Disclaimers

Important Notice

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FCC Compliance

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment OFF and ON, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance may void the user’s authority to operate the equipment.

Simplified EU Declaration of Conformity

Hereby, SolarEdge Technologies Ltd., declares that the radio equipment type Wireless Communication ZigBee Kit is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address:
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About This Guide

This user guide is intended for Photovoltaic (PV) system owners, installers, technicians, maintainers, and integrators who use the SolarEdge power harvesting system.

This manual describes how to install and set up ZigBee™ communication between a SolarEdge device (inverters or Safety and Monitoring Interface) and the SolarEdge home gateway (also referred to as SolarEdge gateway). The manual instructions and graphics refer to the inverter; however apply to SMI as well.

This guide assumes that the SolarEdge power harvesting system is already installed and commissioned. For additional information about how to install and commission the SolarEdge power harvesting system, refer to the relevant installation guide.

The guide includes the following chapters:

- **Chapter 1: Introducing the Home Gateway**, page 7, describes the SolarEdge home gateway functionality and connection.
- **Chapter 2: Home Gateway User Interfaces**, page 10, describes the home gateway connectors, configuration button, and LEDs.
- **Chapter 3: Installing the SolarEdge Home Gateway**, page 14, describes how to mount, connect and verify the connection of the SolarEdge home gateway.
- **Appendix A: Troubleshooting**, page 18, describes connection and communication problems, and how to troubleshoot them
- **Appendix B: Technical Specifications**, page 22, provides the electrical and mechanical specifications of the SolarEdge home gateway device.

For further information, datasheets and the most up-to-date certifications for various products in different countries, please visit the SolarEdge website: www.solaredge.com
Support and Contact Information

If you have technical queries concerning our products, please contact us:

<table>
<thead>
<tr>
<th>Region</th>
<th>Phone Number</th>
<th>Email Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia (+61)</td>
<td>1800 465 567</td>
<td><a href="mailto:support@solaredge.net.au">support@solaredge.net.au</a></td>
</tr>
<tr>
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<td><a href="mailto:support-asia@solaredge.com">support-asia@solaredge.com</a></td>
</tr>
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<td><a href="mailto:support_china@solaredge.com">support_china@solaredge.com</a></td>
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<td><a href="mailto:support@solaredge.nl">support@solaredge.nl</a></td>
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<td><a href="mailto:support-uk@solaredge.com">support-uk@solaredge.com</a></td>
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<tr>
<td>US &amp; Canada (+1)</td>
<td>510 498 3200</td>
<td><a href="mailto:ussupport@solaredge.com">ussupport@solaredge.com</a></td>
</tr>
<tr>
<td>Greece (+30)</td>
<td>00800 125574</td>
<td></td>
</tr>
<tr>
<td>Middle East &amp; Africa (+972)</td>
<td>073 2403118</td>
<td><a href="mailto:support@solaredge.com">support@solaredge.com</a></td>
</tr>
<tr>
<td>South Africa (+27)</td>
<td>0800 982 659</td>
<td></td>
</tr>
<tr>
<td>Turkey (+90)</td>
<td>216 706 1929</td>
<td></td>
</tr>
<tr>
<td>Worldwide (+972)</td>
<td>073 240 3118</td>
<td></td>
</tr>
</tbody>
</table>

Before contacting SolarEdge, ensure you have the product serial number as appears on its label.
Chapter 1: Introducing the Home Gateway

Overview

The SolarEdge home gateway is used for wireless connectivity between one or more inverters at a site and a remote internet gateway point. Wireless connectivity allows simplifying the installations as no outdoor cabling is required. The SolarEdge home gateway communicates using ZigBee, a standard for low-rate, high-reliability, and multi-device wireless protocol for telemetry communications.

Figure 1: The SolarEdge Home Gateway
Figure 2 shows an inverter as an example; however, this illustration is applicable to other SolarEdge devices, such as Safety and Monitoring Interface (SMI).

