

INDUSTRIAL AUTOMATION PRODUCT

B&R X20SM1446-1

Stepper Motor Module

B&R; X20SM1446-1 is a full-bridge X20 stepper-motor module for one 24 to 48 VDC two-phase bipolar motor at 5 A nominal current. It combines 256-microstep control, four 24 V inputs, encoder evaluation, motor identification and stall detection.

IDENTITY	VERIFIED VALUE
Manufacturer	B&R;
Complete model	B&R; X20SM1446-1
Product role	Stepper Motor Module
System family	X20 System
Country of origin	Austria

DOCUMENT SCOPE

Exact identity, manufacturer-supported technical data, installation checks, applications, precautions and controlled verification records.

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B&R X20SM1446-1

Technical Specifications

PARAMETER	VERIFIED VALUE
Motor channels	1 two-phase bipolar stepper motor
Motor supply	24 to 48 VDC $\pm$ 25%
Nominal motor current	5 A
Peak motor current	10 A for 1 s
Microstep resolution	Up to 256 microsteps per step
Digital inputs	4 sink inputs at 24 VDC
Encoder function	1 ABR incremental encoder
Encoder input frequency	50 kHz maximum
Line fuse	10 A maximum, slow-blow
Input current limiting	12.5 A maximum
Electrical isolation	Channel isolated from bus
B&R; ID code	0xF3B0
Protection rating	IP20
Required hardware	X20TB12 terminal block and X20BM31 bus module

Model-Specific Engineering Note

ENGINEERING BOUNDARY

Install B&R; X20SM1446-1 with X20TB12 and X20BM31 and protect the external motor supply with a maximum 10 A slow-blow line fuse. Record motor coil data, configure boost, nominal and holding current, then prove direction, limits, encoder feedback and stall response at controlled speed.

Pre-Installation Checks

NO.	REQUIRED CHECK
1	Confirm the full B&R; X20SM1446-1 marking and assigned mechanical axis before work.
2	Remove the external motor supply and place the driven mechanism in a secured state.
3	Use X20TB12 and X20BM31 and verify the double-width module position.
4	Fit a maximum 10 A slow-blow fuse in the external motor-supply line.
5	Record motor coil current, connection sequence, rotation direction and mechanical travel limits.

System Role and Architecture

B&R; X20SM1446-1 is a full-bridge X20 stepper-motor module for one 24 to 48 VDC two-phase bipolar motor at 5 A nominal current. It combines 256-microstep control, four 24 V inputs, encoder evaluation, motor identification and stall detection.

FUNCTION 1

Controls one two-phase bipolar stepper motor from a full bridge

FUNCTION 2

Generates up to 256 microsteps with separately adjustable current stages

FUNCTION 3

Uses motor identification and stall detection for commissioning feedback

FUNCTION 4

Accepts four limit-switch or ABR encoder inputs at 24 VDC

Common Applications

APPLICATION	ENGINEERING CONTEXT
Indexed positioning axis	B&R; X20SM1446-1 drives a single stepper axis with configurable microstep and current profiles.
Machine feed mechanism	Four digital inputs support limit, reference or encoder signals around the commanded motion.
Compact CNC auxiliary axis	Automation Studio and CNC integration coordinate the documented stepper function with machine control.
Energy-aware holding control	Load-dependent current reduction lowers holding current where the configured motor and duty permit it.

CONTROLLED ACCEPTANCE DUTY

Confirm identity, physical interface, companion hardware, configured values and functional response against the installed-system record before release.

Engineering Precautions

NO.	PRECAUTION
1	Confirm the full B&R; X20SM1446-1 marking and assigned mechanical axis before work.
2	Remove the external motor supply and place the driven mechanism in a secured state.
3	Use X20TB12 and X20BM31 and verify the double-width module position.
4	Fit a maximum 10 A slow-blow fuse in the external motor-supply line.
5	Record motor coil current, connection sequence, rotation direction and mechanical travel limits.
6	Configure boost, nominal and holding current to the installed motor instead of copying another axis.
7	Verify all four 24 V inputs, including limit-switch or ABR encoder assignments.
8	Commission at controlled speed and prove motor identification, stall threshold, travel limits and safe stop.

Model-Specific FAQ - Part 1

QUESTION	ANSWER
Which motor can B&R; X20SM1446-1 control?	It controls one two-phase bipolar stepper motor supplied at 24 to 48 VDC $\pm 25\%$ with 5 A nominal current.
What peak current is available from B&R; X20SM1446-1?	The official data lists 10 A maximum for one second, while continuous nominal motor current is 5 A.
How fine is the step resolution of B&R; X20SM1446-1?	The module supports up to 256 microsteps per full step, with current automatically matched to the configured values.
Can B&R; X20SM1446-1 evaluate an encoder?	Yes. Its four 24 V inputs can be configured for one asymmetrical ABR incremental encoder up to 50 kHz.

Model-Specific FAQ - Part 2

QUESTION	ANSWER
What fuse is required for B&R; X20SM1446-1?	B&R; requires an external motor-supply line fuse rated no more than 10 A with slow-blow characteristic.
What does motor identification do on B&R; X20SM1446-1?	It evaluates coil characteristics and returns feedback that can reveal wiring errors or an incorrect motor type.
How should stall detection be set on B&R; X20SM1446-1?	Define the threshold from controlled tests with the actual motor, load and motion profile; do not copy it from another axis.
What proves successful B&R; X20SM1446-1 commissioning?	Verify direction, current stages, microstep motion, four inputs, encoder feedback, limits, stall response and safe stopping on the installed mechanism.

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MODEL	APTER POWER PAGE
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GE 531X111PSHARG1	View GE 531X111PSHARG1 page

MANUFACTURER SOURCE RECORD

Data sheet X20SM1446-1
B&R; version 1.56, 2025-11-27

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