

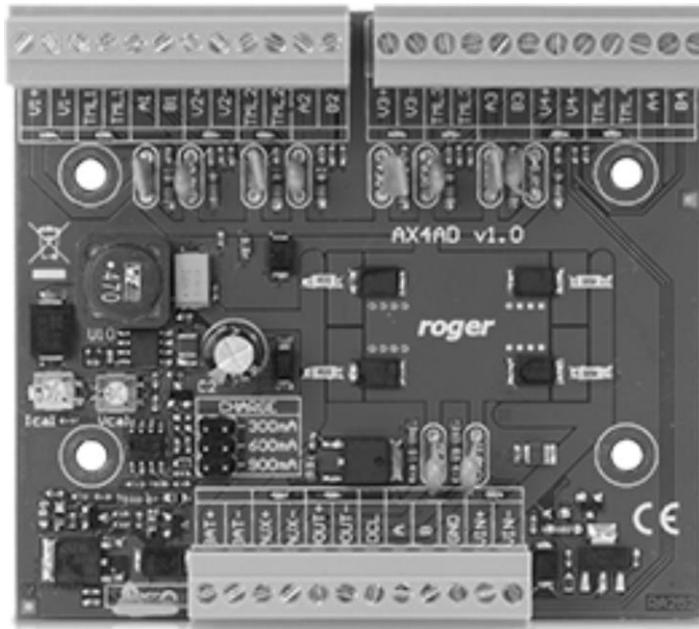
*Roger Access Control System*

## **PSD4D Power Supply and Bus Distributor**

### **Operating Manual**

*Product version: 1.0*

*Document version: Rev. C*



rcdr285

**roger**

## Design and application

PSD4D distributes power supply and RS485 bus to 4 doors. For each door it offers RS485 interface, 1.0A main power supply output and 0.2A auxiliary power supply. Short circuit at output and communication lines of particular door do not affect lines at remaining doors. The PSD4D is supplied from the 13.8VDC PSU which provides power for electronic module and door equipment, including door lock and readers. In case the external power supply is lost, the system is supplied from the backup battery connected to the PSD4D distributor and charged with 0.3A, 0.6A or 0.9A current. PSD4D is equipped with removable terminal blocks which facilitate electrical connections during installation and maintenance. The PSD4D distributor is mainly used in access control systems with MCT-IO readers which are equipped with on-board inputs and outputs.

## Characteristics

- Power supply distribution to 4 doors
- RS485 bus distribution to 4 doors
- 4 supply outputs 12V/1.0A
- 4 supply outputs 12V/0.2A
- Power supply lost signalling output
- Battery charging with 0.3A, 0.6A or 0.9A current
- Protection against deep battery discharge
- Supplied from 13.8VDC/5.4A PSU e.g. PS4D

