

APPLICATIONS

- Energy auditing
 - Monitors and measures energy use
 - Enables effective energy reduction strategies
- Energy monitor
 - Reduce energy costs through energy awareness
 - Continuous, real-time remote energy monitoring
 - Consolidated business energy dashboard
- Solar/wind generation
 - Monitor both generated and consumed energy

EASY TO USE

- Real-time and historical energy data
 - View from any web enabled device: smart phone, tablet, laptop, pc, etc.
 - Real-time data enables a substantial reduction in power consumption through managed change.
- Modular DIN rail mounted system
 - Easy to install in existing or new businesses
 - Easy to expand and customize, easy in-field upgrades
- Self contained
 - Can be used without a central server, no ongoing fees
 - Can be used with or without a smart meter
- Open system software interface
 - Published API available to allow custom software applications

The Aysix NetMeter Commercial/Industrial Power Measurement and Monitoring System

Save Money and Protect the Environment

Power generation and distribution utilities are facing the unprecedented challenge of managing peak power demand, without spending billions of dollars for new generating stations (nuclear, coal etc.). This predicament is compounded by the aging electrical infrastructure.

Furthermore, Commercial/Industrial (CI) energy users are faced with more complex pricing models and regulatory initiatives such as demand response^a. Consequently, companies that are not prepared for these changes will be financially penalized.

Energy Use can be Managed and Controlled

Clearly, increase in electrical power demand is unavoidable; however, it can be controlled and managed with the effective application of modern technology.

The Aysix NetMeter family of products provides CI energy users with real-time power consumption information. Information is presented in an intuitive, visually appealing and easy to understand format on any device

with a web browser including smart phones, tablets, laptop/desktop computers and more.

With the simple installation of a number of cost effective Aysix NetMeters, commercial/industrial energy consumers have the tools they need to understand and then reduce their energy consumption and subsequent energy costs.

Reduce Energy Through Managed Change

The Aysix NetMeter system is specifically designed to help CI energy users improve their energy consumption patterns by making them aware of their real-time and historical energy use. This enables effective, verifiable energy reduction strategies to be implemented.

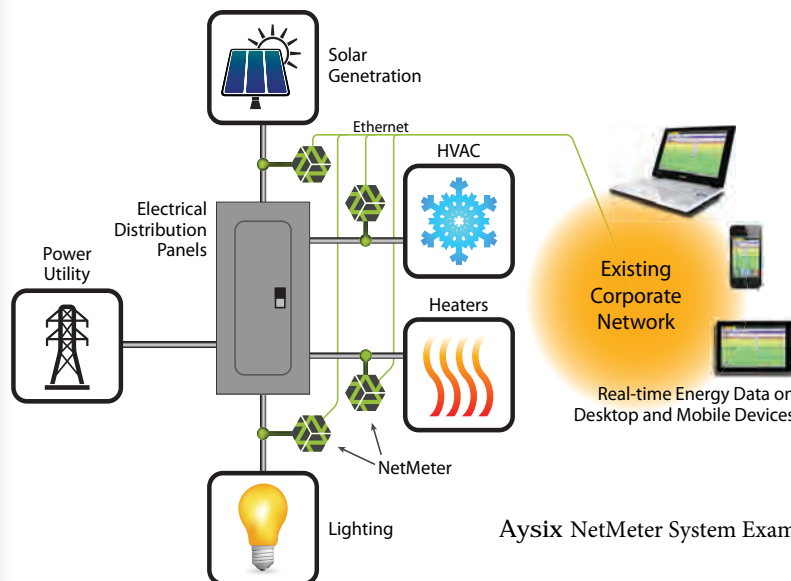
According to the U.S. Department of Energy^b CI users consume over 70% of electrical generating capacity.

For example, in a large North American metropolitan area, a medium size Industrial or Commercial (medium loads) business that uses 200,000 kWh of electricity per month at a cost of \$0.10-0.11 per kWh with a monthly bill of approximately \$22,000, accrues a yearly expenditure of approximately \$265,000.

In this example, a 20% energy reduction equates to a \$53,000/yr savings!

Energy savings of this magnitude are achievable when businesses develop an energy reduction plan based on the insight that the NetMeter products provide.

Even larger businesses can realize greater savings: \$600,000 in the case of a large CI user with loads and monthly consumption in the area



Aysix NetMeter System Example

a. Demand Response is a temporary reduction in electricity usage based on certain triggers such as price, overloading of generation facilities, or emergency events
 b. www.energy.gov

of 2,500,000 kWh at a rate of \$0.09 per kWh. Larger businesses can save millions of dollars.

