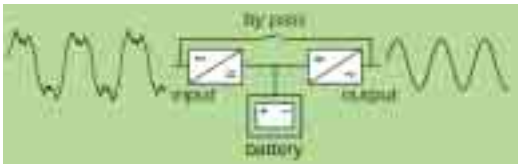
UPS MegaLine

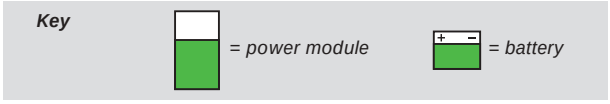
On Line Dual Conversion

This is the only technology that provides a sure fire solution to any power supply problem caused by variations in the frequency or the amplitude of the input voltage. The decoupling of the output from the input makes operation possible with a wide input voltage range, reducing the number of battery switchovers and allowing operation with gen-sets and frequency conversion. Thanks to the inverter, intervention time is nil because it is always on-line, so any transfer time is eliminated.



Block diagram - UPS On Line dual conversion

Modular

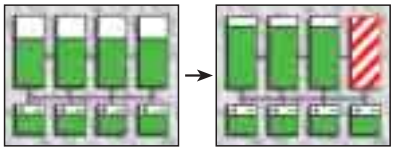


The modular architecture of electronics and batteries admits redundant configurations, simplified maintenance and the option of future expansion.

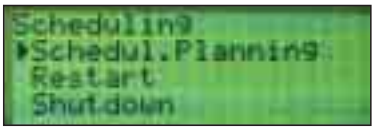

The MegaLines are modular in both power and autonomy

Redundant

Redundancy in terms of both the power modules and the batteries: rectifier, inverter and battery charger are all fitted on each of the power boards. Operating continuity is always guaranteed, even if one of the modules should fail, without any interruption or switchover, thanks to parallel load sharing (all the boards participate in the supply of power to the load). The level of redundancy is set via software using the display, to warn when redundancy, but not operation, may be endangered because of an increase in consumption.


If one board fails, the others share the load. The same principle goes for the batteries.

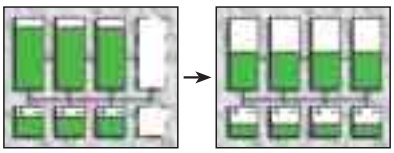
Programmable



All the operating data and UPS settings are readily accessible by way of the LCD panel. The operating parameters can be set in UPS Setup in order to optimise their application. It is also possible to programme UPS switch on, switch off and testing with a daily, weekly or monthly schedule, or on command. The LCD display is extremely user friendly, so that these operations are also accessible to the less experienced. Password protection, however, is envisaged.

