



High Country Tek, Inc.

e-Fan System Controller: **emc-3**

Used to drive smart fans with sourcing input requirement

Electronic Control Solutions for the Global Fluid Power Industry

High Country Tek, Inc. (HCT)

is the Fluid Power Industries premier Independent electro-hydraulic controls supplier with best in class products, service and training.

HCT provides the most 'Ruggedized' electronic control solutions for a wide variety of applications that are successfully applied across the globe in all areas of the fluid power industry.

The new generation of fan controllers using *electric motors* starts with the market driven development of the **emc-3**.

This robust module can individually control up to 3 banks of electric 'Smart' fans allowing precise and accurate forward or reverse cooling air flow across the radiator elements as needed, while the SAE J1939 interface on this module makes full use of the temperature data available while reducing the wire connections and harness requirements to a minimum size and complexity.



emc-3 System Advantages:

- Removal of fan system hydraulic oil, reducing risk of engine compartment 'Thermal events'
- No fluid hoses, couplings, fittings, pumps or motors to leak or spill oil
- Removal of oil tank and associated parts improving engine bay space availability
- Less maintenance requirements meaning lower operational costs and down time
- Positive fuel savings with accurate 'cool-on-demand' operation
- Quieter operation, even at full speed cooling due to smaller fan diameters
- Can be easily programmed to exactly suit individual application needs
- No special interface required - the emc-3 controller uses the available SAE J1939 signals
- Local diagnostic LED's instantly tell 'health' and condition of the cooling system

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emc-3 Controller Specification Information

Controller Specifications:

- Single, multi-layer printed circuit board
- High current capacity parts for reliability
- 10 bit resolution for accuracy and controllability
- Proven circuit technology used throughout design
- Designed to be RoHS compliant
- Intella™ software programmable



Supply Voltage:	9VDC to 32VDC Vin
Supply Protection:	Designed to be SAE J1455 compliant Internal transient surge protection - Use external fuse for HCT warranty compliance
Module Protection:	Over temperature warning/shutdown - Software controlled Under voltage shutdown at <10VDC - Hardware controlled override
Communications:	2x separate CAN ports - SAE J1939 protocols compliant 1x RS232 serial port for PC programming and/or diagnostics
User Voltage / Type:	1x / +5VDC ±5% @ 250mA (internally current limited and protected)
Analog Inputs / Type:	3x / Voltage only / 100K input impedance / Software selectable Lo-HI or Hi-Lo
Analog Input(s) range:	0 to +5VDC max only (can be software configured to act as digital inputs)
Universal Inputs / Type:	3x / Voltage, Current, Pulse, Digital or PWM (software selectable / settable)
Universal Input(s) range:	0 to +5VDC, 0 to +10VDC, 0 to 20mA, 0 to 24Khz (across all 3), 30 to 1500Hz PWM
Digital Inputs / Type:	8x / (1 specific (Digi I/P 1) for remote enable, software selectable / settable)
Digital Input(s) range:	0 to +Vin max (pulled to GND internally through 33K)
Digital Outputs / Type:	3x / High Sided
Digital Output(s) range:	Upto 3 amps each max
PWM Outputs / Type:	3x with I/O optimized resolution
PWM Output(s) range:	0 to 100 mAmps max
Diagnostic Indicators:	4x - MS (Module status), NS (Node status), Default Error status, O/P PWM %
NEMA / IP rating:	NEMA 6P / IP 68
Connector type:	1 x Cinch/Metripack 30 way male and 1 x Cinch/Metripack 18 way male.
Operating Temp. Range:	-40 to +85 Centigrade (-40F to +185F)
Storage Temp. Range:	-40 to +100 Centigrade (-40F to +212F)

emc-3 Controller Specification Information

Applications:

The list below shows some common examples of applications where this controller can be used successfully:

- Transit busses
- School busses
- Recreational vehicles
- Inner city trams
- Air conditioning applications
- Passenger trains
- Auxiliary/Supplementary cooling systems
- Backup/support cooling systems
- Emergency cooling systems
- Marine equipment/cabin
- Off road vehicles
- Construction machines

In addition to the clean, oil free easy installation, this system requires no special skills or tools for installation and can be scaled up or down in number of fan units to suit the radiator size and achieve the required air flow, and can be applied to any vehicle or project with a suitable 12VDC or 24VDC electrical system.

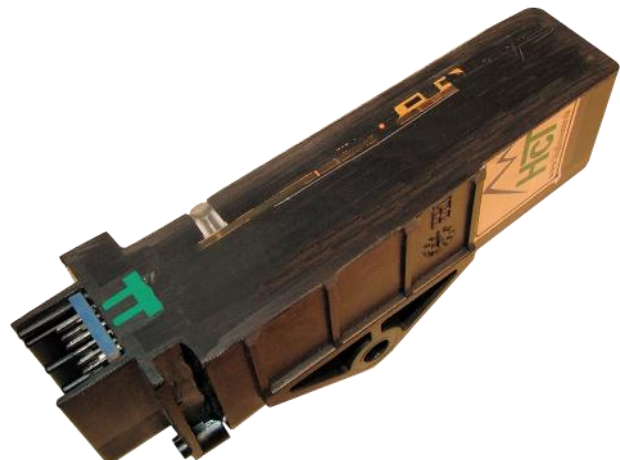
Quality Assurance:

- Designed, Built and manufactured in-house by HCT
- Highest quality components sourced for reliability
- Signature 'Potting' process for extreme durability
- Uses proven Intella™ software for program
- Full automated test on 100% modules
- Can be pre-loaded with system configurations
- Unique part numbers for secure supply chain
- Private label options for your customer support



Environmental Protection:

- Solid 'Pot' using 2 part, black epoxy resin encapsulant
- Flame resistant / retardant material
- No voids, spaces, air gaps or moisture traps
- Does not expand or shrink in temperature extremes
- Hermetic seal over total module
- Impervious to vibration, liquids or mechanical abuse
- Can be mounted at any location to suit application



Standard emc-3 Product Features:

- Operates with major OEM low voltage 'smart' fan units
- Sealed and protected to >IP68 (NEMA 6P)
- Unique 'Solid' potting with flame retardant materials
- SAE-J1939 & HCT-CAN communication protocols
- Transient suppression for use on all mobile equipment
- SAE-J1455 for 'Load-dump' protection
- Patented **Intella™** system configuration software for fast implementation
- Industry standard Cinch or Metripack 18 and 30 way connectors used
- Comprehensive on-line literature, manuals, user guides and application information



Please contact us to discuss your next cooling project so that we can work with you to find the best technology package and most efficient solution for your application.

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|-------------------------|-------------------------|-------------------------|
| ❖ Mining & Exploration | ❖ Reclamation & Salvage | ❖ Power Generation |
| ❖ Agriculture | ❖ Oil Field & Sands | ❖ Emission Controls |
| ❖ Cranes & lifts | ❖ Demolition Equipment | ❖ Integrated Drivers |
| ❖ Refuse & Re-cycling | ❖ Cooling Solutions | ❖ Valve & Pump Controls |
| ❖ Construction | ❖ Military Apparatus | |
| ❖ Off-Road vehicles | ❖ Specialty Use | |
| ❖ Forestry, Wood & Pulp | ❖ Remote Control | |

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