Thermoguard

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Thermoguard Relay Interface
Version 2.91

Contents

Part 1

Danger of electrical hazard:
If 230V~ devices are to be switched over the relay contacts, the *Relay Interface* must be mounted inside of a protective housing!

Introduction

The *Thermoguard* Software directly supports the relay switching interface of the company *AK Modul-Bus*. I. e. that there is no need of additional software to control external alarm systems or 230V~ devices. The configuration is performed for each sensor on the *Thermoguard* CAM settings tab.

You can use up to 16 Relay Interface boxes at COM Ports 1..16 (if present and free) each equipped with 8 single relays (closing contact).

Each single *Relay Interface* box is controlled via its own free serial COM port, a suitable cable is included. The Interface provides a turnkey solution for switching external devices or alarm systems.

Application Areas
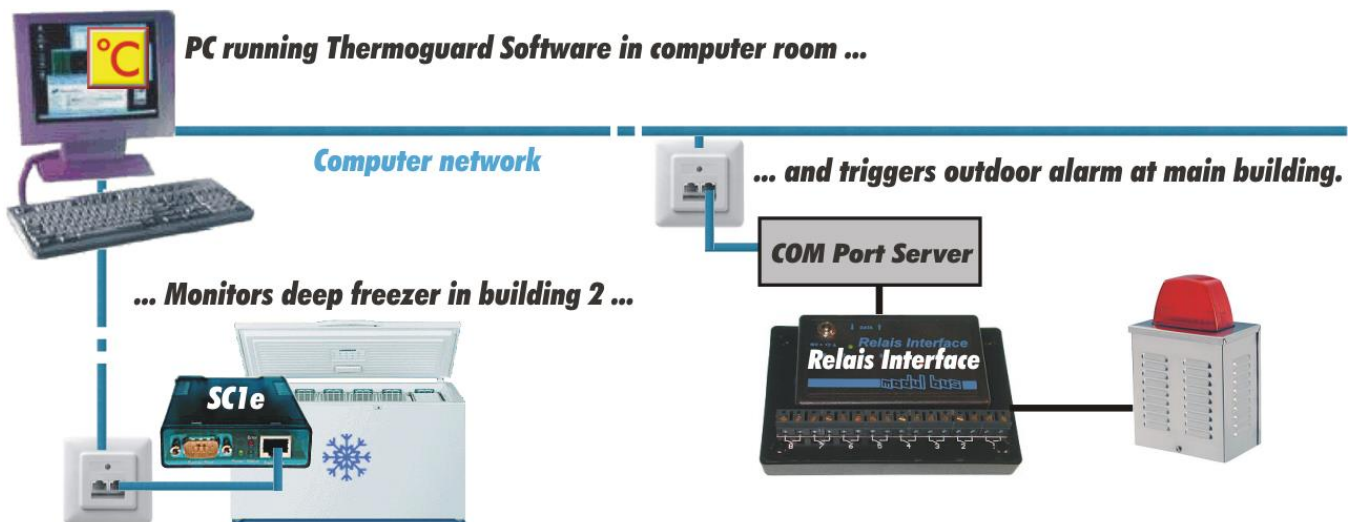
Typical application areas for the *Relay Interface* are:

- Integration of *Thermoguard* in existing (burglary-)alarm- or phone dialer systems: An alarm fired by *Thermoguard* is "forwarded" as a short relay impulse which triggers the external system.
- Switching external alarm devices - for example a 230V~ rotating flashing beacon or a siren: The device will be switched on in case of an alarm; it must be switched off manually (with the utility *TGRelIF*, see below).
- Process control:
  A device (e.g. a fan) is switched on in case of an alarm and switched off if the value is in the "valid" range again.

Serial Interface / Connecting to an USB Port

If there is no free COM port on your computer respectively if it comes with USB ports only, you can simply use an **USB to Serial Converter**.

