



Distributed energy resources installation handbook

**For systems connected to the
South West Interconnected System**

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CONTACT US

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Synergy acknowledges the Traditional Owners of the Land on which we operate and their continuing connection to the land, water and community. We pay our respects to all Aboriginal and Torres Strait Islander communities, their cultures and to Elders past, present and emerging.

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1 Definitions

Term	Explanation
SWIS	South West Interconnected System.
VPP	Virtual power plant.
CSIP-Aus	Common Smart Inverter Profile – Australia. CSIP-Aus (as defined within document SA HB 218:2023) is a communications standard used nationally for remote management of DER.
DER	Distributed Energy Resources. Controllable assets that consume or generate electrical energy.
Export monitoring device	A device that monitors point of connection voltage and active and reactive power flows as per the requirements of Synergy's <i>Utility interconnection handbook</i> .
Gateway	Device that collects data from and controls one or more DER assets e.g. a home energy management system.
Installer test tool	Synergy system that allows installers to verify that a DER system registration has been performed correctly and meets Synergy's requirements.
OEM	Original Equipment Manufacturer.
PoC	Point of Connection – The point where customer equipment meets network. For this document, the PoC also has the same meaning as point of supply as defined in AS/NZS 3000.
Product	An electricity retail product offered to customers by Synergy.
Technology provider	An organisation that has built and is operating a utility client to allow for remote device management through Synergy's utility server. An OEM may act as the Technology provider themselves or have a third party operate as the Technology provider.
Utility client	An IEEE 2030.5 utility client that has implemented the required capabilities and functions set as defined in SA HB 218.
Utility server	An IEEE 2030.5 utility server that has implemented the required capabilities and functions set as defined in the SA HB 218.
CEC	Clean Energy Council.
SAA	Solar Accreditation Australia.
RRN	Retailer Reference Number.
Equipment retailer	An on seller of DER in the SWIS that does not retail electricity. May also be an installer.

2 About Synergy

Synergy is proud to be Western Australia's largest integrated electricity generator and energy retailer. Working with more than one million Western Australian household and business customers throughout the South West Interconnected System (SWIS), we provide safe, reliable power at the lowest sustainable cost.

Alongside our customers, we are on a journey towards a more sustainable energy future. This means developing new renewable energy generation and storage solutions to replace our coal-fired power stations, which will be retired by 2030. Throughout this transition, we are committed to helping our customers better manage their energy usage and contain their costs, without compromising the provision of reliable energy.

The uptake of distributed energy resources (DER) like rooftop solar, batteries, and electric vehicles continues to accelerate in households and businesses across the SWIS. DER is essential to Western Australia's energy transition, as it supports a low carbon, low-cost system. However, high levels of unmanaged DER can pose a risk to the reliability and security of the energy system as it attempts to keep up with the two-way energy flow.

To meet the challenges presented by DER, the State Government released the DER Roadmap in 2020. The roadmap outlines critical actions that need to be taken in order to realise a future with lower emissions and more accessible energy. Synergy's approach to remote management of DER assets plays an integral role in delivering these initiatives and advancing Western Australia's DER maturity.

As part of our approach, we are focused on building low-cost, scalable aggregation and coordination capabilities which will enable us to seamlessly integrate customer DER at scale into the SWIS.

3 Purpose and audience

This document details Synergy's requirements for retailers and installers in the installation of DER in the SWIS. The purpose of this document is to:

1. Present standards for installation and commissioning to meet the remote management requirements specified in Synergy's *DER functionality requirements*.
2. Outline additional roles and responsibilities of retailers and installers when commissioning DER. Roles and responsibilities of retailers and installers are also specified in Synergy's *DER functionality requirements*.
3. Outline the connection and commissioning process for installers via the installer test tool.

This document provides installers, equipment retailers or other industry stakeholders with information regarding what is needed to install and commission in the SWIS.

This document should also be read in conjunction with documents listed under the **Section 5 - Reference documents**.

4 Scope

The scope of this handbook covers actions taken by installers and equipment retailers to meet Synergy's DER functionality requirements in the SWIS.

