ACT88760 ActiveCiPS™

Description

This document describes how to use the ActiveCiPS™ portion of the ACT88760 EVK GUI.

ActiveCiPS™ Functionality

The ActiveCiPS™ functionality allows the user to customize existing CMIs to meet their specific system level requirements. It programs new default settings into the IC. If changes to the IC's registers are not programmed into the IC using the ActiveCiPS™ functionality, then these changes are temporary and the IC register settings change back to the default settings when power is cycled. The ActiveCiPS™ functionality changes the default register settings by programming the register values. The IC functionality that can be changed includes output voltages, current limits, startup sequencing, fault levels, fault masks, low power modes, switching frequencies etc.

Changing the default functionality above requires changing and re-flashing the IC's internal registers. This requires a complex set of I²C commands synchronized with applying programming voltages with specific voltages, ramp rates, and durations. The Qorvo ActiveCiPS™ Dongle automatically handles all these details for the user. The result is a simple, easy to use graphical programming tool.

Limitations

The ACT88760ActiveCiPS™ functionality is only intended to be used in an engineering environment for product evaluaton. ICs that are reprogrammed are NOT suitable for production.

Because this is a non-production environment, each IC should be limited to a maximum of 10 CMI reprogramming cycles.

Reference Documents

For more detailed information, refer to the documents below, or contact customer.support@qorvo.com.

1. ACT88760 Data Sheet.
2. ACT88760 Register Definition Application Note.
3. ACT88760 EVK User's Guide
4. ACT88760 EVK GUI User's Guide

ActiveCiPS™ Dongle

Qorvo's ActiveCiPS™ Dongle connects to the ACT88760 EVK or socketed through a custom cable. The ACT88760 requires "Cable #1". Other ActiveCiPS™ cables look similar but have a different pinout. Only Cable #1 works with the ACT88760 EVK.

ACT88760 GUI

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GUI and Driver Setup

Refer to the standard ACT88760 EVK GUI User's Guide for the guidance on installing the dongle drivers and using the GUI's basic functions

EVK Hardware Setup

Figure 1 shows the ActiveCiPS™ Dongle connection to the EVK. Ensure that the black wire connects to the connector's GND pin.

Figure 1: ACT88760 and ActiveCiPS™ Dongle Connection

Customer PCB Hardware Setup

The ActiveCiPS™ Dongle can be used with the ACT88760 and with customer PCB. When using the dongle with a customer PCB, the PCB requires the additional circuitry shown in Figure 2. The customer PCB must contain either jumpers or zero-ohm resistors to break the connection between the ActiveCiPS™ Dongle and the rest of the PCB during programming.
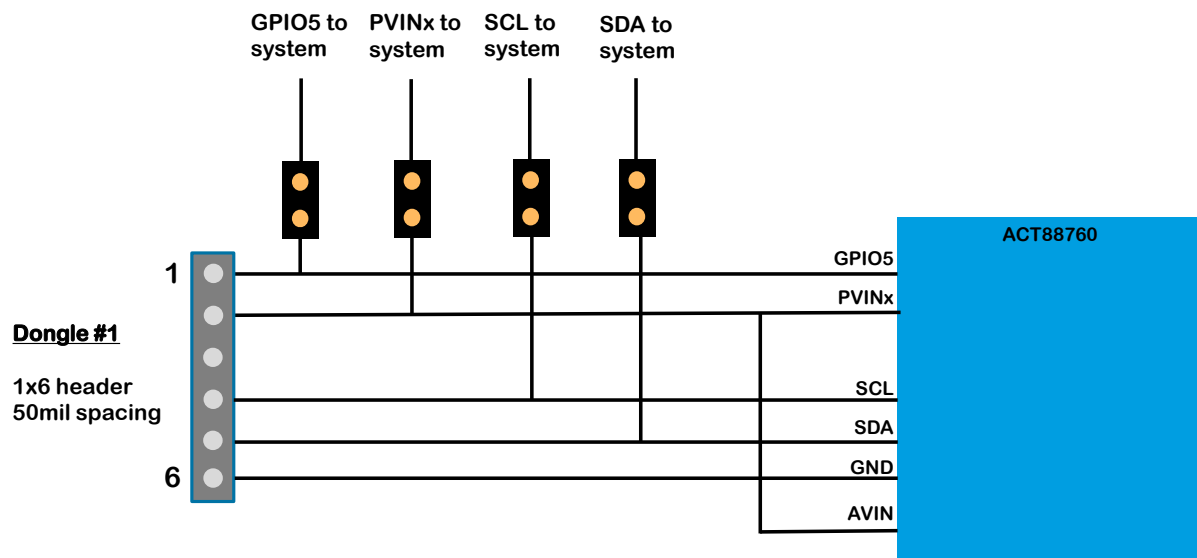

