



## iStar™ Energy Monitor and Cloud Based Dashboard Description and Application

### iStar Energy Intelligence

The iStar Energy Intelligence platform provides simple monitoring and reporting of key energy management information:

- Energy monitoring
- Savings performance
- Equipment status monitoring
- Alarm management
- Cloud based EMS
- BMS integration – local and remote
- Decision support
- Maintenance support

The iStar Energy Intelligence platform is readily deployed to manage a range of energy assets, including:

- Voltage optimisation (energy delivery)
- Energy efficiency suite (energy use)
- DS/DG (renewable integration)
- Sub-circuit metering
- CO2 savings verification

### Energy Monitor

The iStar cloud dashboard system provides measurement and reporting of voltages and currents at revenue grade (Class 1) accuracy.

The energy monitor measures 3 phase voltages (Volts) and neutral and 3 phase currents (Amps). Various sized CT's available for each phase, providing project flexibility. It also provides 3 phase measurement of active power (kW), apparent power (kVA), power factor (pf) and energy consumption of the load (kWh).



The energy monitor is easy to install and to set up. The energy monitor is compact, din rail mounted and can be used for domestic, commercial and industrial applications. It has a built in power supply and comes with a 4G SIM card for remote access from any computer or network connected platform. All data is transmitted to the cloud for maximum security.

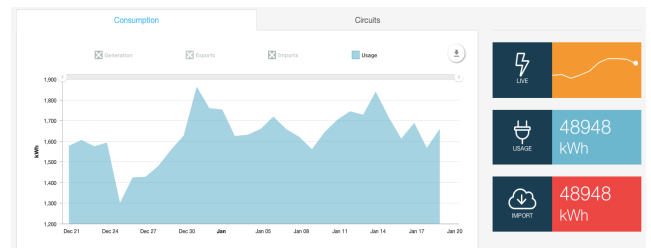
The energy monitor comes with a standard cloud based dashboard for monitoring of the 3 phase active power (kW) and measurement of the 3 phase energy consumption of the load (kWh). Data can be exported to .csv or .xlsx files for analysis in Excel or other applications.

### Energy Monitor Application

For Voltage Optimisation (VO) applications, either 1 or 2 monitoring devices can be used on each system, dependant on the application. A customised cloud based dashboard has been produced to provide important information such as VO status, optimised voltage (Volts) to the load, active power (kW), apparent power (kVA), energy (kWh) consumed and saved, energy (kWh) cost and saved and tonnes CO<sub>2</sub> produced and saved.

### Customised Dashboard

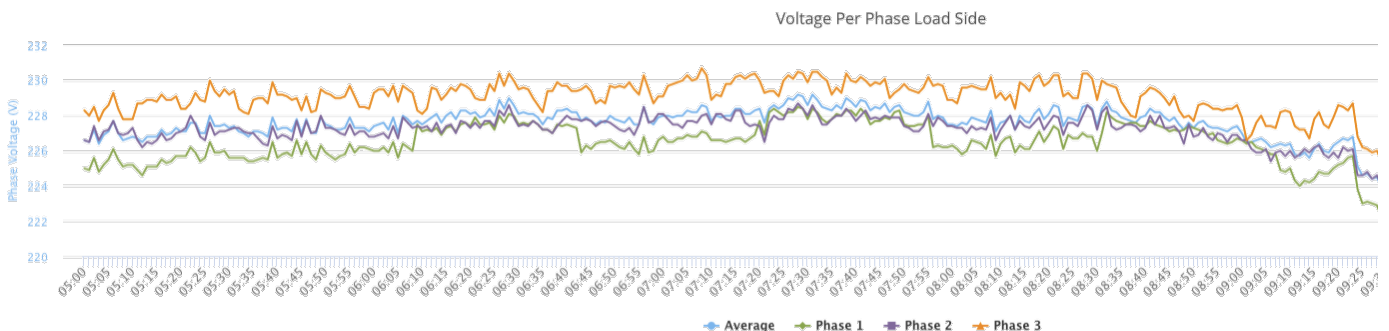
The customised cloud based dashboard for VO applications provides important data for review and analysis. It generates graphical screens which can be printed to .pdf format and all important data can be exported to excel files for analysis and reporting. Also, it provides user level access for key personnel to access various sites across their fleet of sites.



Standard Cloud Based Dashboard

All key site/supply specific information is securely loaded into the dashboard at configuration to inform the graphs, enable calculations, provide user access and to provide the key data for review and analysis.