This document outlines the obligations of equipment retailers to register under Synergy if they wish to supply Synergy customers with DER solutions. Additionally, the document outlines the responsibilities and requirements of equipment retailers and installers; for effective DER commissioning, site assessment, testing and troubleshooting procedures. This document also details the onboarding requirements for equipment retailers and installers of DER in the SWIS in addition to outlining installation requirements.

The scope does not include:

- Requirements or eligibility for customer product participation;
- Details on supported solutions (hardware or software);
- Commissioning requirements in third party systems.

5 Reference documents

Document	Description	Audience
Synergy's Utility interconnection handbook SYN-REQ-DER-0002	Document providing technology providers and original equipment manufacturers (OEMs) with all necessary information to implement a compatible hardware and software solution to allow for testing, listing and being provided with access to production by Synergy.	OEMs and technology providers
DER Functionality requirements SYN-REQ-DER-0001	This document details Synergy's requirements for generating and consuming DER assets in the SWIS, including information about Synergy's remote monitoring and management requirements for DER in the SWIS.	OEMs and technology providers/installers
Synergy's supported solutions list	List of supported utility clients and hardware solutions that meet the requirements of Synergy's <i>Utility interconnection handbook</i> .	Installers and customers
Synergy's Engineering derogation process	Guideline and form for exemption requests for DER installations that do not comply with the DER functional requirements.	Installers and customers
Western Power's Basic Embedded Generator (EG) Connection Technical Requirements	Western Power guideline providing users of basic EG connections, information about their obligations for connection to, and interfacing with Western Power's low voltage distribution network.	Installers
Western Power's Technical rules	Western Power document containing technical requirements that must be met by Western Power and all users of the SWIS.	Installers

6 Roles and responsibilities

Who	Roles and responsibilities
Installers	<ul style="list-style-type: none"> • Complete relevant training and maintain competency in the use of the installer test tool. • Understand the requirements of Synergy's <i>DER functionality requirements</i>. • Perform installations in accordance with this handbook. • Articulate to customers their tiering and access rights for participation in Synergy products and services.
Equipment retailers	<ul style="list-style-type: none"> • Take responsibility for the subcontracting of external installers in alignment with the requirements herein. • Manage the ongoing compliance of installers to ensure effective installation of DER and oversee installer compliance. • Agree to Synergy's terms and conditions when registering as an equipment retailer with Synergy. • Prevent new DER sales where installation conformance is not being met by installers.
Synergy	<ul style="list-style-type: none"> • Operate a utility server that can remotely monitor and manage DER assets. • Operate as the sole aggregator for all non-contestable customers in the SWIS, maintaining authority to control as the default control agent. • Provide the <i>DER functionality requirements</i> documentation. • Provide the <i>Utility interconnection handbook</i> for DER OEMs and technology providers. • Provide and maintain a list of supported solutions that meet Synergy's requirements for remote monitoring and control. • Develop training materials. • Provide support for equipment retailers and installers.

7 Onboarding

This section outlines the onboarding processes for equipment retailers and installers who intend to sell and install DER systems that are compliant to Synergy's *DER functionality requirements*.

7.1 Equipment retailers

To sell DER assets which are compliant to Synergy's *DER functionality requirements*, retailers of DER must be registered as an equipment retailer under Synergy.

It is a requirement for a retailer of DER in the SWIS, to agree to Synergy's terms and conditions if they wish to register and interact with Synergy's systems.

It is the responsibility of the equipment retailer to engage and manage installers and ensure that installers are meeting Synergy's requirements, including completion of training requirements. Synergy will be monitoring and measuring the performance of installations by the equipment retailer to ensure DER systems are connected to Synergy's remote management platform in a compliant manner.



Figure 1: Equipment retailer onboarding and training.

7.2 Installers

Installers are not required to register with Synergy unless the installer is also intending to sell DER equipment, which requires the installer to register as an equipment retailer with Synergy.

All installation works for DER systems compliant to Synergy's *DER functionality requirements* must be undertaken by Solar Accreditation Australia (SAA) accredited installers with the appropriate accreditation.

