

Modular DSP Series

Modular UPS Systems

3Phase in / 3Phase out

20kW Power Modules expandable up to 160kW



- Modular, Scalable and Expandable structure
- DSP controlled IGBT Rectifier Design
- Smallest Footprint, 20kW of power in only 6U
- 20kW power modules expandable to 80kW in a single rack enclosure and 160kW in two rack enclosures
- 20kVA equal 20kW; Output Power factor is 1.
- Input Power Factor Correction PFC(>0,99)
- Low Total Harmonic Distortion Level (THDi < 4%)
- Generator Friendly Operation
- Wide Input Voltage Range
- Hot-Swap Power and Battery Modules
- N+x power scalable Parallel Redundant Operation up to 8 modules
- Touch Screen LCD Graphic Display
- Three Level Temperature Compensated Battery Charging System
- Variable Battery Blocks for extended back up time
- Common Battery Bank operation
- Communication Interface and SNMP compatibility

Technology ;

Modular DSP ups combines the latest IGBT rectifier technology together with Digital Signal Processor (DSP).

Its Modular design ensures reliable and trouble free operation of the valuable equipment and critical loads.

Its transformerless design concept enables to deliver 20kW power in single 6U power module which is the smallest footprint of its kind. Power expansion is very easy to achieve by adding 20kW power modules to the system and you reach 80kW power in single frame. It is possible to connect two frames in parallel in order to have maximum 160kW power. The standard battery module in each frame provides the needful optimum battery run time. Battery autonomy time can be prolonged by adding additional battery module frame to the existing system.

Modular DSP Series are designed to provide the most suitable features and characteristics;

DSP Controller ;

Digital signal processor (DSP) control provides the fastest possible power management with a great sensitivity to increase accuracy and efficiency while reducing component count. Digital control of Modular DSP provides the following benefits increasing the reliability;

- Makes use of the sources that are present within the safe limits as much as possible,
- Observes and displays the failure situations with a great sensitivity with guaranteed accuracy,
- Uses advances in semiconductor technology to achieve: (i) smaller size (ii) lower cost (iii) low power consumption (iv) higher operating speed

- Extensive Flexibility: Reprogrammable, no need to modify the hardware,

• **Power Factor Corrected IGBT Rectifier ;**

- High input power factor, $PFI \geq 0.99$
- Low input current total harmonic distortion, $THDi \leq 4\%$

Thanks to DSP controlled power factor corrected IGBT rectifier provides us higher input power factor, lower input current total harmonic distortion, wide input voltage and frequency tolerance. Inform Modular DSP series provide ≥ 0.99 input power factor (Pfi), and $\leq 4\%$ input current total harmonic distortion (THDi).

High power factor helps you to consume less reactive power and pay lower electrical pay out. It provides minimizations of cable cross-sections, associated switchgear, transformer and generator sizing requirements.

Low input current THD avoids disturbance to other loads connected upstream the power distribution bus and interference reflected to the mains.

Wide input voltage range ;

Modular DSP input voltage tolerance is between 320 to 480V at full load and frequency tolerance is between 45 to 65Hz. The Input voltage range increases with respect to decrease in the Load%. Modular DSP has 240V to 480V operation window at half load. This provides to minimize transfer to battery, and reduce the charging and discharging cycles. Wide input voltage and frequency tolerances minimize battery usage and maximize battery life.

High efficiency (Online & Green Mode) ;

As the mains electricity rates are increasing day by day, efficiency rating of the equipment becomes

critical factor for saving the cost. Inform's Modular DSP series are designed to have high efficiency up to 93% at online operation to reduce the energy losses.

Even small increase in the efficiency rating can make thousands of euro saving. The Green Mode function also allows cost-effective operation of Modular DSP Series. In this operation mode, load is supplied by the mains. In the event of a mains failure, the inverter takes over the load and provides supply continuity to the connected systems. Modular DSP Green mode efficiency is 97% where the losses kept as minimum.

