



Automatic Meter Reading for Gas Meters

The FIREFLY AMR System

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A stylized globe graphic with a grid of latitude and longitude lines, partially visible in the bottom left corner.

TAKE CONTROL



THE FIREFLY AMR SYSTEM FOR GAS METERS

You can't predict the future . . . but you can invent it.

Deregulation and economic uncertainties have added to an already complex business climate and made flexible technology strategies more important than ever. Will your meter reading technology be able to adapt to the shifting business conditions of tomorrow? Which strategy will solve the problems of today and provide a maximum of options for the future?

The FIREFLY Meter Interface Unit (MIU) for Gas Meters emerges from the same design paradigm as the rest of the FIREFLY family of products; being the first RF solution to combine true Meter Independence with robust Integrated Load Profiling in a low-cost package.

Meter Independence

FIREFLY MIU's are available in several different form factors which cover virtually every residential and C&I gas meter (see Appendix A). We call this "Meter Independence". It eliminates the need for meter changeout for the purpose of AMR implementation and gives utilities the freedom to choose meters without the unforgiving constraints of proprietary AMR technologies. Meter Independence can even help utilities save money through better meter pricing. Without the compatibility limitations imposed by other meter-specific AMR technologies, utilities can solicit bids using relatively "open" specifications. This can allow responses from any and all meter manufacturers, thus increasing competition and driving down prices.

Integrated Load Profiling

All FIREFLY MIUs track and archive ProfilePLUS Load Profiling data that is constantly available for retrieval and analysis. The FIREFLY Gas ProfilePLUS chip holds 7,936 intervals of user-defined length. Set the interval to 15 minutes and the FIREFLY holds ¼ hourly consumption data for 82.6 days. Set the interval to 60 minutes and the FIREFLY stores data for over 330! Finer resolutions are achieved by setting the Profile Interval lower (from 1-255 minutes in one-minute increments). Stored data is purged on a FIFO basis once the MIU memory fills to capacity. Thus a "moving window" of historical data is always available (See fig. 1).

$$\text{ProfilePLUS data capacity (in days)} = \frac{7,936}{\left(\frac{1,440}{\text{ProfilePLUS Interval (in minutes)}} \right)}$$

Fig. 1

Practical Considerations

Installation (typical residential meter)

Installation takes only minutes and can be performed in the meter shop or in the field without service interruption*:

1. The original register is unbolted from the meter.
2. The original register is bolted into the recess in the front of the FIREFLY MIU; ensuring that the actuator spindle on the front of the MIU is aligned with the spindle on the back of the register. Note: the actuator spindle on the MIU extends from the front and back.
3. The Lexan cover is bolted over the recess that now contains the original register.
4. The MIU is set on the meter; ensuring the meter spindle is aligned with the actuator on back.
5. The entire assembly is bolted back onto the meter using extended-length bolts provided by Datamatic.
6. The FIREFLY is now ready to be programmed.



*Certain installation details vary with meter model.

Programming

FIREFLY MIU programming is, at the same time, both highly flexible and highly automated. Programming “templates” are defined ahead of time by the utility based on the specifics of their meter population. They are used to automatically enter predefined static parameters (such as the meter type, number of dials and multipliers) while also allowing the installer to enter site-specific values (such as meter number and current reading).

Standing by the meter with a ROADRUNNER X7 handheld computer, a RF link is established with the FIREFLY by entering “Program MIU” mode. After the MIU is awakened, the installer has the choice of using the default template (the meter model last installed) or choosing another from the list. They are then prompted to enter site-specific information. Once finished, the installer confirms the settings and sends the programming string to the MIU. The MIU will respond with a “Programmed Successfully” message.

Reading

Once programmed, FIREFLY MIU’s can be read from walk-by or mobile acquisition platforms and, unlike some competing products, can be read in the same route with electric and water MIU’s. FIREFLY’s constantly transmit at their user-defined interval. The typical recommended setting is every 4 seconds. The reader simply walks/drives down the street with the receiver “open”. Readings and status info (tamper flag, leak flag, battery voltage) are automatically posted to the appropriate record. The reader may set the display to view read, unread, alert status or all meters as they read the route. In most cases, reads can be gathered while driving at posted speeds.

ProfilePLUS Extraction

Extracting ProfilePLUS involves coming within proximity of the meter with a ROADRUNNER handheld or Mobile and entering the "Extract Profile Data" command. The data is then transmitted from the FIREFLY to the ROADRUNNER. Despite the large volume of data that ProfilePLUS captures, a 4MB ROADRUNNER can hold 90 full extractions, while the capacity of the Mobile is virtually unlimited. The extraction process takes about 30 seconds.

Once collected, ProfilePLUS data can be graphed (See Fig. 2) and analyzed in two different ways. If the data was extracted using a ROADRUNNER X7 handheld, the handheld will be brought back to the office where it will be placed in its cradle and unloaded to a PC during a normal communications session. Now the data can be graphed, analyzed and appropriate actions can be taken. ProfilePLUS graphs can be sent to customers in hard copy, faxed, mailed, emailed or posted to a secure section of the utility's website.

The second method involves using Datamatic's optional Profile Manager™ application. Profile Manager is designed to operate on a ruggedized laptop computer/printer and allow ProfilePLUS data to be extracted, graphed, analyzed and printed in the field. Profile Manager is ideal for handling customer service issues onsite with the customer present.

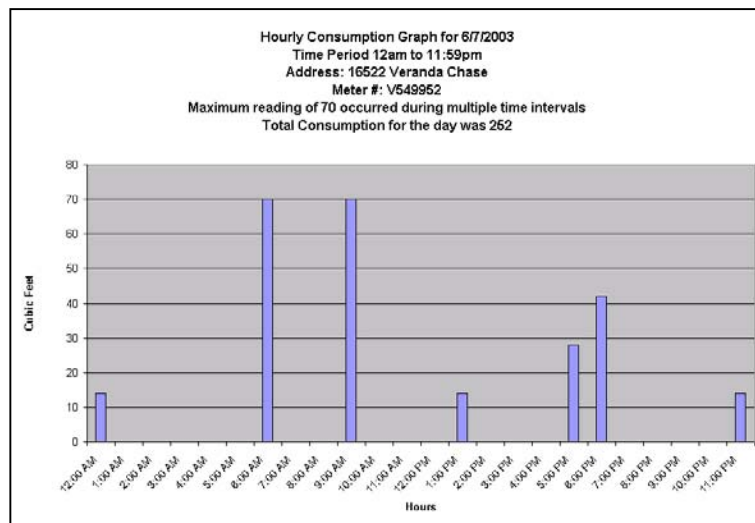


Fig. 2 ProfilePLUS graph from a residential gas customer showing one (1) day's usage at 60-minute intervals.

ProfilePLUS Applications

ProfilePLUS provides data to utilities that has previously been unavailable without costly flow monitors or other devices external to the meter. And since flow monitors are generally installed in response to a complaint or some other issue, they only collect data after-the-fact. The usage period in question can never be retrieved. In contrast, ProfilePLUS data is *always* being recorded and *always* covers the period in question (assuming it was within the past 330 days). Applications include settling consumption disputes, load studies and providing detailed billing to premium customers. ProfilePLUS data can also be used to perform "virtual" turn-on/turn-offs; reducing or eliminating the need for off-cycle reads.

Battery

The FIREFLY Gas MIU is powered by a field-replaceable Lithium Thionyl Chloride battery. Calculated battery life is 10 years.

The FIREFLY AMR System also encompasses solutions for water and electric meters providing complete coverage for multi-utility data collection.