SOLINTEG | aerl

APPLICATION GUIDE

Paralleling and Diesel Generator Solutions

Solinteg M2HT 25–50 kW Hybrid Inverters



M2HT-25K · 29.9K · 30K · 40K · 50K

Application Guide

REV 1.0.2, 9 NOV 2026

AERL.COM.AU

AUSTRALIAN EDITION

Contents

01	**Introduction**	**3**
	Overview	3
	System Types	4
	Solutions in This Guide	4
	Equipment Required	5
02	**How the System Works**	**6**
	Off-Grid Paralleling	6
	Generator Output Modes	6
	Generator Control Methods	7
03	**Wiring**	**8**
	Single Inverter, Generator on the GEN Port, with Grid	8
	Single Inverter, Generator Through an ATS, with Grid	9
	Single Inverter, Generator on the On-Grid Port, No Grid	9
	Off-Grid Parallel, Scenario 1: Grid Only	10
	Off-Grid Parallel, Scenario 2: Generator Only	11
	Off-Grid Parallel, Scenario 3: Grid and Generator	11
	Off-Grid Parallel, Scenario 4: No Grid, No Generator	12
	On-Grid Parallel, Grid and Generator	13
	EDA Back-Up Box and ATS	13
	Rules for Off-Grid Paralleling	14
04	**App Configuration**	**16**
	Off-Grid Paralleling	16
	Diesel Generator	21
05	**Questions and Answers**	**25**
06	**Technical Support**	**28**

Introduction

Overview, system types, solutions in this guide

01

Document

Revision	Effective	Audience	Inverters in parallel
1.0.2 (Australian edition)	**11 / 2026**	**Designers and licensed installers**	**Up to 10 (500 kW)**

Generator size	Extra hardware	App	Format
At least 1.5 × total inverter power	**EDA back-up box, ATS**	**Solinteg IntegHub**	**A4 · 29 pages**

1.1 Overview

Paralleling. Up to ten Solinteg M2HT 25–50 kW hybrid inverters can run in parallel, on both the on-grid side and the back-up side, for a total of up to 500 kW. Parallel systems suit high-power sites such as factories, shopping centres and business parks, and keep the site supplied when the grid is unavailable or unstable. The inverters offer six work modes, including time-of-use (ToU), to reduce energy costs.

Diesel generator solutions. Where the grid is unreliable, a diesel generator (DG) adds a second power source, so the site stays supplied during planned and unplanned outages. Solinteg offers generator solutions for single inverters, and for parallel systems using the Solinteg EDA back-up box and an automatic transfer switch (ATS). These cover applications from residential to commercial, with intelligent management of the whole system.

When the grid fails, the generator can supply the loads and also charge the battery, which makes the system more stable.

> **The generator and the inverters never supply the loads at the same time**
>
> Size the generator and the inverter system so that **each one on its own** can supply the full load.

> **Australian requirements**
>
> Design and install the system in accordance with AS/NZS 3000, AS/NZS 4777.1, AS/NZS 5139 and, for generators, AS/NZS 3010. Grid-connected systems need network approval, and multiple-inverter systems may need central protection. Check with the local network service provider before you design the system. All installation work must be done by licensed electrical workers.

1.2 System Types

Type	Output	Definition	Application
Single	25–50 kW	One inverter	With battery backup. Suits grid-connected and off-grid sites, and sites that need on/off-grid switching because of frequent outages.
On/off-grid parallel	50–500 kW	Up to 10 inverters in parallel on both the on-grid side and the back-up side	System-level battery backup. Suits sites with frequent outages. Reduces reliance on the grid, and keeps the loads running when the grid is down.
Off-grid parallel	50–500 kW	Up to 10 inverters in parallel on the back-up side	System-level battery backup. Suits off-grid sites only. Forms a microgrid supplied by PV and batteries.
On-grid parallel	50–500 kW	Up to 10 inverters in parallel on the on-grid side	No system-level battery backup. Suits sites with a stable grid. Reduces electricity costs through peak/off-peak arbitrage or response to grid dispatch.

1.3 Solutions in This Guide

Type	Solution	Section
Single inverter	Generator on the inverter GEN port, with grid	3.1
Single inverter	Generator through an ATS, with grid	3.2
Single inverter	Generator on the inverter on-grid port, no grid	3.3
Off-grid parallel	Scenario 1: grid only	3.4
Off-grid parallel	Scenario 2: generator only	3.5
Off-grid parallel	Scenario 3: grid and generator	3.6
Off-grid parallel	Scenario 4: no grid, no generator	3.7
On-grid parallel	Grid and generator	3.8

1.4 Equipment Required

Every solution uses Solinteg M2HT 25–50 kW inverters, a three-phase diesel generator that can be started and stopped by a dry-contact (DO) signal, and a Solinteg RMM smart meter (supplied with the inverter). The generator and ATS are sourced locally.

Solution	Generator connects at	Grid	EDA back-up box	ATS	Firmware
Single inverter	GEN port	On-grid or off-grid	—	—	Confirm with AERL
Single inverter	On-grid port	Off-grid	—	—	Confirm with AERL
Single inverter	ATS	On-grid	—	Yes	Confirm with AERL
Off-grid parallel (back-up side)	On-grid port	Off-grid	Yes	—	Confirm with AERL
Off-grid parallel (back-up side)	ATS	On-grid	Yes	Yes	Confirm with AERL
On-grid parallel	ATS	On-grid	—	Yes	Confirm with AERL

How the System Works

Off-grid paralleling, generator output modes

02

2.1 Off-Grid Paralleling

Master and slave control

- Up to 10 inverters can run in off-grid parallel.
- One master inverter controls scheduling and settings, and synchronises them to the slave inverters.
- The master shares the power on each phase evenly across the slaves, based on the load on each of the three phases.

Work modes

- With the grid present, any of the six work modes available to a single inverter can be selected. If the grid is lost, the system switches to off-grid operation automatically.

Rated power

- All the inverters in parallel must be the same model and power rating.
- The total power is $P_{total} = N \times P_{single}$, where N is the number of inverters in parallel.

Faults

Event	System response
A slave fails or trips on protection	The master isolates it and the system keeps running
The master fails	The whole system shuts down
A slave's battery fails	The system keeps running and treats that slave as having no battery
The master's battery fails	The system runs only while the master has PV power

2.2 Generator Output Modes

Output mode	What the generator does
Loads only	The generator supplies the loads only, when required.
Loads and battery	The generator supplies the loads first, and charges the battery with any spare capacity. Charge power = generator maximum output − load power.

2.3 Generator Control Methods

Control method	How it works
Manual	Start and stop the generator from the app. Recommended for first commissioning.
Automatic	The generator starts automatically when the grid fails, and stops when the grid returns. Not available when the generator is connected to the inverter on-grid port.
SOC	When the grid fails, the system supplies the loads from the battery first, and starts the generator when the battery state of charge (SOC) falls below the start setting. The generator stops when the grid returns or the SOC reaches the stop setting.

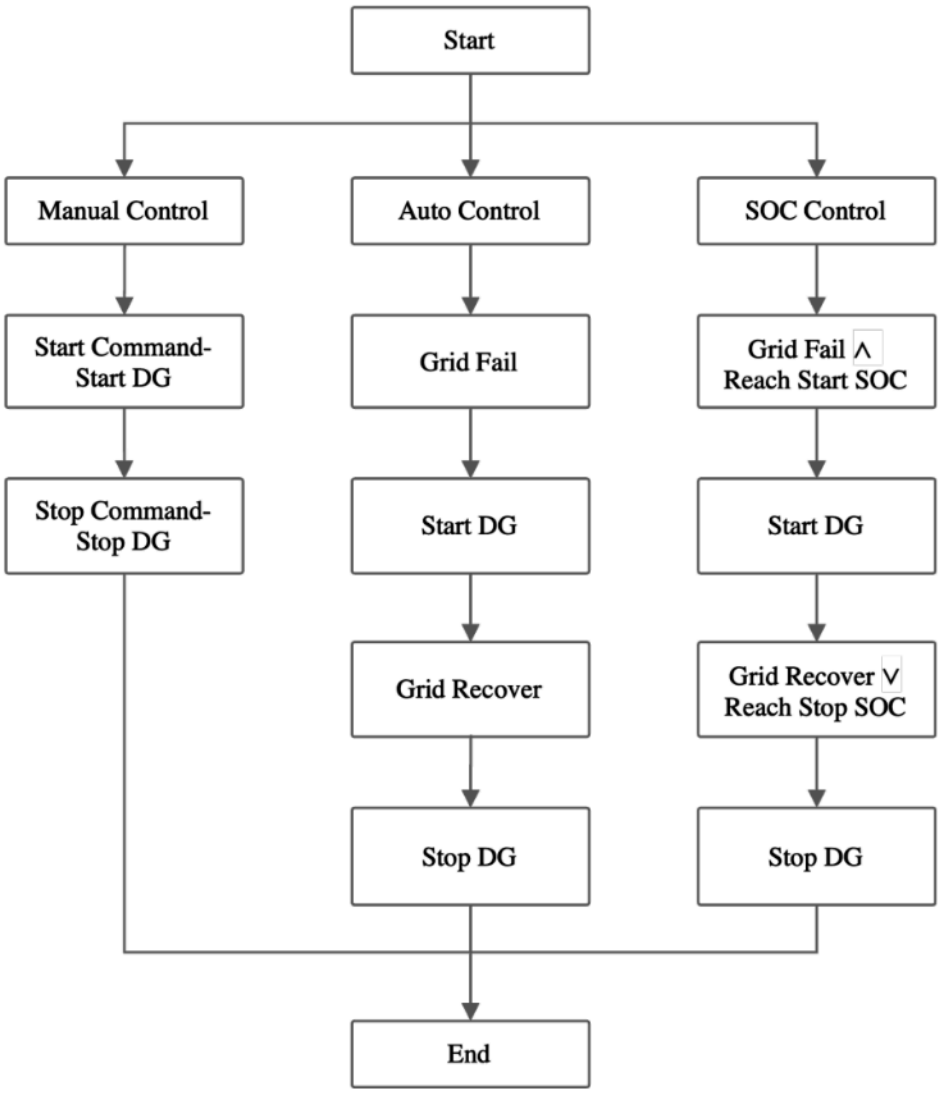


Figure 2.1 Generator control logic for manual, automatic and SOC control.

