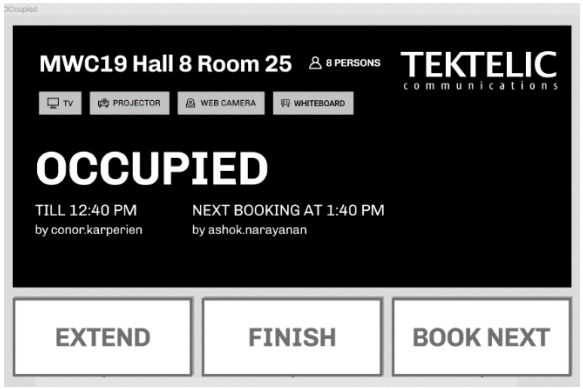

Figure 3-2: Room Occupied state

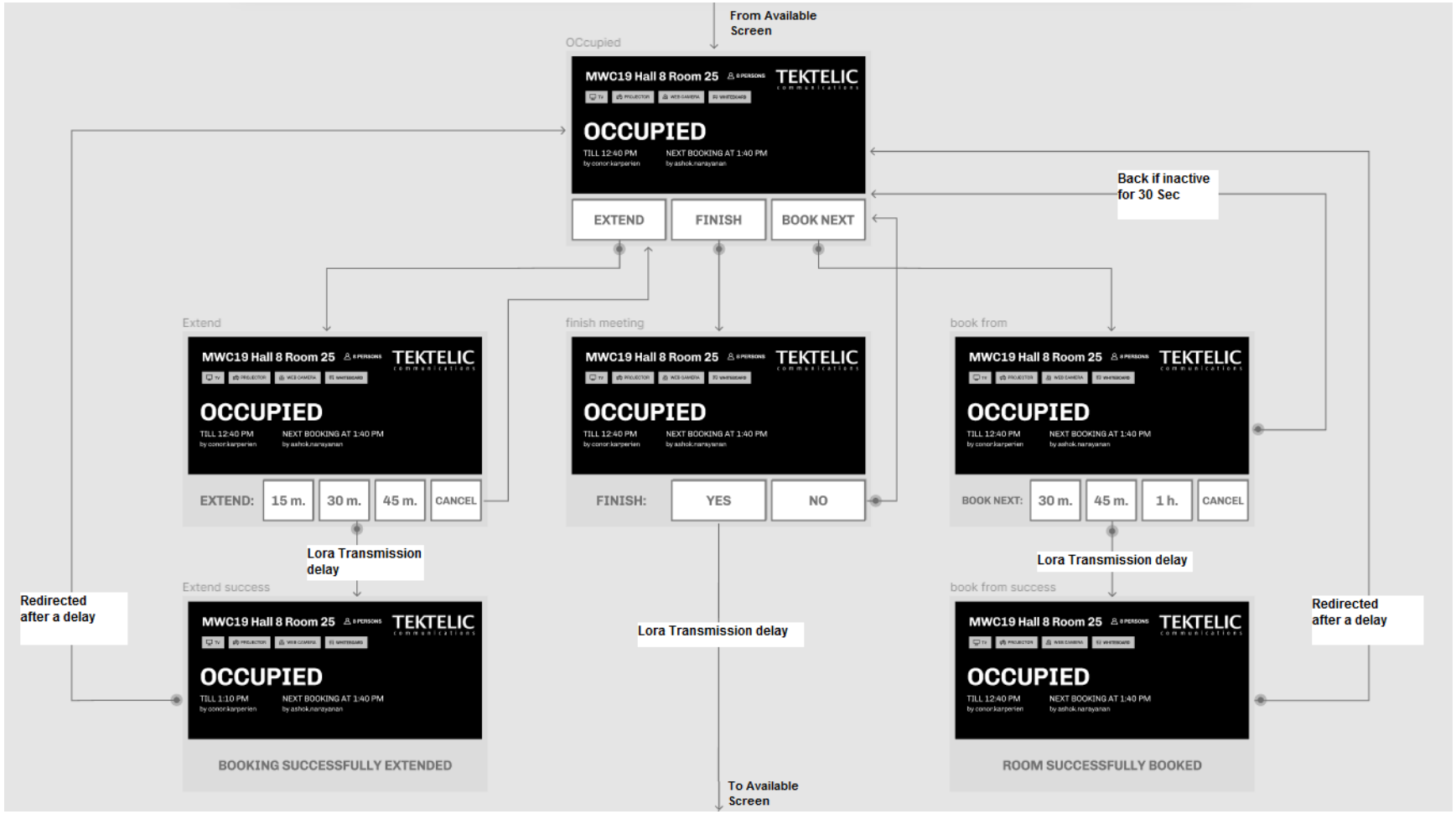

Figure 3-3: Room Occupied – User interface flow

5 Firmware Upgrade Feature

5.1 Setup/Requirements

To complete a Firmware Upgrade on the Tablet, you require the following setup:

- Windows 10 Laptop/PC Required. Drivers for DS may be required to install on the laptop.
- Teraterm
- Micro USB Cable (see Figure 5-1)
- Meeting Room Display Tablet (see Figure 5-2)

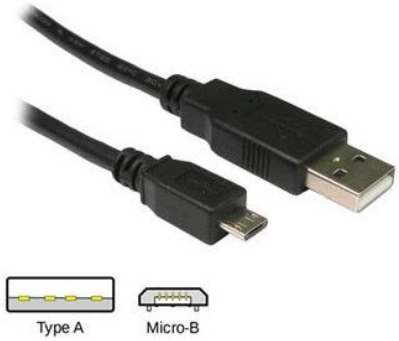

Figure 5-1 USB A to Micro-B Cable

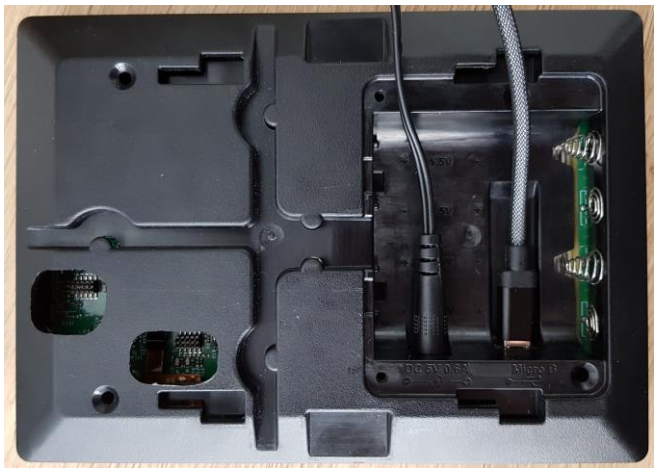

Figure 5-2 Digital Signage Board with power plug and USB cable connected

5.2 Steps to Complete Firmware Upgrade

1. Power Up the Digital Signage.
2. Connect the USB cable to Digital Signage then to Laptop/PC.

3. Then launch the Teraterm application, then select the serial and select the correct COM Port and select “OK”. (See Figure 5-3)

