Introduction

Welcome

Congratulations on downloading and installing Automation ++ for Cosmoteer. This guide will explain how Automation ++ functions, how it can be used, and most other questions you may have had about Automation ++. There are also in-game tutorials included in Automation ++ if you would prefer them instead.

What is Automation ++?

Automation ++ basically adds in a new dimension for automating the supply of power to subsystems, allowing for more realistic ship designs. Automation ++ also includes systems to build remotely controlled drones, and even includes automated weaponry which require no crew to man it.

Addon Packages

Name	Compatibility	link
Weapons Package (UNRELEASED)	NaN	NaN
Micro-drones Package (UNRELEASED)	NaN	NaN

History

Automation ++ is a rewrite of the mod Drones ++. Drones ++ included some of the features seen in Automation ++, such as the automated powering of parts and remote controlled drones. The rewrite included the revamped Automated Reactor Core system and a re-imagining of some other parts too, all purposely done to help rebalance Drones ++.

Why did I rebrand Drones ++ to Automation ++?

Due to massive changes between Drones ++ and Automation ++, I saw it to be less harmful to the community to rewrite Drones ++.

Drones ++ will still be maintained, but will no longer be updated with any new features.

Changelog History

Version	Date	Compatibility	Alias
Drones ++ 0.1	16 Oct ‘17	0.12.x	
Drones ++ 0.2	17 Oct ‘17	0.12.x	
Drones ++ 0.2.1	20 Oct ‘17	0.12.x	
Drones ++ 0.3	21 Oct ‘17	0.12.x	
Drones ++ 0.3.1	25 Oct ‘17	0.12.x	
Drones ++ 0.3.2	1 Nov ‘17	0.12.x	
Drones ++ 0.4	13 Dec ‘17	0.13.0	Weapons Update
Drones ++ 0.5	24 Dec ‘17	0.13.2	Update of Change

Drones ++ 0.5.1	5 Jan ‘18	0.13.2	Update that Fixes the Last Update
Drones ++ 0.5.2	1 Feb ‘18	0.13.2	Community Update
Drones ++ 0.5.3	21 Feb ‘18	0.13.6	Update That Fixes Community Update That Fixes Update That Fixes Update Of Change
Drones ++ 0.6	12 Mar ‘18	0.13.6	Automation Compilation
Fools ++ 1.0	1 Apr ‘18	0.13.6	
Drones ++ 0.6.1	5 Apr ‘18	0.14.0	Bug Spray Update
Automation ++1.0	7th July ‘18	0.14.1	THE BIG ONE
Automation ++ 1.1	21st July ‘18	0.14.2	Weapons Extension 1.0
Automation ++ 1.2		0.14.4	Weapons Extension 2.0

Mechanics

Supply Mode

Supply mode is the newest mechanic, exclusive to Automation ++. In supply mode, auto reactors will distribute power to all nearby power loaders, which will then load the power as batteries into parts.

Note that in either mode, area mode or supply mode, an auto reactor will require a console or a large drone core aboard their ship, in order to operate.

The rate at which power is distributed depends on how many power loaders are nearby. You can use the equation or handy table to calculate the output of an autoloader easily.

Note that different autoloaders will load different amounts of power. The following statistics are correct to a standard power autoloader. Each autoloader will state their relative power consumption.

This new addition is done to avoid the cheaty abuse of spamming parts that supply power, to the point where it was near impossible for parts such as shields or ion beams to be drained of power. By penalising the power production, the amount of power produced actually stays constant, irrespective of how many parts are used.

Autoloaders are capped at 1 battery per second, making them perform most efficiently when 6 or more are used.

An auto reactor is in supply mode by default, and therefore will need no extra infrastructure to operate.

Auto reactors cannot receive power upgrades (yet!) due to some technical limitations.

Note that autoloaders will attempt to load power into parts, even if the parts do no accept the loading of power. As such, autoloaders may cause the loss of power from attempting to load power into parts that don't accept power. Advanced and compact power autoloaders are most vulnerable to this.

Note that should you enable area mode, auto reactors will no longer provide power to auto loaders. This also includes ammunition and missile autoloaders, since they are technically autoloaders.

You can use the following table and equation to solve the power output of each auto loader (in-game graphics will be available soon).

