



**@Process RFID reader and exciter
PRX23**

User Manual

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1. General

PRX23 (marketing name LS5050) is an RFID reader and exciter for Lyngsoe's active tags operating in the 433.92 MHz band. PRX23 (Figure 1) is used for installations in postal applications.



Figure 1 – PRX23

PRX23 is designed to operate in a multi-drop RS485 network or on Ethernet LANs; it has assigned a unique address. PRX23 provides the following main functions:

- Generates Lyngsoe compliant LF excitation field
- Receive over-the-air Lyngsoe tag messages
- Process received messages and send data packets with the received data to the network over RS485 or Ethernet (with PoE option) upon request; PRX23 can also store a number of messages in a non-volatile data memory
- Remote control/configuration using the RS485 communication network or Ethernet
- Output (on/off switchable) to power external devices such as RFID exciter
- Remote reset over the RS485 network

2. Installation

The typical installation of the PRX23 is wall mount (Figure 2). PRX23 is equipped with two receive antennas (1/4 quarter-wave whip) for diversity.



Figure 2 – Typical PRX23 installation

2.1. PRX23 Connections

PRX23 has the following interfaces:

- Power
- RS485
- Ethernet
- Auxiliary power output

2.1.1. Power Connection

WARNING! Before you start the installation, check if the Power Supply provides the specified output voltage, i.e. 24Vdc +/- 10%/0.5A.

For power connection use the 4.2mm Mini-Fit Jr receptacle (LS PN 350238) and the female crimp terminals for AWG18-24 (LS PN 350238). Strip the wire isolation 3.0-3.5 mm and crimp the terminals on the wire using the Molex crimping tool 11-01-0197. Insert the terminals in the receptacle body – terminals 1 for (+24V), terminal 3 for (GND) voltage and terminal 2 (middle) for the ground.

Remove the connectors cover (Figure 3) and plug in the power connector into the **Power In jack**. The Power LED (green) goes ON and the Data LED (red) blinks three times (booting). After booting, PRX23 is ready to receive over the air tag messages.

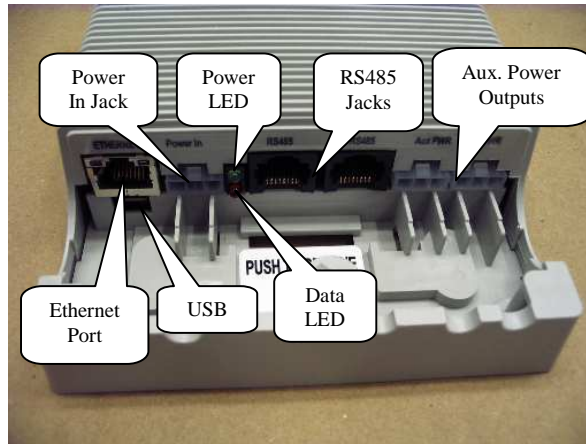


Figure 3- PRX23 with the connector cover removed

2.1.2. RS485 Connection

For the RS485 connection use a standard Cat5 Ethernet cable and RJ45 plug. Crimp the connector using the recommended tool and the following color scheme: pin 1 - Wh/Or; pin 2 – Or; pin 3 – Wh/Gr; pin 4 – Bl; pin 5 – Wh/Bl; pin 6 – Gr; pin 7 – Wh /Br; pin 8 – Br.

PRX23 has a single RS485 port with two RG45 jacks connected in parallel for ease of installation (when several PRX23 are attached to an RS485 network). Insert the RS485 connector into one of the **RS485 Jacks**. The default serial communications parameters are:

- Bits per second: 19200
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow Control: None

Up to 99 PRX23s can be connected to an RS485 serial bus (Figure 4). Each reader has its own serial address.

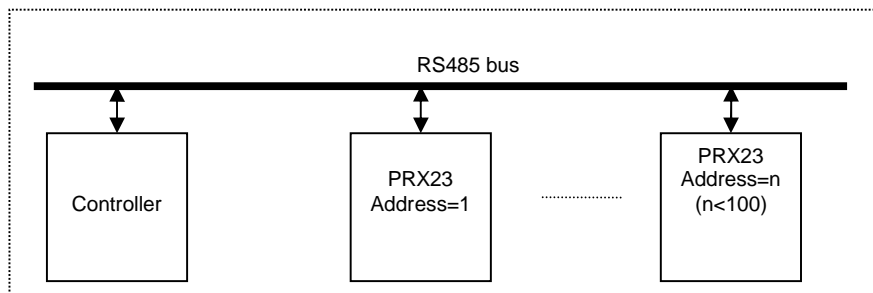


Figure 4 – PRX23 on RS485 network

The operation of the PRX23 reader is controlled by commands and parameters. The commands and parameters are passed to the PRX23 reader by a computer running a serial communication application such as Procomm. There are several specific commands to configure or to query the PRX23 parameter values. Each command starts with an address field. The commands are described in details in the *RFID System S23 Reference Guide* document.