The home gateway is provided with one slave unit that is installed inside the inverter. Up to 15 SolarEdge inverters can be supported per one ZigBee wireless link. In order to enable more than one inverter, additional slave kits are required (sold separately).
Package Contents

- Home gateway with antenna
- Power supply
- CAT 5E Ethernet cable
- ZigBee slave kit, including:
  - ZigBee slave module
  - Antenna with RF cable
  - Mounting bracket clip for installing the antenna on the inverter
  - Installation guide
- This installation guide

Installation Procedure

The following illustrates the steps required for the home gateway installation:

1. **Install a slave module in all inverters and other SolarEdge devices**
2. **Connect the home gateway**
3. **Device discovery**

Refer to the *ZigBee Slave Kit Installation Guide*

Page 16

Page 16
Safety

**WARNING!**

- Do not use the AC power supply if it is broken.
- Do not use the AC power supply if the cable is damaged.
- The home gateway/ repeater kit and the AC power supply are for indoor use only and cannot be used in wet locations.
Chapter 2: Home Gateway User Interfaces

Figure 4: SolarEdge Home Gateway Interfaces
Chapter 2: Home Gateway User Interfaces

Connectors

- **µUSB**: Connection to the power supply. This port can also be used for connecting to a computer for advanced configuration or SW upgrade.
- **Ethernet**: Connecting the SolarEdge gateway to the SolarEdge monitoring portal through an Ethernet switch/router. The Ethernet switch/router should be connected to the Internet.

DIP Switches

Two DIP switches are located at the side of the gateway. They are used for internal configuration; therefore, their position should not be changed.

Configuration Button

The configuration button is used for the following:

- Discovery of slave devices and associating them to the home gateway
- Diagnosis of communication problems

**To use the configuration button:**

- Short press: Pressing the configuration button for 5-10 seconds and releasing it - discover slaves (device discovery)
- Long press: Pressing the configuration button for more than 10 seconds and releasing it - start diagnostics mode (refer to Appendix A: Troubleshooting on page 18.)
## LEDs

The gateway has four LED indicators, as follows:

<table>
<thead>
<tr>
<th>Label and Color</th>
<th>Indication</th>
<th>Functionality¹</th>
</tr>
</thead>
</table>
| S_OK (green)    | Connection with the SolarEdge monitoring portal | **ON** - Connection with SolarEdge monitoring portal is OK  
**OFF** - Communication with the SolarEdge monitoring portal failed |
| Link (yellow)   | Communication with associated slave(s) | **Blinking** - There has been ZigBee communication in the last 15 minutes. The LED blinks according to the number of slaves as follows: for each slave 0.5 sec. **ON** and 0.5 sec. **OFF**. This is repeated following a 5 sec. pause.  
**OFF** - No communication with any slave in the last 15 min |
| 3x Signal strength (RSSI) (green) | Received Signal Strength Indication - Low/Medium/High | **All 3 LEDs ON** - High  
**Two LEDs ON** - Medium  
**One LED ON** - Low |
| Power (green)   | Power | Power supply connected to the home gateway |

¹ Functionality during normal operation. During device discovery and diagnostic mode, the LEDs indicate different functionality (see Appendix A: Troubleshooting)
Chapter 3: Installing the SolarEdge Home Gateway

Installation Guidelines

The following requirements apply when locating and mounting the SolarEdge gateway:

- The SolarEdge home gateway is suitable for mounting indoors only. For outdoor installation, use an external plastic outdoor enclosure (not provided by SolarEdge).
- The SolarEdge home gateway must always remain in an ambient temperature of -20°C (-4°F) to +60°C (140°F).
- Protect the SolarEdge home gateway from dust, wet conditions, corrosive substances, and vapors.
- Install the SolarEdge home gateway on a wall or place it on the desk.

Figure 5: Wall Mount Option
Ensure that the antenna is always vertically oriented.

Figure 6: Antenna Orientation
Connecting the SolarEdge Gateway

1. Install the supplied ZigBee slave module in the slave device (inverters or SMI) as described in the ZigBee Slave Kit Installation Guide. To connect more slaves, purchase an additional ZigBee slave kit for each slave device (sold separately).