Automatic generator start

Contact AERL for current support. Manual control is not affected.

Wiring

Single inverter, generator on the GEN port, with grid

03

All the wiring diagrams in this chapter use the same legend: DC, AC phase conductor, AC neutral, CAN, RS485, digital output (DO) and digital input (DI). Point the CT arrows towards the grid.

3.1 Single Inverter, Generator on the GEN Port, with Grid

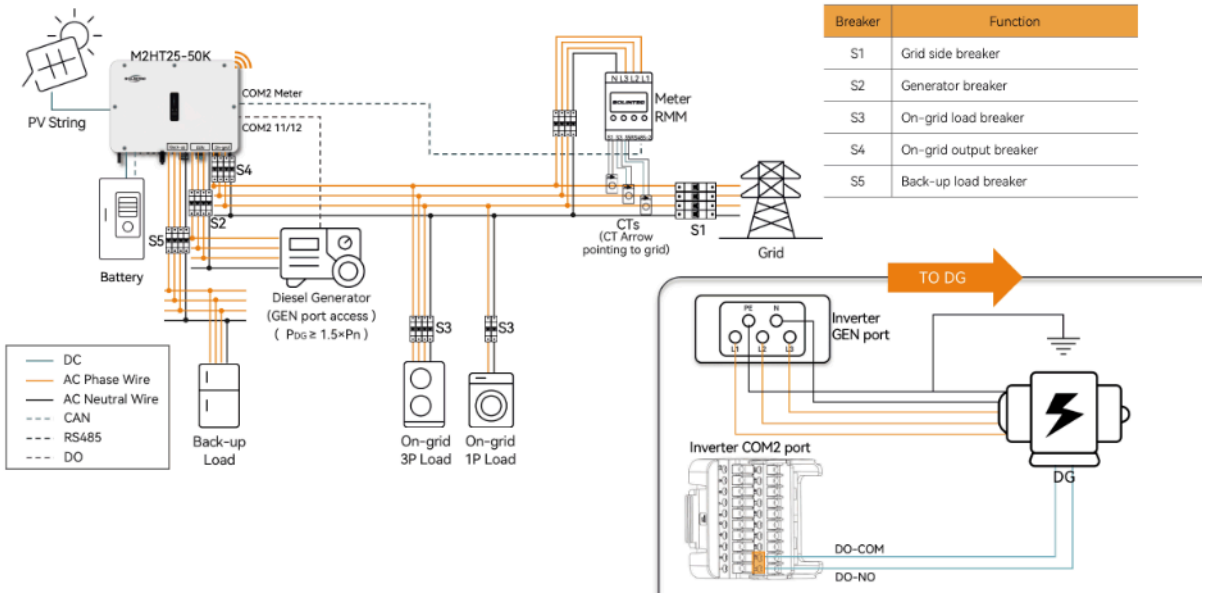


Figure 3.1 Single inverter with the generator on the GEN port. The inset shows the generator start signal from COM2 (DO-COM, DO-NO).

Breaker	Function
S1	Grid-side breaker
S2	Generator breaker
S3	On-grid load breaker
S4	Inverter on-grid output breaker
S5	Back-up load breaker

Before you design with this solution

The generator rating must be at least 1.5 × P_{total}.

3.2 Single Inverter, Generator Through an ATS, with Grid

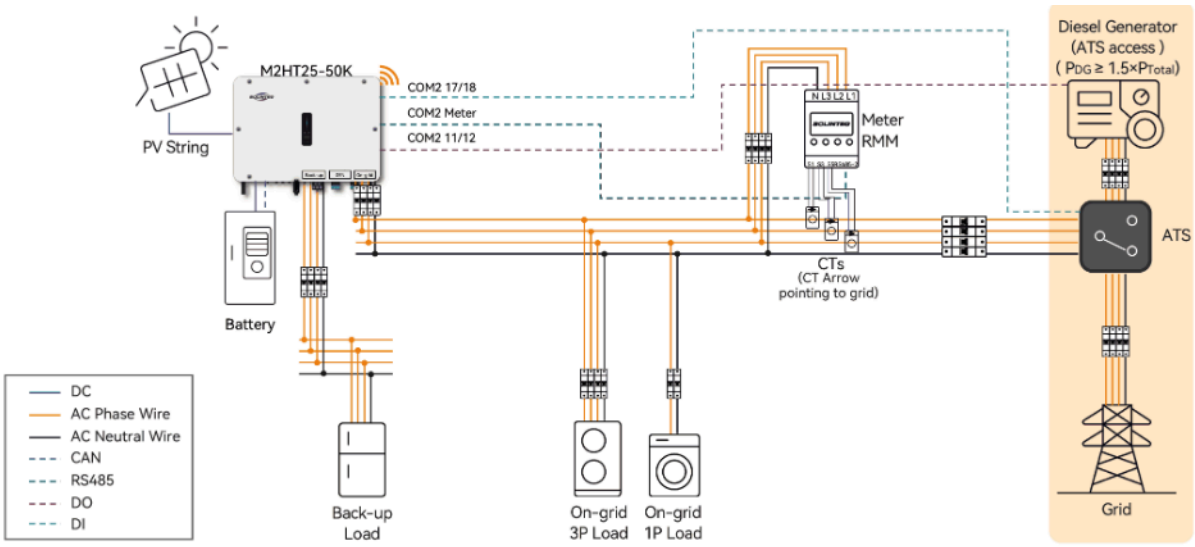


Figure 3.2 Single inverter with the generator and grid switched by an ATS.

> **Before you design with this solution**
> This solution needs an ATS for reliable operation. The generator rating must be at least $1.5 \times P_{total}$.

3.3 Single Inverter, Generator on the On-Grid Port, No Grid

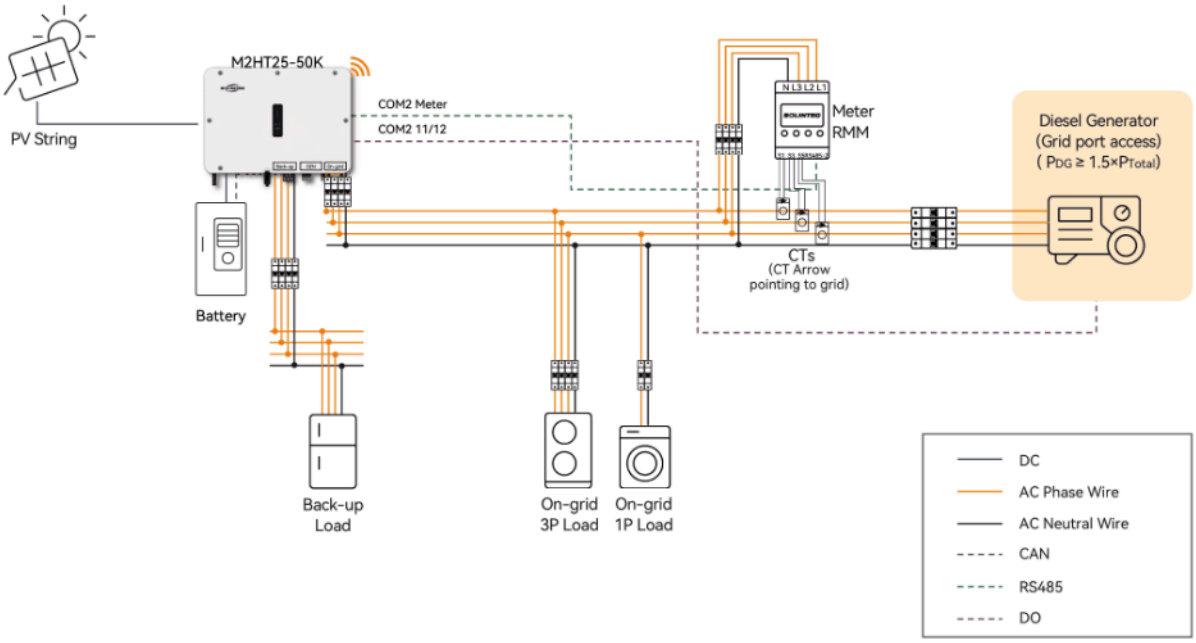


Figure 3.3 Single inverter off-grid, with the generator connected at the inverter on-grid port.

Before you design with this solution

The generator rating must be at least 1.5 × P_{total}.

