

iC-MQ EVAL MQ1D

EVALUATION BOARD DESCRIPTION



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ORDERING INFORMATION

Type	Order Designation	Description
Evaluation Board	iC-MQ EVAL MQ1D	iC-MQ Evaluation Board ready to operate, accessible through software via PC adapter
Software	iC-MQ GUI	GUI software for Windows PC stores setup to file, communication to the IC see chapter EVALUATION SOFTWARE on page 6
To be ordered separately		
PC Adapter	iC-MB3 ICSY MB3U-I2C	BiSS and I2C to PC-USB Adapter

BOARD MQ1D

(size 100 mm x 80 mm)

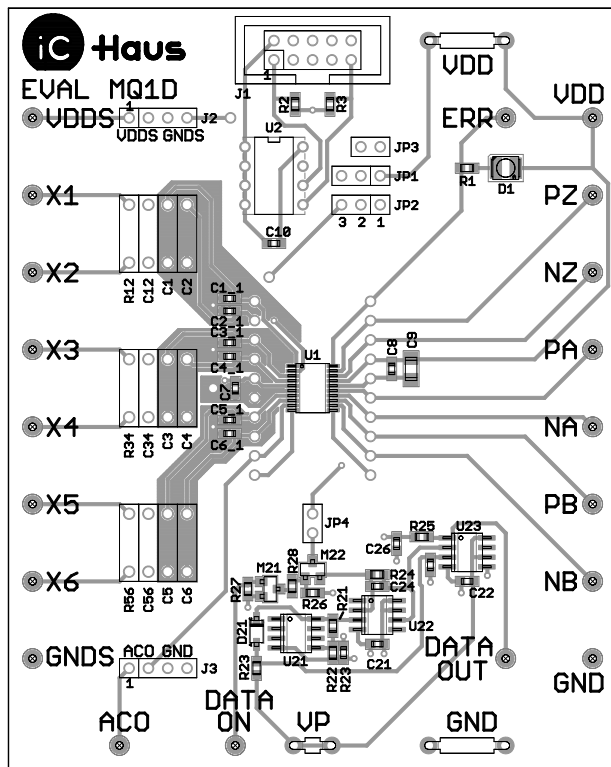


Figure 1: Component side

TERMINAL DESCRIPTION

VDD	+5 V Supply Voltage (ca. 15mA)
GND	0 V Ground
X1	Signal Input 1
X2	Signal Input 2
X3	Signal Input 3
X4	Signal Input 4
X5	Signal Input 5
X6	Signal Input 6
PZ	Output Z+
NZ	Output Z-
PA	Output A+
NA	Output A-
PB	Output B+
NB	Output B-
ERR	Error Signal (Input/Output) Test Mode Trigger Input
ACO	Signal Level Controller Output High-side current source output
VDDS	Switched Supply Output (20 mA max.)
GNDS	Switched Ground Link (20 mA max.)
D1	Indicator LED Illuminates red to indicate errors Connected to ERR pin of iC-MQ

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RELATED DOCUMENTS

- iC-MQ Data Sheet - Specification -
- iC-MQ GUI - GUI software for Windows PC -
- iC-MB3 iCSY MB3U-I2C - BiSS and I2C PC-USB Adapter -

→ <http://www.ichaus.de/iC-MQ>

→ <http://www.ichaus.de/MB3U>

CONNECTOR AND TERMINAL PINOUT

10-pin Connector J1 (to I2C Master)

PIN	Name	Function
1	SCL	Serial Clock Line
2	GND	Ground
3	-	-
4	+5V	Supply Voltage
5	-	-
6	-	-
7	SDA	Serial Data Line
8	-	-
9	SDA	Serial Data Line
10	GND	Ground

4-pin Terminal J2

PIN	Name	Function
1	VDDS	Switched Supply Output
2	VDDS	Switched Supply Output
3	GNDS	Switched Ground Link
4	GNDS	Switched Ground Link

4-pin Terminal J3

PIN	Name	Function
1	ACO	Signal Level Controller Output
2	ACO	Signal Level Controller Output
3	GND	Ground
4	GND	Ground

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CIRCUIT DESCRIPTION

The MQ1D evaluation board is equipped with the iC-MQ sine/cosine interpolation IC. The board features one 10-pin connector for I2C communication. iC-MQ's software can be used to access the board from a Windows PC what needs the MB3U-I2C adapter.

