

iC-TW3 EVAL TW3 2D

EVALUATION BOARD DESCRIPTION



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ORDERING INFORMATION

Type	Order Designation	Description Options
Evaluation Board	iC-TW3 EVAL TW3_2D	iC-TW3 Evaluation Board ready to operate, accessible through GUI via PC adapter
Software	iC-TW3 GUI	GUI software for Windows PC and TW3_2D stores setup to file, communication to iC-TW3 QFN32 please see www.ichaus.com/software for download information
PC Adapter	iC-MB3 iCSY MB3U-I2C	PC-USB Adapter (BiSS and 1wire/SPI/I2C) - to be ordered separately -

BOARD TW3_2D

(size 100 mm x 80 mm)

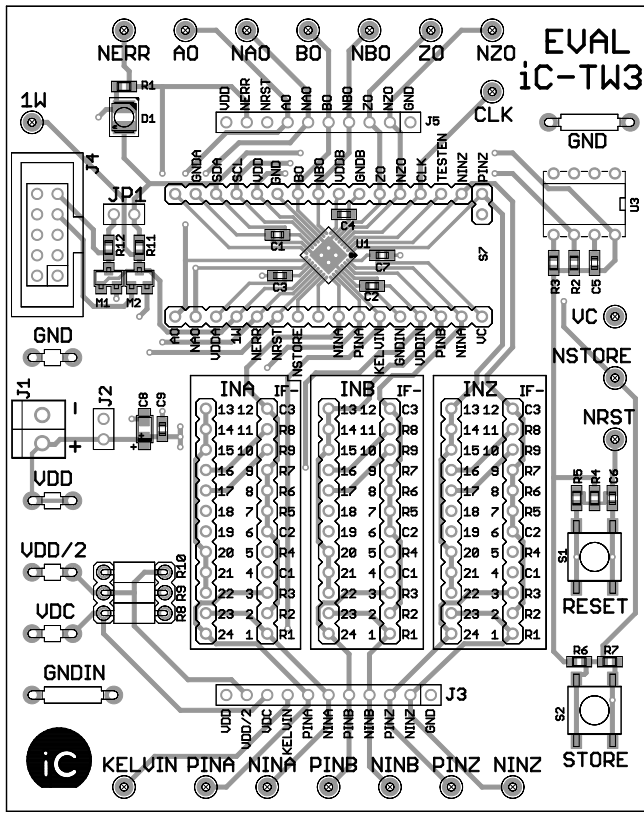


Figure 1: Component side

TERMINAL DESCRIPTION

(J1) VDD	+3.3 ... +5 V Supply Voltage
(J1) GND	0 V Ground
(J2) VDD	+3.3 ... +5 V Supply Voltage
(J2) GND	0 V Ground
VDD	+3.3 ... +5 V Supply Voltage
VDD/2	+1.67 ... +2.5 V Half Supply Voltage
VC	Reference Voltage Output (+2.4 V)
GND	0 V Ground
PINA, NINA	Signal Input A
PINB, NINB	Signal Input B
PINZ, NINZ	Signal Input Z
AO, NAO	Signal Output A
BO, NBO	Signal Output B
ZO, NZO	Signal Output Z
ERROR	Error Indicator LED (red)
(J4) SDA	External Device Serial Data
(J4) SCL	External Device Clock
(J4) VDD	External Device Power Supply
(J4) GND	External Device Ground
CLK	External Clock Input
1W	1W One Wire Interface
NERR	NERR Signal Output
NRST	External Reset Input
(S1) RESET	External Reset Button
NSTORE	External Store Input
(S2) STORE	External Store Button
KELVIN	External Temperature Sensor Input

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CIRCUIT DESCRIPTION

The TW3_2D evaluation board is equipped with the iC-TW3 signal conditioner IC. The board features one 10 pin plug to connect the programming adapter to. iC-TW3 GUI software can be used to access the board from a Windows PC what needs the iC-MB3 iC-SY MB3U-I2C PC-USB adapter.

