XM300C
XML308 / XL308
XML316 / XL316
Permanent insulation monitoring
User’s manual
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- identify your device
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introduction

This manual regroups the information on the three types of devices forming the Vigilohm System series.

description of your device

**type:** XM300C  
**function:** communicating CPI  
**principle:** ensures overall insulation monitoring by continually measuring the insulation resistance value and the earth coupling capacitance of the network. Enables interchange with devices of the Vigilohm system series (XM, XML, XL).

**type:** XML308 / 316  
**function:** communicating CPI + 8 / 16 channel localizer  
**principle:** ensures overall insulation monitoring by continually measuring the insulation resistance value and earth coupling capacitance of the network. Enables interchange with devices of the Vigilohm system series (XM, XML, XL). The localizer part continually measures the insulation resistance value and earth coupling capacitance of each monitored feeder.

**type:** XL308 / 316  
**function:** 8 / 16 channel localizer  
**principle:** associated with a CPI (XM300C or XML), ensures local insulation monitoring by continually measuring the insulation resistance value and earth coupling capacitance of each monitored feeder.
discover your device

protect the qualities of your device prior to installation

identify your device

packaging

+70°C
-20°C

< 14 Kg

1 commercial reference
(see opposite table)

2 commercial name

3 manufacturing code

4 auxiliary supply

example:

1 commercial reference: 50541
(see opposite table)

2 commercial name: XM300C

3 manufacturing code: n/a

4 auxiliary supply: 220 V/240 V AC

auxiliary supply

ref. XM300C

ref. XML316

ref. XML308

ref. XL308

ref. XL316

AC 50 / 60 Hz
115 V / 127 V AC

50540 50490 50322 50606 50615

220 V / 240 V AC

50541 50491 50323 50607 50616

380 V / 415 V AC

50542 50492 50324 50608 50617

check the content of the parcel

1- pull-out drawer containing a simplified keyboard / screen operating manual

2- user’s manual

3- device address and feeder locating table

4- connectors

output relays

9 points

auxiliary supply

3 points

earth faston terminal

2 points

system

2 points

BUS

4 points

toroids

16 points

circuit-breaker contact

3 points

XM300C

1 1 1 1 1 0 1

XML308

1 1 1 1 1 1 1

XML316

1 1 1 1 1 2 1

XL308

1 1 1 0 1 1 0

XL316

1 1 1 0 1 2 0
systems to be monitoring

- Alternating or mixed system with ungrounded neutral or grounded by impedance of the ZX type.
  - Phase to phase voltage: $< 760V^\sim$
  - Available neutral $< 440V^\sim$
  - Frequency: 45 - 1000 Hz
- Ungrounded DC or rectified system.
  - Phase to phase voltage: $< 500V$

$^*$ for higher voltage, use an additional plate PHT 1000 (consult our catalogue).

Interfaces to use

<table>
<thead>
<tr>
<th>type of system to be monitored (device number)</th>
<th>1 XL or 1 XM</th>
<th>XM or XML $\leq 4$ and XL $\leq 8$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>with coupling</td>
<td>without coupling</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>communication function</th>
<th>link to printer</th>
<th>XLI300 + supervisor</th>
<th>XLI300 + supervisor</th>
<th>XLI300 + supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>JBUS link</td>
<td>XLI300</td>
<td>XLI300</td>
<td>XTU300</td>
<td></td>
</tr>
<tr>
<td>nothing</td>
<td>XAS</td>
<td>XTU300</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **XPI300**: printer interface
- **XLI300**: supervisor interface (busbar coupling).
- **XTU300**: supervisor interface (busbar coupling).
- **XAS**: Bus supply box (if no XLI 300, XPI 300, XTU 300).

interface references

<table>
<thead>
<tr>
<th>aux. supply</th>
<th>ref. XPI 300</th>
<th>ref. XLI 300</th>
<th>ref. XTU 300</th>
<th>ref. XAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>115-127 V</td>
<td>50525</td>
<td>50515</td>
<td>50545</td>
<td>50520</td>
</tr>
<tr>
<td>220-240 V</td>
<td>50526</td>
<td>50516</td>
<td>50546</td>
<td>50521</td>
</tr>
<tr>
<td>380-415 V</td>
<td>50527</td>
<td>50517</td>
<td>50547</td>
<td>50522</td>
</tr>
<tr>
<td>500-525 V</td>
<td>50528</td>
<td>50518</td>
<td>50548</td>
<td>50523</td>
</tr>
</tbody>
</table>

### example:

- **1 without coupling**
  - JBUS
  - XLI
- **2 with coupling**
  - JBUS
  - XTU
- **3 without coupling**
  - XAS

  - No communication with outside without interface
install your device

**dimensions**

<table>
<thead>
<tr>
<th>XM 300C</th>
<th>XML 308 / 316</th>
<th>XL 308 / 316</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Dimensions Diagram" /></td>
<td><img src="image" alt="Dimensions Diagram" /></td>
<td><img src="image" alt="Dimensions Diagram" /></td>
</tr>
</tbody>
</table>

**cutouts**

<table>
<thead>
<tr>
<th>XM 300C</th>
<th>XML 308 / 316</th>
<th>XL 308 / 316</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Cutouts Diagram" /></td>
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<td><img src="image" alt="Cutouts Diagram" /></td>
</tr>
</tbody>
</table>

**precautions**

- respect the distances between devices
- mount the devices horizontally

*note:* to ensure a good legibility of display, it is best to place the device at least 1 m 70 from the ground.

**securing**

![Securing Diagram](image)

**dismantling**

![Dismantling Diagram](image)
install your device

use the specific accessories for mounting in Prisma P cabinet

<table>
<thead>
<tr>
<th>XM 300C</th>
<th>XML 308 / 316 - XL 308 / 316</th>
</tr>
</thead>
<tbody>
<tr>
<td>plate</td>
<td>plate</td>
</tr>
<tr>
<td>reference: 07642</td>
<td>reference: 07643</td>
</tr>
<tr>
<td>front cover</td>
<td>front cover</td>
</tr>
<tr>
<td>reference: 07972</td>
<td>reference: 07973</td>
</tr>
<tr>
<td>shutter</td>
<td>shutter</td>
</tr>
<tr>
<td>securing accessories: 2 supports + 4 crosspieces</td>
<td>securing accessories: 2 supports + 4 crosspieces</td>
</tr>
<tr>
<td>reference: 07619</td>
<td>reference: 07619</td>
</tr>
</tbody>
</table>

- for further information, consult the Prisma P design block catalogue. ref: 01302

front cover configuration:

1 XM300C + 3 XD301 or
1 XM300C + 2 XD312 or
1 XM300C + 1 XD301 and 1 XD312

front cover configuration:

- 1 XML 308 /116 or XM300C + 2 interfaces (XTU300, XLI300, XPI300, XAS type)
- 1 XML 308 /316 or XM300C + 1 XL308 or XL316

- DIN rail for mounting Multi 9 type box.