Installers must familiarise themselves with Synergy's *DER functionality requirements*. The document outlines requirements for new and upgraded DER installations, customer participation tiering, considerations for existing site configurations as well as DER asset capability and additional installation considerations.

It is the responsibility of the installer as part of their training to gain proficiency with the use of the installer test tool, to understand how to commission and test installed DER.

8 DER installation requirements

This section provides an overview of the responsibilities of an installer before, during and after the installation of DER systems.

8.1 Relevant standards

All embedded generation installations must comply with all relevant Australian standards and Western Power requirements, including but not limited to the latest versions of the following standards:

- AS/NZS 4777.1 Grid connection of energy systems via inverters installation requirements
- AS/NZS 4777.2 Grid connection of energy systems via inverters inverter requirements
- AS/NZS 3000 Electrical installations
- AS/NZS 5053 Installation and safety requirements for photovoltaic (PV) arrays
- AS/NZS 5139 Electrical installations – safety of battery systems for use with power conversion equipment.
- Western Power's Basic Embedded Generator Connection Technical Requirements

8.2 Pre-installation requirements

Site assessment

It is recommended that the installer undertakes a pre-installation site visit of the customer's premises to assess for any existing DER configurations (including any existing export monitoring device) to ensure that the solution design will meet whole-of-site compliance.

Understand remote management requirements

Equipment retailers and installers shall understand the remote management requirements for DER systems as outlined in the following sections.

(a) Customer participation tiers

Synergy's *DER functionality requirements* define operational tiers for different levels of customer participation.

Equipment retailers and installers must follow the same installation and commissioning requirements outlined in this handbook for all tier levels except where explicitly stated that a tier is excluded from the requirement.

Tier	0	1	2
Participation Level	Passive customer participation - typically used in instances where a site has inadequate internet connection or other site limitations	Active customer participation in which minimum visibility and emergency management requirements are met. – typically used where a customer opts out of participation in a VPP product.	Active customer participation where customers are participating in VPP products that enable remote management of DER systems.

DER Capability	Must include communications solution from supported solutions list	Must include communications solution from supported solutions list	Must include communications solution from supported solutions list
Export Limit	1.5kW (local hardware configured limit)	Remotely managed limit as per product	Remotely managed limit as per product
Ongoing Site Internet Access Capability	No (temporary internet connection required for commissioning)	Yes	Yes

Table 1: Customer participation tiering system.

(a) Supply of Compliant Equipment

Equipment retailers and installers shall utilise equipment specified on Synergy's supported solutions list. The list can be found at synergy.net.au on the [DER industry resources](#) page.

This list of supported solutions may also assist customers and installers to understand what solutions are supported for participation in Synergy's products.

(b) Export Monitoring Device

DER installations are required to be fitted with an export monitoring device. This device must be capable of monitoring point of connection voltage and active and reactive power flows to meet the site monitoring requirements outlined in Synergy's *DER functionality requirements*.

(c) Whole of Site Compliance

New installations under remote management containing multiple DER assets (existing or new) shall have aggregated remote management capability. This may be achieved through direct DER-DER communications (where compatible) or by using a gateway device.

Where a site has existing assets that are not interoperable with existing or new assets, a derogation may be requested. Where a customer site contains devices that are not interoperable with other devices on site, there may be limitations to the customer's ability to participate in certain products.

(d) Exemptions from Compliance

Upgraded systems that contain existing assets that are unable to achieve site compliance requirements may be granted a derogation exemption by Synergy in exceptional cases. Please refer to **Section 5 – Reference documents** for details on the engineering derogation process.

(e) Internet Access

All tier 1 and 2 customers will require ongoing connectivity to the internet. All connectivity must be realised through a password protected private network. It is the customer's responsibility to provide and maintain this internet access.

For an installer actioning a DER installation, they must verify with the customer that the site has active and reliable internet connection. The installer may be required to provide temporary internet connection for the purposes of commissioning.

If there is not a suitable internet connection, the installer shall notify the customer of their requirements to provide a stable internet connection if they wish to participate in VPP products.

