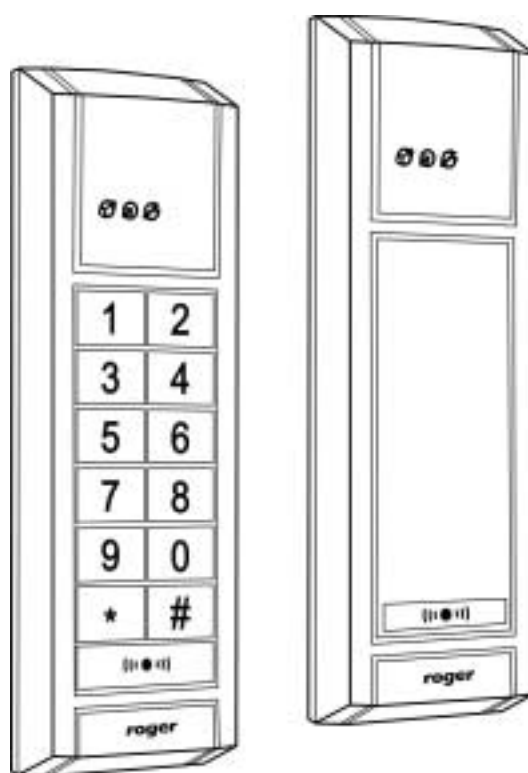


PRT42 and PRT42-BK
Indoor Access Control Terminals
Firmware v72.00



Installation and Programming Guide

1 TABLE OF CONTENTS

1	Table of contents.....	2
2	General.....	3
2.1	Designed function	3
2.2	Features	3
3	Operating Modes.....	4
3.1	Host-controlled Operation (ONLINE mode)	4
3.1.1	Wiegand Data Transmission Format	4
3.1.2	Magstripe Data Transmission Format.....	5
3.1.3	RACS Data Transmission Format.....	5
3.2	Stand-alone Operation (OFFLINE mode).....	5
3.2.1	Full stand-alone operation mode.....	5
3.2.2	Simple stand-alone operation mode	6
4	Installation Guidelines.....	7
5	Programming	8
5.1	Setting Reader Operating Mode	9
5.2	Memory Reset Procedure - Programming MASTER and INSTALLER cards.....	9
5.2.1	Factory Default Settings	9
5.3	Installer Programming Mode.....	9
5.4	User Programming Mode	10
5.4.1	Programming Commands.....	10
5.4.2	Programming Examples	11
6	Stand-alone Operation	13
6.1	Users.....	13
6.2	ARMED and DISARMED Modes	13
6.3	Arming and Disarming of Reader (rearming).....	13
6.4	Opening the Door.....	14
6.5	Alarm Signalization	14
6.6	Acoustic and Optical Signalization	15
7	Tables.....	16

This guide applies to both PRT42 and PRT42-BK types of reader. You may program PIN codes on both version of readers (with or without keypad) but you must be aware that you will be able to make a practical use of PINs only if at least one of the reader (primary or secondary) will be equipped with keypad.

2 GENERAL

2.1 Designed function

The PRT42 reader have been designed for operation in access control systems to allow user identification by using UNIQUE standard proximity cards and/or PIN codes. The reader can be configured for operation in stand-alone mode (called OFFLINE mode) or for use with an external access control unit (ACU) that supports a compatible data interface formats (ONLINE mode).

When reader operate in ONLINE mode, the device functions as a slave unit serving a sole purpose of reading a card and/or entering a PIN code and subsequent transmission of such collected data to a master unit (Access Control Unit – ACU) for further processing. The PRT42 terminal offers several data transmission formats for use in ONLINE mode, which include the popular used Wiegand and Magstripe (simulation of an output of a magnetic card reader) data protocols.

When configured for stand-alone operation (OFFLINE mode), the PRT reader will independently (i.e. autonomously) control the supervised door access point. For this mode, the terminal offers two installation options — one of them uses the reader's built-in I/O signal lines as standard general purpose inputs and outputs, the other uses them for communication with an external XM-2 I/O module and a second PRT reader (see wiring diagrams). An access control installation containing two PRT readers (one at the entry, the other at the exit side of the supervised gate) allows two-way passage control, while adding an XM-2 module provides higher level of security for your whole door control system by separating its logical element (the reader) from the actuator element controlling the door lock (i.e. door lock relay).

Note: When PRT42 reader is configured for Full Stand-alone mode it may operate with second PRT series reader, both device can create both side (entry/exit) door control.

2.2 Features

Host-controlled mode (ONLINE mode)

- 26/34/42/66 bit Wiegand data format interfaces
- Magstripe data format interface (ABA Track II emulation)
- RACS communication interface (for ROGER PR series ACUs)
- Special options for transmission of PIN codes in Wiegand data formats
- LED/BUZZER control input

Stand-alone mode (OFFLINE mode)

- system settings stored in nonvolatile memory
- enrolment up to 120 users
- user identification by card or PIN code
- user indexing (ID indexed user records)
- support for Door Contact (DC) and Request-To-Exit (REX) push button
- Door Alarm and Door Bell outputs
- Reader Disarmed Output and Ready Input for integration with security system
- entry/exit door control (requires second PRT reader to form a pair)
- uses built-in I/Os or remote XM-2 I/O module

3 OPERATING MODES

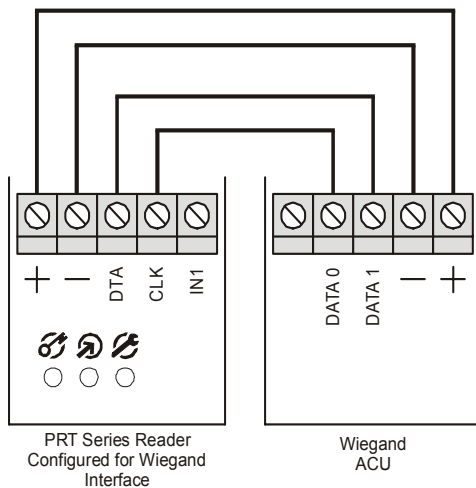
3.1 Host-controlled Operation (ONLINE mode)

In ONLINE mode, a PRT terminal is controlled by a master unit (ACU). The terminal handles card and/or PIN code reading and then transmits the collected data to its master unit for further processing. A PRT terminal offers the following communication interfaces (data transmission formats):

- Wiegand 26bit
- Wiegand 34bit
- Wiegand 42bit
- Wiegand 66bit
- Magstripe (ABA Track II emulation)
- RACS (Roger)

In case of Wiegand data formats there are several further settings to be configured which specify the method of PIN code transmission technique. The RACS format is designed for use with ROGER PRxx1/PRxx2 series ACUs.

3.1.1 Wiegand Data Transmission Format



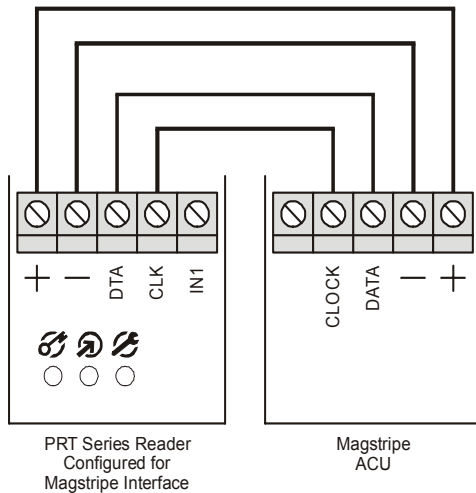
When employing Wiegand transmission format, data are transferred using sequences of pulses sent over the CLK and DTA lines. Depending on the selected version of the transmission format, the PRT reader uses 26, 34, 42 or 66 bits to transmit a code read in from the presented card or a PIN entered.

Note: For card and PIN codes longer than the number of bits available in the selected data transmission format a PRT reader omits the most significant bits of the data transmitted. As a result you may see different card number or PIN as expected.

Generally, transmission of PIN codes to ACU can be carried out in two ways: one is to transmit the entire PIN code as one data frame; the other is to transmit it in separate parts, each containing a code of a single key pressed (for more details about PIN code transmission using Wiegand formats see table 2).

When using Wiegand format, the dual color LED STATUS lights steady in RED, the LED SYSTEM is turned ON for a moment each time the card or PIN code is read. The LED OPEN is controlled by the IN1 input line. When IN1 is shorted with supply minus the LED OPEN turns ON and the internal BUZZER sounds, when IN1 is shorted with supply plus or left unconnected LED OPEN and BUZZER are not active.

