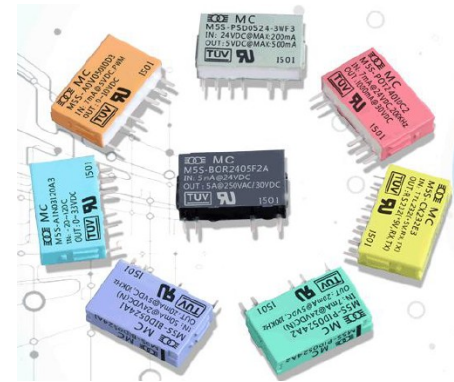


M5S modular I/O components

Modular components with integrated circuits aiming at versatile operation in industrial systems like regulators or programmable logic controllers.

Connection of electronics and industrial control

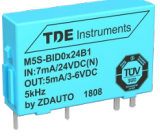
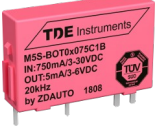
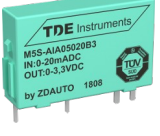
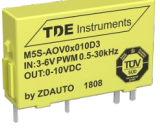
The modules are a connecting element between electronics on one side as well as the world of industrial control on the other side. The modules are completely sealed, water proof, fire proof and dust proof.



Universal wiring diagram for full flexibility

A universal wiring diagram allows all M5S modules to be interchangeable without the need to change the internal or external wiring. By plugging different modules, customer specific input/output configurations can be achieved as well as the addition of functions to already rolled-out devices.

Overview (Standard modules are underlined)

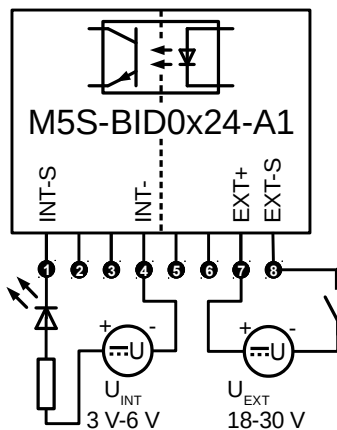
Digital input - „BI“/“PI“ 	Switches, voltage detection	BID0x24A1, <u>BID0x24B1</u> , BIA0x24A1
	Pulses up to 200 kHz	PID0x24A2, PID0x24B2
Digital output - „BO“/“PO“ 	DC switch output	<u>BOT0x075C1B</u> , BOT0X075D1A, BOT0x150E1, BOT0X150F1
	AC switch output	BOS0x080E2B
	Pulses up to 200 kHz	POT03035C2, POT05035C2, POT03150E1, POT05150E1
Analogue input - „AI“ 	20mA analogue signal	<u>AIA03020B3</u> , AIA05020B3, <u>AIA0x020C4</u> , AIA03020A3, AIA05020A3
	10 Volt analogue signal	<u>AIV03010B3</u> , AIV05010B3, <u>AIV0x010C4</u> , AIV03010A3, AIV05010A3
	Temperature sensors type N, type J, type K, Pt100	AIN03120A3, AIN05120A3, AIJ03600A3, AIJ05600A3, AIK031200A3, AIK051200A3, <u>AIP03600A3</u> , <u>AIP05600A3</u>
Analogue output - „AO“ 	20mA analogue signal	AOA03020C3, AOA05020C3, <u>AOA0x020D3</u>
	10 Volt analogue signal	AOV03010C3, AOV05010C3, <u>AOV0x010D3</u>

M5S digital input - „BI“/“PI“

- For detection of switch states, pulses or encoder signals
- Galvanic isolation through optocouples
- Open collector output

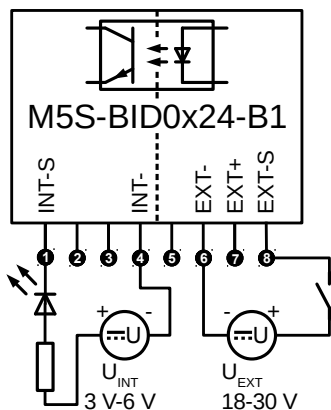
M5S-BID0x24A1

Description	Internal circuit		Isolation	External circuit	
	Signal	Voltage/current		Signal	Voltage/current
DC optocouple binary input	0-5 kHz	3-6 V DC/5 mA	Yes	0-5 kHz, sink	18-30 V DC, 7 mA @ 24 V DC



