



Controlling Ashly Products From a Remote PC Location

Introduction

Ashly networked products can be accessed from a remote PC on a different network if the router used for the Ashly device is properly configured. This document explains how to do that.

Protea software communicates with Ashly devices using the UDP/IP. The User Datagram Protocolⁱ (UDP) and Internet Protocolⁱⁱ (IP) are two of the protocols used by the Internet protocol stackⁱⁱⁱ. The UDP port used for communication is 3100.

Usually, Ashly devices are not directly connected to the Internet. They are connected to a Local Area Network (LAN). The same is true for your home computers, or the computers in your office. One entire LAN is usually connected to Internet through a router (some people call it a gateway). The router is responsible for forwarding IP packets between the LAN and the Internet. The router can also offer additional services to the devices in the LAN such as firewall or DHCP server.

When your computer and the Ashly devices are connected to the same LAN, they can communicate directly. In other words, the IP packets can go straight from source (your PC) to the destination (the Ashly device) and back. A router is not required for this direct communication to happen. In this case, Protea software discovers the Ashly devices in the LAN. It does that by sending broadcast messages. The broadcast messages are packets sent to all the devices in the network.

On the other hand, when your computer is connected to one LAN and the Ashly device you need to control is connected to a different LAN, they can not communicate directly, however the two networks are probably connected through a chain of routers. The routers are responsible for determining the best path between the two networks and carrying the IP packets between the networks.

The routers most likely don't forward broadcast messages, and that means that Protea software can't auto-discover Ashly devices that are in remote LANs. You'll need to know their IP address^{iv} in order to control them.

A common practice in local networks is the use of private IP address space^v. That makes the devices with private addresses in the LAN inaccessible from the Internet. There are a few different ways to go around this limitation, we are going to discuss some of these.

Port forwarding

When the Ashly devices you want to control is in a remote LAN and has a private IP address, it can't be directly accessed from outside that LAN. But a small configuration change on the remote router can make it accessible.

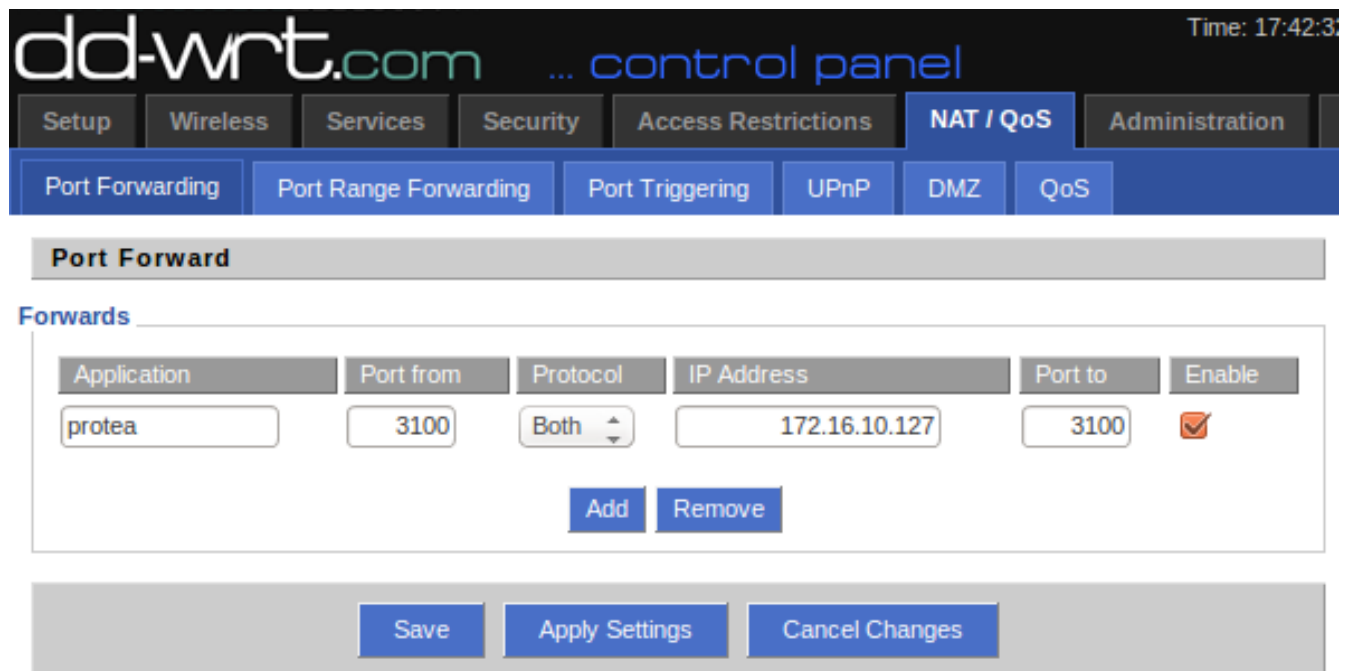
The two specific details you need to know in this situation are the private IP address of the Ashly device, and the public IP address of the remote router. Your network/system administrator should be able to give you this information. You will also need access to the router configuration interface. Most of the modern routers provide a web based configuration interface.

