Olivance PowerLink Gateway OPLG-3000 User Manual
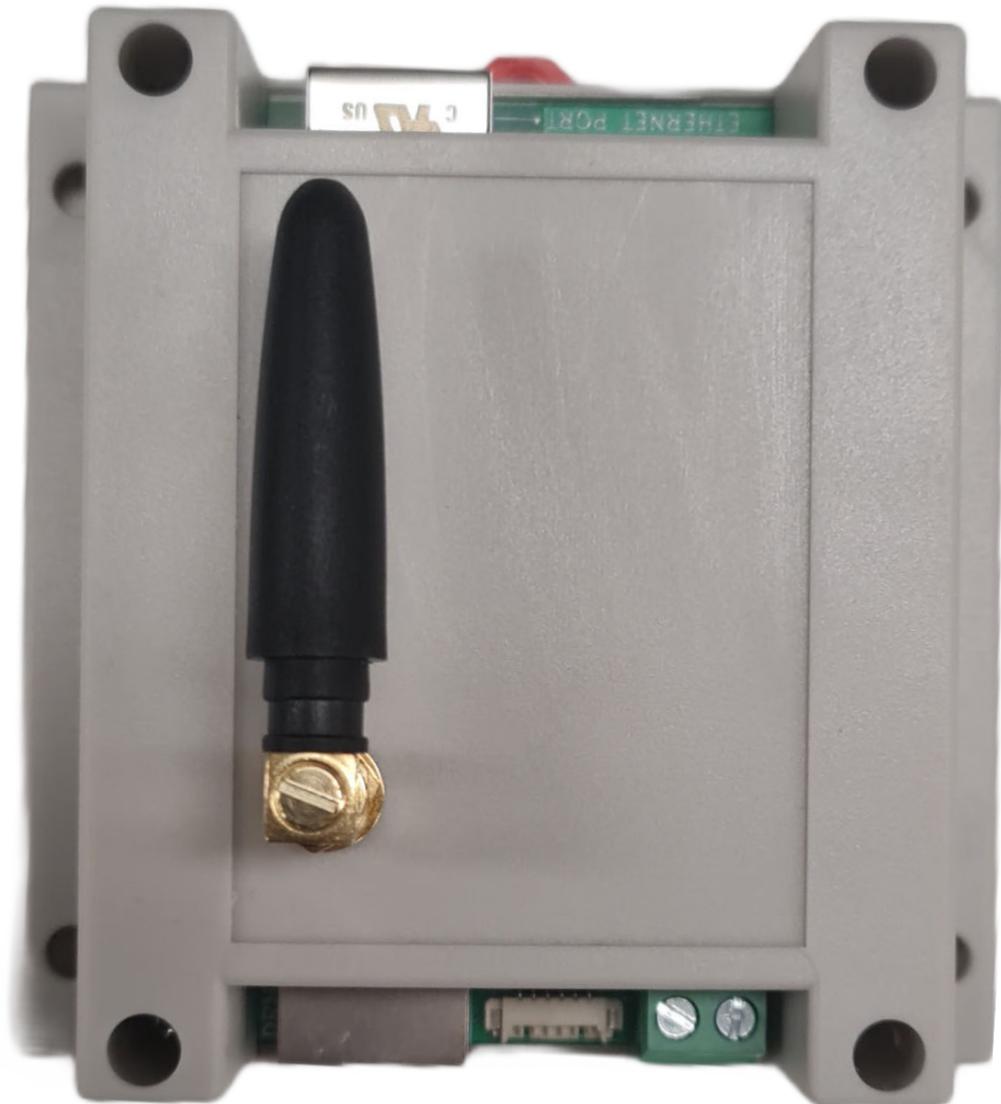
Table of Contents :

Revision History

| Date	revision	Firmware Version	comments
27-1-2023	0.1	1.0.0	Initial Draft
10-05-2023	0.2	1.2.0	Second Draft

