RER 117
LON Bus Connection Module

Installation Guide

ABB

1MRS 750846-MUM   **LON Bus Connection Module**   **RER 117**

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Installation Guide

We reserve the right to change data without prior notice.

Contents

1. Introduction

The bus connection module RER 117 acts as an interface unit between Echelon's PC-Card and a fibre optic LONWORKS®[1] bus. RER 117 does not work as a standalone device. Echelon's PC-card (type PCC-10 Network Adapter) and a laptop are always required.

1.1. Principle of Operation

The bus connection module RER 117 converts incoming optical signals from the LONWORKS® bus to electrical signals for the PCC-10 card and vice versa. RER 117 is connected to the PCC-10 card by using a cable and a D-type sub miniature connector. LONWORKS® networks can be installed, maintenanced and monitored with a laptop, RER 117, PCC-10 card and a network management program, e.g. *Lon Network Tool.*

1.2. Functionality

RER 117 functions is a bus connection module for a fibre optic LONWORKS® interface. The device includes a cable and a bus connection module. RER 117 is optimised for the speed of 1,250 Mbit/s, other speeds are not guaranteed. Logical level (+5v) interface is used between a PCC-10 card and RER 117, which is also powered from the PCC-10 card. RER 117 module supports collision detection.

In the cable, there is also an optional connection for using PCC-10 card's FT-10 twisted pair function. RER 117 does not support FT-10 interface, therefore it must be removed, if FT-10 function is used via the cable. FT-10 function can be used via the cable's D-subconnector pins 6 and 8. See Table 1.2.-1 on page 5. More details for FT-10 twisted pair connection can be found in Echelon's PCC-10 PC Card User's guide.

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1. LONWORKS is a trademark of Echelon Corporation registered in the United States and other countries.

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Table 1.2.-1   Cable connections

PCC-10 Card	RER 117
1 ~Pod_Sense ------------------------	7 GND
2 ~Drive_Pod_Reset ------	
3 ~Sense_Pod_Reset ------	
4 NC	
5 Buf_CP4 ------------------------	5 Collision Detect
6 Buf_CP3	
7 Buf_CP2 ------------------------	3 Transmit Enable
8 Buf_CP1 ------------------------	2 Data ———————⟶
9 Buf_CP0 ------------------------	1 Data ⟵———————
10 Vcc ------------------------	9 Vcc
11 Vcc	
12 GND ------------------------	7 GND
13 GND	
14 FT_NetB ------------------------	6 FT-10 B
15 FT_NetA ------------------------	8 FT-10 A

CableCon

1.3.   PCC-10 Network Adapter

PCC-10 Network Adapter (model 73200), software driver and User's Guide must be ordered separately from Echelon Corporation or Echelon's local vendor.

Contact information:

    Echelon Corporation

    4015 Miranda Avenue

    Palo Alto, CA 94304, USA

    Internet: http://www.echelon.com

2.   Safety Information

⚠ Electrostatic sensitive devices. ESD must be avoided during installation and while components remain detached.

⚠ National and local electrical safety regulations must always be followed.

3. Installation

The bus connection module RER 117 with a laptop and an Echelon´s PCC-10 network adapter card is a portable and powerful tool for installing, maintenance and monitoring devices that use LONWORKS® bus in the LONWORKS® networks. The PCC-10 network adapter can be installed in a PC-card (PCMCIA) slot of a laptop. For proper functionality, the following installation procedure is required:

1 Make sure that the PCMCIA driver is installed.

The PCMCIA driver must be installed before the PCC-10 card is inserted into a PCMCIA slot. (Do not insert the PCC-10 network adapter card yet.)

2 Install the PCC-10 driver software as described in the LONWORKS® PCC-10 PC Card User´s Guide. After installation, reboot the computer.

3 Insert the PCC-10 card into an open PC card slot according to the LONWORKS® PCC-10 PC Card User´s Guide.

4 Connect the bus connection module RER 117 and a PCC-10 network adapter using the cable that is delivered with the RER 117 module.

The 9-pin D-type connector can be attached to the bus connection module by tightening two metal screws.

