Laborstromversorgungen

XTR Series

850 Watt and 1700 Watt
Programmable DC Power Supplies

The XTR Series is the new standard for powerful, programmable DC power systems. Designed for test, production, laboratory, OEM and quality assurance applications, the XTR provides a wealth of features to ensure accuracy and greater efficiency. It puts clean, reliable power at your disposal and delivers stable, variable output voltage and current for a broad range of development, test and system requirements.

Highest Power Density

High frequency, soft switching technology in the XTR Series provides up to 1700 Watts output in a 1U full-rack chassis and 850 Watts in a 1U half-rack package. This represents the highest power density available from any manufacturer. With 12 models at 850 W and 12 at 1700 W, there is a configuration available to meet every application.

Comprehensive Digital and Analog InterfaceOptions

The XTR comes standard with USB 2.0, RS-232, RS-485, isolated and non-isolated analog interfaces to provide a comprehensive set of options to connect to a PC or other network device. This design provides the convenience of being able to accommodate a wide range of installation configurations. Ethernet and GPIB interfaces are available as options.

Scalable, Multi-Unit Design

XTR power supplies can be connected in parallel or series to produce greater current or voltage output for your applications. This scalability allows you to build rack-mounted systems with the XTR that exactly meet your existing requirements while allowing for future expansion.

Multi-Channel Support

Up to 30 XTRs can be connected easily via an RS-485 bus to provide the ultimate flexibility in remote programming.
This eliminates the cost and complexity of requiring GPIB cards in each unit. Once connected, multiple power supplies can be controlled via a single LAN, USB 2.0, GPIB, RS-232 or RS-485 interface. This provides an efficient option to centrally manage each XTR needed for your applications.

Straightforward Front Panel Controls

The XTR is equipped with a unique push button encoder and function selector dial to provide a simple, uncluttered front panel. Both voltage and current can be set quickly and easily using these two controls. Front panel access can be locked out to ensure secure remote operation. This streamlined front panel layout results in fast, intuitive set-up and operation of the XTR.

High Reliability

To guarantee long-term trouble-free performance, the XTR was designed with reliability in mind. Softswitchin technology ensures higher mean time between failure (MTBF) by eliminating high voltage transients found in conventional hard-switching power supplies which can cause premature failure of power components. The XTR was also rigorously tested during the design phase using Highly Accelerated Life Testing (HALT). This rigorous test procedure combines powerful thermal and vibration technologies to stress a product beyond its rated specifications.

XTR Series Electrical Specifications

XTR 850 Watt Electrical Specifications for 6 V to 600 V Models

Models	6-110	8-100	12-70	20-42	33-25	40-21	60-14	80-10.5	100-8.5	150-5.6	300-2.8	600-1.4
Output Ratings												
Output Voltage [1]	6 V	8 V	12 V	20 V	33 V	40 V	60 V	80 V	100 V	150 V	300 V	600 V
Output Current [2]	110 A	100 A	70 A	42 A	25 A	21 A	14 A	10.5 A	8.5 A	5.6 A	2.8 A	1.4 A
Output Power [3]	670 W	810 W	850 W	850 W	835 W	850 W	850 W	850 W	860 W	850 W	850 W	850 W
Line Regulation												
Voltage (0.005% of rated output voltage +2 mV) [4]	2.3 mV	2.4 mV	2.6 mV	3.0 mV	3.7 mV	4 mV	5 mV	6 mV	7 mV	9.5 mV	17 mV	32 mV
Current (0.01% of rated output current +2 mA) [5]	13 mA	12 mA	9 mA	6.2 mA	4.5 mA	4.1 mA	3.4 mA	3.1 mA	2.9 mA	2.6 mA	2.3 mA	2.1 mA
Load Regulation												
Voltage (0.005% of rated output voltage + 2 mV) [6]	2.3 mV	2.4 mV	2.6 mV	3.0 mV	3.7 mV	4 mV	5 mV	6 mV	7 mV	9.5 mV	17 mV	32 mV
Current (0.02% of rated output current +5 mA) [7]	27 mA	25 mA	19 mA	13.4 mA	10 mA	9.2 mA	7.8 mA	7.1 mA	6.7 mA	6.1 mA	5.6 mA	5.3 mA
Output Noise (rms, 300 kHz)												
Voltage	8 mV	8 mV	8 mV	8 mV	8 mV	8 mV	8 mV	8 mV	8 mV	10 mV	25 mV	50 mV
Current [8]	200 mA	180 mA	120 mA	75 mA	60 mA	45 mA	35 mA	25 mA	20 mA	16 mA	10 mA	6 mA
Output Ripple (p-p, 20 MHz)												
Voltage	50 mV	50 mV	50 mV	50 mV	50 mV	50 mV	50 mV	80 mV	80 mV	100 mV	150 mV	250 mV
Maximum Recommended Remote Sense Line Drop Compensation per Line [9]	1 V	1 V	1 V	1.5 V	2 V	2 V	3 V	5 V	5 V	5 V	5 V	5 V
Up-prog. Response Time, 0~Vmax [10]	60 ms	60 ms	60 ms	60 ms	60 ms	60 ms	60 ms	100 ms	100 ms	100 ms	150 ms	250 ms
Down-prog. Response Time: Full Load	50 ms	50 ms	50 ms	50 ms	50 ms	50 ms	50 ms	80 ms	100 ms	150 ms	150 ms	250 ms
Down-prog. Response Time: No Load	300 ms	400 ms	500 ms	600 ms	700 ms	800 ms	900 ms	1000 ms	1200 ms	1800 ms	2200 ms	3500 ms
Over-Voltage Trip Point	0.5–7.5 V	0.5–10 V	1–15 V	1–24 V	2–39 V	2–44 V	3–66 V	3–95 V	3–125 V	3–180 V	5–330 V	5–660 V
Efficiency [11]	75/77%	77/80%	81/84%	82/85%	83/86%	83/87%	83/87%	83/87%	83/87%	83/87%	83/87%	83/87%