The router we're referring to is the one that connects the Ashly device to Internet, not the router that connects your computer to the Internet. This remote router needs to forward all traffic it receives on port 3100 to the Ashly device. When properly configured, your PC will be able to communicate with the router, and the router will transparently forward the packets to the Ashly device.

1.1 Router configuration

In the following example, let's suppose the Ashly device is connected to a LAN, and the Ashly device IP address is 172.16.10.127. Let's also suppose that the public IP address of the router connecting that LAN to Internet is 24.103.151.2. On the router, you need to set up a port forwarding rule that forwards the traffic from 24.103.151.2:3100 to 172.16.10.127.

There are quite a few network gear vendors, each making probably a dozen different router models. So, if the configuration page of your router doesn't look like the images in this document, or the menu options are totally different, please ask your network administrator for help. (The router I used while



writing this document was a Linksys, running dd-wrt.)

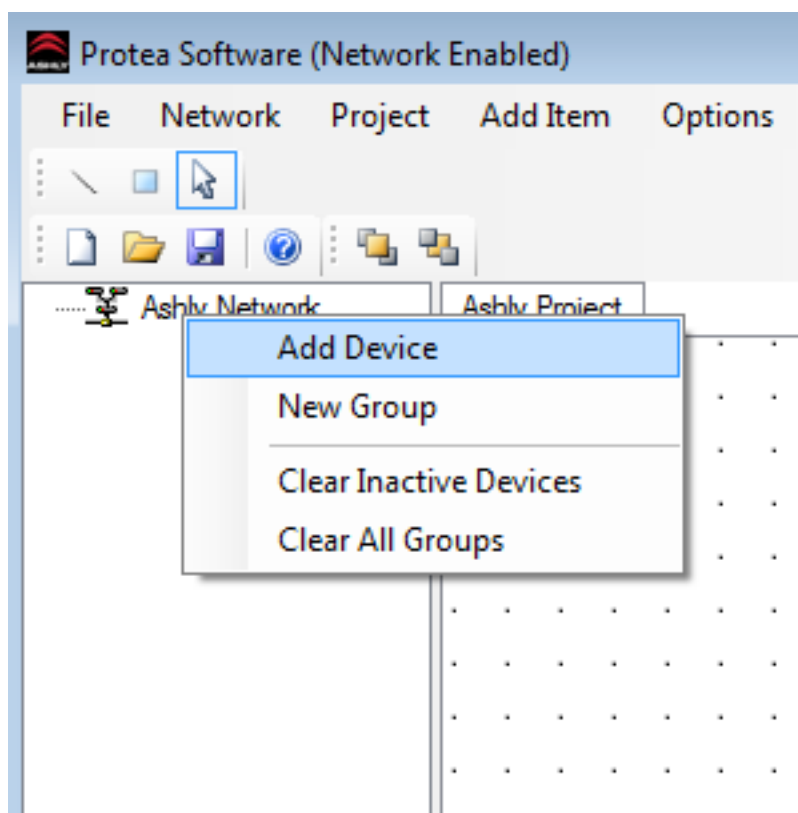
The firmware on your router may use different names for those parameters:

- Port from: “external port” or “out port”
- Port to: “internal port” or “in port”
- IP address: “local address” or “to IP address”

