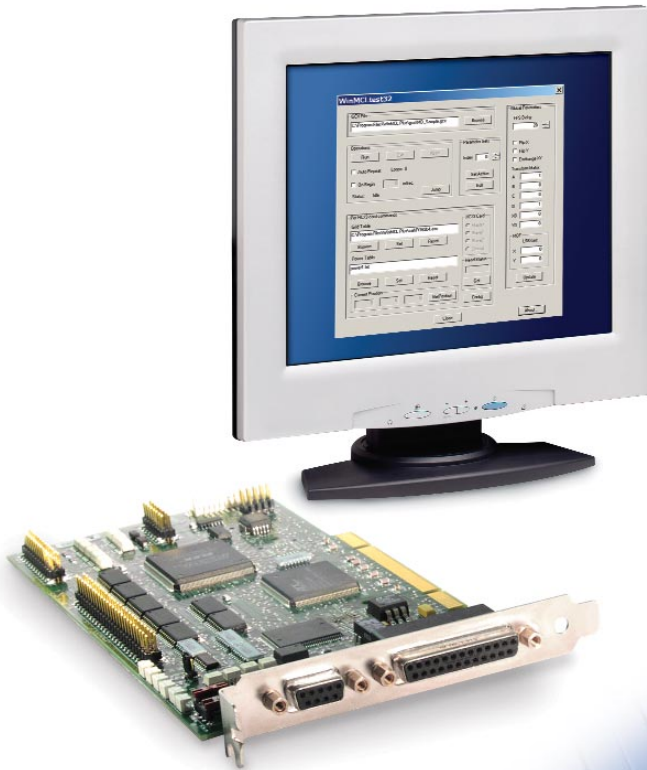


HC/3 and WinMCL Plus

Scan and Laser Control Interface

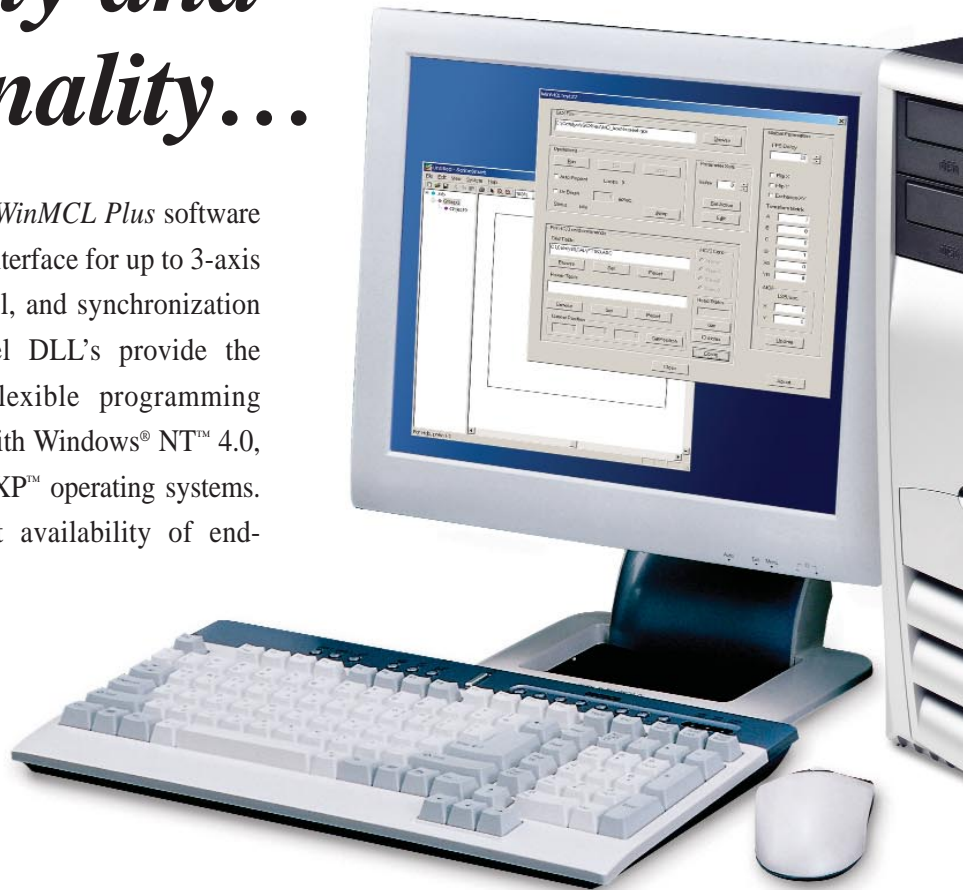


The **HC/3 PCI Controller Card** operates in conjunction with **WinMCL Plus** and its DLLs to provide 2 or 3-axis positioning commands over a high-speed serial link to GMAX™ scan heads. **HC/3** also controls power and timing of most laser types.



When your System Demands Flexibility and Functionality...

