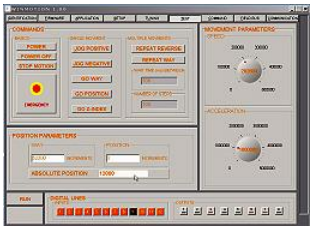
J E N N Y S C I E N C E

exceptional motion controls

INSTRUCTION MANUAL
Sv CONTROLLER

Sv 36V5, Sv 50V4, Sv 72V10
AC/ DC servo controller

Edition September 2012



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General

This instruction manual describes the Sv 36V5, Sv 50V4, Sv 72V10 controller for brushless and brush type DC servo motors.
It contains the necessary information about set up, electrical connections, control, bus operation and error handling etc.

The firmware is already installed and the controller is ready for use.

The controller can be put into operation simply and quickly with the intuitive user-software WINMOTION®.

We will gladly answer any questions you may have or supply additional information.

Alois Jenny
Jenny Science AG

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1 Set up with WINMOTION®

1.1 Power connection, stepper motor

Connect DC-power supply at the PWR plug, pin 1 is 0V and pin 2 is power voltage i.e. 24V. After switching on, the Sv 50 and Sv 72 controller displays a „0“ in the 7-segment display, on the Sv 36 the second LED is active.
This shows that the firmware initialisation was successful and the device is ready for operation.
Connect the servo motor to the controller plug “MOTOR”,
and connect the hall and encoder feedback to controller plug “ENCODER HALL”.

1.2 Serial interface RS 232

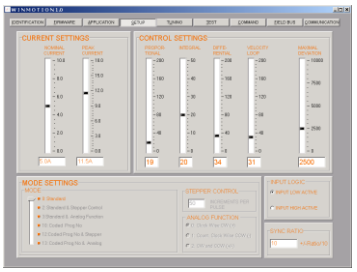
Connection of the St controller to the laptop or PC (9 pole D-SUB cable Rx/Tx crossed)

1.3 Auto connection with WINMOTION®

Start user-software WINMOTION®. Using auto connection the Sv controller will be searched for through the connected COM Port. Afterwards click on MENU. Equipment identification then takes place.

1.4 Set up: nominal current and peak current

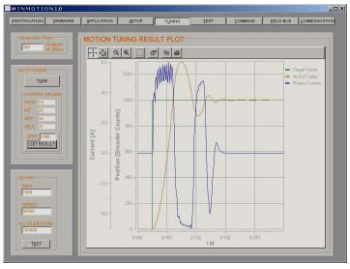
Setup
Current Settings
In accordance with data sheet servo motor



Nominal current xx A
Peak current yy A

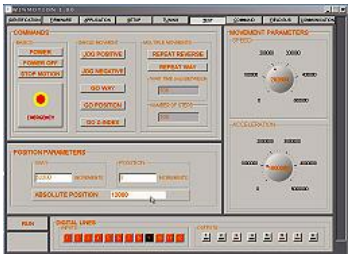
1.5 Executing auto tuning IMT

Intelligent Motion Tuning
execute by clicking on Tuning.
The Control Settings Parameter in Setup are calculated automatically



1.6 Starting the motor

Power
Jog positive
Stop Motion
Way, give a way (distance)
Speed (rotary button)
Acceleration (rotary button)
Repeat Reverse
etc.



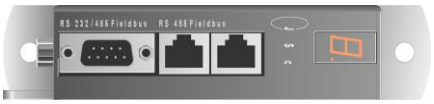
All commands are also directly capable of running under COMMAND. See also the Command Set in the WINMOTION® instruction manual.

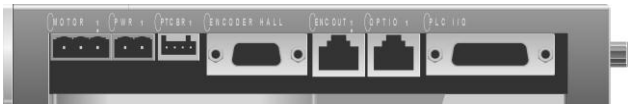
2 Electrical connections

Sv 36V5

Sv 50V4

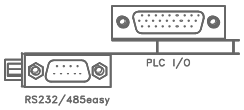
Sv 72V10





DESCRIPTION	PLUG	TYPE
Serial interface RS232/RS485 Bus RS485easy	9 pole RS232/RS485 RS485easy	D-SUB normal Adapter for 2x RJ45 available
Connection RJ45 for RS485easy Connection RJ45 for RS485easy	8 pole RS 485 Field bus 8 pole RS 485 Field bus	RJ45, only by Sv 72 RJ45, only by Sv 72
Connection servo motor Power Sv Encoder and hall (with brushless)	3 pole MOTOR 2 pole PWR 15 pole ENCODER HALL	WAGO Multiconnector, grid 5,0 WAGO Multiconnector, grid 5,0 D-SUB High Density
Encoder Output, return loop, only on Sv 72V10 for Master electronic gear unit or CAM Control	8 pole ENC OUT	RJ 45, only with Sv 72
Control Input, pulse / dir, analogue input for reference speed	8 pole OPTIO	RJ 45
PLC 12 input / 8 output free for user	26 pole PLC I/O	D-SUP High Density

PLC pick-a-pack with Sv 36V5 Option



2.1 Pin configuration

MOTOR

DC-servo motor	AC-servo motor	
Motor -	Phase U	Pin 1
Motor +	Phase V	Pin 2
NC	Phase W	Pin 3

PWR

POWER -		Pin 1
POWER +	Sv 36V5 12-36V	Pin 2
	Sv 50V4 12–50V	
	Sv 72V10 20–72V	

ENCODER HALL

GND for both, encoder and hall	GND	Pin 1
150 mA	5V Encoder	Pin 2
Pull up 2,4k to 5V, differential input 26LS32	Encoder A	Pin 3
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	Encoder A*	Pin 4
Pull up 2,4k to 5V, differential input 26LS32	Encoder B	Pin 5
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	Encoder B*	Pin 6
Pull up 2,4k to 5V, differential input 26LS32	Encoder Z	Pin 7
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	Encoder Z*	Pin 8
Pull up 2,4k to 5V, differential input 26LS32	HALL 1	Pin 9
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	HALL 1*	Pin 10
Pull up 2,4k to 5V, differential input 26LS32	HALL 2	Pin 11
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	HALL 2*	Pin 12
Pull up 2,4k to 5V, differential input 26LS32	HALL 3	Pin 13
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	HALL 3*	Pin 14
150mA	5V Hall	Pin 15

