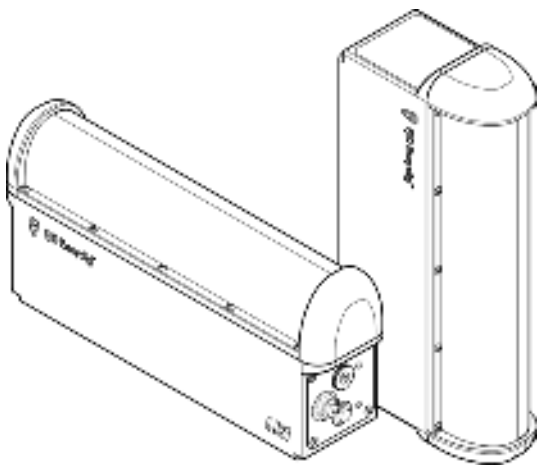
FJD Easydig LR1 Laser Receiver

User Manual



February 23, 2023 | Rev. 1.1

Copyright Notice:

Revisions:

Version	Date	Description
1.1	2023.02.23	Updated the installation instructions.

Read Before Use:

Operate in strict accordance with this manual.

Failure to follow the instructions in this manual may result in machine damage and performance degradation.

If you have any questions during use, contact the service personnel.

Disclaimer:

- The purchased products, services, and features are stipulated by the contract. All or part of the products, services, and features described in this manual may not be within the scope of your purchase or usage. Unless otherwise specified in the contract, all the content in this manual is provided "AS IS" without warranties of any kind, express or implied.
- The content of this manual is subject to change due to product upgrades and other reasons. FJDynamics reserves the right to modify the content of this manual without notice.
- This manual only provides guidance for use of this product. Every effort has been made in the preparation of this manual to ensure accuracy of the content, but no information in this manual constitutes a warranty of any kind, express or implied.

Preface

Thank you for purchasing this FJD Easydig LR1 Laser Receiver. Before use, ensure that you have read this manual carefully and followed the instructions herein to better understand and operate the product.

Technical Support

Starting from the date of purchase, users will be provided with the technical support and upgrade services from FJD.

1. FJD customer service: service@fjdynamics.com
2. FJD official website: https://www.fjdynamics.com/

Contents

1 Product Introduction

1.1 Overview

Featuring a large reception angle and high precision, this laser receiver can assist users to work in all kinds of harsh and complex working conditions. This product can support the automated operation of large, medium, and small machines within a radius of 400 meters. With this product, the machine's depth is shown on the machine control terminal in real time, meeting the need for high-precision depth measurement and application on site quickly and accurately.

This product should be used in conjunction with FJD Easydig G21 2D Excavator Guidance System.

1.2 Specifications

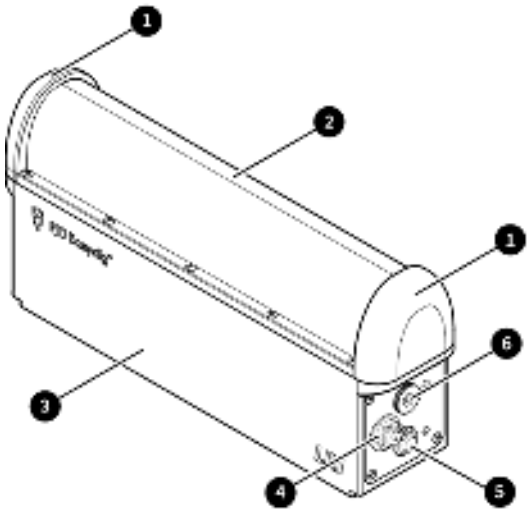
Working diameter	800 m
Model	LR1
Detectable spectrum	580 nm–1100 nm
Reception angles	270°
Length of reception area	160 mm
Detection accuracy	± 3 mm
Laser transmitter supported	Rotary laser transmitters of mainstream brands
Radius of wireless communications	30 m
Communicating method	Bluetooth 5.0 + CAN
Power supply	Built-in rechargeable battery + external power supply via cable
Battery capacity	6400 mAh
Battery type	Li-poly
Charging time	10 h
Charging parameters	5 V/1 A
Battery life	100 h
IP rating	IP66
Dimensions without pinch plate or magnetic base plate	211×49×96 mm
Net weight	1 kg
Storage temperature	-40℃–70℃