Figure 2: ActiveCiPS™ Dongle Connection to Customer Hardware

ActiveCiPS™ Functionality

The ACT88760 EVK GUI integrates auxiliary tools to allow the user to read or write a single I^2C register using Qorvo's USB-to-I^2C dongle or to reprogram the IC's Non-Volatile Memory (NVM) registers with Qorvo's ActiveCiPS™ Dongle. Select the "Tool" tab to navigate to the Auxiliary Tool functions screen as below in **Figure 3**. There are 3 functions available in this mode:

1. Scan I^2C address: detect if an I^2C slave device is available on the bus. Type the slave address in hex then click on the "Scan Addr" button to check. If a device is detected at that slave address, then the GUI displays "Detected", otherwise it displays "Not detected I^2C".
2. Read/Write I^2C: use to read or write a single I^2C register. This is useful if you want to read a single register instead of reading or writing all IC registers. To use this function for a write command, enter the IC's slave address, the register address, and register value to be written. Then click on the Write button. Do the same for a read command but click on the Read button. The register value is displayed in the Value (Hexadecimal) cell.
3. Functions: Click on the arrow next to the run button, select the needed embedded function then click "Run" button invoke the function. Note: Only use functions provided by Qorvo. Do not modify or create new functions.
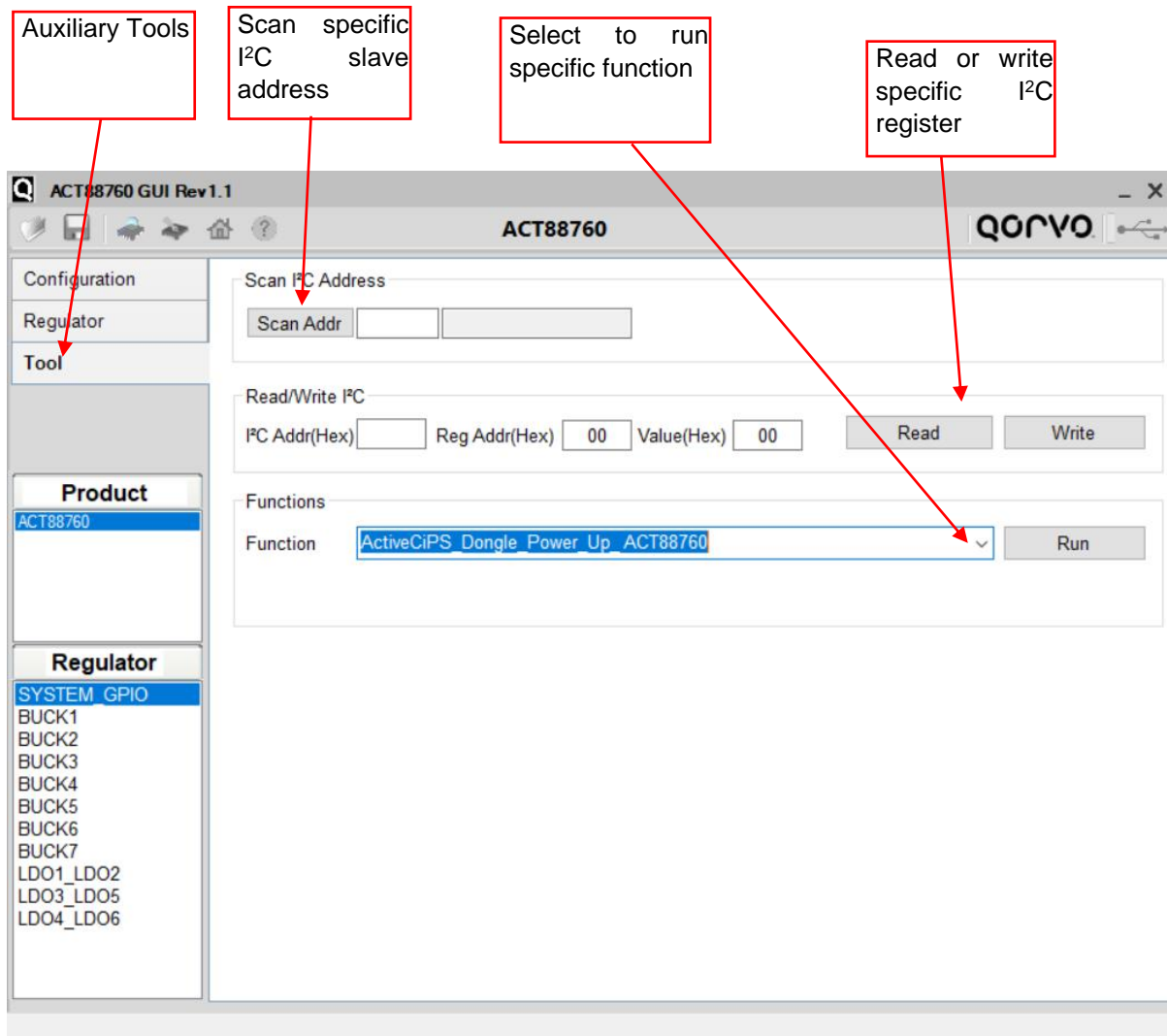
Auxiliary Tools