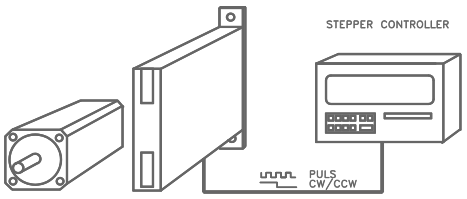
Note: encoder counter can be read with „> TC“ (Tell Counter) command

ENC OUT (Sv 72V10)

GND internal	GND	Pin 1
5V if 0 Ohm resistor mounted	5V	Pin 2
Output encoder 1 return looped	Encoder A	Pin 3
Output encoder 1 return looped	Encoder B	Pin 4
Output encoder 1 return looped	Encoder B*	Pin 5
Output encoder 1 return looped	Encoder A*	Pin 6
Not connected	NC	Pin 7
Not connected	NC	Pin 8

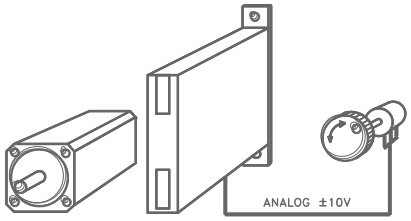
OPTIO

STEPPER CONTROL EMULATION MODE 2 standard



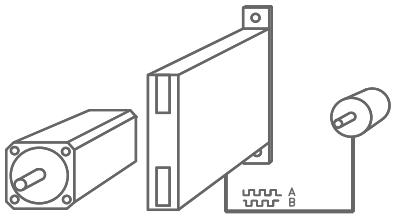
GND internal	GND	Pin 1
Choice of 5V or 10V reference level analogue with resistor (default 10V)	5V or 10V	Pin 2
Pull up 2,4k to 5V, differential input 26LS32	**PULSE**	**Pin 3**
Pull up 2,4k to 5V, differential input 26LS32	**DIRECTION**	**Pin 4**
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	**DIRECTION***	**Pin 5**
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	**PULSE***	**Pin 6**
Analogue input reference, range +/- 10V	+/-10V	Pin 7
Analogue input reference, range 0-10V	0-10V	Pin 8

ANALOGUE FUNCTION MODE 3
standard



GND internal	**GND**	**Pin 1**
Choice of 5V or 10V reference level analogue with resistor (default 10V)	**5V or 10V**	**Pin 2**
Pull up 2,4k to 5V, differential input 26LS32	PULSE	Pin 3
Pull Up 2,4k auf 5V, differential input 26LS32	DIRECTION	Pin 4
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	DIRECTION*	Pin 5
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	PULSE*	Pin 6
Analogue input reference, range +/- 10V	**+/-10V**	**Pin 7**
Analogue input reference, range 0-10V	**0-10V**	**Pin 8**

ENCODER 2
electronic gear, CAM Control
for Sv 72V10 and Sv 50V4
optional



GND internal	**GND**	**Pin 1**
Set to 5V with option ENC 2	**5V or 10V**	**Pin 2**
Pull up 2,4k to 5V, differential input 26LS32	**ENC 2 A**	**Pin 3**
Pull up 2,4k to 5V, differential input 26LS32	**ENC 2 B**	**Pin 4**
Middle level: pull up 2,4k to 5V, pull down 2k, differential input 26LS32	**ENC 2 B***	**Pin 5**
Middle level: pull up 2,4k auf 5V, pull down 2k, differential input 26LS32	**ENC 2 A***	**Pin 6**
Analogue input reference, range +/- 10V	+/-10V	Pin 7
Analogue input reference, range 0-10V	0-10V	Pin 8

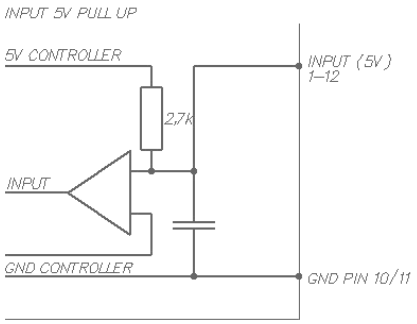
PLC I/O

With Sv 50V4 and Sv 72V10 standard
With Sv 36V5 as pick-a-pack optional

Active low, NPN open collect. 50V/500mA, free wheeling diode		Output 1	Pin 1
Active low, NPN open collect. 50V/500mA, free wheeling diode		Output 2	Pin 2
Active low, NPN open collect. 50V/500mA, free wheeling diode		Output 3	Pin 3
Active low, NPN open collect. 50V/500mA, free wheeling diode		Output 4	Pin 4
Active low, NPN open collect. 50V/500mA, free wheeling diode		Output 5	Pin 5
Active low, NPN open collect. 50V/500mA, free wheeling diode		Output 6	Pin 6
Active low 0V/50mA, high 5V/50mA		Output 7	Pin 7
Active low 0V/50mA, high 5V/50mA		Output 8	Pin 8
Joint of output free wheeling diodes (for connecting with 24V power supply)		COMMON	Pin 9
2A		GND	Pin 10
2A		GND	Pin 11
250mA		5V	Pin 12
5V pull up or 24V pull down *)	Bit 0 binary coded	Input 9	Pin 13
5V pull up or 24V pull down *)	Bit 1 binary coded	Input 10	Pin 14
5V pull up or 24V pull down *)	Bit 2 binary coded	Input 11	Pin 15
5V pull up or 24V pull down *)	Bit 3 binary coded	Input 12	Pin 16
By MODE <10 Input 9-12 normal, by MODE >=10 input 9-12, binary coded for program numbers 1-15			
5V pull up or 24V pull down		Input 1	Pin 17
5V pull up or 24V pull down		Input 2	Pin 18
5V pull up or 24V pull down		Input 3	Pin 19
5V pull up or 24V pull down		Input 4	Pin 20
5V pull up or 24V pull down		Input 5	Pin 21
5V pull up or 24V pull down		Input 6	Pin 22
5V pull up or 24V pull down		Input 7	Pin 23
5V pull up or 24V pull down		Input 8	Pin 24 (program start)
5V pull up 2.7 kΩ on 5V internal VCC or 24V pull down 2.7 kΩ / 10 kΩ, for PNP initiators, please specify when ordering			
Input 8 is intended for program start with binary coded program numbers 1-15 (MODE >= 10)			
2A		GND	Pin 25
250mA		5V	Pin 26

