

Roger Access Control System 5 v 2

Application note no. 002

Document version: Rev. A

Typical installation scenarios for MC16-PAC access controller

Introduction

MC16-PAC physical access controller both in ST and EX versions can be applied in multiple installation scenarios depending on the number of controlled doors, required functionalities, power supply arrangements, expected security level and cost of installation. The RACS 5 system can encompass multiple MC16 controllers.

Regardless of selected scenario, the controller requires connection of external readers directly to controller's mainboard or indirectly via dedicated MCX expanders.

Sixteen MCT series readers (RS485), four Wiegand readers and four PRT series readers (RACS CLK/DTA) can be connected directly to MC16 controller board. The maximal number of readers connected directly and indirectly to the controller equals to 64 readers within up to 32 Access Points.

MC16 offers enough hardware resources (power supply, inputs, outputs, communication interfaces) to control one and in some cases even two doors but software capabilities of the MC16 enable to control even up to 16 read-in/out doors. In such scenario the adequate version of the controller must be considered and the controller must be equipped with I/O expanders and power supplies. Such approach is applied in MC16-PAC-KITs which include factory assembled MC16 controller in metal box with adequate power supply and I/O expander to enable the control of 1 to 4 doors after connection of readers.

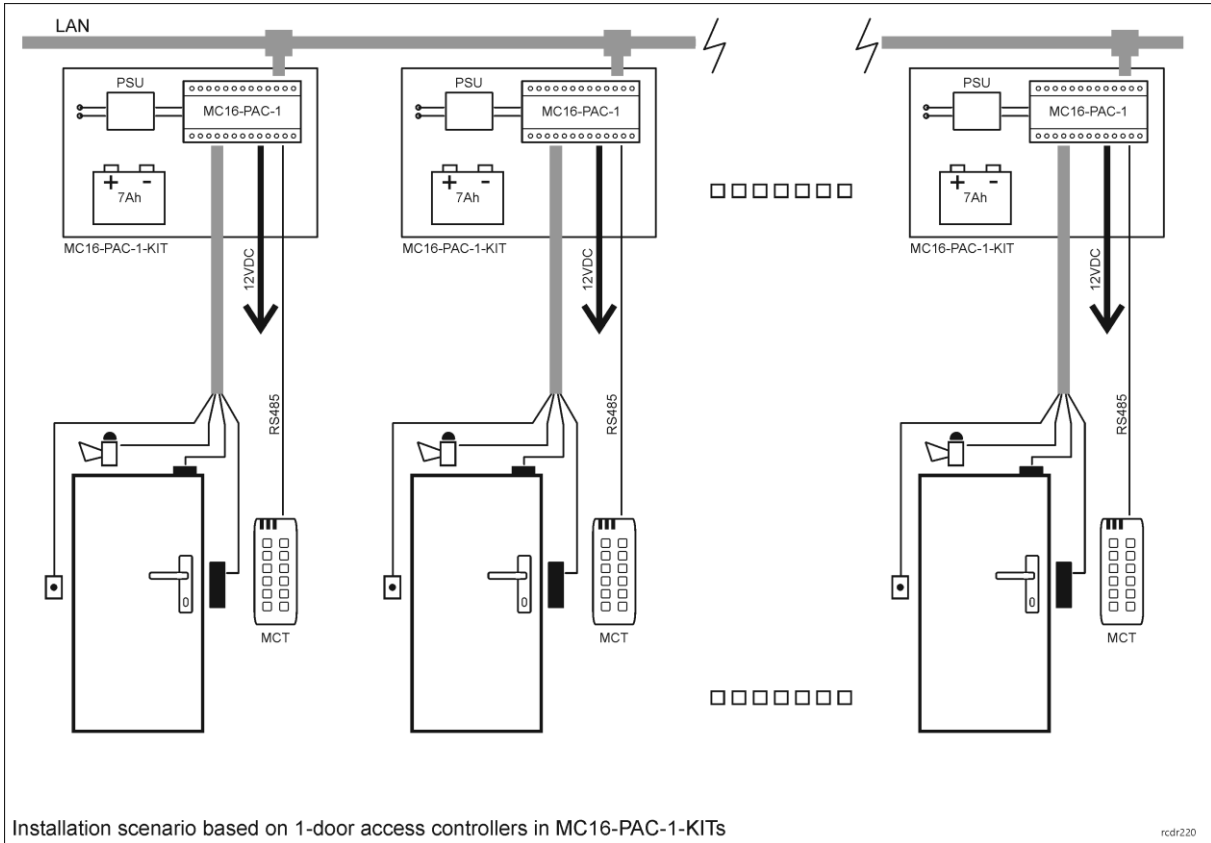
If MCT-IO readers which include built-in I/Os are installed then up to 16 doors can be controlled by MC16 without connection of I/O expanders.

