PTC04-DB-SPI

Daughter Board for Melexis PTC devices

Features and Benefits

PTC04 interface board for testing devices:

- MLX90363

Applications

Experimental tool for Lab and Prototyping
Production Equipment for Serial Programming

Ordering Information

Part No.	***Description***
PTC04-DB-SPI V3.0	Daughter Board

Accessories

Part No.	***Description***
DLL's for all supported products	
User Inter Faces for supported products	
Firmware for supported products	

1. Functional Diagram

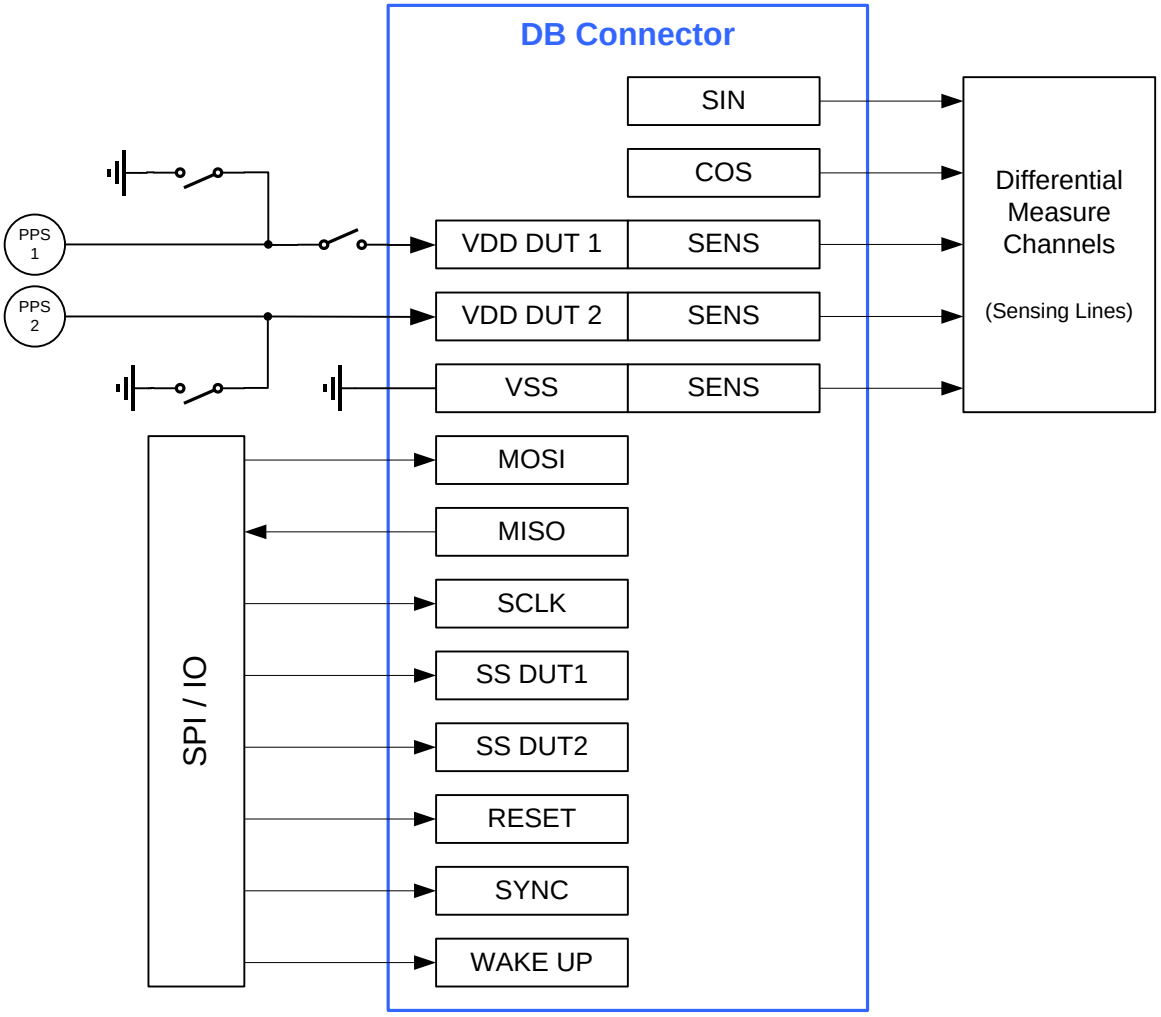

Figure 1: Functional Diagram

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2. Board description

2.1. Board Layout

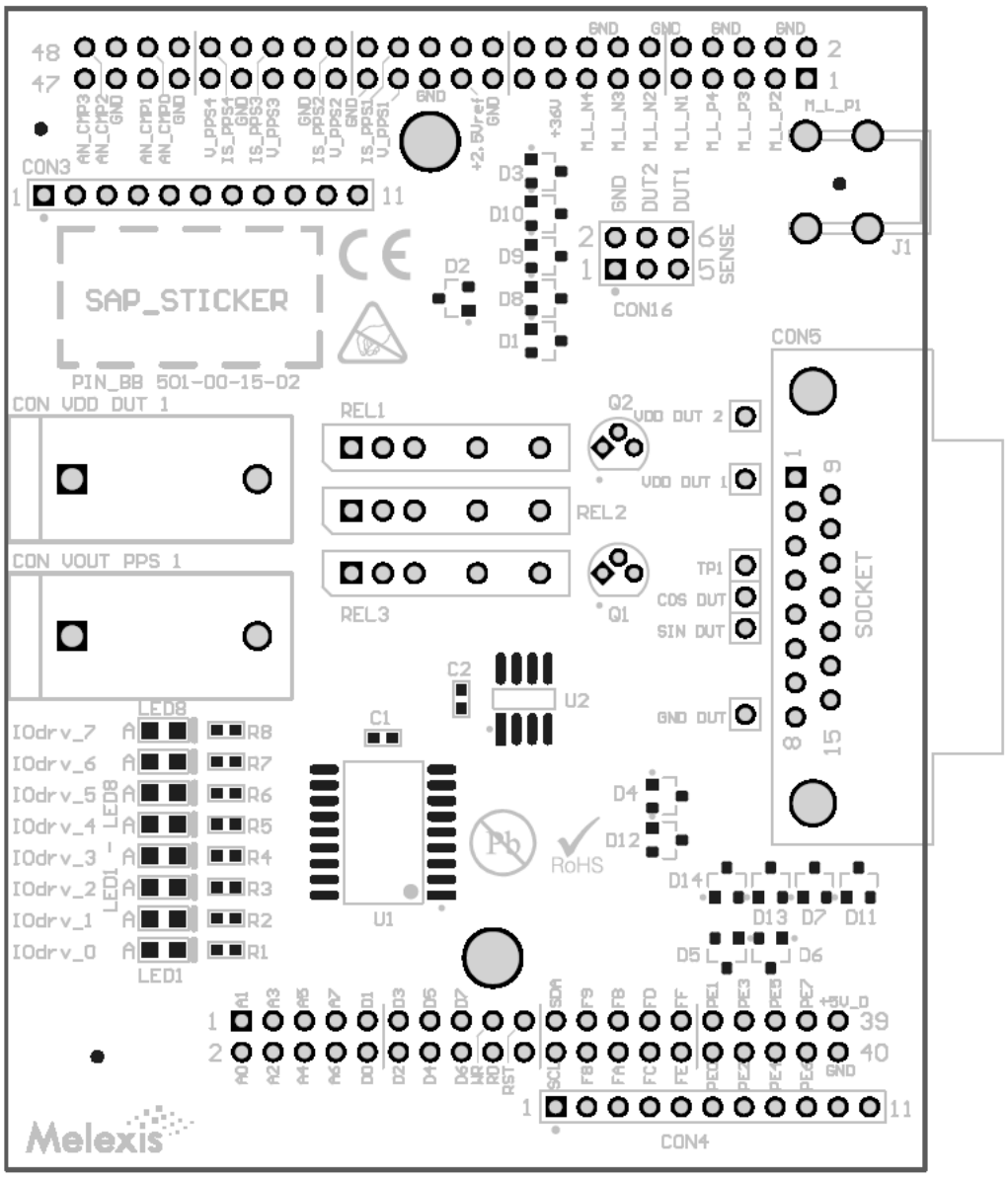


Figure 2: Board Layout Top View.

