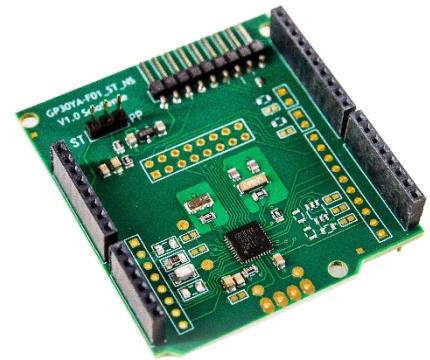




UFC

ST Nucleo Shields

Expansion Boards User Guide



UFC_ST_Nucleo_Shields

Revision: 1A

Release Date: 2022-02-095

Content Guide

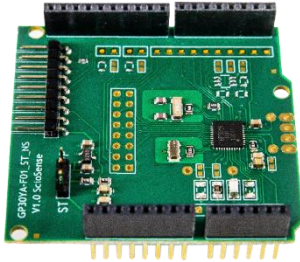


Content Guide	2	2.2.1 AS6031 Schematics	8
1 Introduction	3	2.2.2 AS6031 Layout	7
2 Hardware	4	2.3 AS6040 Shield	9
2.1 GP30YA-F01 Shield	5	2.3.1 AS6040 Schematics	10
2.1.1 GP30YA-F01 Schematics	6	2.3.2 AS6040 Layout	9
2.1.2 GP30YA-F01 Layout	5	3 Copyrights & Disclaimer	11
2.2 AS6031 Shield	7	4 Revision Information	13

1 Introduction

SciSense ultrasonic flow converters are well established in the market as leading solutions as frontends for time-of-flight ultrasonic flow meters. For those users that design their system based on a ST Microelectronics platform SciSense offers a series of ST Nucleo shields. Those boards can easily be combined with both, the ST development kits and the SciSense evaluation kits in combination with the UfcEvaluationSoftware package.

The boards have two rows of connectors following the ARDUINO® Uno V3 connectivity support or Arduino R3 Shield. They fit into the STM32 Nucleo-64 development board and the STM32 Nucleo-144 development board. In addition they have a connector to our PICOPROG interface. Actually, shields are available for TDC-GP30YA-F01 (with flow firmware), AS6031 and AS6040.

Figure 1: Available shields

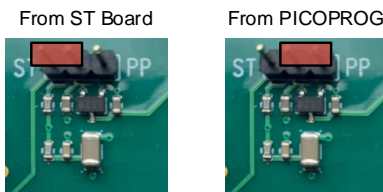
Product	Material number	Image
GP30YA-F01_ST_NS	220260014	
AS6031-QF_ST_NS	221020007	
AS6040-QF_ST_NS	220500002	

2 Hardware

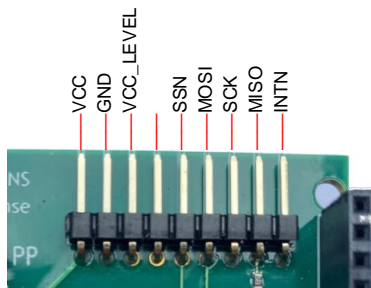
2.1 Common Hardware Elements

All shields have some interfaces or connectors in common:

- Power selection. Via jumper the user can select whether the 5V supply comes from the ST motherboard or from the SciSense PICOPROG interface.



- 9-pin connector to PICOPROG with SPI interface, interrupt, level shifter feedback, power.