The HC/3 and accompanying WinMCL Plus software provide the necessary control interface for up to 3-axis beam positioning, laser control, and synchronization to peripherals. The low-level DLL's provide the system integrator with a flexible programming language tailored to operate with Windows® NT™ 4.0, Windows 2000™ or Windows XP™ operating systems. Contact sales to learn about availability of end-user software

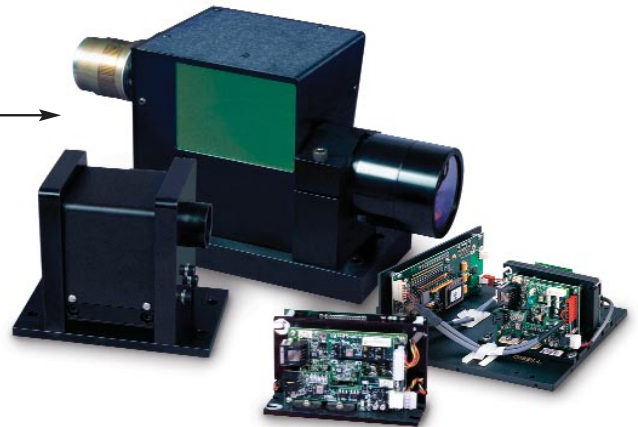


HC/3 Functionality

- **Compatibility**
 - Commands sent via serial protocol developed by GSI Group (XY2-100 standard)
 - WinMCL Plus DLLs compatible with Windows® 2000™, XP™, NT™ 4.0 operating systems
 - HcDrv.sys driver compliant with Microsoft®'s Windows® Driver Model
- **Positioning Control**
 - 16 bit positioning resolution
 - Configurable channel update rate, minimum 10 μ sec.
 - Optional master/slave controls up to 4 heads
- **External I/O**
 - One status read-back per channel
 - Opto-isolated BeginMark and StopMark inputs
 - 16-bit user definable I/O port
 - On-board instruction store (up to 64 K 32-bit words)
- **Laser Control**
 - Configurable first pulse suppression
 - Configurable CO₂ tickle pulse generation
 - Up to 16 bit laser power control
 - Optional analog laser power control (I/O 2 Card)
- **Safety Features**
 - 3 axis disable on mark abort
 - Laser disabled on start-up
 - Optional laser disabled on laser error
- **3 Operational Modes for Marking Jobs**
 - Vector: Character marking, line marking with micro vectors, etc.
 - Raster: Marking gray level pictures, etc.
 - Shoot: Via hole drilling, step and shoot etc.



2 Axis System



3 Axis System

Main capabilities of WinMCL Plus with HC/3 Hardware Controller

Recently redesigned, *WinMCL Plus* has added functionality and operates on Windows® 2000™, XP™ and NT™ platforms. The source code of *WinMCL Plus* has been greatly simplified, which results in reduced delays and more efficient operation. *WinMCL Plus* is not backwards compatible with existing *WinMCL* or *HC/2*.

WinMCL Plus consists of 84 functions that are used to interface the user program to the *HC3 Card*, including:

- Mark on-the-fly
- Spiral marking (dither function)

- Grid correction software
- Laser parameters for most common lasers (CO₂, YAG, etc.)
- Up to 64 different parameter sets with following structure:

BreakAngle	LaserOnDelay	JumpSize
FPSEnable	LaserOffDelay	JumpDelay
Power	TargetXVelocity	StrokeDelay
PowerDelay	TargetYVelocity	DitherWidth
Intensity	MarkSize	DitherFeed
QSwitchPeriod	PolyLineDelay	
QSwitchWidth	StepPeriod	

HC/3 Feature Summary

The *HC/3 Helper Card* has the following features:

- PCI bus, plug and play
- Interface to GMAX™ 2 and 3-axis Scan Heads (with digital interface)
- Shutter control circuitry
- Optically isolated Laser Control I/O
- Laser modulation control: PWM, Q-switch, First Pulse Suppression, Tickle Pulse
- Master/Slave capability (up to 4 *HC/3* cards)
- First in first out RAM

HC/3 Specifications

PC interface	<ul style="list-style-type: none">• PCI 2.1/2.2 compliant• 32-bit• 33 MHz• Target/Initiator (1 master, up to 3 slaves)• +5 V or +3.3 V signaling
PCI bus power input requirements	<ul style="list-style-type: none">• 5 VDC +/- 5%• 600 mA typical, 1500 mA maximum
FIFO RAM	<ul style="list-style-type: none">• 64k 32-bit words
Serial link	<ul style="list-style-type: none">• 25 Pin D-Sub on bulkhead
User I/O	<ul style="list-style-type: none">• External 9 Pin D-Sub, optically isolated inputs and outputs for laser control• Internal 50 Pin header on card for user-designed interface:<ul style="list-style-type: none">- TTL outputs with maximum 10 mA low current- 8-bit input register for byte input to <i>WinMCL Plus</i>- Optional 8-bit analog laser control (I/O2 Board)- 16-bit port to control laser power or other general purpose digital circuitry.
Environmental	<ul style="list-style-type: none">• Operating: 0 to 55 °C, 10 to 85% RH, non condensing• Storage: -40 to 85 °C, 5 to 95% RH, non condensing
Software	<ul style="list-style-type: none">• <i>WinMCL Plus</i> included (Windows® 2000, XP, NT 4.0)• PC-MARK MT compatible (DOS)
System requirements	<ul style="list-style-type: none">• Minimum 500 MHz Intel Pentium III processor• 128 MB RAM (256 MB or more recommended)• CD ROM• 500 MB available disk space• One 32-bit PCI slot for each <i>HC/3</i> (up to 4 max)• Windows® 2000, XP or NT (V4.0, SP5 or higher) operating system

Specifications are subject to change. Consult GSI Group for details



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