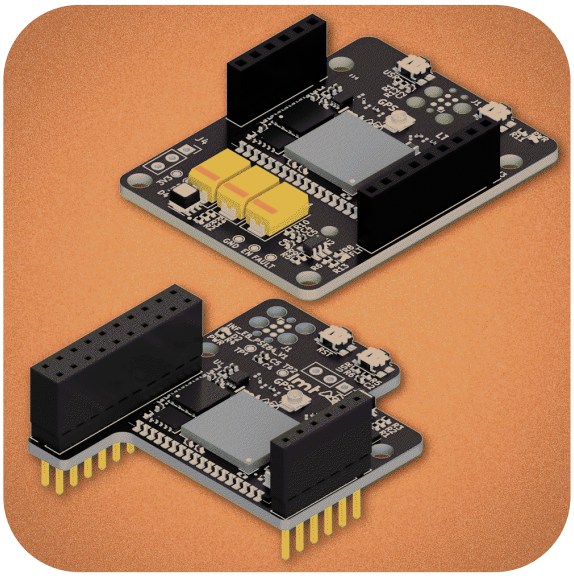
LMT Cellular LPWAN Extension Boards for Infineon PSOC AI Kits



Designed to mount directly onto the Infineon Edge AI Kits, the LMT extension boards provide seamless cellular connectivity for Edge AI applications. Powered by the LMT IoT Shortcut, each board includes a global SIM, native cloud integration, and works with a dedicated SDK featuring "serial-to-cloud gateway" functionality. This complete ecosystem allows developers to effortlessly transmit AI-processed data from the field to the cloud with minimal firmware development.

1 Ordering Information

LMT product number	Product name / Compatibility
`EBI151UFI`	LMT Cellular LPWAN Extension Board for Infineon PSOC Edge E84 AI Kit
`EBI251UFI`	LMT Cellular LPWAN Extension Board for Infineon PSOC 6 AI Kit

- Both product variations include a Molex 824–2170 MHz flexible cellular antenna with a U.FL connector. This antenna must be connected to the port labeled `LTE` before powering on the LMT board.
- The product packaging additionally includes unsoldered pin headers. These headers must be soldered onto the Infineon PSOC AI Kit to ensure proper mechanical mounting of the LMT extension board. See Section 6 for details.

2 Technical Specifications

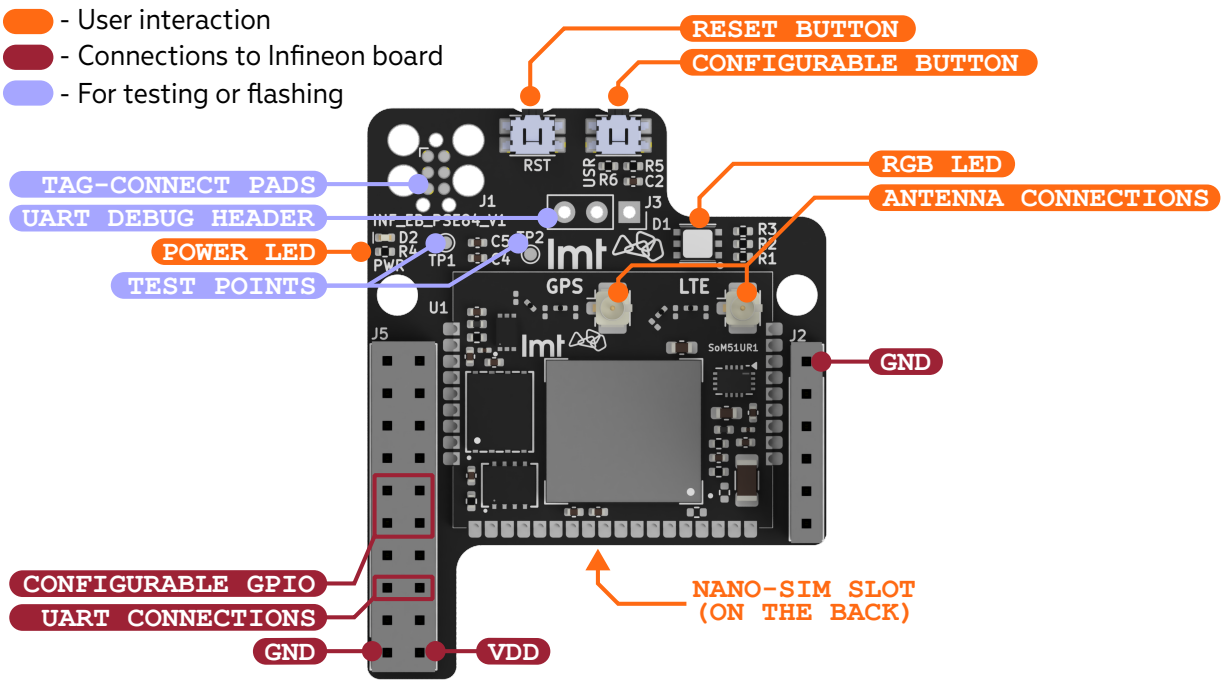
Main modem/MCU	Nordic Semiconductor nRF9151
Connectivity	LTE-M (Cat-M1) or NB-IoT (Cat-NB1/NB2)
SIM card configuration	Global MFF2 SIM included, nano-SIM slot provided
Deep sleep current consumption	<8 µA at 3.6 V supply
Single upload energy consumption	90 mJ or 25 µWh (100 B payload, excellent signal)