5 Configure the PCC-10 network adapter card by selecting "LONWORKS® Plug 'n Play" icon according to the LONWORKS® PCC-10 Card User´s Guide.

The LONWORKS® PCC-10 control panel has the Transceiver button in the Device selection area. Click the Transceiver button. For proper functionality with RER 117, the transceiver of the PCC-10 card must have the following configuration:

Transceiver:	*Custom*
Transceiver type:	*Single Ended*
Bit rate:	*1250Kb*

6 Connect the RER 117 module to the LONWORKS® network by plastic or glass fibre cables.

Connect the incoming optical fibre to the receiver input Rx and outgoing optical fibre to the transmitter output Tx.

Now the laptop, with a network management program (e.g. *Lon Network Tool)*, can be used to install, maintenance and monitor LONWORKS® networks. In case of a problem, please refer to "Appendix" on page 12.

4.   Technical Description

4.1.   Mechanical Construction

The bus connection module RER 117 consists of a printed circuit board and it is housed in a plastic case. The incoming optical fibre is connected to the receiver input Rx and the outgoing optical fibre is connected to the transmitter output Tx.
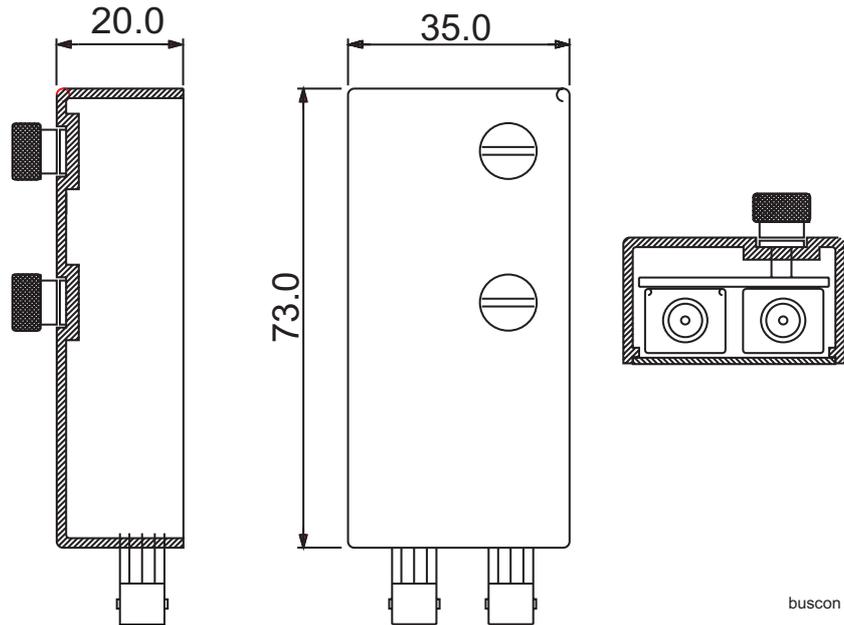

Fig. 4.1.-1   Dimensional drawing of the bus connection module RER 117

4.2.   Type Designation and Spare Parts

In fibre optic connections, it is possible to use glass or plastic fibre optic cables. Depending on the cable type used, an ST type or a snap-in type connector can be selected. Please, see Table 4.2.-1.

Table 4.2.-1   Ordering numbers for RER 117

Type designation	Transmitter	Receiver	Ordering number
RER 117	Plastic	Plastic	RER117-BB
RER 117	Glass	Glass	RER117-MM

If a fault is found in the RER 117 or in the cable, the faulty part shall be replaced with a new one. The RER 117 components can be ordered separately as spare parts. Please, refer to Table 4.2.-2.

Table 4.2.-2   RER 117 spare parts

Type designation	Specification	Ordering number
RER 117	RER117-BB bus connection module without cable	RER117-BB-P
RER 117	RER117-MM bus connection module without cable	RER117-MM-P
Cable	Connection cable for RER 117 bus connection module	1MRS120526

4.2.1.   Fibre-optic specifications

When fibre optic cables are used, special attention must be paid to handling, mounting and connection of the optical fibres. For additional information, see manual 34 SPA 13 EN1 "Plastic-core fibre-optic cables. Features and instructions for mounting".