3.1.2 Magstripe Data Transmission Format

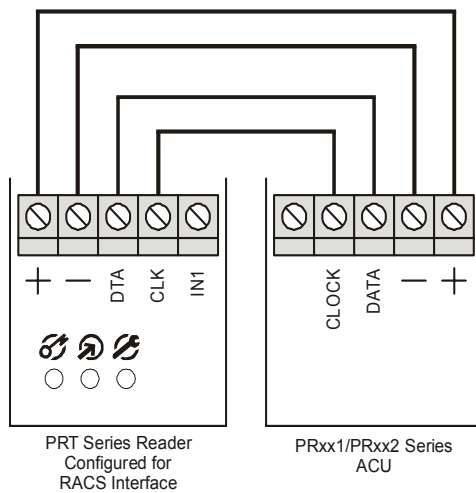


When employing Magstripe transmission format, data is transferred using electric signal waves transmitted via the CLK and DTA lines.

The terminal's LED indicators and buzzer are controlled in the same manner as described for the Wiegand formats (see previous section).

In Magstripe format, the PRT reader transmits a sequence of data bits representing either a code read in from a presented card or digits of an entered PIN. When operating with Magstripe format, the reader stores all pressed keys in a buffer memory and does not transmit them, until the [#] key is pressed — a press of the [#] key is treated by the unit as the end of entered PIN code. The Magstripe format does not allow single digits of a PIN code to be transmitted separately after each corresponding key-press.

3.1.3 RACS Data Transmission Format



When employing the RACS transmission format, the PRT reader communicates with host (ACU) over the CLK and DTA lines. Unlike the Wiegand or Magstripe format, a PRT reader using the RACS format is required to have an individual address (ID numbers = 0...3), which can be set during configuration of the reader.

When using RACS format, communication between the PRT reader and its ACU is bilateral, this allows controller to monitor communication. The reader's LED indicators and buzzer are controlled by a host unit (ACU), unless the reader has lost communication with the host unit.

Note: When all LEDs are flashing it indicates that the reader lost communication with host ACU unit.

Each entry of PIN code must be followed by pressing the [#] key, which is treated as an end of PIN code.

The PRT42 readers offers F1 (Door Bell) function key, pressing this key will cause transmission of adequate event code to host unit which may further take special action (e.g. trigger Door Bell or Light output). The host reaction for functional keys depends of controller's firmware and its configuration, always refer to controller's settings when configuring functional keys on reader.

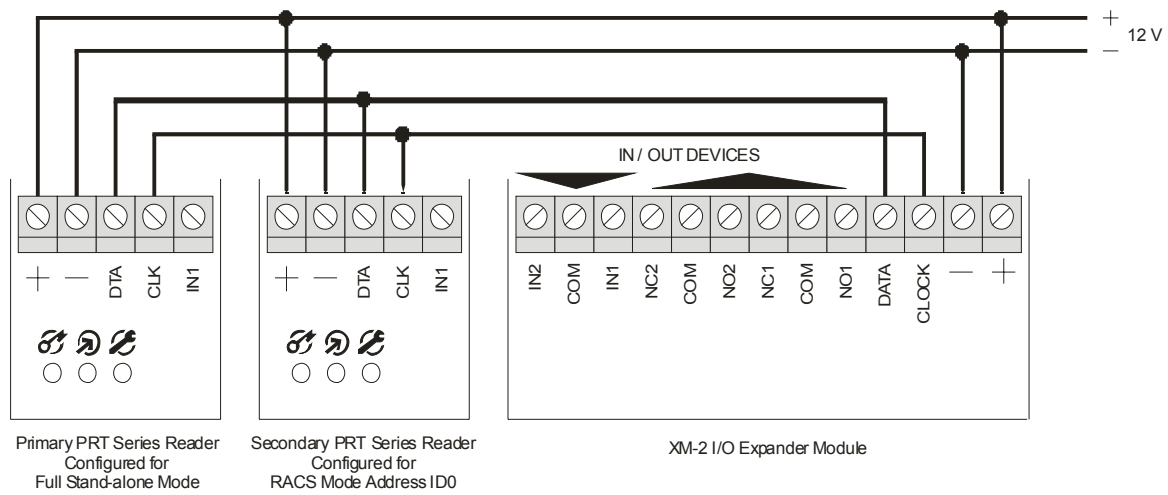
On PRT readers which are not equipped with functional keys like F1 or F2 but are equipped with keypad, user may press [#] key and hold-down it for two or more seconds, the host controller will treat such an action as Door Bell or Exit Push button. The way how the controller will handle long press of [#] key depend in its configuration and firmware.

Note: In RACS format, the IN1 input of the PRT reader is not used to control the reader LED's (LEDs are controlled by host unit) but is dedicated to disable reader's operation. When IN1 is shorted with supply minus reader will not read cards nor accept PIN codes.

3.2 Stand-alone Operation (OFFLINE mode)

The PRT series readers offer two variants of stand-alone operation: Full Stand-alone Mode and Simple Stand-alone Mode. In both operation modes the reader is capable of providing independent (i.e. autonomous) control of one door passage.

3.2.1 Full stand-alone operation mode

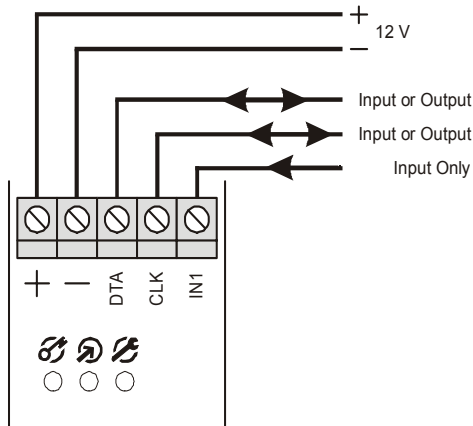


In this mode, the reader's CLK and DTA lines are used for communication with a remote XM-2 I/O module and, optionally, with additional (secondary) PRT reader (to enable two-way door control). The IN1 line operates as a programmable input. The I/O lines on the XM-2 module can be programmed to have several predefined functions (see settings for C5, C6, C7, C8 and C9 parameters in Installer Programming Mode). The Full Stand-alone Operation Mode offers improved security, because it allows for separating the identification device (i.e. the reader) from the actuator element (i.e. the relay controlling the electric lock).

The max. length of the cable run between a PRT reader and an XM-2 module or a secondary PRT reader is limited to 150m. For two-way door control, the main reader needs to be configured in Full Stand-alone Mode, whereas the connected to it secondary PRT reader needs to be set in RACS mode with an address set to ID=0.

Note: The XM-2 I/O expander module connected to PRT reader must be set to address ID=5 (jumpers JP1 and JP3 closed).

3.2.2 Simple stand-alone operation mode



In this mode, the reader's CLK and DTA lines are used as standard I/O lines, the IN1 line operates as programmable input. Each I/O line can be configured to have one of the several available functions.

Note: The CLK and DTA line may operate as input or as output, the function assigned to CLK/DTA line automatically defines whether the line will operate as output or as input.. If configured to be an output, the CLK or DTA line operates as an open-collector line capable to sink up to 50 mA. Such a current is usually enough to drive directly majority of relay's coils used for door lock control.

4 INSTALLATION GUIDELINES

The reader should be mounted near the supervised door on a vertical piece of supporting structure. The power supply should be disconnected before making any electrical connections.

For installations on a metal surface place a non-metallic min. 10 mm thick spacer (a plastic plate, a plaster plate etc.).

When using a separate power supply sources, connect all supply minuses leads together.

Roger recommends to ground the negative (-) power supply lead.

With its relatively weak electromagnetic field generation, the terminal is not expected to cause harmful interferences to operation of other equipment, however other equipment generating interferences, especially radio frequency emitting equipment and electron tube computer monitors, may affect card reading.

For best results mount the proximity readers at least 0.5 m apart.

For installations with two readers to be mounted on opposite sides of the same wall and along the same geometrical axis, place a metal plate between them and make sure none of them has direct contact with it (at least 10 mm space is required).

Should card reading performance of the reader deteriorate (e.g. reduced reading range or incorrect readings) in the desired mounting location, consider choosing a new installation place.

Once the reader is fixed and electrically connected it must be properly configured, the configuration process requires Programming MASTER and INSTALLER Cards and programming Reader Operation Mode. When device is factory new it has both: MASTER and INSTALLER card programmed and reader is configured for RACS mode with address ID0.

The factory programmed MASTER and INSTALLER cards can be replaced by any other cards whenever required (see Memory Reset Procedure).

The Reader Operating Mode can be changed using jumpers located on reader's printed board, jumper locations may be changed with power supply off.

When reader is set configured for ONLINE mode the programming of MASTER and INSTALLER cards can be omitted.

5 PROGRAMMING

Before reader will start operation it must be configured to adequate Reader Operation Mode. When reader is set for any of the ONLINE operating mode it doesn't require any further programming. When reader is set for Stand-alone Operation Mode (OFFLINE), installer must program to a reader two special cards: MASTER and INSTALLER and then enter Installer Programming Mode and make final settings which adopt reader for individual installation requirements. The programming of PINs and/or Cards can be done by installer or end user in User Programming Mode.

