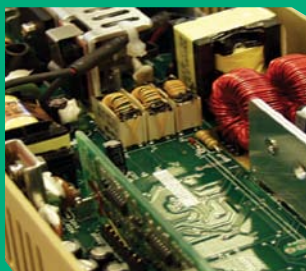


■ Embedded Power for
Business-Critical Continuity™

Power Supply Solutions for the Healthcare Industry




EMERSON™
Network Power



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Local Support

Our regional sales offices are ready to provide expert local applications and sales support. In addition, an extensive network of manufacturers representatives and distributors bring our products to you. Please call for locations of sales offices near you or visit our website at www.Emerson.com/EmbeddedPower.

Americas (USA)

Telephone: +1 760 930 4600
Facsimile: +1 760 930 0698

Europe (UK)

Telephone: +44 (0) 1384 842 211
Facsimile: +44 (0) 1384 843 355

Asia (HK)

Telephone: +852 2176 3333
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Technical Support

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+1 888 412 7832 (North America)

Europe, Middle East and Africa (EMEA)

0 800 0321546 (in the UK)
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+400 88 99 130 (China)
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For additional Information go to
www.Emerson.com/HealthcarePowerSupplies



Emerson Network Power & Healthcare

At Emerson Network Power, our engineers have been designing and developing power supply products for the healthcare industry – including medical imaging, analytical laboratory, clinical & molecular diagnostics, dental, ophthalmic and surgical/medical applications – for over 35 years. With Emerson as your power supply partner, we can help you choose, evaluate and source the perfect power supplies for your application.

Emerson – with its long history of quality and innovation, and a deep understanding of our customers' needs – knows that in product development, time is money. You will find that Emerson power supply products help pave the way for advancements in a variety of healthcare applications by optimizing or eliminating process steps which accelerate your time to market and lower your R&D costs.

More and more medical device manufacturers are selecting Emerson Network Power as their trusted power supply partner for the following reasons:

1. *Experience in the healthcare industry and expertise in power supplies*
2. *Highly developed quality systems focused on the customer*
3. *Processes that are developed to conform to the requirements of international standards and Current Good Manufacturing Practices (cGMP)*

Healthcare equipment manufacturers ensure that their healthcare devices, as integrated with the power supply and other components, comply with the FDA's cGMP/Quality System Regulation (QSR). Though they retain this responsibility independently of their suppliers, Emerson's focus on manufacturing its components to QSR and other applicable international standards helps facilitate manufacturers' compliance with QSR requirements.

Design Controls

- Design Practices
- Component Selection
- Quality Assurance Verification

Purchasing Controls

- Supplier Qualification
- Supplier Quality Management

Post Market Surveillance Requirements

- Field Support
- Automatic CAR System
- Field Failure Tracking System Verification

Customer Quality

Production and Process Controls

- Process Control
- Quality Assurance and Ongoing Reliability Testing

Bio Life Sciences

- Immunoassay Systems
- In-Vitro Diagnostics
- Microbiology
- Centrifuges
- Clinical Chemistry
- Osmometers
- PCRs

Dental

- Gamma Imaging Systems
- CAD/CAM Systems
- Oral Care Equipment
- Digital Radiography
- X-Ray Machines

Imaging

- Ultrasound Scanners
- Computed Tomography (CT) Scan
- Positron Emission Tomography (PET)
- Magnetic Resonance Imaging (MRI)
- Nuclear Medicine
- X-Ray Machines

Laboratory

- Chemical Analysis Equipment
- Mass Analyzers
- Lab Automation
- Sterilization
- Electron Microscopes

Medical

Ophthalmic Equipment

- Surgical Systems
- Ophthalmoscopes

Surgical/Medical Devices

- Surgical Equipment
- Patient Monitoring
- Patient Therapy



For additional information go to
www.Emerson.com/EmbeddedPower

Power Supply Design Controls

Emerson utilizes the following design methodologies and techniques to ensure that our power supplies meet the rigorous quality & reliability requirements and medical standards of the healthcare industry.

Reliability Models and Predictions

- A prediction of design reliability in terms of Mean Time Between Failures (MTBF) using Telecordia, Bellcore or MIL-HDBK-217F
- Not intended as a measure of expected field performance, but for design trade-off analysis and review of part stress derating performance

Failure Modes and Effect Analysis

- An analytical technique to identify and review failure modes, their causes, mechanisms and effects
- Provides a formal risk assessment to reduce field failures at the customer site

Component Selection

- Database warehouse of all component information
- Design engineers can only select components rigorously approved from suppliers that have undergone strict qualification and auditing process

Derating Analysis

- Intended to reduce the failure rate of components

Design for Manufacturability

- Design rules regarding manufacturability

Simulation Analysis – Computer-Aided Engineering Tools

- Thermal Simulation
- Circuit Simulation
- EMI Field Simulation
- Detailed Mechanical Design
- PCB Layout and Tracking
- Structural Simulation

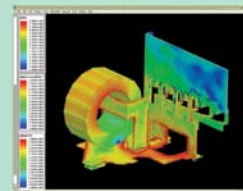
Emerson Computer-Aided Engineering Tools



Thermal Simulation



Circuit Simulation



EMI Field Simulation



Detailed Mechanical Design



PCB Layout and Tracking



Structural Simulation



MyPower Community Portal

Discover. Communicate. Collaborate.

MyPower is a free community portal that provides a variety of tools and resources including:



Community

Utilizing the tools and resources provided will increase your standard knowledge base of our industry. Resources include:

- Industry Links
- What's New
- Trade Shows
- Tools & Calculators



Knowledge Base

Familiarize yourself with our products and services. This section is designed to help build your industry knowledge.

- Product Videos
- White Papers and eBooks
- Industry Books
- Educational Product Videos



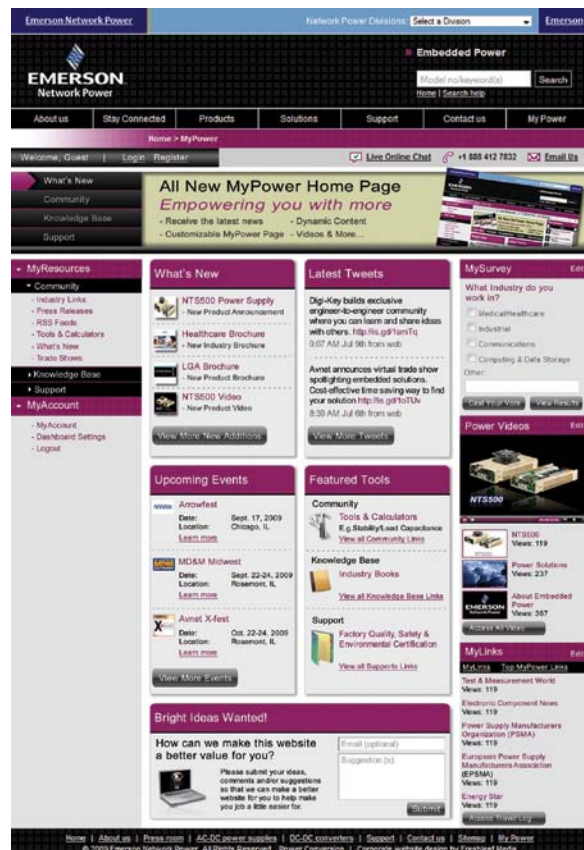
Support

Emerson Network Power strives to support your needs. In this section you will find:

- Factory Quality, Safety and Environmental Certifications

To sign up for a free MyPower account go to

www.Emerson.com/MyPower



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The latest happenings are being posted on Twitter, Facebook and YouTube! Sign up for one or all of the sites below and stay connected with Emerson Network Power – Embedded Power!

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www.facebook.com/EmersonPowerSupplies

www.youtube.com/EmersonNetworkPower



AC-DC Power Supplies

Emerson Network Power is widely acknowledged as an industry leader and produces an exceptionally wide range of AC-DC power conversion products.



AC–DC Power Supplies

Emerson Network Power produces a wide range of AC–DC power supplies certified for use in medical equipment requiring lower safety ground leakage and higher isolation. The power supplies listed below are designed for use in non-patient critical applications: bio-life science, medical, dental, imaging and

laboratory applications such as immunoassay and in-vitro diagnostics machines, ultrasound and mass analyzers. All these power supplies are high efficiency switch-mode designs, and feature full medical safety approval to EN60601-1.

Special Features

All models feature:

- Industry standard footprints
- Wide-range AC input
- Remote sense
- Adjustable outputs
- Power fail
- Full power to 50 °C
- High demonstrated MTBF
- Overvoltage protection
- Overload protection
- Built-in EMI filtering
- Medical approvals
- Extensive safety approvals
- Derated operation above 50 °C

Many models feature:

- EN61000-3-2 compliance
- Supervisory outputs (5 V/12 V)
- Wide-adjust floating 4th output
- Single wire current share
- Wide-adjust on single output models

Low Power

Open frame/enclosed 1-4 outputs

25-500 Watts

Output Power		Output				Size W x L x H (mm)	Model
[Forced Air]	Free Air	V1	V2	V3	V4		
[40 W]  (1) 25 W NPS20-M	5 V @ 5 A [8 A]*					2" x 4" x 1"	NPS22-M
	12 V @ 2.1 A [3.3 A]*					(50.8 x 101.6 x 25.4)	NPS23-M
	15 V @ 1.7 A [2.7 A]*						NPS24-M
	24 V @ 1 A [1.8 A]*						NPS25-M
	48 V @ 0.52 A [0.84 A]*						NPS28-M
[55 W]  (1) 40 W LP40-M Series	5 V @ 8 A [11 A]*					3" x 5" x 1.2"	LPS42-M
	12 V @ 3.3 A [4.5]*					(76.2 x 127 x 30.5)	LPS43-M
	15 V @ 2.6 A [3.6 A]*						LPS44-M
	24 V @ 1.6 A [2.3 A]*						LPS45-M
	5 V @ 4 A [5 A]	12 V @ 2 A [2.5 A]	-12 V @ 0.5 A [0.7 A]				LPT42-M
	5 V @ 4 A [5 A]	15 V @ 2 A [2.5 A]	-15 V @ 0.5 A [0.7 A]				LPT45-M
[60 W]  (1) 45 W NPS40-M Series	5 V @ 8 A [11 A]*					2" x 4" x 1"	NPS42-M
	12 V @ 3.75 A [5 A]*					(50.8 x 101.6 x 25.4)	NPS43-M
	15 V @ 3 A [4 A]*						NPS44-M
	24 V @ 1.9 A [2.5 A]*						NPS45-M
	48 V @ 0.94 A [1.25 A]*						NPS48-M

