Measurably better value

DESIGNED IN THE UK · MANUFACTURED IN THE UK

Single & dual output PowerFlex DC PSUs

High performance autoranging outputs

True analog controls with digital functionality

Isolated tracking for easy series/parallel use

CPX SERIES

360W to 840W

DC Power Supplies

aimtti.com

CPX SERIES
POWERFLEX DC PSU'S

PowerFlex Range control

Custom Limits enables the analogue controls to cover any voltage or current range.

True analog controls make adjustment quick and simple.

S-Lock digitally locks voltage and current settings at the touch of a button.

Selectable fixed range control

High accuracy four digit meters have a fixed resolution for consistent readings at-a-glance.

'Both On/Off' provides synchronous switching of the outputs.

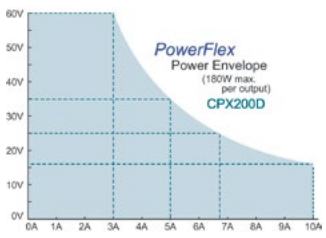
Isolated voltage tracking facilitates tracking voltage rails or control for series or parallel wiring (120V max. or 40A max.)

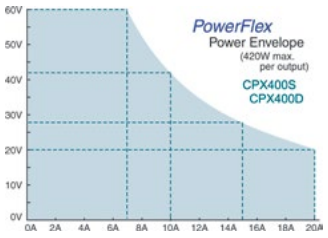
The CPX series is designed to meet the need for flexibility in the choice of voltage and current.

The TTi PowerFlex design of the CPX series enables higher currents to be generated at lower voltages within an overall power limit envelope. (see power curve).

A conventional PSU has a fixed limit giving a power capability that reduces directly with the output voltage (see power curve).

Example voltage & current combinations for the CPX400D include 60V/7A, 42V/10A, 28V/15A, and 20V/20A.





FEATURES SUMMARY

- PowerFlex design gives variable voltage and current combinations within a maximum power envelope
- PowerFlex or fixed-range operation plus custom limits
- Low output noise and good transient response
- True analogue controls with digital settings locking
- Constant voltage or constant current operation
- Independent outputs or isolated voltage tracking (dual)
- Outputs can be wired in series or parallel for 120V or 40A (20A for CPX200 models)
- Safety binding-post terminals
- Duplicate terminals at rear on CPX400SA, SP & DP
- Selectable remote sensing
- 4 digit fixed resolution meters.
- Isolated analogue control interface (CPX400SA only)
- GPIB*, RS-232, USB and LAN interfaces with LXI compliance (CPX400SP & CPX400DP only)
- Compact ½ rack 3U case (dual) or ¼ rack 3U case (single)

Model	Outputs	Voltage / Current	Power	Interfaces
CPX200D	Two	2 x (0 to 60V / 0 to 10A*)	360W	-
CPX200DP	Two	2 x (0 to 60V / 0 to 10A*)	360W	RS232, USB LAN, GPIB*
CPX400S	One	0 to 60V / 0 to 20A*	420W	-
CPX400SA	One	0 to 60V / 0 to 20A*	420W	Isolated Analog
CPX400SP	One	0 to 60V / 0 to 20A*	420W	RS232, USB LAN, GPIB*
CPX400D	Two	2 x (0 to 60V / 0 to 20A*)	840W	-
CPX400DP	Two	2 x (0 to 60V / 0 to 20A*)	840W	RS232, USB LAN, GPIB*

*GPIB Optional

ANALOG CONTROLS WITH DIGITAL STABILITY

As technology has changed, many products have moved from analog controls to digital ones. Although digital controls suit many instruments, they do not necessarily suit a bench power supply. Customer research shows that many users prefer the speed and simplicity of conventional analog controls for setting voltage and current. Digital controls may offer greater precision, but often at the expense of ease-of-use. With this in mind, the CPX400 series retains the true analog controls of its predecessor. The settings of traditional analog potentiometers can drift over time. More importantly, the settings can be changed accidentally with potentially serious consequences.

The CPX series now incorporates S-Lock. One press of the Lock button transfers control of voltage and current from the analog controls to internal digital circuitry. This offers not just complete security, but exceptional stability as well with each setting controlled by an instrumentation quality DAC.

ISOLATED VOLTAGE TRACKING FOR MAXIMUM FLEXIBILITY

The two outputs of the CPX are completely independent and electrically isolated from each other.