- CON16 Force & Sens: Jumpers to connect the measurement sense lines immediately to the force lines. These jumpers are needed when no force and sense is used.
- U2 DB-ID: This ID keeps a few initial variables in mind. It allows for example to detect what DB is connected to the programmer and if the DB is not expired.
- CON1 and CON2 Analogue and Digital connector: See below for a detailed description.
- CON5 DB Connector: Connector to the application. See below for details.
- LED1-8 Indicators: 8 LED Indicators for the DB_IOdrv lines.
- J1: GND connection to back panel.

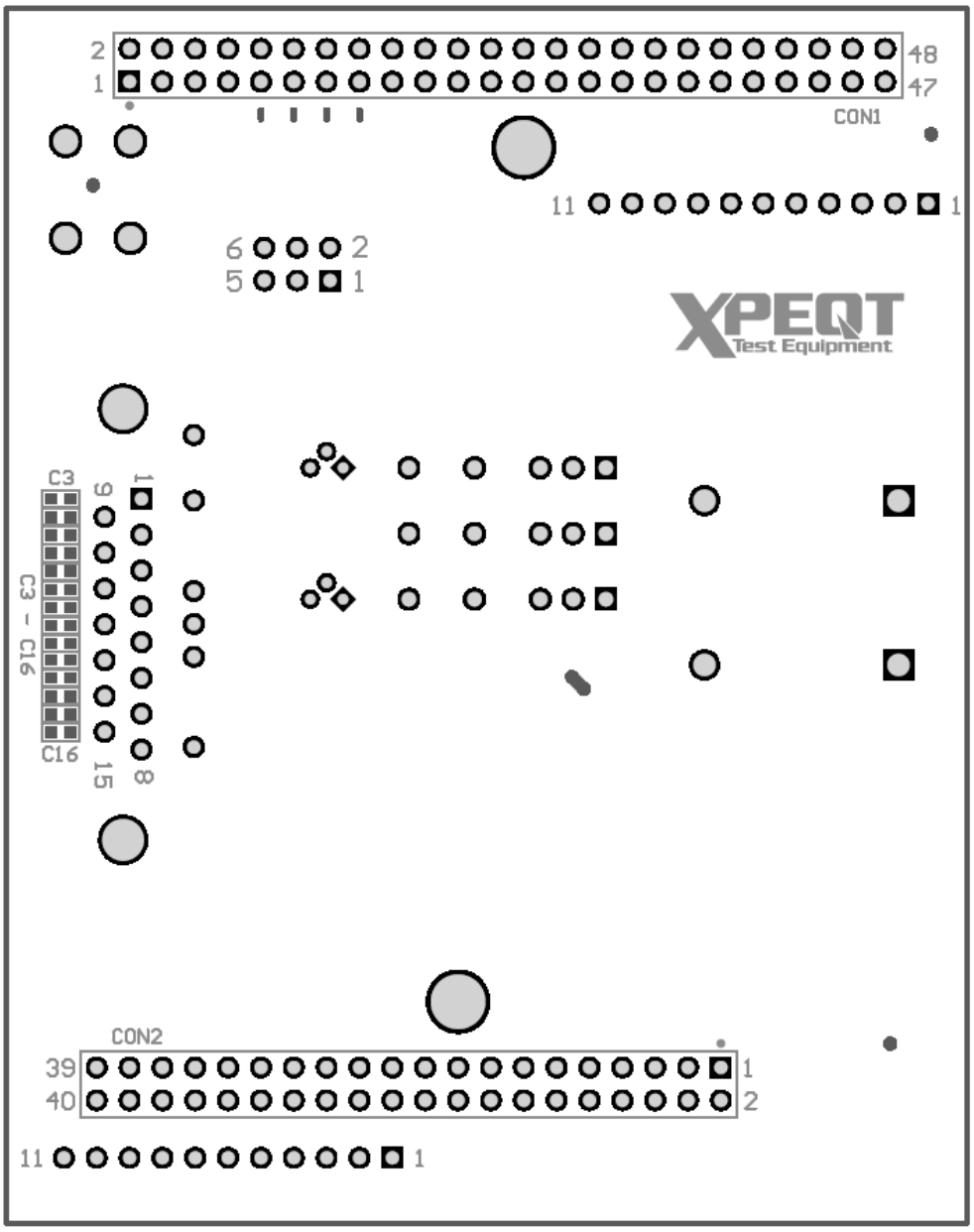
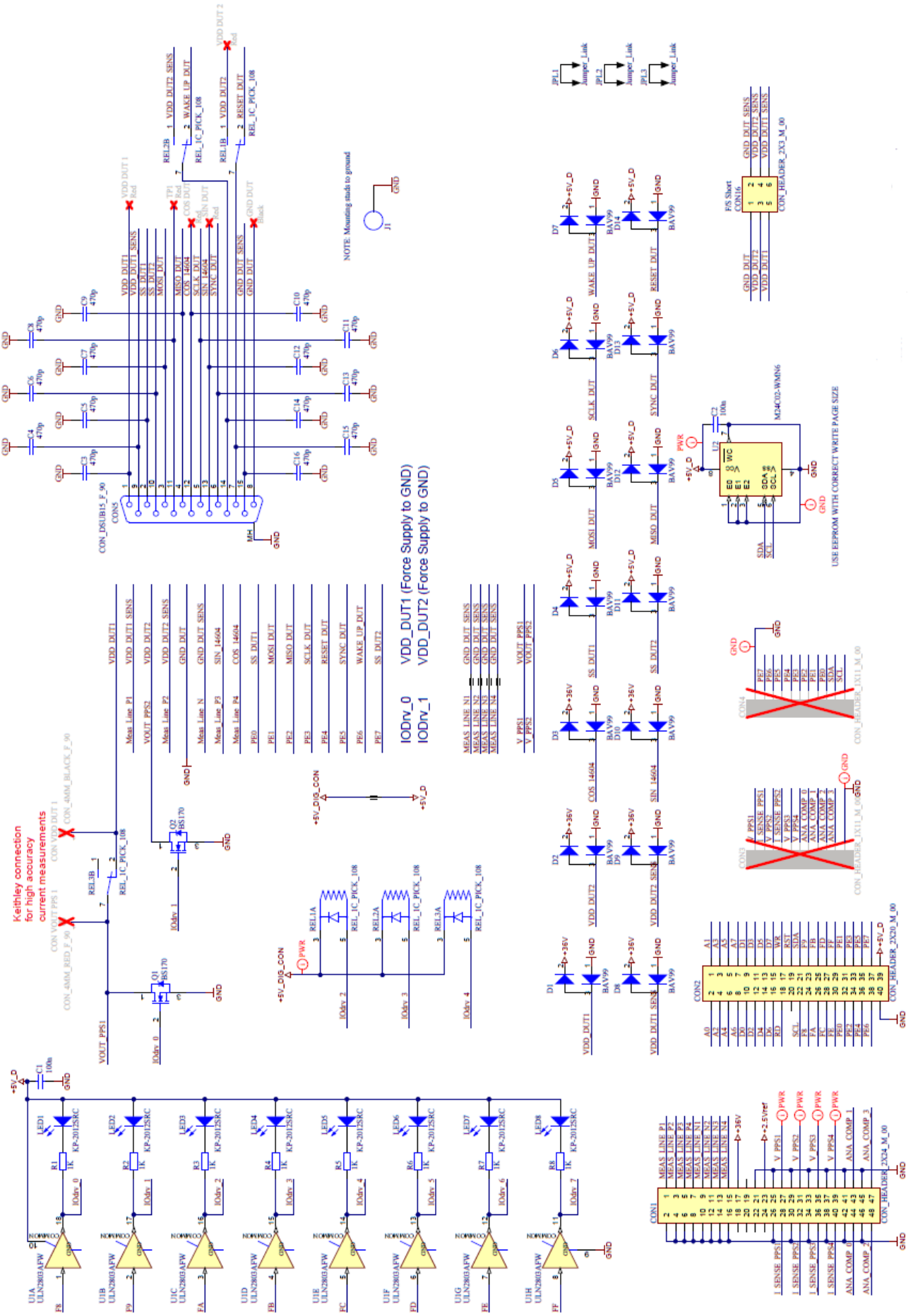


