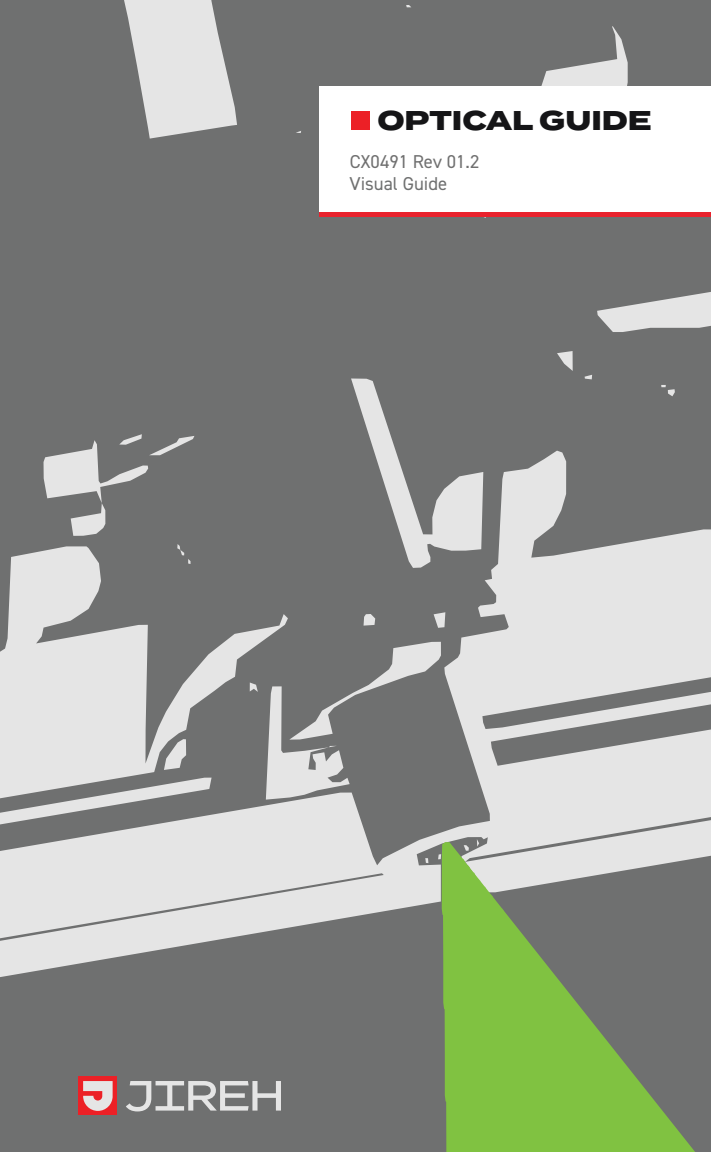
OPTICAL GUIDE

CX0491 Rev 01.2
Visual Guide



JIREH

KEEP THIS MANUAL – DO NOT LOSE
THIS MANUAL IS PART OF THE **OPTICAL GUIDE** AND MUST BE RETAINED FOR THE LIFE OF THE PRODUCT. PASS ON TO SUBSEQUENT OWNERS.
Ensure any amendments are incorporated with this document.

CAUTION! The Optical Guide is designed for a specific use. Using the Optical Guide outside of its intended use is dangerous. Failure to comply with the warnings, instructions, and specifications in this manual could result in **PERSONAL INJURY** or **EQUIPMENT DAMAGE**. Read and understand this manual before using.

CAUTION! Do **NOT** disconnect under load. Shut off power before connecting or disconnecting the Optical Guide. Permanent damage to electronics could occur.

1. Optical Guide Safety Precautions

The optical guide utilizes a class 3R laser which is potentially hazardous. Please read and understand the following warnings prior to use. Class 3R Lasers have the potential to harm eyesight, observe all safety precautions listed within this user manual.

CAUTION! EYE INJURY DUE TO LASER RADIATION. Class 3R laser product.

Avoid direct eye exposure. **NEVER** look into the laser aperture or laser beam.

Do **NOT** aim, point, or direct laser at people or animals.

Do **NOT** place a mirror or reflective surface in the path of the laser beam.

CAUTION! EYE INJURY DUE TO LASER RADIATION. Class 3R laser product.

