SIMARINE ST107

Digital tank module

USERS MANUAL

Revision 1.0

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1   Introduction

Simarine's ST107 Digital tank module is a highly versatile module. Its main purpose is to measure any liquid level. But it can be used to measure voltage, current or temperature.

ST107 Digital tank module can measure liquid level such as water, waste water, fuel or any other liquid. It comes with 4 integrated resistance sensing inputs operating from 0 ohm - 65 kohm and 3 integrated voltage sensing inputs, operating from 0 V - 35 V DC. You can connect any tank or temperature sensor operating in this range.

ST107 also features a configurable alarm contact, which fires on specific alarms. It can handle max. current 1A on max. 30 V DC. The alarm is configurable via PICO's menu.

2   Safety

Installation of Simarine electronics should be made by electrical specialists with proper safety equipment. When working with batteries you should wear protective clothing and eye protection.

CAUTION: Batteries contain acid, a corrosive, colorless liquid that will burn your eyes, skin and clothing. Should the acid come in contact with eyes, skin or clothing, wash it immediately with soap under fresh water for at least 15 minutes, and seek medical support immediately.

CAUTION: Do NOT connect anything to a damaged battery. It could heat up, catch fire or explode.

CAUTION: Lead-acid Batteries can generate explosive gases during operation. Never smoke, allow flames or sparks near the battery. Make sure to keep sufficient ventilation around the battery.

CAUTION: When working with a battery remove all personal metal items like watches, rings, necklaces and bracelets. Metal items in contact with the battery terminals might cause a short circuit with a very high electric current, which may heat up and melt nearby objects and cause severe burns.

3   Overview
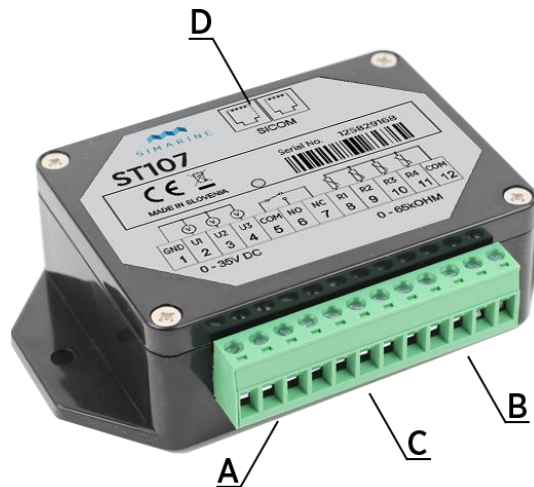
Picture 1 ST107 overview

A – 4x resistance sensing input   C – 1x alarm contact (optional and configurable via PICO menu)
B – 3x voltage sensing input   D – 2x SiCOM port

4   Installation

4.1   Mounting

CAUTION: install the tank module in a clean dry place, protected from accidental spilling of liquids.
- You can fix the tank module with the supplied screws using two holes on both sides of the module.
- Connect all cables (see section 4.3 Connecting).

4.2   Cables

4.2.1   SiCOM data cable

For the SiCOM connection use the supplied cable. If not possible, use the following table to determinate the right cable type.

Cable length	Cable type
< 5m	No limitations
>= 5m	2x2x0.25 mm2 Twisted pair (recommended)

4.3   Connecting

For proper function of Simarine's ST107 digital tank module it is necessary to take the following steps:

1. Connect ST107 Digital Tank module to Simarine's PICO via the SiCOM port.
2. Connect any compatible tank or temperature sensors to ST107 via the resistance or voltage sensing input. *
3. Connect the alarm contact to execute specific operation on an alarm. **

* Each connected liquid or temperature sensor needs to be configured and calibrated. This is done via PICO in an easy way. The configuration and calibration process is described in PICO's manual.