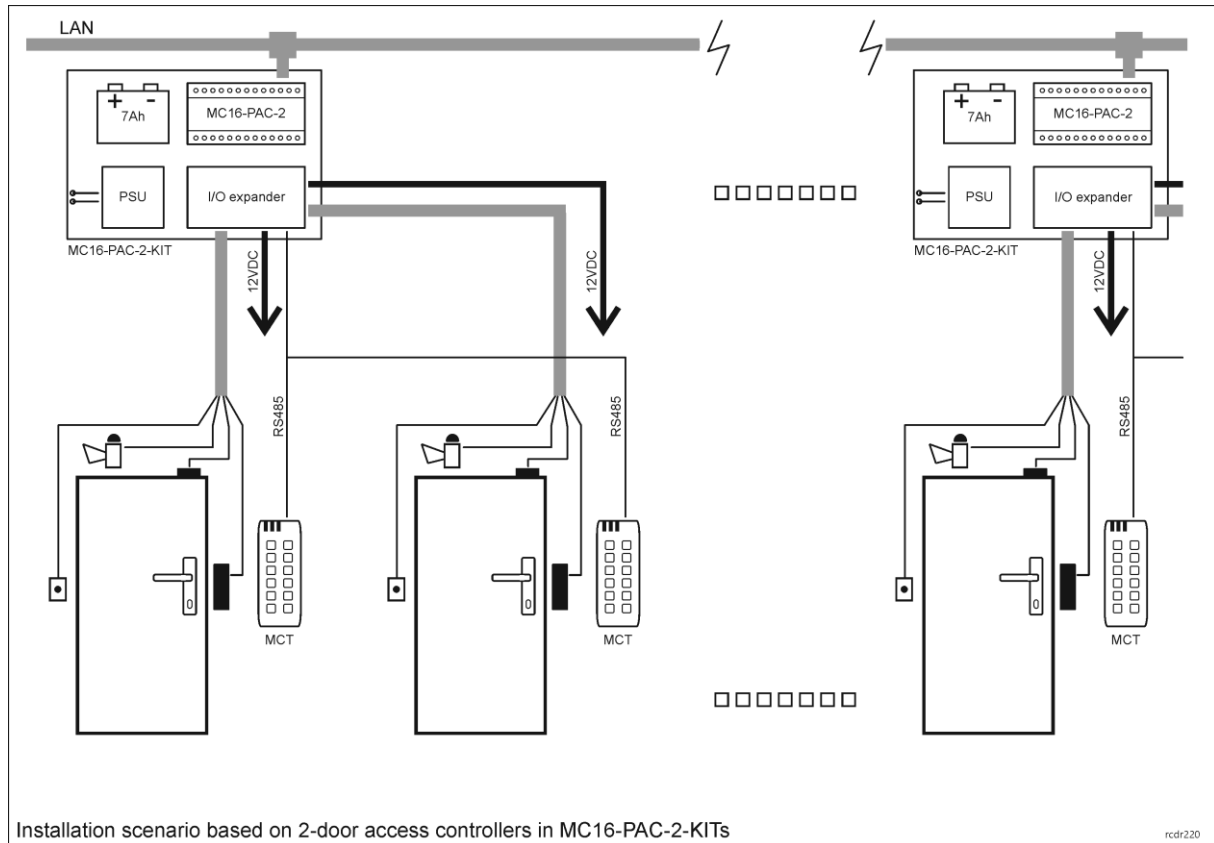
In RACS 5 system all hardware resources of access controller and its peripheral devices can be used regardless of their physical location. It enables flexible use of available resources and limits costs related to cabling and the number of required devices. For example a relay for control of particular door lock can be physically located at MC16 mainboard, at connected reader or at expander and logical assignment is done by software.

