LAN Adapter with Bypass Port

CR-505

User Manual

Version 1.0

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Attention! The device cannot be used with communication lines having no lightning proofness and running outside the limits of one building

Content

1.INTRODUCTION

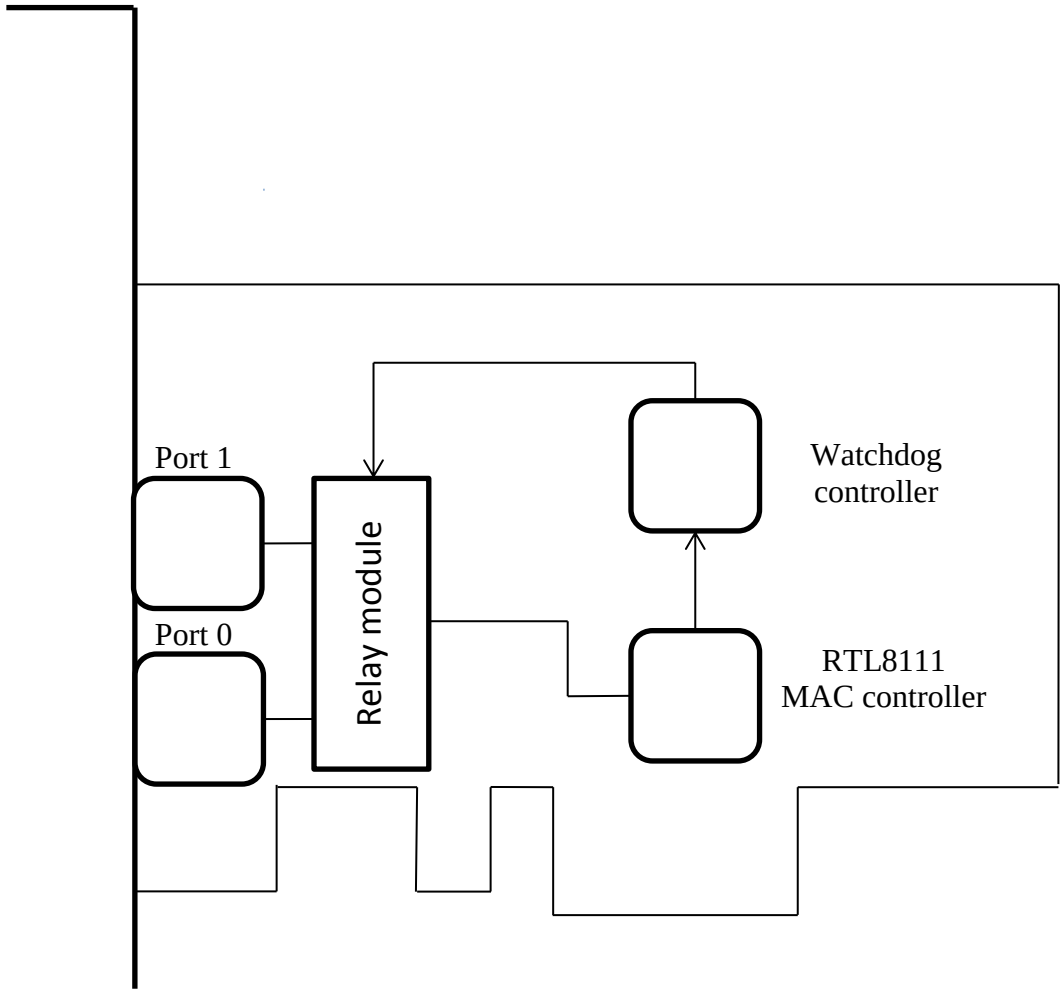
LAN adapter CR-505 is a single channel Ethernet adapter with one main port and one bypass port. Switching from the main port to the bypass port (bypass mode) is automated when the server power supply is off or watchdog controller reacts. Bypass port serves to connect a standby server. Adapter CR-505 can be used for “hot” backup servers – Web-servers, data base and terminal ones.