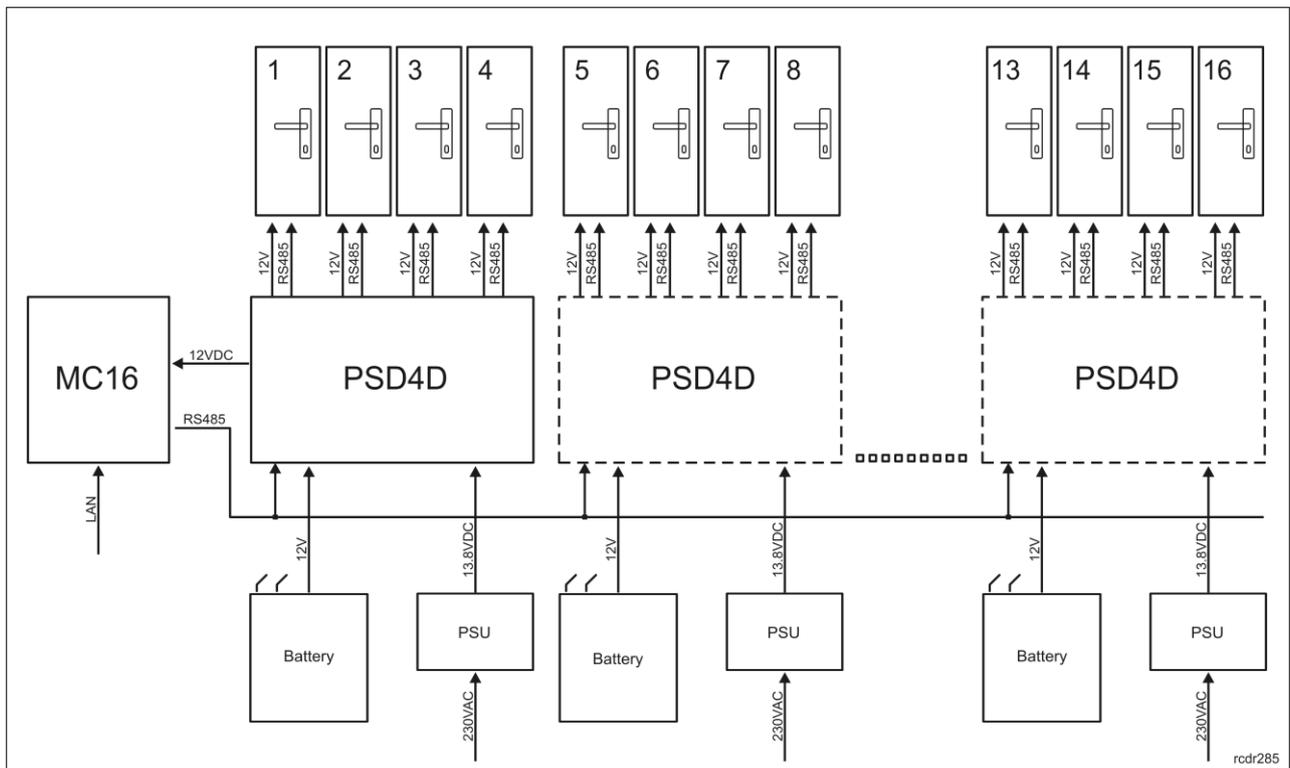


Fig. 1 General concept of PSD4D distributor

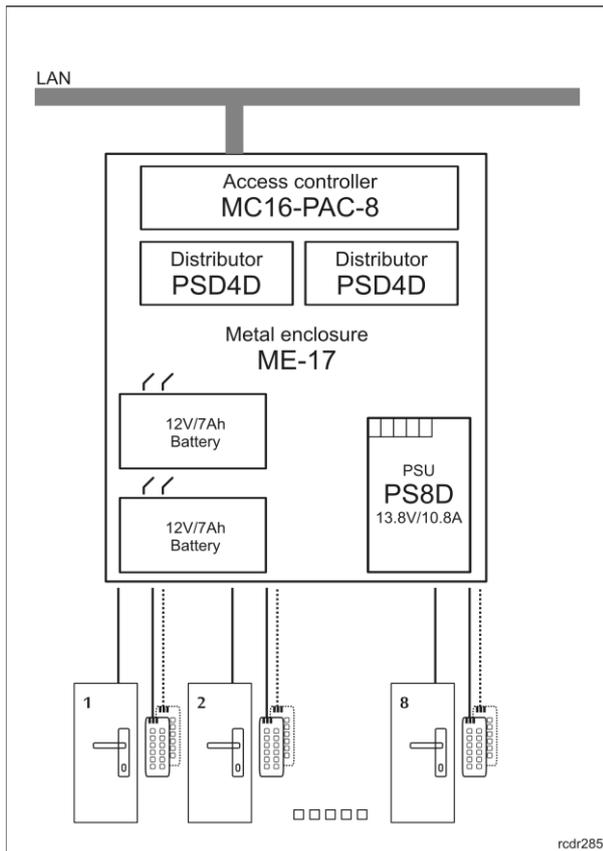


Fig. 2 Access system for 8 doors with MCT-IO series readers and PSD4D distributors (example)

