PRT12-BK v1.3
Outdoor Access Reader

Firmware 74.7

$C\!\epsilon$

Installation and Programming Manual

Important note – read this first

The PRT12-BK can be configured for various operating modes. The factory shipped new reader is preconfigured for **RACS mode address ID=0**. The selection of the required operating mode can be carried out through adequate programming procedure (see: **Setting reader operating mode** later in this document).

If the reader is dedicated for Offline mode (standalone mode) installer must program two special users called MASTER and INSTALLER into a unit, those users will be later required for programming of the reader. If the unit is dedicated for Online mode (slave unit connected to a host controller), programming of the MASTER and INSTALLER users is not necessary. Any EM 125 kHz proximity card or tag can be programmed to be MASTER or INSTALLER. Whenever required (e.g. when stolen or lost) installer may program new MASTER and INSTALLER cards into a unit. The factory new PRT12-BK reader is shipped without any proximity cards.

Note: If after power up of the reader the LED SYSTEM ∅ is on it means that either contents of the reader memory is corrupted or MASTER/INSTALLER users are not programmed yet. In this case the Memory Reset procedure must be carried out and the reader must be completely programmed from the scratch.

Glossary and terms

Clock & Data Interface

The electrical interface used by the reader for communication with various equipment connected to it. Optionally, the PRT12-BK can operate with a second PRT series reader and XM-2 I/O extension module. These devices can be connected to the same Clock and Data lines and must have individual addresses (ID numbers).

Door Release or Door Lock

The electric device used to unlock a door. Typically it can be a door strike or magnetic lock.

Identifier

The method or means which is used for identification of a user. It can be a proximity card, PIN code, finger template etc. In some cases Identifier may consist of two or more items (e.g. when option **Card and PIN** is active).

Identification Mode

The method used by the reader for identification of users (e.g. **Card or PIN**, **Card and PIN**).

Memory Reset

The procedure which clears reader memory.

PRT Series Readers

The PRT reader family developed and manufactured by Roger. Each member of PRT series readers can be connected to the external access controller or operate as standalone unit.

Restart

The process when device goes through initialization procedure, the same as during power up of a unit.

Roger Access Control System (RACS)

The access control system which consists of PR series access controllers developed and manufactured by Roger.

Access Control Unit (ACU)

The logic device which provides access control, usually it is an access controller.

XM-2 I/O Extension Module

The remote I/O extension module for RACS system. The XM-2 provides two NO/NC inputs and two relay outputs.

Standalone mode

The operation mode in which the PRT reader independently controls a single door passage.

Designed function

The PRT12-BK reader has been designed for use in access control installations to enable user identification via EM 125 kHz UNIQUE standard proximity cards. Reader can be configured for Standalone mode (alternatively called Offline mode) or for use with an external access control unit (ACU) supporting compatible data interface formats (Online mode). When in Online mode PRT reader works as a slave unit serving a sole purpose of reading cards and forwarding data to the host ACU for further processing. The PRT12-BK offers several data transmission formats which include the popular Wiegand and Magstripe (i.e. simulation of an output of a magnetic card reader) data protocols.

When configured for Standalone operation (Offline mode), the PRT12-BK reader independently (i.e. autonomously) controls the supervised door access point. For this mode reader offers two installation configurations — first of them uses the reader's built-in I/O signal lines as general purpose inputs and outputs, the second one uses them for communication with an external XM-2 I/O module and a secondary (optional) PRT series reader. An access control installation containing two PRT series readers (one at the entry and other at the exit side of the supervised door) enables two-way passage control. The system setup utilizing an XM-2 module provides higher level of security for door access control system by separating its logical element (a reader unit) from the relay which controls a door lock.

Features

Online mode (Slave unit connected to a host device)
- 26/34/42/66 bit Wiegand data transmission formats
- Magstripe data format (ABA Track II emulation)
- RACS data format (for connection to PR series ACUs from Roger)
- Various options for transmission of PIN codes
- LED/BUZZER control input

Offline mode (Standalone operation)
- System settings stored in nonvolatile memory
- up to 120 users
- User indexing (ID indexed user records)
- Support for **Door Contact** and **Exit Button**
- **Door Alarm** and **Door Bell** outputs
- **Disarmed** output and **Arming Disabled** input for integration with the alarm system
- Two way door control (requires second PRT reader to form a pair)
- Uses built-in I/O-s or remote XM-2 I/O module

Operating modes

There are two main modes of operation available for the reader:
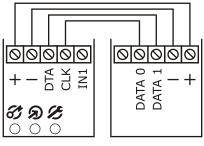- Online mode

- Offline mode

Online mode (host-controlled operation)

When in this mode the PRT12-BK reads cards and then transmits the collected data to the host unit for further processing. The PRT12-BK offers the following data transmission formats:

- Wiegand 26bit
- Wiegand 34bit
- Wiegand 42bit
- Wiegand 66bit
- Magstripe (ABA Track II emulation, sometimes called Clock & Data)
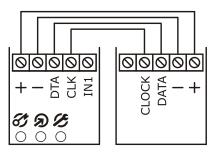- RACS (for PR controllers from Roger)

Wiegand format

When employing Wiegand transmission format, the card code is transferred to the host using sequences of pulses sent over the CLK and DTA lines. Depending on the selected version of the transmission format, the PRT12-BK uses 26, 34, 42 or 66 bits to transmit a card code data to the host unit. If the card number is represented by more bits then available in specific format reader omits the most significant bits of a card code. In Wiegand format, a dual color LED STATUS ✇ lights steady in red. The LED SYSTEM ✇ along with buzzer are activated for a while each time a card is read. The LED OPEN ✇ is normally off, it becomes on when IN1 is shorted with supply negative (GND), also when active, the LED OPEN ✇ is accompanied by continues sound.

PRT series reader configured for *Wiegand* interface

Wiegand ACU

Magstripe format

When employing Magstripe transmission format, the card is transferred to the host using electric signal waves transmitted over the CLK and DTA lines. The LED indicators and the buzzer are controlled in the same manner as in Wiegand formats (see section above).

PRT series reader configured for *Mastripe* interface

Magstripe ACU

RACS format

When employing RACS transmission format, the PRT12-BK unit communicates with PR access controller via CLK and DTA lines. Unlike in the Wiegand and Magstripe formats, the PRT12-BK unit using RACS format requires an individual address (ID=0…3) to be set during configuration of the reader. With RACS format, communications between the PRT12-BK and ACU is bilateral, this allows controller to monitor communication with the reader. The reader's LED-s and the buzzer are controlled by the host unit, unless the reader has lost communication with a host, in this case all LED-s are flashing simultaneously.
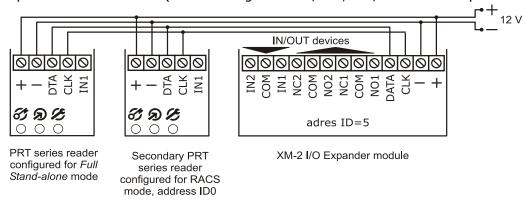
Offline Mode (standalone operation)

The PRT12-BK reader offers two variants of standalone operation:

- Full Standalone mode
- Simple Standalone mode

In both listed above modes the reader is capable of providing independent (i.e. autonomic) control of a single door.

