DMMRUTXB LC10E

Lichuan LC10E EtherCAT Servo Motor Driver Controller User Manual

Model: LC10E | Brand: DMMRUTXB

1. Introduction

This manual provides essential instructions for the installation, operation, and maintenance of the Lichuan LC10E EtherCAT Servo Motor Driver Controller. The LC10E is designed for precise control of AC servo motors in various robotic and industrial applications, supporting power options from 100W to 600W. Please read this manual thoroughly before using the product to ensure safe and efficient operation.

2. Safety Information

WARNING: Improper installation or operation can lead to electric shock, injury, or equipment damage. Always follow safety guidelines.

- Ensure all power is disconnected before installation, wiring, or maintenance.
- Only qualified personnel should perform installation and wiring.
- Verify correct voltage and current ratings before connecting power.
- Do not operate the device in environments with excessive moisture, dust, or corrosive gases.
- Ground the equipment properly to prevent electrical hazards.
- Avoid collisions during transportation and handling. Test the machine before full operation.

3. Product Overview

The Lichuan LC10E EtherCAT Servo Motor Driver Controller offers high-performance control for AC servo motors. It features EtherCAT communication for real-time control and is compatible with a range of motor powers.

3.1 Key Features

- High-performance EtherCAT Servo Motor Driver.

- Supports multiple power options: 100W, 200W, 400W, and 600W.
- Precision control with torque ratings of 0.32, 0.637, 1.27, and 1.91 N.m.
- Compatible with a wide range of AC servo motors.
- Easy integration with existing robotic systems.
- Durable and reliable design for industrial and hobbyist robotics environments.

3.2 Package Contents

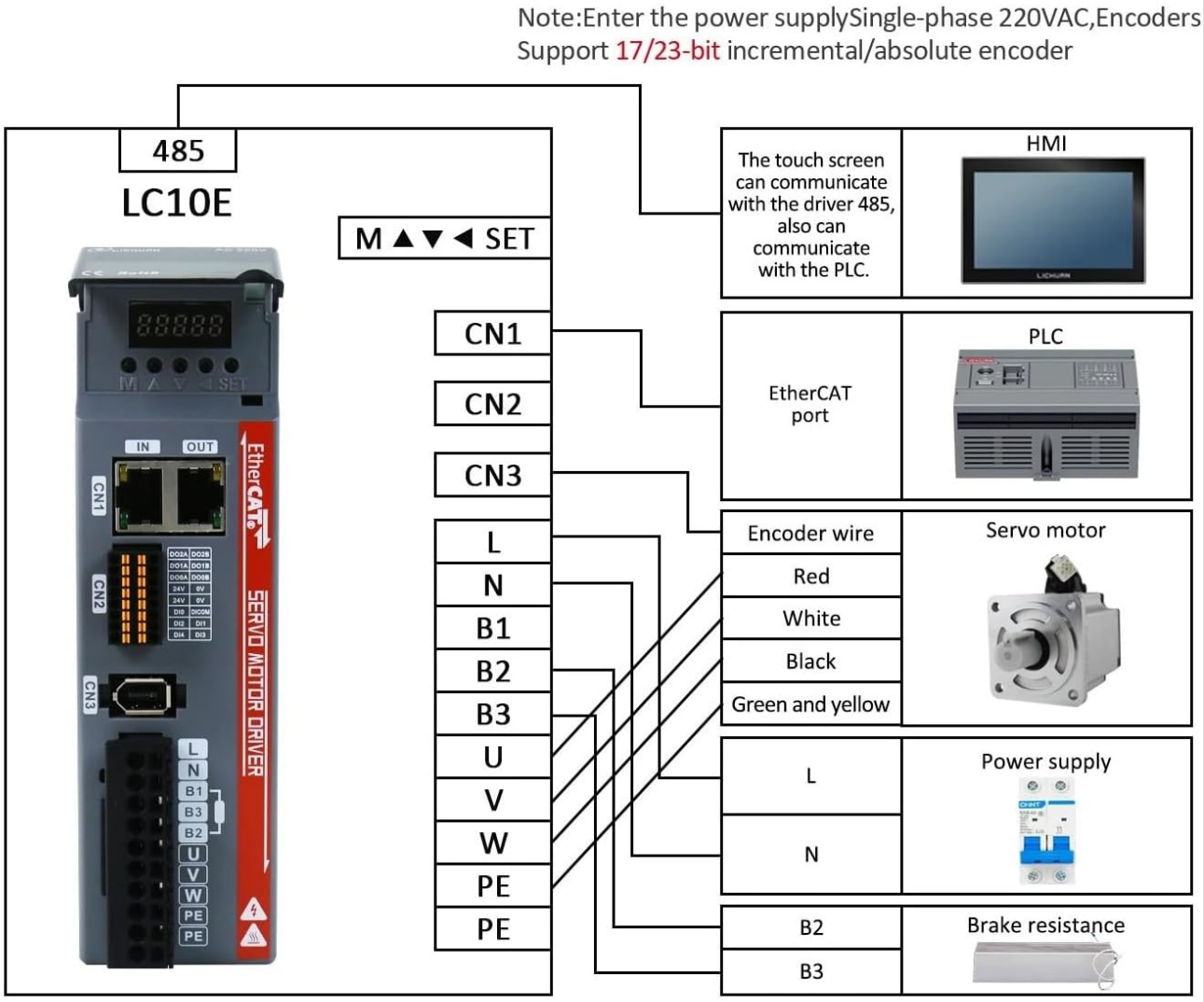
Upon unpacking, verify that all components are present and undamaged. The standard package typically includes:

- Lichuan LC10E EtherCAT Servo Motor Driver
- Compatible AC Servo Motor (specific to ordered kit)
- Encoder Cable
- Power Cable
- Connectors and mounting hardware
- User Manual (this document)

Image: Typical contents of the Lichuan LC10E servo motor driver kit, including the driver, motor, cables, and documentation.

3.3 Driver Components

Wiring diagram



Note: To avoid damage to the motor or drive caused bycollisions during transportation, please power on and test the machine before receiving thegoods,After normal operation, install it onto the machine equipment.

Image: Front view of the Lichuan LC10E driver, showing the EtherCAT ports (IN/OUT), CN1, CN2, CN3 connectors, and power terminals.

Image: Top view of the Lichuan LC10E driver with the protective cover open, revealing the digital display and control buttons (M, ▲, ▼, SET) for configuration.

4. Specifications

Feature	Description
Model	LC10E
Power Options	100W, 200W, 400W, 600W
Torque Ratings	0.32 N.m (100W), 0.637 N.m (200W), 1.27 N.m (400W), 1.91 N.m (600W)
Communication Interface	EtherCAT

Feature	Description
Encoder Support	17/23-bit incremental/absolute encoder
Input Voltage	Single-phase 220VAC
Item Weight	Approximately 1.76 ounces (driver only)
Package Dimensions	Approximately 1.18 x 0.79 x 0.39 inches (driver only)

5. Setup and Installation

Careful installation and wiring are crucial for the proper functioning and safety of the servo system.

5.1 Wiring Diagram

Refer to the following diagram for detailed wiring connections. Ensure all connections are secure and correctly polarized.

Image: Detailed wiring diagram for the Lichuan LC10E EtherCAT Servo Motor Driver, showing connections for power supply, encoder, servo motor, HMI, PLC, and brake resistance.

Wiring Notes:

- **Power Supply:** Connect single-phase 220VAC to L and N terminals.
- **Servo Motor:** Connect U, V, W, N terminals to the corresponding motor phases.
- **Encoder:** Use the provided encoder wire to connect the servo motor encoder to the EtherCAT port. The diagram specifies Red, White, Black, Green, and Yellow wires.
- **EtherCAT Communication:** Use the EtherCAT IN and OUT ports for connection to an EtherCAT master (e.g., PLC).
- **HMI/PLC Communication:** The touch screen (HMI) and PLC can communicate via the driver's 485 interface.
- **Brake Resistance:** Connect external brake resistance to B2 and B3 terminals if required by your application.
- **Grounding:** Ensure the PE (Protective Earth) terminal is properly grounded.