If the *Relay Interface* shall not be located nearby the *Thermoguard* server anyway (because the devices to be switched are located far away from it too), it can be addressed via a separate COM Port Server:
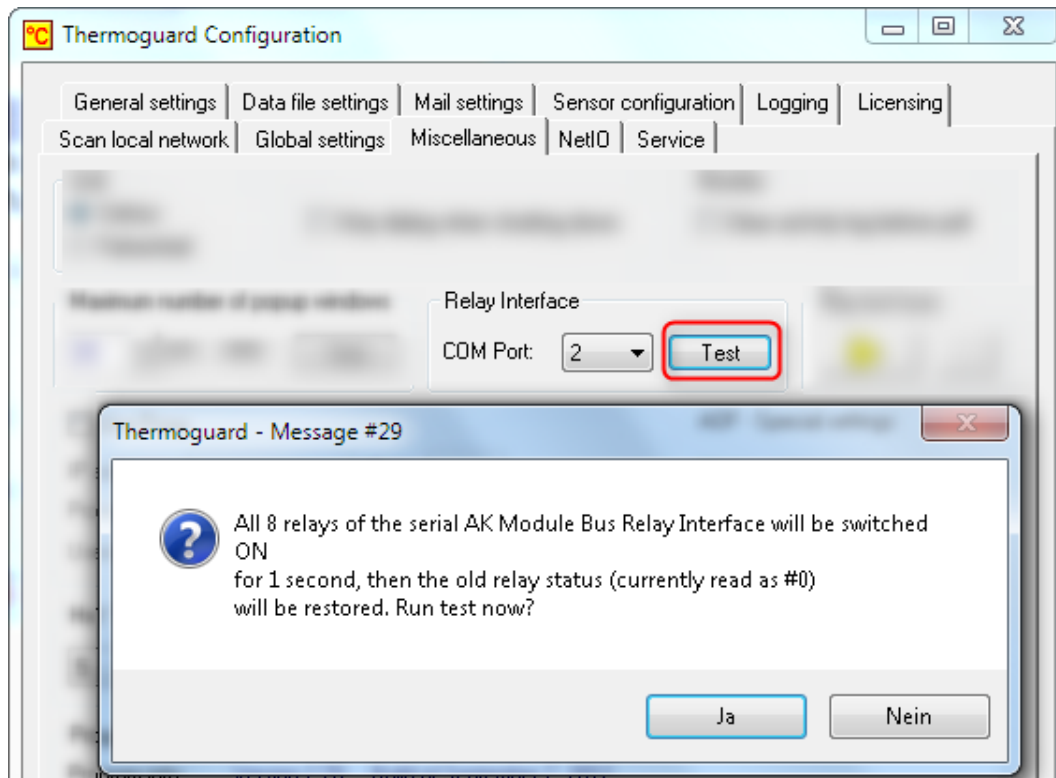
Relay Interface Usage across the Network

There is no need that the Relay Interface must be connected directly to the Thermoguard PC. It is possible to connect and control it via a COM Port Server (further information on request).
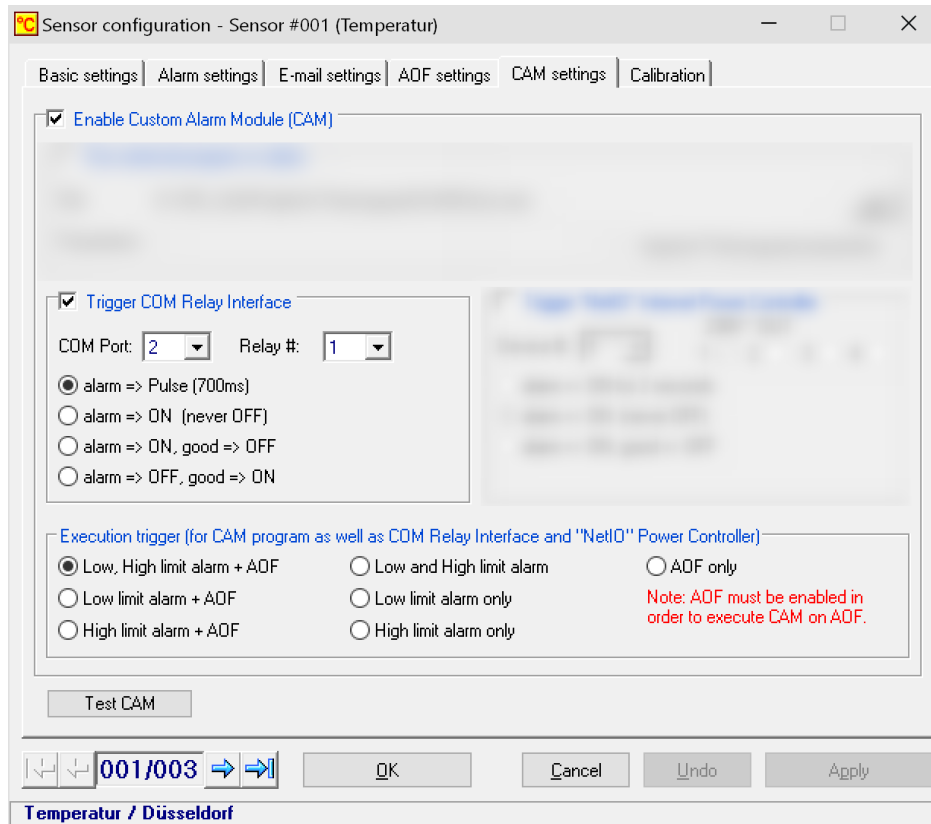
First, please check proper function of the relay interface which is connected to its corresponding COM port on the *Thermoguard Configuration/ Miscellaneous* tab Relay Interface by clicking the "Test" Button:

=>

CAM settings tab in *Sensor configuration*:

For each single(!) *Thermoguard* sensor you can set:

- The COM Port serving the relay interface used for this sensor
- The "*Relay #:*" (1..8) to be used for this sensor. The number is related to the label printed on the housing of *Relay Interface*. Count starts at "8" on the left here and ends at "1", see picture in the Introduction for your reference.
- One of four alarm mode options *"alarm => xxx"*:

  alarm => Short pulse (700ms) see also Appendix "Pulse duration"
    Relay contact is closed an reopened after 0,7 seconds.
  alarm => ON (never OFF)
    If this option is selected, the relays must be released using the *TGRelIF* utility (see next chapter).
  alarm => ON, good => OFF
    On alarm the relay is switched on and switched off again not before the measured value is in the "valid" range again.
  alarm => OFF, good => ON
    On alarm the relay is switched off and switched on again not before the measured value is in the "valid" range again.
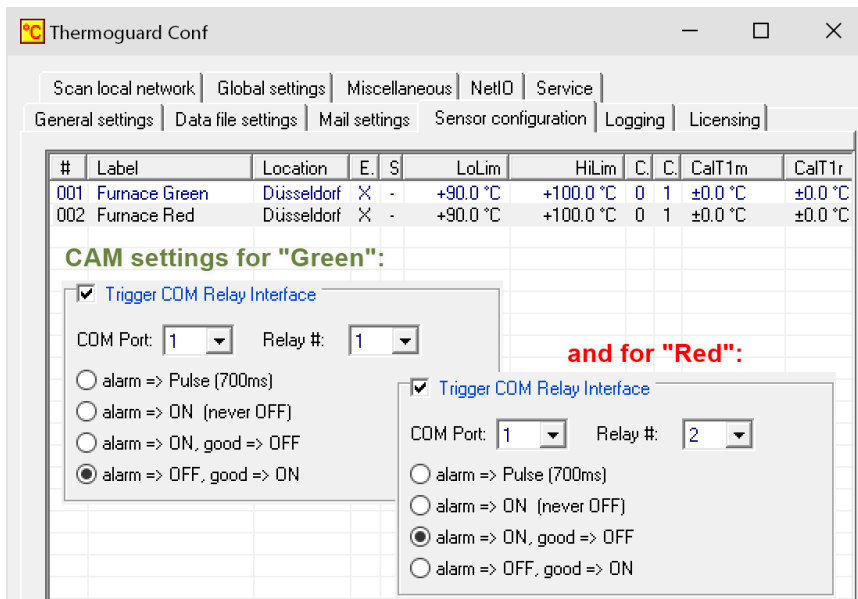
- "Execution trigger ... " option:
  This setting determines for what type of alarm the relay will be switched (Low, High, both, AOF only).

Configuration Example

For monitoring a furnace one green and one red signal lamp are switched via the Relay Interface. The green one indicates a temperature between 90 and 100 °C, the red one lights on if the temperature is outside this range, i.e. either lower 90 or higher 100 °C.

