



**TRACKER**

DR0038 Rev 01.8

Automated Laser Guidance

# SAFETY WARNINGS / PRECAUTIONS

## **KEEP THIS MANUAL – DO NOT LOSE**

THIS MANUAL IS PART OF THE TRACKER SYSTEM 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 Tracker is designed for a specific use. Using the Tracker 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 Tracker. Permanent damage to electronics could occur.



## 1. Tracker Safety Precautions

The Tracker uses a class 3R laser which, although considered safe when handled safely and with restricted beam viewing, is potentially dangerous. Read, understand, and heed all safety warnings in this manual prior to use.



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



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

Turn off system power before mounting the shroud to the Tracker. Do **NOT** attempt to mount the shroud while the laser is active.

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

Do **NOT** disassemble the Tracker. No user-servicable parts. Class 3B laser radiation is possible when disassembled which can cause immediate and serious eye damage. Disassembly of the Tracker could void regulatory certifications and/or effect the safety of the product.

### a. Tracker Safety Label Locations

Do not remove any warning labels from the tracker. Contact the manufacturer for replacement labels when labels are damaged or unreadable.

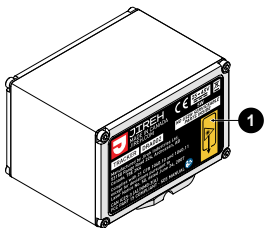


Fig. 1 - Laser safety label locations

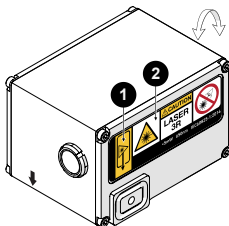


Fig. 2 - Laser safety label locations

- ▶ Laser aperture label (Fig. 1-1) (Fig. 2-1) indicates laser projection location and direction.



Fig. 3 - Laser aperture label

- ▶ Laser Radiation Label (Fig. 2-2) advises the user of the class 3R laser caution of the product.



Fig. 4 - Laser radiation label

## b. Tracker Projection

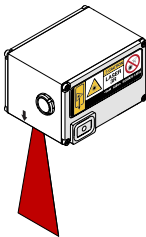


Fig. 5 - Projection

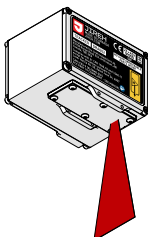


Fig. 6 - Projection

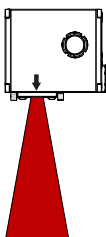


Fig. 7 - Projection

## c. Laser Classification

- ▶ A Class 3R laser is considered safe if handled safely and 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 30 for additional details).*

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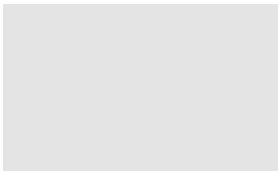
# IDENTIFICATION

## 1.1. Product Brand

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

## 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.

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

### 1.3.3. European Union CE Declarations

Jireh Industries hereby declares that the Tracker 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 Tracker 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. Tracker Specifications

### 2.1.1. Intended Use

The weld TRACKER is to be used in conjunction with the NAVIC crawler. The TRACKER uses a laser to measure the profile of a feature to be tracked, which is most commonly the cap of a weld. This data allows the NAVIC crawler to automatically steer and follow the feature when driving forward.

#### 2.1.1.1 Operating Limits

The TRACKER is intended to:

- ▶ be used only when mounted on a frame bar that is mounted to the front of a NAVIC crawler
- ▶ be activated only when mounted on a frame bar that is mounted to the front of a NAVIC crawler
- ▶ track a feature when driving in the forward direction
- ▶ track a conventional butt joint weld cap with a width no larger than 25 mm (*1 in*), or a similar feature

