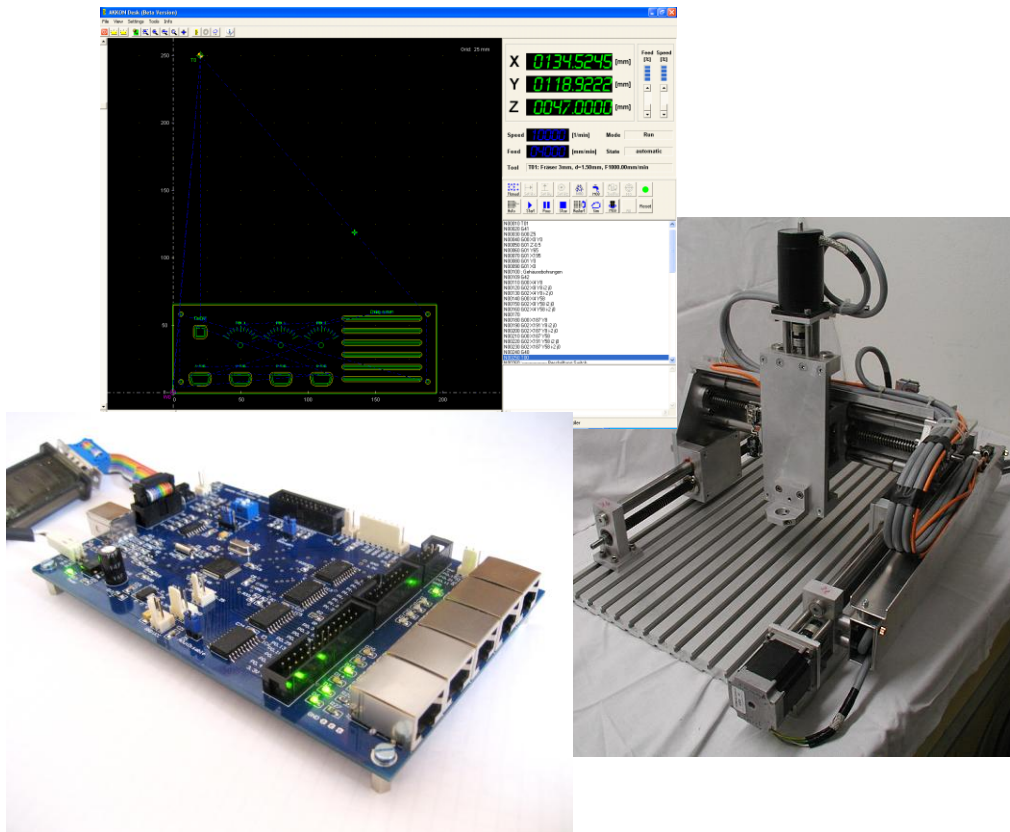


# AKKON CNC SYSTEM

## Using AKKON controller board Datasheet



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### Table of versions

Version	Date	Remarks
1.0	02.06.2008	first version
1.1	22.06.2008	Improving document
1.2	21.12.2008	Extended document

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### 1 Introduction

This document outlines a short description of the AKKON CNC (Computer Numeric Control)-system. The AKKON CNC System is a software and hardware solution for controlling four axis CNC machines. Typical applications are e.g. PCB drilling machines, 2-1/2D milling machines or plasma cutters but the software can also be used for CNC-lathes. The AKKON CNC System consist of the AKKON Desk CNC software, the AKKON USB Controller Board that works as CNC controller as well as the power unit and output driver hardware. In the current state controlling of 2-1/2D milling machines is supported. Figure 1 shows the concept of the AKKON CNC System.