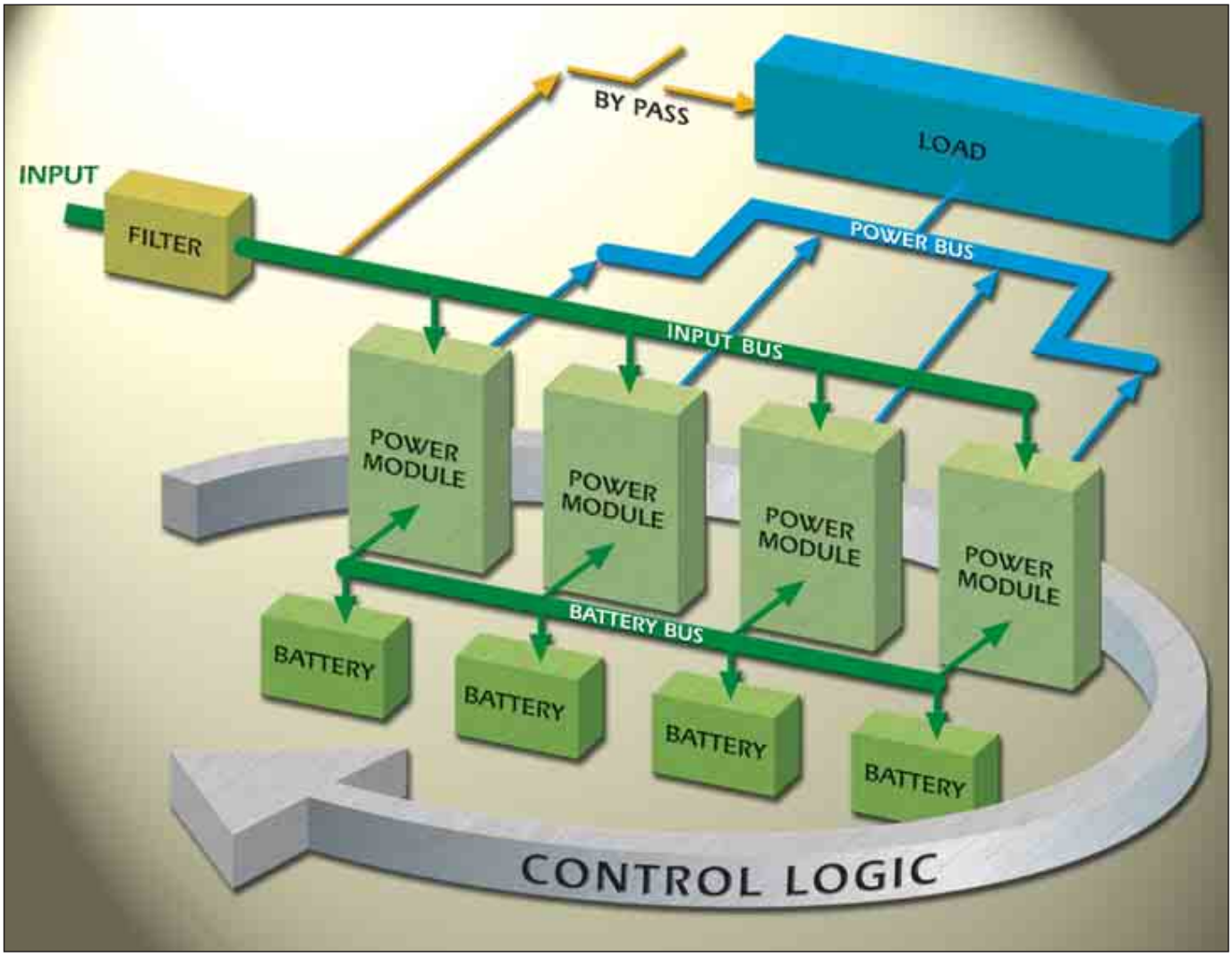
Expandable

Easy to expand in power and autonomy thanks to the full modularity of the boards and the low voltage (36V) battery kits, enabling the battery operation time to be customised according to the specific application. All the models, even the single cabinet versions up to 5000 VA, can be easily connected to external battery cabinets without the need for any modifications thanks to the standard, plug&play-type connection.


If three boards are not enough, fit an extra one. The load is automatically redistributed