Always ensure system power is off while mounting and aligning the Optical Guide. Do **NOT** turn on system power until:

- the Optical Guide has been properly mounted,
- the Optical Guide has been properly aligned to point towards the scan surface, and
- ensuring the laser beam will not be obstructed or contact any reflective surfaces

It is a federal offense to point a laser at any aircraft. **NEVER** point the laser at aircraft or other vehicles.

Do **NOT** open or dismantle the Optical Guide. Class 3B laser radiation is possible if dismantled which can cause immediate and serious eye damage.

a. Optical Guide Safety Label Locations

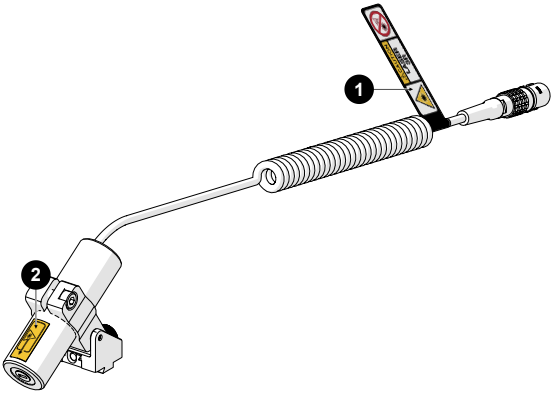


Fig. 1 - Optical guide safety label locations

- Laser Aperture Label *(Fig. 1-2)* indicates lasers projection location and direction.

Fig. 2 - Laser aperture label

- Laser Radiation Label *(Fig. 1-1)* advises the user of the class 3R laser caution of the product.

Fig. 3 - Laser radiation label

b. Optical Guide Projection

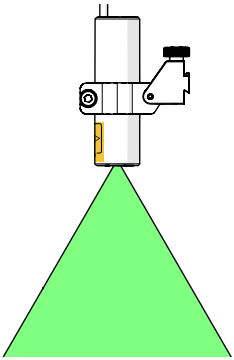


Fig. 4 - Projection

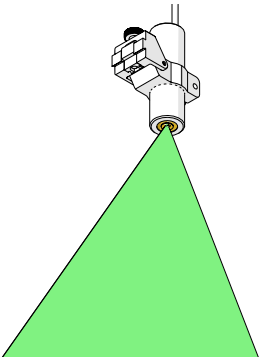


Fig. 5 - Projection

c. Optical Guide Classification

- A Class 3R laser is considered safe if handled carefully, with restricted beam viewing. Visible continuous lasers in Class 3R are limited to 5 mW.

WARNING! DO NOT DISASSEMBLE. No user-serviceable parts. Disassembling any of the components in this product, beyond the instructions in this user manual, could void the regulatory certifications and/or effect the safety of the product.

The WEEE symbol indicates that the product must not be disposed of as unsorted municipal waste, but should be collected separately.

(see "Disposal" on page 27 for additional details).

TABLE OF CONTENTS

IDENTIFICATION

1.1. Product Brand

This user manual describes the proper safety precautions, setup and use of the Optical Guide.

This document defines the intended behaviour of the NAVIC and SKOOT system while using the Optical Guide. From this point of the document, the NAVIC and SKOOT will be referred to as 'Crawler.'

1.2. Manufacturer

Distributor:	Manufacturer:
	Jireh Industries Ltd. 53158 Range Road 224 Ardrossan, Alberta, Canada T8E 2K4 780.922.4534 jireh.com

1.3. Compliance Declarations

1.3.1. ISED Emissions Compliance (Canada)

CAN ICES-003(A) / NMB-003(A)

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

1.3.2. FCC Suppliers Declaration of Conformity (United States)

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.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide

reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

RESPONSIBLE PARTY NAME:	Jireh Industries
ADDRESS:	2955 S Sam Houston Pkwy E Suite 300 Houston, Texas United States 77047
TELEPHONE:	832-564-0626

1.3.3. European Union CE Declarations

Jireh Industries hereby declares that the Optical Guide product complies with the essential requirements and other relevant provisions of the following European Union directives:

2014/30/EU	EMC Directive
2014/35/EU	Low Voltage Directive
2012/19/EU	Directive on Waste Electrical and Electronic Equipment
2011/65/EU	Directive on Restriction of Hazardous Substances (RoHS)

1.3.4. UKCA Declarations

Jireh Industries hereby declares that the Optical Guide product complies with the essential requirements and other relevant provisions of the following UK directives.