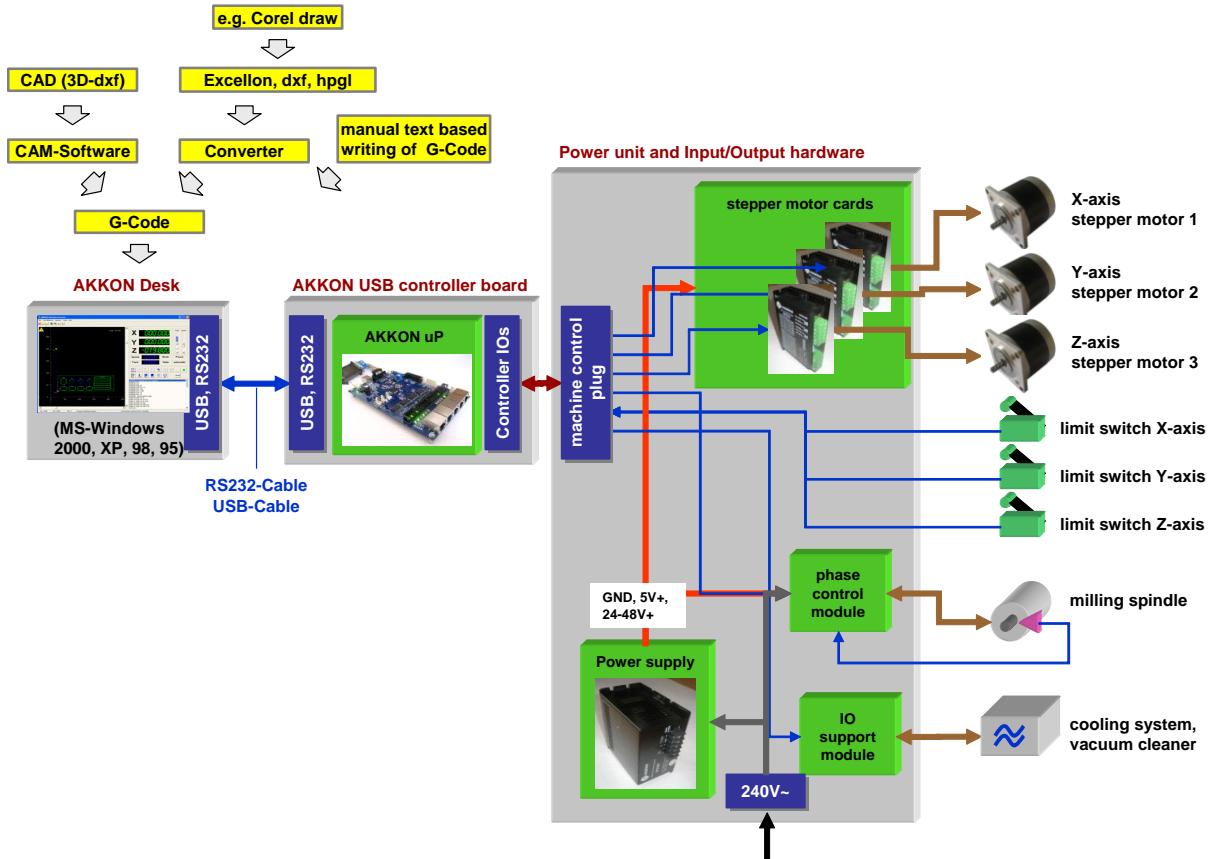


Figure 1: Concept of the AKKON CNC System

### 2 AKKON CNC System

The AKKON CNC System supports two types of controller boards. Either the AKKON USB Controller Board based on PIC18F4550 or the newer AKKON USB Controller board based on LPC2148 ARM7 microcontroller.

#### Key features of the AKKON CNC-system

- Processing of a set of DIN66025 G-Code (G00, G01, G02, G03, G40, G41, G42, M3, M08, M30 etc.)
- Additional G-Code-macros for rapid programming of standard-shapes e.g. rectangular rounded pocket, sub-d-pocket, engraving, drilling available

- 3D-wire model G-Code viewer with zoom functions and real time simulation
- Real time controlling of speed, feed and other parameters during operation
- Control of two different turrets with very flexible steering using G-Code commands
- Automatic tool measurement (currently under development)
- Rapid motion with smooth control of motors
- Manual and automatic mode of controlling 2-1/2D CNC-machines
- Very flexible definable tool change using G-Code commands
- Turret control with a second AKKON Controller board (control of further four help axis)
- Dialog oriented setup of software and hardware
- Setup-program available
- AKKON Desk has been tested on Windows 2000 and Windows XP

### 3 AKKON Desk

AKKON Desk is a Microsoft windows application that is able to load G-Code-files, calculate the cutting path, visualize the result and sends control commands to the AKKON USB controller. The application supports manual and automatic operation mode. Using manual operation mode, the user can steer a CNC machine using the PC keyboard. In automatic mode CNC-programs can be executed automatically. On every stage the user is able to pause or interrupt the program and changes processing parameters like feed, speed etc. Figure 3 shows the graphical user interface of AKKON Desk.