With V-Track selected, the two outputs remain electrically isolated, but the voltage control of the Master output sets an identical voltage on the Slave output.

This enables the user to create two rails of either polarity and to reference them to different grounds if necessary (e.g. digital ground and analog ground). Alternatively, the outputs can be wired in series or parallel to create a voltage capability up to 120V or a current capability up to 40A with the voltage set using a single control.

SAFETY BINDING-POST TERMINALS

All CPX series power supplies are fitted with the new TTi designed output terminals. As well as acting as conventional binding posts for bare wires, spade connectors, or standard 4mm plugs, these can accept a 4mm safety plug with rigid insulating sleeve, a requirement specified by an increasing number of laboratories for safety reasons.

Limited opening length combined with raised insulated shoulders also make these terminals “touch proof” for voltages up to 250V

LOW NOISE AND GOOD DYNAMIC RESPONSE

The PowerFlex regulation system used on the CPX series combines a high frequency pre regulator with a linear post regulator to give both low noise and good transient response. Each output can operate in constant voltage or constant current mode with automatic crossover and mode indication.

INDEPENDENT AND SIMULTANEOUS OUTPUT CONTROL

The Both On/Both Off button is in addition to the individual switches for each output, and allow both outputs to be turned on or off synchronously by a single button press.

Synchronous switching of the outputs is of increasing importance for circuitry which can be damaged if one voltage rail is present without the other.

PRECISION METERING AND REMOTE SENSE

Separate voltage and current meters on each output give a resolution of 10mV and 10mA. The fixed resolution avoids the misinterpretation of readings that can occur with auto-ranging 3 or 3½ digit meters where the decimal point position moves as the reading changes.

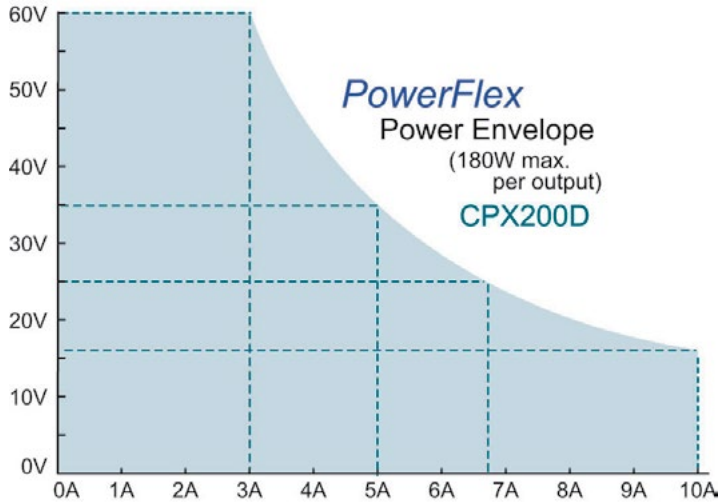
Coarse and fine voltage controls are provided. The current control is logarithmic enabling low current levels to be set accurately. A View Settings button enables limit settings to be checked and adjusted at any time.

Each output incorporates remote sense terminals that can be enabled or disabled at the flick of a switch. Remote sensing is essential for maintaining precise regulation at the load and true metering of the load voltage.

COMPACT DESIGN USES MINIMUM BENCH OR RACK SPACE

Despite the high power output of up to 840 watts, the CPX has a small bench footprint taking up less space on a crowded bench.

For rack-mount applications the half-rack case size enables two units (providing four outputs) to be fitted into a single rack slot using RM460, available to order from the manufacturer or their overseas agents.



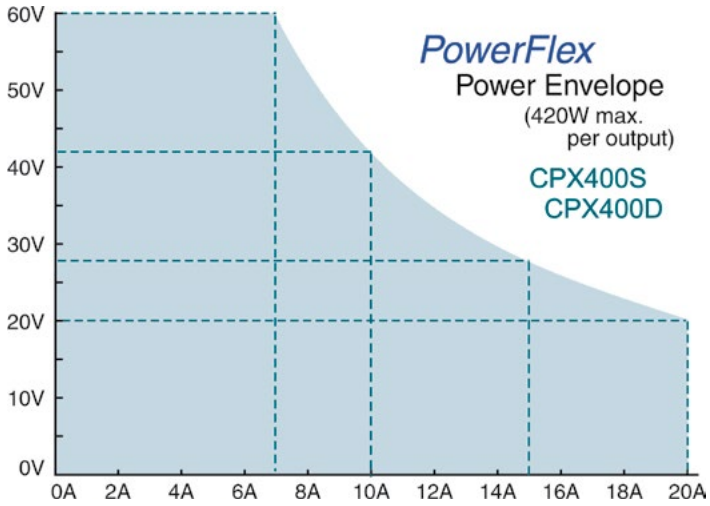
RANGE CONTROL OFFERS EVEN MORE FLEXIBILITY

As an alternative to PowerFlex operation (60V/20A-10A subject to a power limit), the CPX series can be used as conventional fixed range power supply at the press of a button.