Table 4.2.1-1   Fibre-optic specifications

Character	Glass fibre core	Plastic fibre core
Cable connector	ST connector	snap-in connector
Cable diameter	62.5/125 µm	1 mm
Max. cable length	1000 m	20 m
Min. cable length	1 m	1 m
Attenuation	3.0 ... 3.8 dB/km	0.15 ... 0.23 dB/m
Wavelength	820 ... 900 nm	660 nm
Transmitted power	-13 dBm (HFBR – 1414)	-13 dBm (HFBR – 1521)
Receiver sensitivity	-24 dBm (HFBR – 2412)	-20 dBm (HFBR – 2521)

Read the cable manufacturer's specifications for used cable for more details.

Do not touch the fibre-optic transceiver and use always dust shields when transceivers are not in use.

4.3.   Operation Environment

By courtesy of the character of most laptops, RER117 is designed and tested for the office environment. A laptop may cause some special limitations for the working environment, therefore we recommend that you read the laptop manual carefully.

It is recommended to use office quality power point for laptop's external power source. If office quality power point is not available, the laptop's battery power source should be used.

When you connect RER 117 to a LON substation automation network, please make sure that the fibre optic connection cables are long enough to ensure office like EMC (Electro Magnetic Compatibility) environment for the laptop.

4.4.   Technical Data

⚠ The following standards and criteria are guaranteed only, when RER 117 is used with the IBM Think Pad type 2645450. Other types of laptops or laptops from other manufacturers are not tested with RER 117 and if they are used, the fulfilment of the standards and criteria described in Table 4.4.-1 is not guaranteed.

Tested laptop type:

IBM Think Pad

Portable PC + AC adapter P/N 02K7006

Type 2645450

Serial no. 55199HZ

Table 4.4.-1   Standards and criteria that are guaranteed, when RER 117 is used with the tested laptop type

Power consumption		+5V, <100mA
Communication Speed		1.25Mbit/s
Electromagnetic emission test		EN 55022 (1998) Class B
Electromagnetic immunity tests		
Power - frequency magnetic field	Test level:	EN 61000-4-8 (1993) 3 A/m Performance criterion: A
Radiated radio – frequency electromagnetic field, amplitude modulated	Frequency range: Test Level:	EN 61000-4-3 (1996) 80...1000 MHz 3 V/m Performance criterion: A
Radiated radio – frequency electromagnetic field (GSM)	Frequency range: Test level:	ENV 50204 (1995) 900 ± 5 MHz 3 V/m Performance criterion: A
Electrostatic discharge	Test method: Test level:	EN 61000-4-2 (1999) ± 4 kV contact discharge ± 8 kV air discharge Performance criterion: B
Conducted radio – frequency	Test method: Frequency range: Test level:	EN 61000-4-6 (1996) 0.15...80 MHz 3 V/m Performance criterion: A
Fast transient	Test method: Test level:	EN 61000-4-4 (1995) ± 1 kV Performance criterion: B
Surge	Test method: Test level:	EN 61000-4-5 (1995) line to line ± 1 kV line to earth ± 2 kV Performance criterion: B

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Voltage dips and interruptions	Test method:	EN 61000-4-11 (1994)
	Test level:	30% reduction, 10 ms
		Performance criterion: B
	Test level:	60% reduction, 100 ms
		Performance criterion: C
	Test level:	>95% reduction, 5000 ms
		Performance criterion: C
Climatic environmental tests		
Dry heat test		IEC 60068-2-2 (1974) +55°C for 96 hours +70°C for 4 hours
Dry cold test		IEC 60068-2-1 (1990) -10°C for 96 hours -25°C for 4 hours
Damp heat test, cyclic		IEC 60068-2-30 (1980) 6 cycles of 12+12 hours, +25…+55°C, 95% Rh
Storage test		IEC 60068-2-48 (1982 +70°C for 72 hours -40°C for 72 hours

5.   Appendix

5.1.   Installation Hints for Windows NT™[1]

The installation of PCC-10 card is a normal PC-card (PCMCIA) installation procedure. If you have problems with the PCC-10 card after installation, please use the LonWorks® Plug 'n Play –icon's Diagnostic feature. If the card does not work, change the I/O range and especially the IRQ value from the LonWorks® Plug 'n Play -icon. Free I/O range and IRQ value for the PCC-10 card can be found by the Windows NT Diagnostics Tool.

