



SYNRAD Technical Bulletin

00002

Technical Issue: Additional FH Tracker Set-Up Information

Date: 06 February 2001

Description:

This Technical Bulletin provides additional information about setting-up a SYNRAD FH Series Tracker Marking Head and clarifies some sections of the existing Tracker manual. Use this Bulletin as a supplement to the *FH Series Marking Head Operator's Manual* (version 2.0).

This Bulletin covers the following topics:

- 30 VDC power connections
- AC power supply connections
- Power-up sequence
- Tracker setup in WinMark Pro
 - Track Marking Object
 - Sensor Distance
 - Mark placement on Drawing Canvas
- Custom test mark feature
- PCI-bus Fiber Link Controller Card installation
 - Configure the FLCC
 - Install the FLCC
 - Connect the Fiber Optic cable
 - Verify the FLCC's functionality

30 VDC power connections

FH Series DC input voltage specifications are 30 VDC \pm 2.0 V. Damage to electronic components may result if the supply voltage falls below 28 VDC or rises above 32 VDC. It is important to measure this supply voltage before connecting the FH Head's *Power* cable. If Marking Head power is supplied by the laser's power supply, make sure the laser is "On" (under load) before taking voltage measurements.

AC power supply connections

Consult your laser's Operator's Manual for important information about wiring your DC power supply for 115/230 VAC operation. In many cases, when connecting to 115 VAC, a jumper must be installed on the Input Module (the terminal block where the AC power cord is attached). Usually this information is marked on the supply's Input Module; if in doubt refer to your laser manual, the power supply manual, or contact SYNRAD Technical Support.



Power-up sequence

Always power-up your FH Series Marking Head before starting WinMark Pro. This ensures that WinMark Pro properly communicates initialization data to the Marking Head.

Tracker setup in WinMark Pro

The following properties are found on WinMark's *Tracking* tab. This tab appears only when the "Drawing" object is selected and WinMark Pro senses that it is communicating with an FH Tracker Marking Head.

Track Marking Object

Beginning with WinMark Pro version 2.1.0.3268, the *Track Marking Object* property automatically defaults to *Yes*.

Sensor Distance

The term *Sensor Distance* is not entirely accurate because the value entered is not related to the physical part sensor location but rather *Sensor Distance* is defined as ***the distance, at the moment of part sense, from the center of the mark field to the leading edge of the desired mark location.*** Unlike other marking systems that are time-based, Tracker is a distance-based system. This is because at the moment a part is sensed (on the rising or falling edge of the part sense signal), the FH Head begins counting rotary encoder pulses. When the number of encoder pulses counted by the Head equals the *Sensor Distance* (calculated by the *Encoder Resolution*), marking begins. Because Tracker calculates marking vectors based on encoder pulses (distance), Tracker can continue to accurately mark an object when it stops, or even when it reverses direction, once it has entered the mark field.

Use *Sensor Distance* to change the longitudinal location of the mark on the part. The maximum allowable *Sensor Distance* value is 305 mm (12 in.).

Figure 1 illustrates the *Sensor Distance* concept. In this case the part sensor is placed upstream of the mark field (parts are sensed before they reach the center of the mark field) and the sensor is set to trigger on a rising edge transition.

