# Beamicon2 Portfolio

Advantages and applications of the
Beamicon2 CNC control

The Beamicon2 is a modern, innovative CNC control
with almost unlimited possibilities.

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# Purpose

The Beamicon2 is a combination of a PC software and hardware connected via Ethernet. The Beamicon2 is used to control machine tools of any kind, including special purpose machines.With the help of the Beamicon2, a machine tool of any kind can be controlled very easily and intuitively. No special requirements are placed on the control PC.

What types of machines are supported?

In principle everything that has a maximum of 9 axes. These can be milling machines, plasma systems, lasers, lathes, saws, handling machines, wire cutting machines, wire bending machines, water jet cutting machines or any other type of special machine.

## Why Beamicon2?

- ✓ Network connection -> industrial standard with highest reliability
- ✓ industrial design and construction (interference-resistant and robust)
- ✓ Galvanically isolated
- ✓ Short circuit proof
- ✓ The Beamicon2 has an extremely powerful hardware controller that handles all time critical tasks. The PC is not required for this.
- ✓ Stepping frequency up to 1600Khz (1.6MHz) per axis
- ✓ Dynamically calculated S-shaped ramps, jerk limits, acceleration limits.
- ✓ There are no step losses, even if the connection to the PC is lost
- ✓ no IP configuration necessary Plug&Play
- ✓ many import filters and G-Code editor
- ✓ Handwheel support, also from third parties

## A short overview of most features:

- ✓ Ethernet connection
- ✓ fully automatic hardware recognition
- ✓ no dedicated network connection required, can be integrated into the network
- ✓ max. 9 axes interpolated *
- ✓ maximum 1600kHz step frequency
- ✓ System for Windows (XP-Win10) and Linux (Debian), also BananaPI
- ✓ Graphical 3D display of the tool path
- ✓ All machine settings im/exportable, also partial quantities
- ✓ Processing of DIN-ISO G-Code
- ✓ Import from DXF/HPGL
- ✓ Import of graphics/images for engraving
- ✓ optimized path preview with jerk limitation, adjustable lateral acceleration and S-shaped ramps
- ✓ Adaptation of the speed to the course of the curve
- ✓ Improved surface quality through reduced jitter when interpolating multiple axes
- ✓ Tool management with radius and length compensation*
- ✓ Unlimited number of tools*
- ✓ Extensive macro language with loops and variables

- ✓ Extensive calculations like ASIN, ACOS, TAN, ATAN, ROUND, EXP, LOG in G-Code possible
- ✓ Preview of the machine running time
- ✓ Feed and spindle override 0-150% during machining
- ✓ Adjustable jog speeds
- ✓ Offset management (G53, G54-G59, parking, temporary offset)
- ✓ Automatic rotation axis for tangential knives
- ✓ Automatic drum engraving
- ✓ Speed output PWM/0..10V
- ✓ unlimited number of inputs/outputs (with extension module)
- ✓ Dual drives (master/slave) on all axes
- ✓ Handwheel with network connection
- ✓ External MPG/Handwheels and remote controls**
- ✓ Images Engraving function
- ✓ freely definable hotkeys
- ✓ freely assignable hotkeys to hardware inputs
- ✓ Built-in update function
- ✓ Support request at one button push
- ✓ extensive log functions*
- ✓ Built-in user managment*
- ✓ Open GL optimization
- ✓ MDI line, multiple commands
- ✓ Styrofoam wire cutting (XY+UV axes)
- ✓ Backlash compensation
- ✓ short-circuit-proof outputs
- ✓ Range monitoring of the axes (soft limit)
- ✓ Integrated G-Code editor with syntax highlighting
- ✓ Camera support for up to 10 cameras**
- ✓ Minimum quantity lubrication MMS direction controlled (via 4 valves)
- ✓ Maintenance interval programmable*
- ✓ Central lubrication supported (interval etc.)*
- ✓ Freely programmable macros*
- ✓ Freely programmable cycles*
- ✓ Support for many languages
- ✓ Reference switch position freely selectable (start/end/center)
- ✓ CV mode extensively configurable (chord error, acceleration)
- ✓ Tools can limit the maximum speed (e.g. edge finder)*
- ✓ Built-in digital logic*
- ✓ Built-in PLC*
- ✓ Redundant safety circuit
- ✓ Security door with setup mode
- ✓ Definition of prohibited areas, e.g. tool changer in the work area*
- ✓ Startup and stop macros to perform specific tasks*
- ✓ Automatic loading of the last program (can be switched off)
- ✓ Monitoring of directories and automatic loading
- ✓ Adjustable from mm to inch
- ✓ Macros for height measurement and center finder integrated*) Not with Beamicon2-Basic**) additional option with costs