Title	Edition/Date of Issue
Electromagnetic Compatibility Regulations	2016
Electrical Equipment (Safety) Regulations	2016
Waste Electrical and Electronic Equipment Regulations	2013
Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations	2012

PRODUCT SPECIFICATIONS

2.1. Optical Guide Specifications

2.1.1. Intended Use

The Optical Guide provides a visual reference to align the crawler to a given path *(i.e. a weld)*.

2.1.1.1 Operating Limits

The Optical Guide is intended to:

- be used only when mounted on a frame bar that is mounted to the front of a crawler
- be activated only when mounted on a frame bar that is mounted to the front of a crawler

2.1.1.2 Operating Environment

The Optical Guide is designed for use in an industrial environment that is:

- between -20° C *(-4° F)* and 50° C *(122° F)*
- free of mirrors and reflective surfaces

2.1.1.3 User

The Optical Guide is intended to be used by:

- authorized personnel who have read and understand the user manual
- authorized personnel who understand the dangers of laser radiation
- persons without limitations in the physical abilities of the upper and lower limbs, sight, hearing

2.1.2. Unintended Use

The Optical Guide is not intended for use outside of the intended use, specifically including:

- use in locations having an explosion or fire hazard.

2.1.3. Dimensions and Weight

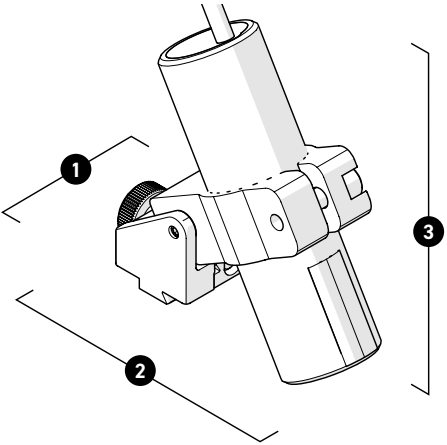


Fig. 6 - Optical guide dimensions

Optical guide width *(Fig. 6-1)*:	2.5 cm	1 in
Optical guide depth *(Fig. 6-2)*:	6.1 cm	2.4 in
Optical guide height *(Fig. 6-3)*:	6.6 cm	2.6 in
Optical guide weight:	0.13 kg	0.29 lb

2.1.4. Power Requirements

Input Voltage:	25-45 VDC
Input Power:	1 W

2.1.5. Environmental Sealing

Dust-tight, watertight *(not submersible)*.

2.2. Parent Products

The Optical Guide may be used with the products listed in this section. These products have a User Manual of their own, and shall be referred to for their product specifications. If the use of the Optical Guide in conjunction with these products modifies the product specifications, those differences are shown here.

2.2.1. NAVIC

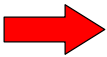
The NAVIC has a user manual of its own, and shall be referred to for the NAVIC'S specifications. The use of the Optical Guide with the NAVIC does not modify the NAVIC specifications.

2.2.2. SKOOT

The SKOOT has a user manual of its own, and shall be referred to for the SKOOT's specifications. The use of the Optical Guide with the SKOOT does not modify the SKOOT specifications.

DEFINITIONS

3.1. Definition of Symbols

	Instructions to ‘look here’ or to ‘see this part’.
	Denotes movement. Instructing user to carry out an action in a specified direction.
	Indicates alignment axis.
	Alerts the user that the view has changed to a reverse angle.

3.2. Safety Symbols

The following safety symbols might appear on the product and in this document. Read and understand their meaning below:

	General warning symbol	This symbol is used to alert the user to potential hazards. All safety messages that follow this symbol shall be obeyed to avoid possible harm or material damage.
	Shock hazard caution symbol	This symbol is used to alert the user to potential electric shock hazards. All safety messages that follow this symbol shall be obeyed to avoid possible harm.
	Laser warning symbol	This symbol is used to alert the user to potential laser hazards. All safety messages that follow this symbol shall be obeyed to avoid possible harm or material damage.

