

iC-MB4 EVAL MB4_1D

EVALUATION BOARD DESCRIPTION

ORDERING INFORMATION

Type	Order Designation	Description
Evaluation Board	iC-MB4 EVAL MB4_1D	iC-MB4 Evaluation Board Ready-to-operate, accessible by GUI using PC adapter (not included)
Software	iC-MB4 GUI	GUI software for Windows PC Device setup file generation, board configuration via adapter For download link check www.ichaus.com/mb4
PC Adapter	iC-MB3 ICSY MB3U-I2C	PC-USB Adapter with I2C/SPI extension cable Download documentation at www.ichaus.com/tools

The device offered here is a multifunctional iC that contains integrated BiSS C interface components. The BiSS C process is protected by patent DE 10310622 B4 owned by iC-Haus GmbH. Users benefit from the open BiSS C protocol with a free license which is necessary when using the BiSS C protocol in conjunction with this iC.

Download the license at www.biss-interface.com/BUA

BOARD MB4_1D

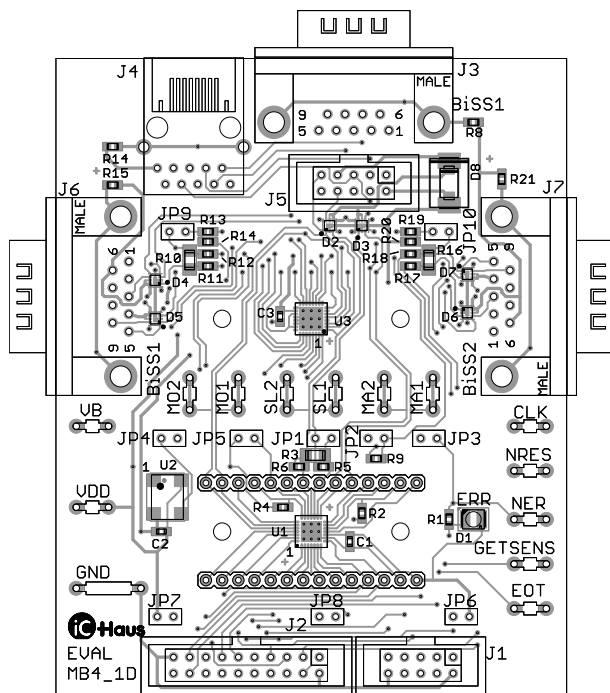


Figure 1: Component side (size 100 mm x 80 mm)

TERMINAL DESCRIPTION

VB	VB BiSS Interface Supply Only on BiSS interface connector.
VDD	+5 V Supply Voltage Input (typ. 75 mA) Connected to PC adapter if jumper JP6 is closed.
GND	0 V Ground
J1	iC-MB4 host interface SPI1 SPI interface connector to MB3U-I2C.
J2	iC-MB4 host interface Connector to all host interface pins.
J3	BiSS Ch. 1 (D-Sub, RS422)
J4	BiSS Ch. 1 (RJ45, RS422)
J5	BiSS Ch. 1+2 (RM2x5)
J6	BiSS Ch. 1 (D-Sub, RS422)
J7	BiSS Ch. 2 (D-Sub, RS422)
CLK	20 MHz clock input/output
NRES	Reset input (low active)
NER	Error output (low active)
GETSENS	Get Sensordata input (high active, static)
EOT	End of transmission output (high active)
D1	Error LED (red) Connected to pin ERR of iC-MB4.

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RELATED DOCUMENTS

- IC Documentation
→ <http://www.ichaus.de/MB4>
- 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/MB4>

CONNECTOR AND TERMINAL PINOUT

J1: iC-MB4 signals

10-pin Connector - male

PIN	Name	Function
1	ALE	SPI Clock Input
2	GND	Ground
3		n.c.
4	VDD	+3 V ... +5.5 V Supply Voltage
5	EOT	End-Of-Transmission Output
6	NER	Error Message Input/Output
7	MOSI	SPI Serial Data Input
8	NCS	SPI Chip Select Input
9	MISO	SPI Serial Data Output
10	GND	Ground

