# FuelCell Addendum – Dual Range Mass Flow Controllers

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## Introduction

This addendum describes the use of dual range mass flow controllers. Dual Range controllers use a parallel combination of a small range MFC with a large range MFC. This allows a combination of accurate control of small fuel flows with large maximum flow capabilities

## Software Support

Requires FuelCell version 3.5f or later. The software version is displayed in the FuelCell program  Help | About FuelCell… screen.

## Hardware Support

Requires the 850/890 Load Unit with Firmware version 3.17 or later. The firmware is displayed on the 850/890 LCD display screen during power up.

The dual range flow control uses signals normally reserved for Reformate Simulation. Contact your Gas Control Unit supplier or Scribner Associates for information on accessing the Reformate Mass Flow Controller signals.

## Enabling Dual Range MFC Support

Dual Range MFC support is enabled through the Instrument Configuration screens in the FuelCell program.

- Start the FuelCell program and select   File | Instrument Configuration…

Some 890C systems are designed to use 2 mass flow controllers (small and large) in parallel to supply the main fuel gas. This design can be used to allow large flow rates while retaining high resolution flow control at low flow rates. When the **Fuel Flow Controller Type** to **Gas Dual Range MFC** the following settings are displayed:

**Controller #2 (Liters/Minute)** sets the full flow size of the second main gas controller. The second controller must be larger than the primary controller. The **Channel Number** selects the Reformate simulator channel that will be used to control the second main gas controller.

## Operation of Dual Range MFCs

The operation of the dual range mass flow controllers is completely transparent to the user. There are no additional controls and the user is not required to select which controller is used.

When the selected flow rate is less than the size of the first (smaller) controller, all gas will flow through the first controller.

When the selected flow rate exceeds the size of the first controller, additional gas will flow through the second (larger) controller.

The maximum allowable flow rate is the sum of the two controllers.