Leadshine

Integrated Steppers
(Open-loop Stepper Systems)

Motor + Drive + Controller + Network

Integrated Steppers
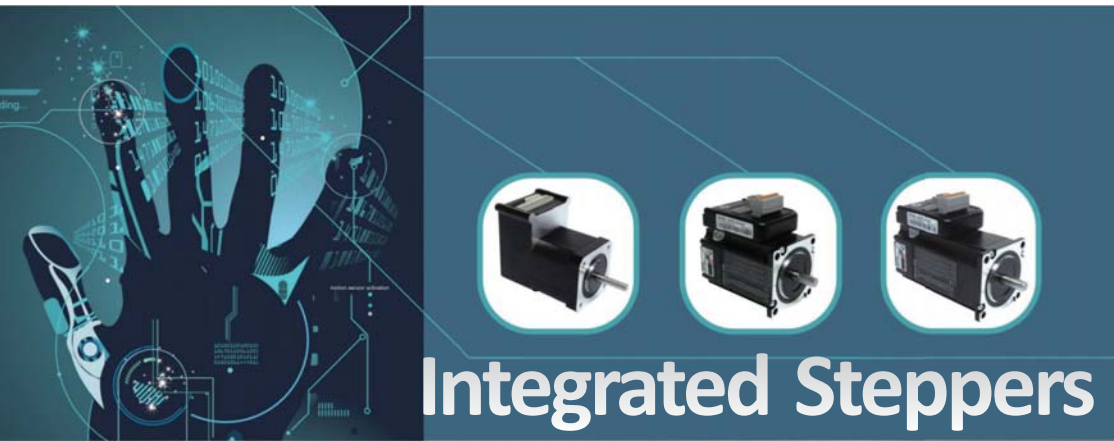
iST Series (Open-loop Stepper Systems)

iST Series Integrated Steppers

Features

- **Highly Integrated,** Stepper motor + advanced DSP stepper drive
- **Extra-low** motor noise
- **Anti-Resonance** optimizes torque and nulls mid-range instability
- **Multi-stepping** allows a low resolution input to produce a higher microstep output for smoother system performance
- Options to set output current and microstep resolutions via DIP switch or software
- Command input of PUL/DIR and CW/CCW
- Over-current, over-voltage, short-circuit protections

Integrated Stepper

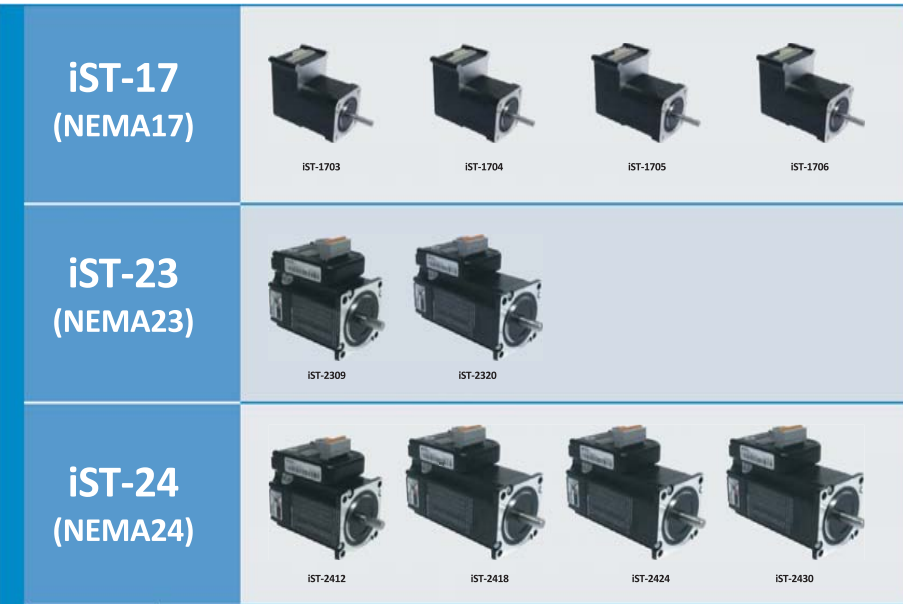| Extra-low Motor Noise	+	Lower Labor Cost	+	Lower Cable Cost	+	Save Mounting Space

Introduction

Leadshine's iST series integrated steppers are one of the most compact stepper systems available on the market. An iST integrated stepper has a stepper motor and an advanced DSP stepper drive. At very compact size and with all components integrated, the iST series steppers can save mounting space, eliminate encoder connection and motor wiring time, reduce interference, and lower cable and labour cost. Owe to its advanced DSP stepper drive, the iST series integrated steppers offer high starting torque, high precision and smooth movement, and extra low noise at low speed movement with no obvious resonance area. The drive takes step & direction commands, and is capable of outputting fault signals back to the master controller or external devices for complete system controls.

