Getting Started with

ICON DIAGNOSTICS

User Manual

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User Manual

About This Manual

This manual has been prepared to assist you in the operation and maintenance of your Eddyfi Technologies' Inuktun equipment. Correct and prudent operation rests with the operator who must thoroughly understand the operation, maintenance, service and job requirements. The specifications and information in this manual are current at the time of printing.

This product is continually being updated and improved. Therefore, this manual is meant to explain and define the functionality of the product. Furthermore, schematics or pictorials and detailed functionality may differ slightly from what is described in this manual.

Eddyfi Technologies reserves the right to change and/or amend these specifications at any time without notice. Customers will be notified of any changes to their equipment.

Information in this manual does not necessarily replace specific regulations, codes, standards, or requirements of others such as government regulations.

Description

ICON Diagnostics – This software is created to provide device debugging and tuning capability for Inuktun Crawlers and camera systems using a computer.

System Requirements

Minimum System Requirements

Processor	Details
Graphics	Intel HD 4000 or greater with Intel QuickSync enabled
Ram	8Gb
Hard Drive	30Gb
Operating System	Windows™ 10
Screen Resolution	1600 x 900 minimum

Note: ICON Diagnostics shares the same architecture and prerequisites as ICON, as a result the file size is large.

Precautions

The following video capture devices are supported by ICON™ Diagnostics:

- Black Magic
- Epiphan AV.io SDI
- Magewell USB Capture Plus frame grabber family

Note: Ensure that the requirements specified by the frame grabber manufacturer meet the system requirements.

Supported Inuktun Products

The ICON™ Suite of applications has been developed to support Inuktun devices and inspection systems including:

- Microtrac™ 4000 Micro-controlled tracks
- Minitrac™ 7000 and 8000 Micro-controlled tracks
- Spectrum™ 45 / 60/ 90 / 120 Cameras
- Inuktun Lights, Manipulators and Actuators
- VT100 MKII Inspection Systems
- VT150 MKII Inspection Systems
- MAGG-UT / MAGG-HD Inspection Systems