The customised cloud based dashboard also provides status of the VO system (ON or OFF) and the status of the monitoring equipment (ON or OFF). If either of the VO or the monitoring devices are OFF, an alarm email is generated so that a site inspection can be scheduled to investigate what has occurred.



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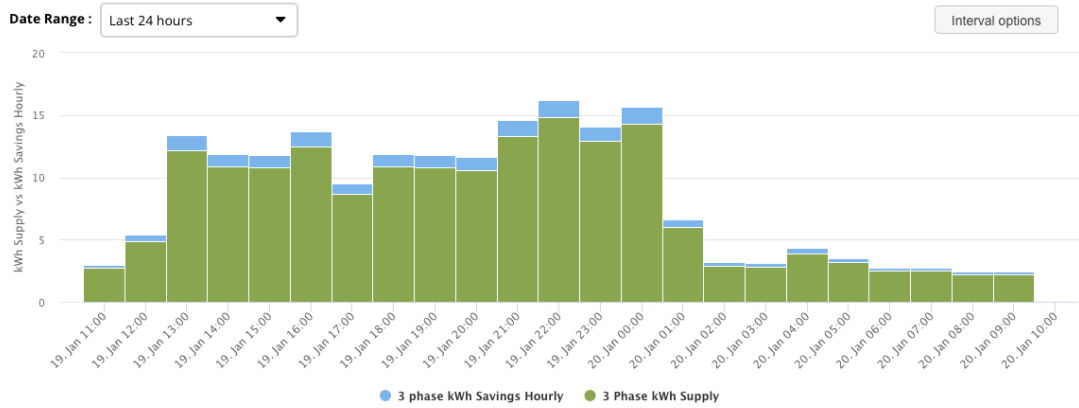


## Security

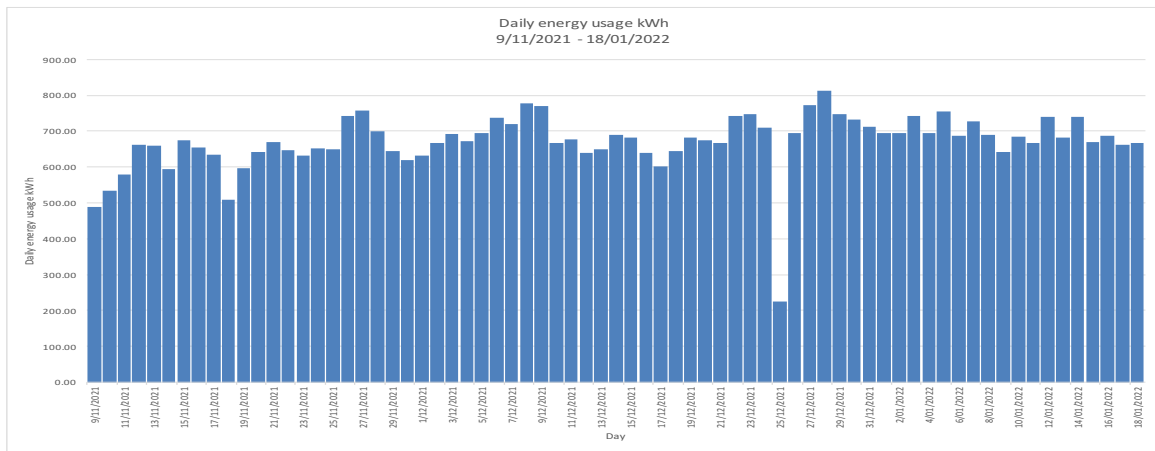
Multilevel security features are provided for user access configuration and data security.

## Sample reports

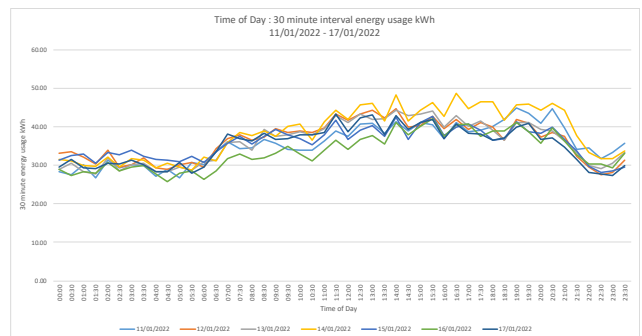
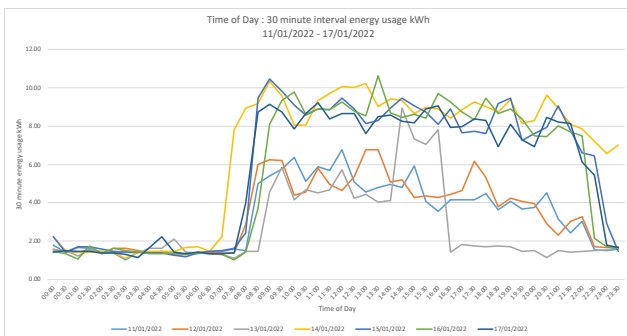
There are many standard reports pre-configured in the dashboard user interface. A few samples are provided below for illustration.



