



## Instruction Manual

**PLEASE READ THIS INSTRUCTION MANUAL CAREFULLY BEFORE INSTALLATION OR USE OF THIS PRODUCT, AND KEEP IT IN A SAFE PLACE FOR FUTURE REFERENCE. FOLLOW ALL WARNINGS AND INSTRUCTIONS MARKED ON THE PRODUCT.**

<b>powerPacs</b>		
<b>Xf</b>	Hi-Rel COTS	400W-1000W
<b>Xi, Xc</b>	Standard	200W-1340W
<b>Xm, Xv</b>	Medical	200W-1340W
<b>Xh</b>	High Temperature	400W-600W
<b>Xq, Xk</b>	Lo-Noise Standard	200W-1200W
<b>Xr, Xz</b>	Lo-Noise Medical	200W-1200W
<b>Xt, Xb</b>	Ultra Quiet Standard	200W-800W
<b>Xn, Xw</b>	Ultra Quiet Medical	200W-800W
<b>UX</b>	Standard & Medical	400W, 900W & 1200W
<b>powerMods</b>		
<b>Xg1, Xg2, Xg3, Xg4, Xg5, Xg7, Xg8</b>		1.0V to 58V
<b>XgA, XgB, XgC, XgD, XgE, XgF, XgG, XgH, XgJ, XgK, XgL, XgM, XgN, XgP, XgQ, XgR, XgT</b>		

UltiMod and Xgen Series products are comprised of:

**powerPac Chassis Converters** intended for use in Xgen and UltiMod series ONLY. These must NOT be used for any other purpose.

and

**powerMod Plug-In Modules** intended for use in Xgen and UltiMod series ONLY. These must NOT be used for any other purpose.

### HIGH VOLTAGE WARNING!

Dangerous voltages are present within these power supplies. These products should only be worked on by qualified personnel.

UltiMod and Xgen Series products are designed for use within other equipment or enclosures, which restrict access to **authorised competent personnel only**. The unit covers are designed only to protect skilled personnel from hazards. They must not be used as part of the external covers of any equipment where they may be accessible to operators, since, under full load conditions, part or parts of the unit may reach temperatures in excess of those considered safe for operator access.

#### IMPORTANT CONSIDERATIONS

The powerPac should be supplied only by a power source of the type indicated on its label. A socket outlet shall be installed near the equipment and shall be easily accessible. The unit should only be used with a suitably rated mains cord and appropriate IEC320 type connector, sourced by the end user, and in accordance with the requirements of Table 3B of IEC60950-1 (latest edition). If in doubt, contact Excelsys Engineering Department for assistance. For installations in accordance with IEC 60601-1, the Neutral input supply lead must be provided with a suitable fuse protection device. See the Fuse table below for details. When adding or removing *powerMods* from the *powerPac*, care must be taken to handle the *powerMods* by the output terminals ONLY, ensuring that all other surface mount components are not unduly damaged.

When securing the product, do not use screws which infringe the maximum penetration depth of 6mm. Customer fixings are provided on the base of the unit in addition to the Excelsys 'fleximount' system which allows the unit to be mounted on either side of the *powerPac* chassis. Both series of power supplies have integral fans and may be mounted in any orientation provided that the air intake and air outlet areas are not impeded with particular regard paid to provide ventilation holes in any chassis on which or near which the unit is mounted. AFTER DISCONNECTING THE AC SOURCE, ALLOW 4 MINUTES BEFORE DISASSEMBLY TO ALLOW CAPACITORS WITHIN THE UNIT TO DISCHARGE.