07619 07642 07972

07619 07643 07973
install your device

**connect your XM300C**

<table>
<thead>
<tr>
<th>terminal n°</th>
<th>function</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-5-6</td>
<td>prevention setting relay</td>
</tr>
<tr>
<td>7-8-9</td>
<td>1st fault setting relay</td>
</tr>
<tr>
<td>10-11-12</td>
<td>2nd failsafe fault setting relay. The relay is de-energized if a fault occurs, in the case of accidental loss of auxiliary supply voltage or should the device breakdown.</td>
</tr>
<tr>
<td>1-2</td>
<td>auxiliary supply</td>
</tr>
<tr>
<td>13</td>
<td>device frame grounded</td>
</tr>
<tr>
<td>14</td>
<td>system / neutral or phase</td>
</tr>
<tr>
<td>15-16-17-18</td>
<td>Bus communication output</td>
</tr>
<tr>
<td>19-20-21</td>
<td>circuit-breaker position contact inputs</td>
</tr>
</tbody>
</table>

**connect your XML308 or XML316**

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<td>Bus communication output</td>
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<tr>
<td>19-20-21</td>
<td>circuit-breaker position contact inputs</td>
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</table>

**connect your XL308 or XL316**

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<th>terminal n°</th>
<th>function</th>
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</tr>
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<td>10-11-12</td>
<td>2nd failsafe fault setting relay. The relay is de-energized if a fault occurs, in the case of accidental loss of auxiliary supply voltage or should the device breakdown.</td>
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<td>1-2</td>
<td>auxiliary supply</td>
</tr>
<tr>
<td>13</td>
<td>device frame grounded</td>
</tr>
<tr>
<td>15-16-17-18</td>
<td>Bus communication output</td>
</tr>
</tbody>
</table>

**Legend:**
- **ut**: application
- **nc**: not connected
- **a.a**: auxiliary supply

**Diagram 1**
- Presence de tension sur les vis des bornes terminal screws are live
- 4 conductor shielded cable
- Circuit-breaker position contacts

**Legend:**
- B: auxiliary supply
- A: device frame grounded
- B-: toroid wiring for 8 channel devices (XML308, XL308).
- A-: toroid wiring for 16 channel devices (XML316, XL316).
install your device

identify your feeders

- A self-adhesive label, provided with your operating manual enables you to identify your feeders.

wiring rules

- communication bus: we recommend precaution you make a loop

<table>
<thead>
<tr>
<th>XL308</th>
<th>XL308</th>
<th>XL300, XPI 300, XTU 300 or XAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>XM 300C</td>
<td>XM 300C</td>
<td>XL308</td>
</tr>
</tbody>
</table>

![Diagram 1: 4 cable wiring](image)

- precaution

connect the shield to a device frame at one end only. (preferably with the interface, in this case XAS).

<table>
<thead>
<tr>
<th>XM 300C</th>
<th>XL308</th>
<th>XL308</th>
</tr>
</thead>
<tbody>
<tr>
<td>XAS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- maxi. wiring length:

the limit length to be respected is the maximum length of the loop.

<table>
<thead>
<tr>
<th>XM 300C</th>
<th>XL308</th>
</tr>
</thead>
<tbody>
<tr>
<td>XAS</td>
<td></td>
</tr>
</tbody>
</table>

- Capacity between line must be less than 100 nF.
- Total resistor must be less than 12 Ω.

installing a new device on an operational system

- Without XTU300, the system automatically takes into account the presence of a new device.
- You can add a device in a system with XTU 300, if the device has been taken into account in XTU programming.
install your device

**toroid transformer**

### XML308 / 316 - XL308 / 316

**toroids to be used**

- **A toroids range**
  - dia. type: TA30, PA50, IA80, MA120, SA200, GA300
  - mm: 30, 50, 80, 120, 200, 300
  - ref.: 50437, 50438, 50439, 50440, 50441, 50442

- **OA opening toroids range**
  - dia. type: POA, GOA
  - mm: 46, 100
  - ref.: 50485, 50486

- **XS toroids range**
  - dia. type: XS30, XS50, XS80, XS120, XS200
  - mm: 30, 50, 80, 120, 200
  - ref.: 50420, 50421, 50422, 50423, 50424

- **N toroids range**
  - dia. type: TN30, PN50, IN80, MN120, SN200
  - mm: 30, 50, 80, 120, 200
  - ref.: 50105, 50106, 50107, 50108, 50109

**compatible toroids (if you are already equipped with).**

- **cable to be used**
  - 2 conductors shielded cable
  - L max: 100 m

<table>
<thead>
<tr>
<th>L (m)</th>
<th>ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>50137</td>
</tr>
<tr>
<td>100</td>
<td>50136</td>
</tr>
</tbody>
</table>

**nota:** do not use the shielding.

**circuit-breaker position contacts**

**XM300C - XML308 / 316**

**wiring**

- **1st case:**
  - only 1 CPI: no position contact required
  - (these inputs only function when there is a XAS, XLI300, XPI300 or XTU300 interface).

**cable to use:**

- section: ≥ 0.75 mm² and ≤ 1.5 mm²
- Lmax = 300 m
- simple twisted cable

**note:** for operating mode by changing circuit-breaker position, see interface manual (XLI300, XTU300).

- **2nd case:**
  - you have 1 XTU300 or 1 XCU10

- **3rd case:**
  - you have 1 XLI300 or 1 XPI300 or 1 XAS

**Maxi time between closing switch I1 and switch I2: 200 ms**

**wiring precautions**

- do not secure the stands on the device.

**cable cross section to used**

- flexible conductor
  - mini: 0.75 mm²
  - maxi: 1.5 mm²

- rigid conductor
  - mini: 1 mm²
  - maxi: 1.5 mm²
electrical data

<table>
<thead>
<tr>
<th>breaking capacity of output contacts</th>
<th>connection to system</th>
<th>standards ( UTE C63-080 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA 380v cos. $\psi = 0.7$ 3 A</td>
<td>measuring voltage (2.5 Hz) 5 V Eff</td>
<td>protection index IP 30</td>
</tr>
<tr>
<td>CA 220v cos. $\psi = 0.7$ 5 A</td>
<td>measuring current 5 mA</td>
<td>protection index front panel: IP40</td>
</tr>
<tr>
<td>CC 220v L/R = 0 0.45 A</td>
<td>50 Hz impedance 20 kΩ</td>
<td>operating temp. -5 C° to +50 C°</td>
</tr>
<tr>
<td>CC 120v L/R = 0 0.65 A</td>
<td>DC resistance 20 kΩ</td>
<td>vibration withstand IEC 68 - 2 - 6</td>
</tr>
<tr>
<td>CC 48v L/R = 0 2.5 A</td>
<td>auxiliary contacts of circuit breaker</td>
<td>- amplitude: 0.075 mm or 2 g</td>
</tr>
<tr>
<td>CC 24v L/R = 0 10 A</td>
<td>contact voltage 24 V</td>
<td>- frequency: 10 to 65 Hz</td>
</tr>
<tr>
<td>auxiliary supply</td>
<td>maxi current 10 mA</td>
<td>- 5 sweepings per axis</td>
</tr>
<tr>
<td>auxiliary supply operating range 0.85 - 1.1 Un</td>
<td>maxi loop resistance 50 Ω</td>
<td>climatic conditions: (tropicalization type T2)</td>
</tr>
<tr>
<td>frequency 45 - 65 Hz</td>
<td>rush current on switch-on 1.5 A</td>
<td>- damp heat: 55 C°, 95 % relative humidity, 6 cycles</td>
</tr>
<tr>
<td>maxi. own consumption 40 VA</td>
<td></td>
<td>(according to standard IEC 68-2-30)</td>
</tr>
</tbody>
</table>

auxiliaries

Cardew C

- **principle:**
  Connected to the secondary of the HV/LV transformer on an ungrounded or impedance-grounded neutral system, it protects LV installations against overvoltage hazards. It clips weak overvoltages and drains off to the ground the high energy resulting from internal breakdown of the transformer or from atmospheric phenomena. It can withstand the transformer short-circuit current.