- These extension boards come pre-flashed with firmware and are pre-provisioned to the user's LMT IoT Cloud account. However, the user must implement the supported "serial-to-cloud gateway" commands within the host Infineon PSOC firmware. For integration details, refer to the LMT IoT SDK documentation and Section 6 of this document.
- The LMT extension boards support firmware-over-the-air (FOTA) updates. Please note that this functionality currently applies only to the LMT module and cannot be used to update the firmware of the host Infineon PSOC AI kit.

- The modules include an integrated global SIM card, providing LTE-M and NB-IoT connectivity in most countries worldwide. For specific coverage details, please contact the LMT IoT team.
- Users may opt to use a custom connectivity provider via the provided nano-SIM slot. Refer to the LMT IoT SDK documentation for instructions on how to toggle the active SIM.

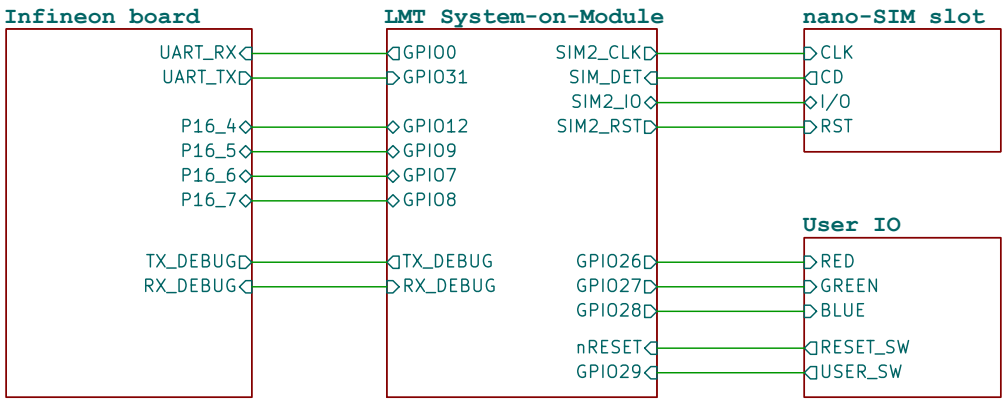
3 Extension Board for Edge E84 AI Kit (EBI151UFI)