3.4 Off-Grid Parallel, Scenario 1: Grid Only

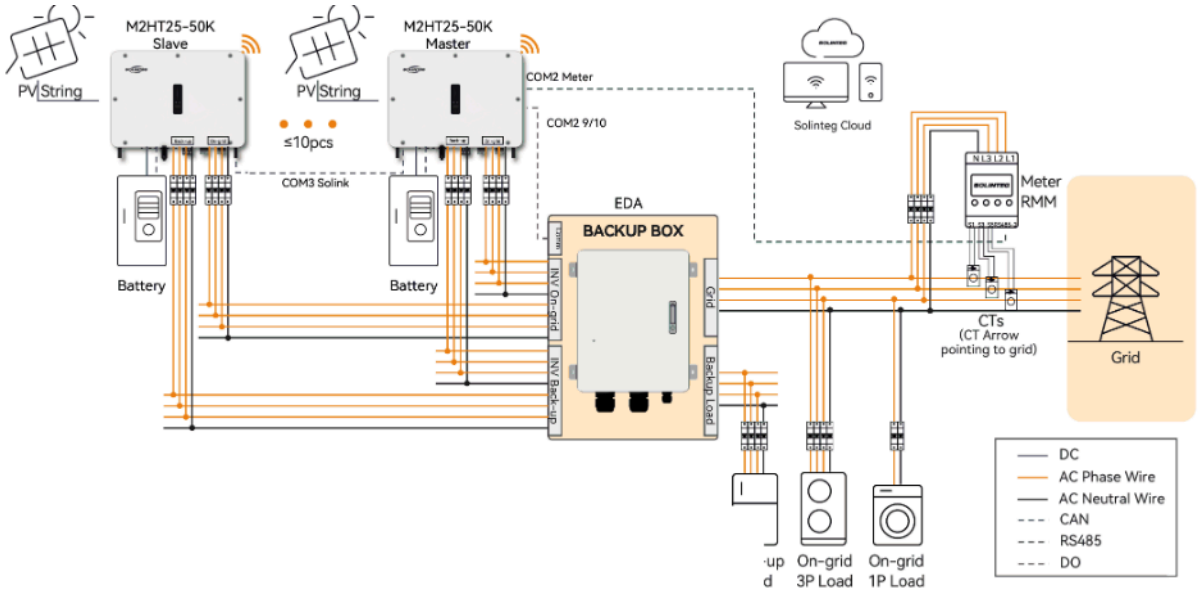


Figure 3.4 Off-grid parallel with grid only. The EDA back-up box switches the back-up loads.

Before you design with this solution

This solution needs the EDA back-up box for reliable operation. All the inverters in parallel must be the same model and power rating. Otherwise the weakest inverter limits the whole system.

3.5 Off-Grid Parallel, Scenario 2: Generator Only

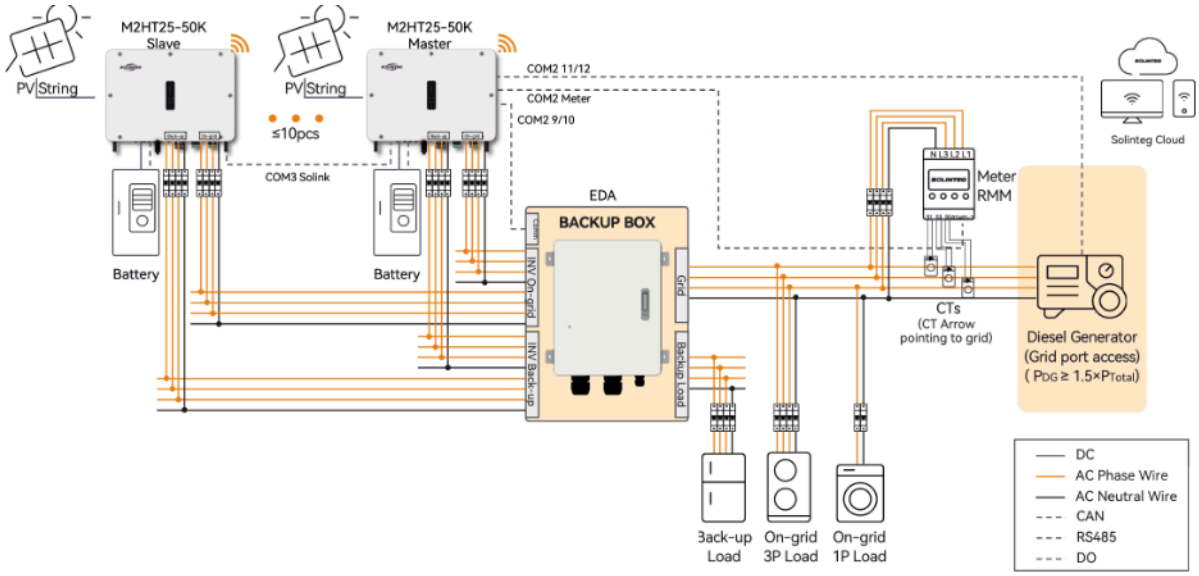


Figure 3.5 Off-grid parallel with a generator only, connected in place of the grid.

> **Before you design with this solution**
>
> This solution needs the EDA back-up box for reliable operation. All the inverters in parallel must be the same model and power rating. Otherwise the weakest inverter limits the whole system. The generator rating must be at least 1.5 × P_{total}.

3.6 Off-Grid Parallel, Scenario 3: Grid and Generator

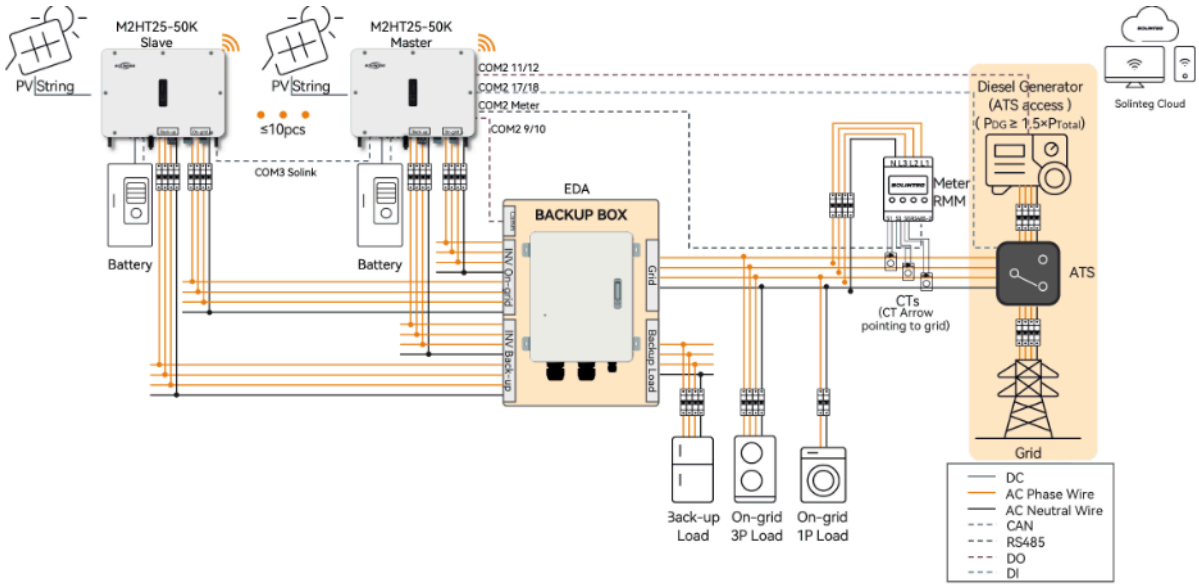


Figure 3.6 Off-grid parallel with grid and generator, switched by an ATS.

Before you design with this solution

This solution needs the EDA back-up box and an ATS for reliable operation. All the inverters in parallel must be the same model and power rating. Otherwise the weakest inverter limits the whole system. The generator rating must be at least 1.5 × P_{total}.

3.7 Off-Grid Parallel, Scenario 4: No Grid, No Generator

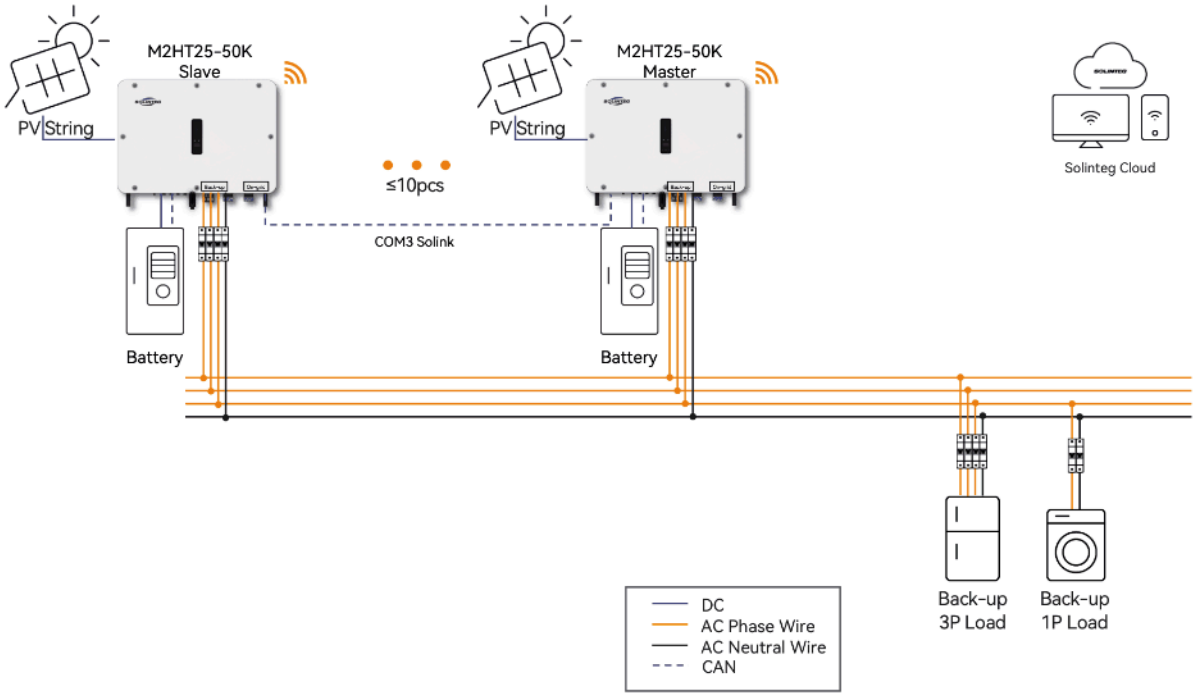


Figure 3.7 Off-grid parallel with no grid and no generator. The loads are on the back-up side.

Before you design with this solution

All the inverters in parallel must be the same model and power rating. Otherwise the weakest inverter limits the whole system.

