

**SETTABLE PARAMETERS ( prog. 366 v1.8 )**

1. mode: open loop =0 / closed loop=1 / closed loop "slow"=2 ( 0 )
2. closed loop range 0-4 ( 3 )  
0=15000rpm, 1=7500rpm, 2=5000rpm 3=2500rpm 4=1500rpm  
above ranges is for 4-pole motor ( 2 pole pair ). For the motor with higher number of poles the max rpm is smaller in the ration of number of poles
3. start ramp 0-5s / 0-50 ( 10 )
4. stop ramp 0-5s / 0-50 ( 5 )
5. I-trip delay 0.01-2.5 / 0-255, 0=I-trip, disabled ( 200 )
6. scale start speed 0-25.5% / 0-255 ( 0 )
7. scale gain 0-2.55 / 0-255 ( 200 )
8. Load compensation ( RxI ) adjust 1-200 ( 5 )  
or in closed loop mode dynamic P-factor
9. closed loop dynamic I-factor 1-200 ( 10 )
10. regen. braking current limit 2-40A / 2-40 ( 25 )
11. Input PIN 15 options ( 0 )  
0 = open or "low" = Local / "high" = Bus  
1 = open or "low" = Bus / "high" = Local  
2 = local/Bus control selection with Bus only  
3= local only and pin 15 as start/stop  
4= local only and pin 15 as stop input  
5= local only and pins 15 and 16 impulse input  
6 = local only and pin 15 as end stop BW
12. current limit 0 / 1-40A / 1-40 ( 20 )
13. Input PIN 19 options 0-100 / 0-100 ( 50 )  
0= input is I-lim analog input 0-5V  
1= stop input  
2= end stop FW  
3 = end stop BW  
4 = analog input  
10-100 = speed-2 enable and par. = speed-2
14. I-trip reset mode ( 0 )  
0= only with disable pin  
1= disable or with speed input change 0 to up  
10-200 = timer reset with 0.1s steps = 1-20s.
- 15 Start up mode when power on & over temp. reset options ( 1 )  
0= ready to run when power on & over temp. reset disable input  
1 = ready to run when power on & over temp. res. with speed 0 to up  
2 = disabled when power on & over temp. res. with speed 0 to up  
10-200 = ready to run when power on & over temp. reset with timer reset time 0.1s steps = 1-20s.
- 16 PIN 17 output function ( 1 )  
0 = overtemp. and overvoltage  
1 = overtemp, overvoltage, and I-trip  
2 = overtemp, overvoltage, I-trip and overcurrent  
3 = reserved for pulse output use, see param 17  
4 = same as the LED on circuit board
- 17 pulse output divider 1-20, enabled only if param. 16=3 ( 1 )  
1 = 1pulse/round  
2 = 1pulse/ 2round...  
...  
20= 1pulse/ 20round
18. brake res. threshold (=overvoltage) 15-60V / 15-60 ( 35 )
19. brake output mode and braking mode 0-3 ( 0 )  
0 = output active if param. 18 value exceed and brk. mode "regenerative"  
1 = output active if param 18 value exceed and brk. mode "freewheel"  
2 = output active when "run" and braking mode "regenerative"  
3= output active when "run" and braking mode "freewheel"
20. Input pin 20 options ( 0 )  
0 = disable ( and reset )  
1 = safety switch stop with wiring monitor ( closing contact )  
2 = stop input  
3 = end stop FW  
4 = end stop BW  
5 = analog input  
6 = inverted disable ( disable when "low" )
21. Baud rate 0..5 ( 3 )  
0= 9600, even, 1 stop, 3= 19200, even, 1 stop  
1= 9600, odd, 1 stop 4= 19200, odd, 1 stop  
2= 9600, none, 2 stop 5= 19200, none, 2 stop
22. Modbus Address 1...247 ( 1 )

**TAKE IN USE**

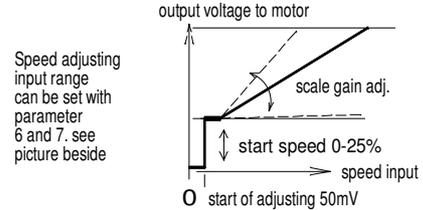
Nominal operating voltage 12-48Vdc ripple less than 20%  
An external supply fuse is recommended ( 2-40A )

Be sharp when connect motor wires, because there is lot of combinations. If motor takes much current or run roughly then change order of hall-sensor and try again

Default settings are in brackets in parameter list. when you uses these default parametrs you need only potentiometer to test motor.

When power turn on the device can be ready to run or disabled  
In ready to run mode driver starts directly if speed is set .  
In disable mode speed must be set to 0 before start is possible.  
See parameter 15

In example picture beside there all input connected, but device work also with less wiring, you can start only with speed signal ( par. = 0 ). More wiring option on application sheet.



In some application load can be generated energy back to drive, when slowing down speed. Then there needed braking resistor, which absorbed extra energy.  
**NOTICE** that the parameter 18 has to be set about 10% higher than unloaded voltage of power supply.  
In the battery powered application the resistor not need, because the battery absorb the regenerated energy.

**CONTROL INPUTS**

**SPEED** input is a analog control input for speed setting.  
Set signal can be between 0-5V and 0-10V  
Speed scaling can be made with parameter 6 and 7.

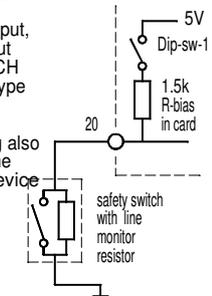
**PIN 15** can be used to select control source LOCAL / BUS  
Local control with card terminal or Buscontrol with Rs-485  
This Input has also another options which can be set with parameter 11

**DIRECTION** input is a digital input. It changes the rotation direction. It uses automatically stop/start ramps during change.

**INPUT PIN 19** is a multifunction input it can be set with 13.  
This can be worked as analog CURRENT LIMIT input, SPEED-2 activation input or different type of STOP inputs

**INPUT PIN 20** is a multifunction input, it can be set with par. 20 This input can be worked as SAFETY SWITCH input, DISABLE input or different type of STOP inputs

**SAFETY SWITCH** option including also line monitor for safety switch. If the line resistance is too high the device gives warning



**OUTPUTS**

**FAULT / PULSE OUT** This output modes can be set with parameter 16. There is some options when output will be activate.  
The special mode is pulse output, in this case output gives out rpm-pulses which can scaled with parameter 17

**BRAKE** output can used to control magnetic brake of motor or switch a braking resistor in regenerative braking. the mode can be set with parameter 19  
Recommend brake resistor , Wirewound 10-50W  
Resistance 4.7R at 12V, 10R at 24V and 22R at 48V

Rs-485 port can be used to control device with Modbus protocol  
This port has own guide sheet " Modbus register definitions for EM-356A"

**MONITOR VALUES**

1. current 1A / digit
2. braking current 1A / digit
3. hall sensor freq. 0-255Hz
4. operation voltage 0.1V / digit
5. pwm 0-255 ( 255 = 100% )

**INDICATIONS.**

Continuous light: Over. temp. or over voltage or disable  
Fast blinking : current limit exceeded  
Short blinks: shutted down by overcurrent ( I-trip )  
Long blinks: safety switch wire fault  
Slow blinking: shutted down by safety switch

Fault output: ( Pin-17 PNP open collector output )  
Overtemperature, Overvoltage, Undervoltage.  
This indicates also I-Trip if parameter 16 is set to = 0