Sense the power of light

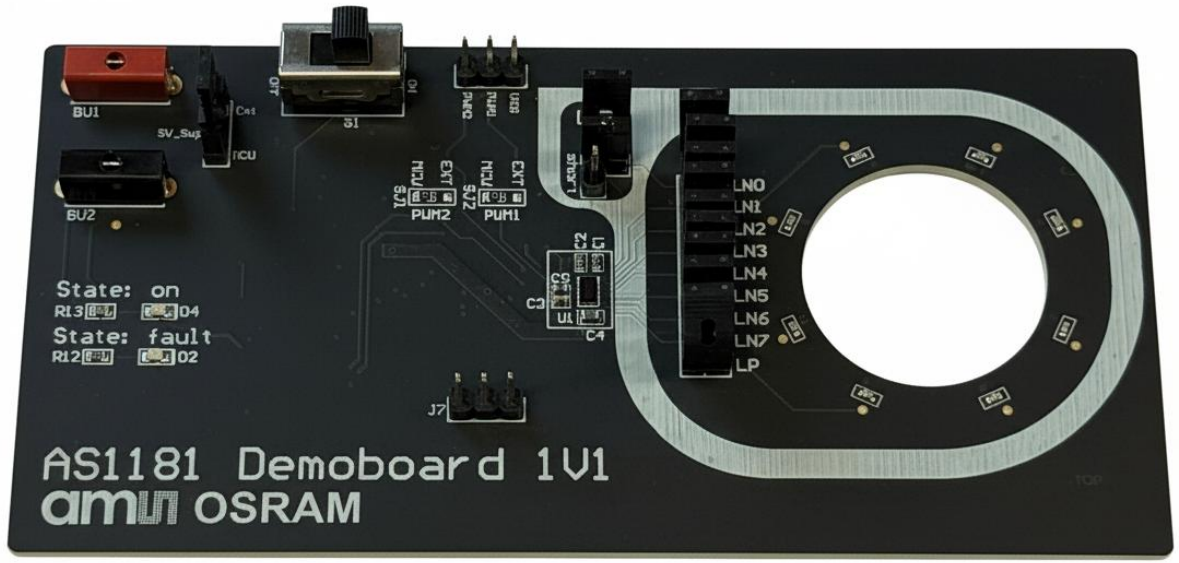
AS1181 EVK Quick Start Guide

Hardware and GUI-SW Description

QG001053 • v1-00 • 2025-Oct-17

AS1181 Demoboard 1V1

How to get started?



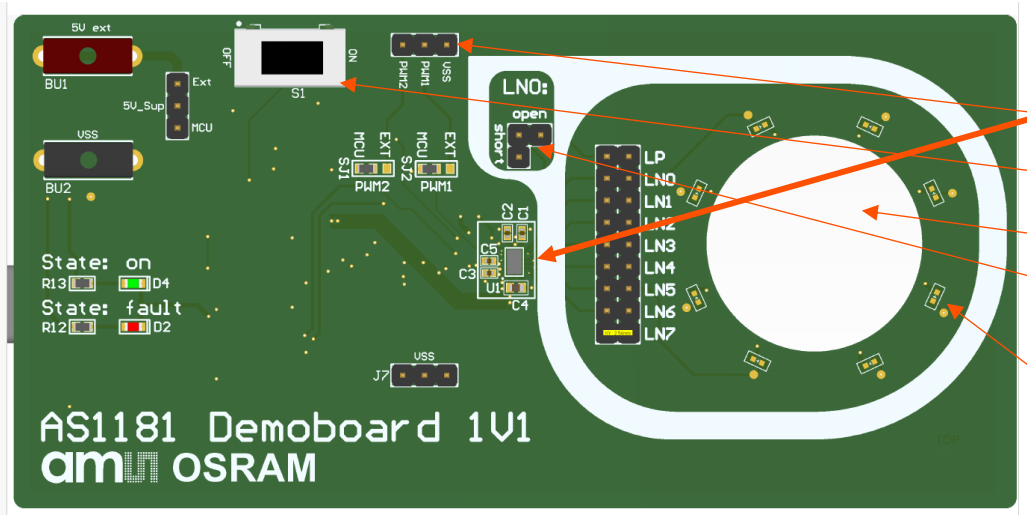
The main purpose of this Hardware is to provide customers an evaluation platform of AS1181.