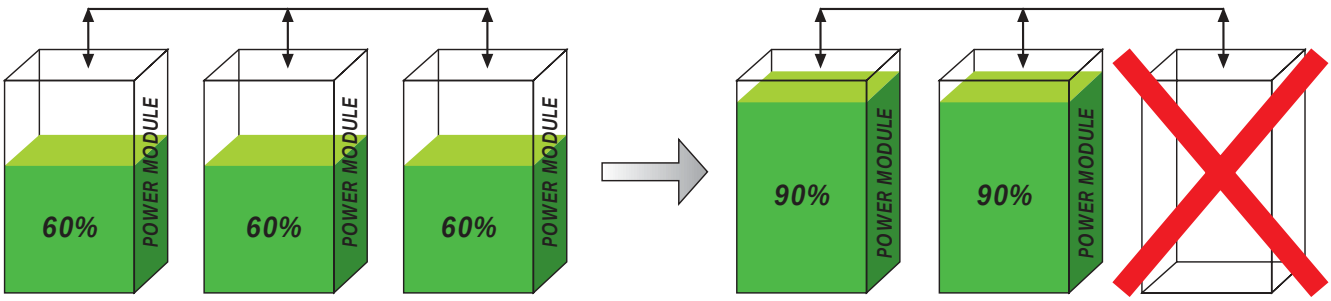
UPS MegaLine

Operating principle



High uptime thanks to redundancy and load sharing

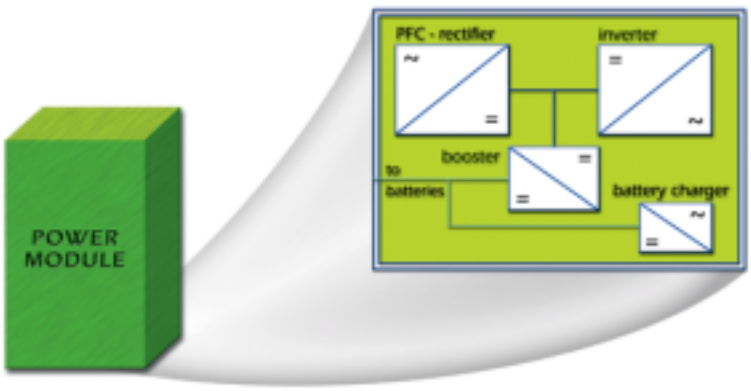
All the modules inside the MegaLines supply the load contemporarily, and all the batteries contribute to the supply of backup energy.
If one of the modules stops working, the others will all continue supplying the load without any interruption, redistributing the percentage of load that was previously supplied by the module now out of order. For example: redundant MegaLine 3750 N+1 supplying a load of 2250 VA. Each module supplies 750 VA. One module goes out of order. The others now supply 1125 VA each.



UPS
MegaLine

"PLUS"

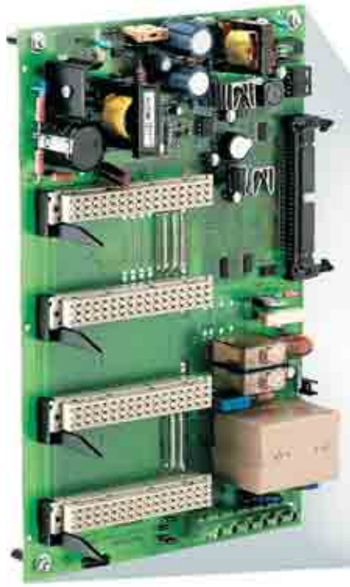
- *Input power factor > 0.99*
- *Input current harmonic distortion < 3%*
- *Advanced expandability of autonomy*
- *Static bypass*
- *Class A/B (immunity/emission)*
- *Automatic sensing (in/out frequency)*
- *Plug & play for gen-sets*
- *Noise level < 40 dBA*
- *Double IBC (intelligent battery charger)*
- *Long life battery control*



Each MegaLine power module is a true, on line dual conversion, with PFC rectifier - inverter - booster and battery charger. All the blocks of all the modules are in parallel, as are the batteries.

On line dual conversion

UPS
MegaLine



Modular

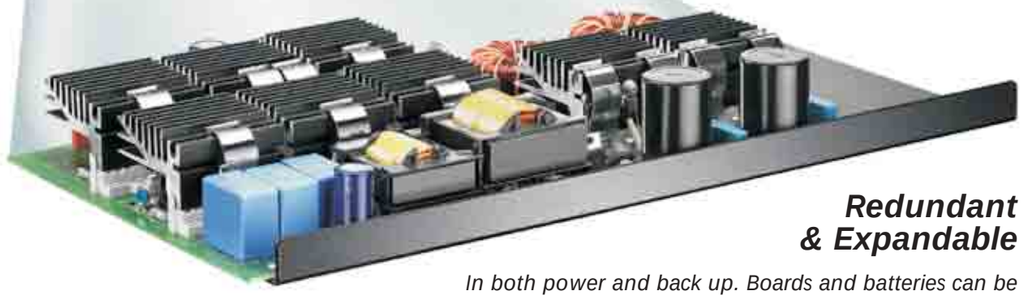
Modularity and total resource distribution lead to MegaLine UPS offering superior uptime.