Note : Please install the latest USB driver before you attach the BiSS PC-USB Adapter to the PC.

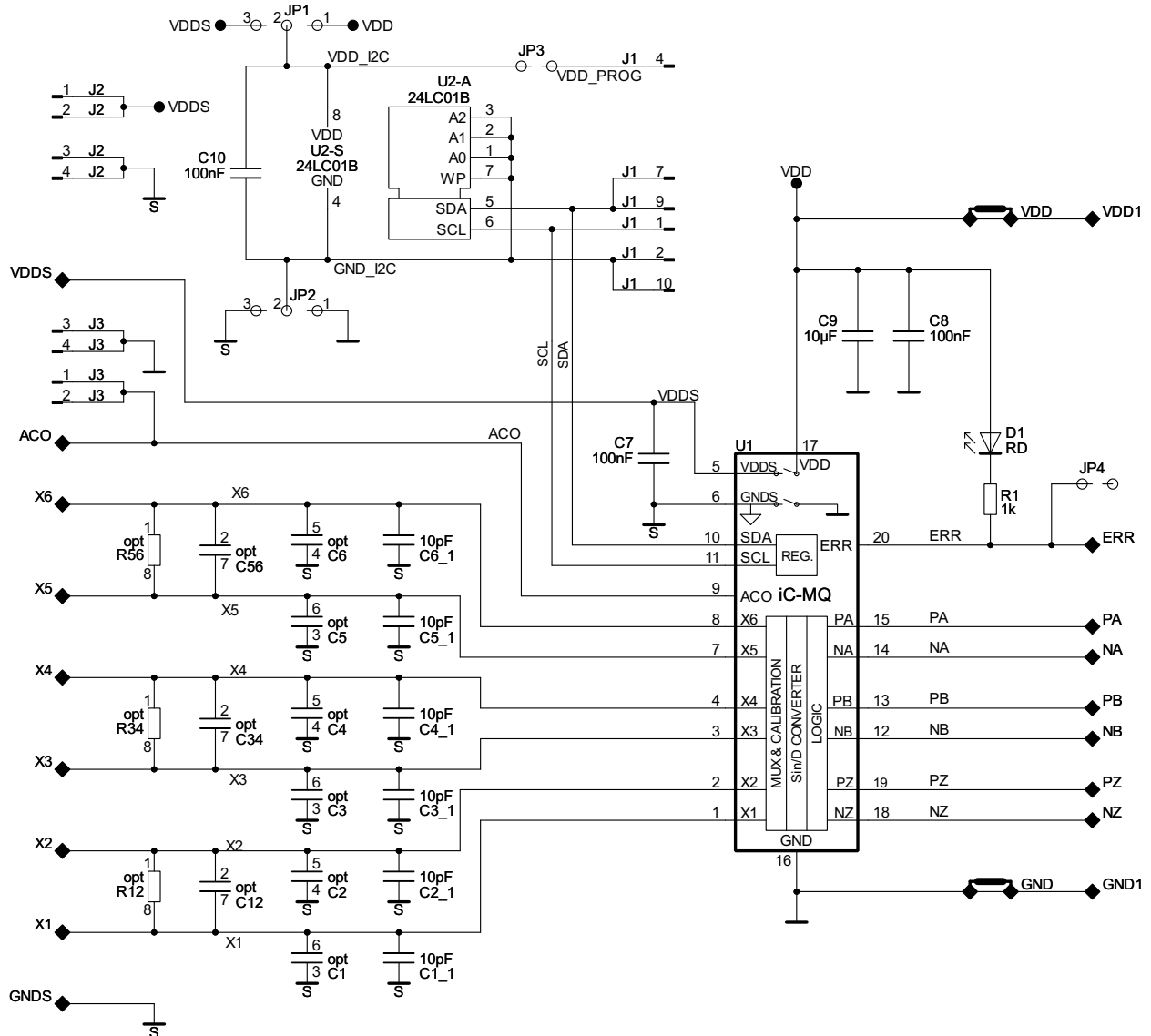


Figure 2: Circuit diagram including optional filter components

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ASSEMBLY PART LIST

Related to circuit diagram Figure 2

Device	Value (typical)	Assembled	Comment
U1	iC-MQ	assembled	Sine/cosine interpolation IC
U2	24C01	assembled	Serial EEPROM (AT24C01B, ST24C02WP recommended)
R1	1 k Ω	assembled	LED series resistor
R2, R3	4.7 k Ω	assembled	I2C pull-up resistor
D1	LS-T670-HK	assembled	Indicator LED for alarm message
C1, C2, C3, C4, C5, C6	10 pF	assembled	Capacitors for input filter
C7, C8	100 nF	assembled	Supply backup capacitors
C9	10 μ F	assembled	Supply backup capacitor
C10	100 nF	assembled	EEPROM backup capacitor
JP1, JP2	SL LP1 097 3 G	assembled	Jumper
JP3	SL LP1 097 2 G	assembled	Jumper
JP1, JP2, JP3		assembled	Jumper cap
J1	WSL10G	assembled	Connector for I2C-TO-PC adapter
J2, J3	MK 01 4 G	assembled	4-pin socket
J4, J5, J6, U2		assembled	8-pin DIL socket
R12, R34, R56		optional	Input filter
C12, C34, C56		optional	Input filter

Related to error monitoring Figure 3

Device	Value (typical)	Assembled	Comment
C21, C22, C23, C24, C25, C26	100 nF	optional	
R21	474 k Ω	optional	
R22	2 k Ω	optional	
R24	470 Ω	optional	
R25	2 k Ω	optional	
R26, R27	100 k Ω	optional	
R28	51 k Ω	optional	
D21	LL4148	optional	
M21	2N7002	optional	
M22	IRLML6401	optional	
U21	LM285	optional	
U22	AD8029	optional	
U23	LM393	optional	

APPLICATION SOFTWARE

iC-MQ 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.

Software overview online: <http://www.ichaus.de/software>

Download package	without RTE (small size)	including RTE (big size)
iC-MQ:	http://www.ichaus.de/MQ_gui	http://www.ichaus.de/MQ_gui_rte

Features

- Reducing evaluation and design-in time and cost
- Manually setting up parameters of iC-MQ
- Saving parameter configuration into ROM
- Saving parameter configuration to Hex files
- Loading predefined configurations from Hex files

Installation

After unzipping the iC-MQ software package MQ1SO_gui_xx resp. MQ1SO_gui_xxрте, the following files are located in the selected working directory.

xx is a placeholder for revisions

- Subfolder MQ1SO_gui_xx including the executable setup.exe which starts the installation routine.
- Driver package for USB adapter.
- Evaluation board description.

Note: Administrator rights are required to run installations.

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

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

1.1 When using an iC-Haus USB adapter, it must be connected to the PC after the driver installation, to complete the whole driver installation procedure.

2. Install the evaluation software MQ1SO by executing the setup.exe located in the subfolder MQ1SO_gui_xx.

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

3. After installation the executable MQ1SO_gui_xx.exe will be available in the selected working directory. Figure 4 shows a screenshot of the evaluation software.