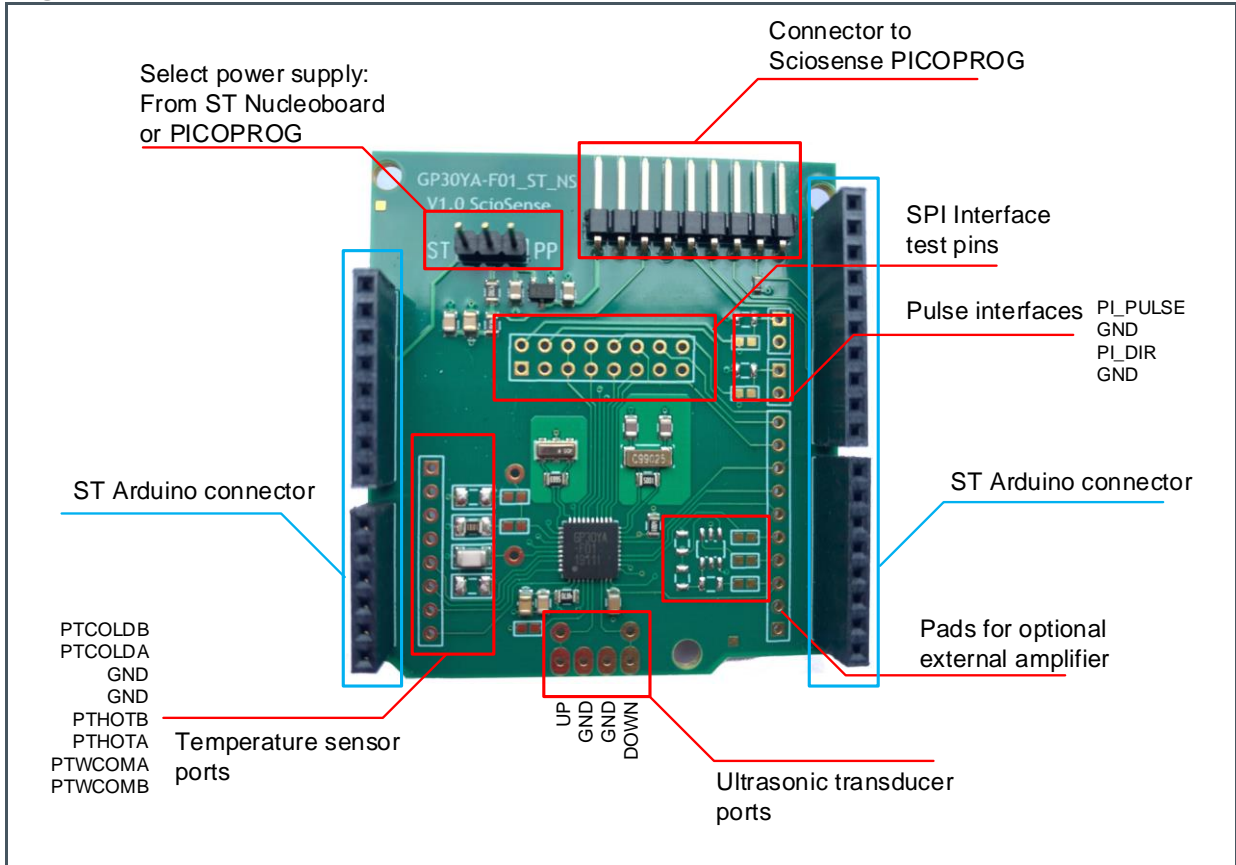


2.2 GP30YA-F01 Shield

This shield is based on TDC-GP30YA-F01 which has a flow firmware on chip.

The following figure shows the main interfaces:

Figure 2: GP30YA-F01 Shield



2.2.1 GP30YA-F01 Layout

Figure 3: GP30YA-F01 Shield layout

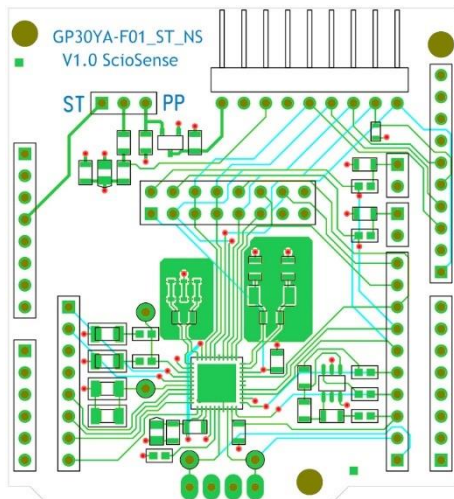
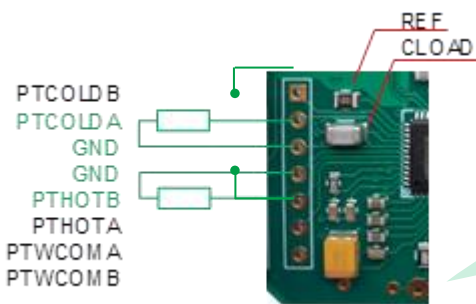