- **standard:**
  N.F.C. 63-150
  N.F. C 15-100
  Compulsory in France and in certain countries.

plate ZX

- **principle:** limitation impedance. Creates an impedance-grounded neutral.

- **impedance:** 1 500 Ω to 50 Hz
  100 000 Ω to 2.5 Hz

- **reference:** 50159

plate PHT1000

- **principle:**
  With the plate PHT 1000, you can use your CPI on networks:
  - accessible neutral
    760 V < U between phases < 1700 V
  - unaccessible neutral
    440 V < U between phases < 1000 V
  - direct current network
    500 V DC < U < 1200 V DC

- **reference:** 50248
address your device

communication

Communication is ensured by means of a BUS. All exchanges transit via the BUS and enable the devices to intercommunicate.

note: The device protocol is of the "random access" type and all the devices in the system must be addressed.

addressing your device

The code wheel found on the rear panel of each device is used to address the devices.

- The 2nd figure is determined by the user acting on the code wheel. Values from 1 to 8 only.
- The 1st figure is a fixed one and determines the type of device.

determining the address

<table>
<thead>
<tr>
<th>device addressing</th>
</tr>
</thead>
<tbody>
<tr>
<td>XM300C</td>
</tr>
<tr>
<td>CPI</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>1 to 4</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

example:
The second figure in the address of the XML localizer part is implicitly fixed at the value chosen for the CPI part.

precaution

Two CPI (XM300C and XML) or two localizers cannot have the same address.

note: this type of anomaly is not detected and results in malfunctioning.
When conducting the dielectric test (of the assembly in which your device is mounted), terminals 1, 2 and 14 must absolutely be disconnected. After the dielectric test, reconnect terminals 1, 2 and 14, then switch on.

When conducting the dielectric test (of the assembly in which your device is mounted), terminals 1 and 2 must absolutely be disconnected. After the dielectric test, reconnect terminals 1 and 2, then switch on.

before switching on, ensure:

1. - the voltage coherence of your device.
2. - that all the devices are correctly addressed.
3. - that the wiring of both the communication BUS and the toroids is correct.

commissioning

presentation of the front panel

1. self-diagnostic red indicator light.
   Reports CPI internal failures.
2. orange indicator light. Reports presence of intermittent faults.
3. "correct insulation" green indicator light.
4. luminous scale. Reports an insulation drop. The number of indicator lights on is proportional to the insulation drop.
5. "insulation fault" red indicator light.
6. pull-out drawer containing an operating manual.
7. interchange keys
8. sealable cap (locking of settings)
9. screen displaying operating measurements and parameters.
11. visualization of the insulation state of each feeder:
   - green indicator light "correct insulation"
   - orange light not used
   - red light "insulation fault"
12. Indicator lights locating the faulty feeder.

graphical representation of the front panel

1. self-diagnostic red indicator light.
   Reports XL internal failures.
2. orange indicator light. Reports presence of intermittent faults.
3. visualization of the insulation state of the feeders:
   - green indicator light "correct insulation".
   - orange indicator light "insulation drop".
   - red indicator light "insulation fault".
4. pull-out drawer containing an operating manual.
5. sealable cap (locking of settings)
6. interchange keys
7. lights indicating the measurements displayed:
   - display of capacity value in μF
   - display of intermittent faults in kΩ
   - display of fault settings in kΩ
   - display of insulation resistance of feeder in kΩ
8. Measurement display screen
9. Indicator lights locating the faulty feeder.
commissioning

switching on

Whatever the order in which the devices are switched on, they all carry out their self-test and communicate with the others to inform them of their presence on the system.

System consideration time:
- switching on of all the devices at the same time: 1 mn 06 s
- addition of a localizer to a system already switched on: 1 mn 06 s
- addition of a toroid on a localizer: Briefly switch off the auxiliary supply of the device in question and wait for the end of the autotest.

self-test

This self-test enables the internal electronics of your device to be tested.

The self-test is carried out for each device:
- each time the device is switched on (without relay)
- every 6 hours (without relay)
- on the operator’s request (with or without relay).

**note:** the values displayed on the screens shown in this manual are purely fictitious and act as a guide only.

<table>
<thead>
<tr>
<th>XM300C</th>
<th>XML308 / 316</th>
<th>XL308 / 316</th>
</tr>
</thead>
<tbody>
<tr>
<td>duration: 40 seconds</td>
<td>duration: 40 seconds</td>
<td>duration: 40 seconds</td>
</tr>
<tr>
<td>1. XM electronics test</td>
<td>1. XML electronics test</td>
<td>1. XL electronics test</td>
</tr>
<tr>
<td>2. output relays test (if the operator requests it. See page 27).</td>
<td>2. output relays test (if the operator requests it. See page 27).</td>
<td>2. output relays test (if the operator requests it. See page 27).</td>
</tr>
<tr>
<td>duration: 1 second</td>
<td>duration: 1 second</td>
<td>duration: 1 second</td>
</tr>
<tr>
<td>3. indicator light and screen test</td>
<td>4. self-test correct</td>
<td>3. indicator light and screen test</td>
</tr>
<tr>
<td>duration: 5 seconds</td>
<td>duration: 5 seconds</td>
<td>duration: 5 seconds</td>
</tr>
<tr>
<td>duration: 20 seconds</td>
<td>duration: 20 seconds</td>
<td>duration: 20 seconds</td>
</tr>
<tr>
<td>main screen</td>
<td>main screen</td>
<td>main screen</td>
</tr>
<tr>
<td>5. measuring the equivalent insulation resistance of the system (Risol).</td>
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<td>5. measuring the equivalent insulation resistance of the system (Risol).</td>
</tr>
<tr>
<td>duration: 1 second duration: 5 seconds</td>
<td>duration: 1 second</td>
<td>duration: 1 second</td>
</tr>
<tr>
<td>3. indicator light and screen test</td>
<td>4. self-test correct</td>
<td>3. indicator light and screen test</td>
</tr>
<tr>
<td>duration: 5 seconds</td>
<td>duration: 5 seconds</td>
<td>duration: 5 seconds</td>
</tr>
<tr>
<td>duration: 20 seconds</td>
<td>duration: 20 seconds</td>
<td>duration: 20 seconds</td>
</tr>
<tr>
<td>main screen</td>
<td>main screen</td>
<td>main screen</td>
</tr>
<tr>
<td>5. measuring the equivalent insulation resistance of the system (Risol).</td>
<td>6. Risol display.</td>
<td>6. Risol display.</td>
</tr>
<tr>
<td>duration: 1 second</td>
<td>duration: 5 seconds</td>
<td>duration: 5 seconds</td>
</tr>
<tr>
<td>3. indicator light and screen test</td>
<td>4. self-test correct</td>
<td>3. indicator light and screen test</td>
</tr>
<tr>
<td>duration: 5 seconds</td>
<td>duration: 5 seconds</td>
<td>duration: 5 seconds</td>
</tr>
<tr>
<td>duration: 20 seconds</td>
<td>duration: 20 seconds</td>
<td>duration: 20 seconds</td>
</tr>
<tr>
<td>main screen</td>
<td>main screen</td>
<td>main screen</td>
</tr>
<tr>
<td>5. measuring the equivalent insulation resistance of the system (Risol).</td>
<td>6. Risol display.</td>
<td>6. Risol display.</td>
</tr>
</tbody>
</table>

If you have a problem during the autotest, follow the instructions on pages 52 and 53.
determine your operating thresholds

definitions

Tp: "prevention" insulation threshold beneath which an alarm is tripped to warn the maintenance department. Tp is determined according to the lowest insulation level authorized before intervention. Bear in mind that insulation reduction depends on:
- the quality of the insulating materials and the design of the installation, switchgear and receivers.
- the age of the network.
- the severity of the network environment (dust, humidity, overvoltage...)