Aysix NetMeters enable Energy Auditors to identify, manage and control energy consumption in your business.

The Real-Time Advantage

Independent studies¹ have proven that real-time energy feedback is effective in driving energy conservation.

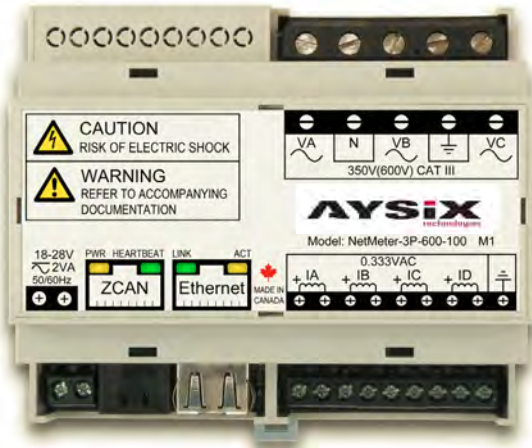
Smart meter-based solutions and other smart grid related products today are unable to display real-time data to users. By contrast, the NetMeter has the capability to graphically display updates every second. Users can see immediate changes in their power consumption, such as turning on or off an electrical load (industrial and commercial equipment, big appliances, HVAC, electric motors, lighting, pumps, compressors etc...).

How it Works

The Aysix NetMeter

Module

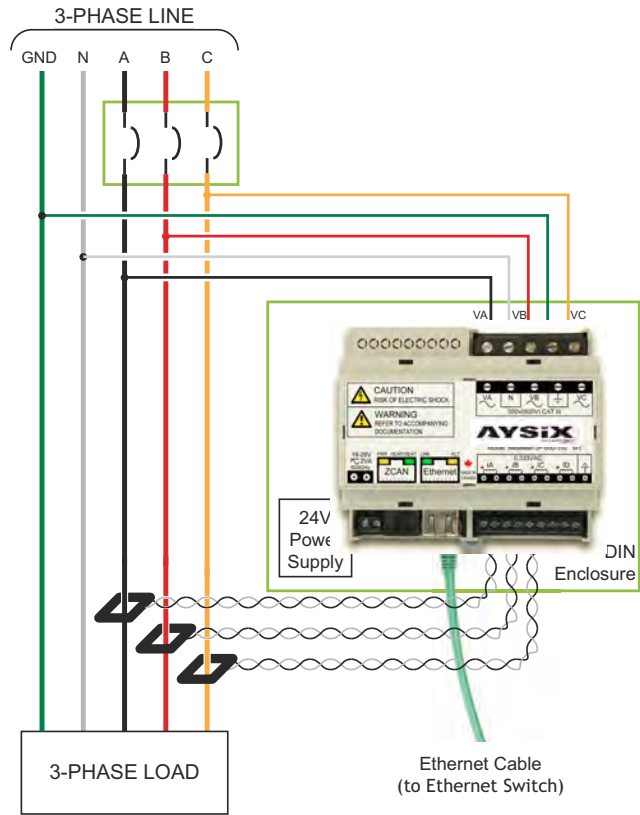
The Aysix NetMeter devices are small modules that utilize the popular DIN rail standard for mounting. NetMeters are typically mounted next to the electrical panel where they are wired-in, to measure voltage and current, using Current Transformers (CTs).



3-Phase Aysix NetMeter Module

Connection² to the Aysix NetMeter is simple:

- Connect up to 3 voltage inputs (plus neutral and ground)
- Connect up to 3 current transformers to the CT inputs
- Supply ~24 volts AC or DC to power the NetMeter
- Use a standard network cable to connect the NetMeter to your local network switch/router



Typical 3-Phase Aysix NetMeter Connection

The Aysix NetMeter is rated for use in 600V 3-phase systems and may also be used with lower voltages, and in split and single phase applications.

A wide range of current measurements is possible and is limited only by the current transformers used.

Both positive and negative energy flow can be measured for consumption(+) or generation(-) applications.