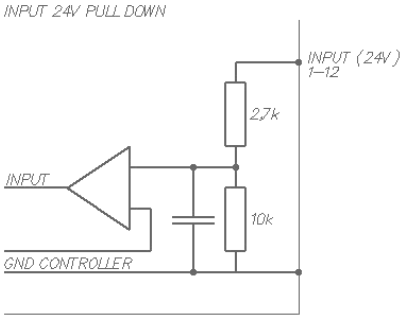
2.2 Input / output schematic

INPUT 1-12
5V pull up



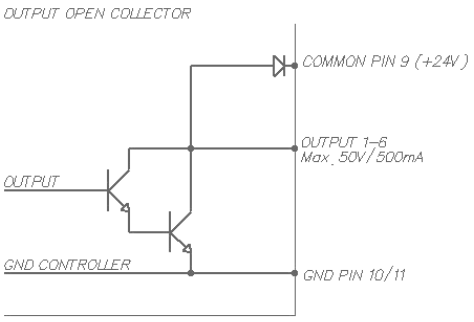
or

24V pull down



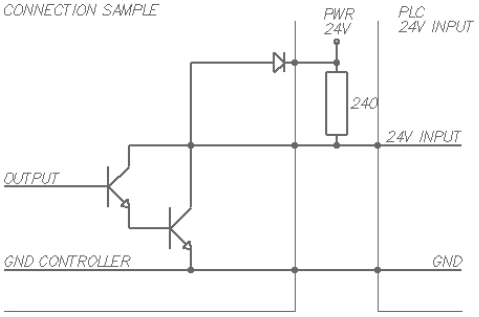
Input configuration 5V or 24V
(please specify when ordering)

OUTPUT 1-6



Important:
Output 1-6, 50V / 500mA
Output 7 and 8, only 5V TTL

Connection example

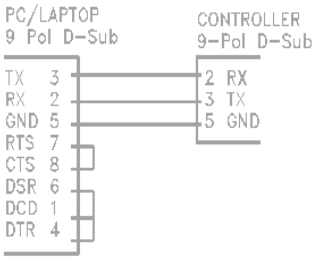


Controller OUTPUT on 24V PLC Input

2.3 Serial interface RS232/RS485

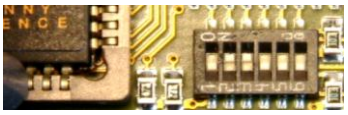
RS 232 / RS 485, 9 POLE D-SUB

Not connected	NC	Pin 1
Receiver Rx	RS232	Pin 2
Transmitter Tx	RS232	Pin 3
Not connected	NC	Pin 4
GND	RS232	Pin 5
Receiver R	RS485	Pin 6
Receiver R*	RS485	Pin 7
Transmitter T	RS485	Pin 8
Transmitter T*	RS485	Pin 9



2.4 Baud rate RS232

Setting the baud rate RS232 using the 6-bit CONFIG switch S1 (remove the cover from Sv 50 and Sv 72 to find the multi switch)
By turning the system off and then back on the new baud rate will be activated.
.

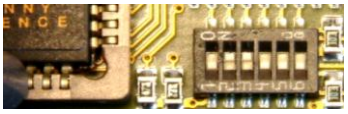


Baud rate	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6
RS232 9600 baud (default)	x	OFF	OFF	x	x	x
RS232 2'400 baud	x	ON	OFF	x	x	x
RS232 4'800 baud	x	OFF	ON	x	x	x
RS232 19'200 baud	x	ON	ON	x	x	x

Data	8 Bit
Parity	no
Stop	1 Bit

2.5 Baud rate RS485

Setting the baud rate RS232 using the 6-bit CONFIG switch S1 (remove the cover from Sv 50 and Sv 72 to find the multi switch)
By turning the system off and then back on the new baud rate will be activated.



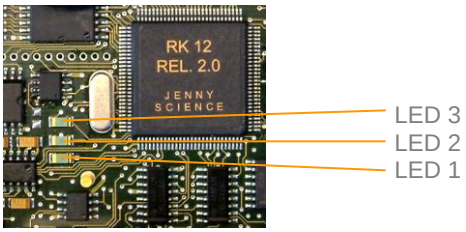
Baud rate	Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6
RS485 19200 baud (default)	x	x	x	OFF	OFF	x
RS485 9'600 baud	x	x	x	ON	OFF	x
RS485 38'400 baud	x	x	x	OFF	ON	x
RS485 free	x	x	x	ON	ON	x

Data	8 Bit
Parity	no
Stop	1 Bit

3 Display operating condition

3.1 With Sv 36, 3x LED

Description	LED
No Firmware, operating system active	only LED 1
Firmware active, Servo amplifier OFF	LED 1,2
Servo amplifier ON, closed loop system active, ready for motion	LED 1,2,3
Error, see troubleshooting	flashing LED 3