Figure 3: Board Layout Bottom View.

2.2. Board Schematics

Below you can find the complete schematics of the DB:

Figure 4: Schematic


VDD_DUT1 (Force Supply to GND)
VDD_DUT2 (Force Supply to GND)
IODrv_0
IODrv_1
Keithley connection for high accuracy current measurements
NOTE: Mounting studs to ground
USE EEPROM WITH CORRECT WRITE PAGE SIZE
CON_DSUB15_F_90
M24C02-WMN6
CON_HEADER_2X3_M_00
CON_HEADER_2X20_M_00
CON_HEADER_2X4_M_00
CON_HEADER_1X11_M_00
CON_4MM_BLACK_F_90
CON_4MM_RED_F_90
REL_IC_PICK_108
KP-2012SRC
BAV99
BSS170
ULN2803APW

2.3. Daughter board Connectors

The PTC04 main board has two connectors to the interface with the application. The PTC allows adding a full PCB in between (Daughter Board). This daughter board can be mounted on the two connectors. In some exceptional cases, a daughter board contains only a few wires from the Analogue connector to the application connector. The pins on of the connectors are described below.

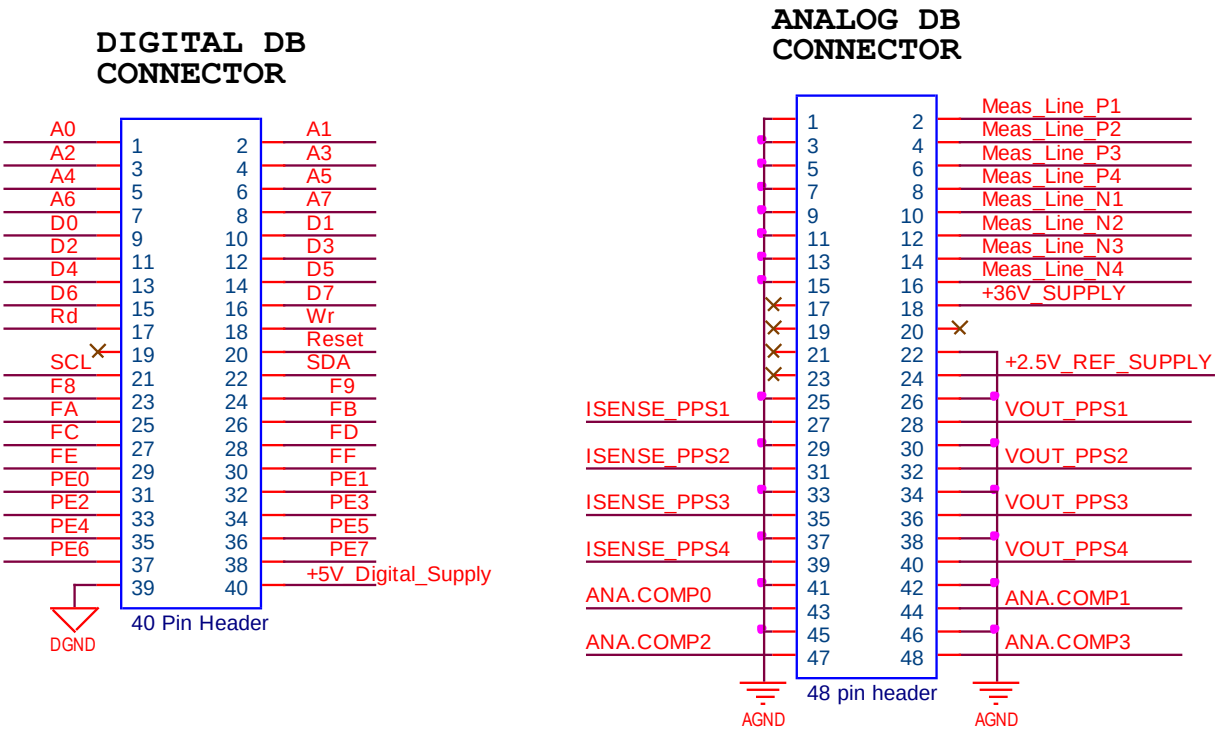


Figure 5: Daughter Board Connectors

2.3.1. Digital DB Connector (40 Pins)

Mainly, the digital connector is meant to expand the programmer to extra needs. Address lines A0-A7 together with the Map Select Lines F8-FF allows to direct access an area of 2 K. Examples would be adding a simple addressed I/O register by using the selection lines. If more complexity is needed, a full FPGA can be mounted on the DB board

Pins	Names	Description
1 – 8	A0 – A7	Address lines
9 – 16	D0 – D7	Data Lines active during Rd or Wr signals
17	Rd	Read: A negative pulse will indicate a sampling of the data on the Data Bus
18	Wr	Write: A Negative pulse will indicate when data is available on the Data Bus
20	Reset	This signal goes low by powering the PTC or by pressing the reset button. This line can be pulled low by application. Check firmware documentation for resetting by software.
