

Recursive blueprints+

The BR+ mod consists of 2 devices for automated use of blueprints.

All devices are controlled by logic signals.

Common signals for all devices

By default the values of the **X** and **Y** signals indicate how many tiles need to be moved away from this device horizontally and vertically (positive directions are to the right and down). If there is a signal [virtual-signal=rbp-absolute]>0, the above signals will be interpreted as absolute coordinates.

Further in these hints, the combination of these three signals will be indicated as a **coordinates**.

The values of the **W** and **H** signals determine the width and height of the area.

The position of the area can be determined in two ways: when the **coordinates** point to the corner of the area or to the center.

The point is selected by the [virtual-signal=rbp-center] signal: >0 center; <0 corner; =0 is determined by the mod setting (for the map) "**Area X,Y position**".

If the point is selected as a corner of the area, then the width and height essentially indicate an offset from the **coordinates**, so negative values can be used.

If the point is selected as the center of the area, then negative values of width and height do not make sense, so in this case the sign of the numbers will be ignored.

Further in these hints, the combination of these six signals will be indicated as an **area**.

Visual check

After sending signals to the device indicating the **coordinates** or **area**, you can check where these signals point to. To do this, select one or more of the devices to be checked with the "BAD Chest Area Indicator" tool.

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BAD chest

(Blueprint Automated Deployment) Automatically builds an inserted blueprint.

This version is controlled by custom signals.

Control signal

 signal is used for control. The action and additional parameters depend on the value of the signal. The signals that influence the action will be indicated in brackets.

Time signal

The device executes commands every tick. It is assumed that the command signals are given by pulses. If, for some reason, the control command is given in a continuous signal, the optional  signal should be used, which sets the command repetition interval. The internal timer is reset when  or  signals change. Changes of other signals are ignored.

Blueprint book navigation signals

[virtual-signal=rbp-book-layer1] signal means "navigation through nested blueprint books".

 signal indicates the number of the slot in the book to be used. If there is a book in the selected slot, then the slot indicated by the  signal will be selected. If there is another book there, then signal  is used for the next selection, and so on up to signal .

 signal indicates the number of the slot in the map's blueprint library. (This is currently used for commands #1, #2, and #102)

Wire usage

By default both wires of the deployer work as a combined input.

The **2W** mark indicates the split of the input wires. Any command with a **2W** mark divides the inputs into the main and additional ones. The wire that received the  signal will become the **main** one. If this signal is received from both wires, then this command will be ignored.

The main wire reads commands and parameters, just like any other commands.

An additional wire is used only by commands with a **2W** mark. This is usually used to read/write remote signals.

List of commands

[1] - use the item in the inventory. The action depends on which item is in the inventory.

Blueprint  ( )

Deploy blueprint at the specified **coordinates**. The construction mode is "forced": it puts what it can without paying attention to obstacles, adds landfill to the water, interfering trees/stones/rocks are marked for deconstruction.

To change the center of the blueprint, enable grid size (1x1 is recommended), and set an absolute reference point.

Additional parameters:

 signal rotates the blueprint. 1 -> 90° CW, 2 -> 180°, 3 -> 90° CCW.

 >0 - use the "superforced" construction mode (i.e. "forced" + interfering friendly buildings are marked for deconstruction).

Deconstruction planner  ( ) / **Upgrade planner**  ()

A deconstruction/upgrade plan for the specified **area** will be used.

Blueprint book  ()

The action depends on the chosen item.

[2] - is the same as **[1]**, but if the item turns out to be a blueprint, parameterization will be applied to it (replacing the parameter signals with the specified signal, as well as replacing the specified numbers with others).

Parameter replacement: numeric signals (from **0** to **9**) indicate which signal to change. The value of the numeric signal indicates which of the present signals (by coincidence of the value) should be pasted instead of the corresponding parameter. Exception: values from 1 to 9 will paste the corresponding numeric signal, value 10 will paste **0** signal.

For example, to replace  with , there should be signals =11 and **1**=11.

Number replacement: a pair of letter signals (**A** - **K** , **B** - **L** , etc. up to **J** - **T**) indicate which number to find and which number to replace it with.

For example, to replace "5001" with "10", there should be signals **A**=5001 and **K**=10.

Note: this parameterization does not support parameters-components for recipes, formulas, and filters/priorities for turrets. If something goes completely wrong, a error message will be displayed in the chat. Please inform the author of the mod about such cases.

[10] - Use a deconstruction plan without a filter on the specified **area** ( )

[11] - Use a deconstruction plan with a filter (item-signals) on the specified **area** (    )

 >0 - trees and rock only mode. In this case, the item-signals will be ignored.

 >0 - the specified items will be added to the filter marked as "any quality".

[20] - Use a upgrade plan without a filter on the specified **area** ()

[30] - Read signals from a constant combinator at the specified **coordinates** (2W  )

 - selecting the section to be read (read all when 0).

 >0 - read the signals from the specified section, even if it is turned off.

[31] - Write signals in a constant combinator at the specified **coordinates** (2W  )

 >0 - save the selected section as disabled.

[32] - Turn On/Off a constant combinator at the specified **coordinates** ()

[33] - Clear a constant combinator at the specified **coordinates**.

[34] - Read signals from a logic wires at the specified **coordinates** (2W )

 - Determines which wire to read: 1 - Red, 2 - Green, 3 - both.

[40] - Clear output signals.