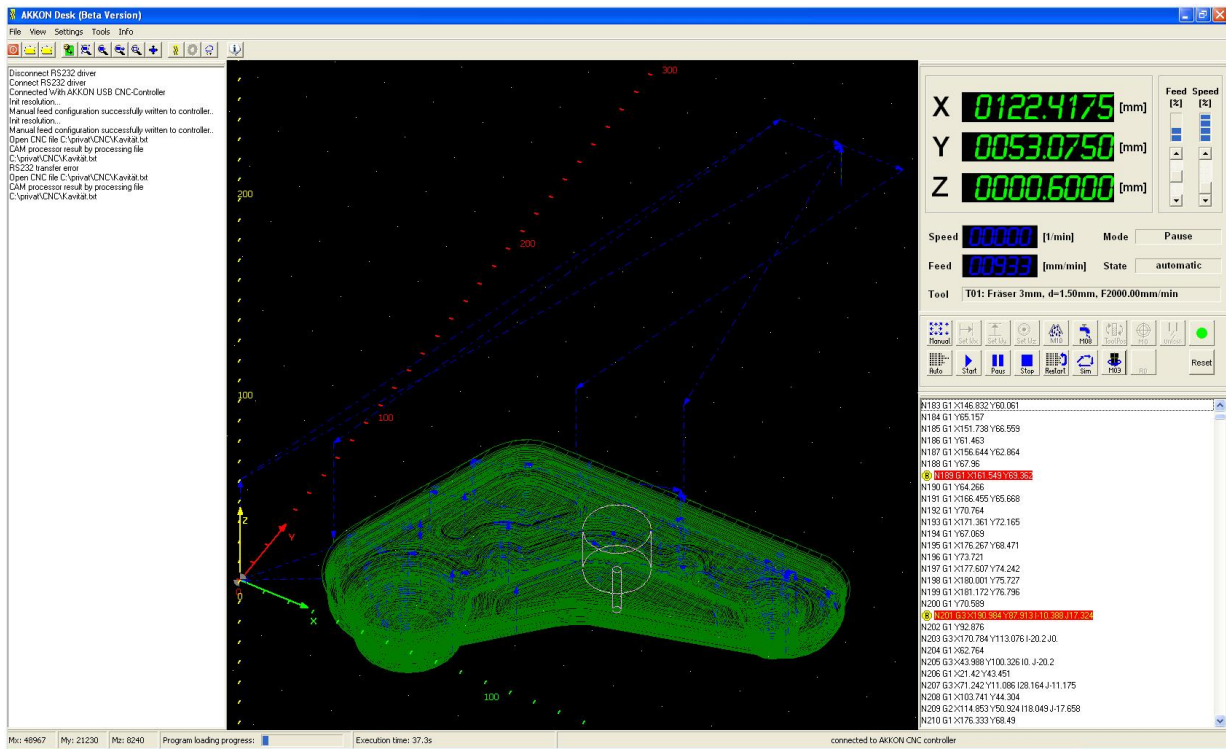


Figure 2: Screen shot of AKKON Desk CNC control software

#### 4 AKKON USB Controller Board

The AKKON USB Controller Board is specially designed as CNC control hardware. The board supports controlling of for axis CNC-machines. In the current state of development only three axis-control is supported. Figure 4 shows a picture of the AKKON USB Controller Board based on ARM7 LPC2148 controller.