3.3. Safety Signal Words

The following safety signal words might appear in this document. Read and understand their meaning below:

DANGER!	The DANGER signal word indicates an imminently hazardous situation. It calls attention to a procedure, practice, or the like that if not correctly performed or adhered to will result in death or serious personal injury. Do not proceed beyond a DANGER signal word until the indicated conditions are fully understood and met.
WARNING!	The WARNING signal word indicates a potentially hazardous situation. It calls attention to a procedure, practice, or the like that if not correctly performed or adhered to could result in death or serious personal injury. Do not proceed beyond a WARNING signal word until the indicated conditions are fully understood and met.
CAUTION!	The CAUTION signal word indicates a potentially hazardous situation. It calls attention to a procedure, practice, or the like that if not correctly performed or adhered to may result in minor or moderate personal injury, material damage, particularly to the product, destruction of part or all of the product, or loss of data. Do not proceed beyond a CAUTION signal word until the indicated conditions are fully understood and met.

SYSTEM COMPONENTS

4.1. Component Identification

The Optical Guide contains the following components:

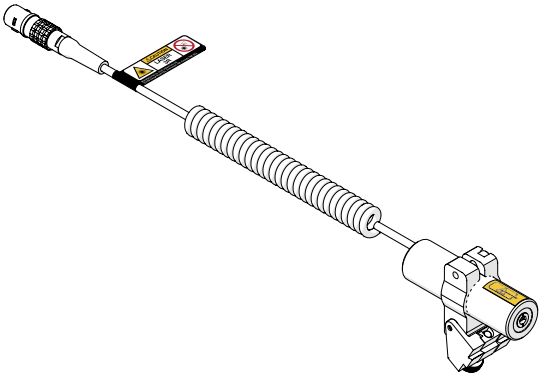


Fig. 7 - Optical Guide CXG035

4.1.1. Optical Guide

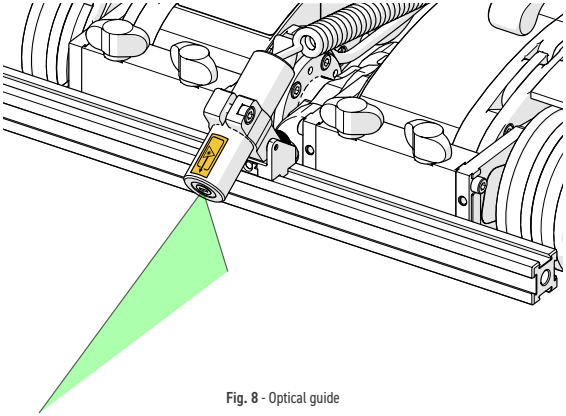


Fig. 8 - Optical guide

The Optical Guide provides a visual reference for guiding automated scanners along a given path *(i.e. a weld)*.

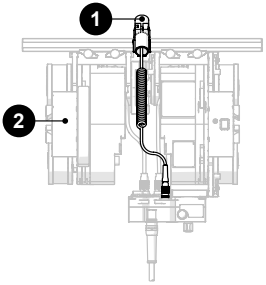
PREPARATION FOR USE

5.1. NAVIC Configurations

First, prepare the NAVIC for use as instructed in the NAVIC user manual. The NAVIC must be outfitted with one of the following:

- frame bar
- vertical probe holder frame
- low profile probe holder frame
- pivoting probe holder frame

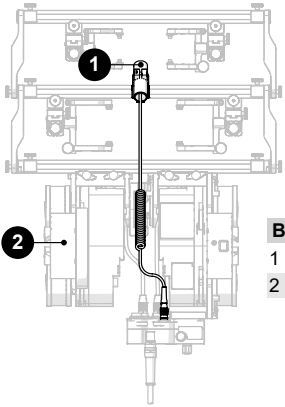
5.1.1. NAVIC with Frame Bar



BOM ID	Description
1	Optical Guide
2	NAVIC System

Fig. 9 - Optical Guide mounted to a frame bar

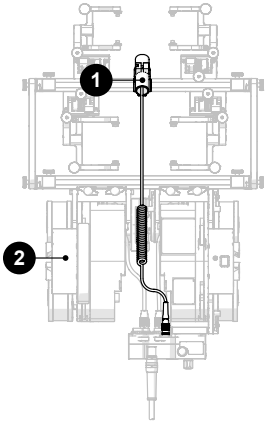
5.1.2. NAVIC with Vertical Probe Holder Frame



