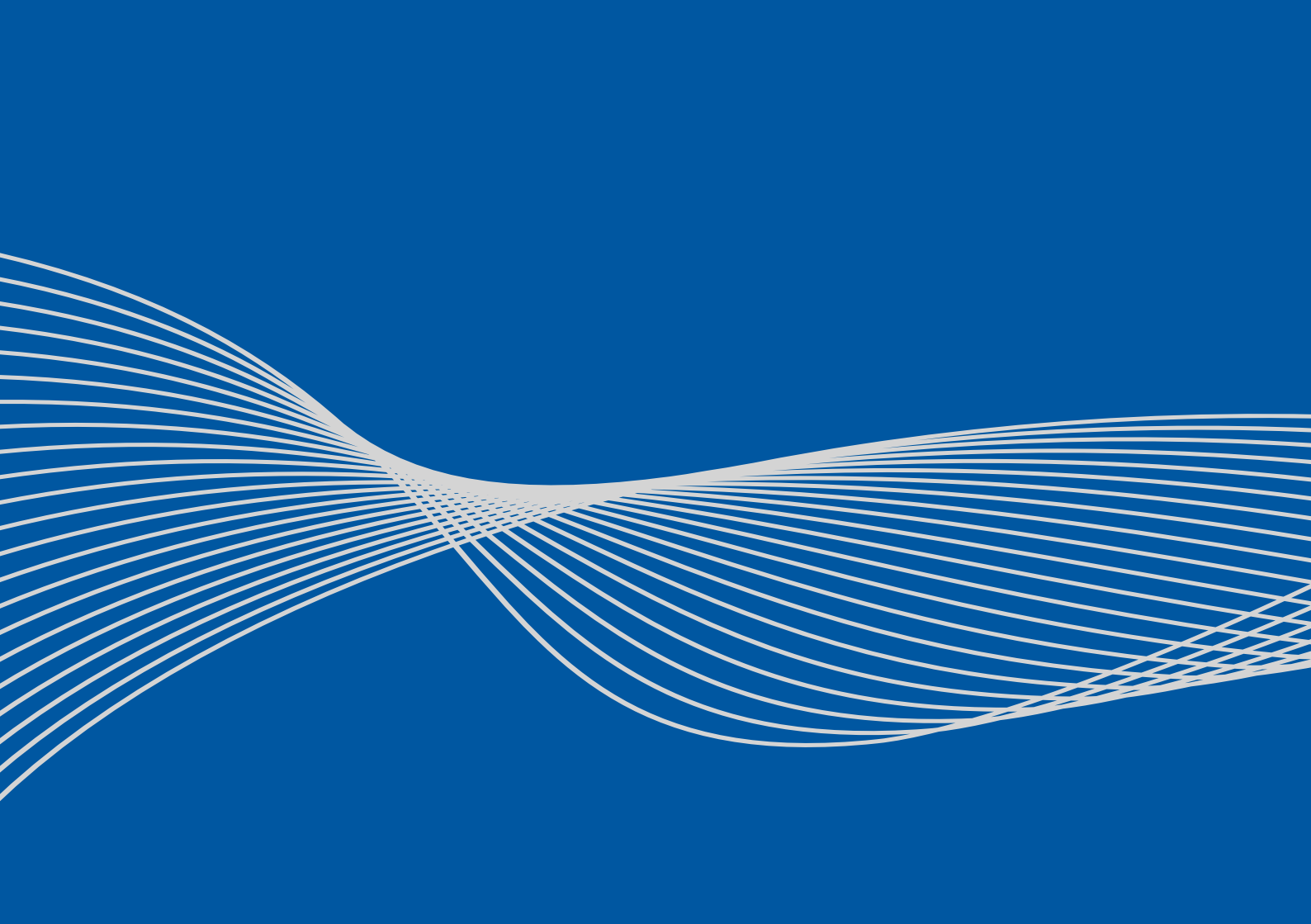
75A-0321-01 Revision A
Versions; T1

# QUICK GUIDE

# Calisto™ T1

Condition Monitoring System


doble®
DOBLE ENGINEERING COMPANY



# T1

## product outline:

The Calisto™ T1 encapsulates the functionality of bushings, partial discharge and I/O modules in a single configurable package in a cost-effective manner. It provides a clear user interface through a built-in server and manages user access, alert setting, alert management and data visualization — bringing together data from Doble and third-party devices. Standard communication protocols include Modbus and DNP3 with optional IEC 61850, that allow data to be moved between Calisto T1 and other applications such as SCADA.

