

Stealth Products[®]



**Alternative
Drive Controls**



Fiber Optics

Owner's Manual - Maintenance Guide

IC12F-1, IC24F-1, IDH503, IDHF510-1

Fiber Optic Switches

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Customer Satisfaction

Stealth Products is committed to 100% customer satisfaction. Your complete satisfaction is important to us. Please contact us with feedback or suggestions to help us improve the quality and usability of our products.

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General

Read and understand all instructions prior to the use of the product. Failure to adhere to instructions and warnings in this document may result in property damage, injury, or death. Product misuse or failure to follow instructions will void the warranty.

Immediately discontinue use if any function is compromised, if parts are missing or loose, or if any component shows signs of excessive wear. Consult with your supplier for repair, adjustment, or replacement.

All persons responsible for fitting, adjustment, and daily use of the devices discussed in these instructions must be familiar with and understand all safety aspects of the devices mentioned. In order for our products to be used successfully, you must read and understand all instructions and warnings, and maintain our products according to our instructions on care and maintenance.

The installation instructions will guide you through this product's options and possibilities.

Instructions are written with the expressed intent of use with standard configurations. They also contain important safety and maintenance information, as well as describe possible problems that can arise during use. For further assistance, or more advanced applications, please contact your supplier or **Stealth Products** at (512) 715-9995 or toll free at (800) 965-9229.

Always keep the operating instructions in a safe place so they may be referenced as necessary.

All information, pictures, illustrations, and specifications are based on the product information that was available at the time of printing. Pictures and illustrations shown in these instructions are representative examples and are not intended to be exact depictions of the various parts of the product.

CAUTION

These products are designed to be fitted, applied, and installed exclusively by a healthcare professional trained for these purposes. The fitting, application, and installation by a non-qualified individual could result in serious injury.

Warranty

Our products are designed, manufactured, and produced to the highest of standards. If any defect in material or workmanship is found, **Stealth Products** will repair or replace the product at our discretion. Any implied warranty, including the implied warranties of merchantability and fitness for a particular purpose, shall not extend beyond the duration of this warranty. **Stealth Products** does not warrant damage due to, but not limited to: misuse, abuse, or misapplication of product, and/or modification of product without written approval from **Stealth Products, LLC**. Any alteration or lack of serial number, where applicable, will automatically void all warranty.

Stealth Products, LLC is liable for replacement parts only. **Stealth Products, LLC** is not liable for any incurred labor costs. **Stealth Products** warrants against failure due to defective materials or workmanship:

Covers: 2 years

Hardware: 5 years

Electronics: 3 years

In the event of a product failure covered by our warranty, please follow the procedures outlined below:

Call **Stealth Products** at (512) 715-9995 or toll free at (800) 965-9229.

Request a Return Authorization (RA) form from the Returns Department and follow the documentation instructions.

Additional warranty information may be found by visiting the website at <https://stlpro.site/returns-n-warranty>. Copies of this manual may be downloaded by accessing the Stealth website (<https://stlpro.site/stealth-docs>) and searching "Fiber Optics Owners Manual" in the search bar at the top of the page.

Supplier Reference	
Supplier:	
Telephone:	
Address:	
Purchase Date:	
Model:	

Important Information

Warning Labels

Warnings are included for the safety of the user, client, operator, and property. Please read and understand what the signal words **DANGER**, **WARNING**, **CAUTION**, **NOTICE**, and **SAFETY** mean, and how they could affect the user, those around the user, and property.



Identifies an **imminent** situation which, if not avoided, may result in **severe injury, death, and property damage**.



Identifies a **potential** situation which, if not avoided, may result in **severe injury, death, and property damage**.



Identifies a **potential** situation which, if not avoided, may result in **minor to moderate injury and property damage**.

NOTICE

Identifies important information not related to injury, but possible **property damage**.

SAFETY

Indicates steps or instructions for safe practices, reminders of safe procedures, or important safety equipment that may be necessary.

Limited Liability

Stealth Products, LLC accepts no liability for personal injury or damage to property that may arise from the failure of the user or other persons to follow the recommendations, warnings, and instructions in this manual.