3.1 Overview

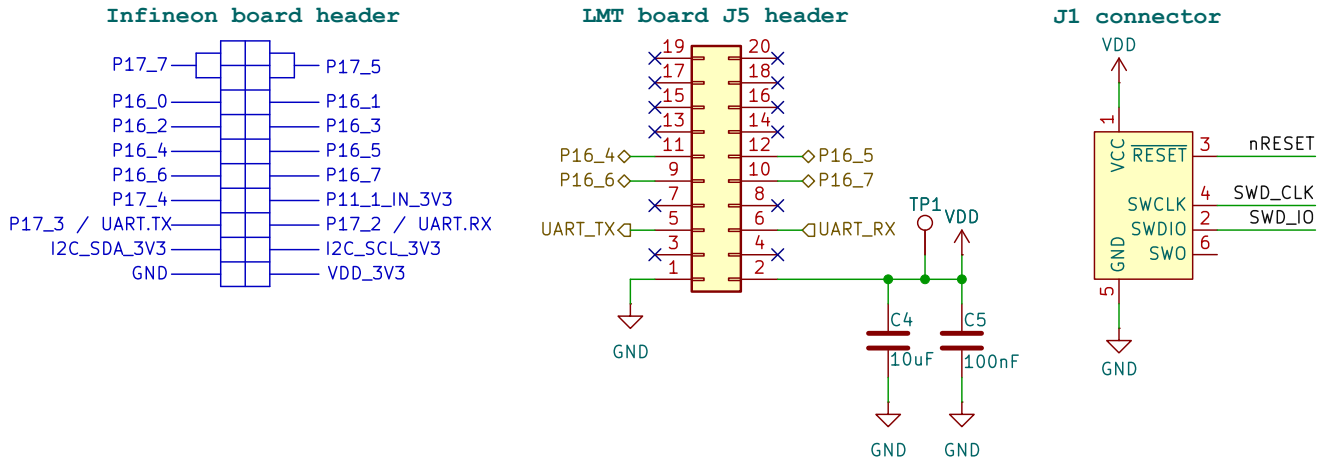


3.2 Design Notes

- The PCB is specifically shaped to prevent radio interference with the Wi-Fi antenna and radar sensor on the host Infineon board. Ensure this clearance area remains free of other metallic components.
- The board pinout is detailed below. For a comprehensive description of the LMT SoM pin designations, refer to the full datasheet. All unmarked pins on the headers serve strictly as pass-through connections and are electrically isolated from the LMT board.