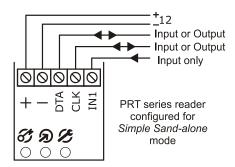### Full Standalone mode (with XM-2 extension module)

In this mode the reader's CLK and DTA lines are used for communication with a remote XM-2 I/O extension module and optionally with second (optional) PRT series reader (for two-way door control). The IN1 line operates as a programmable input and can be configured to various options. The I/O lines on the XM-2 module can be programmed to several predefined functions (see: settings for C5, C6, C7, C8 and C9 parameters in

PRT series reader configured for *Full Stand-alone* mode

Secondary PRT series reader configured for RACS mode, address ID0

XM-2 I/O Expander module

section Installer Programming). The Full Standalone mode offers improved security, because it allows for separation between the reader and the relay which controls a door lock. The maximum length of the cable run between a PRT reader and an XM-2 module and optional secondary PRT reader is limited to 150 m. For two-way door control the primary PRT unit needs to be configured for Full Standalone mode while the secondary reader needs to be configured for RACS mode address ID=0.

> Note: The XM-2 I/O extension module connected to the PRT reader has to be configured for address ID=5.

Simple Standalone mode (without XM-2 extension module)

PRT series reader configured for *Simple Sand-alone* mode

In this mode the reader's CLK and DTA lines are used as standard, general purpose, inputs or outputs while the IN1 line operates always as a programmable input. Each I/O line (CLK, DTA and IN1) can be configured to have one from several available functions.

> Note: The CLK and DTA lines may operate either as an input or output. The function assigned to CLK/DTA line automatically determines whether the line will operate as an output or input. If configured to be an output, the CLK (DTA) line operates as an open-collector line capable to sink up to 50 mA. Such a current is usually sufficient to drive directly majority of relays used for a door lock control. When necessary, both lines (CLK and DTA) can be configured to the same output function and connected together (shorted), such an output will provide up to 100mA sink current.

Functional description for standalone mode

Users

In the standalone mode, the PRT reader can register up to 120 users with card, each user may have ID number (000–119). The PRT12-BK distinguishes following types of users:

User Types		
Type	Authorization	Programming
INSTALLER	This user is authorized for entry to the Installer Programming mode only. Read INSTALLER card once and the reader will enter Installer Programming mode.	This user is programmed during Memory Reset procedure.
MASTER	This user is authorized for entry to the User Programming mode only. Read MASTER card once and the reader will enter User Programming mode.	This user is programmed during Memory Reset procedure.
NORMAL	NORMAL users are solely authorized to unlock the controlled door.	Those users are programmed in User Programming mode.
TOGGLE	TOGGLE users are authorized to unlock the controlled door and to control the Armed/Disarmed mode of the reader.	Those users are programmed in User Programming mode.
TOGGLE LTD	TOGGLE LTD (TOGGLE LIMITED) are solely authorized to control the Armed/Disarmed mode of the reader.	Those users are programmed in User Programming mode.

Managing the users

A new user can be registered in the reader following either a **simple** or **full** programming procedure.

The **simple users programming** procedure consists of programming of a card into the unit without specifying the ID number of a user to whom the programmed card will be assigned — so the system simply stores the card code in any unoccupied memory location and the user ID to whom this card belongs is unknown.

The **full user programming** procedure requires to specify the ID number of the user to whom a new card is being added.

Note: When you add a card using full programming procedure, you will be later able to selectively delete it because you will know the ID number of user to whom this card belongs. If you program card using a simple programming procedure then to remove a given card from the reader you must have this card, otherwise the only one method to remove it from the memory will be the Memory Reset.

User identification

In PRT reader users may be identified in two ways:

- Card or PIN, the reader requires card or PIN, only one of them is necessary for a successful identification
- Card and PIN, the reader requires first to read a card and then to enter a PIN

Because the PRT12-BK is not equipped with keypad setting Card and PIN mode for this reader has no practical sense.

Note: The Identification Mode can be set individually for primary and secondary reader.

Armed and Disarmed modes

When in the standalone mode reader may operate in Armed or Disarmed mode. The actual working mode of the reader is indicated on the dual color LED STATUS ✺, which lights in red for Armed and green for Disarmed. The actual mode in which reader is can be indicated on an output line configured to option **[5]-Disarmed Mode**. Such a configuration allows the output line to be used as an output signal to Arm/Disarm a connected alarm system or to switch on/off some other auxiliary system or device (e.g. heating, lights etc.). In general, the Armed/Disarmed states have no effect on door unlocking, unless the option **Access disabled when reader armed** will be enabled. With this option is active access to the supervised room my be granted only when reader operates in Disarmed mode.

Note: Upon powering on, the PRT12-BK automatically returns to the arming mode (either Armed or Disarmed) it was in before powered off. Also, the reader returns to its original Armed/Disarmed state after leaving the programming mode. After Memory Reset reader always enters the Armed mode.

Arming and disarming

The action changing the reader from Armed to Disarmed and back (i.e. reverse direction) is referred to hereinafter as "rearming". The term "arming" should be understood here as the action effecting a switch into Armed mode, whereas the term "disarming" as a switch into Disarmed mode.

Reader rearming 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. The TOGGLE LTD users rearm the reader simply by a single use of their card.

Note: If the reader operates with an input line configured to option **[3]-Arming Disabled**, then the arming of a reader can be carried out providing that this input is not triggered. When triggered, every attempt to arm a reader will be rejected. The condition of **Arming Disabled** input does not affects disarming of a reader.

Example: Rearm the reader by TOGGLE card
- Read your TOGGLE card
- Once accepted the reader grants you access and its LED SYSTEM ✍ starts blinking
- With the LED SYSTEM ✍ blinking, again read your TOGGLE card
- The reader changes its arming state (the LED STATUS ✺ will change illumination color)

Note: If the option **Access disabled when reader armed** is enabled and the reader is in Armed mode, then in order to unlock a door first you will have to switch the reader to Disarmed state (e.g. by presenting twice the TOGGLE card) and then access might be granted.

Example: Rearm the reader by TOGGLE card
- Read TOGGLE card, reader grants you access and starts flashing LED SYSTEM ✍
- With the LED SYSTEM ✍ flashing, again read your TOGGLE card
- The reader changes its arming state (the LED STATUS ✺ will change illumination color)

Door unlocking

In order to unlock a door user is required to read his card. Whenever this happens, reader activates its LED SYSTEM ✍ momentarily and generates short confirmation beep.

After successful identification reader unlocks a door for **Door unlock time**. When access to the room is denied, reader generates a long continues beep.

Note: The LED OPEN � is activated for the entire time when door is unlocked.

The access can be denied in following situations:
- When the entered card is unknown
- When reader operates in Armed mode and the option **Access disabled when reader armed** is active
- When the card belongs to a TOGGLE LTD user
- When the identification method doesn't comply with the actual Identification Mode valid on the reader (e.g. user presented only card but Card and PIN mode was active on the unit)

With option **Access disabled when reader armed** the TOGGLE or TOGGLE LTD users may use their identifiers to switch reader from Armed to Disarmed mode thus enabling to unlock a door.

Operation with XM-2 I/O extension module

In Full Standalone mode the PRT12-BK requires connection to the external XM-2 I/O extension module. Each input and output of the XM-2 can be programmed on the same basis as internal inputs and outputs of a reader. The XM-2 should be connected to the reader's CLK and DTA lines and should be addressed to ID=5. The maximum distance between a reader and the XM-2 extension module is limited to 150 m.