Td: "fault" insulation threshold. Td is determined by the maintenance department (in agreement with the monitoring organization). When overshot, it trips a general alarm (Maintenance Department + Operator) without causing operation to shut down. The maintenance department must then take immediate action to locate and clear the fault (if a second fault were to occur between the general alarm and clearance of the first fault, the installation would be automatically switched off and the service continuity objective wouldn’t be achieved).

Io max: maximum earth leakage current tolerable in the installation (resistive current + capacitive current).

Risol: insulation resistance measured by the CPI.

Intermittent fault: faults disappearing before clearing (by "reset" button) are known as intermittent faults. Intermittent faults are stored and can be consulted. An orange indicator light on the front face indicates that an intermittent fault is stored.

pilot CPI: the CPI pilots localizers when it injects on the installation part where they are located (XL).

threshold settings

Each CPI has a fault threshold and a prevention threshold.
All the localizer feeders (XL or XML) only have a fault Threshold.

Tp setting tip
Td = 0.8 x Risol
Td > 1.1 Sd

Tp = 0.8 x Risol
Tp > 1.1 Sd

presetting Td in the plant

Td = 02 kΩ

Td setting tip

The optimal setting value is 1 kΩ because this value is compatible with the XD detection function.

CPI threshold setting range (XM and XML)

Td: from 0.2 kΩ to 99.9 kΩ

Tp: from 1 kΩ to 300 kΩ

Td setting range for XL

Td: from 0.2 kΩ to 99.9 kΩ

read range for the insulation resistance measured by the device:

CPI (XM XML): from 0.1 kΩ to 999 kΩ

XL: from 0.1 kΩ to 300 kΩ

setting coherence

We recommend you set all the fault thresholds to the same value, except if there are other specifications.

Use the self-setting function to set at the same time all the fault and prevention thresholds to the same value (see page 41).

special cases

1st case

The fault threshold on a XL feeder is lower than the fault Threshold of the continuous insulation monitor.

consequence:
If the fault lies between the two fault thresholds, only the CPI reports the fault.

2nd case

The fault threshold on a XL feeder is greater than the fault threshold of the continuous insulation monitor.

consequence:
If the fault lies between the two fault thresholds, the CPI does not report the fault.
The Vigilohm System devices (XM300C - XML 308/316 - XL308/316) enable you to measure permanently the insulation resistance and the earth coupling capacitance of your network.

**Why measuring the resistance between your network and earth?**

When your network insulation is degrading, it is your network insulation resistance which is growing down, that's why it important to measure it permanently.

**Why measuring the earth coupling capacitance?**

If your network earth coupling capacitance is too high, it could be an important risk factor for your network.

Example:

A total capacitance of 50 μF equals to a capacitive impedance of 65 Ω (at 50 Hz). In case of insulation fault, this capacitance enables differential current circulation which can damage your network.

Limit your network capacitance impedance

**On high capacitive feeder, segment your fault search.**

If your total capacitance is higher than 15 μF, use the 2nd configuration.

(A too important differential current (> 3 A) may degrade localizer performances).
operation

- The CPI injects permanently a 2.5 Hz voltage and measures the insulation resistance of the network. The localizer (XL part of XML or XL) is in continuous communication with the CPI and measures the insulation resistance of each feeder.

- When the communication BUS connection is cut or when the CPI is faulty and thus stops communicating with the localizer (XL part of XML or XL), the latter changes over to safety operation. So as to avoid breakdown risks, we recommend you use loop wiring.

response time: time required between two measurements:

- CPI
  - XM300C: 10 seconds
  - XML: 15 seconds

- XL localizer:
  
  \[ TR = (10 \text{ sec.}) \times N^* \]

  so the maximum time is:
  - XL308: 10 sec. x 8 = 1 mn. 20 sec.
  - XL316: 10 sec. x 16 = 3 mn. 7 sec.

- XML localizer:
  
  \[ TR = (15 \text{ sec.}) \times N^* \]

  so the maximum time is:
  - XML308: 15 sec. x 8 = 2 mn.
  - XML316: 15 sec. x 16 = 4 mn.

* \( N \) is the number of toroid connected

safety operation

The localizer is in this status for 2 raisons:

- the CPI is faulty: in this case, the CPI has to be repaired
- the communication bus is cut: check out the wiring

consequence on the display

- visualization of localizer fault setting of your XML.

the final screen becomes:

Note: this operation mode is not the normal one and needs a checking of the system (see page 52).
monitor your network

operating examples

example 1: prevention threshold overshooting followed by alarm threshold overshooting

legend: led lit up

screen visualization / status of XM 300 or XML 308 / 316 indicators and relays status

status of XL indicators and relays
monitor your network

operating examples

example 2: intermittent fault appearance an disappearing

legend:
- led lit up
- led flashing

Intermittent faults are stored by the CPI.
You can visualize the last 3 intermittent faults using the visualization mode (see page 30).

Intermittent faults are stored by the XL.
You can visualize the last intermittent fault using the visualization mode. (see page 33.)
operate your XM or XML

operating

The communication with your device is executed with unidirectional scroll menus. The key $\uparrow$ enables you to obtain the different possible options. The key $\checkmark$ enables you to validate your move in the menu block diagram. When no key is pressed, your device presents you an initial status screen (see description page 22).

menu block diagram
operate your XM or XML

initial status screen

Without using keyboard, the device informs you of its status. The next screens are possible:

- display of the system insulation resistance value
- display of fault presence on the system
- display of prevent alarm on the system
- display of fault presence on the system without CPI detection
- display of temporary exclusion of the system.

display of the system insulation resistance value

This configuration is normal there is no insulation fault on the network.

![Insulation Resistance](image)

R = 70 kΩ

This screen signals that a fault has appeared on the network. The insulation resistance value is:

\[ \text{Risol} < \text{Td} \]

![Fault Alarm](image)

Threshold in kΩ prevent ... kΩ fault ... kΩ ok ok give the value of the adjusted settings.

Fault alarm R = ... kΩ aa/mm/jj hh H mn th. reset de-energizesTp, Td and failsafe relays.

display of prevent threshold overshooting

This screen signals that the insulation resistance value Risol is between the 2 threshold values Td and Tp.

\[ \text{Td} < \text{Risol} < \text{Tp} \]

![Prevent Alarm](image)

Threshold in kΩ prevent ... kΩ fault ... kΩ ok ok give the value of the adjusted settings.

Prevent alarm R = ... kΩ aa/mm/jj hh H mn th. reset de-energizes the prevention relay.

