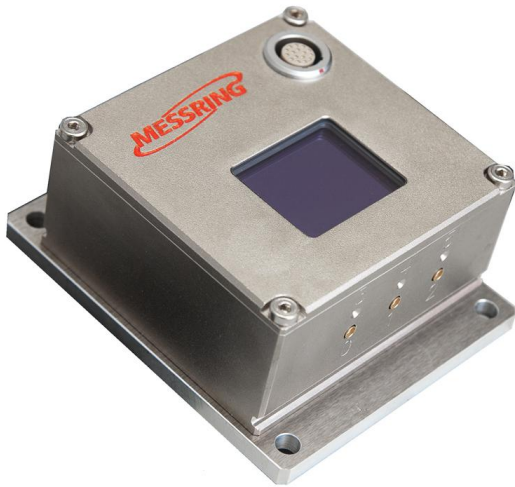


M=BUS



- Support of 3,6,9 M=BUS® lines with up to 32 participants each
- Ruggedized aluminium housing
- Very low current consumption
- Internal backup battery
- Temperature and M=BUS® voltage monitoring
- OLED colour display for visual status control
- Integrated memory to store user-defined data (e.g. documentation, sensor information)

Figure 1: M=BUS® Ethernet Gateway

M=BUS® Ethernet Gateway

The M=BUS® Ethernet Gateway is the standard interface for the bus lines. It can be applied directly to the test object. The shockproof design guarantees a long life even under rough impact test conditions. The M=BUS® connects the bus participants in a daisy chain manner by a single $\varnothing 2.5$ mm coax cable as the umbilical cord to support the M=BUS® Loggers with power and the trigger signal. It also grants a bidirectional communication between Gateway and Logger that allows an easy controlling by the supplied M=BUS® software tool. The Ethernet Gateway is available in three different versions, which are supporting 3, 6 and 9 M=BUS lines with up to 32 participants each.

The M=BUS® Ethernet Gateway is also equipped with a backup system which is activated automatically in case of disconnection of the supply cable. The system trigger is recorded and stored in a non-volatile memory.

The status and supply voltage of all M=BUS® lines is permanently monitored. The integrated OLED display shows the status of the Gateway and the M=BUS® lines. A 3-axis LowG accelerometer detects its orientation.

A local non volatile data memory of 2 MByte can be used as storage for data sheets or documentation and can be configured as Log-Device for the communication.

Technical Specifications

General:

4AD-B31 M=BUS [®] lines:	6 (Up to 1,152 data channels)
4AD-B311 M=BUS [®] lines	3 (Up to 576 data channels)
4AD-B312 M=BUS [®] lines	9 (Up to 1,728 data channels)
Power supply	18 V - 22 V (compatible to NA3x)
Power consumption	Gateway: 120 mA, max. 1 A per M=BUS [®] Line
Trigger	Digital or Trigger-Bus (compatible to NA3x)
Communication	Ethernet 100 Mbit/s, TCP/IP, DHCP, TELNET, FTP
Memory of storage unit	Up to 2 Mbyte
Conformity	SAE-J211

Backup system:

Rechargeable battery	Lithium-Polymer, 620 mAh/3.7 V
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Physical Dimensions:

Overall dimensions L x W x H	115 x 77 x 39mm / without flange: 84 x 77 x 39 mm
Weight	373 g

Environmental Characteristics:

Temperature range	0...50° C
Shockproof	up to 1,000 G

- M=BUS[®] test execution software tool

Scope of supply:

- Adaptor cable to power, trigger, Ethernet (4AD-B39)