2.1.3. Ethernet Connection

PRX23 is equipped with a 10/100 Ethernet port for LAN connection. The default mode is AutoDetect. The port also supports the HP Auto-MDIX mode. The Ethernet port connection use a standard RG45 jack. All the commands and parameters available on the

PRX23 can use either static IP address (default) or dynamic IP address. The IP address has to be set using the USB console. PRX23 uses a UART-to-USB converter (FT232R). When PRX23 is connected to the USB port of a computer for the first time, one needs to install the VCP driver for the FT232R device from <http://www.ftdichip.com/FTDrivers.htm>.

After downloading the driver, plug one end (micro B) of the USB cable into the **USB** port (located under the **ETHERNET** port, see Figure 3) of the Reader and the other end into a computer USB port. The USB serial port settings are:

- Bits per second: 19200
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow Control: None

Before setting the IP address, the subnet Mask and the Gateway need to be set. From the USB console, type **INM="x.x.x.x"** and press **Enter**, where x.x.x.x is the Subnet Mask. You should see:

```
OK
INM="x.x.x.x"
```

If you see ERROR, try again.

Type **IGW="x.x.x.x"** and press **Enter**, where x.x.x.x is the Gateway. You should see:

```
OK
IGW="x.x.x.x"
```

Type **:CONFIG:STORE** and press **Enter** to store these configuration. You should see:

```
OK
00
```

a. Set a static IP address

To assign a static IP address, type **IIP="x.x.x.x"** where x.x.x.x is the IP address, and press **Enter**. You should see

```
OK
IIP=" x.x.x.x"
```

Type **:CONFIG:STORE** and press **Enter**, to store the new IP address. You should see:

```
OK
00
```

Then, type **:RESET** and press **Enter**. You should see:

```
PRX23, Lyngsoe Systems Ltd. (c)
```

b. Use DHCP to get an IP address

Make sure the network cable is connected. Type **IDH=Y** and press **Enter** to select "dynamic IP mode". You should see:

```
OK
IDH=Y
```

Type **:CONFIG:STORE** and press **Enter**. You should see;

```
OK
00
```

Type **:RESET** and press **Enter**. You should see

```
PRX23, Lyngsoe Systems Ltd. (c)
```

Type **IIP** and press **Enter** to read the IP address. You should see:

```
OK
DHCP IP Address: x.x.x.x
```

where x.x.x.x is the IP address assigned to the PRX23. If the PRX23 power is cycled, the dynamic IP address may change.

After the IP address has been set, the reader is ready to communicate over Ethernet; for testing, you can use Hyper Terminal again. To do this, follow the steps below:

3. Operation

Every time a tag message is received it will be shown on the RS485 or Ethernet console if the tag dumping function is enabled. The following is an example:

```
{TS="0905191637Z",LI=-62,UD="C\xFD\x00\x08\x02",EX="\x7F",CT="\x00",FG="HI"}
```

Where:

TS="0905191637Z" is the time the tag is received
LI=-62 indicates the RSSI level of the tag signal in dBm
UD="C\xFD\x00\x08\x02" is the user data of the tag
EX="\x7F" is the Exciter ID (when applicable)
CT="\x00" is the programmed CTRL byte
FG="HI" indicates the tag battery level. H means battery is OK. If the battery is low, this field will show "Lx" where x depends on the tag type.

Type **DAR=N** and press **Enter** to stop dumping tag data. You should see:

OK
DAR=N

Type **DAR=Y** and press **Enter** to start dumping tag data. You should see:

OK
DAR=Y

If the user does not want to automatically dump the data, the commands used to query the reader are described in the *RFID System S23 Reference Guide* document.

Regulatory Compliance:

This device complies with Part 15 of the FCC Rules,. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications of this product, not approved by manufacturer will void the user's authority to operate the equipment.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.