#### INPUT SPECIFICATIONS (powerPac only)

Input Voltage Range	100 to 240Volts AC
Input Frequency	50/60 Hz
Earth Leakage Current	1.5mA Xi, Xc, Xh, Xq, Xk, Xt, Xb, Xf, UXS 300µA Xm, Xv, Xr, Xz, Xn, Xw, UX, UXX

#### Input Fusing

**WARNING! To protect against risk of fire, replace only with fuses of same rating and type. Fuses must be replaced by qualified service personnel only.**

Model	Reference	Fuse	Type	Voltage	Size
XLA, XKA, XMA, XRA, XTA, XNA	FS1	5A	F	250V	5.0 X 20mm
XLB, XKB, XMB, XRB, XTB, XNB, UXS	FS1	6.3A	F	250V	5.0 X 20mm
XLC, XLD, XKC, XRC, XMC, XMD, UX4	FS1	8A	F	250V	5.0 X 20mm
XCA, XFA, XVA, XQA, XHA, XZA, XBA, XWA	FS1	8A	F	250V	6.25 X 32mm
XCB, XFB, XVB, XHB, XBB, XBC, XWB, XWC	FS1	10A	F	250V	6.25 X 32mm
XCC, XCD, XFC, XFN, XVC, XVD, XQB, XQC, XZB, XZC, UX6, UXX	FS1	12A	F	250V	6.25 X 32mm
XCE, XVE	FS1	15A	F	250V	6.25 X 32mm

#### OUTPUT SPECIFICATIONS (powerMod only)

See *powerMod* table below, with more detail in Designers' Manual. Each module may be adjusted over the full voltage range shown in the table **subject to not exceeding the maximum rated Voltage and Power shown in the table.**

#### SAFETY

The Xgen and UltiMod when correctly installed in a limited access environment are designed to comply with the following requirements  
Xi, Xc, Xh, Xq, Xk, Xb, Xt, Xf, UX, UX4, UX6, UXS, UXX :UL60950-1,CAN/CSA C22.2 No.60950-1-07, IEC60950-1, EN60950-1 and IEC61010  
Xm, Xv, Xz, Xr, Xn, Xw, UX4, UX6: ANSI/AAMI ES60601-1, CAN/CSA C22.2 No.60601-1, IEC 60601-1, EN60601-1 and IEC61010

For current approval status, please contact Excelsys Sales. Equipment manufacturers must protect service personnel against inadvertent contact with the module output terminals.

#### Environmental Parameters

The products are designed for the following parameters:

- Pollution Degree 2
- Installation Category 2
- Class I
- For use as part of another piece of equipment such that unit is accessible to service engineers only
- Altitude: -155 metres to +2000 metres from sea level
- Humidity: 10 to 95% non-condensing
- Operating temperature 0°C to 70°C
- Derate at 1.67% per °C above 40°C and up to 70°C
- Derating applies to both *powerPacs* and *powerMods*

#### Approval Limitations

##### Use In North America

When this product is used on 180 to 253 Volts AC mains with no neutral, connect one live wire to L (live) terminal and the other live wire to N (neutral) terminal on the input connector. For installation in accordance with UL60601-1 and UL60950-1 the wires connected to the Neutral terminal must be provided with a suitable fuse protection device. See Fuse Table.

The attachment plug shall be rated to a current not less than 125% of the rated current of the equipment.

#### Levels Of Insulation

Subject to the limitations above

##### Xi, Xc, Xh, Xk, Xq, Xt, Xb and Xf and UXS

- Primary mains circuits to earth: 2.5mm spacing
- Primary mains circuits to secondary: 5mm spacing

Dielectric strength testing is carried out as follows:

- Primary mains circuits to chassis: 1500V AC
- Primary mains circuits to secondary: 3000V AC.

##### Xm, Xv, Xr, Xz, Xn and Xw, UXX and UXX

- Primary mains circuits to earth: 4mm spacing
- Primary mains circuits to secondary: 8mm spacing

Dielectric strength testing is carried out as follows:

- Primary mains circuits to chassis: 1500V AC
- Primary mains circuits to secondary: 4000V AC.

#### Earth Terminal Marking IMPORTANT

If in the end use equipment the incoming mains cable earth wire connects directly to the Xgen/UltiMod "GND" connection without being interrupted or junctioned on its way to that connection, then this connection forms the main protective earth of the system. To comply with IEC60950-1 or IEC60601-1 requirements this must be marked with the symbol defined in the IEC60417 No.5019a. The customer should therefore affix an adhesive label which will pass the 15 Second rub test (IEC60950-1 section 1.7.13) showing the symbol here adjacent to the earth connection. This symbol must only be used at the first interruption /connection of the incoming earth wire.

#### Health And Safety At Work Act (UK only)

To protect service personnel and users and to comply with section 6 of the Health And Safety Acts, a clearly visible label should be fitted warning that surfaces of these units may be hot and must not be touched when the units are in operation.

#### Receipt And Unpacking

On receipt a unit should be unpacked carefully and checked for transit damage. If the unit is damaged, do not apply power or install the unit. SEEK SPECIALIST ADVICE!

#### Warranty

Warranty conditions are contained in our standard terms and conditions. Contact your authorised outlet for repair.

#### Unused Slots

UNUSED SLOTS MUST ALWAYS BE FITTED WITH APPROPRIATE SLOT COVERS XB1, XB2 or XB3. Units must NOT be operated with empty slots.

#### Options

##### Thermal Signals (Option 01 - Standard on UX4 and UX6)

Temperature Alarm & Fan Fail and Open Collector signal indicators.

##### Reverse Fan (Option 02)

1200W models are derated to maximum 1000W when the reverse fan option is used.

XCE/XVE model with Reverse Fan derate from 1250W at 210VAC to 980W at 100VAC

XLD/XMD model with Reverse Fan derate from 750W at 210VAC to 500W at 100VAC

XFC/XFN model with Reverse Fan derate from 850W at 120VAC to 750W VAC at 100VAC

XgA, XgB, XgC & XgD when used in XCE/XVE Model with Reverse Fan derate by additional 10% for full range of Line Voltage 100VAC to 240VAC

##### Low Leakage Current (Option 04)

See Designers' Manual for details.

##### Input Cable

Input Cable and Connector Option.

#### powerMods

Model	Vmin	Vnom	Vmax	Imax	Watts	Watts <sup>(1)</sup>	Watts <sup>(2)</sup>
Xg1	1.5	2.5	3.6	50	125	104	65
Xg2	3.2	5.0	6.0	40	200	166	100
Xg3	6.0	12.0	15.0	20	240	200	120
Xg4	12.0	24.0	30.0	10	240	200	120
Xg5	28.0	48.0	58.0	6	288	240	144
Xg7	5	24.0	28.0	5	120	100	60
Xg8	5/5	24/24	28/28	3/3	72/72	60/60	36/36
XgA	10.8	12	15.6	12.5	150	125	75
XgB	19.2	24	26.4	8.33	200	166	100
XgC	28.8	36	39.6	5.56	200	166	100
XgD	38.4	48	50.4	4.17	200	166	100
XgE	5	24	28	5	120	100	60
XgF	5/5	24/24	28/28	3/3	72/72	60/60	36/36
XgG	1.5	2.5	3.6	40	100	83	50
XgH	3.2	5	6	36	180	150	90
XgJ	6	12	15	18.3	220	184	100
XgK	12	24	30	9.16	220	184	100
XgL	28	48	58	5	240	200	120
XgM	1.0	5.0	6.0	40	200	166	100
XgN	1.0	12.0	15.0	20	240	200	120
XgP	1.0	24.0	30.0	10	240	200	120
XgQ	1.0	48.0	58.0	6	288	240	144
XgR	12.0	24.0	30.0	10	240	200	120
XgT	28.0	48.0	58.0	6	288	240	144

*powerMod* maximum power ratings must not be exceeded

#### Notes:

1. Derating values for *powerMods* when used with the Xb, Xn, Xt, Xw Ultra Quiet Models

2. Derating values for *powerMods* when used with the XHA and XHB High Temperature Models

#### Permitted Power Ratings for Reliable Operation.

*powerPacs* and *powerMods* are operating within their power ratings as listed above, taking care to factor in the appropriate derating if the ambient temperature exceeds 40°C (except for Xn models).