## Features:

Calisto T1 allows for field upgrade of hardware so that you can start small and grow. For example, start with IDD bushing monitoring and add main tank PD later.

Intuitive user interface supports teamwork and investigation of alerts and asset issues.


- Simplify field configuration of condition monitoring installations
  - Configurable multi-functional monitoring in a single, small enclosure
  - Works within your firewall and meets your cybersecurity regulations
  - Visualize and overlay data from multiple assets through a single, intuitive UI
- Comprehensive alert management
  - Set three levels of alert on each data channel
  - Alert default values are configurable
  - Built-in audit trail of alert generation and acknowledgement for post-event investigation
- Simplified upgrade path

## Features:

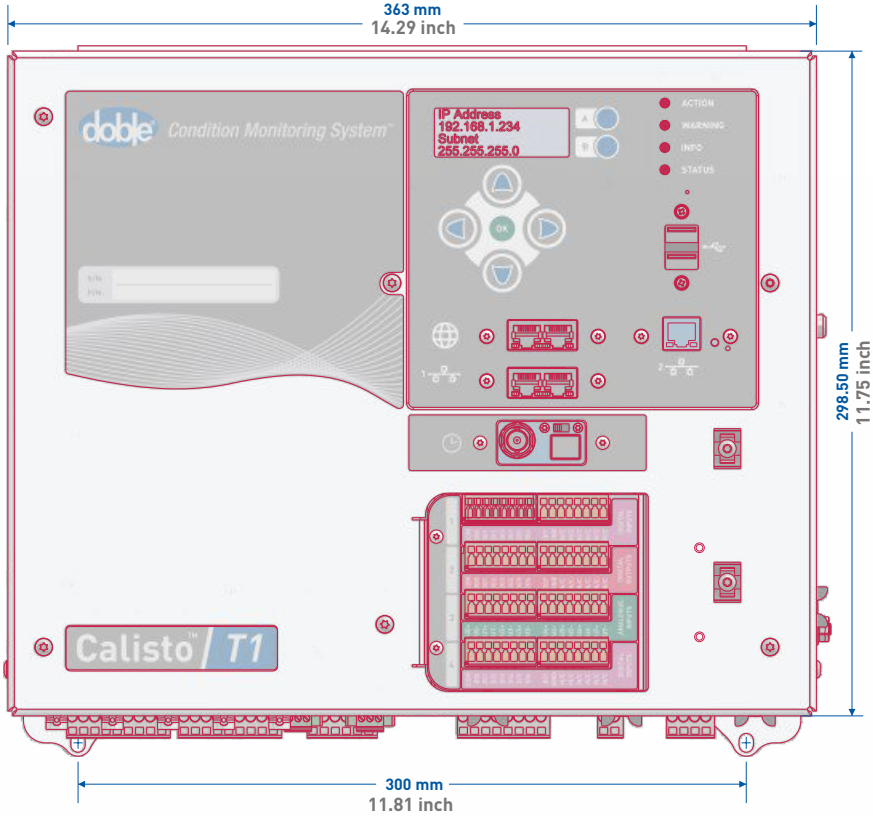
The Calisto T1 can build from a single component to a comprehensive transformer monitor covering partial discharge (PD), bushings, operational data that connects to Dissolved Gas Analysis (DGA) and third-party monitors.