Page 22
operate
your XM or XML

initial status screen

fault reported on a feeder although the CPI does not detect any fault

display of temporary exclusion

This screen signals that your device is excluded. Another CPI injects on the network. You can have access to the menu.
operate your XM or XML

To improve understanding of the operation of your device, do not forget to refer to the menu block diagram on page 20, when faced with writing on black background.

description

main menu description

Using the main menu you can visualize the information relating to the CPI and the other system products (XL, XML).

main menu screens

local CPI parameters menu
access to menu enabling information relating to the CPI to be visualized.

unidirectional scroll menu. Use the central key "^" to position the parameter to be visualized opposite the validation line "->", then validate the information using the "OK" key.

main menu screens

local CPI parameters menu
access to alarm messages relating to the pilot system products. The messages are placed in a pile in chronological order (see page 36).

access to messages relating to a change in system configuration ex: - 2 interfaces on the system (XLI, XTU) - XL vanished. The messages are placed in a pile in chronological order. (see page 38).

internal XL parameters menu
access to menu enabling the information on your XML localizer to be visualized.

description of local CPI parameters menu screens

<table>
<thead>
<tr>
<th>parameter to be validated</th>
<th>screen visualized</th>
<th>comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>fault th.</td>
<td>fault th.</td>
<td>display of fault setting value (see p 28).</td>
</tr>
<tr>
<td>prevention th.</td>
<td>prevention th.</td>
<td>display of the prevention threshold value (see p 29).</td>
</tr>
<tr>
<td>line capacitance</td>
<td>line capacitance</td>
<td>display of the network capacitance (see p 31).</td>
</tr>
<tr>
<td>intermit. fault</td>
<td>intermit. fault</td>
<td>display of the last three intermittent faults. If XTU 300, XLI 300 or XPI 300 exists, the date and hour of faults are displayed (see p 30).</td>
</tr>
<tr>
<td>date / hour</td>
<td>date / hour</td>
<td>display of date and hour. See page 42 to enter date and hour.</td>
</tr>
<tr>
<td>input / relay</td>
<td>input / relay</td>
<td>display of relay position and circuit-breaker position output status (prevention, fault, failsafe).</td>
</tr>
</tbody>
</table>
**description of internal XL screens**

<table>
<thead>
<tr>
<th>Parameter to be validated</th>
<th>Screen Visualized</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL Internal parameters menu</td>
<td>Measures toroid: ... R = .... kΩ C = .... μF tor. quit</td>
<td>Visualization of resistance and capacitance of each feeder. See page 35</td>
</tr>
<tr>
<td>&gt; R (kΩ), C (μF)</td>
<td>Threshold toroid: ... Td = .... kΩ tor. quit</td>
<td>Visualization of fault threshold for each feeder (see page 34).</td>
</tr>
<tr>
<td>&gt; threshold</td>
<td>Fault toroid: ... R = .... kΩ aa/mm/jj hh H mn tor. quit</td>
<td>Visualization of fault resistance for each feeder (see page 32).</td>
</tr>
<tr>
<td>&gt; alarms</td>
<td>Intermit. fault toroid: ... R = .... kΩ aa/mm/jj hh H mn tor. reset</td>
<td>Visualization of intermittent faults on all feeders (see page 33).</td>
</tr>
</tbody>
</table>

**description of alarm visu screens**

<table>
<thead>
<tr>
<th>Parameter to be validated</th>
<th>Screen Visualized</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main menu</td>
<td>Alarm XL ... T ... R = .... kΩ aa/mm/jj hh H mn ok quit</td>
<td>Visualization of fault resistance (fault / device and toroid), see page 36 ex: XL31 TO1. If XTU 300, XLI 300 or XPI 300 exist, the date and hour are displayed.</td>
</tr>
<tr>
<td>&gt; alarms visu</td>
<td>Intermittent XL ... T ... R = .... kΩ aa/mm/jj hh H mn ok reset</td>
<td>Visualization of intermittent faults (fault / device and toroid). If XTU 300, XLI 300 or XPI 300 exists, date and hour of occurrence of the intermittent faults are displayed.</td>
</tr>
</tbody>
</table>

**description of the system state screens**

<table>
<thead>
<tr>
<th>Parameter to be validated</th>
<th>Screen Visualized</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main menu</td>
<td>System modif X... (PI - LI - TU) inhibited</td>
<td>Visualization of the inhibited interface (see page 38). ex: if there are 2 interfaces on the same system, the system automatically inhibits one interface (order of priority: XTU 300, XLI 300).</td>
</tr>
<tr>
<td>&gt; system status</td>
<td>System modif X... (M-ML-L-PI-LI-TU-XCU10) has disappeared</td>
<td>Visualization of the products which, during operation, no longer reply. ex.: supply loss, Bus cut off, device failure.</td>
</tr>
<tr>
<td></td>
<td>System modif XL... TOROID has disappeared</td>
<td>Visualization of the toroids which no longer reply, plus the device on which it occurred ex: XL32 TOROID 02.</td>
</tr>
</tbody>
</table>
COMMUNICATION

communicate in English with your XM300C ou XML308/316

The device you have just installed is programmed in French. You can easily program it in English using the modification screen.

**Page 26**
COMMUNICATION

test the state of order of your device

1. HAVE ACCESS TO TEST MENU

2. SELECT YOUR TEST

3. VALIDATE YOUR CHOICE

4. IN FUNCTION OF YOUR CHOICE
   - > tst with relay
     If you have a password it must be entered for autotest with relay.
     Self-test identical to the operation of the switching on autotest.
     (idem page 14).
   - > tst w-out relay
     Self-test identical to the operation of the switching on self-test without relay activation
     (idem page 14).

5. END OF TEST.
operate your XM or XML

VISUALIZATION

local CPI visualization

local CPI fault threshold visualization Td

1. **MAIN SCREEN**
   - Insulation: R = 0.4 kΩ
   - Have access to the main menu

2. **MAIN MENU**
   - Quit
   - XM visu
   - Alarms visu
   - OK
   - Validate "XM visu" and validate your choice

3. **LOCAL CPI PARAMETERS MENU**
   - Quit
   - Capacitance
   - Fault th.
   - Prevent th.
   - OK
   - Select "fault th."

4. **LOCAL CPI PARAMETERS MENU**
   - Capacitance
   - Fault th.
   - Prevent th.
   - OK
   - Validate your choice

5. **VISUALIZATION OF THE FAULT THRESHOLD**
   - Fault th.
   - > 2 kΩ < mA
   - Date/hour
   - Quit
   - Visualise
   - If U and F have been entered, the value of the max leakage current flowing in the fault in absence of unbalanced capacity, is displayed. If XTU 300, XPI 300 or XLI 300 exists, date and hour of threshold modification are displayed.

6. **VISUALIZATION OF THE FAULT THRESHOLD**
   - Fault th.
   - 2 kΩ < mA
   - Date/hour
   - Quit
   - Capacitance
   - OK
   - Quit
VISUALIZATION

local CPI visualization

local CPI prevention threshold visualization

**MAIN SCREEN**

1. HAVE ACCESS TO THE MAIN MENU

**MAIN MENU**

2. SELECT "XM visu" AND VALIDATE

**LOCAL CPI PARAMETERS MENU**

3. SELECT "prevent th."

**LOCAL CPI PARAMETERS MENU**

4. VALIDATE YOUR CHOICE

**PREVENT THRESHOLD MENU**

5. VISUALISE
   - If XTU300, XPI300 or XLI300 exists, date and hour of threshold modification are displayed.

**PREVENT THRESHOLD MENU**

6. QUIT
VISUALIZATION

local CPI visualization

local CPI intermittent faults visualization and reset

1. **MAIN SCREEN**
   - **HAVE ACCESS TO THE MAIN MENU**
   - insulation: R = 0.04 kΩ
   - test menu

2. **MAIN MENU**
   - **SELECT “XM visu” AND VALIDATE**

3. **LOCAL CPI PARAMETERS MENU**
   - **SELECT “intermit. fault”**

4. **LOCAL CPI PARAMETERS MENU**
   - **VALIDATE YOUR CHOICE**

5. **INTERMITTENT FAULTS VISUALIZATION**
   - **VISUALISE the last 3 intermittent faults**
   - intermittent fault duration
   - intermittent fault value
   - reset intermit. fault
     - YES
     - OK
   - select “yes” and validate by “ok”.

return to visualization of the last 3 intermittent faults.

