

REACT 2 **and UNO-DM-PLUS** **AN-Load manager**

Introduction

REACT 2 and UNO-DM-PLUS load manager feature is used to improve direct solar self-consumption. Referring to Figure 1, typical direct PV self-consumption (dashed area in grey) quota is around 30/40%, so a lot of energy is not consumed and injected into the grid. The load manager can be used to shift some loads/appliances when there is a high availability of solar energy leading to increase PV self-consumption quota up to +10%.

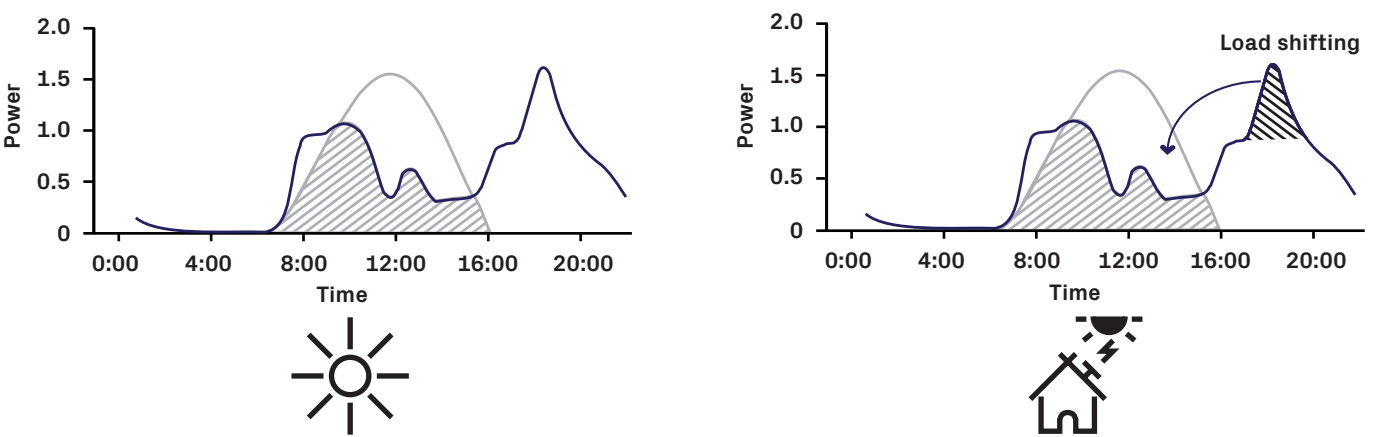


Figure 1

Scope and field of application

Load manager feature is available in the inverter models showed in Table 1

Models	Firmware version	N° of digital outputs	Note
REACT 2	>0.4.7; 1926A ¹	2	Available in every product variant
UNO-DM-PLUS	>1.8.8; 1924A ¹	1	Optional, by installing UNO-DM-COM-KIT or UNO-DM-PLUS Ethernet COM KIT

1) in case the inverter is not up to date, proceed with inverter update. Procedure is shown in the product manual

Table 1 – Compatible models

Description

Availability of load manager behavior options depends on system configuration (e.g presence of meter and/or battery). Possible configurations are shown in Table 2.

Load manager behavior	REACT 2			UNO-DM-PLUS	
	No Meter	Meter	Meter+Battery	No Meter	Meter
Solar production	√	-	-	√	-
Self-consumption boost	-	√	√	-	√
Self-consumption boost preserving battery	-	-	√	-	-
Low priority load disconnection	-	√	√	-	√

Table 2 - Load manager behavior options based on system configuration

Available working mode

Self-consumption boost

Target

Increase self-consumption quota using both solar and battery (if present) power to supply load manager loads. Digital output switch to ON when power to the grid exceeds the activation threshold and it switches to OFF when power from the grid exceeds the deactivation threshold. Specific holding times of power above the activation and below the deactivation thresholds can be set to reduce probability of unwanted activations/deactivation due to power transients.