XTR 1700 Watt Electrical Specifications for 6 V to 600 V Models

Models	6-220	8-200	12-140	20-84	33-50	40-42	60-28	80-21	100-17	150-11.2	300-5.6	600-2.8
Output Ratings												
Output Voltage [1]	6 V	8 V	12 V	20 V	33 V	40 V	60 V	80 V	100 V	150 V	300 V	600 V
Output Current [2]	220 A	200 A	140 A	84 A	50 A	42 A	28 A	21 A	17 A	11.2 A	5.6 A	2.8 A
Output Power [3]	1330 W	1610 W	1690 W	1690 W	1660 W	1690 W	1690 W	1690 W	1710 W	1690 W	1690 W	1690 W
Line Regulation												
Voltage (0.005% of rated output voltage +2 mV) [4]	2.3 mV	2.4 mV	2.6 mV	3.0 mV	3.7 mV	4 mV	5 mV	6 mV	7 mV	9.5 mV	17 mV	32 mV
Current (0.01% of rated output current +2 mA) [5]	13 mA	12 mA	9 mA	6.2 mA	4.5 mA	4.1 mA	3.4 mA	3.1 mA	2.9 mA	2.6 mA	2.3 mA	2.1 mA
Load Regulation												
Voltage (0.005% of rated output voltage + 2 mV) [6]	2.3 mV	2.4 mV	2.6 mV	3.0 mV	3.7 mV	4 mV	5 mV	6 mV	7 mV	9.5 mV	17 mV	32 mV
Current (0.02% of rated output current +5 mA) [7]	49 mA	45 mA	33 mA	22 mA	15 mA	13 mA	10.6 mA	9.21 mA	8.4 mA	7.2 mA	6.1 mA	5.6 mA
Output Ripple (rms, 300 kHz)												
Voltage	8 mV	8 mV	8 mV	8 mV	8 mV	8 mV	8 mV	8 mV	8 mV	10 mV	25 mV	50 mV
Current [8]	200 mA	180 mA	120 mA	75 mA	60 mA	45 mA	35 mA	25 mA	20 mA	16 mA	10 mA	6 mA
Output Ripple (p-p, 20 MHz)												
Voltage	50 mV	50 mV	50 mV	50 mV	50 mV	50 mV	50 mV	80 mV	80 mV	100 mV	150 mV	250 mV
Maximum Recommended Remote Sense Line Drop Compensation per Line [9]	1 V	1 V	1 V	1.5 V	2 V	2 V	3 V	5 V	5 V	5 V	5 V	5 V
Up-prog. Response Time, 0~Vmax [10]	60 ms	60 ms	60 ms	60 ms	60 ms	60 ms	60 ms	100 ms	100 ms	100 ms	150 ms	250 ms
Down-prog. Response Time: Full Load	50 ms	50 ms	50 ms	50 ms	50 ms	50 ms	50 ms	80 ms	100 ms	150 ms	150 ms	250 ms
Down-prog. Response Time: No Load	300 ms	400 ms	500 ms	600 ms	700 ms	800 ms	900 ms	1000 ms	1200 ms	1800 ms	2200 ms	3500 ms
Over-Voltage Trip Point	0.5–7.5 V	0.5–10V	1–15 V	1–24 V	2–39 V	2–44 V	3–66 V	3–95 V	3–125 V	3–180 V	5–330 V	5–660 V
Efficiency [11]	76/78%	77/79%	81/84%	82/85%	83/86%	83/87%	84/88%	84/88%	84/88%	84/88%	84/88%	84/88%