M5S-BID0x24B1

Description	Internal circuit		Isolation	External circuit	
	Signal	Voltage/current		Signal	Voltage/current
DC optocouple binary input	0-5 kHz	3-6 V DC/5 mA	Yes	0-5 kHz, source	18-30 V DC, 7 mA @ 24 V DC

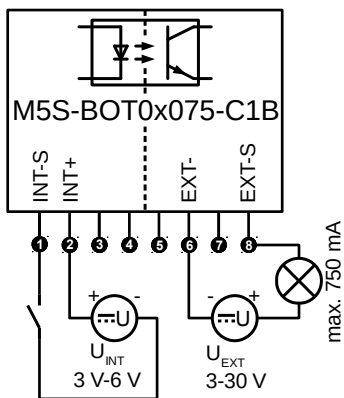


M5S digital output - „BO“/“PO“

- For control of relays, lamps, buzzers or other signaling devices
- Relay, solid state relay, or transistor output
- Galvanic isolation

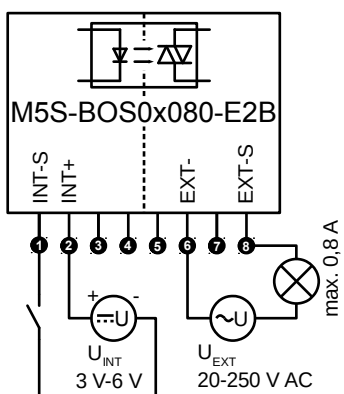
M5S-BOT0x075C1B

Description	Internal circuit		Isolation	External circuit	
	Signal	Voltage/current		Signal	Voltage/current
Optocouple with transistor output	0-20 kHz	3-6 V DC/5 mA	Yes	0-5 kHz, sink	3-30 V/750 mA DC



M5S-BOS0x080C1B

Description	Internal circuit		Isolation	External circuit	
	Signal	Voltage/current		Signal	Voltage/current
Optocouple with SSR output	0-5 kHz	3-6 V DC/5 mA	Yes	50-60 Hz, AC	20-250 V/0.8 A AC

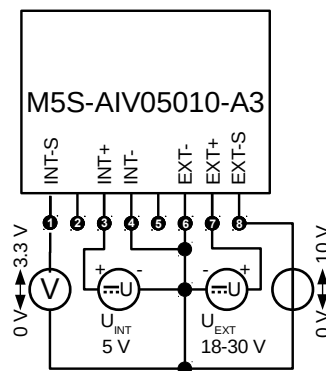
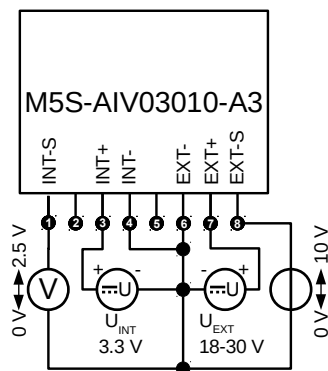


M5S analogue input - „AI“

- For measurement of analogue signals, potentiometers, temperature sensors as well as other current or voltage sources
- Optional: isolated or non-isolated signal
- Multi function: DC Voltage/current as well as different types of temperature sensors

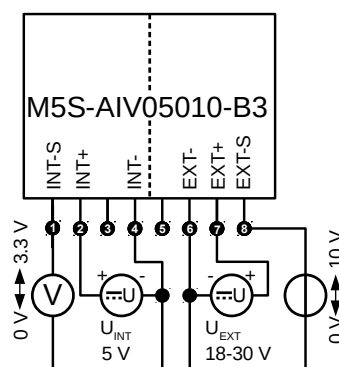
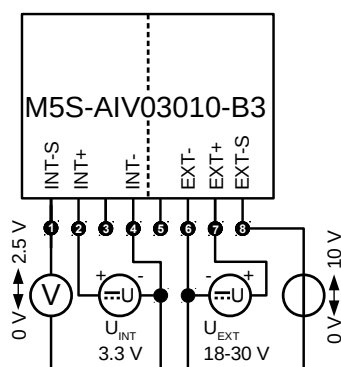
M5S-AIV03010A3, M5S-AIV05010A3

Description	Internal circuit				External circuit	
	Version	Signal	Supply	Isolation	Signal	Supply
Analogue input voltage non-isolated	AIV03	0-2.5 V DC	3.3 V/10 mA DC	No	0-10 V DC common ground	18-30 V 10 mA DC
	AIV05	0-3.3 V DC	5 V/10 mA DC			



