

# iC-MQ EVAL MQ1D

## EVALUATION BOARD DESCRIPTION

### 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
<b>Optional</b> PC Adapter	iC-MB3 ICSY MB3U-I2C	BiSS and I2C to PC-USB Adapter
Software	iC-MQ GUI	GUI software for Windows PC please see <a href="http://www.ichaus.com">www.ichaus.com</a> for download information.

### BOARD MQ1D

(size 100 mm x 80 mm)

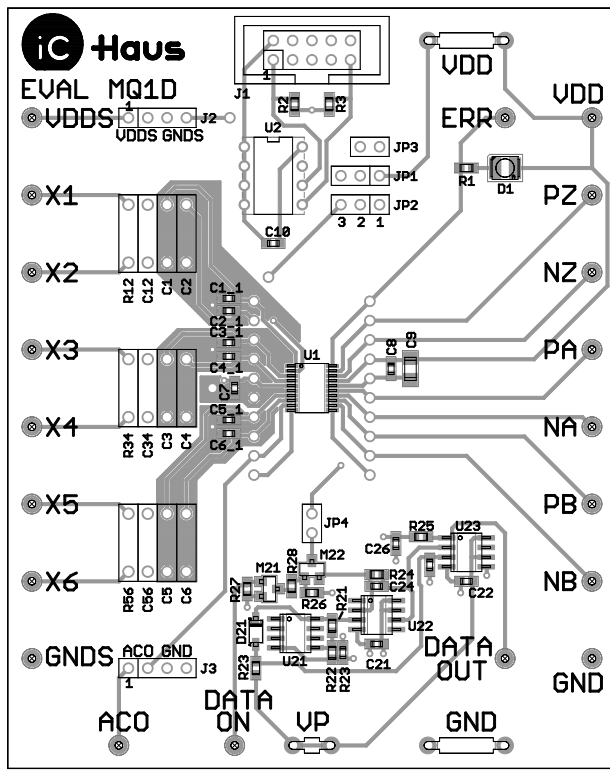


Figure 1: Component side

### 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 -  
→ <http://www.ichaus.de/product.php?prod=iC-MQ>
- iC-MB3 iCSY MB3U-I2C - BiSS and I2C PC-USB Adapter -  
→ <http://www.ichaus.de/product.php?prod=MB3A/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.