When reader is not properly configured it may generate following signals:

No sound signals and the SYSTEM LED is ON – Microprocessor memory error, the unit must be reloaded with new firmware.

Short beeps repeated in sequence (0.2s/0.2s) and the SYSTEM LED is ON – The Reader Operating Mode has not been programmed.

Long beeps repeated in sequence (2s/2s) and the SYSTEM LED is ON – A MASTER and INSTALLER card have not been programmed or the memory is corrupt.

The reader manual programming can be done either in the Installer Programming Mode or in the User Programming Mode. To program the keypad reader you use its numeric keys. To program the no-keypad reader a dedicated Programming Card has to be presented to the reader multiple times. For programming the unit in the User Programming Mode, the MASTER Card is used, for programming the unit in the Installer Programming Mode, the INSTALLER Card is used.

Note: Each User ID number contains 3 digits, only ID numbers within the 000-119 range are allowed. Any attempt to program an existing identification tag (a card or a PIN code) will be indicated as a programming error.

Readers that have no keypad can be programmed by multiple reading of the valid Programming Card. All programming methods and functions described for the keypad readers are also valid for the no-keypad readers, the only difference being that one press of a desired key on keypad reader is simulated on a no-keypad reader by several presentations (readings) of the programming card to it. And so, to simulate on a no-keypad reader a press of N numeric key let the reader read the programming card N times (present it to the reader and take it back) and then wait 2..3 seconds for the reader to generate a special prompt encourage signal (♪ ♪) — this is a prompt indicating that the reader has successfully accepted the series of card readings as a single key-press and is ready to follow next steps of the programming procedure. Here is how to enter a digit or character during programming on readers with no keypad:

Key	How to simulate dedicated KEY on no-keypad readers during programming
[1]	Read 1 time the valid programming card or press 1 time the BELL key.
[2]	Read 2 times the valid programming card or press 2 times the BELL key.
[3]	Read 3 times the valid programming card or press 3 times the BELL key.
[4]	Read 4 times the valid programming card or press 4 times the BELL key.
[5]	Read 5 times the valid programming card or press 5 times the BELL key.
[6]	Read 6 times the valid programming card or press 6 times the BELL key.
[7]	Read 7 times the valid programming card or press 7 times the BELL key.
[8]	Read 8 times the valid programming card or press 8 times the BELL key.
[9]	Read 9 times the valid programming card or press 9 times the BELL key.
[0]	Read 10 times the valid programming card or press 10 times the BELL key.
[*]	Read 11 times the valid programming card or press 11 times the BELL key.
[#]	Read 12 times the valid programming card or press 12 times the BELL key.

Notes: The programming of a reader can be done on primary reader only. This rule is valid to either User and Installer programming modes. The BELL key is available on some PRT readers (e.g. PRT42-BK). When reader is not equipped with any key programming can be entirely done only through valid programming card.

5.1 Setting Reader Operating Mode

The PRT42 reader offer two main modes of operation: ONLINE and OFFLINE (stand-alone), and enables few other options which may modify those main operating modes. The selection of proper operating mode is achieved on programming jumpers (for details see table 2). The reader operating mode can be changed whenever required.

5.2 Memory Reset Procedure - Programming MASTER and INSTALLER cards

The Memory Reset Procedure erases MASTER and INSTALLER cards as well as all users programmed in reader (clears all cards and PINs). After Memory Reset reader restores factory-shipped default settings. The Memory Reset is used only when reader is configured for stand-alone mode, the Memory Reset doesn't affect reader configured for ONLINE mode.

To clear the reader's memory go through the following steps:

- Turn OFF power to the unit.
- Select appropriate stand-alone mode (Full stand-alone or Simple stand-alone mode)
- Install the JP1 jumper.
- Restore power, the reader generates a continuous beep.
- Wait until the LED OPEN starts flashing.
- Open (remove) the JP1 jumper.
- Present any card to the reader — this card becomes a new MASTER Programming Card.
- Present any (second) card to the reader — this card becomes a new INSTALLER Programming Card.
- Once the previous step is completed the reader automatically ends the memory reset procedure and enters the operating mode.

5.2.1 Factory Default Settings

After Memory Reset reader restores the following Factory Default Settings:

- Door lock triggering time: 4 sec.
- Time allowed to close a door: 12 sec.
- Line IN1 on the reader: Door Contact Input.
- Line IN1 on the XM-2 module: Exit Button Input.
- Line IN2 on the XM-2 module: Ready Input.
- CLK/REL1 line function: Door Lock Output.
- DTA/REL2 line function: Reader Disarmed Output.
- User identification mode on the primary reader: Card or PIN.
- User identification mode on the secondary reader: Card or PIN.
- Option [Door Alarm Indication On Internal Buzzer]: Option OFF.
- Option [Access Disabled When Reader Armed]: Option OFF.

5.3 Installer Programming Mode

Use this mode to configure various functionalities of the reader. You can enter it by presenting your INSTALLER Card at the reader. Once in this mode LED OPEN is ON and the LED STATUS is green ON. The reader placed in this mode waits for the installer to sequentially enter thirteen digits labelled C1...C13. After entering the last of them the reader saves all data that has been entered, then it exits the programming mode and returns to condition it was in before entry to installer programming.

Note: Depending on the operation mode desired for the reader (either Simple Stand-alone Mode or Full Stand-alone Mode), the configuration digits C5 and C6 have different effect: for Simple Stand-alone Mode they configure the reader's CLK and DTA internal lines, whereas for Full Stand-alone Mode they configure the REL1 and REL2 relay outputs on the XM-2 expander module.

The IN1 located on reader always operate as input, the reader's CLK and DTA lines can be used both as inputs and outputs, however the REL1 and REL 2 lines can function only as outputs, as well as IN1 and IN2 on XM-2 may operate as inputs only. If you try to program the REL1 and REL2 lines to input function, they will not work at all.

Configuration Parameters in The Installer Programming Mode		
Parameter	Value	Description
C1C2	00-99	C1 and C2 digits define Door Lock Triggering Time (in seconds). When set to C1C2=00, each granted access toggles the REL1 output to opposite condition (Toggle Operation). The Door Ajar alarm is disabled when C1C2 is set to 00.
C3C4	00-99	C3 and C4 digits define Time Allowed to Close the Door (in seconds), the C3C4 timer

		starts after the Door Lock Triggering Time (C1C2) has elapsed.
C5	0 – 7	Function settings for the REL1 output on the XM-2 module or for the CLK line: [0] - Not Used, line ignored; [1] - Door Contact Input, line shorted to supply minus indicates that door is closed; [2] - Exit Button Input, line shorted to supply minus activates door lock; [3] - Ready Input, when line shorted to supply minus reader can be armed; [4] - Door Lock Output, used to control the door releasing device (an electric lock or an electric strike); [5] - Reader Disarmed Output, line is active when reader is disarmed; [6] - Door Alarm Output, line is active when reader has detected any alarm situation, output is modulated according to detected alarm, when more then one alarm exist output signalize alarm with highest priority; [7] - Door Bell Output, line is triggered for approx. 5 seconds after BELL key is momentary pressed or [#] key is pressed and hold-down for min. 2 seconds (this function operates on readers not equipped with BELL key).
C6	0 – 7	Function settings for the REL2 output on the XM-2 module or for the DTA line, assignments as above.
C7	0 – 3	Function settings for the IN1 line on the reader: [0] - Not Used, line ignored; [1] - Door Contact Input, line shorted to supply minus indicates that door is closed; [2] - Exit Button Input, line shorted to supply minus activates door lock; [3] - Ready Input, when line shorted to supply minus reader can be armed.
C8	0 – 3	Function settings for the IN1 line on the XM-2 module: [0] - Not Used, line ignored; [1] - Door Contact Input, line shorted to supply minus indicates that door is closed; [2] - Exit Button Input, line shorted to supply minus activates door lock ; [3] - Ready Input, when line shorted to supply minus reader can be armed.
C9	0 – 3	Function settings for the IN2 line on the XM-2 module: [0] - Not Used, line ignored; [1] - Door Contact Input, line shorted to supply minus indicates that door is closed; [2] - Exit Button Input, line shorted to supply minus activates door lock ; [3] - Ready Input, when line shorted to supply minus reader can be armed.
C10	0 – 1	Primary (main) Reader Identification Mode: [0] - [Card or PIN] identification; [1] - [Card + PIN] identification.
C11	0 – 1	Secondary (auxiliary) Reader Identification Mode: [0] - [Card or PIN] identification; [1] - [Card + PIN] identification.
C12	0 – 1	Option: Door Alarm Indication On Internal Buzzer: [0] - Disabled; [1] - Enabled.
C13	0 – 1	Option: Access Disabled When Reader Armed]: [0] - Disabled; [1] - Enabled.

