

iC-MSB EVAL MSB1D

EVALUATION BOARD DESCRIPTION



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ORDERING INFORMATION

Type	Order Designation	Description
Evaluation Board	iC-MSB EVAL MSB1D	iC-MSB ^{SAFETY} Evaluation Board Ready-to-operate, accessible by GUI using PC adapter (not included)
Software	iC-MSB GUI	GUI software for Windows PC Device setup file generation, board configuration via adapter For download link check www.ichaus.com/msb
PC Adapter	iC-MB3 ICSY MB3U-I2C	PC-USB Adapter with I2C/SPI extension cable Download documentation at www.ichaus.com/tools

BOARD MSB1D

(size approx. 80 mm x 100 mm)

TERMINAL DESCRIPTION

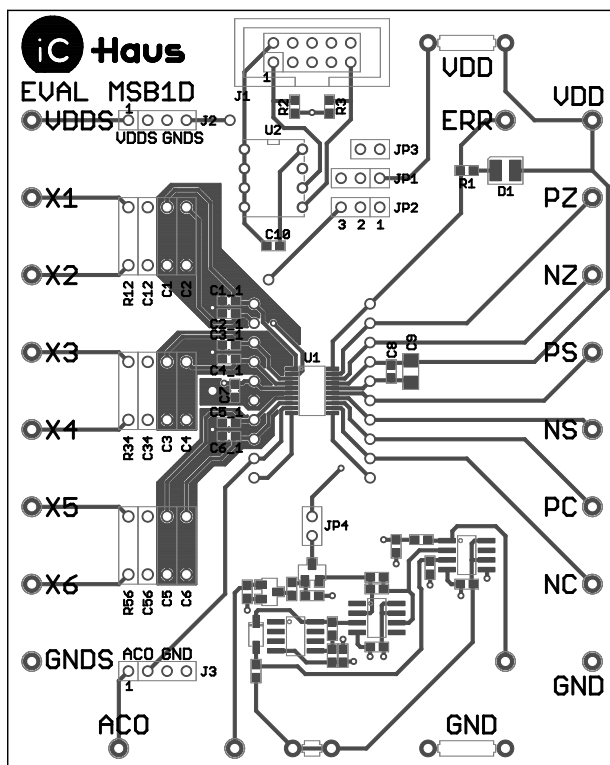


Figure 1: Component side

VDD	+5 V Supply Voltage Input (ca. 15mA) Connected to PC adapter if jumper JP3 is closed.
GND	0 V Ground
X1	Signal Input 1 (Index +)
X2	Signal Input 2 (Index -)
X3...X6	Signal Input 3...6
PZ	Signal Output Index+
NZ	Signal Output Index-
PS	Signal Output Sine+
NS	Signal Output Sine-
PC	Signal Output Cosine+
NC	Signal Output Cosine-
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	Error LED (red) Connected to pin ERR of iC-MSB.
J1	10-pin Male Connector to I2C Adapter

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RELATED DOCUMENTS

- IC Documentation
→ <http://www.ichaus.de/MSB>
- PC-USB Adapter Description
→ http://www.ichaus.de/MB3U_MB3U-I2C_datasheet_en
- GUI software for Windows PC: check here for download links
→ <http://www.ichaus.de/MSB>

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

JUMPER DESCRIPTION

Jumper JP1	Function
Pos. 1-2	EEPROM supplied by VDD
Pos. 2-3	EEPROM supplied by VDDS

Jumper JP3	Function
Closed	VDD sourced from PC adapter
Open	External VDD supply Connect +5 V to supply VDD.

Jumper JP2	Function
Pos. 1-2	EEPROM connected to GND
Pos. 2-3	EEPROM connected to GNDS

Jumper JP4	Function
Closed	Pin ERR connected to decoding circuit (optional, components not populated.)
Open	Pin ERR disconnected from decoding circuit.

