

ENG [www.phytron.eu/ZMXplus](http://www.phytron.eu/ZMXplus)

# ZMX+

## Stepper motor power stage with ServiceBus

The ZMX+ is a plug-in stepper motor power stage for 19" sub-racks with ServiceBus for motor currents up to 9 A<sub>PEAK</sub>.

Due to improved design and greatly reduced power dissipation, the ZMX+ provides reliable high-precision performance with minimised heat emission.

Parameters can be manually set by switches. The ServiceBus interface allows several additional adjustments.

### Application

The ZMX+ is used in different fields of application: e.g. in inspection and test applications, labelling or packaging machines, in equipment manufacturing or in beamlines.

The ZMX+ version with a 32 pin VG connector is pin compatible with commercially available power stages. The optional ServiceBus connector is placed at the front.

### In Focus



Integrated Driver



ServiceBus



EL. Isolated

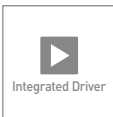
- 19" sub-rack power stage for bipolar control of 2 phase stepper motors
- Up to 9 A<sub>PEAK</sub> at 24 - 70 V<sub>DC</sub>
- Up to 1/512 microsteps
- Parametrising and diagnostic online via ServiceBus — switches for basic adjustment
- Options:
  - 32/48 pin connector
  - With/without electrical isolation
  - With/without ServiceBus

### Highlights



#### ServiceBus Instruction

online setting of parameters during operation via USB, CAN, RS 485...



#### 1/512 Microstep

precise power adjustment and fine positioning up to 1/512 microstep



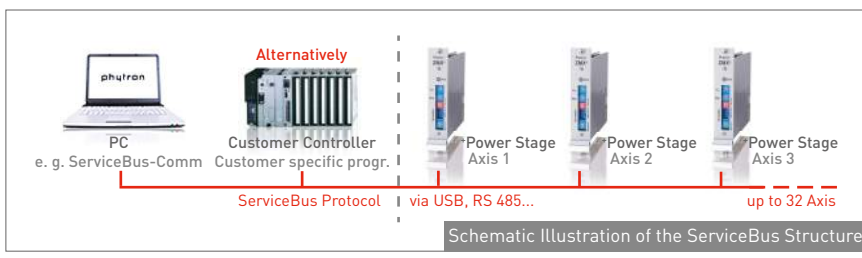
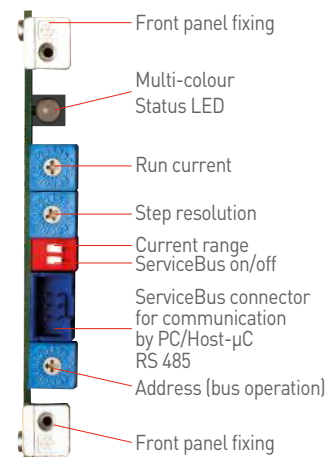
#### Electrical Isolation

with and without electrical isolation of the motor circuit

#### ServiceBus-Comm®

The royalty-free ServiceBus protocol with its extensive command set allows direct communication between phytron power stages and the PC or controller connected — even from a distance. That way not only start, stop and boost current but also parameters like current delay time can be set easily.

Our free Windows® software ServiceBus-Comm® allows to monitor and to adjust up to 32 axes while providing a comfortable and easy to use graphical interface.



## Control

## Specification

## Mechanical

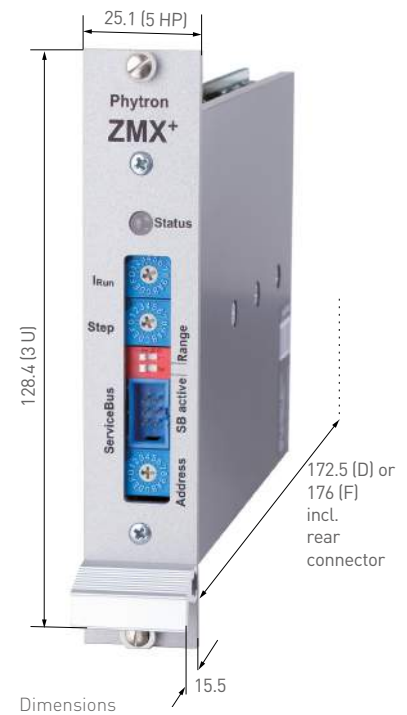
Design	Plug-in board for 19" sub-rack in the format 5HP x 3U x 160 mm
Dimensions (W x H x D)	Option with 32 pin VG connector: 25.1 (5HP) x 128.4 (3U) x 172.5 mm Option with 48 pin VG connector: 25.1 (5HP) x 128.4 (3U) x 176 mm
Weight	Approx. 450 g with front panel