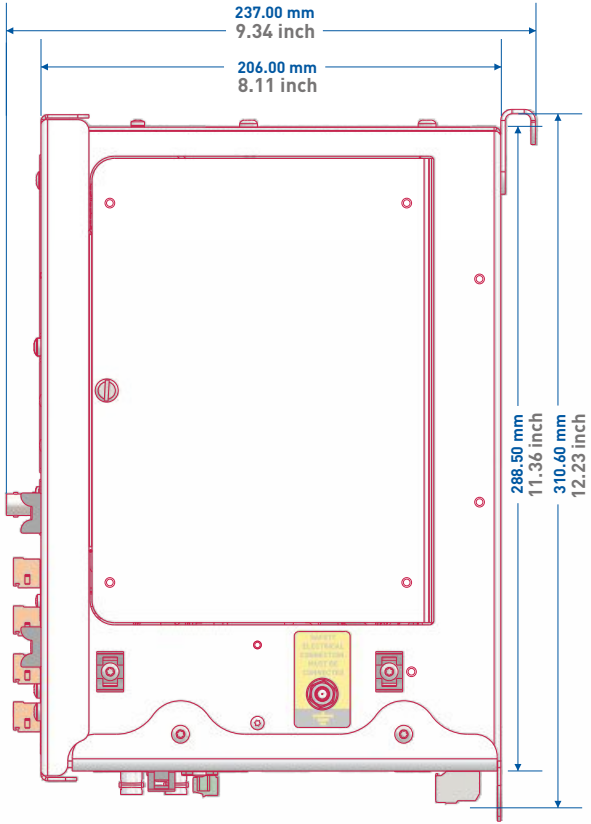
- PD Guard - Doble PD-Guard™ monitors partial discharge (PD) in the transformer bushings, neutral and inside the main tank; it provides local alarms and will communicate data and notifications across standard interface channels and to networked supervisory systems. Doble PD-Guard analyses PD and EMI signals in the HF, VHF and lower UHF ranges with built-in diagnostic tools.

- IDD - Doble IDD™ bushing monitor detects deterioration in bushings, finding abnormalities in the insulation and issuing actionable alerts. It provides leakage current, phase, capacitance, power factor and harmonics analysis for up to six bushings individually. If a voltage reference is available, the Doble IDD will perform both relative and True Power factor to detect issues in bushings and voltage reference devices.

- iO - Doble iO™ is a data recorder that accepts current, voltage, temperature and relay inputs and integrates and displays data from multiple sensors and sources, including load or operational data, tap position indicators and inputs from other vendor devices.

## T1 Dimensions:



## Installation options:

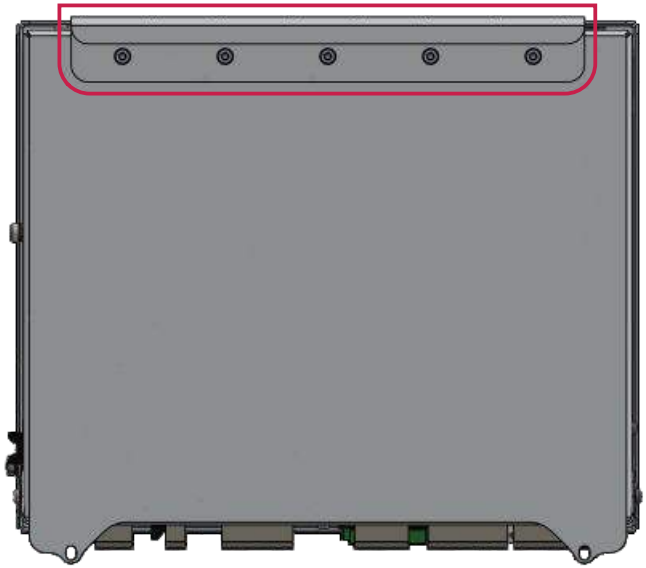
Calisto T1 is provided in an anodized aluminium housing with removable parts to allow hardware upgrade and easy maintenance.

The installation options are:

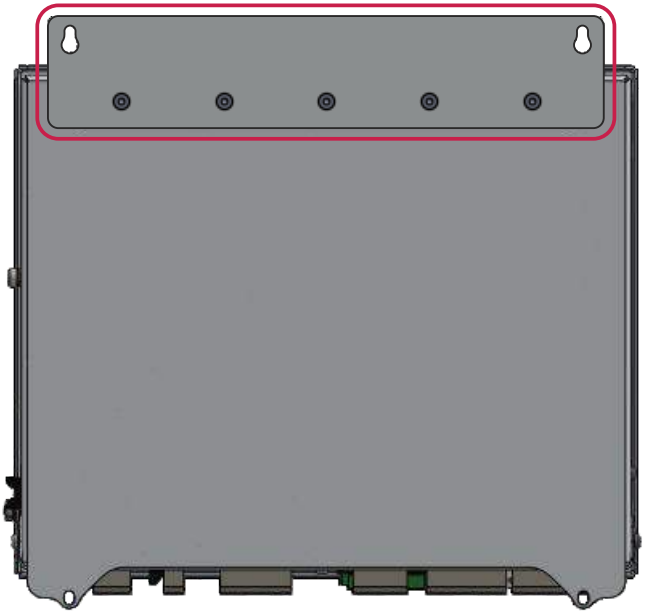
- Panel Mount; using brackets provided.
- DIN Rail bracket is available as part of the 030-2176-01 Kit.