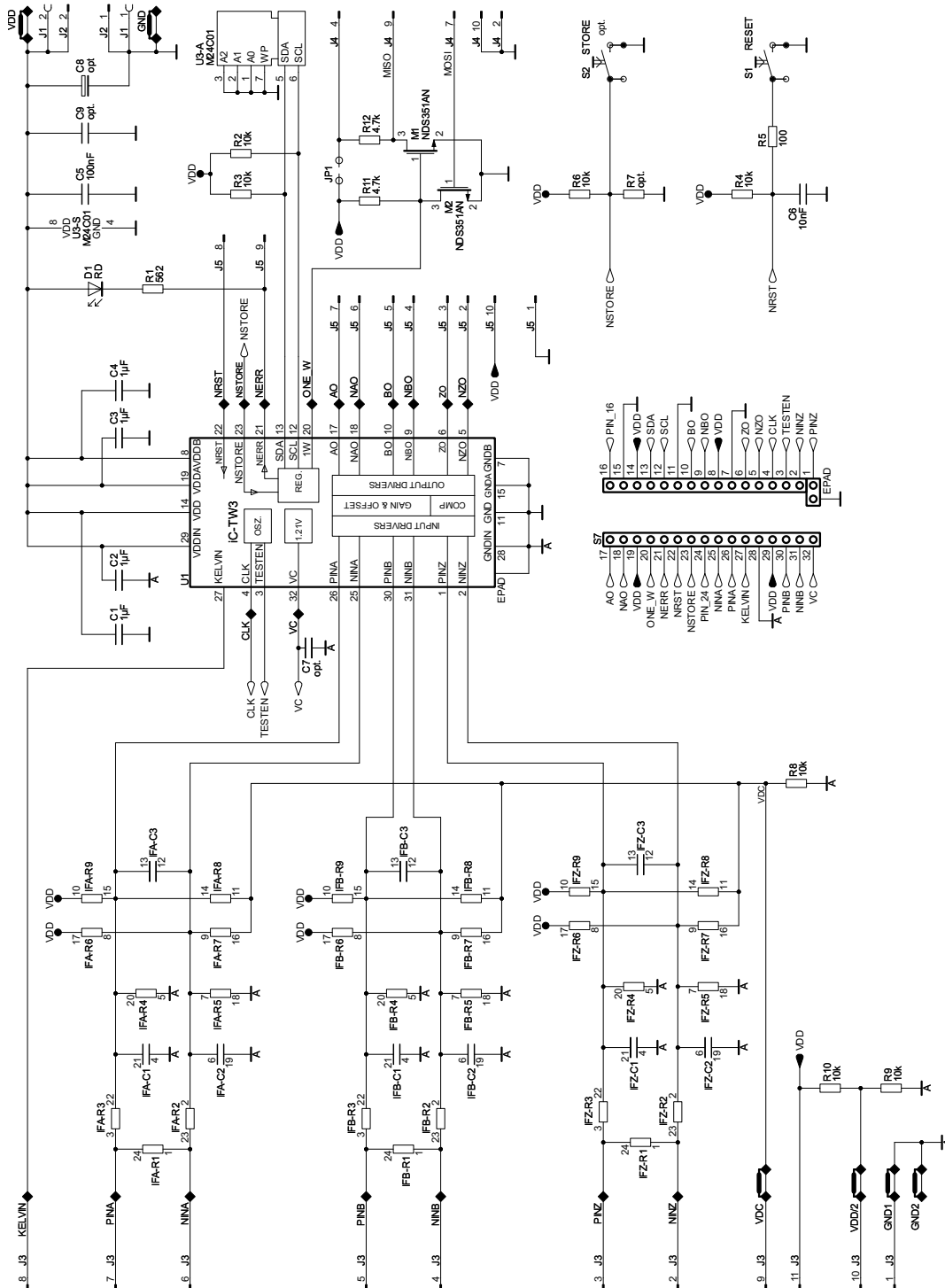


Figure 2: Circuit diagram equipped with iC-TW3 QFN32 including optional components