Family	Model	Watts	L x H x W (mm)
<b>Xi</b>	XLA	200W	260 x 40.4 x 89
	XLB	400W	260 x 40.4 x 89
	XLC	600W <sup>(1)</sup>	260 x 40.4 x 89
	XLD	750W <sup>(2)</sup>	268 x 40.4 x 89
<b>Xk</b>	XKA	200W	260 x 40.4 x 89
	XKB	400W	260 x 40.4 x 89
	XKC	600W <sup>(1)</sup>	260 x 40.4 x 89
<b>Xc</b>	XCA	400W	260 x 40.4 x 127
	XCB	700W	260 x 40.4 x 127
	XCC	1000W <sup>(3)</sup>	260 x 40.4 x 127
	XCD	1200W <sup>(4)</sup>	260 x 40.4 x 127
	XCE	1340W <sup>(5)</sup>	268 x 40.4 x 127
<b>Xf</b>	XFA	400W	268 x 40.4 x 127
	XFB	700W	268 x 40.4 x 127
	XFC	1000W <sup>(6)</sup>	268 x 40.4 x 127
	XFN	1000W <sup>(6)</sup>	268 x 40.4 x 127
<b>Xm</b>	XMA	200W	260 x 40.4 x 89
	XMB	400W	260 x 40.4 x 89
	XMC	600W <sup>(1)</sup>	260 x 40.4 x 89
	XMD	750W <sup>(2)</sup>	268 x 40.4 x 89
<b>Xr</b>	XRA	200W	260 x 40.4 x 89
	XRB	400W	260 x 40.4 x 89
	XRC	600W <sup>(1)</sup>	260 x 40.4 x 89
<b>Xv</b>	XVA	400W	260 x 40.4 x 127
	XVB	700W	260 x 40.4 x 127
	XVC	1000W <sup>(3)</sup>	260 x 40.4 x 127
	XVD	1200W <sup>(4)</sup>	260 x 40.4 x 127
	XVE	1340W <sup>(5)</sup>	268 x 40.4 x 127
<b>Xh</b>	XHA	400W	260 x 40.4 x 127
	XHB	600W	260 x 40.4 x 127
<b>Xq</b>	XQA	400W	260 x 40.4 x 127
	XQB	900W	260 x 40.4 x 127
	XQC	1200W <sup>(4)</sup>	260 x 40.4 x 127
<b>Xz</b>	XZA	400W	260 x 40.4 x 127
	XZB	900W	260 x 40.4 x 127
	XZC	1200W <sup>(4)</sup>	260 x 40.4 x 127
<b>Xb</b>	XBA	400W	260 x 40.4 x 127
	XBB	600W	260 x 40.4 x 127
	XBC	800W <sup>(6)</sup>	260 x 40.4 x 127
<b>Xt</b>	XTA	200W	260 x 40.4 x 89
	XTB	400W <sup>(7)</sup>	260 x 40.4 x 89
<b>Xw</b>	XWA	400W	260 x 40.4 x 127
	XWB	600W	260 x 40.4 x 127
	XWC	800W <sup>(6)</sup>	260 x 40.4 x 127
<b>Xn</b>	XNA	200W	260 x 40.4 x 89
	XNB	400W <sup>(7)</sup>	260 x 40.4 x 89
<b>UX</b>	UX4	600W <sup>(1)</sup>	260 x 40.4 x 89
	UX6	1200W <sup>(4)</sup>	260 x 40.4 x 127
	UXX	900W	260 x 40.4 x 127
	UXS	400W	260 x 40.4 x 89 <sup>(9)</sup>

(1)Derate linearly from 600W at 200Vac to 410W at 100Vac nom.

(2)Derate linearly from 750W at 140VAC to 550W at 100Vac nom.

(3)Derate linearly from 1000W at 134Vac to 900W at 100Vac nom.

(4)Derate linearly from 1200W at 134Vac to 900W at 100Vac nom.

(5)Derate linearly from 1340W at 210Vac to 1070W at 100Vac nom.

(6)Derate linearly from 800W at 134Vac to 650W at 100Vac nom.

(7)Derate linearly from 400W at 134Vac to 315W at 100Vac nom.

