

## Application Note No. 015

# Ripple Control Receiver

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## Version History

- Version 01 (2023-11-7)  
Initial Release

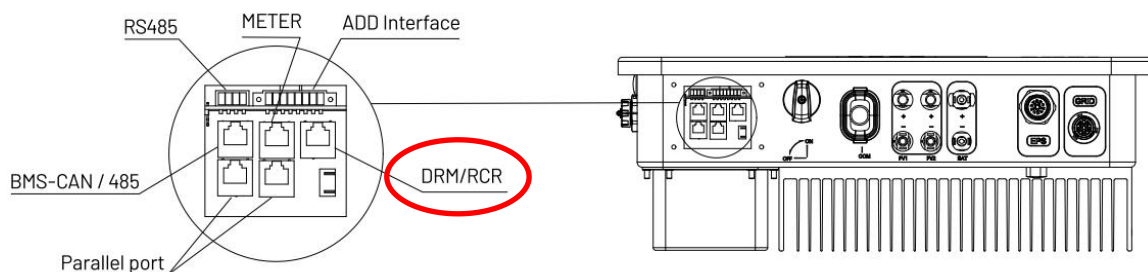
## 1. RCR definition and background

The grid companies use the Ripple Control Receiver(RCR) to convert grid dispatch signals into dry contacts for transmission, and power stations need to receive grid dispatch signals using dry contact communications in Germany and parts of Europe.

Ripple control receiver (RCR) is an interface between a PV system and a power grid company that enables the grid operator to reduce the feed-in power if necessary. Generally, When the grid is overloaded, the power grid company will specify the PV system should reduce its feed-in power to 0%, 30%, or 60% of its rated power. when the grid is underloaded, the PV system will be allowed to input 100% of the power. These control commands will be realized by the RCR function of the Inverter. The RCR receives the signal and then transmits it to the inverter directly or via an interface. The PV system will be limited in how much the power feeds into grids. For 4 different values of the power 0%, 30%, 60%, and 100%. 4 corresponding digital inputs are required on the inverter or external device like a data logger

## 2. Renac Solution

Renac N3 inverter interface



PINS definition:

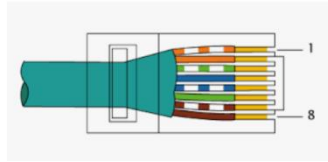


Figure 5-29

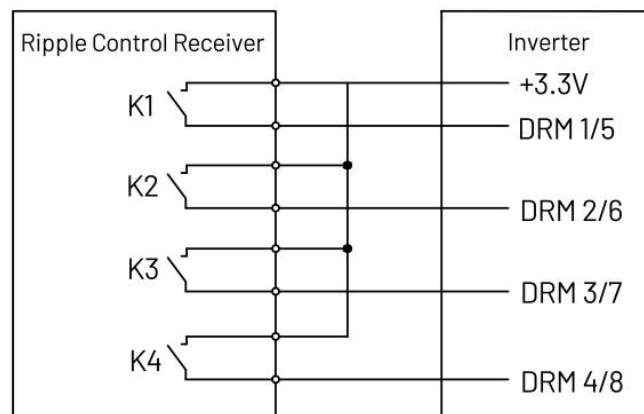
Pin	1	2	3	4	5	6	7	8
Function	DRM1/5	DRM2/6	DRM3/7	DRM4/8	+3.3V	COM/DRM0	GND	GND

The RCR used have four relays (K1-K4). The relays are potential-free make contacts and are interlocked with each other. Furthermore, each of these relays represents one of the following control stages:

K1	K2	K3	K4	Switch Operation on External RCR	Output power (in % of the Rated AC output power)
1	0	0	0	Close K1	100 %
0	1	0	0	Close K2	60 %
0	0	1	0	Close K3	30 %
0	0	0	1	Close K4	0 %

Currently, it is mandatory to respond to DRM0, which allows the network manager to remotely decouple the installation from the distribution network.

This logic interface is for controlling and/or limiting the inverter's output power in German grid code, the grid company uses the Ripple Control Receiver (RCR) to convert the grid dispatching signal and send it as a dry contact signal. The wiring of the ripple control receiver dry contact cables is shown in the figure below:



In the Australian grid code requirements for connection calls for compatibility with Demand Response Enabling Devices (DRED).

The DRED is controlled by a local network operator and allows to put the inverter in one of the Demand Response Modes (DRMs) defined by the standard:

- DRM 0 Operate the disconnection device.
- DRM 1 does not consume power.
- DRM 2 does not consume more than 50% of rated power.
- DRM 3 does not consume more than 75% of rated power and source reactive power if capable.
- DRM 4 Increase power consumption (subject to constraints from other active DRMs).
- DRM 5 does not generate power.
- DRM 6 does not generate more than 50% of rated power.
- DRM 7 does not generate at more than 75% of rated power and sink reactive power if capable.
- DRM 8 Increase power generation (subject to constraints from other active DRMs).