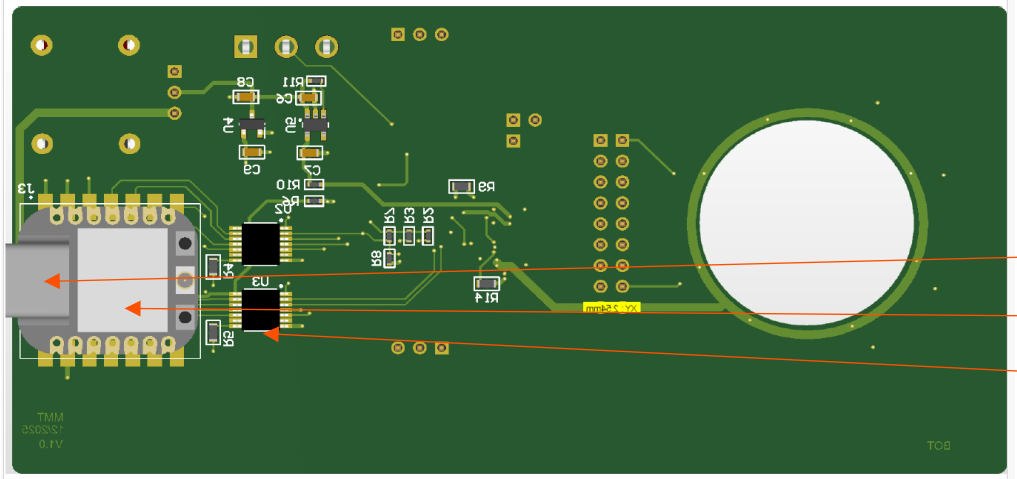
This platform includes a simple PC GUI software to allow configuration of the device and test different modes.

On the backside of the PCB a “seeed studio ESP32” MCU is placed to act as bridge between USB and I²C/I3C of AS1181.

AS1181 Demoboard 1V1

Hardware Description TOP & BOT side





TOP Side:

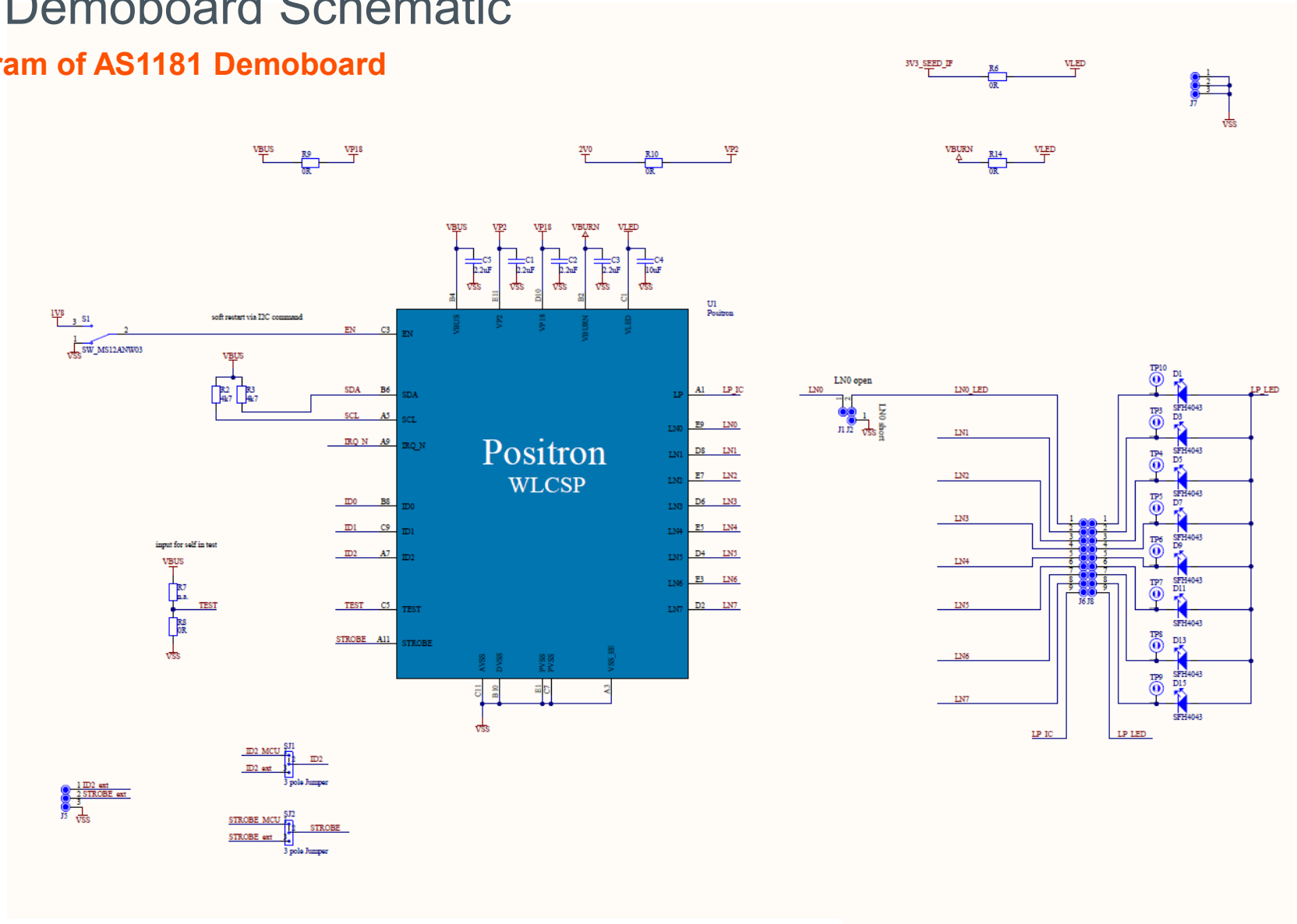
- U1 **AS1181**: 8-channel AR & VR LED Driver
- Connector for external Trigger/PWM Signals
- S1: ON/OFF Switch
- External camera mounting hole
- Force Fault Jumper: OPEN & SHORT LED simulation channel 0
  - OPEN channel 0 = Remove jumper
  - SHORT channel 0 = Set jumper
- 8 x SFH 4043 (940nm) LEDs
- BU1 & BU2: External 5V supply for lab usage (optional)
- Status LEDs: D4 = ON & D2 = FAULT

BOT Side:

- USB Type C connector
- “seeed studio” ESP32 MCU
- Level shifter

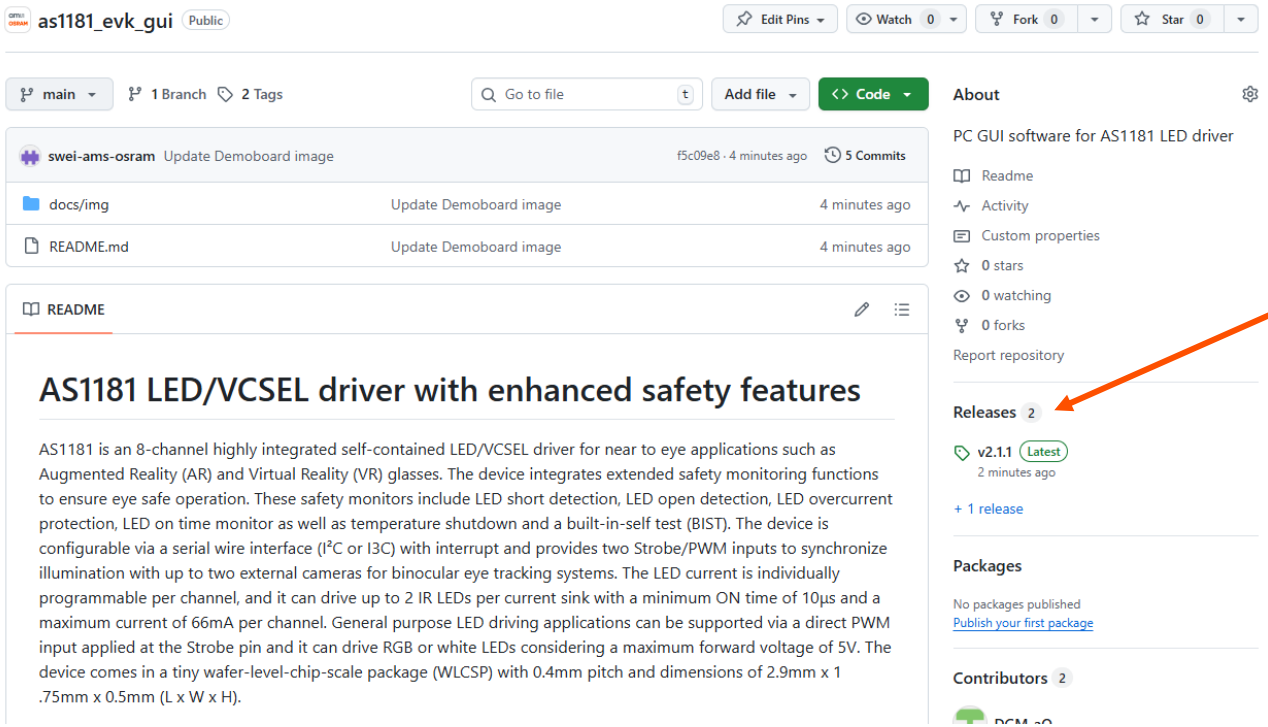
AS1181 Demoboard Schematic

Circuit Diagram of AS1181 Demoboard



Download latest AS1181 PC GUI Software from github

github.com/ams-OSRAM/as1181_evk_gui



as1181_evk_gui repository:

- Download latest GUI software release

AS1181 GUI Software Description

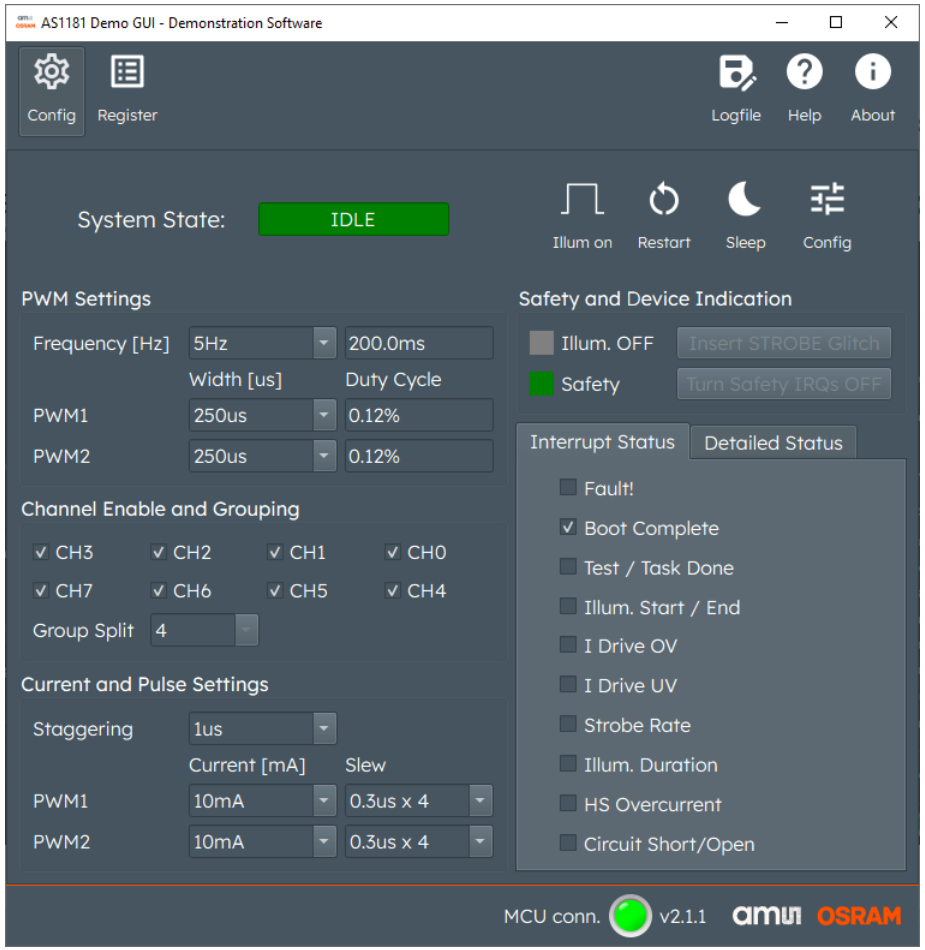
Launch AS1181 demo app from downloaded software container & connect USB-Type C cable to provided connector