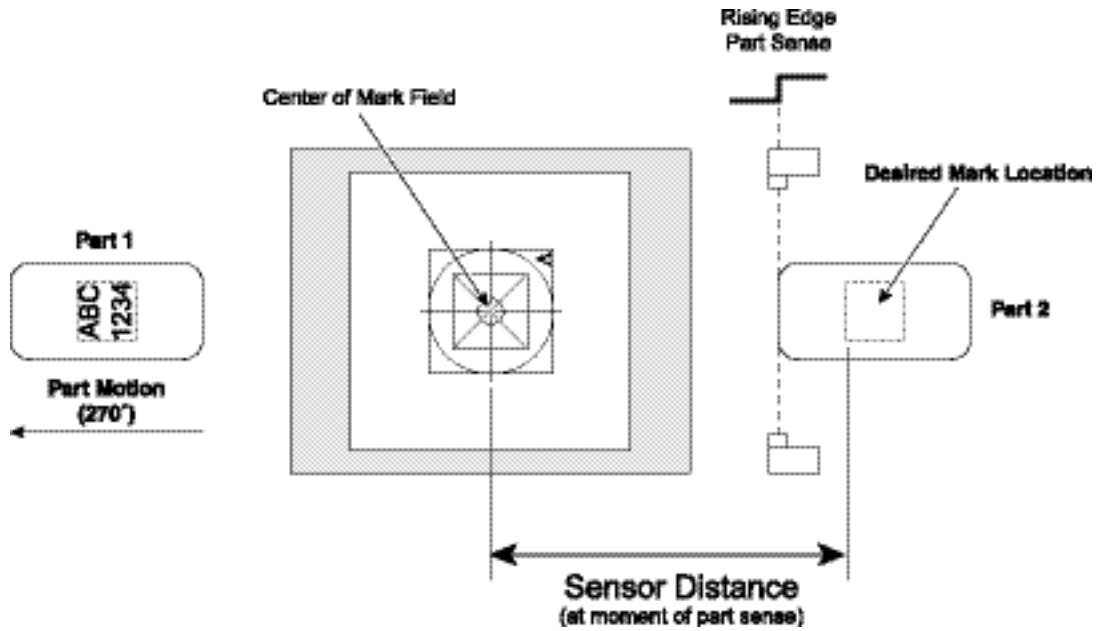


Figure 1 Upstream part sensor, rising edge trigger

Figure 2 shows the part sensor located upstream again but this time the sensor is set to trigger on the falling edge.

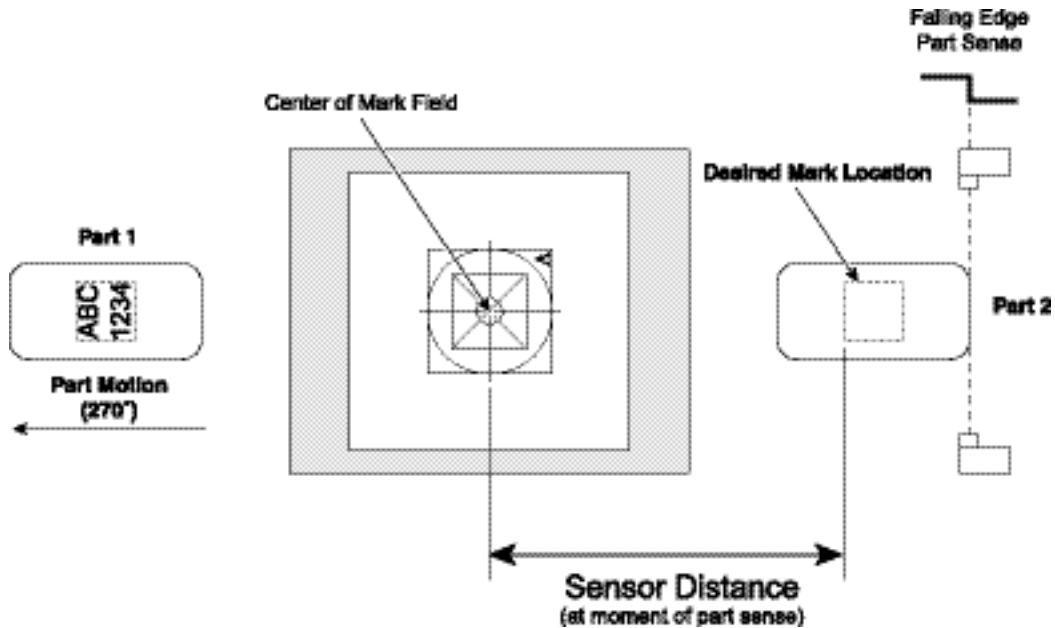


Figure 2 Upstream part sensor, falling edge trigger

Figure 3 illustrates *Sensor Distance* when the part sensor is positioned downstream. Even though the leading edge of the part has traveled past the center of the mark field, the area where the part is to be marked must still be upstream of the centerline.

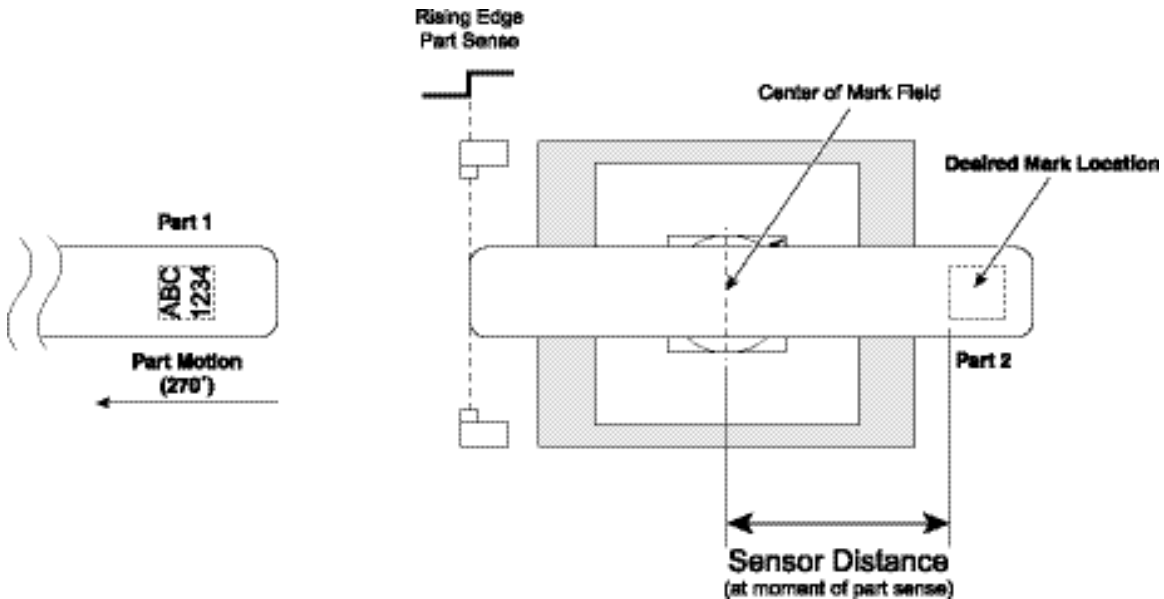


Figure 3 Downstream part sensor

Mark placement on Drawing Canvas

Maximum Tracker mark speeds are obtained when mark objects are positioned near the upstream edge of WinMark's *Drawing Canvas* and when the *Motion Vector* (on the *Tracking* tab) is set to 90° or 270°, which takes advantage of the FH system's rectangular mark field.

Each object to be marked has an X-Y "start mark" point, which is the starting beam position. The *Sensor Distance* must be greater than the value of the X or Y "start mark" coordinate, which is normally the object's top left corner (unless the object has been rotated). When the *Tracking Motion Vector* is 90° or 270°, the *Sensor Distance* must be greater than the Y "start mark" coordinate. When the *Motion Vector* is 0° or 180° then the *Sensor Distance* must be greater than the X "start mark" coordinate. If the *Sensor Distance* minus the mark position on the *Drawing Canvas* is less than or equal to zero, this means that the part will be past the point of marking before the specified *Sensor Distance* has been traveled. If this error occurs, move the part sensor further upstream. If line speed (cycle time) is not an issue, you can instead move the object's location on the *Drawing Canvas*.

In Figure 4, the text object's top left coordinate value is $X = -0.5$, $y = 2.0$ (inches). If the *Drawing's Motion Vector* is 270°, then the *Sensor Distance* entered must be greater than 2.0 inches.