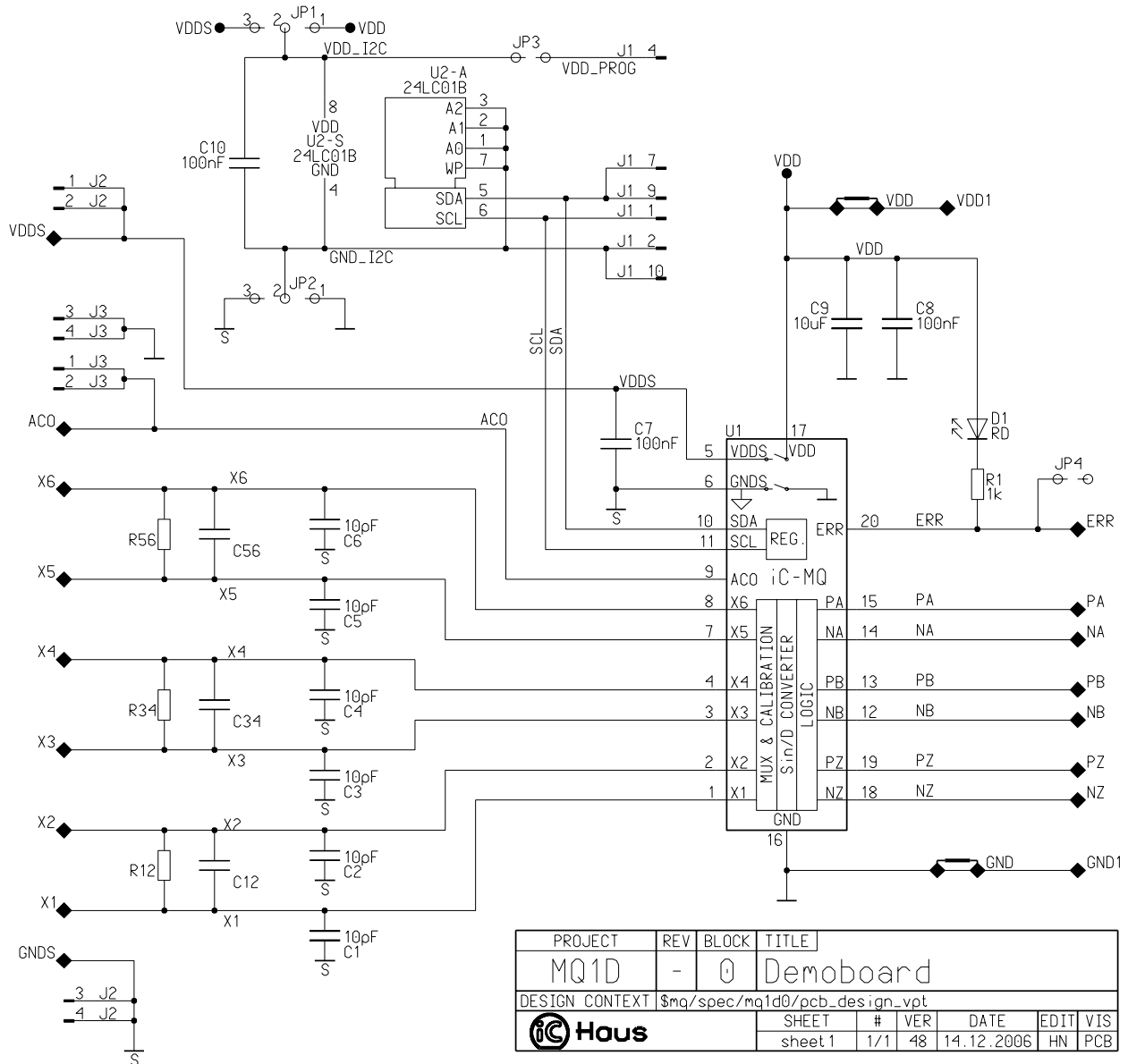


Figure 2: Circuit diagram including optional filter components



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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 $\Omega$	assembled	LED series resistor
R2, R3	4.7 k $\Omega$	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 $\mu$ 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 $\Omega$	optional	
R22	2 k $\Omega$	optional	
R24	470 $\Omega$	optional	
R25	2 k $\Omega$	optional	
R26, R27	100 k $\Omega$	optional	
R28	51 k $\Omega$	optional	
D21	LL4148	optional	
M21	2N7002	optional	
M22	IRLML6401	optional	
U21	LM285	optional	
U22	AD8029	optional	
U23	LM393	optional	

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### 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. Download from <http://www.ichaus.de/product.php?prod=iC-MQ>

#### Installation

After unzipping the "iC-MQ\_xx.zip", the following files are located in the selected directory.  
(xx is a placeholder for revisions)

- iC-MQ\_xx.msi
- mb3u\_usb\_driver.exe
- Mq1d\_qig\_xx.pdf
- readme.txt

**Note :** Administrator rights are required to run installations.

1. The installation of the software starts by executing the iC-MQ\_xx.msi installation package.  
→ Follow the on-screen instructions to finish the installation procedure.
2. USB driver need to be installed to access the MQ1D evaluation board via the PC-USB Adapter.  
→ Execute the mb3u\_usb\_dirver.exe installation package and follow the on-screen instructions. This process can take a few minutes.
3. Installation will make the software "iC-MQ\_xx.exe" available in the selected working directory. The execution of this file will start the software. Figure 4 shows a screenshot of the start up window.