Page 30
VISUALIZATION

local CPI visualization

network capacitance visualization

1. HAVE ACCESS TO THE MAIN MENU

2. VALIDATE "XM visu" AND VALIDATE YOUR CHOICE

3. SELECT "capacitance" AND VALIDATE YOUR CHOICE

4. If the CPI is excluded, it does not display a capacitance value

5. VISUALISE

If the CPI is excluded, it does not display a capacitance value.
VISUALIZATION

Internal localizer visualization

internal localizer alarms visualization

1. HAVE ACCESS TO THE MAIN MENU

2. SELECT "internal XL"

3. VALIDATE YOUR CHOICE

4. SELECT "alarms" AND VALIDATE YOUR CHOICE

5. VISUALISE

6. QUIT
operate your XM or XML

VISUALIZATION

internal locator visualization

internal locator intermittent faults visualization

Reset of the internal locator intermittent faults is performed in the "alarms visu" menu of the CPI main menu.
INTERNAL LOCALIZER THRESHOLD VISUALIZATION

Internal localizer visualization

internal localizer threshold visualization

1. **MAIN SCREEN**
   - HAVE ACCESS TO THE MAIN MENU
   - insulation
   - R = 040 kΩ
   - test menu
   - 1X

2. **MAIN MENU**
   - SELECT "internal XL"
   - quit
   - XM visu
   - alarms visu
   - ok ∧ mod
   - 2X

3. **MAIN MENU**
   - VALIDATE YOUR CHOICE
   - alarms visu
   - internal XL
   - system status
   - ok ∧ mod
   - 1X

4. **INTERNAL XL PARAMETERS MENU**
   - SELECT "threshold"
   - quit
   - alarm
   - intermit. fault
   - ok ∧ mod
   - 3X

5. **INTERNAL XL PARAMETERS MENU**
   - VALIDATE YOUR CHOICE
   - threshold
   - quit
   - ok ∧ mod
   - 1X

6. **INTERNAL XL THRESHOLD VISUALIZATION**
   - th. tor.: 01
   - th = 02.0 kΩ
   - tor. quit
   - next threshold
   - 3X
   - QUIT

Page 34
INTERNAL LOCALIZER
R and C VISUALIZATION

INTERNAL LOCALIZER R and C VISUALIZATION

VISUALIZATION

Internal localizer visualization

internal localizer R an C visualization

1

2

3

2

3

4

5

6

intermit. fault
R(kΩ) C(μF)
threshold
ok ∧ mod

SELECT "internal XL"

VALIDATE YOUR CHOICE

SELECT "R(Ω) C(μF)"

VALIDATE YOUR CHOICE

visualise the other value

HAVE ACCESS TO THE MAIN MENU

SELECT "internal XL"

VALIDATE YOUR CHOICE

visualise the other value

The CPI is fault. The fault is not located on the channel selected.

measure toroid: 01

R = ... kΩ
C = .... μF

VISUALISE: If display marked:

.. kΩ
.. μF

visualise the other value
VISUALIZATION

Localizer piloted by the CPI visualization

Localizer piloted by the CPI intermittent fault and alarms visualization

Reset of intermittent faults of localizers is performed in this menu

1. **MAIN SCREEN**
   - HAVE ACCESS TO THE MAIN MENU

2. **MAIN MENU**
   - SELECT “alarms visu”

3. **MAIN MENU**
   - VALIDATE YOUR CHOICE

4. **ALARMS VISUALIZATION**
   - VISUALISE THE ALARMS

Visualise the next screen. When all the fault have been visualised, you visualise the intermittent fault.

When all the intermittent fault have been visualised, the press on ok provoke the return to previous menu.

Reset the intermittent displayed fault and display the next fault. When all the fault have been visualised, the press on ok provoke the return to previous menu.
VISUALIZATION

Error messages and system state visualization

Error messages visualization

All these messages result from tests carried out on the operation of your device together with tests carried out on the system part of your installation (see page 50).

- The blocking messages interrupt the operation of your device and require immediate intervention. These messages are not stored.
- The non-blocking messages are stored and do not interrupt operation of your device. They can be visualized in "FAILURES VISU".

1. **MAIN SCREEN**
   - HAVE ACCESS TO THE MAIN MENU
   - isolement: R = 0.40 kΩ
   - test menu
   - 1X

2. **TEST MENU**
   - SELECT "failure visu"
   - tst w-out relay
   - failures visu
   - ok
   - 1X

3. **MAIN MENU**
   - VALIDATE YOUR CHOICE
   - tst with relay
   - failures visu
   - quit
   - ok
   - 1X

4. **FAILURE VISU**
   - VISUALISE
   - XML... toroid... has disappeared
   - no anomaly detected
   - ok
   - ok
   - quit
   - 1X

5. **FAILURE VISU**
   - APPEARANCE OF THE CLEAR SCREEN WHEN THERE ARE NO MORE ERROR MESSAGES
   - no other fault acknowledgement?
   - return to test menu
   - quit
   - clear error messages
   - and return to test menu.
   - The LED goes off.
operate your XM or XML

VISUALIZATION

system state visualization

Visualization of messages concerning system configuration modifications. These messages are stored in "system state".

1. HAVE ACCESS TO THE MAIN MENU

2. SELECT "system status"

3. VALIDATE YOUR CHOICE

4. VISUALISE

5. VISUALISE

6. APPEARANCE OF THE CLEAR SCREEN WHEN THERE ARE NO MORE ERROR MESSAGES
set the parameters of your XM or XML

To improve understanding of the operation of your device, do not forget to refer to the menu block diagram on page 20, when faced with writing on black background.

**modification of CPI parameters**

Only parameters relating to the CPI and the internal XL can be modified.

**description of the CPI parameters modification menu screens**

- **fault th.**
  - Parameter to be validated
  - Screen: fault th.
  - Comments: when it leaves the plant, the fault threshold is preset at 2 kΩ. Setting range: 0.2 kΩ < Td < 99.9 kΩ

- **prevent thres.**
  - Parameter to be validated
  - Screen: prevent th.
  - Comments: when it leaves the plant, the prevention setting is preset at 30 kΩ. Setting range: 1 kΩ < Tp < 300 kΩ

- **self-setting**
  - Parameter to be validated
  - Screen: self-setting
  - Comments: enables remote setting of all the Td of the system devices at the same value in one single operation together with Tp on all CPI.

- **date / hour**
  - Parameter to be validated
  - Screen: date / hour
  - Comments: If XTU 300, XLI 300 or XPI 300 exists this menu enables to enter date and hour.

- **interface**
  - Parameter to be validated
  - Screen: interface
  - Comments: enables addressing of your interface "01" to "FE", and choice of the transmission rate of the JBUS link.

- **f (Hz), Un (v)**
  - Parameter to be validated
  - Screen: f (Hz), Un (v)
  - Comments: When entering the system voltage and frequency value, the fault current value is displayed in mA on the "fault threshold" screen. Frequency setting range: 50 Hz, 60 Hz, DC. Voltage setting range: from 0 to 999 V.

- **password**
  - Parameter to be validated
  - Screen: password
  - Comments: when leaving the factory, the password is set at "0000". If this password is modified, the new password must be entered before changing parameters.

- **language choice**
  - Parameter to be validated
  - Screen: language choice
  - Comments: language modification screen, see page 26.
set the parameters of your XM or XML

MODIFICATION

CPI fault threshold modification

1. SELECT AND VALIDATE "fault threshold"

2. VISUALISE THE THRESHOLD

3. MODIFY OR VALIDATE THE 1st DIGIT

4. MODIFY OR VALIDATE THE 2nd DIGIT

5. MODIFY OR VALIDATE THE 3rd DIGIT

6. MODIFY OR VALIDATE THE 3rd DIGIT AND RETURN TO PREVIOUS MENU
This function is available on devices XM or XML. It enables remote setting of all fault thresholds to the same value on the other system devices (XL, XM, XML) from the pilot CPI.