## Panel Mount hole locations

**OPTION A: Top Hook Mount**

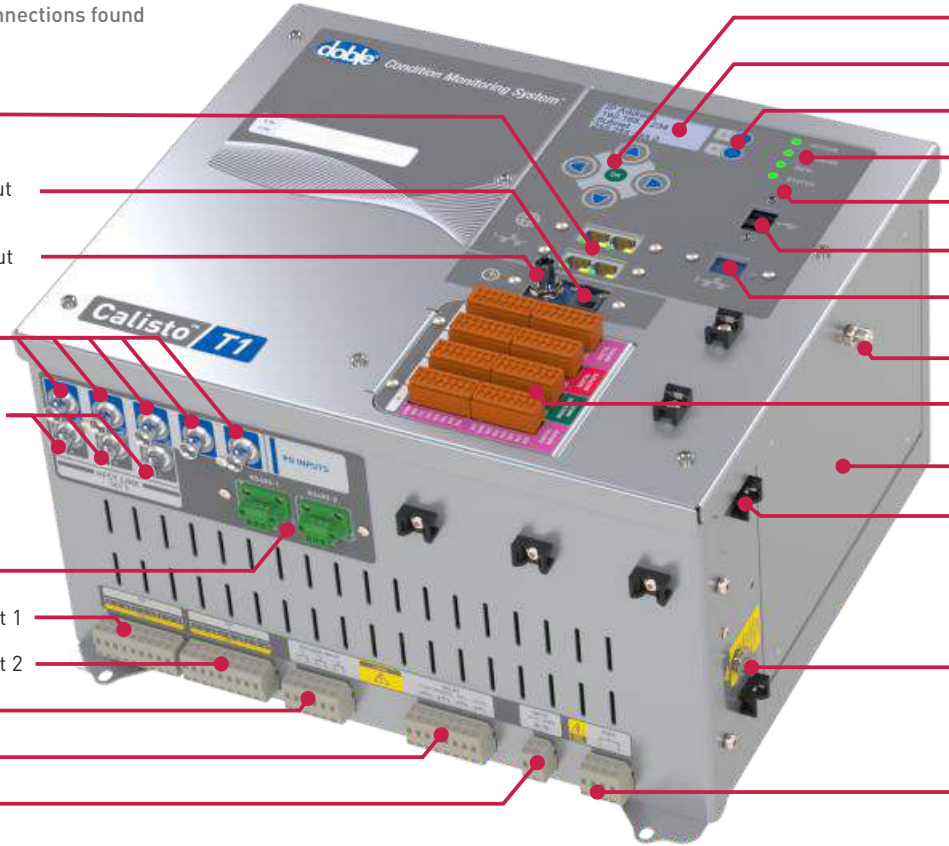


**OPTION B: Screw Mount**



## Identify Connections

Help with identifying the connections found on the Calisto T1.