If a customer site is unable to provide an ongoing internet connection, they may be allowed to progress installation under a tier 0 arrangement with a temporary internet connection utilised for commissioning. In this case, the customer will not be able to participate in DER services and the installer shall configure the site with a fixed export limit (1.5kW hardware limit configured locally).

Apply to connect

(a) DES Application

All DER installations will require customers or installers to undergo a distributed energy system (DES) application process accessible on Synergy's website.

It is recommended that installers conduct a site assessment prior to completing the DES application process.

Following the completion of this application, the applicant will receive a *retailer reference number* (RRN). This number is used for input into the installer test tool and must be acquired by the installer before going to site for installation.

The DES application can be completed at synergy.net.au/des

(b) Embedded Generation Application

It is the responsibility of the customer or installer, to coordinate and obtain approval to connect the DER system to the Western Power network. This can be done by submitting an embedded generation connection application once the RRN has been received from Synergy. Once connection approval has been granted, the installer is able to proceed with the installation of the DER.

The [embedded generation application](#) can be found on the Western Power website.

8.3 Installation requirements

Commissioning

Installers are expected to undertake commissioning in accordance with the relevant OEM or technology provider's installation processes for the solution that they are installing.

For all installations and tier levels, the installer shall ensure the system is configured to have a 1.5kW export limit as a default prior to commencing registration and remote management testing. For tier 1 and 2 customer sites, export limits may be adjusted remotely by Synergy after successful commissioning.

Registration

The installer will be required to initiate registration of DER to Synergy's utility server during the onsite commissioning. This is completed through the technology provider's commissioning portal. For more information installers should seek guidance from the technology provider that they are using.

It is the responsibility of the technology provider to facilitate registration through their equipment application portal and for the installer to execute the registration.

Failure to install equipment listed on Synergy's supported solutions list may result in an installer's inability to successfully register and commission DER.

Remote management testing

The installer test tool is a Synergy system that allows installers to verify that a DER system registration has been performed correctly and trigger remote management testing.

When using the installer test tool for the first time, Installers will need to sign-up.

(a) Application Retrieval

To retrieve an application, the installer will be required to input at least two out of three of the national metering identifier (NMI), RRN or meter number fields into the installer test tool.

The Installer test tool will prompt the installer to provide relevant details on the installed assets, before requesting the execution of commissioning tests.

(b) Test Review

Tests can be executed once the registration is complete and all asset details have been submitted in the test tool. The installer will be provided with visibility of the outcome of the testing within the installer test tool. If all tests have passed, the installer will be notified from within the installer test tool and the installer may move on to closing out (refer to **Closeout** in this section). If the tests have failed, see **Issue rectification** in this section.

Issue rectification

If the tests are not complete or have failed, the installer test tool will present that outcome to the installer and the installer will have the option to re-run the test suite. It is recommended that the installer re-executes the test suite at least once before contacting Synergy for assistance.

For further information regarding troubleshooting see **Section 10: Support**.

Closeout

If the installer test tool has recorded a pass result, the installer may leave the site with the system operational.

For tier 0 sites ensure the local 1.5kW export limit is in place before leaving site.

8.4 Post-installation monitoring

Post installation, Synergy will monitor the DER systems performance to ensure it is successfully registered and operating as per the requirements of this document.

After twenty-one (21) days, if the system is unable to meet the requirements defined in this document, the *DER Functionality requirements* or *Synergy's Utility interconnection handbook*, Synergy will notify the customer of the non-conformance and provide reasons for the non-conformance that needs to be remedied. Synergy may take action to restrict customer system behaviour, for example by applying a reduced export limit, until the non-conformance has been rectified.

9 DER installation process

The diagram below outlines the DER installation process.

