www.phytron.co.uk/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_{PEAK}.

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.

Highlights

ServiceBus

ServiceBus Instruction

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

Integrated Driver

1/512 Microstep

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

El. Isolated

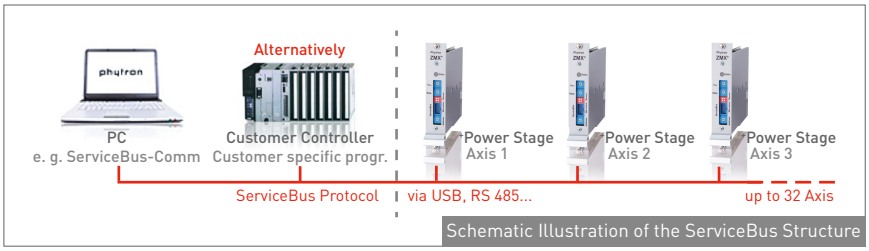
Electrical Isolation

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.

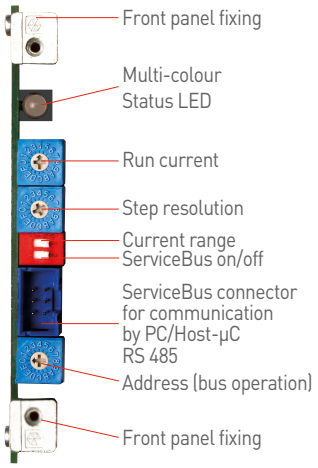


Schematic Illustration of the ServiceBus Structure

In Focus

Integrated Driver · ServiceBus · El. Isolated

- 19" sub-rack power stage for bipolar control of 2 phase stepper motors
- Up to 9 A_{PEAK} at 24 - 70 V_{DC}
- 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



Edition 2014 June

phytron
Beyond Steppers

Control

Specification

Mechanical

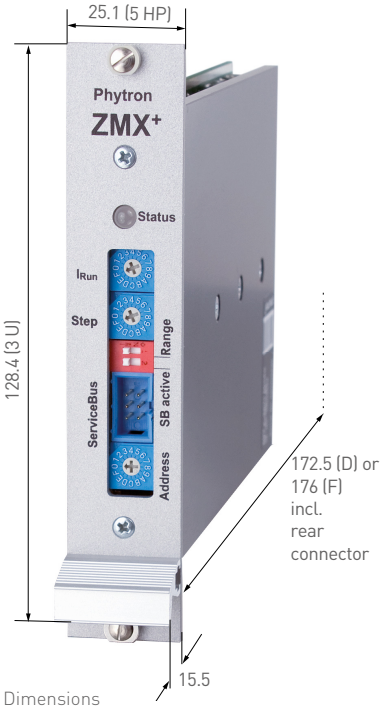
Design	Plug-in board for 19" sub-rack in the format 5HP x 3U x 160 mm
Dimensions (W x H x D)	Option with 32 pin VG connector: 25.1 (5HP) x 128.4 (3U) x 172.5 mm Option with 48 pin VG connector: 25.1 (5HP) x 128.4 (3U) x 176 mm
Weight	Approx. 450 g with front panel

Features

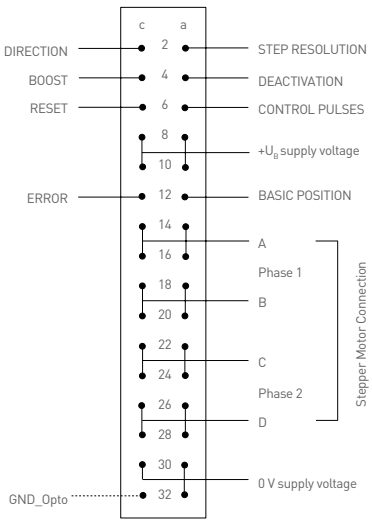
Stepper motors	Suitable for the control of 2 phase stepper motors with 4, (6) or 8 lead wiring
Supply voltage	24 to 70 V_{DC}
Phase current	2 x 9 A_{PEAK}
Adjustable current steps	**Rotary switch mode** 2 currents are selectable: 0 – 1.5 A_{PEAK} or 0 – 9 A_{PEAK} Run current is adjustable in 15 current steps, stop current is 50 %, boost current is 130 % of run current **ServiceBus mode (optional)** Run, stop and boost current from 0 - 9 A_{PEAK} in 100 mA stages
Adjustable step resolution	**Rotary switch mode** Full step, 1/2, 1/2.5, 1/4, 1/5, 1/8, 1/10, 1/16, 1/20 **ServiceBus mode (optional)** 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:	**Without encoder:** Approx. 25,600 positions per revolution (in typical applications) **With encoder:** Precision of positioning approx. 102,400 positions per revolution with a 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