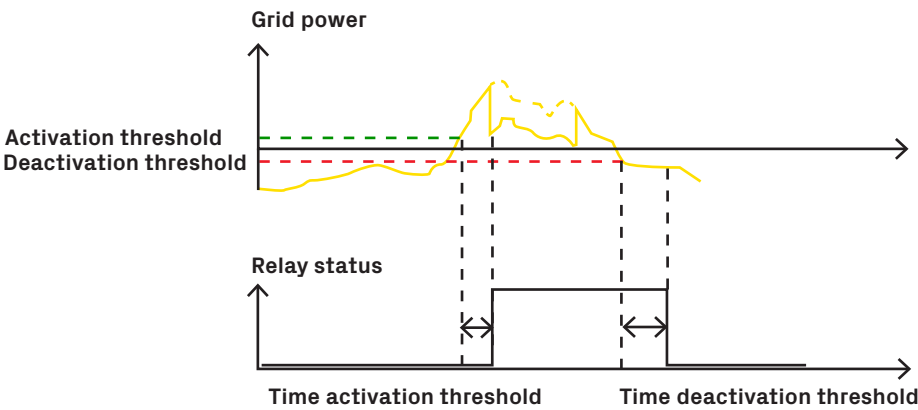


Figure 2

	Threshold	Unit of measurement
Activation (A)	Power into the grid	W
Deactivation (D)	Power from the grid	W

Table 3 - Self-consumption boost - Activation and deactivation thresholds

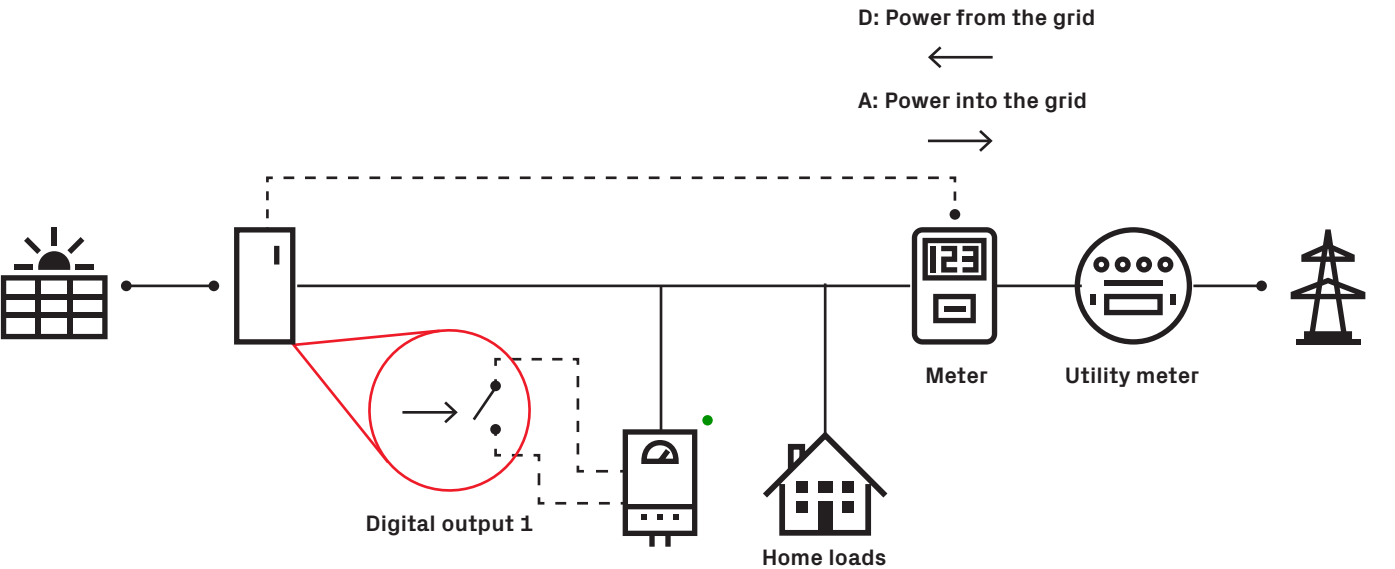


Figure 3

Self-consumption boost preserving battery

Target

Increase the self-consumption quota without using battery power to supply load manager loads.
Digital output switch to ON when power to the grid exceeds the activation threshold and it switches to OFF when discharged power from the battery exceeds the deactivation threshold.

