

- Fully encapsulated chassis mount modules
- Harsh industrial EMC capabilities: Integrated filters for emission (EN 55032) & immunity (EN 55035)
- Ultra wide 4:1 input voltage range: 9-36 and 18-75 VDC
- Operating temperature range -40 to +80 °C without derating
- I/O-isolation 3'000 VDC
- Protection against overload, undervoltage and short circuit
- DC-OK (LED) and Remote On/Off function
- IEC/EN/UL 62368-1 safety approvals
- 3-year product warranty



The TMDC 10 series (10 Watt) is the latest additions to Traco Power's existing TMDC line of Industrial DC/DC off-board modules. Equipped with integrated filters which limit conducted and radiated emissions (EN 55032 class A) but also increase the modules EMC immunity (EN 55035), this series is suitable for many harsh industrial applications which require increased EMC and isolation (3000 VDC I/O-isolation) capabilities.

The modules come in fully encapsulated 3.11" x 1.34" x 0.87" plastic package and feature a temperature range from -40° to 80°C without derating. All models have an ultra wide 4:1 input voltage range from either 9-36 VDC or 18-75 VDC and fully regulated outputs. Latest IT safety certifications (UL 62368-1) and DC-OK and remote on/off functions complete the package to provide an ideal solution for many harsh industrial applications.

### Models

Order Code	Input Voltage Range	Output 1		Output 2		Efficiency typ.
		Vnom	I <sub>max</sub>	Vnom	I <sub>max</sub>	
TMDC 10-2411	9 - 36 VDC (24 VDC nom.)	5.1 VDC	2'000 mA			84 %
TMDC 10-2412		12 VDC	833 mA			86 %
TMDC 10-2413		15 VDC	666 mA			86 %
TMDC 10-2415		24 VDC	416 mA			86 %
TMDC 10-2418		48 VDC	208 mA			84 %
TMDC 10-2422		+12 VDC	416 mA	-12 VDC	416 mA	86 %
TMDC 10-2423		+15 VDC	333 mA	-15 VDC	333 mA	86 %
TMDC 10-2425		+24 VDC	208 mA	-24 VDC	208 mA	85 %
TMDC 10-4811	18 - 75 VDC (48 VDC nom.)	5.1 VDC	2'000 mA			84 %
TMDC 10-4812		12 VDC	833 mA			86 %
TMDC 10-4813		15 VDC	666 mA			86 %
TMDC 10-4815		24 VDC	416 mA			86 %
TMDC 10-4818		48 VDC	208 mA			84 %
TMDC 10-4822		+12 VDC	416 mA	-12 VDC	416 mA	86 %
TMDC 10-4823		+15 VDC	333 mA	-15 VDC	333 mA	86 %
TMDC 10-4825		+24 VDC	208 mA	-24 VDC	208 mA	85 %

### Options

TMDC-MK2	- Optional DIN-Rail Mounting Clip: <a href="http://www.tracopower.com/overview/tmdc-mk2">www.tracopower.com/overview/tmdc-mk2</a>
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### Input Specifications

Input Current	- At no load	24 Vin models: <b>30 mA typ.</b> 48 Vin models: <b>20 mA typ.</b>
	- At full load	24 Vin models: <b>490 mA typ.</b> 48 Vin models: <b>245 mA typ.</b>
Surge Voltage		24 Vin models: <b>50 VDC max.</b> (1 s max.) 48 Vin models: <b>100 VDC max.</b> (1 s max.)
Under Voltage Lockout		24 Vin models: <b>8 VDC typ.</b> 48 Vin models: <b>16 VDC typ.</b>
Recommended Input Fuse		(The need of an external fuse has to be assessed in the final application.)
Input Filter		<b>Internal Pi-Type</b>