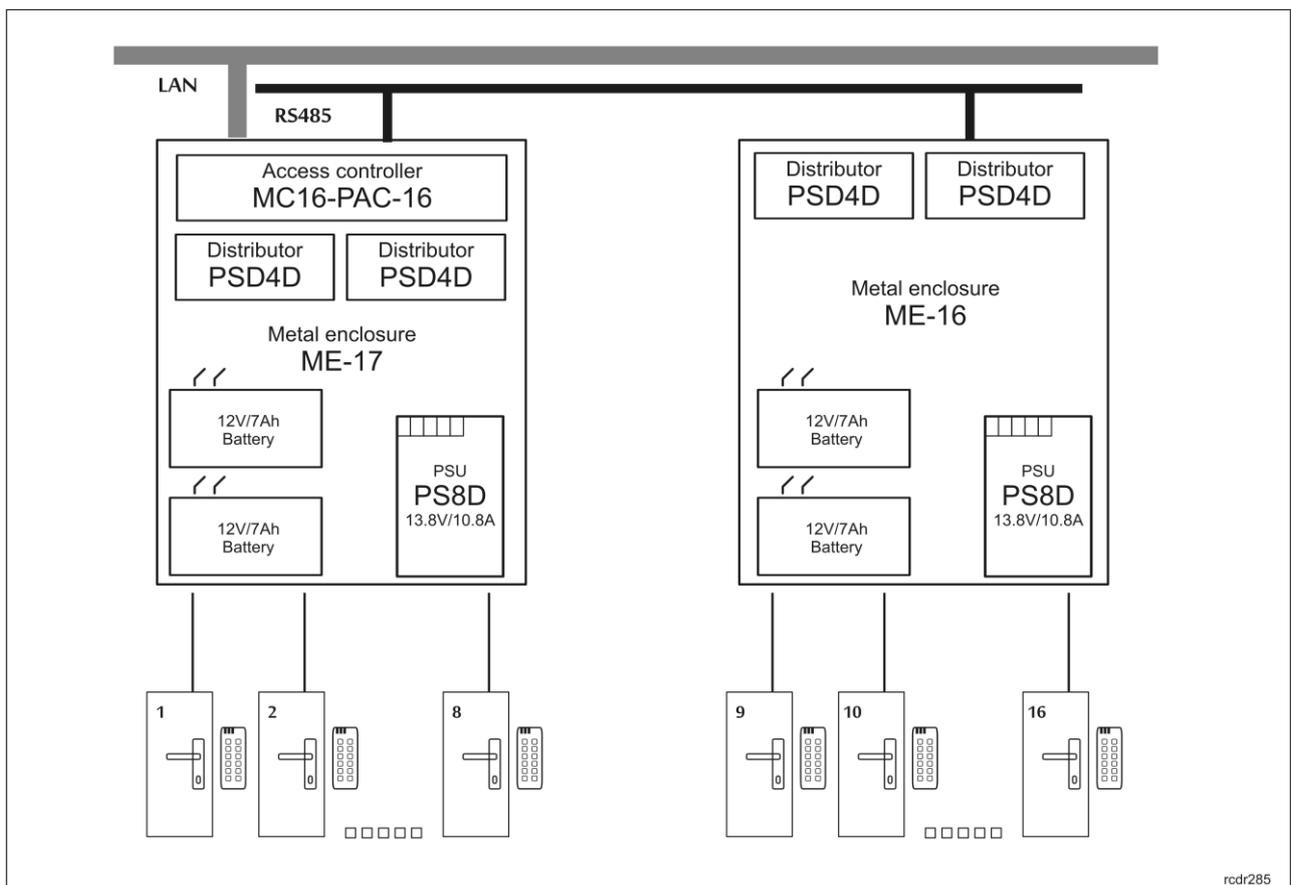


Fig. 3 Access system for 16 doors with MCT-IO readers and PSD4D distributors (example)

## Power supply

The nominal 13.8VDC power source is required to supply PSD4D. The PS4D power supply from Roger is recommended. Due to relatively high current, connection between distributor and PSU should be made using short cables with adequate cross sections. Multiple PSD4D distributors can be supplied from the same PSU but in such a case each distributor should be connected to PSU using separate cable. In order to avoid voltage reduction it is recommended to install PSD4D distributor close to the PSU, preferable in the same enclosure. When PSD4D supply voltage is too low, the battery cannot be fully charged and when the voltage is too high the battery can be damaged. If the PSD4D is supplied from the power source which is equipped with its own backup battery (e.g. UPS) the PSD4D can work without battery and can be supplied from 12-15V range.

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Note: The PS4D can provide 5,4A continues output current. If PSD4D is expected to provide the maximal output current (4 doors with 1,2A and 0,9A battery charging current) the 6,0A supply source is required.

