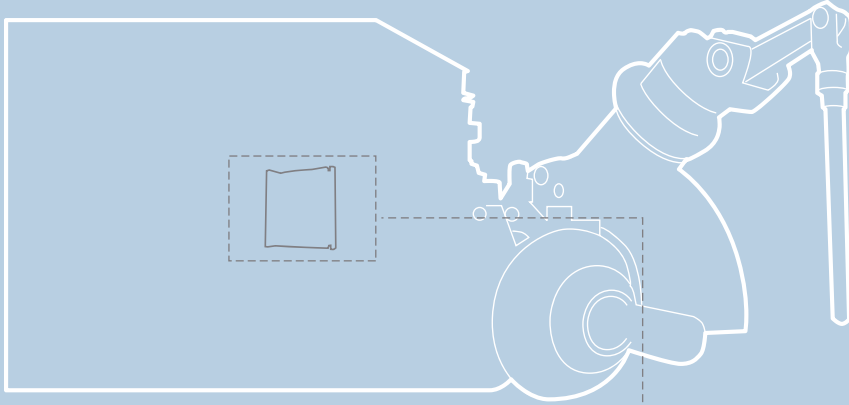
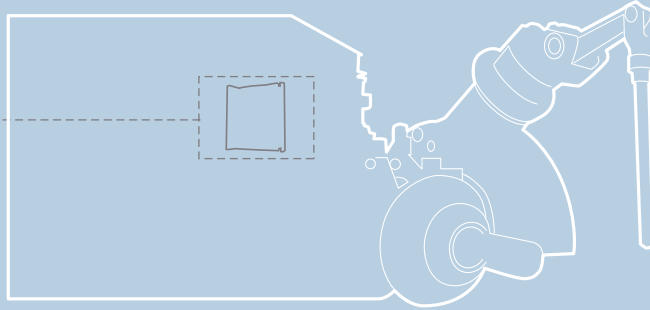




SILENTstep™



Hybrid technology
to get more from your Stepper motor.



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Hybrid technology to get more from your Stepper motor.

Agile Systems has developed SILENTstep™, a breakthrough hybrid technology drive for stepper motors. Without the need for encoder feedback, SILENTstep™ is able to eliminate stalling, reduce audible noise, and increase motor speed. This patent-pending control technology boosts stepper motor operation into the range of servomotor performance while maintaining the inherent simplicity of a conventional stepper motor drive system.

Key Features

- ❖ Breakthrough Hybrid Technology
- ❖ Decreases excitement of mechanical resonance
- ❖ Eliminates stalling
- ❖ Sensorless control method substantially reduces audible noise and increases motor speed while eliminating the need for encoder feedback
- ❖ Boosts stepper-motor operation into the range of servo motor performance while maintaining inherent simplicity of conventional stepper motor drive system.
- ❖ Operates stepper motors in a closed position loop without position sensors

Product Benefits

- ❖ Minimizes audible noise up to 75%
- ❖ Offers stall prevention and detection
- ❖ Increases usable motor speed
- ❖ Acceleration at full torque or torque limit
- ❖ No position loss during acceleration/deceleration or full speed
- ❖ Efficient use of power
- ❖ Slim down the amount of hardware needed to track position of motor
- ❖ Higher performance over traditional stepper motors

Typical Applications

Introduction

Agile Systems has developed SILENTstep™ a Hybrid controller that operates stepper motors at servomotor-performance levels, without using encoders for feedback.

Applications

- ❖ Low Cost Automation
- ❖ PCB Assembly Equipment
- ❖ Lab Automation
- ❖ Semi Fab Automation
- ❖ Packaging Equipment

Verticals

- ❖ Life Science
- ❖ Semiconductor
- ❖ Automation
- ❖ Photonics
- ❖ Automotive

Lab Automation

Today with the spread of viruses, hospitals and researchers need to react quickly. Lab automation equipment has become the tools that researchers and technicians rely on. This equipment has allowed them to run more tests, gather more data and produce solutions faster. Traditionally, engineers have relied on the reliability and price point of stepper motors to provide cost effective equipment. However, with the demand for more throughput, traditional stepper drives cannot meet the demand.