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CIRCUIT SCHEMATIC

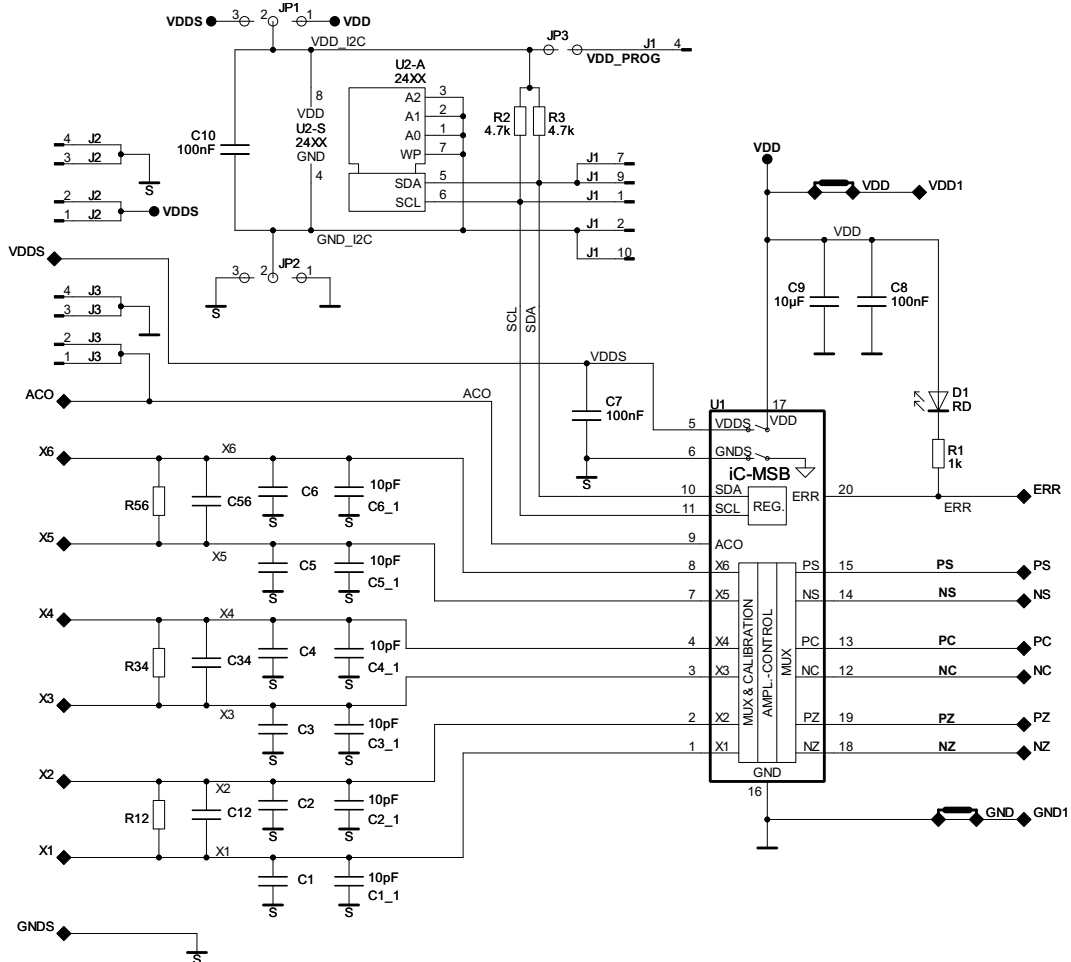


Figure 2: Circuit diagram including optional filter components.

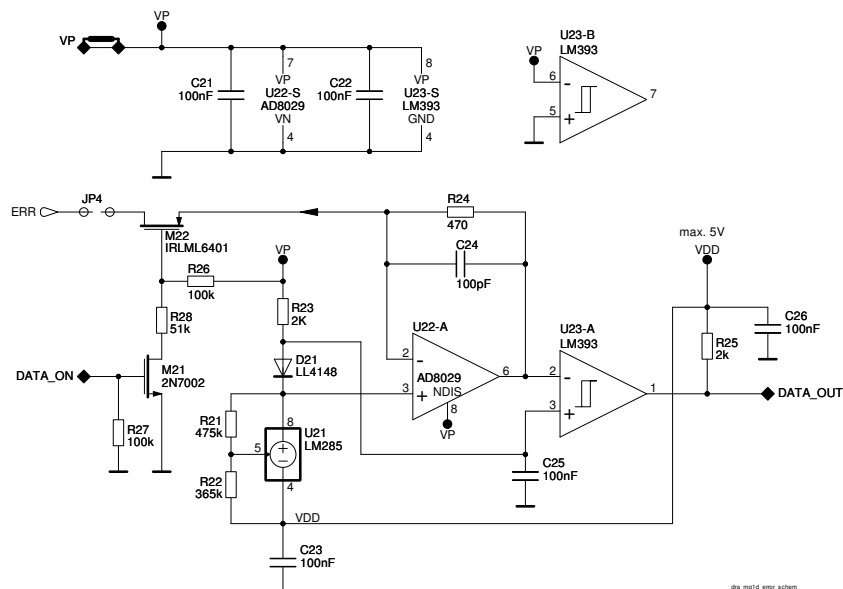


Figure 3: Error interface decoding circuit (components not populated).