1 Introduction

1.1 Overview of the device and its features

The Olivance device works as a pipeline between the signal generating device and the PV inverter. The signal generating device receives a signal from the power network , this signal is either to enable or disable DRM0 mode.
The Oliavance device connects to the signal generating device and detects the signal either to disable or enable the DRM0 then it sends a command to the inverter to apply the status accordingly.
The Olivance device is designed to work seamlessly with SMA inverters in a variety of network configurations. It can be connected using either WiFi or Ethernet, and supports different network topologies This allows for maximum flexibility and compatibility with a wide range of inverter models and network setups.
To connect your Olivance device to your PV inverter, simply follow the instructions provided in the user manual and ensure that your network topology is properly configured. With the Olivance device, monitoring and controlling your PV inverter has never been easier.
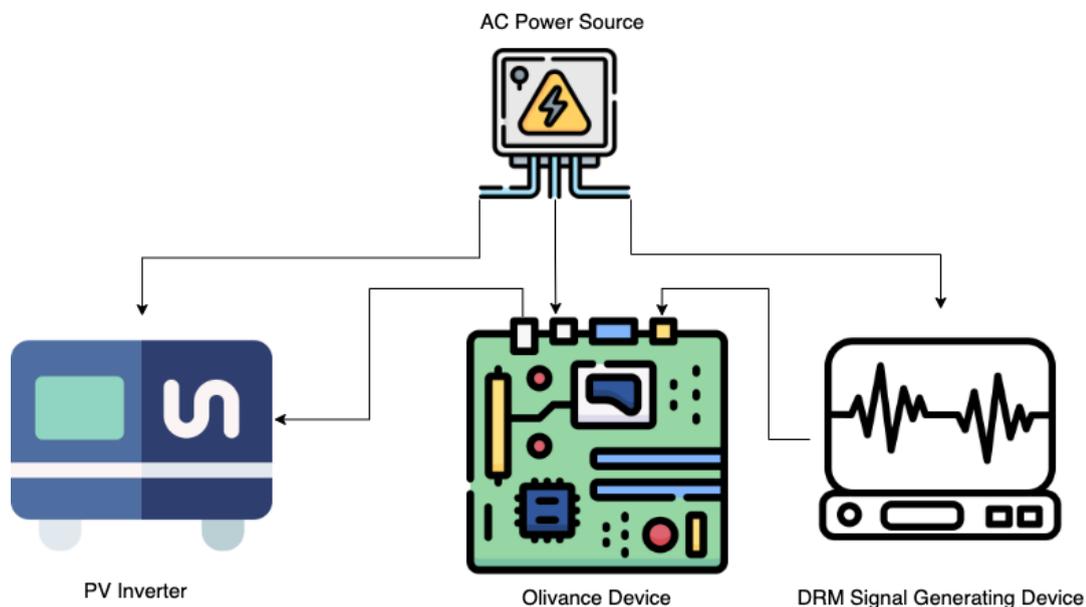
1.2 Safety precautions

- It is important to read and understand this manual before operating the device.
- Please use the correct voltage when connecting the device to power, as using the incorrect voltage can cause damage to the device and may be a fire hazard.
- The device should be connected to a power source of 12V DC through a screw terminal.
- To avoid fire hazard, do not install the device near flammable or explosive materials.
- Keep the device away from moisture and water to prevent electrical shock or damage to the device.
- Do not use any accessories or parts not specified by the manufacturer as they may cause damage to the device or injury to the user.
- The device should be installed and maintained by a qualified professional in accordance with local electrical codes and regulations.
- The device should be installed in a well-ventilated area to avoid overheating.

1.3 Package contents

- Olivance PowerLink Gateway OPLG-300.
- Wi-Fi Antenna.
- Quick start guide.
- Make sure that all the items listed above are included in the package before using the device.
- If any of the items are missing or damaged, please contact the manufacturer for assistance.
- Keep the packaging materials in case you need to transport the device in the future.

