Application Note No. 013

Auto Test Application

Version History

● Version 01 (2020-04-13)

  Initial Release

Introduction

Italian regulation requires that all inverters connected to the grid first perform an SPI self-test. During this self-test the inverter checks the trip times for over-voltage, under-voltage, over-frequency, and under-frequency – to ensure that the inverter disconnects when required. The inverter does this by changing the trip values; for over voltage/frequency, the value is decreased and for under voltage/frequency, the value is increased. The inverter disconnects from the grid as soon as the trip value is equal to the measured value. The trip time is recorded to verify that the inverter disconnected within the required time. After the self-test has been completed, the inverter automatically begins grid monitoring for the required GMT (grid monitoring time) and then connects to the grid.

Renac power On-Grid inverters are compatible with this self-test function. This document describes how to run the self-test using the "Solar Admin" application and using the inverter display.

● To run the self-test using the inverter display, see Running the Self-Test using the Inverter Display on page 2.

● To run the self-test using "Solar Admin", see Running the Self-Test using "Solar Admin" on page 4.

Running the Self-Test through the Inverter Display

This section details how to perform the self-test using the inverter display. Photos of the display, showing the inverter serial number and the test results can be taken and

submitted to the grid operator.

To use this feature, the inverter communication board firmware (CPU) must be below version or higher.

Inverter Type	Firmware Version
R1-1-3K7-SS	V0.12
4-10K5-DS	V1.20
R3-4-15K-DT	V1.45
ESC3-5K-DS	V3.20-E

To perform the self-test through the inverter display:

1. Ensure that the inverter country is set to one of the Italy country settings; the country setting can be viewed in the inverter main menu:

2. To change the country setting, select **SafetyCountry   CEI 0-21**.

```
SafetyCountry
CEI        0-21
```

3. From the inverter main menu, select **Setting Auto Test-Italy**, and long press **Auto Test-Italy** to perform the test.

```
Auto Test-Italy
Pac =      10000W
```
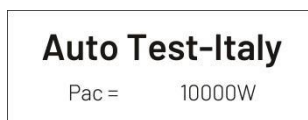
If all tests have passed, the following screen for each test appears for 15-20 seconds. When the screen shows "Test end", the "Self-Test" is done.

59.S1 testing	59.S1 Test ok
253.0V/243.9V	223.3V/1993ms
59.S2 testing	**59.S2 Test ok**
264.5V/232.6V	223.8V/187ms
27.S1 testing	**27.S1 Test ok**
195.5V/213.0V	223.5V/1485ms
27.S2 testing	**27.S2 Test ok**
34.5V/38.8V	230.2V/186ms

81 > .S1 testing 50.20Hz/49.88Hz	81 > .S1 Test ok 49.98Hz/95ms
81 < .S1 testing 49.80Hz/49.88Hz	81 < .S1 Test ok 50.03Hz/88ms
81 > .S2 testing 51.50Hz/51.39Hz	81 > .S2 Test ok 50.04Hz/93ms
81 < .S2 testing 47.50Hz/48.01Hz	81 < .S2 Test ok 50.01Hz/91ms

4. After the testing is done, test results can be viewed by pressing the function button (press the function button less than 1s).

8100831200 1/3 59.S1 test ok	8100831200 2/3 253.0V/230.4V	8100831200 3/3 2000ms/2000ms
8100831200 1/3 59.S2 test ok	8100831200 2/3 264.5V/229.7V	8100831200 3/3 200ms/ 200ms
8100831200 1/3 27.S1 test ok	8100831200 2/3 195.5V/225.7V	8100831200 3/3 1500ms/ 1492ms
8100831200 1/3 27.S2 test ok	8100831200 2/3 34.5V/226.4V	8100831200 3/3 200ms/ 190ms
8100831200 1/3 81＞.S1 test ok	8100831200 2/3 50.20Hz/50.00Hz	8100831200 3/3 100ms/ 84ms
8100831200 1/3 81＜.S1 test ok	8100831200 2/3 49.80Hz/50.00Hz	8100831200 3/3 100ms/ 86ms
8100831200 1/3 81＞.S2 test ok	8100831200 2/3 51.50Hz/50.01Hz	8100831200 3/3 100ms/ 92ms
8100831200 1/3 81＜.S2 test ok	8100831200 2/3 47.50Hz/49.98Hz	8100831200 3/3 100ms/ 98ms

If all tests have passed, the inverter will begin grid monitoring for the required time and connect to the grid.

If one of the tests fails, the faulty message "test fail" will appear on the screen.

5. If a test fails or is aborted, it can be repeated.

Running the Self-Test through the "Solar Admin".

This section details how to perform the self-test using the inverter display. After the self-test is done, the user can download the test report.

To perform the self-test through the "Solar Admin" application:

1. Download and install "Solar Admin" on laptop.
2. Connect the inverter to the laptop via RS485 cable.
3. When the inverter and "solar admin" are successfully communicated. Click   "Sys. setting"-"Other"-"AUTOTEST" enter into the "Auto-Test" interface.
4. Click "Execute" to start the testing.
5. The inverter will automatically run the test until the screen shows "Test end".
6. Click "Read" to read the test value, and click "Export" to export the test report.
7. After clicking the "Read" button, the interface will show the test results, if the test passes, it will show "PASS", if the test is failed, it will show "FAIL".
8. If a test fails or is aborted, it can be repeated.