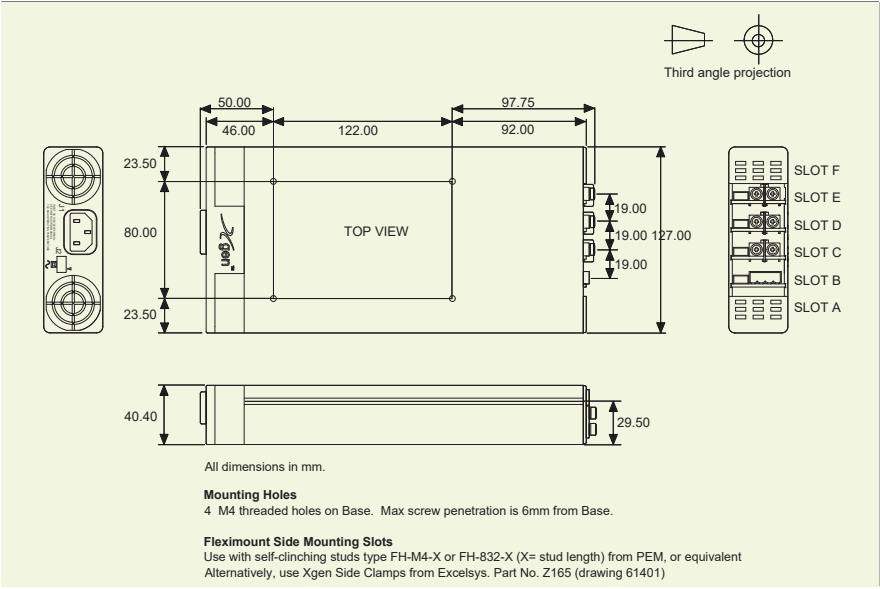
(8) Derate linearly from 1000W at 134Vac to 867W at 100Vac nom.

(9)Overall length 270mm when inserts fitted.

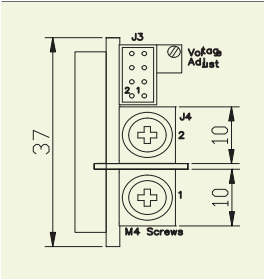
#### Note

A French translation of this Instruction Manual is also available; document number 40115. Contact sales@excelsys.com for a copy of this.

Connectors and Pin-Outs



powerMod Type A



J1: Input Mains Connector  
IEC320

Note: For use in ambient temperatures >60C, a hot condition mating connector and cable must be used.

Input Cable and Connector  
input cable optional  
Line: Connector Faston Receptacle 6.3 x 0.8mm  
Neutral: Connector Faston Receptacle 6.3 x 0.8mm  
Earth: Connector Crimp Terminal Ring M3

J2: powerPac Signal Connector

Pin	J2 powerPac
1	Common
2	+5V Bias
3	
4	AC Fail
5	Fan Fail
6	Global Enable
7	Temp Alarm
8	Global Inhibit

Mating parts:  
HousingMolex p/n 51110  
Crimp Terminal Molex p/n 50394

J3: powerMod Signal Connector

Pi	Type A	Type A	Type B
	Xg1-Xg5	XgA-XgD	Xg7 & XgE - V1 only
	XgG-XgT		Xg8 & XgF - V1 & V2
1	+Sense	Not Used	- PG (V2)
2	-Sense	Common	+PG (V2)
3	Vtrim	Not Used	Inhibit (V2)
4	Itrim	Not Used	Common (V2)
5	+Inhibit/Enable	Inhibit+	-PG (V1)
6	-Inhibit/Enable	Inhibit-	+PG (V1)
7	+Power Good	Not Used	Inhibit (V1)
8	- Power Good	Not Used	Common (V1)