2 Getting Started

2.1 Theory Of operation

The Olivance device connects to the signal generating device through the rj45 DRM port.
The Olivance device hardware can detect all the DRM modes (0,5,6,7,8) but the current firmware only supports the DRM0 mode based on SMA requirements.
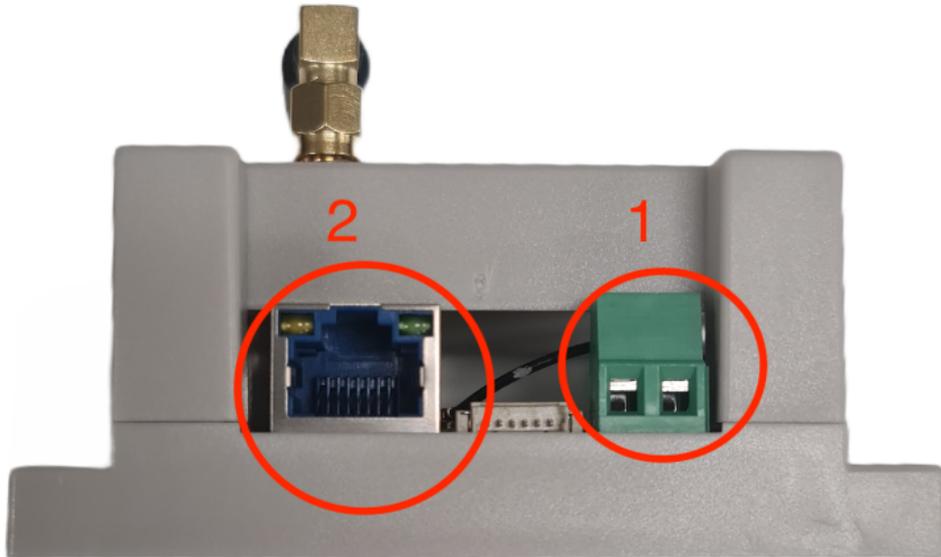The DRM0 Disable signal is a resistance value of $15K\Omega$ between the COM and REF wires.

While the DRM0 Enable signal is either a short or open circuit between the COM and REF wires.
Then the Olivance Device send the command to the inverter accordingly via the Modbus over TCP

Refer to the AS NZS 4577 for more information.

2.2 Device Inputs/Outputs

NO	Function
1	12V DC Power supply

2	RJ45 DRM Connector
3	RJ45 Ethernet Port
	Reset button is the only button on the board (remove the cover to access it)
	Wi-Fi Antenna

2.3 Device setup and installation

Powering up the device:
The device is powered by 12V DC. Connect the device to a power source.

Network connection:
The device can connect to a network or directly to an inverter using one of the topologies that will be explained in later sections.
Connect the ethernet cable between the device and the inverter or the hub if you are using the ethernet method , if you are using the Wi-Fi method you can keep the ethernet port not connected

DRM connection:
Connect the rj45 DRM port on the Olivance device to the rj45 DRM port on the signal generating device.
The DRM rj45 order follows the AS NZS 4755 Stadareds.

Web interface:
The device has a web interface that allows you to enter the settings. To access the web interface, connect to the device's network using a web browser.

Installing the device:
The device should be installed by a qualified professional in accordance with local electrical codes and regulations.
Make sure that the device is installed in a well-ventilated area to avoid overheating.
Keep the device away from moisture and water to prevent electrical shock or damage to the device.

Configuring the device:
After the device powers on it starts in ethernet P2P mode, where the device should be connected directly to the SMA inverter via ethernet cable.
To change the default settings first do a Reset To AP Mode and then follow the below steps

- Connect your laptop or smart device to the Olivance Access point (Olivance Wi-Fi Network)

- Open the web browser and navigate to http://192.168.1.1
- Then you should see the settings page.
- Change the settings if you need to.
- Click on update and wait for the web page to refresh
- Double check the entered settings
- Click on save & restart
- Then the Olivance device will apply the new settings and reboot
- If you set the network topology to a different method , you can access the settings page via the new set method.

