

### OVERVIEW COMPARING ADAPTERS MB3U, MB4U AND MB5U

Feature	MB3U	MB4U	MB5U
<b>USB</b>			
Bandwidth	12 MBit/s	480 MBit/s or 12 MBit/s	480 MBit/s or 12 MBit/s
USB connector	USB B	Mini USB B	Mini USB B
USB interface	FTDI serial	USB PHY + FPGA	USB PHY + FPGA
<b>Hardware</b>			
Housing	Black plastic	Blue aluminium	Black aluminium
Connectors	BiSS, SPI/I2C <sup>1</sup>	BiSS, 2-WIRE	BiSS, 2-WIRE
<b>Power Supply</b>			
USB powered operation	Yes	Yes	Yes
USB powering external sensors with VDD	Yes	Yes	Yes
USB powering external sensors with VB	Yes	Yes	No
Power on/off on external sensor power	No	Yes	Yes
External power supply input	Yes	No	No
<b>Physical interface</b>			
RS422 interface	Yes	Yes	Yes
TTL interface	Yes <sup>2</sup>	Yes <sup>2</sup>	Yes <sup>2</sup>
Galvanic isolation	Yes	No	Yes
<b>Interface protocols</b>			
BiSS B	Yes	Yes	Yes
BiSS C unidirectional	Yes	Yes	Yes
BiSS C SCD	Yes	Yes	Yes
BiSS C register access	Yes <sup>3</sup>	Yes	Yes
SSI	Yes	Yes	Yes
MO line control	No	Yes	Yes
<b>Software</b>			
BiSS Interface DLL	Yes	Yes	Yes
Adapters addressable with the DLL	1 MB3U	up to 15 MB4U	up to 15 MB5U
BiSS Reader Software	Yes	Yes	Yes
Adapters addressable with the BiSS reader software	1	1	1
Data buffering (on adapter)	No	Yes	Yes
<b>BiSS master</b>			
BiSS master core	iC-MB3 TSSOP24	MB100 BiSS IP	MB100 BiSS IP
BiSS slave count	max. 3	max 8	max 8
BiSS SCD length	max. 64 bit/slave	max. 64 bit/slave	max. 64 bit/slave

Table 1: Adapter comparison MB3U, MB4U and MB5U

<sup>1), 2)</sup> Please check the related datasheets for details.

<sup>3)</sup> Implemented with host support via BiSS Interface DLL or BiSS reader software.

### USB INTERFACE

The MB4U and the MB5U adapter are operated with USB 2.0 high speed (480 Mbits/second) or full speed (12 Mbits/second, reduced bandwidth needs to be considered).

The MB3U adapter is operated with Full Speed (12 Mbits/second).

MB4U and MB5U use a Mini-USB B connector.

The MB3U adapter uses an USB-B connector.

### POWER CAPABILITIES

The adapters MB3U, MB4U and MB5U do have different power supply systems on board. All adapters can be operated by USB power supply and can also supply additional sensors with USB power.

**The PC USB power capabilities need to fulfill the adapters and sensors power demand.**

#### MB3U

MB3U uses an isolating DC/DC converter to generate 9 V to 12 V including the galvanic isolation to the USB and iC-MB3 TSSOP24 section. MB3U does convert the 5 V with a linear voltage regulator supplied by the generated 9 V to 12 V. High current consumption on MB3U 5 V generates higher heat dissipation due to linear voltage regulator inside. MB3U provides an external DC power supply input that disconnects the internal DC/DC converter and supplies directly the galvanic isolation to the USB and iC-MB3 TSSOP24 section.

#### MB4U

MB4U uses a DC/DC converter device to generate 9 V to 13 V and 5 V from the USB supply. There is no galvanic isolation on both voltages VB and VDD. High current consumption on MB4U causes internal heat dissipation inside. MB4U provides no external field side DC power supply input. External power supplies need to be added in a cable adapter or wiring.

#### MB5U

MB5U uses an isolating DC/DC converter device to generate 5 V from the USB supply including the galvanic isolation to the USB and FPGA section. There is a galvanic isolation on the voltage VDD and the field BiSS signals. There is no voltage VB supplied. High current consumption on MB5U causes internal heat dissipation inside. MB5U provides no external field side DC power supply input. External power supplies need to be added in a cable adapter or wiring.