[41] - Reset deployer I/O state.

[100] - Copy blueprint or blueprint book to the BAD chest inventory (Wire search) ( )

 >0 - Allow to replace the current (not empty) contents of the BAD chest inventory.

Note: The original blueprint must be in a chest (or inserter with read hand contents) on the same circuit network as the BAD chest. If there are several blueprints in the network, then the one that requires the least number of wire hops will be copied.

[101] - Copy blueprint or blueprint book to the BAD chest inventory (Coordinates search) ( )

Note: The original blueprint must be in a chest at the specified **coordinates**. The BAD chest can copy from itself, in that case it is possible to extract the contents of the blueprint book.

[102] - Copy blueprint or blueprint book to the BAD chest inventory from blueprint library ( )

[120] - Delete blueprint or blueprint book from the deployer inventory.

(It does not remove foreign items, so do not try to use specialized device as a trash bin!)

Debug

 signal is used to display debug messages (it is necessary to enable the trigger condition in the mod settings). Each activation will display in the chat the location of the triggered deployer, the name of the blueprint and the place where the blueprint is applied (if the **coordinates** are specified).

Warning: The chat may omit some of the messages if they are displayed very quickly.

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Area scanner

Counts the number of objects in the specified **area** and outputs the result as signals for the logical network.

Since some categories of objects, such as buildings and their ghosts, are indicated by the same signals, it is necessary to specify a filter for scanning with signal **F**. A particular values for the filter can be found in the scanner itself by clicking on the filter signal button.

Scanning is not performed continuously, but only when any input signal changes.

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Offset calculation tool

This tool calculates the values of the signals that will specify the area selected by the tool. The parameters of the tool can be found in the mod options (for the player).

To use it, take the tool (located in the shortcut bar) and follow these steps:

1. Selecting a reference point: Hold down the **Shift + Left-click** and select **[entity=blueprint-deployer2]**, **[entity=recursive-blueprints-scanner]** or any desired building.
2. Offset measurement: Hold down the **Left-click** to select the desired **area**. The calculated offset values will be displayed in the chat, which you can use as is or proceed to the next step.
3. Write to the constant combinator: Hold down the **Right-click** or **Control + Left-click** to select the **[entity=constant-combinator]** in which you want to write the result of the last measurement. The writing is performed only in the first section, the existing values of the necessary signals will be overwritten.

Note: The reference point and the last measurement are saved individually for each player, so you can "drop" the tool between the above steps.

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Blueprint deployer

Warning: This device is deprecated! It has not been completely removed from the mod only for compatibility with old blueprints.

Automatically builds an inserted blueprint.

This version is controlled by vanilla signals only.

0 signal means "use the item in the inventory". The action depends on which item is in the inventory.

(Previously,  signal was used, but it was replaced by a virtual signal, i.e. not an **item**-signal. When using old blueprints, see the map settings for changing the control signal)

Blueprint

Deploy blueprint at the specified **coordinates**. The construction mode is "forced": it puts what it can without paying attention to obstacles, adds landfill to the water, interfering trees/stones/rocks are marked for deconstruction.

To change the center of the blueprint, enable grid size (1x1 is recommended), and set an absolute reference point.

Additional parameters:

R signal rotates the blueprint. 1 -> 90° CW, 2 -> 180°, 3 -> 90° CCW.

F >0 - use the "superforced" construction mode (i.e. "forced" + interfering friendly buildings are marked for deconstruction).

Deconstruction planner/Upgrade planner /

A deconstruction/upgrade plan for the specified **area** will be used. The deployer will never mark himself for deconstruction.

If the signal **0** <0, the deconstruction/upgrade plan will be used in the "cancel" mode.

Blueprint book

The action depends on the chosen item.

If the signal **0** <0, the sign of the number will be ignored, and the deconstruction/upgrade plan will be used in the "cancel" mode.

0 signal indicates the number of the slot in the book to be used. If there is a book in the selected slot, then the slot indicated by the **1** signal will be selected. If there is another book there, then signal **2** is used for the next selection, and so on up to signal **5**.

Additional commands.

 signal is used as an independent command:

-1 = Use a deconstruction plan without a filter on the specified **area**. The deployer will never mark himself for deconstruction.

-2 = Mark deployer for deconstruction.

-3 = Cancel deconstruction orders on the specified **area**.

The following 4 commands use the item-signals to configure the deconstruction plan filter:

-4 = Deconstruction, whitelist filter.

-5 = Deconstruction, blacklist filter.

-6 = Cancel deconstruction, whitelist filter.

-7 = Cancel deconstruction, blacklist filter.

In addition to item-signals, filter are also used: **T** = Trees, **R** = Rocks, **C** = Cliffs.

Copying/deleting blueprints.

C =1 Copy blueprint or blueprint book to the deployer inventory.

The original blueprint must be in a chest (or inserter with read hand contents) on the same circuit network as the deployer chest. If there are several blueprints in the network, then the one that requires the least number of wire hops will be copied.

C =-1 Delete blueprint or blueprint book from the deployer inventory.

(It does not remove foreign items, so do not try to use specialized device as a trash bin!)

Debug

L signal is used to display debug messages (it is necessary to enable the trigger condition in the mod settings). Each activation will display in the chat the location of the triggered deployer, the name of the blueprint and the place where the blueprint is applied (if the **coordinates** are specified).

Warning: The chat may omit some of the messages if they are displayed very quickly.