Please contact your local PC support, laptop PC vendor or Echelon's customer support, if changing the I/O range and the IRQ value does not help.

Contact information:

> Echelon Corporation
>
> 4015 Miranda Avenue
>
> Palo Alto, CA 94304, USA
>
> Internet: http://www.echelon.com

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1. Windows NT is a trademark of Microsoft Corporation.

5.2.   Check List for PCC-10 Installation Problems

Check from the Control Panel's PC card icon, if the LonWorks® Plug 'n Play driver has installed, started and configured the device.
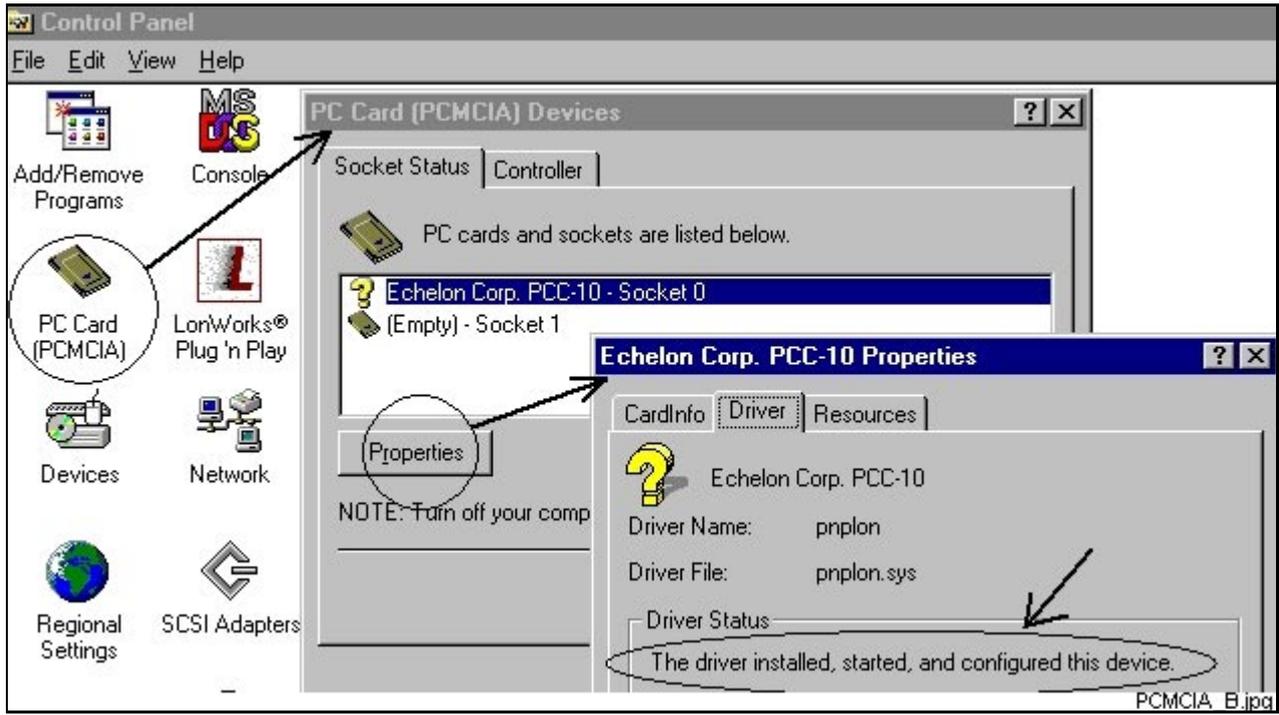

Fig. 5.2.-1   In this figure, the driver has installed, started and configured the device.