The adapter has the following characteristics:

- Form factor – PC card PCI-express
- Standard or low-profile board
- 1 main port 10/100/1000 Base-T, 1 bypass port
- Guaranteed length up to 50 m
- Full/Half duplex with flow control support IEEE 802.3x
- Supporting jumbo frames of 9216 bytes
- Polarity and entangled pairs self-correction
- Microsoft NDIS5 checksum offload (IP,TCP,UDP)
- Supporting IEEE 802.1Q VLAN
- Watchdog controller 60 or 600 seconds

2. ADAPTER STRUCTURE

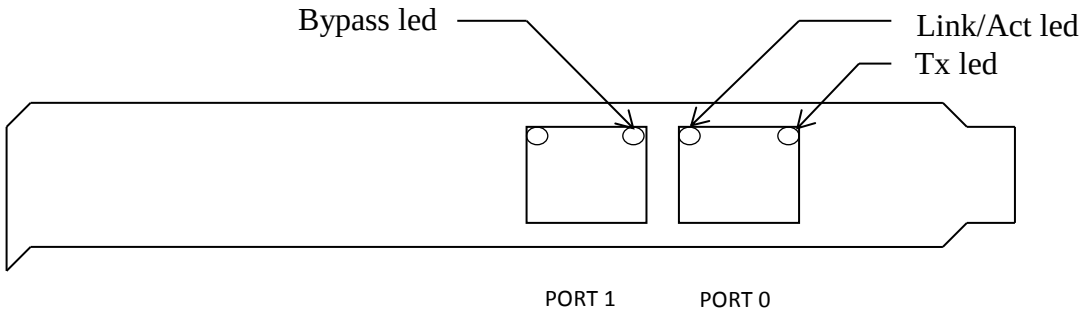
The adapter structure is shown in the picture.



The device is based on MAC controller RTL8111, which port GBe is connected to the relay module. Depending on the mode, the relay module connects either the bypass port (port1) or the MAC controller to the main port (port 0). The relay module is operated with the help of the watchdog controller.

3. CONNECTING ADAPTER BOARD

Below you can find the front panel of adapter CR-505 and a port connection table.

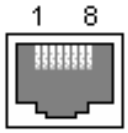


Outputs	1	2	3	4	5	6	7	8
Destinations	A+	A-	B+	C+	C-	B-	D+	D-

Notes.

1. A,B,C,D – duplex twisted-pair wires
2. Standard 10/100 uses pair A for transmission and pair B for receipt
3. LINK/ACT LED – signal presence and packet transmission/receipt indicator
4. Tx led - packet transmission indicator
5. Bypass led –bypass mode indicator (port1 connected to port0).

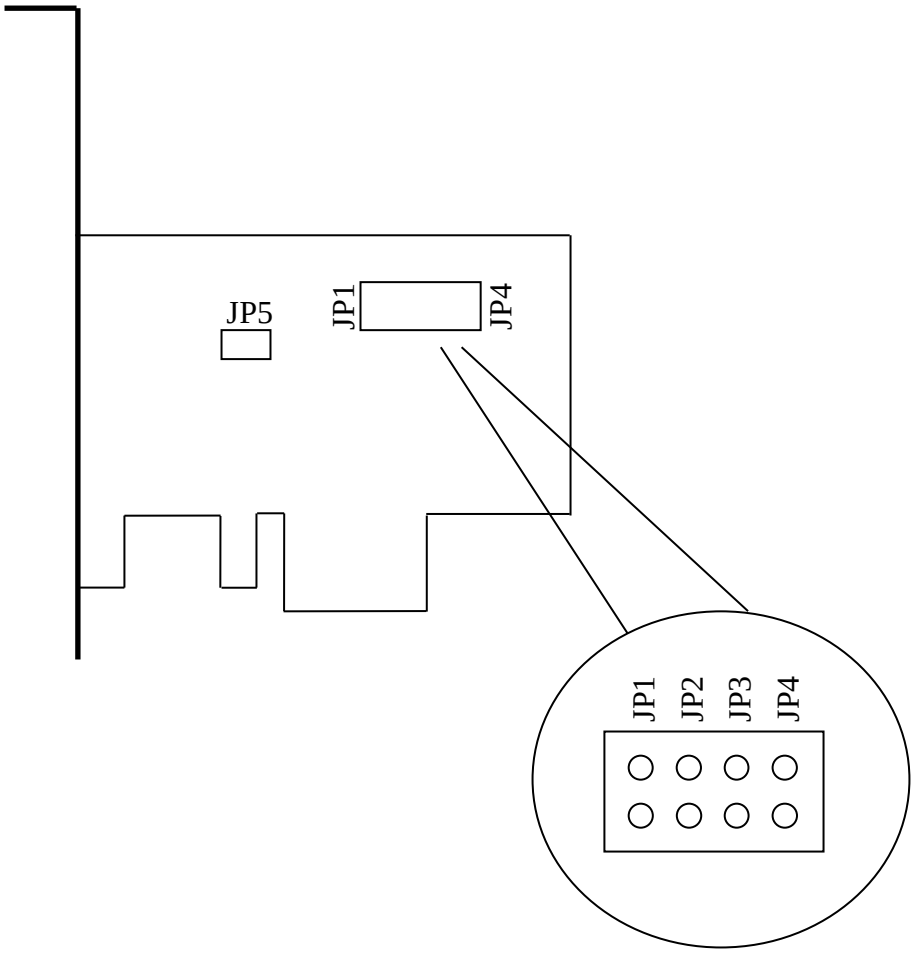
Used connection type RJ-45



4. DEVICE CONFIGURATION

4.1. MODE SELECTION

The mode is selected with the help of jumpers on board (see the picture).



The mode dependence on jumpers position is shown in the table below. On – the jumper is closed, Off – the jumper is open, X – the position is ignored.

JP5	**JP4**	**JP3**	**JP2**	**JP1**	**Mode**
On	X	X	X	X	Bypass mode is on only if there is no power supply of the server. The jumper is precedent over the others.
Off	X	X	X	On	Watchdog controller clearing happens when any packet is transmitted (by Tx led signaling).
Off	X	X	On	X	Watchdog controller clearing happens when a record is made to MAC controller register.
Off	X	On	X	X	Watchdog controller timeout is 60 sec
Off	X	Off	X	X	Watchdog controller timeout is 600 sec

Jumper/Condition	No Power	Hardware Reset of Server	Watchdog controller timeout	Clearing watchdog controller
JP5=On, JP1=X, JP2=X	B	W	W	W
JP5=Off, JP1=On or JP2=On	B	W	B	W

Notes.

1. JP4 is not used.
2. B = bypass mode, port 0 is connected to port1
3. W – working mode, port 0 is connected to the MAC controller

4.2. WATCHDOG CONTROLLER CLEARING

According to the taken work model, the watchdog controller shall be cleared with the server software from time to time. This condition is a sign of the stable functioning of the software. Receiving periodically a clearing signal the watchdog controller views the software operation as normal and finds no need to switch the ports to the bypass mode. Depending on the adapter configuration, the clearing signal can be made by two means.

Clearing by outcoming packets

It is the simplest way to control the work of the server. On having a packet from the adapter to be transmitted the watchdog controller gets cleared and begins counting the period again. If after the expiration of tx period the packet is absent, the software is believed to have failed and the ports are switched to the bypass mode. The advantages of the way include the simplicity of the utilization: no need to install any extra software on the server. The disadvantages are also clear: this means is too brutal and it does not allow controlling a failure of a certain application, for example.