Fixed range mode ensures that, whatever the load, the output can only be in constant voltage or constant current mode and never in power limit. Finer resolution is provided on the current or voltage controls respectively.

Full customisation of voltage and current limits which can be set to suit the user's application. This has the advantage that the controls cover the exact voltage and current range required, providing easier setting and reduced risk of error.

For example, the range could be set to 30V and 14A to create a 30 volt PSU of maximum current capability. Alternatively, it could be set to 5V and 3A if this was all that was required for a particular application.



CPX400S - SINGLE OUTPUT, ULTRA COMPACT DESIGN

The CPX400S is a single output version of the CPX400D providing up to 60 volts and 20 amps within its 420 watt power envelope.

It is housed in a ¼ rack width 3U high case that uses the minimum possible space for either bench use or rack mounting.

CPX400SA - ISOLATED ANALOGUE REMOTE CONTROL

Some applications require analogue remote control rather than digital. The CPX400SA has fully galvanically isolated voltage driven remote control for both voltage and current. In addition, voltage and current front panel settings are provided as non-isolated control voltages, enabling master-slave configurations to be used.

CPX200D - 360W DUAL

PowerFlex extends maximum voltage to 60 volts, whilst the maximum current of 10 amps is available up to 16 volts. Compact ½ rack 3U case for bench use or rack mounting with duplicate terminals at rear on CPX200DP.

