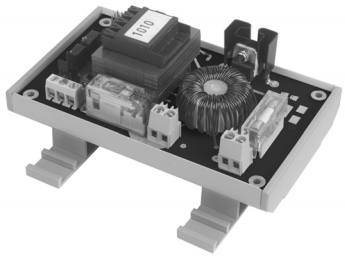
DIN-Rail Mount Fan Speed Controller



Features

- User definable maximum and minimum speed
- Fast on normal start up
- User definable fast start time
- Downloadable configuration software

Specification

Supply	230Vac, -6%, +10%, 47-64Hz
Control inputs, jumper selectable:	
4-20mA, 2-wire, not loop-powered	
0-10Vdc, 2-wire	
0-5Vdc, 2-wire	
10Ω potentiometric, 3-wire	
Output	Triac, supplemented by a relay which only opens or closes when the triac is Off, eliminating arcing on the relay contacts
Dimensions	125W x 75H x 80Dmm
Operating:	
Temperature	-10°C to +50°C
RH	5 to 95%, non-condensing
Storage:	
Temperature	-10°C to +80°C
RH	0 to 90%, non-condensing
Country of origin	UK

Product Codes

FC-DIN1
1A Single Phase Fan Speed Controller

FC-DIN3
3A Single Phase Fan Speed Controller

FC-DIN5
5A Single Phase Fan Speed Controller

FC-DIN1-SP
1A Manual single phase fan speed controller

FC-DIN3-SP
3A Manual single phase fan speed controller

FC-DIN5-SP
5A Manual single phase fan speed controller

Technical Overview

The FC-DIN range of DIN rail mounting fan speed controllers offer user selectable 0-10Vdc, 4-20mA input control signal compatibility for automatic control, and a 3-wire potentiometric input for manual control.

The FC-DIN are available in 1A, 3A and 5A single phase ratings.

A fast start function is available, as well as user definable minimum and maximum run speeds. A simple linear input/output characteristic is selectable, and there is also a feature which allows a user to define, at 16 points, an input/output curve to suit a specific fan or application.

Preset Operation (Modes 1-3)

The FC-DIN controllers can operate according to preset characteristic modes held in firmware. Modes 1 - 3 inc. are preset modes. (see mode selection jumpers)

Mode 1: This is a linear characteristic, giving an output of 0% for an input of 0V, an output of 50% for an input of 5Vdc and an output of 100% for an input of 10Vdc.

Modes 2 & 3: Reserved for future development

Minimum and Maximum Speed Settings:

In modes 1-3, the minimum and maximum outputs can be set by two adjustment pots on the PCB. (see PCB layout)
Note that the maximum speed should normally be set higher than the minimum speed. If the maximum speed is set lower than the minimum speed the control action is reversed (an output of 100% for an input of 0V, an output of 50% for an input of 5Vdc and an output of 0% for an input of 10Vdc).

Fast Start:

In modes 1-3, the fast start is enabled by fitting the fast start jumper (see fast start selection jumper). When fast start is enabled by this jumper, the output will initially be 100% (or whatever the maximum speed has been set to by the maximum speed pot) for a period of 5 seconds. After this, the output will be dependent on the input signal.

On and Off Thresholds

When the input falls below 5% of input range (for example, 0.5Vdc for 0-10Vdc input), the output will turn OFF. When the input rises above 10% of input range (for example,

Technical Overview (continued)

1.0Vdc for 0-10Vdc input), the output will turn ON. **Note:** If fast start is enabled, each time the ON threshold is reached the fast start will operate.

Configurable Operation (Mode 4)

Custom Characteristic Curve

The FC-DIN controllers can operate according to a user programmable characteristic mode held in EEPROM. Mode 4 is the configurable mode. (see mode selection jumpers). The characteristic is defined using the FC-Software tool together with the FC-Cable programming interface cable. A custom curve can be defined at 16 points, and allows the used to create a characterization curve to suit a specific motor, fan or pump system characteristic. When the new curve values are written to the FC-DIN, these new settings are held in flash memory, and are retained if power is lost to the device.

Minimum and Maximum Speed Settings:

In mode 4, the minimum and maximum outputs are be set using the FC-Software tool together with the FC-Cable programming interface cable.

Notes:
The pots used for modes 1-3 are not recognized in mode 4.
The maximum speed should normally be set higher than the minimum speed. If the maximum speed is set lower than the minimum speed the control action is reversed (an output of 100% for an input of 0V, an output of 50% for an input of 5Vdc and an output of 0% for an input of 10Vdc).

