Apter Power

inRAx



MVI71-AFC

PLC Platform

Gas and Liquid Flow Computer

Apter Power

User Manual

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ProSoft TECHNOLOGY

1 Introduction

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The MVI71-AFC Flow Computer module performs measurement of Hydrocarbon Gases and Liquids using currently accepted industry measurement standards. The module consists of a single-slot solution for Rockwell Automation chassis. To obtain its process inputs for calculations, the module uses the process data collected by analog and pulse I/O modules. The processor transfers this data to the AFC module, which then calculates flow rates, accumulated volumes, and accumulated mass. The results of the calculations are transferred back to the processor for use in the application ladder logic, or for transfer to a SCADA host.

The module has two communication ports for Modbus communication allowing easy access to a remote Modbus device. The module works as a Modbus slave or master device.

As discussed later in this manual, the internal Modbus database can be accessed by a Modbus Master device and by the processor (using the Modbus Gateway Function).

The AFC Manager software can be used for easy meter configuration and application monitoring. Refer to the *AFC Manager User Manual* for complete information about this tool.

The following section provides a sample application where input data is transferred from the transmitters to analog input cards on the Rockwell Automation rack and the values are transferred from the processor to the module (the module supports floating-point, scaled integer, or 4 to 20 mA format).

For Pulse meter applications, the pulse count and pulse frequency values are typically transmitted through high-speed counter modules in the rack.

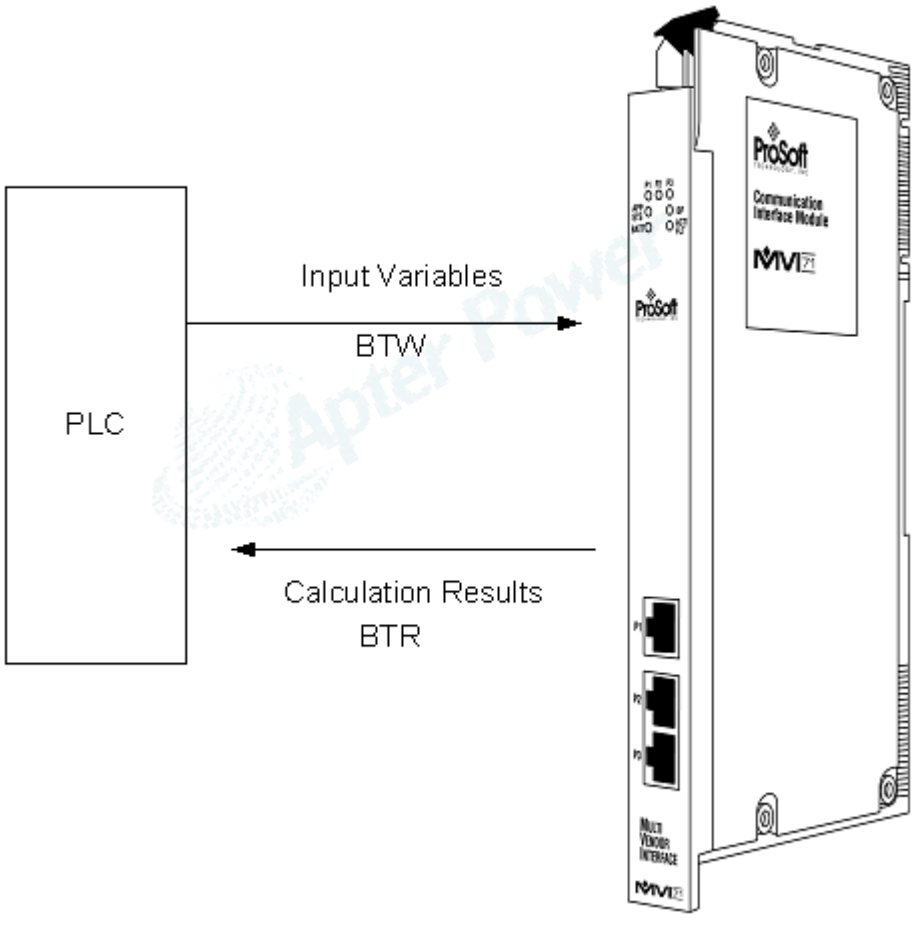
The module performs the flow calculation based on the values transferred through the backplane. The calculation results can be read to the processor or polled from a remote Modbus master unit connected to one of the communication ports.

10 MVI71-AFC Backplane Communications

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The module periodically performs flow calculation using the input variables (temperature, pressure, etc.) transferred from the PLC through the chassis backplane. The calculation results (flow rate, accumulators, etc.) are periodically transferred from the module to the PLC processor.



The backplane communication is also used by the processor to request some tasks from the module (including Modbus master command, set wallclock, set molar analysis data).

The backplane communication between the MVI71-AFC and the processor is performed through Block Transfer instructions (up to 64 words of data). The BTW instruction (Block Transfer Write) writes data from the PLC to the module. The BTR instruction (Block Transfer Read) reads data from the module to the PLC:

10.1 MVI71-AFC Backplane Implementation

This section provides more information regarding how the output (BTW) and input (BTR) blocks are implemented.

10.1.1 Output Blocks (BTWs)

In order to implement block transfers, the MVI71-AFC uses the following structure for each BTW block (output block):

Word 0	Block Synchronization ID
Word 1	Function Block ID (Bitmapped)
Word 2	Output Data Word 0
…	…
…	…
Word 63	Output Data Word 61

Block Synchronization ID

The Block Synchronization ID is an integer number (greater than 0) that identifies each output block.

The following section explains how the BTWs are divided into *Command Blocks* and *Calculation Blocks*.