## Existing software Beamicon2

**(default)** with a simple, clear interface
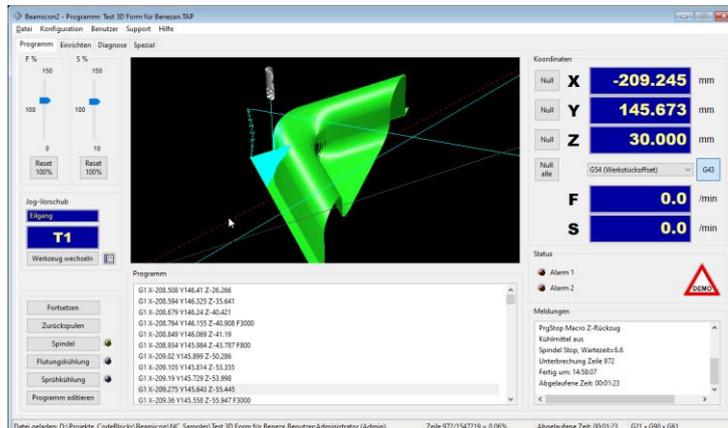


**Beamicon2T (touch)** with a graphical user interface, optimized for touch screen
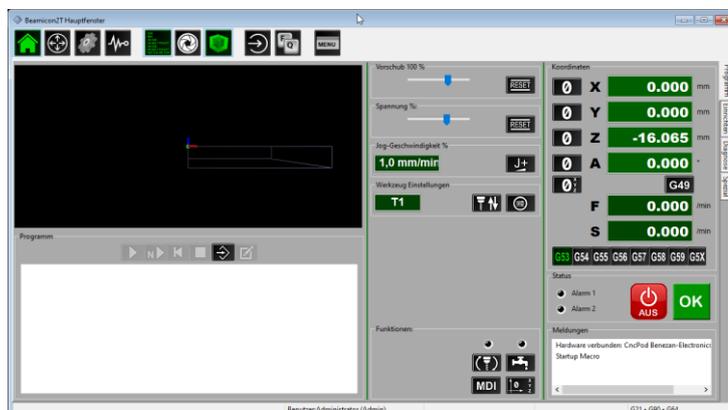


**Beamcion2B (Basic)** with a graphical user interface, displayed advertising and restrictions



**Additional Software Options**:
Option for camera use (fee required)
Option for third party hand wheels (fee required)
Option full version for Beamcion2B (Basic) (fee required)

# Existing hardware

### Micropod

An Ethernet controller with one LPT output. Various inexpensive breakout boards can be connected to it. Also integrated complete power amplifiers, like the Triple-Beast.

Only works in combination with the software Beamicon2B (Basic). A very inexpensive entry-level version. With the option full version the advertising can be switched off and all functions are unlocked.
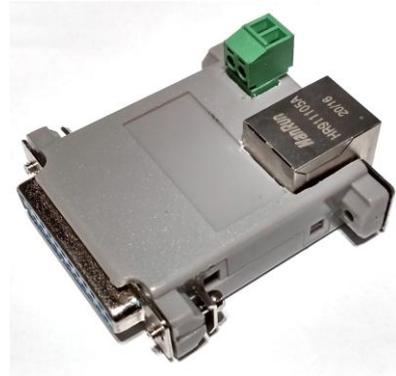
**CNC PodAn** Ethernet controller with two LPT outputs. Various inexpensive breakout boards can be connected to it. Also integrated complete power amplifiers, like the Triple-Beast.There are extensions to be able to use the 2nd LPT board and also an extension for plasma cutting THC-Control.Works with all software variants.

### Netbob1

A breakout board with integrated Ethernet controller. The small version of the breakout board supports up to 4 axes, a 0..10V output for the spindle, has 2 relays for switching consumers, an output for a holding brake and 4 inputs for reference switches. Also an emergency stop entrance. Operating voltage 24V (industrial standard)Works with all software variants.
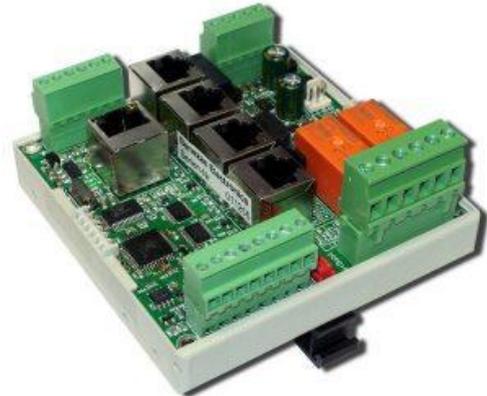
### Netbob2

A breakout boardwith integrated Ethernet controller. It supports up to 6 axes, 9 outputs 24V, 16 inputs (24V), emergency stop input, output for holding brake, jam and enable outputs for the power stages. The power amplifiers are controlled with differential signals. (clock +-, step +-), which greatly increases safety (industry standard).The board is operated with 24V. Works with all software variants.

### I/O-Ext

An expansion board with Ethernet controller. It has 8 inputs and 8 outputs for 24V. The outputs can alternatively be used as inputs, so that you have a board with a maximum of 16 inputs. The outputs are protected against reverse polarity and short circuit. (industry standard) Works with all software variants.