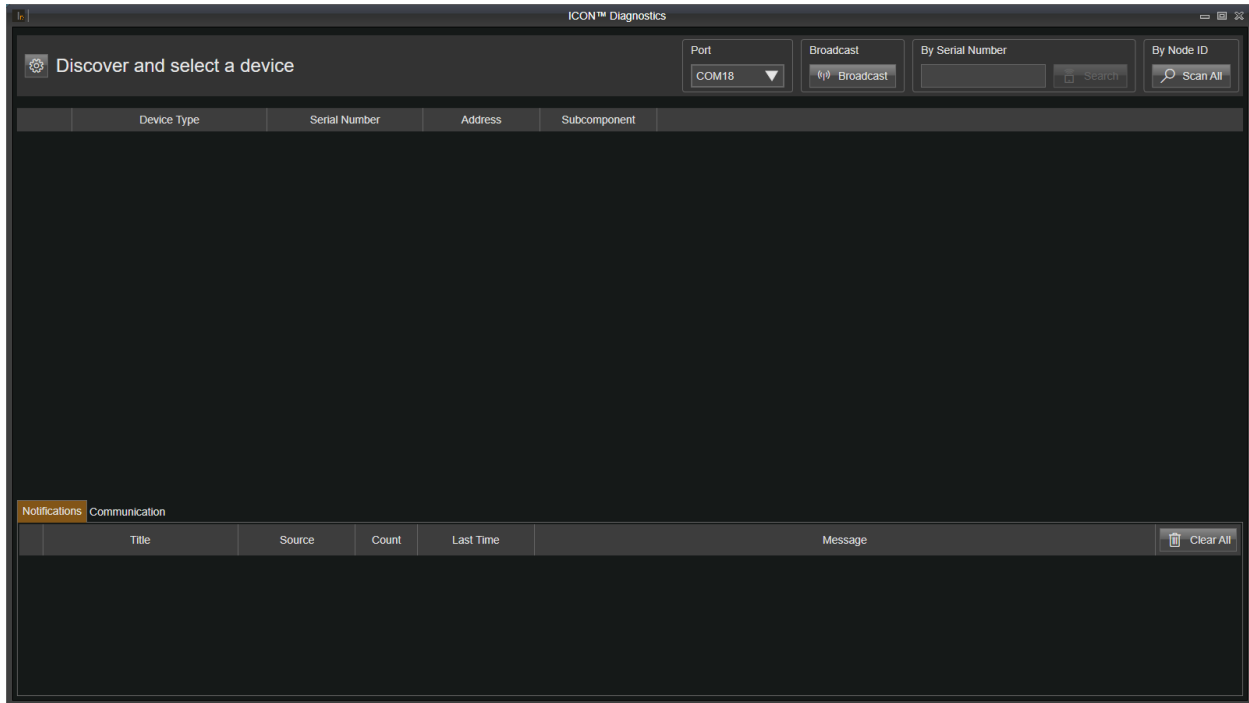## Getting Started

ICON Diagnostics Interface Overview

FIGURE 1

On startup, ICON Diagnostics will display an operation screen which is divided in to 3 sections:

Operations Screen Element	Function
Control Ribbon	Contains all device connection related tools, including discovery method and COM Port.
Device Panel	Displays all the devices detected on the chosen communication channel.
Notification Panel	Displays all the error notifications happened most recently, it provides users the information which can help them diagnose the communication malfunctions and device failures.

Device Panel Overview

The Device Panel is divided into five columns, and these elements are illustrated below in the table.

Device Panel Element	Function
Device Icon	ICON Device categorizes the devices it has detected and assigns an icon to each device as a symbol. Note: The icon does not have to conform with the real device.
Device Type	This column will display the device type of the target device. Note: ICON Device may judge the device type incorrectly, if you think the device is marked wrongly, the type can be manually changed.
Serial Number	This column displays the serial number of the device if available
Function Buttons	There are two buttons in this column, 'Identify' and 'Connect'. 'Identify' button triggers the identify action of the device. 'Connect' button initiates the connection between ICON Device and the device.

Detecting your Devices

Once you have started ICON Diagnostics, you may select one of the Communication Ports from the combo box and discover your devices by 3 different methods:

Scan by Node ID

This option scans every Node ID, discovering devices by this method will fetch all devices on the communication channel automatically. However, as a result it is slower (around 10 seconds to scan).

Broadcast

This option pings the communication channel for a device, getting a reply and discovering the device on the channel. However, this feature only functions if a single device is connected. This option will not work on Cameras.

Discover by Serial Number

This option lets you discover a device on the communication channel very quickly. However, you need to know the serial number.

Note: If you have multiple devices with the same Node ID on the same channel, it will cause communication conflicts, and make one or more devices undetectable. To resolve this, discover the devices by serial number.

Note: If nothing appears when discovering devices, try changing Communication Ports.

Identifying your Devices

The 'Identify' function helps you recognize which device you are currently communicating with, especially when you have identical devices on the same crawler. Click the 'Identify' button on the side of the device to trigger an identify action.
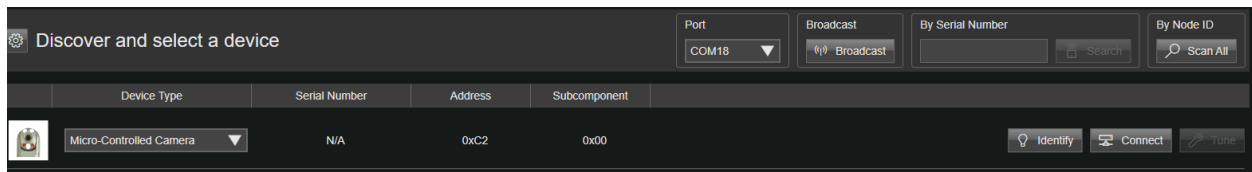

FIGURE 2 AN EXAMPLE OF IDENTIFYING YOUR DEVICE

For a camera or an auxiliary light, the reaction you expect to see will be the twinkling of the LEDs. For a track or an actuator, you should see the device moving back and forth once. For a manipulator, you should see the manipulator opening and closing once.

If you think your device is identified wrongly, you can choose the appropriate 'Device Type' from the combo box. If a wrong device type is assigned to the device, it will not respond to the 'Identify' command.

Device Serial Numbers

Each device is programmed with a serial number from the factory. This serial number must be system unique or the system will not work. If a duplicate serial number is found, the serial number can be changed using ICON™ Diagnostics.

Entering a device serial number, is as follows:

1.   Open Devices.
2.   Select the device from the list of System Devices.
3.   Click **Edit**.
4.   Enter the Device Serial Number in the space provided. Note: serial numbers are case sensitive.
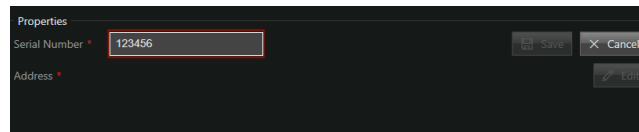5.   Click **Save**.

FIGURE 3: MODIFYING YOUR SERIAL NUMBER

Note: If you change your serial number through ICON Diagnostics, be sure to keep track of the factory serial number.

Connecting to a Device

Clicking the 'Connect' button brings you to the Control Interface for the selected device. The Control Interface contains tools to test the functionalities of the connected device and to read the feedback parameters from it. This information can assist with debugging devices.

Cameras

When connecting to a camera, the interface is divided into the four major parts: 'Camera Controls and Configurations' region, 'Parameter Readings' region, 'Video Output' region and the 'Notification Panel'
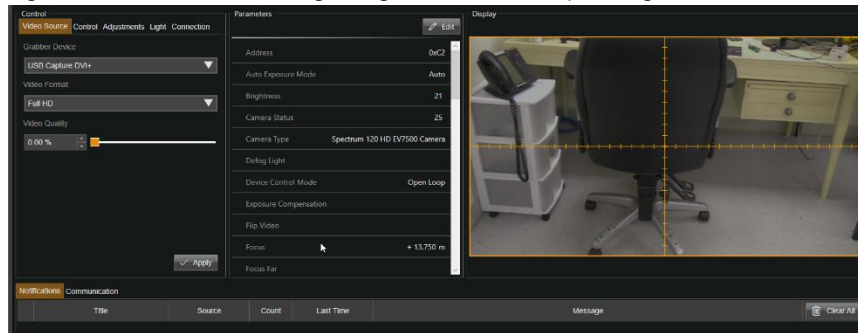

FIGURE 4: DEBUGGING INTERFACE FOR CAMERA DEVICES

Configuring Video Sources

Click the 'Video Source' tab to switch to the page for grabber configuration.

Configuring a Black Magic Grabber

To configure a Black Magic Grabber, do the following:

1. Select 'Black Magic Designer Grabber' from the 'Grabber Type' drop down menu.
2. Set 'Grabber Device' as 'Intensity Pro'.
3. Configuring the grabber properly requires adjustments to 'Input Line' and 'Video Format'. Please check the 'BlackMagic Grabber Setting Table' to learn the feasible 'Input Line' and 'Video Format' combinations. Select the 'Input Line' according to the table first and then select its belonging 'Video Format'.

	Input Line	Video Format
NTSC	Composite	NTSC
PAL	Composite	PAL
1080i59.94	Component/Composite	1080i59.94

1080i50	Component/Composite	1080i50
1080p30	Component/Composite	1080p30
1080p25	Component/Composite	1080p25

TABLE 1: BLACKMAGIC GRABBER SETTINGS

Configuring a Magewell Grabber

To configure the Magewell Video grabber do the following:

1.　　　Select 'USB Capture DVI+' from the Grabber Device drop-down menu.

2.　　　Select appropriate video format from the Grabber Device drop-down menu (Full HD, HD or SD).

3.　　　Click 'Apply' to make configuration take effect.

Configuring an Epiphan AV.IO Grabber

The Epiphan AV.io video capture device is used in high definition video interface boxes.

To configure the Epiphan AV.io do the following:

1.　　　Select 'Epiphan AV.io' from the Grabber Type drop-down menu.

2.　　　Select 'AV.io SDI Video' from the Grabber Device drop-down menu.

3.　　　Select 'HD1080-60P YUY2 1920x1080 @60.00P 16:9' from the 'Video Format' list.

4.　　　Click 'Apply' to make configuration take effect.

Controls

Click the 'Control' tab to switch to page for the camera controls. The controls you have on that panel should conform to the functionalities of your camera.

