

The Qorvo IoT Dev Kit Pro accelerates Matter™ development with a system solution using QPG6105 and QPG7015M that leverages Qorvo ConcurrentConnect™ technology.

The QPG7015M Gateway features turn-key reference applications for Thread, Bluetooth® Low Energy and Zigbee. For QPG6105 connected device, the kit provides a streamlined Bluetooth Low Energy and Matter environment.



Benefits

Qorvo Matter System Solution

- Out-of-the-box IoT Dev Kit Pro enables evaluation and prototyping of a complete system use case by including a QPG6105 device and a QPG7015M gateway integrated with a Raspberry Pi 4 host.
The kit implements a Matter use case with QPG6105 configured as a Matter device (light bulb) and the QPG7015M configured as the Matter hub (Thread border router).
- To leverage ConcurrentConnect™ Antenna Diversity, PCB antennas are used both on the gateway and connected device.

ConcurrentConnect™ Technology

- The QPG7015M gateway leverages **Multi-Radio** to act as a Zigbee coordinator, Matter hub and Bluetooth Low Energy Central/Peripheral concurrently. Multi-radio in the QPG6105 enables seamless and concurrent use of Bluetooth and 802.15.4 for all use cases.
The concurrency, used in the reference applications, makes it easy to build multi-standard applications that simply work without adding a complex software configuration / time-multiplexing mechanism.
- Multi-channel** enables up to 3 IEEE 802.15.4 stacks on the QPG6105 as well as on the QPG7015M.
- Antenna Diversity** increases interference robustness and link budget resulting in superior RF range through preamble-based antenna selection built in the QPG7015M and QPG6105 hardware.

For **Coexistence** with **Wi-Fi**, all tooling required to configure the 3-wire interface for Packet Traffic Arbitration (PTA) and verify it on end products is included. The default coexistence configurations provided have been benchmarked in real-life use cases such as a Wi-Fi Access Points.

Gateway Highlights

- Radio Performance tooling** enables testing and verification of the QPG7015M RF performance.
- Reference designs** for turn-key product solutions. These enable verification and optimization of application requirements and thus achieve a fast-time-to-market.
- The QPG7015M applications are built on top of **Linux**; the typical OS used in smart home gateways. SW developers can leverage powerful Linux API to build the applications.
- Reference Applications**, interoperable with major ecosystems: IKEA Home Smart, Philips Hue, Samsung SmartThings and Amazon Alexa.
- Certified Communication Stacks** for Bluetooth Low Energy 5.2, Zigbee R22 and Thread 1.3.

Connected Device Highlights

- The included reference applications and a Matter application generator ensure **easy and fast development**. Matter and Thread open-source components are pre-integrated and extended with tools and application development guidelines.
- Certified Solution and verified Interoperability** with other Matter devices and infrastructure.

Development Kit – Hardware Overview



The Raspberry Pi in the gateway hosts the user application and communication stacks. The QPG7015M plug-on radio board enables users to verify both **SPI** and **USB** as interface to the QPG7015M giving flexibility.

The radio board also provides access to the Wi-Fi/IoT **coexistence interface** through a pin header.

The **QPG7015M Gateway HW** features:

- QPG7015M transceiver featuring ConcurrentConnect technology
- Raspberry Pi 4 host platform using Linux OS and running QPG7015M applications
- Dual 2.4 GHz PCB antenna supporting ConcurrentConnect Antenna Diversity.

The connected device consists of a QPG6105 plug-on radio board and a carrier board. The carrier board enables application development and debugging of the radio board.

QPG6105 radio board features:

- QPG6105 SoC with 1 MB flash, 128 kB RAM
- Dual 2.4 GHz PCB antenna for antenna diversity.

Smart Home & Lighting Carrier Board features:

- SEGGER J-Link on-board debugger and virtual COM port
- Humidity, PIR and hall sensors
- RGB LED, user LEDs and buttons
- UART interface
- 8 Mbit low-power serial flash
- CR123 battery support
- Extension headers.

Gateway Software Overview

Matter and Thread 1.3

- **Certified Thread** v1.3 solution. Compatibility with Full Thread Devices and Minimal Thread Devices.
- **Thread Border Router for Matter** functionality built-in, making the Development Kit the ideal starting point for developing a Matter hub.
- **Thread FTD CLI** configuration as a starting point for building custom Thread based applications.

- The [Qorvo Gateway GitHub repository](#) contains the QPG7015M Thread applications. A Radio Co-Processor (RCP) approach is used to maximize the abilities to run multiple communication stacks concurrently.

