

- Fully encapsulated low profile plastic case
- Ultra wide 4:1 input voltage range
- Operating temperature range  $-40^{\circ}\text{C}$  to  $+90^{\circ}\text{C}$
- I/O isolation 2500 VDC
- Excellent efficiency up to 91 %
- Input filter to meet EN 55022, class A
- Optional DIN-Rail mount adapter
- No minimum load required
- Power good LED indicator and remote on/off function
- 3-year product warranty



The TMDC 20 Series is a range of encapsulated high performance DC/DC converter modules. With a very high efficiency of up to 91% and the use of highest grade components these 20 W converters are made for a reliable operation in the temperature range of  $-40^{\circ}\text{C}$  up to  $90^{\circ}\text{C}$ . They come in chassis mount version with screw terminal block. The 8 models have a wide 4:1 input voltage range and a tight output voltage regulation. They do not need a minimum load and offer a high efficiency also at low load conditions. They feature a remote control input and a green power good LED which indicates the presence of the output voltage. Protection against overload and short circuit are standard features of these converters. EMC characteristics and safety certifications are aligned for the operation in industrial environment.

### Models

Order Code	Input Voltage Range	Output Voltage nom.	Output Current max.	Efficiency typ.
TMDC 20-2411	9 - 36 VDC (24 VDC nom.)	5.1 VDC	4'000 mA	90 %
TMDC 20-2412		12 VDC	1'670 mA	91 %
TMDC 20-2415		24 VDC	835 mA	91 %
TMDC 20-2418		48 VDC	420 mA	89 %
TMDC 20-4811	18 - 75 VDC (48 VDC nom.)	5.1 VDC	4'000 mA	90 %
TMDC 20-4812		12 VDC	1'670 mA	91 %
TMDC 20-4815		24 VDC	835 mA	91 %
TMDC 20-4818		48 VDC	420 mA	89 %

### Options

TMP-MK1	- Optional DIN-Rail Mounting Kit: <a href="http://www.tracopower.com/overview/tmp-mk1">www.tracopower.com/overview/tmp-mk1</a>
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### Input Specifications

Input Current	- At no load	24 Vin models: <b>70 mA typ.</b> 48 Vin models: <b>35 mA typ.</b>
	- At full load	24 Vin models: <b>931 mA typ.</b> 48 Vin models: <b>466 mA typ.</b>
Surge Voltage		24 Vin models: <b>50 VDC max.</b> (100 ms max.) 48 Vin models: <b>100 VDC max.</b> (100 ms max.)
Under Voltage Lockout		24 Vin models: <b>7.5 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)	<b>0.5% max.</b>
	- Load Variation (0 - 100%)	<b>0.5% max.</b>
Ripple and Noise (20 MHz Bandwidth)	5.1 Vout models:	<b>100 mVp-p max.</b>
	12 Vout models:	<b>150 mVp-p max.</b>
	24 Vout models:	<b>150 mVp-p max.</b>
	48 Vout models:	<b>200 mVp-p max.</b>
Capacitive Load	5.1 Vout models:	<b>6'800 µF max.</b>
	12 Vout models:	<b>1'160 µF max.</b>
	24 Vout models:	<b>300 µF max.</b>
	48 Vout models:	<b>75 µF max.</b>
Minimum Load		<b>Not required</b>
Temperature Coefficient		<b>±0.02 %/K max.</b>
Start-up Time		<b>30 ms max.</b>
Short Circuit Protection		<b>Continuous, Automatic recovery</b>
Output Current Limitation		<b>150% typ. of Iout max.</b>
Oversvoltage Protection		<b>120% typ. of Vout nom.</b> (By Zener diode)
Transient Response	- Response Deviation	<b>5% max.</b> (75% to 100% Load Step)
	- Response Time	<b>250 µs typ.</b> (75% to 100% Load Step)

### Safety Specifications

Standards	- IT / Multimedia Equipment	<b>CSA-C22.2, No. 60950-1</b> <b>EN 60950-1</b> <b>EN 62368-1</b> <b>IEC 60950-1</b> <b>IEC 62368-1</b> <b>UL 60950-1</b> <b>UL 62368-1</b>
	- Certification Documents	<a href="http://www.tracopower.com/overview/tmdc20">www.tracopower.com/overview/tmdc20</a>
Pollution Degree		<b>PD 2</b>

### EMC Specifications

EMI (Emissions)		<b>EN 61000-6-4</b> (Generic Industrial) <b>EN 61204-3</b> (Low Voltage Power Supplies)
	- Conducted Emissions	<b>EN 55032 class A</b> (internal filter) <b>FCC 47 Part 15 class A</b> (internal filter)
	- Radiated Emissions	<b>EN 55032 class A</b> (with external filter) <b>FCC 47 Part 15 class A</b> (with external filter)
		External filter proposal: <a href="http://www.tracopower.com/overview/tmdc20">www.tracopower.com/overview/tmdc20</a>

