

How to Use X10 Function in WebControl™ 3.1.x Firmware

For reference only, no warranty or support

Warning: Use RF equipment maybe subject to government regulation and rules. We do not responsible for any possibility of violation of regulation and law due to X10 RF signal transmission.

1. WebControl X10 Functions and X10 RF devices

The WebControl V3.01.00 firmware and above support X10 function. User can remotely use web browsers or DOS or Linux utilities to control X10 devices. WebControl sends X10 commands in the X10 RF format. User must have proper RF transmitter to use WebControl X10 functions. To use X10 function, it will need WebControl with firmware version V3.01.00 or higher, it will need a RF transmitter that described later, it also need a X10 RF transceiver. In US, that is X10 TM751 or similar. In EU, that can be TM12U, or similar, then you also need X10 lamp module or X10 appliance module for each device you want to control.

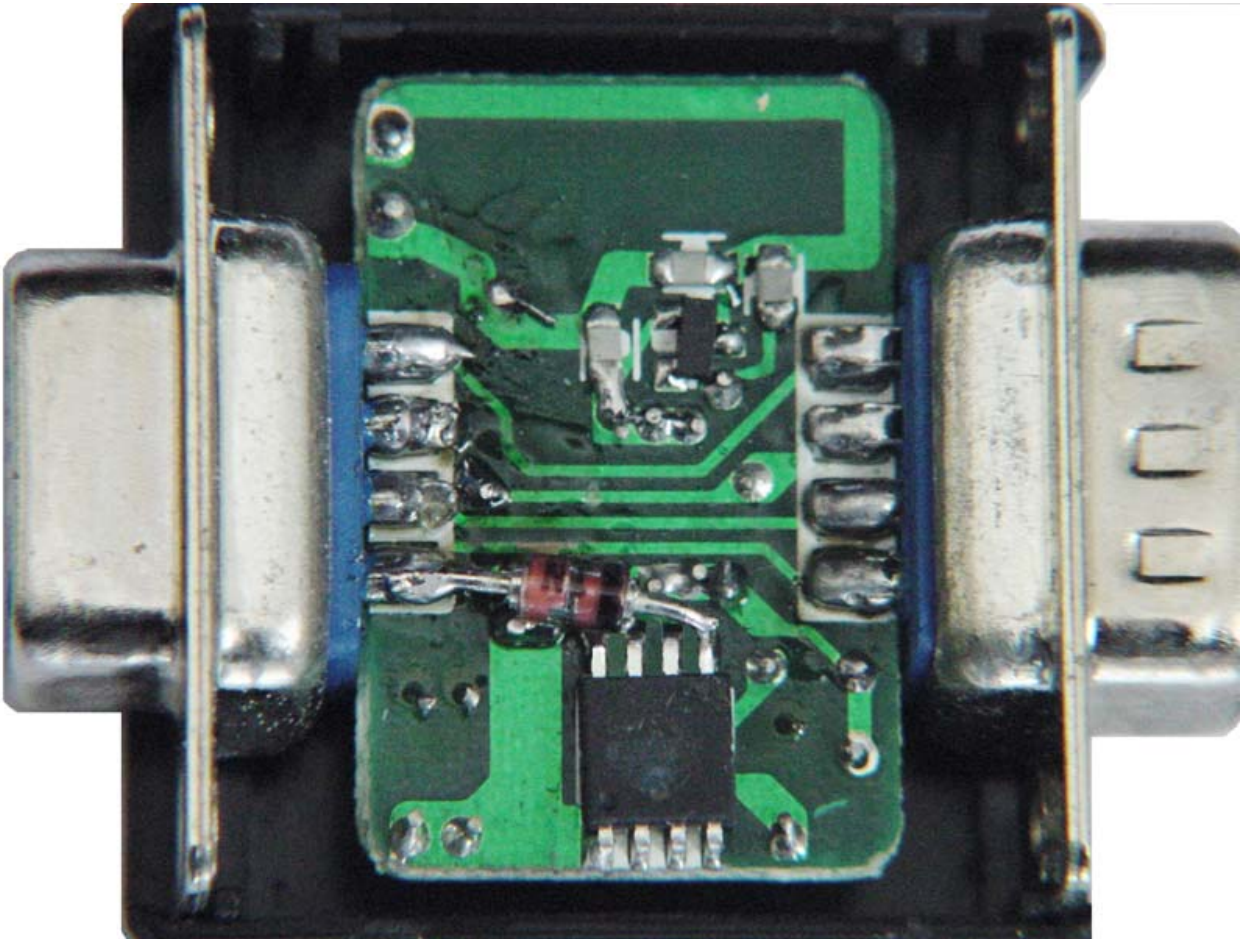
1.1 Wiring X10 RF devices to the WebControl