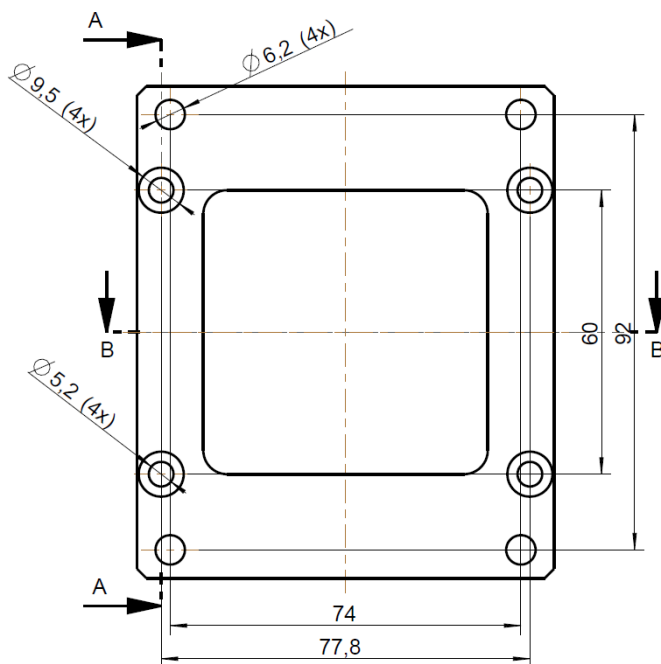


Figure 2: Hole pattern of the Ethernet Gateway Mounting Bracket

M=BUS[®] Ethernet Gateway Connector

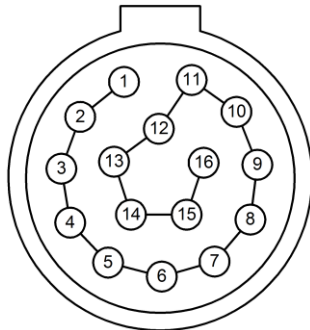
Adapter Cable

Figure 3 shows the pin assignment of the LEMO 2B receptacle of the M=BUS[®] Ethernet Gateway. To connect the system to the power supply, trigger bus and network use the provided M=BUS[®] Ethernet Gateway adapter (see Figure 4). The different connectors are described in the following table.

It is important that the voltage supplied to the “Supply +22 V” does not exceed 22 V.

Connector	Description
Power Supply	If a customer specific power supply is used be aware that the voltage must not exceed 22V. Voltages above this threshold may damage an internal fuse.
Network	The scope of delivery includes two kinds of network cables. One is marked with “crossed/gekreuzt”. Use this cable if you want to connect your M=BUS system directly to your PC/notebook. To operate your system on a network switch use the “one-to-one” cable.
Trigger Bus	On this connector you can connect the standard NA33 trigger bus. Also it is possible to use a switch to trigger the system. The trigger input is described in detail in the section Trigger Bus (Page 6).

M=BUS[®] System Connection



Pin assignment of a 16 pin Lemo 2B fixed receptacle

Frontal view of fixed receptacle

(EGC.2B.316.CYM)

Pin 1:	Network TX+
Pin 2:	Network TX-
Pin 3:	Network RX+
Pin 4:	Network RX-
Pin 5:	Trigger 5 V / 120 mA
Pin 6:	Trigger Signal B
Pin 7:	Trigger Signal A
Pin 8:	Trigger Isolated Ground
Pin 9:	485 A
Pin 10:	485 B
Pin 11:	Supply +22 V
Pin 12:	Supply +22 V
Pin 13:	Supply +22 V
Pin 14:	Ground
Pin 15:	Ground
Pin 16:	Ground

Figure 3: Pin Assignment of the Socket in the M=BUS[®] Ethernet Gateway

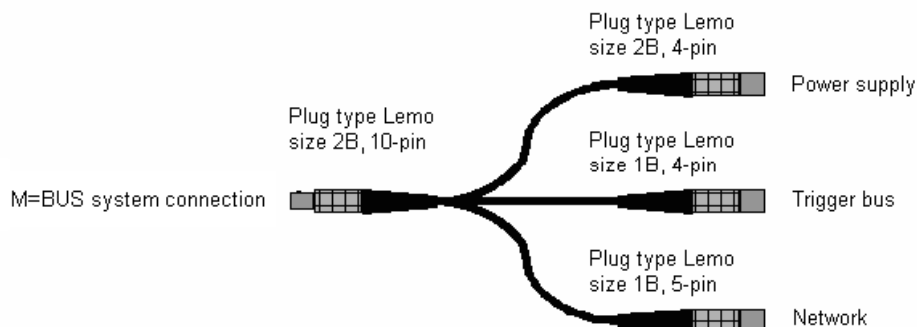
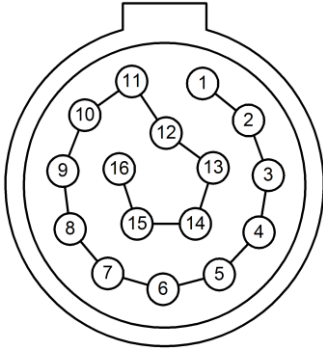