Stealth Products does not hold responsibility for final integration of final assembly of product to end user. **Stealth Products** is not liable for user death or injury.

Testing

Initial setup and driving should be done in an open area free of obstacles until the user is fully capable of driving safely.

Intended Use

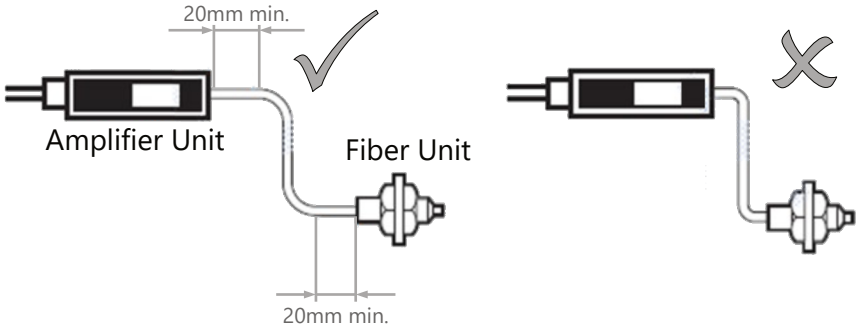
The **Fiber Optic** is a small sensor that can easily be situated in confined spaces, individually, or in groups to create an array of switch sensors. It can be powered by the i-Connect system or the i-Drive interface, does not conduct electricity, or require physical contact to operate, and can be connected to virtually any available switch site. The **Fiber Optic** sensor utilizes a visible red laser and provides no audible feedback. Simply by covering the appropriate sensor, the driver can control the PWC. Drivers can steer the wheelchair by activating the forward or reverse activation beam in combination with either the right or left activation beam.

Specifications

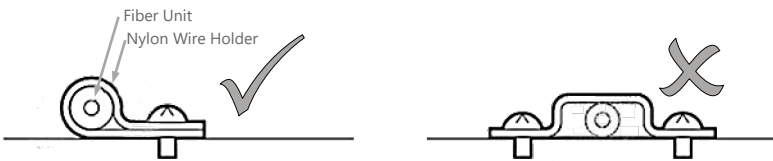
Sensor Size	M3x0.5x2.5mm W x 2-0.5mm ø x 11mm D, 5.5mm W with nuts	Ambient Temperature	-40°F to 158°F -40°C to 70°C
Weight	Approx. 20 Grams	Ambient Humidity	35% to 95% Relative Humidity
Differential Distance	20% max. of sensing distance	Storage Temperature	-40°F to 185°F -40°C to 85°C
Sensor Type	Diffuse-reflective	Operating Voltage Range	10V to 30V DC
Sensor Material	Nickel-Plated Brass	Cable Length	6 ft.

Installation Notes

- To bend the cable, we recommend a bend radius that is at least 6.6mm (.26 in).

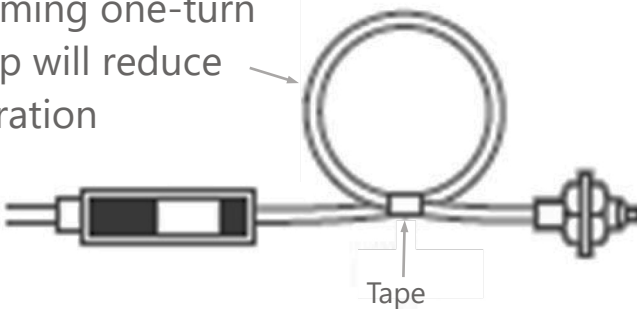


- Do not bend the edge of the fiber units closest to the tip and sensor.
- When wiring the cable, do not subject the cable to a tension greater than 9.8N maximum.
- Do not compress or place heavy loads on the fibers. The method shown below may be an effective method to secure the fiber to the chair, while avoiding excessive load (29.4N max.).