Figure 3a: Example Temperature Ports with PT1000 2 Wire Configuration

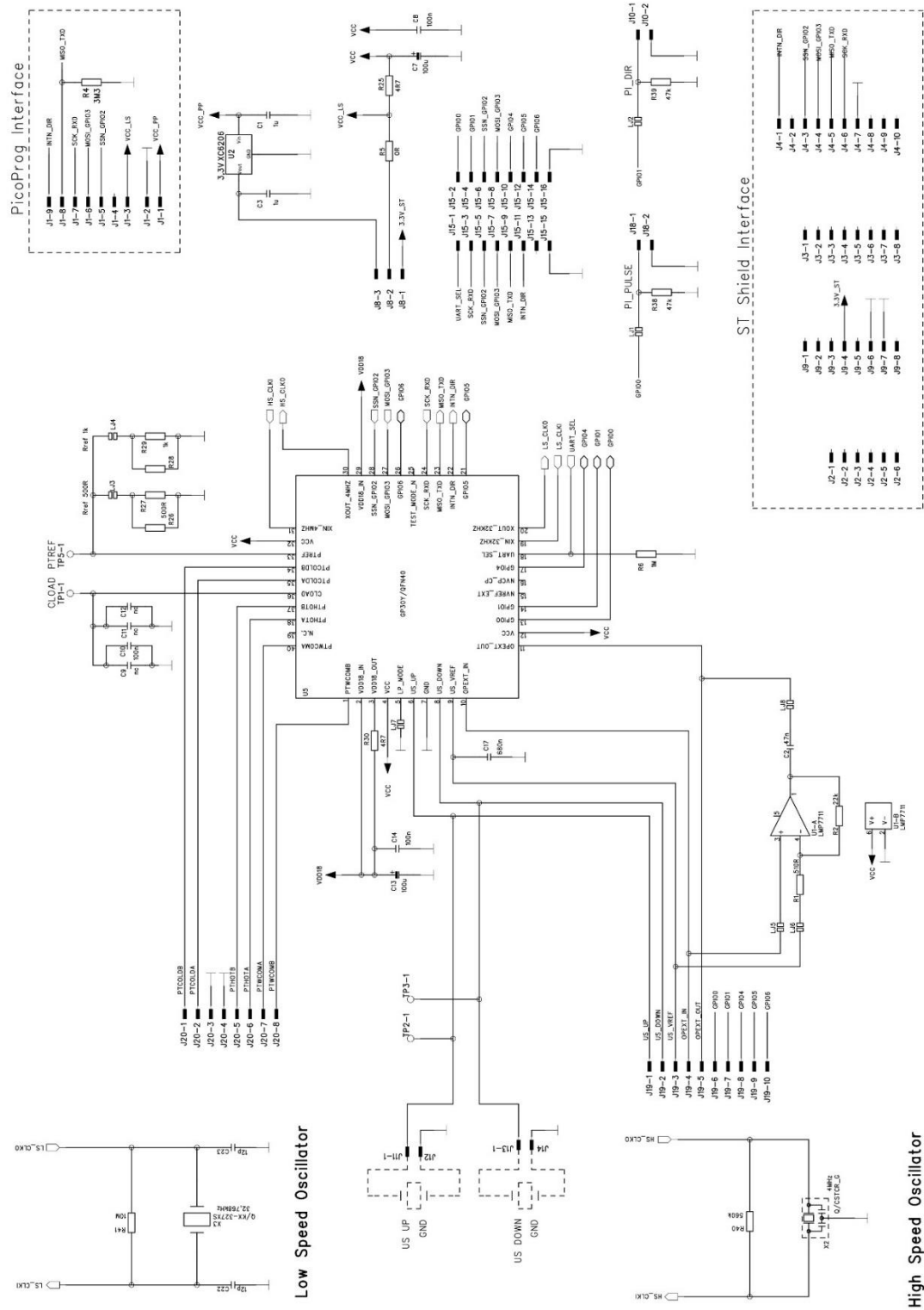


Remark: When using only one PT1000, connect it to "HOT" input (TPI_M2_A)

2.2.2 GP30YA-F01 Schematics

The schematic of this boards is mainly a copy of the GP30-DEV reference board.