On line dual conversion

Sophisticated control logic makes certain that the performance of the MegaLines is at the top of their category.

Programmable

The LCD display makes all diagnostics data and programmable menus accessible without the need for a PC connection.



Redundant & Expandable

In both power and back up. Boards and batteries can be easily added or removed, reducing the average downtime.

UPS
MegaLine

Not only do the MegaLines offer all the standard features of the best on line - dual conversion products, they also offer top-of-the class performance and functions. They are available in two families, with either a single or a double cabinet. The 4 single cabinet models can supply from 1250 to 5000 VA, and can house a maximum of 4 power boards and 4 battery kits. Additional batteries can be housed in bespoke cabinets that are easily connected up thanks to their standard presetting for the expansion of autonomy.

Effective acoustic and visual signals, *even from a considerable distance*

High Frequency and high efficiency *with a reduced footprint*

Static bypass

External maintenance bypass *(optional)*

Cold charging

Real time confirmation of residual autonomy and charge status *on the LCD display*

Input section:

- *Input PF > 0.98 whatever the percentage of load*
- *THD of input current < 3%*
- *Wide range of input voltage and frequency*
- *50 Hz or 60 Hz operating frequency with automatic identification*
- *50 Hz in - 60 Hz out frequency conversion or vice versa*
- *Extension of the input frequency range for operation with gen-sets*
- *DC start*

Technical specifications	***MegaLine 1250***	***MegaLine 2500***	***MegaLine 3750***	***MegaLine 5000***
Technology	*On line dual conversion*			
Nominal power	*1250*	*2500*	*3750*	*5000*
Active power	*875*	*1750*	*2625*	*3500*
Nominal input voltage	*230 V*			
Input voltage range	*184÷264 V with 100% load - 100÷264 V with 50% load*			
Input frequency	*50 / 60 Hz ± 2% autosensing*			
Input current THD	*< 3%*			
Input power factor	*> 0,99 from 20% of load on*			
Nominal output voltage	*230 V ± 1%*			
Nominal output frequency	*50 / 60 Hz synchronized*			
Output voltage THD	*< 1%*			
Batteries	*3 pcs 12 V 9 Ah seald, lead-acid, maintenance free batteries each power board*			
Batteries number	*3*	*6*	*9*	*12*
Back up – 80% load	*11*			
Back up – 50% load	*20*			
Bypass	*Static + electromechanical - zero transfer time*			
Overload capability (mains mode)	*150% for 30 sec. - 200% for 5 sec. Without bypass intervention*			
Acoustic noise @ 1m	*40 dBA*			
Net weight (Kg)	*23,5*	*34*	*43*	*53*
Size (l x h x d) mm	*270 x 475 x 570*			
Reference standards	*EN 50091-1-1, EN 50091-2, EN 50091-3*			
Installed power boards	*1*	*2*	*3*	*4*
Available power slots	*3*	*2*	*1*	*-*
Installed battery kits	*1*	*2*	*3*	*4*
Available battery slots	*3*	*2*	*1*	*-*
Battery charger slots	*1 - in dedicated battery cabinet (optional)*			

UPS
MegaLine

The 5 double cabinet models can supply from 5000 to 10000 VA. They can house a maximum of 8 power boards, each supplying 1250 VA, and 10 battery kits in their bespoke cabinet, which also provides space for 1 extra battery charger. Extra battery cabinets, identical to the standard one supplied, can be added for further expansion of the backup time.