Zoom Controls

To zoom, click and hold the slider and move to the desired direction. The further you move the slider away from center, the faster the camera will zoom. To stop zooming, release the slider. Click 🔍 and 🔍 to zoom to the maximum and minimum.
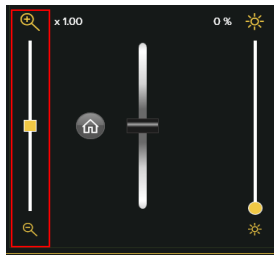

FIGURE 5: CAMERA CONTROL-ZOOM CONTROL

Motion Controls

On Spectrum™ cameras, the attitude of the camera can be adjusted with panning and tilting. Hold the virtual joystick to the upper direction to tilt up, hold it to the down direction to tilt down, hold it to the left direction to pan left, hold it to the left direction to pan right. For cameras with only tilting, the virtual joystick may look different, see Figure 5 for reference.
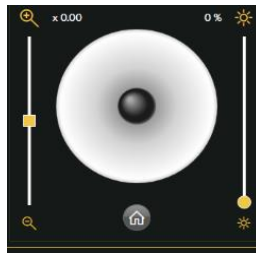

FIGURE 6: CAMERA CONTROL-VIRTUAL JOYSTICK

To go to the camera's home position, click the 'Home' 🏠 button that locates under the virtual joystick.

Adjusting Light Brightness

To adjust the brightness of the enabled light, adjust the intensity bar located to the right of the camera control. Slide the intensity bar until you reach the desired illumination.
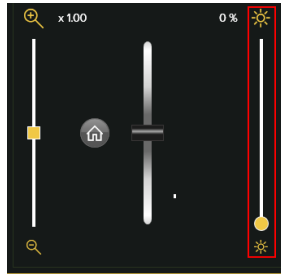

FIGURE 7: CONTROL PANEL- LIGHT INTENSITY CONTROL

You can also click any position on the slider bar to reach an intensity level directly. Click the top or the bottom to reach maximum or minimum.

Camera Adjustments

Please click the 'Adjustments' tab to switch to the page for camera's recording status adjustments.

FIGURE 8: CAMERA ADJUSTMENTS PANEL

Focus Control

By default, camera is set in 'Auto' focus mode, which means the camera should focus automatically when you zoom. Click 'Manual' button to test the manual focus mode. This will enable the Manual Focus Controls as shown below. Click and hold either the '+' icon or '-' icon to manually change the focus. Release the button to stop re-focusing.
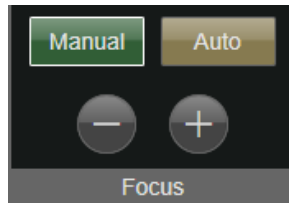

FIGURE 9: MANUAL FOCUS ENABLED

The auto focus sensitivity is deliberately set to low. When switching from manual focus to auto focus, the camera may not immediately auto focus. In this case, zoom in or out a little to trigger the camera's auto focus. Click 'High' to test a more aggressive auto focus.

Defog and Stabilization Control

By default, both 'Defog' and 'Stabilization' are set to off. To apply defog effect to camera recording, click the 'Defog' toggle to turn on this function. To enable Imager Stabilizer, click the 'Stabilization' toggle. The Imager Stabilizer can prevent the camera from losing focus, when the camera is being shaken.
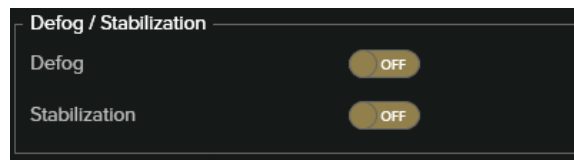

FIGURE 10: DEFOG/STABILIZATION CONTROLS

Camera Lights Control

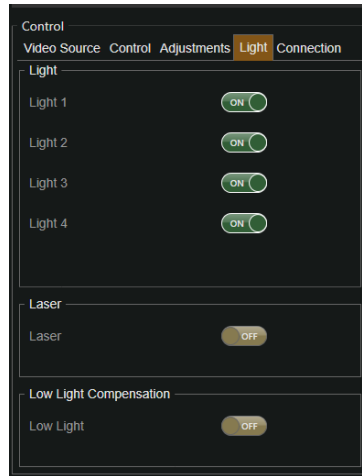Please click to the 'Lights' tab to switch the page for more light and laser controls.

