General Specifications

Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 85°C (-4° to 185°F)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Enclosure Type	Open Equipment
Agency Approvals	UL61010-2 - UL File # E185989 Canada and USA
	CE Compliant EN61131-2*
Noise Immunity	NEMA ICS3-304
EU Directive	See the "EU Directive" topic in the Help File
Weight	174g (6.1 oz)

*Meets EMC and Safety requirements. See the D.O.C. for details.

Power Supply Specifications

Nominal Voltage Range*	12–24 VDC
Input Voltage Range (Tolerance)*	10–36 VDC
Maximum Input Voltage Ripple	<+/- 10%
Maximum Input Power	14W
Cold Start Inrush Current	5A, 2ms
Maximum Inrush Current (Hot Start)	5A, 2ms
Internal Input Protection	Reverse Polarity Protection and Undervoltage
Heat Dissipation	8.7W Max
Voltage Withstand (dielectric)	1500VAC Power Inputs to Ground applied for 1 minute

*Class 2 or LPS Power Supply required.

CPU Specifications

Program Memory Type	FLASH memory
User Data Memory Type	Battery Backed RAM, User configurable
Pluggable Option Module	RS-232, RS-485, Ethernet 10/100 BASE-T (1Mbps throughput max), USB 2.0 Type B
Expansion Modules	2 expansion modules max
Real Time Clock Accuracy	±2.6s per day typical at 25°C ±8s per day max at 60°C
Programming Software	Do-more Designer – Ver. 2.0 or higher
Programming Cable Options	BX-PGM-CBL

Terminal Block Connection Options

BX-RTB10	Terminal Block Kit, 90-degree screw type, Fits all BRX 10-point PLCs and 16 point Expansion I/O Modules. Kit includes (2) 10-pin 3.8mm plugs.
BX-RTB10-1	Terminal Block Kit, 180-degree spring clamp type, Fits all BRX 10-point PLCs and 16 point Expansion I/O Modules. Kit includes (2) 10-pin 3.8mm plugs.
BX-RTB10-2	Terminal Block Kit, 180-degree screw type, Fits all BRX 10-point PLCs and 16 point Expansion I/O Modules. Kit includes (2) 10-pin 3.8mm plugs.
ZL-BX-CBL20	ZIPLink PLC I/O cable, 20-position terminal block to 24-pin connector, 24AWG, cable length 0.5meter (1.6ft).
ZL-BX-CBL20-1	ZIPLink PLC I/O cable, 20-position terminal block to 24-pin connector, 24AWG, cable length 1meter (3.3ft).
ZL-BX-CBL20-2	ZIPLink PLC I/O cable, 20-position terminal block to 24-pin connector, 24AWG, cable length 2meter (6.6ft).
ZL-BX-CBL20-1P	ZIPLink PLC I/O cable, 20-position terminal block to pigtail connection, 24AWG, cable length 1meter (3.3ft).
ZL-BX-CBL20-2P	ZIPLink PLC I/O cable, 20-position terminal block to pigtail connection, 24AWG, cable length 2meter (6.6ft).
ZL-RTB20	ZIPLink Two Level Feedthrough Module, 20-pole, 35mm, DIN mount.
ZL-RTB20-1	ZIPLink Three Level Feedthrough Module, 20-pole, 35mm, DIN mount.

Built-in RS-232/485 Port Specifications

Port Name	RS-232/RS-485 Serial Port
Description*	Non-isolated serial port that can communicate via RS-232 or RS-485 (software selectable). Includes ESD protection and built-in surge protection.
Supported Protocols	Do-more Protocol (Default) Modbus RTU (Master & Slave) K-Sequence (Slave) ASCII (In & Out)
Data Rates	1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200
Default Settings	RS-232, 115200 bps, No Parity, 8 Data Bits, 1 Stop Bit, Station #1
Port Type	3-pin terminal strip 3.5mm pitch
Port Status LED	Green LED is illuminated when active for TXD and RXD
RS-485 Station Addresses	1-247
Cable Recommendations	RS-232 use L19772-XXX from AutomationDirect.com RS-485 use L19827-XXX from AutomationDirect.com
Replacement Connector	ADC Part # BX-RTB03S

Removable connector included.