Output section:

- ***Eco mode*** *operation (energy saving)*
- ***Load-waiting mode*** *operation (protection on demand)*
- *Output voltage can be adjusted in 1-volt steps on the front panel*
- *Low noise levels*
- *Measurement of internal and external temperatures*
- *Ventilation control based on temperature and load*
- *Preset for remote emergency switch-off*

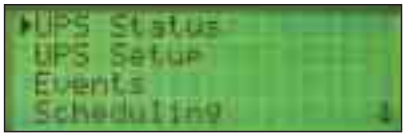
Class A/B (immunity emission)

All the MegaLine models comply with the most stringent standards in terms of both ***emission*** *and* ***immunity*** *to electromagnetic interference, so that they can be used for any application, in either civil or industrial environments*

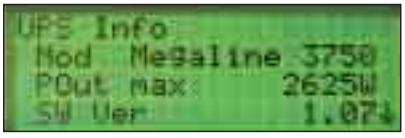
Shutdown software can be downloaded free *of charge off our website*

Technical specifications	***MegaLine 5000/2***	***MegaLine 6250/2***	***MegaLine 7500/2***	***MegaLine 8750/2***	***MegaLine 10000/2***
Technology	*On line dual conversion*				
Nominal power	*5000*	*6250*	*7500*	*8750*	*10000*
Active power	*3500*	*4375*	*5250*	*6125*	*7000*
Nominal input voltage	*230 V*				
Input voltage range	*184÷264 V with 100% load - 100÷264 V with 50% load*				
Input frequency	*50 / 60 Hz ± 2% autosensing*				
Input current THD	*< 3%*				
Input power factor	*> 0,99 from 20% of load on*				
Nominal output voltage	*230 V ± 1%*				
Nominal output frequency	*50 / 60 Hz synchronized*				
Output voltage THD	*< 1%*				
Batteries	*3 pcs 12 V 9 Ah seald, lead-acid, maintenance free batteries each power board*				
Batteries number	*12*	*15*	*18*	*21*	*24*
Back up – 80% load	*11*				
Back up – 50% load	*20*				
Bypass	*Static + electromechanical – zero transfer time*				
Overload capability (mains mode)	*150% for 30 sec. - 200% for 5 sec. Without bypass intervention*				
Acoustic noise @ 1m	*40 dBA*				
Net weight (Kg)	*24 + 50*	*26,5 + 57,5*	*29 + 65*	*31,5 + 72,5*	*34 + 80*
Size (l x h x d) mm	*270 x 475 x 570 x 2 cabinets*				
Reference standards	*EN 50091-1-1, EN 50091-2, EN 50091-3*				
Installed power boards	*4*	*5*	*6*	*7*	*8*
Available power slots	*4*	*3*	*2*	*1*	*-*
Installed battery kits	*4*	*5*	*6*	*7*	*8*
Available battery slots	*6*	*5*	*4*	*3*	*2*
Battery charger slots	*1 - in dedicated battery cabinet*				

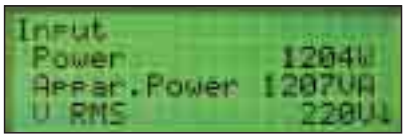
Information



The LCD display provides various information, ranging from basic data such as the name of the model, its power rating, the version of the software and its serial number, to more advanced information concerning the input and output sections, the batteries ... these can be found in the various submenus in the UPS INFO menu.



Input



The submenu in the INPUT section keeps the user informed as regards all the sensitive data concerning UPS operation without the need to connect up any software.

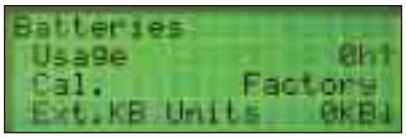
The active and apparent input power, the effective voltage and current, the frequency, the crest factor and the power factor can be consulted at any time during mains operation by simply navigating in two menus.

Output

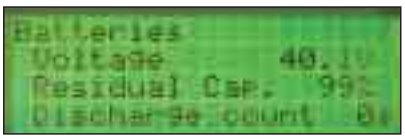
Similar information to that provided for the input section is also available for the OUTPUT section.

The data shown on the first screen (the display is scrolled down vertically to enable access to all the information provided) is especially important for precise monitoring of load levels and thus the prevention of complications, such as overloads.

Batteries



The BATTERIES menu provides important information both concerning the current status of the batteries (charging voltage, residual capacity) and also a battery log. The number of complete discharges, the hours of use, the type of calibration in use, any autonomy expansion kits or extra battery chargers fitted, are all fundamental parameters when assessing the life and usage of the batteries and for scheduling their replacement.



