

Panels, inverter and electrical

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Panels task

After your [roofs have been created](#) and selected, the next step is to add panels to them. This is done in the Panels task. In this task you **choose the panels**, the **layout** and the **mounting system** you'd like to use.

Choosing a panel

When you open the panels task, you'll be prompted to select a panel to use. Select a **manufacturer on the left** and then select an **individual panel in the middle**. You may need to scroll up or down to see the individual panels.

Can't find what you're looking for? Add [custom panels](#).

Once selected, on the right you can see the **specs for the panel** and [Midsummer stock and price information](#). Click on the Midsummer box to view the full listing with datasheets, warranty and more.

Click **Select** in the bottom right once you've chosen your panel

The screenshot shows the 'Choose a solar panel' interface. On the left, a list of manufacturers is shown: Eurener, Jinko, Longi Solar, SolFiT, Trina, * COMMERCIAL PANELS *, AIKO, InstaGen, and Meyer Burger. An orange arrow labeled 'Choose manufacturer' points to this list. In the center, the 'Trina' manufacturer is selected, and a list of panels is displayed. An orange arrow labeled 'Choose panel' points to this list. On the right, the specifications for the 'Trina Vertex S+ 450W Dual Glass Full Black N-Type Mono (Traceable)' panel are shown. An orange arrow labeled 'View specs' points to the 'Specs' table. Below the specs, the 'Distributors' section shows 'MIDSUMMER' with a stock status of '\$196 currently in stock!' and a price of 'Your price: £74.20'. An orange arrow labeled 'View stock levels and your pricing info' points to this section. At the bottom right of the distributor box is a 'Select' button.

Choose a solar panel

Eurener
Jinko
Longi Solar
SolFiT
Trina
* COMMERCIAL PANELS *
AIKO
InstaGen
Meyer Burger

Trina

Trina Vertex S+ 445W Dual Glass Full Black N-Type Mono
Trina Vertex S+ 445W Dual Glass N-Type Bifacial with Clear Backsheet
Trina Vertex S+ 450W Dual Glass Black White N-Type Mono
Trina Vertex S+ 450W Dual Glass Full Black N-Type Mono
Trina Vertex S+ 450W Dual Glass Full Black N-Type Mono (Traceable)
Trina Vertex S+ 455W Dual Glass Black

Trina Vertex S+ 450W Dual Glass Full Black N-Type Mono (Traceable)

Specs

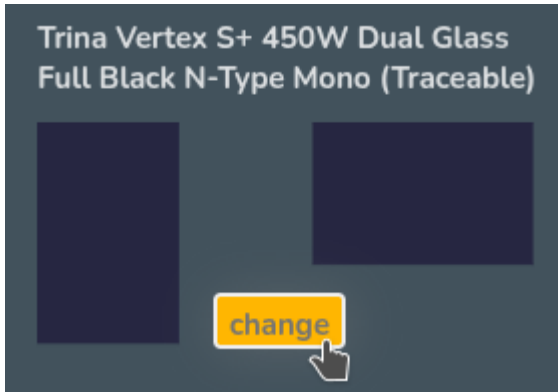
Power	450W
Dimensions	1762 × 1134mm
Frame	30mm black
V _{oc}	52.90V
I _{sc}	10.74A
V _{mpp}	44.60V
I _{mp}	10.09A

Distributors

MIDSUMMER
\$196 currently in stock!
Your price: £74.20
Select

Tip: [Connect your Midsummer Wholesale account](#) for accurate pricing. Not registered? [Sign up here](#).

Once you have selected a panel, you can click **change** on the left-hand menu to reopen the panel menu.