The iST series integrated steppers are suitable for applications require compact size, smooth movement, and extra low noise stepper systems, such as medical devices, dental mills, lab automation instruments, etc.

Part Number

iST – ☐☐ ☐☐ – ☐ – ☐☐☐

| iST: Integrated Stepper | Motor Frame Size 17: NEMA17 (42mm) 23: NEMA23 (57mm) 24: NEMA24 (60mm) | Holding Torque 03: 0.3 Nm 09: 0.9 Nm 20: 2.0 Nm ... | Communication Type Blank: Step & Direction R: RS485 C: CANopen | Custom or Special model number |

Overview

iST-17 (NEMA17)	iST-1703	iST-1704	iST-1705	iST-1706
iST-23 (NEMA23)	iST-2309	iST-2320		
iST-24 (NEMA24)	iST-2412	iST-2418	iST-2424	iST-2430

Specifications

Model		iST-17	iST-23	iST-24
Operating Voltage (VDC)		24	18 to 48	18 to 70
Holding Torque (Nm)		0.3, 0.4, 0.5 and 0.6	0.9 and 2.0	1.2, 1.8, 2.4 and 3.0
Operation Modes		Step & Direction, RS485 and CANopen		
Maximum Input Frequency (kHz)		500		
Protection Functions		Over-current, Over-voltage		
Inputs	Step & Direction	Step & Direction, Enable (differential)		
	RS485 / CANopen	4 digital inputs, 1 analog input (single-end)		
Outputs	Step & Direction	fault out (differential)		
	RS485 / CANopen	2 digital outputs (open collector)		
Storage Temperature		-20 $^\circ$C to 80 $^\circ$C		
Ambient Temperature		0 $^\circ$C to 50 $^\circ$C (Heat sink)		
Humidity		40%RH to 90%RH		

Please visit Leadshine's website at www.leadshine.com for the latest information about the iST series integrated steppers.

Operation Modes

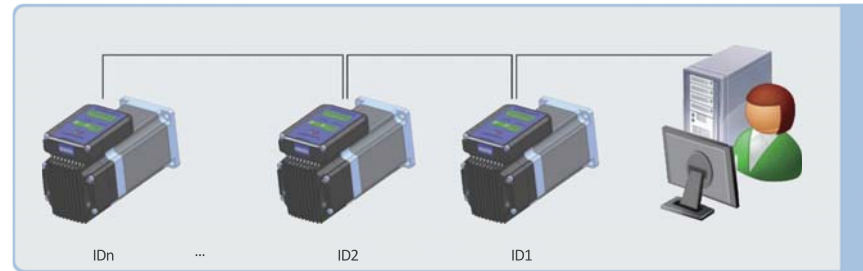### 1. Step & Direction

Motion Controller

Step & Direction
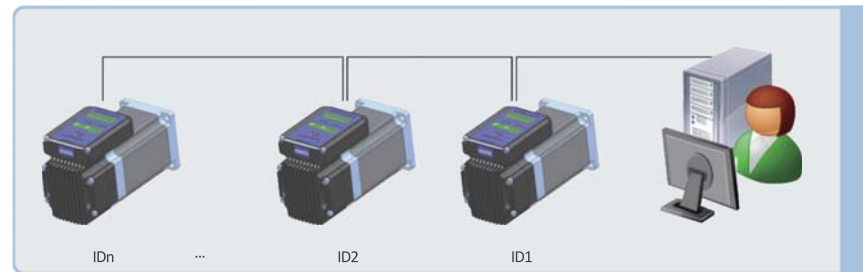CW / CCW Pulse
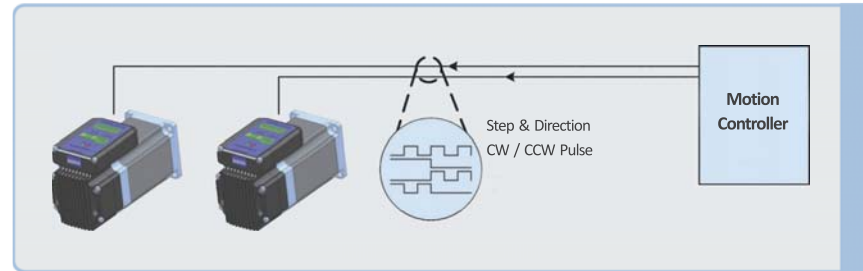
- Support step & direction and CW/CCW pulse commands
- Compatible with 5 to 24 V command signals