Energy Consumed and Saved (kWh) for analysis and export to Excel

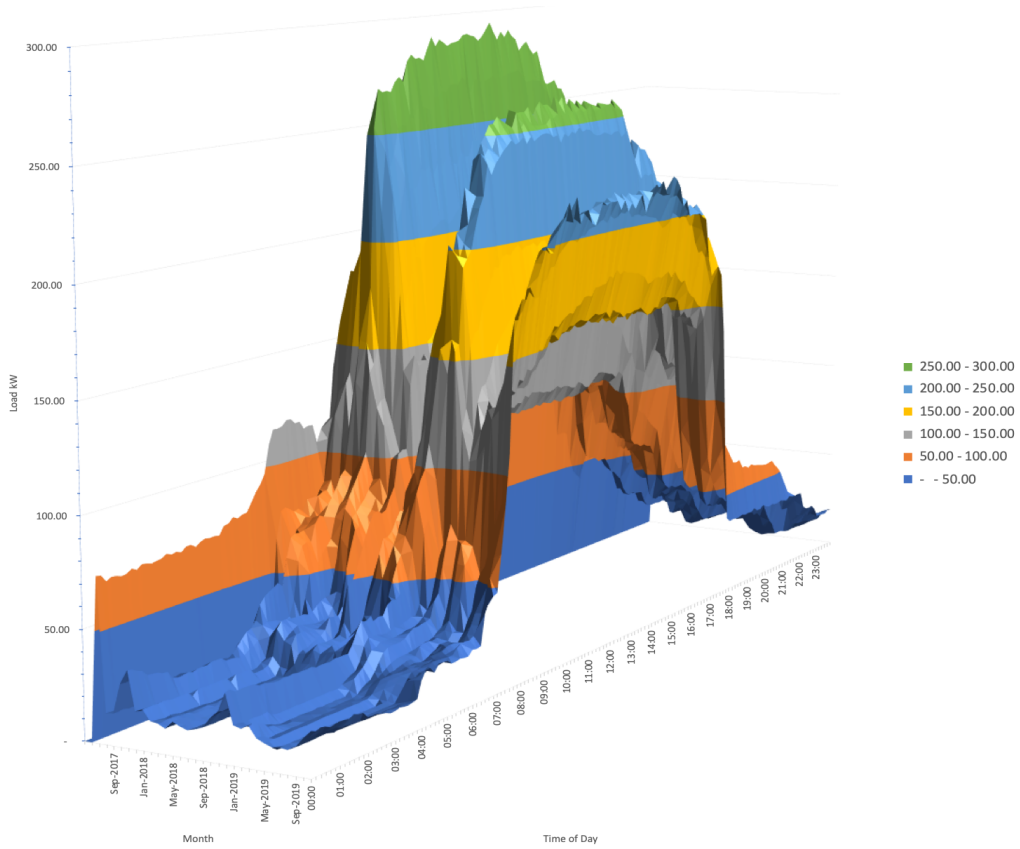


Data may be downloaded and analysed using Excel or other tools





Time of day reports for load energy usage



Every load has a unique signature

<p>Fleet Health   <b>Energy Insights</b>   Device Inventory   Alarms</p>		<p>Australia   Australia   Australia</p> <p>Asset Performance Issues: 11 (Modified: 2020-02-20 12:28:42)</p> <p>Efficiency Opportunities: 26 (Modified: 2019-11-15 16:40:51)</p> <p>Power Quality Opportunities: 43 (Modified: 2020-02-20 13:32:52)</p>	
<p>Australia</p> <p>Aggregate Power: 52.55kW (Modified: 2020-02-20 12:04:20)</p>		<p>Australia</p> <p>Aggregate Energy Consumption History (kWh)</p> <p>02/19/2020 21:32:36 Energy (kWh) (As is): 18.74</p>	
<p>Australia</p> <p>Energy Consumption per Category (7 Days Period)</p> <p>Legend: Air Conditioning, Hot Water, Lighting Power, NoSet, Pool Pump</p>		<p>Australia</p> <p>Energy Consumption per Category (Daily)</p> <p>Legend: Air Conditioning, Lighting &amp; Power, Hot Water, Pool Pump, Not Set, Electric Vehicle</p>	
<p>Australia</p> <p>Energy Sources per Category (7 Days Period)</p> <p>Legend: GridConnect, Solar Generation</p>		<p>Australia</p> <p>Energy Sources per Category (Daily)</p> <p>Legend: Solar Generation, Grid Connect</p>	
		<p>State</p> <p>Device Group Name   Number of Devices</p> <p>NSW: 108</p> <p>QLD: 1</p> <p>VIC: 12</p> <p>Export</p>	
		<p>Australia</p> <p>Low Power Factor Counter (Australia)</p> <p>43 (Modified: 2020-02-20 13:35:46)</p>	
		<p>Australia</p> <p>High Voltage Counter (Australia)</p> <p>1 (Modified: 2020-02-20 13:35:46)</p>	
		<p>Australia</p> <p>Low Voltage Counter (Australia)</p> <p>1 (Modified: 2020-02-20 13:35:46)</p>	

Aggregated monitoring across a cross section of facilities

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## Site configuration

The key site/supply specific information loaded into the customised cloud based dashboard:

Item	Key Information
Company Details	Company Name
	Site Code
	Site Street Address
	Site Suburb
	Site State
	Site Post Code
	Site Label
Energy Savings Percent [%]	Energy Savings Percent [%]
Tariff [\$ / kWh]	Tariff [\$ / kWh]
Energy [kWh]	Energy Consumed [kWh]
	Energy Saved [kWh]
Cost [\$]	Cost [\$]
	Saved [\$]
CO2 Factor [tCO2/kWh]	Emission Factor [tCO2/kWh]
CO2 Emissions [tCO2]	CO2 Emitted [tCO2]
	CO2 Saved [tCO2]

## Key Variables for Reporting

The key site/supply specific information loaded into the customised cloud based dashboard:

Item	Key Information
Active Power [kW]	Minimum Active Power [kW]
	Average Active Power [kW]
	Maximum Active Power [kW]