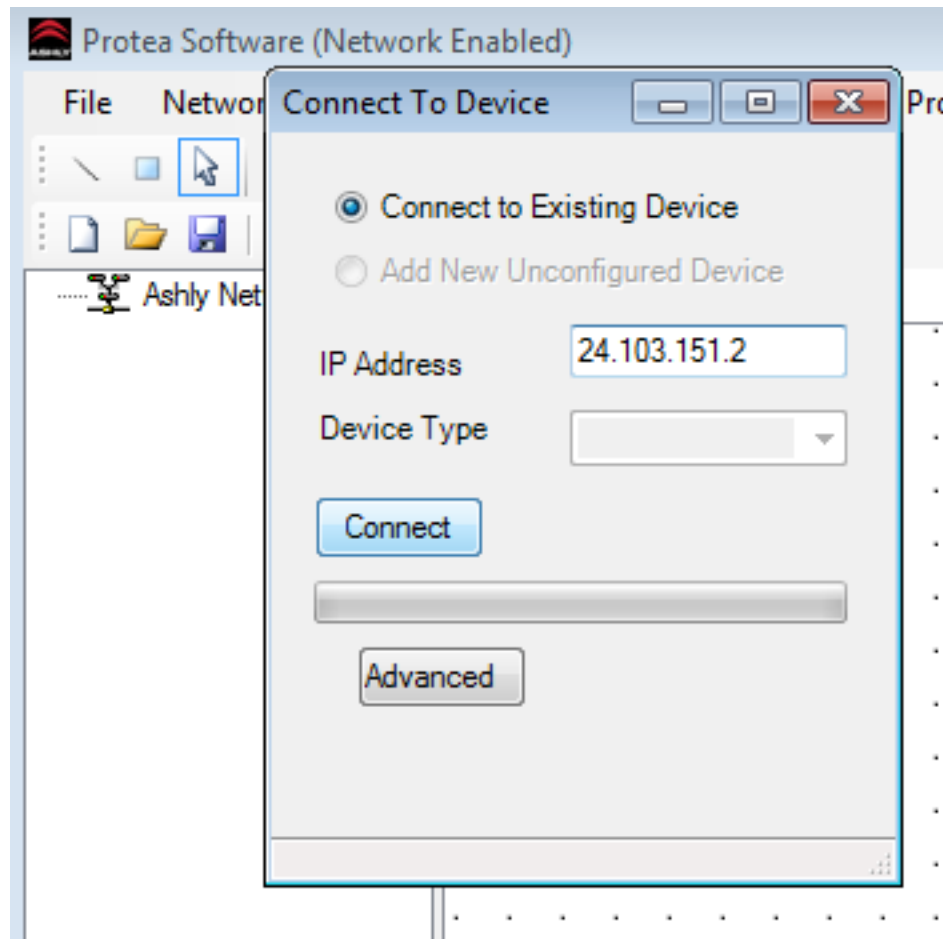
The IP address used in the router NAT configuration (Network Address Translation) is the IP address of the Ashly device. Both port numbers are 3100. The protocol is UDP, but “Both” works as well.

1.2 Protea Software Configuration

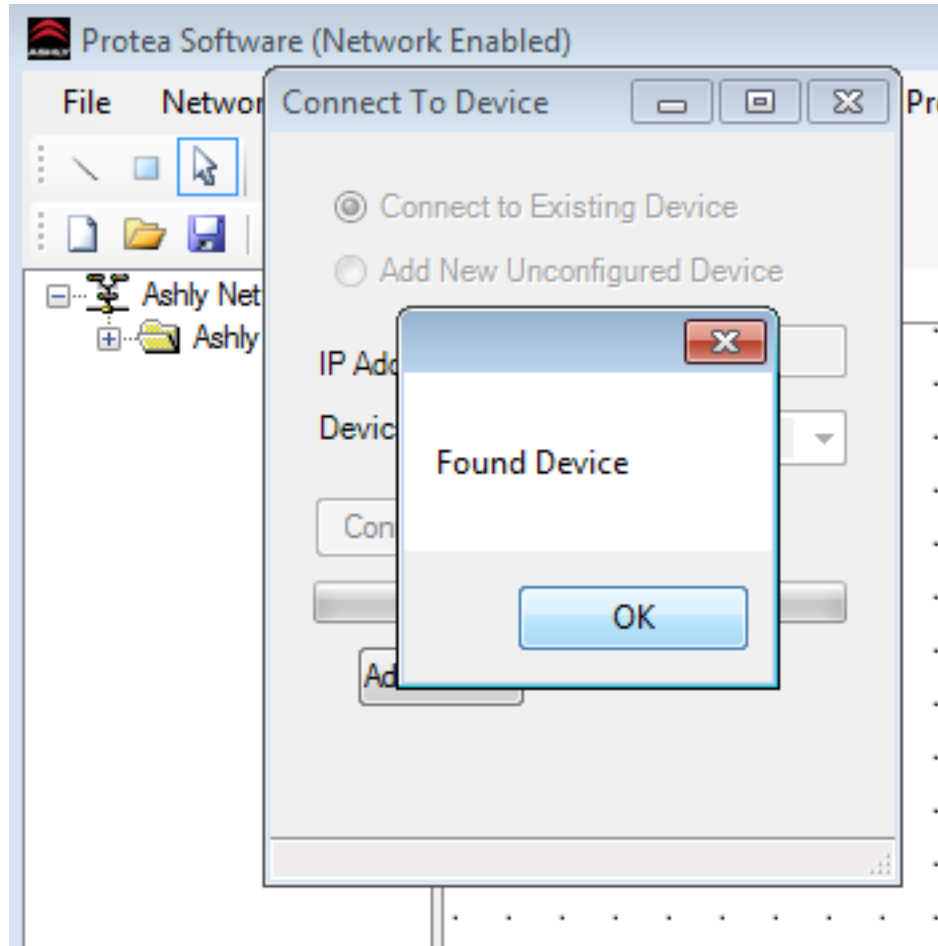
1. Start Protea software, right-click on the Ashly Network device tree then click “Add Device”.



