



SYNRAD Technical Bulletin

00004

Technical Issue: Fiber Optic Data Collisions

Date: 11 July 2001

Description:

Fiber optic data collisions may occur when using FH Series Tracker Marking Heads with firmware version v7 or v8 or FH Series Index Marking Heads / Fenix Laser Markers with firmware versions v7, v8, or v9.

FH Series Tracker Marking Heads with firmware version v9, FH Series and Fenix Marking Heads, with firmware versions v6 or below, and SH or DH Series Marking Heads are not affected by this problem. This Technical Bulletin explains what fiber optic data collisions are and how to prevent them.

This Bulletin covers the following topics:

Data collisions

- Type 1 behavior

- Corrective action

- Type 2 behavior

- Corrective action

Data collisions

Data collisions on the fiber optic link between the Marking Head and the Fiber Link Controller Card (FLCC) occur when the Marking Head and FLCC send data packets at the same instant. During two simultaneous transmissions, one of the two data packets is lost in the "collision", which then results in either Type 1 behavior—unexpected error dialog boxes or Type 2 behavior—the appearance that the Marking Head has "locked up" and is no longer functioning.

Type 1 behavior

When data collisions occur entering or during a marking session, unexpected error dialog boxes may appear. Error messages typically display: "The marking head does not have a correction factor for this lens" or "data type 12 bit error". In both cases WinMark Pro has queried the Head prior to sending microvector data and did not receive, or recognize, the reply. In rare cases, WinMark may incorrectly identify the Marking Head as an SH (12-bit analog Head) and send 12-bit, rather than 16-bit, microvector data. When this happens, it appears that the mark was missed because mark objects are vastly scaled down and mark in the far corner of the marking field. A mark produced by a 12/16 bit data error may not be noticed as it is located away from the center of the marking field and, depending on part height, may be out of focus when its energy hits the marking backstop. In most cases the correct 16-bit data is sent during the next mark.

Corrective action

For Type 1 data collisions that generate unexpected error dialogs, there are two options available to prevent or minimize errors:

- It appears that computers running at faster clock speeds (400 MHz or greater) experience fewer data collisions than computers running at slower speeds.

- The latest version of WinMark Pro for Windows 95/98, 2.1.0.3468, in conjunction with Marking Head firmware version 10 resolves data collisions issues that result in unexpected error dialogs. Version 2.1.0.3453 is available for download at: <http://www.winmark.com/download.html>. Version 10 firmware and MarkLink.exe, which downloads the firmware, are placed in the WinMark folder during installation. See *v2.1.0.3468ReleaseNotes.txt* for firmware upgrade instructions.

Type 2 behavior

Type 2 behavior where the Marking Head appears to “lock up” typically occurs in automated applications when WinMark Pro is programmed to expect an input before, or after, part marking and when more than one part is marked in the mark session. The mark log in the “Launcher” window displays “Waiting for bit pattern x-----“, even though the required input voltage is applied to the specified input on the Marking Head. Since the Head sends input bit status to WinMark Pro only when the head detects a rising or falling edge on an input and this data was lost in the “collision”, WinMark Pro is still waiting to receive a message indicating that a valid input exists.

Corrective action

For Type 2 data collisions that result in the Marking Head “locking up”, there are several solutions identified that prevent data collisions from halting marking operation.

- Connect input wiring to the FLCC’s mini-DIN input connector instead of to the Marking Head’s I/O connector. The FLCC reports input level status in real-time to WinMark Pro, assuring that input status data is not “lost” during fiber optic communication. SYNRAD Technical Bulletin # 0001, *Additional Marking Head I/O Capability for SH, DH, and FH Series Marking Heads and for Fenix Laser Markers* explains FLCC I/O connectors.

- Inject a continuous pulse stream into an unused input on the Marking Head, to force periodic input status updates. If a data collision causes an input change to be missed, subsequent pulses force the Head to send additional status messages to the FLCC. Table 1 shows how the injected pulse stream frequency determines maximum lag time following a “lock up”.



Table 1 Pulse frequency / lag time correlation

Frequency (Hertz)	Max Lag Time (Sec)
1	1.0
10	0.1
100	0.01
1000	0.001

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