5.4 User Programming Mode

Use the User Programming Mode to administrate users registered in the reader, as well as to add and delete proximity badges and PINs. To enter this mode let the reader read one time your MASTER card. In the User Programming Mode, the LED OPEN is ON and LED STATUS is ON in RED. After entering this mode you have 12 programming functions (command sequences) to choose from (see table below). Upon beginning any of function, the SYSTEM LED starts flashing and it keeps flashing until the command sequence has been correctly completed by the programmer. If the reader receives no key pressed from the programmer for more than approx. 20 s between the successive steps of the command sequence, the reader automatically ends the command but still remains in the User Programming Mode — you may either return to the programming process by entering a desired command anew or you may exit the programming mode with a press of a [#] key.

5.4.1 Programming Commands

[1][PIN][#] – Add one NORMAL user with the PIN code specified

The user is stored in a first unoccupied memory location (his ID is unknown) and the PIN code entered is assigned to him.

[2][Card#1][Card#2]...[Card#N] – Add multiple NORMAL card users

The terminal indicates each successful reading of a presented card with a prompt signal for the next one; this function will be ended automatically if no card is presented within approx. 20 sec. from the last completed card presentation or it can be stopped manually by pressing a [#] key. Note that the new card users added with this function are stored in unoccupied location of the terminal's memory, but their IDs are unknown.

[3][ID][PIN][#][Card] – Add one NORMAL user with a specified ID, PIN code and card

A new user is registered in the terminal's memory at the ID = 000–119. Both the entered PIN code and the presented proximity card are assigned to him. When [Card] is omitted new user is registered with ID and PIN only.

[4][PIN][#] – Add one TOGGLE user with a specified PIN code only

The user is stored in a first unoccupied memory location (his ID is unknown) together with entered PIN code.

[5][Card#1][Card#2]...[Card#N] – Add multiple TOGGLE users with cards only

The terminal indicates each successful reading of a presented card with a prompt signal for the next one. This function will be ended automatically if no card is presented within 30 s from the last completed card presentation or it can be stopped manually by pressing a [#] key. Note that the new card users added with this function are stored in unoccupied locations of the terminal's memory, but their IDs are unknown.

[6][ID][PIN][#][Card] – Add one TOGGLE user with a specified ID, PIN code and card

A new TOGGLE user is registered in the terminal's memory at the specified ID index. Both the entered PIN code and the presented proximity card are assigned to him.

[7][PIN][#] – Delete a specified PIN code

The terminal finds a user with the specified PIN code and then deletes it from the terminal's memory; the user can still use his card if it was previously assigned to him.

[8][Card] – Delete a specified card from the terminal memory

The terminal finds a user with the specified card and then deletes it from the terminal's memory; the user can still use his PIN code if it was previously assigned to him.

[9][ID] – Delete a user with a specified ID index

The terminal finds a user with the specified ID and then deletes both his PIN and his card. Once completed, a new user can be programmed to use this ID index.

[*][0] – Delete all users in the system

Deletes all users including their cards and PIN codes.

[#] – Exit the User Programming mode

Once exited from the User Programming mode, the terminal returns to this mode which it operated before entering programming.

Note: The user ID number consist always from three digits from 000–119 range. PIN codes may be 3 to 6 digits long and must be always followed by [#] key which marks the end of a code. An attempt to assign to a new user ID which already is assigned for another one will remove it (the older) form memory.

5.4.2 Programming Examples

Example 1: Add a new NORMAL User, the user's PIN should be 1234 (PIN only)

Read your MASTER card.

The reader enters User Programming Mode (the reader's OPEN LED is ON, the reader's STATUS LED is ON and RED).

Press these keys on the keypad: [1] [1] [2] [3] [4] [#] [#].

The reader registers the [1234] code in its memory and then exits the programming mode and returns to normal operation.

Or follow these steps, if the reader is not fitted with a keypad:

Read your MASTER card.

The reader enters User Programming Mode (the reader's OPEN LED is ON, the reader's STATUS LED is ON and RED).

Present your MASTER card once and wait for the reader to generate a prompt signal (♪ ♪).

Present your MASTER card once and wait for the prompt signal (♪ ♪).

Present your MASTER card twice and wait for the prompt signal (♪ ♪).

Present your MASTER card thrice and wait for the prompt signal (♪ ♪).

Present your MASTER card four times and wait for the prompt signal (♪ ♪).

Present your MASTER card twelve times and wait for the prompt signal (♪ ♪).

Present your MASTER card twelve times and wait for the prompt signal (♪ ♪).

Once the reader has registered the [1234] code in its memory, it exits the programming mode and returns to normal operating mode.

Example 2: Add a new card TOGGLE LTD User

Read MASTER card.

The reader enters User Programming Mode (the reader's OPEN LED is ON, the reader's STATUS LED is ON and RED).

Do the following: Press [*] [5] (Present a new card to the reader) [#] [#]

The reader has registered the new indicated card in its memory and exited the programming mode.

Once the reader has registered the new indicated card in its memory, it exits the programming mode.

Example 3: Add a new NORMAL User with a specified ID number (ID=87) and an entered PIN code (PIN=1234) and a presented card

Read MASTER card.

The reader enters User Programming Mode (the reader's OPEN LED is ON, the reader's STATUS LED is ON and RED).

Press [3] [0] [8] [7] and wait for the reader to generate a prompt signal (♪ ♪).

Press [1] [2] [3] [4][#], present the card for the user.

Once the reader has registered the new user with an ID=87 and assigned the indicated card and the specified PIN to him, it exits the programming mode.

Example 4: Delete a user by using his ID=45

Read MASTER card.

The reader enters User Programming Mode (the reader's OPEN LED is ON, the reader's STATUS LED is ON and RED).

Press [9] [4] [5] [#].

The reader deletes the user with ID=45 from its memory, however, it remains in the programming mode, which allows you to use your next desired programming command.

Example 5: Rearm the reader by presenting a TOGGLE User card

Read your TOGGLE User card; once accepted the reader grants you access and its SYSTEM LED starts blinking.

With the SYSTEM LED blinking, once more present your TOGGLE card.

The reader changes its arming state (the STATUS LED will change illumination color).

Note: If the Access Disabled When Reader Armed option is enabled and the reader is in ARMED state, then in order to gain access first you will have to switch the reader to DISARMED state (by presenting twice the TOGGLE card) and only then use your identification tag once again to open the door.

Example 6: Rearm the reader by entering a TOGGLE User PIN code

Key in the TOGGLE User PIN code; once accepted the reader grants you access and its SYSTEM LED starts blinking.

With the SYSTEM LED blinking, once more key in the TOGGLE User PIN code.

The reader changes its arming state from ARMED to DISARMED or vice versa (the STATUS LED will change illumination color).

Example 7: Rearm the reader when the [Card + PIN] verification mode is enabled

Present your TOGGLE User card to the reader then key in the TOGGLE User PIN code; once accepted the reader grants you access and its SYSTEM LED starts blinking.

With the SYSTEM LED blinking, once more present your TOGGLE card and then key in the PIN.

The reader changes its arming state from ARMED to DISARMED or vice versa (the STATUS LED will change illumination color).

6 STAND-ALONE OPERATION

6.1 Users

In the stand-alone mode, a PRT reader can register up to 120 users, each with a card, a 3 to 6 digit long PIN code and an ID number (000–119). The PRT reader precludes assignment of the same code or card to 2 different users. Users enter their PIN codes keyed in with a press of the [#] key ([#] key is required to mark the end of PIN entry). User identification is done by verifying the PIN code entered or the card presented. When an option [Card+PIN] set users must present his card and subsequently enter its PIN. The [Card+PIN] option can be set separately for primary and secondary reader.

The PRT reader supports five types (classes) of users: INSTALLER, MASTER, NORMAL, TOGGLE and TOGGLE LTD. The INSTALLER and MASTER Users are dedicated for programming purpose only. NORMAL Users are authorized to unlock the supervised door, but not to arming and disarming reader. TOGGLE Users are authorized both to unlock the system-supervised door and to switch reader between ARMED-DISARMED modes. TOGGLE LTD Users are authorized to change ARMED-DISARMED mode of the reader only, they are not authorized for door unlock.

A new user can be registered in the device following either a simple or a full programming procedure. The simple procedure consists in programming a PIN code or a card into the system without specifying the ID number of a user to whom the programmed PIN/card will belong — so the system simply stores the code entered/card presented in a unoccupied ID user number. The full programming procedure requires you to specify an ID number for the new user being programmed which has to be followed by entering his PIN code and presenting his card.

Note: When you program user using full programming procedure you will be able later to selectively delete a user simply by specifying his ID number, so you do not need to know his card or PIN code.

