

SMC116GP Manual



2-phase bipolar motor driver



www.wobit.com.pl

P.P.H. WObit E.K.J. Ober s.c.
Dęborzyce 16, 62-045 Pniewy
tel. 48 61 22 27 422, fax. 48 61 22 27 439
e-mail: wobit@wobit.com.pl
www.wobit.com.pl

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Thank you for selecting our product!

This instruction will help you at correct service and accurate exploitation of described device.

Information included in this instruction were prepared with high attention by our specialists and is description of the product without any responsibilities within the meaning of the commercial law. Based on the information should not be inferred a certain features or suitability for a particular application. This information does not release the user from the obligation of own judgment and verification. P.P.H. WObit E.K.J. Ober S.C. reserves the right to make changes without prior notice.

- Please read instructions below carefully and adhere to its recommendation
- Please pay special attention to the following characters:



CAUTION!

Not adhere to instruction can cause damage or impede the use of hardware or software.

1.Safety and assembly rules

1.1.Safety rules

- Prior to first start-up of the device please refer to this manual;
- Prior to first start-up of the device please make sure all cables are correctly connected,
- Provide appropriate working conditions, in compliance with the device specifications (e.g.: power supply voltage, temperature, maximum current consumption).
- Before making any modifications to wiring connections, disconnect the power supply voltage.

1.2 Assembly recommendation

In the environments of unknown levels of interruptions it is recommended to use the following means preventing against possible interruptions of the device operation:

1. To **minimize noises**, cable which connect motor with driver should be shielded or twisted in pairs (separate twisted pair for A and B phase). It is also recommended to use a ferrite ring on motor cable at controller.
2. Signal cables (**CLK, DIR, EN**) **should** be move away from power supply line and motor wires for min. 10cm.
3. Setting **too high current** for weaker motor cause its asynchronous operation, especially at set higher step division (motor coils saturation). In longer period of time it cause stronger heating of the motor, and in consequence it leads to its damage.
4. Driver should be mounted in upright position to provide proper air circulation.
5. At operations with high currents you should provide cooling of the driver. To do that it is not recommended to mount the driver in closed control cabinet without additional air circulation. Do not cover the ventilator, and do not block it. Temperature of the driver can rise at long operation and at maximum load.

2. Device description

SMC 116GP is a miniature, cost-effective 2-phase bipolar microstep motor driver with controlling current up to 6,7A. It is made up closed profile (G) designed for installation inside a machine or control cabinet. In controlling system are included nonlinear D/A transducers, which allows for step division up to 1/8. The system is equipped in precise current control system and overloads.

The controller has current set by manufacturer, by ordering should be informed about phase motor current, e.g. 4A, 4,5A, 5A, 6A or 6,7A.

Features:

1. Microprocessor, FET lowRon power stages,
2. Miniature module dimensions: 112x46x23mm,
3. Enclosed housing of aluminum profile,
4. Antivoltage and ant rupture protection,
5. Power supply 15V -36VDC,
6. High rated current max. 6,7A on phase,
7. Microstep with division up to 1/8,
8. Automatic current reduction,
9. Galvanic insulated inputs.



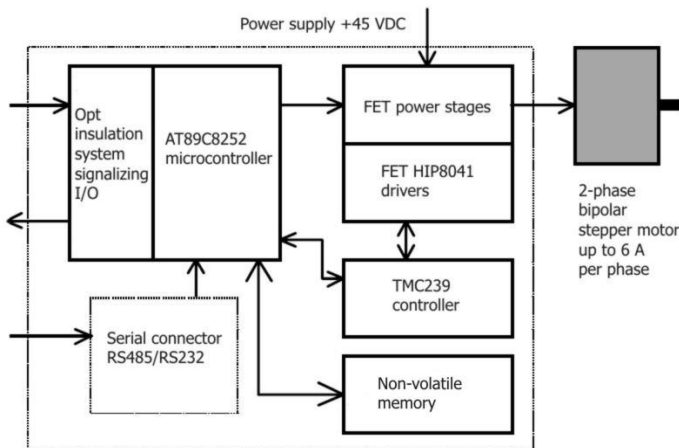
CAUTION!

Reverse polarization or exceeding of maximal voltage supply can cause damage of the driver.

Too little output capacitors or its absence can cause damage of the driver or cause its incorrect operations during operations with high voltage and large motor, which operates dynamically (rapid decrease of motor velocity).