FIGURE 11: LIGHTS CONTROL PANEL

ENABLING/DISABLING LIGHTS

On Spectrum 90™, Spectrum 120™ cameras and the camera on MaggHD™, individual lights can be enabled or disabled depending on the environment. To enable/disable a camera, click the toggle in the 'Lights' section. When a camera light is disabled, the adjustment of light intensity slider will not affect that individual light anymore.

ENABLING/DISABLING LASERS

On Spectrum™ cameras equipped with lasers, click the toggle to turn on the lasers. The lasers are not controlled with the intensity slider. Use caution when activating the lasers. Injury can result from improper use.

LOWLIGHT COMPENSATION CONTROL

By default, 'Low Light Compensation' is set to off. To enable the 'low light compensation' function, click the 'Low Light' toggle.

Camera Connection Configuration

Please click the 'Connection' tab to see the connection related options of the camera.

You can switch the 'Video Signal' between 'Differential' mode and 'Composite' mode here. Additionally, the video channel can be switched between 'Channel One' to 'Channel Two'.
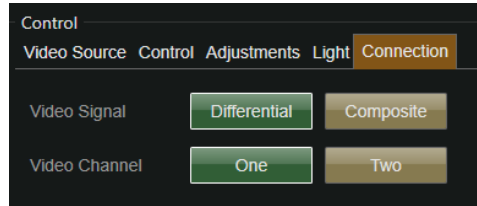

FIGURE 12: CONNECTION CONFIGURATION PANEL

Other Devices

When connecting to a device other than a camera, the interface is divided into four regions: Control Panel, Parameter Readings Panel, Properties Panel, and Notification Panel.
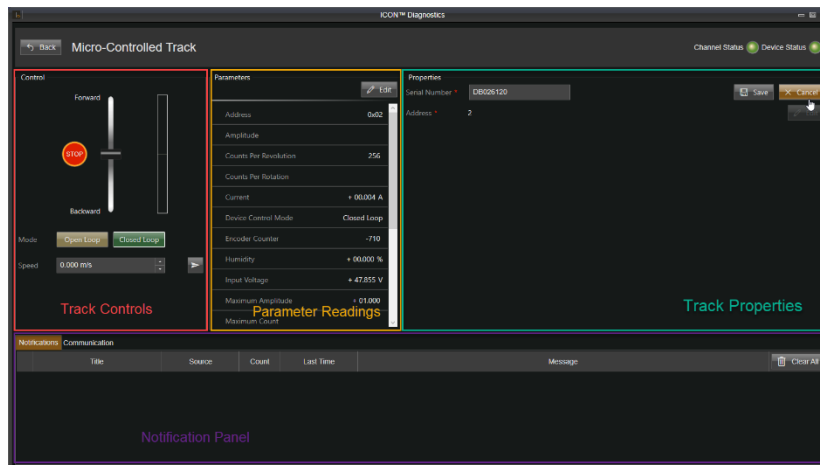

FIGURE 13: INTERFACE FOR TRACKS

Control Panel

Actuators

To move an actuator, move the control slider in either direction. To stop the actuator, press the ▣ button below the slider.The exact behaviour of the sldier depends upon the current control mode. To change the control mode of the actuator, select a new control mode from the dropdown below the control slider.
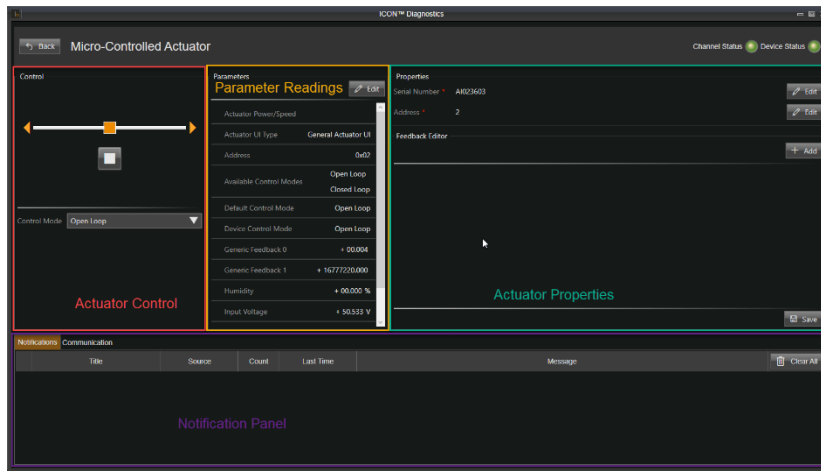