A few typical installation scenarios are presented in this note. They must be treated as examples as they do not cover all possible approaches to installation of RACS 5 system. Additionally it is possible to apply combinations of presented scenarios. It is assumed that RACS 5 system installer or designer has enough knowledge in regard of low voltage installation to design cabling and power supply in such way as to ensure normal working conditions for all devices according to their manuals.

Installation scenario based on MC16-PAC-KITs

In this scenario the MC16 controller kit, depending on its version can control from 1 to 4 doors, each read-in or read-in/out type . MCT readers are connected to the controller's RS485 port directly or indirectly via included expander. Door(s) are fully supplied from factory installed PSU/transformer. Read-in type doors are presented on the drawings. In case of read-in/out door it is just enough to connect additional MCT reader to RS485 bus of particular controller.





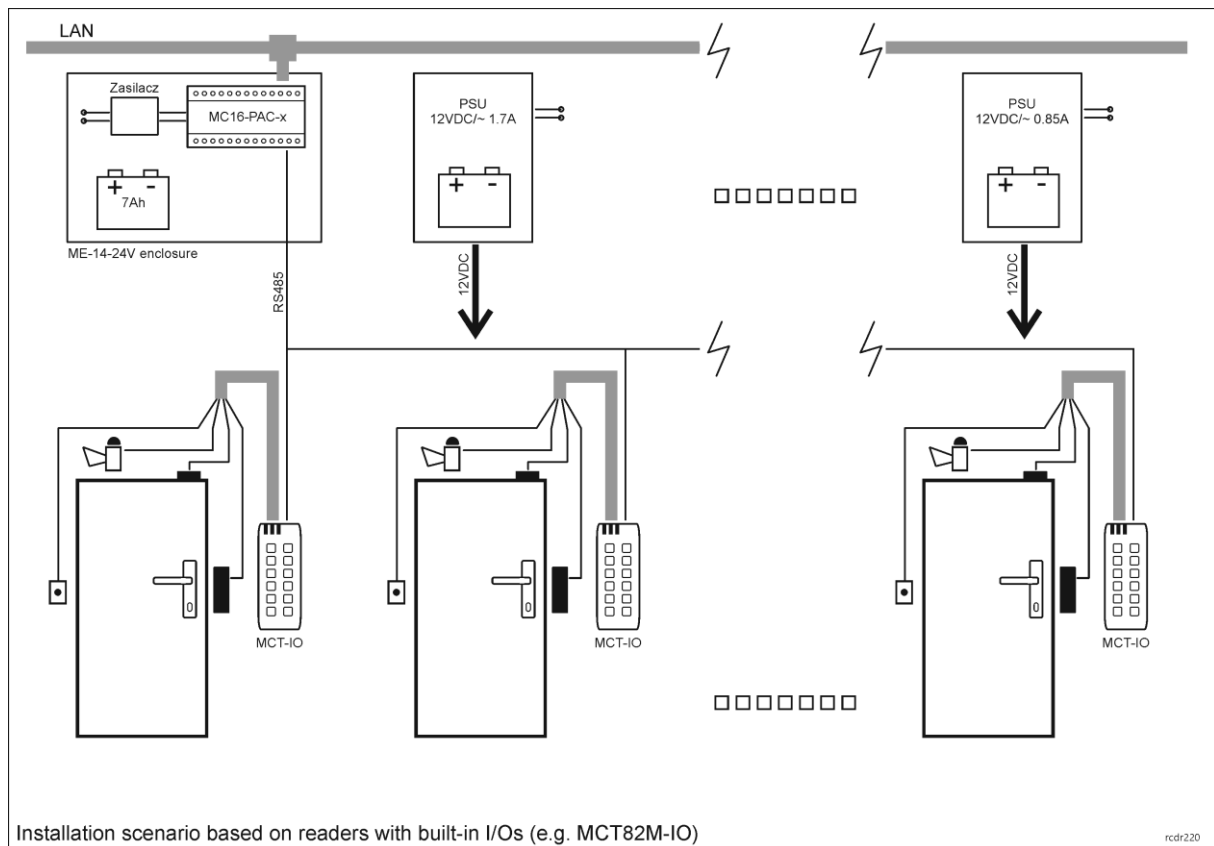
MC16 controller kits for three doors (MC16-PAC-3-KIT) and four doors (MC16-PAC-4-KIT) include expanders with more I/Os (MCX4D instead of MCX2D), power supplies with greater current (PS4D instead of PS2D) and larger metal enclosures with space for 7-17Ah batteries. Nevertheless their installation scenario is similar to installation of controller kit for two doors (MC16-PAC-2-KIT).

Installation scenario based on readers with built-in I/Os

In this scenario, readers with built-in input and outputs (MCT-IO) are applied so door contacts, buttons and other load points including door lock can be connected directly to such readers. Power supply in such system is distributed and ensured by individual power supply units located in vicinity of doors as to avoid requirement for high diameter cables. The element which mostly determines current consumption at controlled door is door lock (door strike, maglock, etc.). In RACS 5 system it can be assumed that each controlled door requires 0.7-1.0A current from PSU. The controller depending on its version can control up to 16 doors and each can be read-in or read-in/out type. In case of read-in/out door it is just enough to connect additional MCT reader (without I/Os) to RS485 bus of particular controller.

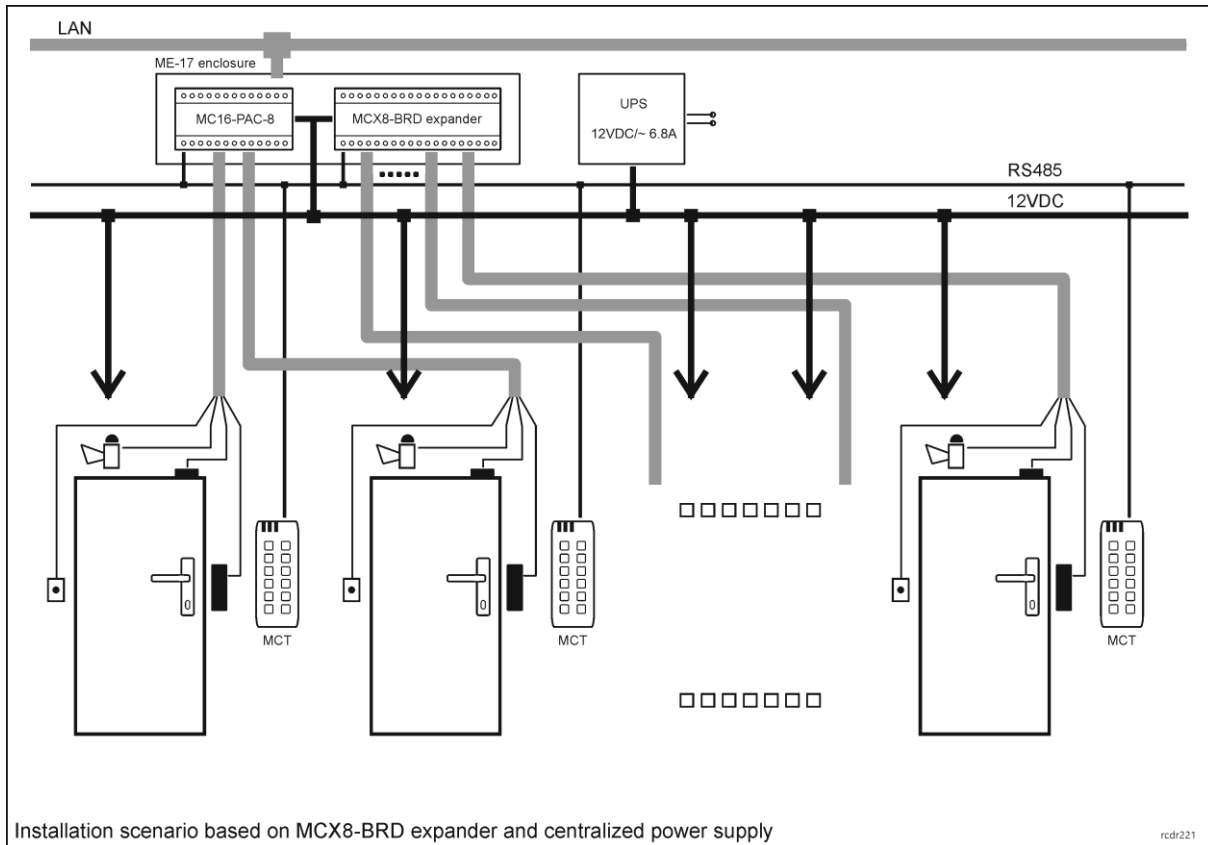
This scenario is characterized by lower resistance to sabotage so it is recommended to apply it in places where high security level is not necessary. In practical applications it is not recommended to install MCT-IO readers at entrances to a building unless such entrances are read-in/out type and MCT-IO reader is installed on safer (internal) side. Usually there are no objections to install MCT-IO readers at internal doors in a building. Due to limited cabling and low number of required devices, this scenario is usually the most economical one.