If the LonWorks® Plug 'n Play driver is not started and it has not configured the device:

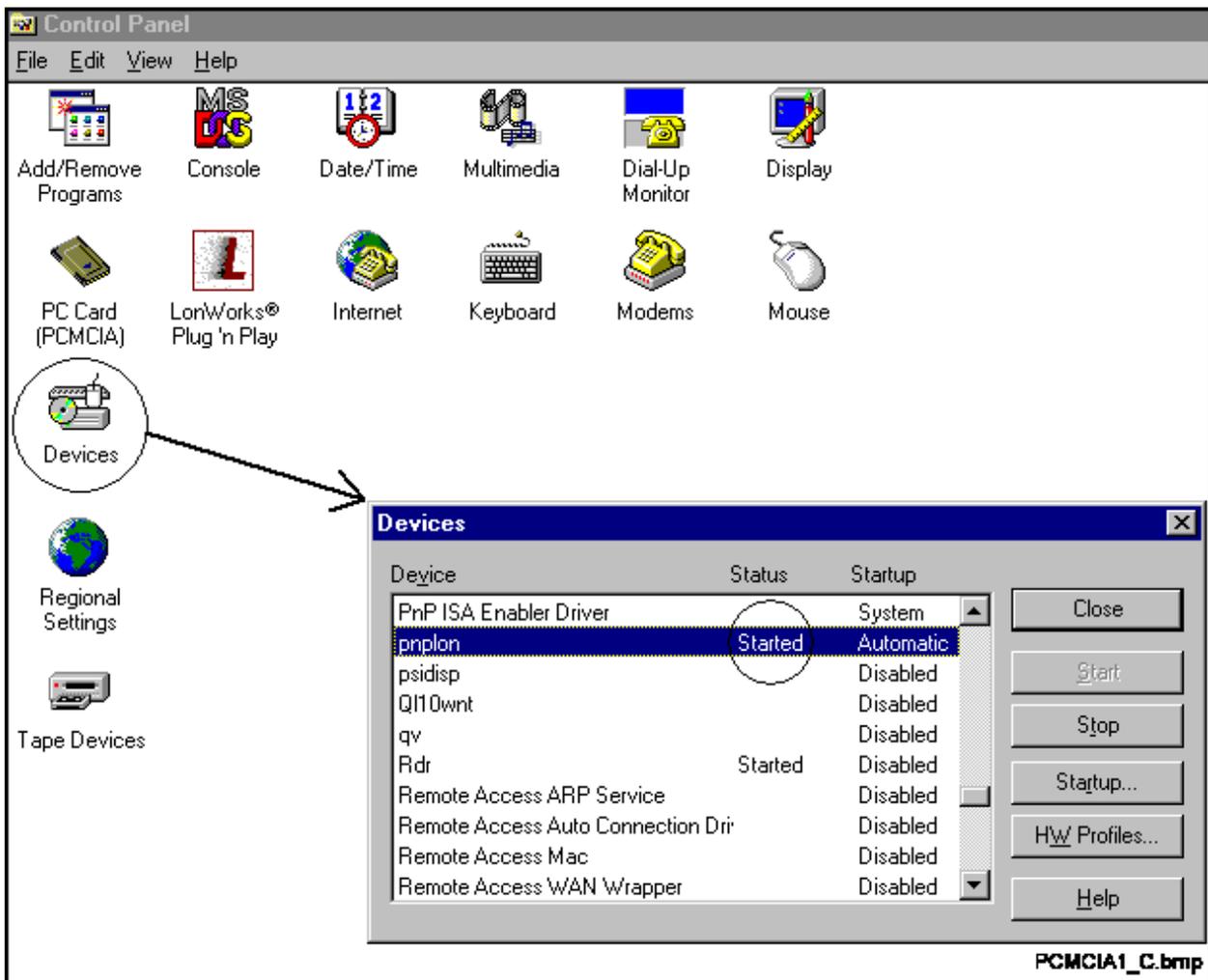**1   Check from the Control Panel's Devices icon that the driver is started.**