It enables automatic calculation of prevention threshold \( T_p = 0,8 \times R_{isol} \) of all CPI (Risol is the insulation resistance measurement of the CPI on which self-setting is performed).

The fault threshold sent to all devices (CPI and localizers) is the fault threshold of the CPI on which self-setting is performed.

**nota:** Self-setting can not be performed on a CPI which is in exclusion mode.
set the parameters of your XM or XML

MODIFICATION

Date / hour modification

If you have a XLI 300, XTU 300, or XPI 300 interface in your system, you can then enter the date and hour in order to date events.

1. SELECT "date / hour"

2. VALIDATE YOUR CHOICE

3. VISUALISE THE PREVIOUS PARAMETERS

4. MODIFY THE DATE

5. MODIFY HOUR

6. VALIDATE YOUR MODIFICATIONS AND RETURN TO PREVIOUS MENU
set the parameters of your XM or XML

MODIFICATION

Interfaces (JBUS) address and transmission rate modification

If you have an XLI 300, XTU 300, or XPI 300 in your system, you must enter:
■ for XLI 300, XTU 300, XCU10: address and rate
■ for XPI 300: address only
The values set by default are: address = 01 rate = 9600 bauds

ADDRESS AND TRANSMISSION RATE MODIFICATION

MODIFY OR VALIDATE THE RATE
The disponibles transmission rate are: 300, 1200, 2400, 4800, 9600, 19200 bauds

MODIFY OR VALIDATE THE RATE AND RETURN TO PREVIOUS MENU

VALIDATE YOUR CHOICE

MODIFY OR VALIDATE THE RATE

MODIFY OR VALIDATE THE RATE

ok annul

ok annul

ok annul

ok annul

ok annul
set the parameters of your XM or XML

**MODIFICATION**

**voltage and frequency of the monitored network entering**

This is optional and means that you can obtain on the fault threshold screen, the maximum value of the current flowing in the fault in absence of unbalanced capacity.

1. **MODIFICATION MENU**
   - quit
   - fault th.
   - prevent th.
   - ok
   - quit
   - SELECT “f (Hz), Un (V)”
   - 5X

2. **MODIFICATION MENU**
   - interface
   - f(Hz), Un(V)
   - langue
   - ok
   - quit
   - VALIDATE YOUR CHOICE
   - 1X

3. **MODIFICATION MENU**
   - frequency
   - 50 Hz
   - Un network...V
   - ok
   - annul
   - MODIFY THE FREQUENCY
   - 1X

4. **MODIFICATION MENU**
   - frequency
   - 60 Hz
   - Un network...V
   - ok
   - annul
   - VALIDATE YOUR MODIFICATION
   - 1X

5. **MODIFICATION MENU**
   - frequency
   - 50 Hz
   - Un network...V
   - ok
   - annul
   - MODIFY THE VOLTAGE VALUE
   - (see fault threshold modification)
   - validate the digit
   - increase the digit value

6. **MODIFICATION MENU**
   - 220
   - ok
   - annul
   - ENTER "OK"
   - VALIDATE YOUR MODIFICATION AND RETURN TO PREVIOUS MENU
set the parameters of your XM or XML

MODIFICATION

password modification

1. MODIFICATION MENU
   - SELECT "password"
   - 6X

2. MODIFICATION MENU
   - VALIDATE YOUR CHOICE
   - 1X

3. MODIFICATION MENU
   - MODIFY OR VALIDATE THE 1st DIGIT
   - 0000
   - validate the digit
   - increase the digit

4. MODIFICATION MENU
   - MODIFY OR VALIDATE THE 2nd DIGIT
   - 1000
   - validate the digit
   - increase the digit

5. MODIFICATION MENU
   - MODIFY OR VALIDATE THE 3rd DIGIT
   - 1300
   - validate the digit
   - increase the digit

6. MODIFICATION MENU
   - MODIFY OR VALIDATE THE 3rd DIGIT AND RETURN TO PREVIOUS MENU
   - 1320
   - validate the digit
   - increase the digit
   - ENTER "OK"
INTERNAL XL PARAMETERS MODIFICATION

On an internal localizer you can only modify the fault threshold.

1. **MAIN MENU**
   - HAVE ACCESS TO THE MAIN MENU
   - Insulation R = 040 kΩ
   - Test menu

2. **MODIFICATION MENU**
   - SELECT MODIFICATION MODE
   - Alarm
   - Internal XL system status
   - Mod

3. **MODIFICATION MENU**
   - ENTER YOUR PASSWORD
   - 0000
   - Ok Mod Quit
   - Nota: This screen only appears if you have already entered a password

4. **MODIFICATION MENU**
   - SELECT THE FEEDER
   - Fault Tor.: 01
   - Td = 02 kΩ
   - Tor. Quit Td
   - Nota: If you wish to adjust all the feeders to the same setting value, press TOR. until toroid XX appears, then adjust the setting value as shown below.

5. **MODIFICATION MENU**
   - HAVE ACCESS TO THE THRESHOLD VALUE MODIFICATION
   - Fault Tor.: 04
   - Td = 02 kΩ
   - Tor. Quit Td

6. **MODIFICATION MENU**
   - MODIFY OR VALIDATE THE 3RD DIGIT AND RETURN TO PREVIOUS MENU
   - Enter "Ok"
   - Validate the digit
   - Increase the digit

Page 46
operate your XL

use of the XL keyboard

enables decrementation of the threshold \( T_d \)
- \( T_d \) maxi 99.9 k\( \Omega \)
- \( T_d \) mini 0.2 k\( \Omega \)

enables incrementation of the threshold \( T_d \)
- \( T_d \) mini 0.2 k\( \Omega \)
- \( T_d \) maxi 99.9 k\( \Omega \)

enables selection of the parameter to be visualised
- \( \Omega \) ... \( \mu F \) press once
- \( \Omega \) ... \( \mu F \) press twice
- \( \Omega \) ... \( \mu F \) press 3 times
- \( \Omega \) ... \( \mu F \) press 4 times

enables self-test or reset
- \( \text{test / reset} \)
  - If there is no fault, the test key validates the self-test function. The self-test is identical to the operation of the commissioning self-test (see page 14).
  - If faults are present, the key validates the reset function. Enables resetting of intermittent faults.

fault threshold adjustment detail

The setting is modified by variable "steps". You MUST keep the "+" or "-" key pressed down.

The values slowly scroll down at the beginning, speeding up until the key is released.

display state

Without using the keyboard, your device informs you by messages of the problem detected.

message | 1 . 5 | tor | test | important problem during the autotest. the device loops in self-test. | measurement impossible. the CPI is a fault. the fault is not on the channel selected.

meaning | the display is off. On all feeders \( R_i > T_d \). | value of the insulation resistance detected in fault. | the pilot CPI does not reply or incorrect self-test. The device continues to work. | address of another XL with a faulty feeder. | important problem during the autotest. the device loops in self-test. | measurement impossible. the CPI is a fault. the fault is not on the channel selected.
operate your XL

**visualization**

you can use the keyboard to visualize the parameters for your device.

- **Ω**: insulation resistance
- **Td**: fault threshold
- **μF**: intermittent fault

**example:** visualization of the fault setting for feeder 3.

1. **Ω**: insulation resistance
2. **Td**: fault threshold
3. **μF**: intermittent fault

**modification**

you can use the keyboard to modify the fault threshold for each feeder.