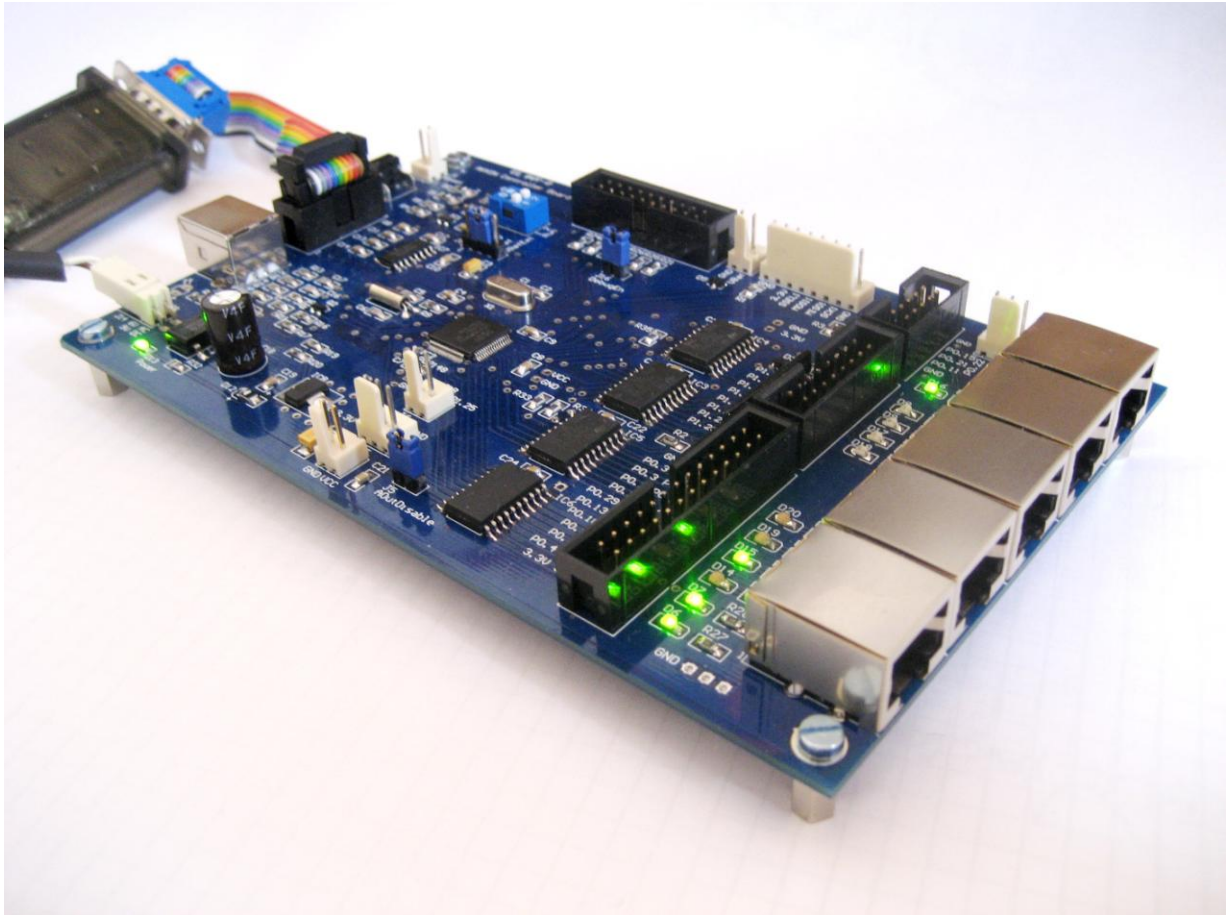


Figure 3: AKKON USB Controller Board

**Key features of the AKKON USB Controller Board**

- operation in micro-stepping mode (stepping frequencies up to 40 KHz)
- manual and automatic mode with smooth startup and break
- pulse with modulation output for main spindle control steering f-U-converters
- digital output for cooling system as well as vacuum cleaner or other devices
- digital input for pause control (e.g. used on plasma cutters as ready signal after ignition of the flame)
- common SPI-interface (current implementation for turret control in progress)
- eight digital inputs for motor axis (min, max) with Pullup-resistors (limit switches can be connected directly to the board)
- digital input for emergency button
- easy hardware installation (every axis has its own RJ45-plug as well as the spindle control), Different kinds of mounting possible
- firmware update using RS232 available, also by end user

- connection to PC using USB or RS232 (in the current version, RS232-control is supported but there is no lake on performance)
- 11 leds indicating current controller state
- Power regulator in board, board can also be power over USB

## 5 Disclaimer

### 5.1 *Limited Warranty and Disclaimer of Warranty*

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