RBD201 - August 12, 2025

Item #RBD201 was discontinued on August 12, 2025. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

19" RACK-MOUNTED BRUSHLESS DC CONTROLLER



Hide Overview

OVERVIEW

Features

- · Supports Thorlabs' Range of 3-Phase, Brushless DC Servo Motor Products
- · Encoder Feedback for Closed-Loop Velocity and Position Control
- USER I/O Port Exposes Encoder Signals for Monitoring
- AUX I/O Port Exposes Digital Input and Output Signals
- Fully Supported by the Kinesis[®] Software Control Suite
- · Seamless Integration with All Thorlabs Motion Controllers

Other Brushless DC Servo Controllers K-Cube® Single-Channel Controller Benchtop Controllers (1-, 2- and 3-Channel) 2-Channel Rack-Mounted Control Module

Other Benchtop Motion Controllers				
1-, 2-, and 3-Channel Brushless DC Servo Controllers				
1-, 2-, and 3-Channel Stepper Motor Controllers				
1- and 3-Channel Open-Loop Piezo Controllers				
1- and 3-Channel Closed-Loop Piezo Controllers				
2-Channel NanoTrak [®] Controllers				

The RBD201 Brushless DC Motor Controller is ideal for motion control applications demanding high-speed (hundreds of mm/s) and high-encoder-resolution (<100 nm) operation. This 1U-high, single-channel controller is designed to fit in a standard 19" rack. It offers high-precision motion control in a wide range of applications, especially when used with our DDS220 or DDS600 linear motor translation stages, where speeds of up to 400 mm/s can be achieved. With the latest digital and analog techniques and high-bandwidth, high-power servo control circuitry, these controllers have been designed to drive Thorlabs' range of 3-phase, brushless DC servo motor products with peak coil currents up to 2.5 A.

The RBD201 controller offers Thorlabs' standard control and programming interface, allowing for easy integration into automated motion control applications. The unit is capable of being reprogrammed in-field, allowing the option to upgrade with future firmware releases as soon as new programming interfaces (such as microscopy standard command sets) are added.

USB connectivity provides easy plug-and-play PC operation. Multiple units can be connected to a single PC via standard USB hub technology for multi-axis motion control applications (such as our MLS203 series of dual-axis stages). Coupling this with the user friendly Kinesis® software allows the user to get reasonably complex move sequences up and running in a short space of time. For example, all relevant operating parameters are set automatically for Thorlabs' stage and actuator products. Advanced custom motion control applications and sequences are also possible using the extensive programming environment described in more detail in the Kinesis Software tab.

We have ensured that the software interfaces to the RBD201 controller are highly integrated with all other Thorlabs motion controllers, providing easy system integration and a reduced learning curve.

Note: The RBD201 controller is specifically designed for use in a 19" rack. For benchtop applications or integration into our MMR601 Rack System Enclosure, please see our benchtop controllers or Brushless DC Motor Controller Module, respectively.

Cabling

Cables for connecting actuators or stages to the controller are shipped with the actuators or stages, not the controller. If you need help identifying the appropriate replacement cable, please contact Tech Support.

Not For Use with Brushed DC Motors or the DDS050 and DDS100 Linear Stages

This controller is designed for use with high power, brushless DC servo motors. For control of the Thorlabs' brushed DC servo motor devices, please see the KDC101

Brushed DC Servo Motor Driver K-Cube[®]. For controlling the DDS050 and DDS100 Linear Stages, please see the KBD101 Brushless DC Servo Motor Driver K-Cube.

Optional Joysticks

The MJC2 and MJC3 joysticks have been designed to provide intuitive, tactile, manual positioning of the stage being controlled. The joysticks feature a two-axis joystick knob for XY control or a three-axis joystick knob for XYZ control, respectively. In most applications, the default parameter settings saved within the controller allow the joystick to be used out of the box, with no need for further setup, thereby negating the requirement to be connected to a host PC, and allowing true remote operation.

Other Controllers

Thorlabs also manufactures a complete range of motion controllers for DC servo motors, stepper motors, and piezoelectric actuators. Please see the links below for more information.





Click to Enlarge **Figure 1.1** RBD201 Front and Rear Panels



Click to Enlarge

Figure 1.2 This image shows an RBD201 controller mounted in a typical 19" rack system.

Hide Specs

SPECS

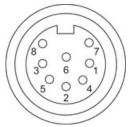
Specifications				
Number of Channels	1			
Motor Drive Connector	8-Pin DIN, Round, Female			
Feedback Connector	15-Pin D-Type, Female			
Brushless Continuous Current Output	2.5 A			
PWM Frequency	40 kHz			
Operating Modes	Position and Velocity			
Control Algorithm	16-Bit Digital PID Servo Loop with Velocity and Acceleration Feed Forward			
Velocity Profile	Trapezoidal/S-Curve			
Position Count	32-Bit			
Position Feedback	Incremental Encoder			
Encoder Bandwidth	2.5 MHz (10 M Counts/sec)			
Encoder Supply	5 V			
AUX Control Connector	15-Pin D-Type, Female			
	150 VA			
Input Power Requirements	Voltage: 100 to 240 VAC			
(Region-Specific Power Cord Included)	Frequency: 50 to 60 Hz			
	Fuse: 2.0 A			
Dimensions	482.6 x 264.8 x 43.7 mm (19" x 10.43" x 1.72")			
Weight	3.4 kg (7.5 lbs)			
	·			