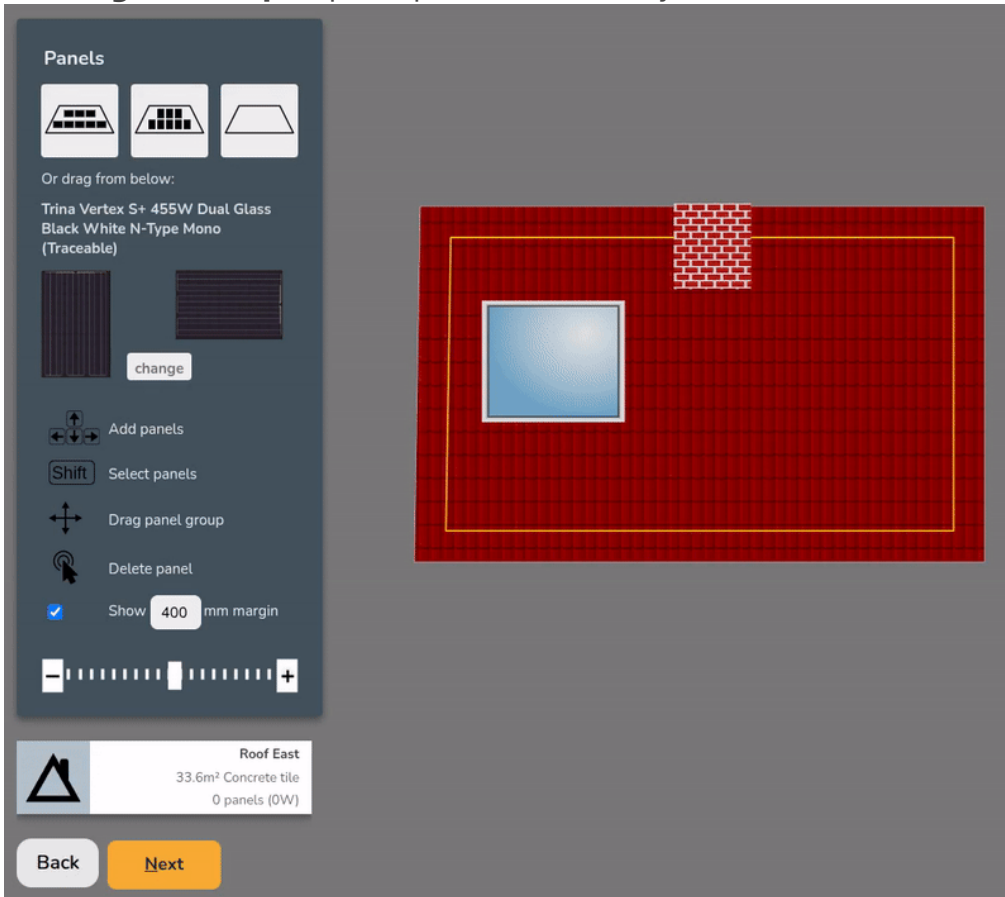


Creating panel layout

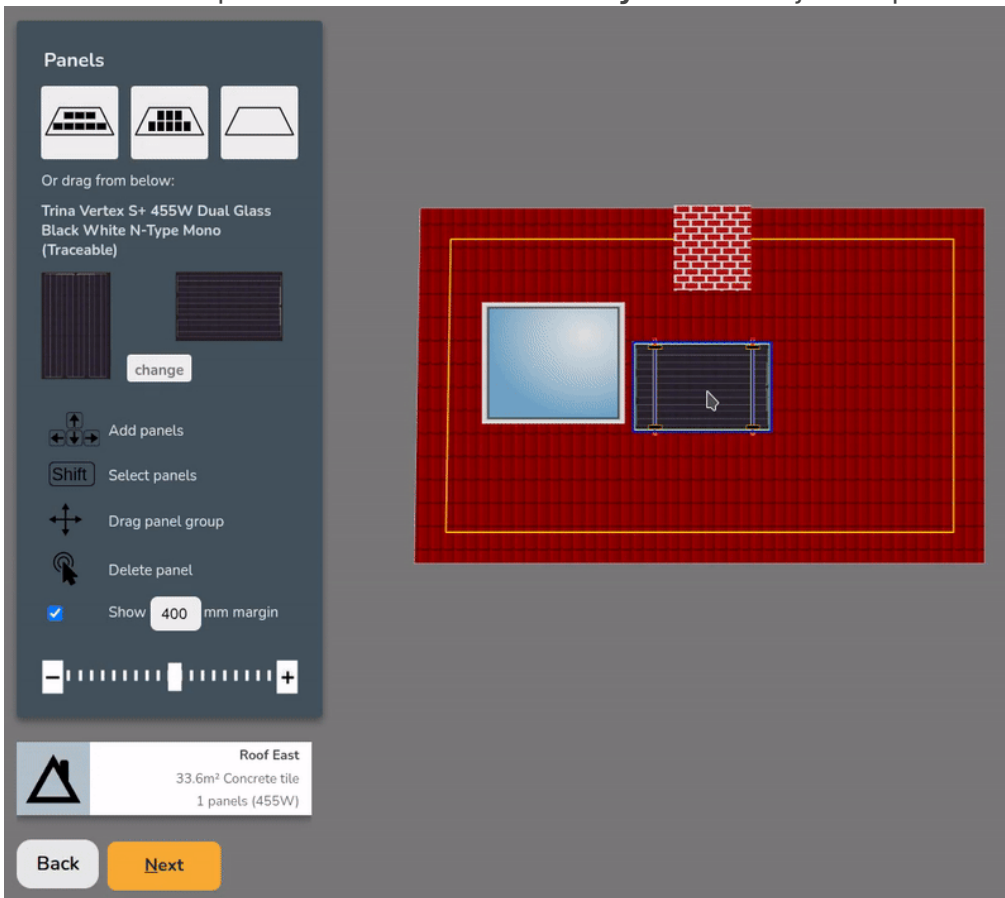
Add panels

There are three ways to **add panels** to a roof:

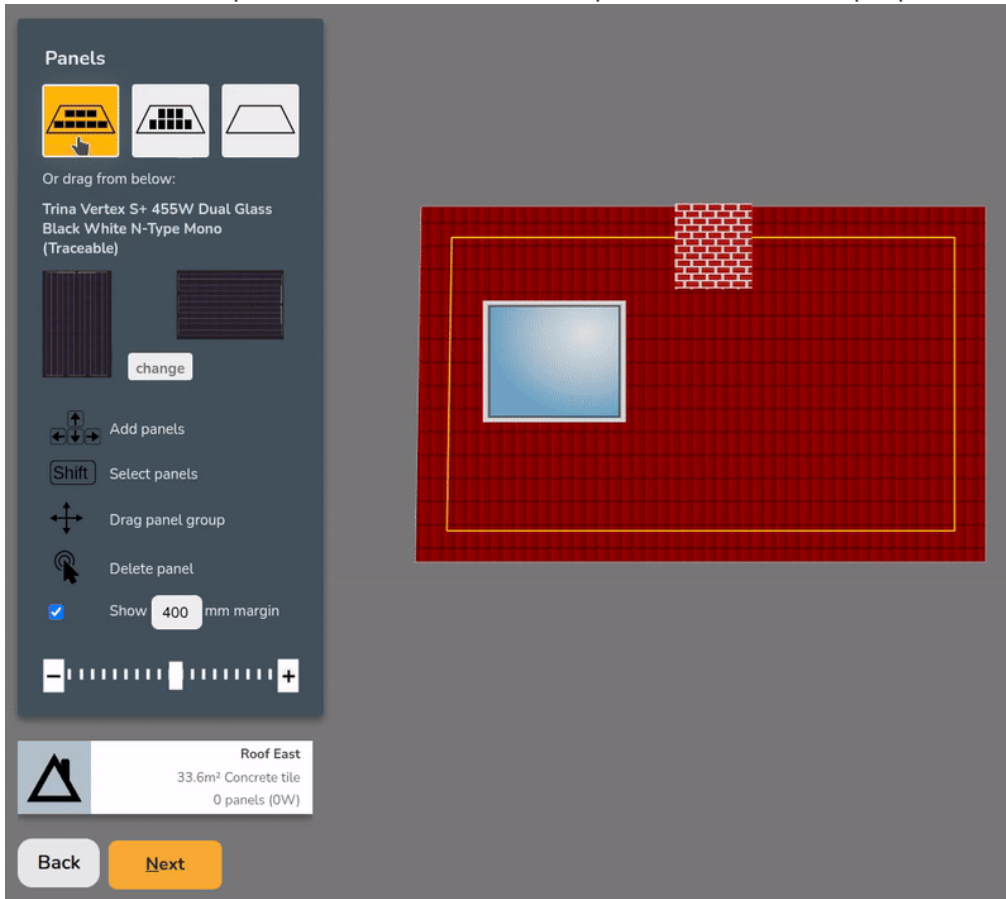
-  **Drag and drop** to place panels individually



-  Click on a panel and use the **arrow keys** to add adjacent panels



- Click **auto-fill** options to fill the roof with portrait or landscape panels

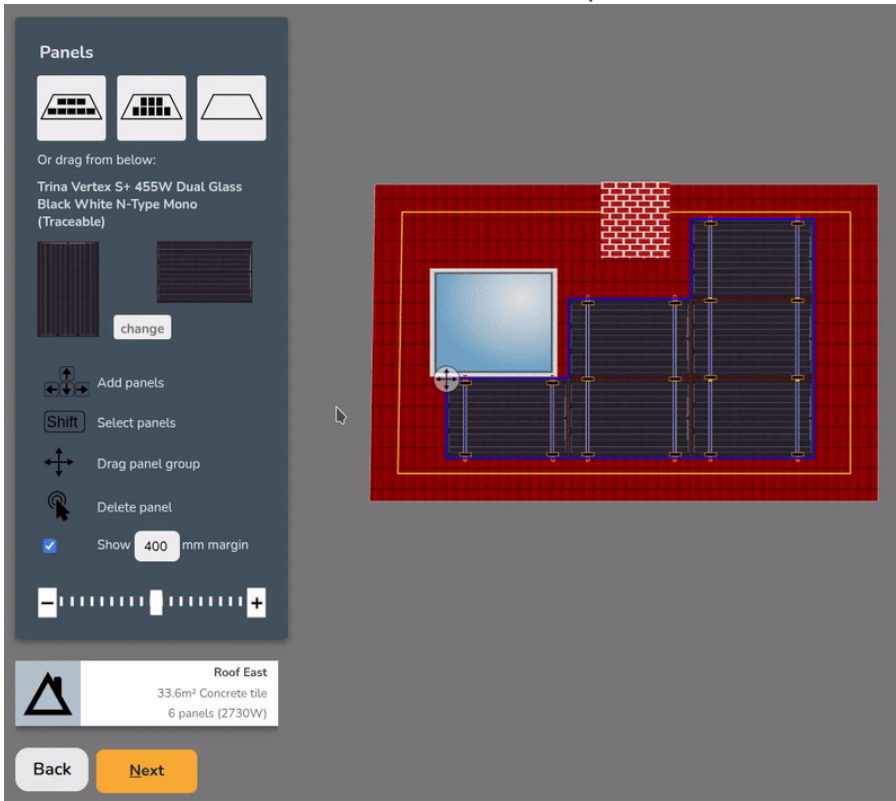


Note: Auto-fill options will avoid obstructions and place as many panels as possible within the configured margin.