Zigbee R22

- The DK is a **Zigbee Platform Certified solution**.
- **API** to access the network and devices in the network, is available. This gives a **Zigbee coordinator** functionality, showcased via a reference command line application.
- **Smartphone application** allows the user to configure and control the Zigbee network. Adding/removing devices is made easy from a smartphone.
- **OTA server functionality** to distribute firmware updates to devices in the network is supported.
- **C++ API** used in the reference applications can be extended with user functionality.

Bluetooth Low Energy 5.2

- **Certified** Bluetooth Low Energy solution.
- **The Bluetooth Low Energy host stack API** is compatible with the **Amazon Common Software (ACS)** API, enabling integration with ACS compliant device SDKs. Bluetooth Low Energy Peripheral and Central functionality is supported.
- A **command line interface** is available as reference application. It shows Bluetooth Low Energy functionality such as scanning, advertising, connecting and exchanging data.

Users have the flexibility to define custom and standard Bluetooth Low Energy services and profiles and interact with services and profiles of connected devices.

Connected Device Software Overview

[Qorvo Matter SDK](#) is available on GitHub allowing easy access to all software required to build Matter products. The kit integrates open-source and Qorvo SW components in a user-friendly way ensuring version dependencies are managed and pre-tested.

The kit comes with helpful installation guides, a free-to-use compiler, development/debug environment and all tools to enable professional embedded C development.

The on-board support for Segger J-Link provides fast and stable debugging capabilities.

Additional tools include:

- **OTA file generator** generates an image in the correct format to be used for over-the-air upgrades.
- **Radio Control Console** allows the user to interact directly with the radio, to validate performance and regulatory certification requirements. The tool can also be used during mass production.

- **Matter Tools** are also accessible via the Qorvo Matter SDK with links to the necessary guidelines.
 - **Matter controller tool** allows to commission a Matter device into the network and to communicate with it.
 - **ZAP tool** converts user-defined application configuration into example code, including clusters and application callbacks.
 - **Application Configurator**: tool that makes it very easy to create a customized version of one of the reference Matter applications.
 - **Device Attestation Tool** allows to generate and programme certificates into the device during development phase.
 - **Production Provisioning Tooling**: tooling for provisioning the device with keys for Matter certificates enabling secure boot and device attestation in the production phase.

Qorvo platform specific dependencies are abstracted in a separate library allowing easy integration.

A **Bluetooth Low Energy certified (v5.3) controller** and host stack is included in the DK. The example applications

show how to access the Bluetooth stack APIs for advertising, connecting, sending and receiving data, and developing custom Bluetooth profiles and services. The Bluetooth Low Energy peripheral application included has sleep enabled and supports Device Firmware Upgrade service. It is based on FreeRTOS and is compatible with the Qorvo Connect smartphone app.

Matter Turn-key Applications

All reference applications are based on FreeRTOS, can perform over-the-air firmware updates and use secure boot to load only authenticated images. They demonstrate a QPG6105 Matter device with Thread connectivity, using Bluetooth Low Energy to perform Matter commissioning.

Provided reference applications are:



Color and dimmable light bulb



Lock



Thermostatic radiator valve



Color dimmer light switch

Ordering Information

Part Number	Packing / Qty	Description	Box Dimensions
QPG6105DK-02	1 Kit	IoT Dev Kit Pro	12" x 9" x 3"



Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations:

web: www.qorvo.com

tel: 1-844-890-8163

email: lpw.support@qorvo.com

Important Notice

The information contained herein is believed to be reliable; however, Qorvo makes no warranties regarding the information contained herein and assumes no responsibility or liability whatsoever for the use of the information contained herein. All information contained herein is subject to change without notice. Customers should obtain and verify the latest relevant information before placing orders for Qorvo products. The information contained herein or any use of such information does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other intellectual property rights, whether with regard to such information itself or anything described by such information. **THIS INFORMATION DOES NOT CONSTITUTE A WARRANTY WITH RESPECT TO THE PRODUCTS DESCRIBED HEREIN, AND QORVO HEREBY DISCLAIMS ANY AND ALL WARRANTIES WITH RESPECT TO SUCH PRODUCTS WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

Without limiting the generality of the foregoing, Qorvo products are not warranted or authorized for use as critical components in medical, life-saving, or life-sustaining applications, or other applications where a failure would reasonably be expected to cause severe personal injury or death.

Copyright 2022-2023 © Qorvo, Inc. | Qorvo is a registered trademark of Qorvo, Inc.

ConcurrentConnect is a trademark of Qorvo, Inc. The Bluetooth® word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by Qorvo is under license. Matter is developed by the Connectivity Standards Alliance™. This brand, related logos, and marks are trademarks of the Alliance, all rights reserved. Zigbee is a trademark of the ZigBee Alliance. Thread is a registered trademark of the Thread Group, Inc. Other trademarks and trade names are the property of their respective owners.