3.2 With Sv 50 and Sv 72, 7-Segment

Description	Display
No Firmware, operating system active	F
Firmware active, Servo amplifier OFF	0
Servo amplifier ON, closed loop system active, ready for motion	1
Error, see troubleshooting	xx blinking

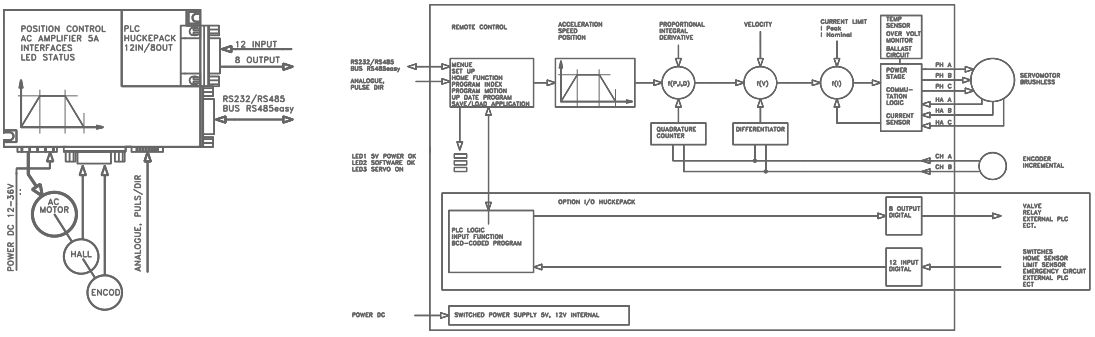
4 Power data Sv 36V5

Voltage	U 12-36VDC
Nominal current	In 0-3A
Nominal current with external heat sink	In 0-5A
Peak current	Ip 10A
Temperature sensor	T 85º
Over voltage monitor	Ov 40V
Ballast circuit	up to 25W
Power fuse	7A idle
Logic fuse	1A

Options
I/O pick-a-pack 12 input , 8 output
External heat sink

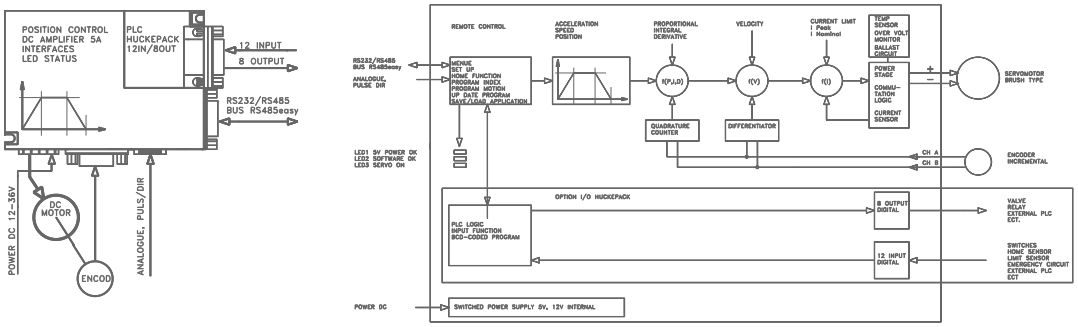
4.1 Block diagram Sv 36V5-AC

Brushless servo motors with hall sensors and encoder



4.2 Block diagram Sv 36V5-DC

Brush type servo motors with encoder



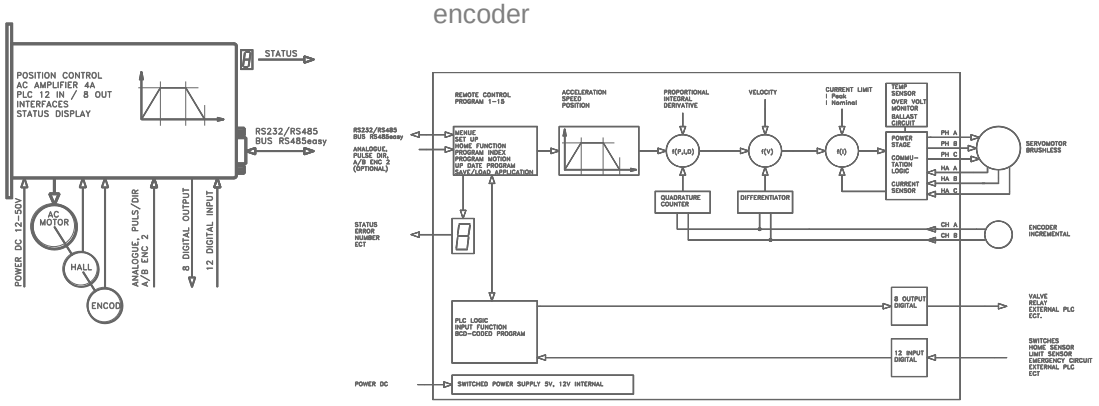
5 Power data Sv 50V4

Voltage	U 12-50VDC
Nominal current	In 0-4A
Peak current	Ip 10A
Temperature sensor	T 85º
Over voltage monitor	Ov 58V
Ballast circuit	up to 80W
Power fuse	7A idle
Logic fuse	1A