### Triple-beast net

The Triple-Beast Net is a complete stepper motor power amplifier for 3 axes with an integrated Ethernet controller. Alternatively an additional 4th power amplifier can be connected. It has 4 inputs for reference switches, 1 emergency stop input, 2 relays for switching consumers, an output for a holding brake and a 0..10V output for the spindle. The output stages can delivera maximum of 5A at a maximum supply voltage of 55V. The Triple-Beast has a heat sink and is short-circuit protected and has a temperature monitor.Works with all software variants.

## Hardware for use with Micropod and CNC-Pod:

### Breakout Board

A breakout board with LPT interface. The version of the breakout board supports up to 4 axes, a 0..10V output for the spindle, has 2 relays for switching consumers, an output for a holding brake and 4 inputs for reference switches. Also an emergency stop entrance. Operating voltage 24V (industry standard)The CNC-Pod or Micropod can be connected directly to the LPT port and you have a breakout board with Ethernet interface.
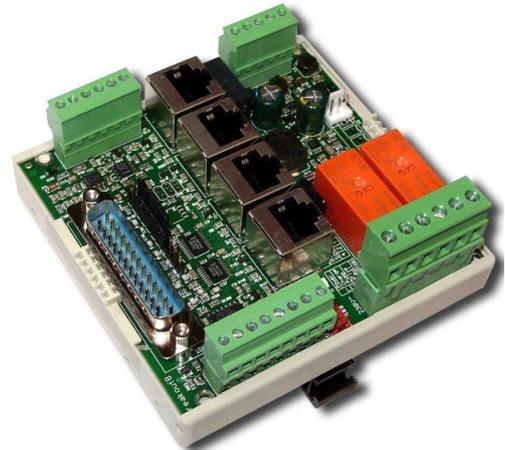
### Triple Beast

The Triple-Beast is a complete stepper motor power amplifier for 3 axes with a LPT port interface. Alternatively an additional 4th power amplifier can be connected. It has 4 inputs for reference switches, 1 emergency stop input, 2 relays for switching consumers, an output for a holding brake and a 0..10V output for the spindle. The output stages can delivera maximum of 5A at a maximum supply voltage of 55V. The Triple-Beast has a heat sink and is short-circuit protected and has a temperature monitor. You can connect a Micropod or CNC-Pod directly to the LPT port.

**Breakout boards and power amplifiers with LPT interface from other manufacturers**

There are a large number of breakout boards from other manufacturers available on the market. Many of these can be used immediately without restriction with the micropod or CNC pod. Prices for a breakout board start at around 11€. There are also different power amplifiers with 3 axes and LPT port interface for starting from 70€. In combination with the Beamicon2B (Basic) and the Micropod this is an extremely inexpensive entry level version. However, these simple breakout boards have no short-circuit protection and usually only work with 5V and not 24V. Simple stepper motor output stages often have no resonance damping and are not sinoidally controlled, i.e. the stepper motors make loud noise when moving and can therefore lose steps. Also the temperature management is bad and the power amplifiers often become very hot. These side-effects are not a lack of quality due to the products of the Beamicon2 series.
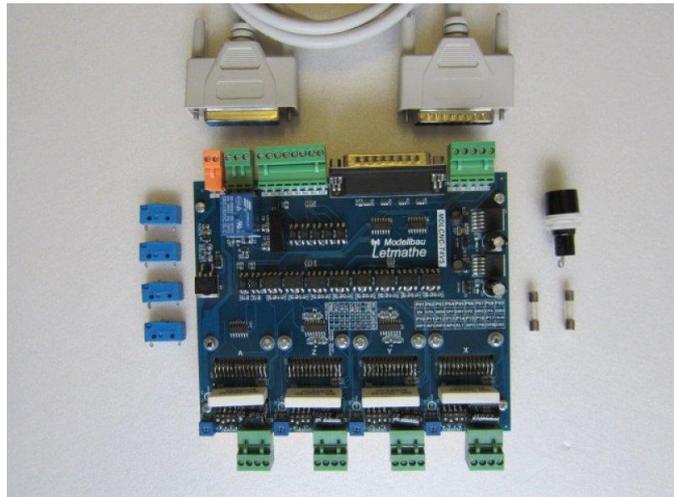
## Postprocessors

The question of a suitable prost processor is always essential. The Beamicon2 supports **G-Code according to DIN/ISO RS274**. This means that almost all CAM programs that output G-code according to this standard can be used. These are, for example, all Fanuc postprocessors. But many CAM also support Beamicon directly, for example

- ✓ **Autodesk Fusion 360 and HBM**
- ✓ **Solidworks 2019**
- ✓ **Vectric VCcarve**
- ✓ **CondaCAM**
- ✓ **Filou**
- ✓ **SheetCAM**
- ✓ **RhinoCAM**
- ✓ **SmartWOP**

## Machine manufacturers and system integrators

Beamicon2 can be customized (subject to a fee).

An interesting feature for machine manufacturers is the possibility of creating finished configurations. This allows the customer to simply switch on the machine, select the appropriate type and start working. So real plug & play.The design of the user interface can also be adapted or functions for special machines can be implemented (subject to charge).

Just ask us, we will advise you without obligation.