Mating parts:  
HousingMolex p/n 51110  
Crimp TerminalMolex p/n 50394

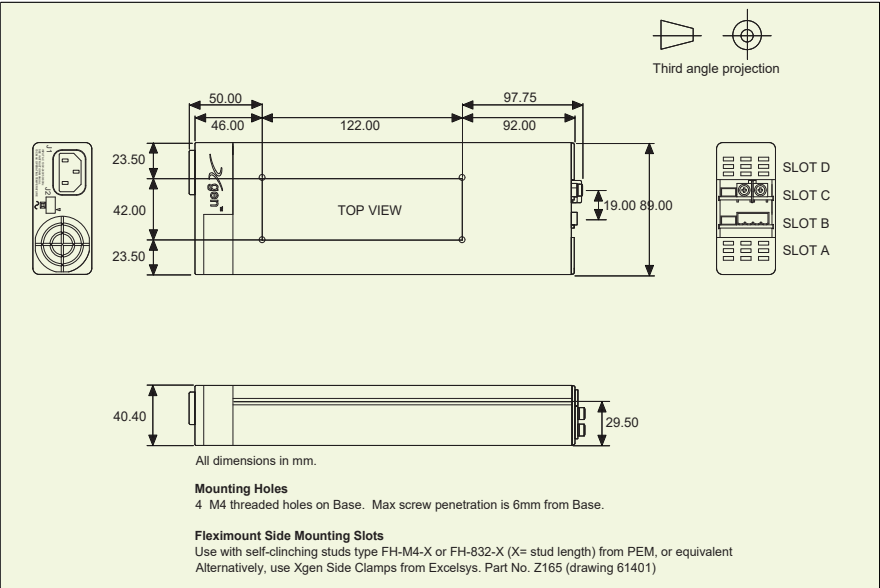
J4: powerMod Output Connector

Pin	Type A	Type B
1	-Vout	- V2
2	+Vout	+V2
3		-V1
4		+V1

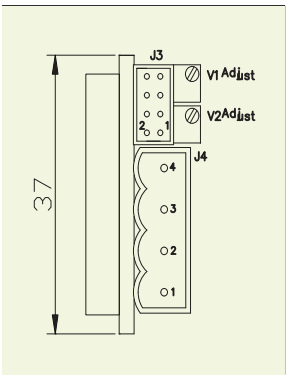
Type A : M4 Screw Terminals  
Type B : Mating part:  
Camden - CTB9200/4A

Note: Cables must be rated 105°C minimum.

Note: XCE, XVE, XFA, XFB, XFC, XFN dimensions L=268mm



powerMod Type B



Note: XLD, XMD dimensions L=268mm

Labeling and Model Numbers

powerMod  
powerMod labels contain:  
..Minimum, Nominal & Maximum voltage adjustment range.  
..Maximum current (Imax)  
..Maximum power (Watts)  
..Model number  
Model numbers are easily identified by the number marked on the top of signal connector J3.

powerPac  
powerPac labels contain:  
..Input Freq  
..Input Voltage  
..Fuse rating  
..Serial Number  
..Maximum combined power rating of inserted powerMods  
..Maximum Line current under rated conditions  
..Model Number in the format XCD □ □ □ □ □ - 01 as an example for a 1200W Xc model, with optional Thermal Signals.

When the powerPac has no powerMods inserted, its Model number is simply XCD-01.

When the powerPac has one or more powerMods inserted, its model number may be easily read to be XCD012340-01 as an example, where powerMods Xg1, Xg2, Xg3, Xg4 are inserted in Slots B,C,D,E respectively with slot covers in the remaining slots A and F.

Configuration Considerations

1. When parallel connecting outputs, refer to Section 4.6 of Product catalogue for set-up, including Vtrim adjust and I-Share switch.
2. When connecting outputs in series to achieve voltages in excess of 59VDC (SELV), ensure that appropriate safety precautions are taken in the system.
3. Before removing and replacing output modules, remove input power for 2 minutes.
4. For proper connection to Inhibit, Enable, Fan Fail, Over Temp alarm, and Output Signals Power Good refer section 4.7 and 4.9 of Product Catalogue.
5. For power derating, refer to Section 4.11 of Product Catalogue.
6. For motor loads, high inductance, and high capacitance: blocking diode may be needed. Contact Excelsys for support.  
Refer to the Product Series Catalogue for information on all the above and additional information regarding the set, installation and operation of the UltiMod and Xgen Series.

Excelsys Technologies Ltd. reserves the right to alter or improve the specification, internal design or manufacturing process without notice. Please check with your Excelsys representative or visit [www.excelsys.com](http://www.excelsys.com) to ensure that you have the current and complete specification for your product before use. For information and instructions on use, please consult the Designers' Manuals for these products at [www.excelsys.com](http://www.excelsys.com).

UltiMod and Xgen Series Part Numbering System