BOM ID	Description
1	Optical Guide
2	NAVIC System

Fig. 10 - Optical Guide mounted to a vertical probe holder frame

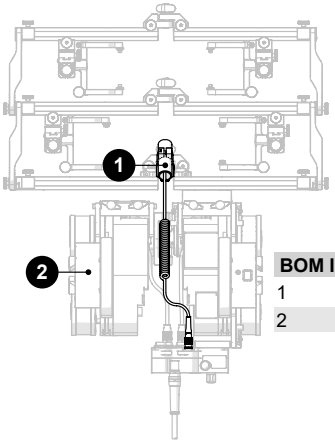
5.1.3. NAVIC with Low Profile Probe Holder Frame



BOM ID	Description
1	Optical Guide
2	NAVIC System

Fig. 11 - Optical Guide mounted to a low profile probe holder frame

5.1.4. NAVIC with Pivoting Probe Holder Frame



BOM ID	Description
1	Optical Guide
2	NAVIC System

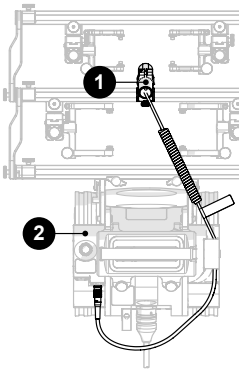
Fig. 12 - Optical Guide mounted to a pivoting probe holder frame

5.2. SKOOT Configurations

First, prepare the SKOOT for use as instructed in the SKOOT user manual. The SKOOT must be outfitted with one of the following:

- vertical probe holder frame
- low profile probe holder frame

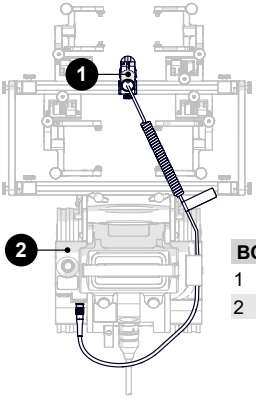
5.2.1. SKOOT with Vertical Probe Holder Frame



BOM ID	Description
1	Optical Guide
2	SKOOT System

Fig. 13 - Optical Guide mounted to a vertical probe holder frame

5.2.2. SKOOT with Low Profile Probe Holder Frame



BOM ID	Description
1	Optical Guide
2	SKOOT System

Fig. 14 - Optical Guide mounted to a low profile probe holder frame

5.3. Optical Guide Installation

CAUTION! EYE INJURY DUE TO LASER RADIATION. Class 3R laser product.

Always ensure system power is off while mounting and aligning the Optical Guide. Do **NOT** turn on system power until:

- the Optical Guide has been properly mounted,
- the Optical Guide has been properly aligned to point towards the scan surface, and
- ensuring the laser beam will not be obstructed or contact any reflective surfaces

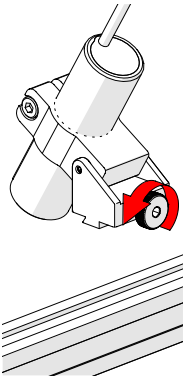


Fig. 15 - Loosen knob

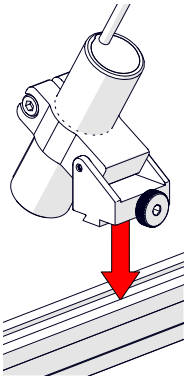


Fig. 16 - Mount to frame bar

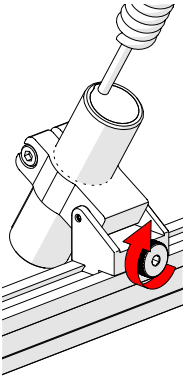


Fig. 17 - Tighten knob

1. Ensure power to the crawler is shut off *(see crawler user manual for details)*
2. Loosen the optical guide knob *(Fig. 15)*.
3. Mount the optical guide to the frame bar *(Fig. 16)*.
4. Tighten the optical guide knob *(Fig. 17)*.