2. RS485

IDn   …   ID2   ID1

- One host up to 32 drives
- Can be used with either 2-wire (half-duplex) or 4-wire RS485 (full-duplex) implementation
- DLL is available for API function calling
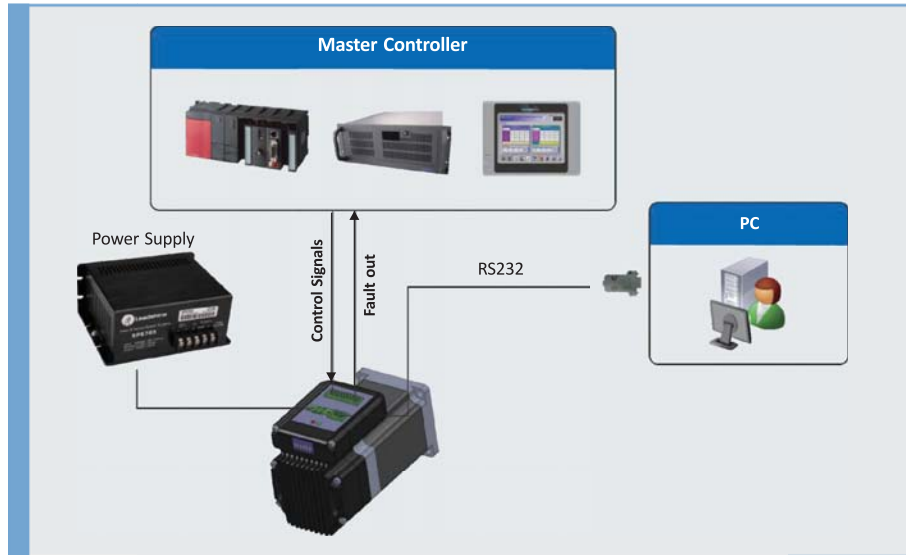- Easy to wire and build multi-axis systems
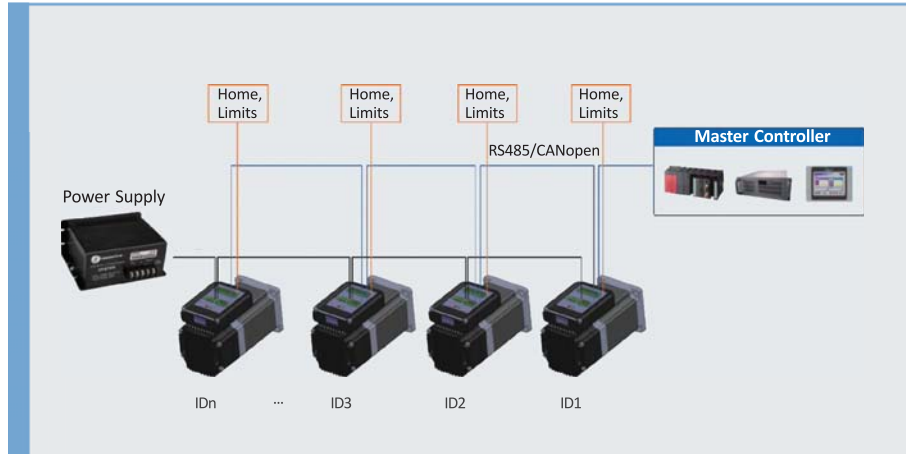
3. CANopen

IDn   …   ID2   ID1

- One host up to 127 drives
- CANopen standards: CiA Standard 301 (DS301), CiA Standard 402 (DSP402)
- Up t 1 Mbit/sec speeds possible
- Easy to wire and build multi-axis systems
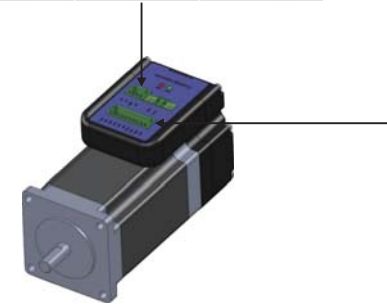
Typical System Configurations

1. Step & Direction

Master Controller

Power Supply

Control Signals

Fault out

RS232

PC

2. RS485 and CANopen

Home, Limits | Home, Limits | Home, Limits | Home, Limits

RS485/CANopen

Master Controller

Power Supply

IDn   ...   ID3   ID2   ID1

Pin Assignment

Model	Step&Direction	RS485	CANopen
iST-17	+5V	T+	CANH
iST-23	TX	T-	CANL
iST-24	GND	R+	CANH
	RX	R-	CANL
	GND	GND	GND

Model	Step&Direction	RS485/CANopen
iST-17	PUL+ PUL- DIR+ DIR- ENA+ ENA- PEND+ PEND- ALM- +VDC GND	IN1 IN2 IN3 IN4 OUT1 OUT2 VIN+ VIN- COM+ COM- +VDC GND
iST-23	PUL+ PUL- DIR+ DIR- ENA+ ENA- PEND+ PEND- ALM+ ALM-	IN1 IN2 IN3 IN4 OUT1 OUT2 VIN+ VIN- COM+ COM-
iST-24		

