

# iC-MSA EVAL MSA1D

## EVALUATION BOARD DESCRIPTION



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### ORDERING INFORMATION

Type	Order Designation	Description
Evaluation Board	iC-MSA EVAL MSA1D	iC-MSA Evaluation Board Ready-to-operate, accessible by GUI using PC adapter (not included)
Software	iC-MSA GUI	GUI software for Windows PC Device setup file generation, board configuration via adapter For download link check <a href="http://www.ichaus.com/msa">www.ichaus.com/msa</a>
PC Adapter	iC-MB3 ICSY MB3U-I2C	PC-USB Adapter with I2C/SPI extension cable Download documentation at <a href="http://www.ichaus.com/tools">www.ichaus.com/tools</a>

### BOARD MSA1D

(size 100 mm x 80 mm)

### TERMINAL DESCRIPTION

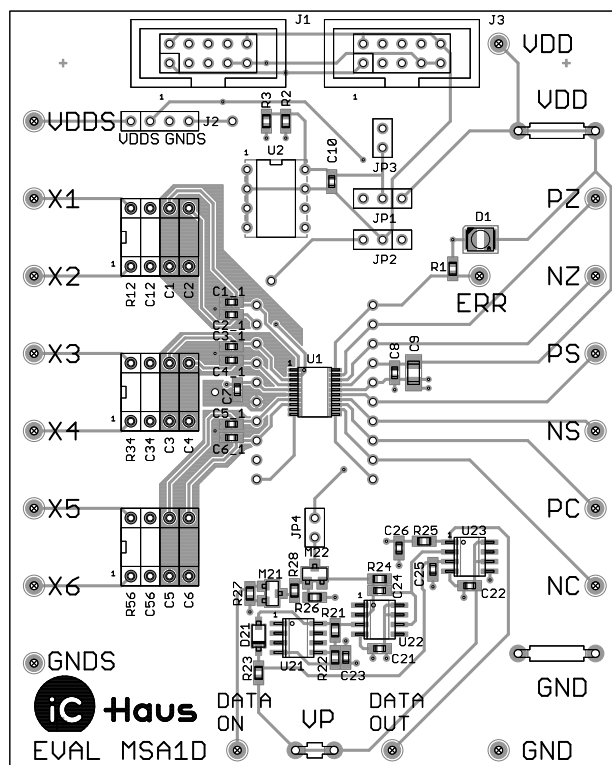


Figure 1: Component side

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.)
GND	Switched Ground Link (20 mA max.)
D1	Error LED (red) Connected to pin ERR of iC-MSA.
J1	10-pin Male Connector to I2C Adapter
J3	10-pin Male Connector to MSB1D board

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### RELATED DOCUMENTS

- IC Documentation  
→ <http://www.ichaus.de/MSA>
- PC-USB Adapter Description  
→ [http://www.ichaus.de/MB3U\\_MB3U-I2C\\_datasheet\\_en](http://www.ichaus.de/MB3U_MB3U-I2C_datasheet_en)
- GUI software for Windows PC: check here for download links  
→ <http://www.ichaus.de/MSA>