Options:

[] Rating with 30 CFM of air

(1) Optional cover/enclosure

* Floating output

Output Power		Output				Size W x L x H (mm)	Model
[Forced Air]	Free Air	V1	V2	V3	V4		
[55 W]  (1)	55 W	LP50-M Series					
		3.3 V @ 8 A	5 V @ 3 A	12 V @ 0.5 A		2" x 4" x 1.3"	LPT51-M
		5 V @ 8 A	12 V @ 3 A	-12 V @ 0.5 A		(50.8 x 101.6 x 33)	LPT52-M
		5 V @ 8 A	15 V @ 2.4 A	-15 V @ 0.5 A			LPT53-M
		5 V @ 8 A	24 V @ 1.5 A	12 V @ 0.5 A			LPT54-M
[60 W]  (1)	60 W	5 V @ 11 A*					LPS52-M
		12 V @ 5 A*					LPS53-M
		15 V @ 4 A*					LPS54-M
		24 V @ 2.5 A*					LPS55-M
		48 V @ 1.25 A*					LPS58-M
[75 W] 	65 W	NLP65 Series					
		12 V @ 6.5 A*				3" x 5" x 1.26"	NLP65-9912J ⁽⁵⁾
		15 V @ 5.3 A*				(76.2 x 27 x 32)	NLP65-9915J ⁽⁵⁾
		24 V @ 3.5 A*					NLP65-9924J ⁽⁵⁾
		5 V @ 8 A	12 V @ 3 A				NLP65-9929J ⁽⁵⁾
		5 V @ 8 A	24 V @ 2 A				NLP65-9920J ⁽⁵⁾
[80 W]  (1)	60 W	LP60-M Series					
		12 V @ 5 A [6.7 A]*				3" x 5" x 1.65"	LPS63-M
		15 V @ 4 A [5.3 A]*				(76.2 x 127 x 41.9)	LPS64-M
		24 V @ 2.5 A [3.3 A]*					LPS65-M
		5 V @ 7 A [8 A]	12 V @ 3 A [3.5 A]	-12 V @ 0.7 A [1 A]			LPT62-M
		5 V @ 7 A [8 A]	15 V @ 2.8 A [3.3 A]	-15 V @ 0.7 A [1 A]			LPT63-M
[110 W] 	80 W	NLP110 Series					
		5 V @ 22 A*				3" x 6.5" x 1.26"	NLP110-9905J
		12 V @ 9.2 A*				(76.2 x 165.1 x 45.72)	NLP110-9912J
		24 V @ 4.6 A*					NLP110-9924J
		48 V @ 2.3 A*					NLP110-9917J
		3.3 V @ 20 A	2.5 V @ 20 A	12 V @ 1 A			NLP110-9994J
		5 V @ 18 A	3.3 V @ 20 A	12 V @ 1 A			NLP110-9993J
		12 V @ 8.5 A	3.3 V @ 20 A	-12 V @ 1 A			NLP110-9995J
		12 V @ 8.5 A	5 V @ 18 A	-12 V @ 1 A			NLP110-9908J
[130 W]  (1)	80 W	LPT100-M Series					
		3.3 V @ 13 A [18 A]	5 V @ 5 A [9 A]	12 V @ 1 A [2.3 A]		2" x 4" x 1.28"	LPT101-M
		5 V @ 13 A [18 A]	12 V @ 5 A [9 A]	-12 V @ 1 A [2 A]		(50.8 x 101.6 x 32.7)	LPT102-M
		5 V @ 13 A [18 A]	15 V @ 4 A [7.2 A]	-15 V @ 1 A [1.5 A]			LPT103-M
		5 V @ 13 A [18 A]	24 V @ 1.5 A [3 A]	12 V @ 1 A [2.3 A]			LPT104-M

Options:

[] Rating with 30 CFM of air

(1) Optional cover/enclosure (see datasheet for increased dimensions)

(5) These models feature harmonic current correction to EN61000-3-2

* Floating output

Output Power		Output				Size W x L x H (mm)	Model
[Forced Air]	Free Air	V1	V2	V3	V4		
[150 W]  (1)	100 W	LPS100-M Series					
		5 V @ 16 A [24 A]*				2" x 4" x 1.29"	LPS102-M
		12 V @ 8.3 A [12.5 A]*				(50.8 x 101.6 x 33)	LPS103-M
		15 V @ 6.7 A [10 A]*					LPS104-M
		24 V @ 4.2 A [6.3 A]*					LPS105-M
		48 V @ 2.1 A [3.1 A]*					LPS108-M
[150 W]  (1)	100 W	TLP150 Series					
		12 V @ 12.5 A*				3" x 5" x 1.25"	TLP150N-99S12JF
		24 V @ 6.3 A*				(177.8 x 101.6 x 31.75)	TLP150N-99S24JF
[175 W]  (1)	110 W	LP170-M Series					
		5 V @ 22 A [35 A]* (2.5-6 V)				4.25" x 8.5" x 1.5" (108 x 215.9 x 38.1)	LPS172-M
		12 V @ 9.1 A [15 A]* (6-12 V)					LPS173-M
		15 V @ 7.3 A [12 A]* (12-24 V)					LPS174-M
		24 V @ 4.5 A [7.5]* (24-54 V)					LPS175-M
[200 W]  (1)	100 W	LPQ200-M Series					
		3.3 V @ 13 A [18 A]	5 V @ 13 A [18 A]	12 V @ 5 A [9 A]	-12 V @ 1 A [2 A]	3" x 5" x 1.32"	LPQ201-M
		5 V @ 13 A [18 A]	12 V @ 5 A [9 A]	24 V @ 1.5 A [3 A]	-12 V @ 1 A [2 A]	(76.2 x 127 x 33.6)	LPQ202-M
[250 W]  (1)	125 W	LPS200-M Series					
		5 V @ 20 A [40 A]*				3" x 5" x 1.32"	LPS202-M
		12 V @ 10.3 A [20.8 A]*				(76.2 x 127 x 33.6)	LPS203-M
		15 V @ 8.3 A [16.6 A]*					LPS204-M
		24 V @ 5.2 A [10.4 A]*					LPS205-M
		48 V @ 2.6 A [5.2 A]*					LPS208-M
[250 W]  (1)	175 W	NLP250 Series					
		12 V @ 21 A*				4" x 7" x 1.5"	NLP250N-99S12J
		24 V @ 10.5 A*				(101.6 x 177.8 x 38.1)	NLP250N-99S24J
[500 W]  (4), (5)	200 W	NTS500-M Series					
		12 V @ 16.6 A [41.7 A]*				4" x 7" x 1.5"	NTS503-M
		24 V @ 8.3 A [20.8 A]*				(101.6 x 177.8 x 38)	NTS505-M
		48 V @ 4.2 A [10.4 A]*					NTS508-M

Options:

[] Rating with 30 CFM of air

(1) Optional cover/enclosure

(4) Optional fan covers (see datasheet for increased dimensions)

* Floating output

(5) Optional end fan cover (see datasheet for increased dimensions)

F Replace the 'J' at the end of the model number with 'FJ' when the optional standby output and/or remote ON/OFF control is required e.g., TLP150N-99S12FJ

Low Power

External power adapters

12-60 Watts

Output Power	V1	V2	V3	Size W x L x H (mm)	Model
12 W	DA12-M Series				
	5 V @ 2 A			1.10" x 2.36" x 2.14" (28 x 60 x 54.3)	DA12-050AU-M
	12 V @ 1 A				DA12-120AU-M
	5 V @ 2 A			1.10" x 2.36" x 2.48" (28 x 60 x 63.1)	DA12-050EU-M
	12 V @ 1 A				DA12-120EU-M
	5 V @ 2 A			1.98" x 2.36" x 1.90" (50.2 x 60 x 48.3)	DA12-050UK-M
	12 V @ 1 A				DA12-120UK-M
	5 V @ 2 A			1.10" x 2.36" x 1.99" (28 x 60 x 50.6)	DA12-050US-M
	12 V @ 1 A				DA12-120US-M
	12 V @ 1 A			1.10" x 2.36" x 2.14" (28 x 60 x 54.3)	DA12-120MP-M ⁽¹⁾
24 W	DP40 Series				
	9 V @ 4.4 A			2.4" x 4.88" x 1.55" (61 x 124 x 39.5)	DP4009N2M
	9 V @ 4.4 A				DP4009N3M
	12 V @ 3.33 A				DP4012N2M
	12 V @ 3.33 A				DP4012N3M
	15 V @ 2.67 A				DP4015N2M
	15 V @ 2.67 A				DP4015N3M
	18 V @ 2.22 A				DP4018N2M
	18 V @ 2.22 A				DP4018N3M
	24 V @ 1.67 A				DP4024N2M
	24 V @ 1.67 A				DP4024N3M
	48 V @ 0.84 A				DP4048N2M
	48 V @ 0.84 A				DP4048N3M
50 W	AD50-M Series				
	12 V @ 4.16 A			2.56" x 4.72" x 1.61" (65 x 120 x 41)	AD5012N2LM
	12 V @ 4.16 A				AD5012N3LM
50 W	DPT50-M Series				
	3.3 V @ 9 A	5 V @ 3 A	-12 V @ 0.5 A	2.39" x 5.24" x 1.62" (60.7 x 133 x 41.15)	DPT51-M
	5 V @ 8 A	12 V @ 3 A	-12 V @ 0.5 A		DPT52-M
	5 V @ 8 A	15 V @ 2.4 A	-15 V @ 0.5 A		DPT53-M
	5 V @ 8 A				DPT54-M
60 W	DPS50-M Series				
	5 V @ 6 A			2.39" x 5.24" x 1.62" (60.7 x 133 x 41.15)	DPS52-M
	12 V @ 5 A				DPS53-M
	15 V @ 4 A				DPS54-M
	24 V @ 2.5 A				DPS55-M
	48 V @ 1.25 A				DPS58-M

Options:

(1) Interchangeable AC plug - must be purchased separately.