Figure 4: M=BUS[®] Ethernet Gateway Adapter

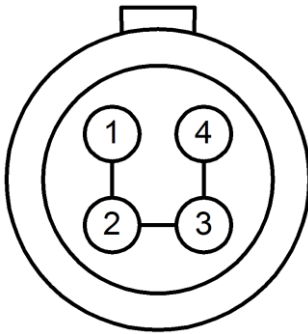
M=BUS® System Connection

Pin 1:	Network TX+
Pin 2:	Network TX-
Pin 3:	Network RX+
Pin 4:	Network RX-
Pin 5:	Trigger 5 V / 120 mA
Pin 6:	Trigger Signal B
Pin 7:	Trigger Signal A
Pin 8:	Trigger Isolated Ground
Pin 9:	485 A
Pin 10:	485 B
Pin 11:	Supply +22 V
Pin 12:	Supply +22 V
Pin 13:	Supply +22 V
Pin 14:	Ground
Pin 15:	Ground
Pin 16:	Ground

Pin assignment of the 16 pin Lemo 2B plug (black bend relief)

Frontal view of plug

(FGC.2B.316.CYCD.92.ZN)

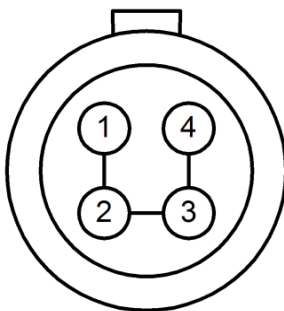
Power Supply

Pin 1:	Supply +22V
Pin 2:	Ground
Pin 3:	485 A
Pin 4:	485 B

Pin assignment of the 4 pin Lemo 2B free receptacle (red bend relief)

Frontal view of free receptacle

(PHG.2B.304.CYMD.62.ZR)

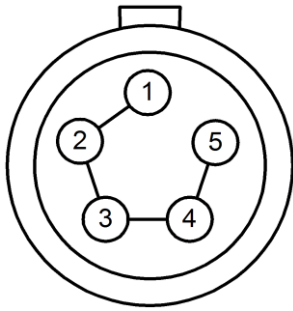
Trigger Bus

Pin 1:	Trigger 5 V / 120 mA
Pin 2:	Trigger Signal B
Pin 3:	Trigger Signal A
Pin 4:	Trigger Isolated ground

Pin assignment of the 4 pin Lemo 1B free receptacle (black bend relief)

Frontal view of free receptacle

(PHG.1B.304.CYMD.42.ZN)

Network

Pin 1: Network TX+
Pin 2: Network TX-
Pin 3: Network RX+
Pin 4: Network RX-
Pin 5: not connected

Pin assignment of the 5 pin Lemo 1B free receptacle (orange bend relief)

Frontal view of free receptacle

(PHG.1B.305.CYMD.42.ZS)

Figure 5: Pin Assignment M=BUS[®] Ethernet Gateway Adapter

Trigger Bus

The Trigger Bus works on insulated RS485 line. A trigger occurs if you generate at least one alternating signal on the signal wires.

Features:

- 1:1 cable (2 wires) between different M=BUS[®] Gateways, NA33 and NA34
- 4 pin Lemo
- Insulated (300 V)
- No trigger priorities, wired OR trigger
- Insulated VCC/GND (5 V @ 120 mA) on Lemo plug for external trigger