3.8 On-Grid Parallel, Grid and Generator

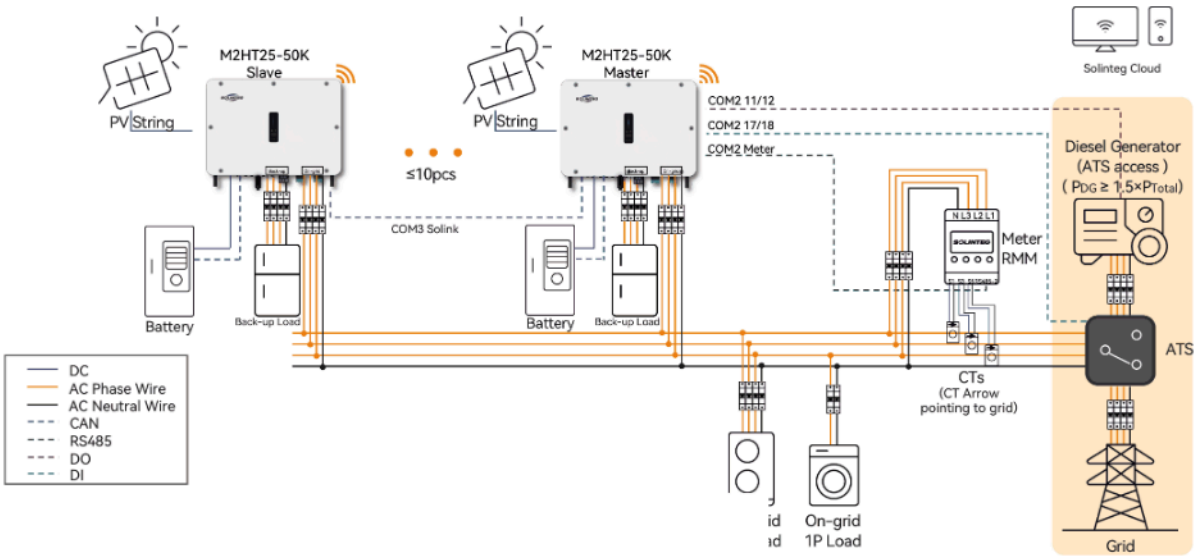


Figure 3.8 On-grid parallel with grid and generator, switched by an ATS.

> **Before you design with this solution**
>
> All the inverters in parallel must be the same model and power rating. Otherwise the weakest inverter limits the whole system. The generator rating must be at least 1.5 × P_{total}.

3.9 EDA Back-Up Box and ATS

The **EDA** is a Solinteg back-up box controller. It switches seamlessly between on-grid and off-grid operation in parallel systems, keeping the system stable and making the hybrid system more reliable and resilient.

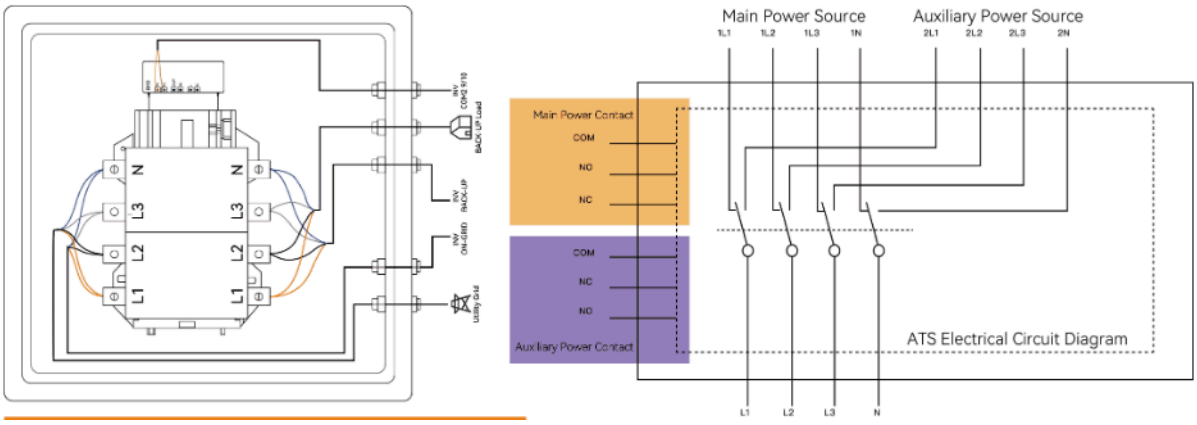


Figure 3.9 EDA back-up box circuit (left) and ATS circuit (right). The ATS main contact switches the grid (main source) and the auxiliary contact switches the generator (auxiliary source).

Device	Connects to the inverter (master) at
Generator start signal (DO)	COM2 pins 11 and 12
ATS position signal	COM2 pins 17 and 18
EDA back-up box	COM2 pins 9 and 10

Communication wiring

The inverter reads the ATS signal on COM2 pins 17 and 18 to tell whether the grid or the generator is supplying power:

- **Open** contact: the grid is supplying power.
- **Closed** contact: the generator is supplying power.

Connect EDA pins 11 and 12 to inverter COM2 pins 9 and 10. The order of the two wires does not matter.

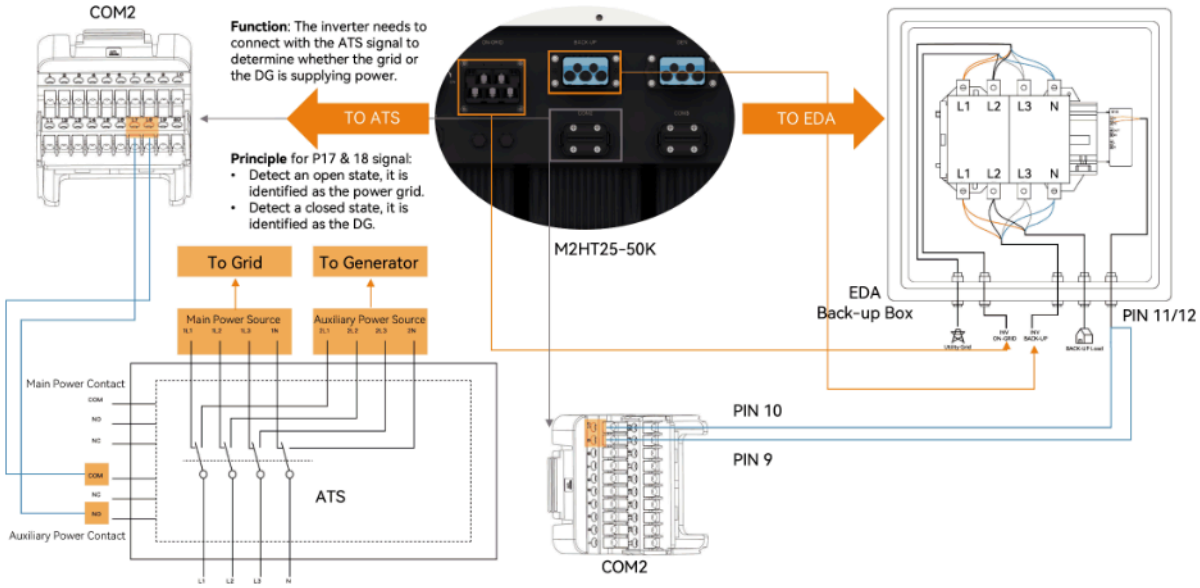
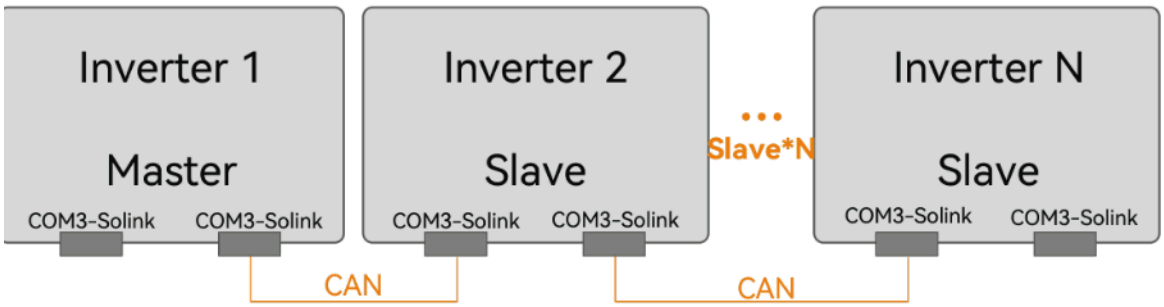


Figure 3.10 Communication wiring between the inverter COM2 connector, the ATS and the EDA back-up box.

3.10 Rules for Off-Grid Paralleling

Item	Requirement
Number of inverters	Up to 10 in off-grid parallel
Inverter model	All inverters must be the same model and power rating
PV and battery	The PV strings and battery capacity on each inverter must be equal, or close to equal
Communication module	Every inverter needs its own communication module (dongle)
Smart meter	The RMM smart meter must communicate with the master inverter

Item	Requirement
EDA	Off-grid parallel needs the EDA back-up box
Generator	The generator must support start and stop by a DO (dry-contact) signal
ATS	The ATS must have a normally open (NO) auxiliary contact output for the back-up source (generator)
Breakers	Every inverter needs its own AC breaker
Phase sequence	The phase sequence must match across all the inverters, on both the on-grid side and the back-up side
Parallel cables	The parallel communication cables and RJ45 plugs are supplied by Solinteg
CAN bus	The CAN communication of every inverter must be working. Turn on the SYNC termination resistor and the parallel CAN termination resistor on the **first and last** inverters only
Master position	Only the first or the last inverter in the chain can be the master



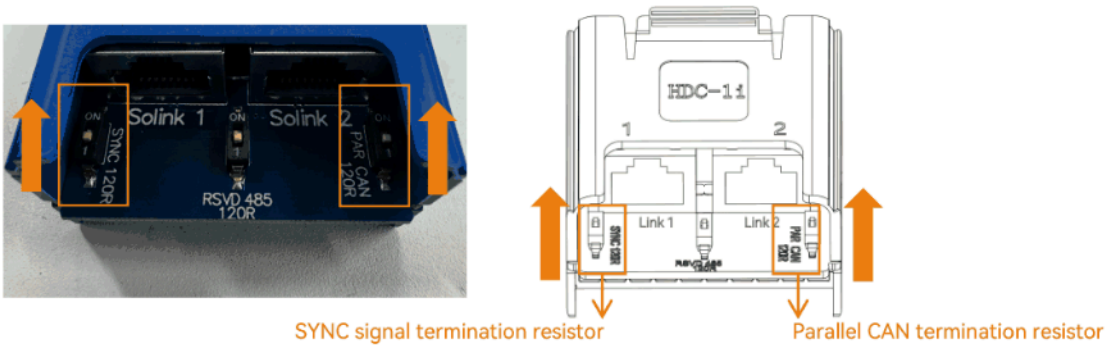


Figure 3.11 Parallel CAN chain on the COM3 Solink ports, and the SYNC and parallel CAN termination switches.