Fast Start:

In mode 4, fast start is set using the FC-Software tool together with the FC-Cable programming interface cable (see full speed startup setting). When fast start is enabled, the output will initially be 100% (or whatever the maximum speed has been set to by the software) for a user definable period (see startup setting). After this period, the output will be dependent on the input signal (see input enable setting).

Input Enable

The software allows the user to disable the input control signal. In this instance, the motor will run at the speed defined by the maximum speed setting (after fast start, if enabled). This can be useful for commissioning, or where a control signal is not available.

Technical Overview (continued)

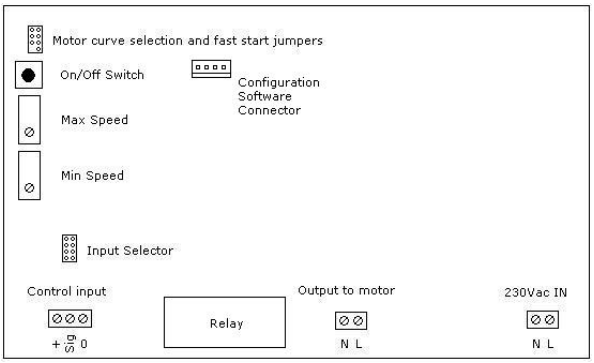
Other Options

"Remember status" is a continuation mode after power failure, i.e. if set to "True" the output does what it did before the power failure. The "Restart at power-up" setting is ignored.

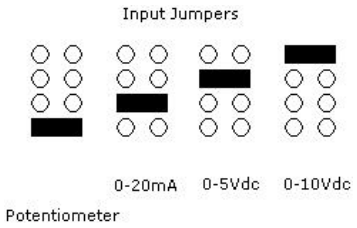
If "Remember status" is set to "False" the "Restart at power-up" setting is read. If set to "True" the output is ON when power is restored. If set to "False" the output is OFF when power is restored.

PCB and Jumper Settings

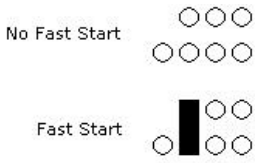
PCB Layout



Input Mode Selection Jumper

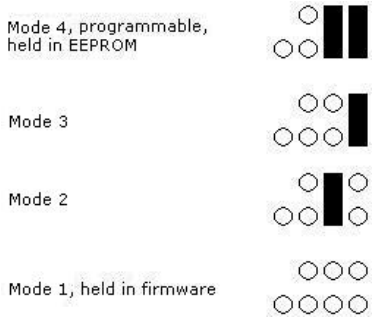


Fast Start Selection Jumper



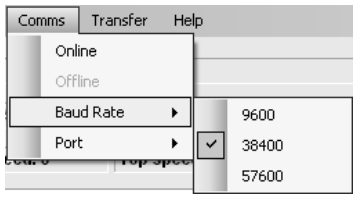
Technical Overview (continued)

Mode Selection Jumpers:

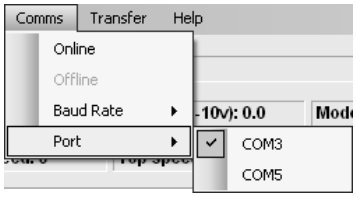


Configuration Software

The FC-Software connects to an FC-DIN *via* the FC-Cable USB cable. To start communications, click on <Comms> then <Baud Rate>. Select 38400.



The FC-Cable has an integral USB to serial TTL converter. When plugged into a USB socket on a PC, drives will be installed and appear as a serial port. Note the serial port number in Windows Device Manager. To select which comm. Port for the software to use, click on <Comms> then <Port>. Select the serial port noted above..

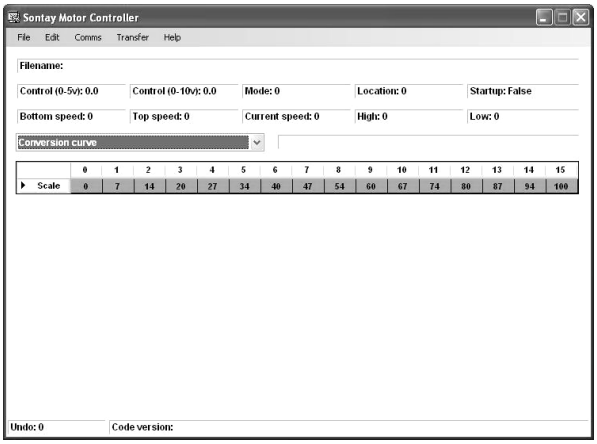


To establish communications, click on <Comms> then <Online>.