### 2.1.1.1.1 Working Area

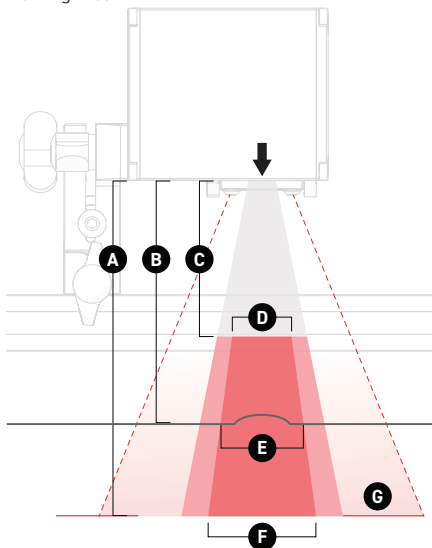


Fig. 8 - Working area

<b>A</b>	Maximum working distance.	112 mm (4.4 in)
<b>B</b>	Nominal height ( <i>Inspection surface</i> ).	78.9 mm (3.1 in)
<b>C</b>	Minimum working distance.	52 mm (2 in)
<b>D</b>	Maximum weld width at the minimum working distance.	20 mm (0.8 in)
<b>E</b>	Maximum weld width at the standard mounting height.	25 mm (1 in)
<b>F</b>	Maximum weld width at the maximum working distance.	36 mm (1.4 in)
<b>G</b>	The visible laser line is much wider than the actual working width.	

### 2.1.1.2 Operating Environment

The TRACKER is designed for use in an industrial environment that is:

- ▶ between  $-20^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$ ) and  $50^{\circ}\text{C}$  ( $122^{\circ}\text{F}$ )
- ▶ free of mirrors and reflective surfaces

### 2.1.1.3 User

The TRACKER is intended to be used by:

- ▶ personnel who have read and understand the user manual
- ▶ 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 TRACKER 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

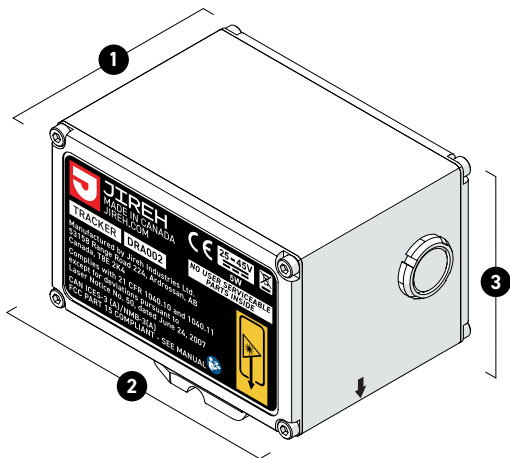


Fig. 9 - Tracker dimensions

1:	Width:	7 cm	2.8 in
2:	Depth:	9.4 cm	3.7 in
3:	Height:	6.5 cm	2.6 in
4:	Tracker weight:	0.45 kg	1 lb

### 2.1.4. Power Requirements

Input Voltage:	25-45 VDC
Input Power:	5 W

### 2.1.5. Environmental Sealing

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



## 2.1.6. Performance Specifications

Beam Divergence	20°
Laser Wavelength	650nm
Laser Output Power	<5mw
Laser Class	IIIa/3R

## 2.2. Parent Products

The Tracker 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 Tracker 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 Tracker with the NAVIC modifies the NAVIC specifications shown below:

#### 2.2.1.1 Operating Limits

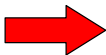
Category	Parameter	Specification
Inspection Surface	Minimum OD, external circumferential driving	610 mm (24 in)
	Required radial clearance	> 150 mm (6 in)

## DEFINITIONS

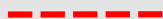
### 3.1. Definition of Symbols



Instructions to 'look here' or to 'see this part'.



Denotes movement. Instructing users 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 Tracker contains the following components:

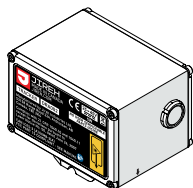


Fig. 10 - Tracker  
DRA002

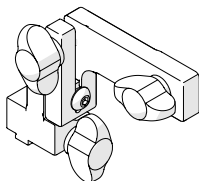


Fig. 11 - Tracker Mounting Bracket  
DRS001

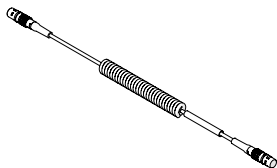


Fig. 12 - Tracker Cable  
UMA042

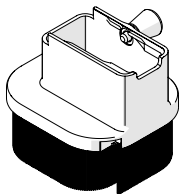


Fig. 13 - Shroud  
DRS004

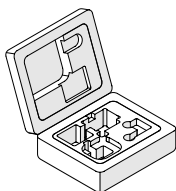


Fig. 14 - Tracker Case  
DRA003

## 4.2. Base System Components

### 4.2.1. Tracker

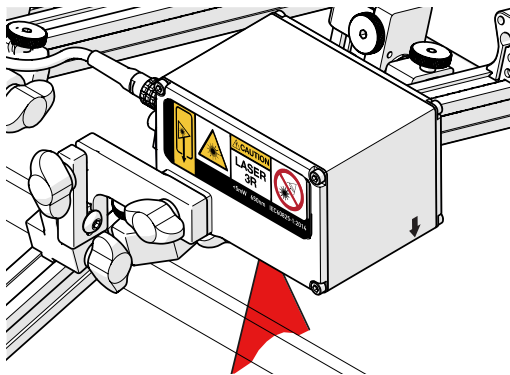


Fig. 15 - The Tracker

The Tracker contains the laser required for detecting the weld cap or similar feature to be tracked. The Tracker system uses the information from the laser to automatically steer the NAVIC along the feature.

### 4.2.2. Tracker Mounting Bracket

The Tracker Mounting Bracket attaches the unit to a frame bar and provides alignment adjustment.

### 4.2.3. Tracker Cable

The Tracker Cable connects the Tracker to the NAVIC umbilical.

### 4.2.4. Shroud

Circumstances may arise when the Tracker has difficulty operating effectively under direct/bright sunlight. Should this occur, the shroud may be installed to shade the laser.

### 4.2.5. Tracker Case

The product includes a fitted case for all the components of this system.

## PREPARATION FOR USE

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. Configurations

#### 5.1.1. NAVIC with Frame Bar

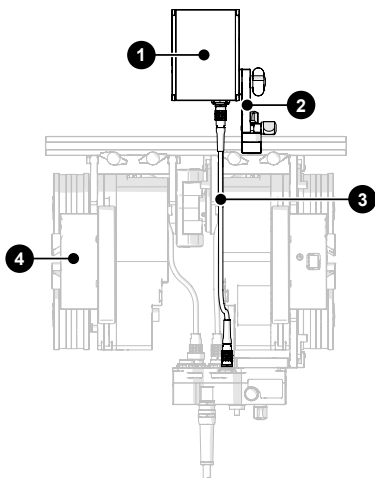


Fig. 16 - Tracker mounted to a frame bar

BOM ID	Description
1	Tracker
2	Tracker Mounting Bracket
3	Tracker Cable
4	NAVIC System

## 5.1.2. NAVIC with Vertical Probe Holder Frame

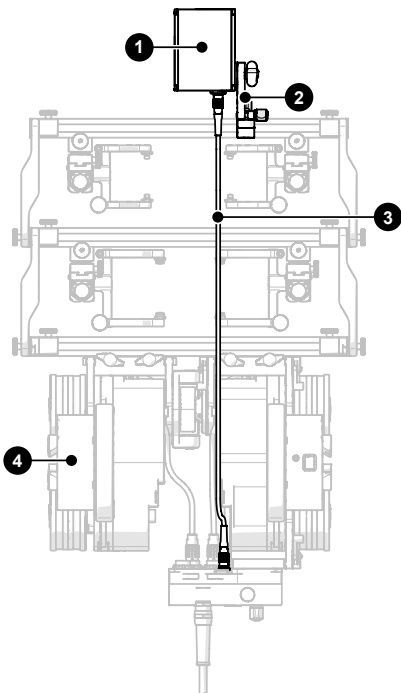


Fig. 17 - Tracker mounted to a vertical probe holder frame

BOM ID	Description
1	Tracker
2	Tracker Mounting Bracket
3	Tracker Cable
4	NAVIC System