App Configuration

Off-grid paralleling, diesel generator

04

All configuration is done in the Solinteg IntegHub app. Scan a code to install it, or search for **IntegHub** in Google Play or the App Store.

Get the IntegHub app

Android
Google Play

iPhone
App Store

4.1 Off-Grid Paralleling

Before you set any parameters:

1. Complete the installation and wiring.
2. Create a plant in Solinteg Cloud or the IntegHub app.
3. Add all the inverters to the plant in the app.

Then work through these five steps:

Step	What to do
1. Check firmware	Paralleling has no firmware requirement. For automatic generator start, contact AERL.
2. Set inverter roles	Set one inverter as the master and enter the number of inverters in parallel. Set the others as slaves.
3. Set the work mode	Set the work mode on the master. It is synchronised to the slaves automatically.
4. Set the phase sequence	Set the grid phase sequence on the master so the inverters and the grid match. The default is auto-adaptive.
5. Custom switches (optional)	Set only if the site needs it.

Step 1: Check the firmware

1	On the plant page, tap **Device**.
2	On the **Device** page, tap each inverter.
3	Check the **Slave Firmware Version** of every inverter in parallel.
4	Paralleling has no firmware requirement. For automatic generator start, contact AERL.
5	If the firmware needs updating, contact AERL support.

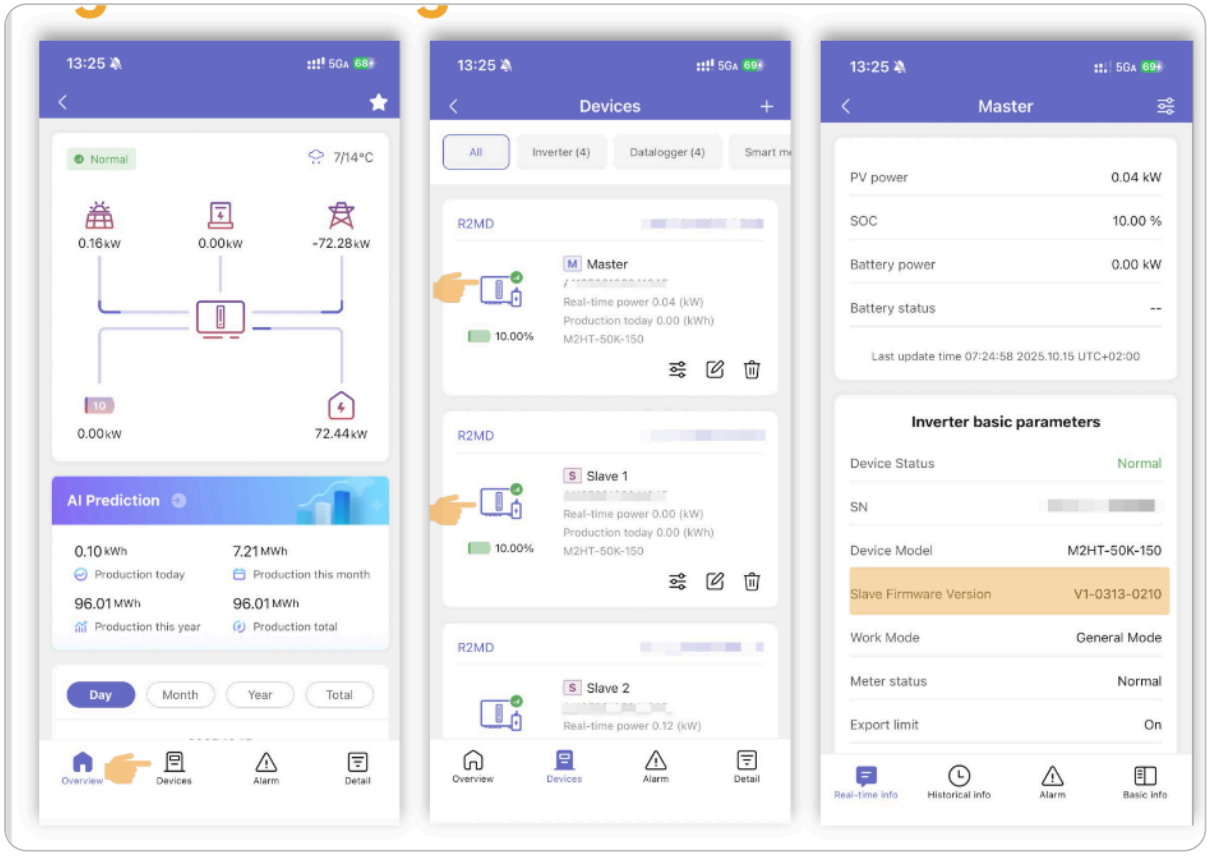


Figure 4.1 Checking the firmware version in the IntegHub app.

Step 2: Set the inverter roles

1	On the **Device** page, tap the settings button of each inverter.
2	On the **Parameter settings** page, tap **Feature parameters**.
3	On the master inverter, set the role to **Master** and enter the number of inverters in parallel.*
4	On each slave inverter, set the role to **Slave** and enter its inverter address.**

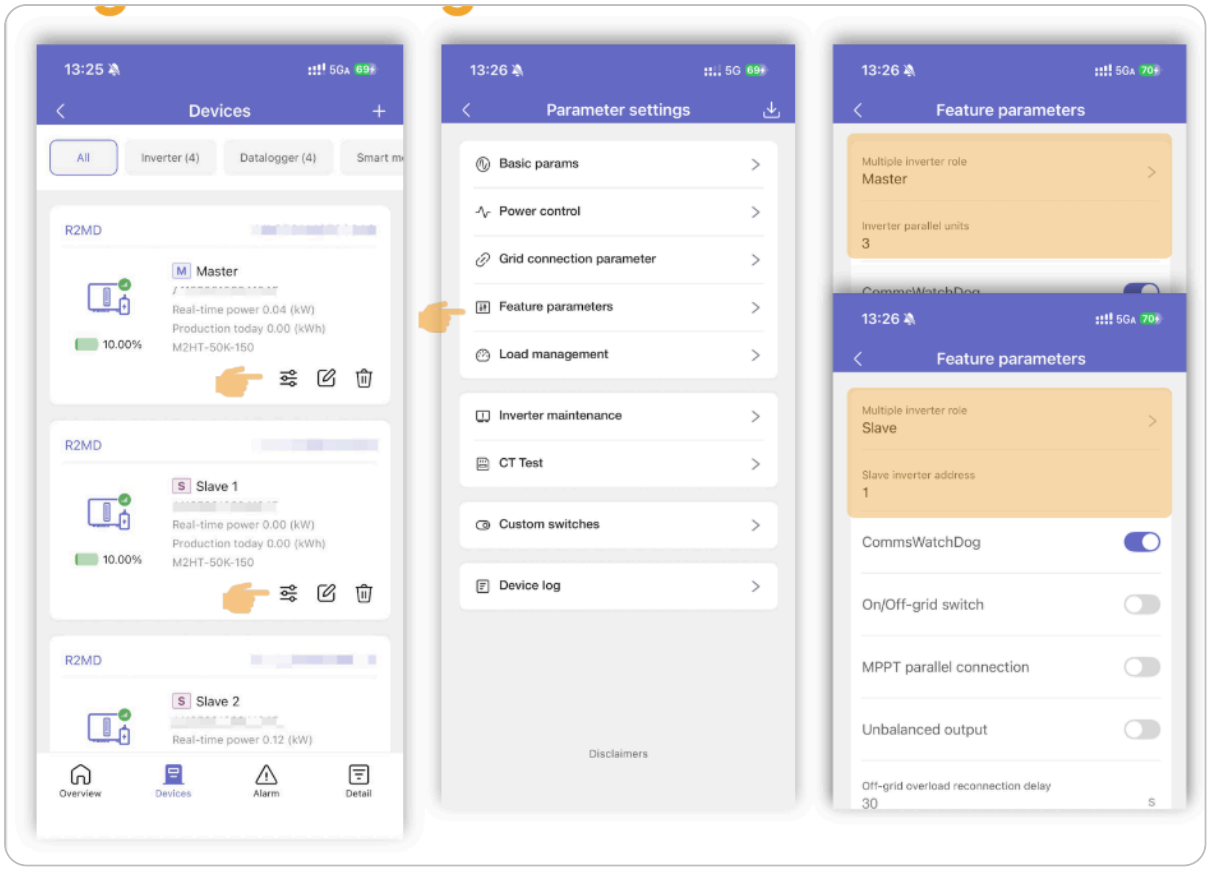


Figure 4.2 Setting the master and slave roles.

* The master starts working only when the number of inverters it detects online matches the number entered.

** Slave addresses must start at 1, and be unique and consecutive.

Step 3: Set the work mode

1	On the **Device** page, tap the settings button of the **master** inverter.
2	On the **Parameter settings** page, tap **Basic params**.
3	Tap **Work mode**.
4	Select the work mode and tap **Confirm**.