### 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

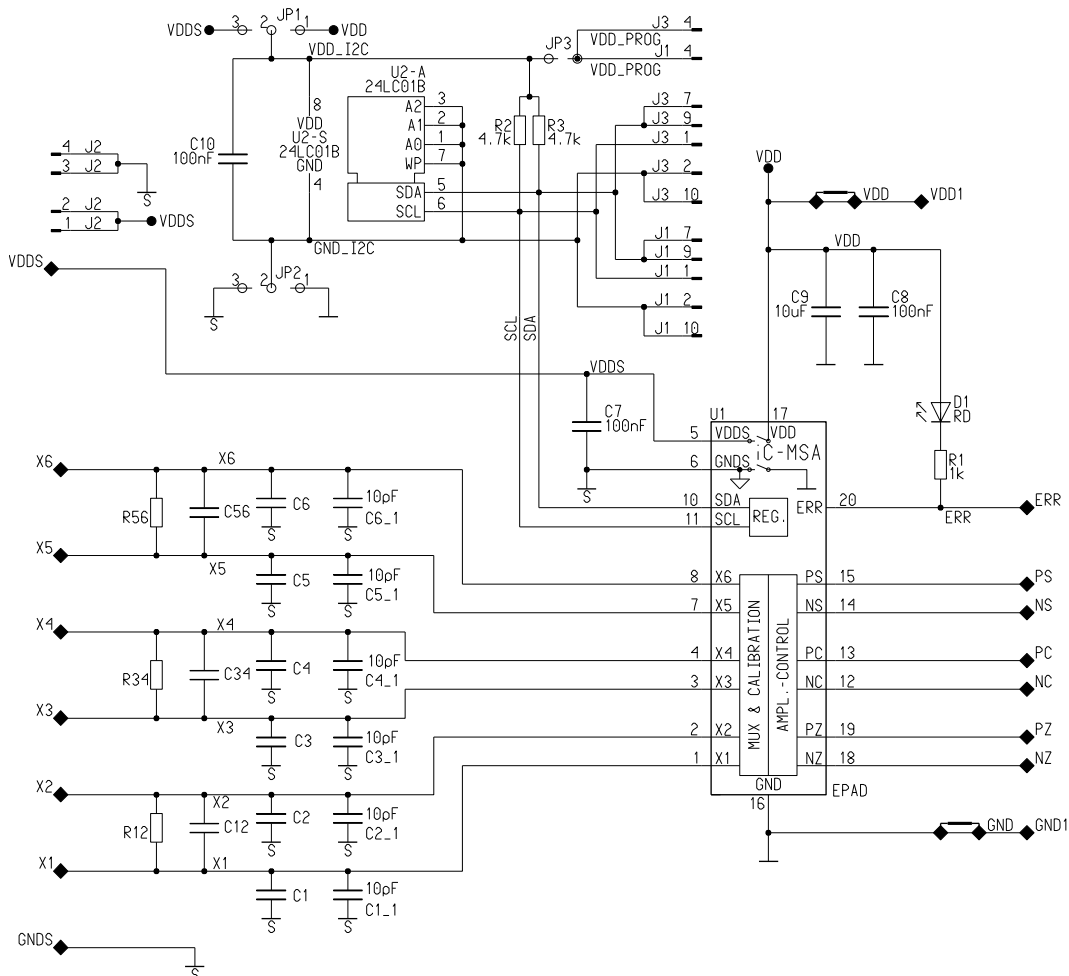


Figure 2: Circuit diagram including optional filter components.

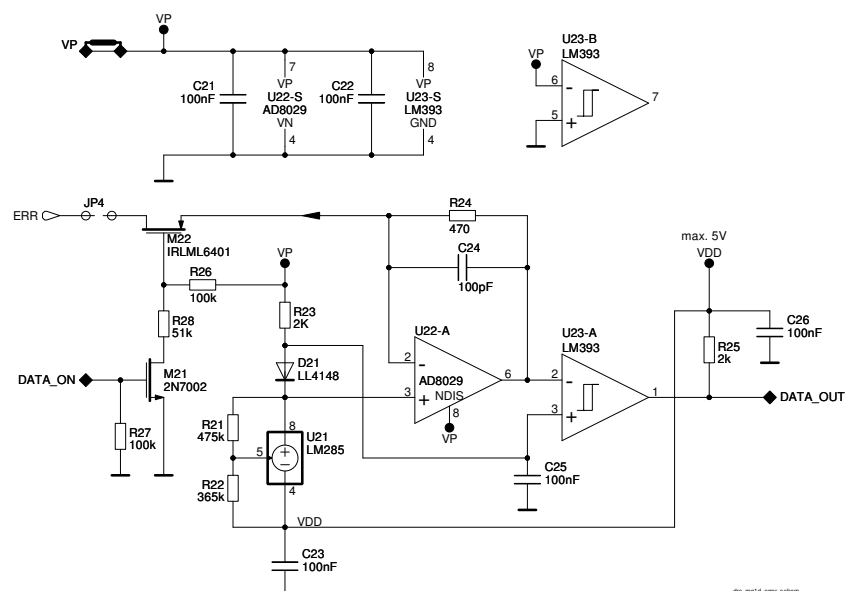


Figure 3: Error interface decoding circuit (optional components).

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### ASSEMBLY PART LIST

#### Related to circuit diagram, Figure 2

Device	Value (typical)	Comment
U1	iC-MSA	Sine/cosine signal conditioner IC
U2	24C01	Serial EEPROM (AT24C01C, ST24C02WP recommended)
R1	1 k $\Omega$	LED series resistor
R2, R3	4.7 k $\Omega$	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 $\mu$ 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, J3	WSL10G	I2C connector to PC-USB adapter, to MSB1D board
J2	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, 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	
JP4	SL LP1 097 2 G	optional	

### EVALUATION SOFTWARE

iC-MSA 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

iC-MSA:

#### without RTE (small size)

[http://www.ichaus.de/MSA\\_gui](http://www.ichaus.de/MSA_gui)

#### including RTE (big size)

[http://www.ichaus.de/MSA\\_gui\\_rte](http://www.ichaus.de/MSA_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-MSA software package MSA1SO\_gui\_xx resp. MSA1SO\_gui\_xxрте, the following files are located in the selected working directory (xx is a placeholder for revisions):

- Subfolder MSA1SO\_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-MSA 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 MSA1SO by executing the setup.exe located in the subfolder MSA1SO\_gui\_xx.  
→ Follow the on-screen instructions to finish the installation.