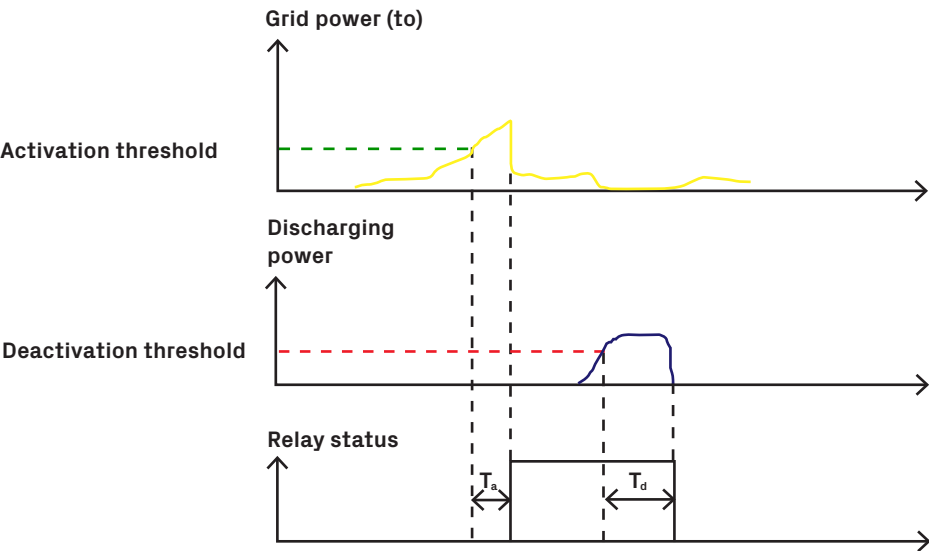


Figure 4

	Threshold	Unit of measurement
Activation (A)	Power into the grid	W
Deactivation (D)	Discharging power	W

Table 4 - Self-consumption boost preserving battery - Activation and deactivation thresholds