The calibration of the batteries, set in the TOOLS menu, is needed for acquiring the typical discharge parameters for the batteries in use. It can be executed on command or planned as part of a regular schedule. The UPS updates it automatically each time the batteries are fully discharged. The advantage of calibration, used for the calculation of the autonomy and the recharge time, is that it takes a large number of factors into consideration, even those relating to the environment such as the impact of temperature and age.

Programming

With the MegaLine's LCD display, it is very simple to schedule the automatic switching on and off of the UPS, without the need to connect up a computer. Even battery calibration and testing can be scheduled. A total of 16 programming events can be stored in its memory. The events can take place:

- √ *Daily*
- √ *Weekly*
- √ *Monthly*
- √ *On command*

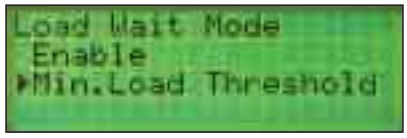
so that each individual type of event can be managed with total flexibility (e.g. regular on/off but occasional calibration).

Bypass

The BYPASS can also be scheduled to operate in a variety of ways:

- √ *Off line – energy saving*
- √ *Load waiting– the UPS switches on when the load exceeds the threshold that is set on the panel*
- √ *Forced bypass– the UPS is excluded from the system*

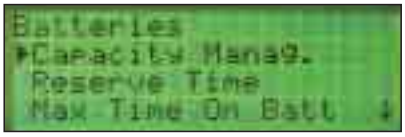
The delay before intervention can also be adjusted to allow for repeated peaks of consumption by the load by modifying the speed of the dipswitch (e.g. for laser printers or photocopying machines).



Backup

The method used to manage autonomy can be customised according to the requirements of the particular application. It is possible to choose between time-based management or management based on the battery voltage threshold.

For example, with time-based management, it is possible to set the time limit for battery operation or the maximum operating time after the reserve signal (UPS close to battery exhaustion). With voltage threshold management, the thresholds can be adjusted to safeguard optimum or customised use of the available resources. EXTERNAL OPTIONS is used for the recognition of expanded autonomies or additional battery chargers.



Output configuration

The output voltage can be adjusted in 1-Volt steps whereas the frequency can be set to a fixed value, separate from the input, or left free to synchronise with the input. With fixed frequency, the MegaLine can be set for operation as a frequency converter. Redundancy N+X, on the other hand, is a warning function: if parameter X=1,2 etc is set, the power of one module is reserved exclusively for redundancy and a warning signal is provided should the load exceed the power available. For example: MegaLine 3750 - Redundancy N+1 – load 2100 VA.

1250 VA of the available 3750 VA is redundant whilst the remaining 2500 VA is for use by the load. Should the load increase in excess of 2500 VA, the UPS will warn that redundancy is no longer available. It will, however, continue to supply the load correctly.

Alarms and signals

An acoustic signal and high-visibility flashing on the backlit front panel ensure that any alarm signal is noticed immediately.
The signals can be divided up into various categories based on their severity:

Normal Operation – Fixed Green
- *Normal operation, no anomaly.*

Battery Mode – Flashing Yellow
- *Battery operation, accompanied by a slow, intermittent acoustic alarm signal, which can be silenced.*

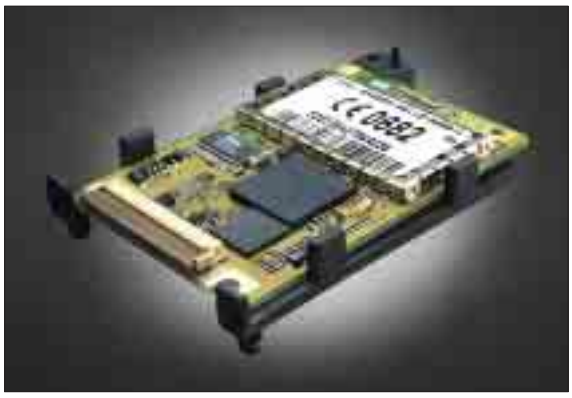
Severe alarm – Fixed Red (accompanied by an acoustic alarm signal)
- *Operation blocked*
- *Anomalies concerning the output voltage*