Apparent Power [kVA]	Minimum Apparent Power [kVA]
	Average Apparent Power [kVA]
	Maximum Apparent Power [kVA]
Voltage [V rms]	Voltage By Phase [Va Vb Vc rms AVG]
	Minimum Voltage [V rms]
	Average Voltage [V rms]
Current [I rms]	Current By Phase [Ia Ib Ic rms AVG]
	Minimum Current [I rms]
	Average Current [I rms]
Savings of kWh [%kWh]	Maximum Current [I rms]
	Energy Consumed With VO ON [kWh]
	Energy Consumed With VO OFF [kWh]

## Energy Monitor specification

Item	Information
Communications	GSM/GPRS/EDGE: Quad band 850/900/1800/1900MHz UMTS/HSPA+: Five band 800/850/900/1900/2100MHz External antenna
Power Supply	Built in (operates from phase 1) universal power supply
Measurement Channels	Up to 6 depending on configuration
Hosting	Hosted on AWS
Device Management	Device management features including: Firmware updates, remote network diagnostics, configurable reporting rate
Measurement Interval	5 to 150 seconds (configurable)
Energy Logging	5 minute intervals; servers request logged data
Logged Values	Real and reactive power, min and max voltage and current, frequency
Logging Period	30 days of 5 minute data for 6 channels. The log is kept current and used after an operational device has been offline.
Reporting Interval	Default 30 seconds, configurable between 5 to 150 seconds
Report Contents	Real, reactive energy, voltage, current, frequency
Data Volume	18 MB / month (30 second data, indicative only)
Protocol	Proprietary
Voltage Connections	Four pin connector supports three phases and neutral. Phase 1 and neutral are required to power the device and sense P1. Phase 2 and phase 3 are for measurement only.
Current Sensing	Standard CTs: 60A, 120A, 400A, 600A field interchangeable 3000A Rogowski coils must be pre-configured
Configuration	No network configuration required at install time. All APN settings pre-configured
Product Certifications & Markings	Conforms with all relevant Australian, New Zealand and US standards Is certified for network connection to the 3G AT&T cellular network in the US (PTCRB) Conforms with a range of other international standards relevant to the European Economic Community (including the UK) Carries a number of marks (UL, CE, FCC) for which NATA registered laboratories have issued test reports

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## Contact us

For any further details or information regarding the monitoring device or the customised cloud based dashboard for the VO and other energy efficiency applications, please contact our authorised sales representative or VAASCO directly on telephone number 1300 659 463 or by email on sales@vaasco.net

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