Pinout	RS232	RS485
1	GND	GND
2	RX	D-
3	TX	D+

TX / RX — GND / RX/D- / TX/D+ — RS232/RS485

* NOTE: When using RS-485, a terminator resistor is built-in and software selectable.

CPU Mode Switch Functions

RUN position	CPU is forced into RUN Mode if no errors are encountered.
TERM position	RUN, PROGRAM and DEBUG modes are available. In this position, the mode of operation can be changed through the Do-more Designer Software.
STOP position	CPU is forced into STOP Mode.

BX-DM1E-10ED23-D
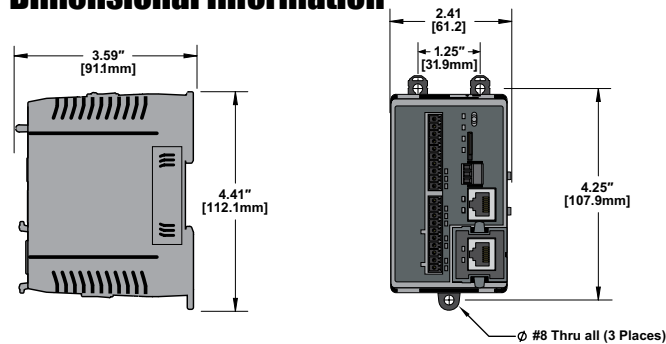
BRX MPU with Do-more! DM1 technology
24 VDC required, serial port, Ethernet port, microSD slot, Discrete Input: 6-point, sink / source, Analog Input: 1-channel, current / voltage, Discrete Output: 4-point, sourcing, Analog Output: 1-channel, current / voltage.

I/O Terminal Blocks sold separately.
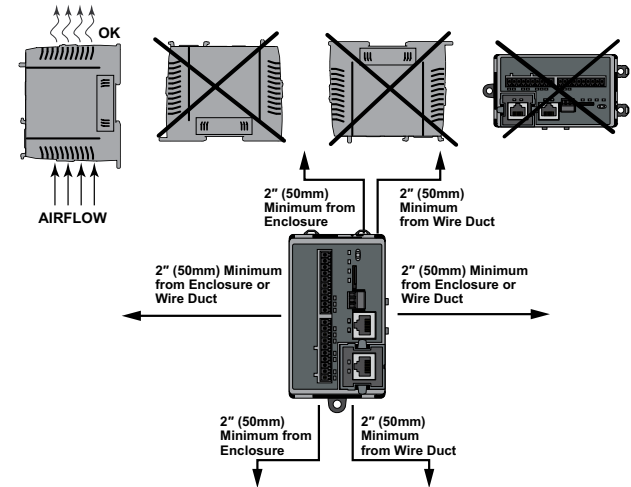(See Terminal Block Connection Options table).

Document Name	Edition/Revision	Date
BX-DM1E-10ED23-D	1st Ed. RevE	7/10/2024

Dimensional Information

3.59" [91.1mm]
2.41 [61.2]
1.25" [31.9mm]
4.41" [112.1mm]
4.25" [107.9mm]
∅ #8 Thru all (3 Places)

Mounting Restrictions

OK
AIRFLOW
2" (50mm) Minimum from Enclosure
2" (50mm) Minimum from Wire Duct
2" (50mm) Minimum from Enclosure or Wire Duct
2" (50mm) Minimum from Enclosure or Wire Duct
2" (50mm) Minimum from Enclosure
2" (50mm) Minimum from Wire Duct

Terminal Block Connector Specifications

Part Number	BX-RTB03S	BX-RTB10	BX-RTB10-1	BX-RTB10-2
Connector Type	Screw Type-90°	Screw Type-90°	Spring Clamp Type-180°	Screw Type-180°
Wire Exit	180°	180°	180°	180°
Pitch	3.5mm	3.81mm	3.81mm	3.81mm
Screw Size	M2	M2	N/A	M2
Recommended Screw torque	<1.77 lb·in (0.2 N·m)	<1.77 lb·in (0.2 N·m)	N/A	<1.77 lb·in (0.2 N·m)
Screwdriver Blade Width	2.5mm	2.5mm	2.5mm	2.5mm
Wire Gauge (Single Wire)	28-16 AWG	28-16 AWG	28-18 AWG	30-16 AWG
Wire Gauge (Dual Wire)	28-16 AWG	28-16 AWG	30-20 AWG (Dual Wire Ferrule Required)	30-18 AWG
Wire Strip Length	0.24in (6mm)	0.24in (6mm)	0.35in (9mm)	0.26in (6.5mm)
Equiv.Dinkle part #	EC350V-03P-BK	EC381V-10P-BK	ESC381V-10-BK	EC381F-10P-BK