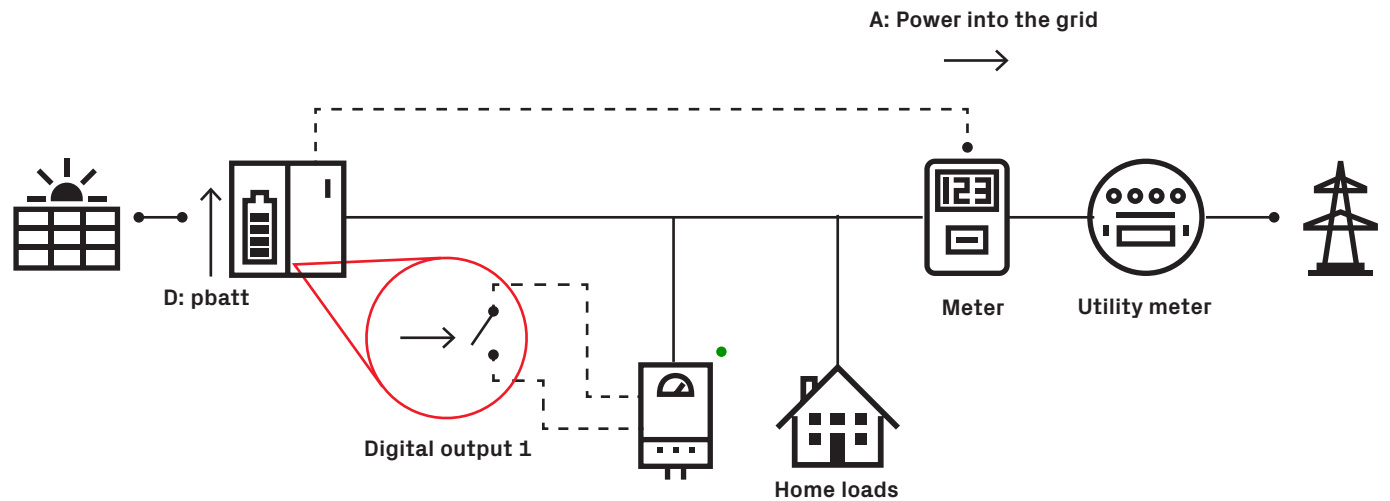


Figure 5

Low-priority load disconnection

Target

Avoid unwanted utility meter trips due to overload. In some countries (e.g Italy) grid fails if the absorbed power exceeds the contract power limit.
Digital output switches to ON (normally-closed contact, NC) when power from the grid exceeds the activation threshold.
It switches to OFF when power from the grid goes below the deactivation threshold.

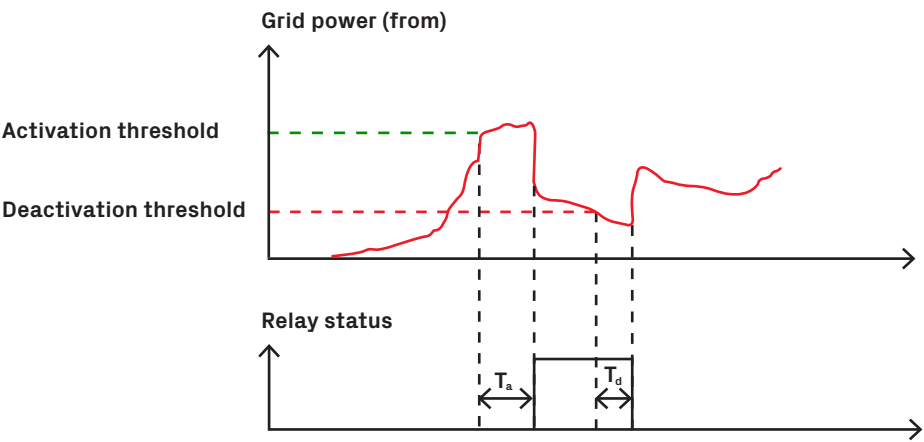


Figure 6

Threshold		Unit of measurement
Activation (A)	Power from grid	W
Deactivation (D)	Power from grid	W

Table 5 - Low-priority load disconnection - Activation and deactivation thresholds

