



## *UltiMod*

*The UltiMod series from Excelsys - the Ultimate range of Modular Configurable Power Supplies*

- ***Unique in Flexibility***
- ***Unrivalled in Performance***
- ***Ultra Cost Competitive***



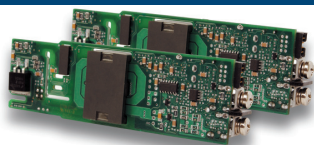
**Unique in Flexibility, Unrivalled in Performance, Ultra Cost Competitive**

**FEATURES & OPTIONS**

- Dual Safety Approvals
  - UL/EN60950 2nd edition
  - UL/EN60601-1 3rd edition
- Highest Efficiency - up to 91%
- User & Field Configurable
- Standard Medical Features
  - Leakage Current <300µA (<150µA optional)
  - 2 MOPP
  - 4KV Isolation
- Lowest Acoustic Noise
- -40°C Startup Temperature
- Extra Ruggedised Optional
  - Shock: >60G's
  - Vibration: MIL STD-810G
- No Minimum Load
- Extra low profile <1U height
- All outputs fully floating
- Series / Parallel of multiple outputs
- 5V Isolated standby voltage
- Active PFC (Power Factor Correction)
- Product Options: Conformal Coating, Low Leakage Current, Connector, Cabling & Mounting options and Reverse Fans Additional Ruggedisation

**TYPICAL APPLICATIONS**

- Medical; Clinical diagnostic equipment, Medical lasers, Dialysis equipment, Radiological Imaging, Clinical Chemistry
- Industrial; Test and Measurement, Industrial Machines, Automation equipment, Printing, Telecommunications, Audio equipment



The UltiMod Series from Excelsys - the **Ultimate** range of Modular Configurable Power Supplies provides up to 1200W output power in a compact 1U form factor. The series is designed for **highest efficiencies** and consists of two Input AC front ends (*powerPacs*), UX4 and UX6 and a wide range of DC output modules (XgA-XgL & Xg1-Xg8).

Both *powerPacs* carry **dual safety certification**, EN60950 for Industrial Applications and EN60601-1 3rd Edition for Medical Applications. The UX4 delivers up to 600W and can be populated with up to 4 *powerMods*, the UX6 delivers up to 1200W and can be populated with up to 6 *powerMods*.

The *powerMods* provide up to 12 fully isolated DC outputs ranging from 1.15V to 58V. Users can select the modules most suitable for their application based on power level and/or desired control feature set. The series provides **unique levels of flexibility** and is completely user field configurable. Customers can configure any combination of *powerMods* in series/parallel. This unique flexibility combined with our Industry leading **5 Year Warranty** minimises the total cost of ownership for our customers.

**The UltiMod Series of modular configurable power supplies provides global leadership in product reliability, efficiency and cost effectiveness.**

**UltiMod powerPacs**

	Model	Slots	Power	Medical Approval UL/EN60601-1 3rd edition	Industrial Approval UL/EN60950 2nd edition
	UX4	4	600W	Yes	Yes
	UX6	6	1200W	Yes	Yes

**powerMods**

Model	Vnom (V)	Set Point Adjust Range (V)	Dynamic Vtrim Range (V)	I <sub>max</sub> (A)	Power (W)	Remote Sense	Power Good
XgA	12.0	10.8-15.6	-	12.5	150	-	-
XgB	24.0	19.2-26.4	-	8.3	200	-	-
XgC	36.0	28.8-39.6	-	5.6	200	-	-
XgD	48.0	38.5-50.4	-	4.2	200	-	-
XgE/Xg7	24.0	5.0-28.0	-	5.0	120	-	Yes
XgF/Xg8	24.0	5.0-28.0	-	3.0	72	-	Yes
	24.0	5.0-28.0	-	3.0	72	-	Yes
XgG	2.5	1.5-3.6	1.15-3.6	40.0	100	Yes	Yes
XgH	5.0	3.2-6.0	1.5-6.0	36.0	180	Yes	Yes
XgJ	12.0	6.0-15.0	4.0-15.0	18.3	220	Yes	Yes
XgK	24.0	12.0-30.0	8.0-30.0	9.2	220	Yes	Yes
XgL	48.0	28.0-58.0	8.0-58.0	5.0	240	Yes	Yes
Xg1	2.5	1.5-3.6	1.15-3.6	50.0	125	Yes	Yes
Xg2	5.0	3.2-6.0	1.5-6.0	40.0	200	Yes	Yes
Xg3	12.0	6.0-15.0	4.0-15.0	20.0	240	Yes	Yes
Xg4	24.0	12.0-30.0	8.0-30.0	10.0	240	Yes	Yes
Xg5	48.0	28.0-58.0	8.0-58.0	6.0	288	Yes	Yes

See our new Wide Trim *powerMods* on page 40 and Reactive Load *powerMods* on page 42 of the Excelsys Product Catalogue.

