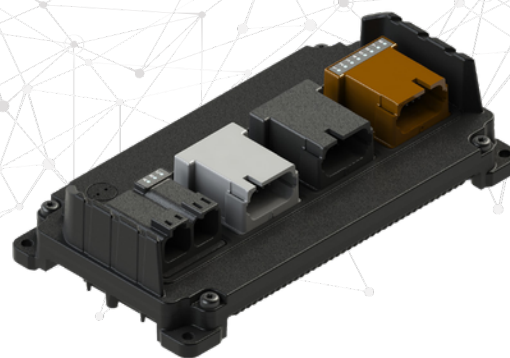
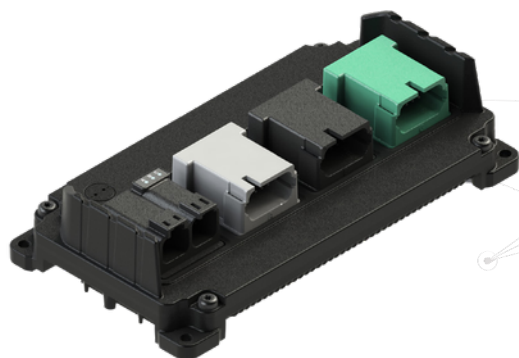




uControl™ SERIES

Get the most out of any application with powerful, flexible and precise controllers. Featuring multiple CAN interfaces, extensive outputs and an available high-current output option, the complete family of uControl mobile machine controllers can handle any job, big or small.





MC4-26-20

INPUTS	
UNIVERSAL ANALOG / HIGH FREQUENCY	10
UNIVERSAL ANALOG	16
TOTAL INPUTS	26
OUTPUTS (SOFTWARE SELECTABLE)	
4A PWM (FEEDBACK)	10
DUAL-RANGE PWM 4A / 0.5 A (FEEDBACK)	10
15A PWM (FEEDBACK)	-
TOTAL OUTPUTS	20
OTHER	
CAN 2.0B / J1939	
SENSOR SUPPLY	
	3 Channels
	(2) 400mA max @ 5 or 10 VDC [Software Selectable Voltage]
CONNECTORS	
	J1A (4 pin) - DTP06-4S J1B (6 pin) - DT06-6S-E008 J2 (18 pin - A key) - DT16-18SA-K004 J3 (18 pin - B key) - DT16-18SB-K004 J4 (18 pin - C key) - DT16-18SC-K004 (1)
LED INDICATORS	
	Green - Power Status (1) White - Software Configurable (1) Blue - Software Configurable
DIMENSIONS	
	10.09 x 5.45 x 2.38 in (256.2 x 138.5 x 60.4 mm)

MC4-21-14-H8

INPUTS	
UNIVERSAL ANALOG / HIGH FREQUENCY	8
UNIVERSAL ANALOG	13
TOTAL INPUTS	21
OUTPUTS (SOFTWARE SELECTABLE)	
4A PWM (FEEDBACK)	6
DUAL-RANGE PWM 4A / 0.5 A (FEEDBACK)	8
15A PWM (FEEDBACK)	8
TOTAL OUTPUTS	22
OTHER	
CAN 2.0B / J1939	
SENSOR SUPPLY	
	3 Channels
	(2) 400mA max @ 5 or 10 VDC [Software Selectable Voltage]
CONNECTORS	
	J1A (4 pin) - DTP06-4S J1B (6 pin) - DT06-6S-E008 J2 (18 pin - A key) - DT16-18SA-K004 J3 (18 pin - B key) - DT16-18SB-K004 J4 (18 pin - D key) - DT16-18SD-K004
LED INDICATORS	
	(1) Green - Power Status (1) White - Software Configurable (1) Blue - Software Configurable (8) Green - High Current Status • Solid - Output Active • Dark - Output Inactive • Blinking - Output in Fault
DIMENSIONS	
	10.09 x 5.45 x 2.38 in (256.2 x 138.5 x 60.4 mm)

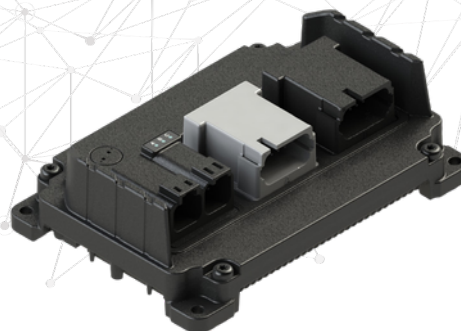
INPUT OPTIONS (ALL CONTROLLERS)