J3: BiSS Channel 1

9-pin Connector -SUB-D9 - male

PIN	Name	Function
1	VB	VB output
2	MAO	BiSS Clock Line Output
3	NMAO	BiSS Clock Line Output
4	VDD	+3 V ... +5.5 V Supply Voltage
5	NSLO	BiSS Data Line Output
6	GND	Ground
7	SL	BiSS Data Line Input
8	NSL	BiSS Data Line Input
9	SLO	BiSS Data Line Output

J2: iC-MB4 signals

20-pin Connector - male

PIN	Name	Function
1	VDD	+3 V ... +5.5 V Supply Voltage
2	GND	Ground
3	INT_NMOT	Comm. Mode Select Input
4	CFGSPI	S/P Mode Select Input
5	NWR_E	Read Input
6	NRD_RNW	Write Input
7	NCS	SPI Chip Select Input
8	ALE	SPI Clock Input
9	DB0	SPI Serial Data Input
10	DB1	SPI Serial Data Output
11	DB1	Data Bus Input/Output
12	DB2	Data Bus Input/Output
13	DB4	SPI2 Chip Select Input
14	DB5	SPI2 Clock Input
15	DB6	SPI2 Serial Data Input
16	DB7	SPI2 Serial Data Output
17	EOT	End-Of-Transmission Output
18	GETSENS	Sensor Data Request Input
19	GND	Ground
20	VDD	+3 V ... +5.5 V Supply Voltage

J4: BiSS Channel 1

10-pin Connector -RJ45 - male

PIN	Name	Function
1	SL	BiSS Data Line Input
2	NSL	BiSS Data Line Input
3	MAO	BiSS Clock Line Output
4	SLO	BiSS Data Line Output
5	NSLO	BiSS Data Line Output
6	NMAO	BiSS Clock Line Output
7	VB	VB output
8	GND	Ground
9	SLO	BiSS Data Line Output
A	VB1	VB1 output
B	GND1	Ground1
S	GND	Ground
S1	GND	Ground

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J5: BiSS Channel 1

10-pin Connector - male

PIN	Name	Function
1	VB	VB output
2	GND	Ground
3	MAO	BiSS Clock Line Output
4	SL	BiSS Data Line Input
5	NMAO	BiSS Clock Line Output
6	NSL	BiSS Data Line Input
7	VDD	+3 V ... +5.5 V Supply Voltage
8	SLO	BiSS Data Line Output
9	NSLO	BiSS Data Line Output

J7: BiSS Channel 2

9-pin Connector -SUB-D9 - male

PIN	Name	Function
1	VB	VB output
2	MAO	BiSS Clock Line Output
3	NMAO	BiSS Clock Line Output
4	VDD	+3 V ... +5.5 V Supply Voltage
5	NSLO	BiSS Data Line Output
6	GND	Ground
7	SL	BiSS Data Line Input
8	NSL	BiSS Data Line Input
9	SLO	BiSS Data Line Output

J6: BiSS Channel 1

9-pin Connector -SUB-D9 - male

PIN	Name	Function
1	VB	VB output
2	MAO	BiSS Clock Line Output
3	NMAO	BiSS Clock Line Output
4	VDD	+3 V ... +5.5 V Supply Voltage
5	NSLO	BiSS Data Line Output
6	GND	Ground
7	SL	BiSS Data Line Input
8	NSL	BiSS Data Line Input
9	SLO	BiSS Data Line Output

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JUMPER DESCRIPTION

Jumper JP1	Function
Pos. 1-2	120Ω on SL1
Open	No termination on SL1

Jumper JP2	Function
Pos. 1-2	Output enabled on RS422 line driver iC-HF
Open	Output disabled on RS422 line driver iC-HF

Jumper JP3	Function
Pos. 1-2	NERR input/output connected to NERR of RS422 line driver iC-HF
Open	NERR input/output not connected to NERR of RS422 line driver iC-HF

Jumper JP4	Function
Pos. 1-2	Use external 20 MHz oscillator
Open	Use internal 20 MHz oscillator

Jumper JP5	Function
Pos. 1-2	Use SPI interface
Open	Use parallel interface

Jumper JP6	Function
Pos. 1-2	VDD supply through J1

Jumper JP7	Function
Pos. 1-2	VDD supply through J2.20

Jumper JP8	Function
Pos. 1-2	VDD supply through J2.21

Jumper JP9	Function
Pos. 1-2	VDD/2 on NQ6 of RS422 line driver iC-HF

Jumper JP10	Function
Pos. 1-2	VDD/2 on NQ5 of RS422 line driver iC-HF

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CIRCUIT SCHEMATIC

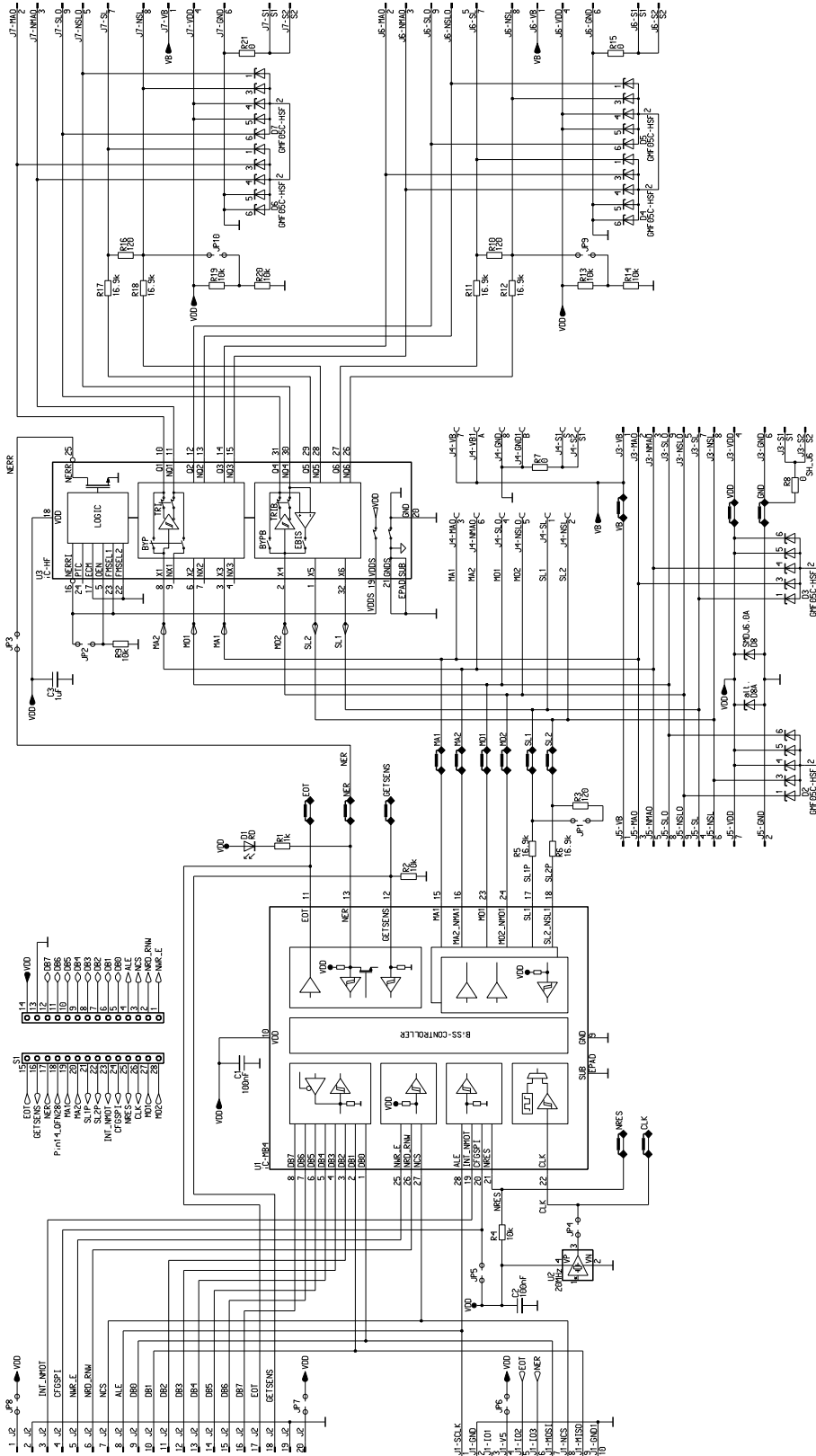


Figure 2: Circuit diagram

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ASSEMBLY PART LIST

Device	Value (typical)	Comment
PCB	MB4_1D	PCB 100 mm x 80 mm
C1, C2	SMD-C 100 nF	100 nF CSMD0603 10% X7R 16V Size 0603
C3	SMD-C 1 μ F	1 μ F CSMD0603 10% X7R 16V Size 0603
D1	SMD-LED SUPER-RED	RD LED_PLCC2 LS-T67K
D2 ... 8	SMD-TVSD (5x)	GMF05C-HSF VISHAY_LL75-6L 5V BI GMF05C-HSF LLP75-6L (SOT363)
GND	Jumperlink 10.16 mm	LBS04 TESTCLAMP_400 d=1 mm
J1, J2, J5	Connector 2x5-pole	WSL10 CONN_WSL_10_MALE male (WSL10G)
J4	Connector 8+2-pole	RJ45_10 YAMAICHI_RJ45_10_Y-CONJACK-21 male RJ45
J3, J6, J7	Connector 9-pole SUBD	D_SUB9_MALE_RH CONN_SUBD_9_MALE_RH male 90
JP1 ... 10	Connector 2x1-pole	SLLP10972G W2X1 2.54 mm (SLLP10972G)
R1, R5, R6	SMD-R 1k	1k RSMD0603 1% Size 0603
R11, R12	SMD-R 16K	16.9k RSMD0603 1% Size 0603
R3, R10, R16	SMD-R 120R	120 RSMD1206 1% Size 1206
R17, R18	SMD-R 16K	16.9k RSMD0603 1% Size 0603
R2, R4, R9, R13, R14, R19, R20	SMD-R 10K	10k RSMD0603 1% Size 0603
R8, R7, R15, R21	SMD-R 0R	0 RSMD0603 5% 1A Size 0603
S1	Socket 14x1-Pin	2 X_S14X1 DIL28_2X_S14X1 (MK0114G)
VB, VDD, MA1, MA2, MO1, MO2, NER, MRES, SL1, SL2, EOT, GETSENS, CLK	Jumperlink 5.08 mm	LBS02 TESTCLAMP_200 d=1 mm (LBS02G)
U1	iC-MB4	iC-MB4 QFN28 5x5
U2	20 MHz Quartz	OSC4_SMD_7X5 SMD-Oscillator 20 MHz 50 ppm 5V 7 mm x 5 mm