**example:** modification of the fault setting of feeder 3 to 4 kΩ.

1. **Ω**: insulation resistance
2. **μF**: intermittent fault
3. **μF**: intermittent fault

**signalling**

**example 1:** alarm fault feeder 2

- Reset de-energizes the fault and failsafe relays.

**example 2:** intermittent fault feeder 4

- both leds flash.
- the display shows 1 kΩ.

Reset of the intermittent faults (see next page).
signalling

**example 3:** alarm fault feeder 2 and intermittent fault feeder 4.

For a fault alarm, the fault value is automatically displayed.

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**clearing intermittents faults**

Intermittent faults are reset feeder by feeder.

**example:** intermittent faults on feeders 2 and 4.

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The device displays 999 and moves to the following feeder (if the following feeder is not used, the device automatically moves to the one after).
problems during the autotest

**error screen identification of XM and XML**

<table>
<thead>
<tr>
<th>blocking messages</th>
<th>not blocking messages</th>
</tr>
</thead>
<tbody>
<tr>
<td>address XM/XML &gt; 14 (18) modify</td>
<td>measure error ACQ</td>
</tr>
<tr>
<td>insulation R = 130 kΩ test menu</td>
<td>incorrect Req</td>
</tr>
<tr>
<td>test menu</td>
<td>measurement</td>
</tr>
<tr>
<td>validate the error message</td>
<td></td>
</tr>
<tr>
<td>The failsafe relay is de-energized</td>
<td></td>
</tr>
<tr>
<td>switch off your device</td>
<td></td>
</tr>
<tr>
<td>switch on your device</td>
<td></td>
</tr>
<tr>
<td>modify the address</td>
<td></td>
</tr>
<tr>
<td>the autotest is started again</td>
<td></td>
</tr>
</tbody>
</table>

1. check the indicator lights are functioning properly.
2. watch out for any error messages display on the screen.

self control test in progress

if the fault persists

1. note the error messages
2. contact Schneider Electric

running self test

operating test is right

memory error

1. consult "failures visu"
2. identify the error message and refer to page 51.

1. check the operating parameters (visualization mode p.28).
   - Tp
   - Td
2. change any wrong parameters (modification mode p.39).
3. start up the autotest again.

all the temporary message are stored and can be visualized in "failures visu" (see page 37).
problems during the autotest

identification of error messages

<table>
<thead>
<tr>
<th>messages</th>
<th>interpretation and action</th>
<th>visualization</th>
<th>signalling</th>
</tr>
</thead>
<tbody>
<tr>
<td>not blocking</td>
<td>blocking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>input $i_1 = i_2 = 1$ inconsistent XM is inhibited</td>
<td>incorrect wiring circuit-breaker position contact</td>
<td>&quot;failures visu&quot;</td>
<td>red led</td>
</tr>
<tr>
<td>XML... tore... has disappeared</td>
<td>toroid short-circuited or disconnected</td>
<td>&quot;failures visu&quot;</td>
<td>red led</td>
</tr>
<tr>
<td>memory problem check parameters</td>
<td>check the operating parameters $T_p, T_d$</td>
<td>&quot;failures visu&quot;</td>
<td>red led</td>
</tr>
<tr>
<td>address XM/XML &gt; 14 (18) correct</td>
<td>correct the address ACQ startup the autotest again</td>
<td>red led</td>
<td>+ failsafe relay</td>
</tr>
<tr>
<td>measurement error</td>
<td>contact Schneider Electric</td>
<td>red led</td>
<td>+ failsafe relay</td>
</tr>
<tr>
<td>memory error</td>
<td>RAM problem contact Schneider Electric</td>
<td>&quot;failures visu&quot;</td>
<td>red led</td>
</tr>
<tr>
<td>no measurement possible</td>
<td>contact Schneider Electric</td>
<td>red led</td>
<td>+ failsafe relay</td>
</tr>
</tbody>
</table>

XL308 - XL316

<table>
<thead>
<tr>
<th>visualization</th>
<th>interpretation</th>
<th>signalling</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ]</td>
<td>the device continually loops on the autotest</td>
<td>red led</td>
</tr>
<tr>
<td>[ ]</td>
<td>autotest problem. the device continues to operate or safe operate mod, check the bus wiring</td>
<td>red led</td>
</tr>
<tr>
<td>[ ]</td>
<td>toroid short-circuited or disconnected, check the connection between toroid and relays</td>
<td>red led</td>
</tr>
</tbody>
</table>
any problems?

seek out the cause

<table>
<thead>
<tr>
<th>symptoms</th>
<th>probable causes</th>
<th>solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The device displays nothing when switched on.</td>
<td>The device is not supplied. The auxiliary supply does not comply.</td>
<td>Check the auxiliary supply is present. Check the value of the auxiliary voltage. 0.85 Un &lt; U &lt; 1.1 Un.</td>
</tr>
<tr>
<td>The device continuously displays 999 kΩ when switched on</td>
<td>Incorrect connection of the injection circuit, insulation of your system exceeds 999 kΩ.</td>
<td>Check that the fast-on terminal 13 is connected to the ground and terminal 14 to the neutral or a phase (unavailable neutral).</td>
</tr>
<tr>
<td>You deliberately create an insulation fault. The device still shows the same insulation value.</td>
<td>The XM or XML injection circuit is cut off. Incorrect grounding connections.</td>
<td>Check connection on terminals 13 and 14. Check interconnection of all grounds.</td>
</tr>
<tr>
<td>The monitoring device on the failsafe output (3) is continuously activated (alarm or indicator light)</td>
<td>Removal or drop of auxiliary supply. Incorrect fail-safe relay output wiring.</td>
<td>Check the auxiliary supply is greater than 0.85 Un. Check that outputs wired are: 11 and 10 or 11 and 12.</td>
</tr>
<tr>
<td>The monitoring device on the output (3) is not activated when the auxiliary supply is removed.</td>
<td>The alarm or indicator light is supplied. Incorrect fail-safe relay output wiring.</td>
<td>Start resupplying the failsafe device. Check that outputs wired are: 11 and 10 or 11 and 12.</td>
</tr>
<tr>
<td>The monitoring device on the output (1) &quot;prevent alarm&quot; is continuously activated.</td>
<td>Incorrect &quot;prev&quot; relay output wiring.</td>
<td>Check that outputs used are: 5 and 6, or 5 and 4.</td>
</tr>
<tr>
<td>The monitoring device on the output (3) &quot;prevent alarm&quot; is not activated when Risol &lt; Tp</td>
<td>The &quot;prevent alarm&quot; device is not supplied.</td>
<td>Start resupplying prevention.</td>
</tr>
<tr>
<td>The monitoring device on the output (2) &quot;fault alarm&quot; is continuously activated.</td>
<td>Incorrect &quot;fault&quot; relay output wiring.</td>
<td>Check that outputs used are: 8 and 9, or 8 and 7.</td>
</tr>
<tr>
<td>The monitoring device on the output (2) &quot;fault alarm&quot; is not activated when Risol &lt; Td.</td>
<td>The response time is not over. Incorrect &quot;fault relay&quot; output wiring.</td>
<td>Wait for the end of the response time. Check that outputs used are: 8 and 9, or 8 and 7.</td>
</tr>
<tr>
<td>The corresponding indicator lights do not come on for anomalies and faults.</td>
<td>Faulty indicator lights.</td>
<td>Start up the autotest again and check that all the indicator lights come on briefly.</td>
</tr>
</tbody>
</table>