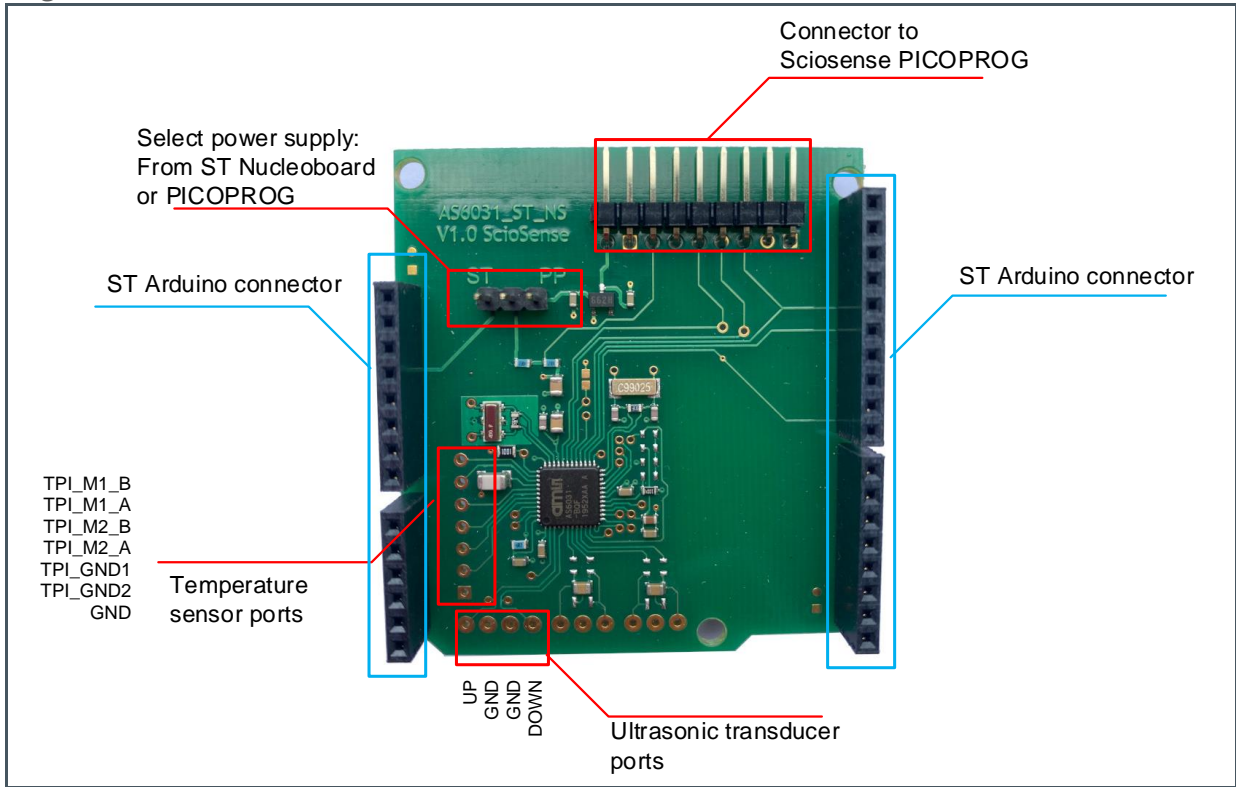
Figure 4: GP30YA-F01 Shield schematics



2.3 AS6031 Shield

This shield is based on AS6031-QF_DK_RB. The following figure shows the main interfaces:

Figure 5: AS6031 Shield



2.3.1 AS6031 Layout

Figure 6: AS6031 Shield layout

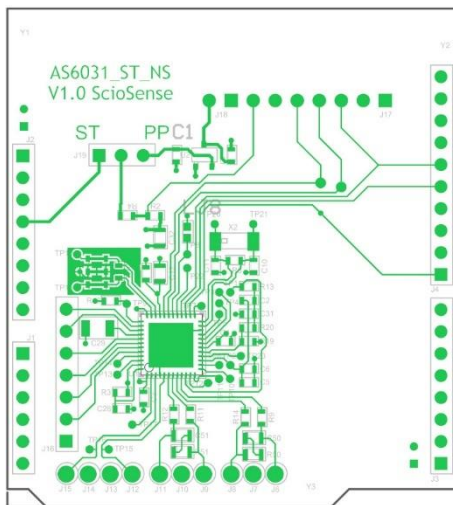
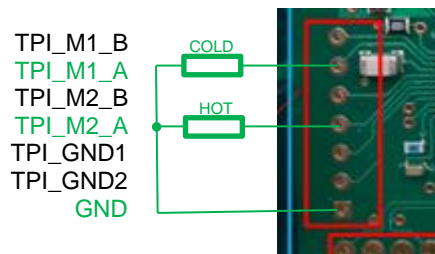