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

EMS (Immunity)	<ul style="list-style-type: none"> <li>- Electrostatic Discharge</li> <li>- RF Electromagnetic Field</li> <li>- EFT (Burst) / Surge</li> <li>- Conducted RF Disturbances</li> <li>- PF Magnetic Field</li> </ul>	Air: EN 55024 (IT Equipment) EN 55035 (Multimedia) EN 61000-4-2, $\pm 8$ kV, perf. criteria A Contact: EN 61000-4-2, $\pm 4$ kV, perf. criteria A EN 61000-4-3, 10 V/m, perf. criteria A EN 61000-4-4, $\pm 2$ kV, perf. criteria A EN 61000-4-5, $\pm 2$ kV, perf. criteria A EN 61000-4-6, 10 Vrms, perf. criteria A Continuous: EN 61000-4-8, 30 A/m, perf. criteria A
EMC / Environmental	- Certification Documents	<a href="http://www.tracopower.com/overview/tmdc20">www.tracopower.com/overview/tmdc20</a>

## General Specifications

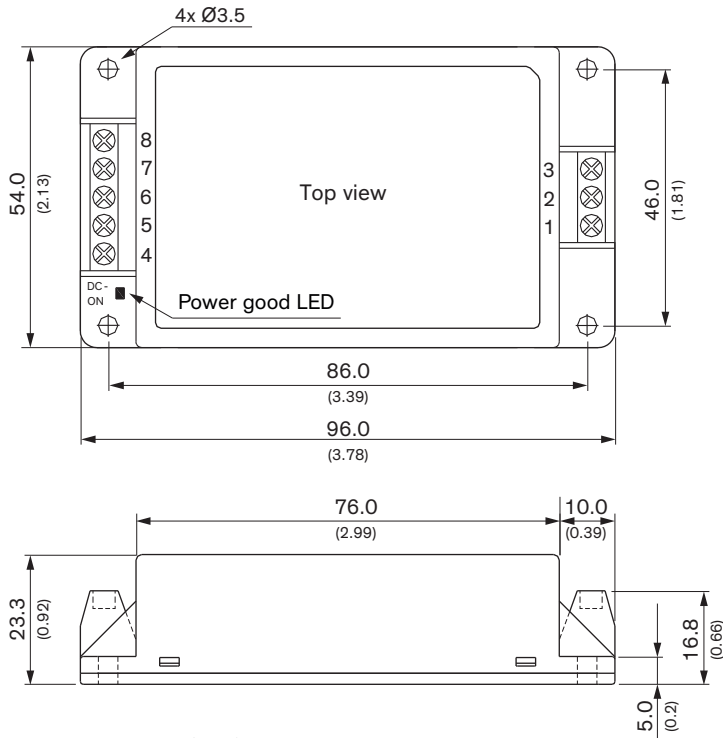
Relative Humidity		95% max. (non condensing)
Temperature Ranges	<ul style="list-style-type: none"> <li>- Operating Temperature</li> <li>- Case Temperature</li> <li>- Storage Temperature</li> </ul>	-40°C to +90°C +95°C max. -50°C to +125°C
Power Derating	<ul style="list-style-type: none"> <li>- High Temperature</li> </ul>	10 %/K above 85°C See application note: <a href="http://www.tracopower.com/overview/tmdc20">www.tracopower.com/overview/tmdc20</a>
Cooling System		Natural convection (20 LFM)
Remote Control	<ul style="list-style-type: none"> <li>- Voltage Controlled Remote (passive = on)</li> <li>- Off Idle Input Current</li> <li>- Remote Pin Input Current</li> </ul>	On: 3.5 to 12 VDC or open circuit Off: 0 to 1.2 VDC or short circuit Refers to 'Remote' and '-Vin' Pin 3 mA typ. -0.5 to 0.5 mA
Altitude During Operation		6'000 m max.
Switching Frequency		285 kHz typ. (PWM)
Insulation System		Functional Insulation
Isolation Test Voltage	- Input to Output, 60 s	2'500 VDC
Isolation Resistance	- Input to Output, 500 VDC	1'000 M $\Omega$ min.
Isolation Capacitance	- Input to Output, 100 kHz, 1 V	2'200 pF max.
Reliability	- Calculated MTBF	775'200 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		107 g
Thermal Impedance	- Case to Ambient	3.9 K/W typ.
Status Indicator		Indicated by green LED
Environmental Compliance	<ul style="list-style-type: none"> <li>- REACH Declaration</li> <li>- RoHS Declaration</li> <li>- SCIP Reference Number</li> </ul>	<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 <a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a> Exemptions: 6c, 7c-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule.)) 87a413cc-de8d-4661-a038-9e14e0eace68

## Supporting Documents

Overview Link (for additional Documents)	<a href="http://www.tracopower.com/overview/tmdc20">www.tracopower.com/overview/tmdc20</a>
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### Outline Dimensions



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

Mounting screw locked torque: 0.49 Nm (5.0 kgfcm)

Pinout	
Pin*	Function
1	Remote
2	-Vin (GND)
3	+Vin (Vcc)
4	NC
5	-Vout
6	NC
7	+Vout
8	NC

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

Terminal screw locked torque:  
0.5 Nm max.