

# TI Designs

## Flow Meter Host MCU Board with Segment LCD and Prepayment or Dual RF Option Test Results



### TI Designs

TI Designs provide the foundation that you need including methodology, testing and design files to quickly evaluate and customize a system. TI Designs help *you* accelerate your time to market.

### Design Resources

[www.ti.com/tool/TIDM-FLOWMETER-DUALRF](http://www.ti.com/tool/TIDM-FLOWMETER-DUALRF)

Tool Folder Containing Design Files

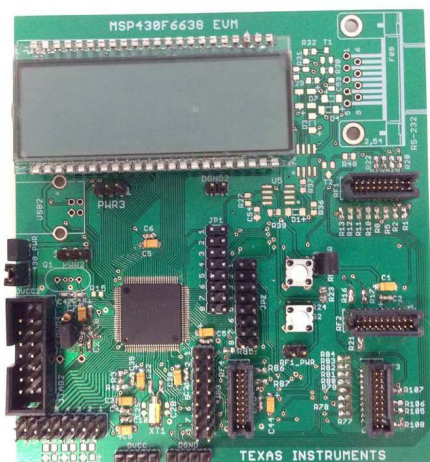


Figure 1. EVM Hardware

### Design Features

- Ultra-low power MSP430F6638 microcontroller
- Prepayment option with interface to the TRF7970 module
- Ready to be used software running on MCU to talk to the pre-payment module
- 160 segments LCD
- 2 low power RF Evaluation Module (EM) connectors
- UART communication and JTAG debug interfaces

### Featured Applications

- Flow Meters
- RFID Pre-Payment Applications



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## 1 Power Supply Options

[Figure 1](#) shows the EVM hardware. The EVM can be powered by using either JTAG or an external, 3.3V DC supply.

The EVM can be configured to be powered via multiple sources, as outlined in [Section 1.1](#) and [Section 1.2](#).

### 1.1 Option 1: JTAG

To provide power to EVM via JTAG, the following Jumpers must be placed as follows:

- Place Jumper on [1-2] on PWR1
- Place Jumper on 430\_PWR
- Place Jumper on DVCC2

### 1.2 Option 2: External Power Supply

To provide power to EVM via External Power, the following Jumpers must be placed as follows:

- Place Jumper on 430\_PWR
- Place Jumper on DVCC2

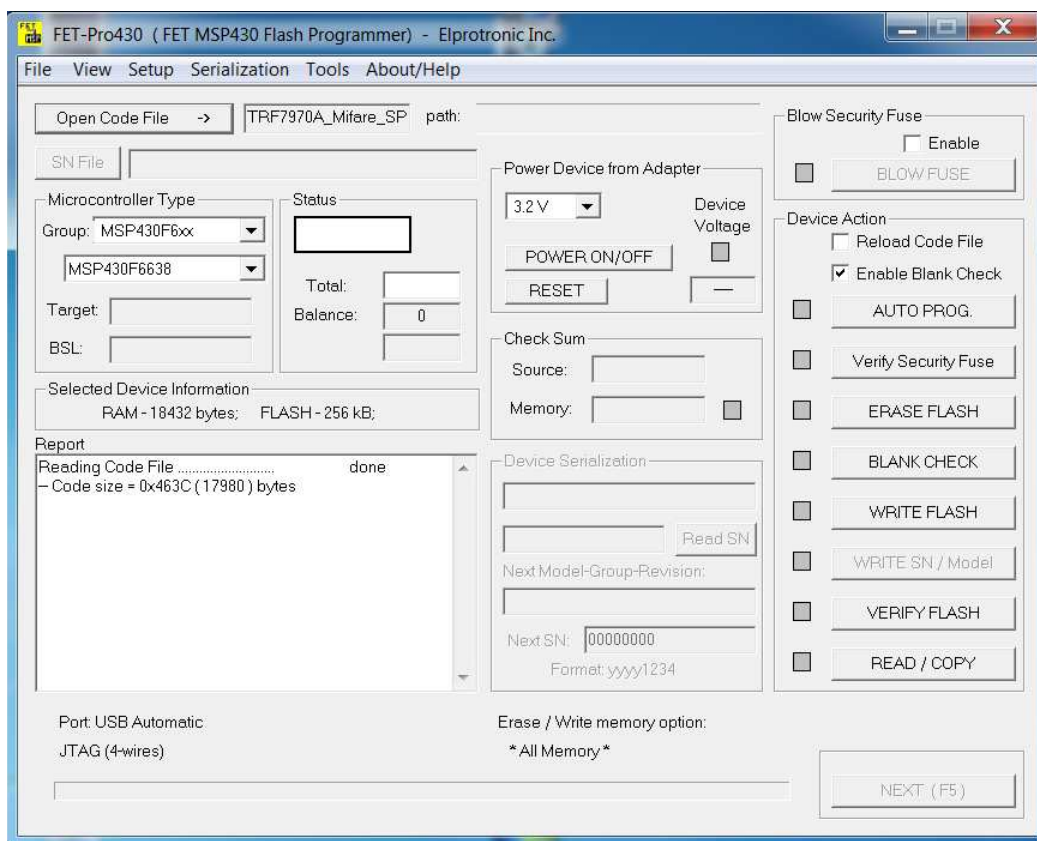
On placing above jumpers, external power can be provided directly between DVCC and DGND headers on EVM.