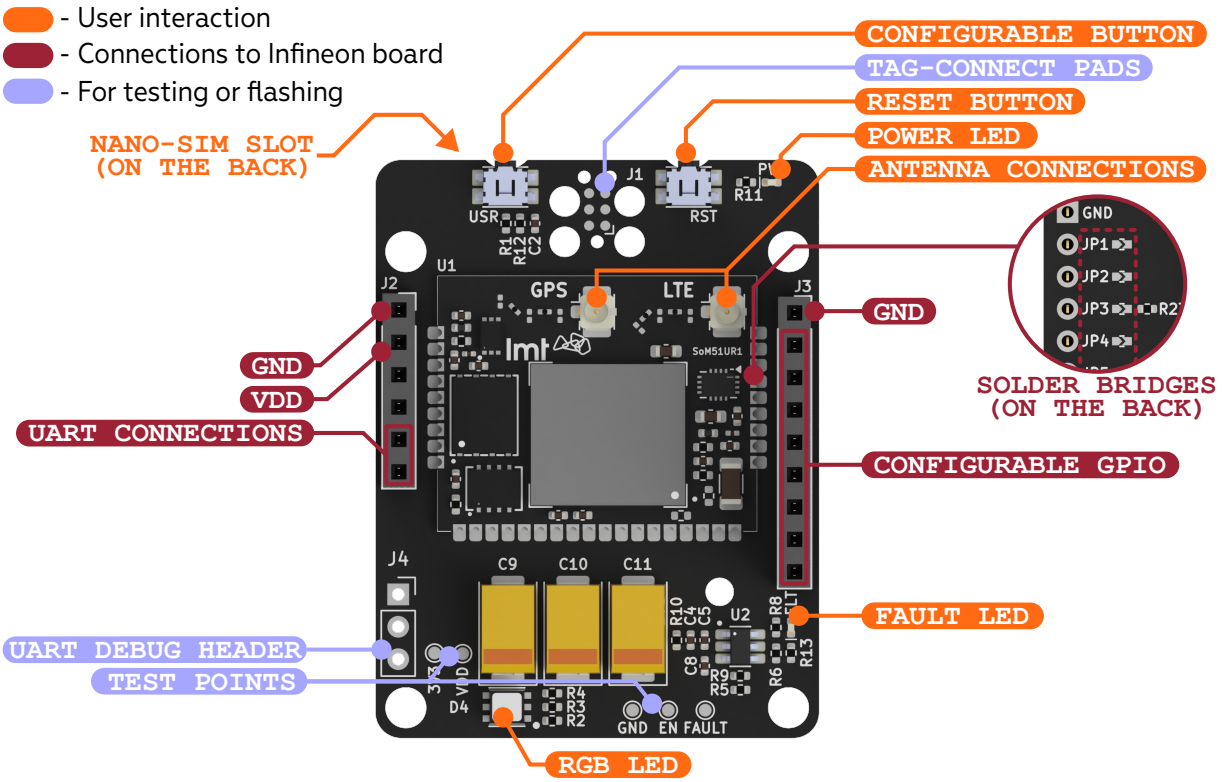


- Dedicated test points are routed to `VDD` and `GND`, allowing for convenient voltage level measurements without the need to probe the pin headers directly. Additionally, a power indicator LED is connected across these lines to visually confirm the active power state.
- Tag-Connect pads are routed to the `nRESET`, `SWDIO`, `SWDCLK`, `VDD`, and `GND` pins of the LMT module to facilitate custom firmware flashing and debugging. For programming interfaces, we recommend cables such as the TC2030-CTX or the space-saving TC2030-CTX-NL.



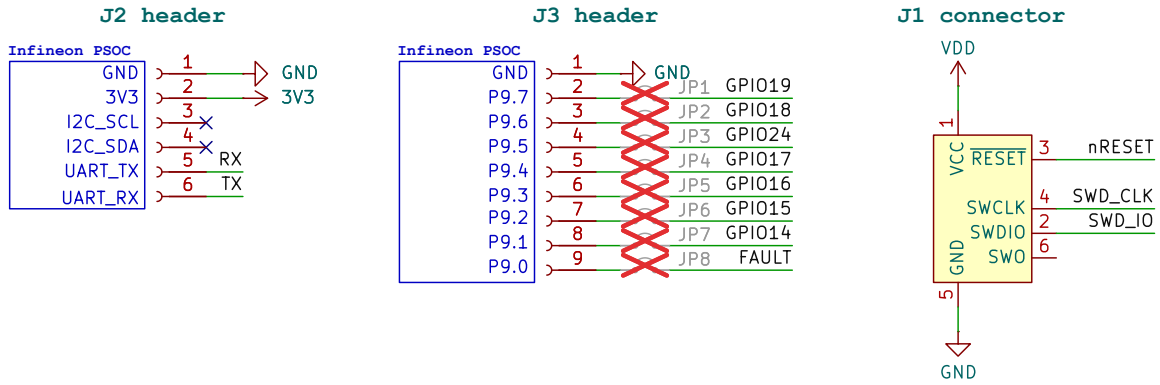
4 Extension Board for PSOC 6 AI Kit (`EBI251UFI`)

4.1 Overview



4.2 Design Notes

- The board pinout is detailed below. For a comprehensive description of the LMT SoM pin designations, refer to the full datasheet. All unmarked pins on the headers serve strictly as pass-through connections and are electrically isolated from the LMT board. However, bridging the designated solder jumpers (JP1–JP8) will connect some of the pins to specific I/O on both the Infineon and LMT modules for custom applications.