** To fire the alarm contact it is necessary to configure it via PICO in an easy way. The configuration process is described in PICO's manual.
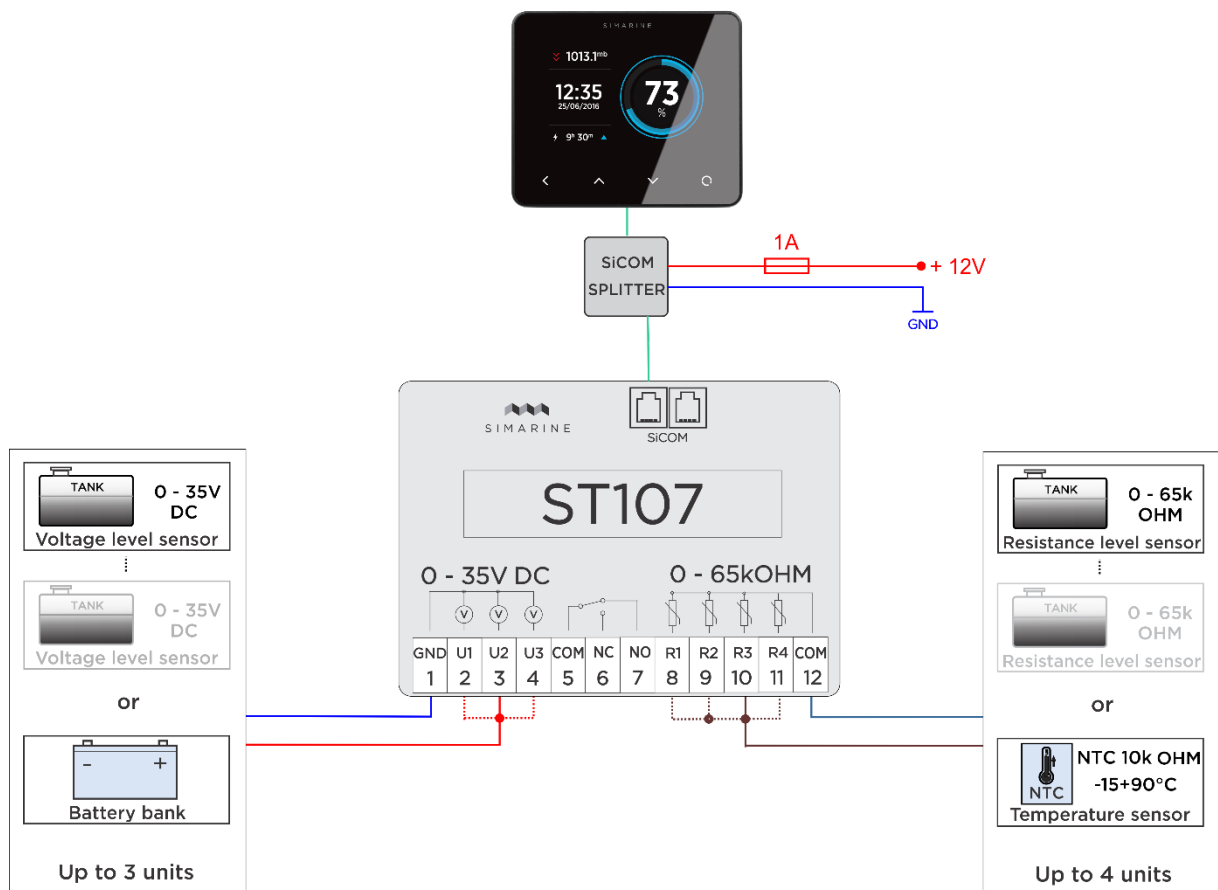
4.4   Wiring diagram

Note:
——— +
——— -
——— data
——— resist./temp. +
——— resist./temp. -
------------ alternative

Picture 2 ST107 wiring diagram

5   Technical specifications

Operating	
Voltage range	6 - 35 V
Temperature range	-20 – 70 °C (-4 – 158 °F)
Power consumption at 12 V	
Operating	2.5 mA
Voltage inputs	3
Range	0 – 35 V
Resolution	1 mV
Accuracy	± 0.2 %
Sampling rate	10 ms
Resistance inputs	4
Range	10 ohm – 65 kohm
Accuracy	± 0.1%
Sampling rate	10 ms
Dimensions	112x72x31 mm
Connectivity	**Up to**
Tank level sensors*	7
Temperature sensors**	4
SICOM port	2
Alarm contact	1

Table 1Technical specifications

* Maximal number of connected tank sensors to one ST107 digital tank module. This includes 4 resistance and 3 voltage sensing inputs, which excludes connecting any temperature sensor.

** Maximal number of connected temperature sensors to one ST107 digital tank module, which excludes connecting any tank sensor

6   Trouble shooting

6.1   Tank sensor is not visible on PICO

If the tank sensor is not visible in PICO's menu, check the following:

- Is the ST107 properly connected via the SiCOM port to the PICO.
- If you are using your own SiCOM cable make sure you are using the right one. See 4.2.1 SiCOM data cable.

6.2   Tank sensor is showing the same liquid level for long time

In case you installed the sensor for the first time, consider checking the following:

- Are you using a compatible resistance/voltage tank sensor? Check the requirements in chapter 5 Technical specifications.
- Is the tank sensor properly installed and working?
- Is the tank sensor properly connected to the right resistance or voltage input sensor on ST107?
- Is the tank sensor calibrated via PICO's menu? Each tank sensor needs to be calibrated to show the right level. Check PICO's manual, how to calibrate a tank sensor.

In case the tank sensor has stopped working, consider checking the following:

- Is the tank sensor properly installed and working? In case you are using a floating sensor, it could be stuck.
- Consider to recalibrate the tank sensor.

6.3   Tank sensor is showing empty tank

In case you installed the sensor for the first time, consider checking the following:

- Is the tank sensor covering the whole tank level? In case you are using a floating sensor, which is to short, it can happen that the sensor is not detecting any liquid under a specific level.
- Consider to recalibrate the tank sensor.