In particular, this scenario can also be applied when migration of RACS 4 system based on PRxx2 series controllers with built-in readers (e.g. PR312, PR612, PR622) to RACS 5 system is planned. In case of such migration, the installation of new MC16-PAC controller(s) is necessary while cabling and readers usually do not require modification. PRxx2 controllers require firmware upgrade so they could be operated as MCT readers.



Installation scenario based on MCX8-BRD expander and centralized power supply

In this scenario, the MC16 access controller operates with MCX8-BRD expander and all doors are supplied from centralized power supply units (preferably UPS). In total, 10 relays, 6 transistor outputs and 16 inputs are available in such scenario. Assuming two inputs and two outputs per door this arrangement enables the control of 8 read-in type doors or 7 read-in/out type doors. In RACS 5 system it can be assumed that each controlled door requires 0.7-1.0A current from PSU.



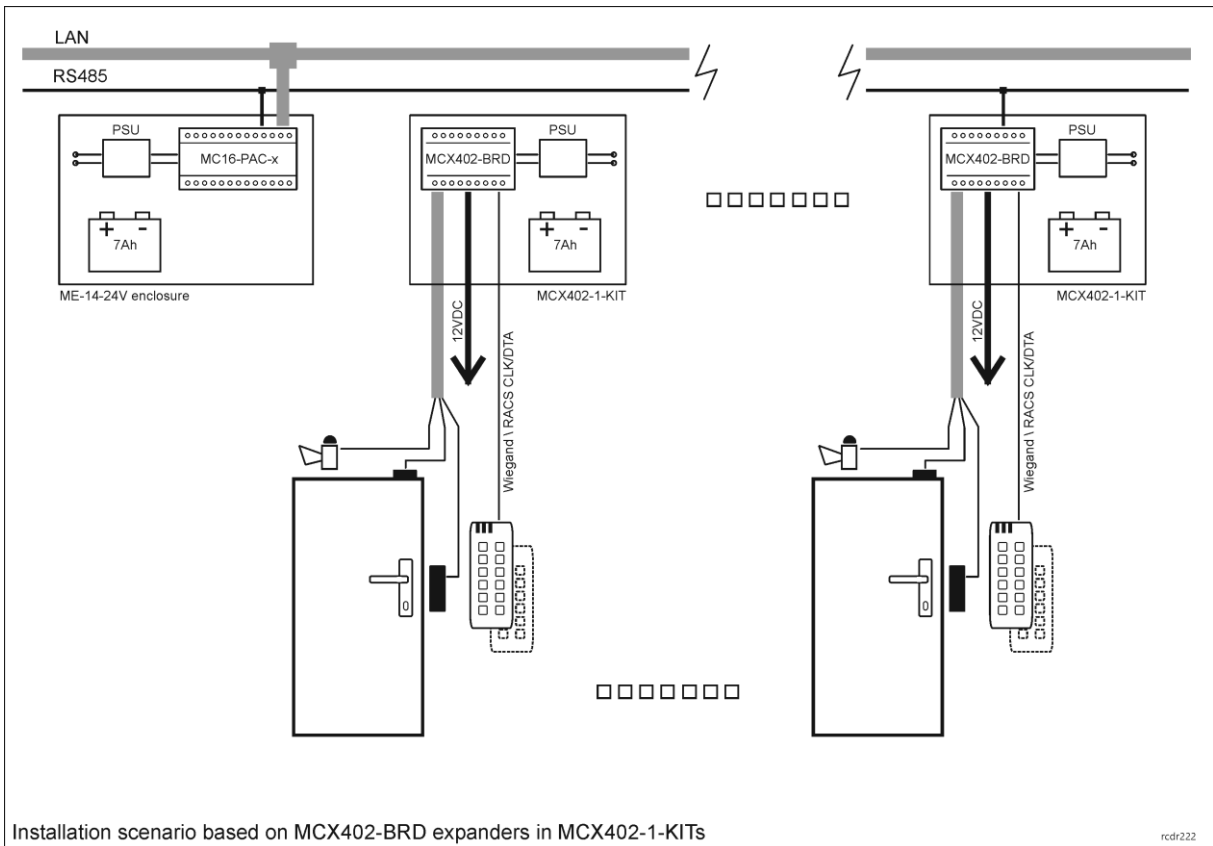
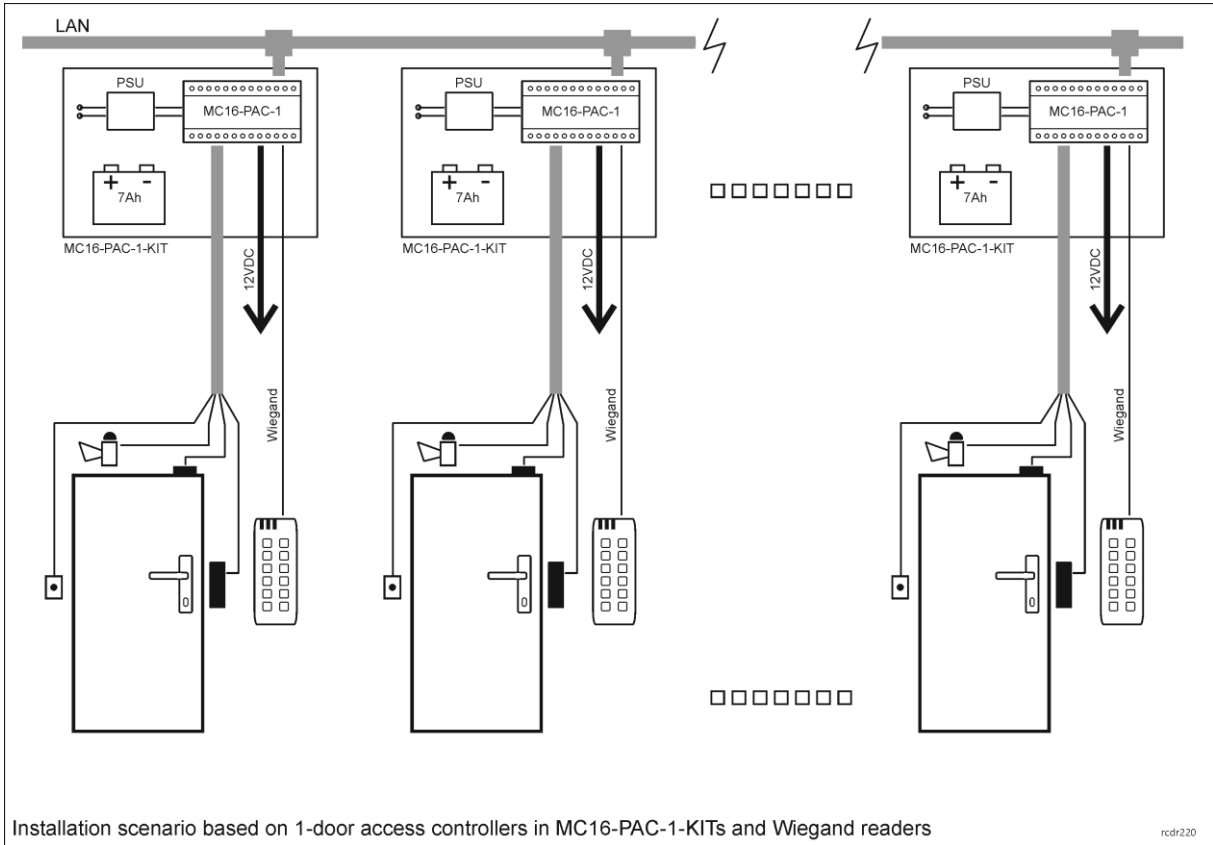
Installation scenario based on Wiegand or PRT readers

In this scenario it is assumed that Wiegand readers (third party) or PRT readers (RACS 4 system) are used instead of typical MCT readers. In such case MC16-PAC-1-KITs can be applied and then MC16 controller’s inputs (Wiegand readers) or MC16 controller’s RACS CLK/DTA bus (PRT) are used.