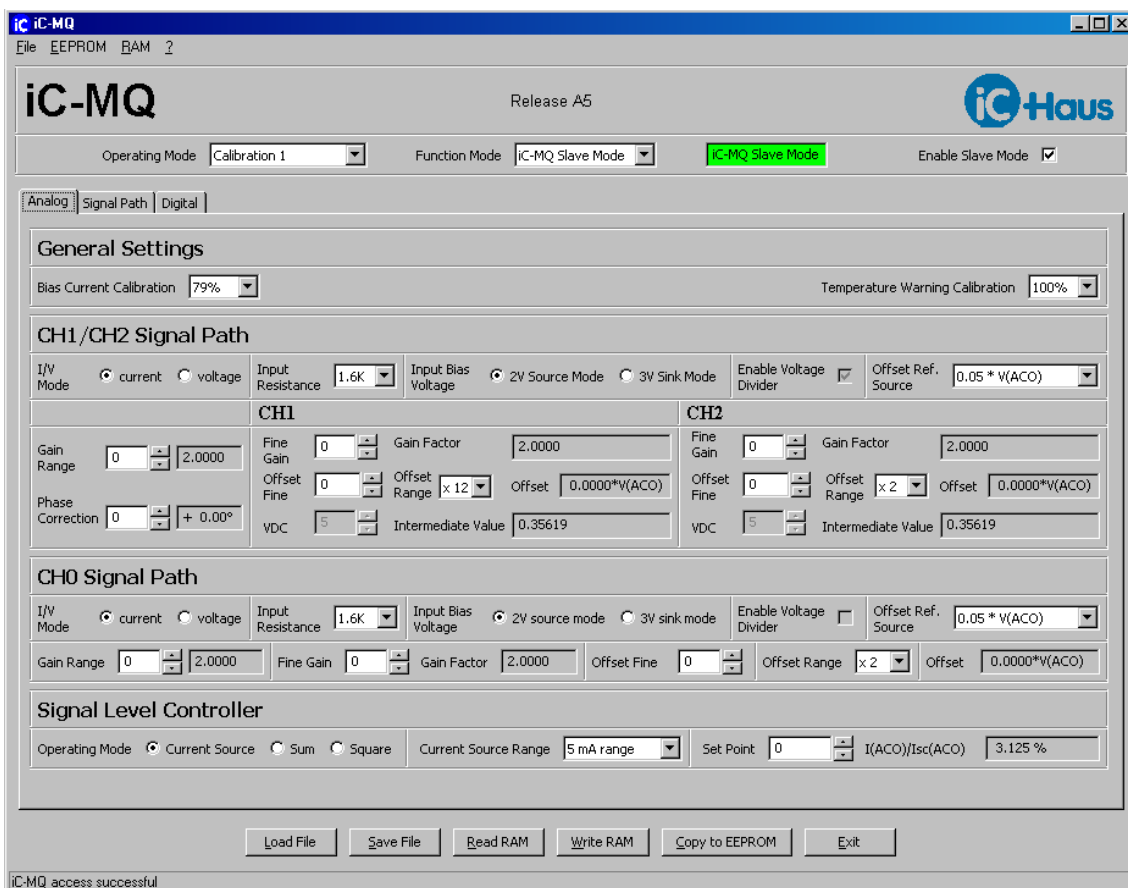


Figure 4: Screenshot of the software

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### Instructions

The software features two major modes.

- **Software Mode**
- **iC-MQ Slave Mode**

The software starts up in "iC-MQ Slave Mode" as long as the communication to the evaluation board was successful. Several errors, like wire connection problems for example, will force the software to switch to the "Software Mode". Not only errors but the need of configuring the iC-MQ parameters without communicating directly with the IC makes the Software Mode a useful tool. Therefore this mode should be used for setting up configuration profiles.

### Menu Section

	<b>Button</b>	<b>Description</b>
<File>	Load File	Chip configuration I/O, Intel hex file format (*.hex)
	Save File	Intel hex file format, suits most EEPROM programmers
	Exit	Quit software
<EEPROM>	Copy to EEPROM	Transfers the iC-MQ RAM content to EEPROM
	Read EEPROM	Loads EEPROM content to software GUI
	Hex Editor EEPROM	Starts a content-viewer window (hexadecimal)
	Test Com. to EEPROM	Checks the communication to EEPROM
<RAM>	Write RAM	Transfers the displayed setup to iC-MQ RAM
	Read RAM	Loads iC-MQ RAM content to software GUI
	Hex Editor RAM	Starts a content-viewer window (hexadecimal)

### Bottom Section

<b>Button</b>	<b>Description</b>
Load File	See description of Menu section
Save File	See description of Menu section
Read RAM	See description of Menu section
Write RAM	See description of Menu section
Copy to EEPROM	See description of Menu section
Exit	See description of Menu section

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 tool tip is displayed identifying the corresponding parameter name as described in the specification.

### REVISION HISTORY

<b>Rev</b>	<b>Notes</b>	<b>Pages affected</b>
A1	Initial version	
A2	Document layout revised	2, 5, 6
A3	Minor content changes	
A4	Introduction of optional components (Figure 3)	4, 5

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