User Types (User Classes)	
INSTALLER	A card of this user allows you to enter Installer Programming Mode. INSTALLER user has no PIN code.
MASTER	A card of this user allows to enter User Programming Mode. MASTER user has no PIN code.
NORMAL	Users of this type are solely authorized to unlock the door. They can use a card or a PIN code.
TOGGLE	Users of this type have the authorization to unlock the door and to control the ARMED-DISARMED state of the reader. They can use a card or a PIN code.
TOGGLE LTD	Users of this type are solely authorized to control the ARMED-DISARMED state of the reader. They can use a card or a PIN code.

6.2 ARMED and DISARMED Modes

In the standalone mode, the reader can be in any of the operational states, either ARMED or DISARMED. Its current state is indicated by the reader's dual color LED STATUS — it lights in RED for ARMED or GREEN for DISARMED.

The change of the reader's state to ARMED can be additionally indicated through the output line (for this, enable the Reader Disarmed Output setting). Such configuration allows the output line to be used as a driver to arm/disarm a connected alarm system or to switch on/off some other auxiliary system or device such as heating, lights etc. In general, the reader's ARMED-DISARMED states has no effect on unlocking door, unless the Access Disabled When Reader Armed option has been enabled (see C13 digit in Installer Programming Mode). With this option activated, access to the supervised room is granted only when the reader is disarmed. Use of the reader's configuration option mentioned above makes TOGGLE Users capable of enable/disable access to the supervised room; and it allows automatic access locking upon a reader entering the ARMED state.

Note: Upon powering on, the reader automatically returns to the ARMED/DISARMED state it was in before power off. Also, the reader restores its original ARMED/DISARMED state after exiting the programming mode. After erasure of the reader's memory the reader always returns to ARMED state

6.3 Arming and Disarming of Reader (rearming)

The action that changes the reader's state from ARMED to DISARMED and vice versa will be referred to as REARMING, the term "arming" should be understood as switching the reader into the ARMED state, and the term "disarming" as switching the reader into the DISARMED state.

Reader rearming operation can be done by TOGGLE or TOGGLE LTD Users. The action needed by a TOGGLE user to rearm the reader is to read twice the TOGGLE card or to enter twice the TOGGLE PIN code — however, when reader operates with the Card+PIN mode activated, user needs to do both things, read a card and enter a PIN. TOGGLE LTD users may rearm the reader simply by a single use of their identification tag (Card, PIN or both when Card+PIN option is active).

If the reader operates with input line defined as Ready Input the arming of a reader can be carried out only when this input remains in active condition, when such a input is not triggered (passive state) every attempt to arm reader will be rejected. Usually the Ready Input should be connected to the Alarm System Control Unit's output which is intended to indicate that the Alarm System is ready for arming (Ready Output on an Alarm System Control Unit).

6.4 Opening the Door

In order to open the door user must present its card, enter its PIN or do both things when Card+PIN mode is active. Each time card is read or key is pressed reader activates orange LED SYSTEM and generates short beep. After successful identification reader activates door lock for predefined time (see Installer Programming Mode, C1 and C2 digits which define Door Lock Triggering Time). The activation of a lock is signaled on green LED OPEN, this led remain ON as long as door lock is energised. When access to room is denied reader generates long beep. The access to a room can be disabled in two situations:

- When Card or PIN is unknown or
- When reader operates in ARMED mode and has set an option: **Access Disabled When Reader Armed**

If the second scenario occurs the TOGGLE or TOGGLE LTD. user may use its identifier (Card, PIN or both when Card+PIN mode is active) to switch reader from ARMED to DISARMED mode thus enabling NORMAL users to open the door or may switch reader from DISARMED to ARMED mode in order to disable NORMAL users to open the door.

6.5 Alarm Signalization

The PRT reader may signalize three type of alarms: Door Forced, Prealarm and Door Ajar. The alarm signalization is carried out on dedicated output line (Alarm Output) and optionally on internal buzzer (see option: **Door Alarm Indication on Internal Buzzer**). Each alarm is signalized in different way (see table below). Duration of alarm, regardless of its type is ~3 minutes. An alarm can be stopped within 3 minutes time from its start by entering any identification tag (Card or PIN) registered in the reader. The Door Ajar alarm is immediately stopped, once the door is closed. If more than one alarm is triggered, the reader indicates the alarm with the highest priority. The Forced Entry and Door Ajar alarms may occur only if the reader operates with a door open sensor.

Alarm Signalization on Output and/or Buzzer			
Alarm type	Priority	Indication method	Alarm situation
Door Forced	High	In cycles with the following sequence: Active - 4 sec., Pause - 4 sec. 	Door opened without use of valid card or PIN.
Prealarm	Medium	In cycles with the following sequence: Active - 1 sec., Pause - 1 sec. 	Detection of 3 consecutive attempts to enter an unregistered (unknown) card or PIN code.
Door Ajar	Low	In cycles with the following sequence: Active - 1 sec., Pause - 1 sec., Active - 1 sec., Pause - 5 sec. 	After access has been granted and door opened it is left ajar for the time exceeding the door open time setting (see C2C3 parameter in Installer Programming Mode).

6.6 Acoustic and Optical Signalization

Acoustic Signals in Stand-alone Operation Mode		
Indication	Symbol	Description
One long signal	♪	Error indication, unknown card or PIN, access denied.
Two long signals	♪ ♪	Attempt to assign the same function to two different output lines.
Three beeps	♪♪♪	Command successfully completed (OK Signal).
Two series of three beeps	♪♪♪ ♪♪♪	Signal OK repeated two times - reader restarted.
Two short signals	♪♪	Prompt (encourage) signal, the reader is waiting for the next part of the command being entered. This signal is intended to encourage the programmer to enter next programming steps.
One long signal continuously repeated	♪ ♪ ♪ ♪ ... and so on	Memory error or MASTER or INSTALLER cards not programmed - memory reset necessary. This signal is accompanied by LED SYSTEM steady ON.
Legend: ♪ - one long signal ♪ - One short signal (beep)		

LED Indications in Stand-alone Operation Mode			
STATUS LED	OPEN LED	SYSTEM LED	Meaning
Green	—	—	The reader is in DISARMED state now.
Red	—	—	The reader is in ARMED state now.
Red	Green	—	The reader is in User Programming Mode.
Green	Green	—	The reader is in Installer Programming Mode.
—	—	Orange Flashing	Waiting for a user to enter the next part of a command or programming function.
—	—	Orange, one flash	A user card has been read or a user PIN entered.
—	Green	—	Door lock is activated, the LED remains active as long as door lock is triggered.
—	Green flashing	—	The reader is waiting for a user to enter his PIN code.
—	—	steady	The reader has detected some problem (Memory contents is corrupted or the MASTER/INSTALLER card are not programmed).

7 TABLES











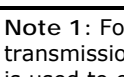
Table 1: Reader Operating Modes		
Code	Operating Mode	Description
	OFFLINE MODE SIMPLE Stand-alone Mode	The reader operates in a stand-alone mode, the CLK and DTA lines serve as ordinary I/O lines.
	OFFLINE MODE FULL Stand-alone Mode	The reader operates in a stand-alone mode, the CLK and DTA lines are used to communicate with remote XM-2 I/O module set to address ID=5 and optional secondary PRT reader set to address ID=0.
	ONLINE MODE RACS Communication Interface Address ID=0	The reader operates in Host-controlled mode, it needs to be connected to a PR series access controller.
	ONLINE MODE RACS Communication Interface Address ID=1	The reader operates in Host-controlled mode, it needs to be connected to a PR series access controller.
	ONLINE MODE RACS Communication Interface Address ID=2	The reader operates in Host-controlled mode, it needs to be connected to a PR series access controller.
	ONLINE MODE RACS Communication Interface Address ID=3	The reader operates in Host-controlled mode, it needs to be connected to a PR series access controller.
	ONLINE MODE MAGSTRIPE Communication Interface	The reader operates in Host-controlled mode, it needs to be connected to a master unit (ACU) which requires Magstripe data format.
	ONLINE Mode 26 bit WIEGAND Communication Interface	The reader operates in Host-controlled mode, it needs to be connected to a master unit (ACU) which requires 26 bit Wiegand data format.
	ONLINE Mode 34 bit WIEGAND Communication Interface	The reader operates in Host-controlled mode, it needs to be connected to a master unit (ACU) which requires 34 bit Wiegand data format.
	ONLINE Mode 42 bit WIEGAND Communication Interface	The reader operates in Host-controlled mode, it needs to be connected to a master unit (ACU) which requires 42 bit Wiegand data format.
	ONLINE Mode 66 bit WIEGAND Communication Interface	The reader operates in Host-controlled mode, it needs to be connected to a master unit (ACU) which requires 66 bit Wiegand data format.
<p>Note 1: For Wiegand data interfaces the JP1 and JP2 jumpers are used to specify the method of PIN code transmission (for coding details see table 2 below). In the stand-alone mode (OFFLINE mode) the JP1 jumper is used to enter the Memory Reset Procedure. In RACS data formats the JP1 and JP2 jumpers are used to specify reader's address (ID number).</p> <p>Note 2: For both Simple and Full stand-alone modes the JP1 jumper is used to initialize the Memory Reset Procedure.</p>		