For this scenario two sensor entries are created in the Sensor configuration sensor list both using the same sensor: "Furnace Green " (via Relay #1) und "Furnace Red " (via Relay # 2) Low-Limit is set to 90.0 and High-Limit to 100.0 °C for both sensors.

CAM-Option "alarm => OFF, good => ON" is set for the green and "alarm => ON, good => OFF" for the red lamp:

Now, the scenario can be tested using two simulation text files and the *TGRelIF* utility (see next chapter) without the need to actually setting up the involved hardware components. The two simulation files are identical because both simulate reading values from the very same sensor. Source is set to "Simulation file Temperature".

Contents of files C:\ProgramData\Thermoguard Data\sim\TG_Furnace Green.sim and C:\ProgramData\Thermoguard Data\sim\TG_Furnace Red.sim:

```
[TGSimulation.Values]
1  =80                    => red (green off)
2  =85                    => red
3  =89.9                  => red
4  =90                    => green (red switched off)
5  =90.1                  => green
6  =95                    => green
7  =99.9                  => green
8  =100                   => green
9  =100.1                 => red (green switched off)
10 =110                   => red
11 =101                   => red
12 =100                   => green(red switched off))
13 =90                    => green
14 =89                    => red (green switched off)
15 =restart
```

It is not possible to read the current state (switched or released) of a relay from the Relay Interface. Therefore *Thermoguard* saves the state to the `TGuard.ini` file. For each COM port there is an own section in the `TGuard.ini` file; format:

```
[RelIF_COMPort#0xx] (xx= COM Port-Number 1..16)
RelIFStatus=(Status-Byte 0..255)
RelIFRelais1=(Sorted list of sensors which switched on this relay)
RelIFRelais2= Example: 001,002,011
RelIFRelais3=
RelIFRelais4=
RelIFRelais5=
RelIFRelais6=
RelIFRelais7=
RelIFRelais8=
```
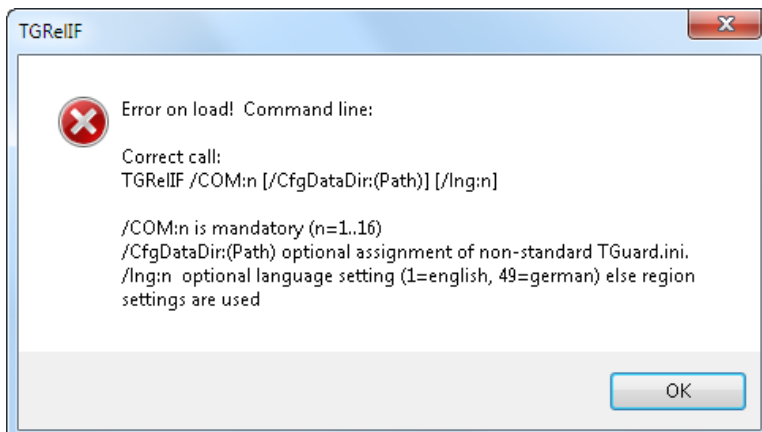
Execute the program via the start menu|Thermoguard folder:
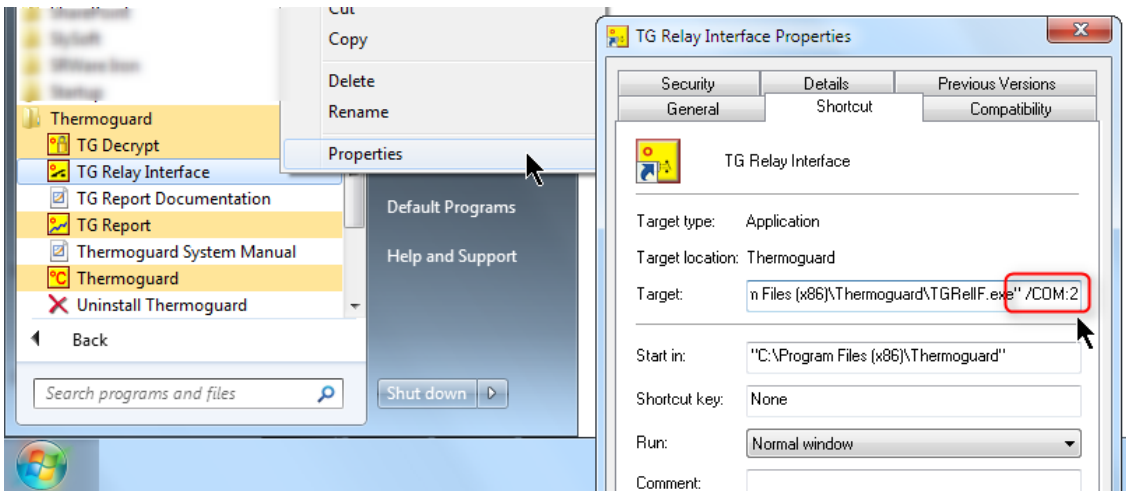

