LAM Technologies
electronic equipment

DS5x series

Programmable drives with

USB - RS232 - RS485

### interface and

Modbus-RTU

communication protocol

The DS5x two phase stepper motor drives series is composed of 27 different models, divided in 9 power sizes and 3 different interface types: DS50→RS485, DS52→RS232, DS54→USB. The communication interface is insulated from the power supply to grant reliability and noise immunity.

The chosen communication protocol is the Modbus-RTU industrial standard which offers good performances at low costs. Through the commands set provided by the protocol, the master device (PC, PLC, etc.) is able to access in real time to the drive registers and to the user's variables, freely declarable during programming, which can represent a data exchange area between the master device and the user's program in execution in the drive.

The programming capability and the flexibility offered by the available programming blocks (which also include mathematical blocks) together with the many I/O resources which the drive is provided with, allow to simply realize applications with decentralized intelligence which relieve the master from the most onerous real-time activities and reduce the data traffic on the communication bus.

✓ Modbus-RTU communication protocol
✓ Insulated USB, RS232 and RS485 interface
✓ Driver USB for Linux and Windows (98, SE, Me, 2K, XP, VISTA and 7) 32bit and 64bit
✓ Registers and user's program variables accessible through the bus
✓ **Up to 3000rpm at 1/128 step/rev**
✓ Mathematical functions at 32bit
✓ Speed or position control
✓ Independent acceleration and deceleration ramps
✓ Absolute or relative positioning
✓ 4 digital and two +/-10V analog inputs
✓ 2 digital and one 0-10V analog ouputs
✓ 100KHz high speed counter
✓ AC power supply models available
✓ Optocoupled and differential I/O, independently NPN or PNP usable
✓ Inputs from 3Vdc up to 28Vdc
✓ Line driving supported
✓ 11 bit analog inputs resolution
✓ 32bit quote registers from -2,147,483,638 to +2,147,483,647
✓ Resonance damping
✓ Automatic current reduction
✓ High efficiency power mosfet stage
✓ Complete diagnostics with univocal indication for each anomaly
✓ Over/under voltage protection, short circuit protection (cross phase, ground and positive supply)
✓ Overheating protection
✓ Break motor phase diagnostics
✓ Compact size
✓ Easy DIN rail installation
✓ Removable terminal block connector
✓ IP20-compliant construction
✓ Cost-effective

Wide voltage and current ranges

240Vdc 10Arms

POWER

18Vdc 0.3Arms

I

V
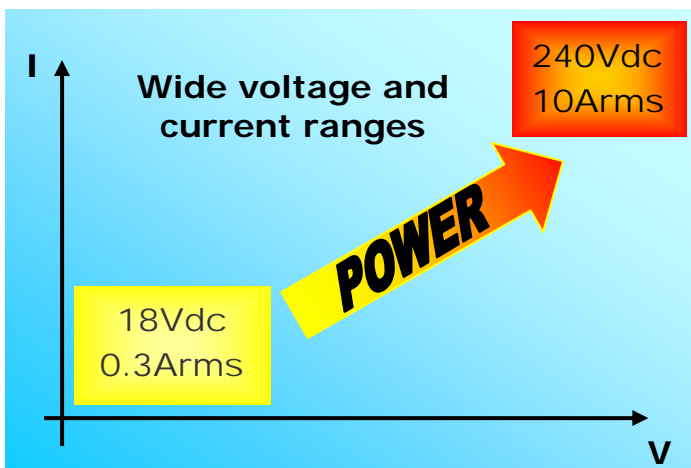
Symbol	Description		Value			Unit
			Min	Typ	Max	
Vp	Power supply voltage (for DC models)	DS5x41(A)	18		50	Vdc
Vac	Power supply voltage (for AC models)		16		36	Vac
If	Motor phase current (**rms**)		0.3		1.4	Arms
Vp	Power supply voltage (for DC models)	DS5x44(A)	20		50	Vdc
Vac	Power supply voltage (for AC models)		18		36	Vac
If	Motor phase current (**rms**)		1		4	Arms
Vp	Power supply voltage	DS5x48	20		50	Vdc
If	Phase current (**rms**)		3		8	Arms
Vp	Power supply voltage (for DC models)	DS5x73(A)	24		90	Vdc
Vac	Power supply voltage (for AC models)		20		65	Vac
If	Motor phase current (**rms**)		0.8		3	Arms
Vp	Power supply voltage	DS5x76	24		90	Vdc
If	Motor phase current (**rms**)		2		6	Arms
Vp	Power supply voltage	DS5x78	24		90	Vdc
If	Motor phase current (**rms**)		4		10	Arms
Vp	Power supply voltage	DS5x84	45		160	Vdc
If	Motor phase current (**rms**)		2		4	Arms
Vp	Power supply voltage	DS5x87	45		160	Vdc
If	Motor phase current (**rms**)		4		8.5	Arms
Vp	Power supply voltage	DS5x98	45		240	Vdc
If	Motor phase current (**rms**)		4		10	Arms
Vdi	Digital input voltage range		3		28	Vdc
Idi	Digital input supply current		4	6	8	mA
Vdo	Digital output voltage range		1		30	Vdc
Ido	Digital output current range				50	mA
Vai	Analog input voltage range		-10		10	Vdc
Rai	Analog input impedance			47		KΩ
Vao	Analog output voltage range		0		10	Vdc
Iao	Analog output current range				10	mA
Prt	Protections / Diagnostics / Alarms		Over/Under voltage, Short circuit, Overheating, Break phase			
Mpr	Quote range (1/128 step)		-2,147,483,638 / +2,147,483,647			1/128s
Psp	User program memory (functional blocks)			250		
Clp	Mathematical calculation resolution			32		bit
Bcr	Communication speed		9600		38400	baud
Bf	Data format		N,8,2 / E,8,1 / O,8,1			bits
Mechanical Specifications						
FDh	Height				100.4	mm
FDl	Depth				119.0	mm
FDw	Width	DS5x41(A), DS5x44, DS5x73	22.7			mm
		DS4x44A, DS5x73A, DS5x48(A), DS5x76(A), DS5x78(A), DS5x84(A), DS5x87(A), DS5x98	35.0			
FDnw	Weight	DS5x41(A), DS5x44(A), DS5x73(A)	200 (250)			g
		DS5x48(A), DS5x76(A), DS5x78(A), DS5x84(A), DS5x87(A), DS5x98	320 (400)			

Note: The A suffix (ex. DS5x76A) identifies the AC power supply versions

UDP30
Programming, debug and diagnostics interface

- DO1
+ DO1
AO0
AI1
AI0
GND

SHIELD
FB-
FB+
FA+
FA-

GND (Vac)
+Vp

USB

RS232
RS485

- DI1
+ DI1
- DI0
+ DI0

+ DI2
- DI2
+ DI3
- DI3
+ DO0
- DO0

Input / Output equivalent circuit

+
39V
-

6mA (typ)

+
-
1K