A permanent supply in any environment – today and in the future
High-performance power supply – fit for digitalisation
Let’s connect.

Power supplies
Make the most of high savings potential and increased efficiency
PROtop power supplies - efficient and sustainable

Production processes constantly need to be made more efficient. As well as performance, energy efficiency and sustainability are also playing an increasingly important role in cutting-edge industry. PROtop power supplies combine excellent performance data with exemplary sustainability, which has a positive impact on the productivity of the entire production facility.

- Sustained reduction in energy costs thanks to improved efficiency
- Increased system availability thanks to long service life and high MTBF values
- Extremely space-saving design types for high functional density

PROtop can achieve significant savings compared to conventional power supply units. Its increased efficiency saves an average of 50 kWh per day in a medium-sized production facility with approx. 100 PROtop power supplies working in three-shift operation. This adds up to over 15,000 kWh a year and also improves the facility’s carbon footprint. The service life, which is twice as long as that of standard power supplies, also sustainably reduces the costs of repurchase and exchange.

Optimally suited to the automotive industry thanks to a reliable supply and sustainable energy savings: three-phase PROtop power supplies have an efficiency level of up to 95.3% and an MTBF value of over 1,000,000 hours.

Perfect for the food industry thanks to complete data transparency: communication-capable PROtop power supplies can be easily integrated into control systems and are particularly space-saving.

Sustainable and innovative device concept
- Optimum efficiency levels (up to 95.3%) for sustainable energy savings
- High MTBF values (> 1,000,000 h) for permanently high system availability
- Direct parallel switching without diode modules thanks to integrated ORing MOSFETs for reduced system costs

Outstanding peak load reserves
- High dynamic range thanks to unique DCL (dynamic current limiting) technology
- Continuous peak load reserves from millisecond to second range
- Ideal for reliably triggering circuit breakers or for powerful motor starts
- With additional short circuit cut-off for improved cable protection thanks to DCL

Highly future-proof
- Complete data transparency through to the cloud
- Remote controllability for integration into machine control systems
- CANopen and IO-Link communication protocols

Compact dimensions and maximum flexibility
- Up to 40% space savings for increased functional density within the control cabinet
- Wide range of uses thanks to various operating modes
- Variable connection options thanks to plug-in terminals, with time-saving PUSH IN connection system or traditional screw system

Optimally suited to the automotive industry thanks to a reliable supply and sustainable energy savings: three-phase PROtop power supplies have an efficiency level of up to 95.3% and an MTBF value of over 1,000,000 hours.
Communication-capable components form the basis of networked production and can be used to exploit the potential of Industry 4.0. They can record product and status-oriented data, as well as machine-internal measured values and energy parameters, and store them in a cloud. Based on the evaluated data, new services can be established for the optimisation and diagnosis of production processes or for energy management. All devices should therefore be networked as quickly as possible and connected to a cloud.

**Communication-capable with retrofit solution**

PROtop can be retrofitted with a communication module for the requirements of tomorrow. This retrofit solution is simply connected to the PROtop power supply and allows for the transmission of process data to the higher-level control system. This networks the power supply to other components within the system. The solution is remote-controllable and is integrated into a system’s condition monitoring system.

**Process optimisation with condition monitoring**

Condition monitoring allows for comprehensive process optimisation, such as reduced power consumption or the systematic planning of maintenance work. This considerably increases the functional reliability and efficiency of an extremely wide range of systems – in food and packaging systems with high hygiene requirements or in hard-to-access wind power installations in offshore wind parks.

The benefits of the PROtop communication module

- Simple integration of process data into the higher-level control system for improved condition monitoring
- New solutions such as voltage tracking or load cut-off thanks to remote control capability
- Simpler commissioning thanks to automatic parameterisation via machine control and minimal maintenance work

The combination of automation and digitization

Future-proof Industry 4.0 solutions from Weidmüller

**Digitalisation**

- Combination of automation and digitalisation in order to optimise production output
- Leading edge thanks to data-based business models such as application-specific Analytics solutions for the detection of anomalies and Predictive Maintenance

**Automation**

- Open, platform-independent automation toolbox u-mation
- Optimally tailored components u-control, u-create, u-remote and u-view for customised automation solutions

**Field**

- Communication-capable components such as PROtop for the quick provision of process data for intelligent networking of machines and IT systems

www.weidmueller.com/protop
The ORing technology in the PROtop power supplies improves performance and reduces system costs.

PROtop guarantees maximum supply reliability for continuous operation systems in particular. This is achieved thanks to the reliable redundant power supply, the long-term stability as a result of the parallel connection option with ORing MOSFETs and the corrosion-proof protective coating on the PCBs.

Innovative elements such as the integrated ORing MOSFETs set new standards in the field of power supply units. These elements reduce system costs and increase system availability.