Operation with the external PRT series reader

In Full Standalone mode the PRT12-BK may operate with second PRT series reader. If used, the additional PRT reader enables two-way door control. The PRT reader should be connected to the reader's CLK and DTA lines and must be addressed to ID=0. The maximum distance between primary and secondary PRT reader is limited to 150 m.

Note: When the PRT12-BK reader operates with second access reader the LED indications and buzzer on the second reader mimics (follows) the LED-s and buzzer on primary reader.

Function keys

The PRT12-BK is not equipped with any functional keys.

Alarms

The PRT12-BK reader can detect and indicate following alarm types:
- Forced Entry
- Prealarm
- Door Ajar

Forced Entry and **Door Ajar** alarms will occur only if the reader operates with a door open sensor. The alarm indication is carried out over the dedicated output line **[6]-Door Alarm** and optionally on the internal buzzer (see option **Door alarm indication on internal buzzer**). For each type of alarm the PRT12-BK uses different modulation.

Alarm indication methods			
Alarm type	Priority	Output modulation method	Alarm situation
Forced Entry	High	By cycles with the following sequence: Active - 4 sec., Pause - 4 sec. 	A door was open without use of a valid identifier or exit button.
Prealarm	Medium	By cycles with the following sequence: Active - 1 sec., Pause - 1 sec. 	Detection of 3 consecutive attempts of entering an unregistered (unknown) identifier.
Door Ajar	Low	By cycles with the following sequence: Active - 1 sec., Pause - 1 sec., Active - 1 sec., Pause - 5 sec. 	Access has been granted but door is left ajar for time longer then time defined by C3C4 parameters.
Note: Modulation methods are used for both alarm output and for internal buzzer (if configured for alarm indication).			

Alarm duration is always ~3 minutes regardless of the alarm type. Each alarm can be stopped reading any valid card. The Door Ajar alarm is also immediately stopped once the door is closed. If more than one alarm is triggered, reader signals the alarm with the highest priority.

Acoustic and optical signals in Offline mode

Acoustic Signals in Offline (standalone) mode		
Signal	Symbol	Description
One long signal	-	Error, unknown identifier, access denied.
Two long signals	- -	Attempt to assign the same function for two different input lines.
Three short beeps	¤ ¤ ¤	Command successfully completed (OK signal).
Two short beeps	¤ ¤	Prompt signal, the reader is waiting for the next part of the command to be entered. This signal is intended to encourage the

		programmer to proceed with next programming steps.
One long signal continuously repeated	- - - - - - … and so on	Memory contents corrupted or either MASTER or INSTALLER card not programmed - Memory Reset is necessary. This signal is accompanied by the steady lit LED SYSTEM ⌀.
Short signal repeated continuously	¤ ¤ ¤ ¤ ¤ ¤ ¤ ¤… and so on	The operating mode of the reader is not programmed.
Legend: - single long audible signal, ¤ single short audible signal (beep)		

LED indications in Offline (standalone) mode			
LED STATUS ⌀	LED OPEN ⌀	LED SYSTEM ⌀	Description
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 the user to enter the next part of the command or programming function.
—	—	Orange - single flash	An identifier (Card/PIN) has been entered.
—	Green	—	The door is unlocked, this LED remains on as long as controlled door lock is released.
—	—	Steady	The reader has detected some problem (memory contents is corrupted or the MASTER & INSTALLER cards are not programmed).

Programming

The PRT12-BK can not be programmed from PC, it can be only programmed manually.

The programming steps necessary for the PRT12-BK reader depend on the operating mode to which it was configured for.

The PRT12-BK reader can be programmed in the similar way as the reader equipped with keypad, the difference is so that instead of pressing certain keys you must emulate them by multiple, consecutive readings of the suitable **Programming Card**. For example in order to emulate key [9] please read adequate programming card 9-times (simply present it to the reader and take it back 9-times) and then wait 3 seconds for the reader to generate a confirmation signal (two beeps) which means that reader has accepted series of card readings as a equivalent of a single press of a [9] key and is waiting for the next step of the programming procedure. Here is how to emulate pressing of the keys on PRT12-BK reader:

Digit/mark	Programming method
[1]	Read 1-time your valid Programming Card.
[2]	Read 2-times your valid Programming Card.
[3]	Read 3-times your valid Programming Card.
[4]	Read 4-times your valid Programming Card.
[5]	Read 5-times your valid Programming Card.
[6]	Read 6-times your valid Programming Card.
[7]	Read 7-times your valid Programming Card.
[8]	Read 8-times your valid Programming Card.
[9]	Read 9-times your valid Programming Card.
[0]	Read 10-times your valid Programming Card.
[*]	Read 11-times your valid Programming Card.
[#]	Read 12-times your valid Programming Card.
Note: Each time you completed multiple reading of the programming card wait for the reader to generate prompt signal (¤ ¤) which will confirm that reader has accepted those consecutive card readings as one digit or mark.	

Example: In order to program **[*][1][0][ID][#]** where ID=113 do following:

1. [*]: Read 11-times programming card
2. [1]: Read 1-time programming card
3. [0]: Read 10-times programming card
4. [1]: Read 1-time programming card
5. [1]: Read 1-time programming card
6. [3]: Read 3-times programming card
7. [#]: Read 12-times programming card

Note: The programming of a reader can be done on primary reader only.

Preparing the reader for Online mode

If the unit is dedicated for Online mode the only one programming step which is required is setting of the reader operating mode.

Preparing a reader for Offline mode

If the unit is dedicated for Offline mode the installer must perform four programming steps:

1. Setting the reader to Full or Simple standalone mode
2. Programming cards for MASTER and INSTALLER users
3. Configuring the reader for specific installation scenario (Installer Programming)
4. Programming access users (User Programming)

Setting the reader operation mode

The factory new reader is pre-configured for **RACS mode address ID=0**. In order to change this default setting installer must program two digits which will specify a new operating mode.

Operating modes			
Type	Code	Operating mode	Description
Offline modes	06	Simple Standalone	The reader operates autonomously, the CLK and DTA lines works as ordinary I/O lines.
	04	Full Standalone	The reader operates autonomously, the CLK and DTA works as communication lines with remote XM-2 I/O and optional (second) PRT reader.
Online modes	00	RACS address ID=0	The reader operates as a slave unit connected to the host controller that requires RACS data transmission format. The RACS communication format is used in PR access controllers manufactured by Roger.
	01	RACS address ID=1	
	02	RACS address ID=2	
	03	RACS address ID=3	
	20	Magstripe (Clock & Data)	The reader operates as a slave unit connected to the host controller that requires Magstripe data transmission format.
	40	Wiegand 26 bit	The reader operates as a slave unit connected to the host controller that requires Wiegand 26/34/42/66 bit data transmission format.
	60	Wiegand 34 bit	
	50	Wiegand 42 bit	
	70	Wiegand 66 bit	

When the reader is set for standalone mode, installer must program to the reader two special cards: MASTER and INSTALLER and then enter the Installer Programming mode and make final configuration settings. The programming of the user cards can be carried out in the User Programming mode.