In an off-grid parallel system, set the work mode on the master inverter only.

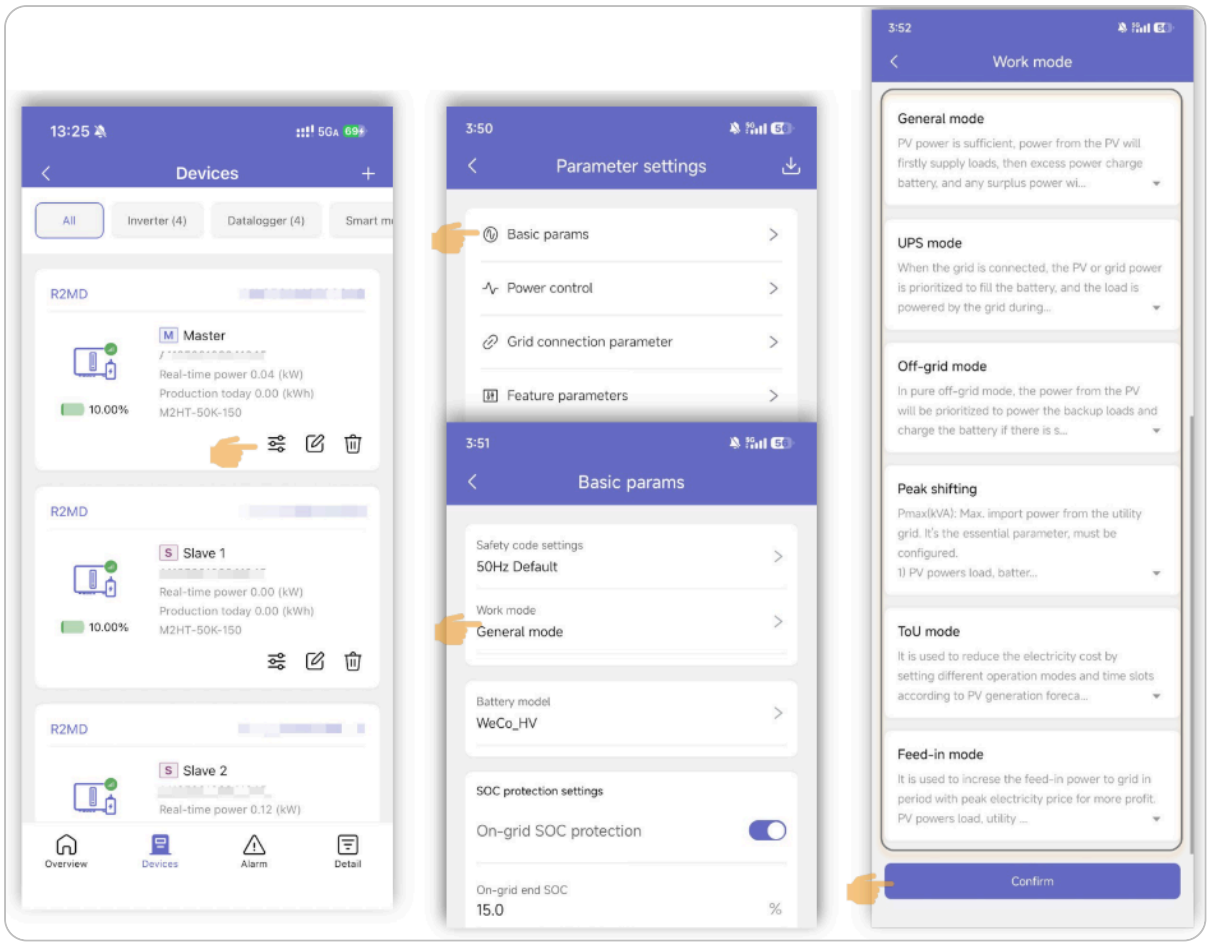


Figure 4.3 Setting the work mode on the master inverter.

Step 4: Set the phase sequence

1	On the **Device** page, tap the settings button of the **master** inverter.
2	On the **Parameter settings** page, tap **Feature parameters**.
3	Tap **Grid phase sequence settings**.
4	Leave the setting at **Auto adaption** (the default and recommended setting), or select **Positive sequence** or **Negative sequence** to suit the site.

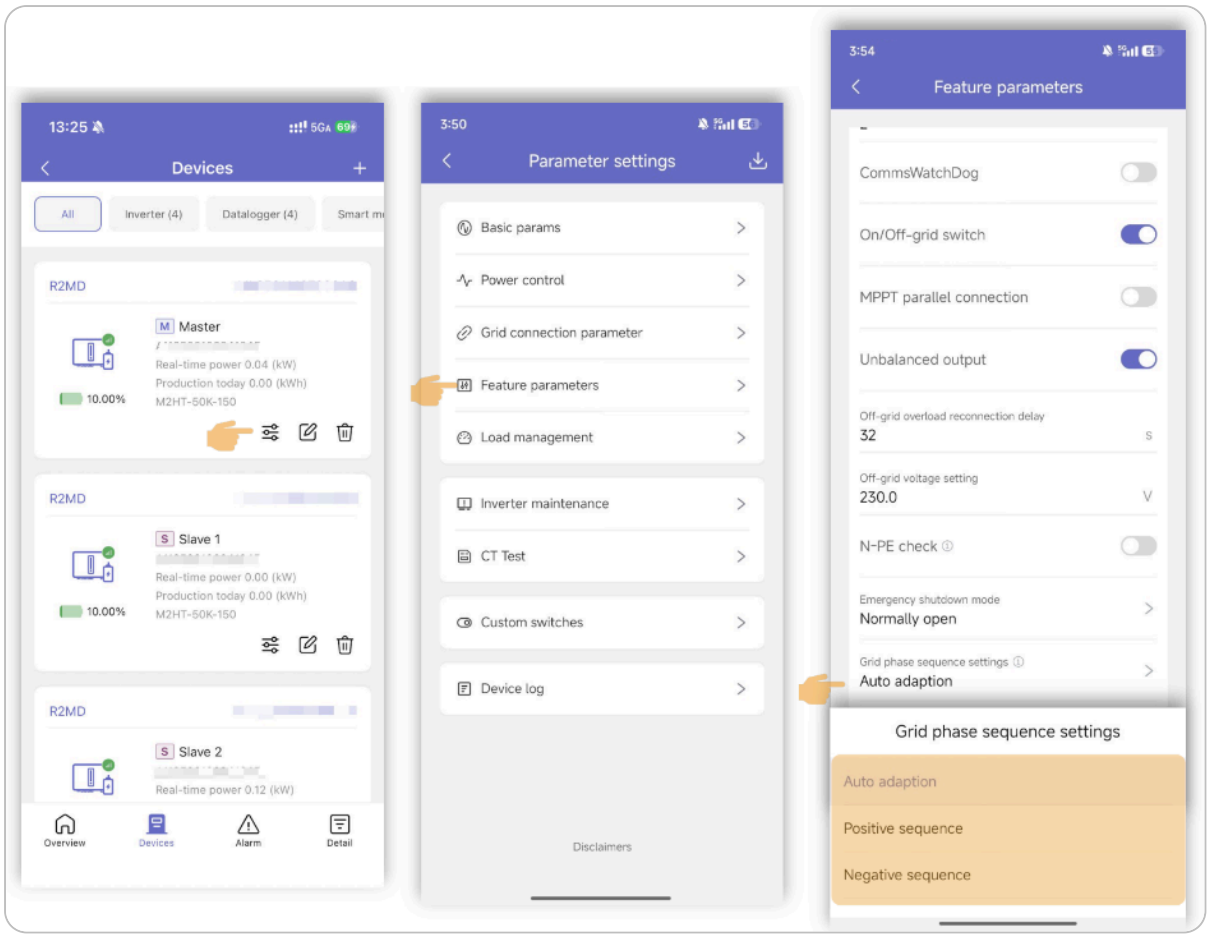


Figure 4.4 Setting the grid phase sequence.

Step 5: Custom switches (optional)

1	On the **Device** page, tap the settings button of the **master** inverter.
2	On the **Parameter settings** page, tap **Custom switches**.
3	Set the switches to suit the site.

> **Warning**
>
> We do not recommend changing the custom switches. If a change is needed, contact AERL support first.