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ASSEMBLY PART LIST

Device	Value (typical)	Comment
Board	TW3_2D	
R1	562 Ohm	
R2-R4, R6	10 kOhm	
R5	100 Ohm	
R9, R10	10 kOhm	
C1-C4	1 uF	
C5, C9	100 nF	
C6	10 nF	
D1	LS-T670 or LS-T67K	
M1, M2	2N7002	
U1	iC-TW3 QFN32	
U3	Dil8	
U3	M24C01	
GND, VDC, VDD, VDD/2	LBS02	
GND1, GND2	LBS04	
CLK, KELVIN, NERR, NINA, NINB, NINZ, PINA, PINB, PINZ, NRST, ONE_W, VC, AO, NAO, BO, NBO ZO, NZO	S1-F	
S1	B3S 1000	
S3-S6, S10, S11	MK01 12G	
S8,S9	MK01 3G	
J1	AKL059_02	
J2	Pin Header 2pol	
J3	Pin Header 11pol	
J4	WSL10G	
J5	Pin Header 10pol	
JP1	Pin Header 2pol	
IFA_R2, IFA_R3, IFB_R2, IFB_R3, IFZ_R2, IFZ_R3	CB 6 G	

JUMPER AND PLUG DESCRIPTION

JP1: Adapter Power Supply Selector

2-pin jumper terminal male

PIN	Name	Function
1	VDD _{Adapter}	+5 V Adapter Supply Voltage
2	VDD _{Board}	+3.3 ... +5 V Supply Voltage

J1: Power Supply Input

2 cable connector terminal

PIN	Name	Function
1	VDD	+3.3 ... +5 V Supply Voltage
2	GND	0 V Ground

J2: Power Supply Input

2 pin terminal

PIN	Name	Function
1	VDD	+3.3 ... +5 V Supply Voltage
2	GND	0 V Ground

J3: Sensor Interface Input

11-pin terminal male

PIN	Name	Function
1	GND	0 V Ground
2	NINZ	Signal Input Z-
3	PINZ	Signal Input Z+
4	NINB	Signal Input B-
5	PINB	Signal Input B+
6	NINA	Signal Input A-
7	PINA	Signal Input A+
8	KELVIN	External Temperature Sensor Input
9	VDC	DC Voltage Output
10	VDD/2	+1.67 ... +2.5 V Half Supply Voltage
11	VDD	+3.3 ... +5 V Supply Voltage

J4: 10-pin Adapter Connector (to 1W/SPI/I2C Master)

10-pin terminal male

PIN	Name	Function
1	SCL	Serial Clock Line
2	GND	0 V Ground
3	Reserved -	
4	+5V	+3.3 ... +5 V Supply Voltage
5	Reserved -	
6	Reserved -	
7	MOSI	Serial Data Line
8	Reserved -	
9	MISO	Serial Data Line
10	GND	0 V Ground

J5: Signal Conditioner Output

10-pin terminal male

PIN	Name	Function
1	GND	0 V Ground
2	NZO	Z- Signal Output
3	ZO	Z+ Signal Output
4	NBO	B- Signal Output
5	BO	B+ Signal Output
6	NAO	A- Signal Output
7	AO	A+ Signal Output
8	NRST	External Reset Input
9	NERR	NERR Signal Output
10	VDD	+3.3 ... +5 V Supply Voltage