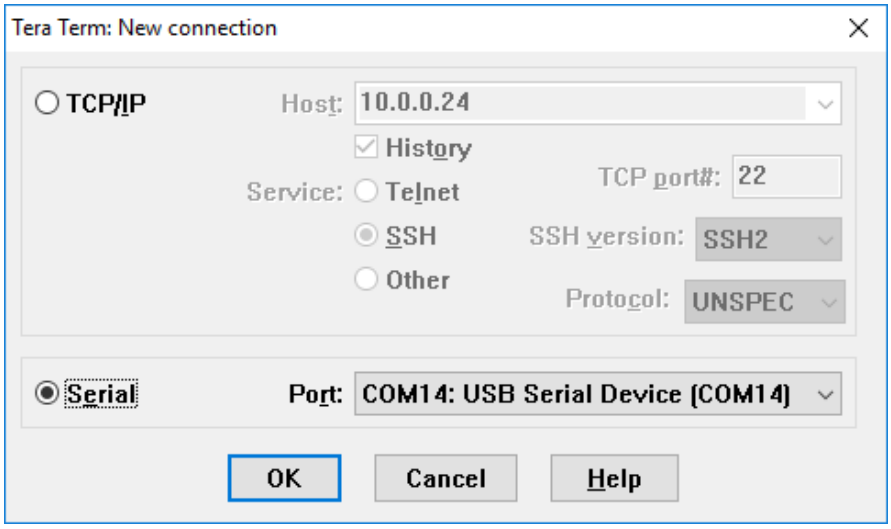

Figure 5-3 Com Power Selection

4. Then click the “Setup” menu and then click the “Serial Port” then set the “Speed” to 115200. Then click “OK”.

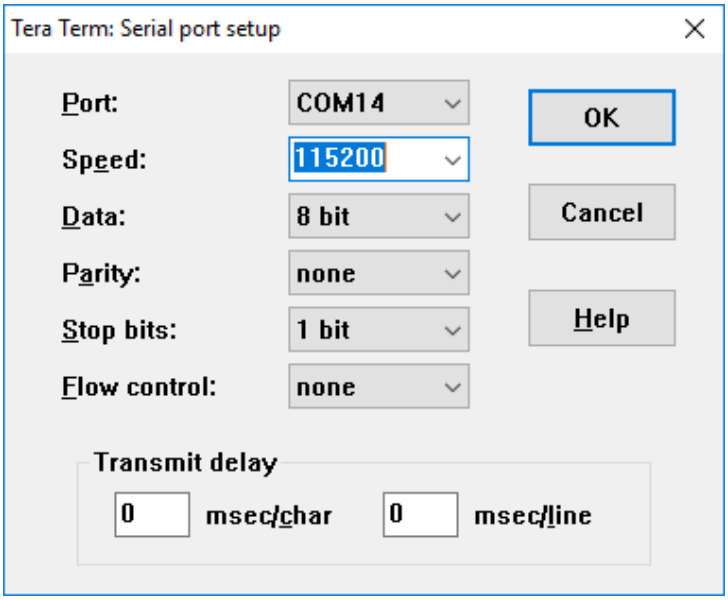

Figure 5-4 Serial Port and Speed Selection

5. Then “reset” the Digital Signage by pressing the reset button using a pin. Then Tera Term serial console would display a “Ready for the firmware file” message along with continuous “C”.

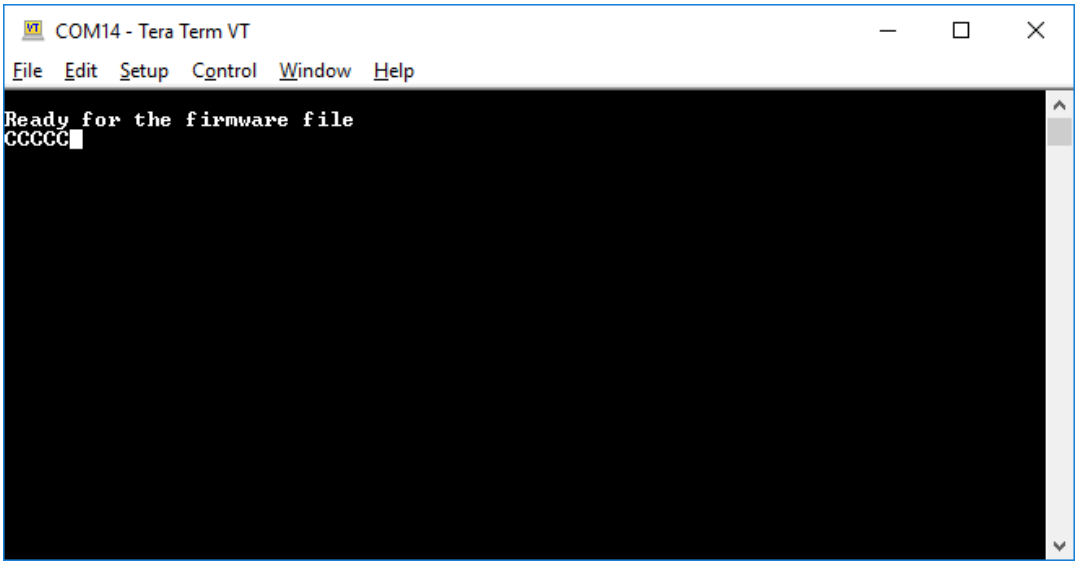

Figure 5-5 Ready for Firmware Note

6. Then go to “File->Transfer->XModem->Send”. Then browse and select the FW file (.hex file). Then select “Open”. Then Firmware Upgrade would start. The progress bar would be displayed.