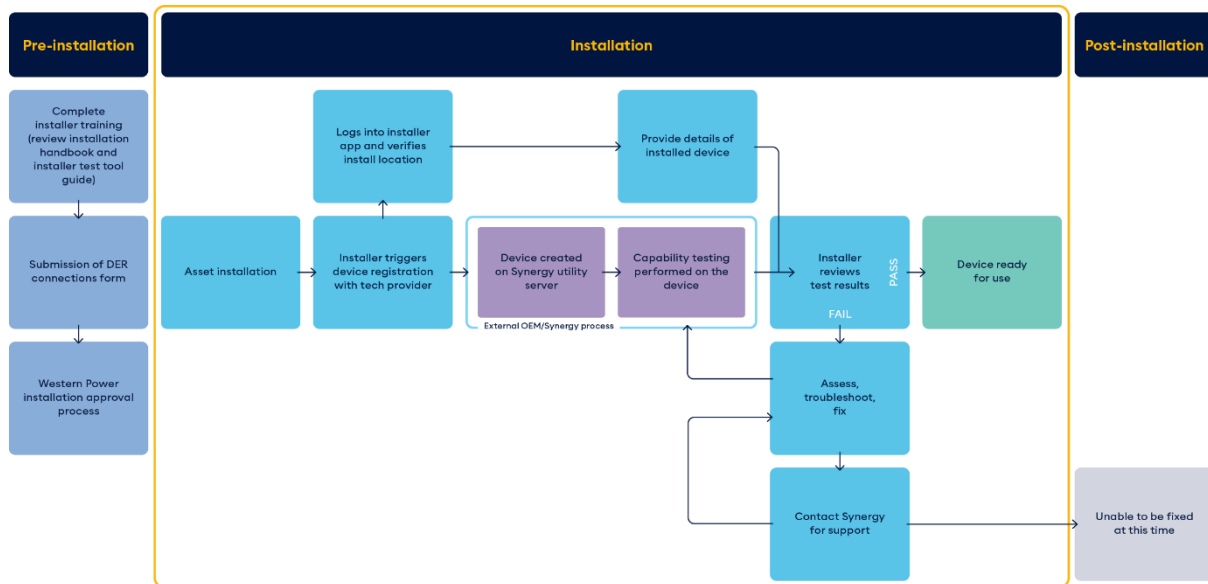


Figure 2: Installer DER commissioning process.

10 Support

10.1 Onsite support process

In the event commissioning of a DER asset fails, the following steps should be followed:

1. Verify the customer's modem is still connected to the internet.
2. The technology provider's hardware is connected to the customer's modem.
3. An open, and approved application exists for the NMI.
4. The NMI input into the technology provider app matches the NMI in the test tool.
5. The technology provider's commissioning guide has been followed correctly.
6. All information has been inserted into the test tool correctly and the test suite re-run.
7. If steps 1-6 have not worked, contact the technology provider for support and re-run the test suite.
8. If the technology provider cannot resolve the issue or is not available, proceed to step 9.
9. Call Synergy's DER Support on **08 6282 7983** outlining any error messages (see the test tool guide for more information on error messages). **Note: Do not start this step unless the previous steps have been completed.**
10. If the issue cannot be resolved, Synergy will log the issue and the installer can leave site pending local configuration of a 1.5kW site export limit. Inform the equipment retailer that there was an issue in the commissioning process.
11. Notify the customer that there was an issue commissioning and refer them to their equipment retailer.
12. As soon as reasonably practicable, follow the process outlined in **Section 10.2 – Offsite support process**.