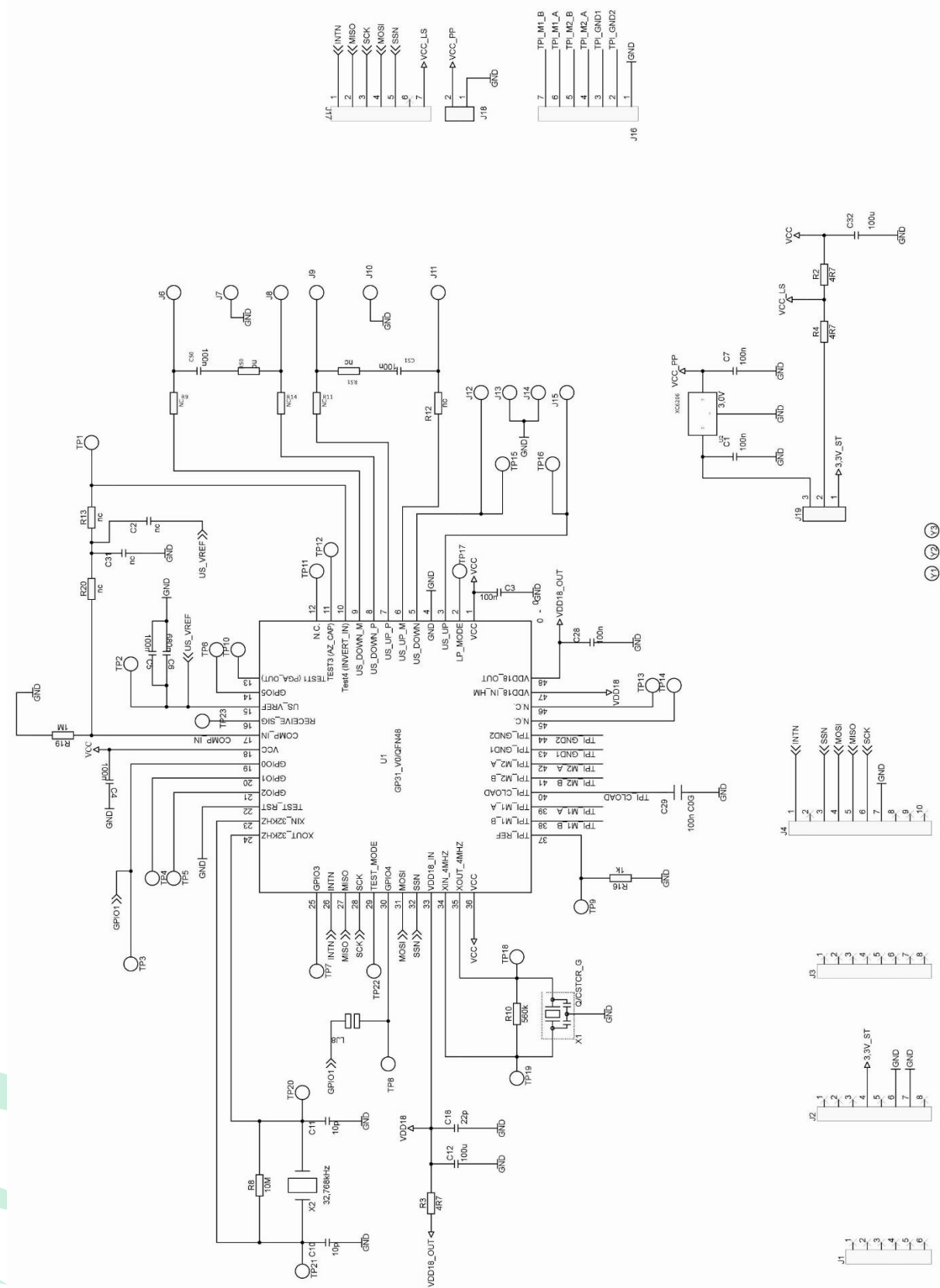
Figure 6a: Example Temperature Ports with PT1000 2 Wire Configuration



Remark: When using only one PT1000, connect it to "HOT" input (TPI_M2_A)

2.3.2 AS6031 Schematics

Figure 7: AS6031 Shield schematics

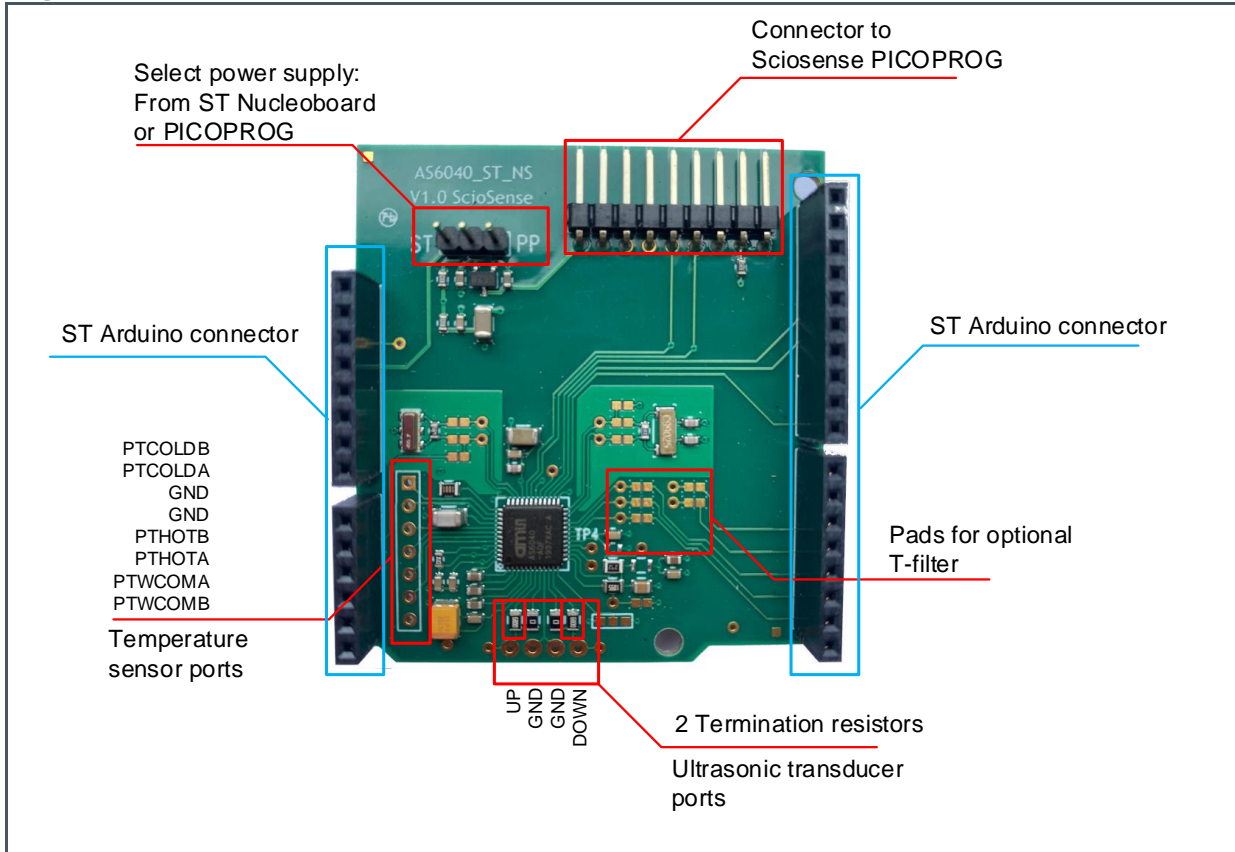


2.4 AS6040 Shield

This shield is based on AS6040-QF_DK_RB.