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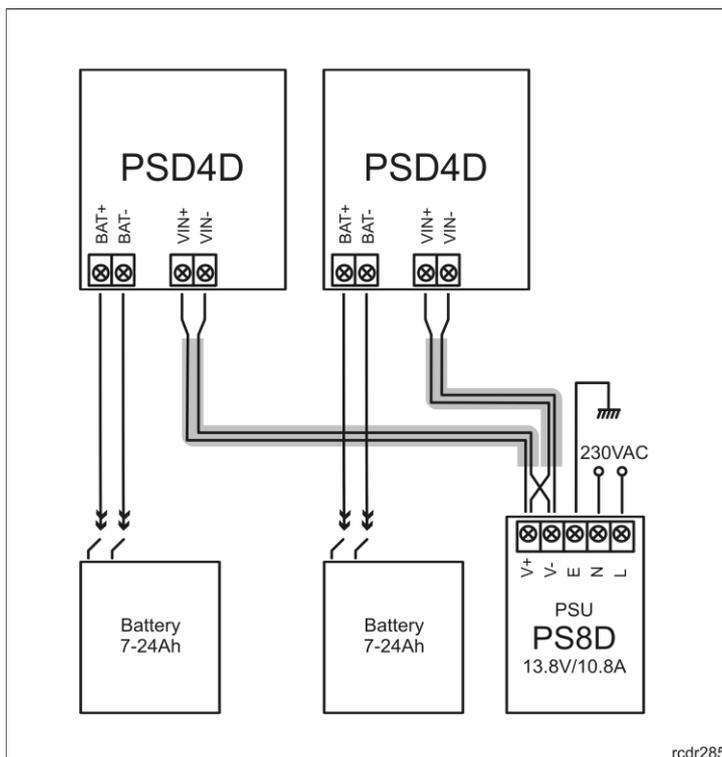


Fig. 4 Supplying 2 PSD4D modules from the same PSU (example)

## Backup battery

PSD4D enables battery charging with 0.3A, 0.6A or 0.9A current and up to the voltage which is equal to supply voltage (nominally 13.8VDC). The battery charging current is selected with jumpers. When battery voltage drops to approximately 10V then it is disconnected from the distributor. The battery is reconnected when power supply is restored. In order to ensure battery charging up to 80% level within 24h (according to EN 60839 standard) the following current settings must be applied:

- 0.3A for 7Ah battery
- 0.6A for 17Ah battery
- 0.9A for 24Ah battery

## RS485 Bus Distribution

PSD4D is connected to the controller's RS485 bus but it does not occupy any address. The bus is distributed to each controlled door. Each reader connected to the distributor must have unique address. Addressing of the readers can be done during low level configuration by means of RogerVDM software or manually, during memory reset procedure.

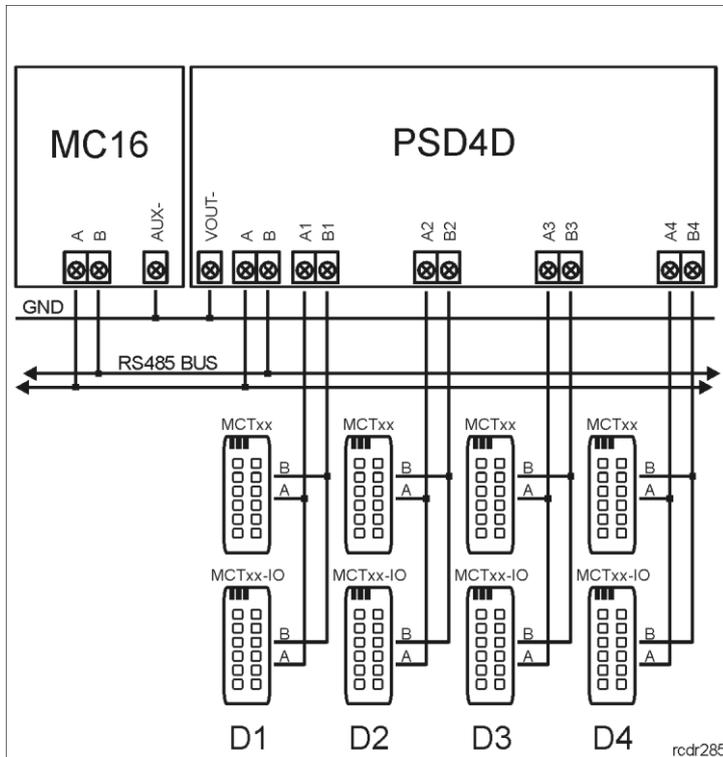


Fig. 5 RS485 bus distribution to readers

## VDR Power Output

VDR power supply output is dedicated to supply door lock, alarm signalling device and other door related devices. The terminal VDR+ provides supply plus and is protected with 1.0A electronic fuse. The terminal VDR- provides supply minus and is internally shorted with system ground. Green LED indicator is located at VDR+ terminal to signal voltage at the output.