INPUT					
Parameter	Conditions/Description	Min	Nom	Max	Units
Input Voltage Range	Universal Input 47-440Hz	85 120		264 380	VAC VDC
Power Rating	UX4: See derating curves UX6: See derating curves		600 1200		W W
Input Current	UX4 UX6		7.5 11.5		A
Inrush Current	230VAC @ 25°C UX6/UX4			25/50	A
Undervoltage Lockout	Shutdown	65		74	VAC
Power Factor	110 VAC @ Full Load	0.98	0.99		
Fusing	UX4 UX6	250V 250V	F8A HRC F12A HRC		
OUTPUT					
Parameter	Conditions/Description	Min	Nom	Max	Units
powerMod Power	As per powerMod table				
Output Adjustment Range	Manual: Multi-turn potentiometer. As per powerMod table Dynamic: As per powerMod table				
Minimum Load			0		A
Load & Cross Regulation	For 25% to 75% load change			±0.2	%
Transient Response	For 25% to 75% load change: Voltage Deviation; XgA-XgD Settling Time: XgA-XgD Voltage Deviation: XgE-XgL, Xg1-Xg8 Settling Time: XgE-XgL			2.5 500 10 250	% µs % µs
Ripple and Noise	20MHz 100mV or 1.0% pk-pk (except 150mV XgA)				
Overvoltage Protection	Latching	105		170	%
Overcurrent Protection	Straight line with hiccup activation at <30% of Vnom.	105		170	%
Line Regulation	For ±10% change from nominal line			±0.1	%
Remote Sense	Max. line drop compensation (except XgA, B, C, D, E, F)			0.5	VDC
Overshoot				2	%
Rise Time	Monotonic		15		ms
Turn-on Delay	From AC in and Global Enable powerMod Enable		700 2		ms ms
Hold-up Time	For nominal output voltages at full load.	15		20	ms
Output Isolation	Output to Output/Output to Chassis	500 / 500			VDC
GENERAL					
Parameter	Conditions/Description	Min	Nom	Max	Units
Isolation Voltage	Input to Output Input to Chassis	4000 1500			VAC VAC
Efficiency	230VAC, 1200W @ 24V		90	91	%
Safety Agency Approvals	EN60601-1 3rd Edition, UL60601-1, CSA601, UL File No. E230761 EN60950 2nd Edition, CSA C22.2 No. 60950-1, UL File No.E181875				
Leakage Current	250VAC, 60Hz, 25°C 250VAC, 60Hz, 25°C (Option 04)			300 150	µA µA
Weight	See weight calculators on Excelsys website				
Signals	See section 4.9 of catalogue				
Bias Supply	Always on, current 500mA	4.8	5.0	5.2	VDC
Reliability	Failures per million hours at 40°C and full load See Section 7.1 . powerPac excludes fans			0.958 0.92	fpmh fpmh
MTBF	UX4 with two XgA's @ full load. Telecordia SR-332 , Issue 1 May 2001, ground benign, ambient temperature of 40°C	670			kHours
EMC					
Parameter	Standard	Level			Units
Emissions					
Conducted	EN55011, EN55022, FCC		Class B		
Radiated	EN55011, EN55022, FCC		Class B		
Harmonic Distortion	EN61000-3-2 Class A		Compliant		
Flicker & Fluctuation	EN61000-3-3		Compliant		
Immunity					
Electrostatic Discharge	EN61000-4-2		Level 2		
Radiated Immunity	EN61000-4-3		Level 3		
Fast Transients-Burst	EN61000-4-4		Level 3		
Input Line Surges	EN61000-4-5		Level 3		
Conducted Immunity	EN61000-4-6		Level 3		
Voltage Dips	EN61000-4-11, SEMI F47 Compliant (1)		Compliant		
ENVIRONMENTAL					
Parameter	Conditions/Description	Min	Nom	Max	Units
Operating Temperature	Operates to specification below -20°C after 10 min warm-up	-40		+70	°C
Storage Temperature		-40		+85	°C
Derating	See Page 8 for full temperature deratings				
Relative Humidity	Non-condensing	5		95	%RH
Acoustic Noise	Measured from distance of 1m; UX4/UX6. See Page 58 of catalogue		39.8/42.7		dBA
Shock		60			G
Vibration	MIL-STD810G				
Altitude	Operational: 2000m, Storage: 8000m				