Speed-Torque Curves

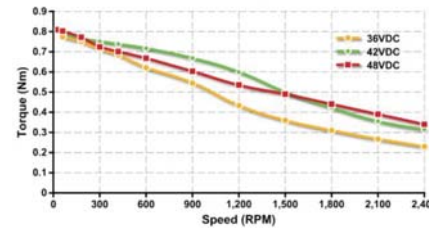

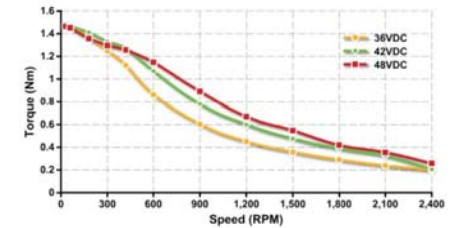Model: iST-1703, Resolution:3200steps/rev., Peak Current: 1.4 A — 24VDC
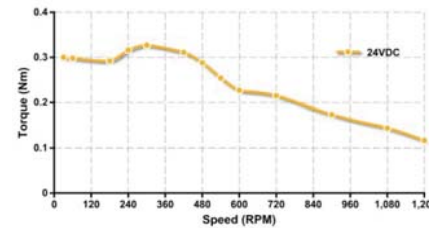
Model: iST-1706, Resolution:1600steps/rev., Current: Maximum — 24VDC, 36VDC
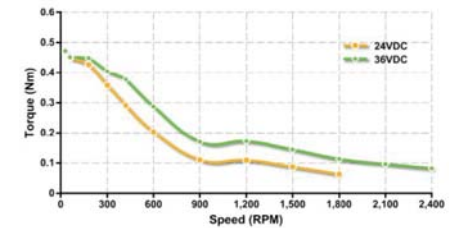
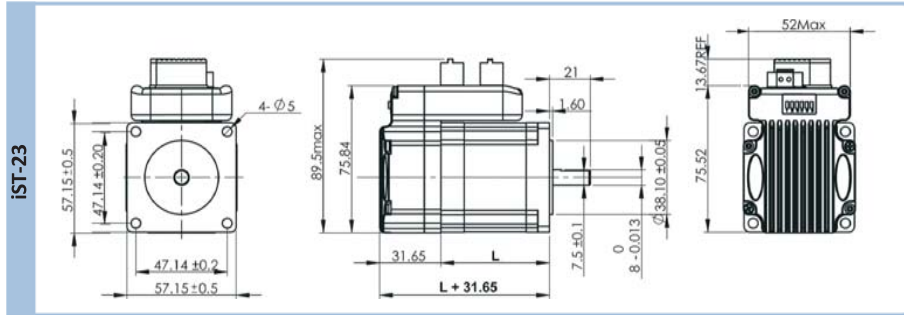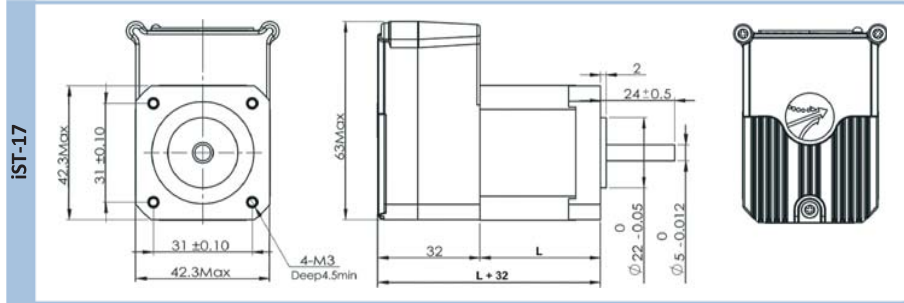Model: iST-2309, Resolution: 1600steps/rev., Current: Maximum — 36VDC, 42VDC, 48VDC

Model: iST-2320, Resolution:1600steps/rev., Current: Maximum — 36VDC, 42VDC, 48VDC

* Please contact Leadshine or visit www.leadshine.com for more speed-torque curves of other models.

Mechanical Specifications

iST-17

iST-23

Frame Size	Motor Body Length (mm)	Holding Torque (Nm)	Model
iST-17 (NEMA17)	L = 33	0.3	iST-1703-x
	L = 39	0.4	iST-1704-x
	L = 47	0.5	iST-1705-x
	L = 58	0.6	iST-1706-x
iST-23 (NEMA23)	L = 56	1.0	iST-2309-x
	L = 80	2.0	iST-2320-x
iST-24 (NEMA24)	L = 47	1.2	iST-2412-x
	L = 55	1.8	iST-2418-x
	L = 68	2.4	iST-2424-x
	L = 85	3.0	iST-2430-x