2.4 Connection Topologies

Olivance devices can communicate with the inverter either via Wi-Fi or ethernet by following one of the below topologies. Refer to the "Configure the device" section for changing the settings to the desired topology

1. **Ethernet P2P (default topology)**
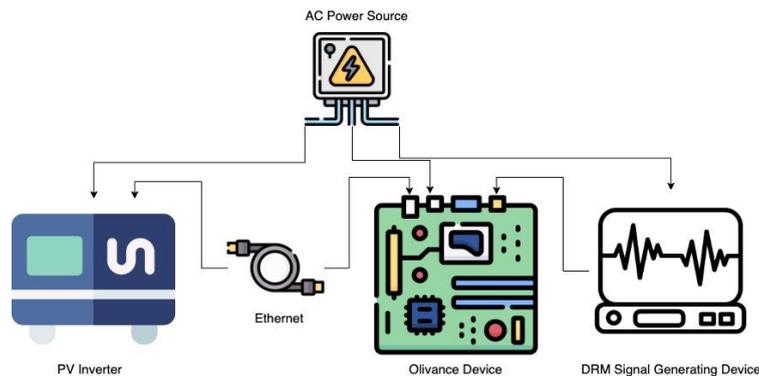
The Olivance device connects to the inverter directly using an Ethernet cable. In this case, both the inverter and Olivance device must have unique static IP addresses.

2. **Ethernet with hub**
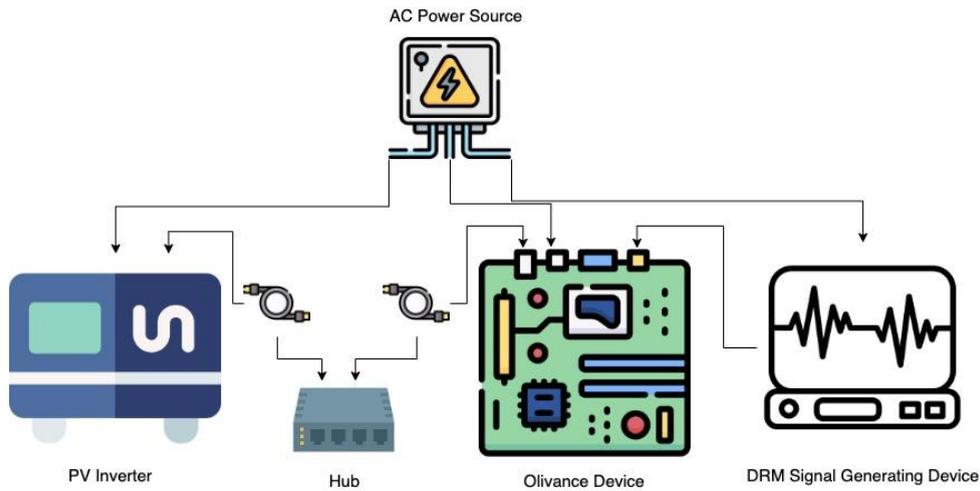
Both the Olivance device and inverter are connected to a hub or switch. If the Olivance device's IP address is set to a specific IP, it will ask the hub for that IP address. Make sure it is available. If the IP address is set to 0.0.0.0, the Olivance device will obtain an IP from the router's DHCP. Check the router's settings page to check the Olivance device's connectivity status and IP address.

3. Wi-Fi Client
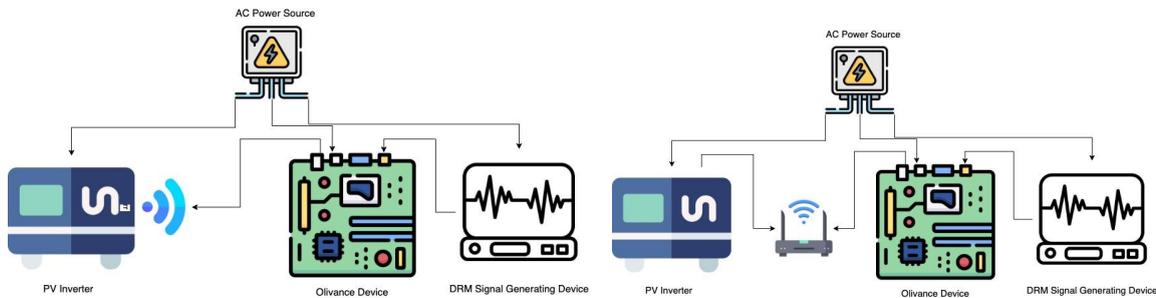
Wi-Fi Client: In this scenario, the Olivance device connects to the inverter's Wi-Fi access point or both the Olivance device and inverter connect to the same router. If the Olivance device's IP address is set to a specific IP, it will ask the router/access point for that IP address. If the IP address is set to 0.0.0.0, the Olivance device will obtain an IP from the access point/router DHCP. Check the access point/router's settings page to check the Olivance device's connectivity status and IP address.