### Output Specifications

Voltage Set Accuracy		<b>±2% max.</b>
Regulation	- Input Variation (Vmin - Vmax)	single output models: <b>0.5% max.</b> dual output models: <b>0.5% max.</b>
	- Load Variation (0 - 100%)	single output models: <b>0.5% max.</b> dual output models: <b>0.5% max.</b> (Output 1) <b>0.5% max.</b> (Output 2)
	- Voltage Balance (symmetrical load)	dual output models: <b>2% max.</b>
	- Cross Regulation (25% / 100% asym. load)	dual output models: <b>5% max.</b>
Ripple and Noise (20 MHz Bandwidth)	- single output	5.1 Vout models: <b>90 mVp-p typ.</b> 12 Vout models: <b>90 mVp-p typ.</b> 15 Vout models: <b>90 mVp-p typ.</b> 24 Vout models: <b>180 mVp-p typ.</b> 48 Vout models: <b>180 mVp-p typ.</b>
	- dual output	12 / -12 Vout models: <b>90 / 90 mVp-p typ.</b> 15 / -15 Vout models: <b>90 / 90 mVp-p typ.</b> 24 / -24 Vout models: <b>180 / 180 mVp-p typ.</b>
Capacitive Load	- single output	5.1 Vout models: <b>1'000 µF max.</b> 12 Vout models: <b>470 µF max.</b> 15 Vout models: <b>330 µF max.</b> 24 Vout models: <b>150 µF max.</b> 48 Vout models: <b>68 µF max.</b>
	- dual output	12 / -12 Vout models: <b>220 / 220 µF max.</b> 15 / -15 Vout models: <b>150 / 150 µF max.</b> 24 / -24 Vout models: <b>68 / 68 µF max.</b>
Minimum Load		<b>Not required</b>
Temperature Coefficient		<b>±0.02 %/K max.</b>
Start-up Time		<b>60 ms max.</b>
Short Circuit Protection		<b>Continuous, Automatic recovery</b>
Output Current Limitation		<b>150% typ. of Iout max.</b>
Transient Response	- Response Deviation	<b>5% max.</b> (75% to 100% Load Step)
	- Response Time	<b>500 µs max.</b> (75% to 100% Load Step)

### Safety Specifications

Standards	- IT / Multimedia Equipment	<b>EN 62368-1</b> <b>IEC 62368-1</b> <b>UL 62368-1</b>
	- Certification Documents	<a href="http://www.tracopower.com/overview/tmdc10">www.tracopower.com/overview/tmdc10</a>
Pollution Degree		<b>PD 3</b>

All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

### EMC Specifications

EMI (Emissions)	- Conducted Emissions	EN 55032 class A (internal filter) FCC 47 Part 15 class A (internal filter)
	- Radiated Emissions	EN 55032 class A (internal filter) FCC 47 Part 15 class A (internal filter)
EMS (Immunity)	- Electrostatic Discharge	Air: EN 61000-4-2, ±8 kV, perf. criteria A Contact: EN 61000-4-2, ±6 kV, perf. criteria A
	- RF Electromagnetic Field	EN 61000-4-3, 10 V/m, perf. criteria A
	- EFT (Burst) / Surge	EN 61000-4-4, ±2 kV, perf. criteria A
	- Conducted RF Disturbances	EN 61000-4-5, ±2 kV, perf. criteria A
	- PF Magnetic Field	EN 61000-4-6, 10 Vrms, perf. criteria A
		Continuous: EN 61000-4-8, 100 A/m, perf. criteria A
EMC / Environmental	- Certification Documents	<a href="http://www.tracopower.com/overview/tmdc10">www.tracopower.com/overview/tmdc10</a>