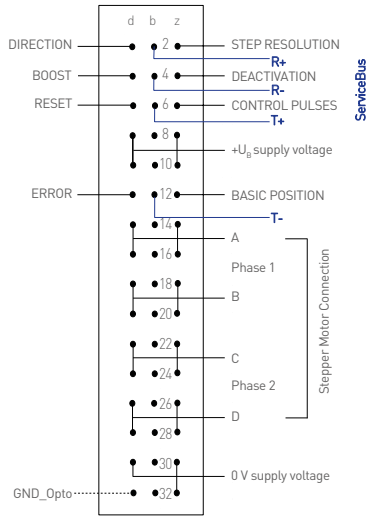
Inputs	Control pulses, direction, boost, deactivation, reset, step resolution (optional: inputs electrically isolated)
Outputs	A, B, C, D for a 2 phase stepper motor, basic position (opto-decoupled optional, type Open-Collector), ERROR (opto-decoupled optional, type Open-Collector)



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

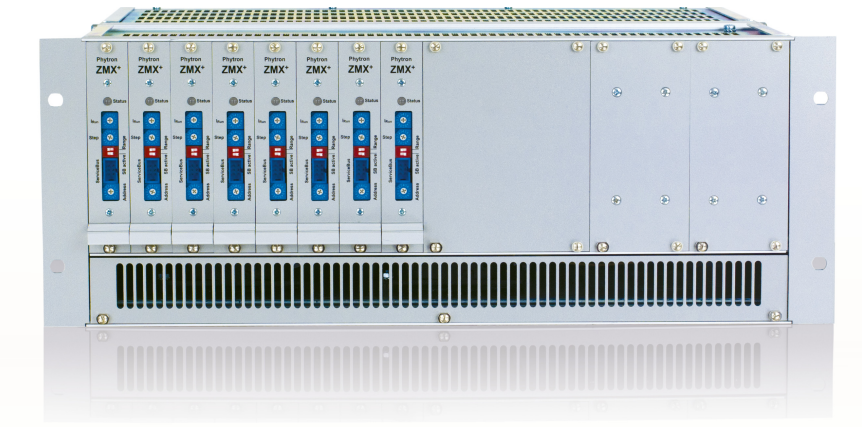
Communication and Programming

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® for Windows®

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 immudity Acc. to EN6100-4-2...6, -11 immunity testing
Approval	CE

Plug-in power stage unit SLS-ZMX+



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

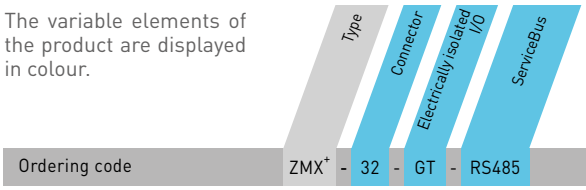
Up to 8 ZMX+ power stages are possible.

For more information look up www.phytron.co.uk/SLS

Control

Ordering Code

The variable elements of the product are displayed in colour.



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® is a trade mark of Microsoft.
ServiceBus-Comm® is a trade mark of Phytron-Elektronik GmbH.

Extent of Supply

- Free ServiceBus-Comm® software for the ZMX+ with ServiceBus

Optional Accessories

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

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