Configuration Software (continued)

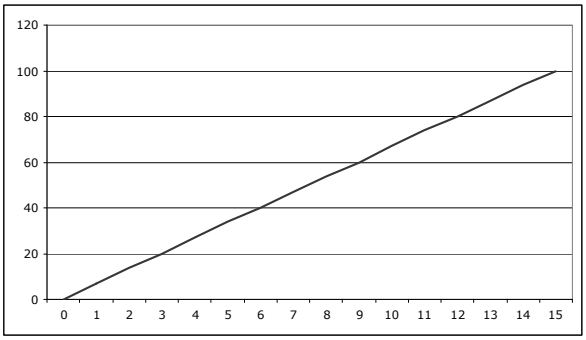
Defining a Custom Curve

Using the FC-Software configuration software, user defined control curves can be easily produced. Select "Conversion curve" from the drop down menu, then enter values (between 0 and 100) to define the curve required.



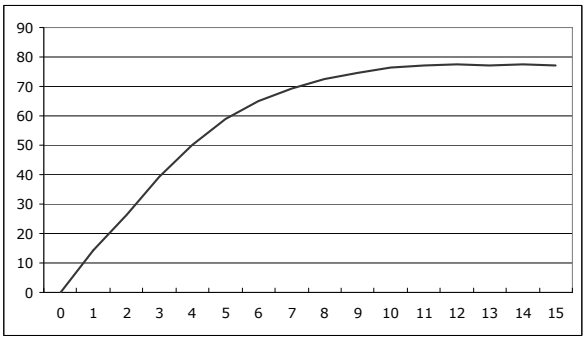
Examples:

Linear Scaling:



0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	7	14	20	27	34	40	47	54	60	67	74	80	87	94	100

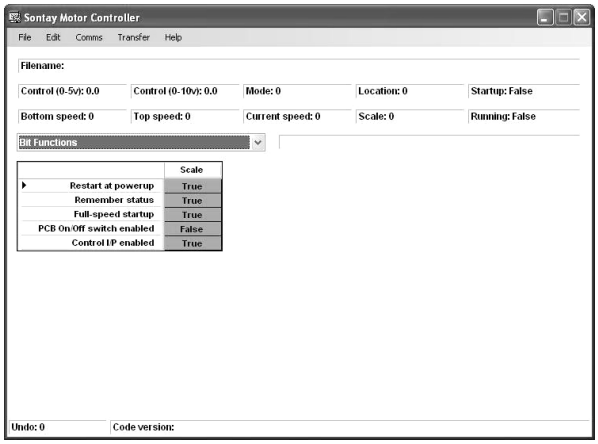
Non-Linear Scaling



0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	14	26	39	50	59	65	69	72	74	76	77	78	77	78	77

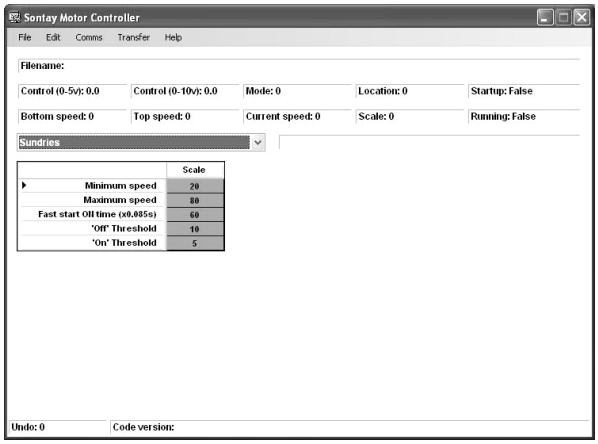
Configuration Software (continued)

Select "Bit Functions" from the drop down menu. Each bit function can be enabled by setting the value to "True" of disabled by settings the value to "False". See Configurable Operation (Mode 4) for details of each function.



Select "Sundries" from the drop down menu. Each function can have a value set between 0 and 100. See Configurable Operation (Mode 4) for details of each function.

On and Off Thresholds



When the input falls below the Off threshold, the output will turn OFF. When the input rises above the On threshold, the output will turn ON.

Note that the settings made can be saved by clicking <File> then <Save Data As>. To retrieve saved settings, click <File> then <Open Data>.

To send the new settings to the FC-DIN controller, click <Transfer> then <Write All>.

To retrieve settings from an FC-DIN controller, click <Transfer> then <Read All>.