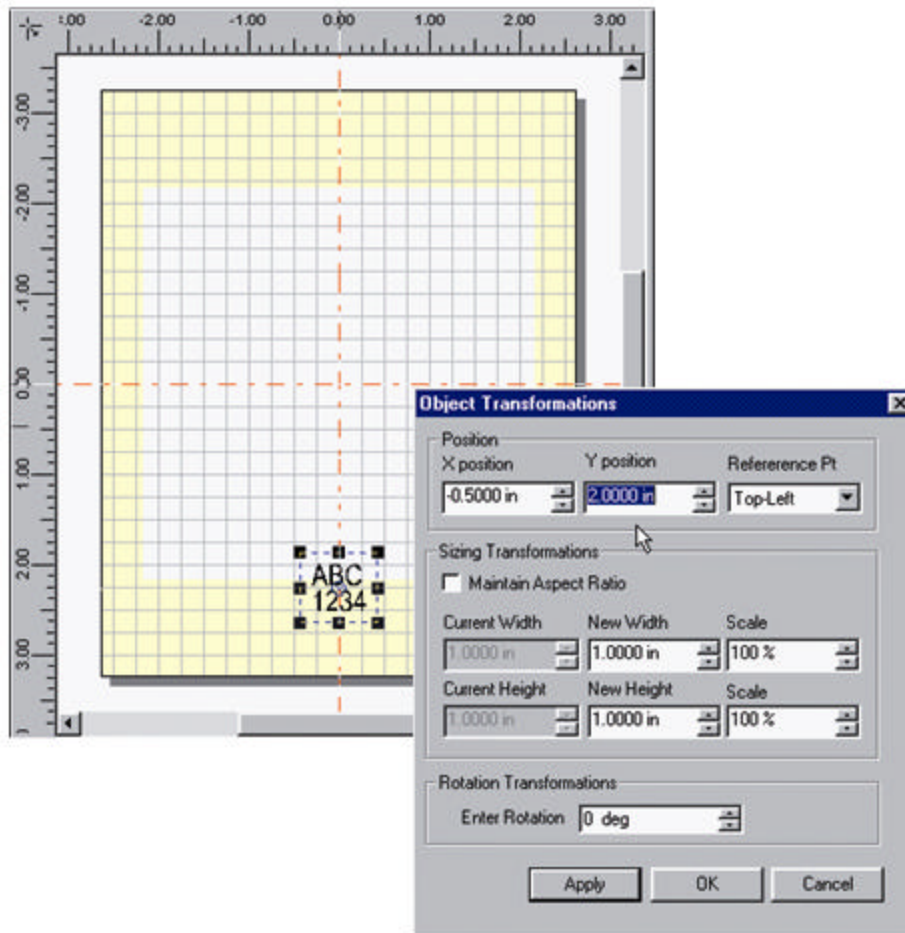


Figure 4 X-Y “start mark” coordinates

Rotating an object changes the X-Y coordinates of its “start mark” point, which may require you to reposition the mark object on the *Drawing Canvas* or change *Sensor Distance* (move the part sensor). Depending upon the *Motion Vector* selected, rotating an object 180° may allow the object to be placed closer to the upstream edge of the *Drawing Canvas*, increasing line speed.

Custom test mark feature

The Custom test mark feature described in the *FH Series Marking Head Operator’s Manual* is only available if (1) the firmware version in your FH Series Marking Head is v7.0 or later, (2) the firmware version in your FLCC is v6.0, and (3) you are using WinMark Pro version v2.0.0.3019 or later.

PCI –bus Fiber Link Controller Card installation

A PCI-bus version of the Fiber Link Controller Card (FLCC) is now available. Refer to the following instructions to install your PCI-bus FLCC and its associated Device Driver.

SYNRAD's new PCI Fiber Link Controller Card is designed for installation in PCI bus slots in IBM-compatible computers. The Fiber Link Controller Card (FLCC) is very sensitive to static electricity discharges. Because it is possible to damage the FLCC or your computer through improper handling, please follow the installation directions carefully.

Caution

possible equipment damage

Static sensitive components on the Fiber Link Controller Card may be damaged if exposed to static electricity discharges. Always wear a static control wrist strap when handling the Fiber Link Controller Card. If a static control wrist strap is not available, ground yourself by maintaining continuous contact with your computer's grounded metal chassis.