### 5.1.3. NAVIC with Low Profile Probe Holder Frame

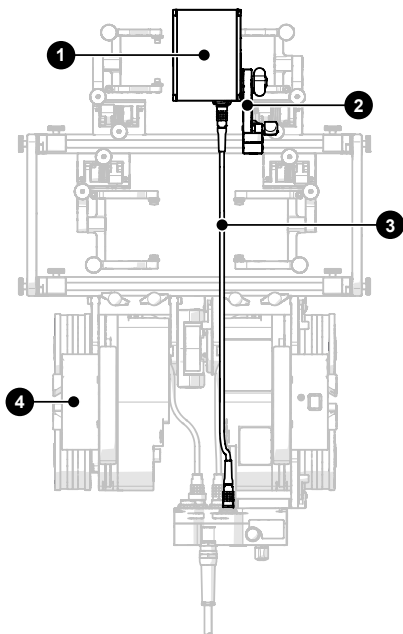


Fig. 18 - Tracker mounted to a low profile probe holder frame

BOM ID	Description
1	Tracker
2	Tracker Mounting Bracket
3	Tracker Cable
4	NAVIC System

#### 5.1.4. NAVIC with Pivoting Probe Holder Frame

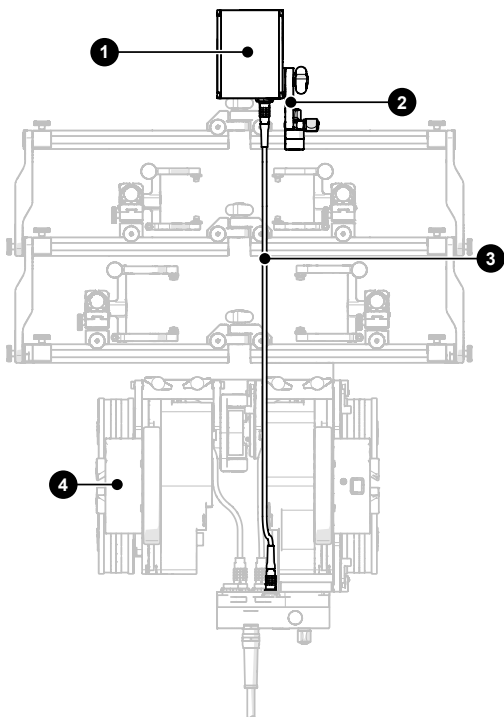


Fig. 19 - Tracker mounted to a pivoting probe holder frame

BOM ID	Description
1	Tracker
2	Tracker Mounting Bracket
3	Tracker Cable
4	NAVIC System

## 5.2. Tracker Installation



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



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

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

1. Ensure power to the NAVIC system is shut off (see *NAVIC user manual for details*).
2. Loosen the bar clamp knob of the Tracker mounting bracket **1** (Fig. 20).
3. Place the Tracker mounting bracket's dovetail jaw in the frame bar **2** (Fig. 20).
4. Tighten the bar clamp knob (Fig. 21).

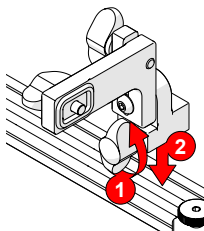


Fig. 20 - Mount to frame bar

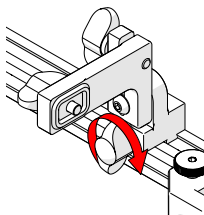


Fig. 21 - Tighten bar clamp knob

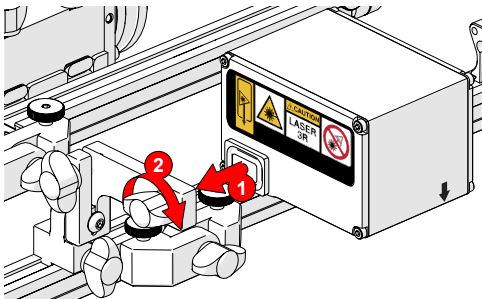


Fig. 22 - Attach the tracker module to the tracker mounting bracket

5. Align the indent feature of the Tracker module **1** (Fig. 22) with the Tracker mounting knob **2** (Fig. 22), and tighten the Tracker mounting knob.

