

# iC-MSA EVAL MSA1D

## EVALUATION BOARD DESCRIPTION



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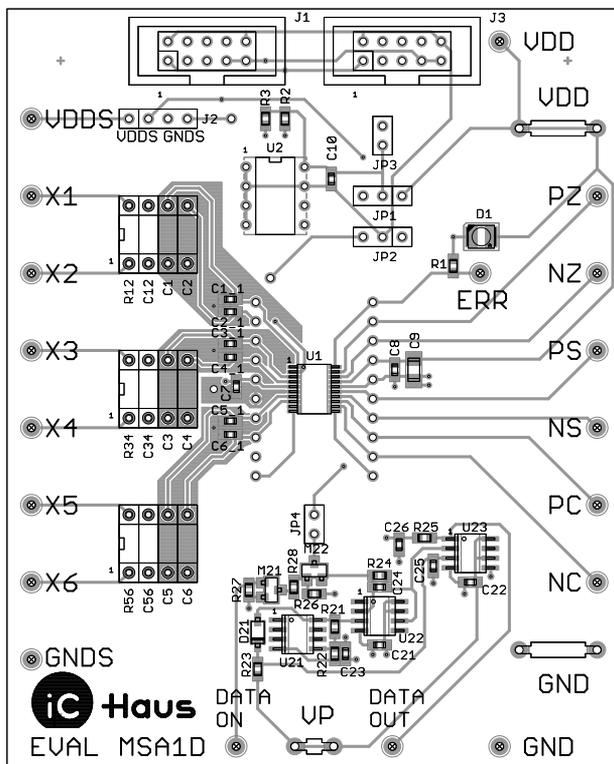
### ORDERING INFORMATION

| Type             | Order Designation    | Description  |
|------------------|----------------------|--|
| Evaluation Board | iC-MSA EVAL MSA1D    | iC-MSA Evaluation Board<br>Ready-to-operate, accessible by GUI using PC adapter (not included)   |
| Software         | iC-MSA GUI           | GUI software for Windows PC<br>Device setup file generation, board configuration via adapter<br>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<br>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



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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<br>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