In order to configure PRT12-BK operating mode follow these steps:
1. Power down the unit
2. Remove all connections from DTA and IN1 lines
3. Connect DTA to IN1
4. Restore power, the reader generates a continuous beep
5. Wait until LED SYSTEM ⌀ starts flashing
6. Disconnect DTA from IN1
7. Read any proximity card K-times (K represent first digit of the operating code)
8. Wait until the reader generates two short beeps (¤ ¤)
9. Read any proximity card L-times (L represent second digit of the operating code)
10. Once the previous step is completed the reader automatically ends the programming procedure and goes to normal operation

Note: If you observe that after selection of a reader operation mode or after power up of a unit the LED SYSTEM ✍ is on and accompanied with acoustic signal it means that the contents of reader memory is corrupted or the MASTER/INSTALLER cards are not programmed yet. In this case you must perform the Memory Reset and program the reader once again.

Example: Configuring the PRT12-BK reader for Wiegand 66 bit data format (operating mode code: 70)

1. Power down the unit
2. Remove all connections from DTA and IN1 lines.
3. Connect DTA to IN1
4. Restore power, the reader generates a continuous beep
5. Wait until the LED SYSTEM ✍ starts flashing
6. Disconnect DTA from IN1
7. Read any proximity card 7-times
8. Wait for the prompt signal (two short beeps)
9. Read any proximity card 10-times
10. Wait for the prompt signal (two short beeps)
11. Once the previous step is completed the reader automatically ends programming procedure and goes to normal operation

Memory Reset - programming MASTER and INSTALLER cards

The Memory Reset erases entire reader memory, all cards including MASTER and INSTALLER cards will be deleted. Also, after Memory Reset reader restores the factory-shipped default settings. The Memory Reset has practical sense for standalone modes only, it does not affect the unit if it is configured for Online mode. To perform Memory Reset follow these steps:

1. Power down the unit
2. Remove all connections from CLK and IN1 lines
3. Connect CLK to IN1
4. Restore power, the reader will generate a continuous signal
5. Wait until the LED OPEN ⧉ starts flashing
6. Disconnect CLK from IN1
7. Present any card to the reader, this card becomes the new MASTER card
8. Present any card to the reader, this card becomes the new INSTALLER card
9. Once the previous step has been completed reader automatically ends the Memory Reset and enters the Armed mode

Installer Programming

Note: Use INSTALLER card as a programming card in this mode.

You can enter it by reading your INSTALLER card. Once in this mode the LED OPEN ⧉ is on and the LED STATUS ⧂ lights in green. The reader placed in this mode waits for the installer to sequentially enter thirteen digits marked as C1…C13. Once the last digit (C13) is entered reader saves all entered data, then exits the programming mode and returns to the operation mode it was in before entering Installer Programming.

Note: If you don't press any key within 20s time, reader will automatically leave the programming mode.

Depending on the variant of standalone mode (Simple Standalone or Full Standalone) the configuration digits C5 and C6 may have different effects: for Simple Standalone mode they assign specific I/O functions to reader's CLK and DTA internal lines, while for Full

Standalone mode they program functions of the REL1 and REL2 relay outputs located on XM-2 I/O extension module.

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

Configuration parameters			
Parameter	Range	Defaults	Description
C1 C2	00–99	04	The C1 and C2 digits define time for which the reader unlocks a controlled door. The C1C2 digits are called **Door unlock time**, the C1C2 time is defined in seconds. When C1C2=00 reader switches door lock to opposite condition (latch operation). Setting C1C2=00 disables the Door Ajar alarm.
C3C4	00–99	12	The C3 and C4 digits define **Door open timeout** in seconds. Once the C1C2 time is passed by reader starts count C3C4 time. Door should be closed within this time otherwise the Door Ajar alarm will arise. If reader is not connected to door contact sensor then the Door open timeout is ignored.
C5	0 – 7	4	Function for REL1 output on the XM-2 module (when in Full Standalone mode) or for the CLK line (when in Simple Standalone mode). For function assignments see table below.
C6	0 – 7	5	Function for the REL2 output on the XM-2 module or for the DTA line.
C7	0 – 3	1	Function for the IN1 line on the reader.
C8	0 – 3	2	Function for the IN1 line on the XM-2.
C9	0 – 3	3	Function for the IN2 line on the XM-2.
C10	0 – 1	0	The Identification Mode for primary (main) reader: [0] - Card or PIN [1] - Card and PIN
C11	0 – 1	0	The Identification Mode for secondary (auxiliary) reader: [0] - Card or PIN [1] - Card and PIN
C12	0 – 1	0	Option: **Door alarm indication on internal buzzer** [0] – Disabled [1] – Enabled
C13	0 – 1	0	Option: **Access disabled when reader armed** [0] – Disabled [1] – Enabled

I/O line functions			
Code	Type	Name	Description
0	Input	**Line Off**	Signals on this input are ignored.

1	Input	**Door Contact**	Line shorted to supply minus indicates that controlled door is closed.
2	Input	**Exit Button**	Whenever line is shorted with supply minus reader unlocks a door for time defined by Door unlock time.
3	Input	**Arming Disabled**	When line is shorted with supply minus reader will reject any attempt to go into Armed mode.
4	Output	**Door Lock**	Whenever reader grants access this output is activated for a time defined by C1C2 parameters.
5	Output	**Disarmed Mode**	Line is active for the entire time when reader is in Disarmed mode.
6	Output	**Door Alarm**	Output is modulated according to detected alarm type, when more then one alarm exist output indicates the alarm with the highest priority.
7	Output	**Door Bell**	Whenever the F1-Bell or F2-Light function key is pressed this output turns on for app. 5 seconds. Note: F1 and F2 keys are not available in PRT12-BK reader.

Example: Configuring the reader in the Installer Programming mode

Read your INSTALLER card once, the reader enters Installer Programming mode (the LED OPEN 🔓 is on and the LED STATUS ⌘ lights in green) then enter following set of 13 digits: 0206451230001. These digits configure the reader for following settings:

- Door unlock time: 2 sec.
- Door open timeout: 6 sec.
- CLK or REL1 line function: Door Lock output
- DTA or REL2 line function: Disarmed Mode output
- 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: Arming Disabled input
- Identification Mode on primary reader: Card or PIN
- Identification Mode on secondary reader: Card or PIN
- Option: Door alarm indication on internal buzzer disabled
- Option: Access disabled when reader armed enabled

Last step completes the programming and the reader automatically leaves Installer Programming mode and returns to the working mode (either Armed or Disarmed) it was in before entry to the Installer Programming.

Note: Installer Programming can be accessed only if the reader was earlier configured for either Full Standalone or Simple Standalone mode.

User Programming

Note: Use MASTER card as a programming card in this mode.

In the User Programming mode you can add and remove users. To enter this mode read you MASTER card. Once in the User Programming mode the LED OPEN 🔓 is on and the LED STATUS ⌘ lights in red. In the User Programming mode you have 9 programming functions (command sequences) to choose from. Once you start programming function the LED SYSTEM ⌘ starts flashing and it keeps flashing until this function will be completed. If you stop programming for more than 20 sec. (between the successive

steps of the command sequence), reader will automatically end the programming function but it will still remain in User Programming mode so you may return to any function again. In order to leave the User Programming enter [#] ([#] is emulated through 12 sequential readings of the MASTER card) or wait ~150 sec. and the reader will leave User Programming automatically.

User programming commands

Note: Any attempt to program an already registered card will be indicated as a programming error.

[2][Card 1][Card 2]...[Card N][#] – Add cards for NORMAL users

The reader indicates each successful card reading with an acoustic prompt signal for the next one to follow. This function will be ended automatically if no card is presented within 20 sec. from the last card read or you can leave it earlier by entering the [#] mark. Note, that cards added with this function are stored in unoccupied (free) location of the memory and the users ID-s to whom they were assigned are unknown.