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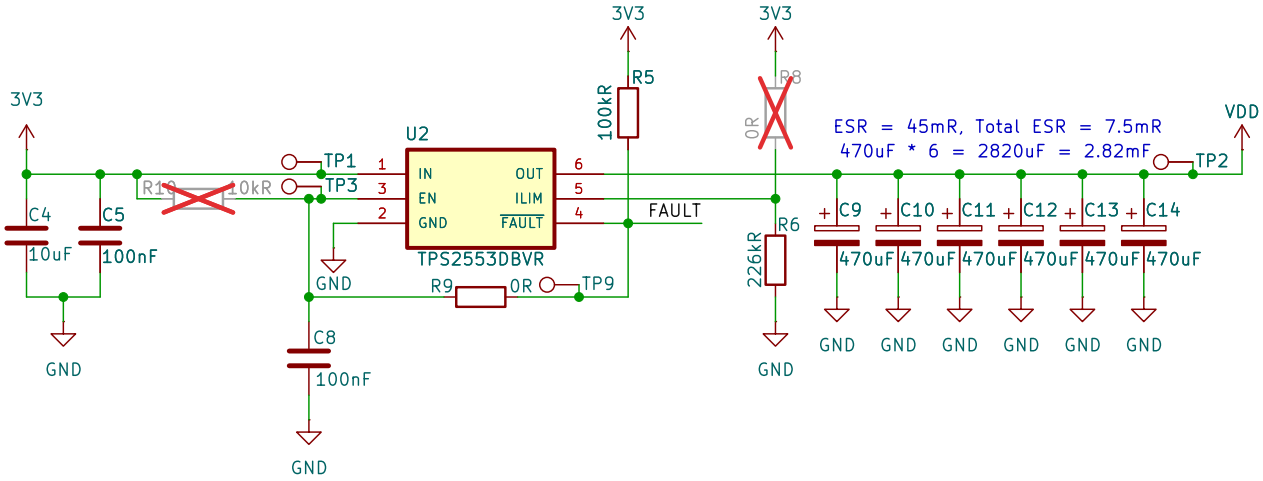
- Because the host Infineon board can supply a maximum of 120 mA to external devices, the LMT board's power circuitry incorporates a Texas Instruments TPS2553 power-distribution switch to cap the continuous current draw at this level. This protection prevents overloading the Infineon board's power supply. Such an overload could otherwise occur during extended cellular transmissions (e.g., sending large data payloads), which keeps the modem in active transmit mode long enough to deplete the onboard buffering capacitors designed to absorb transient current spikes.



- The power limiter also provides short-circuit protection. In the event of a short circuit, the voltage supply to the module is immediately disconnected. When this occurs, the fault LED (FLT) will illuminate, and the corresponding test point (FAULT) will be asserted. After a brief delay, the circuit will automatically re-trigger the enable (EN) pin of the power switch to attempt restoring power. To make this fault status readable by the host Infineon board, bridge the JP8 solder jumper, which routes the FAULT signal to the Infineon board's P9.0 pin. For power supply debugging, two key test points are provided: the 3V3 test point (indicating the raw supply voltage from the Infineon board) and the VDD test point (confirming the active voltage output from the power limiter to the LMT SoM).

5 Mechanical Dimensions

5.1 Board for Edge E84 AI Kit (EBI151UFI)

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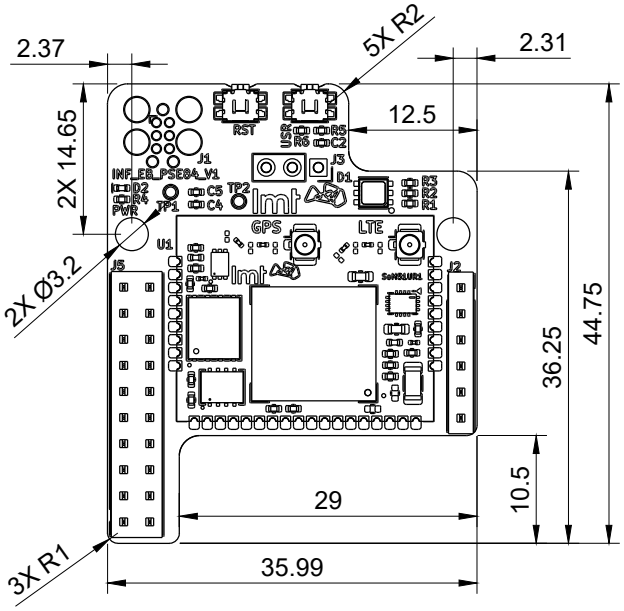