It is recommended to use electrolytic capacitors 10000 μ F at maximal current of the driver and high rotational speed (>5 rpm).

Block diagram



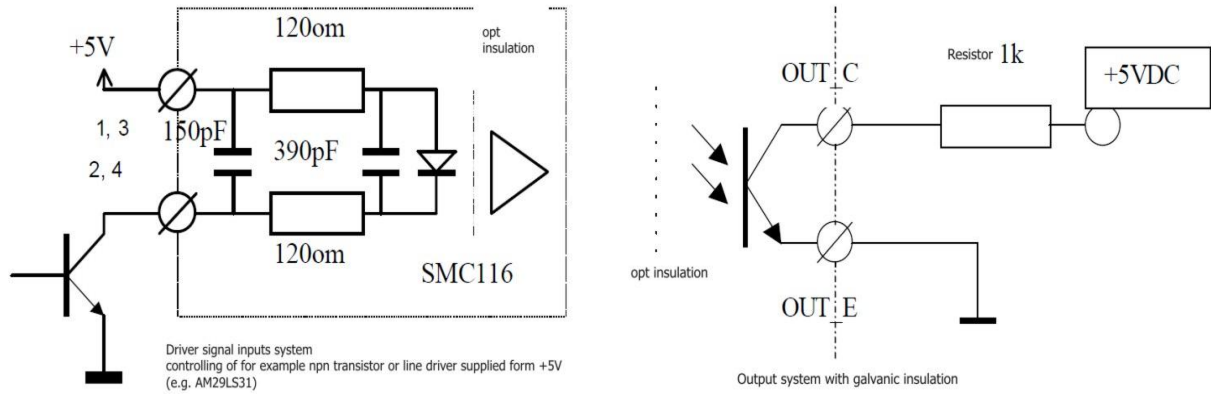
Power stage is based on modern power transistors HEXFET with low activation resistance $R_{on} = 0,023 \text{ Ohm}$ and direct current 57 A in miniature D2Pak gull wing housing. Eight of this transistors is controlled by two efficient HIP4081 drivers. Modern TMC239 controller made by Trinamic company, controls driver operation. It controls current in motor phases on processor command. Overvoltage or overheating cause lockout of input power stages and the processor gives signal on galvanic insulated output OUT (in 1.2 version).

2.1 Description of signal inputs

All input signals of SMC116GP driver are opto- insulated. Clock and Direction inputs are fast inputs and other inputs and output are galvanic insulated by slower transoptors. Giving Enable signal (5-20 mA current must flow through transoptor) is a condition of current flow through motor.

Number	Symbol	Description of signal connector
1	+ CLK	Insulated clock input, each pulse cause motor revolution one step ahead or its fraction (depends on M1 and M2 signals) or enables for independent motion in case of programming by motion trajectory serial connector
2	- CLK	As above, transoptor cathode $I_{max}=20\text{mA}$
3	+ DIR	Insulated direction input $I_{max}=20\text{mA}$
4	- DIR	0 – clockwise 1 - Opposite direction
5	+ ENABLE	Motion permission
6	- ENABLE	1- motor do not operate, 0 – motor is active

Description of input signals



Step division set by M1 and M2 jumpers				
M2 jumper M1 jumper				
Division	1/8 step	¼ step	½ step	Full step
No. of micro steps per revolution	1600	800	400	200

Controlling and output signals

STEP	Step, pulses up to 100 kHz
DIR	Direction of motor rotation
EN	Motor relieving signal
OUT	Programmable output
Jumpers	
M 1, 2	Inputs for step division
M4	Interference-suppression filter
M3	Automotive current reduction/ terminal operation for RS232/RS485 option
IN 1, 2	Controlling inputs

10. Technical parameters

Description	Parameter
Type	SMC 116 GP
Power supply	DC 15 up to 36V
Phase current	3- 6,7A
Set current	solid resistor
Automatic current reduction	Yes
Type of work	Bipolar
Step division	1, ½, ¼, 1/8,
Input signals	TTL, CMOS
Optically isolation	For inputs
Current of input signals	20 mA
Operation temperature range	0 up to 40 °C
Connection motor	Pluggable terminal block
Connection signals	Screw connectors
Dimensions	90*145*29mm
Way of mounting	M3 screws

Housing outline:

