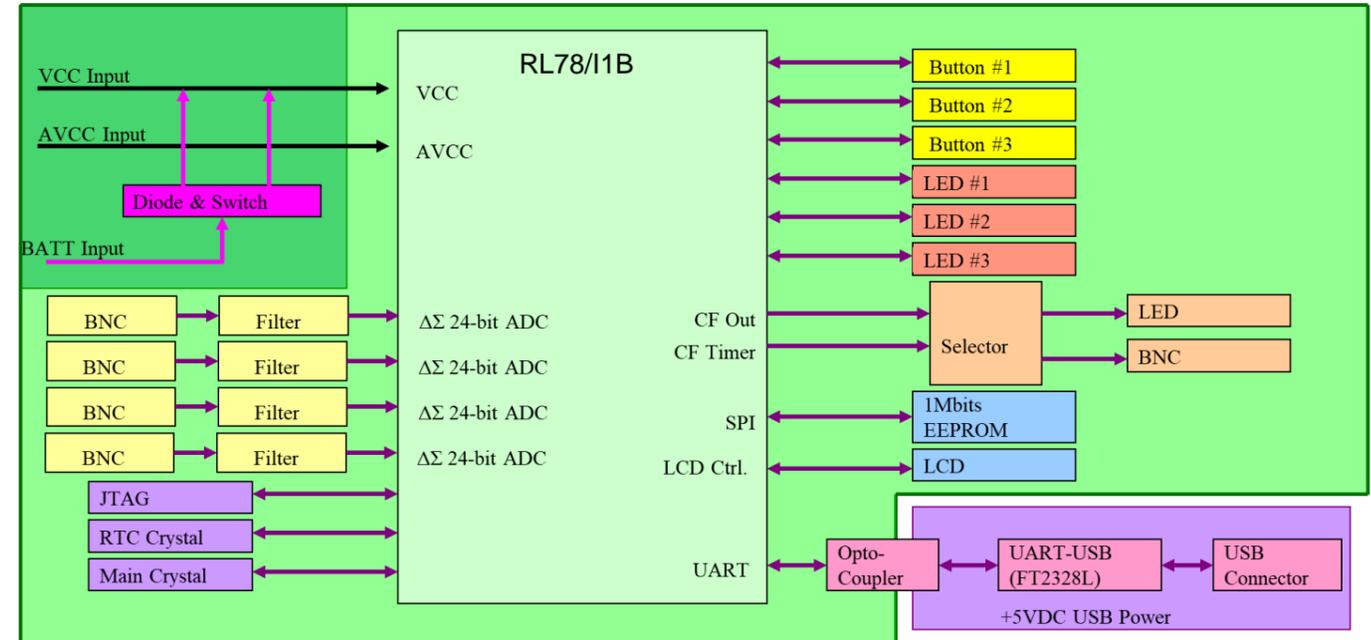
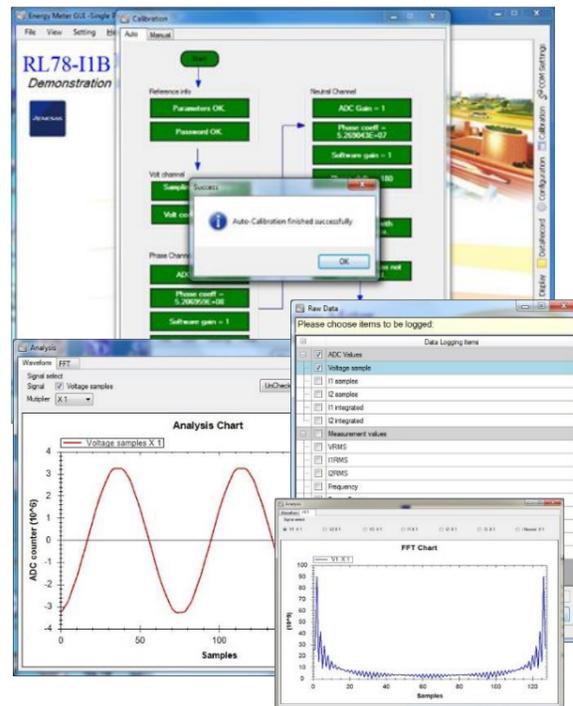
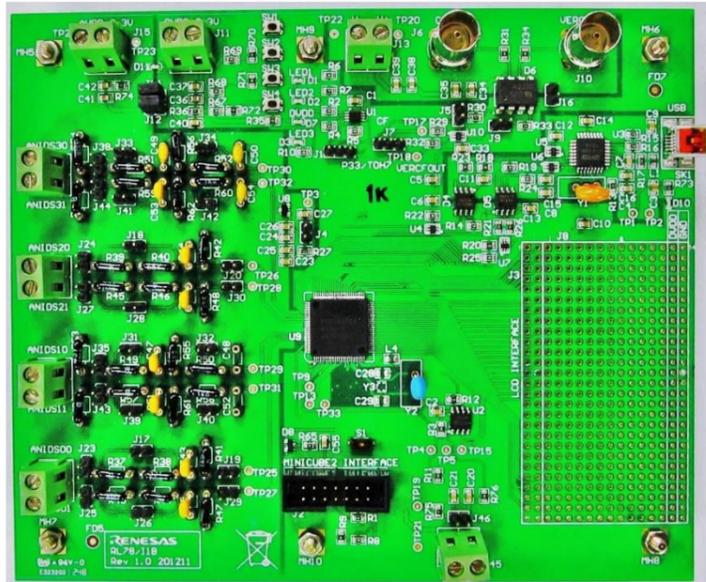