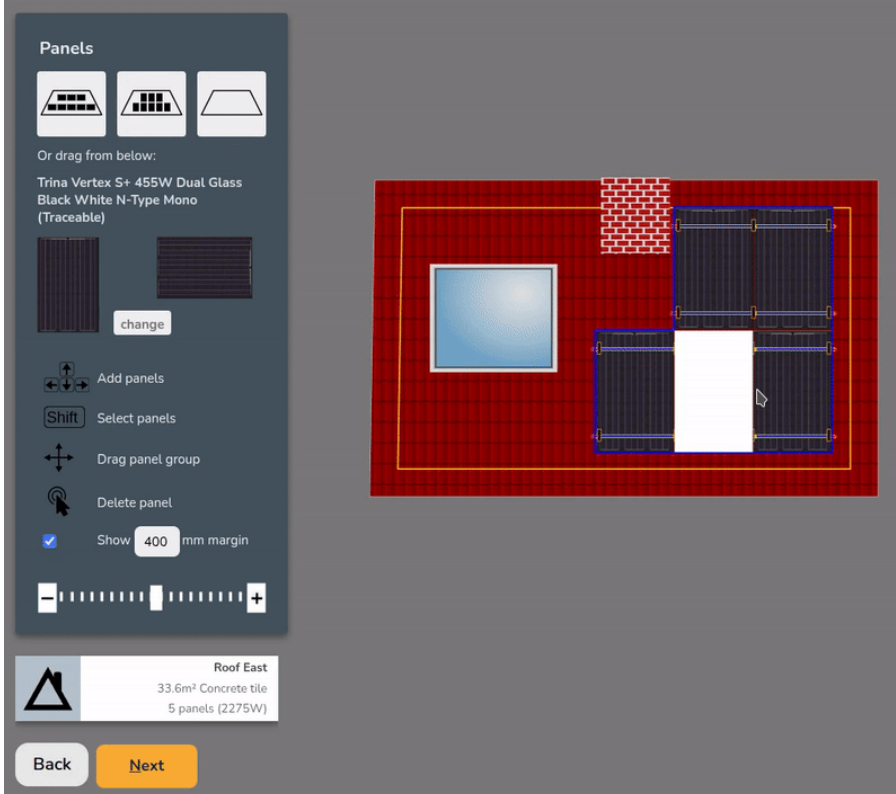
Remove panels

To **remove** panels, you can:

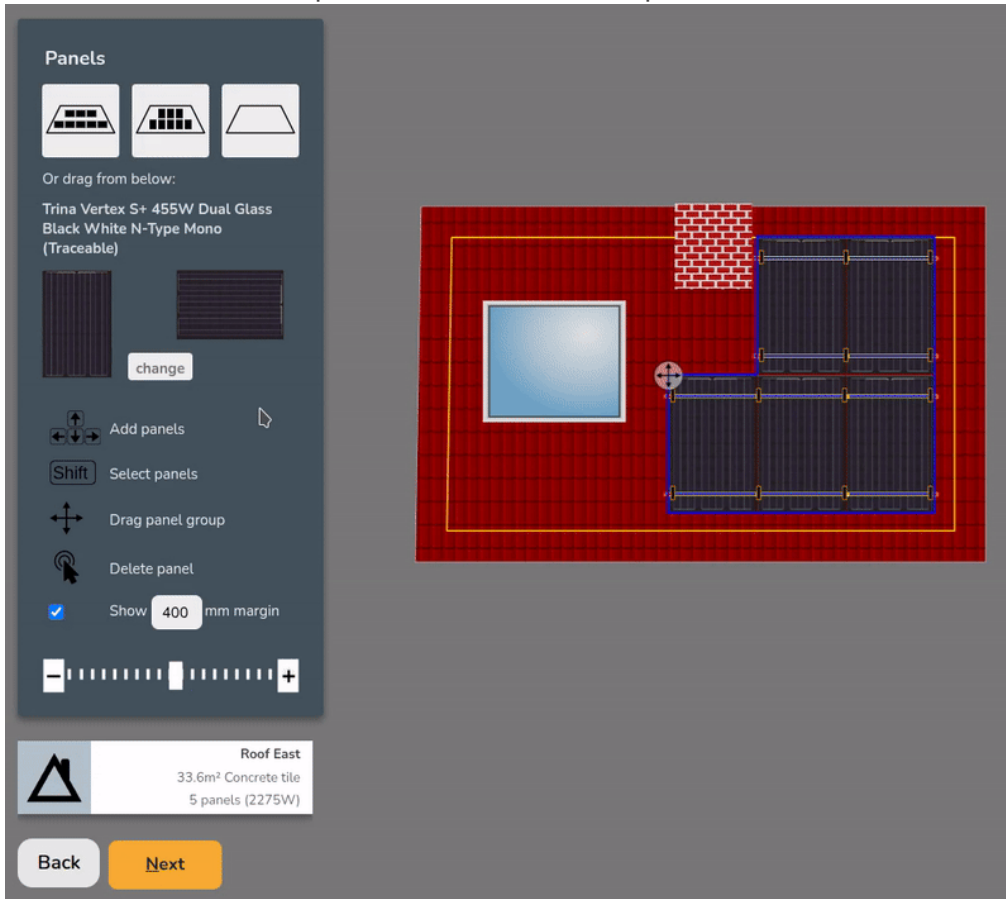
-  **Double click** to remove an individual panel



- **Shift** + **Click** + **Drag** to select multiple panels and **Delete** or **Backspace** to remove



- Click the **clear roof** option to remove all the panels



Choosing a mounting system

Once the roof has panels on it, you can choose from the available mounting options on the right. The mounting options displayed will be compatible with the **roof** and **panel size and layout**.