Micro MP Series

Cost-efficient, configurable power supply with market-leading density and efficiency

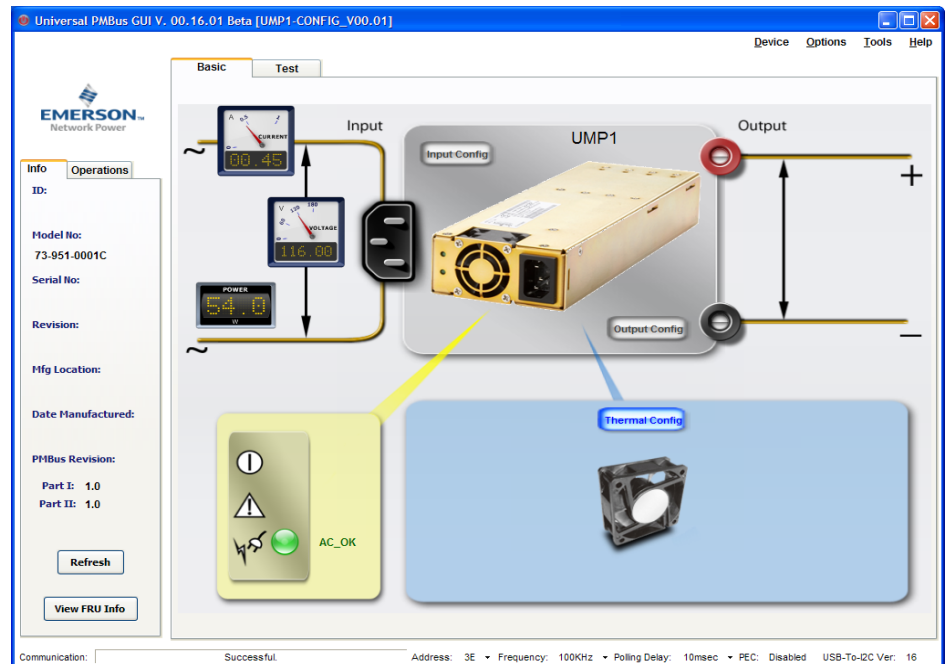
Up to 1200 Watts

Total Power: Up to 1200 Watts
 Input Voltage: 85-264 Vac
 120-300 Vdc
 # of Outputs: Up to 12



Special Features

- Full Medical EN60601 approval
- PMBus
- High efficiency
- Low profile 1U size
- Multi output
- Current limit modification (foldback or constant current)
- High power density
 - μ MP4: 10.8 W/cu-in
 - μ MP1: 15.1 W/cu-in
- Intelligent fan (speed control/fault status)
- Downloadable GUI from website
- μ P controlled PFC input with active inrush protection
- Optional conformal coating
- Industrial temp range (-40 °C to 70 °C)
- No preload required
- Industrial shock/vibration (>50 G's)
- Low cost
- IEC or terminal block input



Electrical Specifications

Input	
Input range	85-264 Vac 120-350 Vdc (limited to 250 Vac/300Vdc in medical apps)
Frequency	47-440 Hz
Inrush current	40 A peak max. (soft start)
Efficiency	Up to 91% @ full case load
Power factor	0.99 typ. meets EN61000-3-2 (n/a @ 440 Hz)
Turn-on time	AC on 2 sec for μ MP1 and 1.5 sec for μ MP4, inhibit/enable 250 ms typical
EMI filter	CISPR 22/EN55022 Level "B"
Leakage current	300 μ A max. @ 240 Vac for μ MP1 and 500 μ A max. for μ MP4; 47-63 Hz
Radiated EMI	CISPR 22/EN55022 Level "B"
Warranty	Two years



Electrical Specifications

Output	
Factory set point accuracy	±1%
Margining	±3-7% nominal analog (single output module only)
Overall regulation	0.4% or 30 mV which ever is greater
Ripple	RMS: 0.1% or 10 mV, whichever is greater Pk-Pk: 1.0% or 50 mV, whichever is greater. Bandwidth limited to 20 MHz
Dynamic response	<±5% or 250 mV, with 50% step load
Recovery time	To within 1% in <300 µs
Reverse voltage protection	100% of rated output current
Thermal protection (OTP)	All outputs disabled when internal temp exceeds safe operating range.
Remote sense	Up to 0.5 V total drop (not available on triple output module)
Single wire parallel	Current share to within 5% of total rated current
DC OK	±5% of nominal
Minimum load	Not required
Housekeeping standby	5 Vdc @ 1.0 A max. present whenever AC input is applied
Module inhibit	Logic - output on with low or open. Different logic options available
Output/Output isolation	>1 Megohm, 500 V

Environmental Specifications Safety

Operating temperature	-40 °C to 70 °C ambient. Derate each output 2.5% per degree from 50 °C to 70 °C. (-20 °C start up) Meets full spec after 1/2 load. 10 min warm-up
Storage temperature	-40 °C to 85 °C
Electromagnetic susceptibility	Designed to meet EN61000-4; -3, -6, -11 Level 3, Level 4 for -2, -4, -5
Humidity	Operating; non-condensing 10% to 95% RH
Vibration	MIL-STD-810E
MTBF demonstrated	>350,000 hours at full load, one µMP4 case + two modules, Telcordia SR-332 calculated MTBF
Altitude:	Up to 10k feet; derate linear to 50% from 10k-30k feet

UL	UL60950/UL60601-1
CSA	CSA22.2 No. 234 Level 5
VDE	EN60950/EN60601-1
BABT	Compliance to EN60950/EN60601 BS7002
CB	Certificate and report
CE	Mark to LVD
CCC	Approved
BSMI	Approved

Voltage Codes

Standard Output Ratings				
Module Output Voltage Code	Single Output ONE SLOT 240 W Max	*Dual Output ONE SLOT 192 W Max		
Module Identification	S2	D		
Output Module Line-Up				
Code	Volts	Output Current V1	Output Current	
			V1	V2
A	2.0	40.0	N/A	
B	2.2	40.0	N/A	
C	3.0	40.0	N/A	
D	3.3	40.0	N/A	
E	5.0	36.0	4.0	4.0
F	5.2	34.0	4.0	4.0
G	5.5	32.0	4.0	4.0
H	6.0	30.0	4.0	4.0
I	8.0	25.0	4.0	4.0
J	10.0	24.0	4.0	4.0
K	11.0	22.0	4.0	4.0
L	12.0	20.0	4.0	4.0
M	14.0	17.0	4.0	4.0
N	15.0	16.0	4.0	4.0
O	18.0	13.0	4.0	4.0
P	20.0	12.0	4.0	4.0
Q	24.0	10.0	4.0	4.0
R	28.0	8.6	3.4	3.4
S	30.0	8.0	N/A	
T	33.0	7.0	N/A	
U	36.0	6.7	N/A	
V	42.0	5.7	N/A	
W	48.0	5.0	N/A	
X	54.0	4.4	N/A	

* Outputs share a common ground

Parallel Codes					
Code	Slots in Parallel	Code	Slots in Parallel	Code	Slots in Parallel
1	1&2	6	1&2&3	B	1,2&3; 4&5
2	2&3	7	1,2,3&4	C	1,2,3&4; 5&6
3	3&4	8	1,2,3,4&5	D	1&2; 3&4; 5&6
4	4&5	9	1,2,3,4,5&6	E	1,2&3; 4,5&6
5	5&6	A	1&2; 3&4	0	no module in parallel

Ordering Information

Case Size	Module/Voltage/Option Codes	Case Option Codes	Software Code	Hardware Code
µMPXY	First - Module Code Second - Voltage Code Third - Option Code	00	A	###
Case Size (mm) Single-Phase Input where X = 4 = 1.57" x 3.5" x 10"; 400 W - 600 W, 4 slots 1 = 1.57" x 5" x 10"; 1000 W - 1200 W, 6 slots Input Type where Y = T = Terminal Block C = IEC Connector, C14 B = IEC Connector, C16	Module Codes S2 = 200 W Single O/P (1 slot) D = 96 W/96 W Dual O/P (1 slot) Voltage Codes: See Voltage Code Table	Case Option Codes First digit 0 - E = Parallel Code Second digit 0 = No Options 1 = Reverse Air 3 = Global Enable 5 = Opt 1 + Opt 3	Factory assigned for modified standards	Factory assigned for modified standards