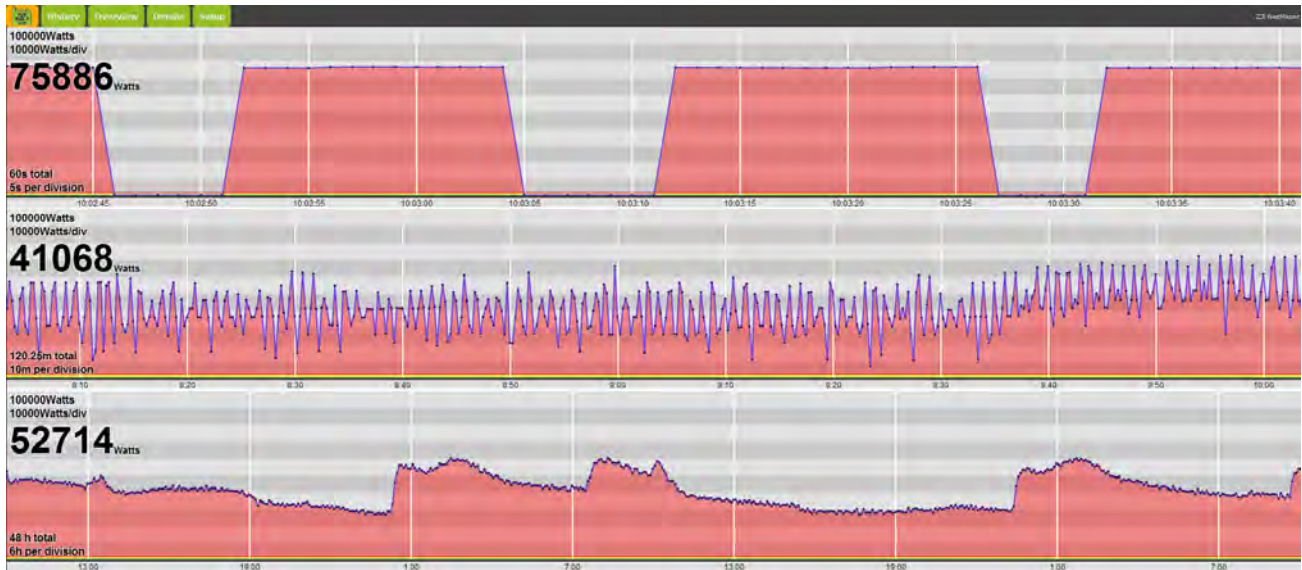
Plug-and-play Operation

A self-contained Web server inside the Aysix NetMeter serves up a full featured user interface that may be accessed using a standard web browser.

Since the Aysix NetMeter units communicate using a standard web browser, there is no need to install and maintain an application program on the users computer.

The built-in web server is compatible with all major web browsers including Firefox, Internet Explorer 9, Chrome, Safari, Opera, or any standards compliant web browser.





Real-time Graph (updated every second), Top: Past Minute, Middle: Past 2 Hours, Bottom: Past 2 days

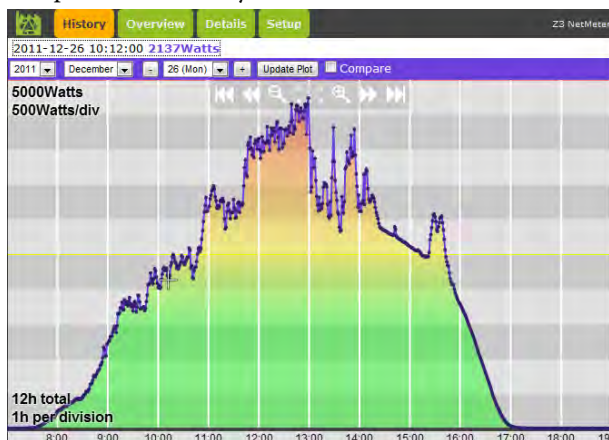
Real-Time Data

Through a web browser, real-time data from the Aysix NetMeter can be viewed either graphically or numerically.

Historical Data

The Aysix NetMeter can store more than 2 years of detailed energy history (1 minute resolution) and well over 10 years of hourly energy history.

A calendar style overview shows daily energy use. Clicking on one of the days takes the user immediately to an interactive chart where the energy use for the selected day may be viewed (with zoom/pan controls) and compared to other days.



Energy History Display

Power Quality Analysis

In addition to power and energy measurement, the Aysix NetMeter is also a full-featured tool for power quality

analysis. All key electrical parameters can be displayed in real-time including:

- Active power
- Reactive power
- Apparent power
- Accumulated energy (active/reactive/apparent)
- Fundamental accumulated energy (active/reactive)
- RMS current
- RMS voltage
- Power factor
- Phase angle
- Line frequency
- Totals and per-phase measurements

With the proliferation of IT infrastructure and new lighting technologies, power utilities are becoming more concerned about the load quality of their commercial/industrial clients. The result is that poor load quality can adversely affect the price customers pay. The ability of the Aysix NetMeter to monitor power quality in real-time allows your operations to take action thus avoiding unnecessary costs.