## TML Power Output

TML power supply output is dedicated to supply readers. The terminal TML+ provides supply plus and is protected with 0.2A electronic fuse. The terminal TML- provides supply minus and is internally shorted with system ground. Green LED indicator is located at TML+ terminal to signal voltage at the output.

## VOUT Power Output

VOUT power supply output is dedicated to supply additional electronic modules including access controller. The terminal VOUT+ provides supply plus and is protected with 0.2A electronic fuse. The terminal VOUT- provides supply minus and is internally shorted with system ground. Green LED indicator is located at VOUT+ terminal to signal voltage at the output.

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Note: If access controller is supplied from own PSU and connected with own backup battery then it cannot be at the same time supplied from PSD4D.

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## AUX Power Output

AUX power supply output is dedicated to supply additional electronic devices in vicinity of the distributor. The terminal AUX+ provides supply plus and is protected with 0.2A electronic fuse. The terminal AUX- provides supply minus and is internally shorted with system ground. Green LED indicator is located at AUX+ terminal to signal voltage at the output.

### ACL Signalling Output

The ACL is a 15mA rated transistor output. When switched off it remains in high resistance. It shorts to ground to ground if power supply is lost. In order to monitor power supply status it should be connected to any system input programmed for **[116]: AC Lost Status** function.

Note: Multiple ACL outputs can be connected to the same monitoring input but in such case it is not possible to distinguish the source of failure.

### Door Control

PSD4D distributes power supply and RS485 communication bus to all 4 doors. For each door, it offers 1.0A main power supply (VDR+/VDR- terminals), 0.2A auxiliary power supply (TML+/- TML- terminals) and communication bus (A/B terminals). The 1.0A output is dedicated to supply door lock and other equipment (e.g. alarm siren, door bell etc.). The 0.2A output is dedicated to supply readers. Supply outputs are protected against overload with electronic fuses and separated in such a way that overload or shortage on one supply output doesn't affect other supply outputs. The A/B lines are dedicated to door readers.

### Door Control with MCT-IO Readers

In this scenario of operations MCT-IO reader is used to control door using its own, on-board IO lines. The MCT-IO readers offer 3 input and 3 outputs including one relay output. These lines usually are enough to control door thus no extra IO lines at the controller or expander are required. In typical scenario, door lock is controlled by relay output while alarm signalling device is controlled by transistor output. Both devices are triggered by shorting to ground. If the door is read-in/read-out type then additional MCT reader (without built-in IOs) should be installed. Due to security reasons it is recommended to install MCT-IO reader on the internal (safe) side of the door while MCT reader on the external (public) door side. In the example below, door contact and exit button are connected to MCT-IO reader.

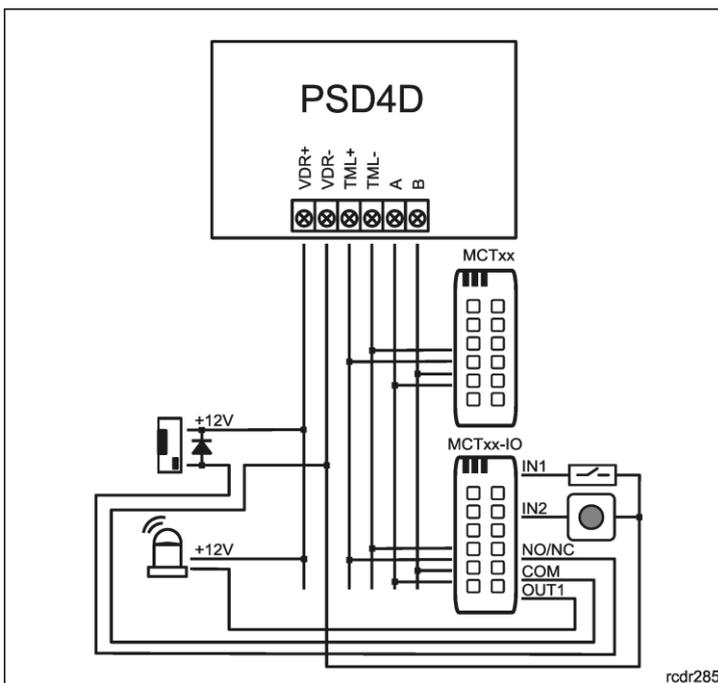


Fig. 6 Read-in/read-out door control with MCT-IO and MCT readers (example)

### Connection to Access Controller

MC16 access controller can be supplied from own transformer and operate with its own battery or, as shown on the figure below, it can be supplied from the PSD4D distributor. In the diagram below entire system is supplied from the same PSU. If the controller is supplied from the transformer or other power source, then it is necessary to short controller ground (AUX-) with distributor ground (VOUT-).