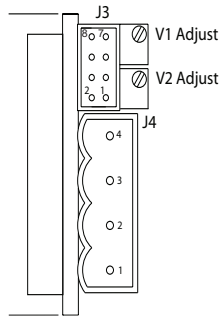
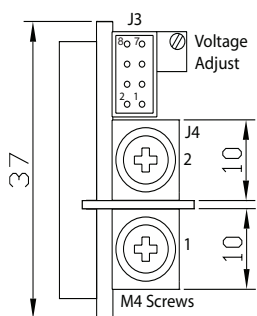
- NOTES**
1. SEMI F47 compliant at input voltages >160VAC. Consult Excelsys for details.
  2. Visit [www.excelsys.com](http://www.excelsys.com) for configuration and ordering and contact information.
  3. Product is not UL/EN certified for 120-380VDC input operation. Consult Excelsys for details.

**Output Connectors**

The output *powerMods* connection details are shown below. Type A connectors are for single output *powerMods* XgA-XgT and Xg1-Xg7. The Type B connector is for the dual output XgF/Xg8 *powerMod*. The power and signal connectors are as follows:

**Type A: *powerMods***  
XgA to XgE  
XgG to XgT  
Xg1 to Xg7

**Type B: *powerMod***  
XgF/Xg8



**Output Signals and Power Connector Pinout**

Pin	J3 (XgA to XgD)	J3 (XgG-XgT) (Xg1-Xg5)	J3 (XgE) (Xg7)	J3 (XgF) (Xg8)	J4 (Type A)	J4 (Type B)
1	not used	+Sense*	not used	-pg (V2)	-Vout	-V2
2	Common	-Sense*	not used	+pg (V2)	+Vout	+V2
3	not used	Vtrim	not used	Inhibit V2)		-V1
4	not used	Itrim	Common	Common (V2)		+V1
5	+Inhibit	+Inhibit/Enable	-pg	-pg (V1)		
6	-Inhibit	-Inhibit/Enable	+pg	+pg (V1)		
7	not used	+pg	Inhibit	Inhibit (V1)		
8	not used	-pg	Common	Common (V1)		

\*remote sense not present on XgR and XgT *powerMods*.

**Output Mating Connectors**

J3: Locking Molex 51110-0860; Non Locking Molex 51110-0850; Crimp Terminal: Molex p/n 50394. Or Molex 51110-0856, includes Locking Tab & Polarization Keying,

J4 (Type A): M4 Screw (8mm)

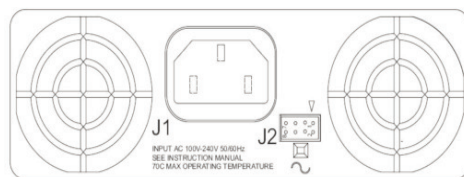
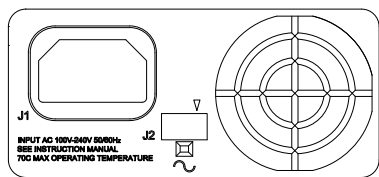
J4 (Type B) Connector(s): Camden CTB9200/4A

**Input Connectors**

The UltiMod series has a variety of input connector options to ease system integration. These include IEC, Input cables (3-wire) and IEC to Screw Terminal Adaptor.

**J1 & J2 Connectors UX4**

**J1 & J2 Connectors UX6**



Pin	J1	J2
1	Line	Common
2	Neutral	+5V Bias
3	Earth	not used
4		AC Fail
5		Fan Fail
6		Global Enable
7		Temp Alarm
8		Global Inhibit

**Input Mating Connectors**

J1: IEC320 type female plug rated 13, Locking IEC cable and connector: Schaffner EMC part number IL13-US1-SVT-3100-183.