When selected, Easy PV will specify the necessary mounting components. Depending on the mounting system, you may also have additional options to **configure the components** further (rail colour, preferred hook, bird blocker etc.).

Mounting system

No mounting

Fastensol

Renusol

K2 SolidRail

GSE

Mounting components

	Renusol black universal end clamp	12
	Renusol black universal mid clamp	6
	Renusol black end cap	12
	Renusol landscape RH1 pantile roof hook (with fixings)	18
	Renusol silver rail 3600mm	5

Preferred hook:

RH1 pantile

☐ Genius FlexiFlash

Run rails:

vertically

NOTE: You may be able to use fewer RH1 roof hooks for this design – please see the structural task to change the number of roof hooks.

Bird Protection:

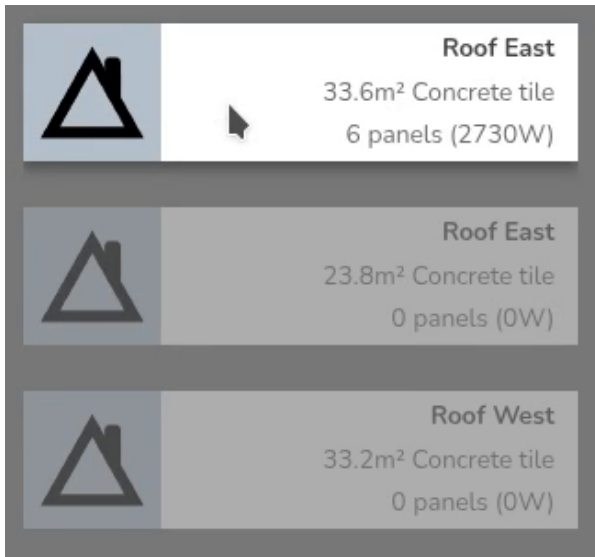
None

easy-pv.co.uk This mounting kit list does not take into account structural considerations. Adjustments needed to the number of hooks can be calculated in the **structural task** (UK only) or otherwise.

If the mounting system you want to use is not available, select **No mounting**. For flat roofs, you will have additional options to [configure the panel layout](#), including east-west options.

Multiple roofs

Use the list on the left to navigate and configure the panel layout for each roof.



Once all roofs are completed click **Next** onto the inverter task.

Still Need Help?

- **Related FAQs:** Check out our [Panels, Inverter and Electrical FAQs](#) for answers to common questions
- **More guides:** Take a look at the [Inverter task](#) or [Electrical task](#) guides
- **Live training:** [Book onto a live demo session](#) to see this feature in action

Contact Support: If you've got further questions, get in touch with our support team at **help@easy-pv.co.uk** (UK) or **help@easy-pv.ie** (IE). *If you are experiencing a bug, to help us look into your issue faster, please include the email address of your account, the name of the project and screenshots of any unexpected behaviour.*

Inverter task

In this task you select **the inverter** and **batteries** you'd like to use and **how many panels to allocate to each MPPT**. You can also choose whether you want to include **optimisers**.

Choosing an inverter

The screenshot shows the 'Inverters' selection screen. On the left, a list of manufacturers is sorted by type and manufacturer. The main area displays 'Recommended for this project' with three categories: String inverters, Hybrid inverters, and Optimised inverters. A vertical line separates the recommended inverters from the rest of the list. Annotations include: 'Inverter library sorted by type and manufacturer' pointing to the left list; 'Peak panel output 5280W, Optimum inverter size 4234W' at the top right; 'Peak panel output and optimum inverter size' pointing to the vertical line; and 'Recommended inverters' pointing to the recommended section. A 'go' button is at the bottom right.

Inverters

Recommended

String Inverters

- Fox ESS (String)
- Fronius (String)
- GivEnergy (String)
- Growatt (String)
- InstaGen (String)
- Sofar Solar
- SolaX (String)
- Sungrow (String)

Optimised

- SolarEdge
- SolarEdge Home Hub - 3ph

Microinverters

- Atmoce
- Enphase

Hybrid Inverters

- EcoFlow Power Ocean
- Eleven Energy
- Fox ESS (Hybrid)
- Fox ESS EVO All in One series
- GivEnergy (Hybrid)
- GivEnergy 3ph
- GivEnergy All in One 2
- Growatt 1ph HV
- Growatt 3ph HV
- Growatt LV
- InstaGen
- MvEnergi Libbi

Recommended for this project

String inverters

- Fronius Primo 1ph 3.68kW WLAN
- SolaX X1-BOOST G4 3.68kW 1ph string
- GivEnergy G3 3.6kW String

Hybrid inverters

- SolaX X1 G4 3.7D hybrid
- Libbi 3.68kW 1ph

Optimised inverters

- SolarEdge 3500 HD Wave - Screenless SETAPP

Peak panel output 5280W
Optimum inverter size 4234W

Peak panel output and optimum inverter size

Recommended inverters

go

Can't find what you're looking for? See how to add custom [inverters](#).

When you open the inverter task, a menu will pop up with the following information:

- **Inverter recommendations:** Recommended based on array size, number of inputs and cost. Choose from string, hybrid, optimised inverters.
- **Peak panel output and optimum inverter size:** The installed capacity of the system and optimum inverter size based on solar data for project location.
- **List of inverter manufacturers:** List of all inverter manufacturers stocked by Midsummer, sorted by type.

If you select a manufacturer from the list on the left, you can then:

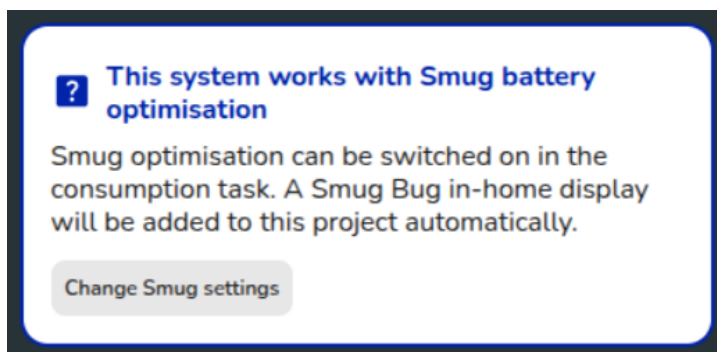
- Choose between **single phase** and **three phase** inverters for that manufacturer.

- View the **output loss percentage** for each inverter, which you can use to choose an appropriately sized inverter.

Once selected, you'll see the **specs for the inverter** and [Midsummer stock and price information](#) on the left. Click on the Midsummer box to view the full listing with datasheets, warranty and more.

Click **go** in the bottom right once you've chosen your inverter to add it to the project.

Tip: [Connect your Midsummer Wholesale account](#) for accurate pricing. Not registered? [Sign up here](#).



You will be notified of the inverter's Smug compatibility and given the option of changing your [Smug settings](#).

If you wish to benefit from **Smug smart battery optimisation**, choose a [Smug-compatible inverter](#) at this stage. Click [here](#) to find out more about Smug optimisation.

Panel allocation

Once you've chosen your inverter, the next step is to **select how many panels you want for each MPPT**. If the inverter was from the recommended section, this step will be completed for you.

In the top right you can see **how many panels you need to allocate**. On each inverter you will see the **different combinations** that can be allocated to each string. Once the right number of panels have been allocated, a green tick will appear.

Multiple string arrangements are typically possible. Below shows an example with 12 panels, selecting 1x6 (1 string of 6 panels) to each input and then 1x4 and 1x8:

ProjectsTasksComponentsFormsReportsHelp

My AccountUpgrade to pro

Eleven Energy North Sea EL3600 3.6kW hybrid

ADD OPTIMISERS

Input 1: Trina Vertex S+ 440W Dual Glass N-Type Bifacial with Clear Backsheet solar panels

1 string	3x3	1x3	1x3	1x4	1x5	1x5	1x7	1x8	1x9	3x10	1x11
2 strings	2x2	2x3	2x3	2x4	2x5	2x5	2x7	2x8	2x9	2x10	2x11
3 strings	2x3	2x2	2x3	1x4	2x5	2x5	2x7	2x8	2x9	2x10	2x11

Power

The rated AC output power of the inverter is 3600W.

Current

The maximum DC input current of the inverter input is 18A.

Max voltage

The maximum input voltage of the inverter input is 550V.

Operating range

The MPPT voltage range of the inverter input is 80V to 550V.

Input 2: Trina Vertex S+ 440W Dual Glass N-Type Bifacial with Clear Backsheet solar panels

1 string	3x3	1x3	1x3	1x4	1x5	1x5	1x7	1x8	1x9	3x10	1x11
2 strings	2x2	2x3	2x3	2x4	2x5	2x5	2x7	2x8	2x9	2x10	2x11
3 strings	2x3	2x2	2x3	1x4	2x5	2x5	2x7	2x8	2x9	2x10	2x11

Power

The rated AC output power of the inverter is 3600W.

Current

The maximum DC input current of the inverter input is 18A.

Max voltage

The maximum input voltage of the inverter input is 550V.

Operating range

The MPPT voltage range of the inverter input is 80V to 550V.

Batteries

Eleven Energy Galvani 4.5 kWh Stackable Sodium Ion Battery	1	2	3	4	5	6	7	8	9	10
Eleven Energy Volta 4.5kWh Na-ion	1	2	3	4	5	6	7	8	9	10

Inverters

Electrical components

0 out of 12 Trina Vertex S+ 440W Dual Glass N-Type Bifacial with Clear Backsheet are allocated

Please add some batteries to your Eleven Energy North Sea EL3600 3.6kW hybrid

Electrical compatibility

The number of viable inputs will vary depending on the the inverter and the panels chosen. For each input, some options will show in **red**, indicating the arrangement does not pass the electrical checks, and others in **green**, indicating the arrangement does pass all the electrical checks Easy PV is doing.