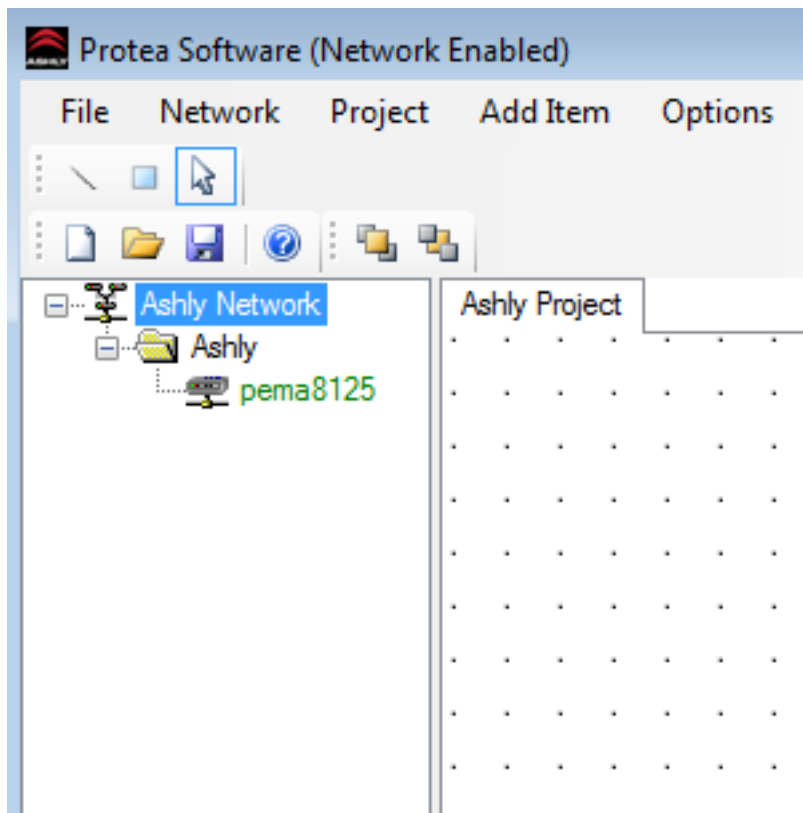
2. Choose "Connect to Existing Device" and enter the public IP address of the router