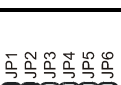
Table 2: PIN Transmission Options for Wiegand Interfaces		
JP1 and JP2	Description	Details
	1 to 10 keys long PIN, transmitted in BCD format	Each key pressed on the reader's keypad is buffered and the transmission starts only after pressing the [#] key indicating end of code. The PIN code keyed in is transmitted as a BCD coded number.
	1 to 12 keys long PIN, transmitted in binary format	Each key pressed on the reader's keypad is buffered and the transmission starts only after pressing the [#] key indicating end of code. The PIN code keyed in is transmitted as a binary number.
	Each key transmitted separately with two control bits	Each key pressed on the reader's keypad is immediately transmitted to the master controller unit as a sequence of 6 bits (EXXXXP) where XXXX represents the code of the pressed key supplemented by two control bits (E and P), each controlling half of the transmission stream. This format is compatible with HID 5355 series readers, option: With Parity.
	Each key transmitted separately, no control bits added	Each key pressed on the reader's keypad is immediately transmitted to the master controller unit as a sequence of 4 bits (XXXX) which represent the code of the pressed key. This format is compatible with HID 5355 series readers, option: Without Parity.
Note: The PIN code transmission options described in this table apply only to Wiegand26/34/42/66bit data communication formats.		

Table 3: Technical Specification	
Input voltage	10...16 V DC
Current consumption	Avg. 60 mA
Anti-sabotage feature (Tamper output)	Transistor output, 20mA max. sink current at 16V max.
Reading distance	Up to 12 cm for ISO cards – depending on card type, card supplier and card quality
Proximity cards	EM UNIQUE 125 kHz, ASK modulation, 64 bits (compatible with EM4100/4102)
Distance to ACU when in online mode or to XM-2 and secondary PRT reader when in off line mode	150 m
Environmental class (according to EN 50131-1)	Class I, Indoor temp.: +5°C +40°C Relative humidity: RH 10 to 95% (non-condensing)
Ingress protection	IP 30
Dimensions	45 X 151.5 X 20.5
Weight	~90g
Approvals	CE

Table 4: Connection Terminals			
Label	Simple Stand-alone Operation Mode	Full Stand-alone Operation Mode	Networked Mode
+12V	Supply input plus		
GND	Supply input minus		
CLK	Can be configured to be used as an input or an output	CLOCK communication line	DATA 0 line for Wiegand formats CLOCK for Magstripe and RACS formats
DTA	Can be configured to be used as an input or an output	DATA communication line	DATA 1 line for Wiegand formats DATA for Magstripe and RACS formats
IN1	In stand-alone modes this line functions as an electric input and it can be configured to several available functions.		In Wiegand and Magstripe formats, the IN1 line activated by shorting it with the negative lead (-) of power supply. When IN1 is triggered it turns the OPEN LED to ON and also activates acoustic signal on the internal buzzer.
TAMP	Tamper switch, NC contacts, 24V/50mA.		

Table 5: Ordering Codes	
PRT42	RFID/PIN reader, black
PRT42-BK	RFID reader, black
PRT42 Grey	RFID/PIN reader, light grey
PRT42-BK Grey	RFID reader, light grey
RM-2	Relay module. The RM-2 offers two relays with one NO/NC contact 5A/24V rated, relay contacts protected with overvoltage elements.
XM-2	I/O expander module, digital communication with host unit, two inputs and two relay outputs, each relay output offers one NO/NC contact 5A/24V rated. Relay contacts protected with overvoltage elements.

Table 6: Product History			
Hardware	Firmware	Date	Description
PRT42 v1.0	71.00	18/04/05	The initial product version.
PRT42 v1.0	72.00	05/07/05	Error signalization modified.

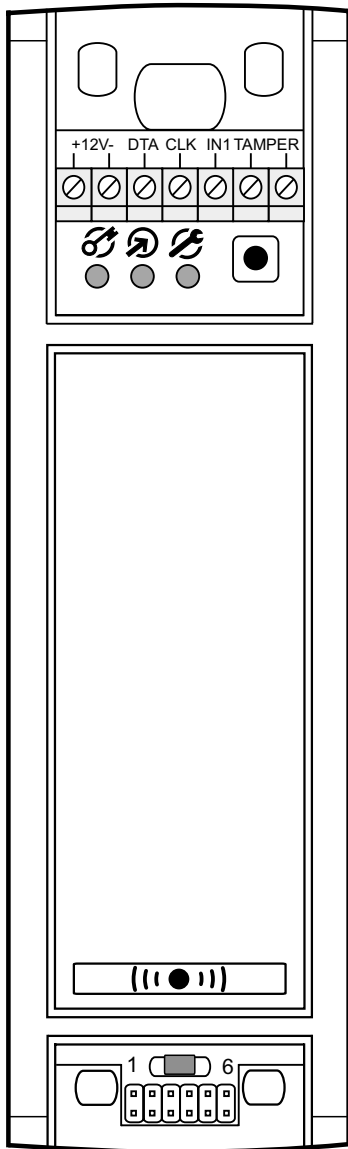
Contact information:
 Roger sp. j.
 82-416 Gościszewo
 Gościszewo 59
 Phone: 055 272 0132
 Fax: 055 272 0133
 e-mail: biuro@roger.pl

USER LIST				
Site name:		Reader location:		
ID Number	Card number	PIN	Type	User Name
Master		-	-	
Installer		-	-	
0.				
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				
31.				
32.				
33.				
34.				
35.				
36.				
37.				
38.				
39.				
40.				
41.				
42.				
43.				
44.				
45.				
46.				
47.				
48.				
49.				
50.				
51.				
52.				
53.				
54.				
55.				
56.				
57.				
58.				
59.				
60.				
61.				
62.				
63.				

USER LIST				
Site name:		Reader location:		
ID Number	Card number	PIN	Type	User Name
64.				
65.				
66.				
67.				
68.				
69.				
70.				
71.				
72.				
73.				
74.				
75.				
76.				
77.				
78.				
79.				
80.				
81.				
82.				
83.				
84.				
85.				
86.				
87.				
88.				
89.				
90.				
91.				
92.				
93.				
94.				
95.				
96.				
97.				
98.				
99.				
100.				
101.				
102.				
103.				
104.				
105.				
106.				
107.				
108.				
109.				
110.				
111.				
112.				
113.				
114.				
115.				
116.				
117.				
118.				
119.				

Front and Side View of PRT42/PRT42-BK Readers (scale 1:1)