Electrical compatibility information for the selected arrangement is shown below the stringing options. This indicates which limiting factors (power, current, max voltage, operating rage) for that input are met or exceeded.

Example: passed and failed check

✗

Not electrically viable: with this arrangement, the max voltage for the MPPT is exceeded:

[clear](#)

Input 1: Trina Vertex S+ 440W Dual Glass N-Type Bifacial with Clear Backsheet solar panels

1 string	1 × 1	1 × 2	1 × 3	1 × 4	1 × 5	1 × 6	1 × 7	1 × 8	1 × 9	1 × 10	1 × 11
2 strings	2 × 1	2 × 2	2 × 3	2 × 4	2 × 5	2 × 6	2 × 7	2 × 8	2 × 9	2 × 10	2 × 11
3 strings	3 × 1	3 × 2	3 × 3	3 × 4	3 × 5	3 × 6	3 × 7	3 × 8	3 × 9	3 × 10	3 × 11

! Power

The rated AC output power of the inverter is **3600W**.

The maximum DC input power is **4400W**.

✓ Current

The maximum DC input current of the inverter input is **18A**.

The highest input current expected for this array at 40°C is **10A**.

✗ Max voltage

The maximum input voltage of the inverter input is **550V**.

The open circuit voltage for a string of 10 panels at -10°C is **568V**.

✓ Operating range

The MPPT voltage range of the inverter input is **80V to 550V**.

The MPPT voltage of the array will be approximately **424V** at 40°C and **479V** at -10°C.

✓ **Electrically viable:** with this arrangement, all checks on power, current, max voltage and operating range have passed:

[clear](#)

Input 1: Trina Vertex S+ 440W Dual Glass N-Type Bifacial with Clear Backsheet solar panels

1 string	1 × 1	1 × 2	1 × 3	1 × 4	1 × 5	1 × 6	1 × 7	1 × 8	1 × 9	1 × 10	1 × 11
2 strings	2 × 1	2 × 2	2 × 3	2 × 4	2 × 5	2 × 6	2 × 7	2 × 8	2 × 9	2 × 10	2 × 11
3 strings	3 × 1	3 × 2	3 × 3	3 × 4	3 × 5	3 × 6	3 × 7	3 × 8	3 × 9	3 × 10	3 × 11

✓ Power

The rated AC output power of the inverter is **3600W**.

The maximum DC input power is **2640W**.

✓ Current

The maximum DC input current of the inverter input is **18A**.

The highest input current expected for this array at 40°C is **10A**.

✓ Max voltage

The maximum input voltage of the inverter input is **550V**.

The open circuit voltage for a string of 6 panels at -10°C is **341V**.

✓ Operating range

The MPPT voltage range of the inverter input is **80V to 550V**.

The MPPT voltage of the array will be approximately **255V** at 40°C and **287V** at -10°C.

Panel allocation is then completed in the [Performance task](#).

Adding battery storage

You can add battery storage to **hybrid** or **AC-coupled inverters**. In each case, you will see a list of compatible batteries for that inverter, with the options most suitable for the system shown in green. Darker green options are compatible but may not be optimal.

When you make a selection, warnings about the battery capacity and maximum battery charge rate will display below to help in choosing an appropriate size.

Batteries

 Eleven Energy Galvani 4.5 kWh Stackable Sodium Ion Battery	1	2	3	4	5	6	7	8	9	10
 Eleven Energy Volta 4.5kWh Na-ion	1	2	3	4	5	6	7	8	9	10

Battery Capacity

This inverter can be linked to up to 36.00 kWh of battery capacity and should have a minimum of 4.50 kWh of battery.

Please select a battery for this inverter

Power

The maximum battery charging rate of this inverter is 5000W

The inverter charging power is small compared to the capacity of the battery array. It is unlikely to be fully utilised except in perfect weather.

Battery only: On every project, you will need either a string or hybrid inverter as battery only projects are not yet supported. If you have an AC inverter, you will also need a string inverter.

Looking to add batteries later? You can skip adding a battery to a hybrid inverter if the plan is to install one at a later date. Simply add the inverter and don't select a battery. A warning will appear when going to the [Electrical task](#), just click **OK** to continue.

Additional options

- **Delete inverter**

This is in the top right of each inverter.

- **Clone inverter**

This is in the top right of each inverter. Cloning will also copy stringing arrangements.

- **Add Optimisers +**

This is to the top right of the first input on compatible inverters. After adding, select from the drop-down which optimiser you want to use. This will add **one optimiser per panel**.

- **Add PV Inverter or Battery Storage System +**

Click this to add another inverter. This is to the bottom right of the last inverter. This will re-open the inverter selection menu.

Note: Using optimisers or microinverters will also mean you need to [manually allocate panels](#) in the [Performance task](#).

Still Need Help?