Intelligent MP Series

*Intelligent modular power supply
for optimum flexibility*

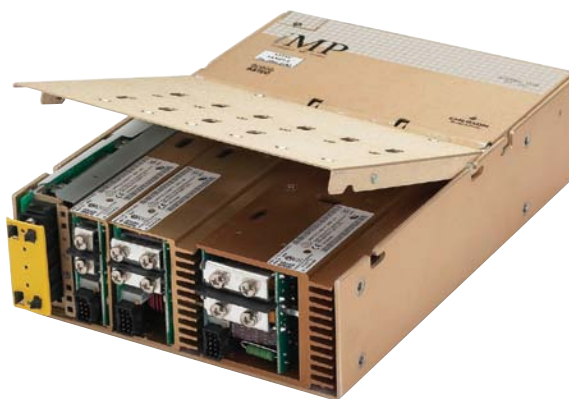
Up to 1500 Watts

Total Power: Up to 1500 Watts

Input Voltage: 85-264 Vac
120-300 Vdc

of Outputs: Up to 21

iMP®



Special Features

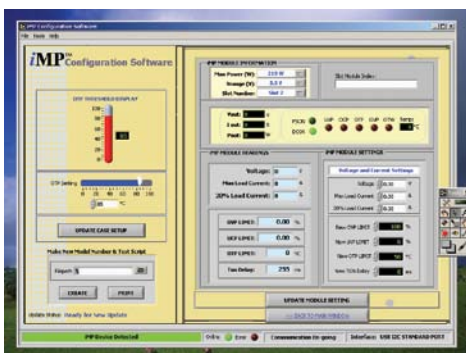
- **Full Medical EN60601 approval**
- Intelligent I²C control
- Voltage adjustment on all outputs (Manual or I²C)
- Configurable input and output (case and module) OK signals and indicators
- Configurable inhibit/enable
- Configurable output UP/DOWN sequencing
- Configurable current limit (foldback or constant current)
- High power density (8.8 W/cu-in)
- Intelligent fan (speed control/fault status)
- Downloadable GUI from website
- Customer provided air option
- μ P controlled PFC input with active inrush protection
- I²C monitor of voltage, current, and temp
- Programmable voltage, current limit, inhibit/enable through I²C
- Optional extended hold-up module (SEMI F47 compliance)
- CAN BUS and RS-485 interface option
- Increased power density to 50% over standard MP
- Backward compatibility with standard MP
- External switching frequency sync input
- Optional conformal coating
- Industrial temp range (-40 °C to 70 °C)
- No preload required
- Industrial shock/vibration (>50 G's)



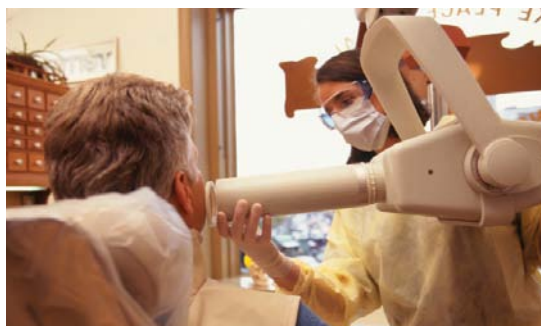
Electrical Specifications

Input

Input range	85-264 Vac 120-300 Vdc (limited to 300 Vdc in medical applications)
Frequency	47-440 Hz
Inrush current	40 A peak max. (soft start)
Efficiency	Up to 85% @ full case load
Power factor	0.99 typ. meets EN61000-3-2 (n/a @ 440 Hz)
Turn-on time	AC on 2 sec typ., inhibit/enable 150 ms typical Programmable delay; 50 ms internal turn-on delay (Dual Output only)
EMI filter	CISPR 22/EN55022 Level "B"
Leakage current	300 μ A max. @ 240 Vac; 47-63 Hz
Radiated EMI	CISPR 22/EN55022 Level "B"
Input fuse (internal)	iMP4: 16 A; iMP8: 20 A; iMP1: 25 A (both lines fused)
Warranty	Two years



The iMP software is designed to make the iMP Power Supply Unit (PSU) accessible to the user. It is intended to provide information gathered from the PSU and interactive controls to the basic capabilities of iMP power supply. To download go to www.powerconversion.com/impsoftware



Electrical Specifications

Output	
Adjustment range*	±10% minimum all outputs (manual) (full module adjustment range using I ² C)
Margining	±4-6% nominal analog (single output module only)
Overall regulation	0.4% or 20 mV max. (1500 W modules 1% max. 36 W modules 4% max.)
Ripple	RMS: 0.1% or 10 mV, whichever is greater Pk-Pk: 1.0% or 50 mV, whichever is greater Bandwidth limited to 20 MHz
Dynamic response	<2% or 100 mV, with 25% load step
Recovery time	To within 1% in <300 µs
Overcurrent protection**	Configurable through I ² C (calibration required). Single output module and main output of the dual output module 105-120% of rated output current. Aux output of dual output module 105-140% of rated output current
Short-circuit protection	Protected for continuous short-circuit Recovery is automatic upon removal of short
Overvoltage protection*	Configurable through I ² C
- Single output module	2-5.5 V 122-134%; 6-60 V 110-120%
- Dual output module	2-6 V 122-134%; 8-28 V 110-120%
- Triple output module	
Reverse voltage protection	100% of rated output current
Thermal protection* (OTP and OTW)	Configurable through I ² C All outputs disabled when internal temp exceeds safe operating range. > 5 ms warning (AC OK signal) before shutdown
Remote sense	Up to 0.5 V total drop (not available on triple output module)
Single wire parallel	Current share to within 2% of total rated current
DC OK*	±5% of nominal. Configurable through I ² C
Minimum load	Not required
Housekeeping standby	5 Vdc @ 1.0 A max. present whenever AC input is applied (Optional 2.0 A available)
Module inhibit*	Configured and controlled through I ² C
Switching frequency	250 kHz accepts external sync signal
Output/Output isolation	>1 Megohm, 500 V

* Can be controlled via I²C** Controlled via I²C but requires load calibration

Environmental Specifications

Operating temperature	-40 °C to 70 °C ambient. Derate each output 2.5% per degree from 50 °C to 70 °C. (-20 °C start up)
Storage temperature	-40 °C to 85 °C
Electromagnetic susceptibility	Designed to meet EN61000-4; -2, -3, -4, -5, -6, -8, -11 Level 3
Humidity	Operating; non-condensing 10% to 95% RH
Vibration	IEC68-2-6 to the levels of IEC721-3-2
MTBF demonstrated	>550,000 hours at full load, 220 Vac and 25 °C ambient conditions

Safety

UL	UL60950/UL2601
CSA	CSA22.2 No. 234 Level 5
VDE	EN60950/EN60601-1
BABT	Compliance to EN60950/ EN60601 BS7002
CB	Certificate and report
CE	Mark to LVD



Output Module Voltage/Current

Voltage	Voltage Code	Single Output Module Code				Dual Output***		Triple Output			I ² C Adjustment Ranges****
		1	2	3	5+	V1	V2	—	—	—	
2 V	A	35 A	60 A	150 A	—	10 A	10 A	—	—	2 A	1.8-2.2
2.2 V	B	35 A	60 A	150 A	—	10 A	10 A	—	—	2 A	2.0-2.4
3 V	C	35 A	60 A	150 A	—	10 A	10 A	—	—	2 A	2.7-3.3
3.3 V	D	35 A	60 A	150 A	—	10 A	10 A	—	—	2 A	3.0-3.6
5 V	E	35 A	60 A	150 A	—	10 A	10 A	—	—	2 A	4.5-5.5
5.2 V	F	35 A	60 A	144 A	—	10 A	10 A	—	—	2 A	4.7-5.7
5.5 V	G	34 A	58 A	136 A	—	10 A	10 A	—	—	2 A	5.0-6.1
6 V	H	23 A	42 A	97.5 A	140 A	10 A*	10 A*	—	—	2 A	5.4-6.6
8 V	I	20 A	36 A	84.4 A	140 A	10 A	4 A	1 A	1 A	1 A	7.2-8.8
10 V	J	18 A	32 A	75 A	140 A	10 A	4 A	1 A	1 A	1 A	9.0-11.0
11 V	K	17 A	31 A	68 A	136.3 A	10 A	4 A	1 A	1 A	1 A	9.9-12.1
12 V	L	17 A	30 A	62.5 A	125 A	10 A	4 A	1 A	1 A	1 A	10.8-13.2
14 V	M	14 A	21 A	53.5 A	107 A	9 A	4 A	1 A	1 A	1 A	12.6-15.4
15 V	N	14 A	20 A	50 A	100 A	8 A	4 A	1 A	1 A	1 A	13.5-16.5
18 V	O	11 A	19 A	41.6 A	83.3 A	—	—	—	0.5 A	0.5 A	16.2-19.8
20 V	P	10.5 A	18 A	37.5 A	75 A	—	—	—	0.5 A	0.5 A	18.0-22.0
24 V	Q	8.5 A	15 A	30 A	62.5 A	4 A	2 A	—	0.5 A	0.5 A	21.6-26.4
28 V	R	6.7 A	11 A	26.8 A	53.5 A	3 A	2 A	—	0.5 A	0.5 A	25.2-30.8
30 V	S	6.5 A	11 A	25 A	50 A	—	—	—	—	—	27.0-33.0
33 V	T	6.2 A	10.9 A	22.7 A	35.8 A	—	—	—	—	—	29.7-36.3
36 V	U	5.8 A	10 A	20.8 A	35.8 A	—	—	—	—	—	32.4-39.6
42 V	V	4.2 A	7.5 A	16 A	35.7 A	—	—	—	—	—	37.8-46.2
48 V	W	4 A	7.5 A	15.6 A	31.2 A	—	—	—	—	—	43.2-52.8
54 V	X	3.7 A	6 A	13.9 A	27.7 A	—	—	—	—	—	48.6-59.4
60 V	Y	3.5 A	6 A	12.5 A	25 A	—	—	—	—	—	54.0-66.0
Non-std**	Z	Special Voltage - Consult factory for specifications									

* Note: Contact Factory for extended range down to 6 V.

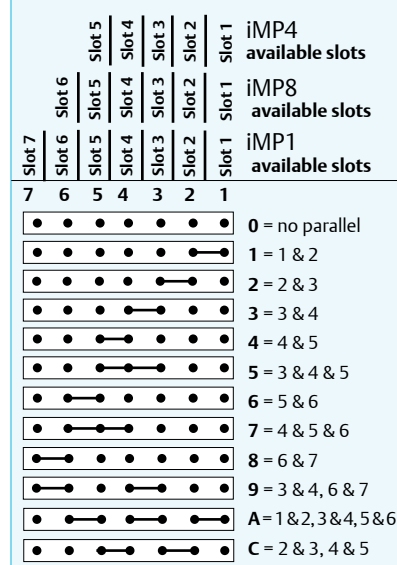
** Increments of current not shown can be achieved by paralleling modules (add currents of each module selected).

*** Total output power on dual module must not exceed 144 W.

**** For single output modules only.

+ Applicable for iMP1 only.