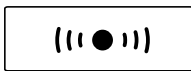
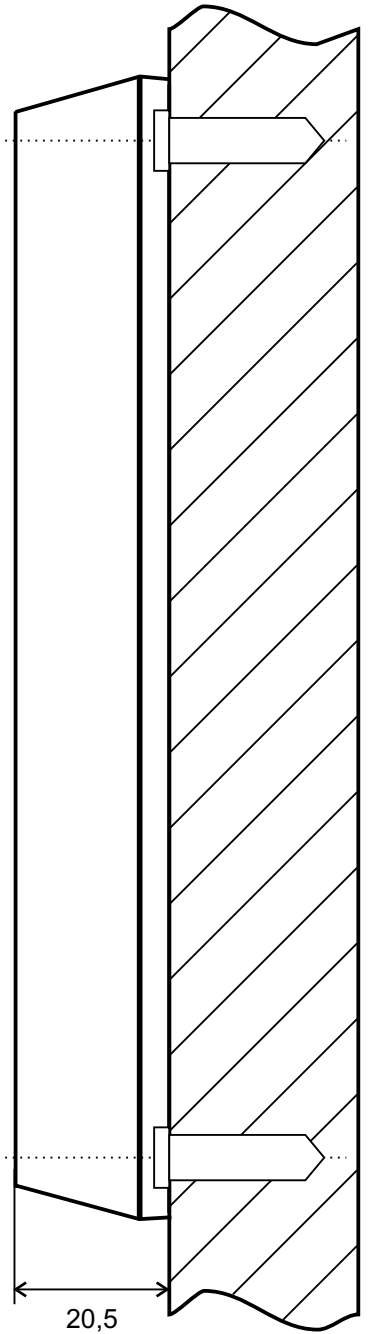
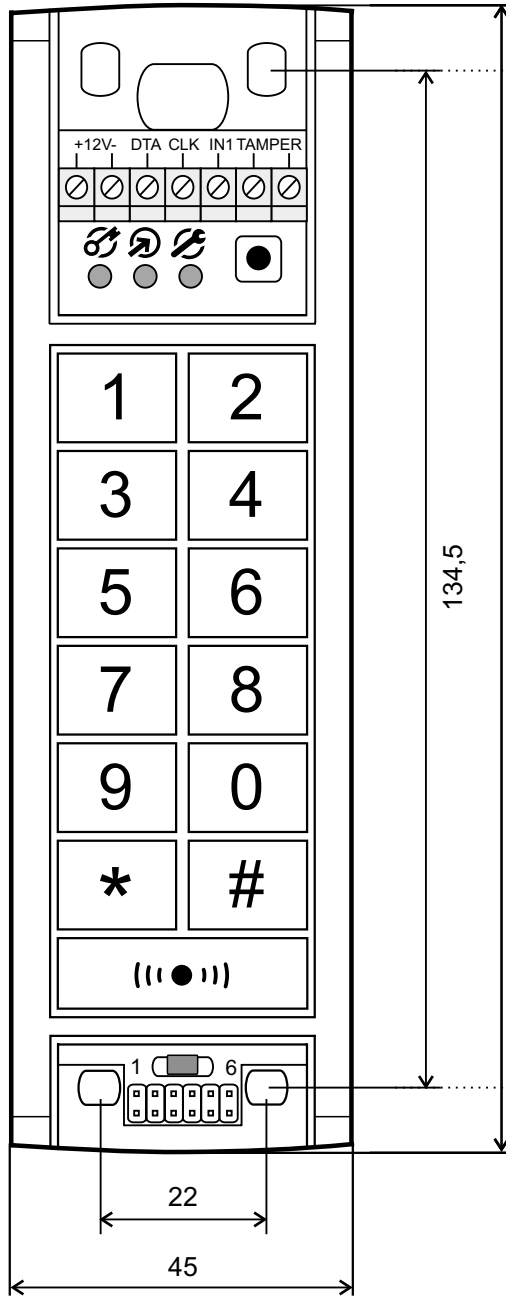
PRT42 - BK



JP1 JP2 JP3 JP4 JP5 JP6

Warning
Prior to Jumper Modification Remove Power

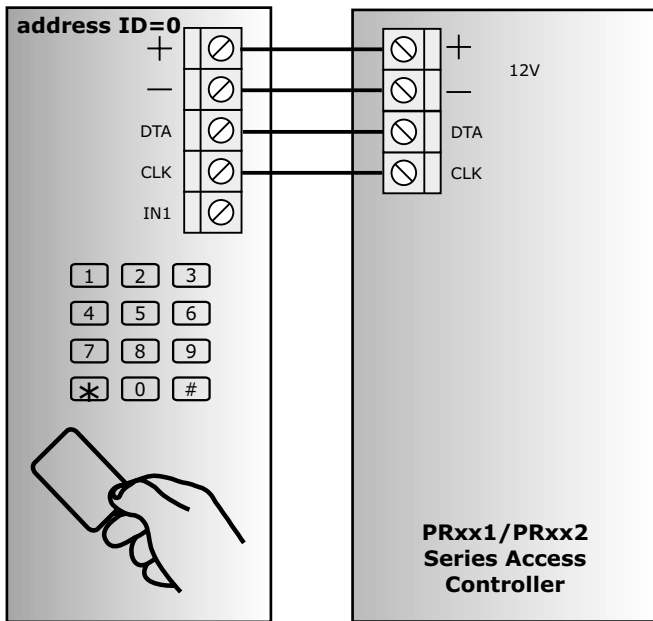
PRT42



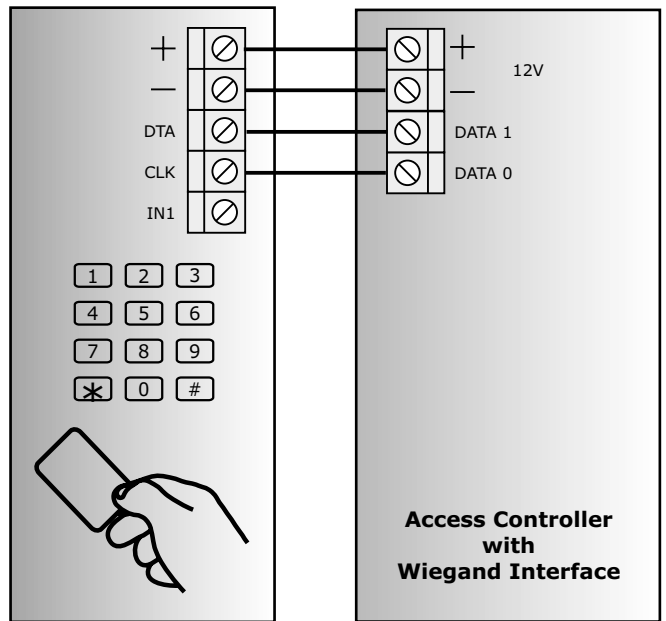
F1 Function Key
(BELL KEY)

LED	Icon	Color	Description
LED 1		Red or Green	RED - Reader Armed GREEN - Reader Disarmed
LED 2		Green	OPEN
LED 3		Amber	SYSTEM

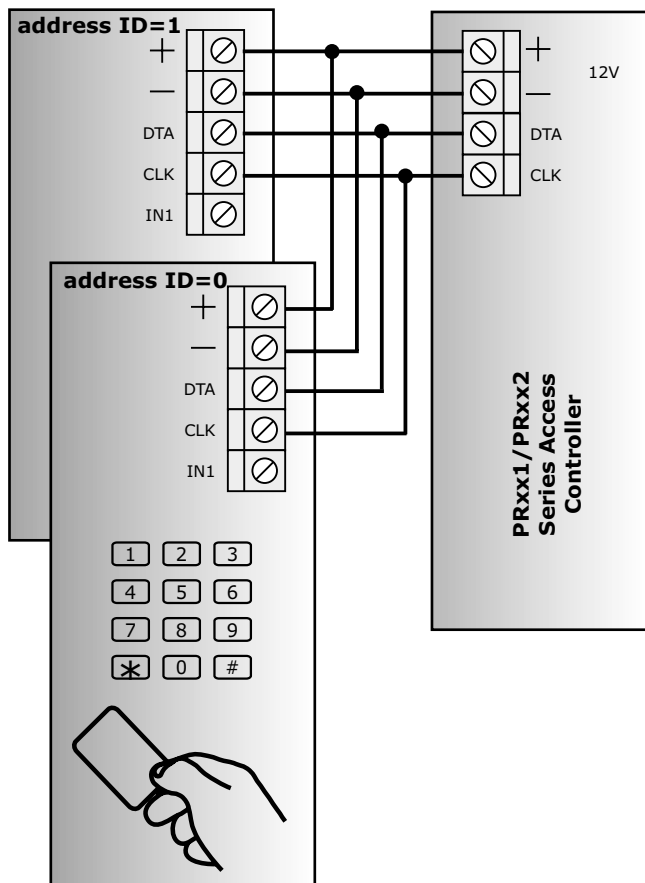
Note
The *Armed/Disarmed* modes were in previous version of RACS (Roger Access Control System) called as *OFF/ON* modes. Actually (in RACS v4.1) the *OFF* term was replaced by *Armed* whereas *ON* by *Disarmed*. All methods and rules which previously referred to On/OFF modes now refers to Armed/Disarmed modes.



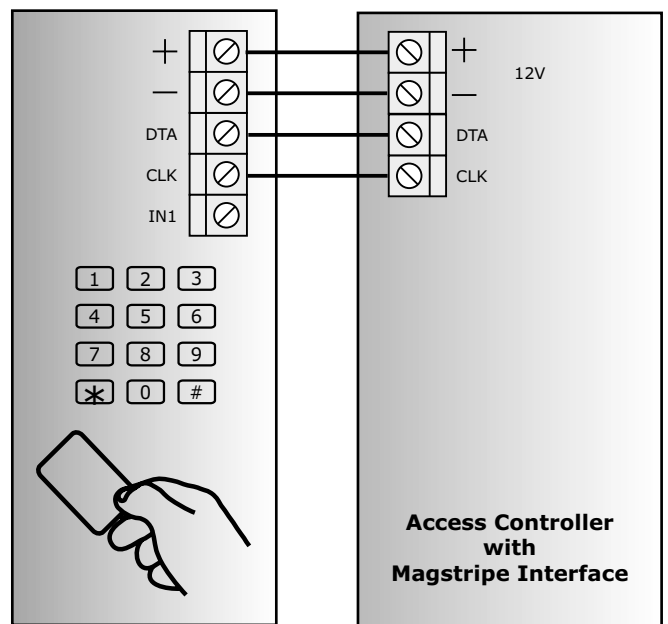
PRT reader in ONLINE mode.
 Connection to PRxx1/PRxx2 series access controller from Roger.
 (one-way door control)



PRT reader in ONLINE mode.
 Connection to access control unit with Wiegand interface.