CPU Status Indicators

Indicator	Status	Description
PWR	OFF	Base Power OFF
	Green	Base Power ON
	Yellow	Low Battery
RUN	OFF	CPU is in STOP Mode
	Green	CPU is in RUN Mode
	Yellow	Forces are Active
MEM	OFF	No ROM Activity, No SD Card
	Yellow	ROM Activity (Flash or SD Card)
	Green	SD Card Installed and Mounted
	Red	SD Card Installed and Not Mounted
ERR	OFF	CPU is functioning normally
	Red	CPU Fatal Hardware Error or Software Watchdog Error

Built-in Ethernet Specifications

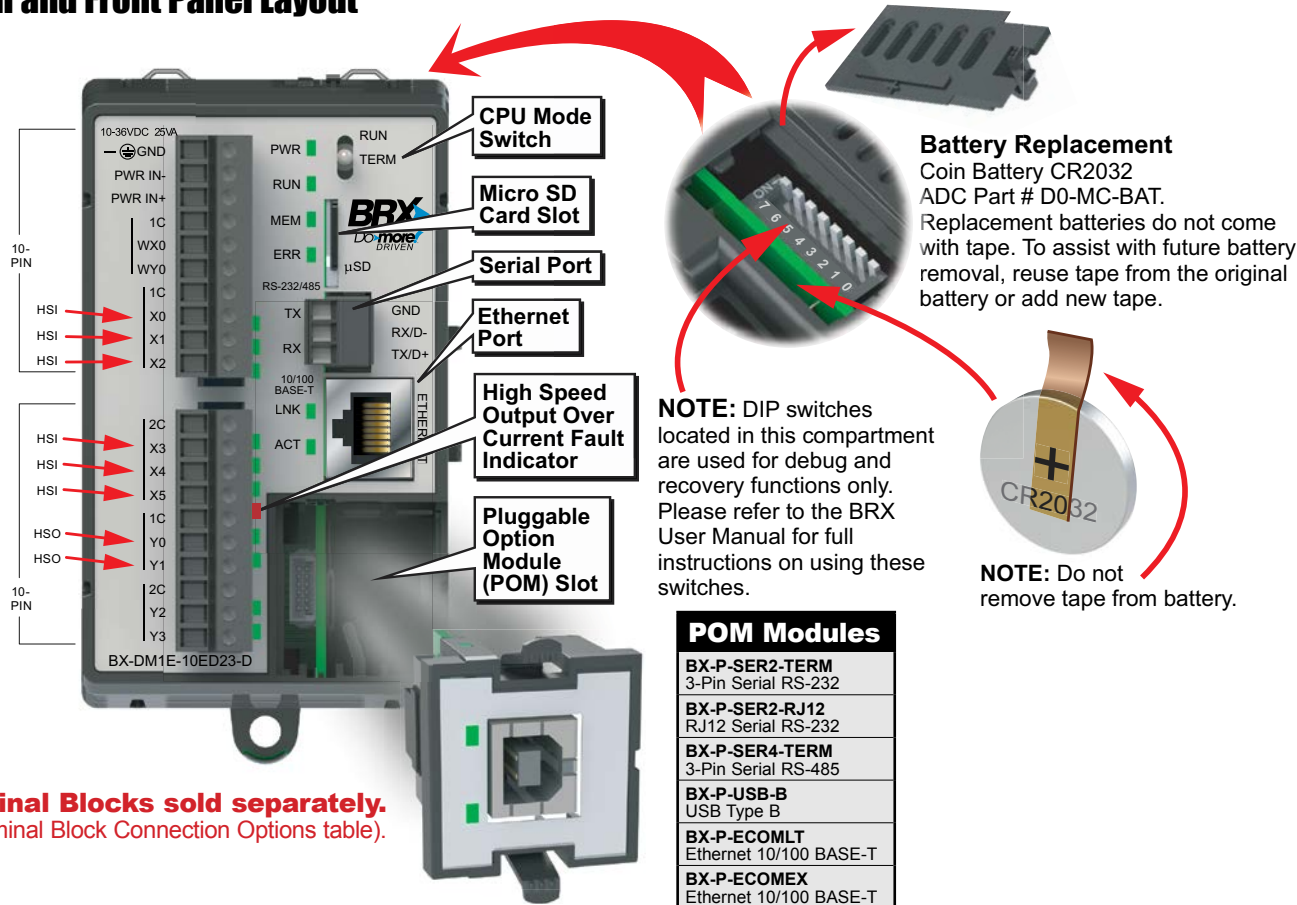|	
Port Name	ETHERNET
Description	Standard transformer isolated Ethernet port with built-in surge protection.
Transfer Rate	10Mbps (Yellow LED) and 100Mbps (Green LED)
Port Status LED	LED is solid when network LINK is established. LED flashes when port is active (ACT).
Supported Protocols	Do-more! Protocol Ethernet Remote I/O Modbus TCP/IP (Client & Server) EtherNet/IP (Explicit & Implicit, Scanner & Adapter) HOST ECOM (DirectLogic), HTTP SMTP (Email), SNTP (Time Server) TCP/IP, UDP/IP (Raw packet) MQTT
Cable Recommendation	C5E-STxxx-xx from AutomationDirect.com
Port Type	RJ45, Category 5, 10/100 BASE-T, Auto Crossover
Ethernet Port Numbers:	
MODBUS TCP/IP	502, TCP
EtherNet/IP	44818, TCP
HOST ECOM	28784, UDP
Do-more Protocol	28784, UDP

