Application Note on Reading the Vigilohm® IM400 Insulation Monitoring Device Installed in Conext™ Core XC and XC-NA Series Inverters

Audience

This Application Note is intended for anyone who will operate the Conext Core XC and XC-NA Series Grid Tie Photovoltaic Inverter. Operators must be familiar with all the safety regulations pertaining to operating high-voltage equipment as dictated by local code. Operators must also have a complete understanding of this equipment's features and functions.

Overview

Certain versions of the Schneider Electric Conext Core XC and XC-NA Series use a Vigilohm IM400 Insulation Monitoring Device to monitor insulation resistance of the inverter and its associated components (for example, the medium voltage transformer and PV array) to ground in a floating PV system. The IM400 device is located inside the DC cabinet, as shown in Figure 1 on page 2. The inverters have a feature that will allow the DC cabinet door to be opened without interrupting inverter operation (opening any other doors will interrupt inverter operation). This feature is intended only to allow the DC cabinet door to be opened to read the display of the Vigilohm insulation monitoring device, and must be closed again immediately after reading the display.

⚠️⚠️ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE

This Application Note is in addition to, and incorporates by reference, the relevant product manuals for the Schneider Electric Conext Core XC and XC-NA Series Grid-Tied Photovoltaic Inverters. Before reviewing this Application Note you must read the relevant product manuals. Unless specified, information on safety, specifications, installation, and operation is as shown in the primary documentation received with the product. Ensure you are familiar with that information before proceeding.

Failure to follow these instructions will result in death or serious injury.

⚠️⚠️ DANGER

Do not open any cabinet doors on the Conext Core XC and XC-NA Series inverter other than the DC cabinet door, and do not remove any barriers inside the DC cabinet.

Failure to follow these instructions will result in death or serious injury.
HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE

The settings on the Vigilohm IM400 Insulation Monitoring Device are configured in the factory and may be changed only by Schneider Electric authorized service personnel. Do not attempt to change the settings.

Failure to follow these instructions will result in death or serious injury.

HAZARD OF EQUIPMENT DAMAGE

- Close the DC cabinet door as soon as you have read the display of the isolation monitor.
- Avoid longer than necessary operation with the DC cabinet door open.

Failure to follow these instructions can result in damage to equipment, can compromise the environmental protection of the inverter.

Figure 1 Location of the Vigilohm IM400 device
Indicator Lights

The IM400 indicator lights are illustrated in Figure 2 and described in Table 1.

![IM400 indicator lights](image)

Not in use in Conext Core XC and XC-NA Series inverters

Insulation Status (green)

Insulation Alarm (yellow)

See note below figure.

**Figure 2** IM400 indicator lights

Note: The figure above shows a sample resistance value for illustrative purposes. The value appearing on the IM400 device in a particular Conext Core XC and XC-NA Series installation may be different.

### Table 1 Indicator lights

<table>
<thead>
<tr>
<th>IM400 Status</th>
<th>Insulation OK</th>
<th>Insulation Alarm</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>Vigilohm IM400 de-energized.</td>
</tr>
<tr>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>Vigilohm IM400 energized. No insulation fault detected.</td>
</tr>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>Vigilohm IM400 energized. Insulation fault detected.</td>
</tr>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>Flashing</td>
<td>Vigilohm IM400 energized. No insulation fault detect but transient insulation fault has been detected.</td>
</tr>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>Vigilohm IM400 energized but inoperative. Call for service.</td>
</tr>
</tbody>
</table>
Reading the IM400 Insulation Monitoring Device

The IM400 device continually measures insulation resistance of the inverter, PV array, and its associated components to ground and displays the readings on the IM400 user interface. This section describes the status of the indicator lights on the IM400 user interface during normal operation, when an insulation fault occurs, and when the insulation fault is determined to be transient.

Normal Operation

When the measured insulation resistance is at acceptable levels, the IM400 displays the green Insulation OK indicator light (see Figure 3).

![Figure 3 Sample IM400 screen during normal operation](image)

The Insulation OK light is green.

See note below figure.

Insulation Fault

When the IM400 measures a decrease in insulation resistance below acceptable levels, the device records an error and sends a signal to the inverter's control logic that a ground fault has occurred. The device also displays the Ins. Alarm screen, turns off the green Insulation OK indicator light, and turns on the yellow Insulation Alarm indicator light (see Figure 4 on page 5).

The Insulation Alarm indicator light remains on and the display screen flashes continually until the resistance levels rise to within the normal range.
Application Note on Reading the Vigilohm IM400 Installed in Conext Core XC and XC-NA Series Inverters

**Note:** The date and time information on the status bar of the Ins. Alarm display screen is not one of the supported features of Conext Core XC and XC-NA Series and should be ignored.

The display screen flashes.

![Image](image_url)

The Insulation Alarm light is yellow.

See note below figure.

**Figure 4** Sample IM400 display screen when an insulation fault occurs

Note: The figure above shows a sample resistance value for illustrative purposes. The value appearing on the IM400 device in a particular Conext Core XC and XC-NA Series installation may be different.

## Transient Fault

If the insulation resistance returns to normal levels after an insulation alarm event occurs, the IM400 changes the Insulation Alarm indicator light from a steady yellow to flashing yellow and turns on the green Insulation OK light (see Figure 5). The display screen stops flashing and changes to the normal operation screen (see “Normal Operation” on page 4).

![Image](image_url)

The Insulation Alarm light flashes yellow.

The Insulation OK light is green.

Reset button

See note below figure.

**Figure 5** Sample IM400 display screen when a transient fault occurs

Note: The figure above shows a sample resistance value for illustrative purposes. The value appearing on the IM400 device in a particular Conext Core XC and XC-NA Series installation may be different.

The yellow Insulation Alarm light will continue to flash until it is reset manually. To reset it, press the lowest button in the three-button column on the IM400 device (see Figure 5).