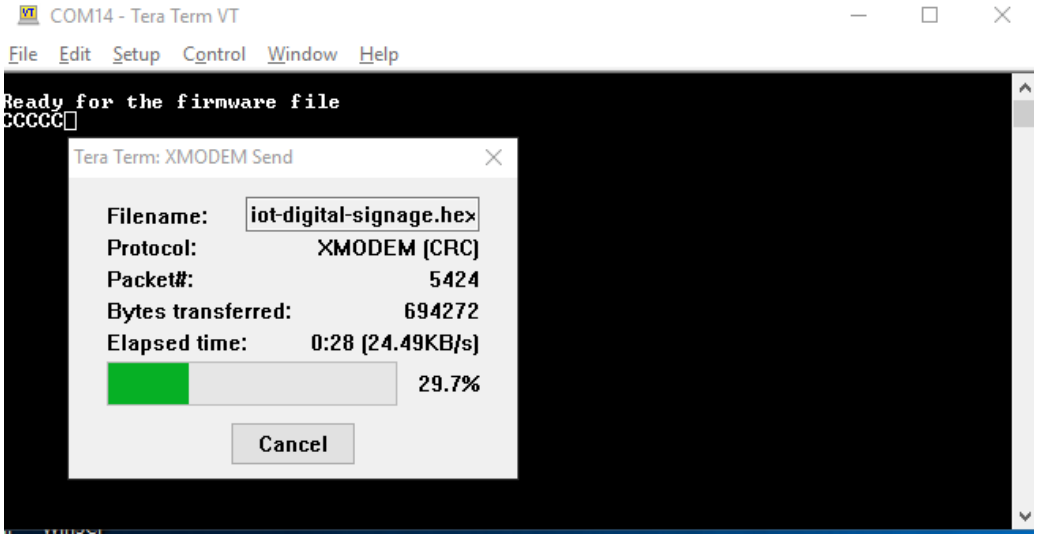

Figure 5-6 Progress Bar

NOTE: Starting the FW Upgrade should happen within a minute. Otherwise, the USB operation would timeout and go to the actual image. These messages would be displayed when it is timed out.