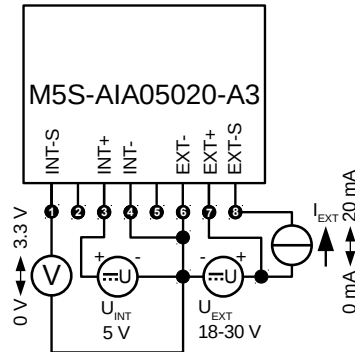
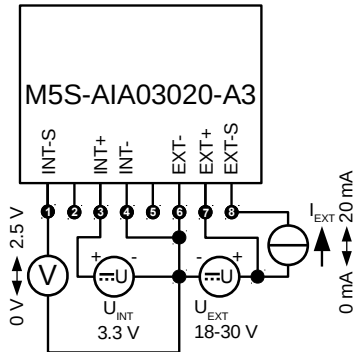
M5S-AIV03010B3, M5S-AIV05010B3

Description	Internal circuit				External circuit	
	Version	Signal	Supply	Isolation	Signal	Supply
Analogue input voltage isolated	AIV03	0-2.5 V DC	3.3 V/10 mA DC	Yes	0-10 V DC	18-30 V 10 mA DC
	AIV05	0-3.3 V DC	5 V/10 mA DC			



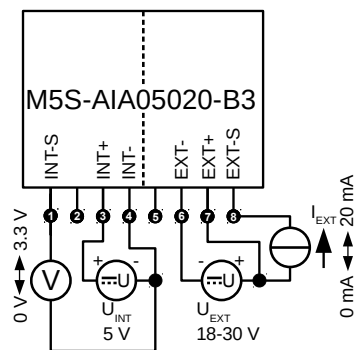
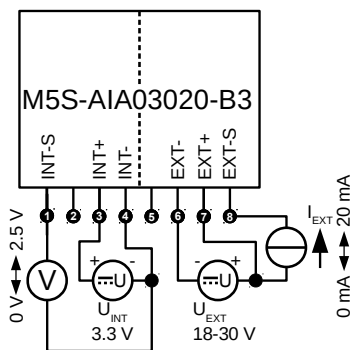
M5S-AIA03020A3, M5S-AIA05020A3

Description	Internal circuit				External circuit	
	Version	Signal	Supply	Isolation	Signal	Supply
Analogue input current non-isolated	AIA03	0-2.5 V DC	3.3 V/10 mA DC	No	0-20 mA DC common ground	18-30 V 10 mA DC
	AIA05	0-3.3 V DC	5 V/10 mA DC			



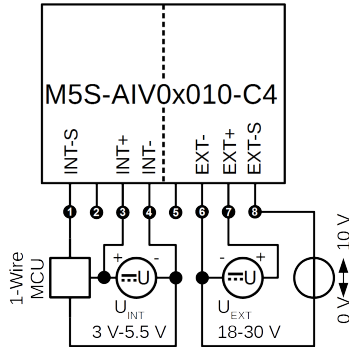
M5S-AIA03020B3, M5S-AIA05020B3

Description	Internal circuit				External circuit	
	Version	Signal	Supply	Isolation	Signal	Supply
Analogue input current isolated	AIA03	0-2.5 V DC	3.3 V/10 mA DC	Yes	0-20 mA DC	18-30 V 10 mA DC
	AIA05	0-3.3 V DC	5 V/10 mA DC			



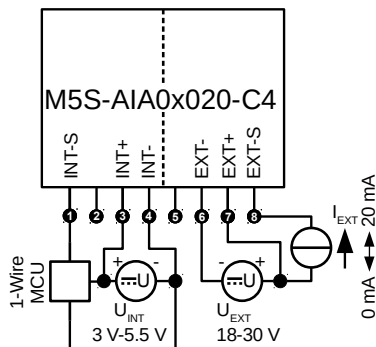
M5S-AIV0x010C4

Description	Internal circuit		Isolation	External circuit	
	Signal	Supply		Signal	Supply
Analogue input current isolated, 1-Wire	3-5.5 V 1-Wire serial interface	3-5 V/10 mA DC	Yes	0-10 V DC	18-30 V/30 mA