FIGURE 14: ACTUATOR CONTROL INTERFACE

Auxilary Lights

To adjust the intensity of an auxiliary light, move the light control slider. The top position of the slider is maximum intensity, and the bottom position is minimum intensity (off).
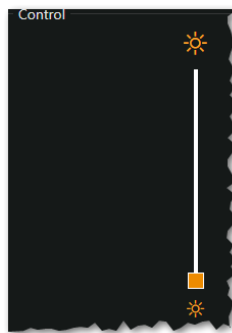

FIGURE 15: LIGHT CONTROL

Tracks

To test a single track, adjust the vertical slider forwards or backwards to control the moving direction of the crawler (see figure 13). The middle position of the vertical slider means zero throttle.

The power bar beside the slider displays the speed or the power of the track. The display is indicative of the speed/power percentage of the track. Green color indicates that the track intends to move forwards, and red color indicates that it intends to move backwards. Note that tracks can be installed in a reversed position by design, and may thus appear to move backwards.

Clicking 🔴 on the left side of the slider sets the power to zero and reset the slider.

You can switch between 'Open Loop' mode and 'Closed Loop' mode by clicking the corresponding buttons. In 'Closed Loop' mode, the speed of the track motor is calculated based on user input. Once set, the track will try to maintain that speed until it is changed by user input. In 'Open Loop' mode, the percentage of power supplied to each track motor is calculated based on user input. The track makes no efforts to maintain speed.

Sensors

There is no control interface for sensors.

Properties Configuration

Updating the Serial Number

To change the serial number of a device, click the edit button beside the current serial number. Update the serial number, and then click 'Save' button. If you want to abandon the change, click the 'Cancel' button to reset.

FIGURE 16: ASSIGNING A SERIAL NUMBER

Updating the Node ID/Address

To change the address of a device, click the edit button beside the current address. Update the address, and then click 'Save' button. If you want to abandon the change, click the 'Cancel' button to reset.

FIGURE 17: ASSIGNING A NODE ID

Reading Parameters

The parameters listed in the Parameter Readings Panel shows the working status of the connected device, the readings shall react to users' operations in real-time. For example, if you disabled a light on the camera, you will see the status of that light in the parameter list changing to 'OFF'. Please use the information gathered from this panel to diagnose the issues that you would have with the device.

Notification Panel

The 'Notification Panel' lists all the errors happened during the communication between 'ICON Device' and your devices. A critical Issue has an ⚠ icon in front of the error title, while a minor issue has the same icon but in white color.

The notification provides following information:

- The title of the error.
- The source of the error.
- The amount of this type of error happened before.
- The last time of this type of error happened.
- A short description about this error.

The error notification messages serve the purpose of helping users diagnose the problems happened to the connected devices.
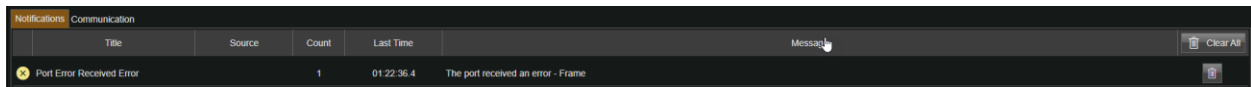

FIGURE 18: NOTIFICATION PANEL

Known Issues

Installation Error

If you receive the error: "Fatal error: Microsoft SQL Server Data-Tier Application Framework (x64) mandatory prerequisite was not correctly installed." Follow the installation instructions below:

1. Ensure that the ICON installer is local (not on the network).
2. Ensure that your PC does not have any updates pending.
3. Prior to installation, restart your PC.
4. Ensure you have full administration privileges.
5. Follow the ICON installation setup wizard.
6. Following the installation, restart your PC to ensure installation was properly applied.

Grabber Load Error

Symptom: A error notification with title 'Grabber Load Error' posted on the notification panel.

Cause: The grabber of the connected camera is not properly configured yet.

Solution: Configure the camera grabber properly according to the section 'Configuring Video Source' in this manual.

Open Port Error

Symptom: Failed to discover devices on a COM port, a notification with title 'Open Port Error' posted.