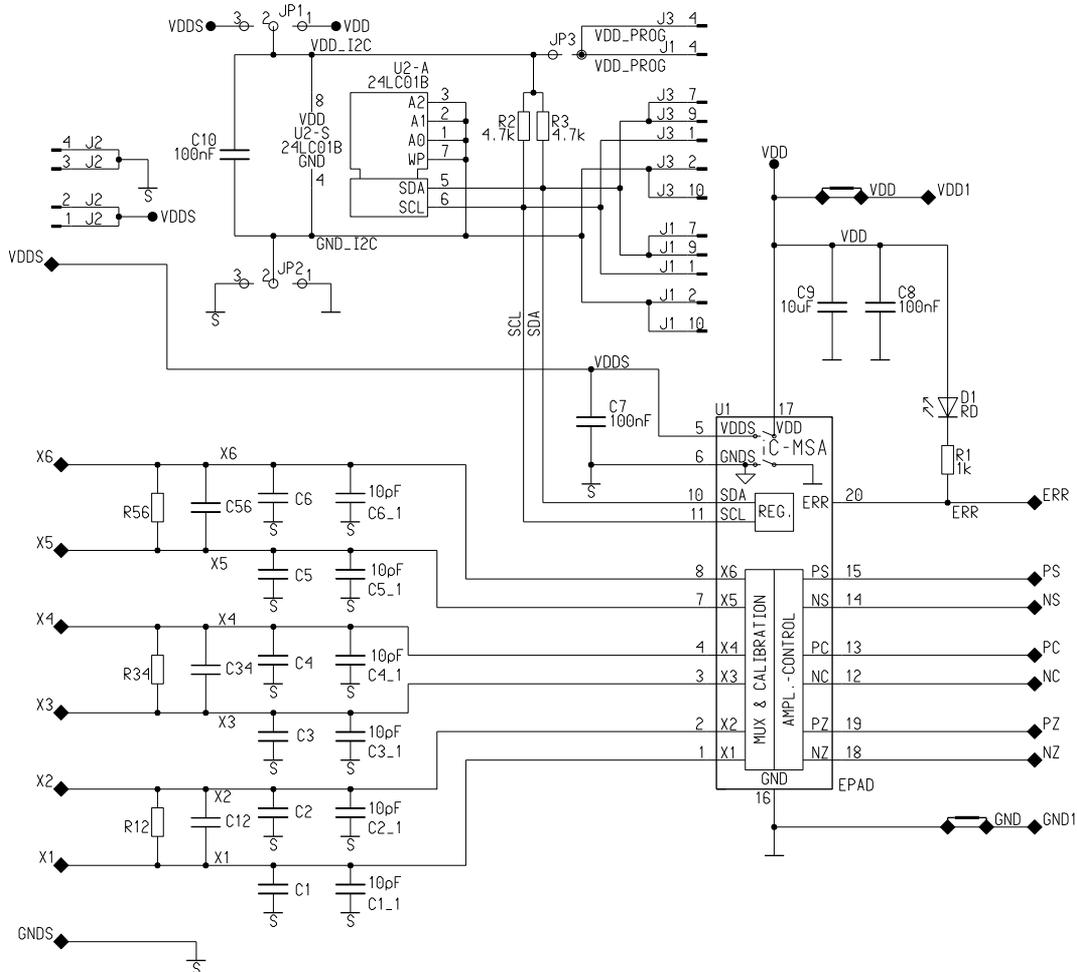


Figure 2: Circuit diagram including optional filter components.

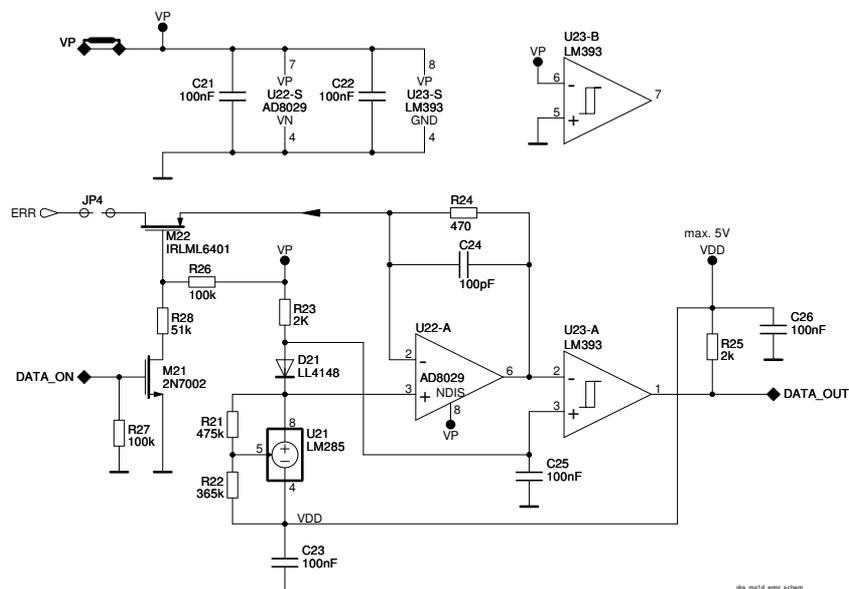


Figure 3: Error interface decoding circuit (optional components).

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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<br>(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 | without RTE (small size)  | including RTE (big size)  |
|------------------|---|---|
| iC-MSA:          | <a href="http://www.ichaus.de/MSA_gui">http://www.ichaus.de/MSA_gui</a> | <a href="http://www.ichaus.de/MSA_gui_rte">http://www.ichaus.de/MSA_gui_rte</a> |

### 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.

LabView™ is a trademark of National Instruments.