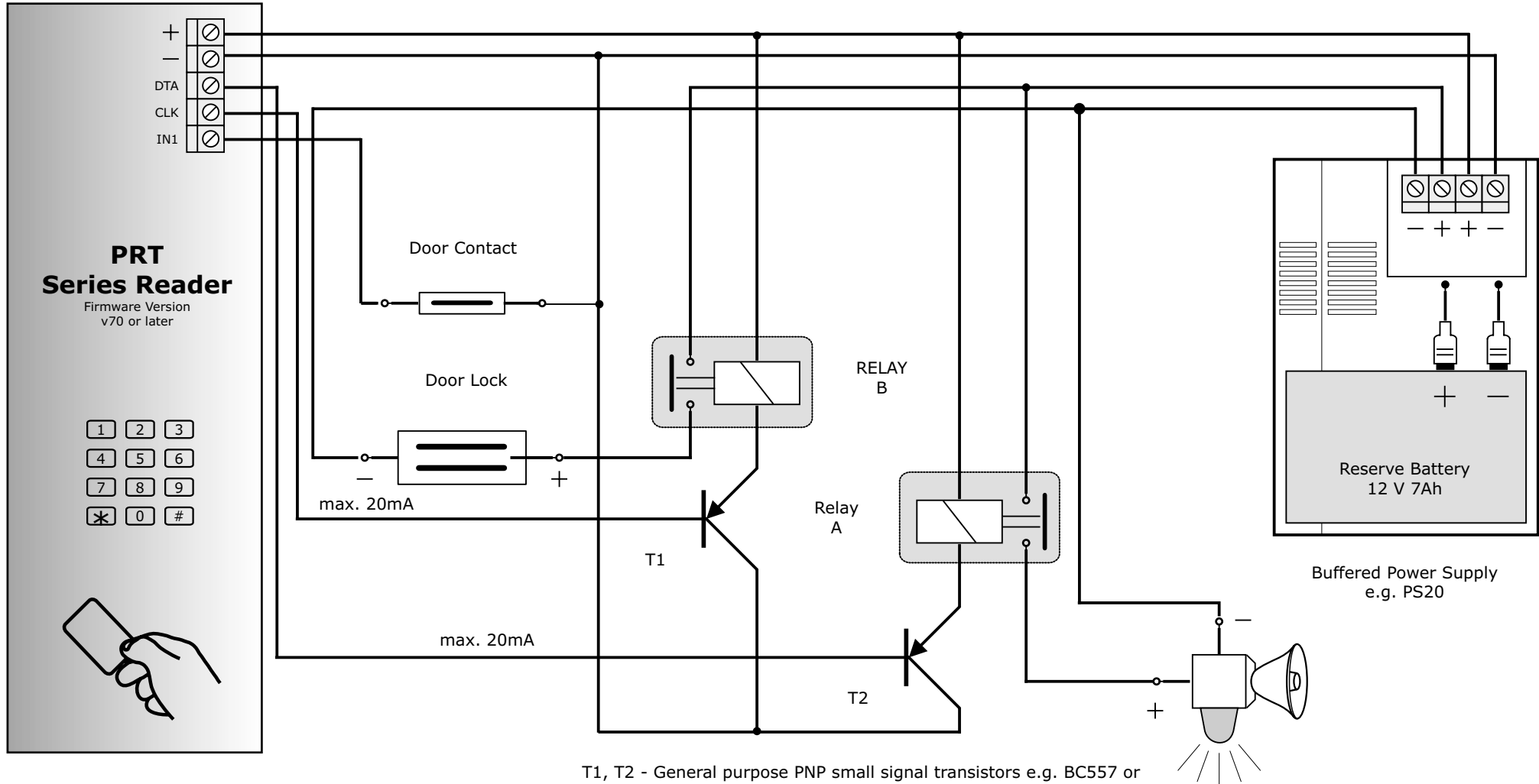


PRT reader in ONLINE mode.
 Connection to PRxx1/PRxx2 series access controller from Roger.
 (two-way door control)



PRT reader in ONLINE mode.
 Connection to access control unit with Magstripe interface.

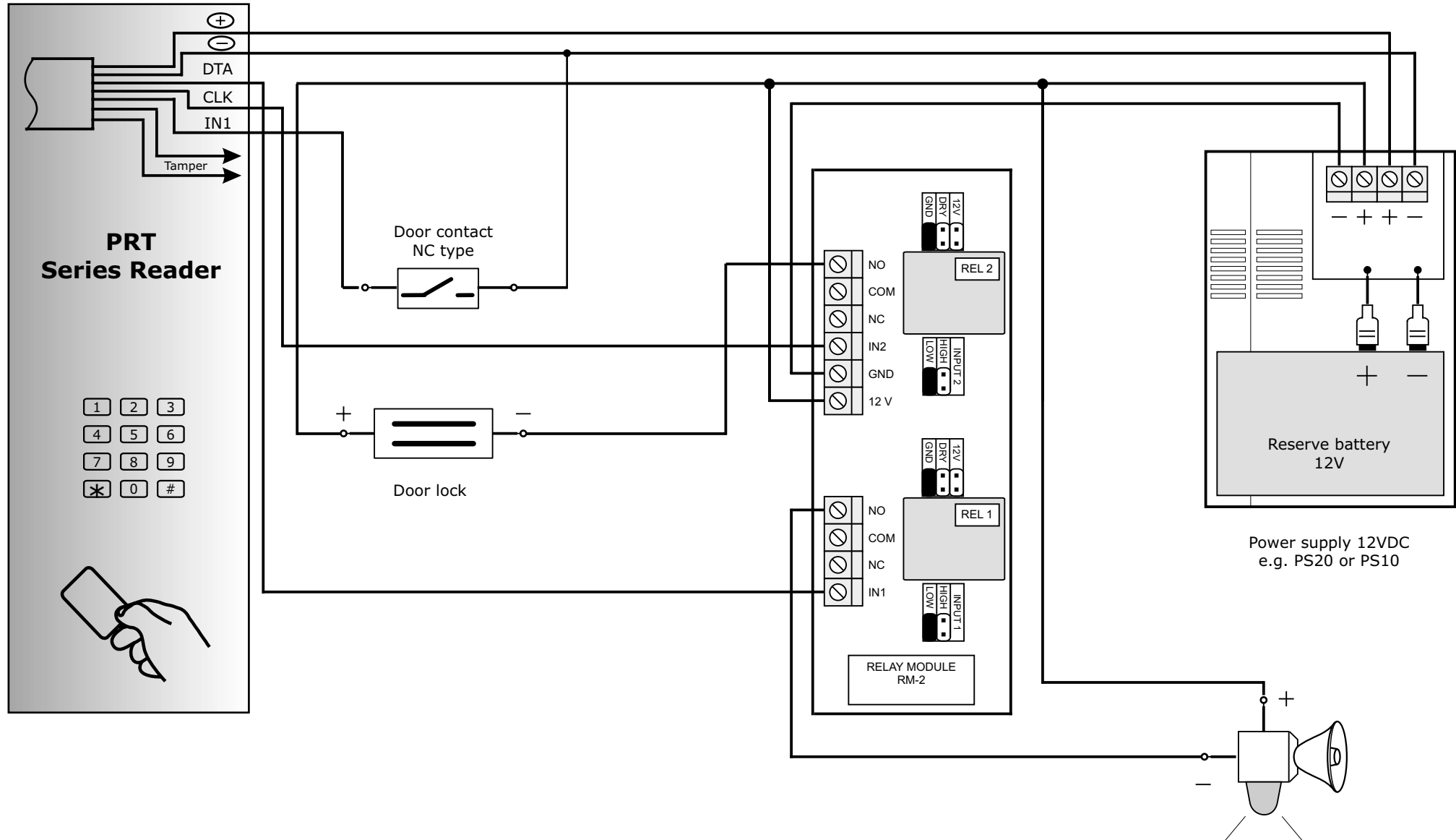
Wiring diagram
 PRT Reader Operation in Simple Stand-alone Mode - sample only
 (no XM-2 module connected)



T1, T2 - General purpose PNP small signal transistors e.g. BC557 or equivalent

Note:
 When coil resistance of REL A and REL B is higher than 600 ohm the T1 and T2 are useless. The CLK/DTA can directly drive relay's coils.

PRT Series Reader in Simple Stand-alone Mode
 Operation with RM-2 Relay Module
 (sample only)



PRT Series Reader in Full Stand-alone Mode
 Operation with XM-2 I/O Extension Module and Second PRT Reader
 (sample for two-way door control)