S1 = OFF:

D4 = OFF & System State = device NACK

S1 = ON:

D4 = ON, System State = IDLE, IRQ Boot Complete is set



System States of AS1181

IDLE, CONFIG and SLEEP Mode

After power on reset AS1181 powers up in IDLE mode.

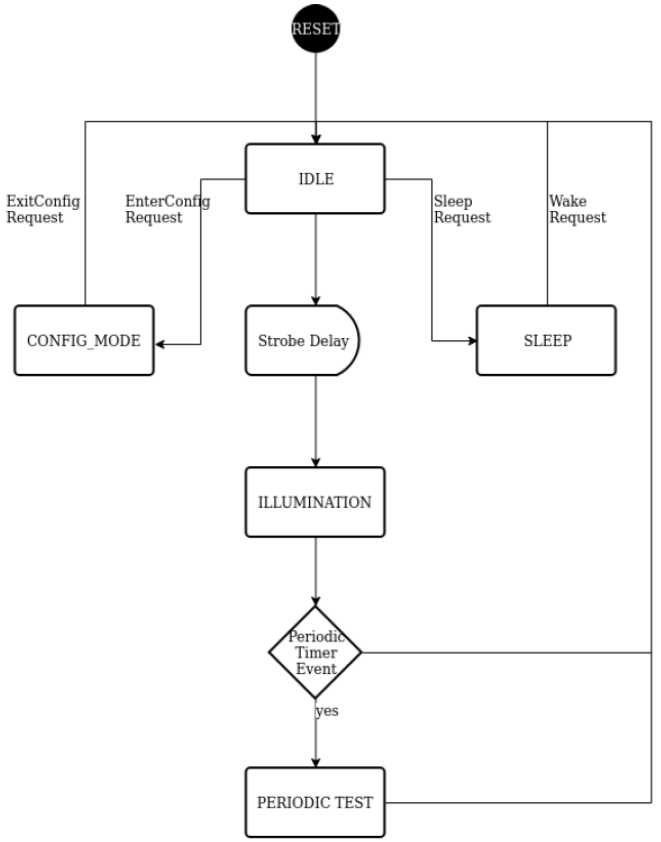
From IDLE it is possible to access “SLEEP” or “CONFIG” mode by clicking the respective buttons in the GUI.

SLEEP: E.g., power saving mode

CONFIG: E.g.: To configure the device (Change LED current, Turn on/OFF IRQs)

Note: **ILLUMINATION** can only be started from IDLE state.

Before pressing “Illum ON” Config or Sleep mode needs to be left by clicking on it again.