Warning – Flashing Red (accompanied by an acoustic alarm signal)
- *Failure of one or more power modules*
- *Incorrect connection of neutral on input*
- *Overload*

The events log can be accessed from the front panel and can store up to 192 successive events, complete with the date and time they took place.
Self-diagnostics and the memorisation of events facilitate the identification of hardware faults or anomalies in UPS operation (overload, high temperature, etc.), thus making it possible to solve any problems much quicker. The internal clock is adjusted by default and also manages daylight saving / standard time changes automatically.

GSM Telediagnostics

The GSM interface module features two operating modes:
- *Alarm*
- *Control*



In alarm mode, the UPS uses the GSM interface to call the preset numbers and commence data or SMS transmission. This can be used to receive alarms from the UPS and then to interrogate it, giving it orders depending on the type of alarm signal received.

In control mode, the GSM module acts as a modem, allowing the UPS to be called from a distance and then executing information polling in order to verify its operating status at regular intervals and to carry out programming via SMS or data connection.

The GSM module is interfaced using a dedicated port; it does not, therefore, compromise the use of either the RS232 serial port or of the two logic level interfaces on the UPS.

Battery Mode Operation

A slow intermittent acoustic signal, which can be silenced, and high-visibility yellow flashing of the entire front panel informs the user that the UPS is operating in battery mode.

During the discharge stage, the MegaLine indicates:

- √ *The percentage of residual charge*
- √ *The amount of autonomy time actually remaining*
- √ *Output power and voltage*

When the MegaLine is recharging, it indicates the percentage of charge that is actually available.

More expert users have the option of setting the mode for the exploitation of the backup energy based on battery voltage thresholds, predetermined operating time limits or according to the Status Of Charge of the batteries.

Expanded autonomies

Model \ Autonomy	15'	30'	45'	60'	2h	3h	4h	8h	Accessories
MegaLine 1250	1	2	3	4			3		KB MegaLine/1
					7	10	10	25	KB MegaLine/2
					1	1	1	3	Batt MegaLine
								2	MegaLine Splitter
MegaLine 2500	1								KB MegaLine/1
		3	5	7	14	20	26	49	KB MegaLine/2
		1	1	1	2	2	3	5	Batt MegaLine
					1	1	2	4	MegaLine Splitter
MegaLine 3750	2				1				KB MegaLine/1
		5	8	10	20	30	39	73	KB MegaLine/2
		1	1	1	2	3	4	8	Batt MegaLine
					1	2	3	7	MegaLine Splitter
MegaLine 5000	2	6	10	14	28	40	52	97	KB MegaLine/2
	1	1	1	2	3	4	6	10	Batt MegaLine
				1	2	3	5	9	MegaLine Splitter
MegaLine 5000/2	2	6	10	14	28	40	52	97	KB MegaLine/2
			1	1	3	4	5	10	Batt MegaLine
			1	1	3	4	5	10	MegaLine Splitter
MegaLine 6250/2	2	7	12	17	34	50	65	121	KB MegaLine/2
		1	1	2	3	5	6	12	Batt MegaLine
		1	1	2	3	5	6	12	MegaLine Splitter
MegaLine 7500/2	3	9	15	20	41	60	78	145	KB MegaLine/2
		1	2	2	4	6	8	15	Batt MegaLine
		1	2	2	4	6	8	15	MegaLine Splitter
MegaLine 8750/2	3	10	17	24	48	70	91	170	KB MegaLine/2
		1	2	3	5	7	9	17	Batt MegaLine
		1	2	3	5	7	9	17	MegaLine Splitter
MegaLine 10000/2	3	12	20	27	55	80	104	194	KB MegaLine/2
	1	1	2	3	6	8	11	20	Batt MegaLine
	1	1	2	3	6	8	11	20	MegaLine Splitter