21-22	SCL / SDA	I2c Bus
23-30	F8,F9,…,FF	CS lines when the address areas are accessed
31-38	Port E	Note: These pins are limited to 5 Volt input\output!!!! The full Port E of the Atmega core is mounted to these pins. This allows us to use advanced features like PWM, UARTS, Time Measurements, etc…. By using firmware that supports these, functions, application specific requirements can be fulfilled.
39	DGND	Digital Ground
40	+5V Digital	5 Volt Digital Supply. Maximum current to get out of this supply: 250mA

Note: All the pins are limited to 5 Volt input\output!!!! However, there are Protections, please take precautions in order to avoid damage of the main board.

2.3.2. Analog DB Connector (48 Pins)

Mainly, the analog connector provides all the analog signals and measure possibilities.

Pins	Names	Description
28,32,36	PPS 1-3	Output of the Programmable Supplies
40	PPS 4	Output of the Fast DAC Programmable Power Supply
27,31,35,39	Isense_PP1-4	Outputs (Driver outputs before Rsens) for current evaluations. These outputs could be used to connect to the analog comparators in order to create fast digital signals based on current.
2,4,6,8	ExtMeas1-4Pos	There are 4 differential inputs for making measurements
10,12,14,16	ExtMeas1_4Neg	The negative inputs of ExtMeas1-4Pos
17,19,21,23	Shtd_PPS1-4	Outputs that shows the status of the Drivers. Signals are meant to connect LED's to put the front panel
43,44,47,48	AnaComp0-3	Input (limited to 5V) See *Note. Fast Level comparators in order to remove time consuming measurement
18	+35V_Supply	Supply to extend the daughter board with some extra drivers
24	+2.5V Ref	Output of internal reference
All other	AGND	Analog Ground

Note: All the pins are limited to 35 Volt input\output!!!! However, there are Protections, please take precautions in order to avoid damage of the main board.