Conventional redundancy concepts require additional redundancy or diode modules with high space requirements and large power losses. Never systems with MOSFET transistors reduce power loss to approx. 10% but still take up a lot of space in the control cabinet.

The integrated ORing MOSFETs in PROtop provide high power with minimal dimensions and do not require any additional assembly or wiring work. This reduces system costs and saves space in the control cabinet. The parallel operation option makes current sharing easier and guarantees maximum long-term stability.

The benefits of integrated ORing MOSFETs

- Accelerated build-up of a redundant power supply
- No additional redundancy or diode modules
- Reduced space requirements
- Lower system costs
- Increased system availability

Simpler build-up, improved performance: systems with traditional diode and redundancy modules compared to PROtop power supply systems with future-proof ORing technology.

<table>
<thead>
<tr>
<th>Topic</th>
<th>With ORing technology</th>
<th>Traditional concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term stability</td>
<td>good to excellent (hands-on parallel mode)</td>
<td>not be entered due to cable resistance</td>
</tr>
<tr>
<td>Current balancing @ 24 V DC</td>
<td>no thanks to parallel operating modes</td>
<td>yes, fine adjustment due to cable resistance</td>
</tr>
<tr>
<td>System of components</td>
<td>x PRO power supply units</td>
<td>x PRO power supply units</td>
</tr>
<tr>
<td>Wiring</td>
<td>optimized</td>
<td>additional calc for power and signals</td>
</tr>
<tr>
<td>Spare integration</td>
<td>optional</td>
<td>optional</td>
</tr>
<tr>
<td>Power loss</td>
<td>reduced to a minimum</td>
<td>significantly higher</td>
</tr>
<tr>
<td>System costs</td>
<td>optimal</td>
<td>higher</td>
</tr>
<tr>
<td>N+1 redundancy / more than 2 PSU</td>
<td>via or</td>
<td>via or</td>
</tr>
</tbody>
</table>

The ORing technology in the PROtop power supplies improves performance and reduces system costs.
Derating curve

High-end power supplies need to perform efficiently and reliably even in challenging industrial environments. This requires high power reserves, a long service life and optimal protection against surge voltage, vibration and extreme temperatures.

PROtop power supplies have a particularly robust network input level and are not sensitive to mechanical influences. This guarantees reliable operation even in challenging conditions such as those in wind power installations.

Thanks to the future-oriented DCL (dynamic current limiting) technology, high pulse reserves are available at all times. The resulting dynamic range can be used for the reliable triggering of circuit breakers or for powerful motor starts. At a motor's starting torque, for example, approx. 300% power reserve will be available for the reliable triggering of circuit breakers or for powerful motor starts. At a pulse reserves are available at all times. The resulting dynamic range can be used for reliable tripping of line circuit breakers, even 600% is available for 15 ms.

The benefits of DCL technology

- Reliable triggering of circuit breakers
- Dynamic and powerful motor starts
- Additional power reserves

Economical and reliable supply even in extreme conditions: single-phase PROtop versions with innovative DCL technology for permanently reliable operation - even at -40°C

DCL – project planning table showing the maximum cable lengths for selective fuse triggering

<table>
<thead>
<tr>
<th>Cable cross-section/mm²</th>
<th>0.75</th>
<th>1.0</th>
<th>1.5</th>
<th>2.5</th>
<th>4.0</th>
<th>6.0</th>
<th>10.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRO TOP 7/12 W 24 V 2 A with DCL technology</td>
<td>C2/m</td>
<td>18</td>
<td>25</td>
<td>35</td>
<td>62</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Cable length with circuit breaker</td>
<td>C2/m</td>
<td>35</td>
<td>45</td>
<td>63</td>
<td>11</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>PRO TOP 7/24 W 24 V 2 A with DCL technology</td>
<td>C2/m</td>
<td>11</td>
<td>15</td>
<td>21.5</td>
<td>35</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>PRO TOP 7/36 W 24 V 3 A with DCL technology</td>
<td>C2/m</td>
<td>3.5</td>
<td>4.5</td>
<td>6.5</td>
<td>11</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>PRO TOP 7/48 W 24 V 3 A with DCL technology</td>
<td>C2/m</td>
<td>2</td>
<td>4</td>
<td>5.5</td>
<td>10</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>PRO TOP 7/60 W 24 V 4 A with DCL technology</td>
<td>C2/m</td>
<td>1.5</td>
<td>3.5</td>
<td>7</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>PRO TOP 7/960 W 48 V 20 A with DCL technology</td>
<td>C2/m</td>
<td>12</td>
<td>16.5</td>
<td>23</td>
<td>35</td>
<td>60</td>
<td>95</td>
</tr>
<tr>
<td>PRO TOP 7/1 280 W 48 V 10 A with DCL technology</td>
<td>C2/m</td>
<td>8</td>
<td>11.5</td>
<td>15</td>
<td>23.5</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>PRO TOP 7/1 280 W 48 V 10 A with DCL technology</td>
<td>C2/m</td>
<td>5</td>
<td>7</td>
<td>11.5</td>
<td>19</td>
<td>30</td>
<td>50</td>
</tr>
<tr>
<td>Cable length with circuit breaker</td>
<td>C2/m</td>
<td>3.5</td>
<td>4.5</td>
<td>6.5</td>
<td>11</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>PRO TOP 7/480 W 48 V 20 A with DCL technology</td>
<td>C2/m</td>
<td>12</td>
<td>16.5</td>
<td>23</td>
<td>35</td>
<td>60</td>
<td>95</td>
</tr>
<tr>
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<td>11</td>
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<td>–</td>
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</table>