### 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.

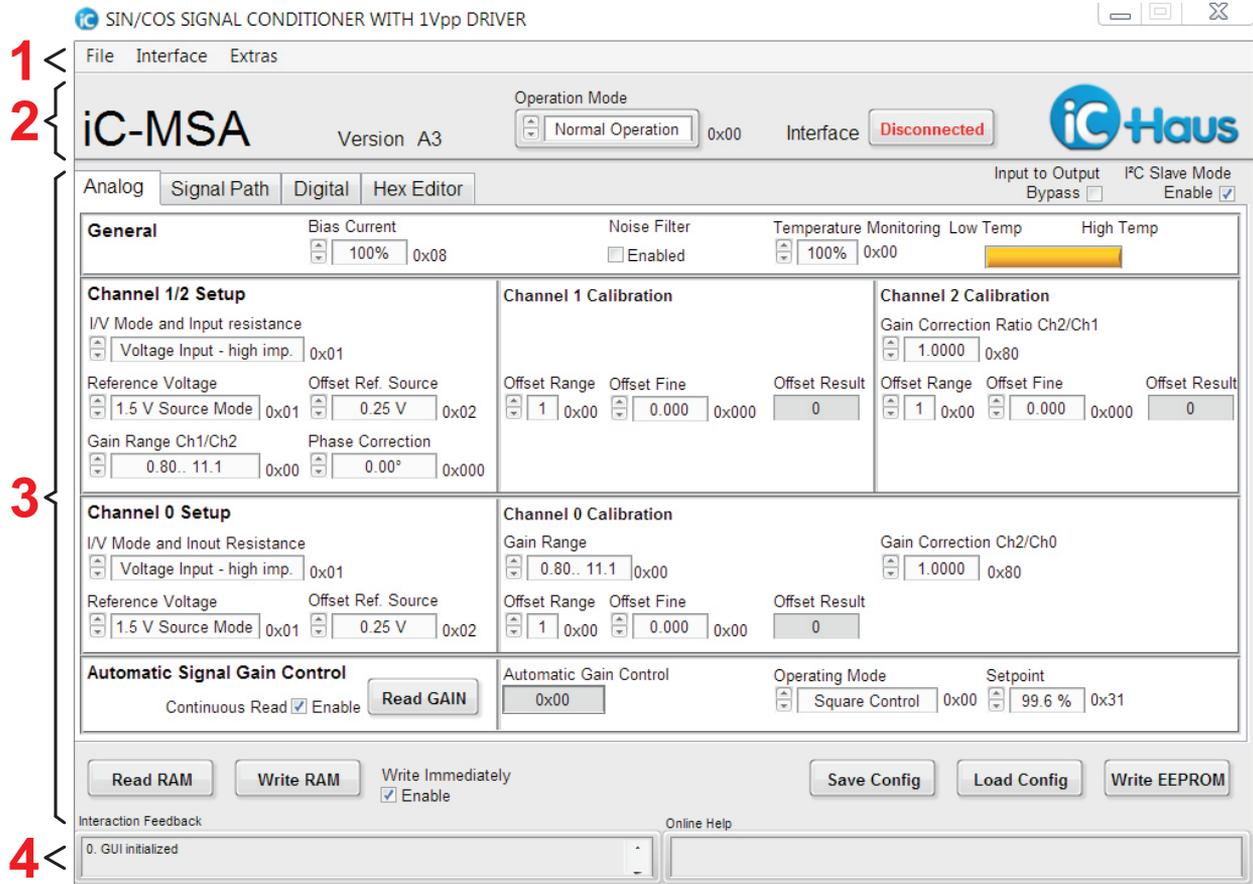


Figure 4: GUI start-up window.

| Menu                       | Button                                | Description  |
|----------------------------|---------------------------------------|--|
| <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<br>→ Connect & Read | Checked: connects the PC adapter and reads the IC registers.<br>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  |
| <b>2 Header Section</b>    |                                       | Project title, chip version, software version and connection state   |
| <b>3 Parameter Section</b> |                                       | 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  |
| <b>4 Status Section</b>    |                                       | 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  |

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