J2: Locking Molex 51110-0860; Non Locking 51110-0850; Crimp Terminal: Molex p/n 50394: Or Molex 51110-0856, includes Locking Tab & Polarization Keying

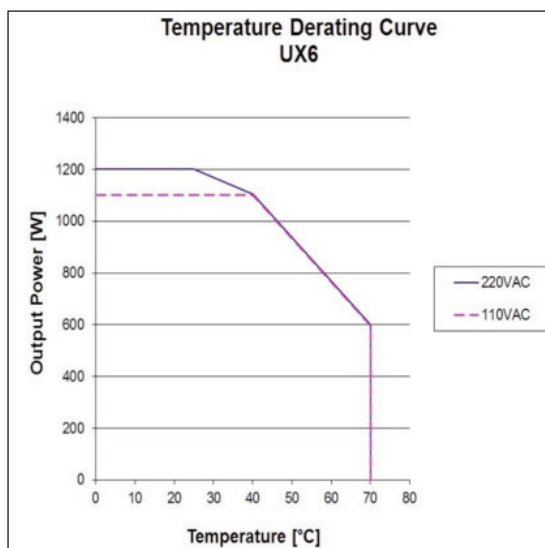
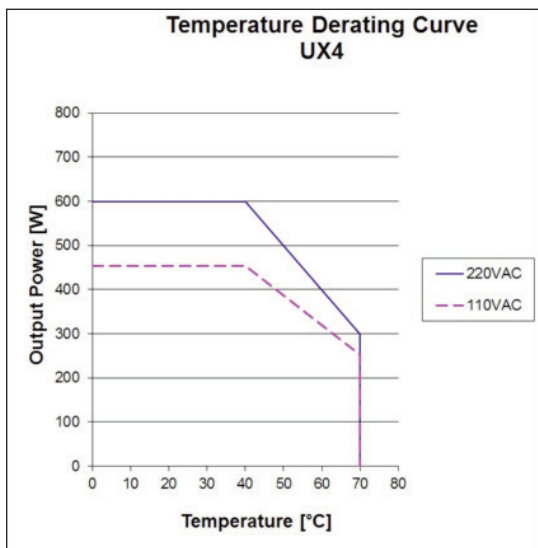
**Input Cable (Option D)**

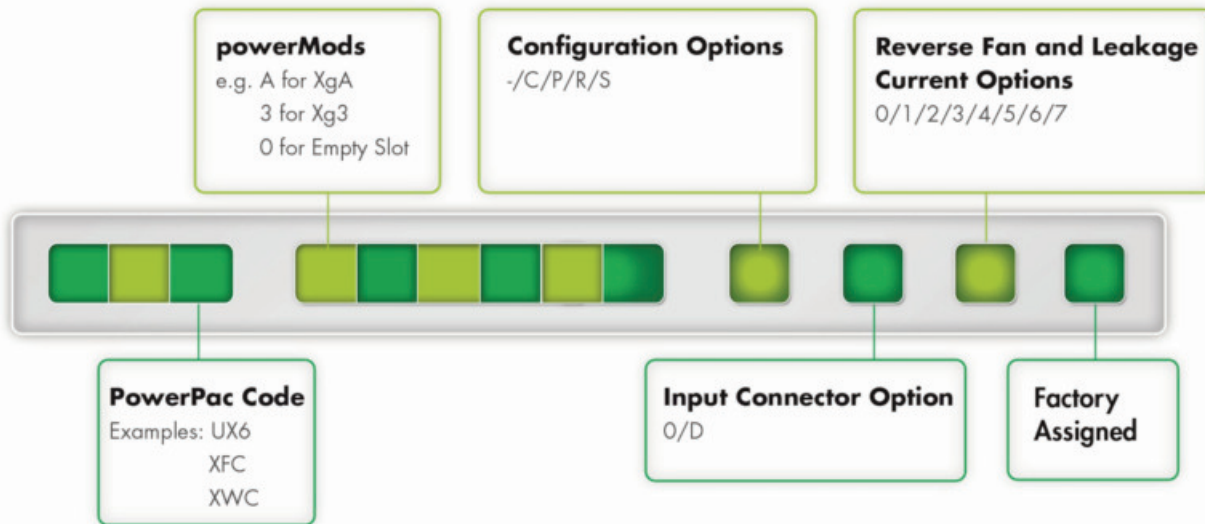
The UltiMod Series is also available with an input cable connection option allowing greater flexibility when mounting the UltiMod in the system. Individually insulated input cables are 300mm in length and come supplied with Faston connectors.