5.2 Installation Steps

1. **Mounting:** Securely mount the LC10E driver and servo motor to a stable surface or within an enclosure using appropriate fasteners. Ensure adequate ventilation around the driver.
2. **Power Wiring:** Connect the main power supply (single-phase 220VAC) to the L and N terminals of the driver.
3. **Motor Wiring:** Connect the servo motor power cables (U, V, W, N) to the corresponding terminals on the driver.
4. **Encoder Wiring:** Connect the servo motor's encoder cable to the designated EtherCAT port or encoder input on the driver, following the color code in the wiring diagram.
5. **Communication Wiring:** Connect the EtherCAT IN/OUT ports to your EtherCAT network. If using HMI or PLC communication via 485, connect the appropriate cables.
6. **Grounding:** Connect the PE terminal to a reliable earth ground.
7. **Initial Check:** Before applying power, double-check all wiring connections for correctness and security.
8. **Pre-Operation Test:** To avoid damage from potential collisions during transportation, power on and test the

machine before receiving the goods. After normal operation is confirmed, install it onto the machine equipment.

6. Operating Instructions

Once the driver and motor are correctly installed and wired, you can proceed with operation.

6.1 Power On and Initial Configuration

1. **Apply Power:** Turn on the main power supply to the LC10E driver. The display on the driver should illuminate.
2. **Parameter Settings:** Use the M, ▲, ▼, and SET buttons on the driver to navigate through the menu and adjust necessary parameters. Refer to the detailed programming guide (if provided separately) for specific parameter definitions and adjustment procedures. Common parameters include motor type, encoder resolution, control mode (position, speed, torque), and communication settings.
3. **EtherCAT Communication:** Ensure your EtherCAT master (e.g., PLC) recognizes the LC10E driver and establishes communication. Configure the EtherCAT network settings on your master controller.

6.2 Motor Control

The LC10E driver operates under the command of an EtherCAT master controller. Control commands for position, speed, or torque are sent from the master to the driver via the EtherCAT network.

- **Position Control:** Send target position commands to the driver. The driver will move the servo motor to the specified position with high accuracy.
- **Speed Control:** Send target speed commands. The driver will maintain the motor at the desired rotational speed.
- **Torque Control:** Send target torque commands. The driver will apply the specified torque to the motor.

Monitor the driver's display for status indicators and error codes during operation. Consult the troubleshooting section for any issues.

7. Maintenance

Regular maintenance helps ensure the longevity and reliable operation of your LC10E servo system.

- **Cleaning:** Keep the driver and motor free from dust, dirt, and debris. Use a soft, dry cloth for cleaning. Do not use solvents or abrasive cleaners.
- **Ventilation:** Ensure that the cooling fan (if present) and ventilation openings on the driver are not obstructed. Periodically check for dust buildup in the fan.
- **Connection Checks:** Periodically inspect all wiring connections for tightness and signs of wear or corrosion. Re-tighten any loose connections.
- **Environmental Conditions:** Ensure the operating environment remains within the specified temperature and humidity ranges.
- **Firmware Updates:** Check the manufacturer's website for any available firmware updates for improved performance or bug fixes. Follow update instructions carefully.

8. Troubleshooting

This section provides solutions to common issues you might encounter. For complex problems, contact technical support.

Problem	Possible Cause	Solution
Driver does not power on	No power supply; incorrect wiring; blown fuse	Check power connections; verify input voltage; inspect fuses.
Motor does not move	Incorrect motor wiring; encoder not connected; no command from master; parameter error	Verify motor and encoder wiring; check EtherCAT communication; review driver parameters.
Motor vibrates or makes noise	Gain settings incorrect; mechanical issue; motor overloaded	Adjust PID gain parameters; check for mechanical binding; ensure motor is not overloaded.
EtherCAT communication error	Cable issue; incorrect network configuration; master controller problem	Check EtherCAT cables; verify network settings on master and driver; restart master controller.
Overcurrent/Overvoltage fault	Motor overload; short circuit; power supply issue	Reduce load; check motor and wiring for shorts; verify power supply stability.

9. Warranty and Support

For warranty information, please refer to the terms and conditions provided by your point of purchase or contact the manufacturer directly. Warranty periods and coverage may vary.
For technical support, troubleshooting assistance beyond this manual, or inquiries about spare parts, please contact your supplier or the manufacturer's customer service department. Have your product model (LC10E) and serial number ready when contacting support.