RL78/I1B Evaluation Board

For single phase electricity meter

Overview

The Evaluation Board RL78/I1B is designed to evaluate how a particular solution is designed using RL78/I1B 100-pin MCU chip. The board also provides a useful platform for evaluating the Renesas suite of development tools such as. for coding and debugging, CubeSuite+ and for programming, Renesas Flash Programmer (RFP) via E1 emulator. The RL78/I1B Evaluation Board is a good design with low current consumption and high performance solution for many applications. The MCU product is built on Renesas RL78 Group MCUs that is fully integrated with 16 bit RL78 CPU core, ultra-low power technology with high speed on chip oscillator correction function, 24-bit $\Delta\Sigma$ A/D Converter, reset and supply management, battery backup function, on chip data transfer controller (DTC) and multiple communication interfaces. In addition, the board is designed for user to evaluate the capabilities of the device and its peripherals in a matter of a few minutes after opening box. The evaluation board RL78/I1B can also be connected to the Energy Meter GUI interface via USB.



24-bit $\Delta\Sigma$ A/D Converter

The 24-bit A/D converter has a 24-bit resolution when converting an analog input signal to digital values. S/N+D ratio: 80 dB min. (when pre-amplifier gain of $\times 1$ is selected). The sampling frequency is 3.906 kHz/ 1.953 kHz. RL78/I1B, 80-pin products have 3 channels (current channel: 2 channels, voltage channel: 1 channel) while 100-pin products has 4 channels (current channel: 2 channels voltage channel: 2 channels) . Total Analog input pins: 8 (1 pair of positive, negative input/channel).

16 Bit RL78 CPU Core

The MCU delivers 33 DMIPS at maximum operating frequency of 24 MHz. 86% of instructions can be executed in 1 to 2 clock cycles due to the CISC architecture (Harvard) with 3-stage pipeline. In addition, it is able to multiply signed & unsigned is 16 x 16 to 32-bit result in 1 clock cycle. While MAC is 16 x16 to 32-bit result in 2 clock cycles. 16-bit barrel shifter for shift & rotate in 1 clock cycle. The MCU has 1-wire on-chip debug function which optimize the pin usage.

High speed OCO clock frequency correction function

Using the subsystem clock f_{SUB} (32.768 kHz) as a reference, the frequency of high-speed on-chip oscillator is measured, thus the accuracy of the high-speed on-chip oscillator clock (f_{IH}) frequency can be corrected in real time.

Data Transfer Protocol

The DTC (data transfer controller) is a function that transfers data between memories without using the CPU. The DTC is activated by a peripheral function interrupt to perform data transfers without CPU operation.