Beckhoff KL4022

Beckhoff KL4022 Analog Output Module User Manual

2-POINT, 4-20MA, 2X16BIT

1. Introduction

This manual provides essential information for the safe and efficient installation, operation, and maintenance of the Beckhoff KL4022 Analog Output Module. Please read this manual thoroughly before using the device to ensure proper functionality and safety.

2. Safety Instructions

Adherence to these safety instructions is crucial for preventing personal injury and damage to equipment.

- Ensure all power is disconnected from the system before performing any installation, wiring, or maintenance tasks.
- Installation and wiring must be performed exclusively by qualified and authorized personnel.
- Observe all local, national, and international electrical codes and regulations.
- Do not operate the module if it shows any signs of damage, such as cracks, deformities, or exposed wiring.
- Protect the module from moisture, excessive dust, corrosive substances, and extreme temperatures.

3. Product Overview

The Beckhoff KL4022 is a 2-channel analog output terminal designed to generate precise current signals in the range of 4 to 20 mA. Each channel features a high resolution of 16 bits, making it suitable for industrial control applications requiring accurate analog output.

3.1. Module Identification

The module's model number and key specifications are clearly visible on its label.

Figure 1: Front view of the Beckhoff KL4022 module packaging, displaying the model number and output specifications.

3.2. Module Components

The KL4022 module integrates seamlessly into a Bus Terminal system, providing two independent analog output channels. Its compact design allows for efficient use of space within control cabinets.

Figure 2: Top view of the KL4022 module, illustrating its terminal layout and compact form factor.

4. Installation and Setup

4.1. Mounting

The KL4022 module is designed for standard DIN rail mounting. Ensure the module is securely seated within the Bus Terminal block, making proper contact with the power contacts and data bus.

4.2. Power Supply

The module requires a 24V DC power supply, which is typically provided via the power contacts of the Bus Terminal system. Refer to the overall system documentation for detailed power bus connection and fusing requirements.

5. Wiring

The KL4022 provides two analog output channels. Each channel requires specific connections for the output signal and a common ground. Proper wiring is essential for correct operation.

5.1. Output Connections

Connect your analog output devices to the designated terminals on the module. The module delivers a 4-20mA current output. Refer to the wiring diagram below for terminal assignments.

Figure 3: Detailed view of the KL4022 module, including its wiring diagram for analog outputs, power, and shield connections.

- **Output 1:** Connect the positive terminal of the first analog output device.
- **Output 2:** Connect the positive terminal of the second analog output device.
- **+24V:** Connect the 24V DC power supply for the output circuitry.
- **GND:** Connect the common ground for the output circuitry.
- **Shield:** Connect the cable shield to the designated terminal for electromagnetic interference (EMI) reduction.

Ensure that the connected load impedance for each output channel is less than 500 Ohm to guarantee proper current delivery.

6. Operation

The KL4022 module operates as an integral part of a Beckhoff Bus Terminal system. Configuration, control, and data exchange are typically managed via the connected fieldbus controller (e.g., using Beckhoff TwinCAT software).

6.1. Data Representation

The analog output values are typically represented as 16-bit digital values within the control system. These digital values are then converted by the module into the corresponding 4-20mA current range.

6.2. Output Range and Load

The module provides a current output range of 4-20mA. It is critical to ensure that the connected load impedance for each channel does not exceed 500 Ohm to maintain specified performance and prevent damage to the module.

7. Maintenance

The Beckhoff KL4022 module is designed for maintenance-free operation under normal industrial conditions. However, periodic inspection can help ensure long-term reliability.

7.1. Inspection

Periodically inspect all wiring connections to ensure they are secure and free from corrosion. Check the module for any visible signs of damage, such as discoloration, cracks, or loose components.

7.2. Cleaning

If necessary, clean the exterior of the module with a soft, dry, lint-free cloth. Do not use abrasive cleaners, solvents, or any liquid directly on the module, as this may cause damage.