S7: Signal Conditioner PCB Connector

33-pin terminal female

PIN	Name	Function
1	NINZ	Signal Input Z-
2	PINZ	Signal Input Z+
3	TESTEN	Test Mode Enable -Reserved
4	CLK	External Clock Input
5	NZO	Z- Signal Output
6	ZO	Z+ Signal Output
7	GND	0 V Ground
8	VDD	+3.3 ... +5 V Supply Voltage
9	NBO	B- Signal Output
10	BO	B+ Signal Output
11	GND	0 V Ground
12	SCL	Serial Data Clock
13	SDA	Serial Data Line
14	VDD	+3.3 ... +5 V Supply Voltage
15	GND	0 V Ground
16	PIN16	Pin 16
17	AO	A+ Signal Output
18	NAO	A- Signal Output
19	VDD	+3.3 ... +5 V Supply Voltage
20	ONE_W	One_Wire Interface
21	NERR	NERR Signal Output
22	NRST	External Reset Input
23	NSTORE	External Store Input
24	PIN24	Pin 24
25	NINA	Signal Input A-
26	PINA	Signal Input A+
27	KELVIN	External Temperature Sensor Input
28	GND	0 V Ground
29	VDD	+3.3 ... +5 V Supply Voltage
30	PINB	Signal Input B+
31	NINB	Signal Input B-
32	VC	Reference Voltage Output
EPAD	GND	0 V Ground

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Voltage Supply - Adapter MB3U-I2C

Voltage Supply		Component Supply	Jumper Configuration
via board terminals ¹	via J4 plug ²	iC-TW3	JP1 (VDD) +5 V via J4
-	X	via J4 (VDD)	bridged
X	-	via board terminals	open

EVALUATION SOFTWARE

iC-TW3 software for PCs running on Windows operating systems, as well as the required USB driver are available as a ZIP file. iC-Haus software built with LabVIEW™ requires the installation of the LabVIEW™ Run-Time Engine (RTE). The RTE must be installed only once, hence there are two download links available.

Download package without RTE (small size): http://www.ichaus.de/TW3_gui

Download package including RTE (big size): http://www.ichaus.de/TW3_gui_rte

Features

- Reducing evaluation and design-in time and cost
- Manually setting up parameters of iC-TW3
- Saving parameter configuration into EEPROM
- Saving parameter configuration to Hex files
- Loading predefined configurations from Hex files
- Reading and displaying of sensor data

Installation

After unzipping the iC-TW3 software package TW31SO_gui_xx resp. TW31SO_gui_xxрте, the following files are located in the selected working directory.

xx is a placeholder for revisions

- Subfolder TW31SO_gui_xx including the executable setup.exe which starts the installation routine.
- Driver package for the USB adapter.
- Evaluation board description.

Note: Administrator rights are required to run installations.

1. To access the iC-TW3 evaluation board, interface adapter drivers for USB needs to be installed. Before connecting the adapter to your PC the driver installation must be completed successfully.

→ Execute the iC_USB_driver_ftdi20204.exe installation package and follow the on-screen instructions. This can take a few minutes.

1.1 The iC-Haus USB MB3U-I2C adapter has to be connected to the PC after the driver installation, to complete the whole driver installation procedure.

2. Install the evaluation software TW31SO by executing the setup.exe located in the subfolder TW31SO_gui_xx.

→ Follow the on-screen instructions to finish the installation.

3. After installation the executable TW31SO_gui_xx.exe will be available in the selected working directory.

Figure 3 shows a screenshot of the evaluation software.