1. Minimum voltage is guaranteed to maximum 0.2% of the rated output voltage.
2. Minimum current is guaranteed to maximum 0.4% of the rated output current.
3. Total output power is also based on AUX1 Output Voltage (5 V) and AUX1 Output Current (0.5 A) and AUX2 Output Voltage (15 V) and AUX2 Output Current (0.5 A).
4. From 85–132 Vac or 170–265 Vac, constant load.
5. From 85–132 Vac or 170–265 Vac, constant load.
6. From no load to full load, constant input voltage.
7. For load voltage change, equal to the unit voltage rating, constant input voltage.
8. For 6 V models the ripple is measured at 2–6 V output voltage and full output current. For other models, the ripple is measured at 10–100% output voltage and full output current.
9. When using remote sense, the total of the load voltage and the load line drops must not exceed the rated output of the power supply. For example, for an XTR 6-110 in an application with 1 V of load line loss
   (0.5 V/Line), the maximum available load voltage would be 6–1= 5 V. Note: The unit may operate at higher output voltages than this, but there is no guarantee that the power supply will meet performance
   specifi cations. Ultimately, the upper limit of the output voltage will be determined by internal circuitry of the power supply (non-adjustable.)
10. With rated, resistive load.
11. At 100/200 Vac input voltage and maximum output power.

Applies to all footnotes: Programming and Readback: RS-232, RS-485, USB built in. GPIB, Ethernet optional.
Specifi cations are guaranteed from 1% to 100% of the rated output voltage, current, and power.

