

Newsletter: WHY COMPONENTS?

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NEWSON

Newson is dedicated to providing essential components for laser beam deflection within laser machines. Newson firmly believes in **empowering laser machine builders with the freedom to design the optimal deflection solution for their applications.**

This approach offers several advantages to the machine builder:

- **Competitive Advantage**
- **Maximum Design Freedom:** by using small-sized deflectors and electronics
- **Added Copy Protection**
- **Reduction of Bill of Materials:** Ensuring quality without unnecessary costs. No meaningless profits on profits.

Newson's deflection components are user friendly, featuring integrated driver electronics in all actuators. This design choice eliminates the need for external regulators, minimizes noise-sensitive cabling, maintains a low-power supply (avoiding thermal challenges), and utilizes a single coaxial connector for seamless connection to steering electronics (SPD Shared Power and Data). Additionally, Newson provides software tools for autotuning and field calibration.

Freedom manifests in various forms:

- **Freedom of Chassis**
- **Freedom of Control**
- **Freedom to Create Electronics**
- **Freedom of Software**

Newson consistently offers different options, allowing machine builders to explore the specific details of individual parts, utilize more integrated components, or incorporate third-party parts.

The following sections delve into these options in more detail.

1. Freedom of Chassis

For a seamless integration of the deflection system into a laser machine, Newson offers a range of modules specifically designed for beam delivery systems, with a focus on the rhothor™ Smart Deflector as a fundamental building block. This modular framework facilitates effortless integration, customizable branding, and accommodation for specific machine layouts, providing laser machine builders with a versatile and user-friendly solution. For added convenience, fully pre-mounted deflection systems are also available.

Dual-axis systems are designed for apertures of 10, 15, 20 and 30mm, catering to the precise needs of laser machine builders. Within the aperture range of 30-50mm, the cyclops™ features a single mirror actuator, if needed housed within a dedicated mount block, ensuring precision and adaptability in optical systems for laser machines.

For the 3rd dimension, Newson offers ELEVathor™. ELEVathor™ is a linear actuator for precise lens adjustment, enabling alterations to the working distance, field size and focus spot size. Operating along the z-axis, this lens shifter provides a travel range of 4 mm with an exceptional position accuracy of 65nm. When seamlessly integrated with the rhothor™ deflection system, it forms a comprehensive 3D deflection solution, enabling simultaneous control of all axes. This configuration facilitates three-dimensional laser tracking, showcasing a high level of precision and coordination in laser applications.

For a typical 2D scanner, the essentials include:

- ✓ Chassis/base for mounting deflectors and f-theta lens
- ✓ Single-axis deflector + X size mirror
- ✓ Single-axis deflector + Y size mirror
- ✓ Steering electronics

Newson supplies:

- ✓ Fully mounted 2D + 3D laser scanners: 2D-MSA and 3D-MSA
- ✓ Downloadable chassis designs for customization to company style and machine concept: RTBM and lens mounts RTLM in different heights
- ✓ Actuators to build into the chassis which design meets the machine builder's requirements.

Actuators : Single Axis Deflectors rhoTHOR™ RTA/RLA

- For apertures ranging from 10mm to 35mm
- With or without mirror (autotune functionalities are standard available)
- Integrated amplifier + regulator
- 1 coax (SMA) for 12V PWS and data (10 Mbit/sec bidirectional)
- Very low power consumption (typical 2 Watt!)
- Patented moving coil technology
- Fully certified
- Compact design for flexible design rules

Actuators : Single Mirror Dual Axis Deflector cyclops™ CYA

- Standard 1.5" or 2" mirror
- Integrated axial air flow mirror cooling
- Integrated amplifier and regulator
- 2 coaxial connectors
- PWS 12V, typ 300 mA (= only 3.6 Watt for aperture 40mm system!)
- Patented position sensing technology
- Fully certified
- Very compact and lightweight

Actuators : Focus Shifter ELEVathor™ ELA

- Clear aperture 20mm
- Moving lens: 25mm, 15mm, 1", 0.5" Edge: 2-5 mm
- Mechanical travel: 4mm
- Fixed lens: 25mm, 1" Edge: 2-5 mm
- Integrated amplifier and regulator
- 1 coax (SMA) for 12V PWS and data (10 Mbit/sec bidirectional)
- Patented position sensing technology

2. Freedom of Control

Offering Unparalleled Control Flexibility

When it comes to deflector control, Newson empowers the machine builder with an unparalleled degree of freedom. Choose the preferred method, aligning seamlessly with the system requirement.