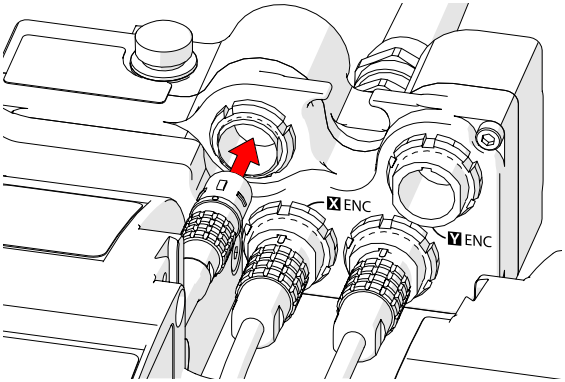


Fig. 18 - Plug-in the optical guide connector into the umbilical

5. Plug the connector of the optical guide into the 4-pin expansion connector *(Fig. 18)* on the umbilical.
6. Do not activate the Optical Guide until the following alignment procedure is complete *(see "Optical Guide Alignment" on page 19)*.

5.4. Optical Guide Alignment

CAUTION! EYE INJURY DUE TO LASER RADIATION. Class 3R laser product.

Always ensure system power is off while mounting and aligning the Optical Guide. Do **NOT** turn on system power until:

- the Optical Guide has been properly mounted,
- the Optical Guide has been properly aligned to point towards the scan surface, and
- ensuring the laser beam will not be obstructed or contact any reflective surfaces

For best results, the Optical Guide should be centred over the weld.

5.4.1. Vertical Adjustment

1. Adjust the optical guide's friction pivot to direct the laser beam as required *(Fig. 19)*.

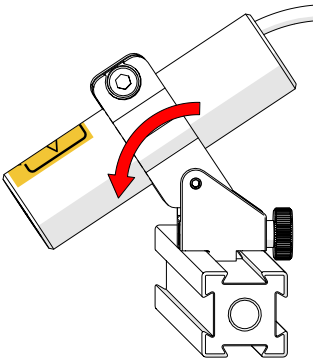


Fig. 19 - Mount on frame bar

5.4.2. Horizontal Adjustment

1. Loosen the optical guide knob to adjust the side-to-side position as required.

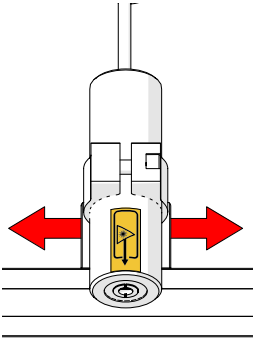


Fig. 20 - Horizontal adjustment

5.4.3. Optical Guide Barrel Adjustment

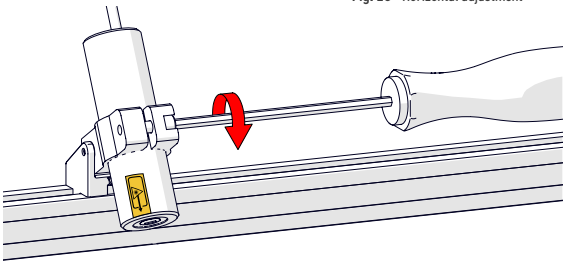


Fig. 21 - Loosen Optical Guide screw

1. Loosen the Optical Guide clamp screw *(Fig. 21)*.

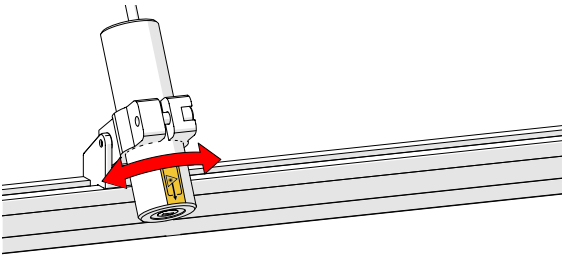


Fig. 22 - Loosen Optical Guide screw

2. Rotate the barrel of the Optical Guide to achieve the desired laser beam angle *(Fig. 22)*.
3. Retighten the Optical Guide clamp screw when the laser beam is angled as required.

OPERATION

CAUTION! EYE INJURY DUE TO LASER RADIATION. Class 3R laser product.

Do **NOT** turn on system power until:

- the Optical Guide has been properly mounted,
- the Optical Guide has been properly aligned to point towards the scan surface, and
- ensuring the laser beam will not be obstructed or contact any reflective surfaces.

