

Overview

AirCare Full-Feature EC™ ACM1022 for EBM fans is a robust variable-speed controller intended for brushless DC (BLDC), electrically-commutated (EC) motors. The ACM1022 Series combines intelligent speed control with industry standard MODBUS® networking. The versatile design allows for analog (0-5V or 20mA current loop) or network control input and analog or tachometer feedback. Precise control is possible over a wide speed range (1-100%).

ACM1022 closed-loop control (CLC) capability supports a wide range of sensors such as air pressure, air flow and temperature. In closed-loop mode, ACM1022 adjusts motor speed to converge the value of a selected feedback source to the set-point value.

ACM1022 control options include:

- o Onboard/External manual adjust
- o Analog 0-5,10V or 0,4-20mA signal from a sensor, potentiometer, or controlled voltage source
- o Motor tach RPM control
- o MODBUS RTU RS485 control (stand-alone or networked)

Specifications

- Simple connections
 - o 4 Pin MTA for motor control signals
 - o 2 Pin MTA for external fault LED
 - o RJ45 for networking
 - o 2 Pin terminal for power input
 - o 3 Pin terminal for analog inputs
 - o 3 Pin terminal for accessory output voltage
- LED diagnostics
 - o Board Status
 - o Network traffic
 - o Fault condition
- Multimeter Outputs
 - o mVDC set-point
 - o mVDC RPM Feedback
- Industry standard MODBUS Networking
 - o RTU Protocol
 - o RS485 9600,8,n,1
- Flexible analog control options
 - o 0-5,10V source
 - o 0,4-20mA source
 - o Manual Speed Adjust
 - o Sensor with 0-5,10V output
 - o Internal closed-loop control
- PWM Speed Command Signal
 - o 10V, 80Hz
- TACH Motor Speed Input
 - o 10V @ 1mA needed switched to ground.
 - o Maximum 5000 RPM measured
 - o Minimum 60 RPM measured
- Powered from Network or Local Supply
 - o 12-24V AC or DC
- OEM module
 - o Open-frame PCB with standoffs
 - o Panel mounted
 - o 0-40°C operating temperature



Installation

ACM1022 gets its low voltage power from a 12-24V DC supply or AC transformer.

Two RJ45 jacks provide In/Out connections for network cables. Like the AirCare VariPhase™, the ACM1022 is daisy-chained using CAT5 patch cables.

Please see the ACM1022 Advanced Technical Manual for further installation options and details.

Table 1 ACM to ECM Cable Control Wiring

ACM1022 Controller			
J1 Pin	Ref	Type	Function
1	ENBL	OUT	Motor Enable
2	TACH	IN	Feedback
3	COM	REF	Common
4	PWM	OUT	Speed

Motor Control Port J1 Connectors

The J1 motor control port connector is a 4 position 0.1” Amp/TE MTA-100 Style Header.

Part Numbers:

- 22AWG: # 3-643813-4 (RED)
- 24AWG: # 3-643814-4 (WHT)
- 26AWG: # 3-643815-4 (BLU)
- 28AWG: # 3-643816-4 (GRN)

Mating connector for ACM1022 for EBM-ECM Fan/Motor:

Flying leads are used to connect to an EBM fan

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Electrical & Environmental Ratings

The ACM1022 Series accepts bias power from external, isolated AC or DC sources.

Table 2 Electrical & Environmental Ratings

Parameter	Min	Typical	Max	Units
Input Voltage, AC, 50/60Hz	12 ¹		28 ¹	V AC
Input Voltage, DC	14		30	V DC
Operating Current, AC		35		mA AC
Operating Current, DC		30		mA DC
Accessory Current 5V,10V			50 ³	mA DC
Accessory Current, V.RFU ²			100 ³	mA DC
Ambient Operating Temp	0		40	°C

¹ AC voltage spec refers to *actual AC voltage values*, i.e., not transformer ratings, etc.

² V.RFU is rectified and capacitive-filtered, but is unregulated.

³ Maximum current values stated in support of a single connected load.

Table 3 "Stand Alone Operation" Power Source Ratings

Parameter	Min	Typical	Max	Units
Supply Transformer Voltage Rating	12	18-24	24	V AC
Supply Transformer Power Rating	2			VA
Regulated DC Supply Voltage Rating	14	18-24	30	V DC
Regulated DC Supply Power Rating	2			Watts

These values assume no accessory current demand.

Increased Accessory Current

Accessory output currents may be increased under the following conditions.

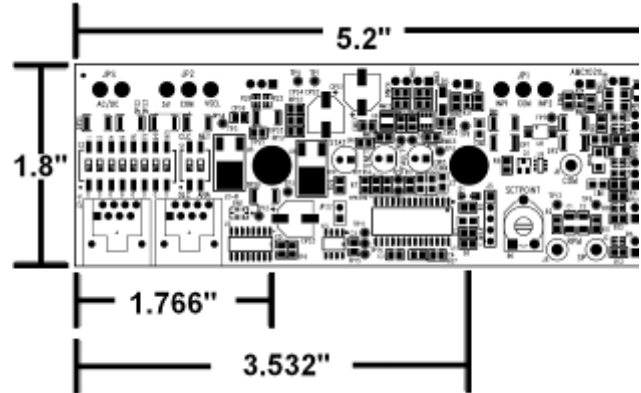
Table 4 Extended Accessory Output Currents for Stated Input Voltage Condition

Input Voltage	Accessory Current, DC mA ²			Suggested AC/DC Source Power Rating
	5V	10V	V.RFU	VA
14VDC Regulated	300	300	500	20,20,30
30VDC Regulated	50	50	500	10,10,60
12VAC ¹ Transformer	100	100	100	5,5,5
28VAC ¹ Transformer	50	50	200	10,10,25

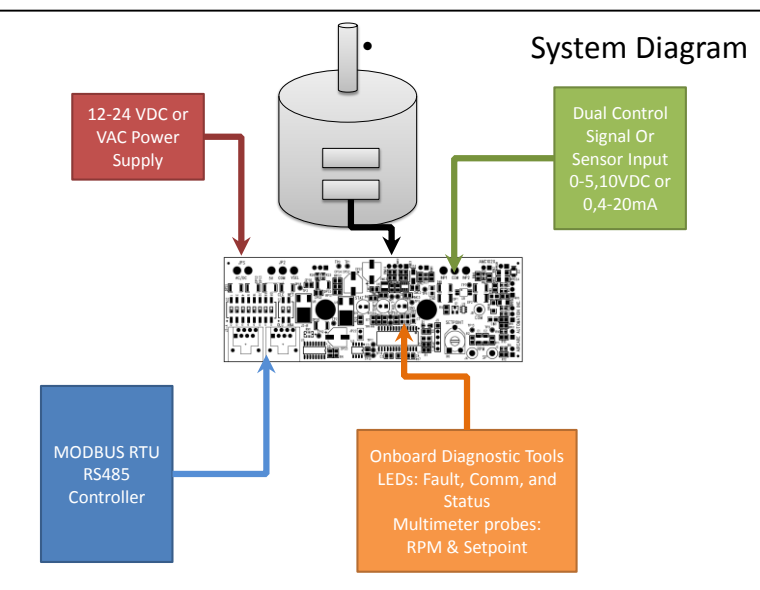
¹ AC voltage spec refers to *actual AC voltage values*, i.e., not transformer ratings, etc.

² Current values stated in support of a single connected load.

Mechanical Dimensions



#8 or #10 1.5" screw used to mount to panel



Optional Plate shown: Add a Suffix P to order:

