



**ICE**  
PROTECTIONS  
& CONTRÔLE  
COMMANDE

***FIRST HANDLING GUIDE***  
***DIGITAL SYNCHROCHECK***  
***NPRG 810***

**TECHNIREL**

**ICE - 11, rue Marcel Sembat - 94146 ALFORTVILLE CEDEX - France**  
TEL. : +33 1 41 79 76 00 - FAX : +33 1 41 79 76 01 – E-MAIL : [contact@icelec.com](mailto:contact@icelec.com)  
WEBSITE: [www.groupeice.com](http://www.groupeice.com)

<b>NPRG 810</b> <b>First Handling Guide</b>	<b>Issue : a</b>	<b>Fichier : A421A -</b> <b>NPRG810 First</b> <b>Handling Guide</b> <b>indice a.doc</b>	<b>Date : 02/2009</b>
--	------------------	--	-----------------------

# FOREWORD

This aim of this handbook is to provide to the User useful information for the commissioning and the tests of NPRG 810 Synchrocheck.

We advise you to read it attentively, in order to take note of the available functionalities and to proceed to connection and power of the product in accordance with the provided recommendations.

Before any use, we recommend you to read the safety instructions of this guide.

This guide is an add-on to the other documents of the NP800 range:

- ◆ “General presentation of the NP800 range”, which shows the respective functions of each product of the range, the physical characteristics and the environment ratings.
- ◆ “NPRG 810 user’s guide”, introducing each function and the using of local MMI.
- ◆ “SMARTSoft setting software user’s guide”, which introduces its using with a computer (*including installation procedure*) and the communication protocol with a SCADA.
- ◆ Diagrams of the various products.

These functions described in the following chapters are partially programmable locally or fully by the dedicated SMARTSoft setting software used on a computer.

- ◆ Synchrocheck “NPRG810-1G”
  - ANSI 25
  - Paralleling of Dead Bus
- ◆ Synchrocheck “NPRG810-4G”
  - ANSI 25
  - Dead Bus paralleling
  - Management of 4 Generators

The operation functions of the Synchrocheck are configurable from the menu “**OPERATION**”, or from the sub-menu “Parameters” available at SMARTSoft setting software.

Locally, setting, commissioning and real time or event readings are accessible from keyboard located on the front plate and displayed on the display screen.

To be fully exploited, the available functions must be programmed and consulted with the setting software PC – SMARTSoft, provided with the product

# CONTENTS

<b>1.</b>	<b>SAFETY INSTRUCTIONS</b>	<b>3</b>
1.1	DOCUMENTATION .....	3
1.2	CONNECTION OF NP800 RELAYS.....	3
1.3	ON LOAD WITHDRAWAL.....	3
1.4	REMOVAL AND DESTRUCTION.....	3
<b>2.</b>	<b>RELAY CHECKING AND COMMISSIONING</b>	<b>4</b>
2.1	RECOMMENDATIONS.....	4
2.2	PRELIMINARY INFORMATION .....	4
2.3	CHECKING'S PRIOR TO THE COMMISSIONING.....	4
2.4	CONNECTION DIAGRAMS.....	4
<b>3.</b>	<b>CHOICE OF THE PHASE DISPLACEMENT OF GE MEASUREMENT</b>	<b>5</b>
<b>4.</b>	<b>VOLTAGE MEASUREMENTS CALIBRATION</b>	<b>5</b>
<b>5.</b>	<b>TESTING OF THE CHECK SYNCHRONISING FUNCTION [25]</b>	<b>6</b>
<b>6.</b>	<b>TEST OF THE INHIBITION OF THE FUNCTION [25]</b>	<b>6</b>
<b>7.</b>	<b>DEAD BUS PARALLELING</b>	<b>7</b>
<b>8.</b>	<b>COMMISSIONING</b>	<b>8</b>

# 1. Safety instructions

For your safety, we recommend you to read the following information carefully. They have the aim of specifying the precautions essential to the good installation and the correct operation of the products.

## 1.1 Documentation

Following documentations are available for the products of the range NP800:

- ◆ General Presentation of the NP800 range
- ◆ Application guide of the NP800 series
- ◆ User's Guide of SMARTSoft Setting Software
- ◆ User's Guide (for each kind of relay)
- ◆ First Handling Guide (for each kind of relay)
- ◆ Diagram of each relay.

We advise you to read them before any handling.

## 1.2 Connection of NP800 relays

The terminal blocks of the NP800 relays are studied to ensure the safety of the people during the operation of the relays.

During installation, commissioning or maintenance, they can however present high voltages and possibly a thermal heating. Consequently, the following precautions must be respected:

- ◆ Connection of the terminal blocks at installation must be carried out after having ensured of the absence of any voltage
- ◆ Their access during operation must be carried out through adequate means ensuring as well electric as thermal insulation
- ◆ The connection of the earth at the back of the relays must imperatively be done with mean of a 2.5 mm<sup>2</sup> wire.

Before powering the relays, it will be necessary to check in particular:

- ◆ The value of the voltage rating of the auxiliary supply and its polarization
- ◆ Integrity of the connection to the earth.

## 1.3 On load withdrawal

It is formally misadvised to withdraw the connectors under voltage or on load.

## 1.4 Removal and destruction

The relays should in no case be opened by the User. During their removal, they must be completely isolated from any external polarity and condensers must be discharged by connecting their external terminals to the earth.

Destruction of the relays will have to be carried out in accordance with legislation in force, in particular in compliance with the environment and safety requirements.

## 2. Relay checking and commissioning

### 2.1 Recommendations

All the relays are delivered after a final inspection in factory.

It is important before any test to make sure that the relay did not suffer any mechanical damage.

### 2.2 Preliminary information

In the NP800 range of relays, technology used is digital.

Due to their design, they comprise a significant number of self-controls, as well as powering as under operation. Any material or software failure is automatically detected and announced by an alarm.

During the first use, it is thus not necessary to test all the functions. It is on the other hand recommended to look after and check the good wiring of the relay, and the specifications of this handbook have the aim of allowing a fast setting in order of the relay.

The User will be able then to define the setting values necessary to its installation, and to adjust the relay using the Setting software, common to the whole of the range. The saving of the configuration and its loading will be carried out with a laptop.

The functions of recording of events and disturbance recording, available through the setting software, will also largely contribute to the commissioning of the installation.

### 2.3 Checking's prior to the commissioning

They are intended to check that the hardware did not suffer damage during its transport or its storage and constitute a proof of right operation at the set values.

These simple tests require minimum equipment, as indicated:

- ◆ Voltage generator with variable frequency, automatic injection cut-off system, timer and auxiliary supply.
- ◆ A second voltage generator able to provide a voltage equal to the rated voltage is also required.

In order to be free from the interaction of the multiple functions of the Synchrocheck, the tests must be carried out by following the different chapters as below.

### 2.4 Connection diagrams

Connection diagrams for each version are available as follow:

Synchrocheck version	Drawing reference
NPRG810-1G	S 39371
NPRG810-4G	S 39610

### 3. Choice of the phase displacement of GE measurement

For the groups generator-transformer call "Block", a phase displacement of the voltages reference, generator and network, is imposed by the power transformer.

In order to correct this phase displacement, which is generally 11 hours (330°), an angular parameter, by software programming, is available from SMARTsoft setting software.

This shifting, which is generally 11 hours (330°), is carried out by setting with SMARTSoft.

NB: For more explanations, refer to the NP800 application guide.

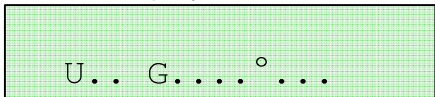
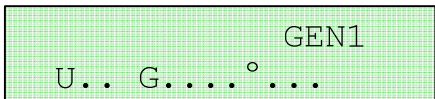
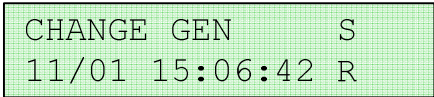
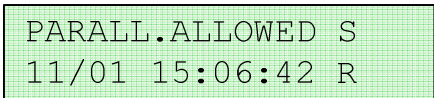
### 4. Voltage measurements calibration

The calibration of the voltage measurements is carried out directly by parameters configuration "Analogue Voltage Inputs" from the SMARTsoft setting software.

NB: For more explanations, refer to the user guide of the PC setting software of NP800 range.

## 5. Testing of the check synchronising function [25]

Check that the digital input n°2 “Inhibition of the function [25]“ is not activated.

Carried out the steps sequence as follows	Results after each step
Apply the auxiliary supply.	<p><u>Display indication:</u></p>  <p>NPRG 810-1G version</p>  <p>NPRG 810-4G version</p>
Connect the voltage generator in parallel on the <b>A-1/A-2</b> & <b>A-3/A-4</b> terminals.	
Enabling D.I n°5 "Selection Generator 1" if NPRG 810-4G version only.	<p><u>Display indication:</u></p>  <p>Acknowledge the event by pressing <i>CLEAR</i> and <i>ENTER</i> keys.</p>
Inject the voltage to the rated value (secondary VT's side) with rated frequency.	<p><u>Display indication:</u></p>  <p>Operation of the output unit <b>C</b> at the end of the Time delay of the paralleling authorisation.</p>

Acknowledge the event by pressing *CLEAR* and *ENTER* keys.

**NB:** With NPRG810-4G version, carried out tests as above for each Generators.

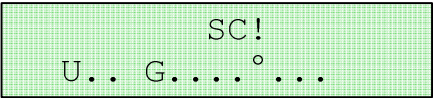
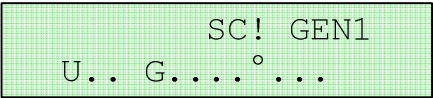
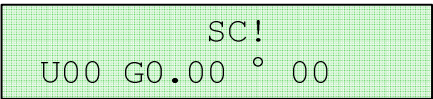
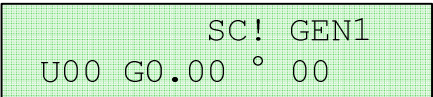

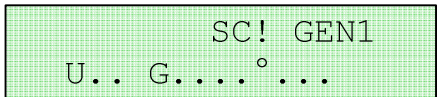
## 6. Test of the inhibition of the function [25]

Energize Digital Inputs n°2 “Inhibition of the function [25] “ and carried out the same tests as above and check that the output relay unit **C** doesn't change when all conditions are sensed.

**NB:** With NPRG810-4G version, carried out tests as above for each Generators.

## 7. Dead Bus paralleling

Enable function "Paralleling of Dead Bus line" with Digital Input n°1.

Carried out the steps sequence as follows	Results after each step
Apply the auxiliary supply.	<p><u>Display indication:</u></p>  <p><i>NPRG 810-1G version</i></p>  <p><i>NPRG 810-1G version</i></p>
Connect the voltage generator on <b>A-1/A-2</b> terminals.	
Connecter le générateur de tension sur les bornes <b>A-3/A-4</b> .	
Inject both voltages to the rated value (secondary VT's side) with rated frequency.	<p><u>Display indication:</u></p>  <p><i>NPRG 810-1G version</i></p>  <p><i>NPRG 810-1G version</i></p> <p>Output unit <b>C</b> must not be activated.</p>
Stop injection on <b>A-3/A-4</b> terminals.	<p><u>Display indication:</u></p>  <p><i>CLEAR and ENTER</i></p>  <p>Operation of the output unit <b>C</b> at the end of the Time delay of the paralleling authorisation.</p>

Acknowledge the event by pressing *CLEAR* and *ENTER* keys.

**NB:** On NPRG810-4G version, carried out tests as above for each Generators.



## 8. Commissioning

Before the commissioning of the relay, it is necessary to check that the:

- ◆ Secondary voltage of the VT's matches the rated value of the relay.
- ◆ Frequency of the relay label is the same as the frequency of the network
- ◆ Wiring is in conformity with the connection diagram
- ◆ Auxiliary supply match the auxiliary supply range of the relay label
- ◆ Tripping circuit is OK.

Warning for the phase sequence and the polarity of the VT's