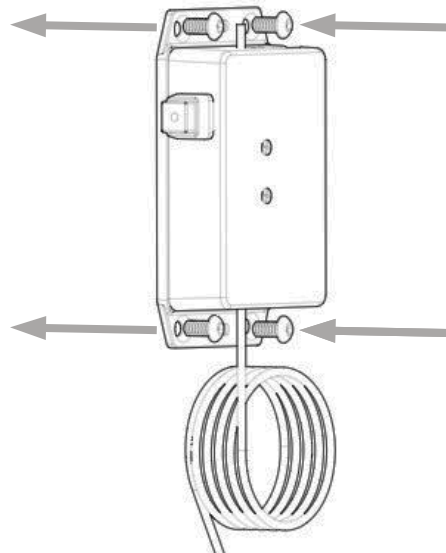
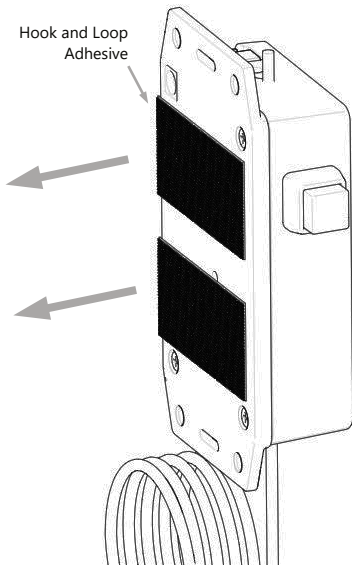
- The method shown below is an effective way to prevent the fiber from breaking due to vibration.

Forming one-turn loop will reduce vibration



Mounting the Amplifier Box

- The amplifier box should be mounted in a secure location where it will not be damaged.
- Mount the amplifier box using the mounting tabs on the edges of the box or by applying hook and loop material or another suitable form of removable adhesive.
- Although the box can be mounted anywhere, it is preferable to mount it to the back of the chair or in another location where it is less likely to be damaged by impact.
- Ensure that excess wiring is gathered and securely routed to avoid entanglement with the user or other equipment.



NOTICE

Hook and Loop adhesive and screws for mounting the Amplifier Box are not included.

Power Supply

The i-Connect version of **Fiber Optics** (IC12F-1 and IC24F-1) will require an appropriate version of the i-Connect power source. For more information, see the ICPS user manual (Available at <https://stlpro.site/stealth-docs>, search: ICPS)

The i-Drive compatible version (IDH503 & IDHF510-1) will be powered by the i-Drive.

Fiber Optic Cables

Cutting

1. Insert the fiber cable into an appropriate fiber cutting hole.
2. Press down on the blade with a single stroke to cut the fiber cable.
 - a. A clean cut is necessary to ensure proper function of the amplifier.

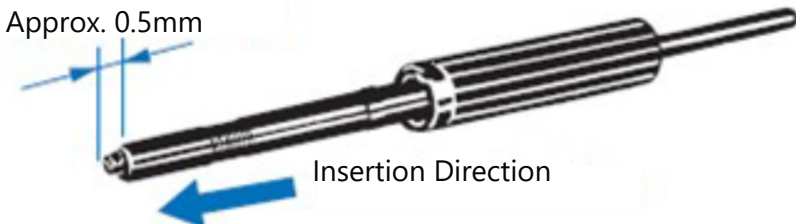
NOTICE

Trimming excess cable may help prevent accidental damage to the fiber optic cable.

Fiber Attachment Adjustment

The attachment of the end of the fiber cable must be properly adjusted to ensure proper function. Repetitive removal of the fiber cable from the amplifier may require readjustment of the attachment.

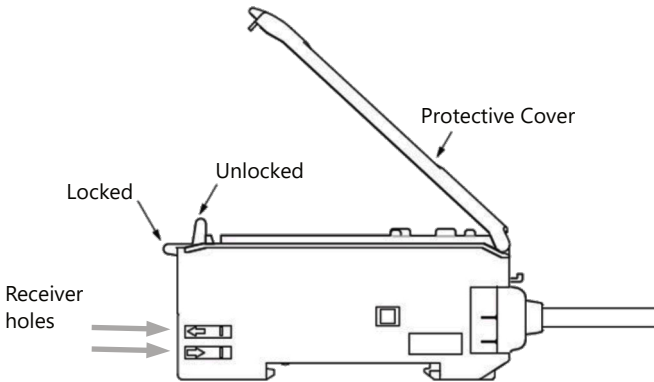
1. Loosen the fiber attachment by twisting the top portion only.
 - a. It is not necessary to remove the top portion; it only needs to be loose.
2. Slide the fiber cable in or out until the fiber extends approximately .5mm (1/64 in.) past the tip.