Equation

Where "a" is the number of auto loaders, and "p" is the power output of each auto loader:

$$a > 6,\ p = 6 \div a$$

$$a \leq 6,\ p = 1$$

Handy Table

# Auto loaders	Power per second per auto loader	Auto Reactor Strain

1	1	16.67%
2	1	33.33%
3	1	50%
4	1	66.67%
5	1	83.33%
6	1	100%
7	0.86	100%
8	0.75	100%
9	0.66	100%
10	0.6	100%
11	0.55	100%
12	0.5	100%

Area Mode

Area mode represents a form of power distribution that was the core mechanic of Drones ++. In Automation ++, area mode has been significantly tweaked and rebalanced.

Note that in either mode, area mode or supply mode, an auto reactor will require a console or a large drone core aboard their ship, in order to operate.

Area mode works by having the auto reactor itself powering all nearby parts, as opposed to supply mode which only powers individual components.

To enable area mode, an auto reactor requires a circuit breaker to be placed next to the reactor. Once the circuit breaker has been placed, further upgrades can be made by adding transformers or more circuit breakers. These upgrades are described under each part.

Note that auto reactors in area mode will not power auto loaders.

You can use the following table and equation to calculate the range and power output of auto reactors (in-game graphics will be available soon).

Equation

Where “c” is the number of circuit breakers and “r” is the radius of the auto reactor:

$$r = \sqrt{50c \div \pi}$$

Where “c” is the number of circuit breakers, “t” is the number of transformers and “p” is the power per second per part:

$$p = (1 + 0.5t) \div 20c$$

Handy Table

# Circuit breakers	Radius of auto reactor	Base power output per second per part
1	4 metres	0.24
2	5.6 metres	0.12
3	7 metres	0.08
4	8 metres	0.06
5	9 metres	0.048
6	9.7 metres	0.04

Drones

Drones are another mechanic dating back to the beginning of Drones ++. Drones function by having a drone core aboard an appropriate drone.

Small drones should use the small drone core, which provides a small amount of power to nearby parts, as well as control for the player. Larger drones should use the large drone core, which despite not providing any power itself, will enable auto reactors to function.

Both types of drone cores require some form of drone controller nearby to function. A drone controller will require crew to operate it, but does not have to be aboard the drone itself. Drone controllers can also be buffed by having sensor arrays next to it.

Alternatively, a player can place an AI module aboard their drone, which does not require crew in order to operate, and is much smaller than the drone controller. However, AI mainframes have a much poorer range than the drone controller, and cannot be upgraded by sensor arrays.

Note that drones will not function if they are junk or barbarian.

Parts

Power

Automated power systems center around the automated reactor core, which can have several subsystems and addons attached to change its behaviour. Most of this is described under "supply mode" and "area mode".

Automated Reactor Core

The auto reactor is the center of all automated power systems. The auto reactor does require a large drone core or a console present, in order to function. The auto reactor currently has two modes: supply mode and area mode. These modes are described under their topics.

Circuit Breaker

The Circuit Breaker is responsible for enabling area mode for an auto reactor. Should one enable area mode, the circuit breaker's main function is to increase the area that auto reactors will power, at the cost of power per part. Adding more circuit breakers will also increase the area (not radius) of the auto reactor by 50m².

Power Transformer

The Transformer's main function is to increase the power output of auto reactors, but will also quickly make the reactor more unstable and explosive! The transformer itself is also explosive.

Automated Power Loader

The auto loader is used by auto reactors in supply mode. Auto loaders will power whatever part they are facing. The power auto reactors provide will be divided equally among all auto loaders. The standard auto loader will load 1 battery every 1 second, at maximum efficiency.

Advanced Automated Power Loader

The advanced auto loader is used by auto reactors in supply mode. Advanced auto loaders act very similar to auto loaders, but will power all the parts they are touching; not just the one in front of them. However, advanced auto loaders consume double the power of a standard auto loader to supply all the parts it influences, and will load 1 battery every 2 seconds per side, at maximum efficiency.

Compact Automated Power Loader

The compact auto loader is a special auto loader that functions similar to the advanced auto loader. It's major advantage is that it also functions as corridor, which crew can traverse. However, it is much less powerful. It consumes half the power of a standard autoloader, and will load 1 battery every 8 seconds per side, at maximum efficiency. Therefore, it is best suited to powering subsystems.