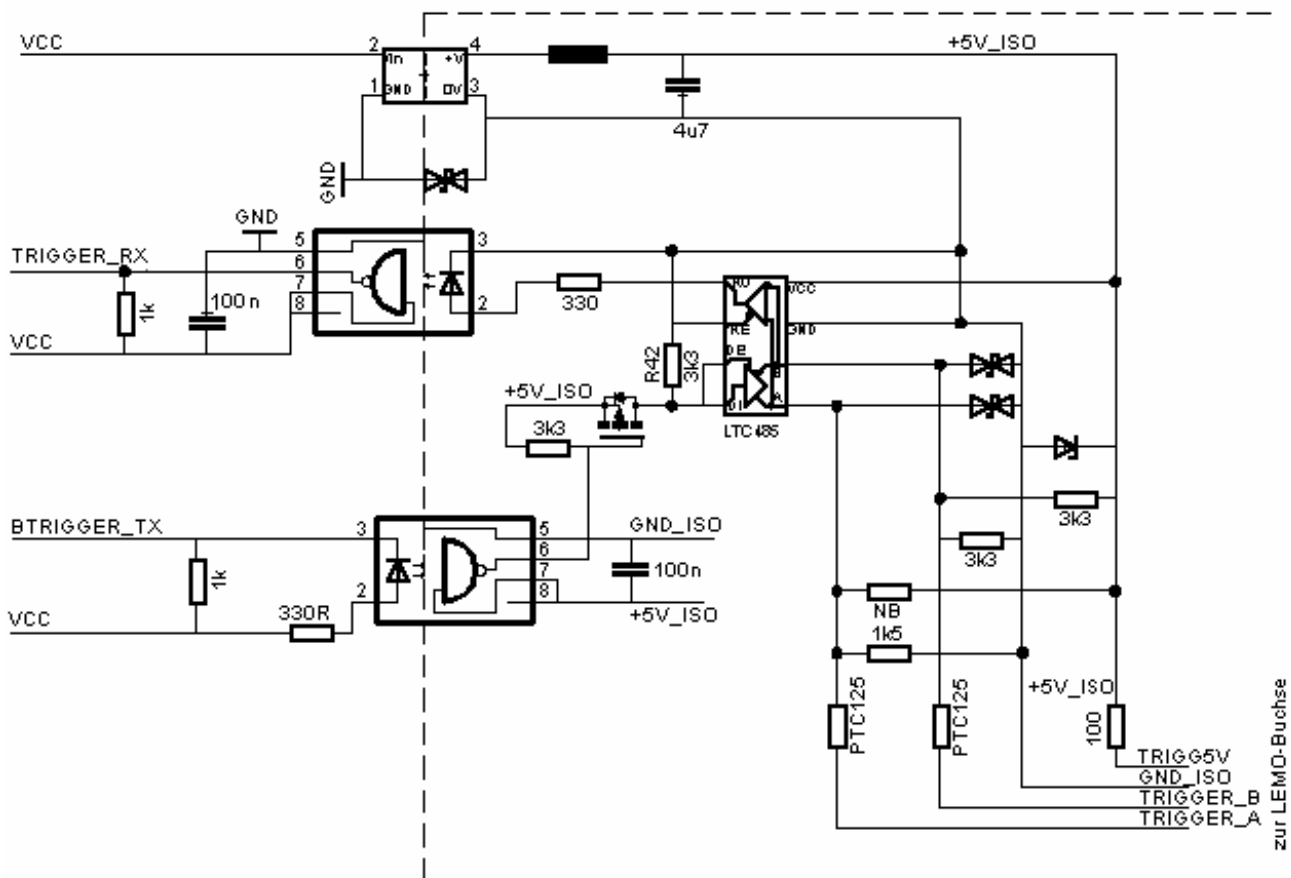


Figure 6: Block Diagram, Trigger Bus

The trigger input is configured as shown in Figure 7 (default setting). The Trigger_B line is kept on a 2.5V level due to a resistor divider. The Trigger_A line is pulled low by a pull-down resistor. To trigger the system connect the Trigger_A line with the 5 V_ISO line while the Trigger_B line stays at its level (2.5 V).