Examples of Expanded Autonomies with 80% load

Scalability - Expanded Power – Increasing redundancy - PW1250

All the models (except for the MegaLine 5000 single cabinet and the MegaLine 10000 double cabinet) can be increased in power in order to satisfy the requirements of the user. Installation is very simple. Expanding power: the additional board must be fitted along with an extra battery kit. Increasing redundancy: the board can be fitted without the corresponding kit of batteries.*

Scalability - Expanded Autonomy - KB MegaLine/1 - KB MegaLine/2

All the MegaLine models can be expanded in autonomy by fitting kits of 3, 12V - 9Ah batteries inside their battery cabinet (max. 4 in the single cabinet, max 10 in the battery cabinet of double cabinet models) or in additional battery cabinets.

Additional battery cabinets - Batt MegaLine

It is possible to connect additional battery cabinets (optional) in parallel in order to expand autonomy using the bespoke MegaLine splitter cables. There is no theoretical limit to the number of cabinets that can be connected given the low battery voltage of the MegaLine range. In fact, with the 36 V kits it is possible to create a parallel of batteries with many legs, increasing the degree of redundancy of the system.

Additional Battery charger - CB36

An additional CB36, 7A battery charger can be fitted inside the dedicated housing in the battery cabinets. This reduces the overall recharge time and is particularly useful when a large number of extra battery kits have been fitted.

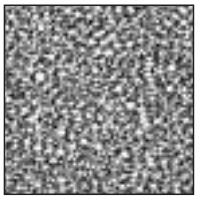
Manual maintenance bypass - BP/1 - BP/2

The manual maintenance bypass makes it possible to remove the UPS from its original application without interrupting the power supply to the load so that it is possible to complete any job that needs to be done with the UPS switched off: maintenance, upgrades, and expansions of power or autonomy. It replaces the rear connector and can be easily disconnected from the UPS. Available in two versions for the single (BP/1) or double cabinet (BP/2).

Relay Interface

The interface is used to signal the operating status of the MegaLine range of UPS by opening or closing the insulated contacts of a relay. The interface indicates mains operation, battery operation, low batteries (autonomy reserve) and anomaly (overload or internal anomaly). Maximum capacity of the relay contacts: 1A (150Vdc or 125Vac).

Air filter



It is possible to fit an air filter inside the front grill of the MegaLines for applications in critical industrial environments in order to prevent dust or small objects being sucked up inside the UPS. The lapse between the internal and external temperatures is measured and is used to signal when the filter must be cleaned. This information is provided automatically by the LCD display.

** this solution is not recommended – it is important to keep the same level of redundancy for the batteries.*

Shutdown software

Diagnostics and shutdown software can be downloaded free of charge from the website www.metasystem.it and gives access to all the MegaLine's operating data (also visible via the LCD display). It is also possible to adjust and set the special functions and to control shutdown of Windows and Linux operating systems.

***UPS Communicator** is complete with an in-line help function and operates as a service.*

***UPS Communicator** communicates and controls, connected to the serial port, leaving the USB interface free for applications that require higher communication speeds.*

***UPS Communicator** manages the shutdown of the local server and uses remote management modules to control the shutdown of servers connected via TCP/IP, even in a heterogeneous network, managing the transmission of alarm messages to users and enabling remote monitoring of connected UPS.*

Our optional UPS SuperviSor shutdown software is available on CD-Rom and is able to manage the controlled shutdown of any operating system in heterogeneous network environments (Windows, Novell, Linux, most Unix).

Its advanced networking functions can manage a hierarchy in multi-server shutdown and remote UPS management, even via the Internet.

The benefits of MegaLine technology are extremely important for servicing.

The MegaLine's modularity makes it possible to offer efficient technical service directly on site with truly minimum inconvenience for the user and for the applications protected by the UPS (if a manual bypass is fitted, servicing is completely transparent for the load).

The module-based structure and the ease of replacing all of the boards reduce downtime to a minimum. Typical downtime is less than 10 minutes.