## 2 Loading the Code

To download code onto EVM, the Flash programmer, Lite FET-pro430 Elprotronic, needs to be installed on the PC or laptop.

On successful installation of the Flash programmer, follow the steps below to program code:

1. Connect the MSP430 UBS-Debug Interface MSP-FET430OUIF JTAG tool to the EVM JTAG header. Ensure the board is powered, as outlined in [Section 1.1](#) and [Section 1.2](#).
2. Open the FET-PRO430 Flash Programmer, open the code file, and point to the TRF7970A\_Mifare\_SPI\_F6638.txt file



**Figure 2.**

3. In the Microcontroller Type section, click on the drop-down tab and select:  
Group: MSP430F6xx  
MSP430F6638
4. Click on the AUTO PROG. tab to download the .txt file onto the EVM to test pre-payment functionality.

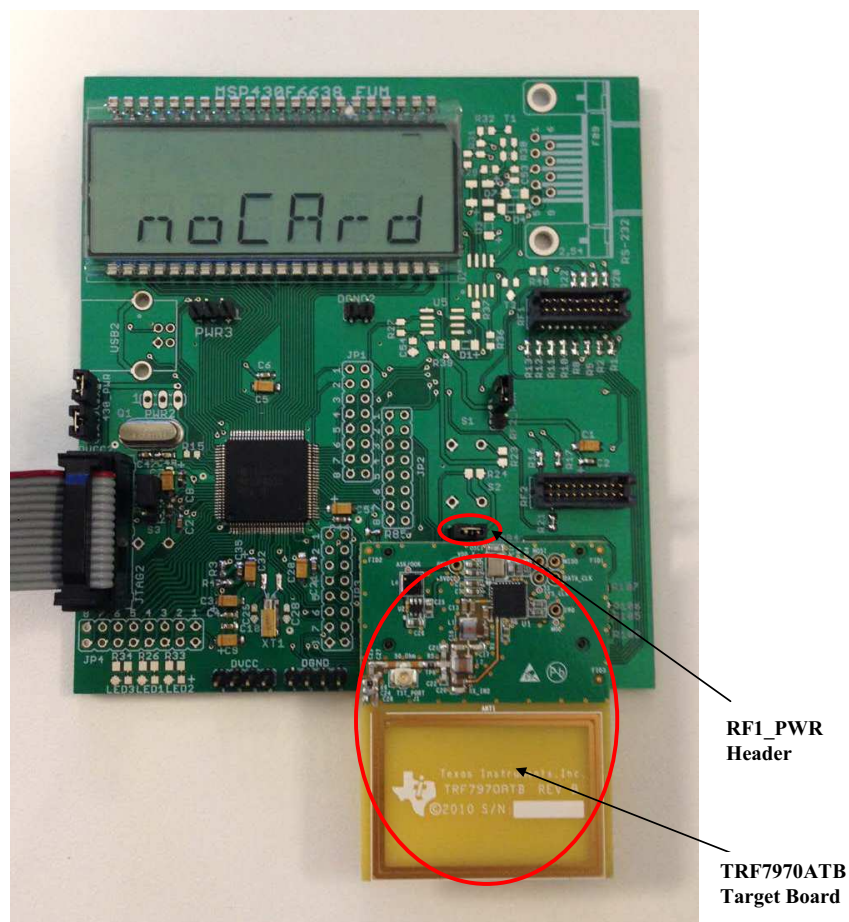
### 3 Pre-Payment Card Reader

The EVM supports a NFC card reader module. The following test uses the TRF7970A RFID Target board. For more information regarding the RFID board, visit [www.ti.com](http://www.ti.com).



**Figure 3.**

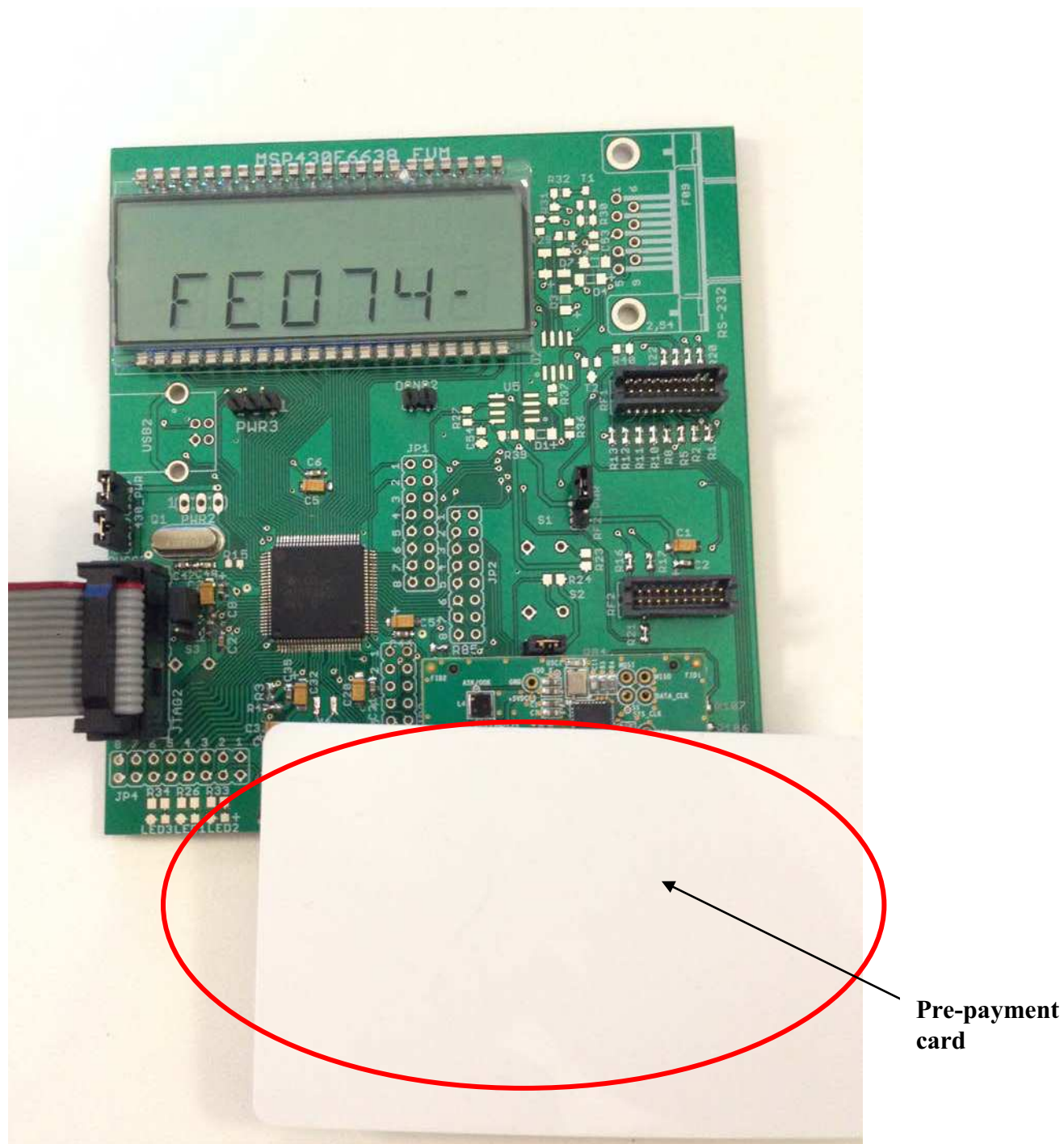
The TRF7970ATB target module needs to be plugged into the RF connectors: RF3 and RF4 on the EVM, along with a jumper on the RF1\_PWR header to provide power to TRF7970 target board (see [Figure 4](#)).



**Figure 4.**



When a pre-payment card is in range of the reader module, the id of the card will be displayed on the LCD screen as shown in [Figure 5](#).



**Figure 5.**

## 4 Test Results

The test is successful. The ID of pre-payment card is read successfully when the card is placed in close proximity to the TRF7970 reader module and the LCD displays the pre-payment card.



Figure 6.

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