4. Wi-Fi Access Point
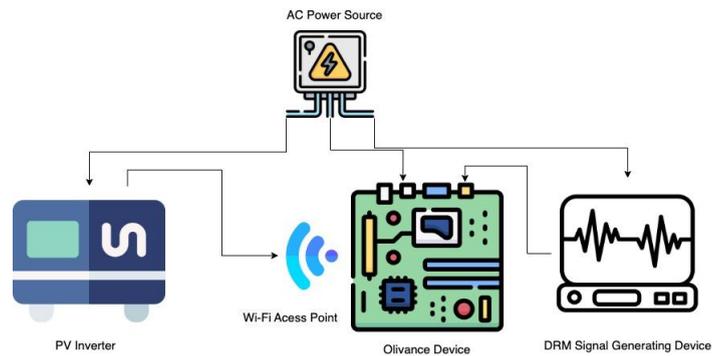
In this topology, the Olivance device will start a Wi-Fi access point and the inverters should connect to this access point. The Olivance device's Wi-Fi DHCP will assign an IP address to the inverter. Usually, the IP address will be the next available IP. For example, if the Olivance   device's IP address (which is also the gateway) is 192.168.1.1, and the first device connects to the Olivance, it should be the inverter and it will have the IP address of 192.168.1.2. It is recommended to check the inverter's settings page to see the IP address if it is available.