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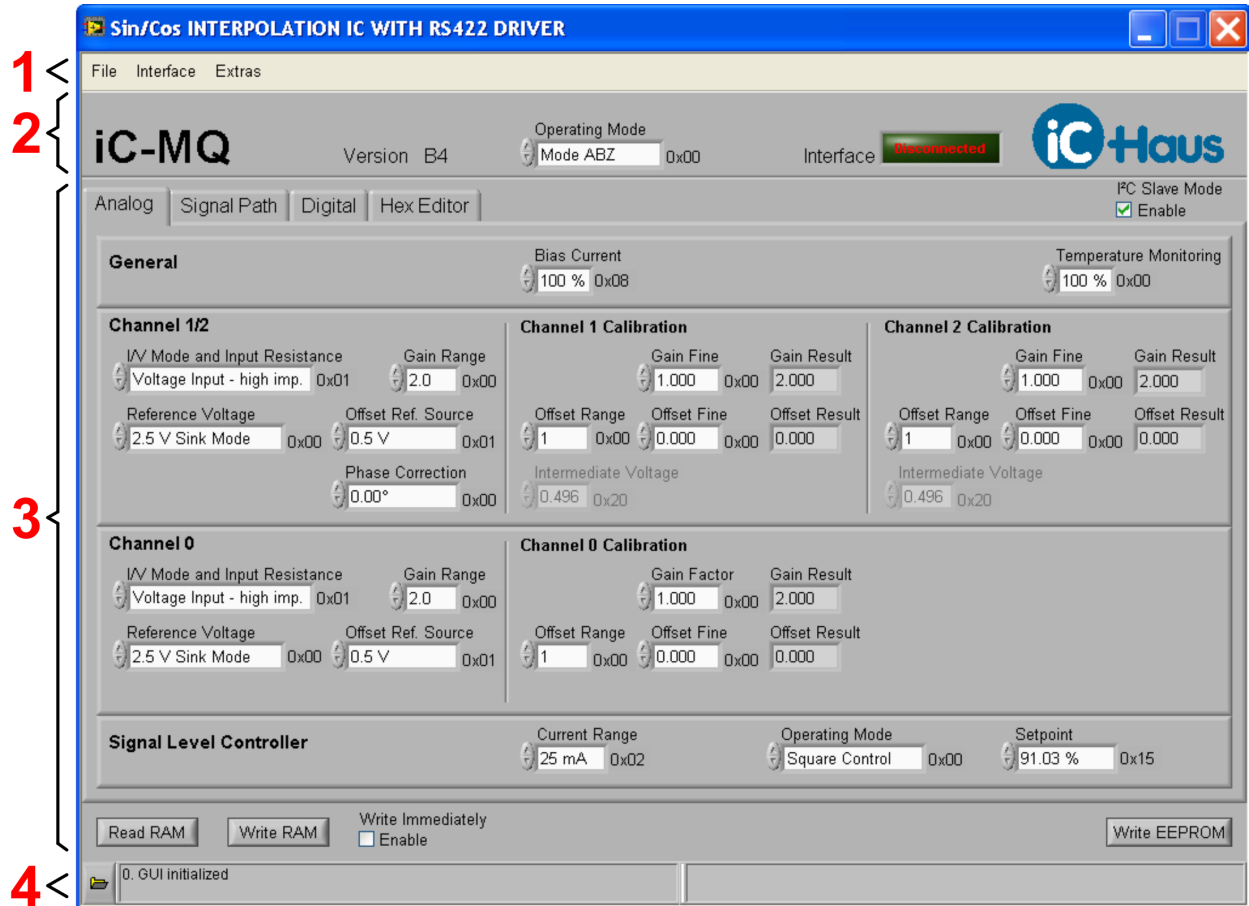


Figure 4: Evaluation software start-up window

Function Description

The iC-MQ software starts in *No Hardware* mode (Interface disconnected). For a detailed description of the parameter settings please refer to iC-MQ's data sheet. When moving the mouse cursor to a parameter input box, a tooltip is displayed identifying the corresponding parameter name as described in the specification.

The evaluation software is divided into four sections.

- Menu
- Header
- Parameter
- Status

1 Menu Section

	Button	Description
<File>	Save File	Saves the configuration to a file, Intel Hex file format (*.hex)
	Load File	Loads the configuration to the IC, Intel Hex file format (*.hex)
	Exit	Quits the software
<Interface>	Connect & Read	Checked: connects the PC adapter and reads the IC registers. Unchecked: connects the PC adapter without reading the IC registers.
	No Hardware	Switches to <i>No Hardware</i> mode to reset the communication between the PC and the adapter
	iC-Interface ↔ USB (MB3U) for use with PC-USB adapter MB3U-I2C	...enables communication between the PC and the iC-MQ and reads all parameters from the iC to the evaluation software.
<Extras>	About	Additional software information

2 Header Section

Project title, software version and connection state

3 Parameter Section

Reading and writing Parameter configuration

<Tabs>	Analog	see iC-MQ datasheet
	Signal Path	see iC-MQ datasheet
	Digital	see iC-MQ datasheet
	Hex Editor	This tab is a different view of the IC's register content in HEX format. Changes made are not automatically updated to the other tabs. Push <Read RAM> to update the parameter tabs.
<Parameter>	Read RAM	Reads all parameters from the iC-MQ to the evaluation software.
	Write RAM	Writes all parameters from the software to the iC-MQ RAM.
	Write Immediately	Writes changes to parameters immediately. Disable this to use the software without hardware.
	Write EEPROM	Writes all parameters to the EEPROM

4 Status Section

Displaying feedback of user interaction

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

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REVISION HISTORY

Rev	Notes	Pages affected
A1	Initial version	
A2	Document layout revised	2, 5, 6
A3	Minor content changes	
A4	Introduction of optional components (Figure 3)	4, 5
A5	Chapter Application Software revised	6
A6	Chapter Application Software revised	7-9
B1	Figure 2 (circuit diagram) revised	3

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