Cause: The COM port is occupied or busy, usually because ICON is also running.

Solution: Close ICON, make sure the process of ICON is ended, and then try again.

Parts and Repairs

Ordering Parts/Customer Service

Spare and/or replacement parts are available for your product and can be ordered directly from your local office.

When ordering parts always make sure to quote the sales order acknowledgement (SOA) number and/or the serial number of the system component in question.

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Warranty Repairs

Warranty conditions are specified in the Warranty section. Should any conditions of the manufacturer's warranty be breached, the warranty may be considered void. All returned items must be sent prepaid to Eddyfi Technologies at the above address.

Factory Returns to Canada

Some sub-assemblies of your Eddyfi Technologies product are not field-serviceable and may need to return to the factory for repair. Warranty claims must return to the factory for evaluation.

To return an item for evaluation or repair, first contact Eddyfi Technologies at our toll-free number or e-mail address. Eddyfi Technologies will supply a Return Merchandise Authorization (RMA) number with detailed shipping and customs instructions. Items shipped without an RMA number will be held at Eddyfi Technologies until the correct paperwork is completed. If cross-border shipments are not labelled as per the instructions, the items may be held by customs and issued additional fees.

All returned items must be sent prepaid unless other specific arrangements have been made.

When the product or system is being shipped anywhere by courier or shipping company, it must be packaged in the original packaging it was received in. This measure greatly reduces the consequences of rough handling and subsequent shipping damage.

Eddyfi Technologies cannot be held responsible for damages due to improper packaging. Shipping damage may have significant impact on repair turnaround times.

Product/System Drawing Package Availability

Mechanical assembly and electrical wiring diagram drawing packages for your equipment are available in PDF format upon request. Printed copies may also be purchased from Eddyfi Technologies. Contact your local sales contact for more information.

Limited Warranty Policy

Eddyfi Technologies will repair or replace, at its expense and at its option, any system or component, subject to the limitations and / or exclusions specified herein, which in normal use has proven to be defective in workmanship or material provided that, within one (1) year of the purchase date, the original purchaser returns the product prepaid, accompanied by proof of purchase, from a sales agent authorized by Eddyfi Technologies, and provides Eddyfi Technologies with reasonable opportunity to verify the alleged defect by inspection.

Warranty Limitations and/or Exclusions:

1. This warranty does not apply to light bulbs.

2. Batteries, fuses, transistors, integrated circuit modules (IC's), voltage regulating devices and electrical plugs and / or connectors are warranted to be free from defects in material and workmanship for a period of ninety (90) days from the date of shipment to the original purchaser.

3. Any article purchased from, but not manufactured by, Eddyfi Technologies is sold with only such warranties as are made by the manufacturer therein. Eddyfi Technologies only warrants that it has title thereto, free of all liens or encumbrances.

4. This warranty does not apply to units which are damaged by connection to improperly wired AC receptacles.

5. Track belts, tethers, view ports and other components subject to wear through abrasion are warranted to be free from defects in material and workmanship for a period of ninety (90) days from the date of shipment to the original purchaser.

6. Any damage caused by failure to observe proper packing or to observe instructions for operation and maintenance as contained in the Instruction Manual furnished with the equipment, by accident in transit or elsewhere, will not be covered by the warranty.

7. Repairs are warranted for 90 days.

Eddyfi Technologies may require that certain components may be returned, prepaid, to a manufacturer's authorized station for inspection and repair or replacement.

Eddyfi Technologies will not be responsible for any asserted defect which has resulted from Acts of God, normal wear, misuse, abuse, improper configuration, repair, or alteration made, or specifically authorized by, anyone other than a representative of Eddyfi Technologies authorized to do so. The giving of, or failure to give, any advice or recommendation by Eddyfi Technologies shall not constitute any warranty by, or impose any liability on, Eddyfi Technologies.

The foregoing constitutes the sole and exclusive remedy of the purchaser and the exclusive liability of Eddyfi Technologies and is in lieu of any and all other warranties, express, implied or statutory as to merchantability, fitness for purpose sold, description, quality productiveness, or any other matter. Under no circumstances shall Eddyfi Technologies be liable for special, incidental or consequential damages, or for delay in performance of this warranty.

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Eddyfi Technologies

Beyond current