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ASSEMBLY PART LIST

Related to circuit diagram, Figure 2

Device	Value (typical)	Comment
U1	iC-MSB	Sine/cosine signal conditioner IC
U2	24C01 (DIL 8)	Serial EEPROM
R1	1 k Ω	LED series resistor
R2, R3	4.7 k Ω	I2C pull-up resistor
D1	LS-T670-HK	Indicator LED for alarm message
C1, C2, C3, C4, C5, C6	10 pF	Capacitors for input filter
C7, C8	100 nF	Supply backup capacitors
C9	10 μ F	Supply backup capacitor
C10	100 nF	EEPROM backup capacitor
JP1, JP2	SL LP1 097 3 G	Jumper
JP3	SL LP1 097 2 G	Jumper
JP1, JP2, JP3		Jumper cap
J1	WSL10G	I2C connector to PC-USB adapter
J2, J3	MK 01 4 G	4-pin socket
J4, J5, J6, U2		8-pin DIL socket

Related to error interface decoding circuit, Figure 3

Device	Value (typical)	Assembled	Comment
C21, C22, C23, C25, C26	100 nF	optional	
C24	100 pF	optional	
R21	475 k Ω	optional	
R22	365 k Ω	optional	
R23, R25	2 k Ω	optional	
R24	470 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	

EVALUATION SOFTWARE

iC-MSB 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-MSB:	http://www.ichaus.de/MSB_gui	http://www.ichaus.de/MSB_gui_rte

Features

- IC configuration made easy by parameter tables and tool tips
- Editing of application-specific default setups (*.hex) with CRC calculation
- Access to DUT and transfer of setup data to RAM and/or EPPROM
- Storage of IC setups as Intel Hex file for programming devices

Installation

After unzipping the iC-MSB software package MSB1SO_gui_xx resp. MSB1SO_gui_xxрте, the following files are located in the selected working directory (xx is a placeholder for revisions):

- Subfolder MSB1SO_gui_xx including the executable setup.exe which starts the installation routine.
- Driver package for USB adapter.

Notice: Administrator rights are required to run installations.

1. To access the iC-MSB evaluation board, interface adapter drivers for USB and/or other adapter devices need to be installed. The driver installation must be completed successfully before connecting the adapter to your PC.
→ Execute the USB_xx.exe installation package and follow the on-screen instructions. This can take a few minutes.

1.1 To complete the driver installation procedure, the PC adapter must be connected to USB finally, after driver installation (only required if the adapter will be used).

2. Install the evaluation software MSB1SO by executing the setup.exe located in the subfolder MSB1SO_gui_xx.
→ Follow the on-screen instructions to finish the installation.

3. After installation the executable MSB1SO_gui_xx.exe will be available in the selected working directory.

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GUI Description

The GUI is divided into four sections:

- 1: Menu section
- 2: Header section
- 3: Parameter tables and control buttons
- 4: Status section with transcript window and online help window.