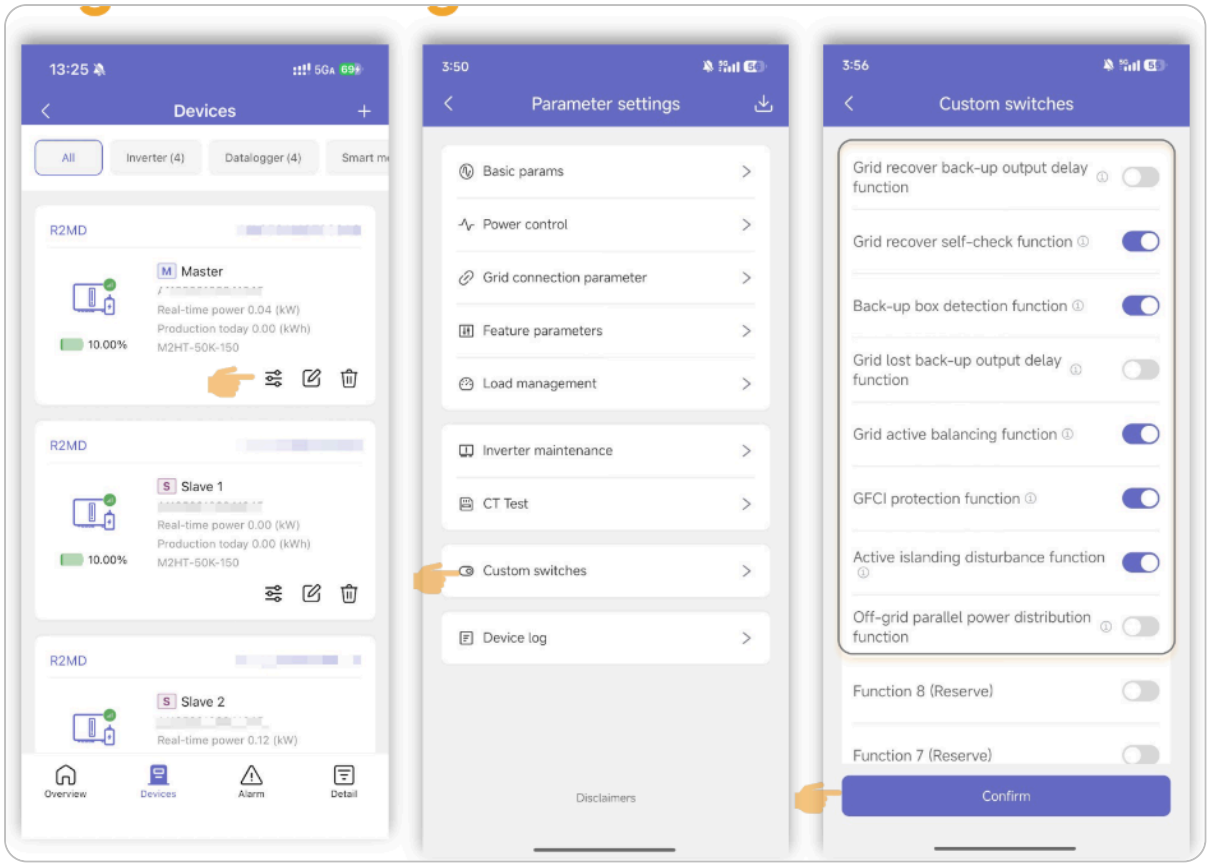


Figure 4.5 Custom switches.

4.2 Diesel Generator

Step 1: Add the generator in the IntegHub app

1	You need a hybrid inverter plant in Solinteg Cloud before you can use this function.
2	On the **Devices** page, tap **+**, choose **Third-party devices** and tap the **Diesel generator** icon.
3	Name the generator. Tap **Superior device** and select the serial number of the inverter that the generator connects to.
4	Tap **Unconnected** to choose the access method.

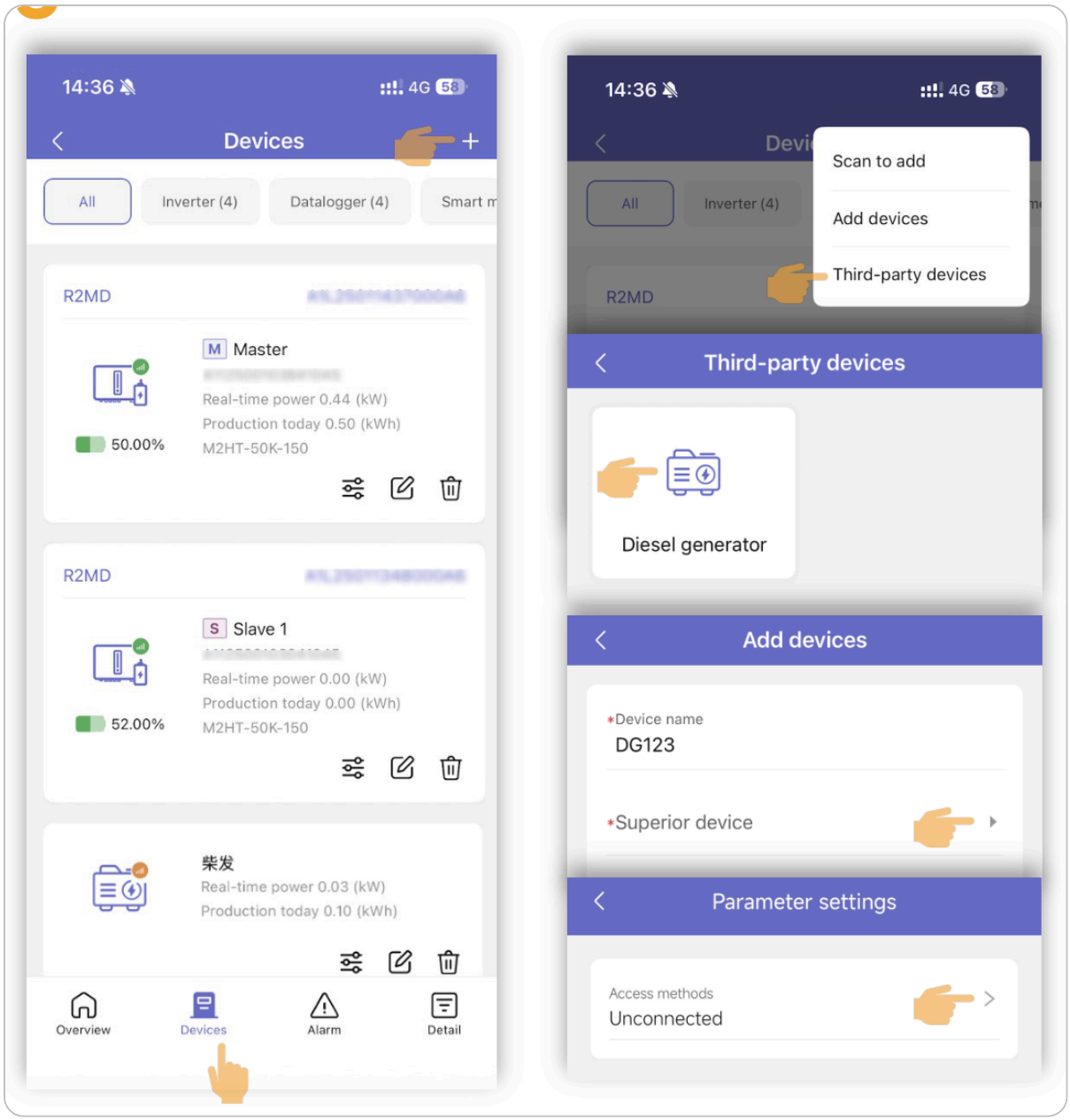


Figure 4.6 Adding the generator as a third-party device.

Step 2: Select the access method

1	Select how the generator is connected (GEN port, ATS or grid port) and tap **Confirm**.
2	Tap the arrow next to **Control mode** and select the control method (section 2.3).

> **Note**
>
> A generator connected at the inverter on-grid (grid) port offers **Manual control** and **SOC control** only. A generator connected at the GEN port or through an ATS also offers **Automatic control**.

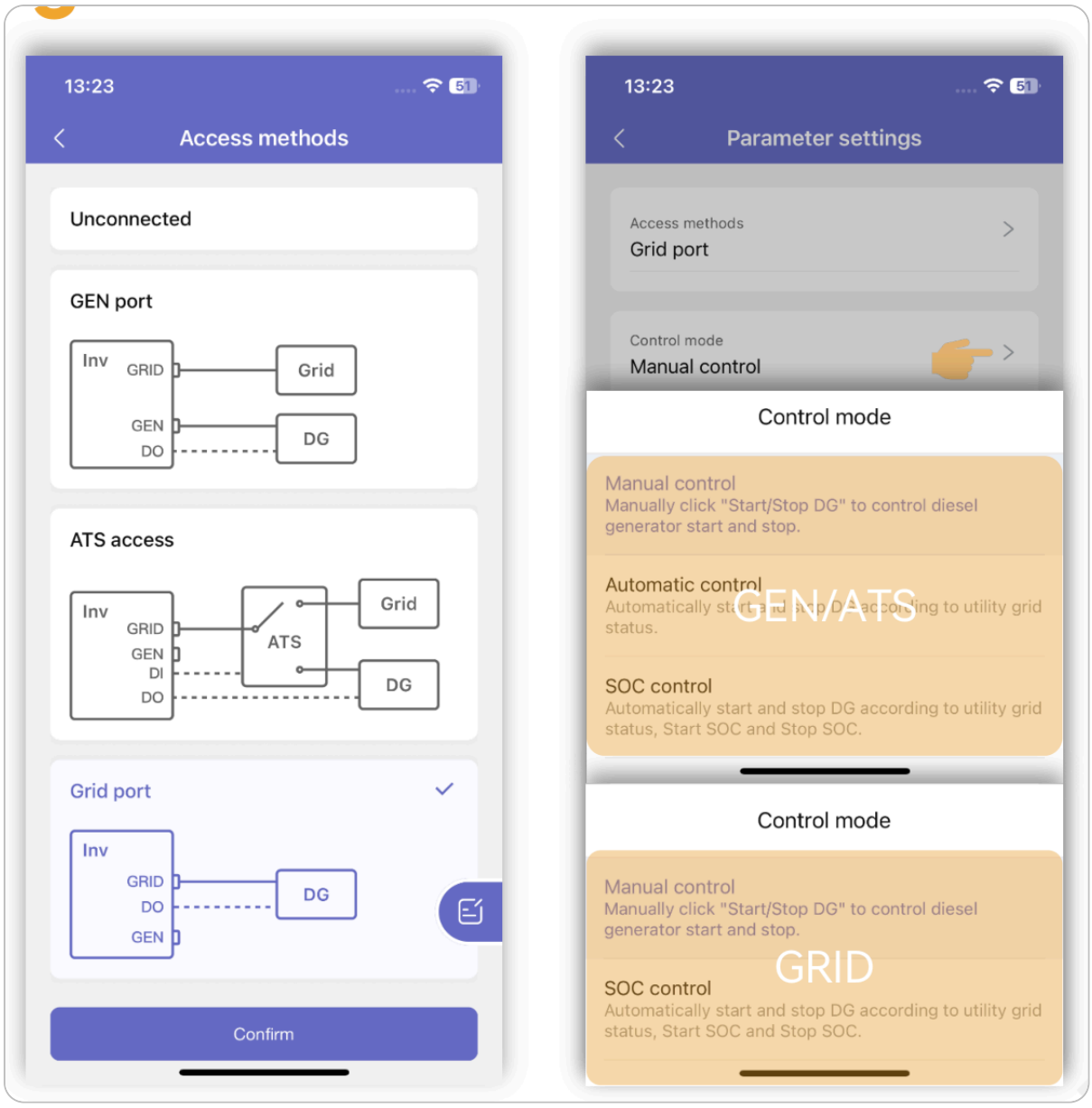


Figure 4.7 Access methods and control modes. The upper control-mode list applies to the GEN port and ATS; the lower one to the grid port.