ANALOG FUNCTION				DIGITAL MODE		
ADC RESOLUTION	12 bits			TYPE	Low/High Side (Software Configurable)	
ACCURACY	0-5 VDC Mode: Typical +/- 0.2 % FS All Other Modes: Typical +/- 1 % FS					
MEASURING RANGES	Voltage Mode		Current Mode	Resistive Mode	INPUT IMPEDANCE	Nominally 10 kΩ (Configuration Dependent)
	0 to 5V (Absolute / Ratio-metric)	0 to 36V	0 to 22 mA	100Ω to 100 kΩ		
INPUT RESISTANCE	10kΩ +/- 20%		200Ω	20kΩ	SAMPLING FREQUENCY	250 Hz
SWITCH-ON LEVEL					SWITCH-OFF LEVEL	Software Configurable from 0 to 36V
SAMPLING FREQUENCY	1kHz					
HIGH FREQUENCY MODE						
TYPE	Single ended, digital low/high side (Software Configurable)					
INPUT IMPEDANCE	Nominally 10 kΩ (Configuration Dependent)					
INPUT FREQUENCY	1Hz...50kHz					
THRESHOLD 1	Standard switch on at 2.5 V / Standard switch off at 1.25 V					
THRESHOLD 2	Standard switch on at 7.5 V / Standard switch off at 3.75 V					



MC2-18-6

INPUTS	
UNIVERSAL ANALOG/HIGHFREQUENCY	4
UNIVERSAL ANALOG	14
TOTAL INPUTS	18
OUTPUTS (SOFTWARE SELECTABLE)	
4A PWM (FEEDBACK)	2
DUAL-RANGE PWM 4A / 0.5 A (FEEDBACK)	4
15A PWM (FEEDBACK)	-
TOTAL OUTPUTS	6
OTHER	
CAN 2.0B / J1939	2 Channels
SENSOR SUPPLY	(1) 400mA max @ 5 or 10 VDC [Software Selectable Voltage] J1 (18 pin - E key) - DT16-18SE-K004
CONNECTORS	J2 (18 pin - B key) - DT16-18SB-K004 (1) Green - Power Status (1) White - Software Configurable (1) Blue - Software Configurable
LED INDICATORS	
DIMENSIONS	5.60 x 5.44 x 2.38 in (142.3 x 138.3 x 60.4 mm)



MC3-21-10

INPUTS	
UNIVERSAL ANALOG / HIGH FREQUENCY	8
UNIVERSAL ANALOG	13
TOTAL INPUTS	21
OUTPUTS (SOFTWARE SELECTABLE)	
4A PWM (FEEDBACK)	6
DUAL-RANGE PWM 4A / 0.5 A (FEEDBACK)	4
15A PWM (FEEDBACK)	-
TOTAL OUTPUTS	10
OTHER	
CAN 2.0B / J1939	3 Channels
SENSOR SUPPLY	(1) 400mA max @ 5 or 10 VDC [Software Selectable Voltage]
CONNECTORS	J1A (4 pin) - DTP06-4S J1B (6 pin) - DT06-6S-E008 J2 (18 pin - A key) - DT16-18SA-K004 J3 (18 pin - B key) - DT16-18SB-K004
LED INDICATORS	(1) Green - Power Status (1) White - Software Configurable (1) Blue - Software Configurable 7.85 x 5.44 x 2.38 in (199.3 x 138.3 x 60.4 mm)
DIMENSIONS	

OUTPUT OPTIONS (BY TYPE)

	4A BINARY (FEEDBACK)	4A PWM (FEEDBACK)	DUAL-RANGE PWM 4A / 0.5A (FEEDBACK)	15A [SINGLE] / 25A [PARALLEL] PWM (FEEDBACK)
TYPE	Low/High side, H-bridge (Software configurable as push/pull or float)			
PWM FREQUENCY	N/A	50 – 5 kHz		50 – 2 kHz
DITHER FREQUENCY		Configurable		
DITHER AMPLITUDE		Configurable		
CONTROL RANGE		0.05 - 4A	Low Current Mode: 0.005 – 0.5A High Current Mode: 0.05 - 4A (software configurable)	0.1A – 25A (if in parallel with high side channel) 0.1A – 15A
CONTROL RESOLUTION		1 mA	Low Current Mode: 1mA Hight Current Mode: 1 mA (software configurable)	20mA
FLY BACK PROTECTION		Integrated		
DUTY CYCLE RESOLUTION	.01% @ 250Hz			
MAX AMPERAGE	4A			15A (Parallel with mated high side driver for 25A)
OUTPUT INDICATION	N/A			LED with output state & fault state Single Red LED per output
DIAGNOSTICS	Open/Short Circuit Protection			
FAULT MODES	Short circuit, overcurrent and open circuit protection Overtemperature			

SERIES SPECIFICATIONS

COMPUTING	
PROCESSOR	Renesas®Super H72546@200MHz(32-bit)
FLASH	3.75 MB (1,000 writes)
SRAM	256 KB
MRAM	32 KB
EEPROM	128 KB