5.2 Board for PSOC 6 AI Kit (EBI251UFI)

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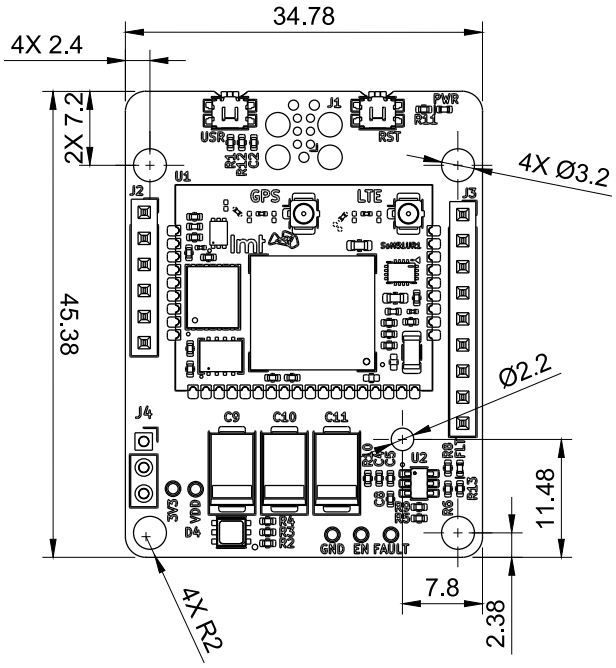
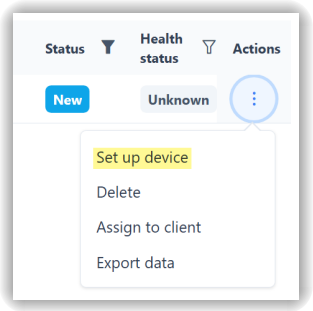
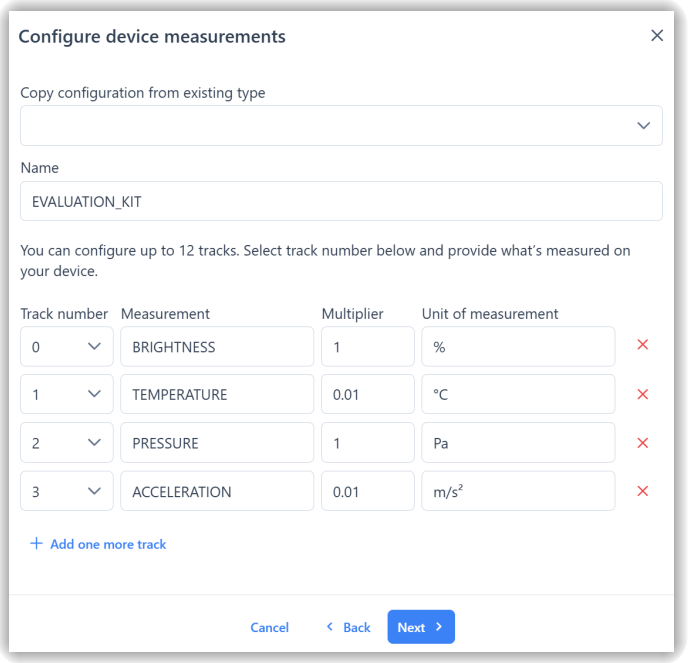


6 Usage and Integration Guidelines

6.1 Cloud and Firmware Configuration

1. **Verify Cloud Registration:** Verify the LMT board's presence on the LMT IoT Cloud. LMT personnel will have already pre-provisioned the shipped device to your user account.
2. **Configure Data Payload:** Using the dedicated configuration wizard on the cloud platform, define the structure of the data you intend to transmit as seen below (i.e., configure the CoAP protocol tracks for incoming messages).