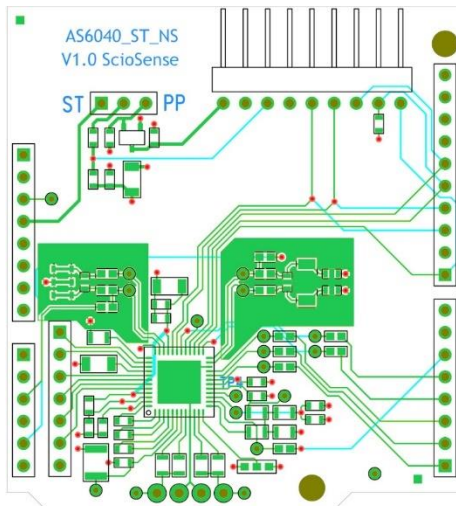
The following figure shows the main interfaces:

Figure 8: AS6040 Shield



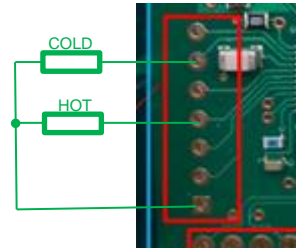
2.4.1 AS6040 Layout

Figure 9: AS6040 Shield layout



**Figure 9a: Example Temperature Ports with PT1000
2 Wire Configuration**

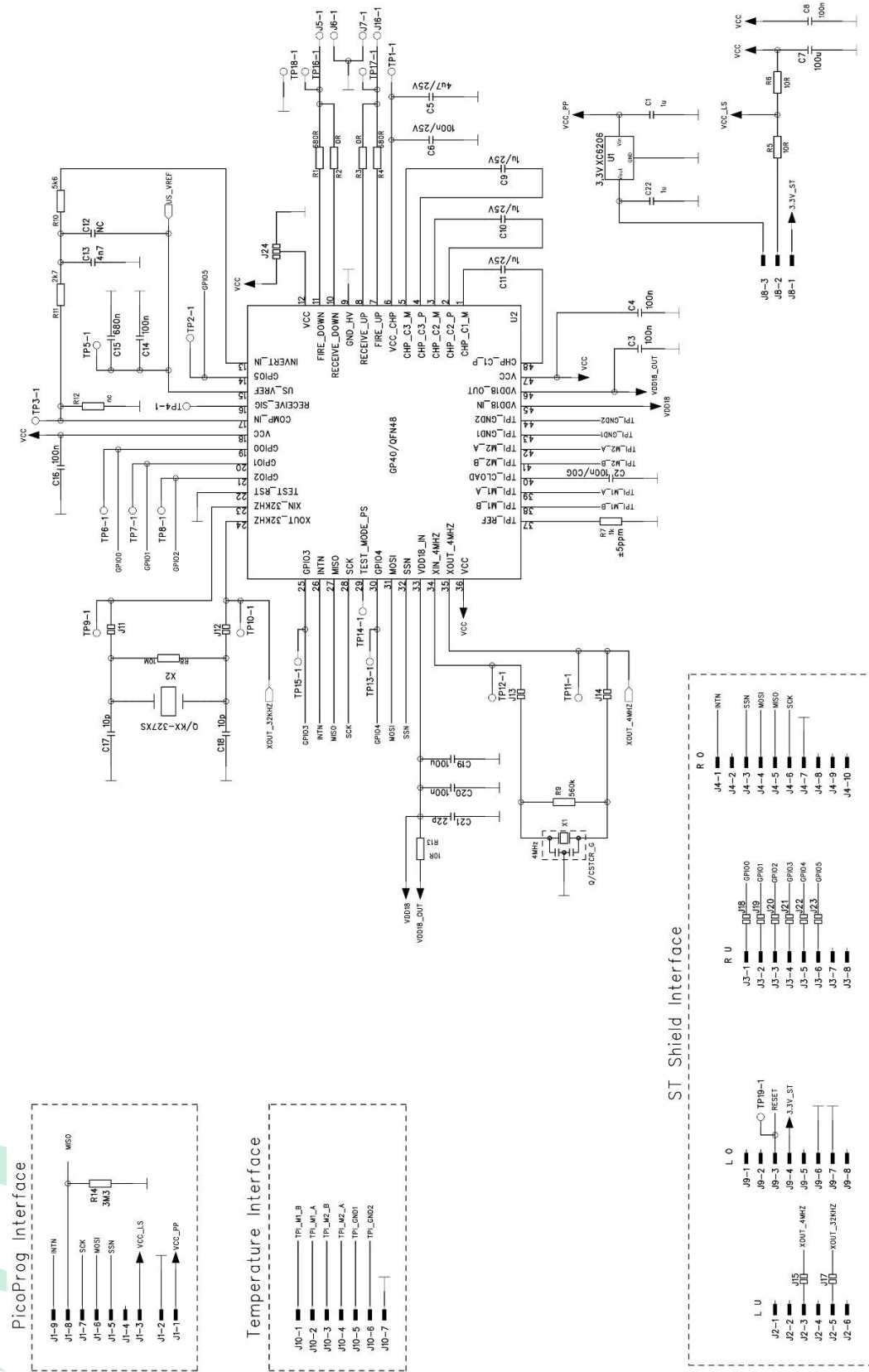
TPI_M1_B
TPI_M1_A
TPI_M2_B
TPI_M2_A
TPI_GND1
TPI_GND2
GND