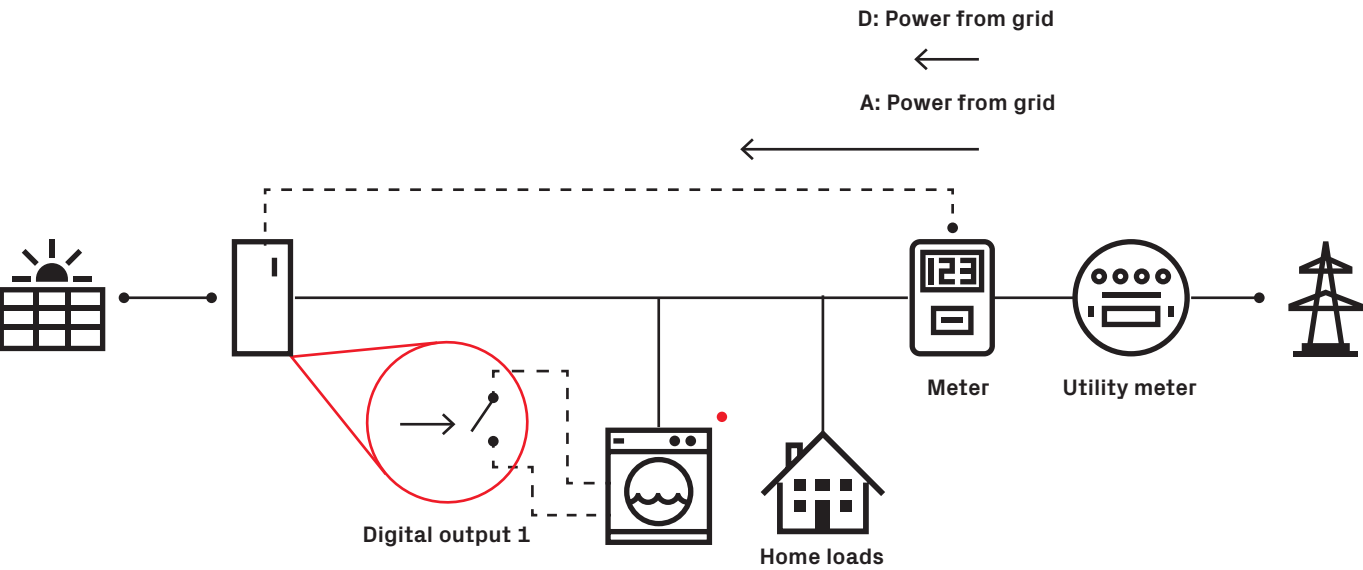


Figure 7

Solar production

Target

Increase self-consumption quota using solar power with no meter in the plant.
Load manager load is activated if inverter solar power is greater than the activation threshold and switched off when solar power is lower than the deactivation threshold.

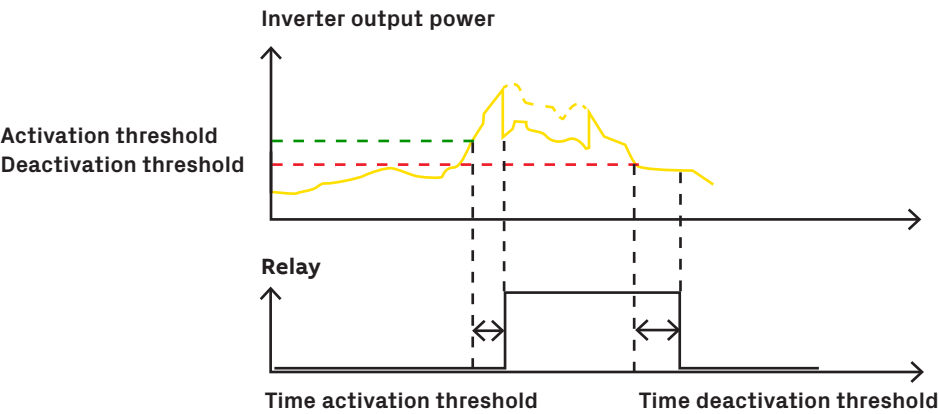


Figure 8

Threshold		Unit of measurement
Activation (A)	Inverter output power	W
Deactivation (D)	Inverter output power	W