8. Troubleshooting

This section provides solutions to common issues encountered with the KL4022 module.

8.1. No Output Signal

- **Power Supply:** Verify that the 24V DC power supply is correctly connected and active at the module's power contacts.
- **Wiring:** Check all wiring connections for the output device, ensuring correct polarity and secure contact. Refer to the wiring diagram in Section 5.
- **Configuration:** Confirm that the module is correctly configured and enabled within the control system software (e.g., TwinCAT).
- **Load Impedance:** Ensure the connected load impedance is within the specified range (< 500 Ohm). An excessive load can prevent current flow.

8.2. Incorrect Output Value

- **Control System Value:** Verify the digital value being sent from the control system to the module.
- **Calibration:** While typically factory calibrated, ensure no software-based scaling or calibration errors exist in the control system.
- **Interference:** Inspect for potential external electromagnetic interference or ground loops that could affect the analog signal. Ensure proper shielding is implemented.

9. Specifications

Technical specifications for the Beckhoff KL4022 Analog Output Module:

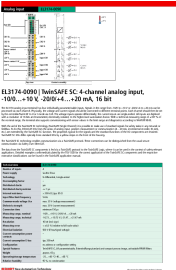| Parameter	Value
Model	KL4022
Channels	2 x Analog Output
Output Current Range	4-20 mA
Resolution	16 Bit
Load Impedance	< 500 Ohm

Parameter	Value
Power Supply	24V DC (via power contacts)
Product Dimensions	23 x 16 x 18 inches; 2 Pounds (Note: These dimensions typically refer to shipping packaging.)
Material	Metal, Plastic
Manufacturer	Beckhoff

10. Warranty and Support

The Beckhoff KL4022 Analog Output Module is covered by the standard manufacturer's warranty. For detailed warranty terms, technical support, service requests, or to access additional documentation, please contact Beckhoff Automation directly or refer to their official website. Always provide the model number (KL4022) and any relevant serial numbers when seeking support.

Related Documents - KL4022

[Beckhoff EL3174-0090 TwinSAFE SC 4-Channel Analog Input Terminal](#)
Datasheet for the Beckhoff EL3174-0090 TwinSAFE SC, a 4-channel analog input terminal supporting -10/0...+10 V and -20/0/+4...+20 mA signals with 16-bit resolution. Details technical specifications, features, and related products for industrial automation.

[EL6751 Master/Slave-Klemme für CANopen - Beckhoff Technische Dokumentation](#)
Umfassende technische Dokumentation für die Beckhoff EL6751 Master/Slave-Klemme für CANopen. Erfahren Sie mehr über Installation, Konfiguration, CANopen-Kommunikation und Fehlerbehebung für industrielle Automatisierungslösungen.

[Beckhoff ELX3202 and ELX3204 Operating Manual: Analog Input Terminals](#)
Operating manual for Beckhoff ELX3202 and ELX3204 2- and 4-channel analog input terminals. Covers installation, wiring, technical specifications, parameterization, and Ex safety for RTD measurements in hazardous areas.

	[Beckhoff TwinCAT 3 NC PTP TF50x0 Manual: Motion Control Configuration and Parameters](#) Beckhoff's TwinCAT 3 NC PTP (TF50x0) manual detailing motion control configuration, setup, and parameters for industrial automation. Covers quick start, axis configuration, motion parameters, PLC integration, and technical specifications.
	[Beckhoff CB4055 Industrial Motherboard Manual](#) Detailed manual for the Beckhoff CB4055 industrial motherboard, covering features, specifications, connectors, BIOS settings, and technical data for control and automation engineering specialists.
	[Beckhoff Service Tool (BST) Manual - Backup and Recovery for Industrial PCs](#) Comprehensive guide to using the Beckhoff Service Tool (BST) for creating, restoring, and managing system images on Industrial PCs. Covers installation, configuration, remote access, and support.