Note: Insert the fiber in the direction indicated by the arrow.

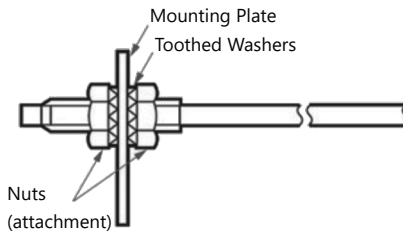
Locking the Cable in the Amplifier

1. Open the lock lever by releasing it away from the fiber cable receiving holes.
2. Insert the fiber cable into the receiver hole until it bottoms out. Do not force it past this point.
3. Close the lock lever by flipping it toward the receiver holes.

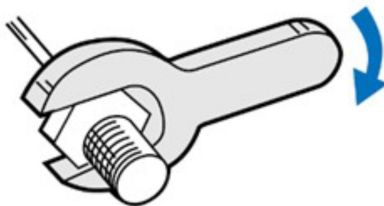


- The fiber sensor end of the fiber cable must be properly mounted to ensure proper function. Once the location has been determined, use the supplied nuts and washers to mount the sensor. The image below shows an example of the correct mounting.

Note: Do not exceed a clamping force of .78 N·m on the mounting nuts.



Note: Use a properly-sized 3mm wrench to avoid damage to sensitive parts.

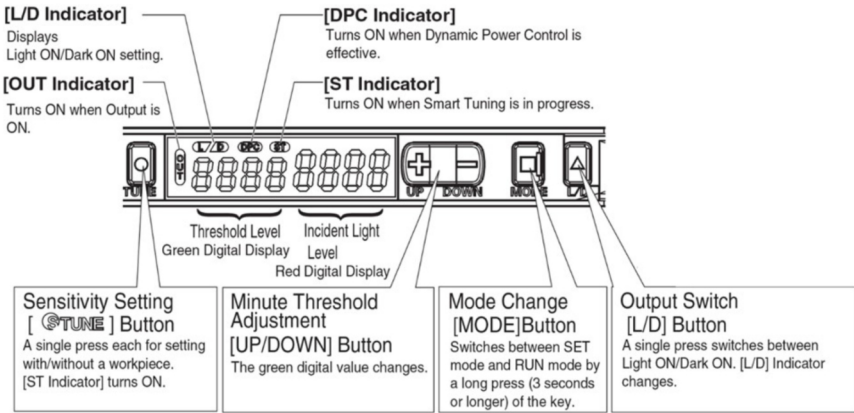


Programming Instructions

Layout

NOTICE

All of Stealth's **Fiber Optics** utilize the same amplifier.



- **Threshold Level** -- Numbers displayed in Green. This indicates the level that must be achieved to cause a successful activation.
- **Incident Light Level** -- Numbers displayed in Red. This indicates the level at which the Fiber Optic is currently sensing a reflection, i.e. how far away an object is from the sensor.
- **L/D** -- Light On/Dark On
 - When set to Light On, the beam must be broken (covered) to activate the signal to the chair. This is most commonly used in situations when the Fiber Optic is being used to send drive or mode commands to the chair.
 - When set to Dark On, the beam must be unbroken (uncovered) to activate the signal to the chair. This is most commonly used in situations when the Fiber Optic is being used as an emergency stop function, such as a fiber optic attached to a sip-n-puff straw.
- **Tuning** -- Tuning is used to precisely set the distance at which the activations will occur. This will help produce a more precise driving experience.

Note: Refer to the following sections for more information about tuning and additional settings.