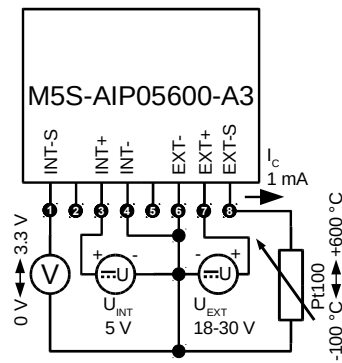
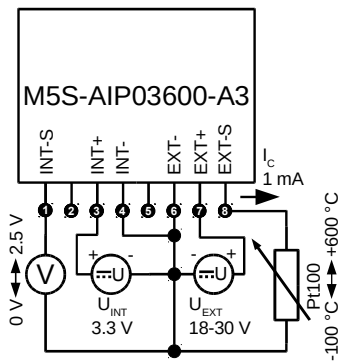
M5S-AIA0x020C4

Description	Internal circuit		Isolation	External circuit	
	Signal	Supply		Signal	Supply
Analogue input voltage isolated, 1-Wire	3-5.5 V 1-Wire serial interface	3-5 V/10 mA DC	Yes	0-20 mA DC	18-30 V/30 mA



M5S-AIP03600A3, M5S-AIP05600A3

Description	Internal circuit			Isolation	External circuit	
	Version	Signal	Supply		Signal	Supply
Analogue input temperature sensor Pt100 non-isolated	AIP03	0-2.5 V DC	3.3 V/10 mA DC	No	Pt100 2-wire -100-600 °C	18-30 V 10 mA DC
	AIP05	0-3.3 V DC	5 V/10 mA DC			

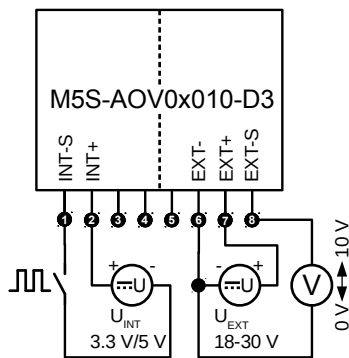


M5S analogue output - „AO“

- For the control of speed regulators, heating regulators or other voltage/current measuring devices.
- Optional: isolated or non-isolated signal
- Analogue signals: 10 V, 20 mA

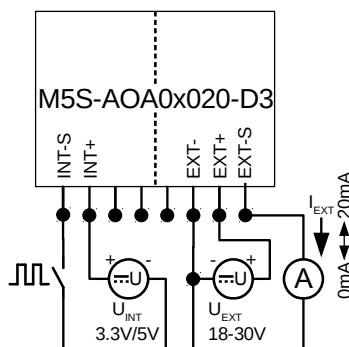
M5S-AOV0x010D3

Description	Internal circuit		Isolation	External circuit	
	Signal	Supply		Signal	Supply
Analogue output voltage isolated	0.5-30 kHz	3-6 V DC 5 mA	Yes	0-10 V DC	18-30 V/10 mA