3. When it finds the device, click OK



4. Now, the device should appear in the device tree



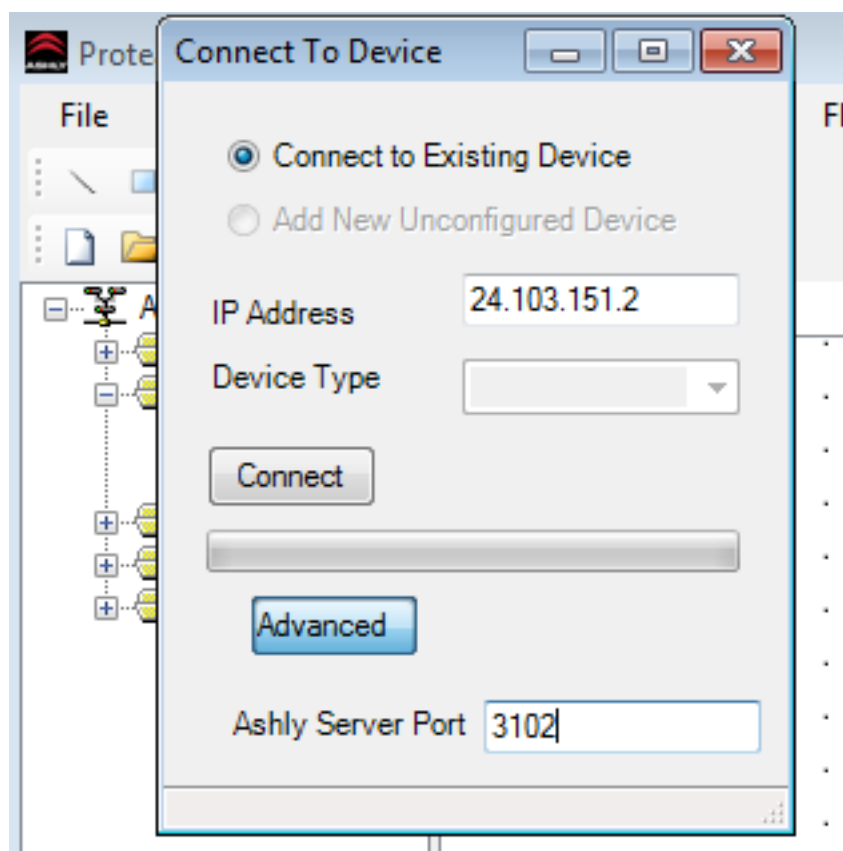
1.3 Controlling multiple devices

If there are more than one Ashly device that you need to control, you can map different ports on the router to different IP addresses in the LAN. For example, let's assume that there are four Ashly devices having IP addresses from 192.168.1.101 to 192.168.1.104. One possible configuration that allows you to access them is the following:

Application	Port From	Protocol	IP Address	Port To
Device1	3100	UDP	192.168.1.101	3100
Device2	3101	UDP	192.168.1.102	3100
Device3	3102	UDP	192.168.1.103	3100
Device4	3104	UDP	192.168.1.104	3100

The port 3100 on the router is forwarded to the port 3100 on the first device (192.168.1.101), port 3101 on the router is forwarded to the port 3100 on the second device(192.168.1.102) and so forth. *Note that the "Port to" field is always 3100 !* The application field is just a label, you can use any string that best identifies your device.

Now, when you add the devices in Protea software, after you chose "Connect to Existing Device", click the "Advanced" button and enter the correct port number in the "Ashly Server Port" Field. This is a port from the "Port From" column.



1.4 Troubleshooting

If you followed the steps above and still can't connect to the Ashly device, here are some things to try:

- Is there a firewall between your computer and the Ashly device? Usually the firewall is a software component on the router, or a different box that the router is connected to. Ask your network administrator. If there is a firewall, make sure it allows traffic to the port 3100, UDP.
- Are the network settings on the Ashly device correct? Check the network settings on the Ashly device. Do the IP address, netmask and gateway have correct values?

Connect to the remote network using a VPN

The network hosting the Ashly device may be accessible via a Virtual Private Network^{vi} (VPN). A VPN is an extension of a LAN which allows a remote computer to exchange data with the local network as if it were directly connected to the local network.

There are quite a few vendors providing VPN solutions (e.g. Citrix, Cisco) and free solutions as well (e.g. openvpn.net).

Ask your network administrator about the VPN access and configuration details. Setting up VPN clients is outside the scope of this document.

Using Remote Desktop

If by any chance there is a windows server in the same LAN with the Ashly device you need to control, you could run Protea software on the windows server and connect to the server using remote desktop connection.

Please consult the documentation provided by Microsoft for your version of Windows: <http://windows.microsoft.com/en-us/windows/remote-desktop-connection-faq>

As with the port forwarding example, you may need to change the router configuration so it forwards the TCP port 3389 to the IP address of the windows server.

Using a SSH tunnel

The very few people that may consider this solution probably already know what to do.

Using a Proxy device

We don't have anything like this yet, but that would be a nice project to work on.
Raspberry Pi?

External links and other information

Find the public IP address of your router:

<https://www.google.com/search?q=my+ip+address>

Setting up Single Port Forwarding on Linksys Smart Wi-Fi Routers and Linksys Wi-Fi Routers using the Classic firmware:

<http://kb.linksys.com/Linksys/ukp.aspx?pid=80&vw=1&articleid=21470>

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- i User Datagram Protocol http://en.wikipedia.org/wiki/User_Datagram_Protocol
 - ii Internet Protocol http://en.wikipedia.org/wiki/Internet_Protocol
 - iii The Internet Protocol suite: http://en.wikipedia.org/wiki/Internet_protocol_suite
 - iv IP address: http://en.wikipedia.org/wiki/IP_address
 - v Private IP address space: http://en.wikipedia.org/wiki/Private_network
 - vi Virtual private network: http://en.wikipedia.org/wiki/Virtual_private_network

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