The ESIMD3™ Modular Decentralised Inverter Series

e24™

P304E

Modular Decentralised Medium Scale Range ESI for Villas, Buildings, Businesses and Industrial Applications from 40 to 2080KVA

The ESIMD3™ Energy Storage Solution is a modular and decentralised 3 phases Modular Decentralised energy storage solution from 3x60A to 3x500A applications requiring the interaction of multiple energy sources: solar PV, wind, auxiliary generator, main utility etc... The ESIMD3™ Modular Decentralised inverter combines multiple energy sources in a manner to optimise energy costs while maximizing uptime and power quality to the user.

The ESIMD3™ Modular Decentralised Inverter Series exceptional design allows to instantly upgrade in power capacity, reliability, PV or wind power capacity, auxiliary generator capacity and runtime by adding or swapping modules.

The ESIMD3™ is completely decentralised, making it fault tolerant and allowing it to be gradually upgradable. The system can be configured from 40 to 520KVA per frame. Up to 4 Frames can be placed in parallel to reach up to 2080 KVA of total capacity with runtimes of up to 18 hours.

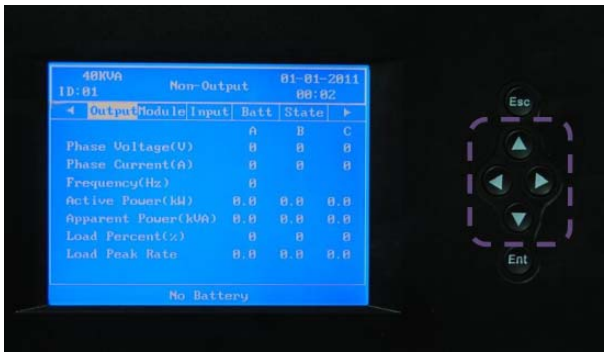
The ESIMD3™ Series

The ESIMD3™ Modular Decentralised Inverter Series is built in modules of 50KW each allowing to reach a total capacity of 2400 KW (4 Units of 600KW Units in parallel). The ESIMD3™ is highly compact and efficient allowing substantial savings in space and energy.

The ESIMD3™ Modular Decentralised Inverter Series exceptional design meets all modern requirements of building and operating energy efficient and environmentally friendly homes, buildings, business and industrial applications. The ESIMD3™ Modular Decentralised Inverter Series employs transform less double conversion Inverter topology and is available in four possible frame sizes: 200 KW (4 modules of 50KW), 300KW (6 modules of 50KW), 400KW (8 modules of 50KW), 500KW (10 Modules of 50KW) and 600KW (up to 12 modules of 50KW).

The E24 ESIMD3™ Series is designed with the flexibility to accommodate an increase in power, reliability level, runtime or renewable energy capacity by simply adding a module.

Easy installation and maintenance was at the base of the de-sign for this Modular Decentralised Inverter system with front access to electrical connections and fully serviceable components.



- **Up to 96 % AC–AC efficiency**
- **Unity input power factor**
- **Fully scalable up to 2.4 MW**
- **N+X redundancy**
- **Hot-Swapable Power Modules**

The ESIMD3™ Unmatched Performance

The ESIMD3™ Modular Decentralised Inverter Series is engineered to adapt to almost any existing energy source in a manner to optimise energy costs and minimize generator operation while offering outstanding power quality.

Multi-input power selection:
When used as part of a turnkey E24 Energy Storage Solution, the ESIMD3™ Modular Decentralised inverter may connect to 2 primarily AC three phase inputs, 1 DC couples renewable energy input (PV or Wind) and 1 AC coupled renewable energy input (PV or Wind). An optional extra input source can be added with a pre-set level of priority and a preset level of maximum energy intake.

With or without renewable energy sources:
The ESIMD3™ system may be used without renewable energy inputs. Under such a case the ESIMD3™ will only store the energy of the grid into the batteries and seamlessly restore the energy to the load without any interruption in the event of a power failure.

Any quality of input power is acceptable:
The ESIMD3™ accepts almost any quality of input with voltage per phase ranging from 120V to 280V per phase and frequency variations from 40Hz to 70 Hz.

Programmable priority of energy sources:
When used as part of a turnkey E24 Energy Storage Solution, the ESIMD3™ may be programmed by default to root the renewable energy generated on priority to the load, then to the batteries. Any unused renewal energy generated is feedback to the grid for Net-meetering benefits. Other priority configurations can be programmed at will.