[3][ID][Card] – Add card for the NORMAL user with indicated ID

The new NORMAL user with card is registered in the memory at the location indicated by his ID number (ID=000–119).

[5][Card 1][Card 2]...[Card N][#] – Add cards for TOGGLE users

The reader indicates each successful card reading with an acoustic prompt signal for the next one to follow. This function will be ended automatically if no card is presented within 20 sec. from the last card read or you can leave it earlier by entering the [#] mark. Note, that cards added with this function are stored in unoccupied (free) location of the memory and the users ID-s to whom they were assigned are unknown.

[*][5][Card 1][Card 2]...[Card N][#] – Add cards for TOGGLE LTD users

The reader indicates each successful card reading with an acoustic prompt signal for the next one to follow. This function will be ended automatically if no card is presented within 20 sec. from the last card read or you can leave it earlier by entering the [#] mark. Note, that cards added with this function are stored in unoccupied (free) location of the memory and the users ID-s to whom they were assigned are unknown.

[6][ID][Card] – Add card for the TOGGLE user with indicated ID

The new TOGGLE user is registered in the memory at the location indicated by ID number (ID = 000–119).

[*][6][ID][Card] – Add card for the TOGGLE LTD user with indicated ID

The new TOGGLE LTD user is registered in the memory at the location indicated by ID number (ID=000–119).

[8][Card] – Delete a card

The reader searches its memory for the presented card. Once successful it removes it from the memory.

[9][ID] – Delete a user with indicated ID

The user with indicated ID is deleted.

[*][0] – Delete all users

Reader deletes all users (all cards) so that all ID-s are released and can be programmed anew.

[#] – Exit User Programming mode

After exit from the User Programming mode the reader returns to the operation mode it was in before entry to User Programming.

Note: Each user ID index consists always of three digits to form ID numbers ranging 000–119. In case you assign a new user the ID that is already occupied by some other user this will remove the older one from the memory.

Programming examples

Example: Add three new TOGGLE LTD users with cards (programming sequence: [*][5][Card 1] [Card 2] [Card 3] [#] or [*][5][Card 1] [Card 2] [Card 3] [Wait ~20s])

1. Read your MASTER card, reader enters User Programming mode (LED OPEN i⊛ s on and its LED STATUS ⊘ is on and red)
2. Read MASTER card 11-times then wait for prompt signal (¤ ¤) and LED SYSTEM ⊘ starts flashing
3. Read MASTER card 5-times then wait for prompt signal (¤ ¤)
4. Read a card which you want to assign for first TOGGLE LTD user
5. Read a card which you want to assign for second TOGGLE LTD user
6. Read a card which you want to assign for third TOGGLE LTD user
7. Read MASTER card 12-times then wait for prompt signal (¤ ¤) or wait approx. 20s and the reader will end programming function
8. Command is completed, three new TOGGLE LTD users with cards are programmed, reader still remains in User Programming mode, so that you may use your next desired programming command.

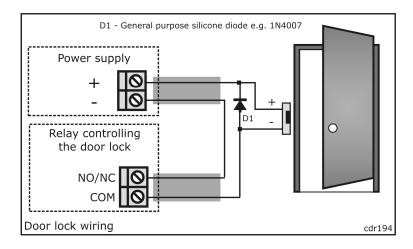**Example:** Delete a user with ID=45 (programming sequence: [9][0][4][5][#])

1. Read your MASTER card, reader will enter User Programming mode (LED OPEN ⊛ is on and its LED STATUS ⊘ is on and red)
2. Read MASTER card 9-times then wait for prompt signal (¤ ¤)
3. LED SYSTEM ⊘ starts flashing
4. Read MASTER card 10-times then wait for prompt signal (¤ ¤)
5. Read MASTER card 4-times then wait for prompt signal (¤ ¤)
6. Read MASTER card 5-times then wait for prompt signal (¤ ¤)
7. Read MASTER card 12-times then wait for prompt signal (¤ ¤)
8. Command is completed, reader deletes the user with ID=45 however, it still remains in User Programming mode, so that you may use your next desired programming command.

Installation guidelines

Note: Two programming steps (setting the reader operating mode and programming of a MASTER and INSTALLER cards) require access to the reader connection cable. Installer must be aware that access to this wires must be guaranteed whenever re-configuration of a unit will be necessary.

- Before the reader will be mounted in desired location we suggest to configure it for required operating mode and if necessary program the MASTER and INSTALLER users.
- Any EM 125 kHz UNIQUE standard card can be programmed as a MASTER or INSTALLER card, manufacturer of the reader does not supply the unit with any cards.

- When lost or stolen a new MASTER and INSTALLER cards can be reprogrammed to a reader.
- When the reader is configured for Online operation, the programming of MASTER and INSTALLER users can be skipped.
- A new factory delivered unit is configured for RACS mode address ID=0 .
- Disconnect power supply before making any electrical connections.
- For installations on a metal surface, place a non-metallic min. 10 mm thick spacer (a plastic/plaster plate etc.) between the reader and the supporting structure.
- For installations with two readers to be mounted on the opposite sides of the same wall and aligned along the same geometrical axis, place a metal plate between them and make sure none of them has direct contact with it (allow min. 10 mm space).
- For best results mount the proximity readers at least 0.5 m apart.
- When using separate power supply sources, connect all power supply negative (−) together.
- With its relatively weak electromagnetic field generation, the terminal should not cause any harmful interference to operation of other equipment. However, its card reading performance can be affected by other interferences generated by other devices, esp. radio waves emitting equipment or CRT computer monitors.
- If card reading performance of the reader deteriorates (e.g. reduced reading range or incorrect readings) consider reinstallation in a new location.
- Always connect a general purpose, silicon diode (e.g. 1N4007) in parallel to a door lock, install diode close to the lock.
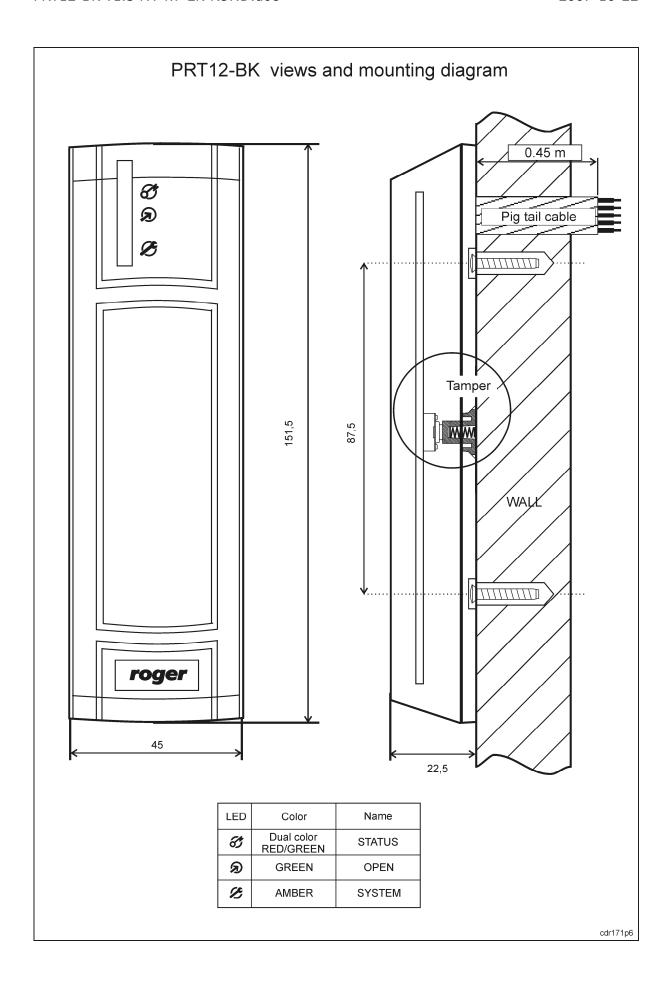