Modular hot swappable power modules for power upgrade or redundancy;



Practical and Smart design of the Power Module Frame allows a safe and easy module replacement during online operation. The power demand may require to be raised for more consumption and Modular DSP Power Frame structure simplifies the Module addition to the system. The power upgrade is achieved by less cost with respect to more cost-effective power solution. The system expands easily to provide maximum results. As the power consumption grows, the system modularity

plays a key role in optimizing your capital planning and deployment.

Parallel redundant operation of the power modules ensures an increased power protection and maintains an easy repair & replacement process. Load sharing principle distributes the load among each module equally where redundancy ensures the supply of the needed optimum energy continuously.



N+x power scalable Parallel Redundant Operation;
Inform Modular DSP UPS is designed to have flexible scalable power concept. The power modules can be configured according to power consumption and the power can be upgraded in the future according new requirements. The standard frame contains all the necessary accessories and devices for future expansion. The new module can be simply plugged into the system and the system automatically detects paralleled modules and fully configures itself for parallel operation.

Two kinds of (60kW & 80kW) power frames provide solution for existing power consumption and enable a future expansion. The systems structure also ensures bigger power increase by adding a new power frame in parallel to the existing one. The total system power

can be expanded up to 160kW.

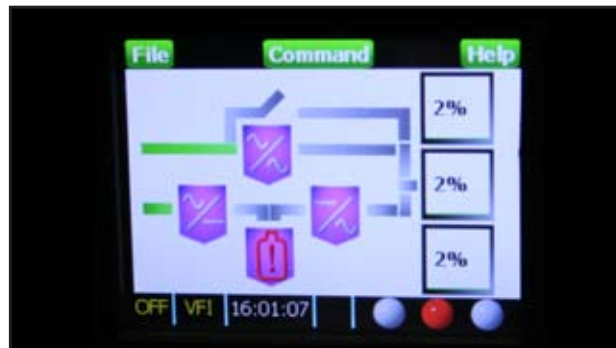
MD60 Type power frame can consist of max. 3pcs power modules and MD80 can consist of max. 4pcs power module. It is possible to have max. 80kW power in single frame. Each system can operate according to N+x principle for increased reliability or power upgrade principle for extended consumption.

Touch Screen LCD Graphic Display ;

The administrator can monitor and manage the Modular DSP from LCD Display panel.

The user friendly touch screen LCD panel enables an easy changeover among the display menu.

Multi-functional LCD Display presents access to Measurements, Commands, Status, Alarms, Diagnostics, Event Log and Settings menus. Also personalization of operation modes, voltage configurations, frequency windows, bypass tolerances, output voltages adjustments can be done from LCD panel. Self- Diagnostic enables to service the ups via LCD Display for professional adjustment and calibration. Password protected service menu helps the technical personnel to service the ups easily



Ability to be loaded with all kinds of loads ;

Modular DSP is able to handle the loads having

power factor from 0,6 lagging to 0,9 leading. There is no power downgrade or derating at non-linear loads. It has high crest factor (3:1). The UPS power is used at most efficiency to comply the consumption demand. It also provides a fast response to step loads (< 5 ms at ± 2 % variation)

Variable Battery Blocks ;

Flexible and adjustable battery quantity feature of Modular DSP enables to configure the ups with best fitting battery capacity and quantity configuration to have the exact and accurate required autonomy time.

Modular DSP battery quantity. can be configured from 28pcs to 32pcs. The entire configuration can be done easily from the LCD Display panel.

Common Battery Bank for parallel power modules ;

All Modular DSP battery modules are placed on moving trays which eases the replacement or placement.

Thank you for the hot-swappable function, the battery modules can be placed and installed safely during online operation. Common battery module can be used for all power modules. It is possible to extend the battery operation time by adding additional battery modules to the system. Thanks to high charging current capacity of Modular DSP power modules which are able to charge even very high capacity batteries within the ideal recharge time. Each Modular DSP power module has approximately 10Amp charge current capability. This enables to have long battery autonomy time.