1. **By 3rd Party Electronics:** opt for the versatility of third-party electronics, leveraging the open protocol of Newson's deflectors. This option ensures compatibility and integration with a wide array of systems, allowing the machine builder to tailor the control mechanism to their specific needs.
2. **By the Standard XY2-100 Protocol:** harness the precision of the XY2-100 protocol using Newson's dedicated front end, available in both 16 and 18-bit configurations. This standardized approach provides a reliable and well-established method for deflector control, ensuring seamless integration into machine builder's setup.
3. **By Analog Signal:** Embrace the analog realm by employing Newson's analog front end. This method offers a classic yet robust approach to deflector control, allowing for fine-tuned adjustments and customization to suit the nuances in machine builder's application.
4. **By Connecting with 3.3 V logic, FPGA, PLD, DSP, and more:** Enter the digital domain with the flexibility to connect via 3.3 V logic, FPGA, PLD, DSP, and other electronic interfaces. Utilize Newson's power data merger to seamlessly integrate these technologies, providing a comprehensive solution for precise and dynamic control.
5. **Or, the Obvious Choice, by Employing Newson's Control Electronics: PCB Hybrids:** Opt for the convenience and reliability of Newson's control electronics. Newson's PCB hybrids offer an integrated solution designed specifically for deflector control providing a streamlined and efficient means to the laser system performance. Notably, they're fully certified, ensuring adherence to industry standards and reinforcing their reliability in diverse applications.

Newson supplies:

- ✓ open protocol of the deflectors
- ✓ XY2-100 front ends (RTFE-D15D) / back ends (RTBE-D25D)
- ✓ Analog front ends (RTFE-D15A)
- ✓ Power data merger front ends (RTFE-PDM)
- ✓ **PCB hybrids (CUA32-FE and CUA32-TGT):** more details in next chapter

In every scenario, Newson ensures that the machine builders retain the autonomy to shape the deflector control system according to their unique specifications. Whether it's analog or digital, direct or via electronics, the choice is at the machine builder, offering a level of control flexibility that sets Newson apart in the realm of laser system solutions.

3. Freedom to Create Electronics

Choosing Newson's control electronics provides machine builders with the flexibility to utilize the electronics as standalone modules or seamlessly integrate Newson's PCB control hybrids into their own electronics systems. The advantages of opting for these hybrids are numerous:

1. Development of Proprietary Control Cards:

Embrace innovation by integrating our PCB hybrids into your own electronics, enabling the development of proprietary control cards tailored to the specific machine requirements. This approach allows for a high degree of customization, ensuring optimal performance in line with machine builder's unique application needs.

2. **Maximal Flexibility:** The PCB hybrids offer maximal flexibility thanks to their compact size. By minimizing the dimensions of the hybrids, Newson empowers machine builders with the freedom to design and implement intricate control systems without sacrificing valuable space. This aspect is particularly advantageous in applications where space is a critical consideration.

3. **Integration in Hand Held Devices:** Harness the power of compact design by seamlessly integrating Newson's PCB hybrids into handheld devices. The small size of the hybrids facilitates their incorporation into portable systems, opening up possibilities for applications that demand mobility without compromising on the precision and control by Newson's technology.

