



Sensors



Switches



Controls

## Application notes



**Application Note : November 2019**

**Market involved : Semiconductor industry**

**Product : NRGC, RGC1A60CM32GEN**

**Customer : OEM**

**Subject : Control of the IR heaters in the manufacturing of flexible solar panels**

### CUSTOMER ISSUE :

Customer produces innovative flexible solar panels.

The selenium evaporation and its reaction to the polyamide material is done through a heating process controlled by solid state relays (SSRs) due to the precision needed.

Due to the sensitivity of the process and the need to ensure a high quality end product, monitoring of the status of SSR and respective heaters is required to predict failures and prevent machine stoppages during critical processes that can cost a lot of money.

Customer tested the available NRG series but would like to use the comms interface to control the SSRs since this would greatly reduce the wiring from the main controller to the SSR. Since IR heaters are used in the process, the need, in this application, is to control the SSRs by Advanced Full Cycle firing for more precise control and reduced visual flickering.

### OUR SOLUTION :

The RG..CM..N is an evolution of the NRG series already available that enables the comms interface to be used for controlling the switching of the SSRs in addition to real-time monitoring.

The RG..CM..N interfaces to the main controller through the NRG controller, NRGC, through the NRG internal bus. The NRGC interfaces with the main controller through Modbus on RS485.

The RGC1A60CM32GEN used in this application is configured to the Advanced Full Cycle switching mode amongst the various possible switching modes. Read-outs of variables from each SSR, such as current and power, are used to guarantee process stability.

Additionally, to provide predictive maintenance indications, a load deviation alarm has been added to the RG..CM..N.

### BENEFITS :

- **Cost savings** by elimination of additional components otherwise needed for monitoring. Elimination of PLC output modules since SSRs are controlled through the comms interface.
- **Reduced installation time.** Control cables to the SSR are not needed. The same bus cables utilised for monitoring are used for SSR switching.
- **Reduction of stock.** SSRs can be configured in different switching modes (ON/OFF, Burst, Distributed or Advanced Full Cycle).
- **PLC off-loading.** The RG..CM..N can be controlled by a % power control. The intelligence to distribute the power to the load as required resides in the SSR hence off-loading the PLC from this computation.
- **Enabling predictive and preventive maintenance** through various registers indicating SSR and load status.