Charging temperature	0℃–40℃
Operating temperature	-20℃–45℃

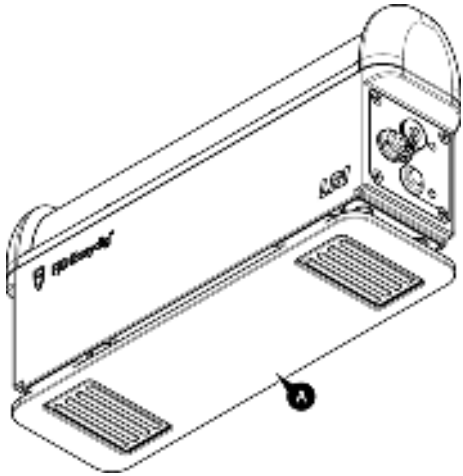
1.3 Packing List

No.	Name	Qty.
1	LR1 laser receiver	1
2	Charger	1
3	User Manual	1
4	Magnetic base plate	1

1.4 Structure

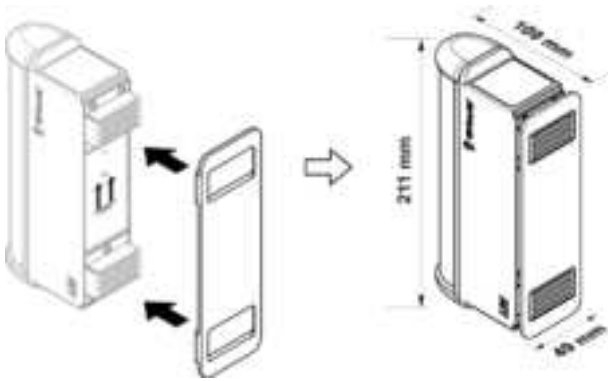


1	Protective shell	4	Aviation connector to the control terminal
2	Laser reception area	5	On/Off button
3	Housing	6	DC charging port



A	Installing the magnetic base plate

1.5 Installation



- Using the magnetic base plate
  1. Clean the bottom of the base plate and the arm surface;
  2. Install the base plate on the arm surface;
  3. Follow the direction indication on the bottom of the receiver to place it correctly;
  4. Secure the receiver on the base plate.

!	**Note: Above is the general configuration of LR1 and only serves as a reference. The actual product may differ slightly.**

2 Precautions

2.1 Before Use

- Ensure that the receiver status and working environment are normal. To prevent damage to the internal circuit, do not clean the housing with high-pressure water flow. With an IP rating of IP66, the receiver should still be protected from high-pressure water flow and prolonged immersion to avoid damage.
- To avoid irreversible damage to the housing, do not place the receiver near the fire and heat source.

2.2 Battery Charging

- Charge the battery in a suitable temperature range.
- Charge the battery at rated voltage and current.
- Do not replace the battery.

2.3 Radio Wave

- Strong radio waves in the following environments will affect the operation of the receiver.
  - Strong electromagnetic interference, such as signal transmitters.
  - Radio towers, such as TV and radio signal towers.

2.4 Safety Instructions

To avoid injuries and reduce risks, operators should read and understand the following safety instructions. Take anti-collision measures to protect the receiver during transportation. Serious collisions may affect the receiver's accuracy when it receives laser beams.

WARNING
• Disassembly and maintenance can only be carried out by FJD or its authorized personnel. Fire, electric shock, or other physical injuries may occur if you disassemble or maintain the receiver by yourself. • To avoid the risks of fire and electric shock, do not use damaged power charging cables, cables, and sockets. • To avoid explosion, do not use the receiver near dangerous goods containing flammable gas, liquid, and other substances or in coal mines.