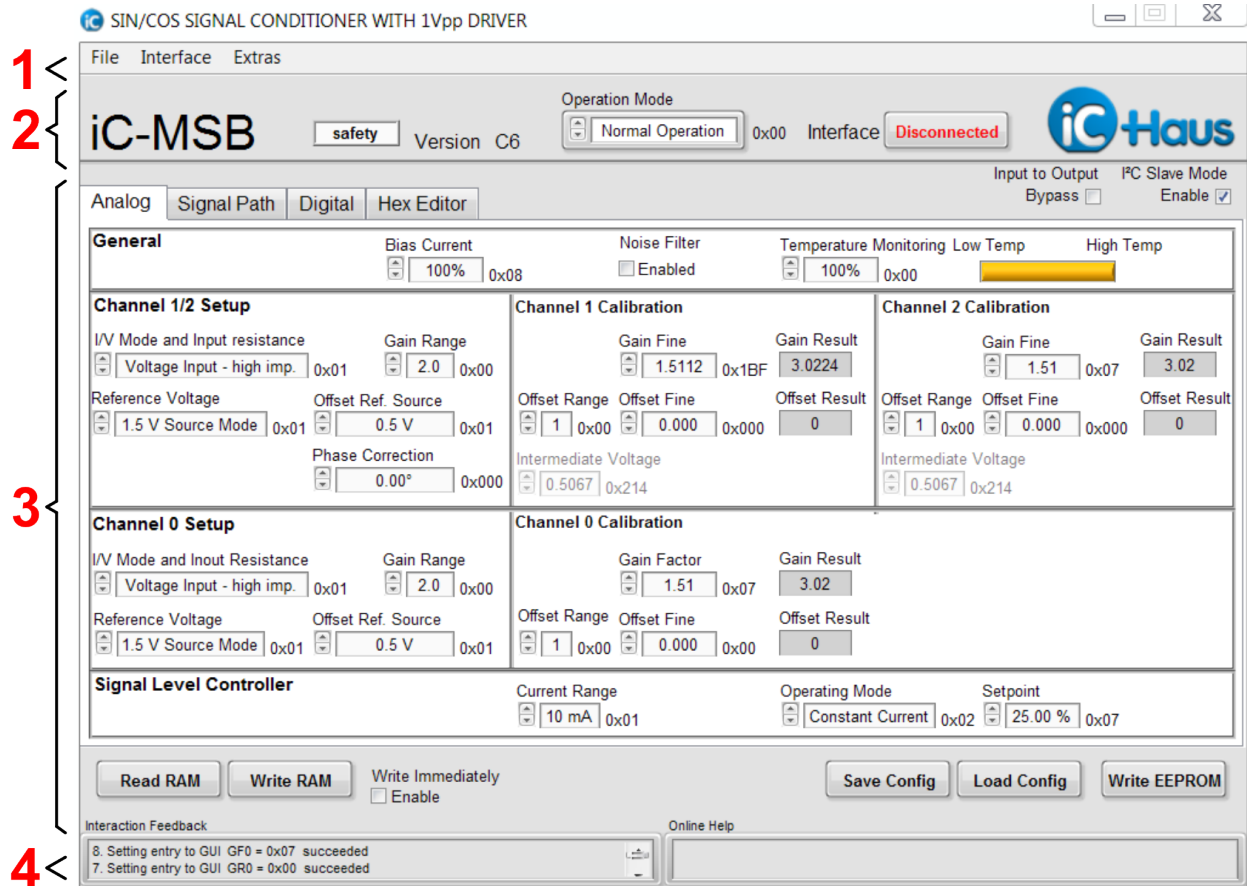


Figure 4: GUI start-up window.

Menu	Button	Description
1 Menu Section		
<File>	Save Config File	Saves the configuration to a file, Intel Hex file format (*.hex)
	Load Config File	Loads the configuration to the IC, Intel Hex file format (*.hex)
	Exit	Quits the software
<Interface>	No Hardware	Disconnects the board and resets the communication between PC and adapter.
	iC-Interface ↔ USB (MB3U)	Selection for PC-USB adapter MB3U-I2C.
	Interface Options → Connect & Read	Checked: connects the PC adapter and reads the IC registers. Unchecked: connects the PC adapter without reading the IC registers.
<Extras>	Parameter Search	Enables a search field to locate a parameter's control field. If a name match is found, the corresponding control field will be highlighted and focused.
	Generate Report	Generates a *report.zip archive reporting the current software status. This report eases debugging software issues by the iC-Haus' support team.
	About	GUI release information
2 Header Section		Project title, chip version, software version and connection state
3 Parameter Section		Parameter configuration, read/write access to IC.
<Tabs>	Analog	Refer to IC datasheet.
	Signal Path	Refer to IC datasheet.
	Digital	Refer to IC 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 and refreshes the display.
	Write RAM	Writes all parameters from GUI to IC RAM.
	Write Immediately	If checked, any change to a parameter is transferred immediately. If disabled, the GUI can be used stand-alone without hardware.
	Write EEPROM	Writes all parameters to the EEPROM
4 Status Section		Transcript and feedback messages of user actions.

The GUI software starts with <Interface> *Disconnected*.

When moving the mouse cursor across an input box, a tooltip comes up and displays the real parameter name according to this box. If a functional parameter description is required, please refer to the IC datasheet.

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REVISION HISTORY

Rel.	Rel. Date*	Chapter	Modification	Page
A1	2006-06-30		Initial release	all

Rel.	Rel. Date*	Chapter	Modification	Page
A2	2007-10-08		Document layout revised	

Rel.	Rel. Date*	Chapter	Modification	Page
A3	2011-07-04	EVALUATION SOFTWARE	Chapter revised	5-7

Rel.	Rel. Date*	Chapter	Modification	Page
A4	2014-03-19		Overall revision; chapter Jumper Description revised;	all

Rel.	Rel. Date*	Chapter	Modification	Page
A5	2020-04-07	ORDERING INFORMATION	Item iC-MSB2 removed	1

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* Release Date format: YYYY-MM-DD