Table 6 - Solar production - Activation and deactivation thresholds

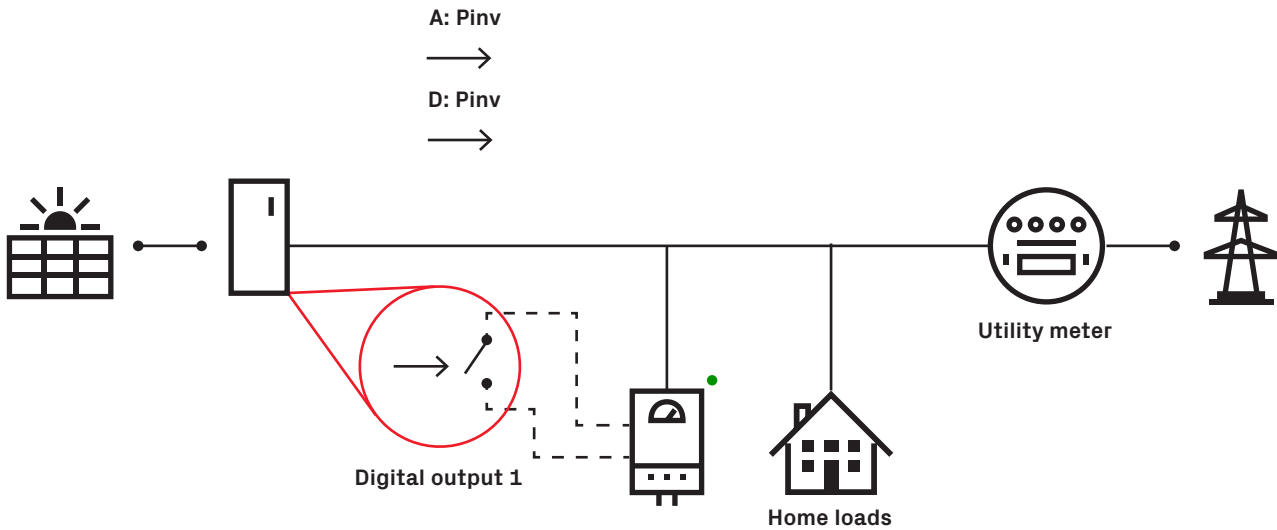


Figure 9

Physical connection

REACT 2

REACT 2 is equipped with 2 multifunction relays (digital output) configurable as load manager. These two signal relays (ratings in table) can be used in normally open or normally closed modes.

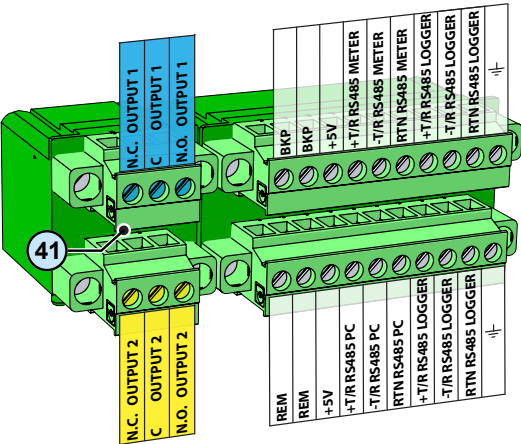


Figure 10

AWG	Maximum AC voltage	Maximum current	Ambient temperature range
22-24	< 240 V	1 A	-20...+ 60 °C

UNO-DM-PLUS

A multifunctional relay, configurable as load manager, is included in the optional UNO-DM-COM-KIT and UNO-DM-PLUS Ethernet COM KIT. This multifunctional relay (ratings below) can be used in normally open or normally closed modes.

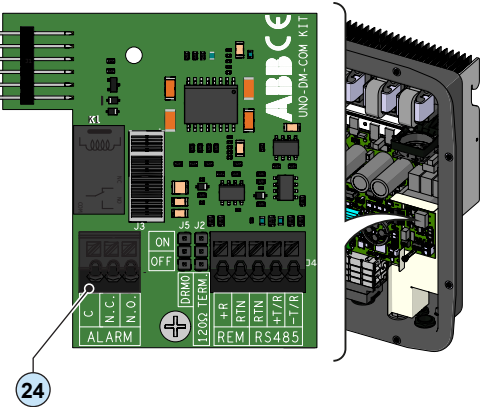


Figure 11

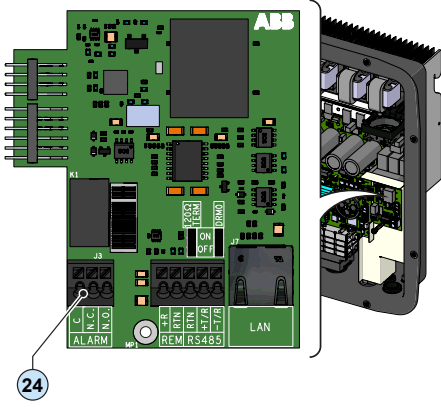


Figure 12

Relay ratings:

Maximum current: 230 Vac
Maximum current: 1 A

AWG	Maximum AC voltage	Maximum current	Ambient temperature range
22-24	< 300 V	1 A	-20...+ 60 °C

Enabling and modifying load manager parameters

- 1) Access the webserver user interface of REACT 2 and UNO-DM-PLUS. Details on product user manuals.
- 2) Access as administrator.
- 3) Click the icon 1, select Digital output and finally the gear icon (3) on the relay to be configured.
- 4) Set load manager in the configuration select and fill the other inputs as desired.