3 LAN 1

12 **(Optional)** Timing input
1pps fibre

13 **(Optional)** Timing input
IRIB-B BNC Connector

20 **(Optional)** PD Inputs
Channels 4 - 8

19 **(Optional)** HFCT Set 2
Output Channels

5 RS485 x 2

8 **(Optional)** Bushing Set 1

9 **(Optional)** Bushing Set 2

10 **(Optional)** Voltages

2 Relay Output

1 Power supply

14 Keypad

15 LCD display

16 Keypad; menu

7 Indicator LED

18 Reset; Pinhole

6 USB interface

17 **(Optional)** IEC61850 port

24 Captive screw

11 **(Optional)** iO card slots

21 Side flap

22 Cable binding block

23 Earth stud

4 **(Optional)** Sync

## Connection Details:

1. **Power supply:** 24VDC 2A
2. **Relay output:** 4 x relay, 250VAC 5A, switched according to alert conditions detected by Calisto T1 a. ACTION (NC); b. WARNING (NC) c. INFO (NC) d. STATUS (NO)
3. **LAN1:** Quad ethernet switch, access to Calisto user interface (http) and communication protocols (Modbus TCP and DNP3 TCP)
4. **(Optional) Sync Input:** Wire sync to external AC source
5. **RS485:** 2-wire, Modbus Master/Slave or DNP3 Master/Outstation, for communication with supervisory systems or monitoring devices
6. **USB interface:** Firmware update
7. **Indicator LED:** switched according to alert conditions detected by Calisto T1 a. ACTION (flashing red); b. WARNING (flashing yellow) c. INFO (flashing green) d. STATUS (flashing blue)
8. **(Optional) Bushing SET 1:** 3x bushing leakage current measurement
9. **(Optional) Bushing SET 2:** 3x bushing leakage current measurement
10. **(Optional) Voltage:** 3x voltage measurement from instrument tranformers
11. **(Optional) iO card slots:** Add up to 4 card in the slots for: analog inputs, digital inputs, temperature and digital outputs. Select any card configuration.
12. **(Optional) Timing input:** 1pps fibre, from optional Doble GPS timing source
13. **(Optional) Timing input:** IRIG-B BNC connector, from existing station timing system
14. **15. & 16. LCD display and keypad:** Navigate through the system status and configuration on the display
17. **(Optional) IEC61850 port:** To serve connection from IEC61850 clients
19. **(Optional) PD input Channels 4 -8:** Each can be configured for a different type of sensor
20. **(Optional) HFCT SET 2 output A-B-C:** Each output can be linked to a PD input channel. Output A to input 4, output B to input 5 and output C to input 6. Use the short coax leads provided

## iO card installation and upgrade:

The iO Multi-Function Data Recorder is a flexible and network-able device that captures, displays and monitors data from any commonly available sensor or module.

There are four different types of cards available. The cards can be inserted in any available slot when the unit is powered off. Calisto application detects the cards during the boot-up process.

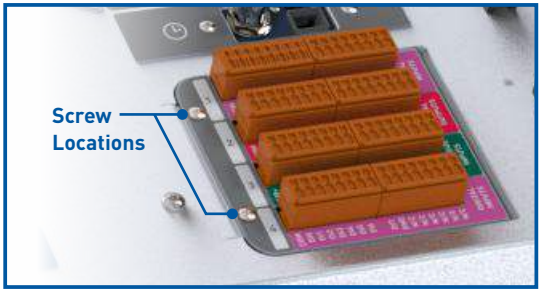
8AI - 8 channel analog input, 4-20 mA (default) or 0-10V. Jumper selectable

4TI - 4 channel temperature input, PT100. 2- or 3-wire connection

8DI – 8 channel digital input, dry or wet contact

8DO - 8 channel digital output, sink type only

The cards are accessible by removing the two screws on the front and the terminals, then lift the front flap.



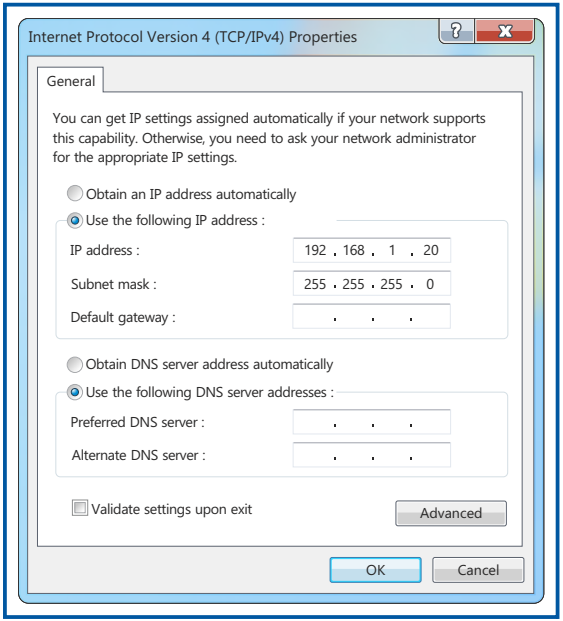
## Default IP Configuration

### Section A: Login Details

You must have this information to log in:

- Calisto IP address - **192.168.1.234**
- Username - **dobleAdmin**
- Password - **dobleAdmin1!**

If you need any of this information, consult your system administrator.