Do-more BRX Manual available at http://www.automationdirect.com/pn/doc/manual/BX-DM1E-10ED23-D

IMPORTANT!

Hot-Swapping Information
Note: This device cannot be Hot Swapped.

Terminal and Front Panel Layout

CPU Mode Switch

Micro SD Card Slot

Serial Port

Ethernet Port

High Speed Output Over Current Fault Indicator

Pluggable Option Module (POM) Slot

BX-DM1E-10ED23-D

I/O Terminal Blocks sold separately.
(See Terminal Block Connection Options table).

Battery Replacement
Coin Battery CR2032
ADC Part # D0-MC-BAT.
Replacement batteries do not come with tape. To assist with future battery removal, reuse tape from the original battery or add new tape.

NOTE: DIP switches located in this compartment are used for debug and recovery functions only. Please refer to the BRX User Manual for full instructions on using these switches.

NOTE: Do not remove tape from battery.

POM Modules

BX-P-SER2-TERM	3-Pin Serial RS-232
BX-P-SER2-RJ12	RJ12 Serial RS-232
BX-P-SER4-TERM	3-Pin Serial RS-485
BX-P-USB-B	USB Type B
BX-P-ECOMLT	Ethernet 10/100 BASE-T
BX-P-ECOMEX	Ethernet 10/100 BASE-T

NOTE: Only POM modules can be hot-swapped.