2.4 Web Interface Settings
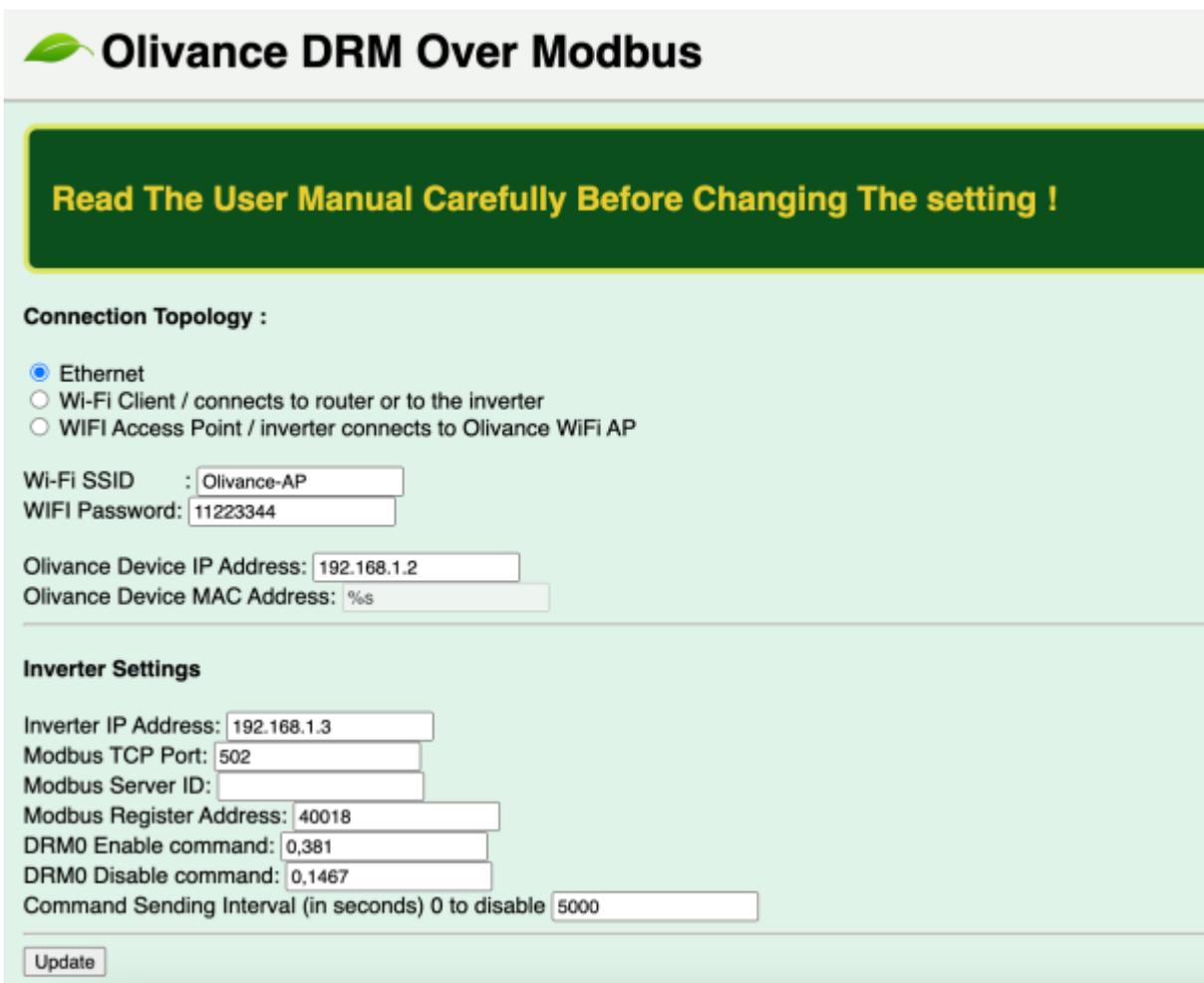
Olivance DRM Over Modbus

Read The User Manual Carefully Before Changing The setting !

Connection Topology :

- ● Ethernet
- ○ Wi-Fi Client / connects to router or to the inverter
- ○ WIFI Access Point / inverter connects to Olivance WiFi AP

Wi-Fi SSID   : Olivance-AP
WIFI Password: 11223344

Olivance Device IP Address: 192.168.1.2
Olivance Device MAC Address: %s

Inverter Settings

Inverter IP Address: 192.168.1.3
Modbus TCP Port: 502
Modbus Server ID:
Modbus Register Address: 40018
DRM0 Enable command: 0,381
DRM0 Disable command: 0,1467
Command Sending Interval (in seconds) 0 to disable 5000

[Update]

1. **Connection topology:**

A. Ethernet if the device connects directly to the inverter or the hub using ethernet cable

B. Wi-Fi client if the Olivance device connects to the inverter wifi or to the network router Wi-Fi.

C. Wi-Fi access point if the inverter connects to the Wi-Fi of the Olivance device.

2. **Wi-Fi SSID , Wi-Fi Password :**

Only if a Wi-Fi method is used , if the selected topology is Wi-Fi Client these credentials should be for the target network i.e.. Inverter Wi-Fi access point, or the router Wi-Fi.

However if the topology is a Wi-Fi access point these credentials will be the Olivance Wi-Fi credentials that other devices (inverter) will connect to.

3. **Olivance IP Address :**

The IP address for Olivance device whatever the topology is the Olivance device will always have this IP address , so if the topology is ethernet or Wi-Fi client make sure the other device allows Olivance device to have this IP address.
However if you wish to use DHCP and let the DHCP device for example router to assign an automatic IP address to Olivance , then set this value to 0.0.0.0 in this case the DHCP server will assign an IP for Olivance device.

Note: most inverters do not have DHCP so make sure to manually assign the IP address for Olivance device if the Olivance device connects directly to the inverter, The subnet mask is 255.255.255.0

4. Olivance Device MAC Address

MAC (Media Access Control) of the Olivance device this value is read only .

5. Inverter IP Address

The IP address of the inverter that Olivance will send commands to.

6. Modbus TCP Port :

The default value is 502 on most of the Modbus TCP devices, change this value if the port is different in case this port is not allowed by the router or for any other reason.

7. Modbus Server ID

Server ID of the Inverter (in decimal)

8. Modbus Register Address

The Modbus register address(in decimal) that Olivance will be sending commands to, by default this address is the default SMA address (refer to default values table). Note :contact Olivance or the inverter manufacturer for more information.