Door lock wiring   cdr194

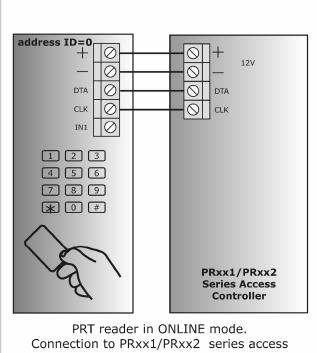| Connection wires assignments				
Wire Color	Label	Offline mode		Online mode (unit connected to host ACU)
		Simple Standalone mode	Full Standalone mode	
Red	+12V	Supply input plus.		
Blue	GND	Supply input minus.		
Green	CLK	Programmed as input or output.	CLOCK communication line.	DATA 0 line for Wiegand formats CLOCK for Magstripe and RACS formats.
Brown	DTA	Programmed as input or output.	DATA communication line.	DATA 1 line for Wiegand formats DATA for Magstripe and RACS formats.
Yellow	IN1	Programmed input line.		In Wiegand and Magstripe formats, the IN1 line activated by shorting it with the supply minus. When IN1 is triggered it turns the LED OPEN ☞ to on and also activates acoustic signal on the internal buzzer.
Grey	TAMP	Isolated, tamper switch contacts, when case is closed contacts are shorted.		
White				
Pink	NC	Not used (reserved for further use)		
Shield	None	Cable shield is internally connected with supply minus (GND)		

Technical specification	
Input voltage	10…15 VDC
Current consumption	Avg. 50 mA
Anti-sabotage protection (Tamper)	NC contact, 50mA/24V, IP67
Reading distance	Up to 12 cm for ISO cards (depends on cards).
Proximity cards	EM UNIQUE 125 kHz, ASK modulation, 64 bits (compatible with EM4100/4102).
Communication distance	Between controller and PRT reader in Online mode: max. 150 m. Between main PRT reader and second PRT reader: max. 150 m. Between main PRT reader and XM-2 extension module: max. 150 m.
Environmental class (according to EN 50131-1)	Class IV, Outdoor-General, temperature: -25°C- +60°C, relative humidity: 10 to 95% (non-condensing).
Ingress protection	IP 65
Dimensions	H100 X W40 X D25 mm
Weight	~150 g
Approvals	CE

Ordering codes	
PRT12-BK /G	RFID/PIN reader, grey color
PRT12-BK /L	RFID/PIN reader, light grey color
RM-2	Relay module, the RM-2 offers two relays with one NO/NC contact 1.5A/24V rated, relay contacts are protected by over-voltage components.
RM-2 Brd	The RM-2 PCB module without casing.
XM-2	I/O addressable extension module, digital communication with host reader, two NO/NC inputs and two relay outputs, each relay offers one NO/NC contact 1.5A/24V rated. Relay contacts are protected by over-voltage components.
XM-2 Brd	The XM-2 PCB module without casing.

Product history			
Hardware	Firmware	Date	Description
PRT12-BK v1.0	71.00	18/04/05	The initial product version.
PRT12-BK v1.0	72.00	05/07/05	Error indications changed. Reading errors when reading some cards corrected.
PRT12-BK v1.1	72.00	14/09/05	The optical tamper detection circuit replaced by the mechanical contact.
PRT12-BK v1.2	72.00	17/11/05	Keypad backlight improved.
PRT12-BK v1.2	73.00	21/04/06	1. LED SYSTEM ✍ doesn't react a single key press. This modifications refers to Wiegand modes which are configured for transmission of a single key press (option: X=3 and X=4). 2. The transmission of F1 and F2 keys in Wiegand and Magstripe formats added.
PRT12-BK v1.3	73.00	29/05/06	1. Connection cable modified – new color assignments. 2. Metal spring added to a tamper detection mechanism.
PRT12-BK v1.3	74.7	05/10/2006	Definition of MASTER and INSTALLER identifiers modified. In this version, both, MASTER and INSTALLER may have card and/or PIN. This modification is valid for PRT readers with keypad only.