Options
Second encoder channel E2

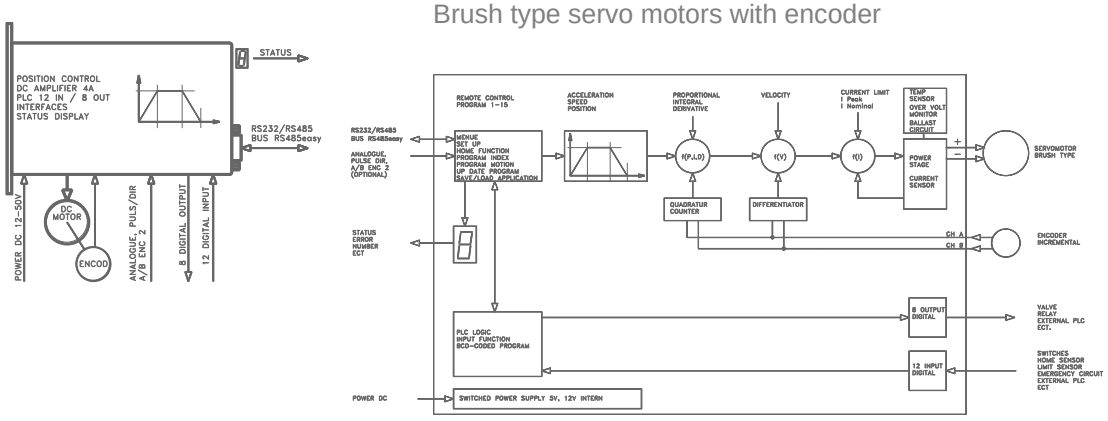
5.1 Block diagram Sv 50V4-AC

Brushless servo motors with hall sensors and encoder



5.2 Block diagram Sv 50V4-DC

Brush type servo motors with encoder



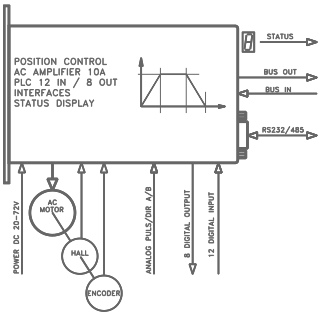
6 Power data Sv 72V10

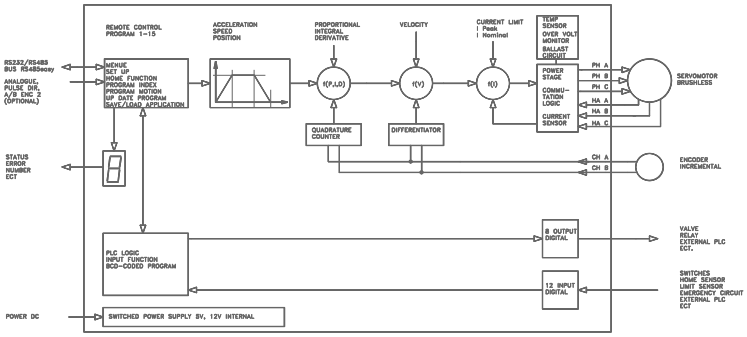
Voltage	U 20-72VDC
Nominal current	In 0-8A
Nominal current with external heat sink	In 0-10A
Peak current	Ip 18A
Temperature sensor	T 85º
Over voltage monitor	Ov 95V
Ballast circuit	up to 300W
Power fuse	10A idle
Logic fuse	1A

Options
Second encoder channel E2
External heat sink

6.1 Block diagram Sv 72V10-AC

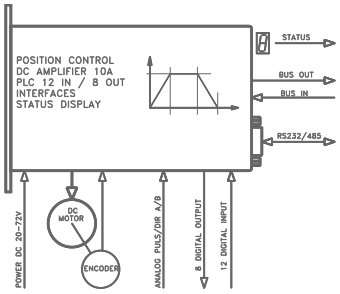
Brushless servo motors with hall sensors and encoder

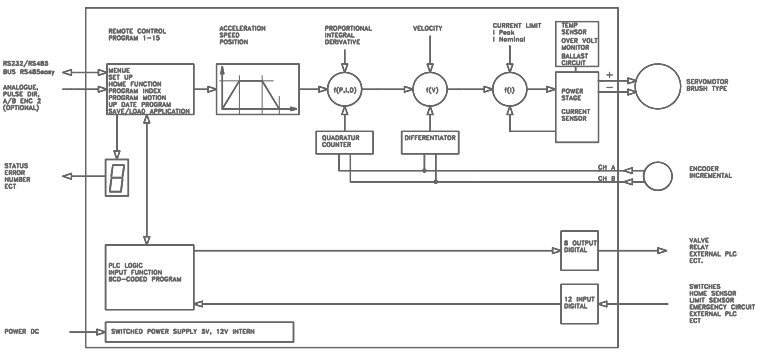




6.2 Block diagram Sv 72V10-DC

Brush type servo motors with encoder





7 Installed Software

7.1 Operating system

The operating system remains in the background for the user and is only required for:
- Boot firmware
- Download functions

7.2 Firmware xxxx_yyy.S19

The firmware contains the travel and positioning calculations and provides functional- and programming possibilities.

This firmware is already installed and is delivered with all equipment on CD

When turning on the device this firmware is active automatically

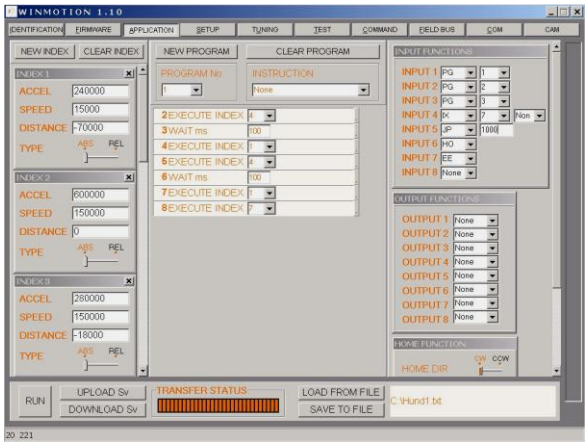
Installation and update with WINMOTION®

7.3 Application program

The Application program contains all user-data, functions and programs of the user such as:

SETUP
HOME FUNCTION
INDEX
INPUT FUNCTION
OUTPUT FUNCTION
PROGRAM MOTIONS

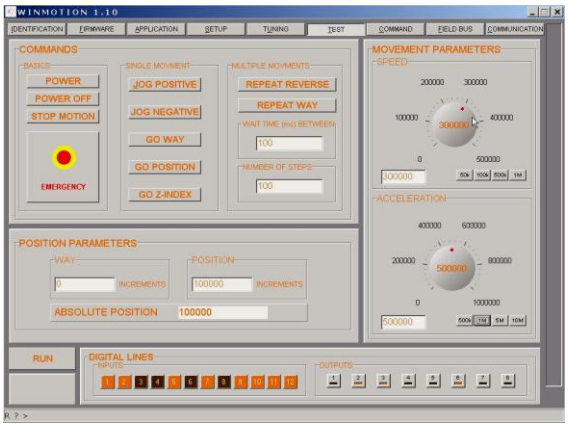
Programming and update with WINMOTION®



8 Programming and controller activation

8.1 User-software WINMOTION®

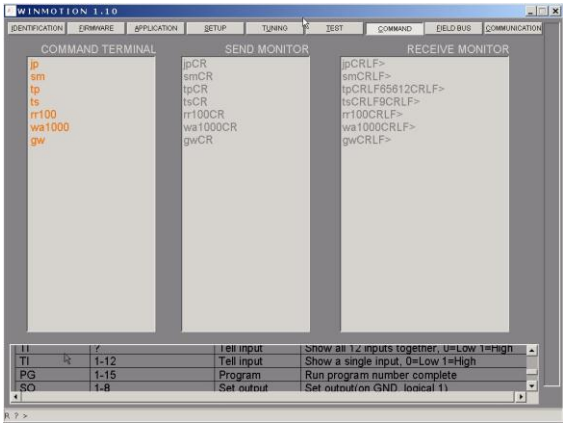
The controller is supplied with the WINMOTION® CD.
This intuitive user software is then installed on the PC an communicates via serial COM interface with the controller.



8.2 ASCII command set

The St controller can be controlled directly by using the ASCII command set. See also the commands in the WINMOTION® instruction manual.

Connect the serial interface RS232 of the Sv controller with the PC/Laptop. After start up send a <CR> (ENTER key), and the Sv controller will respond with the prompt “>“. Now the system operates from the command set.



Command	**[Parameter]**		
PW		"CR"	
SP	25-20’000	"CR"	
AC	1’000-100’000	"CR"	
"CR"	"LF"	>	Response: command accepted
"CR"	"LF"	?	Response: command not recognized

For more information see WINMOTION® instruction manual, Command Set

8.3 Start program from RS232/485

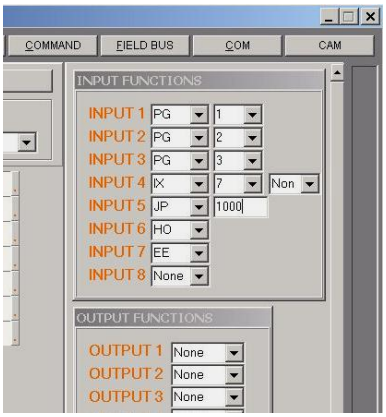
Via the serial interface the following pre-programmed operating sequences can be started directly:

Command	[Parameter]		Description
HO		"CR"	HOME FUNCTION will be executed according to the programmed operating sequence
IX	1-50	"CR"	INDEX xx (predefined acceleration, speed and distance) will be executed
PG	1-15	"CR"	PROGRAM xx will be completely executed

8.4 Start program from INPUT

Assign inputs to a function in INPUT FUNCTIONS.

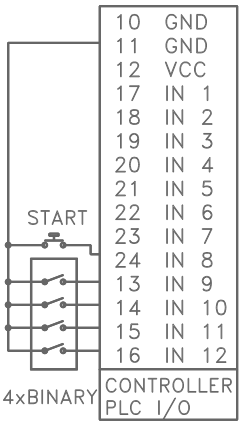
With this simple, efficient instruction the most varied functions can be assigned directly to an input. By operating the appropriate input the assigned function is implemented.



8.5 Start program from binary coded INPUT

Should several programs be called up over the input lines, the MODE in SET-UP VALUES can be set to >=10.
Now the input lines 9 – 12 are evaluated as binary coded program numbers. Input line 8 in this case is acting as the trigger to start each pre-selected program. Program number 0 is not used.

Pre-select program number with binary-switch (No. 1-15).
Start program with start button.



9 Bus RS485easy

An "axis manager" (PC or programmable control) can control up to 32 St 40V5 stepper motor controllers (position, handle I/O etc.) with a simple RS485 interface.

9.1 Bus adapter RS485easy

Option Bus Adapter RS485easy
2 x Modular RJ45

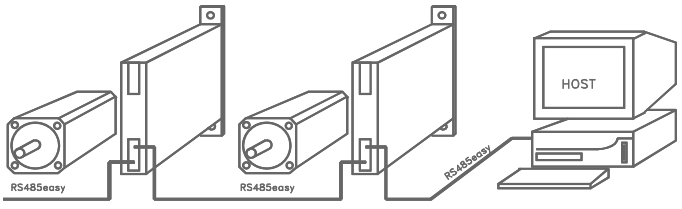
	NC	Pin 1
	NC	Pin 2
	NC	Pin 3
Receiver R*	**RS485**	**Pin 4**
Receiver R	**RS485**	**Pin 5**
	NC	Pin 6
Transmitter T*	**RS485**	**Pin 7**
Transmitter T	**RS485**	**Pin 8**

Modular RJ45 Ethernet cables shielded
Wiring 1:1
Twisted pair 1&2, 3&6, 4&5, 7&8
foil-shielding

These cables are widely available in computer accessory shops in different lengths and moderately priced.

9.2 Equipment connection

The connection can be realized with normal Ethernet network cables. The RS 485easy bus adapter can be plugged into the serial interface D-SUB connector. A 560 Ω bus termination is already installed in the controller.



9.3 Installation RS485easy

1. Set the CI (Card Identifier) via RS232 e.g. to 5, test with CI? <CR> (under COMMAND in WINMOTION®)

2. Carry out the connection on RS485 and PC/Laptop, set baud rate to 19'200.

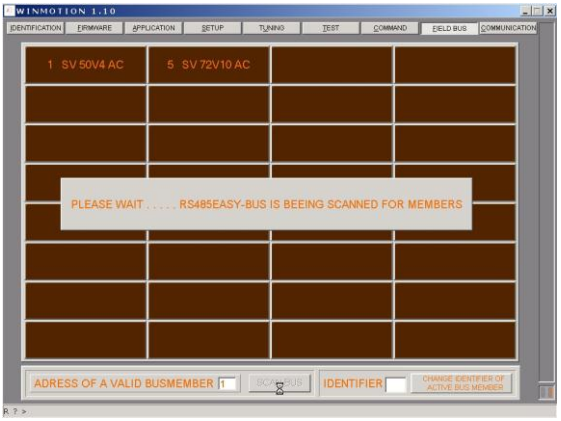
3. As the first command, set “RI” (Required Identifier) to 5, no echo is produced, but the unit ”listens in“ and recognizes its own address.

4. After an additional <CR> an echo occurs and the connection to the unit CI 5 exists. (If there is no echo: check the connection RS485, check the baud rate, the default should be 19'200 with RS485).

Field bus with WINMOTION®

. First, all connected Sv/St controllers in the RS485 easy bus can be automatically searched for with FIELD BUS in WINMOTION®. The model types are showed in the bars.

By clicking in the appropriate bar the St controller can be accessed directly.



9.4 Simple functioning of the RS485easy

Every controller has been initialized with an „original“ Card Identifier (>CI ##) via RS232. Thus an Identifier number may be assigned only once. The Card Identifier "CI" remains stored in the controller.

Controller is loaded with Card Identifier CI

The axis manager (PC, PLC etc.) addresses the individual controllers with a Required Identifier (>RI ##). The unit which has the Required Identifier corresponding to the Card Identifier becomes active and receives the Bus. The axis manager remains connected to the corresponding controller until a new Required Identifier is recognized. All controllers coupled to the RS485easy bus have their receiver constantly active and “listen in”.

A maximum of 32 St stepper motor controllers can be connected to the same RS485easy bus system.

Addressing controller using Required Identifier RI

In the Bus operating mode commands and parameters are identical to the normal RS232 point-to-point connection.

Load Card Identifier
>CI## <CR> (Value 1-99)
Request Card Identifier >CI?

Load Required Identifier
>RI## <CR> (Value 1-99)
Request Required Identifier check
>RI?

Device identification commands

By means of the RS485easy Bus the Card Identifier “CI“ can be changed afterwards, provided the actual CI is known.

Via the RS485easy it is possible to send commands to all connected controllers simultaneously. In this case the Required Identifier must be set to zero (“RI = 0“). I.e. the simultaneous initializing of a system can be started using the command “>HO”.

After Power ON, the device memory for the Required Identifier is set to the value 0.

Note: Only the device with CI = 1 (Card Identifier on 1) will send an echo to the axis manager in the simultaneous mode. If no controller has the value 1, no echo will be received.

Simultaneous operation with RS485 easy

10 Troubleshooting

10.1 Error 7-segment Display

Error messages for the Sv 50 and Sv 72 are shown on the 7-segment display as a 2-digit flashing number. It is distinguished between “wait for external condition” (WH, Wait High/ WL, Wait Low) and “trouble in the controller”. With error codes below 50 the program can be continued, above this it will be stopped.

Notes:
Error messages with the Sv 36V5 controller are shown by a flashing LED 3. An error number is not directly evident. This can determinated by “TE” (Tell Error) command.

10.2 Error codes

Error codes	Description	Notes
01 to 12	Waiting for input (low or high)	Continues if status has been reached or restarts new if HO, SM or PQ, PW
50	Position deviation is too large	This means that the difference between the internal calculated position and the momentary motor position (encoder) is larger than the value defined as DP (deviation position) in Setup.
60	Over temperature power stages	Above 85° detected by separate temperature sensor on power stage. Power stage will be switched off.
61	Over voltage, DC power supply	Power supply voltage too high or retarding energy from servo motor too high
62	Ballast circuit too long active	The ballast circuit is still more than 5 sec continuously active: Retarding energy too high or the power supply voltage is too high, the power stage will be switched off.

10.3 Notes for error 50

There can be different reasons for the error 50 (position deviation is too large). Please check following points:

Test encoder counter

In WINMOTION® with IDENTIFICATION or TEST. In a terminal program with the command TPC (Tell Position Continues)

Turn the motor shaft clockwise (view from the front side of shaft), the encoder counter must count upward. Turn the motor shaft counter clockwise, the encoder counter must count downward. If there is a problem, please check the encoder, encoder supply and connection.

Test the parameter in the Setup

I NOM	high enough?
I PEAK	high enough?
PROPORTIONAL	ca 5-20
INTEGRAL	0-5
DERIVATIVE	ca 10-50
VELOCITY	ca 10-50
INC PER PULSE	0
DEVIATE POS	min. 1000

Test if the system runs when speed reduced

With TEST in WINMOTION® or with following commands
> SP 10’000
> AC 100’000
> PW
> JP

Test the power supply equipment

Is there enough voltage and enough current?

With brushless motors test the hall and motor phase signals (wire and colours)

Unfortunately, there is no standardisation for these connections, we test in each case the motor and indicate the correct connection.
By presumption of this error, please give us the motor type, then we can offer you support.

With brush type motors test the correct motor connection

Change the two motor wires in case of wrong direction.