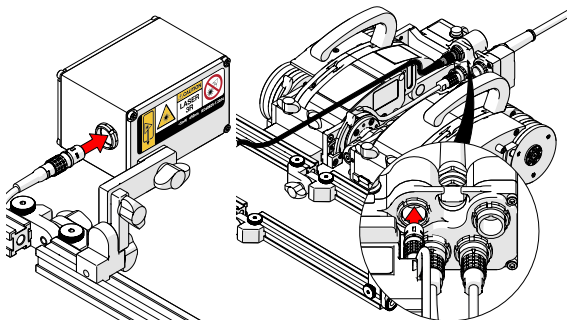


Fig. 23 - Plug tracker cable into the tracker

Fig. 24 - Plug tracker cable into the 4-pin expansion connector of the umbilical

6. Plug the tracker cable into the Tracker (Fig. 23).
7. Route the tracker cable to the umbilical. Plug the tracker cable into the 4-pin expansion connector of the umbilical (Fig. 24).
8. Do not activate the Tracker until the following alignment procedure is complete (see "Tracker Alignment" on page 20).

### 5.3. Tracker Alignment



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



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

- the Tracker has been properly mounted,
- the Tracker 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 laser should be centred over the weld. Utilize the engraved alignment arrows on the Tracker housing to accomplish this by following these steps:

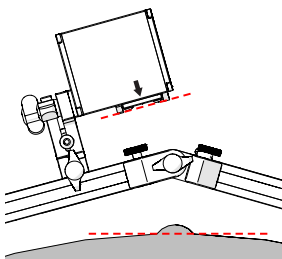


Fig. 25 - Incorrect alignment with the scan surface

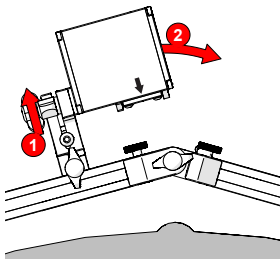


Fig. 26 - Loosen the tracker pivot knob to pivot the tracker

1. Ensure power to the **NAVIC** system is shut off (see *NAVIC user manual* for details).
2. Loosen the Tracker pivot knob **1** (Fig. 26) to pivot the Tracker module **2** (Fig. 26).
3. Align the bottom of the Tracker parallel

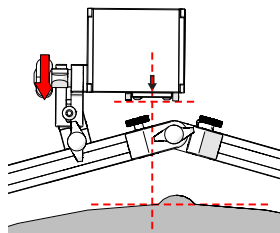


Fig. 27 - Tighten tracker pivot knob to align tracker

with the weld surface and tighten the Tracker pivot knob (Fig. 27).

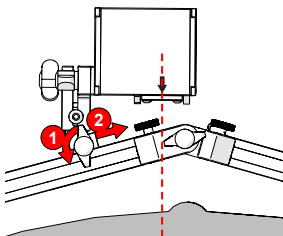


Fig. 28 - Loosen bar clamp knob to position tracker

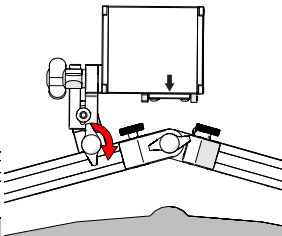


Fig. 29 - Tighten bar clamp knob when alignment is achieved

4. Slightly loosen the black wing knob of the mounting bracket **1** (Fig. 28). Slide the Tracker along the frame bar **2** (Fig. 28) to align the laser with the centre of the weld to be tracked. Use the arrow on the housing of the Tracker to assist with alignment.
5. When the Tracker is aligned with the centre of the weld, tighten the black wing knob (Fig. 29).

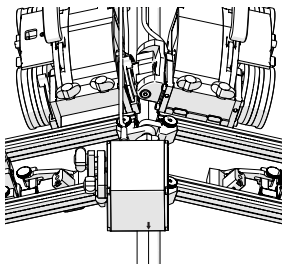


Fig. 30 - Properly aligned laser to the weld

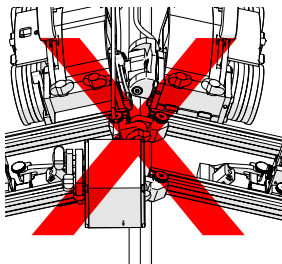


Fig. 31 - Improperly aligned laser to the weld

## 5.4. Shroud Installation/Removal



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



Turn off system power before mounting the shroud to the Tracker. Do **NOT** attempt to mount the shroud while the laser is active.