Analog Current Sinking Input Circuits

2-Wire Transmitter

3-Wire Transmitter — 24VDC User Supplied Power

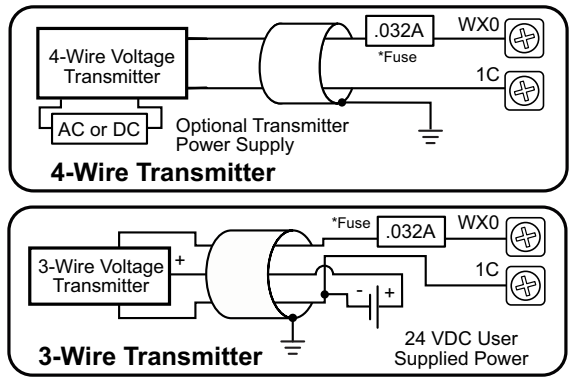**4-Wire Transmitter** — User Supplied Transmitter Power
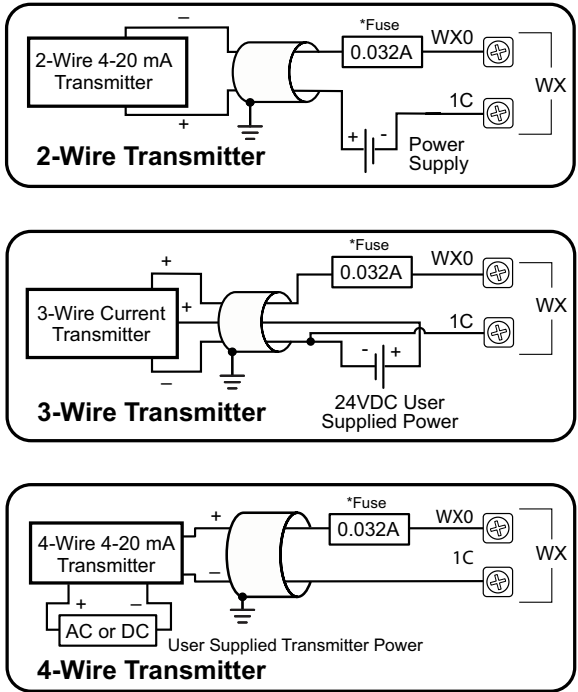
*NOTE: An Edison S500-32-R 0.032A fast-acting fuse is recommended for all analog voltage inputs, analog outputs, and current loops.

Analog Output Wiring

Current Source Output

Voltage Output
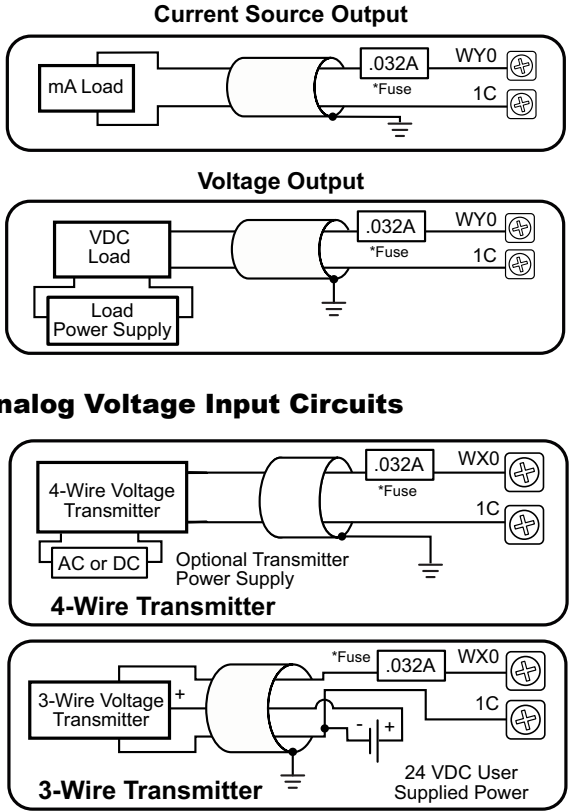
Analog Voltage Input Circuits

4-Wire Transmitter — Optional Transmitter Power Supply

3-Wire Transmitter — 24 VDC User Supplied Power

Discrete Input Specifications

Input Type	Sink/Source
Total Inputs per Module	6 High Speed – All inputs may be used as standard inputs
Commons	2 (3 points/common) Isolated
Nominal Voltage Rating	12–24 VAC/DC
Input Voltage Range	9–30 VAC/DC
Maximum Voltage	30 VAC/DC
DC Frequency	0–250kHz - High Speed
Minimum Pulse Width	0.5 μs - High Speed
AC Frequency	47–63 Hz (60–240Hz filter must be set in software for AC operation)
Input Impedance	3kΩ @ 24VDC
Input Current (typical)	6mA @ 24 VAC/DC
Maximum Input Current	12mA @ 30 VAC/DC
Minimum ON Current	5.0mA (9V required to guarantee ON state)
Maximum OFF Current	2.0 mA
ON Voltage Level	> 9.0 VAC/VDC
OFF Voltage Level	< 2.0 VAC/VDC
Status Indicators	Logic Side, Green

Analog Input Specifications

Inputs per Module	1
Input Voltage Range*	Software Selectable ±10V, ±5V, 0-10V, 0-5V
Input Current Range*	Software Selectable ±20mA, 4-20 mA
Resolution	16 bit @ ± 10V, ± 20mA
Conversion Time	1.2 ms
Input Impedance Voltage Modes	100kΩ
Input Impedance Current Modes	249Ω

*Software selectable per channel.