Fig. 5.2.-2   In this figure, the device driver is started successfully

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2 **If the LonWorks® Plug 'n Play driver cannot start and configure the PCC-10 card, check and change the PCC-10 card's I/O range and the IRQ value from the Control Panel's LonWorks® Plug 'n Play icon.**
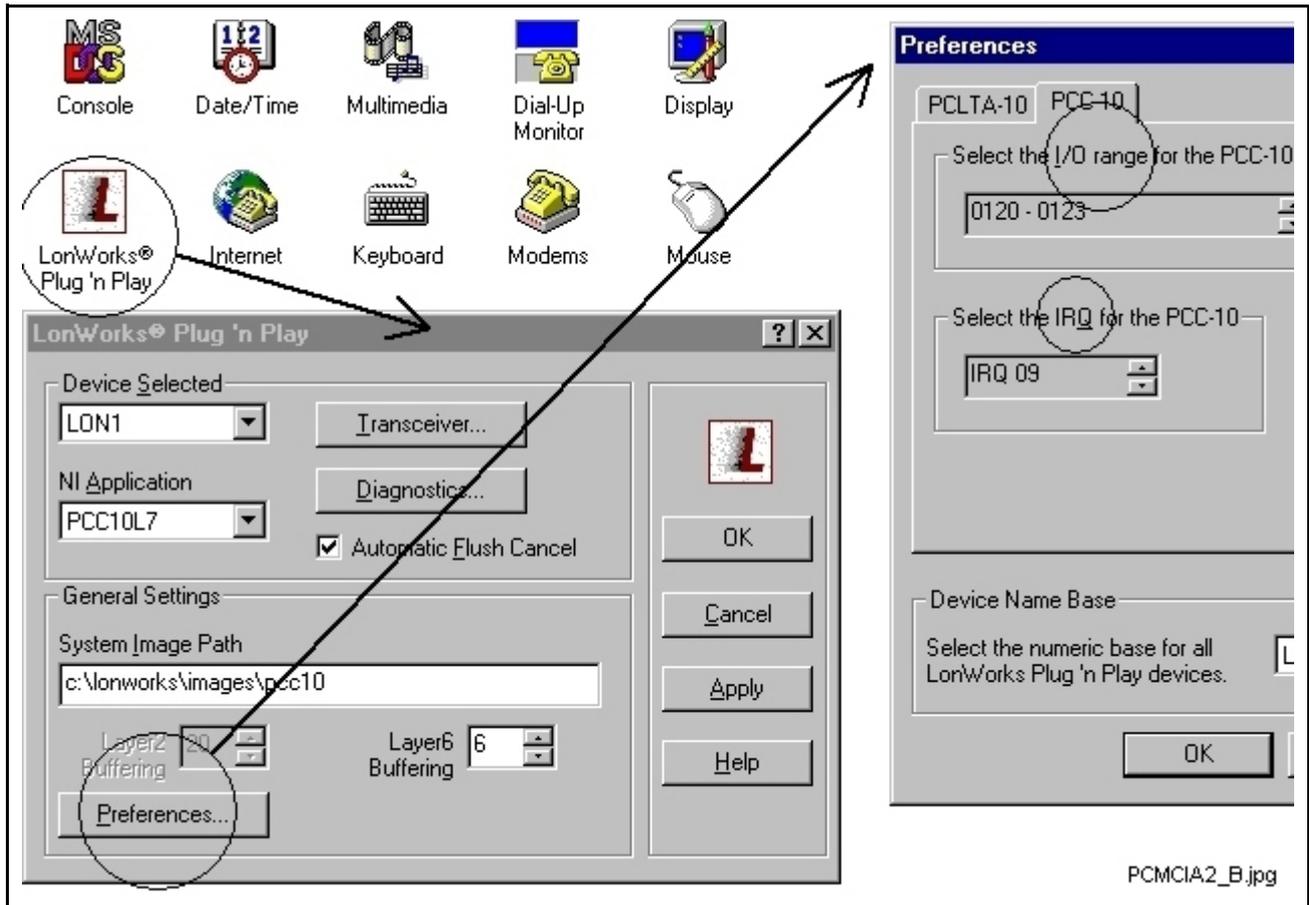