Remark: When using only one PT1000, connect it to “HOT” input (TPI_M2_A)

2.4.2 AS6040 Schematics

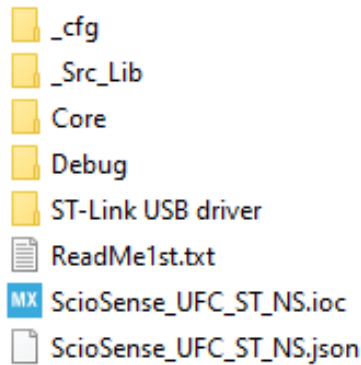
Figure 10: AS6040 Shield layout



3 Software

SciSense provides a common sample software package for the three UFC chips.

SciSense_UFC_ST_NS package



Package Details

_cfg\ 	Cconfigurations for the different shields, using SciSense GUI
_Src_Lib\ 	Contains necessary, useful and additional functions, macros and declarations
Core\ 	Modified include and source Files
Debug\ 	.bin file for STM32CubeProgrammer .elf file is the output from the link step. Those executable files can have .elf, .out or .axf extension.
ST-Link USB driver\ 	ST-LINK, ST-LINK/V2, ST-LINK/V2-1, STLINK-V3 USB driver signed for Windows7, Windows8, Windows10
ReadMe1st.txt	Package details
SciSense_UFC_ST_NS.ioc	STM32CubeMX project file
SciSense_UFC_ST_NS.json	JSON (JavaScript Object Notation) is the dashboard flow for STM32CubeMonitor

The main program is found in the \Core\Src folder.

4 Copyrights & Disclaimer

Copyright **SciSense B.V High Tech Campus 10, 5656 AE Eindhoven, The Netherlands.** Trademarks Registered. All rights reserved. The material herein may not be reproduced, adapted, merged, translated, stored, or used without the prior written consent of the copyright owner.

Devices sold by SciSense B.V. are covered by the warranty and patent indemnification provisions appearing in its General Terms of Trade. SciSense B.V. makes no warranty, express, statutory, implied, or by description regarding the information set forth herein. SciSense B.V. reserves the right to change specifications and prices at any time and without notice. Therefore, prior to designing this product into a system, it is necessary to check with SciSense B.V. for current information. This product is intended for use in commercial applications. Applications requiring extended temperature range, unusual environmental requirements, or high reliability applications, such as military, medical life-support or life-sustaining equipment are specifically not recommended without additional processing by SciSense B.V. for each application. This product is provided by SciSense B.V. "AS IS" and any express or implied warranties, including, but not limited to the implied warranties of merchantability and fitness for a particular purpose are disclaimed.

SciSense B.V. shall not be liable to recipient or any third party for any damages, including but not limited to personal injury, property damage, loss of profits, loss of use, interruption of business or indirect, special, incidental or consequential damages, of any kind, in connection with or arising out of the furnishing, performance or use of the technical data herein. No obligation or liability to recipient or any third party shall arise or flow out of SciSense B.V. rendering of technical or other services.

5 Revision Information

Table 1: Revision History

Revision	Date	Comment	Page
1	July 2021	Initial Version	
2	Jan 2022	Temperature Ports description updated: Picture deleted in Sec 2.1 and Figure 3a, 6a, 9a added	4,5,7,9

Note(s) and/or Footnote(s):

1. Page and figure numbers for the previous version may differ from page and figure numbers in the current revision.
2. Correction of typographical errors is not explicitly mentioned.



SciSense is a Joint Venture of ams AG

Headquarters: ScioSense B.V.
High Tech Campus 10
5656 AE Eindhoven
The Netherlands

Contact: www.sciosense.com
info@sciosense.com