The distance between the Power Supply and the load (l) is measured under real conditions.

The following parameters are the basis of measurement:
- Siemens circuit-breaker (5SY61xx-x)
- The short circuit generated by a semiconductor switch
- In addition to the short circuit current, the Power Supply provides half of the nominal current for a parallel connected load

(Status: April 2018)
Intelligent protection of DC loads
topGUARD load monitoring system with communication via IO-LINK

Modern machines and plants require load monitoring systems capable of communication. The IO-Link-capable load monitoring system topGUARD offers remote control options, full data transparency, and reliable protection of the 24 V system voltage.

topGUARD is an outstanding supplement to the IO-LINK-capable PROtop power supplies for innovative power management systems. It saves space and time during device installation through an innovative approach to integrated distribution of potential. Parameterisation, control and provision of all operating data are carried out via the plug-in module of the IO-Link module and integrating an IODD file. The module can be used for PROtop power supplies as well as for topGUARD load monitoring.

Your special advantages

- Data transparency and remote control due to IO-Link
- Maximal flexibility thanks to a modular system
- Voltage-adaptive load monitoring according to Class 2
- Time and cost savings due to an integrated distribution of potential
- Simple migration from maxGUARD to topGUARD

IO-LINK capable
The IO-Link-capable load monitoring system topGUARD offers remote control options, provides operating data for optimal condition monitoring, and enables entirely new control solutions.

Integrated distribution of potential
The integrated distribution of potential, well known from the maxGUARD concept, takes up significantly less space and saves valuable time during installation.

Modular and innovative
The modular concept enables custom-fit solutions. The first of its kind, voltage-adaptive class 2 load monitoring allows the continued use of 18 to 30 V DC operating voltage.
Intelligent load monitoring and potential distribution

topGUARD – control voltage distribution on a new level

- Pluggable IO-LINK communication module
- Full channel monitoring: ON/OFF, Triggered, Fault
- Access to all channel currents and output voltages
- Programmable tripping current and free selection of characteristic curves
- Remote access to all load monitoring: ON/OFF; Reset
- Pre-selectable switch-on delay, alarm and early warning values
- Modular and flexible with 3 load monitoring types: 1-6 A (6.1 mm), 4-12 A
- (12.2 mm), 1-4 A class 2 (6.1 mm)
- Extended temperature range: -25…+70°C

- ESG marker in 8x13.5 mm
- For station labelling

- Pluggable IO-LINK module
- 16 mm² connections for station power feed up to 40 A

- Pluggable connector
  - with mounting flange for fast but reliable IO-LINK connection

- Test openings
  - For quick system checks

- Active power-feed module for station management

- Station bus

- Main channel: plus

- Main channel: minus

- Button for station addressing

- LED gr/rd for ON/OFF
  - LED ye for Auto/Manual

- Station expansion made simple by dual shaft channels for plus, minus and station bus

- Additional WS x/6 markers for marking the tripping current

- WS x/6 or endless markers for quick application of the equipment label

- 2 mm test sockets on all connection elements allow easy access to all potentials during troubleshooting

- Unique marking of the connection terminal

- Coloured pusher for easy potential tracking
  - Red - active load monitoring output (plus)
  - White - distribution potential (fused plus)
  - Blue – general minus

- Marking of dual contacts for expansion purposes by means of transverse bridges

- Save space and time, and avoid wiring errors – thanks to the innovative maxGUARD concept.
  - Fast and easy duplication of load circuit connections through the use of precisely fitting potential distributors and ready-made bridges.