For testing purpose, the load manager can be forced to: ON or OFF manually by pressing the dedicated buttons, Clicking on AUTO button the load manager behavior follows the above settings

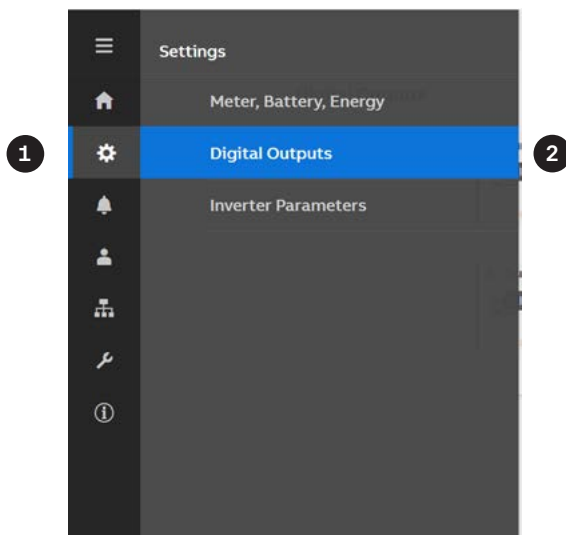


Figure 13

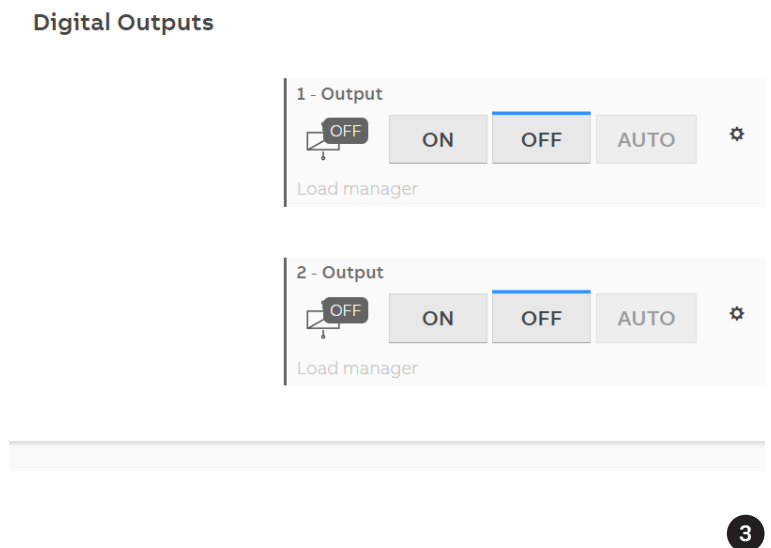


Figure 14

Settings

Configuration

Load manager

Name

Please fill the input

Required

Behavior

-- Please select --

Required

Activation

AC Solar power [W]

0

Time activation threshold [s]

60

Minimum holding time of the power above the activation threshold for the load manager to activate the load.
The longer is the holding time, the lower is probability of unwanted activations due to power transients.

Deactivation

AC Solar power [W]

0

Time Deactivation threshold [s]

60

Minimum holding time of the power below the deactivation threshold for the load manager to deactivate the load.
The longer is the holding time, the lower is probability of unwanted deactivations due to power transients.

Back

Save

Load name

Digital output behavior selection
(see available working modes paragraph for details)

Activation threshold

Time activation threshold
Minimum holding time of the power above the activation threshold for the load manager to activate the digital output. Longer time avoids undesired activation due to power transients

Deactivation thresholds

Time deactivation thresholds
Minimum holding time for which the power shall remain above the deactivation threshold to deactivate the digital output. Longer time avoids undesired deactivation due to power transients

Figure 15