2. Connect the power supply to the μUSB connector and connect to an AC source. The power LED is lit to indicate power connection.

3. Connect the Ethernet cable between the gateway connector and the router or switch used to connect to the Internet.

Device Discovery

Press the configuration button on the home gateway for 5-10 seconds and release. Release the button after all LEDS have turned on. The gateway starts discovering the slave device(s). The device discovery may take 2-3 minutes, during which all the LEDs blink. The signal strength LEDs also light up (refer to LEDs on page 13).
Chapter 3: Installing the SolarEdge Home Gateway

Verifying the Connection

1 Verify that the S_OK LED is ON, which indicates the communication with the SolarEdge portal is established. This may take up to five minutes. If the LED does not light up, refer to Appendix A: Troubleshooting on page 18.

2 After device discovery, verify that the yellow (Link) LED blinks and indicates the correct amount of slaves, as described in the following illustration.

   **One slave**

   - 0.5 sec. 0.5 sec.  | Pause | 0.5 s. 0.5 s.  | Pause | 0.5 s 0.5 s

   **Two slaves**

   - 0.5 s 0.5 s 0.5 s 0.5 s  | Pause | 0.5 s 0.5 s 0.5 s 0.5 s  | Pause | 0.5 s 0.5 s 0.5 s 0.5 s

   ![Figure 7: Example of LED Blinks for One or Two Slaves](image)

3 Verify signal strength: Check that at least two RSSI LEDs are ON, which indicates medium signal strength. If only one LED is ON, the signal strength is Low. Consider relocating the home gateway closer to the inverter to improve reception. If all RSSI LEDs are OFF, place a SolarEdge ZigBee repeater (sold separately) between the home gateway and the inverter. Refer also to Troubleshooting Ethernet Connection, below.
Appendix A: Troubleshooting

Troubleshooting Ethernet Connection

If the S_OK LED on the gateway is not ON, use the diagnostics mode to identify the error:

Press the gateway configuration button for more than 10 seconds and release it (after all LED turn on and then off while pressing). The home gateway is now in diagnostics mode.

- If all LEDs light up – no error has occurred.
- If one of the LEDs is OFF, refer to the following table to diagnose the problem. If more than one problem is identified, diagnose the top one first.

Figure 8: Home Gateway LEDs
<table>
<thead>
<tr>
<th>Label and Color</th>
<th>Indication when OFF During diagnostic mode</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSSI 1 (Low, green)</td>
<td>An Ethernet physical cable connection fault: The Ethernet link or physical Ethernet cable are not connected properly</td>
<td>Check the cable pin-out assignment and cable connection</td>
</tr>
<tr>
<td>RSSI 2 (Medium, green)</td>
<td>The gateway failed to get a valid IP address from the DHCP server, or The DHCP/static IP settings in the gateway are not the same as those of the router.</td>
<td>Refer to Error! Reference source not found. on page Error! Bookmark not defined.</td>
</tr>
<tr>
<td>RSSI 3 (High, green)</td>
<td>The connection to the router is not available: Ping to the first local switch/router failed (LAN error)</td>
<td>Check the physical connection to the switch/router. contact your network IT, otherwise replace the cable or change it from cross to straight connection</td>
</tr>
<tr>
<td>Link (yellow)</td>
<td>The connection to the Internet is not available: Ping to google.com failed</td>
<td>Connect a laptop and use the configuration tool to check for internet connection. If internet access is unavailable, contact your IT admin or your internet provider.</td>
</tr>
<tr>
<td>S_OK (green)</td>
<td>The connection to the SolarEdge portal was not established: Communication with the portal failed</td>
<td>Check the SolarEdge server address</td>
</tr>
</tbody>
</table>
Troubleshooting ZigBee Wireless Connection

Yellow LED (Link) does not blink after device discovery

If the yellow LED (Link) does not blink after device discovery, a connection error may have occurred. Try the following troubleshooting actions:

- Relocate the home gateway closer to the inverter to improve signal strength.
- Disconnect the inverter from the AC source and check that the ZigBee slave inside the inverter is in the correct orientation and that all its pins are inserted into their correct locations in the communication board, and no pins are left out of their socket.
- Place a SolarEdge repeater (sold separately) between the home gateway and the inverter. Refer to the SolarEdge Repeater Installation Guide.