Configure the FLCC

We recommend that you configure DIP switches before installation. Figure 5 shows factory default DIP switch settings.

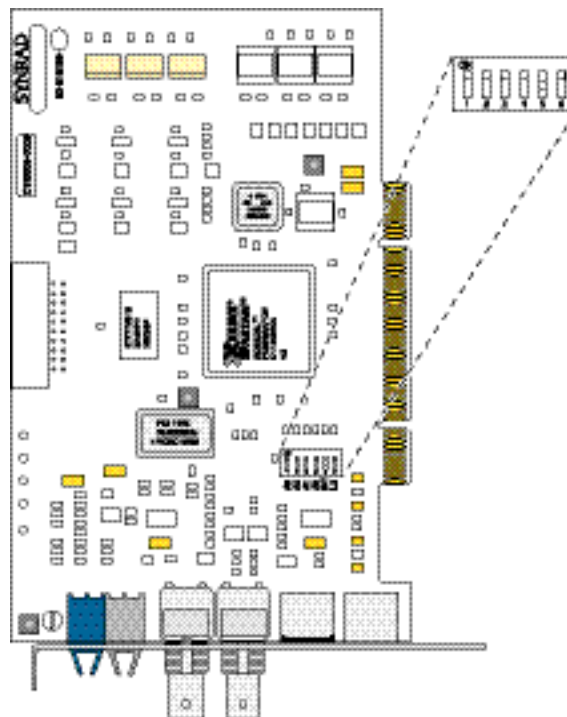


Figure 5 DIP switch settings



Table 1 lists FLCC DIP switch functions.

Table 1 DIP switch functions

DIP SW#	Default Position	Switch Function
1	ON	Card ID Address A3 (MSB)
2	ON	Card ID Address A2
3	ON	Card ID Address A1
4	ON	Card ID Address A0 (LSB)
5	OFF	Fast Acting Safety Interlock (FASI) – ON enables the FASI function; OFF disables the Interlock function. When the FASI Interlock is enabled (ON), a high level input must be present on Input # 3 (IN3) for marking to proceed.
6	ON	Used only with DH Series Marking Heads.

The card ID number, set by the Card ID Address DIP switches, is only necessary when more than one PCI card is installed in the system. Because the Windows Plug and Play feature, not the user, assigns the card address, the Card ID Address provides a way for the user to ensure the correct card is selected when marking or assigning Input/Output (I/O) properties in multi-card systems.

When DIP SW4–SW1 are set to ON, the Card ID Address is 0; when SW4–SW1 are set to OFF, the Card ID Address is 15. If, for example, SW4, SW3, and SW2 = OFF and SW1 = ON, then the Card ID Address is 7.

Install the FLCC

To install the PCI-bus FLCC, perform the following steps:

- 1 Turn off your computer, but leave it plugged into a properly grounded outlet. Leaving the computer plugged in means that the computer chassis will remain grounded, enabling you to discharge harmful static electricity before handling sensitive electronic components.
- 2 Remove the computer’s case or cover to expose the expansion slots. Locate an empty PCI bus slot (the PCI-bus FLCC will not physically fit in an ISA slot).
- 3 If there is a “space filler” metal bracket covering the PCI slot, then remove the bracket. Save the screw.

- 4 Make sure you are grounded before handling the FLCC. While grounded, install the FLCC in the PCI slot. The gold contact fingers on the card should slide into the mating PCI bus slot without using excessive force.
- 5 When the card is properly seated, use the screw removed in step 3 to secure the card to the computer chassis.
- 6 Reinstall the computer's case or cover.