Step 3: Set the generator parameters

1. Tap the arrow next to **Output mode** and select:
   a. **Load only**: once started, the generator supplies the loads only
   b. **Load & Charge battery**: once started, the generator supplies the loads and charges the battery.

2. Set the other generator parameters (such as rated power, maximum power limit, start and stop SOC, start-up delay and stop delay) from the generator rating plate and the site requirements.

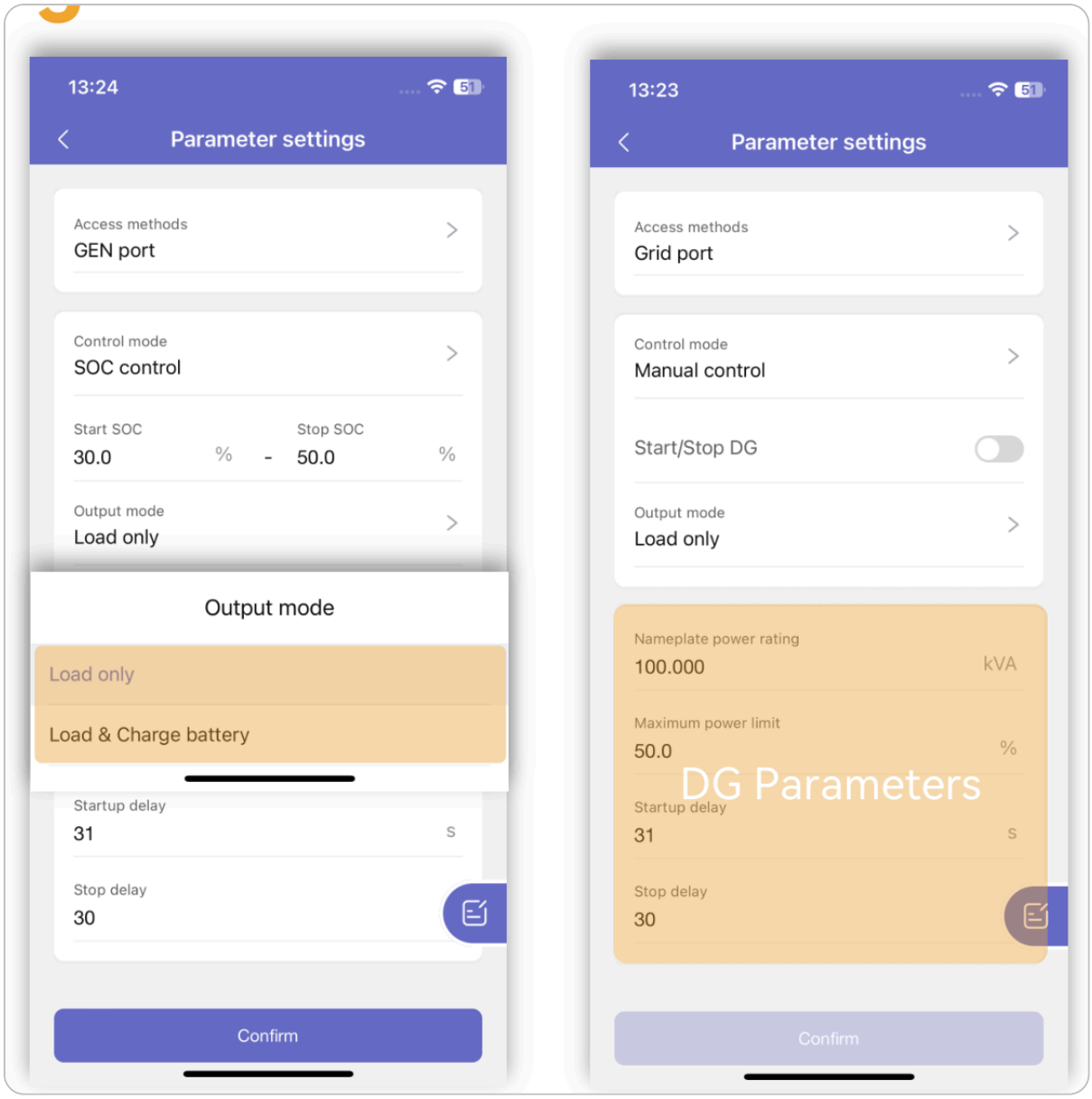


Figure 4.8 Generator parameters.

Questions and Answers 05

How do I connect the EDA back-up box to the inverter?

Connect EDA pins 11 and 12 to inverter COM2 pins 9 and 10. The order of the two wires does not matter.

How big should the generator be?

At least 1.5 × P_{total}, the total rated power of the inverters. A smaller generator is more likely to give an unstable supply.

Can the system avoid exporting power to the generator?

Yes. Because the generator and the inverters never supply the loads at the same time, no power is exported to the generator, provided the system is wired and configured as this guide describes.

What happens if an inverter in a parallel system fails?

The parallel system works as a whole. A failed slave inverter is isolated and the rest keep running. If the master fails, the system stops.

How do I keep the system running if the master fails and the replacement hasn't arrived?

Make another inverter the master:

1	Choose the slave next to the original master as the new master.
2	Disconnect the CAN cable between the new master and the original master.
3	Move the meter communication cable to the new master.
4	Turn on the termination resistors on the new first and last inverters.
5	Reconfigure the system in the IntegHub app.

How do I choose an ATS?

The following is a guide only. Have the final design done by a qualified professional.

1. The ATS current rating should be at least the system's maximum operating current, plus a 10–25% margin.
2. Allow for the generator's starting current and short-circuit capacity.
3. For loads that cannot tolerate an interruption, consider a closed-transition ATS.
4. In three-phase systems, use a 3-pole or 4-pole ATS. Use 4-pole if the neutral must be switched (check the MEN arrangement required by AS/NZS 3000 and AS/NZS 3010).
5. Rate the ATS for the ambient temperature, derating and enclosure rating (IP) of the installation.

How does M2HT paralleling differ from the earlier MHT 25–50 kW?

	MHT 25–50 kW	M2HT 25–50 kW
Inverters in parallel	Up to 4 off-grid; up to 10 on-grid	Up to 10 off-grid; up to 10 on-grid
Firmware	ARM 05 or later and DSP 05 or later	No firmware requirement for paralleling
Work modes	7	6 (no economic mode)
Parallel connection	COM2 pins 17 and 18, twisted pair	COM3 Solink ports (RJ45)
Termination (DIP switches)	Turn on PAR CAN 120R on the first and last inverters	Turn on SYNC 120R and PAR CAN 120R on the first and last inverters



Figure 5.1 MHT: parallel connection on COM2 pins 17 and 18.

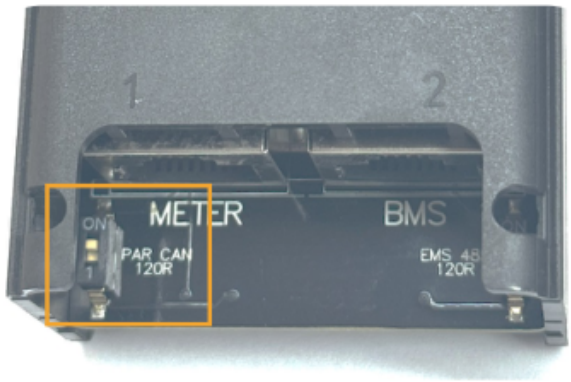


Figure 5.2 MHT: PAR CAN 120R switch.



Figure 5.3 M2HT: Solink 1 and Solink 2 ports on COM3.

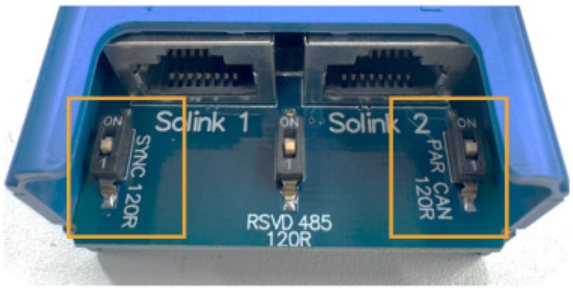


Figure 5.4 M2HT: SYNC 120R and PAR CAN 120R switches.

Technical Support 06

Contact AERL for help with system design, installation, commissioning, firmware, warranty and spare parts for Solinteg inverters, EDA back-up boxes and batteries in Australia.

AERL technical support

- **Phone:** 1800 950 865
- **Email:** support@aerl.com.au
- **Web:** aerl.com.au
- **Address:** AERL, 1/75 Bluestone Circuit, Seventeen Mile Rocks QLD 4073, Australia

When you contact AERL, have the following ready:

- the solution you are using (sections 3.1–3.8) and a single-line diagram of the site
- the model, serial number and firmware versions of every inverter, and which one is the master
- the generator make, model and rating, and the ATS make and model, if fitted
- any alarm or fault codes, and when they occurred
- screenshots of the parallel and generator settings in the IntegHub app.



MANUFACTURED BY SOLINTEG
SUPPLIED AND SUPPORTED IN AUSTRALIA BY AERL

Australian Energy Research Laboratories

ADDRESS

1/75 Bluestone Circuit
Seventeen Mile Rocks QLD 4073
Australia

CONTACT

sales@aerl.com.au
support@aerl.com.au

aerl.com.au

Phone
1800 950 865