Parallel Codes



Ordering Information

Sample below is 1500 W case with 12 V @ 62.5 A; 5 V @ 60 A; 24 V @ 8.5 A; 12 V @ 10 A; 12 V @ 4 A; with no options.

Case Size	Module/Voltage/Option Codes First - Module Code Second - Voltage Code Third - Option Code	Case Option Codes	Software Code	Hardware Code
iMP1*	3L0 - 2E2 - 1Q1 - 4LL0	00	A	###
Case Size (mm) 4 = 2.5" x 5" x 10"; 750-1100 W, 5 slots (63.5 x 127 x 254) 8 = 2.5" x 7" x 10"; 1000-1200 W, 6 slots (63.5 x 177.8 x 254) 1 = 2.5" x 8" x 11"; 1200-1500 W, 7 slots (63.5 x 203.2 x 279.4) *Note: Add "E" after iMP4 to denote IEC input option. e.g., iMP4E (Not available on iMP8 or iMP1)	Module Codes Module/voltage/option codes Module codes: (None) = 36 W triple O/P (1 slot) 1 = 210 W single O/P (1 slot) 2 = 360 W single O/P (2 slot) 3 = 750 W single O/P (3 slot) 4 = 144 W dual O/P (1 slot) 5 = 1500 W single O/P (4 slot) 6 - 9 = Future Voltage Codes: See Output Module Voltage/Current table above Option Codes: 0 = Standard 1 = Module enable 2 = Constant current 3 = 1 & 2 combined 4 = Set for use in standard (non-intelligent case) 5 = Shutdown mode for 1500 W 6 = 1 & 5 combined 7 - 9 = Future	Case Option Codes First digit 0 - 9 = parallel code (See Parallel Codes table above) Second digit 0 = No options 1 = Reverse air 3 = Global enable 4 = Fan off w/inhibit 5 = Opt 1 + Opt 3 6 = Opt 1 + Opt 4 7 = Opt 3 + Opt 4 8 = Opt 1 + 3 + 4 9 = CAN BUS/RS-485 73-544-002 B = USB 73-546-002	Software code used for configuration change. "A" is standard	Factory assembled for hardware of firmware mods.
Ordering Note: 1. The cases and modules of both MP and iMP series can be interchanged to allow more flexibility. If intelligent modules are used with non-intelligent cases, a numeric code "4" is placed at the end of the module code (ex. 4LL0 becomes 4LL4). 2. USB to I ² C module order code 73-769-001				

Intelligent VS Series

*Intelligent modular power supply
for optimum flexibility*

Up to 4920 Watts

Total Power: Up to 4920 Watts
Input Voltage: 85-264 Vdc
120-300 Vdc
of Outputs: Up to 24

iVS™



iVS1-3E0-210-2Q0-1WD-00-A

Special Features

- Full medical EN60601 approval
- Intelligent I²C control
- Voltage adjustment on all outputs (manual or I²C)
- Configurable input and output OK signals and indicators
- Configurable inhibit/enable
- Configurable output UP/DOWN sequencing
- High power density (12 W/cu-in)
- Intelligent fan (speed control/fault status)
- μ P controlled PFC input with active Inrush protection
- I²C monitor of voltage, current, and temp
- Programmable voltage, current limit, inhibit/enable through I²C
- CAN BUS and RS-485 interface option
- Optional extended hold-up module (SEMI F47 compliance)
- Increased power density to 150%
- Optional conformal coating
- Industrial temp range (-40 °C to 70 °C)
- Uses standard iMP modules
- Field upgradeable firmware
- RoHS compliant



210 W



360 W

Single



750 W



1500 W



144 W

Dual



36 W

Triple

Electrical Specifications

Input

Input range

iVS1 & iVS3: 90-264 Vac 1Ø: 120-300 Vdc

iVS6 & iVS8: 170-264 Vac 3Ø

Frequency 47-440 Hz

Inrush current 40 A peak maximum (soft start)

Efficiency Up to 85% @ full case load

Power factor 0.99 typ. meets EN61000-3-2

Warranty Three years



Electrical Specifications

Output	
Adjustment range*	±10% minimum all outputs (manual) (full module adjustment range using I ² C)
Margining	±4-6% nominal analog (single output module only)
Overall regulation	0.4% or 20 mV max. (1500 W modules 1% max.)
Ripple	RMS: 0.1% or 10 mV, whichever is greater Pk-Pk: 1.0% or 50 mV, whichever is greater Bandwidth limited to 20 MHz
Dynamic response	<2% or 100 mV, with 25% load step
Recovery time	To within 1% in <300 µs
Overcurrent protection**	Configurable through I ² C. single output module and main output of the dual output module 105-120% of rated output current. Aux output of dual output module 105-140% of rated output current. Special programmable OCP delay on 1500 W module from 100 ms to 25.5 seconds with shutdown features
Short-circuit protection	Protected for continuous short-circuit Recovery is automatic upon removal of short (Shutdown mode on 1500 W module)
Overvoltage protection*	Configurable through I ² C
– Single output module	2-5.5 V 122-134%; 6-60 V 110-120%
– Dual output module	2-6 V 122-134%; 8-28 V 110-120%
– Triple output module	No overvoltage protection provided
Thermal protection*	Configurable through I ² C All outputs disabled when internal temp exceeds safe operating range. > 5 ms warning (AC OK signal) before shutdown
Remote sense	Up to 0.5 V total drop (not available on triple output module)
Single wire parallel	Current share to within 2% of total rated current
DC OK*	+/-5% of nominal. Configurable through I ² C
Minimum load	Not required
Housekeeping bias voltage	5 Vdc @1.0 A max. present whenever AC input is applied
Module inhibit*	Configured and controlled through I ² C
Output/Output isolation	>1 Megohm, 500 V

* Can be controlled via I²C

** Controlled via I²C but requires load calibration

Safety

UL	UL60950/UL2601
CSA	CSA22.2 No. 234 Level 5
VDE	EN60950/EN60601-1
BABT	Compliance to EN60950/ EN60601 BS7002
CB	Certificate and report
CE	Mark to LVD

Environmental Specifications

Operating temperature	-40 °C to 70 °C ambient. Derate each output 2.5% per degree from 50 °C to 70 °C. (-20 °C start up)
Storage temperature	-40 °C to 85 °C
Electromagnetic susceptibility	Designed to meet EN61000-4; -2, -3, -4, -5, -6, -8, -11 Level 3
Humidity	Operating; non-condensing 10% to 95% RH
Vibration	IEC68-2-6 to the levels of IEC721-3-2
MTBF demonstrated	>550,000 hours at full load, 220 Vac and 25 °C ambient conditions





Output Module Voltage/Current*

Voltage	Voltage Code	Single Output Module Code				Dual Output**		Triple Output			I ² C Adjustment Ranges***
		1	2	3	5	V1	V2				
2 V	A	35 A	60 A	150 A	—	10 A	10 A	—	—	2 A	1.8-2.2
2.2 V	B	35 A	60 A	150 A	—	10 A	10 A	—	—	2 A	2.0-2.4
3 V	C	35 A	60 A	150 A	—	10 A	10 A	—	—	2 A	2.7-3.3
3.3 V	D	35 A	60 A	150 A	—	10 A	10 A	—	—	2 A	3.0-3.6
5 V	E	35 A	60 A	150 A	—	10 A	10 A	—	—	2 A	4.5-5.5
5.2 V	F	35 A	60 A	144 A	—	10 A	10 A	—	—	2 A	4.7-5.7
5.5 V	G	34 A	58 A	136 A	—	10 A	10 A	—	—	2 A	5.0-6.1
6 V	H	23 A	42 A	97.5 A	140 A	10 A*	10 A*	—	—	2 A	5.4-6.6
8 V	I	20 A	36 A	84.4 A	140 A	10 A	4 A	1 A	1 A	1 A	7.2-8.8
10 V	J	18 A	32 A	75 A	140 A	10 A	4 A	1 A	1 A	1 A	9.0-11.0
11 V	K	17 A	31 A	68 A	136.3 A	10 A	4 A	1 A	1 A	1 A	9.9-12.1
12 V	L	17 A	30 A	62.5 A	125 A	10 A	4 A	1 A	1 A	1 A	10.8-13.2
14 V	M	14 A	21 A	53.5 A	107 A	9 A	4 A	1 A	1 A	1 A	12.6-15.4
15 V	N	14 A	20 A	50 A	100 A	8 A	4 A	1 A	1 A	1 A	13.5-16.5
18 V	O	11 A	19 A	41.6 A	83.3 A	—	—	—	0.5 A	0.5 A	16.2-19.8
20 V	P	10.5 A	18 A	37.5 A	75 A	—	—	—	0.5 A	0.5 A	18.0-22.0
24 V	Q	8.5 A	15 A	30 A	62.5 A	4 A	2 A	—	0.5 A	0.5 A	21.6-26.4
28 V	R	6.7 A	11 A	26.8 A	53.5 A	3 A	2 A	—	0.5 A	0.5 A	25.2-30.8
30 V	S	6.5 A	11 A	25 A	50 A	—	—	—	—	—	27.0-33.0
33 V	T	6.2 A	10.9 A	22.7 A	35.8	—	—	—	—	—	29.7-36.3
36 V	U	5.8 A	10 A	20.8 A	35.8	—	—	—	—	—	32.4-39.6
42 V	V	4.2 A	7.5 A	16 A	35.7	—	—	—	—	—	37.8-46.2
48 V	W	4 A	7.5 A	15.6 A	31.2	—	—	—	—	—	43.2-52.8
54 V	X	3.7 A	6 A	13.9 A	27.7	—	—	—	—	—	48.6-59.4
60 V	Y	3.5 A	6 A	12.5 A	25	—	—	—	—	—	54.0-66.0
Consult Factory											
Special*	Z	35 A	60 A	150 A	—	—	10 A	—	—	—	2.3-2.6
Special*	Z	35 A	60 A	150 A	—	—	10 A	—	—	—	3.7-4.4
Special*	Z	20 A	36 A	80 A	140 A	—	8 A	—	—	—	6.7-7.1

* Note: Consult factory for extended range down to 6V.