Automated Ammunition Loader

The automated ammunition loader is an autoloader capable of manufacturing and distributing ammo shells to appropriate hardware. It loads 2 ammunition shells (1 to each of its front faces) every 2 seconds, at maximum efficiency. It consumes the same power as the standard auto loader.

Automated Missile Loader

The automated ammunition loader is an autoloader capable of manufacturing and distributing missiles to appropriate hardware. It loads 3 missiles (1 to each of its faces) every 1.5 seconds, at maximum efficiency. It consumes the same power as the standard auto loader.

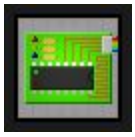
Console

The console can take the place of a large drone core, to enable auto reactors to function, however it does require crew to function.

Drones

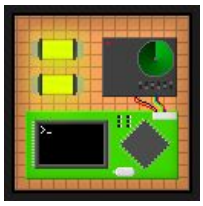
Drones are a way to fully automate whole ships, completely devoiding them of any crew to operate them. This, of course, presents many advantages and disadvantages. For information about drones, see the drones topic.

Small Drone Core



The small drone core allows remote control of small, unmanned drones. The small drone core does require a nearby drone controller to function correctly. However, when functional, will act like a control room allowing player control of the drone. The small drone core will also provide a minute amount of power in a small area around it.

Large Drone Core



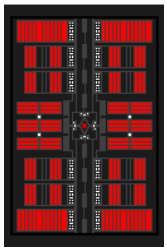
The large drone core is the center of any large drone. It functions similar to the small drone core, but will not supply power on its own. Instead, it will use auto reactors to power parts.

Drone Controller

The drone controller allows remote access of drones. By default, a drone controller has a range of 500 metres, but this can be drastically increased by adding sensor arrays around the drone controller. Each sensor array increases the range by an additional 500 metres. Note that drone controllers will not function, unless there is a functional control room onboard it's ship.

!WARNING! Long ranges can cause massive lag spikes which could cause the universe to collapse into a blackhole - upgrade with caution!

AI Mainframe



The AI Mainframe acts as an alternative to the drone controller. The AI Mainframe requires no crew or previous control, and is far smaller than the drone controller, making it a good choice to be placed aboard drones. Its disadvantages are its pitiful 150 metre range, which cannot be improved by sensor arrays.

Weaponry

Weapon Controller

The weapon controller allows the automated control of more complicated weaponry, which would otherwise require crew to operate it. Any compatible weaponry that is next to the Weapon controller will be activated, and available for the player to control. It does require a console or large drone core onboard to function.

The current list of compatible weapons are as follows:

- Laser Blaster
- Heavy Laser Blaster
- Electro-Bolter
- Ion Beam

Automated Ranged Offense Systems

Automated Ranged Offense Systems are a series of Drones ++ and Automation ++ exclusive weapons. They feature inbuilt targeting and guidance systems, and thus don't require a weapon controller, making them perfect for use aboard small drones. Current weapons in the series are:

Automated Ranged Offense Gun

A good, short ranged browning weapon. Has high spread and fast firing speed.

Automated Ranged Offense Laser

Medium ranged laser. Nothing particularly unusual, but it makes for a decent all-rounder weapon.

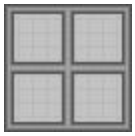
Automated Ranged Offense Rifle

Long ranged laser. Deals good damage, but has the longest firing interval.

Miscellaneous

Miscellaneous parts are miscellaneous parts that fall under the miscellaneous category for their function is miscellaneous.

Internal Structure



Internal structure is a variant of structure, designed to fill in the voids of decently sized ships, without severely affecting their stats. It has the same weight and price of structure, and the same penetration resistance of corridor. It is also unpressurised, therefore non-flammable. However, it cannot be walked on by crew.

Small Sensor

The small sensor is designed for use aboard drones which, by default, have a fairly poor sensor range. The small sensor includes the extra hardware for detecting enemy vessels, to allow drones to have sensor ranges similar to that of a crewed ship.

Lantern

The lantern is a part designed to mark the area in which automated items will power. It is only available in debug mode.

Debug mode? What debug mode?!