Refer to the crawler user manual for preparation for the use and operation of the crawler. Powering up the crawler with the Optical Guide connected will activate the Optical Guide laser.

MAINTENANCE

7.1. Cleaning

CAUTION! EYE INJURY DUE TO LASER RADIATION. Class 3R laser product.

Turn off system power before performing maintenance on the Optical Guide.

General cleaning of components is important to keep your system working well. All components that have no wiring or cables are waterproof. All components can be washed with warm water, dish soap and a medium bristle brush.

Before using the scanner, ensure all connectors are free of water and moisture.

Inspect cables/connectors daily and as required, depending on the occurrence of damaging events.

NOTE: *All components with wiring, cables or electrical connections are splashproof. However, these components are* ***NOT*** *submersible.*

NOTE: *Never use strong solvents or abrasive materials to clean your scanner components.*

TROUBLESHOOTING

CAUTION! EYE INJURY DUE TO LASER RADIATION. Class 3R laser product.

If removal of the Optical Guide from the crawler is required for troubleshooting, turn off system power before removing the Optical Guide.

Problem	Possible Cause	Solution
Laser line is angled or skewed.	Improper alignment of the optical guide.	Loosen the Optical Guide screw and position the Optical Guide as required *(see "Optical Guide Alignment" on page 19).*

SERVICE AND REPAIR

CAUTION! EYE INJURY DUE TO LASER RADIATION. Class 3R laser product.

Do **NOT** open or dismantle the Optical Guide. Class 3B laser radiation is possible if dismantled which can cause immediate and serious eye damage..

WARNING! DO NOT DISASSEMBLE. No user-serviceable parts. Disassembling any of the components in this product, beyond the instructions in this user manual, could void the regulatory certifications and/or effect the safety of the product.

There are no user-serviceable components inside the Optical Guide. Do NOT open the housing or attempt any repairs. For issues with the Optical Guide, first, consult “Troubleshooting” *(see “Troubleshooting” on page 24)* and then “Technical Support” *(see “Technical Support” on page 25)*.

9.1. Technical Support

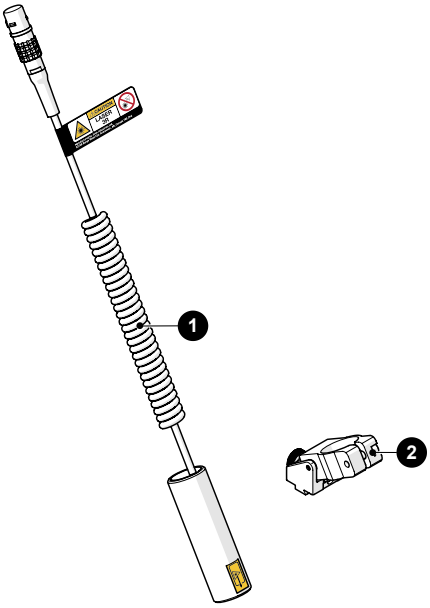
For technical support, contact Jireh Industries *(see “Jireh Industries Ltd.” on page 1)*

SPARE PARTS

To order accessories or replacement parts for the Optical Guide *(contact Jireh Industries Ltd. on page 1)*.

> ***NOTE:*** *These drawings are for parts order. This is not a list of kit contents.*

10.1. Optical Guide



BOM ID	Part #	Description
1	CXS119	Optical Guide
2	CXS082	Optical Guide Clamp

Fig. 23 - Optical Guide Spare Parts

DISPOSAL

WEEE Directive

In accordance with European Directive on Waste Electrical and Electronic Equipment (WEEE), this symbol indicated that the product must not be disposed of as unsorted municipal waste, but should be collected separately. Refer to Jireh Industries for return and/or collection systems available in your country.

LIMITED WARRANTY

WARRANTY COVERAGE

Jireh Industries warranty obligations are limited to the terms set forth below: Jireh Industries Ltd. (“Jireh”) warrants this hardware product against defects in materials and workmanship for a period of THREE (3) YEARS from the original date of purchase. If a defect exists, at its option Jireh will (1) repair the product at no charge, using new or refurbished replacement parts, (2) exchange the product with a product that is new or which has been manufactured from new or serviceable used parts and is at least functionally equivalent to the original product, or (3) refund the purchase price of the product. A replacement product/part assumes the remaining warranty of the original product or ninety (90) days from the date of replacement or repair, whichever provides longer coverage for you. When a product or part is exchanged, any replacement item becomes your property and the replaced item becomes Jireh’s property. When a refund is given, your product becomes Jireh’s property.