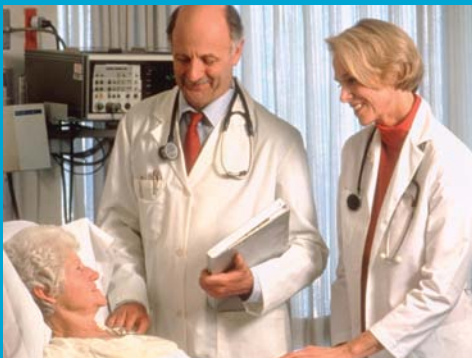
** Total output power on dual model must not exceed 144 W.

*** For single output modules only.

Ordering Information

Sample below is 3210 W case with 12 V @ 125 A; 24 V @ 8.5 A; 5 V @ 60 A; 12 V @ 10 A and 12 V @ 4 A; with no options.

Case Size	Module/Voltage/Option Codes First - Module Code Second - Voltage Code Third - Option Code	Case Option Codes	Software Code	Hardware Code
iVS1	5L1 - 1Q1 - 2EO - 4LL0	00	A	###
Case Size (mm) 1-Phase Input 1 = 5" x 5" x 11"; 1500-3210 W, 9 slots (127 x 127 x 279.4) 3 = 5" x 8" x 11"; 1800-4170 W, 15 slots (127 x 203.2 x 279.4) 3-Phase Input* 6 = 5" x 5" x 11"; 3120 W, 9 slots (127 x 127 x 279.4) 8 = 5" x 8" x 11"; 4170 W, 15 slots (127 x 203.2 x 279.4) <i>*3-phase versions not medically approved</i>	Module Codes Module/voltage/option codes Module Codes: (None) = 36 W triple O/P (1 slot) 1 = 210 W single O/P (1 slot) 2 = 360 W single O/P (2 slot) 3 = 750 W single O/P (3 slot) 5 = 1500 W single O/P (slot 4) 4 = 144 W dual O/P (1 slot) HUP = Extra 30mS hold-up (1 slot) Voltage Codes: See Output Module Voltage/Current table above Option Codes: 0 = Standard 1 = Module enable 2 = Constant current 3 = 1 & 2 combined 4 = Set for use in standard (non-intelligent case) 5 = Shutdown mode for 1500 W 6 = 1 & 5 combined 7-9 Future	Case Option Codes First Digit 0 - 9 = Parallel code (See parallel codes table in datasheet) Second Digit 0 = No options 1 = Reverse air 2 = Not used 3 = Global enable 4 = Fan Off w/inhibit 5 = Opt 1 + Opt 3 6 = Opt 1 + Opt 4 7 = Opt 3 + Opt 4 8 = Opt 1 + 3 + 4 9 = CAN BUS/RS-485 73-544-001 B = USB 73-546-001 M = Medical N = M + 1 P = M + 3 R = M + 1 + 3	Software code used for configuration change. "A" is standard Ordering Note: 1. USB to I ² C module order code 73-769-001	Factory assembled for hardware of firmware mods.



DC–DC Converters

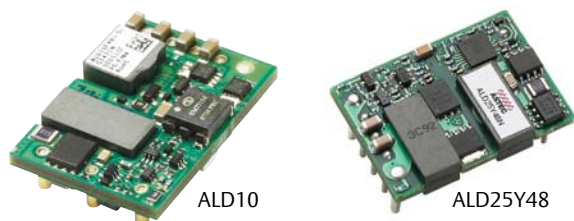
Emerson Network Power is widely acknowledged as an industry leader in distributed power applications and produces an exceptionally wide range of DC–DC conversion products.



DC-DC Converters

Emerson Network Power is widely acknowledged as an industry leader in distributed power applications and produces an exceptionally wide range of DC-DC conversion products for health care applications.

Sixteenth-Brick



Special Features

- Industry leading sixteenth-brick standard package and feature sets
- Scalable offering: 35 W and 60 W platforms
- Mechanical options for optimum mounting flexibility: Through-hole (default) or surface mount (suffix “-S”) termination; 5 mm (default) or 3.7 mm through-hole pin length option
- Meets basic insulation
- Power densities as high as 146.5 W per cubic inch
- International safety standards approvals – UL, CSA, TÜV

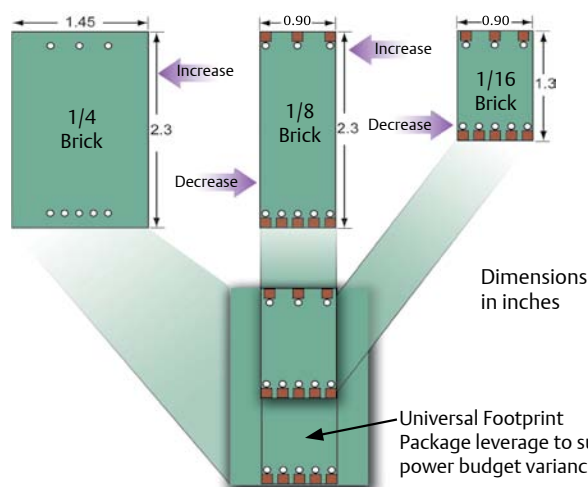
Vout	Iout	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
1.2 V	Open-frame				
	15 A	48 V (36-75 V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	84%	ALD15K48N-L
	25 A	48 V (36-75 V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	84%	ALD25K48N-L
1.5 V	Open-frame				
	15 A	48 V (36-75 V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	85%	ALD15M48N-L
	25 A	48 V (36-75 V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	85%	ALD25M48N-L
1.8 V	Open-frame				
	13 A	48 V (36-75 V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	87%	ALD13Y48N-L
	25 A	48 V (36-75 V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	88%	ALD25Y48N-L
2.5 V	Open-frame				
	11 A	48 V (36-75 V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	89%	ALD11G48N-L
	20 A	48 V (36-75 V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	89%	ALD20G48N-L
3.3 V	Open-frame				
	10 A	48 V (36-75 V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	90%	ALD10F48N-L
	18 A	48 V (36-75 V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	90%	ALD18F48N-L
5 V	Open-frame				
	7 A	48 V (36-75 V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	91%	ALD07A48N-L
	12 A	48 V (36-75 V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	91%	ALD12A48N-L
12 V	Open-frame				
	2.75 A	48 V (36-75 V)	1.3" x 0.9" x 0.35" (33 x 22.86 x 8.89)	92%	ALD03B48N-L

Footprint/Package Leverage

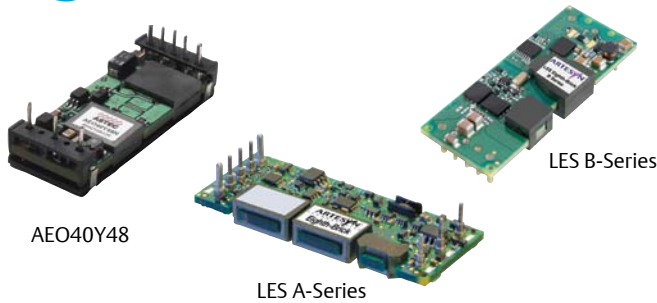
Common Features

- Open-frame or baseplate
- Through-hole or SMT
- 3.7 mm or 5 mm pin length
- Negative or Positive enable

Designing multiple footprints maximizes product availability (supply) and creates greatest cost/price leverage



Eighth-Brick



Special Features

- Industry leading eighth-brick standard package and feature sets
- Scalable output power offering: Low power 80 W series or up to 120 W high power series
- Mechanical options for optimum mounting flexibility: Open-frame (ALO or LES) or baseplate (AEO) construction; Through-hole (default) or surface mount (suffix “-S”) termination; 5 mm (default) or 3.7 mm through-hole pin length option
- Meets basic insulation
- Power densities as high as 181 W per cubic inch
- Wide operating temperature range
- International safety standards approvals – UL, CSA, TÜV

Vout	Iout	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
1.0 V	Open-frame				
	25 A	48 V (36-75 V)	2.3" x 0.9" x 0.36" (58.42 x 22.86 x 9.14)	85%	LES25B48-1V0REJ
1.2 V	Open-frame				
	25 A	48 V (36-75 V)	2.3" x 0.9" x 0.36" (58.42 x 22.86 x 9.14)	86%	LES25B48-1V2REJ
	50 A	48 V (36-75 V)	2.3" x 0.9" x 0.34" (58.42 x 22.86 x 8.64)	86%	LES50A48-1V2REJ
	Baseplate				
1.5 V	Open-frame				
	25 A	48 V (36-75 V)	2.3" x 0.9" x 0.36" (58.42 x 22.86 x 9.14)	88%	LES25B48-1V5REJ
	40 A	48 V (36-75 V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	88%	ALO40M48N-L
	Baseplate				
1.8 V	Open-frame				
	20 A	24 V (18-36 V)	2.3" x 0.9" x 0.34" (58.42 x 22.86 x 8.64)	91%	LES20A24-1V8REJ
	25 A	48 V (36-75 V)	2.3" x 0.9" x 0.36" (58.42 x 22.86 x 9.14)	89%	LES25B48-1V8REJ
	40 A	48 V (36-75 V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	90%	ALO40Y48N-L
2.5 V	Baseplate				
	25 A	48 V (36-75 V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	87%	AEO25Y48N-L
	40 A	48 V (36-75 V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	90%	AEO40Y48N-L
	Open-frame				
3.3 V	Open-frame				
	22 A	48 V (36-75 V)	2.3" x 0.9" x 0.36" (58.42" x 22.86 x 9.14)	91%	LES22B48-2V5REJ
	40 A	48 V (36-75 V)	2.3" x 0.9" x 0.34" (58.42" x 22.86 x 8.64)	91%	LES40 A48-2V5REJ
	Baseplate				
5 V	Open-frame				
	20 A	48 V (36-75 V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	90%	AEO20G48N-L
	35 A	48 V (36-75 V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	90%	AEO35G48N-L
	Baseplate				
12 V	Open-frame				
	20 A	24 V (18-36 V)	2.3" x 0.9" x 0.34" (58.42 x 22.86 x 8.64)	90%	LES20A24-3V3REJ
	20 A	24 V/48 V (19-60 V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	91%	ALO20F36N-L
	20 A	48 V (36-75 V)	2.3" x 0.9" x 0.36" (58.42 x 22.86 x 9.14)	91%	LES20B48-3V3REJ
15 V	Open-frame				
	30 A	48 V (36-75 V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	91%	ALO30F48N-L
	Baseplate				
12 V	Open-frame				
	20 A	48 V (36-75 V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	91%	AEO20F48N-L
	30 A	48 V (36-75 V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	91%	AEO30F48N-L
	Baseplate				
12 V	Open-frame				
	13 A	48 V (36-75 V)	2.3" x 0.9" x 0.36" (58.42 x 22.86 x 9.14)	92%	LES13B48-5V0REJ
	20 A	48 V (36-75 V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	93%	ALO20A48N-L
	Baseplate				
12 V	Open-frame				
	12 A	48 V (36-75 V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	93%	AEO12A48N-L
	20 A	48 V (36-75 V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	92%	AEO20A48N-L
	Baseplate				
12 V	Open-frame				
	6.7 A	48 V (36-75 V)	2.3" x 0.9" x 0.36" (58.42 x 22.86 x 9.14)	93%	LES06B48-12V0REJ
	10 A	48 V (36-75 V)	2.3" x 0.9" x 0.32" (58.42 x 22.86 x 8.13)	92%	ALO10B48N-L
	Baseplate				
15 V	Open-frame				
	4 A	48 V (36-75 V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	93%	AEO04B48N-L
	10 A	48 V (36-75 V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	92%	AEO10B48N-L
	Baseplate				
15 V	Open-frame				
	5 A	24 V (18-36 V)	2.3" x 0.9" x 0.4" (58.42 x 22.86 x 10.16)	91%	LES05B24-15V0J