SPECIFICATION	CPX200D & CPX200DP	CPX400S, CPX400SA, CPX400SP, CPX400D & CPX400DP
OUTPUT SPECIFICATIONS (each output)		
VOLTAGE/CURRENT/POWER LEVELS		
Voltage Range:	0V to 60V.	
Current Range:	0A to 10A.	0A to 20A.
Note: Actual maxima for voltage and current are typically 1% greater than the figures given above.		
Power Range:	Up to 180W subject to power envelope.	Up to 420W subject to power envelope.
Power Envelope	The maximum current at any voltage settings is limited by the power envelope which is set to give 3A at 60V rising to 10A at 16V under all ac supply conditions (both outputs loaded). At lower output voltages the power is restricted by the 10 amps current maximum. See PowerFlex power envelope graph.	The maximum current at any voltage settings is limited by the power envelope which is set to give 7A at 60V rising to 20A at 20V under all ac supply conditions (both outputs loaded). At lower output voltages the power is restricted by the 20 amps current maximum. See PowerFlex power envelope graph.
OUTPUT SETTING & CONTROL		
Voltage Setting:	By coarse and fine controls.	
Current Setting:	By single logarithmic control.	
Output Mode:	Constant voltage or constant current with automatic cross-over. CC indicator lit in constant current mode.	
Output Switch:	Electronic, non isolating. Preset voltage and current limit displayed when Output is off. Output rise time no load <10ms.	
View Settings:	With the output On, the meters show actual voltage and current. The preset levels can be viewed and adjusted at any time by pressing the View Settings button.	
Status Indication:	LED indication of Output On, V/I Limits, CV, CI, Power Limit, Remote, LAN status. Message on meter display for trip condition.	
S-LOCK		
(Settings Lock) Voltage and current settings can be locked by a single button press. Lock accuracy is equal to the meter accuracy (see Meter Specifications).		
OUTPUT PERFORMANCE		
Ripple & Noise:	Typically <1mV rms, <15mV pk-pk, (3mV rms max.)- CV mode.	Typically <3mV rms, <15mV pk-pk, (5mV rms max.)- CV mode.
Load Regulation:	Voltage - <0·01% of maximum output for any load change within the PowerFlex envelope (remote sense connected). Current - <0·05% of maximum output for any load change within the PowerFlex envelope.	
Line Regulation:	Voltage - <0·01% of maximum output for a 10% line change. Current - <0·01% of maximum output for a 10% line change.	
Transient Response:	<250µs to within 50mV of setting for a 5% to 95% load change.	
Temp. Coefficient:	Typically <100ppm/°C	
OUTPUT PROTECTION		
Output Protection:	Forward protection by Over-voltage Protection (OVP) trip. Reverse protection by diode clamp for currents to 3A.	
OVP Setting/Range:	1V to 66V set by front panel screwdriver adjustment or via the remote interfaces (CPX-P only). Setting resolution: 100mV. Accuracy: ± (1% of setting ± 200mV). Response time: Typically 1ms. Maximum voltage that should be applied across the terminals is 70V	
OCP Setting/Range:	Measure-and-compare over-current protection is implemented in firmware and can only be set via the remote interfaces (CPX-P only). Setting resolution: 10mA. Accuracy: ± (0.3% of setting ± 30mA).Response time: typically 500ms. CPX-D=OCP fixed at 11A, CPX-S/SA=OCP fixed at 22A.	
Over-temperature:	Output trips off for over-temperature.	
Safety Interlocks:	Operations that could cause an unexpected change in voltage or current settings are interlocked with the output switch.	
OUTPUT CONNECTIONS		
Output Terminals:	Universal 4mm safety binding posts on 19mm (0·75”) spacing at front. Screw terminals at rear (CPX200DP, CPX400SA, CPX400SP, CPX400DP only).	
Terminals can accept fixed shroud 4mm plugs, standard 4mm plugs, fork terminals and bare wires.		
REMOTE SENSE		
Sense Selection:	Voltage sensing is selected as Local or Remote by front panel switch.	
Sense Terminals:	Sprung loaded screw-less terminals at front. Screw terminals at rear (CPX200DP, CPX400SA, CPX400SP, CPX400DP only).	
METER SPECIFICATIONS (each output)		
Display Type:	Dual 4-digit meters, 10mm (0·39”) LED.	
VOLTAGE METER		
Resolution/ Accuracy:	10mV / ± 0·1% of reading ± 2 digits	
CURRENT METER		
Resolution/ Accuracy:	10mA / ± 0·3% of reading ± 20mA	
VOLTAGE TRACKING		
Independent Mode:	In the normal mode of operation, each output is fully independent and isolated. Operation is equivalent to two single output power supplies.	
Voltage Tracking Mode:	The two outputs remain isolated, but the Slave voltage controls are disabled and the Slave voltage is set equal to the Master voltage. This can be used to generate tracking bipolar voltages, or tracking unipolar voltages relative to different grounds. When voltages greater than 60V are required, the outputs can be wired in series to generate 0 to 120V with the voltage controlled from the Master.	
	When currents greater than 10A are required, the outputs can be wired in parallel to create the equivalent of a 20A power supply with the voltage controlled from the Master.	When currents greater than 20A are required, the outputs can be wired in parallel to create the equivalent of a 40A power supply with the voltage controlled from the Master.
Track Accuracy:	Slave voltage = ± (0·1% of Master voltage setting + 10mV)	
BOTH ON / BOTH OFF		
Each output has an independent DC On/Off control, however, an additional control button is provided which turn both outputs on or off simultaneously.		