In case of electrically incompatible Wiegand readers which are connected to MC16 controller, it might be necessary to install MCI-7 interfaces which supersede previously offered PR-GP-BRD modules.

The alternative approach is based on installation of multidoor MC16 access controller with MCX402-BRD expanders (max. 16) which are offered as ready to install MCX402-1-KITs (single read-in/out door). Such sets offer enough I/Os and power supply at door(s). Expanders are usually installed in vicinity of doors to avoid requirement for high diameter cables. More information on Wiegand readers installation and configuration is given in AN001 application note.

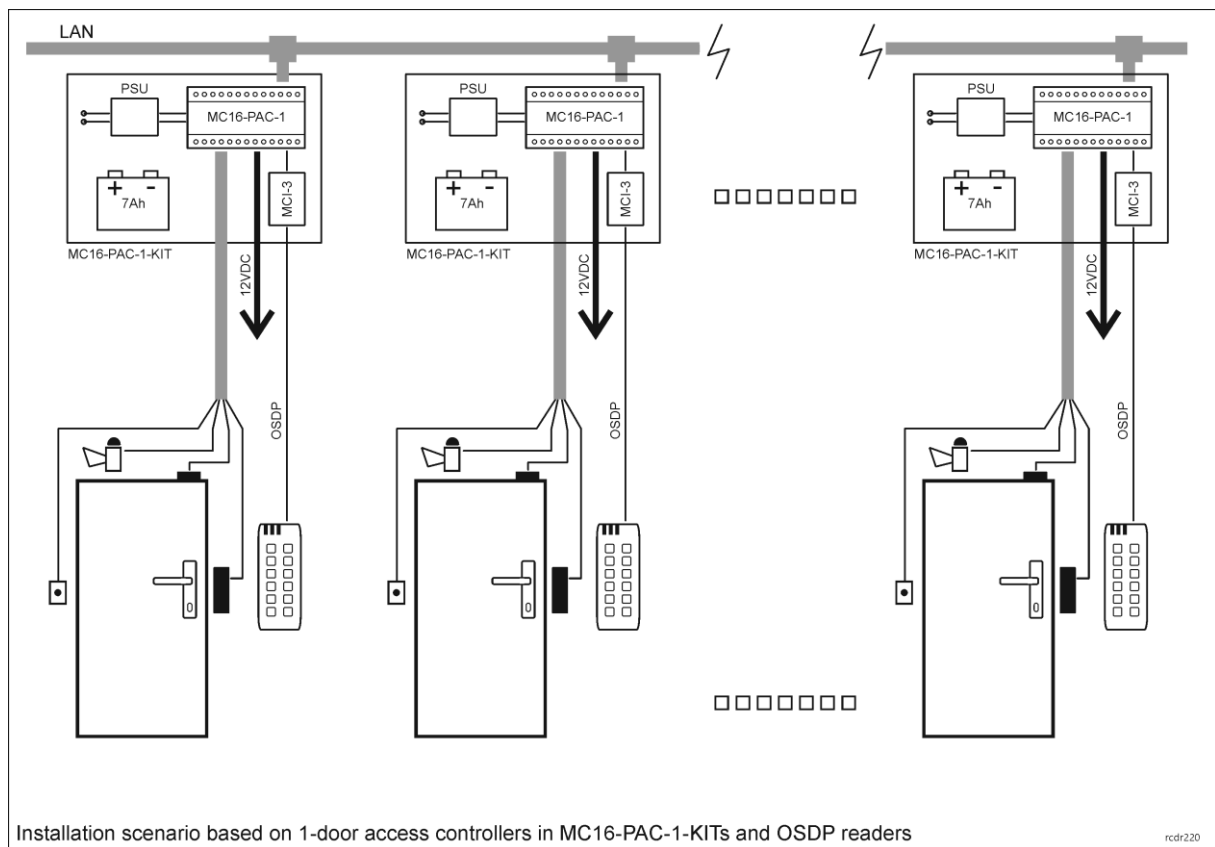
In particular, this scenario can also be applied when migration of RACS 4 system based on PR402 type controllers or PR102 controllers and PRT readers to RACS 5 system is planned. In case of such migration the installation of new MC16-PAC controller(s) is necessary while cabling and readers usually do not require modification. PR402/PR102 controllers require firmware upgrade so they could be operated as MCX402/MCX102 expanders.