Scan specific I²C slave address

Select to run specific function

Read or write specific I²C register

Figure 3: ACT88760GUI Auxiliary Tool and Functions

Reprogramming an ACT88760 EVK using an ActiveCiPS™ Dongle

Software Setup

The following steps are required to enable the ActiveCiPS™ functionality in the GUI

1. Get two software files from Qorvo
   a. ActiveCiPS_Dongle_Power_Up_ ACT88760.xml
   b. ActiveCiPS_Dongle__Program_ACT88760.xml
   c. ActiveCiPS_Dongle__Power OFF_ACT88760.xml
2. Paste the files in the "Script" subfolder in the GUI folder.

Hardware Setup

1. Disconnect ACT88760EVK or customer PCB from all power supplies.
2. Remove all regulator loads on the ACT88760EVK.
3. Disconnected any device with I^{2}C address 0xCCh or 0xAAh from the I^{2}C Bus.
4. If using a customer PCB, disconnect the four jumpers or 0 ohm resistors to isolate the Dongle from all other circuitry.
5. Connect Cable #1 between the ActiveCiPS™ Dongle and the EVK/socketed board or the customer PCB if applicable.
   Connect a USB cable from the ActiveCiPS™ Dongle to USB port on PC.
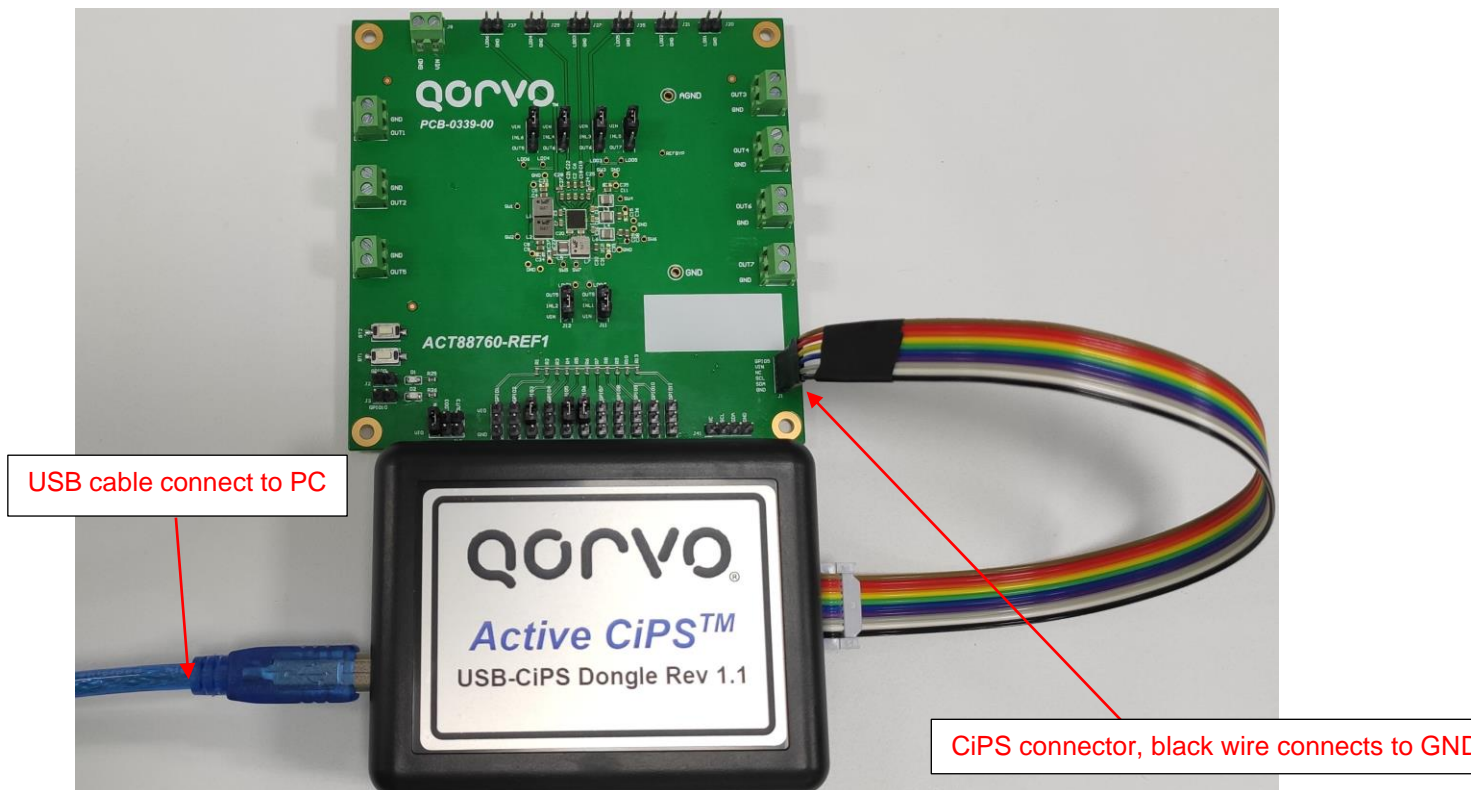6. Open the ACT88760GUI and follow below programming steps to complete programming the device.

USB cable connect to PC

CiPS connector, black wire connects to GND

Figure 4: ACT88760 and ActiveCiPS dongle connection

Programming Steps