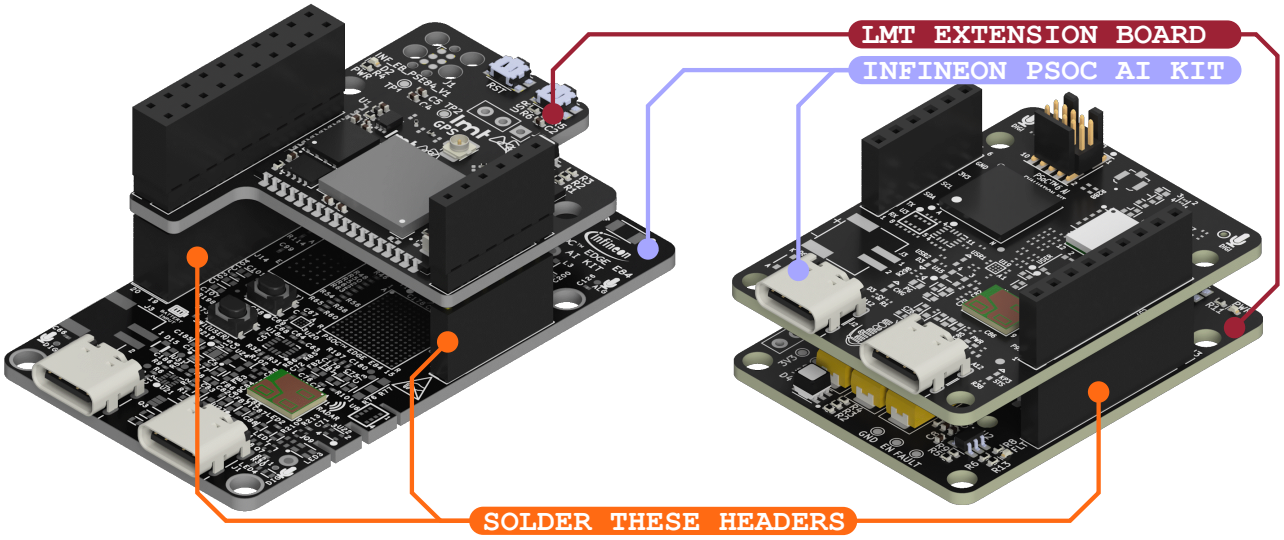




3. **Develop Host Firmware:** Develop the host Infineon firmware. Follow the LMT IoT SDK documentation guidelines to implement the "serial-to-cloud gateway" functionality, ensuring the transmitted data packet format matches the configuration defined in the cloud.

6.2 Hardware Mounting and Initialization

1. **Prepare the Extension Board:** Connect the provided U.FL cellular antenna to the LMT board. If additional GPIO routing is required for custom applications (applicable to the `EBI251UFI`), bridge the necessary solder pads before mounting. Note that the pre-flashed firmware supports fundamental data transfer commands as detailed in the LMT IoT SDK documentation and any GPIO pins connected using the solder bridges require custom firmware on the LMT board.
2. **Prepare the Infineon PSOC AI Kit:** Solder the included female pin headers onto the host Infineon PSOC AI Kit, as illustrated in the figure below. This ensures proper mechanical support for both sides of the LMT board and prevents physical strain on the primary header connections.
3. **Mount the Extension Board:** Flash your compiled application firmware onto the host Infineon board. Carefully mount the LMT extension board onto the Infineon host kit, as illustrated in the figure below. Apply power to the system and verify successful data uploads via the LMT IoT Cloud dashboard.



4. **If troubleshooting is necessary:** Utilize the UART debug header to inspect serial communication between the host Infineon board and the LMT module.
5. **If modifications to the LMT module's onboard firmware are required:** (e.g., to define custom user button actions or specific RGB LED behaviors), utilize the Tag-Connect pads for reprogramming.