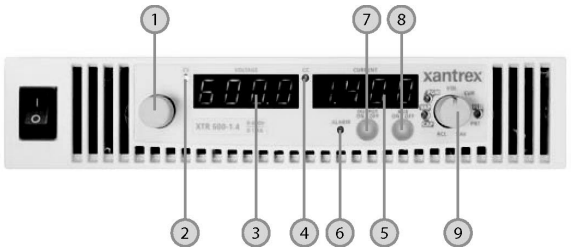
XTR Series General Specifications

Programming Mode	APG	ISOL	Digital
Voltage and Current Output Voltage Programming	0–100%, 2~ up to 10 V, programmable	0–100%, 2~ up to 10 V, programmable	
Current Output Resistor Programming	0–100%, 2~ up to 10 k, programmable	0–100%, 2~ up to 10 k, programmable	
Voltage Output Resistor Programming	0–100%, 2~ up to 10 k, programmable	0–100%, 2~ up to 10 k, programmable	
Output Voltage and Current Monitor	0–100%, 2~ up to 10 V, programmable	0–100%, 2~ up to 10 V, programmable	
Voltage Programming Accuracy (mV)	± 0.5% of rated output voltage	± 0.5% of rated output voltage	± 0.1% of rated output voltage
Current Programming Accuracy (mA)	± 1% of rated output current	± 1% of rated output current	± 0.2% of rated output current
Voltage Readback Accuracy (mV)	± 1% of rated output voltage	± 1% of rated output voltage	± 0.1% of rated output voltage
Current Readback Accuracy (mA)	± 1% of rated output current	± 1% of rated output current	± 0.2% of rated output current
Voltage and Current Programming Resolution			0.012% of full scale
Voltage and Current Readback Resolution			0.012% of full scale
Parallel Operation	Up to 4 units in master/slave mode		
Series Operation	Up to 2 units (with external diodes)		
Constant Voltage (CV)/Constant Current (CC) Indicator	CV: TTL High (4–5 V)		
	CC: TTL Low (0–0.6 V)		
Output Voltage and Current Monitor			
On/Off Control		TTL level	
AUX On/Off Control		TTL level or dry contact	
Power Supply Status Signal		TTL high: ok	
		TTL low: fail	
AC Line Input Specifications			
Rated AC Input Voltage/Frequency	100–240 Vac, 50–60 Hz		
Operational AC Input Voltage/Frequency	85–265 Vac continuous, 47–63 Hz, single phase		
Input Current (at 100/200 VAC)	11.5/6 A (850W), 23/12 A (1700W)		
Inrush Current (100/200 VAC)	Less than: 25 A (850W), 50 A (1700W)		
Power Factor Correction	0.99@100/200 Vac, rated output power		
Output Performance Specifications			
Temperature Coefficient	100 PPM/° C from rated output voltage, after a 30-minute warm-up		
Drift (8 hours)	0.05% of rated output voltage & current over an 8 hour interval with constant line, load & temperature, after a 30-minute warm-up		
Hold-up Time	Typical 20 ms at any rated input line.		
Transient Response Time	Less than 1 ms for 6 V to 60 V models. Less than 2 ms for 80 V to 600 V models		
Meter Accuracy	0.5% ± 1 count		
Environmental Specifications (Indoor use)			
Operating Temperature Range	32° F to 122° F, 100% load (0° C to 50° C)		
Storage Temperature Range	-4° F to 158° F (–20° C to 70° C)		
Operating Humidity Range	30–90% RH (no condensation)		
Storage Humidity Range	10–95% RH (no condensation)		
Operating Altitude	Up to 6,500 feet (2,000 m)		
Protection			
Foldback Mode	Output will disable when a transition is made from CV to CC mode or from CC to CV mode		
Foldback Mode Delay	Programmable time delay of 0.5s to 50s over which the mode transition must remain to trigger the Fold Mode to activate		
Under Voltage Protection (UVP)	Adjustable from 0V to Vset – 5%		
Over-Temperature Protection Lock (OTP)	Disables the output in the event of an over temperature alarm. Can be set to auto recover or to latch off		
Local Lockout	Allows the front panel controls to be locked out		
External Shudown	Allows the user to shutdown the output through a TTL or CMOS logic signal		
Interlock	Enables or disables the output via dry contact type switch		
Mechanical Specifications			
XTR 850 Watt (W×H×D)	8.4 × 1.7 × 19.0 inch (214 × 43.6 × 483 mm)		
XTR 1700 Watt (W×H×D)	16.8 × 1.7 × 19.0 inch (429 × 43.6 × 483 mm without rack mount ears)		
Weight	XTR 850 Watt: 11 lb (5kg); XTR 1700 Watt: 22 lb (10 kg)		
Cooling	Forced air cooling by internal fans		
Regulatory Approvals			
Safety	CSA 22.2 No. 61010-1 and UL61010-1. Marked with c(UL)us CE (pending) EN61010-1		
EMC	Complies with EN55022, Class B, FCC Part 15B for conducted emissions		
	Complies with EN55022, Class A, FCC Part 15A for radiated emissions		
	Complies with EN61000-4 series of standards for immunity		

1. Time for the output voltage to recover within 0.5% at its rated output for a load change 10–90% of rated output current. Output set point 10–100%.

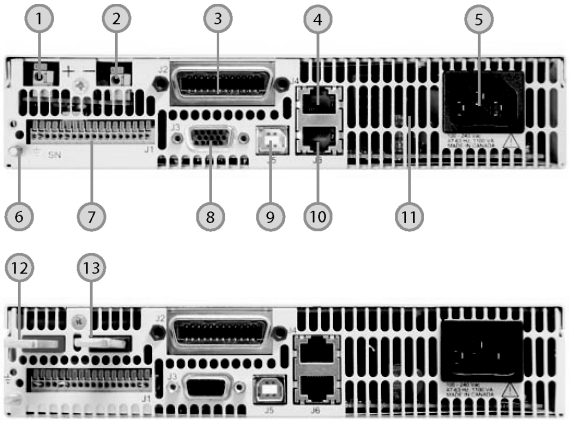
XTR 850W and 1700W Interface Features

Front Panel Display and Control: 850 Watt & 1700 Watt Series



Item	Description
1	Rotary knob/ENTER button
2	Voltage mode LED (green)
3	Voltage meter
4	Current mode LED (green)
5	Current meter
6	Alarm indicator LED (red)
7	Output ON/OFF button
8	Auxiliary ON/OFF button
9	Rotary selection knob

Rear Panel Connectors: 850 Watt Series



Item	Description
1	DC output connector positive (60-600 V)
2	DC output connector negative (60-600 V)
3	LAN or GPIB connector (optional)
4	RS-232/RS485 Connector in port
5	AC input
6	Chassis ground screw
7	Control connector
8	Auxiliary output & isolated control connector
9	USB connector
10	RS-485 connector out port
11	Fan Exhaust Vents
12	DC output bus bar positive (6-40 V)
13	DC output bus bar negative (6-40 V)

Rear Panel Connectors: 1700 Watt Series