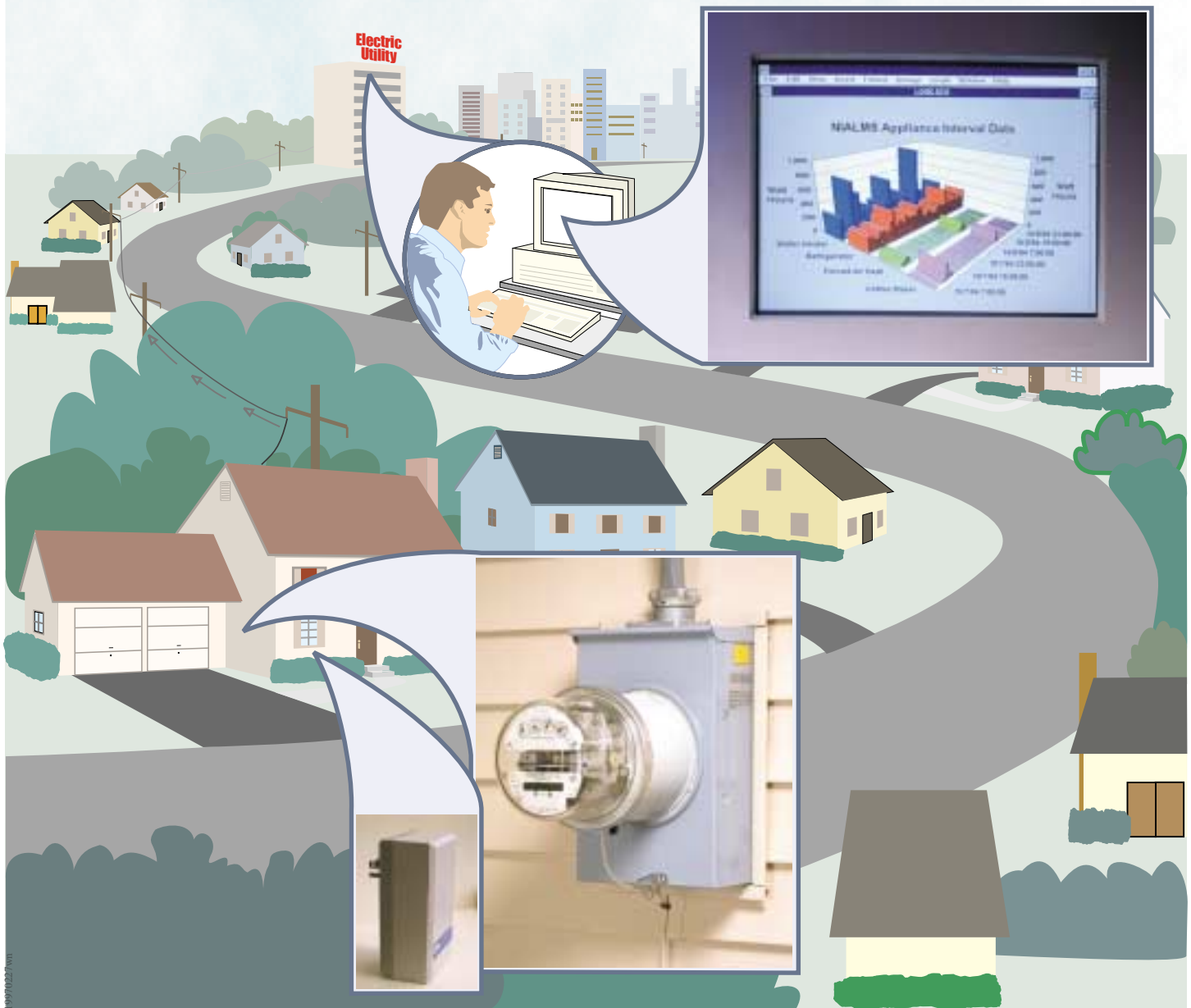


From *Enetics*

Single Point End-use Energy Disaggregation
SPEEDTM



for Energy Use Analysis


Get Accurate and Comprehensive

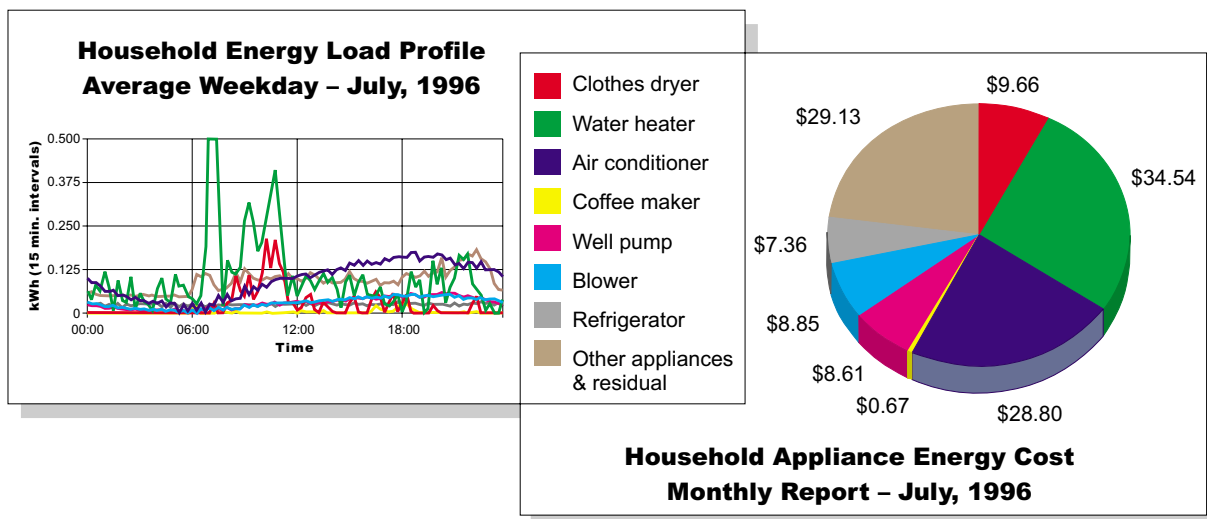
Energy Load Inform

SPEED[™] determines energy consumption of individual electric loads within a premises without the need for expensive instruments attached to each appliance. *SPEED* monitors energy flow through the utility meter only. Advanced computing algorithms used by the *SPEED* software identify patterns in the whole building energy use and then determine which appliances are on, the amount of energy used by each, and the time of operation.

SPEED your way to end-use load profiles

The accuracy of *SPEED* is excellent when compared with traditional invasive data collection methods. With this technology, you will be able to *SPEED* your way to accurate time-of-use energy profiles by specific load.

Load Detected by <i>SPEED</i>	Correlation with Traditional Methods 
Whole premises	>98%
Water heater (resistive heating)	94%
Refrigerators / Freezers	87%
Water pumps (well, pool, sewage)	96%
Air conditioners	87%



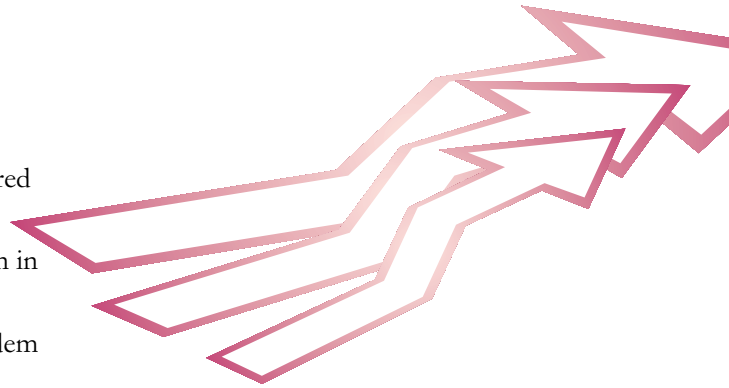
The *SPEED*[™] product line is based on Non-Intrusive Appliance Load Monitoring System (NIALMS) – technology developed initially by Telog Instruments, Inc. under the sponsorship of the Electric Power Research Institute (EPRI). *SPEED* products are now available after successful testing and performance verification under actual application situations at nine utilities.

Information with *SPEED*[™], *Single-Point End-use Energy Disaggregation*.

LD-1100 Recorder



- Logs premises load data
- Rated for 200A direct metered service
- Ring and ringless installation in form 2S meter base
- Built-in phone/cellular modem
- Transfers data to Master Station by telephone, walk-up, or alternative communications
- Records outside temperature