Hide Pin-Out Details

PIN-OUT DETAILS

MOTOR DRIVE

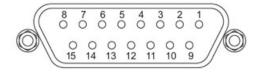
Female



Pin	Description	Pin	Description
1	Motor Phase V	5	Stage ID
2	GND	6	GND
3	Temp Sensor (Not Used)	7	Motor Phase W
4	Motor Phase U	8	Enable

FEEDBACK

D-type Female

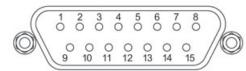


Pin	Description	Pin	Description	
1	Not Connected	9	GND	
2	GND	10	Limit Switch +	
3	Not Connected	11	Limit Switch -	
4	Index -	12	Index +	
5	QB -	13	QB+	
6	QA -	14	QA+	
7 ^a	5 V	15	Not Connected	
8 ^a	5 V	15	Not Connected	

· Pins 7 and 8 are Short-Circuited Internally

USER I/O

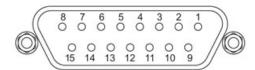
D-Type Male



Pin	Description	Pin	Description	
1	5 V	9	QA+	
2	Trigger IN	10	QA -	
3	Trigger OUT	11	QB+	
4	Ground	12	QB -	
5	Ground	13	Index/Ref +	
6	For Future Use	14	Index/Ref -	
7	For Future Use	45	0 1	
8	For Future Use	15	Ground	

AUX I/O

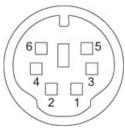
D-Type Female



Pin	Description	Pin	Description
1	Digital O/P 1	9	Digital Ground
2	Digital O/P 2	10	Digital Ground
3	Digital O/P 3	11	For Future Use
4	Digital O/P 4	12	For Future Use
5	Digital Ground	13	Digital I/P 4
6	Digital I/P 1	14	5 V Supply O/P
7	Digital I/P 2	15 5 V Supply O/P	
8	Digital I/P 3	15	5 V Supply O/P

HANDSET

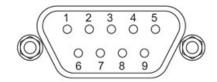
Mini DIN Female



F	Pin	Description	Pin	Description
1	1	RX (Controller Input)/RS232	4	Supply Voltage for Handset 5 V
2	2	Ground	5	TX (Controller Output)/RS232
3	3	Ground	6	Ground

INTERCONNECT

D-Type Male



Pin	Description	Pin	Description
1	Not Connected	6	Not Connected
2	RX (Controller Input)	7	Not Connected
3	TX (Controller Output)	8	Not Connected
4	Not Connected		Not Connected
5	Ground	9	Not Connected

Hide Kinesis Software

KINESIS SOFTWARE

Software Developers Support CD

A developers' kit is shipped with all of our APT™ series controllers. This additional software support is intended for use by software developers working on large, system integration projects that incorporate APT™ products. The kit contains an extensive selection of useful code samples as well as a library of Video Tutorials.

Kinesis[®] Software

Thorlabs offers the Kinesis software package to drive our wide range of motion controllers. The software can be used to control devices in the Kinesis family, which covers a wide variety of motion controllers ranging from small, low-powered, single-channel drivers (such as the K-

Cubes®) to high-power, multi-channel benchtop units and modular 19" rack nanopositioning systems (the MMR60x Rack System).



Figure 58A Kinesis GUI Screen

Software

Kinesis Version 1.14.54

The Kinesis Software Package, which includes a GUI for control of Thorlabs' Kinesis system controllers.

Also Available:

· Communications Protocol

The Kinesis Software features .NET controls which can be used by 3rd party developers working in the latest C#, Visual Basic, LabVIEW™, or any .NET compatible languages to create custom applications. Low-level DLL libraries are included for applications not expected to use the .NET framework and APIs are included with each install. A Central Sequence Manager supports integration and synchronization of all Thorlabs motion control hardware.

By providing this common software platform, Thorlabs has ensured that users can mix and match any of our motion control devices in a single application, while only having to learn a single set of software tools. In this way, it is perfectly feasible to combine any of the controllers from single-axis to multi-axis systems and control all from a single, PC-based unified software interface.

The software package allows two methods of usage: graphical user interface (GUI) utilities for direct interaction with and control of the controllers 'out of the box', and a set of programming interfaces that allow custom-integrated positioning and alignment solutions to be easily programmed in the development language of choice.

Hide Part Numbers

Part Number	Part Number Description			
RBD201	Customer Inspired! 1-Channel Rack-Mounted 3-Phase Brushless DC Servo Controller	\$2,584.51	Lead Time	
MJC2	2-Axis USB HID Joystick	\$600.27	In Stock Overseas	
MJC3	3-Axis USB HID Joystick	\$638.47	Today	