History		Overview	Details	Setup	Energy Use
A/B/C	2012-01-25 17:57:19		A	B	C
F	V	RMS Voltage (Volts)			
		339.0	340.4	344.9	
Frequency (Hz)	I	RMS Current (Amps)			
60.00		2.06	2.02	2.20	
P	P	Power (Watts)			
Total Power (Watts)		332.7	242.6	307.5	
882.9	Φ	Phase Angle (Degrees)			
		59.9	69.7	65.5	
Sample Mode	PF	Power Factor			
Single		0.4757	0.3531	0.4049	
Stop	VA	Volt-Ampere			
Update Rate		699.4	687.3	759.5	
100ms	VAR	Volt-Ampere Reactive			
		612.8	640.8	692.4	

Power Details Display



NetAysix Meter Evaluation System

Built-in Data Logger

Up to 47 different measurements can be enabled for storage by the internal data logger. This is in addition to the historical power data.

Logged data can be downloaded in Comma Separated Values format (CSV) for use in spreadsheet or other programs. It can also be accessed as JSON format (JavaScript Object Notation) for use in web applications.

The Z3 Open Application Framework

Z3 provides a documented Application Programming Interface (API) based on a cost-free license. It allows users and 3rd party developers to easily integrate the Z3 data into their custom application:

- Generate reports that consolidate enterprise wide energy assets
- Combine energy data into integrated displays of information important to business operations (dashboards)

With the Z3 API, real-time and historical energy data is available using standard Web 2.0 programming techniques such as HTML, JavaScript, and AJAX.

Presets	
Selection presets:	<input type="button" value="Select All"/> <input type="button" value="Select None"/> <input type="button" value="Reset Form"/> <input type="button" value="Select Active Phases Only"/> <input type="button" value="Select Sums Only"/>
Log Control	
Log Interval:	15 Seconds
Log Enable:	Auto-enable after power-up/reset <input checked="" type="checkbox"/> <input type="button" value="Enable Log Now"/>
Instantaneous Measurements	
Voltage:	V(A) <input type="checkbox"/> V(B) <input type="checkbox"/> V(C) <input type="checkbox"/>
Current:	I(A) <input type="checkbox"/> I(B) <input type="checkbox"/> I(C) <input type="checkbox"/>
Power:	P(A) <input type="checkbox"/> P(B) <input type="checkbox"/> P(C) <input type="checkbox"/> P(A+B+C) <input checked="" type="checkbox"/>
Volt-Amperes(VA):	VA(A) <input type="checkbox"/> VA(B) <input type="checkbox"/> VA(C) <input type="checkbox"/> VA(A+B+C) <input checked="" type="checkbox"/>
VA Reactive(VAR):	VAR(A) <input type="checkbox"/> VAR(B) <input type="checkbox"/> VAR(C) <input type="checkbox"/> VAR(A+B+C) <input checked="" type="checkbox"/>
Phase Angle:	Φ(A) <input type="checkbox"/> Φ(B) <input type="checkbox"/> Φ(C) <input type="checkbox"/>
Power Factor:	PF(A) <input type="checkbox"/> PF(B) <input type="checkbox"/> PF(C) <input type="checkbox"/> PF(A+B+C) <input checked="" type="checkbox"/>
Line Period:	T(A) <input type="checkbox"/>
Cumulative Measurements (Total)	
Active Energy:	WHR(A) <input type="checkbox"/> WHR(B) <input type="checkbox"/> WHR(C) <input type="checkbox"/> WHR(A+B+C) <input checked="" type="checkbox"/>
Reactive Energy:	VARHR(A) <input type="checkbox"/> VARHR(B) <input type="checkbox"/> VARHR(C) <input type="checkbox"/> VARHR(A+B+C) <input type="checkbox"/>
Apparent Energy:	VAHR(A) <input type="checkbox"/> VAHR(B) <input type="checkbox"/> VAHR(C) <input type="checkbox"/> VAHR(A+B+C) <input type="checkbox"/>
Cumulative Measurements (Fundamental)	
Active Energy:	WHR(A) <input type="checkbox"/> WHR(B) <input type="checkbox"/> WHR(C) <input type="checkbox"/> WHR(A+B+C) <input type="checkbox"/>
Reactive Energy:	VARHR(A) <input type="checkbox"/> VARHR(B) <input type="checkbox"/> VARHR(C) <input type="checkbox"/> VARHR(A+B+C) <input type="checkbox"/>
<input type="button" value="Clear All Previous Log Data!"/>	
Changes Pending:	<input type="button" value="Save New Log Configuration"/> <input type="button" value="Abandon Changes"/>
Summary	
Duration of Log:	Each log entry requires 21 bytes of data storage. With a storage interval of 15 Seconds, the total log duration is about 4.27 days.

Data Logger Setup Screen