SPECIFICATION	CPX200D & CPX200DP	CPX400S, CPX400SA, CPX400SP, CPX400D & CPX400DP
ANALOGUE REMOTE INTERFACE (CPX400SA only)		
The CPX400SA offers galvanically isolated analogue remote control of voltage and current from control voltages. Voltage and current front panel settings generate non-isolated analogue output voltages that can be used to control slave power supplies		
Input Scaling:	0 to 100% control of voltage or current from 0 to 5V or 0 to 10V (selectable)	
Input Accuracy:	Voltage: 0.3% ±20mV. Current: 0.5% ±50mA. Input impedance 10kW	
Output Scaling:	Set values of 0 to 100% of rated output voltage and current generate 0 to 5V (not isolated)	
ANALOGUE REMOTE INTERFACE continued... (CPX400SA only)		
Output Accuracy:	Voltage: 0.3% ±20mV. Current: 0.5% ±50mA. Output impedance 125W	
Remote On/Off:	Output On/Off can be controlled by external switch closure (not isolated)	
DIGITAL BUS INTERFACES (CPX200DP, CPX400SA, CPX400SP & CPX400DP)		
The CPX200DP, CPX400SA, CPX400SP & CPX400DP offers full remote control and read-back using RS-232, USB, GPIB or LAN (compliant with LXI class C). All interfaces are at ground potential and opto-isolated from the output terminals. Note: Remote/Local Sense, is manually selectable only.		
RS-232	Standard 9-pin D connector. Baud rate 9,600.	
USB	USB 2.0 connection (backwards compatible with USB 1.x). Operates as a virtual COM port.	
GPIB (IEEE-488) Optional	The interface conforms with IEEE-488.1 and IEEE-488.2.	
Ethernet (LAN)	Standard 10/100 base-T hardware connection. ICMP and TCP/IP Protocol for connection to Local Area Network or direct connection to a single PC.	
LXI Compliance	LAN interface is compliant with LXI Core 11 v1.4. (LXI is the abbreviation for Lan eXtensions for Instrumentation). For more information visit: www.aimtti.com/go/lxi	
DIGITAL PROGRAMMING PERFORMANCE (CPX200DP, CPX400SA, CPX400SP & CPX400DP)		
VOLTAGE SETTING		
Resolution/Accuracy:	1mV / ± (0.05% +10mV)	
CURRENT SETTING		
Resolution/Accuracy:	1mA / ± (0.3% +5mA)	
PROGRAMMING SPEED		
Command Delay:	Typically <25ms (this must be added to any of the figures below)	
Voltage Up Time:	<10ms* to 1%	
Voltage Down Time:	<80ms* to 1% (full load); <1.5s* to 1% (no load)	
* The up and down times vary with range and voltage step size. More information is contained in the operating manual which can be downloaded from our web site.		
GENERAL SPECIFICATIONS		
INPUT		
AC Input:	100 to 240 volts ±10% 50/60Hz. Installation Category II.	
Input Power:	500VA max.	Single - 625VA, Dual - 1250VA max
TEMPERATURE & ENVIRONMENTAL		
Operating Range:	+5ºC to +40ºC, 20% to 80% RH	
Storage Range:	-40ºC to + 70ºC	
Environmental:	Indoor use at altitudes up to 2000m, Pollution Degree 2.	
Cooling:	Rear discharge variable speed fan.	
SAFETY & EMC		
Safety:	Complies with EN61010-1	
EMC:	Complies with EN61326	
PHYSICAL		
Size:(size excludes feet, knobs and terminals)	210 x 130 mm (½ rack 3U) x 377mm	Single - 107 x 130 (¼ rack 3U) x 398mm Dual - 210 x 130 mm (½ rack 3U) x 377mm
Weight:	5.0kg (11lb)	Single - 4.25kg (9.35lb), Dual - 6.3kg (13.9lb)
DRIVER SOFTWARE SUPPLIED (CPX200DP, CPX400SA, CPX400SP & CPX400DP)		
IVI DRIVER		
An IVI driver for Windows is supplied. This provides support for common applications such as LabView*, LabWindows*, HPVEE* etc.		
USB DRIVER		
An installation file is supplied which calls a standard Windows* USB driver.		
OPTIONS		
RACK MOUNTS		
RM460 19 inch 4U rack mount suitable for up to four single or two dual power supplies.		
Dual output units can also be fitted into the RM300A 3U rack		

** LabView and LabWindows are trademarks of National Instruments. HPVEE (now Agilent VEE) is a trademark of Agilent Technologies. * USB interface is supported for Windows 2000 and above.Windows is a trademark of Microsoft.*

Accuracy specifications apply for the temperature range 18ºC to 28ºC after one hour warm-up. Thurlby Thandar Instruments Ltd. operate s a policy of continuous development and reserves the right to alter specifications without prior notice.

EXCELLENCE THROUGH EXPERIENCE

Aim-TTi is the trading name of Thurlby Thandar Instruments Ltd. (TTi), one of Europe's leading manufacturers of test and measurement instruments.

The company has wide experience in the design and manufacture of advanced test instruments and power supplies built up over more than thirty years.

The company is based in the United Kingdom, and all products are built at the main facility in Huntingdon, close to the famous university city of Cambridge.

TRACEABLE QUALITY SYSTEMS

TTi is an ISO9001 registered company operating fully traceable quality systems for all processes from design through to final calibration.

bsi. ISO 9001 Quality Management

ISO9001:2015

Certificate number FM 20695

WHERE TO BUY AIM-TTI PRODUCTS

Aim-TTi products are widely available from a network of distributors and agents in more than sixty countries across the world.

To find your local distributor, please visit our website which provides full contact details.

www.aimtti.com

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