PRT12-BK views and mounting diagram

151,5

87,5

45

0.45 m

Pig tail cable

Tamper

WALL

22,5

roger

LED	Color	Name
	Dual color RED/GREEN	STATUS
	GREEN	OPEN
	AMBER	SYSTEM

cdr171p6

address ID=0

12V

DTA

CLK

IN1

PRxx1/PRxx2
Series Access
Controller

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

12V

DTA

CLK

IN1

DATA 1

DATA 0

Access Controller
with
Wiegand Interface

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

address ID=1

12V

DTA

CLK

IN1

DTA

CLK
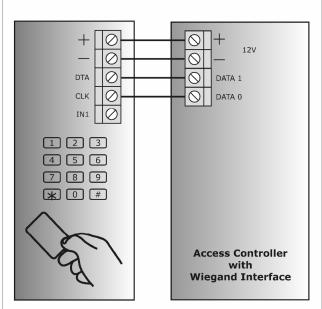
address ID=0

DTA

CLK

IN1

PRxx1/PRxx2
Series Access
Controller

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

12V

DTA

CLK
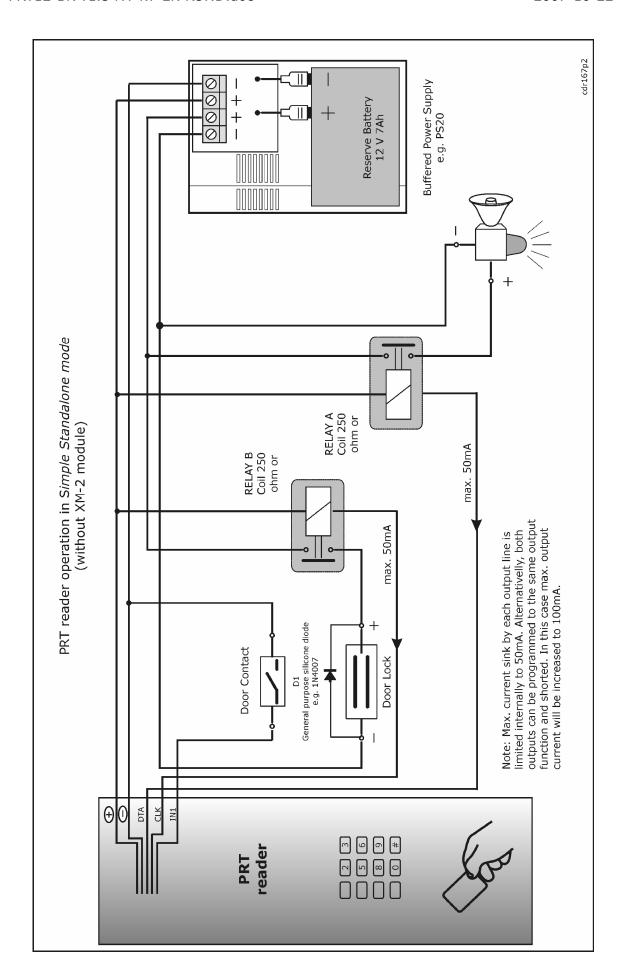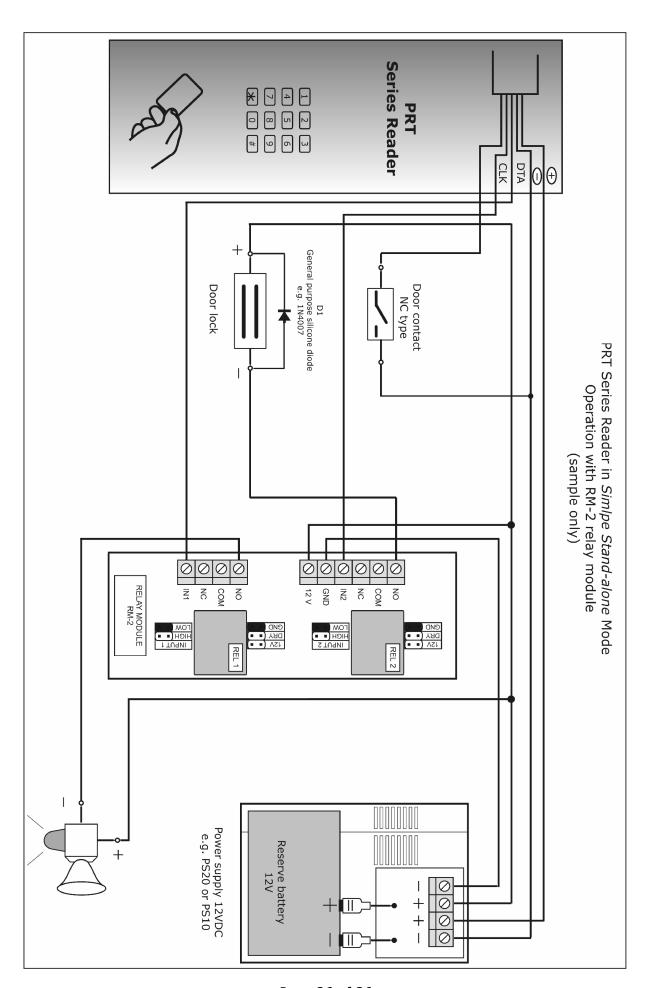
IN1

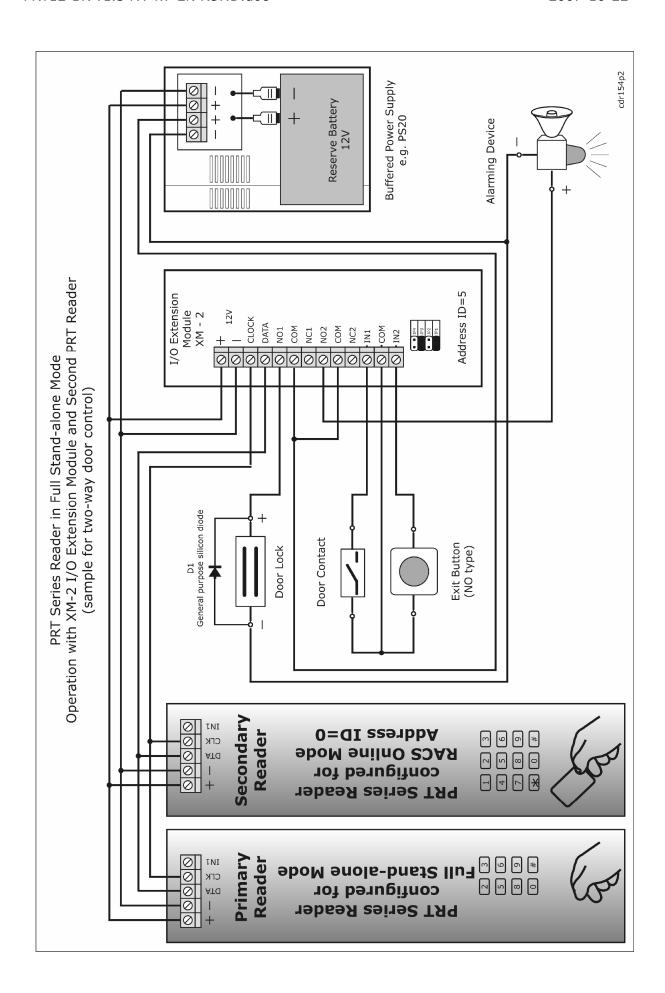DTA

CLK

Access Controller
with
Magstripe Interface

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

cdr156p3

PRT reader operation in *Simple Standalone mode*
(without XM-2 module)

cdr167p2

Buffered Power Supply
e.g. PS20

Reserve Battery
12 V 7Ah

RELAY A
Coil 250
ohm or

RELAY B
Coil 250
ohm or

max. 50mA

max. 50mA

Door Contact

D1
General purpose silicone diode
e.g. 1N4007

Door Lock

Note: Max. current sink by each output line is limited internally to 50mA. Alternativelly, both outputs can be programmed to the same output function and shorted. In this case max. output current will be increased to 100mA.

PRT
reader

DTA
CLK
IN1

PRT Series Reader in *Simlpe 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)

Reader name:			Reader location:		
ID	Card code	PIN	Type	User Name	
None			MASTER		
None			INSTALLER		

Deklaracja Zgodności EC
Declaration of Conformity EC

CE

Producent urządzenia / manufacturer:

ROGER sp.j.

82-416 Gościszewo 59, Poland

deklaruje z pełną odpowiedzialnością, że produkt:
declares under his sole responsibility that the product:

PRT12-BK Czytnik RFID / RFID Reader

nazwa produktu, nazwa handlowa, model / product name, trade name, model

jest zgodny z postanowieniami następujących dyrektyw:
complies to the essential requirements and other relevant requirements of the directive:

Numer dyrektywy / Number of directive		
1.	2004/108/EC (EMC)	Dotyczy / Applicable
2.	99/05/EC (R&TTE)	Dotyczy / Applicable
3.	2006/95/EC (LVD)	Nie dotyczy / Not applicable

oraz z wymienionymi poniżej normami, co zostało potwierdzone przez testy przeprowadzone przez laboratorium notyfikowane:

and is compliant with the following standards and/or other normative documents, what is confirmed by tests in accredited laboratory:

Norma / Normative document	Dyrektywa / Directive	Laboratorium / Laboratory
PN-ETSI EN 301 489-1 V1.3.1:2003 (U) PN-ETSI EN 301 489-3 V1.4.1:2004 (U)	Kompatybilność elektromagnetyczna/ Electromagnetic compatibility (EMC)	Instytut Elektrotechniki Oddział w Gdańsku The Technical Institute The Gdańsk Branch, Poland
ETSI EN 300 330-1 V1.3.1:2001 ETSI EN 300 330-2 V1.1.1:2001	Wyposażenie radiowe i terminali telekomunikacyjnych / Radio directive (R&TTE)	VOP-026 Šternberk, s.p. Divie VTÚPV, Vyškov Czech Republic
_____	Niskonapięciowe wyroby elektryczne/ Low voltage directive (LVD)	_____

Informacje dodatkowe / Additional information:
Miejsce przechowywania dokumentacji technicznej: Roger Sp.j. 82-416 Gościszewo 59.
The technical documentation is kept by Roger Sp.j. in 82-416 Gościszewo 59, Poland.