### General Specifications

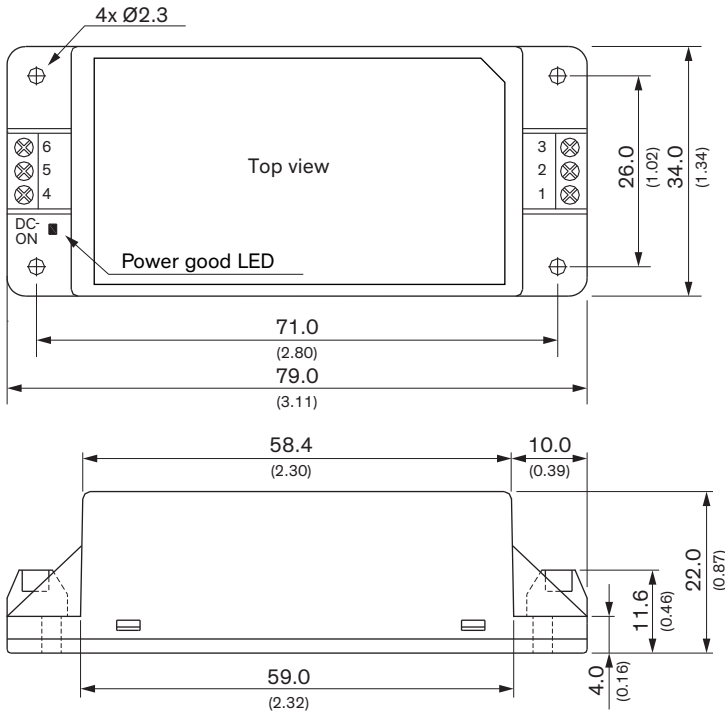
Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +93°C
	- Case Temperature	+105°C max.
	- Storage Temperature	-50°C to +125°C
Power Derating	- High Temperature	4 %/K above 80°C
		See application note: <a href="http://www.tracopower.com/overview/tmdc10">www.tracopower.com/overview/tmdc10</a>
Cooling System		Natural convection (20 LFM)
Remote Control	- Voltage Controlled Remote (passive = on)	On: 3.5 to 12 VDC or open circuit Off: 0 to 1.2 VDC or short circuit Refers to 'Remote' and '-Vin' Pin
	- Off Idle Input Current	2.5 mA typ.
	- Remote Pin Input Current	-0.5 to 0.5 mA
Altitude During Operation		5'000 m max.
Switching Frequency		330 kHz typ. (PWM)
Insulation System		Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s	3'000 VDC
Isolation Resistance	- Input to Output, 500 VDC	1'000 MΩ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	2'200 pF typ.
Reliability	- Calculated MTBF	4'100'000 h (MIL-HDBK-217F, ground benign)
Housing Material		Plastic resin (UL 94 V-0 rated)
Potting Material		Silicone (UL 94 V-0 rated)
Housing Type		Plastic Case
Mounting Type		Chassis Mount
Connection Type		Screw Terminal
Weight		65.8 g
Thermal Impedance	- Case to Ambient	4.3 K/W typ.
Environmental Compliance	- REACH Declaration	<a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a> REACH SVHC list compliant REACH Annex XVII compliant
	- RoHS Declaration	<a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a> Exemptions: 6c, 7a (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule))
	- SCIP Reference Number	de4f84e8-2447-4bc0-ba1a-699eb0ab4359

### Supporting Documents

Overview Link (for additional Documents)	<a href="http://www.tracopower.com/overview/tmdc10">www.tracopower.com/overview/tmdc10</a>
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All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

### Outline Dimensions



Dimensions in mm (inch)  
 Tolerances: x.x ±0.5 (±0.02)  
 x.xx ±0.25 (±0.01)

Mounting screw locked torque: 0.2 Nm (2.04 kgfcm)

Pinout		
Pin*	Single Output	Dual Output
1	Remote	Remote
2	-Vin (GND)	-Vin (GND)
3	+Vin (Vcc)	+Vin (Vcc)
4	-Vout	-Vout
5	NC	Common
6	+Vout	+Vout

NC: Not connected  
 \* Wires 1.5 mm<sup>2</sup> max.

Terminal screw locked torque: 0.2 Nm max.