Cutting Tables

Existing cutting tables that use stepper technology suffer from three challenges – they are noisy, they stall, and have no feedback. SILENTstep™ reduces the noise issues that plague this type of machine due to the large inertial loads, mechanical links, stretched belts and changing load factors. Stalling, is the second element that is reduced with this technology. If a motor is heavily loaded, it will actually 'catch up' missed steps and increase the speed to get back to it's programmed state. SILENTstep™ has sensorless feedback that enables the drive to know where it should be at any given time. If the drive is overloaded, it will provide feedback to the machine.

The SILENTstep™ Hybrid stepper drives can meet these performance increases and maintain the price point of a traditional drive.

Retro-fitting Existing Equipment

In today's world, automation equipment is part of every day life. Also, time-to-market is critical as manufacturers have to build more efficiently and faster in order to compete. Agile Systems is providing products that allow for an increase in performance and less down- time without lengthy engineering projects. It is as easy as changing the traditional stepper drive to a SILENTstep™ and running the automated motor verification tool.

Software

Introduction

Agile provides software tools for configuring the SILENTstep™ controllers.

Application Software

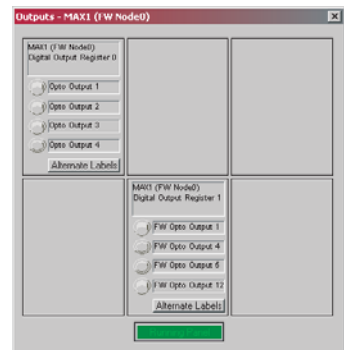
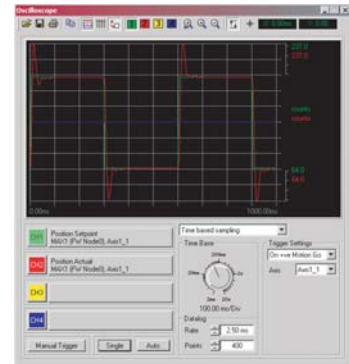
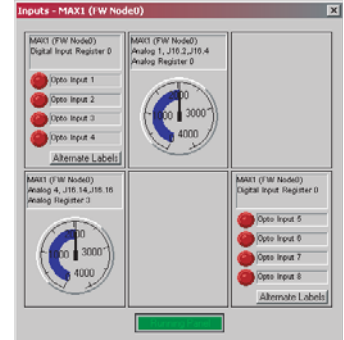
- DP•SS™ – Setup, tuning and application

DP•SS™ Tuning Tools

DP•SS™ is a Windows 2000/XP graphical environment which is used to setup and troubleshoot. The following list describes the key features:

- > Quickly set up the SILENTstep™ line of products and configure the controller
- > An oscilloscope tool to datalog system registers real time
- > Auto-calculates the optimum current loop settings which allows the use of any stepper motor
- > Advanced Tuning
- > View and set inputs and outputs
- > Motor Verification Tool

A comprehensive overview of DP•SS™ can be found in the DP•SS™ datasheet or in the DP•SS™ Help System.



Product Specifications

General Specifications

Type	Hybrid Stepper
Variants	1
Design Modularity	Pulse and Direction
Feature Flexibility	Software Selectable
Serviceability	Single axis design
Number Of Axis	1

Networking/Architecture

Architecture Options	Pulse and Direction
Peer to peer networking	No
Network Types	RS232 (Setup Only)
Theoretical Network Bandwidth	115.2 Kps
Real Network Bandwidth	100 Kps

Motor

Motor types	Stepper
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Memory/Programming

Memory Capability	Parameters
User Processing	None
Configuration	Stand Alone
Software	DP • SS™

User Inputs/Outputs

Opto Inputs	1 Enable
Differential Inputs	2- Pulse and Direction
Analog Inputs	None
Opto Outputs	2-Fault and Stall
High Current Outputs	None
Input position latch	None