Three level temperature compensated battery charge system ;

Considering the importance of the battery in a UPS system, Modular DSP uses special technology to

maximize the battery lifetime. It has three level charging concept;

- 1) Float Charge: Constant Voltage Charge
- 2) Equalizing Charge: Constant Current Charge
- 3) Pulse Charge: Extended battery life time

Temperature Controlled Charging principle is vital especially in the applications where the installation location is subject to large temperature swings. There is protection against overcharge and overdischarge prolonging the life time of the batteries. There is programmable automatic battery test function in order to control the batteries periodically. Modular DSP is able to charge different kinds of batteries such as lead acid, NiCd, Gel type...etc

Communication with Computers, Remote Monitoring, Control and Management ;

- RS232 Communication port as standard
- Monitoring and Management Software
- EPO port for emergency power off
- SNMP option for extended communication with network systems
- Dry Contact Board option
- USB Communication Card option

All the information on the Modular DSP database status, measurements, alarms, as well commands is transmitted via RS232 serial port. Modular DSP Software allows monitoring and Management Facilities to the user from many computers having different operating systems. The compatible operating systems extend from windows, novel, linux... to sun solaris, apple and many others. Modular DSP software provides the monitoring of ups status, ups parameters (as voltage, current, frequency, load, temperature, battery ...etc) and receives and displays the auxiliary alarm messages. Its management capability provides the user to send shut down signals, text messages, e-mails, or perform battery tests. Event recorder informs the user about the status of ups continuously.

Thanks to multi server shut down licenses; which can operate an unlimited number of clients and automatically shut down entire networks, distribute warning messages in multiple languages, and execute any kind of remote actions on most operating systems.

Modular DSP SNMP provides the connection to local network where the monitoring and management is possible through both software and web-browser. It makes all UPS data and operating commands accessible through the network.

Modular DSP Specifications

MODULAR DSP POWER FRAMES			
MODEL	MD-60	MD-80	BATMD-120
Output Power Kw	60kW	80kW	--
UPS Modules (max.)	3pcs	4pcs	Battery Only
Inbuilt Batteries	Yes	Yes	Yes
Dimensions (cm)	19" 36U 1000mm	19" 42U 1000mm	19" 42U 1000mm
Weight (kg) w/o modules	130	145	145

MODULAR DSP POWER MODULES	
Topology	Online Double Conversion (VFI - SS - 111)
Operation Type	Real Current Sharing Parallel Redundant
Max. Parallel Modules	8pcs
Nominal Output Power	20kVA (20kW) per module
INPUT	
Voltage	380V / 400V / 415V 3Phase+N+G
Tolerance @ Full Load	±20%
Tolerance @ Half Load	+20%..-40%
Frequency	50 / 60Hz
Tolerance	±10%
Power factor	0.99
Current Harmonic Distortion (THDi)	<4%
Max. Inrush Current at Start up	<45Amp
OUTPUT	
Power	20kVA (20kW)
Power Factor	1
Voltage	380V / 400V / 415V 3Phase+N+G
Tolerance (Static Condition)	± 1%
Tolerance (Dynamic Condition)	± 3%
Total Output Voltage Distortion Rate on Linear Load	<3%
Total Output Voltage Distortion Rate on non-Linear Load	<5%
Crest Factor	3:1
Frequency	50 or 60 Hz
Frequency Tolerance	±0.01%
Overload	
100% - 125% Load	10min.
125% - 150% Load	1min.
Overall Efficiency	up to 93%
Green Mode Efficiency	up to 97%
BYPASS	
Frequency Variation Speed	<1Hz/sec
Voltage Tolerance	±15%
Frequency	50 or 60 Hz
Frequency Tolerance	±2%
BATTERY	
Type	Maintenance-free lead acid or NiCd batteries
Quantity	28pcs ... 32pcs (configurable)
DISPLAY	
	LCD Graphical Touch Screen
COMMUNICATION	
Interface (Communication Ports)	RS232 Communication port and EPO as standard
PHYSICAL SPECIFICATIONS	
Weight Without Battery (kg)	60
Dimensions (mm) WxDxH	440x660x265 - 6U
ENVIRONMENT	
Audible Noise	<55dBA
Operating Temperature	0-40°C
Relative Humidity (non condensing)	0-95%
Protection Level	IP20
STANDARDS	
Standards	EN 62040-1-1 (safety), EN 62040-2(EMC), EN 62040-3 (Performance)