Specifications of these PCB hybrids include:

- Controls 3 deflectors (20 bit) + 3 table stages (pulse/dir)
- Supports on-the-fly and hybrid marking
- Analog + digital outputs for laser and peripherals
- 12V PWS
- 24V IO's (sourcing 300mA, 300 nsec switch time, inductive load support, integrated ESD protection)
- High frequency (40MHz) laser output + speed modulation
- Up to 8 units (8*3 deflectors + 8*3 table stages) as a result: **48-axis controller!**
- Small size PCB board (half the size of a credit card)
- Bridges the steering electronics with main machine computer
- Galvanically isolated USB
- internet (TCP-IP/UDP)
- UART (RTS/CTS support)
- CAN (master mode)
- Flash memory for stand-alone operation
- Even smaller size PCB board (a third the size of a credit card)

Newson supplies:

- ✓ Ready to use, fully certified, DIN rail mountable controllers (CUA32-MST-AC, CUA32-SLV-AC, CUA32-MST-DC, CUA32-SLV-DC, CUA32-RF)
- ✓ PCB hybrids (CUA32-FE, CUA32-TGT)
- ✓ Open schematics of Newson's controllers as guide

4. Freedom of Software

Unlocking Versatility: Exploration of Newson's Comprehensive Software Options

When it comes to software, Newson provides machine builders with a spectrum of options, each tailored to elevate control and customization. These offerings empower users to harness the full potential of Newson's cutting-edge technologies. Let's delve into the details of these software options:

1. rhothor DLL

A Symphony of Commands – Creativity Unleashed

A DLL file, short for Dynamic Link Library, is a file type that comprises instructions that other programs can call upon to do certain things. Software engineers of machine builders can write their own software code, calling/using the functionalities of this DLL. This feature not only provides unmatched flexibility but also empowers machine builders to craft their own software solutions tailored to their precise needs.

- ✓ License free open-source software.
- ✓ No penalties when selecting Newson's control electronics.
- ✓ Boasting over 150 commands, the rhothor dll is a powerhouse for controlling various aspects. From moving deflectors and tables stages to configuring analog and digital IOs, for moving deflectors, moving table stages, setting analog and digital IOs, activating on-the-fly functionalities, setting laser parameters, and even activating beam shaping and Lissajous style wobble, auto aligning with track movement, allowing analog power modulation during wobble, powering by speed modulation, and more – its capabilities are vast and versatile.

2. Configuration Software: rhothor exe

- ✓ An executable designed for seamless system configuration.
- ✓ Allocate IO's, fine-tune deflector dynamics, calibrate laser scanner, verify deflector behaviour, and more. The rhothor exe provides a user-friendly interface for efficiently configuring machine builder's laser system.

3. Graphical Software Development Kit flight SDK *Where Creativity Takes Flight*

Newson's flight SDK is not just a software development kit; it's a gateway to unparalleled creativity. Designed as a laser marking software toolbox for integrators, it offers 2D, layered 2D, and 3D support, extensive import features, adaptive wobble support, and open-source templates for languages such as VB.NET, C#, C++. Flight SDK supports CUA32 controllers, and is based on rhothor DLL.

- ✓ License free open-source graphical software development kit
- ✓ Steers the deflectors based on graphical data stored in various formats, including Bitmap files, True type fonts, DXF (2D + 3D), Gerber and Excellon. The flight SDK unleashes creativity by allowing users to develop intricate graphical control schemes.

4. Open Protocol

Direct Control Unleashed

An open protocol granting direct control over deflectors.

- ✓ The protocol and communication schemes with the deflector are open, providing machine builders with unprecedented freedom.
- ✓ The protocol and communication schemes with the deflector are open, providing machine builders with unprecedented freedom. The smart deflector, powered by a single 12V power supply through a coaxial connection, utilizes serial data communication, exchanging set points and actual positions, modulated on the power signal. This unique approach ensures that the coax connector serves as both a data conduit and a power supply, streamlining the integration process.

In essence, Newson's software options not only provide powerful tools for control but also grant machine builders the flexibility to choose the level of customization that aligns with their specific needs. Whether it's unleashing a multitude of commands with rhothor DLL, configuring systems with rhothor exe, fostering creativity with flight SDK, or enjoying direct control through open protocol, Newson's software solutions pave the way for innovation and precision in laser system applications.

More information:

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Crafted by the Newson NV team, enriched with the innovative capabilities of OpenAI for a more engaging reading experience.

✓ Newson supplies:

All software modules available on Newson's website: www.newson.be/downloads.htm.

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