### Section B: Login Procedure

**To log in to Calisto T1:**

1. When the front panel of T1 show blue and green LEDs (see page 6; 7 Indicator LED) the device has finished booting, this normally takes approximately 1 minute, the T1 will now require an additional 30 seconds to start communicating.
2. Connect your computer to T1 using an ethernet cable.
3. Set your computer IP address and subnet to match T1 (see image; left)
4. Open a browser and enter the IP address.
5. Enter your username and password.
6. (Optional) If this is the first time you have logged in, Doble recommends that you change your password immediately **Do not continue to use the password provided by Doble.**
7. Click **Sign In**.

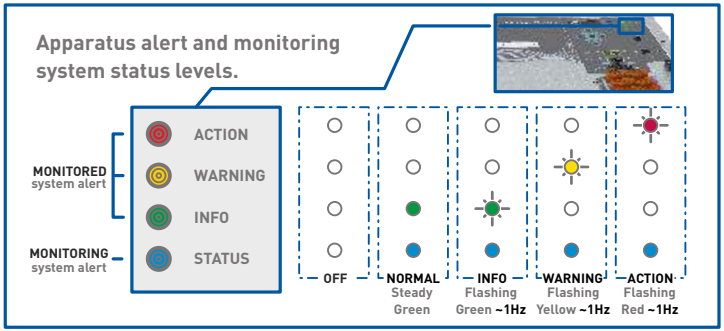
### Section C: Reset Procedure

**Details of procedure:**

1. Perform the IP reset on T1 by inserting and holing a paperclip or similar in the pinhole (see pinhole location on page 6: Identify connections); the LEDs will go out then light up in sequence bottom to top, when all the LEDs start flashing at the same time you can release the paperclip from the pinhole
2. After the paperclip is removed out of the pinhole, T1 will perform a reset itself.
3. Go to section B to continue

## Troubleshooting Indicators

A normal state is indicated by the green and blue indicator LEDs being lit.




### OPERATION:

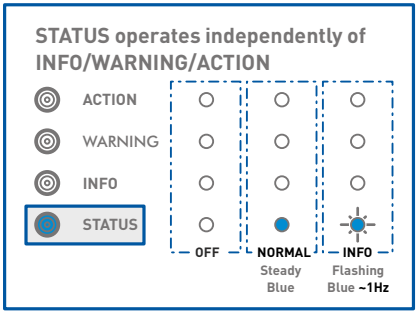
**BLUE -**
Indicates system active

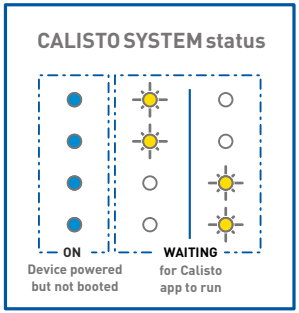
**STEADY GREEN -**
Indicates Normal (healthy) state.

**FLASHING GREEN -**
Indicates transition to INFO.
INFO provides information.

**FLASHING YELLOW -**
Indicates WARNING.
Requires further investigation.

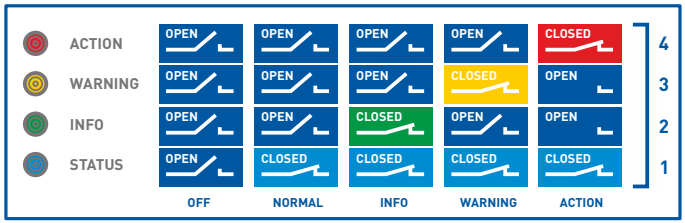
**FLASHING RED -**
Indicates ACTION.
Requires immediate attention!

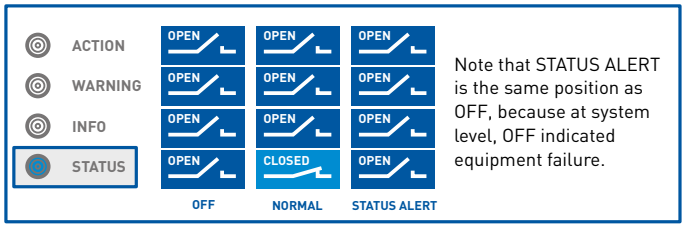


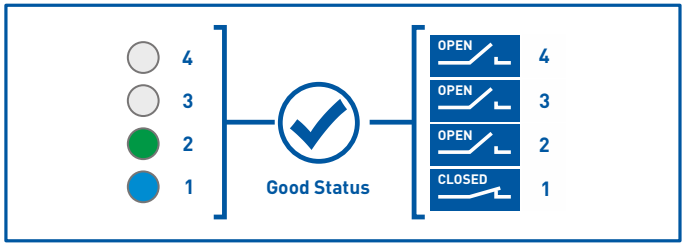

### RELAY:

OPERATION in NORMAL condition:
INFO/WARNING/ACTION - Normally OPEN
STATUS - Normally Closed