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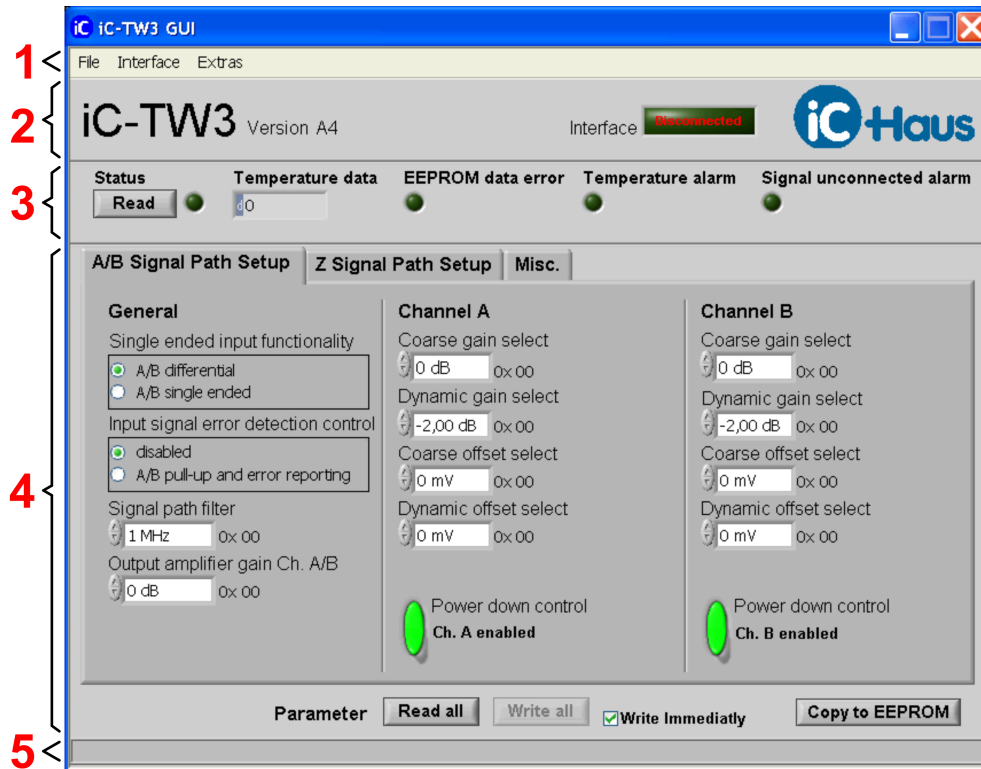


Figure 3: Evaluation software start-up window

Function Description

The iC-TW3 software starts in *No Hardware* mode. Connect the adapter to the PC and the iC-TW3 evaluation board. Select <Interface><iC-Interface ↔ USB> to establish connection to the iC-TW3. This will also read all parameters from the iC to the evaluation software.

The evaluation software is divided into five sections.

- Menu
- Header
- Sensor
- Parameter
- Status

1 Menu Section

	Button	Description
<File>	Save	Saves the configuration to a file, Intel Hex file format (*.hex)
	Load	Loads the configuration to the IC, Intel Hex file format (*.hex)
	Exit	Quits the software
<Interface>	No Hardware	Switches to <i>No Hardware</i> mode to reset the communication between the PC and the adapter
	iC-Interface ↔ USB	for use with PC-USB adapter MB3U resp. MB3U-I2C. Also reads all parameters from the iC to the evaluation software.
<Extras>	LUT Editor	Opens a window for the Look-up-tables configuration
	About	Additional software information

2 Header Section		Project title, software version and connection state
Button		Description
3 Sensor Section		Reading and displaying of sensor data
Button		Description
<Status>	Read	Periodically reads temperature data, alarm and error bits
4 Parameter Section		Reading and writing Parameter configuration
Button		Description
<Parameter>	Read all	Reads all parameters from the iC to the evaluation software
	Write all	Writes all parameters from the evaluation software to the iC
	Write immediately	Writes changes to any parameter immediately. Disable this to use the software without hardware
	Copy to EEPROM	Writes all parameters from the evaluation software to the EEPROM
5 Status Section		Displaying feedback of user interaction
Button		Description

For parameter settings, please refer to iC-TW3 data sheet for a detailed description.

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RELATED DOCUMENTS

- iC-TW3 Data Sheet - Specification -
→ <http://www.ichaus.de/iC-TW3>
- iC-MB3 iCSY MB3U-I2C - PC-USB ADAPTER -
→ <http://www.ichaus.de/MB3A/MB3U>

REVISION HISTORY

Rev	Notes	Pages affected
A1	Initial version	
A2	Chapter Evaluation Software revised	6,7,8

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