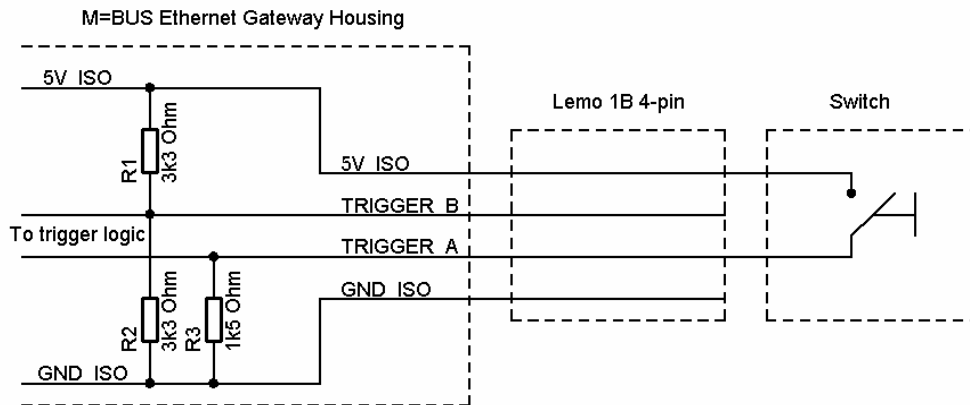


Figure 7: Schematic for Trigger Switch

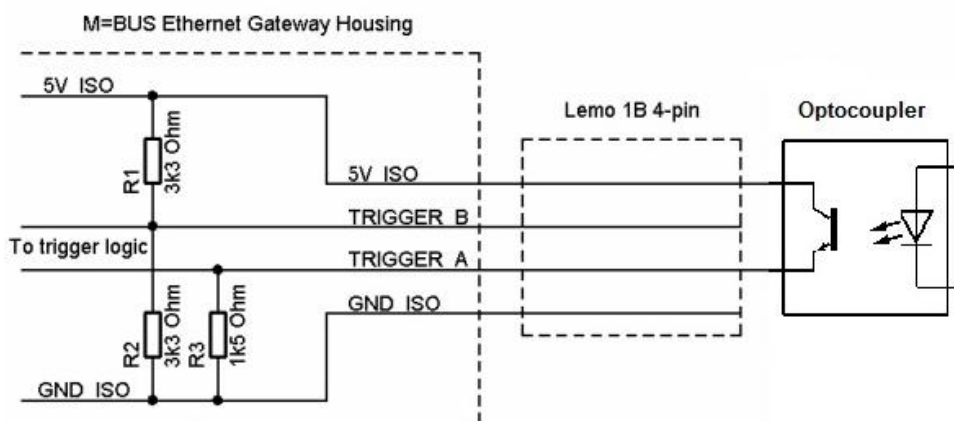


Figure 8: Schematic for Optocoupler