U3	iC-HF	iC-HF QFN32 5x5
RF1 ... 4	Rubberfoot	12.7 mm x 12.7 mm x 5.6 mm

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EVALUATION SOFTWARE

iC-MB4 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-MB4:

without RTE (small size)

http://www.ichaus.de/MB4_gui

including RTE (big size)

http://www.ichaus.de/MB4_gui_rte

Features

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

Installation

After unzipping the iC-MB4 software package MB41SO_gui_xx resp. MB41SO_gui_xxрте, the following files are located in the selected working directory (xx is a placeholder for revisions):

- Subfolder MB41SO_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-MB4 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 MB41SO by executing the setup.exe located in the subfolder MB41SO_gui_xx.
→ Follow the on-screen instructions to finish the installation.

3. After installation the executable MB41SO_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, status and control buttons
- 4: Application status section with transcript window and online help window.



Figure 3: 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>	General	Channel and Master configuration, refer to IC datasheet.
	Communication	Register and Command communication, refer to IC datasheet.
	Slave 1 ... 4	Slave 1 ... 4 configuration, refer to IC datasheet.
	Slave 5 ... 8	Slave 5 ... 8 configuration, refer to IC datasheet.
	Status	Status overview, refer to IC datasheet.
	Misc	Miscellaneous status and feedback, 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.
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	2014-04-28		initial version	
A2	2015-07-07		BiSS BUA added	1
		BOARD MB4_1D	MB3U-I2C supplies via JP6 not JP3	1

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