Features

- Insulated control of three different AC switches used to drive AC loads up to 1 kW (230 Vrms) for residential appliances
- Interface with STM32 Nucleo-64 development board
- Three control modes available thanks to STM32 Nucleo-64 firmware (continuous or pulse gate current, timer option and phase control)
- Easy to configure through user-friendly interface
- Compatible with any external microcontroller
- Input voltage range: 90 VAC to 265 VAC 50 / 60 Hz
- Operating temperature: 0 °C to 60 °C
- 5 V and 3.3 V insulated power supply
- Low standby power losses (< 300 mW)
- Criteria A @ 2 kV IEC 61000-4-4
- Criteria B @ 4 kV IEC 61000-4-4
- RoHS compliant

Description

The STEVAL-GLA001V1 evaluation board allows insulated control of three AC loads up to 1 kW (230 Vrms) with Triacs and AC switches (instead of relay solutions), particularly suitable for residential appliances.

The board must be controlled with an STM32 microcontroller embedded on an NUCLEO-F030R8 STM 32 Nucleo development board, or other microcontroller supplied by the user.

If you are using an STM32 Nucleo development board, three AC switch control modes are available for load control: continuous or pulse gate current, timer option and phase control. The STSW-GLA001V1 firmware is available for free download and easily programmable through a PC interface on a USB bus. The main parameters can be adjusted through a common interface like HyperTerminal, without needing to edit the MCU firmware.

The hardware is designed to offer a wide input voltage range, low standby power losses, IEC61000-4-4 robustness and two low voltage power supplies.

<table>
<thead>
<tr>
<th>Product summary</th>
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<tbody>
<tr>
<td>Insulated AC switch control evaluation board for home appliances</td>
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<tr>
<td>AC switch control evaluation firmware</td>
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<tr>
<td>Overvoltage protected AC switch (ACS™)</td>
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<tr>
<td>Overvoltage protected AC switch</td>
</tr>
<tr>
<td>16 A Snubberless Triac</td>
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</tbody>
</table>
1 Block diagram

Figure 2. STEVAL-GLA001V1 block diagram

- **90 - 265V AC Mains**
- **Protection**
- **AC switches**
- **Gate control**
- **Load**
- **Power management**
- **User interface**
- **Isolation**

STEVAL-GLA001V1

STM32 NUCLEO development platform
Figure 3. STEVAL-GLA001V1 - AC input

- N_inp
- L_inp
- TP100
- F100
- FUSE 10A/250V
- SW100
- SW KEY-SPST/10A
- C108 68nF/275Vac/X2
- C109 10nF/275Vac/X2
- R121 2.3k/0.5W
- D101 1N4007
- D102 3.3k/0.5W
- D103 BZX79C2V4
- J100 conn_3pts

N
L

DB3422
- Rev 2

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Figure 4. STEVAL-GLA001V1 - ZVS detection
Figure 5. STEVAL-GLA001V1 - Triac gate control

- GND_AC
- VCC_AC
- TP115, G1I
- TP109, G2I
- TP106, G3I
- U103, TLP187
- U102, TLP187
- U101, TLP187
- Q100, SMBTA42
- R112, 1k
- R113, 10nF
- C103, 1k
- C104, 10nF
- R116, 4.7k
- R106, 374 / 0.5W
- R107, 374 / 0.5W
- C102, 10nF
- R108, 1k
- R103, 560 / 0.5W
- R104, 560 / 0.5W
- C101, 10nF
- TP117, GND
- TP114, G1
- TP110, G2
- TP117, GND
- TP114, G1
- TP110, G2
- TP117, GND
Figure 6. STEVAL-GLA001V1 - Triac and ACS connections

Figure 7. STEVAL-GLA001V1 - Power supply
Figure 8. STEVAL-GLA001V1 - LED indicators

Figure 9. STEVAL-GLA001V1 - Command and parameter push buttons
Figure 10. STEVAL-GLA001V1 - Mode selector switch

Figure 11. STEVAL-GLA001V1 - Customer board connector
Figure 12. 34-Pin ST board connector
## Revision history

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Changes</th>
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<tr>
<td>15-Nov-2017</td>
<td>1</td>
<td>Initial release.</td>
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<tr>
<td>19-Feb-2019</td>
<td>2</td>
<td>Updated title&lt;br&gt;Added Section Product Summary Table&lt;br&gt;Added Section 1 Block diagram&lt;br&gt;Text and formatting changes throughout document</td>
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