Circumstances may arise when the Tracker has difficulty operating effectively under direct/bright sunlight. Should this occur, the shroud may be installed to shade the laser.

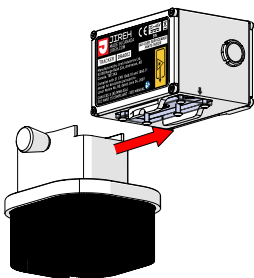


Fig. 32 - Press onto the tracker module

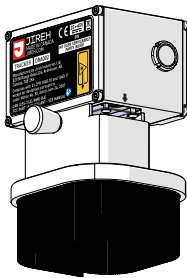


Fig. 33 - Attach to tracker module with screws

1. Ensure power to the NAVIC system is shut off (see *NAVIC user manual for details*).
2. Align the shroud with the Tracker module ensuring the grooves of the shroud and Tracker line up properly (Fig. 32). Press the shroud onto the Tracker (Fig. 33).
3. To remove the shroud, pull the pin and slide the shroud from the Tracker (Fig. 34).

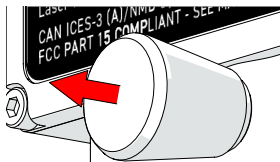


Fig. 34 - Pull out and twist pins

## OPERATION



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



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

- the Tracker has been properly mounted,
- the Tracker 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 **NAVIC** user manual for preparation for the use and operation of the **NAVIC**. Powering up the **NAVIC** system with the Tracker connected will activate the Tracker laser and the Tracker screens described below.

## 6.1. Tracker Screen

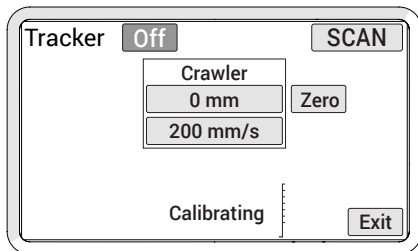


Fig. 35 - Tracker calibration screen

The **Tracker** screen will first display an **Initializing** screen during power-up before entering calibration mode. Calibrating will appear anytime an adjustment of the optical sensor is performed. When the Tracker cannot register a surface, the sensor is blocked, or excess ambient light interferes, the Tracker will not complete calibration.

Ensure the Tracker is a reasonable distance from a scan surface during calibration.

Clean the sensor's protective glass with a microfiber cloth if calibration continues to fail.



When excess ambient light (*direct sunlight*) may be disrupting the calibration process, mount the shroud to the Tracker (see “*Shroud Installation/Removal*” on page 22 for additional details).

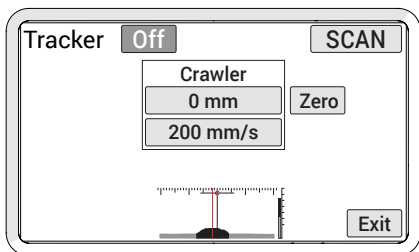


Fig. 36 - Tracker screen

**On/Off Button:** (Fig. 36) Activate or turn off the tracking function. When the button is greyed out, this indicates a weld has not been detected and tracking is unavailable.

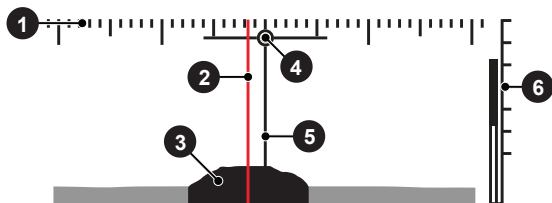


Fig. 37 - Tracker indication display

**Scale:** **1** (Fig. 37) Dynamic scale displays metric millimetre increments or 1/16th inch increments to change the measurement units on the system (see *NAVIC user manual for details*).