Yellow LED (Link) does not blink according to no. of Slaves

If the yellow LED does blink, however not the correct number of times (according to number of slaves), try the following troubleshooting actions:

1. Check the inverters as follows in order to identify a disconnected inverter:
   a. Short-press the inverter's LCD light button until reaching the Server status screen:

```
Server: Zigbee <S_OK>
Status <OK>
```

20 Home Gateway Installation Guide – MAN-01-00118-1.5
b. Check that S_OK appears in the Server field to indicate a functioning connection to the SolarEdge monitoring portal, which was validated during the last two minutes. Check that the <OK> appears in the Status field.

If S_OK is not displayed, or Gateway Not Found / Master Not Found appear, then this is the slave not detected. Do the following:
- Check that the ZigBee slave inside the inverter is in the correct orientation and that all its pins are inserted into their correct locations in the communication board, and no pins are left out of their socket.
- Reload ZigBee defaults as described in the ZigBee Slave Kit Installation Guide.

2 Short-press the inverter's LCD light button until reaching the ZigBee status screen:

```
P A N  I D : 0 0 0 0 0 1 A B 7
C H :  1 5 / 1 F F E  R S S I :  < M >
I D :  0 0 1 3 A 2 0 0 4 0 4 9 B 2
M I D : 0 0 1 3 A 2 0 0 4 0 9 2 0 3 3 6
```

3 Check the following:
- **MID**: check that an MID (Master ID) value appears, to indicate the identification number of the home gateway. If ZigBee Ready appears, the inverter is not associated with the home gateway. Perform device discovery.
- **RSSI**: check that H (High) or M (Medium) appears which indicates the signal strength. If L (Low) or no values appear, relocate the gateway for better signal reception, or use a repeater.
## Appendix B: Technical Specifications

<table>
<thead>
<tr>
<th></th>
<th>North America</th>
<th>Worldwide</th>
<th>Unit</th>
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<tbody>
<tr>
<td><strong>Functional</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of inverters that can be monitored</td>
<td>1-15</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Performance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmit power</td>
<td>22.8</td>
<td>11.8</td>
<td>dBm</td>
</tr>
<tr>
<td>Receiver Sensitivity</td>
<td>-102</td>
<td></td>
<td>dBm</td>
</tr>
<tr>
<td>EIRP with Antenna</td>
<td>27.8</td>
<td>16.8</td>
<td>dBm</td>
</tr>
<tr>
<td>Outdoor (LOS) range</td>
<td>400/1300</td>
<td></td>
<td>m/ft</td>
</tr>
<tr>
<td>Indoor range(^1)</td>
<td>50/160</td>
<td></td>
<td>m/ft</td>
</tr>
<tr>
<td>Frequency Band</td>
<td>2400 - 2483</td>
<td></td>
<td>MHz</td>
</tr>
<tr>
<td>Maximum Emitted Power</td>
<td>(\leq 30)</td>
<td>(\leq 20)</td>
<td>dBm</td>
</tr>
<tr>
<td>Antenna Gain</td>
<td>5</td>
<td></td>
<td>dBi</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>(-20 \div +60)</td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>(-20 \div +60)</td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td>Relative humidity (non condensing)</td>
<td>0 ÷ 80</td>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Ingress protection</td>
<td>IP20</td>
<td></td>
<td></td>
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<tr>
<td><strong>Power Supply Requirements</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>5</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>Current</td>
<td>A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) Approximate values, may differ depending on specific installation conditions
If you have technical queries concerning our products, please contact our support through SolarEdge service portal: http://www.solaredge.com/service/support

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