Discrete Output Specifications

Output Type	Sourcing
Total Outputs per Module	4 Total – 2 High Speed (Y0..Y1)* 2 Standard (Y2..Y3) *All outputs may be used as standard outputs
Commons	2 (2 points/common) Isolated
Maximum Current per Common	1A
Nominal Voltage Rating	12–24 VDC
Operating Voltage Range	5–36 VDC
Maximum Voltage	36VDC
Minimum Output Current	0.1mA @ 24VDC
Maximum Output Current	0.5A per output, no derating over temperature range
Maximum Leakage Current	10μA
Maximum Switching Frequency	1m cable — 250KHz; 10m cable — 100KHz
Status Indicators	Logic Side, Green

Analog Output Specifications

Outputs per Module	1
Output Voltage Range*	Software Selectable ±10V, ±5V, 0-10V, 0-5V
Minimum Voltage Load Impedance	1kΩ
Output Current Range*	Software Selectable ±20mA, 4-20 mA
Maximum Current Load Impedance	500Ω
Settling Time	< 1ms
Resolution	16 bit @ ± 10V, ± 20mA

*Software selectable per channel.

High Speed Input (HSI) Functions

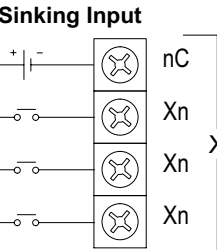| Input Function	Inputs Required[1]		10/ 10E	18/ 18E	36/ 36E
High-Speed Counting Position Scaling Frequency Measurement	1	Up counters			
	1	Down counters			
	2	Up/Down counters			
	2	Pulse/Direction (Bidirectional) counters	Up to (3)		
	2	Quadrature (A and B) counters			
	3	Quadrature (A and B with Z) counters			
Interval Measurement	1	Single Input (Edge) timers			
	2	Dual Input (Dual Edge) timers			
Duration Measurement	1	Single Input (Edge) timers			
Table-Driven Output(s)[2]		Programmable limit switches			
		Preset tables			
Interrupt(s)	4	Input interrupts	Up to (4)		
	0	Timer interrupts			
	0	Match register interrupts			

1. Standard inputs may be used with high-speed functions, but at lower response frequencies of approximately 120Hz.
2. Table Driven Output(s) are triggered by an Axis Position or a high-speed counter/timer accumulator value. It requires the selection of 1 discrete output. (see HSO Note 1 below)

High Speed Output (HSO) Functions

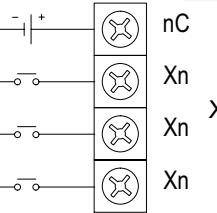|	Outputs Required[1]	Function[2]	10/ 10E	18/ 18E	36/ 36E
Pulse Mode	0	Virtual axis	4	4	4
	2	PTO linear step/direction outputs	2	3	3
	2	PTO rotary clockwise/counter-clockwise (CW/CCW) outputs	2	3	3
	2	PTO quadrature (A and B) output	2	3	3
	1	PWM pulse width modulation outputs	4	4	4
Axis Profile		Relative/Absolute positioning, Velocity mode, Trapezoid, S-curve, Electronic gearing, Camming, Following, Homing, Jogging			

1. Standard outputs may be used for high-speed functions, but at lower response frequencies of approximately 110Hz. Use of relay outputs is not recommended.
2. This is the total number of functions. A combination of high-speed outputs and standard outputs may be used up to this total.

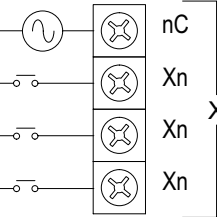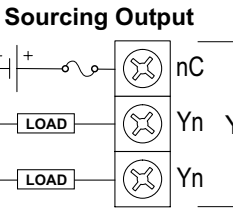## I/O Wiring

Discrete Input Wiring

Sinking Input

Sourcing Input

AC Input

Discrete Output Wiring

Sourcing Output

Supply Power Wiring

DC Power
DC Power In
12–24VDC
Class 2 or LPS User Supplied Power