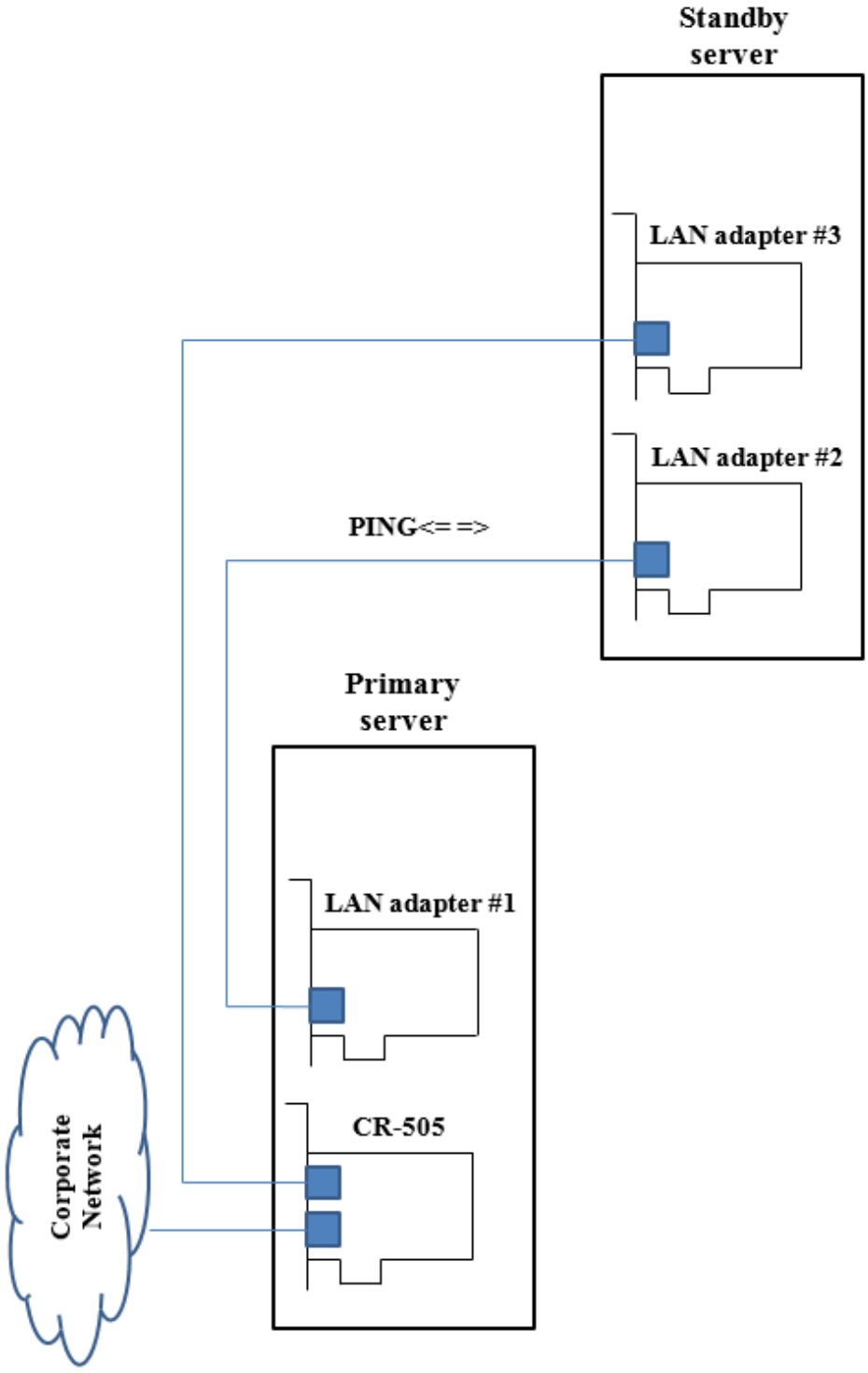
Clearing by making records to the adapter register

Watchdog controller is cleared with setpci utility (pciutils packet).

 # setpci -v -d 10ec:8168 4a.b=0

This command resets the watchdog controller and the adapter keeps working. The advantage of this method is that the server performance condition verification can be as complex as you wish. The server administration can check external connections with the script as well as the performance of certain applications. On having a positive response the script shall clear the watchdog controller.

4.3. APPLICATION EXAMPLE



According to this scheme the primary server checks from time to time the connectivity to the standby server via LAN adapters #1 and #2. Adapter CR-505 is installed to the primary server and is connected to the standby server with a bypass port. If the connectivity is lost (or the software of

the primary server “hungs”) the standby server is connected to the operating network via bypass port. The standby server shall also have the exact copy of the primary server software; also, the same MAC address shall be set for adapter #3 and adapter CR-505. The given scheme provides for a “hot” backing up of the primary server. The administrator can be notified of the occurred server rotation by the appearance of an Ethernet link in adapter #3.

5. SCOPE OF DELIVERY

- Adapter board
- CD with user’s manual
- Certificate of warranty
- Packing box sized 26x17x3 cm

The set weight is not over 0.5 kg.