Note that STATUS ALERT is the same position as OFF, because at system level, OFF indicated equipment failure.



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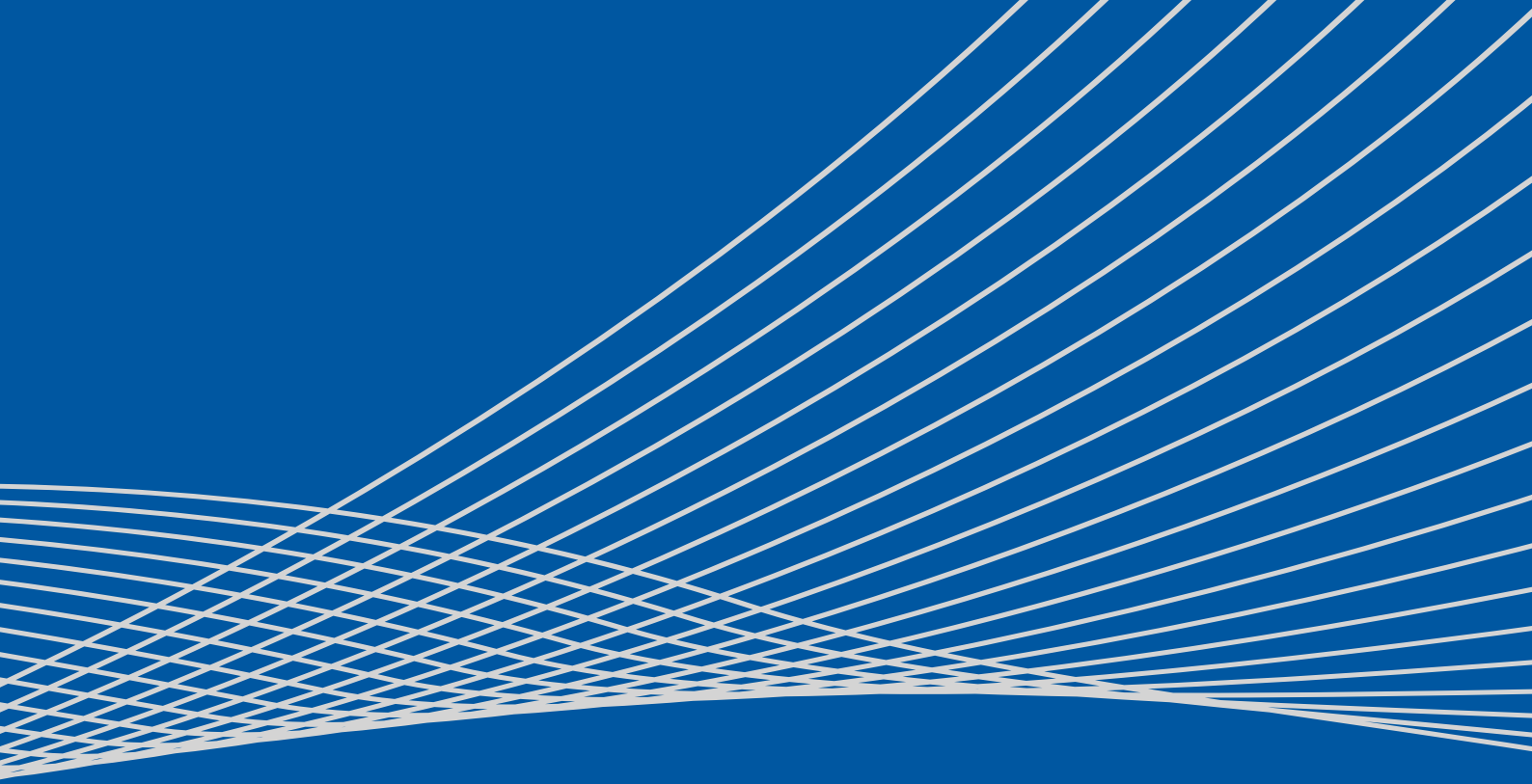