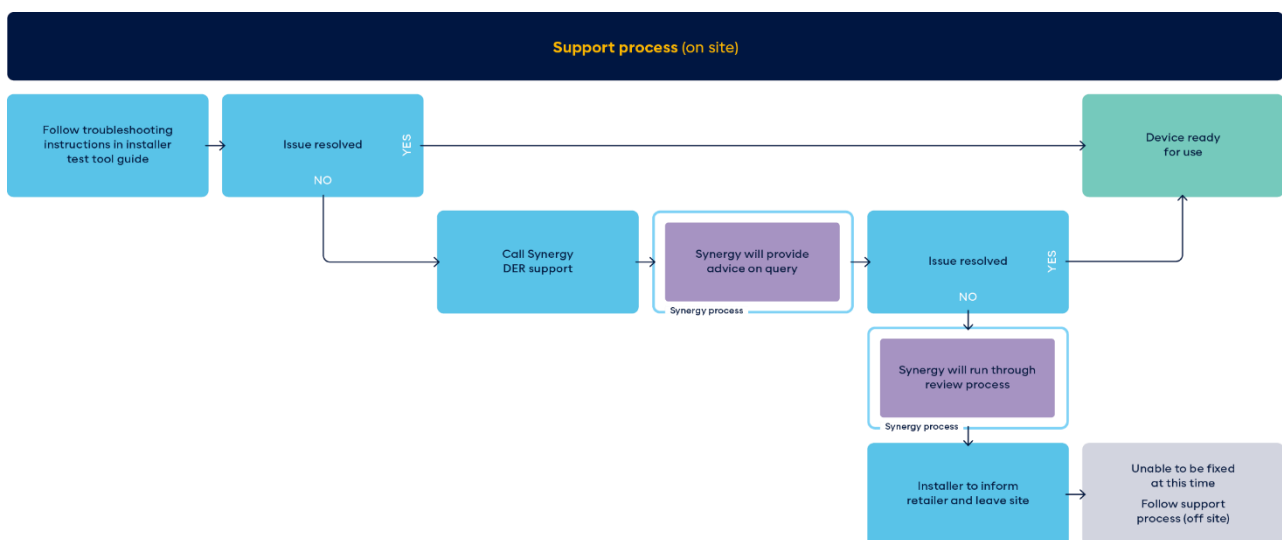


Figure 3: Commissioning support process.

10.2 Offsite support process

If rectifying a previously failed commissioning or seeking a general enquiry; follow the process below:

1. Raise a query through the following methods:
 - a. Email der-support@synergy.net.au
 - b. Online [[Enquiry Form](#)]
2. Synergy will review the query and respond.
3. Installers will need to confirm whether the query is resolved and action advice.

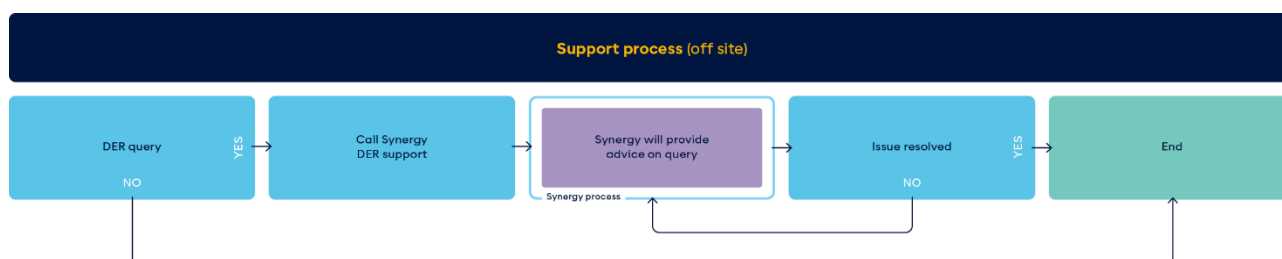


Figure 4: Offsite support commissioning process.

11 Frequently asked questions

I have not been instructed to perform a site evaluation. What do I do if I have been requested to install an asset?

Contact the equipment retailer to confirm the DER connection application has been approved and if a site evaluation has been conducted. If not, inform the equipment retailer that a site evaluation is recommended to confirm the pre-installation requirements before installation commences.

The site does not have internet, how do I commission a DER system?

If a site does not have internet access, it is deemed a tier 0 site. However, the system must still be commissioned in line with the requirements of this document. The installer must utilise a temporary internet connection in order to commission the system and ensure a local hardware export limit is applied after internet access is removed. Where a temporary internet connection cannot be established, refer to Synergy's engineering derogation process or contact Synergy as outlined in **Section 10.2: Offsite support process**.

The asset did not register successfully. What do I do?

Follow the installation support process in **Section 10: Support**. For further support call Synergy's DER Support on **08 6282 7983**.



synergy.net.au