### GALVANIC COUPLING

The MB3U adapter is galvanically isolated.

The MB4U adapter is galvanically coupled.

The MB5U adapter is galvanically isolated.

On harsh environments galvanic isolation might be required due to differing ground points and required shield. On lab environments galvanic isolation is often not required and a single ground point is available.

External RS422 isolators can be attached to MB4U on demand.

MB5U can typically replace the MB4U in such applications, reconsidering the missing VB and maximum current of VDD.

### MO LINE CONTROL

All adapters MB3U, MB4U and MB5U do support MA and SL lines.

The adapters MB4U and MB5U support and provide additional the BiSS MO line control. This MO line enables to control the processing time by the BiSS adapter. This function is only supported by the adapter MB4U.

The BiSS master parameter *EN\_MO* and *MO\_BUSY* control the timing of the MO line. This function is currently covered by the BiSS interface DLL but not by the BiSS reader software.

The MO line is only required if multiple BiSS sensors with differing processing time are connected to a BiSS master.

The MO line is also required if *2-WIRE protocol* devices are connected to an MB4U or MB5U.

The MB3U adapter does provide a static MO signal of logic 0 state at the defined pins:

- MO+ = 0 (GND 0V)
- MO- = 1 (5V)

### BiSS READER SOFTWARE

All adapters MB3U, MB4U and MB5U are supported by the BiSS Reader Software. The BiSS reader software can connect to one adapter at once. The BiSS reader software does currently not support the MO line control of MB4U but dedicated software supports 2-WIRE communication.

The adapter MB4U and MB5U provide an additional function exclusively: **BiSS Fast Reader**. This function reads multiple SCD frames with a configured timing (**FREQAGS**) and is only supported by the adapter MB4U and MB5U.

### BiSS INTERFACE DLL API

The BiSS Interface DLL supports all adapters MB3U, MB4U and MB5U. The adapter MB4U and MB5U provide an additional DLL function that is not supported by MB3U: **BiSS\_ReadSCDFrames**. This function reads multiple SCD frames with a configured timing (**FREQAGS**) and is only supported by the adapter MB4U and MB5U and also used in the **BiSS Fast Reader**.

As adapter MB4U and MB5U provide an identification (ID, 4 character serial number code), multiple MB4U or MB5U adapter can be allocated by the BiSS Interface DLL at the same time. The function **BiSS\_SetInterface** connects the interface defined by parameter `ullInterface`. The parameter `char *pcInterfaceOption` carries the MB4U and MB5U serial number of the adapter (last 4 chars: e.g. "CABC"). This is only needed if multiple MB4U or MB5U are connected to the single PC system.

As MB3U adapters do not provide any ID identification. Only one MB3U adapter can be allocated by the BiSS Interface DLL at the same time.

### RELATED DOCUMENTS

- MB3U Product page -  
→ <http://www.ichaus.de/MB3U>
- MB3U Data Sheet - Specification -  
→ [http://www.ichaus.de/MB3U\\_MB3U-I2C\\_datasheet\\_en](http://www.ichaus.de/MB3U_MB3U-I2C_datasheet_en)
- MB4U Product page - Specification -  
→ <http://www.ichaus.de/MB4U>
- MB4U Data Sheet - Specification -  
→ [http://www.ichaus.de/MB4U\\_datasheet\\_en](http://www.ichaus.de/MB4U_datasheet_en)
- MB5U Product page - Specification -  
→ <http://www.ichaus.de/MB5U>
- MB5U Data Sheet - Specification -  
→ [http://www.ichaus.de/MB5U\\_datasheet\\_en](http://www.ichaus.de/MB5U_datasheet_en)
- BiSS Reader GUI - GUI software for Windows PC -  
→ [http://www.ichaus.de/BiSS\\_gui\\_rte](http://www.ichaus.de/BiSS_gui_rte)
- BiSS Interface DLL - Library Description -  
→ [http://www.ichaus.de/biss1sl\\_interface](http://www.ichaus.de/biss1sl_interface)

### REVISION HISTORY

Rel	Rel.Date	Chapter	Modification	Page
	15-04-22		Initial Release	

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