PTS Plug-in Temperature Sensors

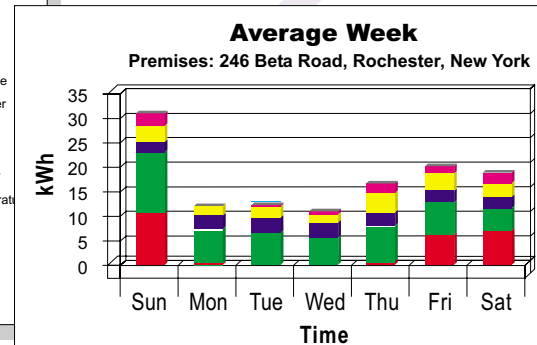
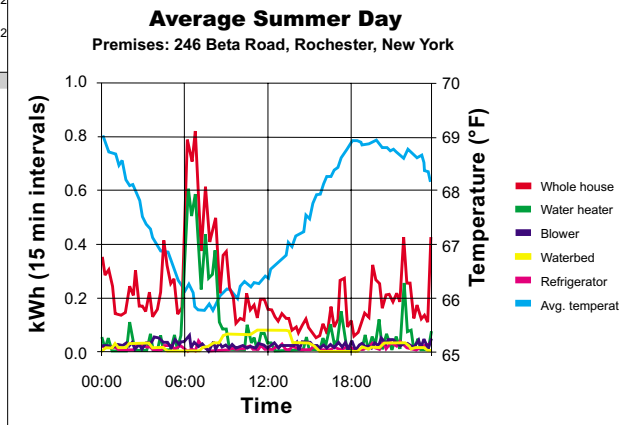
- Records indoor temperature
- Temperature data is collected for correlation with energy-use
- Plugs into standard 110 VAC receptacle
- Compact size: 12 cm x 6.5 cm x 6.5 cm

Analysis Station

- Generates graphical and text reports
- Supports multi-user networked environment
- Exports data
 - by file transfer (e.g., Excel[®], ASCII, mv)
 - by cut & paste
- Runs within Windows NT[®] or Windows
- Follows all Windows[®] operational conventions

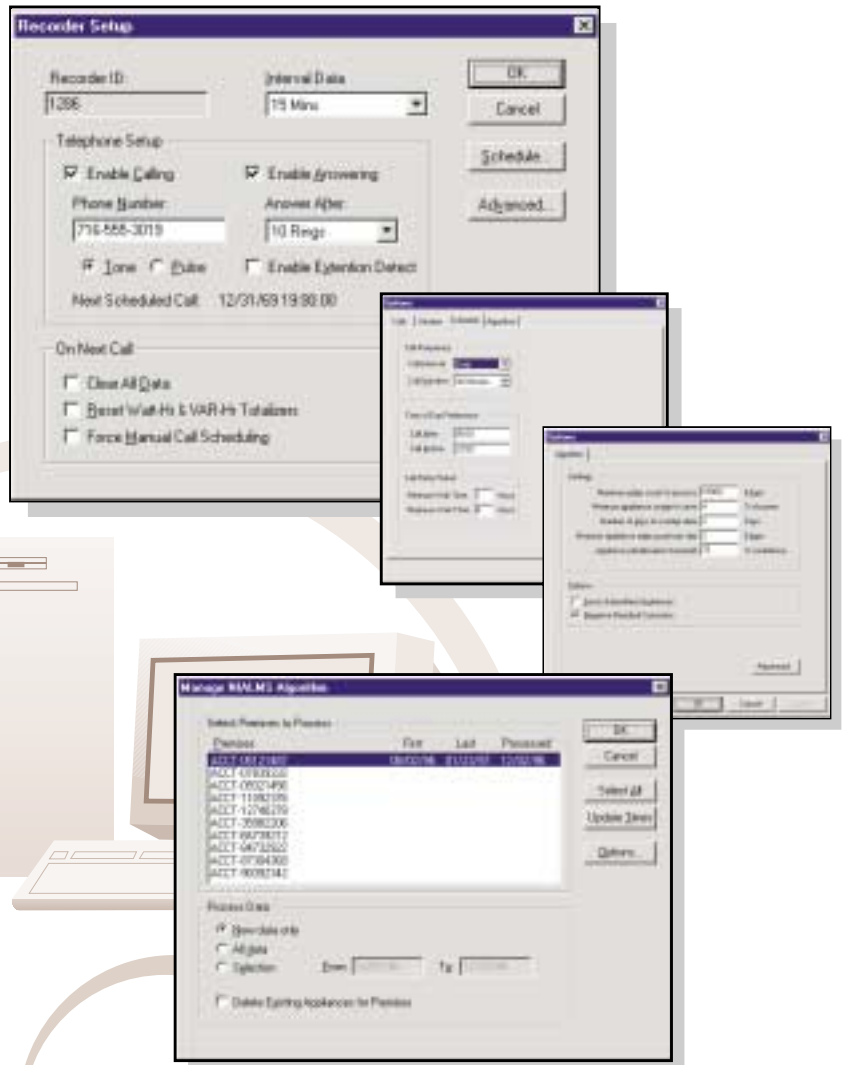
Appliance Summary Report
 Report generated: 12/15/95 09:31:38
 Premises name: 246 Beta Road, Rochester, New York
 Start of data: 06/30/95 23:00:00
 End of data: 07/14/95 23:00:00

