
EN006 - DigiSpeed™ Selection Chart

The DigiSpeed range is designed to allow you to control the speed of your spindle motor from your CNC software. They do this by accepting a control signal from the CNC software and converting to an isolated DC control voltage suitable to the DC motor controller or VFD you are using.

The range of DigiSpeed controllers provides you with numerous options when choosing a controller for your VFD or DC motor controller. This Engineering Note summarizes the various features available and helps you choose the right DigiSpeed for the job.

Each DigiSpeed has been designed for a particular task, targeted for a specific use. Table 1 below provides a brief summary for each of the DigiSpeed controllers. For full details of a units features and functionality, please refer to the particular units user manual.

Table 2 below Provides a list of the features associated with each particular DigiSpeed unit. Use it to find the unit with the features you need and to ensure that it is compatible with your CNC control software.

<i>DigiSpeed</i>	<i>Description</i>
DC-01	<p>DigiSpeed. This was the initial DigiSpeed developed. It was designed to fit into a Sherline DC motor enclosure housing. It has an on-board switch to select between Auto and manual mode. In manual mode the original speed pot is used to control the spindle speed. There is a LED indicator to show that this mode is selected.</p> <p>It also has a multi-colored LED to indicate what is happening while under computer control. The connection to your controller breakout board is via a 6-pin mini-din connector. There is also available a matching mini-din breakout board.</p> <p>The DigiSpeed has a 3.5mm stereo connector to facilitate the connection of a spindle index sensor, which is then routed to your controller box via the mini-din connector and cable. This board has now been superseded by the newer DC-04 DigiSpeed-SL.</p>
DC-02	<p>DigiSpeed-XL. This unit has been designed for use with VFDs and the speed controllers found in many of the Asian import mills and lathes. It is the most versatile of the range with many options and features. In addition to the features found on the DC-01 DigiSpeed, it contains the following;</p> <ul style="list-style-type: none"> ● Spindle index sensor conditioning circuitry. - This circuitry, allows for simple raw sensors to be connected to the XL. It cleans up and filters the signal making it suitable to be fed into your controllers breakout board. ● On-Board Manual Potentiometer and Selection switch – The XL has an option to have these components mounted on the PCB. This means that the amount of wiring required is greatly reduced. ● On-Board Relays. - There are 2 small relays that can be used for spindle direction control, and for brake/ enable control.
DC-03	<p>DigiSpeed-GX. This unit has been specifically designed to interface to the Gecko G100 controller, which outputs the spindle control signal as a 0-5Vdc voltage. The GX converts this into an isolated 0-10V signal suitable for VFDs and other Speed controllers.</p> <p>The GX has the option for a DC/DC converter for instances where the spindle controller cannot supply the required isolated voltage supply. It also has an multi-turn attenuator for controlling the maximum voltage output, useful for limiting the spindle maximum speed.</p> <p>The GX can also be controlled via a PWM signal, making it a very cheap and basic converter</p>

<i>DigiSpeed</i>	<i>Description</i>
DC-04	<p>DigiSpeed-SL. The SL is very similar to the DC-01 in that it is designed to be installed into the Sherline DC Motor housing. It has the additional features of;</p> <ul style="list-style-type: none"> ● RJ-11 Sensor connector. This allows the Sherline Tacho encoder sensor (part No.81500) to be plugged directly into the unit. ● Index Sensor Conditioning Circuitry. As the tacho sensor is a raw sensor, this circuitry filters and cleans up the signal before passing it out via the 6-pin mini-din connector.
DC-05	<p>DigiSpeed-MC This DigiSpeed is a basic cut-down version of the DigiSpeed-GX. It accepts a PWM signal with a base frequency in the range of 2KHz to 100Khz. It is specifically designed to be driven from a ModIO unit or ncPod. The isolated Voltage output circuitry is identical to the DigiSpeed-GX.</p>
DC-06	<p>DigiSpeed-SD. This unit is designed to accept the Step/Dir signals from Mach3. It converts these into an isolated 0-10Vdc signal. The unit has the following features;</p> <ul style="list-style-type: none"> ● Two onboard relays. One driven by the Dir line, the other by the Enable line. These can be used for controlling the VFD or motor controller. ● Optional DC/DC converter. This converter can be used where the VFD or Motor controller cannot supply the required isolated power supply. ● Accepts Active Hi, or Active Lo inputs. ● Requires a single 5V supply.

Table 1: DigiSpeed Model Overview

<i>Feature</i>	<i>DC-01 DigiSpeed</i>	<i>DC-02 DigiSpeed XL</i>	<i>DC-03 DigiSpeed GX</i>	<i>DC-04 DigiSpeed SL</i>	<i>DC-05 DigiSpeed MC</i>	<i>DC-06 DigiSpeed SD</i>
Step/Dir Input						X
PWM Input (5-100Hz)	X	X	X	X		
Analog Input			X			
Up/Down Input	X	X		X		
Dir/Count Input	X	X		X		
HF PWM (2KHz - 100KHz)					X	
On-board Relays		X				X
On-board Manual/Auto Switch	X	X		X		
On-board Manual Potentiometer		X				
Connector for Manual Potentiometer Control.	X	X		X		
Optional DC/DC converter		X	X		X	X
Spindle Index Sensor Conditioning Circuitry		X		X		
Mini-Din Connector	X	X		X		
Voltage Output attenuation control		X	X			X
Programmable linearisation offsets	X	X		X		
Mach3 Parallel Port Compatible	X	X	X	X		X
Gecko G100 Compatible			X			
Smooth-Stepper Compatible	X	X	X	X		X
NcPod Compatible.					X	
TurboCNC Parallel Port Compatible	X	X	X	X		
EMC Parallel Port Compatible	X	X	X	X		X
ModIO Compatible	X	X	X	X	X	

Table 2: DigiSpeed Features

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