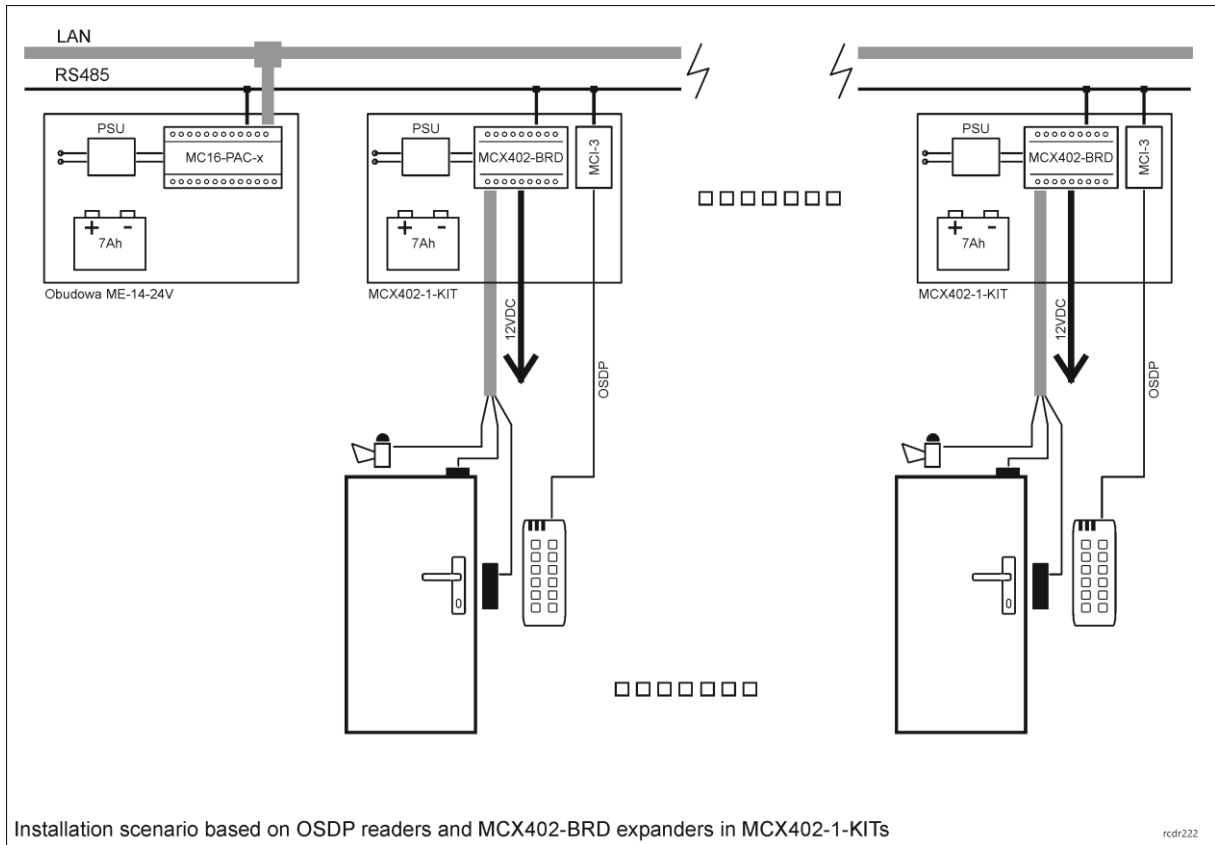


Installation scenario based on OSDP readers

In this scenario it is assumed that OSDP readers are used instead of typical MCT readers. OSDP communication protocol similarly as older Wiegand communication protocol enables the installation of devices from various manufacturers in the same access control system. In the scenario below it is assumed that third party OSDP readers are installed in RACS 5 system as the installation of Roger OSDP readers in RACS 5 system does not offer significant benefits in comparison with the installation of typical MCT readers.

OSDP readers can be connected directly to MC16-PAC-1-KITs or they can be connected to multidoor MC16 access controllers in parallel with MCX402BRD expanders (max. 8) which are offered as ready to install MCX402-1-KITs (single read-in/out door). In all cases MCI-3 interfaces must also be applied (single interface per door). Read-in type doors are presented on the drawings. In case of read-in/out door it is just enough to connect additional OSDP reader to the same MCI-3 interface.





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