- **Related FAQs:** Check out our [Panels, Inverter and Electrical FAQs](#) for answers to common questions
- **More guides:** Take a look at the [Inverter task](#), [Electrical task](#) and [Performance task](#) guides
- **Live training:** [Book onto a live demo session](#) to see this feature in action

Contact Support: If you've got further questions, get in touch with our support team at **help@easy-pv.co.uk** (UK) or **help@easy-pv.ie** (IE). *If you are experiencing a bug, to help us look into your issue faster, please include the email address of your account, the name of the project and screenshots of any unexpected behaviour.*

Electrical task

This is the final stage of the kit builder and is where you specify **isolators**, **cables**, **meters** and any other kit needed in the system. Most components are pre-selected automatically based on your panel and inverter choices. You can review and adjust them as needed.

DC Isolators

Choose a DC isolator for each inverter input.

- Click on the **Current** and **Voltage** sections to view full details.
- Click **Match all DC isolators...** to **bulk edit** DC isolators for that inverter.



Eleven Energy North Sea EL5000 5kW hybrid

Match all DC isolators for this inverter to be the same as string 1

String 1: 8 Trina Vertex S+ 450W Dual Glass Full Black N-Type Mono (Traceable) solar panels

IMO 16A DC Isolator 2-pole 1-string ▼

✓ Current

✓ Voltage

String 2: 8 Trina Vertex S+ 450W Dual Glass Full Black N-Type Mono (Traceable) solar panels

IMO 16A DC Isolator 2-pole 1-string ▼

✓ Current

✓ Voltage

Once selected, you can click **Next: Cables**.

DC Isolators

Choose a DC isolator for every inverter input and check that it has appropriate voltage and current ratings.

[Next: cables](#)

DC cable and connectors

Specify the length of run and cable cross section of the DC cable to check voltage drop.

- Enter the **DC cable run lengths** and select the **size**.
- Use [Match all DC cable runs...](#) button to **bulk edit** cable size and lengths for that inverter.



Eleven Energy North Sea EL5000 5kW hybrid

[Match all DC cable runs for this inverter to be the same as string 1](#)

String 1: 8 Trina Vertex S+ 450W Dual Glass Full Black N-Type Mono (Traceable) solar panels	10 m run of 4mm2 DC Cable	 Voltage drop Voltage drop at maximum power point at 40°C will be around 0.92 V (0.27 percent)
String 2: 8 Trina Vertex S+ 450W Dual Glass Full Black N-Type Mono (Traceable) solar panels	10 m run of 4mm2 DC Cable	 Voltage drop Voltage drop at maximum power point at 40°C will be around 0.92 V (0.27 percent)

If you're not looking to add Solshare, at this point click [Next: AC Isolators](#).

SolShare

Before navigating to the AC Isolators section, you'll see the option to add a SolShare to the project. If you'd like this included in the project, click [SolShare](#).

DC cable and connectors

Specify the length of run and cable cross section of the DC cable to check voltage drop.

Back

SolShare

Next: AC Isolators

Then:

1. Select which inverters you wish to be paired with SolShare
2. Select how many connections the SolShare will be supplying



Growatt MOD 13000 TL3-X 3ph

Paired with SolShare: ☐

Number of single phase connections: 0

Number of three phase connections: 0

Size of circuit breaker for SolShare: 32 A

Location of flat's energy meters: Inside

✓ ACOutput

The output current of this inverter is under 35A, inside the SolShare limits

✓ Phases

Correct inverter phase for SolShare, only three phase (or three single phase) inverters are valid for SolShare

✓ Battery

This is not an AC inverter, so can be used as an input to the SolShare box

If the selected inverter is not compatible with Solshare, you will not be able to add one. For guidance on designing a SolShare system, chat to your [Midsummer account handler](#). SolShare requires a minimum of 6x single-phase or 2x three-phase connections. The site must have a multi-service distribution board (MSDB) supplied by 1x incoming supply to enable SolShare system to work. **Read more about Solshare [here](#).**

AC Isolators

Specify an appropriate AC isolator for each inverter in your project, and check that it has an appropriate current rating.



Growatt MOD 13000 TL3-X 3ph

Rated output of inverter: 21.7 A.

AC isolator - IMO - 20A 4-pole

Current

Phases

AC isolator - IMO - 20A 4-pole
AC isolator - IMO - 32A 4-pole
AC isolator - IMO - 40A 4-pole
AC isolator - IMO - 63A 4-pole
AC isolator - IMO - 80A 4-pole
AC isolator - IMO - 100A 4-pole
AC isolator - KN 125A 4-pole
AC isolator - IMO - 125A 4-pole

Once selected, you can then click **Next: Meters**.

Meter

In this section, you'll be able to select from compatible generation meters.

If no meters supplied by Midsummer are compatible, you will only have the option to select **No meter thanks**. You can also [add a custom meter](#).

Then click **Next: Extras**.

Extras

Add monitoring, immersion controllers, battery storage and accessories to your project.

Any extras required for components you've already added to the system will be selected automatically. Increase the count of any other extras you'd like included in the project.

A **Smug Bug** will be added automatically in the 'Extras' if you have [Smug smart battery optimisation](#) toggled on by default, and if you have selected a compatible inverter.



1

Smug Bug
Smug Bug in-home display for connecting your inverter to the Smug battery optimisation app.

To finish of the electrical task, click **Next: overview**. This will take you to the project overview where you can either click **Add to Cart** on the Midsummer basket or continue with the [Performance task](#).

Still Need Help?

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