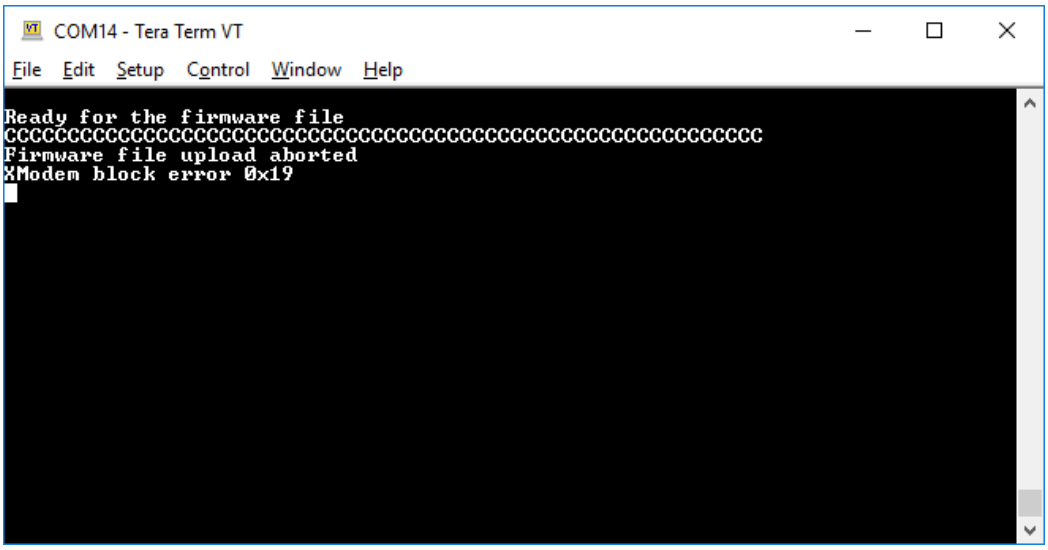

Figure 5-7 Firmware file upload aborted

7. After the successful Firmware Upgrade, the following message would be displayed in the serial console.

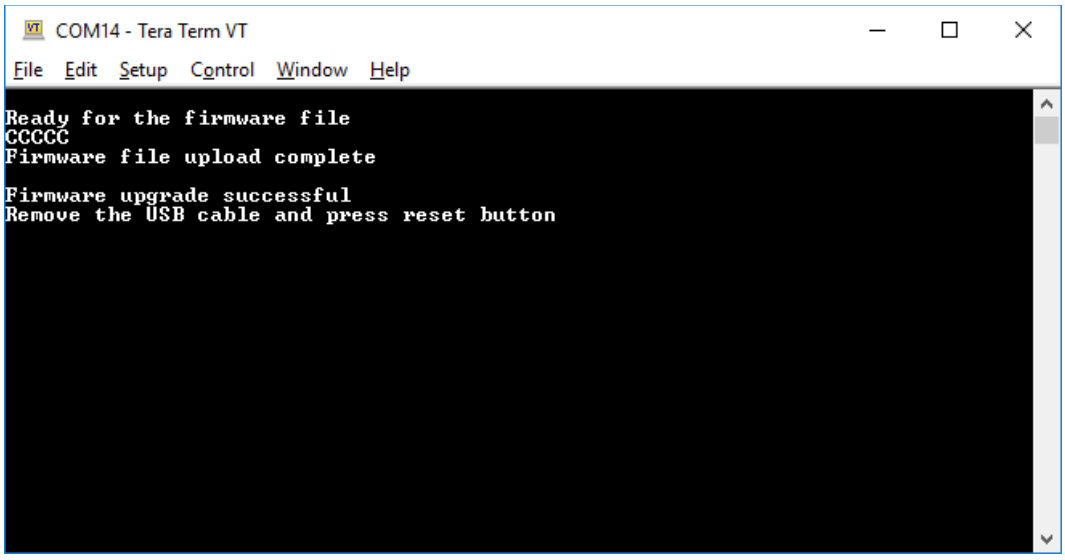

Figure 5-8 Firmware upgrade successful

8. Then as per the messages displayed in serial console, remove the USB cable and press the “reset” button on the DS and let the device power up.

6 Troubleshooting section

Question	Answer
Why does my screen blink periodically?	The blinking screen represents LoRa traffic being sent or received by the device.
What version of LoRaWAN do the sensors implement?	All TEKTELIC Sensor products run LoRaWAN 1.0.2
The serial numbers on my case are different from the serial numbers on the circuit board. Did my order get mixed up?	All TEKTELIC products have multiple serial numbers so we can track the devices at each stage of production. It is normal that your sensor board and sensor assembly have different numbers.
Where can I find the commissioning values for my sensors? (DEVEUI, APPEUI and APPKEY)	We keep the commissioning values for each sensor secure on our own server. We send the commissioning values for each sensor sent with a shipment but if this was misplaced, please send the serial number the revision and the Tcode of the sensor and we can get the information for you.
Why is my sensor sending more packets than the Network Server receives?	This occurs when the channel plan does not reflect the number of channels accepted by the gateway. By default, all sensors come up in 64 channel mode which results in lost packets if a gateway with less than 64 channels is used. If you have an 8-channel gateway for example, ensure this is configured in the device settings in the Network Server. In the TEKTELIC NS under the "advanced network settings" tab change the configuration of the "default channel mask" to reflect the number of channels used by the gateway used.

7 Safety Precautions and Compliance Statements

7.1 Safety Precautions

The following safety precautions should be observed:

- The Tablet is for indoor use only. Do not connect the Tablet to any outdoor cables.
- The Tablet has no internal field serviceable parts other than the batteries. Other than installing or replacing the batteries, the Tablet must only be opened by an approved TEKTELIC service center.
- All installation practices must be in accordance with the local and national electrical codes.
- Ensure that the Tablet is located to eliminate any physical hazard to people or property.
- The Tablet shall be powered from the supplied AC-DC power adaptor or through Power over Ethernet (PoE) or 4xAA batteries. Simultaneous application of power through more than one input may result in unexpected operation and shall be avoided.
- Keep batteries away from the reach of children.
- Do not mix old and new batteries.
- If the Tablet is not expected to be used for extended periods of time, the batteries should be removed before storage to avoid any leak.

7.2 Compliance Statements

Federal Communications Commission:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

To comply with FCC exposure limits for general population / uncontrolled exposure, this device should be installed at 20 cm from all persons and must not be co-located or operating in conjunction with any other transmitter.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These

limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Innovation, Science and Economic Development Canada:

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

(1) This device may not cause interference.
(2) This device must accept any interference, including interference that may cause undesired operation of the device.

This device should be installed and operated with minimum distance 0.2 m from human body.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

a. L'appareil ne doit pas produire de brouillage.
b. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Cet appareil doit être installé et utilise à une distance minimale de 0.2 m du corps humain.

California Proposition 65:

⚠ **WARNING:** This product can expose you to chemicals including lead, nickel & carbon black, which are known to the State of California to cause cancer, birth defects or other reproductive harm. For more information, go to www.p65warnings.ca.gov

Revision History

Version	Date	Editor	Comments
0.1	July 17, 2019	Emma Tholl	Initial Draft.
0.2	November 7, 2019	C Karperien	General updates and template updates
0.3	November 25, 2019	A Narayanan	Updated to include Tablet specific instructions.
0.4	December 5, 2019	C Karperien	General Updates and addition of Firmware Upgrade Feature
0.5	March 2, 2020	A. Narayanan	Updated Tcodes in Table 1 and Temperature specification in Table 2
0.6	April 20, 2020	C Karperien	Changes to Firmware Upgrade section
0.7	December 02, 2022	Ade Adegboye	Minor Formatting changes
2	July 17, 2024	Marharyta Yuzefovych	Updated to a user-friendly format