ENVIRONMENTAL	
OPERATING TEMPERATURE	-40° to +221°F (-40° to +105°C)
STORAGE TEMPERATURE	-40° to +257°F (-40° to +125°C)
OPERATING ALTITUDE	0 - 4000 meters
PROTECTION	IP67, IP69K with Protective Boot
HOUSING	Cast aluminum housing, soft-gel potted for extreme ruggedness and durability

POWER SUPPLY	
SUPPLY VOLTAGE	6-32 VDC, Nominal Operation @ 12 / 24 VDC
PEAK SUPPLY VOLTAGE	36 VDC
MAXIMUM CURRENT (MC4-21-14-H8)	100A
MAXIMUM CURRENT (MC4-26-20)	50A (25 A with only 1 Power / 1 GND connected)
MAXIMUM CURRENT (MC3-21-10)	40A
MAXIMUM CURRENT (MC2-18-6)	24A
IDLE CURRENT 12/24 VDC	< 200mA @ 12VDC < 100mA @ 24VDC
STANDBY CURRENT 12/24 VDC	< 5mA @ 12VDC < 2.5mA @ 24VDC
SLEEP PIN	Control sleep and wake functionality

MECHANICAL TESTING	
IP6X	IEC 60529 Section 14.2.6, SAE J1455, Section 4.7.3
IPX7	IEC 60529 Section 14.2.7
IPX9K	IEC 60529, Section 14.2.9 (with protective boot)
VIBRATION	J1455 Section 4.10.4.1/5.82Grms, 8 hours per axis
SHOCK	J1455 Section 4.10.4/6+/-pulses, 50 G's, 6 ms
FLUID COMPATIBILITY	J1455 Section 4.4.3
HANDLING DROP TEST	J1455 Section 4.11.3.1, 1-meter drop on concrete on each of 6 box faces
SALT FOG	ASTM-B117/96 Hours at 35°C 5% NaCl
HUMIDITY / TEMPERATURE	SAE J1455 4.2.3 with reference to ISO 15998-7.2.2 for temperature & humidity levels

ELECTRICAL TESTING	
2004/108/EC (E-MARK)*	Broadband radiated emissions [ref. CISPR 25 sec 6.4], Conducted immunity [ref. ISO 7637-2], Conducted emissions [ref. ISO 7637-2], Narrowband radiated emissions, Radiated immunity [ref. ISO11452-2]
CISPR 11*	Radiated emissions [ref. CISPR 16-1]
CISPR 25*	Conducted emissions (power lines), Conducted emissions (signal lines), Radiated emissions
EN 60945*	Conducted emissions [ref. CISPR 16-1], Conducted immunity (RF disturbance) [ref. EN 61000-4-6], ESD immunity [ref. EN 61000-4-2]
EN 61000-4-2*	ESD immunity, 8kV contact & 16 kV air. Response level I.
EN 61326-1*	Radiated immunity [ref. EN 61000-4-3], Conducted immunity (fast transients on power & signal lines) [ref. EN 61000-4-4], Conducted immunity (surges on power lines) [ref. EN 61000-4-5], Magnetic immunity [ref. EN 61000-4-8]
SAE J1113-2*	Conducted immunity (power leads) [ref. MIL-STD0461F]
SAE J1113-4*	Conducted immunity (BCI) [ref. ISO 11452-4]
SAE J1113-11*	Conducted immunity (transients on power leads) [ref. ISO 7637-2], 5 pulses of 174V for 350 ms with 40 source impedance. Severity level 4, response I.
SAE J1113-12*	Conducted immunity (coupling clamp on signal lines) [ref. ISO 7637-3]
SAE J1113-13*	ESD immunity [ref. ISO 10605]
SAE J1113-21*	Radiated immunity (absorption lined chamber) [ref. ISO 11452-2] >150 V/m (200MHz -3.2GHz)
SAE J1113-21*	Radiated immunity (magnetic fields) [ref. MIL-STD-461F]
SAE J1113-22*	Radiated immunity (ac electric fields - power lines)
SAE J1113-26*	Inductive switching, 10 sequential 28V +/-600 V pulses of 1ms duration on I/O lines
SAE J1455*	Internal testing where power outputs, signal lines, all inputs and powered outputs are shorted to Vbat and then ground for one minute each.
SHORT CIRCUIT PROTECTION	Internal testing suite (dropouts, dips, random bounce, engine cranking). Reverse voltage test is -32 V for one minute.
SUPPLY VOLTAGE VARIATION	Internal testing of powerup and 24-hour operation at -40° C and 85° C
EXTREME TEMPERATURES	

* Pending Final Testing

SOFTWARE OPTIONS	
CODESYS	For users experienced with controller programming, uControl mobile machine controllers support CODESYS for development.

⚠ CALIFORNIA PROP65 WARNING: This product can expose you to chemicals known to the State of California to cause cancer. For more information, go to www.P65Warnings.ca.gov

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