Basic State Diagram

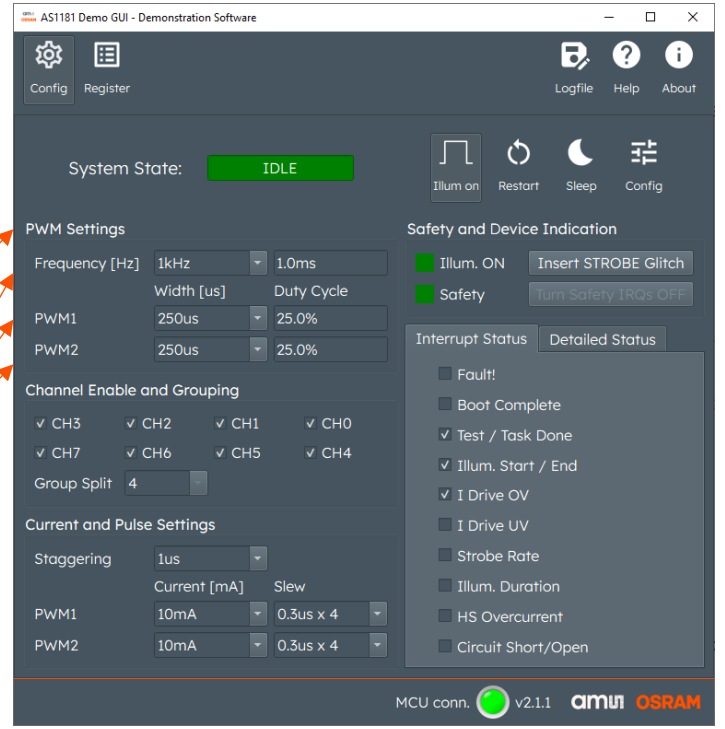
Turning on Illumination

Note: IR LEDs assembled on Demoboard are not visible for human eye. Pictures below taken with camera.

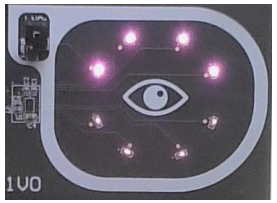
AS1181 has several modes to trigger illumination:

- Illumination time set and controlled by AS1181 and triggered via external strobe
- 1 PWM input for all channels
- 2 PWM inputs for configurable group of channels
- AS1181 Demoboard is pre-configured for 2 PWM inputs
  - ESP32 is generating PWM signals according to the “PWM Settings Tab”
  - User can configure Frequency and Duty Cycle of both PWM signals
- Depending on the “Group Split” configuration the PWM inputs are assigned to different channels. e.g.:
  - Group Split 4 = PWM 1 for CH0-3 and PWM 2 for CH4-CH7
  - Group Split 2 = PWM 1 for CH0-1 and PWM 2 for CH2-CH7

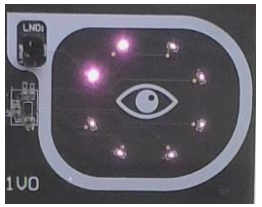
Note: If the PWM ON Time is programmed longer than the internal Illumination duration monitor (TD_ILLUM_MAX register). AS1181 will detect a fault and notify user.



Group Split 4



Group Split 2

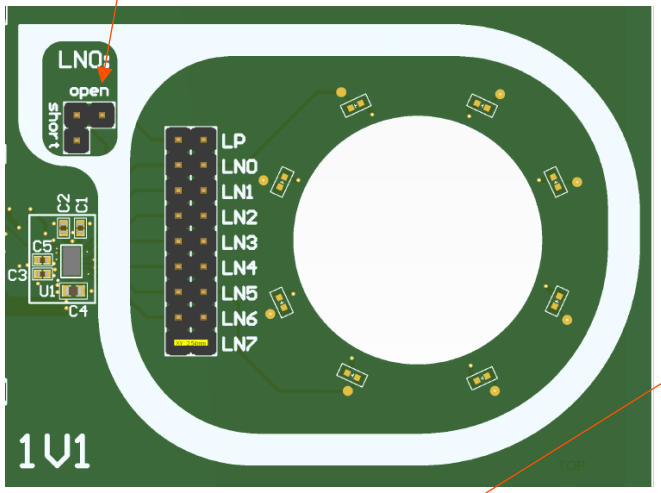


Different PWM settings per Group

Force Error Detection

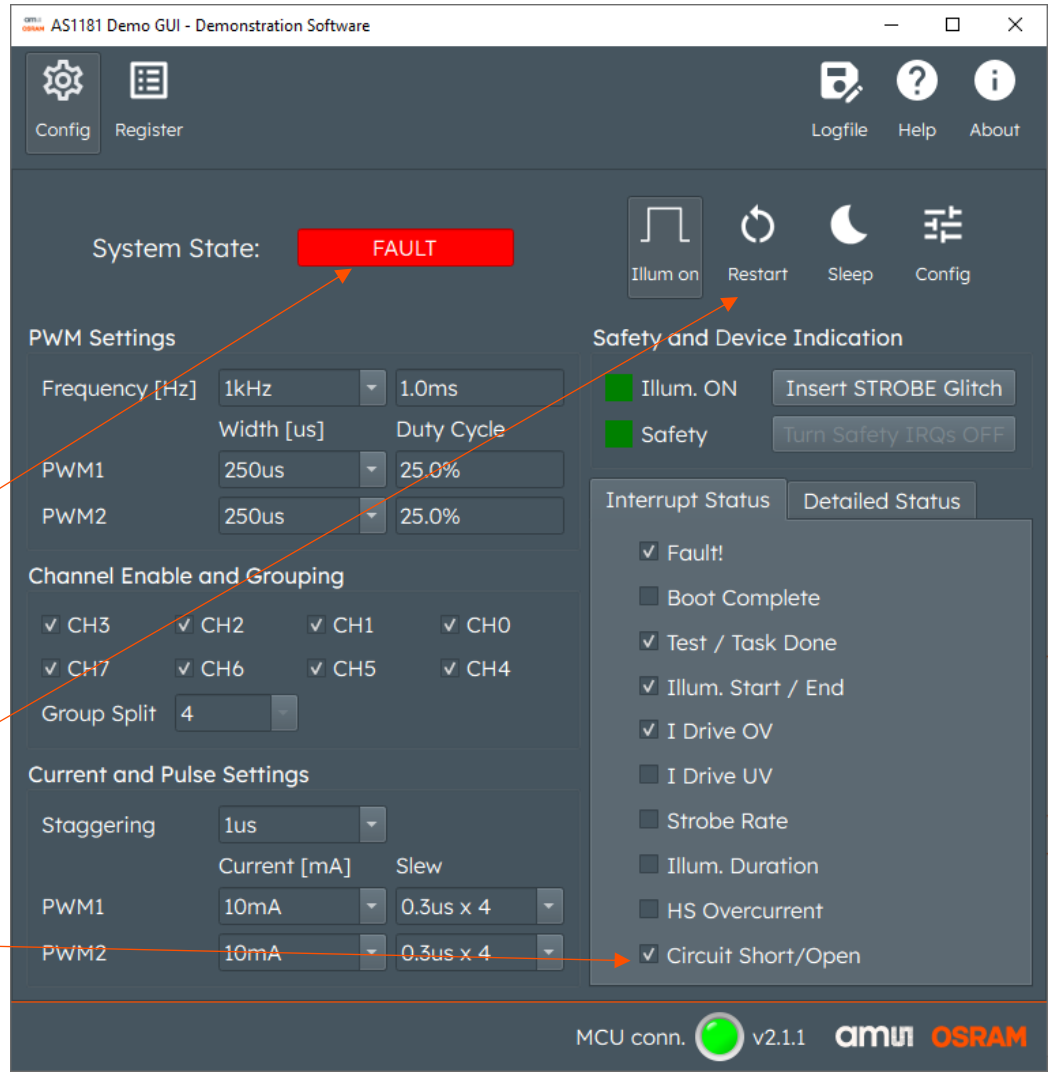
Simulate LED Error

AS1181 provides several safety checks. Some can be simulated by removing Jumper “OPEN” below or setting Jumper “SHORT”. This simulates OPEN or SHORTED LED on channel 0.



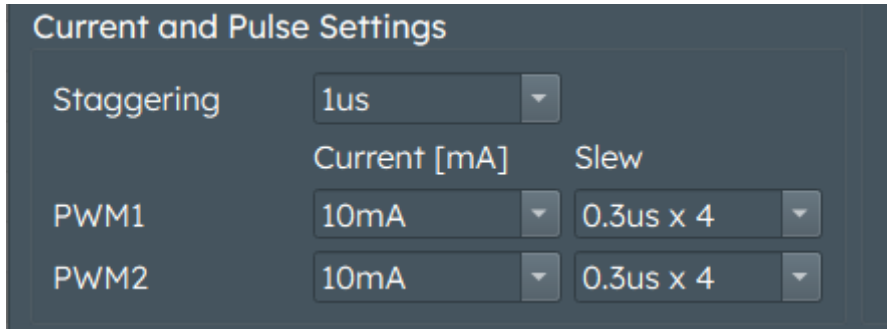
As soon as the Jumper is removed during active ILLUMINATION or before power-on-reset the System State is changing to “FAULT”, D2 illuminates “RED” and respective Interrupts are set.

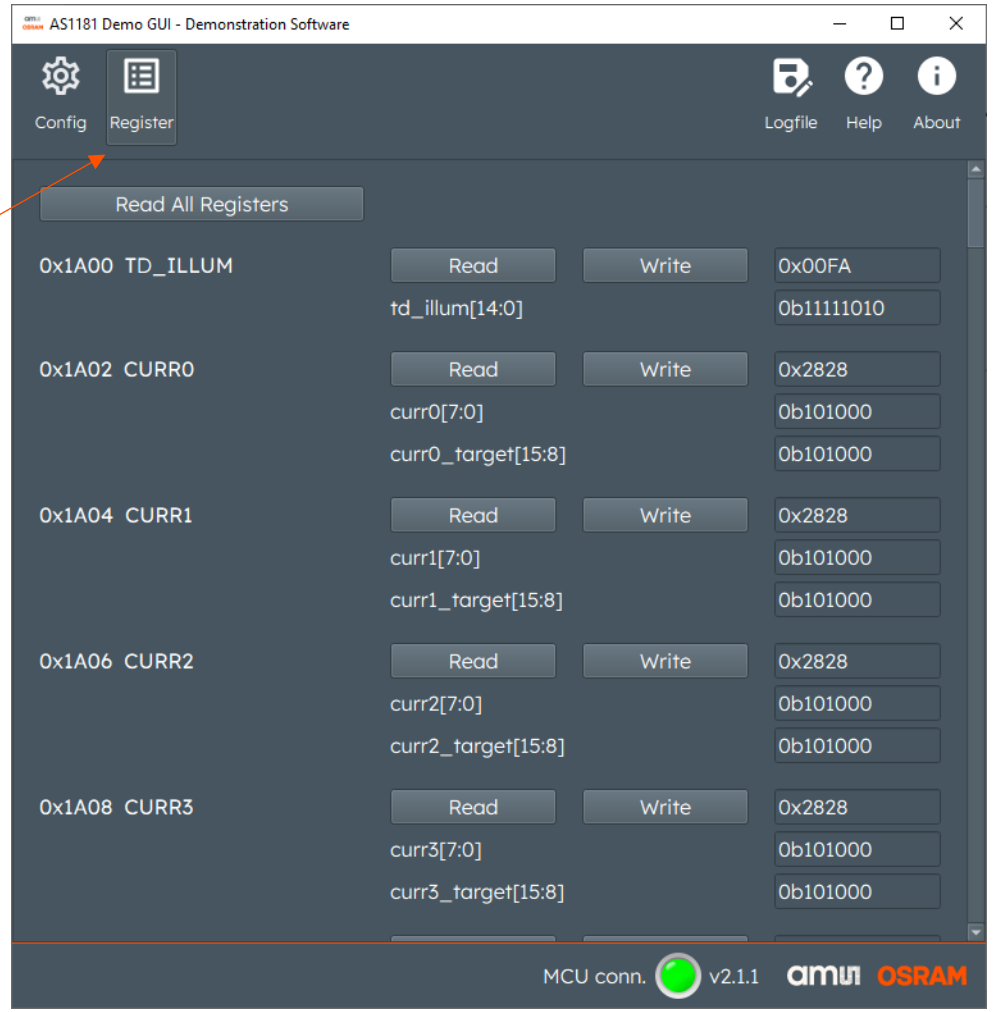
To clear the “FAULT” – “FAULT” needs to be removed, and “Restart” needs to be pressed.



Other Configuration possibilities with the GUI Software

- In CONFIG Mode it is also possible to configure “Staggering”: This is a configurable delay [µs] from channel to channel (TD_STAGGER)
- For very short LED pulses also the Slew Rate of the current sources can be configured. Slew Rate is defined with step time [µs] x number of steps.
- For advanced use all registers of AS1181 can be accessed via the “Register” Tab.
- Please refer to the AS1181 Datasheet for all configuration possibilities





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