1. On the GUI, navigate to the "Tool" tab, then select and run the "ActiveCiPS_Dongle_Power_Up_ ACT88760" function to power the ACT88760 EVK or socketed board from the ActiveCiPS dongle. Refer to **Figure 3**. Use DMM to measure output voltage make sure device is started properly.

2. Click the "Read" button to acquire all the register values.

3. Navigate to Configuration Setting or Registers to modify the parameter(s) or register values as required.

4. Click the "Write" button to transfer the change(s) into the IC.

5. Qorvo recommends to either read the register values back or measure the changed functions on the test bench to confirm that the changes are successfully transferred to the IC and are in effect.

6. Navigate to the "Tool" tab, select and run the "ActiveCiPS_Dongle__Program_ACT88760" function. Follow the pop-up messages to complete the NVM programming. After programming is complete, the ActiveCiPS™ dongle automatically powers down the ACT88760 EVK. At this point, the user can safely unplug Cable #1 from the EVK or the customer PCB.

7. On a customer PCB, reconnect the jumpers or zero-ohm resistor.

8. Power up the PCB to confirm the new default register settings.

Revision history

REVISION	DATE	DESCRIPTION
0.1	10-Aug-2020	Initial Released
0.2	21-Aug-2020	Update text and correct picture.

Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations:
Web: www.qorvo.com
Email: customer.support@qorvo.com

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