9. DRM0 Enable Command

The command that Olivance device will send to the inverter pr-entered register address,
 The value is in decimal only and the word size is 16-bit, if the command length is one word just just enter it , however if it is more that one word separate the words by

following this format :
 "word_1,word_2,word_3….word_n"

Note :the words are separated by "," and there is no space at all, not following the format will lead to unexpected values

Depends on the command length Olivance , will send the command based on its size, examples :
The command register address is 40018

example-1 : DRM0Command is = "0,381" :

Register Address	40018	40019
Register Value	0	381

example-2 : DRM0Command is = "0,1467" :

Register Address	40018	40019
Register Value	0	1467

example-3 : DRM0Command is = "0,111,0" :

Register Address	40018	40019	40020
Register Value	0	111	0

example-4 : DRM0Command is = "123" :

Register Address	40018
Register Value	123

10. DRM0 Disable Command

The Olivance device will send this command to the same register address in the event a DRM0 disable signal is detected; it follows the same format as the enable command.

11. Command Sending Interval

The time interval in seconds for sending the commands to the inverter
If this value is set to 10 seconds the Olivance device will send the command to the inverter every 10 seconds.
Note: if you want the command to be sent only once set this value to "0"

3. Specifications

3.1 Hardware

Parameter	Value	Comments
Supply Voltage	5-15 V DC	12V,1A power supply is recommended
Device / DRM Port Voltage	3.3 VDC	
Power Consumption	< 4 Watt	
Connectivity	Wi-Fi 802.11b/g/n	Client / Access point (max 4 clients)
	Ethernet	10/100 mbps half/full duplex
DRM Port	Rj45	AS NZS 4755
DRM0 Enabled Threshold Resistance	MAX = 20KΩ MIN = 10KΩ	Typical = 15KΩ
DRM0 Detecting Time	Less than 1 Second	
2 LED Indicators	Power/status	
Button	reset	tactile button
Dimensions	90x90x45 mm	
mounting	Din-rail / wall mounting	

3.2 Default Values

Parameter	Default Value	Comment
Topology	Ethernet P2P	
Wi-Fi SSID	Olivance-AP	
Wi-Fi Password	11223344	
AP Wi-Fi gateway	192.168.1.1	
Olivance IP Address	169.254.12.4	
Subnet Mask	255.255.255.0	
MAC Address	Unique for each device	

Inverter IP Address	169.254.12.3	
Modbus port	502	TCP port
Modbus Server ID	3	Decimal value
Modbus Register Address	40018	Decimal value
DRM0 Enable Command	0,381	16-bit Decimal value words separated by ","
DRM0 Disable Command	0,1467	16-bit Decimal value words separated by ","
Command Interval	5	seconds

3. Led Status

Olivance device has 2 LEDs one is the power LED which should be always on , otherwise it means there is no power supply.

The other LED is a status LED that indicates the current status of the device.

- Fast blinking: If the LED is fast blinking (on for 200ms and off for 200ms), this means that the device is trying to connect to the network.
- Slow blinking: If the LED is slow blinking (on for 200ms and off for 2 seconds), this means that the device is connected to the network.
- Off: If the LED is off, this means that the device is connected to the network but there is an error in Modbus communication.

4. Reset

4.1 Reset To AP Mode

In the event that the connection to the network is lost, the Olivance device offers a useful feature to reset the device to Wi-Fi Access Point (AP) mode. This allows the user to connect to the device's Wi-Fi network and access the settings page.

To enter AP mode, follow these steps:

1. Press and hold the reset button. the status LED will turn off .
2. After 5 seconds the LED will blink 4 times.
3. Release the button and wait for 30 seconds.
4. The device will now restart in Wi-Fi AP mode. The SSID and password will reset to their default values. This process may take up to 30 seconds to complete.

4.2 Factory Reset

Alternatively, the user can also perform a factory reset on by following these steps:

1. Press and hold the reset button. the status LED will turn off.
2. After 5 seconds, the status LED will blink 4 times. Keep holding the reset button.
3. After 10 seconds, the status LED will blink 3 times. Release the reset button.
4. The device will now reset all values to their default settings and restart. This process may take up to 1 minute to complete.

5 Troubleshooting tips

Definitions

PV	Photovoltaic
DRM	Demand Response Mode
AP	Access Point