3. After installation the executable MSA1SO\_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.

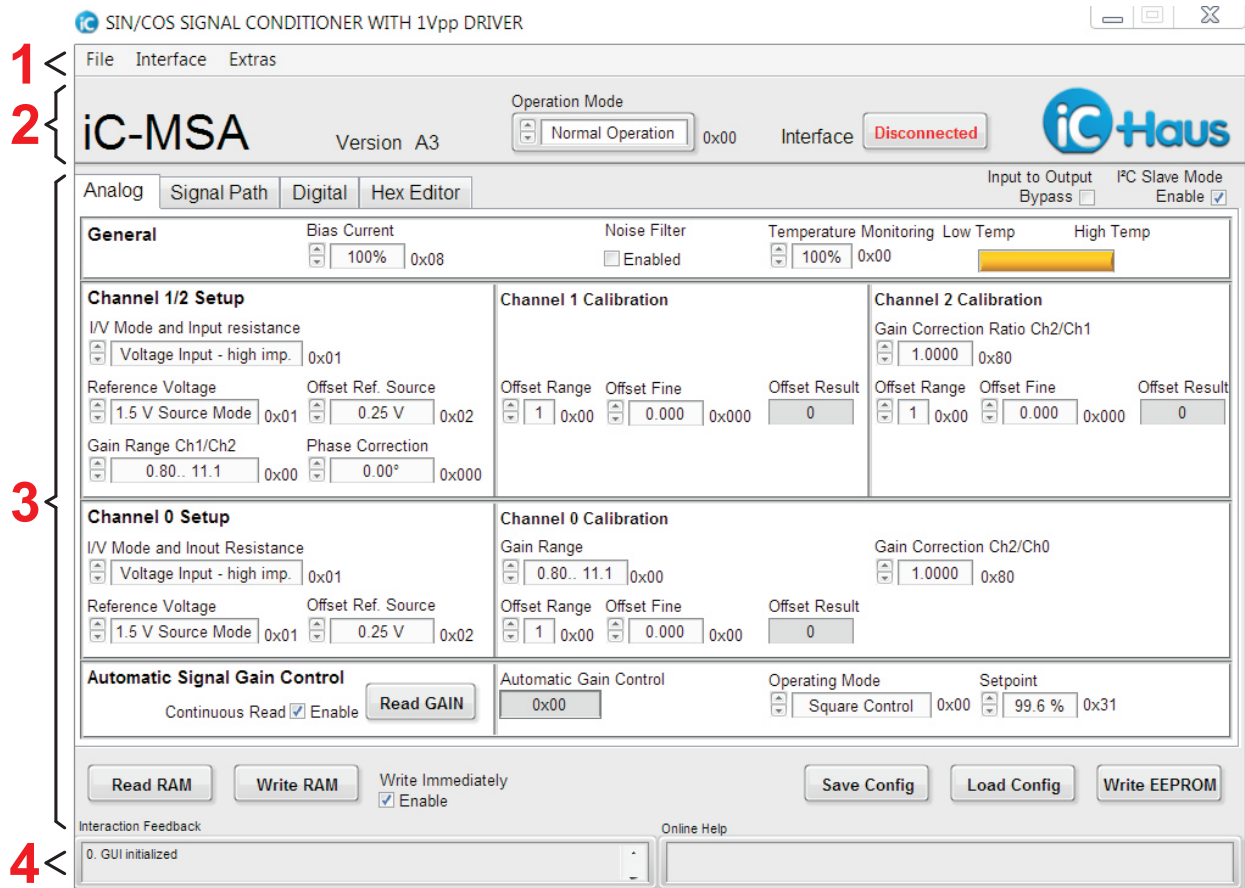


Figure 4: GUI start-up window.

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Menu	Button	Description
<b>1 Menu Section</b>		
<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	14-03-24		Initial version	all

iC-Haus expressly reserves the right to change its products and/or specifications. An info letter gives details as to any amendments and additions made to the relevant current specifications on our internet website [www.ichaus.de/infoletter](http://www.ichaus.de/infoletter); this letter is generated automatically and shall be sent to registered users by email.

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