OBTAINING WARRANTY SERVICE

To utilize Jireh’s warranty service you must ship the product, at your expense, to and from Jireh Industries. Before you deliver your product for warranty service you must phone Jireh and obtain an RMA number. This number will be used to process and track your product. Jireh is not responsible for any damage incurred during transit.

EXCLUSIONS AND LIMITATIONS

This Limited Warranty applies only to hardware products manufactured by or for Jireh Industries. This warranty does not apply: (a) to damage caused by accident, abuse, misuse, misapplication, or non-Jireh products; (b) to damage caused by service (including upgrades and expansions) performed by anyone who is not a Jireh Authorized Service Provider; (c) to a product or a part that has been modified without the written permission of Jireh.

Jireh Industries Ltd.
53158 Range Road 224
Ardrossan AB T8E 2K4
Canada

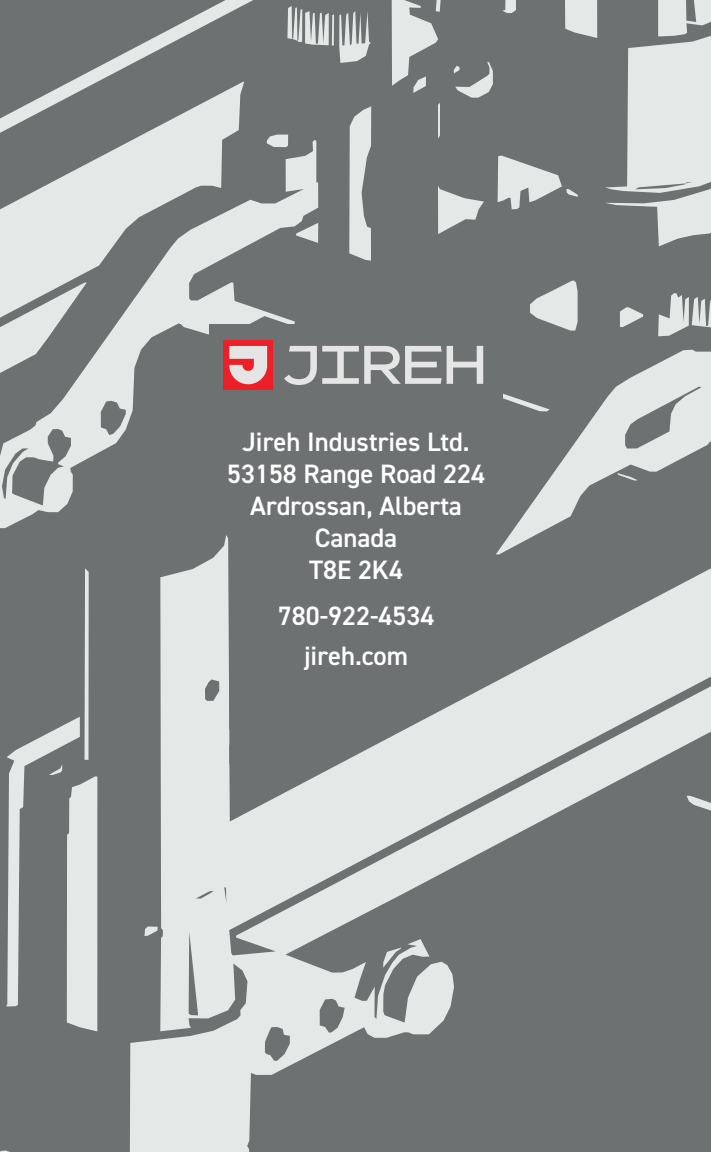
Phone: 780-922-4534

jireh.com

All brands are trademarks or registered trademarks of their respective owners and third-party entities.

Changes or modifications to this unit or accessories not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

All specifications are subject to change without notice.



Jireh Industries Ltd.
53158 Range Road 224
Ardrossan, Alberta
Canada
T8E 2K4

780-922-4534

jireh.com