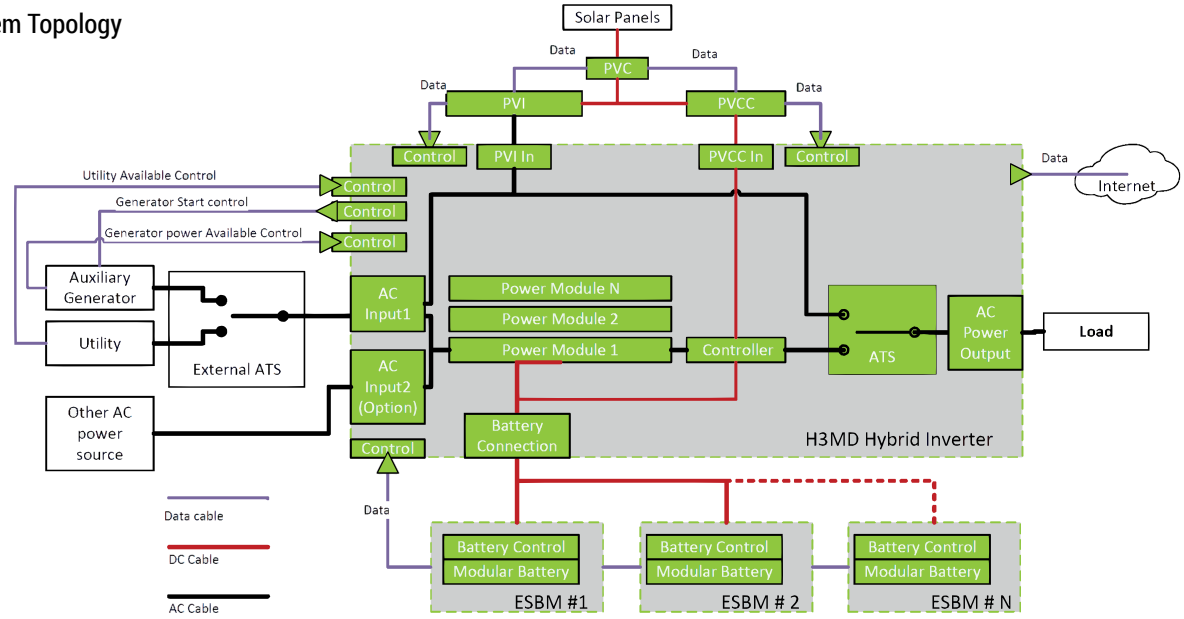
Generator control:
When used as part of a turnkey E24 Energy Storage Solution, the ESIMD3™ includes the controls to automatically start and stop an auxiliary generator in the event where the power drawn by the load either exceeds a preset level of current discharge of the batteries or a preset level of battery capacity.

The preset level of discharge can be set to trigger the starting of the generator when the load reaches a level that will deplete the batteries in less than 3 to 8 hours.

The preset level of battery discharge that will trigger the starting of the generator can be set to a depth of discharge ranging between 30% and 80%. The lower the depth of discharge set, the higher the runtime on batteries before the generator starts but the shorter the number of cycles that the batterry can de-liver (shorter battery lifetime). Refer to our battery brochure for details.

The ESIMD3™ automatically shuts down the generator when the load is decreased below the prest maximum load or when the battery capacity is restored.

System Topology



100% isolated from the grid:

The ESIMD3 continuously feeds the load from the batteries while refilling them with the exact same energy discharged (100% on-line double conversion topology). This means that the load is constantly being powered by a freshly synthesized sine wave of the purest quality in order to be 100% isolated from any grid disturbance, surge, brownout or harmonics.

The ESIMD3 includes the option to deactivate the double conversion topology and may be operated in green function mode to save about 3% on the double conversion efficiency.

Three Phase load balancing technology

It is common to trip the main utility or the generator breaker due to one of the phases being overloaded. The ESIMD3 Modular Decentralised inverter includes the technology to equally distribute the load on the three input phases equally in a manner to delay tripping the utility of generator breaker until the three phases reach simultaneously their maximum allowed threshold. This function is extremely valuable for customers with limited available utility breakers or slightly under-sized generators.