Connect the Fiber Optic cable

To install the *Fiber Optic* cable, refer to Figure 6 and perform the following steps:

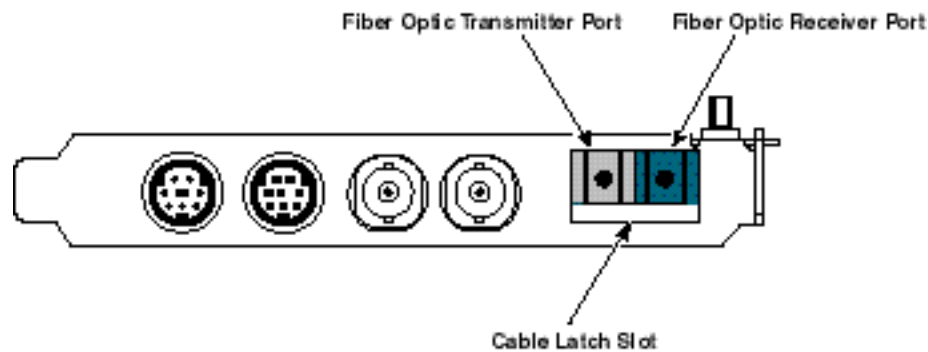


Figure 6 Fiber Link Controller Card connectors

- 1 With the back of the computer accessible, locate the *Fiber Optic Receiver/Transmitter* port on the FLCC.
- 2 Remove the rubber dust caps from the fiber optic ports.
- 3 Locate the *Fiber Optic* cable in the shipping box. The end that attaches to the FLCC terminates into a single duplex connector.
- 4 Insert the duplex connector into the *Fiber Optic Receiver/Transmitter* port on the FLCC. When properly connected, the latch on the connector should clip into the cable latch slot. You should not be able to remove the *Fiber Optic* cable without depressing the latch.

Note: The fiber optic connection is the only connection necessary to control Fenix or FH Series Marking Heads; no other connections are typically made to the FLCC.

- 5 Connect the other end of the *Fiber Optic* cable to your Marking Head.

Turn on your computer.

Verify the FLCC's functionality

Follow the steps below to verify that the PCI card is functioning properly.

- 1 Start your computer and install WinMark Pro if you have not already done so.
- 2 Double-click the Shortcut to WinMark icon on your desktop.
- 3 When WinMark Pro opens, click *Tools* on the *Menu* bar and then click *General Settings....* On the *Application Settings* tab, locate the *DA Card Selection* property and verify that the PCI card is properly identified. See Figure 7. If an older ISA-bus FLCC is also installed in your computer, you may need to select the PCI card from the drop-down list.

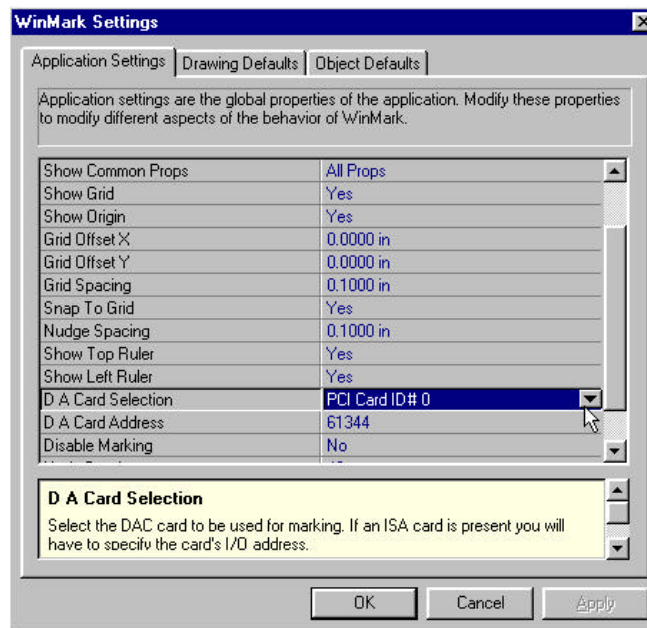


Figure 7 Application Settings tab

- 5 Create a new drawing, or open an existing file, and mark the drawing.

This completes the installation of your PCI-bus Fiber Link Controller Card.

For further information contact SYNRAD at: 1-800-796-7231 (in the U.S.) or 1-425-349-3500.