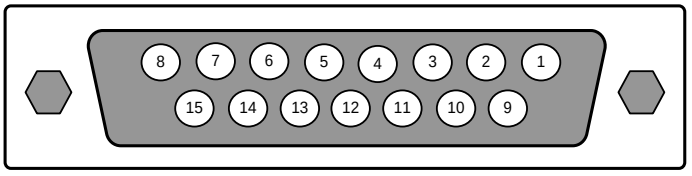
** Note: Some pins are protected and limited to 5 Volt!!!! However, there are Protections, please take precautions in order to avoid damage of the main board.*

2.4. Application Connector

The figure and table below shows the connections as provided by the daughterboard PTC04-DB-SPI.

The view of the connector is **front view** for the **female** connector of the PTC04-DB-SPI which corresponds to the **solder side** of the **male** connector.

DB15 Female Connector



Pins	Names	Description	MLX90363 SOIC-8	MLX90363 TSSOP-16
1	VDD_DUT1	Device Supply for DUT 1	Pin 1	Pin 3
2	SS_DUT1	Slave Select DUT 1	Pin 5	Pin 15
3	MOSI_DUT	Master Out Slave In common for both devices	Pin 6	Pin 8 & 16
4	MISO_DUT	Master In Slave Out common for both devices	Pin 2	Pin 4 & 12
5	SCLK_DUT	Clock common for both devices	Pin 4	Pin 6 & 14
6	SYNC_DUT	SYNC device	N/A	N/A
7	RESET_DUT / VDD_DUT2	Reset device / Device Supply for DUT 2	N/A N/A	N/A Pin 11
8	GND_DUT	Analogue Ground Device common for both devices	Pin 8	Pin 2 & 10
9	VDD_DUT1_SENS	Sensing Device Supply for DUT 1	Pin 1	Pin 3
10	SS_DUT2	Slave Select DUT 2	N/A	Pin 7
11	NC	Not Connected	NC	NC
12	COS_ DUT	Sensing Cosine angle	N/A	N/A
13	SIN_DUT	Sensing Sine angle	N/A	N/A
14	WAKE_UP_DUT / VDD_DUT2_SENS	Wake Up device / Sensing Device Supply for DUT 2	N/A N/A	N/A Pin 11
15	GND_DUT_SENS	Sensing Analogue Ground Device common for both devices	Pin 8	Pin 2 & 10

2.5. Jumper Selection

The D-SUP DA-15 connector of the daughter board is equipped with a sensing line for each analog device pin.

The top row is the force line of the device pins. The bottom row is the sensing line of the device pins.

Between each force and sense line there is a jumper to short the sense line at the D-SUP DA-15 connector on the daughter board.

The jumper is placed when the external sensing is not required. For example: an application with a digital or PWM output.

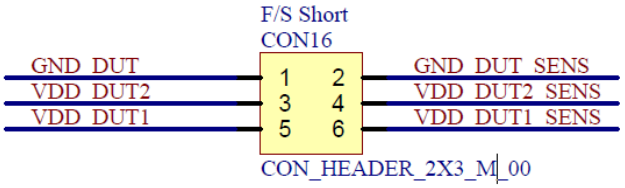


Figure 6: Jumper between force and sense line.

CON16 is used to short the force and sense line of the analog device pins.

In other words, they are used to select single wire or double wire connection to the pin of the module / sensor.

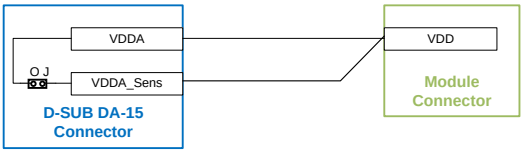
Single wire connection

When the jumper is closed, only one wire is required **per pin** between the PTC-04 and the module or sensor.

In the table above these pins are marked as “Minimum required single/dual die connection”.

In this configuration the measurement of VDD, OUT1 or OUT2 is done at the D-SUB DA-15 connector of the PTC04-DB-SPI.

Double wire connection



When the jumper is open, two wires are required **per pin** between the PTC-04 and the module or sensor.

With two wires connected at the module side, the measurement of VDD, OUT1 or OUT2 is done on the module or sensor connector.

The external sensing line per pin is only required for applications with an analog sensor output and where a higher measuring accuracy is required.

3. Contact

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