RL78 Rotational Flow Demonstration Kit

Based upon the RL78/I1D

Renesas' Rotational Flow Demonstration Kit is based upon the RL78/I1D, an ultra-low power 16-bit MCU. The metrology approach works using an active inductive method where two coils are used to sense the rotational position of a part-metalized disk, and a third coil is used to generate a reference signal.

The beauty of this implementation is that it accomplishes the rotational position detection using the MCU's on board Data Transfer Controller (DTC) function, a form of state machine, whilst the MCU's core is in stop mode, keeping the average current consumption at the lowest possible level. Due to the unique methodology implemented, this solution is capable to sense not only the flow magnitude, but also the flow direction, so allowing reverse flow to be detected.

As an example, given a battery with a capacity of 2600 mAh, Renesas' rotational detection solution could achieve a system life time exceeding 35 years. However, the approach is not specifically linked to the RL78/I1D only, but can be easily implemented with other family options like the RL78/G11 and the RL78/G14.

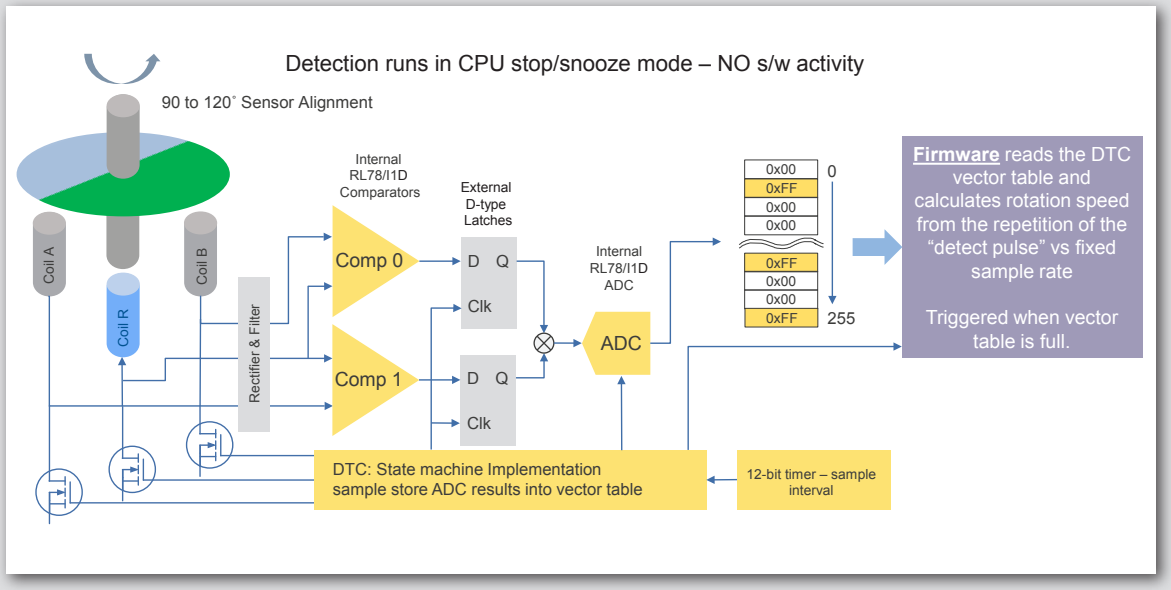
Target Applications

- Any type of rotational based metrology in the Water-, Gas- and Heat-Metering domain

Key Benefits

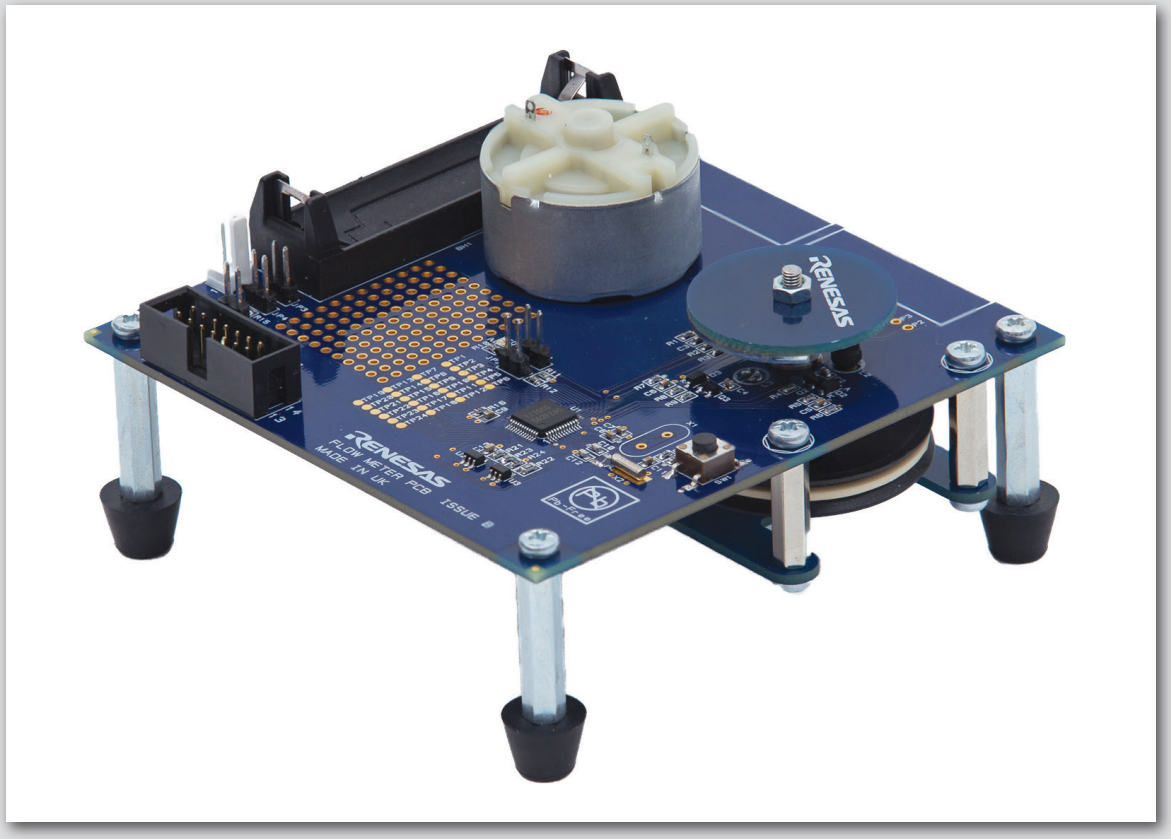
- Ultra-low power data acquisition: I_{AV} = 4.5 µA sensing, 32 sample burst per second
- Cost effective standard off-the-shelf MCU
- High degree of design freedom due to MCU platform versatility

System Block Diagram



Key Features

The Demonstration Kit uses a simple electric motor to drive a metalized wheel to simulate flow; the mechanical setup looks as follows:



The sensor disk's RPM may be controlled by tuning the motor's DC voltage. An optical sensor is included to determine the exact RPM of the disk.

The visualization of the acquired data is being achieved used the e² studio software development platform, which includes a simple debugger GUI.

Ordering Information

Part number: YFLOW-IT-RL78

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