3 Maintenance and Service

1. Keep the housing dry and clean.
2. Avoid the accumulation of impurities or debris on the magnetic material.

4 Disposal

This product contains metallic materials and electronic components. For environmental protection, hand over the wastes, including the packing materials, metallic parts, and electronic components, to a qualified recycling company according to the local laws and regulations.

5 Warning message

CE Warning：

When charging, please place the device in an environment that has a normal room temperature and good ventilation. It is recommended to charge the device in an environment with a temperature that ranges from 0℃~40℃. Please ensure to use only the charger offered by the manufacturer. Using unauthorized charger may cause danger and violate the authorization of the device and the guarantee article. The adapter shall be installed near the equipment and shall be easily accessible.

Warning:- replacement of a battery with an incorrect type that can defeat a safeguard;

- disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, that can result in an explosion;
- leaving a battery in an extremely high temperature surrounding environment that can result in an explosion or the leakage of flammable liquid or gas; and
- a battery subjected to extremely low air pressure that may result in an explosion or the leakage of flammable liquid or gas.

This device is a low-power radio transmitter and receiver. As recommended by international guidelines, the device meets applicable national SAR limits of 2.0W/kg (10g).10g SAR: meets low-power exclusion level, SAR test is not required.

This product can be used across EU member states.

FCC Warning：
This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or changes to this equipment. Such modifications or changes could void the user's authority to operate the equipment.

When using the product, maintain a distance of 20cm from the body to ensure compliance with RF exposure requirements.

NOTE:
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

6 Equipment Under Test (EUT) Description

Product Name:	FJD Easydig LR1 Laser Receiver
Maximum EIRP:	-2.13 dBm
Hardware Version:	V3.2
Software Version:	V1.0.0.8
Frequency Range:	Bluetooth: 2402 MHz ~ 2480 MHz
Antenna information:	PCB Antenna, 1.5 dBi
Bluetooth Version:	5.0
Modulation Type:	GFSK
Note:	BLE only support 1M

EU Declaration of Conformity

Number

FJD Easydig LR1 Laser Receiver_LR1_of Doc

Name and address of the Manufacturer
FJ Dynamics Co.,Ltd.
1709, WeiXing Building 61 GaoXin South 9th Rd Nanshan District, Shenzhen
This declaration of conformity is issued under the sole responsibility of the manufacturer.
Object of the declaration
LR1 is a Laser Receiver which incorporate Bluetooth technologies

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation
Directive RED: 2014/53/EU

and other Union harmonization legislation where applicable:

Directive RoHS: 2011/65/EU
Directive WEEE: 2012/19/EU

References to the relevant harmonised standards used or references to the other technical specifications in relation to which conformity is declared.

EN IEC 62368-1:2020+A11:2020;
ETSI EN 301 489-1 V2.2.3;
ETSI EN 301 489-17 V3.2.5;
EN 50663:2017;
ETSI EN 300 328 V2.2.2;

The Notified Body
Name: Phoenix Testlab
Number: 0700

Performed
Applicable Modules: B+C

CE

And issued the EU-type examination certificate
Certificate number:

This product can be used across EU member states.

Description of accessories and components, including software, which allow the radio equipment to operate as intended and covered by the DoC

Hardware version	V3.2
Software version	V1.0.0.8
Antenna	WLAN/BT: PCB Antenna
Battery	EVE-INR18650J33V 3.6V/6200mAh (EVE Energy CO., LTD.)
Adapter 1	XSD-0501000NEUD Input:100-240V,50/60Hz,0.5A Output: 5.0V/1.0A Shenzhen Sunshine Technological Co.,Ltd.
Adapter 2	XSD-0501000NUSD Input:100-240V,50/60Hz,0.5A Output: 5.0V/1.0A Shenzhen Sunshine Technological Co.,Ltd.

Please note: In order to fix bugs or further enhance functionalities of your device. could release software updates after the launch of the product.
All software versions launched. are verified and compliant with EU regulations. All RF parameters (e.g. frequency range, output power) are not accessible to the end user, and thus cannot be changed or altered

Signed for and on behalf of:
Shenzhen,2023/07/31
Place and date of issue

Jett Liao
Name, Function, signature