**IEC to Screw Terminal Adaptor**

Some applications may require a screw terminal input rather than the standard IEC320 connector provided with the UltiMod. For such applications, Excelsys can offer the XE1, the IEC to Screw terminal adaptor accessory plug. This is a press fit connector that plugs securely into the UltiMod *powerPac* and provides the system integrator with screw terminals for mains connection. Recommended IEC to Faston/Terminal Lugs Schurter P/N 4788.8000

**Derating Curves**





## Section 3.4 Configuring your Modular Power Supply

The Xgen and UltiMod series of user configurable power supplies combine feature rich AC input front-ends (powerPacs) with slide-in DC output modules (powerMods). The plug and play architecture allows system designers to define and build ‘instant’ custom power solutions with industry leading 17W/in<sup>3</sup> power density and up to 92% efficiency.

Configured units may be specified and ordered using the part

### OPTION CODES EXPLAINED

#### CONFIGURATION OPTIONS

- “-” Standard. No additional configuration  
Nominal output voltages and no options
- “C” Conformal Coating
- “P” Preset. Voltage Adjustments, Series, Parallel Outputs
- “R” Extra Ruggedisation for Shock and Vibration
- “S” Conformal Coating and Extra Ruggedisation for Shock and Vibration

#### INPUT CONNECTOR CONFIGURATOR OPTIONS

- “0” Standard IEC Input Connector
- “D” Input Cable Option

#### REVERSE FAN AND LEAKAGE CURRENT OPTIONS

- “0” Standard Thermal Signals + Fan Fail Signal Included
- “1” Standard Thermal Signals + Fan Fail Signal Included (Xgen models only)
- “2” Reverse Fan (Includes “0”)
- “3” Reverse Fan, Standard Thermal Signals + Fan Fail Signal Included (Xgen models only)
- “4” 150uA Leakage Current\*(medical models only, Includes “0”)
- “5” 150uA Leakage Current\*, Standard Thermal Signals + Fan Fail Signal Included (Xgen models only)
- “6” 150uA\* + Reverse Fan (medical versions only, Includes “0”)
- “7” 150uA Leakage Current\*, Reverse Fan, Standard Thermal Signals + Fan Fail Signal Included (Xgen models only)

### Specifying & Ordering Configured Power Supplies

Configured Units may be specified and ordered using the part numbering system shown opposite. At our configuration centre we will assemble the Power Supply as specified by you accounting for slot preferences and also for preferred settings (Voltage/Series/Parallel etc), and also incorporating any Options required.

Configuration example for UltiMod: part number UX4CGD0-D4 specifies the following product;

- UX4 powerPac – 600W (Medical & Industrial)
- Slot 1: XgC: 36V/5.6A powerMod
- Slot 2: XgG: 2.5V/40A powerMod
- Slot 3: XgD: 48V/4.2A powerMod
- Slot 4: empty
- Option D (input cable) & Option 4 (150uA Leakage current)

Configuration example for XF: part number XFC2DK4BHS01 specifies the following product;

- XFCS01 powerPac - 1000W (includes options S & 1 as standard)
- Slot 1: Xg2C 5V/40A powerMod
- Slot 2: XgDC 48V/4.2A powerMod
- Slot 3: XgKC 24V/9.2A powerMod
- Slot 4: Xg4C 24V/10A powerMod
- Slot 5: XgBC 24V/8.3A powerMod
- Slot 6: XgHC 5V/36A powerMod

Configuration example for Xgen: part number XVD2345F0-D4 specifies the following product;

- XVD powerPac - 1200W (Medical)
- Slot 1: Xg2:5V/40A powerMod
- Slot 2: Xg3:12V/20A powerMod
- Slot 3: Xg4:24V/10A powerMod
- Slot 4: Xg5:48V/6A powerMod
- Slot 5: XgF:24V/3A, 24V/3A powerMod
- Slot 6: empty
- Option D (input cable) & Option 4 (150uA Leakage current)

\*UltiMod comes with Thermal and Fan Fail signals as standard

\*With 150uA Leakage Current (Option 4) some external filtering may in certain cases be needed to meet system level EMC specifications. Consult Excelsys for support.

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