**Weld Centre:** **2** (Fig. 37) Indicates the centre of the weld.

**Weld Profile:** **3** (Fig. 37) Represents the size and shape of the weld.

**Positioning Sight:** **4** (Fig. 37) Indicates if the weld is adequately centred for tracking.

**Tracker Centre:** **5** (Fig. 37) This line is located at the centre of the display.

**Signal Strength:** **6** (Fig. 37) The bottom indicator (*tick*) of the graph represents the cut-off when the signal strength is no longer viable. Should signal strength drop below the lowest indicator of the graph, ensure the sensor's protective glass is clean (*using a microfiber cloth*) and/or install the shroud onto the Tracker to eliminate excess ambient light (see "*Shroud Installation/Removal*" on page 22).

Should the Tracker lose the profile of the weld, the crawler will immediately stop all motion and display the **Weld Lost** screen.

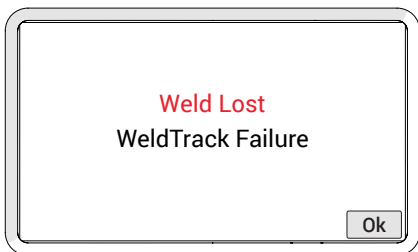


Fig. 38 - Weld lost screen

Press **OK** to return to the **Tracker** screen.

# MAINTENANCE

## 7.1. Cleaning



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



Turn off system power before performing maintenance on the Tracker.

General cleaning of components is important to keep your system working well. All components that have no wiring or cables are waterproof. The Tracker lens has a special coating and should only be wiped gently with a lens cleaning cloth or tissue. Other than the lens, 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 Tracker from the **NAVIC** system is required for troubleshooting, turn off system power before removing the Tracker.

Problem	Possible Cause	Solution
1. Glass shield on the Tracker is damaged.	Improper handling of the Tracker.	Return to manufacturer for repair. Do not activate Tracker, and do not attempt to repair it. (see <i>“Jireh Industries Ltd.” on page 1</i> ).
2. Tracker is not responding as expected.	Calibration required.	Press and hold on the weld diagram on the handheld controller to activate the calibration of the Tracker.
3. Weld not detected.	Incorrect alignment with the scan surface.	Ensure the Tracker is aligned correctly (see <i>“Tracker Alignment” on page 20</i> ).

# SERVICE AND REPAIR



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



Do **NOT** disassemble the Tracker. No user-serviceable parts. Class 3B laser radiation is possible when disassembled which can cause immediate and serious eye damage. Disassembly of the Tracker could void regulatory certifications and/or effect the safety of the product



**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.

For issues with your Tracker, first, consult “Troubleshooting” (see “*Troubleshooting*” on page 27) and then “Technical Support” (see “*Technical Support*” on page 28).

## 9.1. Technical Support

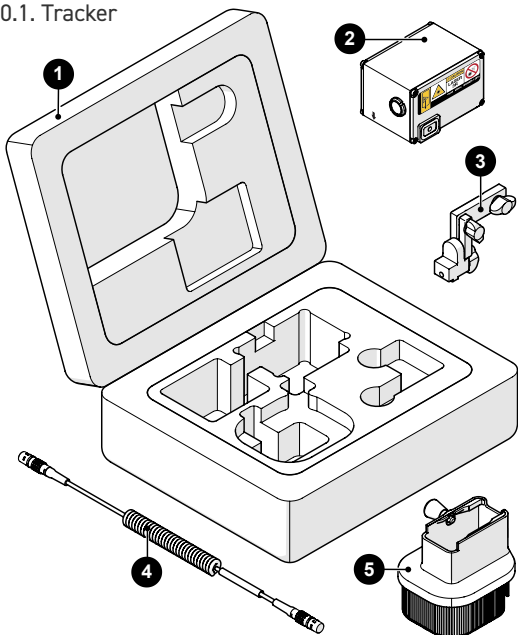
For technical support, contact Jireh Industries (see “*Jireh Industries Ltd.*” on page 1)

## SPARE PARTS

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

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

## 10.1. Tracker



BOM ID	Part #	Description
1	DRA003	Tracker Case
2	DRA002	Tracker Module
3	DRS001	Tracker Mounting Bracket
4	UMA042	Tracker Cable
5	DRS004	Shroud

Fig. 39 - Tracker

# DISPOSAL

### WEEE Directive

In accordance with European Directive on Waste Electrical and Electronic Equipment (WEEE), this symbol indicates 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.

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All specifications are subject to change without notice.

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