Gościszewo 20/07/2007

Miejsce i data wystawienia deklaracji
Place and date of issue of this declaration

Grzegorz Wensker
Dyrektor Techniczny / Technical Manager

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roger

RMA Form

ROGER Sp.j.
Gosciszewo 59,
82-416 Gosciszewo,
pomorskie, Poland

Tel.: +48 55 272 0132
Fax: +48 55 272 0133
Tech. Support: +48 55 267 0126
http://www.roger.pl

Please note:
In the unlikely event you experience difficulties with your ROGER product, please contact ROGER's Technical Support Department to resolve the problem.
They may be reached at **+48 55 2670126** or **support@roger.pl** Monday through Friday **8:00 A.M. to 4:00 P.M. (GMT + 1)**. You can also contact the Technical Support Department by **fax** at **+48 55 2720133**.
If it is determined that you need to return the product, the following procedure must be followed to ensure prompt service.

RMA no.

_____

Customer information:

Company Name: ………………………………………

Contact Name: ………………………………………..

Street: …………………………………………….

Code, City: …………………………………………

Country: ……………………………………………..

E-mail: ………………………………………………

Contact phone: …………………………………….

Fax: ……………………………………………………

_____

Product information:

Product Name: ………………………………………

Serial Number: ……………………………………..

Date of Purchase: …………………………………

Reason for return:

☐ Warranty repair:

☐ Repair:

☐ Complaint:

☐ Wrong delivery:

    Others: ……………………………………………

    ………………………………………………………
    (please specify)

Fault description:

what does not work, what is the reason for complaint, what can ROGER do for you ?

……………………………………………………..…..

...…………………………………………….………

…………………………………………………….……

……………………………………………………………

……………………….…………………………………

………………………………………..…………………

………………………………………......................

………………………………………..…………………

…………………………………………………………

1. Any product returned to ROGER must have an RMA number. ROGER will refuse any package that is returned without a valid RMA number.

2. ROGER products cannot be returned for any reason other than defective

3. Defective products will only be accepted in accordance with the ROGER`s warranty requirements.

4. All RMA numbers will be valid for a period of not longer than 14 days.

   Any package send to ROGER after 14 days of issuance will be refused and shipped back to you at additional cost.

5. If you purchased Roger product not directly from Roger company, please return it to the place where you bought it.

6. In order to receive RMA number please fill out the following form.

7. Once the completed form has been received and processed it will be returned to you with a RMA number appended. This is your authority to return the product.

8. Please ensure that this document accompanies the product when it is returned and that a copy is retained such that you can refer to it when requesting an update on the progress of a repair.

9. Use one RMA number per one returned product.

10. Put your RMA number on the shipping/address label

11. Please make sure that you always return product in appropriate packaging together with a RMA form in order to avoid damages during transit, You are advised to get proof of delivery

12. Some repairs may be chargeable and you will receive formal advice if this is the case.

13. If product returned as defective is found **not** to be defective, it will be returned back to the customer at his expenses. In that case the customer will be also charged with costs which may arise after triggering the RMA procedure.

14. If the product is beyond economical repair then the following options will be given:

Scrapped – This will occur automatically if ROGER does not receive a reply to three notices send to the customer at least in 5 days interval.
(There may be some exceptions to this) or if you instruct us during these communications.
Returned – However this will incur shipping charges.

Note: All repairs are dealt with as rapidly as possible although repair time is not guaranteed. Please contact us and we will try our best to suggest an estimated lead-time.

Notes

No.	Fault description (filled out by the customer)	Date of repair (filled out by the service)
1.		
2.		
3.		
4.		
5.		

roger

Roger Worldwide Limited Warranty

(valid only with proof of purchase and when completely fulfilled)

ROGER Sp.j.

Gosciszewo 59,

82-416 Gosciszewo,

pomorskie, Poland

Tel: +48 55 272 0132

Fax: +48 55 272 0133

Tech. support: +48 55 267 0126

http://www.roger.pl

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PRODUCT INFORMATION:

Product Name: ..…………..……………………………………………………………

…………………………………………………………………………………

…………………………………………………………………………………

Serial Number: ..…………………………………………………………………….

Date of Purchase, Purchase receipt: ....…………………………………………………………………

WARRANTY TERMS:

ROGER sp.j. (Roger) Worldwide Limited Warranty is applicable worldwide and supersedes any other warranty.

WARRANTY
This limited warranty extends only to the original purchaser of the Roger product.

WARRANTY DURATION
Roger warrants to You (original purchaser) that for a period of one year (the "Warranty Period") from the date of original purchase, limited by the end of 3 years period starting with the date of manufacture, your Roger Product will be substantially free of defects in materials and workmanship under normal use.

WARRANTY COVERAGE
If the Product proves defective during the Warranty Period please contact Roger Technical Support. BE SURE TO HAVE YOUR PROOF OF PURCHASE ON HAND WHEN CALLING.

If ROGER receives defective product (together with a copy of your original proof of purchase and RMA Number), ROGER will either repair or replace parts which, under normal conditions of use and service, prove to be defective in material or workmanship.

No charge will be made for labor or parts with respect to defects covered by this warranty, provided that the work is done by Roger or a Roger authorized service center.

This warranty does not cover expenses incurred in the transportation, removal or reinstallation of the product, whether or not proven defective.

Replacements or repairs furnished under this warranty are subject to the same terms and conditions of the original warranty.

EXCLUSIONS AND LIMITATIONS
This warranty does not apply if the Product (a) has been altered, except by Roger, (b) has not been installed, operated, repaired, or maintained in accordance with instructions supplied by Roger, or (c) has been subjected to abnormal physical or electrical stress, misuse, negligence, or accident. In addition, due to the continual development of new techniques for intruding upon and attacking networks, Roger does not warrant that the Product will be free of vulnerability to intrusion or attack.

This warranty does not cover repair or replacement where normal use has exhausted the life of a part or instrument.

ALL IMPLIED WARRANTIES AND CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO THE DURATION OF THE WARRANTY PERIOD. ALL OTHER EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF NON-INFRINGEMENT, ARE DISCLAIMED.

IN NO EVENT WILL ROGER BE LIABLE FOR ANY LOST DATA, REVENUE OR PROFIT, OR FOR SPECIAL, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR PUNITIVE DAMAGES, REGARDLESS OF THE THEORY OF LIABILITY (INCLUDING NEGLIGENCE), ARISING OUT OF OR RELATED TO THE USE OF OR INABILITY TO USE THE PRODUCT (INCLUDING ANY SOFTWARE), EVEN IF ROGER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT WILL ROGER' LIABILITY EXCEED THE AMOUNT PAID BY YOU (original purchaser) FOR THE PRODUCT, WITH THE LIMITATION THAT THE AMOUNT CAN NOT BE HIGHER THAN ROGER'S RECOMMENDED ENDUSER PRICE (WHICH IS AVAILABLE ON REQUEST DIRECTLY FROM ROGER).

The foregoing limitations will apply even if any warranty or remedy provided under this Agreement fails of its essential purpose. The terms of this warranty may not be varied by any person, whether or not purporting to represent or act on behalf of Roger. **This warranty represents the full extent of Roger's responsibility.** This warranty shall become null and void in the event of a violation of the provisions of this limited warranty.

…………….……………………………………….…………………….

Date, sign and stamp of the seller