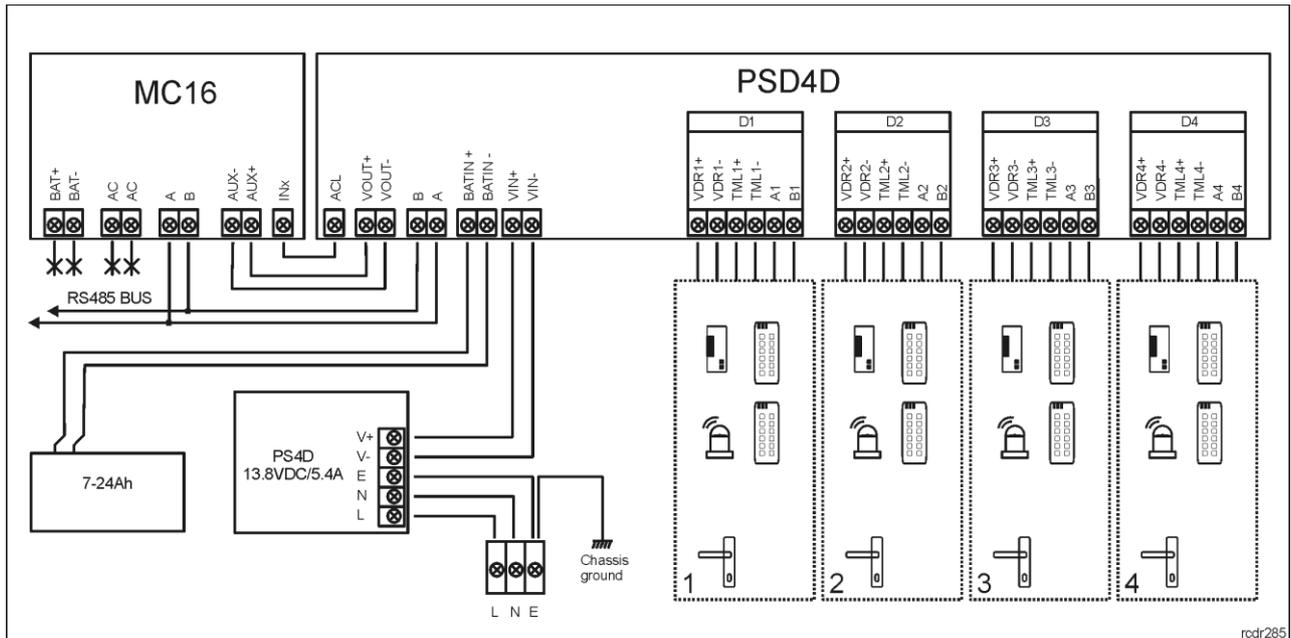


Fig. 7 Access controller supplied from the PSD4D distributor

### System with Multiple Distributors

The example below presents access system with MC16 controller operating with 3 PSD4D distributors. Each PSD4D operates with its own battery and is supplied from its own PSU. The PSU should be installed close to the distributor, preferably in the same enclosure.