Amplifier Options

Voltage	15-75V
Peak Current	7A

SILENTStep™ Electric/Electronic Specifications

Feature	Min	Typ.	Max.	Units
Supply Voltage	15	75	75	Volts
Supply Trip Voltage		86		Volts
Continuous Motor Current		7		Amp
Peak Motor Current		7		Amp
Pulse Frequency			50	kHz
Pulse Input Current			15	mA
Pulse Input Voltage			5.1	Volts
Pulse Trip Current		50		mA
Direction Input Current			15	mA
Direction Input Voltage			5.1	Volts
Direction Trip Current		50		mA
Enable Input Current			15	mA
Enable Input Voltage			5.1	Volts
Enable Trip Current		50		mA
Fault Output Response	1			msec
Fault Output Current			20	mA
Fault Output Voltage			5.1	Volt
Fault Output Trip Current		50		mA
Stall Output Response	1			msecs
Stall Output Current			20	mA
Stall Output Voltage			5.1	Volt
Stall Output Trip Current		50		mA
RS 232 digital TX			115	kBaud
RS 232 digital RX			115	kBaud
RS 232 Logic Voltage			5.1	V
RS 232 Logic Current			50	mA

Network I/O

Introduction

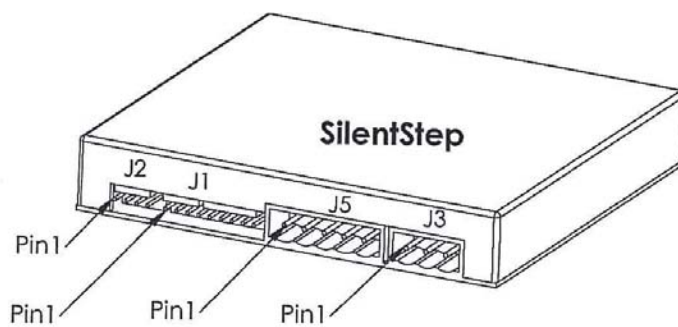
The Silentstep™ platform has the flexibility to communicate over a network

➤ RS-232

Network	Bandwidth	Overview
RS-232	115k KBps	Standard RS-232

SILENTstep™ has built-in RS-232 communication for set-up configuration and trouble-shooting.

SILENTStep™ Mechanical Drawing



Connector Pinouts

SILENTstep Connectors

Connector	Type	Pins
1	PHOENIX	3
2	PHOENIX	5
3	Molex Right Angle	9
4	Molex Right Angle	4

J1 Input Pulse / Output Connector

Pin	Function	Name
1	Motor Enable	Enable_In+
2	Motor Enable Return	Enable_In-
3	Pulse	Pulse_In+
4	Pulse Return	Pulse_I-
5	Direction	Direction_In+
6	Direction Return	Direction_In -
7	Fault Notification	Fault_Out
8	Stall Notification	Stall_Out
9	Fault / Stall Return	Out_Common

J2 Serial Connector Pinout

Pin	Function	Name
1	Ground	EXT_GND
2	RS232 Transmit	RS232_TX
3	5 Volt Supply	EXT_5VOLT
4	RS232 Receive	RS232_RX

J3 Power Connector Pinout

Pin	Function	Name
1	Motor Power Return	PWR_GND
2	Motor Power Supply	HV+
3	Shield	EARTH_GND

J5 Stepper Motor Connector Pinout

Pin	Function	Name
1	Motor Phase D	D_Phase
2	Motor Phase C	C_Phase
3	Motor Phase B	B_Phase
4	Motor Phase A	A_Phase
5	Shield	EARTH_GND

About Agile Systems

Agile Systems is a world leader in the design, development and manufacturing of advanced motion control technology including motor control and power conversion. Our team is highly skilled in integrating power electronics, digital controls and network communications into small, compact and cost effective packages.



AGILE SYSTEMS

575 Kumpf Drive
Waterloo, ON
Canada N2V 1K3

T (519) 886-2000
F (519) 886-2075
E info@agile-systems.com

agile-systems.com