RF Power Bricks



RFF700



RFB300

Special Features

- Specialized high power bricks for RF applications such as base station power amplifiers
- Offered in 24 V and 48 V input voltages
- Wide output voltage adjustability
- -40 °C to 100 °C baseplate temperature with no derating at rated power
- International safety standard approvals – UL, CSA, VDE, CB Report

Half-Brick

Vout	Iout	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
7.2-13.2 V	Baseplate				
	25 A	24 V (18-36 V)	2.4" x 2.27" x 0.5" (60.96 x 57.66 x 12.7)	86%	RFB300-24S12-R5Y
	29.2 A	48 V (36-75 V)	2.4" x 2.27" x 0.5" (60.96 x 57.66 x 12.7)	86%	RFB350-48S12-R5J
16.8-29.4 V	Baseplate				
	11 A	24 V (18-36 V)	2.4" x 2.27" x 0.5" (60.96 x 57.66 x 12.7)	90%	RFB300-24S28-R5Y
	11 A	48 V (36-75 V)	2.4" x 2.27" x 0.5" (60.96 x 57.66 x 12.7)	91%	RFB300-48S28-R5J
	12.5 A	48 V (36-75 V)	2.4" x 2.27" x 0.5" (60.96 x 57.66 x 12.7)	91%	RFB350-48S28-R5Y

Full-Brick

Vout	Iout	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
16.8-29.4 V	Baseplate				
	17.9 A	24 V (18-36 V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	90%	RFF500-24S28-5Y
	17.9 A	48 V (36-75 V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	91%	RFF500-48S28-5Y
	21.4 A	24 V (18-36 V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	90%	RFF600-24S28-5Y
	21.4 A	48 V (36-75 V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	91%	RFF600-48S28-5Y
	25 A	48 V (36-75 V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	91%	RFF700-48S28-5Y



C-Class – High Density LGA C Series

The latest addition to the C-Class non-isolated DC-DC converter offering packaged in an ultra-compact, low-profile Land Grid Array with current densities up to 225 A/in³.



Special Features

- High density, ultra low profile surface mount module in Land Grid Array (LGA) package
- Available in 4 different output current levels: 3, 6, 10 and 20 Amps
- Wide input voltage range: 3.0-14.0 V
- Adjustable output voltage: 0.59-5.1 V via external resistor
- High efficiency ~92% typical
- Wide ambient operating temperature range: -40 °C to 85 °C
- Input UVLO; Remote On/Off; Output Adjust; Margin; PGood signal, Differential sense
- Current sink capability for voltage termination applications
- Integrated input and output capacitors resulting to minimal external capacitance required for stable operation

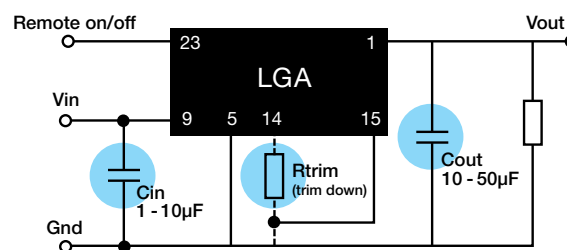
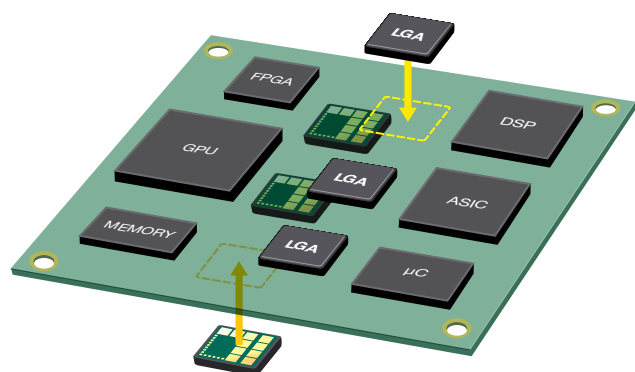
LGA C Series Non-Isolated DC-DC Converters

Output Current	Input Voltage	Output Voltage	Efficiency	Package L x W x H (mm)	Model Number
Surface-Mounting					
3 A	3.0-14 Vdc	0.59-5.1 V	92%	0.65" x 0.65" x 0.129" (16.51 x 16.51 x 3.27)	LGA03C-00SADJJ
6 A	3.0-14 Vdc	0.59-5.1 V	92%	0.65" x 0.65" x 0.129" (16.51 x 16.51 x 3.27)	LGA06C-00SADJJ
10 A	3.0-14 Vdc	0.59-5.1 V	92%	0.65" x 0.65" x 0.129" (16.51 x 16.51 x 3.27)	LGA10C-00SADJJ
20 A	4.5-14 Vdc	0.59-5.1 V	91%	0.65" x 0.65" x 0.210" (16.51 x 16.51 x 5.33)	LGA20C-01SADJJ

Note: Optional heatsink kits are available. Ordering part number is LGA-HTSK-KIT-XXX

XXX = Total height of the LGA20C-01SADJJ with heatsink attached: 045 = 0.45"; 048 = 0.48"; 050 = 0.50"

A Paradigm Shift in Converter Packaging



- Compact LGA package - significant improvement in current density, saves board space
- Allows for bilateral thermal management not easily provided by "down" solutions or typical modules (e.g., uniform height for coldplate cooling)
- Scalable solution, one footprint design for 3, 6, 10 and 20 A offering
- Fully operational DC-DC solution with 3 external components

Power Factor Correction (PFC)



Special Features

- 1600 W/720 W
- Unity power factor
- Universal input and frequency range
- Positive and negative enable
- Paralleling with current share
- IEC 1000-3.2 compliance
- 100 °C baseplate
- Clock synch (in/out)
- Current monitoring
- Vout adjust
- On/off enable
- Remote sense
- 95% efficiency
- Fast transient response

Vout	Iout	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
PFC Module - Baseplate					
380 V	4.2 A	85-264 Vac	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	95%	AIF04ZPFC-01L
380 V	4.2 A	85-264 Vac	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	95%	AIF04ZPFC-02L
393 V	0.25 A	100-122 Vac	2.3" x 1.45" x 0.5" (57.91 x 36.83 x 12.7)	90%	AIQ00ZPFC-01NL
393 V	2.08 A	85-264 Vac	3.5" x 2.4" x 0.5" (88.9 x 60.96 x 12.7)	93%	AIT02ZPFC-01NL

High Power 300 Vin



300 V input 65-600 W output

Special Features

- 300 V input (250-420 V PFC-ready)
- 2nd generation product
- Standard through-hole termination
- Power density >100 W/in³
- 100 °C max baseplate operating temperature
- Embedded controls on secondary side (Full- and Half-brick):
 - Temp monitor
 - Current sharing
 - Power good signal
 - Current limit & OVP adjust

	Vout	Iout	Input Voltage	Package L x W x H (mm)	Efficiency	Model Number
AIF 300 Vin	Full-Brick – Baseplate					
	1.8 V	120 A	300 V (250-420 V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	80%	AIF120Y300-L
	3.3 V	120 A	300 V (250-420 V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	87%	AIF120F300-L
	5 V	80 A	300 V (250-420 V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	90%	AIF80A300-L
	12 V	50 A	300 V (250-420 V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	90%	AIF50B300-L
	15 V	40 A	300 V (250-420 V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	90%	AIF40C300-L
	24 V	25 A	300 V (250-420 V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	90%	AIF25H300-L
	48 V	12 A	300 V (250-420 V)	4.6" x 2.4" x 0.5" (116.84 x 60.96 x 12.7)	91%	AIF12W300-L
AIH 300 Vin	Half-Brick – Baseplate					
	1.8 V	50 A	300 V (250-420 V)	2.3" x 2.4" x 0.5" (58.42 x 60.96 x 12.7)	80%	AIH50Y300-L
	3.3 V	50 A	300 V (250-420 V)	2.3" x 2.4" x 0.5" (58.42 x 60.96 x 12.7)	85%	AIH50F300-L
	5 V	40 A	300 V (250-420 V)	2.3" x 2.4" x 0.5" (58.42 x 60.96 x 12.7)	88%	AIH40A300-L
	12 V	20 A	300 V (250-420 V)	2.3" x 2.4" x 0.5" (58.42 x 60.96 x 12.7)	90%	AIH20B300-L
	15 V	16 A	300 V (250-420 V)	2.3" x 2.4" x 0.5" (58.42 x 60.96 x 12.7)	90%	AIH16C300-L
	24 V	10 A	300 V (250-420 V)	2.3" x 2.4" x 0.5" (58.42 x 60.96 x 12.7)	90%	AIH10H300-L
AIQ 300 Vin	Quarter-Brick – Baseplate					
	28 V	2.32 A	300 V (250-420 V)	2.3" x 1.45" x 0.5" (57.91 x 36.83 x 12.7)	89%	AIQ02R300L

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(Continued on next page)

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8. EXCUSE OF PERFORMANCE: Seller shall not be liable for delays in performance or for non-performance due to acts of God; acts of Buyer; war; fire; flood; weather; sabotage; epidemics; strikes or labor disputes; civil disturbances or riots; governmental requests, restrictions, allocations, laws, regulations, orders or actions; unavailability of or delays in transportation; default of suppliers; or unforeseen circumstances or any events or causes beyond Seller's reasonable control. Deliveries or other performance may be suspended for an appropriate period of time or canceled by Seller upon notice to Buyer in the event of any of the foregoing, but the balance of the agreement shall otherwise remain unaffected as a result of the foregoing.