10.4 Status queries with command

Command	Description	Remarks
TS	Tell Status	Status: 0 = Power OFF, 1 = Power On, 2 = In travel, 3 = Progr. active, 9 = Error
TE	Tell Error	Error numbers 01-99
TI	Tell Input	Condition Input, all 12 inputs

10.5 No communication

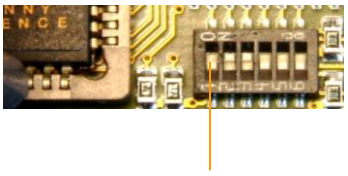
Situation: serial interface connection and settings correct.

The controller does not respond to „ENTER“ on terminal (no prompt „>“) and communication is not possible. In this case a Forced-Start within the operating system level can be of help.

Remove controller cover, CONFIG switch Bit 1 to ON.
Switch off St controller and switch on again.
"F" must now appear in the display.
If no "F" indicated, send device for repair.

After „F“ with the command OS „>COLD“ initialize the memory again, old Firmware and application are replaced.

Now load new FIRMWARE and then a new application with WINMOTION®.
Finally set the CONFIG switch, bit 1, back to OFF.



10.6 Firmware does not run correctly

On the firmware level and using the command „>OPSYS“ the operating system level can be reached.
Afterwards use the command „>COLD“ to initialize the complete memory (delete).
Load a new FIRMWARE and the desired APPLICATION using WINMOTION®.

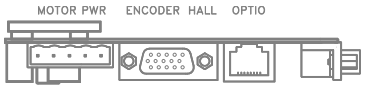
11 Technical data

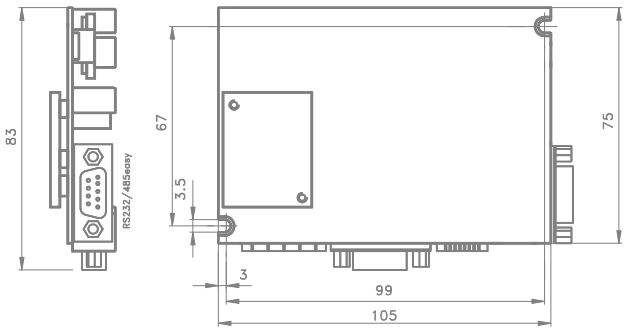
11.1 Electronics, Firmware

Description	Data
Status display	7-segment display, 3 LEDs on Sv 36V5
Inputs	12, 5V pull up or 24V pull down
Outputs	8, 6x500 mA, 50V and 2xTTL
Interfaces	RS232/ RS485, master encoder, analogue
Bus RS485easy	RS485easy field bus integrated
Program up-date	via serial interface, WINMOTION®
Application and parameter store / load	via serial interface, WINMOTION®
Program memory	256kx8 ,16-bit access
Application-programs	15 x 50 lines
Index (predefined travel motion)	50 x acceleration, speed, way
Home Function (seek predefined zero point)	yes, flexible, incl. Coarse zero sensor
I/O pre-selected application programs in MODE >=10	15, select program with 4 binary coded digital inputs start via input 8

11.2 Dimensions Sv 36V5

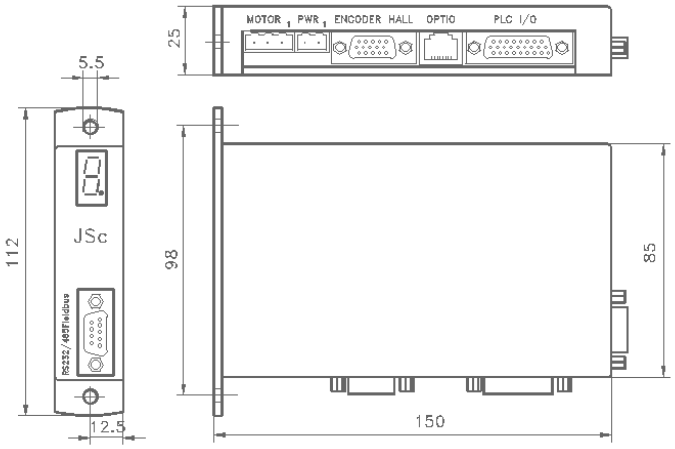
Supply voltage DC	12-36V
Weight Sv 36V5	110g





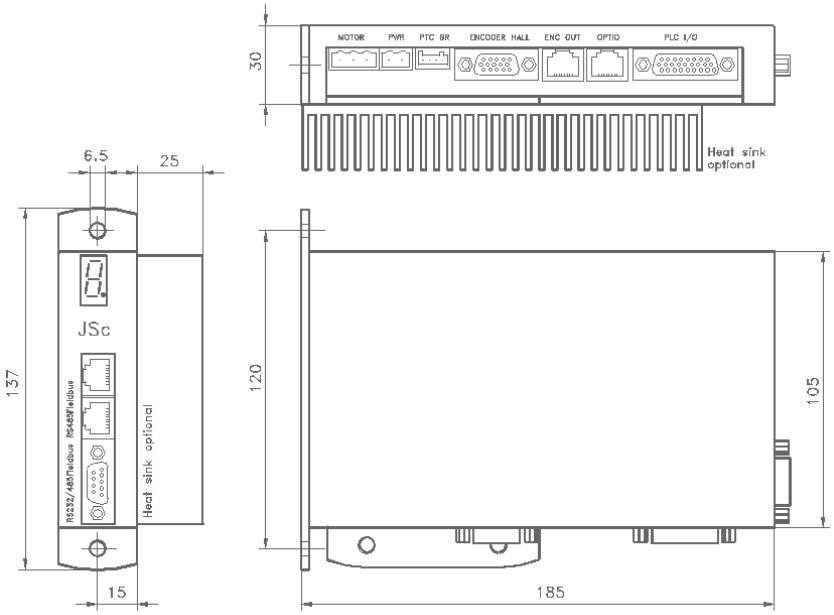
11.3 Dimensions Sv 50V4

Supply voltage DC 12-50V
Weight Sv 50V4 360g



11.4 Dimensions Sv 72V10

Supply voltage DC 20-72V
Weight Sv 72V10 620g



Notes

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