Appliance	kWh	Line 1		Line 2		On Time		Off Time	
		Watt	VAR	Watt	VAR	Mean	StdDev	Mean	StdDev
Heat Pump	154.6	1,700.2	954.1	1,045.1	685.6	3.8	1.0	27.1	85.3
Oven/Range	50.6								
Refrigerator	33.1								
Water Heater	169.8								



Master Station

- Manages recorders: configurations, call schedules, locations and demographics
- Processes recorder data into individual load interval data
- Acts as server and database manager for
 - pre- and post-processed energy consumption data
 - temperature data
 - queries from analysis stations
 - queries from other information systems
- Runs within Windows NT® and follows all Windows® operational conventions



Database
Microsoft SQL

Other
Information
Systems

ments
90™)
95
ntions

- Clothes dryer
- Water heater
- Blower
- Waterbed
- Refrigerator

Quickly,



- Quick 10-minute installation

Simply,

- Single point monitoring – behind billing meter

Non-intrusively,

- Access to premises not required for installation

and Economically...

- One third the cost of alternative methods

- Records watt, VAR, interval data by appliance
- Correlates temperature data with energy-use
- Monitors all major appliances on premises
- Adaptable to cellular, wireless or cable communications
- Remotely programmable:
 - recording interval
 - recorder sensitivity threshold
 - data upload time
 - firmware

... for Many Applications.

- Load research
- Rate validation
- Resolution of billing disputes
- Verification of DSM programs
- Detection of theft of services
- Trend analysis
- Strategic Planning
- Marketing evaluation programs
- Improving operational effectiveness
- Pricing by power factor and by peak demand
- TOU pricing by load type
- Implementation of environmentally friendly programs
- Establishing energy-use baselines by demographic area
- Verifying effectiveness of new rate structures

SPEED™

in Action

*Enhances
Service*

*Improves
Planning*

Providing a Baseline Prior to Rate Structure Changes

While planning a series of rate changes to improve its competitiveness, an electric utility realized that without end-use monitoring it could not discern the impact on their consumers. They installed *SPEED* equipment at residences in demographically diverse areas in advance of the rate changes. This initiative is establishing a stable baseline upon which program effectiveness and customer impact can be evaluated.

Managing Operations Cost Effectiveness

A southeastern utility wanted to change its demand profile to improve cost effectiveness in power generation. Using *SPEED*, it conducted a residential survey which showed that a shift in the water heater load in 27% of the residences would achieve the efficiency targets. The utility initiated an incentive program to put timers on water heaters in selected areas. *SPEED* is monitoring the results.

Retaining Customers Targeted by Competitors

When a natural gas utility moved into its service area, one midwestern utility took action to avert the potential loss of customers and revenue. With *SPEED*, it plans to offer reduced electric rates for water heaters. *SPEED* not only enables this type of program, but also gives the versatility to extend this appliance-specific rate structure to other appliances.

Addressing High Bill Complaints

Every customer contact is a test and an opportunity. An electric utility finds that resolving high billing complaints in a timely and comprehensive manner enhances customer loyalty. In a recent case, *SPEED* identified the culprit of a high bill as an oil sump heater which was cycling improperly. Customer service says, "With *SPEED*, we can do the installation and get results much more quickly. This greatly enhances our responsiveness on high bill complaints."

Attracting and Retaining Customers

Faced with competition, energy suppliers need to provide differentiating services to remain successful. *SPEED* provides the necessary information to create innovative programs that attract and retain customers. Using *SPEED*, electric utilities' marketing departments are now investigating the implementation of the following programs.

- Preferred billing rates for specific types of appliances
- Time-of-day billing by appliance or load
- Customer reports showing energy-use per appliance
- Discounts for shifting loads to off-peak hours
- Billing rates based on power factor or peak demand



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About Enetics

Based in the Rochester, NY area, Enetics, Inc. is a subsidiary of Telog Instruments, Inc. and inherits over ten years of experience in manufacturing microprocessor-based data acquisition and communications systems. Enetics focuses on non-intrusive services and products that characterize and measure energy-use in the utility market. Enetics' *SPEED*™ is based on commercialization of technology funded by the Electric Power Research Institute (EPRI), New York State Energy Research and Development Authority (NYSERDA), Empire State Electric Energy Research Corporation (ESEERCO), Consolidated Edison Company of New York, and Rochester Gas and Electric Corporation.