TGRelIF Program Icon

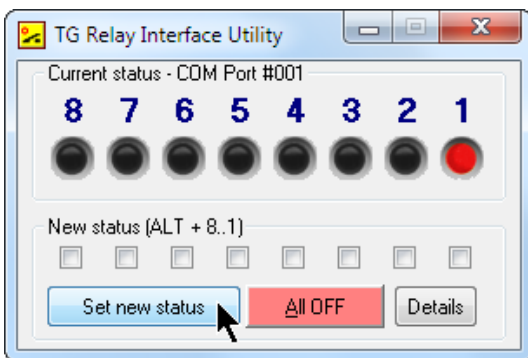***Program execution; by default shortcut uses COM Port 2 (see next page)***

Important: *TgRelIF* requires the COM Port to which it is connected as a mandatory command line switch; Message if it is called without it:

By default the start menu shortcut uses COM Port 2 as command line parameter after installation. Please change the value to your COM Port accordingly, if necessary:
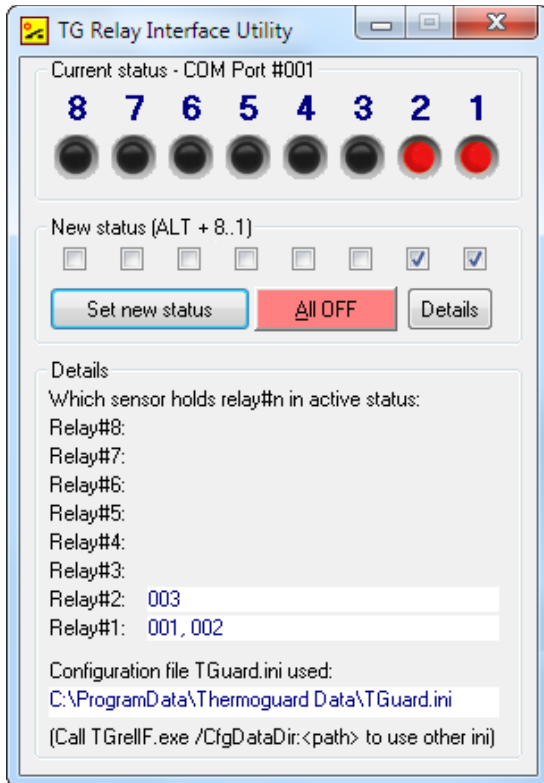

TGRelIF reflects the state of all *Relay Interface* relays and allows to change it manually

Relay #1 has been switched ON by the Thermoguard main program and may be released using the "Set new status" button.

Note: If the *Relay Interface* experiences a power disruption, all relays are released on repower. In this case the "all off" state must be synchronized with *TGRelIF* manually.

Details:

Clicking "Details" expands the window.

Within the bottom frame the `TGuard.ini` path used is displayed (the mouse tool tip reveals the complete path in case it is abbreviated).