Power Factor Correction

Analog utility KWH meters do not record accurately KWH. Under low power factor operation, some analog meters record KVAH rather than KWH which substantially increase the utility bill especially under brownout conditions.

Diesel generators consume fuel in proportion to the KVA loads rather than KW. Correcting the load to unity power factor may decrease fuel consumption up to 50%.

The ESIMD3™ includes DSP technology allowing to correct for the input power factor in a manner to substantially save on both the utility and generator bill.

Seamless, easy operation:

The ESIMD3™ is engineered to operate without any user intervention. There is no need to push any buttons or understand how it works. It simply does.

Touch Screen LCD:

For those who do want to know what is happening, when and why, the ESIMD3™ Modular Decentralised inverter series include a touch screen
LCD display with an intuitive menu displaying detailed data about the system.

Fool proof technology:

The ESIMD3™ does not trip any breaker in the event of an overload:

If the overload occurs when the utility is present, the ESIMD3™ will not raise any alarm until it senses that the overload is about to trip the main utility breaker or generator breaker. Only then will it raise an alarm and send an sms / email to a number of pre-programmed coordinates in order to alert the user to decrease the power consumption to avoid running on batteries when the utility power is available.

If the overload occurs on the battery, the ESIMD3™ will sound a short buzzer and send an sms. If ignored, the ESIMD3 will initiate the starting of the generator to avoid fast depletion of the batteries.

In the event where the generator is not operational, the ESIMD3 will disconnect the load for 1 minute to give the user the time to lower the power consumption. After 1 minute the ESIMD3™ will reconnect the power automatically.

If for any reason the ESIMD3™ is damaged or its battery fully depleted, it will automatically disconnect itself from the circuit and bypass itself. The load will continue to be powered by either the utility power or the generator until the ESIMD3 Modular Decentralised inverter is serviced.

ESIMD3-FR5 & ESIMD3-FR8

ESIMD3-FR13

Unmatched Features

Besides its unmatched performance and flexibility, the ESIMD3™ offers a number of features:

N+X parallel redundancy

Up to 12 modules of ESIMD3-M50KI can be positioned in parallel per frame and up to 4 frames can be connected in parallel redundancy mode to reach up to 2.4MW.

This means that if any power module fail, the system will continue to operate normally (after sounding an alarm) with the only consequence of a decrease in maximum power equal to the number of modules which failed. The likeliness of 2 modules failing at the same time being less than 1 in a million, the reliability of the overall system is the highest in the industry.

DSP Technology

The ESIMD3™ Modular Decentralised Inverter is built on advance Digital Signal Processing technology in order to provide high performance steady and accurate operation over its lifetime while offering outstanding efficiency (up to 96% in online mode).

Intelligent Battery Management

The ESIMD3™ Modular Decentralised Inverter includes an intelligent battery charger that includes a float/boost charger and a dynamic cut-off level that reduces battery maintenance and improves battery life.

Battery Discharge Time Prediction

The ESIMD3™ Modular Decentralised Inverter is capable of predicting the remaining time on battery under a current load level allowing you to make accurate decision making.

Flexible Battery Configuration

The ESIMD3™ Modular Decentralised Inverter is programmable to operate on a variable number of batteries. This means that in case one or more batteries are damaged, the ESIMD3™ can be programmed to operate on less batteries until the damaged battery is replaced avoiding any downtime.

Hot-Swappable Power Modules

In the event of a power module being damaged, it is possible to replace the damaged module with a new one without shutting down the inverter and without any load interruption.

Strong Overload Capability

The ESIMD3™ Modular Decentralised Inverter is capable of handling overloads of 110% / 125% / 150% for 60min / 10min / 1 min respectively.

Power Walk In

Power Walk In function allows the rectifier of each unit to be turned on progressively and in sequences in order to avoid the sudden load on generators.

Emergency Power Off (EPO)

The ESIMD3™ Series is equipped with a concave red EPO button with transparent cover built into the control panel for emergency power off.

Comprehensive Communication Options

Communications options include: RS232, RS485, Modbus (option), SNMP adaptor (Option), Dry Contacts.