## Features

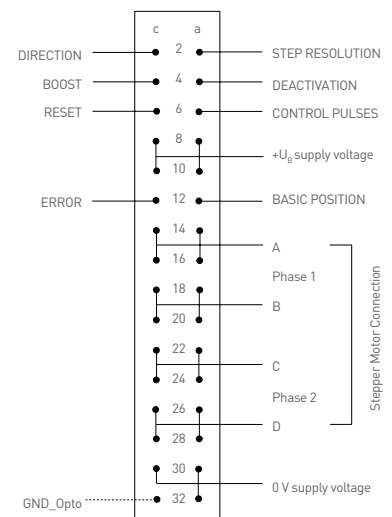
Stepper motors	Suitable for the control of 2 phase stepper motors with 4, (6) or 8 lead wiring
Supply voltage	24 to 70 V <sub>DC</sub>
Phase current	2 x 9 A <sub>PEAK</sub>
Adjustable current steps	<b>Rotary switch mode</b> 2 currents are selectable: 0 – 1.5 A <sub>PEAK</sub> or 0 – 9 A <sub>PEAK</sub> Run current is adjustable in 15 current steps, stop current is 50 %, boost current is 130 % of run current <b>ServiceBus mode (optional)</b> Run, stop and boost current from 0 - 9 A <sub>PEAK</sub> in 100 mA stages
Adjustable step resolution	<b>Rotary switch mode</b> Full step, 1/2, 1/2.5, 1/4, 1/5, 1/8, 1/10, 1/16, 1/20 <b>ServiceBus mode (optional)</b> Full step, 1/2, 1/2.5, 1/4, 1/5, 1/8, 1/10, 1/16, 1/20, 1/32, 1/64, 1/128, 1/256, 1/512 Microstepping
Maximum step frequency	500,000 Hz control pulse frequency (pulse width > 1 μs)
Physical resolution:	<b>Without encoder:</b> Approx. 25,600 positions per revolution (in typical applications) <b>With encoder:</b> Precision of positioning approx. 102,400 positions per revolution with a 200 step motor depending on the encoder (evaluating by a superior controller required)
Chopper frequency	Patented phytron chopper technology for a minimal heat loss in the motor and smooth rotation. Two chopper frequencies according to the current range: 25 kHz for currents 0 - 9 A 50 kHz for currents 0 - 1.5 A
Cable length	Motor : shielded: 50 m max. Signal: shielded: 100 m max.
Operating modes	Rotary switch mode and ServiceBus mode (optional)
Functional safety	Safety Integrity Levels, such as e. g. Safe Torque Off (STO) from IEC 61508-2 are not directly compatible
Diagnosable errors	Undervoltage error (< 22 V) Overtemperature error (T > 90 °C) Overcurrent and short circuit error (I > 30 A temporary)

## Interfaces

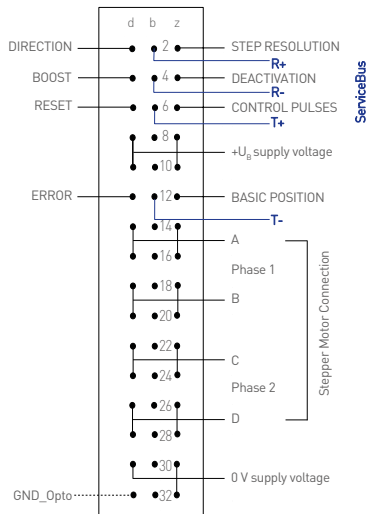
Inputs	Control pulses, direction, boost, deactivation, reset, step resolution (optional: inputs electrically isolated)
Outputs	A, B, C, D for a 2 phase stepper motor, basic position (opto-decoupled optional, type Open-Collector), ERROR (opto-decoupled optional, type Open-Collector)



Dimensions



32 pin VG connector DIN 41612, type D



48 pin VG connector DIN 41612, type F

## Specification

### Interfaces (continued)

Mechanical switches	Rotary switches for addressing up to 16 addresses DIP-switches for current range selection, ServiceBus activation (optional), output logic switch, overdrive activation and input logic switch
ServiceBus (optional)	phytron's power stage interface for parameterisation and diagnostic via RS 485

### Communication and Programming

Diagnostic via Status LED	Ready, Busy, Fault, Reset/Disable
Parameter interface via ServiceBus (optional)	Run, stop, boost current, step resolution, current delay time, chopper frequency, define overdrive switch frequency, in- and output logic, preferential direction, reset, deactivation,
Diagnostic interface via ServiceBus (optional)	Basic position, current setting, power stage temperature, power stage status, error check, intermediate circuit voltage
Programming	Phytron's ServiceBus-Comm <sup>®</sup> for Windows <sup>®</sup>

### Operating Conditions

Temperature	Operation: +4 to +40°C, storage and transport: -25 to +85 °C
Relative humidity	85 % maximum non-condensing
Degree of pollution	Level 2
Protection class	IP 20 at operation in 19" rack
Vibration / Shock protection	Acc. to EN 60068-2-6 Acc. to EN 60068-2-27/29
EMC immunity / EMC emission	Acc. to EN 61000-3-2 EMC Acc. to EN 61000-6-1, -3, -4: EMC and RFI immunity Acc. to EN6100-4-2...6, -11 immunity testing
Approval	CE

## Plug-in power stage unit SLS-ZMX<sup>+</sup>



phytron delivers also fully assembled 19" sub-rack modules with integrated power supply.

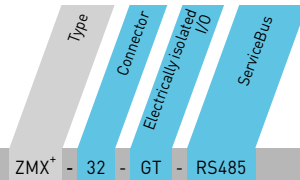
Up to 8 ZMX<sup>+</sup> power stages are possible.

For more information look up [www.phytron.eu/SLS](http://www.phytron.eu/SLS)

## Control

## Ordering Code

The variable elements of the product are displayed in colour.



Ordering code ZMX<sup>+</sup> - 32 - GT - RS485

## Options

Connector	32 48	32-pin VG connector DIN 41612 (D) 48-pin VG connector DIN 41612 (F)
Electrically isolated I/O	GT	with electrical isolation without electrical isolation
ServiceBus	RS485	ServiceBus via RS 485 without ServiceBus

Windows<sup>®</sup> is a trade mark of Microsoft.

ServiceBus-Comm<sup>®</sup> is a trade mark of Phytron-Elektronik GmbH.

## Extent of Supply

- Free ServiceBus-Comm<sup>®</sup> software for the ZMX<sup>+</sup> with ServiceBus

## Optional Accessories

- Front panel Al 2.5 mm, with handle
- ServiceBus cable
- Mini USB RS 485 converter

Any questions? Please contact us.

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