A different ini file can be specified with command line switch `/CfgDataDir:[Directory]`.
Default is
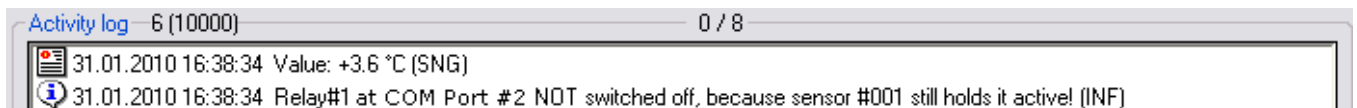`%ALLUSERSPROFILE%\Thermoguard Data`

Within the frame "Details" under *Which sensor holds relay#n in active status:* a list for each of the eight relays is displayed showing which sensors did switch on the respective relay. This list reflects the corresponding entries in the `TGuard.ini` file.
These entries are set by the *Thermoguard* main program. In case a list should not fit into its white display field, the mouse tool tip reveals up to 51 sensors (first 255 characters).
But you may set the cursor into the field and scroll through the list by pressing `Ctrl` + `→`.

So what purpose serve these sensor list? In the above example sensor #001 as well as sensor #002 both switched ON relay #1. *Both* sensors were assigned to relay #1 in their CAM options and configured to use mode "alarm => ON, good => OFF". On alarm, sensor #001 switches relay #1 ON; "001" is written to file `TGuard.ini`.
The same relay #1 (maybe switching a beacon light) is now "switched ON" (well, the relay is still ON) by sensor #002. If later the measured value polled from sensor #002 falls into the "green" range again, relay #1 would be switched OFF by sensor #002. Now *Thermoguard* recognizes that sensor #001 (still in "red" condition) is keeping relay #1 in ON status and does *not* switch OFF the relay. However, "002" is removed from the relay's #1 sensor list and an appropriate log message is written:

Activity log — 6 (10000)   0 / 8
31.01.2010 16:38:34 Value: +3.6 °C (SNG)
31.01.2010 16:38:34 Relay#1 at COM Port #2 NOT switched off, because sensor #001 still holds it active! (INF)

A relay will only be switched OFF, if its sensorlist entry is empty or the sensor #nnn itself is the only one in the list.

Note: "Set new status" clears the sensorlist of a relay if its new status is OFF.
If any configuration changes are executed via the *Thermoguard* main program and at least one sensorlist entry exists, all entries will be cleared in order to prevent any "orphaned" active status entries. An appropriate message box pops up in this case.
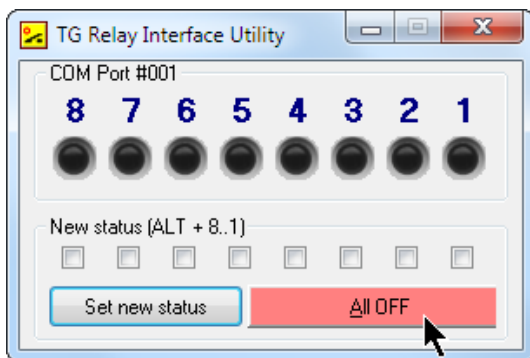
"Emergency Stop Button":
Clicking the "All OFF" button releases all relays immediately.
This is the same as unchecking all 8 checkboxes first and then clicking "Set new state".
The "Emergency Stop Button" is especially useful in the "iniless" operation mode described next:

Operation without *Thermoguard* (without TGuard.ini file):
If *TGRelIF* does not find any TGuard.ini file on the system where started, it opens up in "iniless mode":

In this mode the "Details" button is not available. Due to lacking access to TGuard.ini the utility can not reflect the actual status of the 8 relays.
In "iniless mode" you are only able to set a new status for each of the 8 relays. Normally this mode will be used for the purpose of an "Emergency Stop Switch":
Using *TGRelIF* on any PC without a *Thermoguard* Installation allows the PCs user to shutdown relays quickly - e.g. to stop a beacon light from flashing or to silence a loud alarm siren.

You may run *TGRelIF* on a PC *with* a *Thermoguard* Installation anyway in "iniless mode" despite an existing TGuard.ini if you like: Just execute it using the /CfgDataDir:<Path> parameter with an invalid path for <Path>, e.g. TGRelIF /CfgDataDir:xxx

Appendix: Pulse duration

If the default value 700ms of the pulse duration option is not suitable for your application, you can set the duration for each sensor individually (>=500ms).

See "`TG System Manual-en.pdf`" under
"Additional sensor settings customization using the Sensor description field" =>
`##RelayPulse=<value in ms>`

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