Fig. 5.2.-3   This figure shows, how to check the I/O range and the IRQ level

3 **When the Plug 'n Play driver has started and configured the device, check and set the transceiver values from the Control Panel's LonWorks® Plug 'n Play icon.**
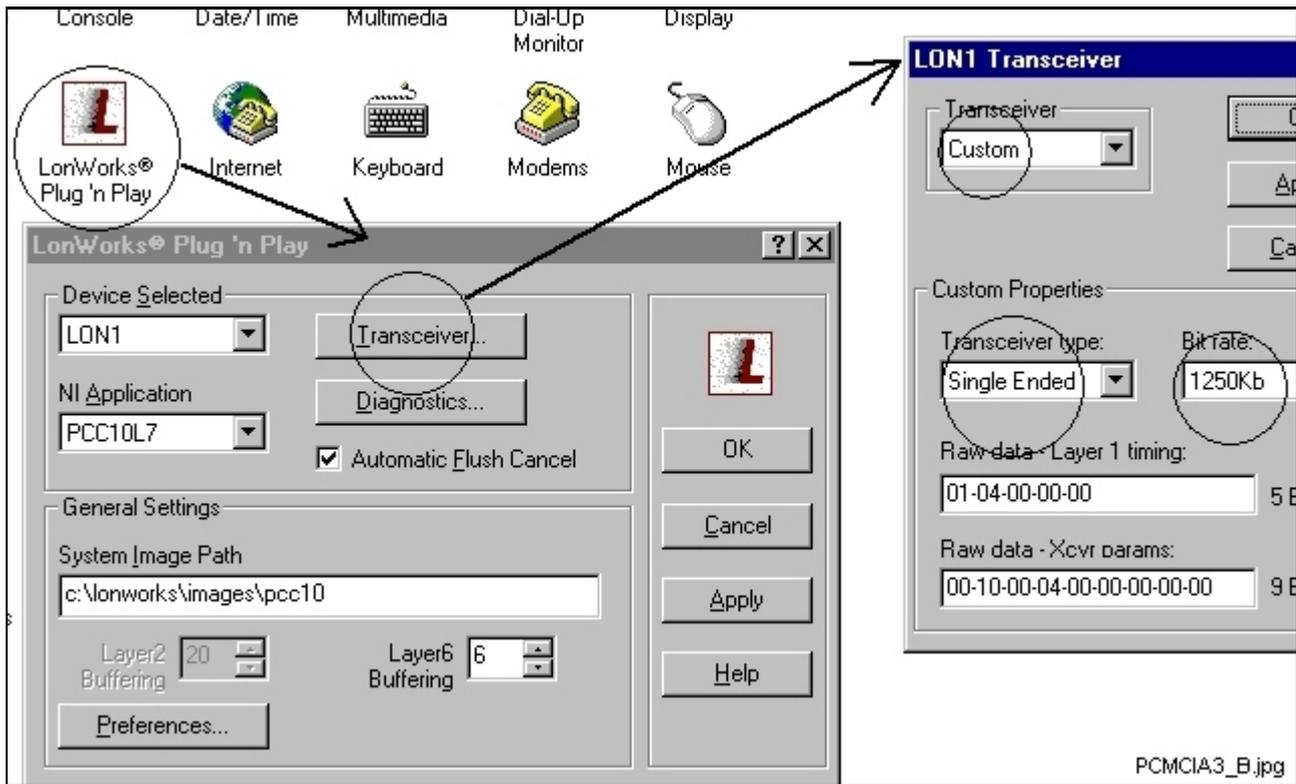

Fig. 5.2.-4　Transceiver card settings are shown in the LON1 Transceiver dialogue

Control Panel's LonWorks® Plug 'n Play icon includes a diagnostic feature, which can be used for testing and resetting the PCC-10 card.

Fig. 5.2.-5   The Diagnostics dialogue can be used for testing the PCC-10 card