

Simple guide to powering a ship

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Why write a guide?

Lots of people in [r/elite](#)[dangerous](#) ask similar questions about why their ship loses power under certain conditions, or why their weapons stop firing. This guide is for those CMDRs, and also for those who want to investigate some basic engineering and ship build theory concepts.

Module performance

Modules come in one of five categories:

Rating	Performance	Price	Power draw	Mass	Use case
E	Poorest	Cheapest	Lowest	Light	Low energy use
D	Poor	Cheap	Low	Lightest	Longer jump range
C	Mid range	Mid range	Mid range	Mid range	
B	High	Expensive	High	Highest	Combat
A	Highest	Most expensive	Highest	High	General first choice

Optional internal modules and weapons also loosely stick to this pattern. For example, bi-weave shield generators only come in type C. They have a high energy draw and a low shield strength to balance it, but they also charge very quickly. Prismatic shield generators only come in type A. They are the strongest, but draw the most power, and so charge very slowly.

Most core and internal modules will draw some level of power from the ship's power grid. The ship's power is supplied by the power plant, and prioritised by the power distributor.

Power plant

Your ship will have a maximum size of power plant that it can equip. In most cases, the bigger the power supply, the better – but not in all cases. For example, when building an exploration ship, one of the best ways to increase range without engineering is to downsize the power plant, which is normally the heaviest module in the ship.



Power plant module selection, showing power plants which are too big to be equipped as greyed out

You will need to choose a power plant that is able to meet the power demands of your ship. The best way to figure out the power draw you will need to meet is to theorycraft your ship first, in [EDSY](#) or [Coriolis](#) before buying anything. This will give you a power budget for your ship, showing when your weapons and utilities, such as limpet controllers, are both retracted (RET) and deployed (DEP).

TTL	MASS	FUEL	CRGO	PSGR
CUR	2,374.2	64	0	
MAX	2,405.4	64	32	0
CRW	AVL	SYS	ENG	WEP
DST	RST	SYS	ENG	WEP
RET	66.5%	1		
DEP	79.7%	1		

EDSY screengrab showing power supply and demand

Once you have built the ship, this is reflected in the bottom of your right hand panel under “modules”. The same ship theorycrafted in EDSY above, draws the same amount of power with weapons deployed, when in-game, as shown below.

The screenshot shows the 'MODULES' tab in a ship's control interface. The table lists various modules with their power and health status. The 'POWER PLANT' and 'CARGO RACK (CAP: 32)' are highlighted in yellow, indicating they are the primary power sources. The 'OUTPUT' is at 100% and 'USAGE' is at 75%.

NAME	TYPE	POWER	HEALTH	PRIORITY
<input checked="" type="checkbox"/> SUPERCRUISE ASSIST	1E SYS	1%	100%	< 1 >
<input checked="" type="checkbox"/> POINT DEFENCE TURRET	0I WEP	0%	100%	< 1 >
<input checked="" type="checkbox"/> POINT DEFENCE TURRET	0I WEP	0%	100%	< 1 >
<input checked="" type="checkbox"/> COCKPIT CANOPY	1I SYS	0%	100%	< 1 >
<input checked="" type="checkbox"/> POWER PLANT	8A SYS	0%	100%	< 1 >
<input checked="" type="checkbox"/> CARGO RACK (CAP: 32)	5E SYS	0%	100%	< 1 >
<input checked="" type="checkbox"/> ADVANCED PLANETARY APPROACH SUITE	1I SYS	0%	100%	< 1 >
<input checked="" type="checkbox"/> DATA LINK SCANNER	0I WEP	0%	100%	< 1 >
<input checked="" type="checkbox"/> COMPOSITION SCANNER	0I SYS	0%	100%	< 1 >

OUTPUT 100%
USAGE 75%

Right hand screen on modules tab, showing power supply and demand

Module priority setting

It is possible to set a priority order for your ship's modules, to ensure that the most important modules stay powered when this ship goes over the power budget available. The highest priority is 1, and the lowest priority is 5.

If you equip modules which draw too much power, then when they are all powered on, such as when you deploy your weapons, then everything will switch off – even the atmosphere in the ship's cockpit.