Tuning

Automatic Tuning

Automatic Tuning will capture the capabilities of the end user. This will automatically assign a threshold level based on light levels during tuning.

1. Press the *Tune* button once while breaking the beam.
 - a. The display will read *St 1Pnt*.
2. Press the *Tune* button once again with nothing breaking the beam.
 - a. The display will read *St 2Pnt*.
3. Setting is complete.

NOTICE

Steps One and Two may be reversed. The larger of the two light levels will be used for this setting. The threshold will be set based on this.

Minute Tuning

Minute Tuning allows you to fine tune the threshold level.

1. Press the '+' or '-' button until you find the appropriate threshold.
 - a. '+' will increase the threshold value. The higher the number, the closer to the emitter you must be to break the beam.
 - b. '-' will decrease the threshold value. The lower the number, the farther from the emitter you must be to break the beam.

A higher threshold level typically means that the activation occurs closer to the sensor as compared to a lower threshold level.

Tuning Errors

Error Displayed	Cause	Remedy
nEAr Err	Light level between points 1 and 2 are too small.	<ul style="list-style-type: none"> • Re-tune the system. • Mount the sensor closer to the surface that is breaking the beam.
ovEr Err	Light level is too high.	<ul style="list-style-type: none"> • Re-tune the system. • Increase the tuning level. • Mount the sensor farther from the surface that is breaking the beam.
Lo Err	Light level is too low.	<ul style="list-style-type: none"> • Re-tune the system. • Increase the tuning level. • Mount the sensor farther from the surface that is breaking the beam.

NOTICE

Start with auto-tuning then adjust with minute-tuning if auto-tuning fails or if small adjustments are required.

Additional Features

Light On / Dark On

A single press of the L/D button will swap between the Light On and Dark On modes.

- Light On: User must break the beam to activate, much like a normally open switch.
- Dark On: User must break the beam to deactivate, much like a normally closed switch.

Reset Settings

This feature will return the amplifier to factory settings.

1. Press and hold the *Tune* button. While holding the *Tune* button, press the L/D button.
 - a. Hold for 3 seconds or longer.
2. Select *rSt* button on the display with the '+' or '-' buttons.
 - a. Press the *Mode* button.
3. Select *rSt init* button on the display with the '+' or '-' buttons.
 - a. Press the *Mode* button.

Locking Buttons

This feature will disable all button operation. *Loc-on* will display when a button is pressed.

1. Press and hold either the '+' or '-' button and the *Mode* button at the same time.
 - a. Hold for 3 seconds or longer.

Repeat the process to unlock.

Dealer Assistance

During first time use by the client, it is advised that the dealer or service technician assists and explains the configuration to the customer (the user and/or the attendant). If needed the dealer can make final adjustments.

User Testing

It is important that the customer is fully aware of the installation and what/how the product can be adjusted. Ensure the user can safely operate the wheelchair and that the fiber optics are working properly, and in the necessary way.

If needed, adjust the fiber optics so they function to the user's needs.

Explain to the customer possible problems and how to address them.

Conditions of Use

The proximity fiber optics are intended for use as installed by the dealer, in accordance with the installation instructions in this manual.

- The foreseen conditions of use are communicated by the dealer or service technician to the user and/or attendant during the first time use.
- If the usage conditions change significantly, please contact your dealer or service technician to avoid excessive wear and tear or unintended damage.



WARNING

Check that no cabling is loose and the user can operate the chair properly with the **Fiber Optics** attached.

Cleaning

Periodically ensure the fiber optic sensor is free and clear of foreign debris.

To clean:

- Gently wipe off with a dry cloth, or blow off with compressed air.
- Do not use thinners or other organic solvents.
- If necessary, tighten screws or reapply the adhesive used to secure the box.
- Check that all connections are tight.

Maintenance

- Check the fiber optic sensor(s) and mounting for loose screws or adhesive. Repair or replace when necessary.
- Periodically inspect the fiber optic cables for damage. Repair or replace when necessary.
- Periodically inspect the housing to ensure that there is no damage.



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Warranty Information



Home Page



Online User Manual



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