If Seller determines that its ability to supply the total demand for the Goods, or to obtain material used directly or indirectly in the manufacture of the Goods, is hindered, limited or made impracticable due to causes set forth in the preceding paragraph, Seller may allocate its available supply of the Goods or such material (without obligation to acquire other supplies of any such Goods or material) among its purchasers on such basis as Seller determines to be equitable without liability for any failure of performance which may result therefrom.

9. RESCHEDULE/CANCELLATION: Unless otherwise agreed in writing by Seller, orders under this agreement may not be rescheduled or canceled by Buyer for any reason.

10. CHANGES: Buyer may request changes or additions to the Goods and/or Software consistent with Seller's specifications and criteria. In the event such changes or additions are accepted by Seller, Seller may revise the price, license fees and dates of delivery. Seller reserves the right to change designs and specifications for the Goods and/or Software without prior notice to Buyer, except with respect to Goods and/or Software being made-to-order for Buyer. Seller shall have no obligation to install or make such change in any Goods and/or Software manufactured prior to the date of such change.

11. NUCLEAR/MEDICAL: GOODS AND SOFTWARE SOLD HEREUNDER ARE NOT FOR USE IN CONNECTION WITH ANY NUCLEAR, MEDICAL, LIFESUPPORT AND OTHER HIGH RISK APPLICATIONS WHERE GOODS OR SOFTWARE FAILURE COULD LEAD TO LOSS OF LIFE OR CATASTROPHIC PROPERTY DAMAGE. Buyer accepts Goods and Software with the foregoing understanding, agrees to communicate the same in writing to any subsequent purchasers or users and to defend, indemnify and hold harmless Seller from any claims, losses, suits, judgments and damages, including incidental and consequential damages, arising from such use, whether the cause of action be based in tort, contract or otherwise, including allegations that the Seller's liability is based on negligence or strict liability.

12. ASSIGNMENT: Buyer shall not assign its rights or delegate its duties hereunder or any interest herein without the prior written consent of Seller, and any such assignment, without such consent, shall be void.

13. SOFTWARE: Notwithstanding any other provision herein to the contrary, Seller or applicable third party licensor to Seller shall retain all rights of ownership and title in its respective Software, including without limitation all rights of ownership and title in its respective copies of such Software. Except as otherwise provided herein, Buyer is hereby granted a nonexclusive, non-transferable royalty free license to use the Software incorporated into the Goods solely for purposes of Buyer properly utilizing such Goods purchased from Seller. All other Software shall be furnished to, and used by, Buyer only after execution of Seller's (or the licensor's) applicable standard license agreement, the terms of which are incorporated herein by reference. The Software is Seller's own or Seller's supplier's proprietary information, and Buyer and its employees and agents shall not disclose the Software to others without Seller's prior written consent.

14. TOOLING: Tool, die, and pattern charges, if any, are in addition to the price of the Goods and are due and payable upon completion of the tooling. All such tools, dies and patterns shall be and remain the property of Seller. Charges for tools, dies, and patterns do not convey to Buyer, title, ownership interest in, or rights to possession or removal, or prevent their use by Seller for other purchasers, except as otherwise expressly provided by Seller and Buyer in writing with reference to this provision.

15. DRAWINGS: Seller's prints and drawings (including without limitation, the underlying technology) furnished by Seller to Buyer in connection with this agreement are the property of Seller and Seller retains all rights, including without limitation, exclusive rights of use, licensing and sale. Possession of such prints or drawings does not convey to Buyer any rights or license, and Buyer shall return all copies (in whatever medium) of such prints or drawings to Seller immediately upon request therefor.

16. BUYER'S COMPLIANCE WITH LAWS: In connection with the transactions contemplated by this agreement, Buyer is familiar with and shall fully comply with all applicable laws, regulations, rules and other requirements of the United States and of any applicable state, foreign and local governmental body in connection with the purchase, license, receipt, use, transfer and disposal of the Goods and/or Software.

17. EXPORT/IMPORT: Buyer agrees that all applicable import and export control laws, regulations, orders and requirements, including without limitation those of the United States and the European Union, and the jurisdictions in which the Seller and Buyer are established or from which Goods and/or Software may be supplied, will apply to their receipt and use. In no event shall Buyer use, transfer, release, import, export, Goods and/or Software in violation of such applicable laws, regulations, orders or requirements.

18. GOVERNMENT CONTRACT CONDITIONS: In the event Buyer supplies Goods or Software to the U.S. Government or to a prime contractor selling to the U.S. Government, the following Federal Acquisition Regulation (FAR) clauses are accepted by Seller and are made part of this agreement applicable to such supply: 52.222-21 Prohibition of Segregated Facilities; 52.222-26 Equal Opportunity; 52.222-35 Equal Opportunity For Special Disabled Veterans, Veterans of Vietnam Era, and Other Eligible Veterans; 52.222-36 Affirmative Action For Workers with Disabilities; and 52.219-8 Utilization of Small Business Concerns. No additional FAR or FAR Supplement clauses are accepted by Seller. In the event Buyer elects to sell Goods or Software to the U.S. Government or any national, state, provincial or local non-U.S. governmental entity or to a prime contractor selling to such entities, Buyer does so solely at its own option and risk, and agrees not to obligate Seller as a subcontractor or otherwise to the U.S. Government or other governmental entity except as described in this Section 18. Buyer remains solely and exclusively responsible for compliance with all statutes and regulations governing sales to the U.S. Government or any national, state, provincial or local non-U.S. governmental entity. Seller makes no representations, certifications or warranties whatsoever with respect to the ability of its Goods, Software, or prices to satisfy any such statutes and regulations.

19. GENERAL PROVISIONS: These terms and conditions supersede all other communications, negotiations and prior oral or written statements regarding the subject matter of these terms and conditions. No change, modification, rescission, discharge, abandonment, or waiver of these terms and conditions shall be binding upon the Seller unless made in writing and signed on its behalf by a duly authorized representative of Seller. No conditions, usage of trade, course of dealing or performance, understanding or agreement purporting to modify, vary, explain, or supplement these terms and conditions shall be binding unless hereafter made in writing and signed by the party to be bound, and no modification or additional terms shall be applicable to this agreement by Seller's receipt, acknowledgment, or acceptance of purchase orders, shipping instruction forms, or other documentation containing terms at variance with or in addition to those set forth herein. Any such modifications or additional terms are specifically rejected and deemed a material alteration hereof. If this document shall be deemed an acceptance of a prior offer by Buyer, such acceptance is expressly conditional upon Buyer's assent to any additional or different terms set forth herein. No waiver by either party with respect to any breach or default or of any right or remedy, and no course of dealing, shall be deemed to constitute a continuing waiver of any other breach or default or of any other right or remedy, unless such waiver be expressed in writing and signed by the party to be bound. All typographical or clerical errors made by Seller in any quotation, acknowledgment or publication are subject to correction. In the event that any provision or portion thereof contained in the Contract is held to be unenforceable, the Contract shall be construed without such provision or portion thereof.

(A) If Seller is a U.S. incorporated entity: This Agreement shall be governed by the laws of the State of Delaware, U.S.A., without reference to its choice or conflict of laws principles. The parties agree to submit to the exclusive jurisdiction of the courts of the State of Delaware for all actions arising in connection herewith.

(B) If Seller is a European incorporated entity: This Agreement shall be governed by the laws of England. Any dispute arising out of or in connection with this Agreement that cannot be resolved through friendly consultation shall be referred to and finally resolved by arbitration in London, England before the London Court of International Arbitration in accordance with its arbitration rules. The arbitral award shall be final and binding on the parties.

(C) If Seller is an entity incorporated in the Asia Pacific region: This Agreement shall be governed by the laws of the Hong Kong Special Administrative Region of the People's Republic of China. Any dispute arising out of or in connection with this Agreement that cannot be resolved through friendly consultation shall be referred to and finally resolved by arbitration in Hong Kong before the Hong Kong International Arbitration Centre in accordance with its arbitration rules. The arbitral award shall be final and binding on the parties.

(D) No action, regardless of form, arising out of transactions relating to this agreement, may be brought by either party more than two (2) years after the cause of action has accrued. The U.N. Convention on Contracts for the International Sales of Goods shall not apply to this agreement.

Revised February 6, 2009

Ecosystem Leadership

Just as nature relies on communities of organisms functioning as an ecological unit, embedded power solutions depend on a broad and powerful ecosystem, including standards bodies, industry associations, technology alliances and engineering communities. Emerson Network Power brings a wealth of innovation and many years experience to accredited standards development organizations, specification consortia and industry associations through our executive memberships and key committee positions. We have long been committed to a strong ecosystem that works to further the development of the industries and technologies that are important to our customers' success.



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