The screenshot shows the 'MODULES' tab in a ship's control interface. The table lists various modules with their power and health status. The 'THRUSTERS' module is highlighted in red, indicating it is a high-priority module. The 'OUTPUT' is at 100% and 'USAGE' is at 117%, which is above the 100% limit, resulting in a red warning icon.

NAME	TYPE	POWER	HEALTH	PRIORITY
<input checked="" type="checkbox"/> THRUSTERS	5A ENG	41%	100%	1
<input checked="" type="checkbox"/> GUARDIAN FRAME SHIFT DRIVE BOOSTER	0H SYS	13%	100%	< 1 >
<input checked="" type="checkbox"/> FUEL SCOOP	6A SYS	9%	100%	< 1 >
<input checked="" type="checkbox"/> BEAM LASER	2E WEP	6%	100%	< 1 >
<input checked="" type="checkbox"/> BEAM LASER	2E WEP	6%	100%	< 1 >
<input checked="" type="checkbox"/> SHIELD GENERATOR	3D SYS	5%	100%	< 1 >
<input checked="" type="checkbox"/> FRAME SHIFT DRIVE (SCD)	5A ENG	4%	100%	< 1 >
<input checked="" type="checkbox"/> CARGO HATCH	1H SYS	4%	100%	< 1 >
<input checked="" type="checkbox"/> LIFE SUPPORT	4D SYS	3%	100%	< 1 >

OUTPUT 100%
USAGE 117%

Ship is at 117% of budget and nearly all modules are set at power priority 1 – it cannot fly or carry out any functions

It's possible to fly a ship which demands more power than the grid can supply by switching on and off the modules in use. You can do this manually via the modules tab – use your select button on a module on the panel (default space bar) and then toggle the active/inactive button at the top left. This is particularly helpful when you want to use your bubble taxi to carry a weapon to an engineer's workshop. The bubble taxi can't power a big weapon, but it doesn't need to, it just needs to move the weapon there and back.



A beam laser has been manually deactivated

Certain module types are mutually exclusive – for example, weapons, limpet controllers and SLFs can't be used when in supercruise. Weapons and limpet controllers also only draw power when they are deployed, and not when they are stowed. This means that if you balance your power priorities well, you can use the deployment or withdrawal of weapons to automate power demand.

A good premise is to set all weapon-type power demand (weapons and limpet controllers) to priority 2, and all non-combat functions (supercruise assist, fuel scoop, FSD booster) to priority 3. When you deploy your weapons your priority 3 items will switch off to power the priority 2 items. When you withdraw your weapons, they will power down, enabling your priority 3 items.

Also, unless you are intending to collect materials or items, you can save power by just switching off your cargo hatch. This even works where you need to use repair limpets as the limpet does not need to be recaptured.

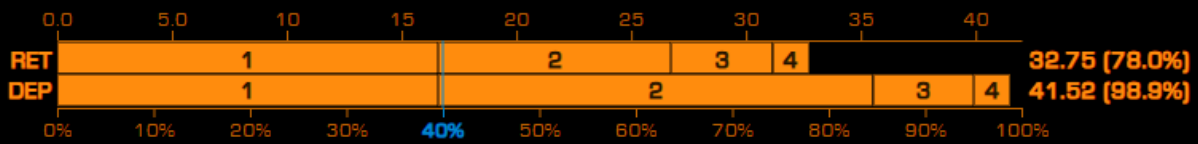


Power priorities for supercruise functions set to 3, and cargo hatch turned off

In certain circumstances, and particularly in PVP, it's possible for your power plant to become disabled. Provided that your priority modules don't draw more than 50% of your power plant's normal output, they will still function if your power plant is disabled. It's possible to theorycraft this in [EDSY](#) or [Coriolis](#), and both platforms will highlight the power budget allocated to each priority setting.

