Internet Control of the RCX

An RCX unit can be controlled over the Internet. The program you write can be downloaded to an RCX located near any computer running ROBOLAB that is linked via the Internet.

Note: you need two computers, an internet connection with a known IP address. One computer must have the IR Transmitter and RCX set up and ready to go.

Running the ROBOLAB Server

First, set up the computer which is going to receive the ROBOLAB program and download it to the waiting RCX. This computer must run a special software called ROBOLAB Server. The ROBOLAB Server is different than ROBOLAB. The ROBOLAB Server Program is in the Extras Folder.

Before running ROBOLAB Server, make sure that ROBOLAB is not running on the remote computer. You may want to start by running ROBOLAB to test communications between the remote computer, the IR Transmitter, and the RCX.

IMPORTANT Note: The ROBOLAB Server must be from version 2.0.1 or later to run properly.

To start ROBOLAB Server, choose File Open. Next, open the Extras folder and then the Server folder. Double click on ROBOLAB Server.exe.

Running the ROBOLAB Server opens a window on the remote computer. This window must be open for Internet control of the RCX to work.

Testing Communication is successful when the RCX plays a rising sweep and the green indicator in the ROBOLAB Server window turns from red to green.

Red test indicator light shows no communication between computer and RCX.

After starting the ROBOLAB Server, the computer and RCX are ready to receive programs over the internet.
How do you create ROBOLAB programs to send over the Internet?

There are two new types of ROBOLAB commands used for Internet control of the RCX. These commands are found in the Internet sub menu of the Programmer - Inventor Level 4 or in the Investigator - Program Level 5. They are the “Internet Begin” & “Begin Internet Direct Mode”, each with a corresponding end command.

Note: If you do not see these icons, you must install extras. Under Project choose Install Extras and follow the prompts.

Internet Begin and End

The **Internet Begin** command is used instead of the standard Begin command in ROBOLAB programs. It is required as the first command in every Investigator or Inventor Internet program that will be downloaded to the remote RCX. The IP address of the remote computer that will be transmitting the program to the RCX must be specified. The remote computer must be running ROBOLAB Server.

The **Internet End** command is used at the end of every Investigator or Inventor Internet program that begins with the Internet Begin Command.

**String** modifier is used to specify the IP address of the remote computer.

**Example 1**

Download a program from a remote computer to run a motor for 2 seconds.

This program sends a program to the remote computer with IP address 130.62.208.54. This computer then downloads the program to the remote RCX. When the remote RCX is run the motor on Port A runs for 2 seconds and stops.

**Note**: the remote computer must be running the ROBOLAB Server and have an IR Transmitter attached with the remote RCX on and nearby.

**Behavior**: When the program is downloaded the remote RCX must be run by pushing the red run button. The remote RCX will then run the motor on Port A for 2 seconds.
Direct Mode over the Internet

The **Begin Internet Direct Mode** command is used to actively control the remote RCX. It is used instead of the standard Begin command or Internet Begin command. This command downloads and runs the program in the remote RCX. The IP address of the remote computer that will be transmitting the program to the RCX must be specified. The remote computer must be running ROBOLAB Server.

The **End Internet Direct Mode** command is used at the end of every direct mode program that begins with the Begin Internet Direct Mode command.

**Example 2**

Download and run a program to run a motor for 1 second.

This program is sent to the remote computer with IP address 130.64.208.54. The remote computer then downloads and runs the program in direct mode on the remote RCX. The RCX runs the motor on Port A for 1 second and then stops.

Clicking on the run arrow sends the program via the Internet to the remote computer where it is downloaded and run on the RCX. There is no indication on the local computer if the program was completed successfully.

An error message appears if there are any problems with the transmission from the local computer to the remote computer.

The programs in these examples use simple commands. Programs for Internet Control of the RCX can be as complex as any of the conventional RCX programs for your local computer. There are a few exceptions - ROBOLAB Server does not support Internet Direct Mode for programs with Data Acquisition or Looping structures. These formats are supported by the Internet Mode.