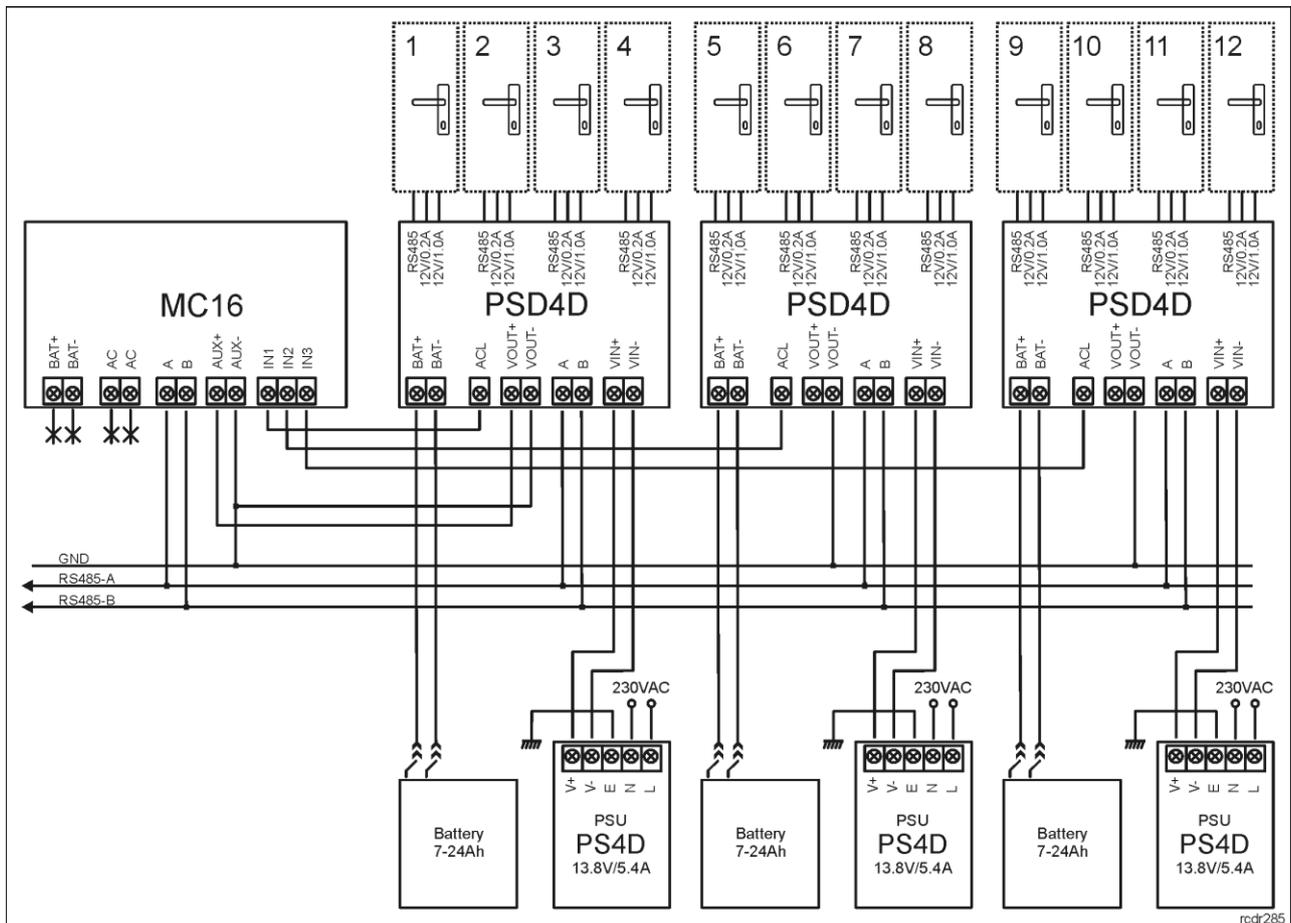


Fig. 8 Access system with 3 PSD4D distributors and MC16 controller (example)

### Installation

The PSD4D distributor is factory equipped with the plastic clips which enable its installation on the DIN rail. If required, plastic clips can be removed and then module can be installed on flat surface. All electric connections should be done when entire system is without power supply. It is recommended to install the distributor in the same enclosure as PSU. The wires which supply the distributor should have adequate cross section so the voltage drop would not exceed 200mA. It is recommended to use wires with minimal cross section 1mm<sup>2</sup> and length up to 30cm. Such wires are included with PSxD power supplies.