TTL	MASS	FUEL	CRGO	PSGR
CUR	2,023.3	32	0	
MAX	2,086.2	32	64	0
CRW	AVL	SYS	ENG	WEP
DST	RST	SYS	ENG	WEP
RET	86.8%	1	2	3
DEP	104.2%	1	2	3

EDSY UI highlights that power priority 1 modules will consume less than 50% of overall power by showing priority 1 power draw as green in the "totals" panel (normally bottom left)



Coriolis UI has a similar function at the bottom of the power management panel, normally bottom left; the 40% line will turn blue if all priority 1 modules can all be accommodated within 40% of the power output of the power plant

Power distributor

The power distributor takes the power supplied by the power plant and channels it to where you consider is the most important demand. Your capacitor stores energy for those three forms of demand, and supplies the demand. It backfills the supply from the power plant. This is represented on the distributor display in the cockpit.

- **ENG** is engines, or thrusters
- **WEP** is weapons
- **SYS** is systems, which means everything else; this includes shields and utility slot items.



Capacitor showing three pips in SYS and three pips in WEP

Pip management

When the power capacitor is depleted it recharges those reserves based on the priorities you have set. You can tell the capacitor what you think is the most important area of need by changing prioritisation. Using your key bindings, you can move the six “pips” on the distributor to do this. You can distribute the pips in any order you like, and you can have a max of four pips out of six allocated to any use. You can even change the priority settings in the middle of combat, using your keybinds. This is known as “pip management”.

More pips in one area makes that area more effective. For example, four pips in ENG increases your maximum thrust speed and boost recharge rate. More pips in SYS increases the power and recharge rate of your shield. More pips in WEP increases the amount of power and recharge rate available to your lasers.

It is also possible to have half-pips in areas, by using your keys to stack pips in one area and then in another. For example, my cursor keys are bound to pip management. DOWN resets to the standard 2 / 2 / 2 configuration. If I input DOWN, UP, RIGHT, RIGHT my pips will be set to 0.5 / 2 / 3.5.

Pip management is a tactical priority decision made in the moment. The following table illustrates pip management in an AX combat zone setting:

Phase	SYS	ENG	WEP
Thargoid interceptors warp in and fire shutdown fields	4	2	0
Attack run	0	2	4
interceptor sleep phase (until SYS recharged)	2	4	0
Shield stripping	0	4	2

Heat

Low temperature allows you to avoid ship scans for contraband cargo, and makes target lock difficult, particularly for thargoid interceptors, which is very important in AX combat.

Heat is generated by power. When a capacitor's reserve is fully depleted and there is still high demand, say for example weapons fire, then the continued demand for energy from the capacitor, without the ability of the capacitor to generate sufficient store to meet it, overdraws on the power grid and thus creates significant extra heat.

Whilst this can be temporarily countered with the use of a heatsink launcher, it is not a long term solution to the power budget issue. The best solution is to build a ship which runs sufficiently cool under thrust, and to prioritise pips as the circumstances require.

There are consequences from overheating due to poor pip management. If an AX pilot sets four pips to SYS for a shutdown field and does not set them back to WEP when the shutdown has passed, they will quickly deplete the WEP capacitor during firing, resulting in significant heat generation. An interceptor will then be able to lock on to the heat signature of the AX pilot's ship and do extensive damage.

Similarly, a smuggler who puts all pips to SYS and boosts like crazy to avoid ship scans risks using all ENG capacitor volume, and thus generating an increased heat profile. They will then be visible to system security and be able to be scanned. In addition, the ship will not be able to boost at all until there is sufficient juice in ENG to power a boost.



Fully drained ENG with no pips to recharge – the ship cannot boost any more until pips are put back into ENG

Engineering

It is possible to engineer a power plant with overcharged, and the monstered experimental, to squeeze extra power out of it. Overcharged engineering will significantly increase your heat generation, and may not be the best choice where stealth is important. The armoured engineering option also gives an additional 12% power when engineered to grade 5.

Conversely, it's also possible to use other engineering, such as low emissions and the thermal spread experimental, to reduce the thermal signature of the ship. These engineering choices will however significantly reduce the power output and budget available.

It's important to understand the overall demand for power on your ship's grid before engineering the power plant. The best approach is generally to first build the ship, then choose the power plant and engineering for it.

Conversely, in nearly all circumstances the best engineering for the power capacitor is charge enhanced with super conduits. There are some niche exceptions where engine focused is better, such as small ships used in a racer or courier role. Weapons focused can also be useful for a surface laser mining ship, depending on circumstances.