M5S-AOA0x020D3

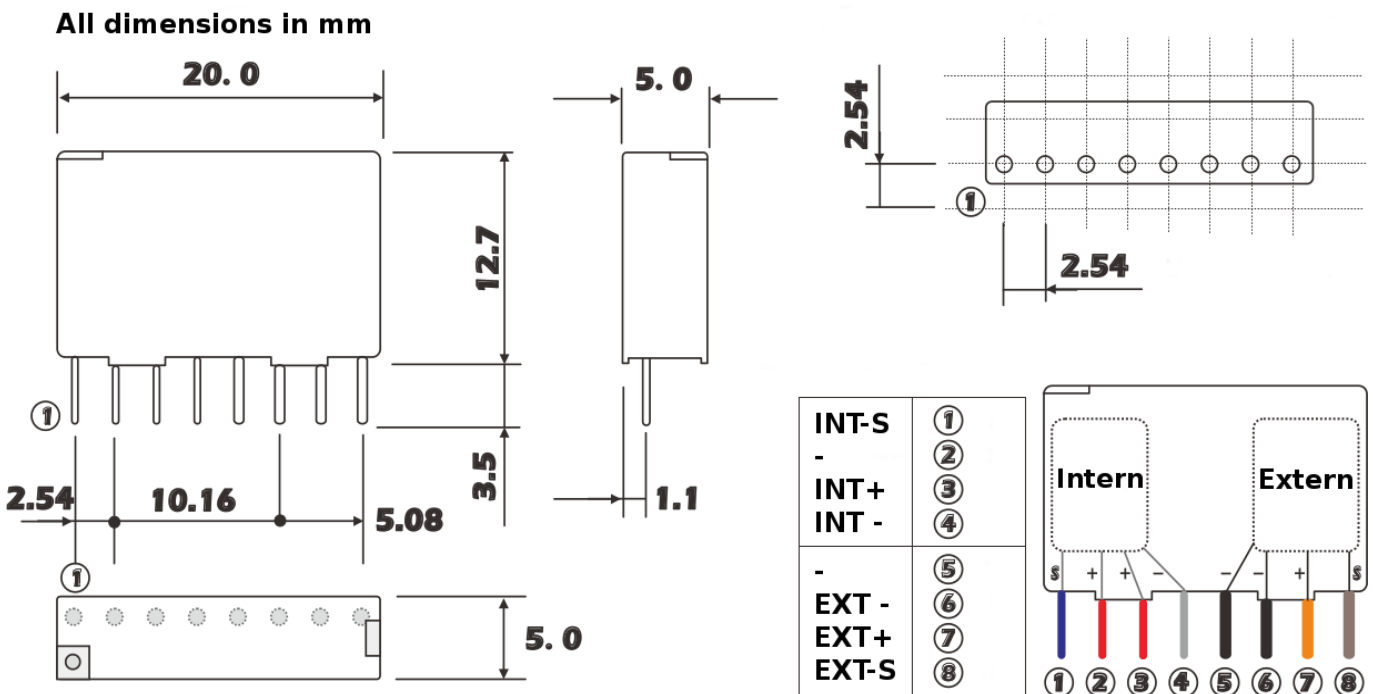
Description	Internal circuit		Isolation	External circuit	
	Signal	Supply		Signal	Supply
Analogue output current isolated	0.5-30 kHz	3-6 V DC 5 mA	Yes	0-20 mA DC	18-30 V/10 mA



Signal description

Signal	Name	Description
INT-S	Internal signal	Internal connection to the micro controller, can be used as GPIO (BI, PI, BO, PO modules) or PWM (AO modules). If supported by the micro controller, also analogue signals (ADC or DAC) (AI, AO modules) or 1-wire serial interface (AI modules), for micro controllers that do not have ADC functions.
INT+	Internal positive supply	Internal power supply of the micro controller, e.g. 3.3 V or 5 V
INT -	Internal negative supply	Ground of the internal supply circuit
EXT -	External negative supply	Ground of the external supply circuit
EXT+	External positive supply	External power supply, mostly 24 V DC
EXT-S	External signal	External signal. This is where the external signals like switching signals, switched loads, temperature sensors, analogue sensors or analogue control inputs are connected.

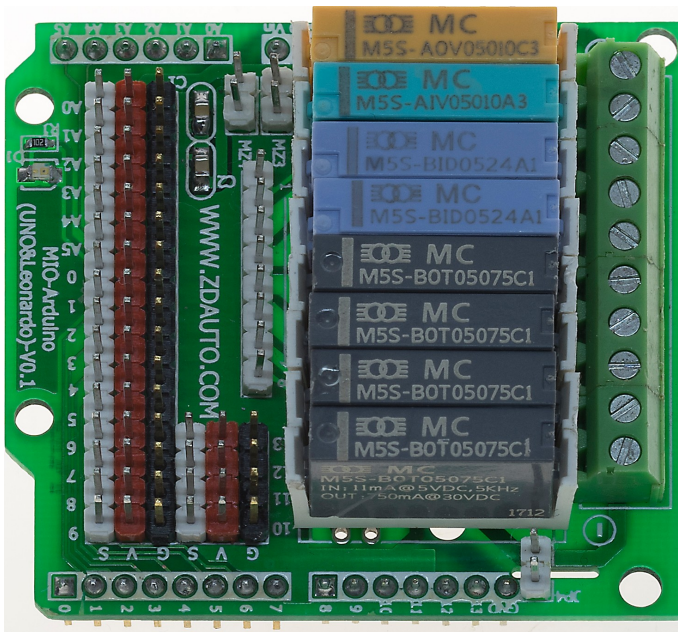
Dimensions



Evaluation boards for Arduino and Raspberry Pi

- Using the evaluation boards, the function of M5S modules can be explored easily
- Terminal blocks for external circuit and external power supply, e.g. 24 V DC
- Pin headers for internal circuit
- Configuration and pin mapping via jumpers

MIO-Arduino-UNO



MIO-Raspberry_Pi_3