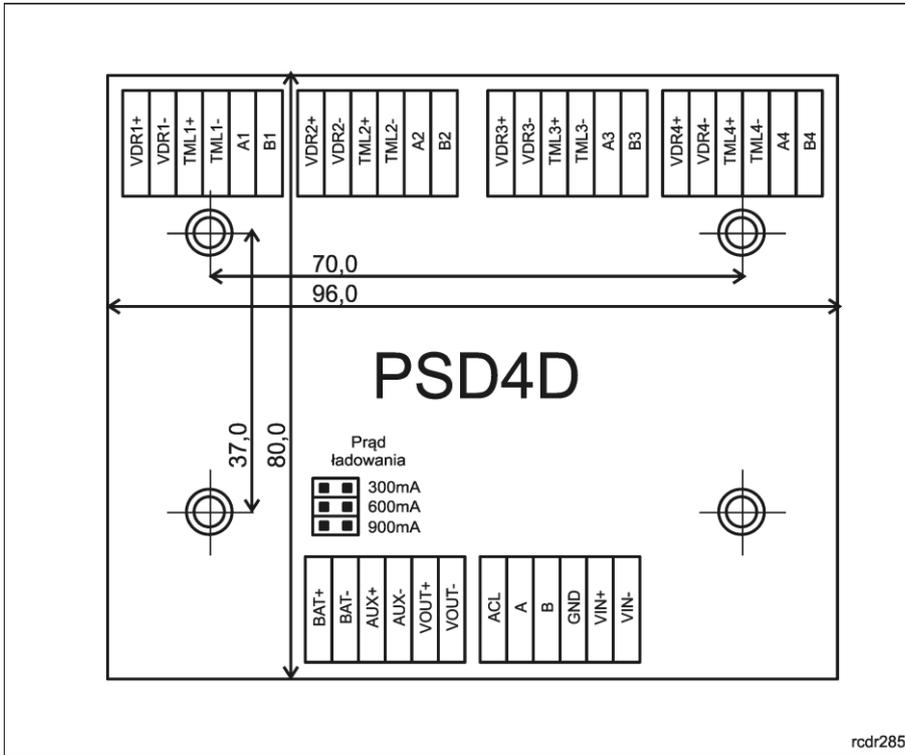


Fig. 9 PSD4D module view

Battery Charging Current Selection	
	300 mA; recommended current for 12V/7Ah battery
	600 mA; recommended current for 12V/17Ah battery
	900 mA; recommended current for 12V/24Ah battery

Connection Terminals	
Name	Function
BAT+	Battery plus
BAT-	Battery minus
AUX+	13.8VDC/0.2A auxiliary power output plus
AUX-	13.8VDC/0.2A auxiliary power output minus
VOUT+	13.8VDC/0.2A auxiliary power output plus
VOUT-	13.8VDC/0.2A auxiliary power output minus
VIN+	13.8VDC power input plus

VIN-	13.8VDC power input minus
A	RS485 communication bus input, line A
B	RS485 communication bus input, line B
ACL	Power supply lost signalling output
<i>Note: Following terminals are replicated 4 times on the PSD4D module. The letter "x" stands for door number (1-4).</i>	
VDRx+	13.8VDC/1.0A main power output plus
VDRx-	13.8VDC/1.0A main power output minus
TMLx+	13.8VDC/0.2A terminal power output plus
TMLx-	13.8VDC/0.2A terminal power output minus
Ax	RS485 communication bus output, line A
Bx	RS485 communication bus output, line B

## Technical Specification

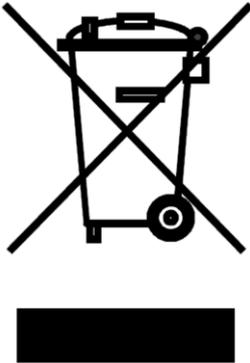
Power supply	13.8VDC; +/- 100mV
Supply current	Up to 6,0A (depend on the expected electrical loads)
AUX+/AUX- auxiliary power output	13.8VDC/0.2A; overload protection
VOUT+/VOUT- auxiliary power output	13.8VDC/0.2A; overload protection
VDRx+/VDRx- main power output	13.8VDC/1.0A; overload protection
TML+/TML- terminal power output	13.8VDC/0.2A; overload protection
Power supply lost output	15VDC/15mA; overload protection
Battery charging current	0.3A; 0.6A; 0.9A
Battery cut-off voltage	App. 10.0V
Distributor to controller cable length	Max. 1200m
Distributor to terminal cable length	Max. 150m
Environmental class	Class I, indoor general conditions, temperature: +5°C to +40°C, relative humidity: 10 to 95% (no condensation)
Dimensions	96 x 80 mm
Weight	85 g
Certificates	CE

## Ordering Information

Product	Description
PSD4D	Power Supply and Communications Bus Distributor

## Product History

Version	Date	Description
PSD4D v1.0	10/2017	First commercial version of the product

	<p>This symbol placed on a product or packaging indicates that the product should not be disposed of with other wastes as this may have a negative impact on the environment and health. The user is obliged to deliver equipment to the designated collection points of electric and electronic waste. For detailed information on recycling, contact your local authorities, waste disposal company or point of purchase. Separate collection and recycling of this type of waste contributes to the protection of the natural resources and is safe to health and the environment. Weight of the equipment is specified in the document.</p>
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