- topGUARD – with the advantages of the maxGUARD concept

  - Innovative integrated potential distribution
  - Extremely space-saving 6.1 mm pitch
  - Modular concept saves unused fuse channels
  - Service-friendly and expandable at any time
Three-phase PROtop power supplies in standard design

- Digital 24 V DC input
- IEC = 884-16, EN 60601
- Output voltage: 230 V ± 30 V DC
- Protection class: with I/O connection
- Dynamic information: 500 kbit/s, green/yellow
- Protection class: IP20

PRO TOP1 72W 24V 3A F Typ. 89% 35 ● ● ● ●
PRO TOP1 120W 24V 5A F Typ. 91% 35 ● ● ● ●
PRO TOP1 240W 24V 10A F Typ. 92% 39 ● ● ● ●

Accessories for PROtop power supplies

- Attachable CANopen communication module
- Attachable IO-Link communication module

TopGUARD articles

- Digital 48 V DC output
- IEC = 950-16, EN 60601
- Output voltage: 230 V ± 30 V DC
- Protection class: with I/O connection
- Dynamic information: 500 kbit/s, green/yellow
- Protection class: IP20

PRO switch short-circuit operating mode: continuous short-circuit current/blanked
- Standard installation class II acc. to EN 50532
- PRO switch: single-pole operation

Single-phase PROtop power supplies in standard design

• For connection to AC or DC systems: 3 x 320...575 V AC / 450...800 V DC
• 24 V and 48 V versions in performance classes 24 to 960 W
• Optimum efficiency levels (up to 83.3%) for sustainable energy savings

PRO TOP1 120W 24V 5A F Versions with additional screw flange for increased mechanical requirements

Intelligent Potential Chooser

- Integrated potential distributor
- IO-Link-capable load monitoring

Screw connection system

- For connection to AC or DC systems: 3 x 320...575 V AC / 450...800 V DC
• 24 V and 48 V versions in performance classes 24 to 960 W
• Optimum efficiency levels (up to 83.3%) for sustainable energy savings

PRO TOP1 120W 24V 5A EX 5 A 30 A / 15 ms Screw Typ. 89% 35 ● ● ● ●
PRO TOP1 480W 24V 20A EX 20 A 100 A / 15 ms Screw Typ. 93%

Load monitoring: TGD ELM-4 CL2 1
Load monitoring: TGD ELM-12 1
Load monitoring: TGD ELM-6 1
Supply module: TGD FIM-C 1

- Emitted interference: class B acc. to EN 55032
- Circuit current/shut-off

PRO COM IO-LINK 1
PRO TOP BRACKETS 1
PRO CAB SUBD-RJ45 2.5 M 1
PRO CAB SUBD-RJ45 1.0 M 1
PRO CAB SUBD-RJ45 0.5 M 1
PRO COM CAN OPEN 1

- Time-saving PUSH IN connection system
- 12 / 24 / 48 V versions in performance classes 72 W to 960 W
- For connection to AC or DC systems: 85...277 V AC / 80...410 V DC

PRO TOP1 960W 48V 20A 20 A 80 A / 15 ms Screw Typ. 94% 124 ● ● ● ●
PRO TOP1 480W 24V 20A 20 A 100 A / 15 ms Screw Typ. 93%

- Attachable CANopen communication module
- Attachable IO-LINK communication module

Description

- Input voltage range/overvoltage category:
- Rated voltage:
- Rated current:
- DCL peak load reserves:
- Efficiency in %:
- Temperature range:
- Approvals:

Recommended applications

- Process applications
- Energy applications
- Simple process applications
- Machinery and plant engineering
- Field devices (internal)
- External control cabinets

PRO TOP1 120W 12V 10A 40 A / 15 ms Screw Typ. 90% 39 ● ● ● ●
PRO TOP1 72W 24V 3A 12 A / 15 ms Screw Typ. 89% 35 ● ● ● ●
PRO TOP1 480W 48V 10A 60 A / 15 ms Screw Typ. 93%

- Short-term reserve capacity: 150% for 5 s at 60 °C
- Potential-free relay contact (NO contact)
- Reserve capacity: 130% continuous current up to 40 °C
- DIP switch short-circuit operating mode: continuous short-circuit current/blanked
- Standard installation class II acc. to EN 50532
- PRO switch: single-pole operation

Single-phase PROtop power supplies with PCB protective coating

- For connection to AC or DC systems: 85...277 V AC / 80...410 V DC

PRO TOP1 960W 24V 40A 40 A 160 A / 15 ms PUSH IN Typ. 95.3% 89 ● ● ● ●
PRO TOP3 240W 24V 10A 10 A 60 A / 15 ms PUSH IN Typ. 92% 39 ● ● ● ●
PRO TOP1 480W 24V 20A 20 A 100 A / 15 ms PUSH IN Typ. 93%
As experienced experts we support our customers and partners around the world with products, solutions and services in the industrial environment of power, signal and data. We are at home in their industries and markets and know the technological challenges of tomorrow. We are therefore continuously developing innovative, sustainable and useful solutions for their individual needs. Together we set standards in Industrial Connectivity.