Low input current total harmonic distortion (THDi)

The ESIMD3™ Modular Decentralised Inverter Series actively manages the input current total harmonic distortion (THDi) at a low level (2 percent at 100 percent load). E24's unique technology neutralizes the emission of harmonics at the input of the Modular Decentralised Inverter system, providing greater reliability of operations for circuit breakers and extending the overall service life of the equipment. Low harmonic distortion saves unnecessary over sizing of gensets, cabling and circuit breakers, avoids extra heating of input transformers and extends the overall service life of all components.

Truly Modular and Evolutive

The ESIMD3™ Modular Decentralised Inverter Series is built into a 19" cabinet allowing to increase power capacity or reliability.

Each ESIMD3™ Rack includes by default one of each of the following modules:

- Input/Output module (1)
- Control & Bypass Module (1)
- 50 KVA Power Module (1)
- Communication Module (1)

More power modules can be added in order to configure the ESIMD3™ to the required capacity or level of reliability:

If for example a Rack is configured with 3 power modules of 50KW each, the maximum power of the Inverter will be 3x50KW = 150KW.

If the load is constantly under 100KW, and one module fails, the Inverter will sound an alarm and the load will be automatically transferred to the 2 remaining power modules without any load interruption.

19" Rack mounted Power Module

Upgrade as you Grow

The ESIMD3™ can be upgraded by adding modules. You may start with a ESIMD3™ Modular Decentralised inverter equipped with only one power module and decide later that you wish to upgrade.

Simply add one 50KW power Module, and the required number of battery modules (check with your dealer for the number required to reach the runtime desired) and you're all set.

Easy to Service

The advantage of a modular system is that it allows to replace one module in case of a damaged part.

The ESIMD3™ allows to detect easily which module is faulty. It is then easy to swap the faulty module with a new one. Simply remove and slide out the faulty module and replace and snap in the new module and the system is operational again.

Customers who own multiple ESIMD3™ units may keep one module as a common spare part for all racks allowing to minimize downtime.

Module Technical Specifications

Capacity (VA/W)	Module		50K/50K
Input	Phase		3Phase/4Wires + Ground
	Rated Voltage		380/400/415Vac
	Voltage Range		208-478Vac
	Frequency Range		40~70Hz
	Power Factor		≥0.99
	Bypass Voltage Range		Max. voltage: +15% (optional +5%, +10%, +25%) Min. voltage: - 45% (optional -20%, -30%) Frequency protection range: ±10%
	Current Harmonic		≤3(100% non-linear load)
Output	Phase		3Phase/4Wires + Ground
	Rated Voltage		380/400/415Vac
	Power Factor		0.9
	Voltage Precision		±2%
	Output Frequency	Utility Mode	±1%, ±2%, ±4%, ±5%, ±10% of the rated frequency (optional)
		Battery Mode	(50/60±0.2)Hz
	Crest Factor		03:01
	Transfer Time		Utility to Battery: 0 ms Utility to bypass: 0ms (following)
	Overload capacity		Load ≤110%, 60 min, ≤125%, last 1 min, ≥150% shut down Inverter immediately
	THD		≤2% with linear load ≤5% with non linear load
Efficiency			ECO mode ≥98%; Normal mode ≥92%
Communication Interface	Inverter module		RS232, RS485, SNMP card
Battery	Voltage		±192V\±204V\±216V\±228V\±240V DC : battery quantity (optional)
	Charge Current (A)	Module	Maximum current 20A
	Backup time		Depends on the capacity of external batteries
Operating Environment	Temperature		0^{O}C~ 40^{O}C
	Humidity		0~95% non condensing
	Storage temperature		-25^{O}C~55^{O}C
	Altitude		<1500m
Other	Unit Dimensions (WxHxD)		443x131x580mm
	Weight(KGS)		38
Industry Standard			EN 62040-1:2008+AI:2013, EN 62040-2:2006 IEC 62040-2:2005, IEC 62040-3:2001

Frame Technical Specifications

Model			ESIMD3-FR6	ESIMD3-FR8	ESIMD3-FR12
Capacity (VA/W)	Inverter Frame		50-300KVA/50 - 300 KW	50 - 400KVA / 50 - 400 KW	50 - 600KVA/50 - 600KW
	HPM Module		50 KVA/50KW		
Input	Phase		3 Phase 4 Wires and Ground		
	Rated voltage		380/400/415Vac		
	Voltage Range		208-478Vac		
	Frequency Range		40Hz-70Hz		
	Power Factor		≥0.99		
	Current THDi		≤3% (100% non linear load)		
	Bypass Voltage Range		Max. Voltage: +15% (optional + 5%, +10% + 25%) Min. Voltage: -45% (optional -20%, -30%) Frequency protection range: ±10%		
	Generator Input		Support		
Output	Phase		3 Phases 4 Wires and Ground		
	Rated voltage		380/400/415Vac		
	Power factor		0.9		
	Voltage regulation		±2%		
	Frequency	Utility Mode	±1%, ±2%, ±4%, ±5%, ±10% of the rated frequency (optional)		
		Battery Mode	(50/60±0.2%)Hz		
	Crest Factor		3:1		
	THD		≤2% with linear load ≤5% with non linear load		
	Waveform		Pure Sine wave		
Efficiency			≥92% at normal mode		
	Voltage		384V\408V\432V\456V\480V DC; battery quantity (optional)		
	Changing Current	Frame	100A Max. (Charge current can be set according to battery capacity installed)	160A Max. (Charge current can be set according to battery capacity installed)	260A Max. (Charge current can be set according to battery capacity installed)
		Module	20A Max. (charge current can be set according to battery capacity installed)		
Transfer Time			Utility to battery : 0ms; Utility to bypass: 0 ms		
Protection	Overload	AC Mode	Load≤110%: last 60 min, ≤125% : last 10 min, ≤150%:last 1 min, ≥150% shut down Inverter immediately		
		Bat. Mode	Load≤110%: last 10 min, ≤125% : last 1 min, ≤150%:last 1 S, ≥150% shut down Inverter immediately		
		Bypass Mode	breaker 3 x 300A Breaker 3 x 500A Breaker 3 x 800A		
	Short circuit		Hold whole System		
	Overheat		Line Mode: Switch to Bypass; Backup Mode: Shut down Inverter immediately		
	Battery low		Alarm and switch Off		
	Self-diagnostics		Upon power On and software control		
	EPO (optional)		Shut down Inverter immediately		
	Battery		Advanced battery management		
	Noise Suppression		Complies with EN62040-2		
Alarms	Audible & Visual		Line Failure, Battery Low, Overload, System Fault		
	Status LED & LCD		Line Mode, Eco Mode, Bypass Mode, Battery Low, Battery Bad, Overload & Inverter Fault		
	Reading on the LCD		Input voltage, input frequency, output voltage, output frequency, load percentage, battery voltage & inner temperature		
Communication Interface	Inverter Frame		RS232, RS485, Intelligent slot x 2, Dry Contact		
Environment	Operating temperature		0°C-40°C		
	Storage temperature		-25°C~+55°C		
	Humidity		0~95% non condensing		
	Altitude		< 1500m		
	Noise		<60dB(at 1 meter)		
Safety Conformance			EN 62040-1:2008+AI:2013, EN 62040-2:2006 IEC 62040-2:2005, IEC 62040-3:2001		
Dimension (WxHxD) mm			600x1400x860	600x2000x860	1200x2000x860
Net weight			270 Kg	380 Kg	560 Kg

Off-Grid Inverter | Storage Inverter | Battery



E24 Modular Range Of Products For Building Easy, Flexible & Evolutive Solutions

E24 products dynamically evolve with the lifestyle and work style of its customers while easing the installation process.

E24 products are conceived in modules allowing for an easy upgrade to adjust with the needs of the customers. Being modular and easy to connect E24 products allow installers to easily configure the required modules for an optimal solution while offering easy upgrade options.

Ordering Information

Ref Number	Description
ESIMD3-FR4X50	H3MD Frame for up to 4x ESIMD3-M50KI Modules
ESIMD3-FR6X50	H3MD Frame for up to 6x ESIMD3-M50KI Modules
ESIMD3-FR8X50	H3MD Frame for up to 8 x ESIMD3-M50KI Modules
ESIMD3-FR10X50	H3MD Frame for up to 10x ESIMD3-M50KI Modules
ESIMD3-FR12X50	H3MD Frame for up to 12 x ESIMD3-M50KI Modules
ESIMD3-M50KI	Rack Modular Energy Storage Inverter, N+X, 1 Phase, +/-240Vdc, 50KW, 220Vac, 50/60Hz

www.e24solutions.com

ISO 9001:2015

QUALITY STANDARD