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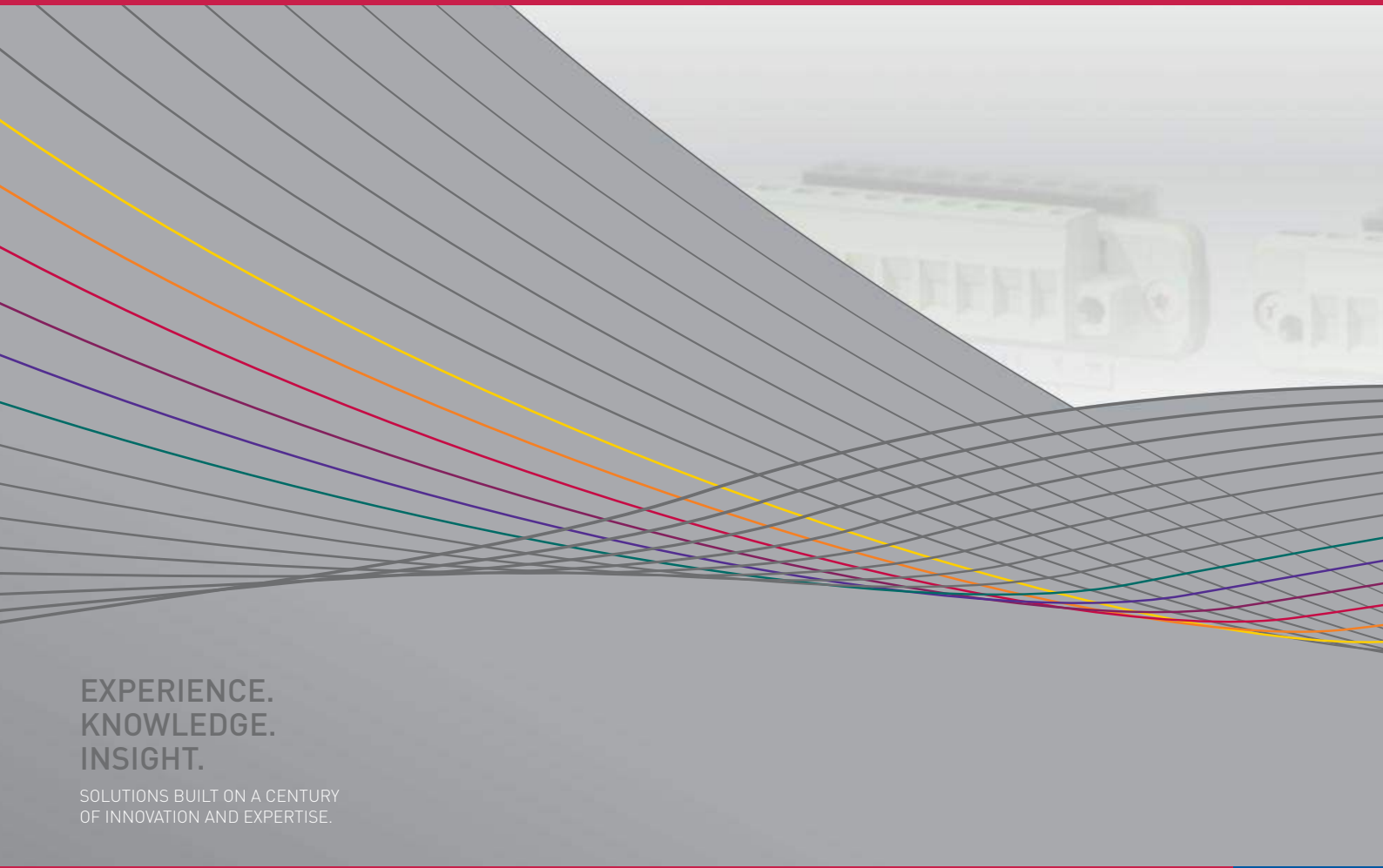

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SOLUTIONS BUILT ON A CENTURY
OF INNOVATION AND EXPERTISE.