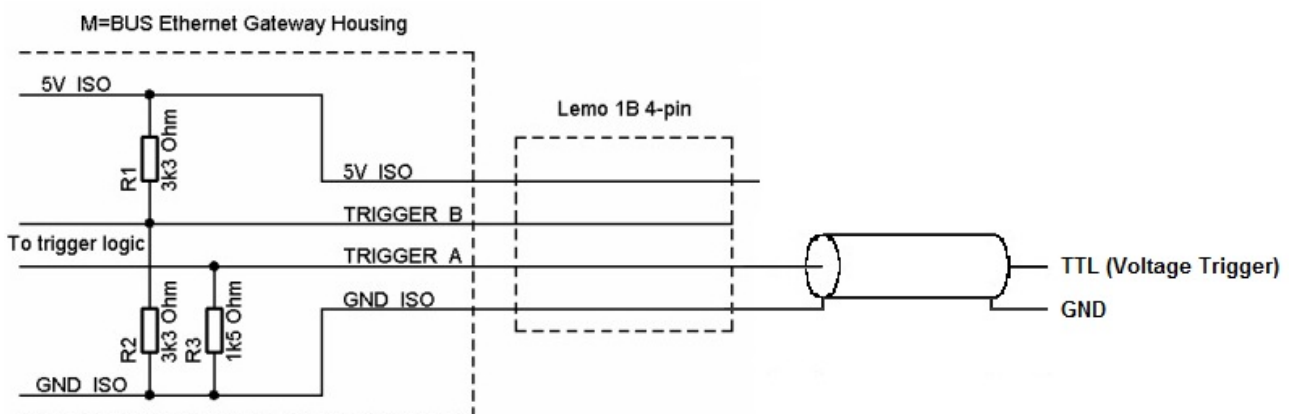


Figure 9: Schematic for TTL

M=BUS DAS System Configuration

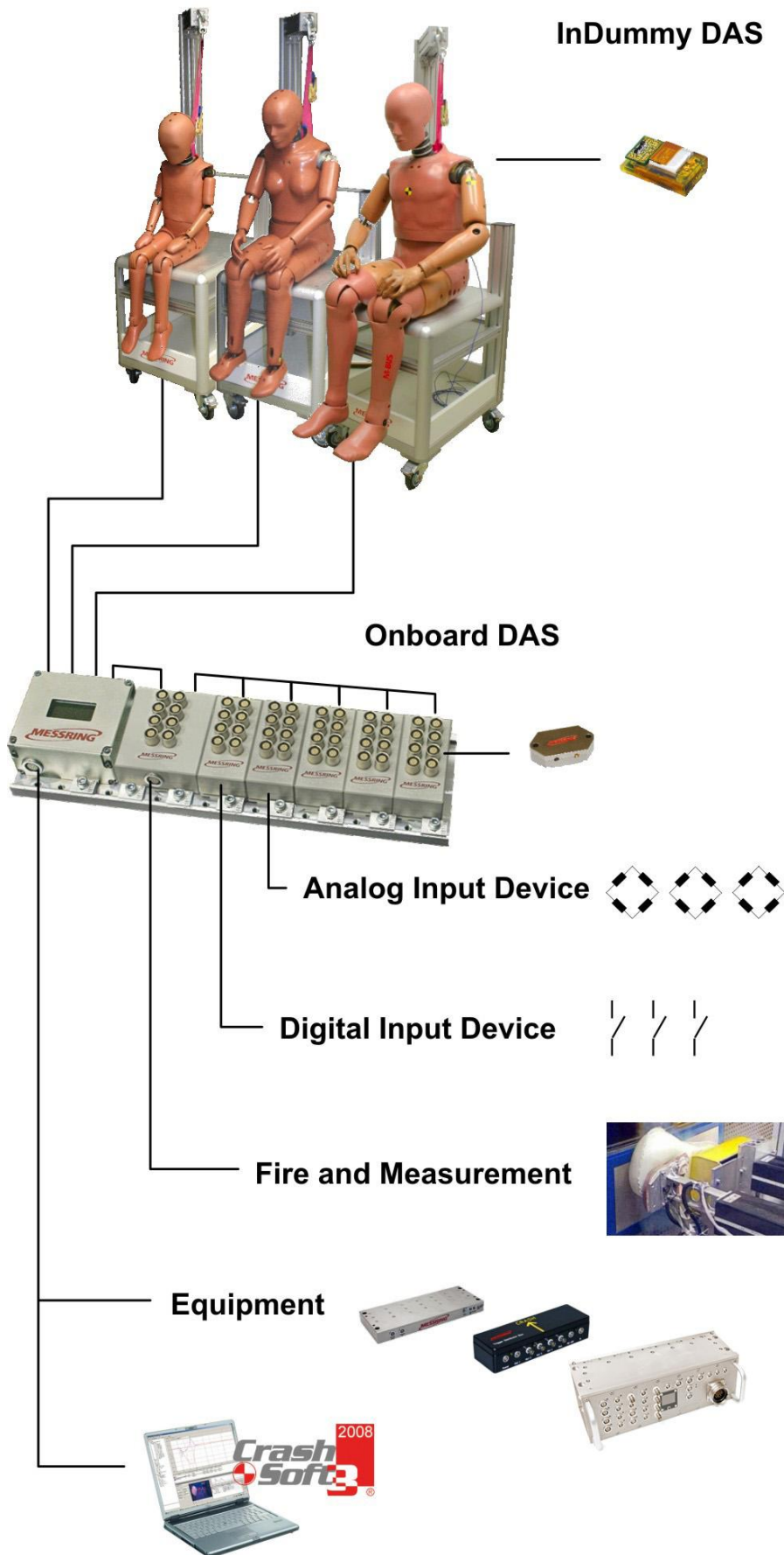


Figure 10: M=BUS[®] DAS System Configuration - Overview