When X10 function is enabled, TTL output 7 and 8 will be used for sending commands to X10 transmitters. TTL 7 will be constantly on to provide 5V DC to the X10 RF transmitter. TTL 8 should be wired to the X10 RF transmitter data line. The ground should be connect to the ground of the X10 RF transmitter.

WebControl can work with many popular RF transmitters for X10 control. In the North America, the RF transmitter should have frequency of 310MHz. If you can not find a 310MHz RF transmitter, you can modify X10 Firecracker or other X10 RF remote to use its transmitter. Outside North America, the X10 frequency is 433.92MHz. You can easily find RF transmitters on eBay or microcontroller parts store.

1.2 X10 Firecracker Modification

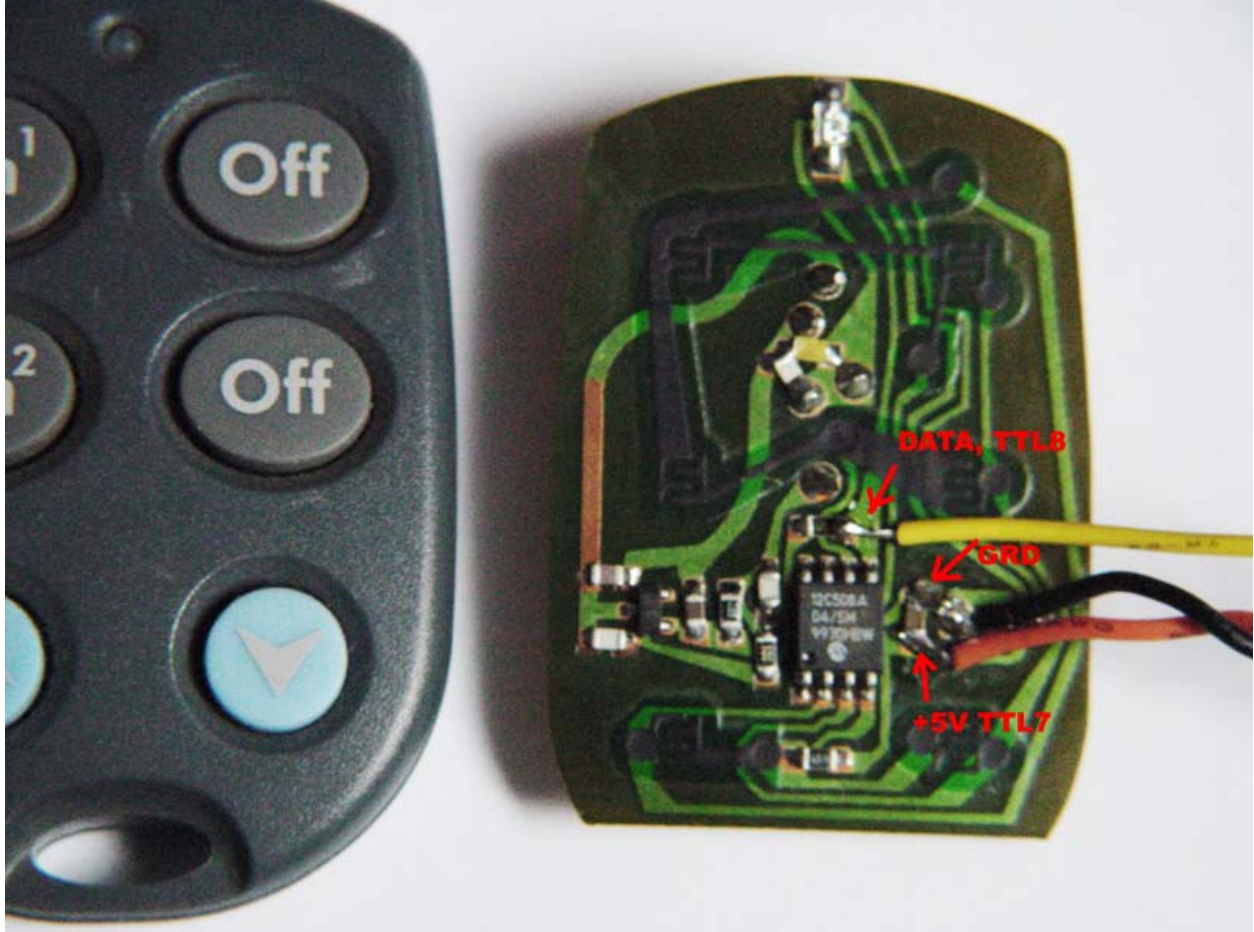
If you have an old X10 Firecracker, or Key Chain X10 remote control, you can easily modify it for WebControl to use. The following picture shows add one diode like 1N914 or similar diode to the Firecracker:



The modification is simple, soldered the diode between the serial port pin 9 and the IC pin 5. After this modification, Firecracker can still function with serial port, also it can work with WebControl. Using a serial cable, connect pin 4 wire to TTL 7, pin 5 wire to ground, and pin 9 to the TTL 8 on the WebControl. **Please note, do NOT use TTL7 to power any other device, over current on TTL7 will cause permanent damage to WebControl and its not covered by warranty.**

1.3 X10 Keychain Remote Modification

If you have an old X10 Key Chain remote control, you can easily modify it for WebControl to use. The following picture shows soldering wires to the KeyChain Remote:



The modification is simple, soldered three wires to the keychain remote. After this modification, connects the +5V to WebControl TTL7, Data to WebControl TTL8, and GRD to the ground on the TTL output block. **Please note, do NOT use TTL7 to power any other device, over current on TTL7 will cause permanent damage to WebControl and its not covered by warranty.**

1.4 WebControl and 433MHz Transmitter

WebControl can use 433MHz RF link transmitter to control X10 devices in outside North American. The exact frequency is 433.92MHz. A little transmitter like this one working well:



This kind of RF transmitter normally has Ground, +POWER, and DATA pin. Connects the +POWER to TTL output pin 7, and DATA to the TTL output 8, and the Ground to TTL block number 9 or 10. **Please note, do NOT use TTL7 to power any other device, over current on TTL7 will cause permanent damage to WebControl and its not covered by warranty.**

You may extend those three wires to somewhere else. There is no length limit on the wires.

2. X10 Related Programming and Control

The WebControl V3.01.00 firmware allow user to user Web GUI to control the X10 Device or use command line wget to control the X10 device. In the X10 devices on the consumer market, it uses House Code A-P and Unit Code 1-16 to address different devices. WebControl maps those House Code to 0-F, and Unit Code to 0-F also. So that in WebControl, House Code 3 means X10 House Code C; In WebControl Unit Code 2 means the X10 Unit Code 3.

To use X10 function, user must first go to I/O Setup screen to Enable X10 functions:

CAI WebControl PLC

Version: v03.01.00 IpAddress: 192.168.1.15 Name: WEBCONTROL1 04/15/2011 13:14:49

I/O Setup

- System Status
- Output Control
- x10 Control
- I/O Setup**
- Email Setup
- Temperature Sensor Setup
- PLC Program
- General Setup
- Network Setup
- Help

Global PLC Enable X10 Enable

TTL Inputs								
	1	2	3	4	5	6	7	8
State Inverted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

TTL Outputs								
	1	2	3	4	5	6	7	8
Browser Control Enabled	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Plc Control Enabled	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
State Inverted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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2.1. Web GUI Control of the X10 Devices

The WebControl V3.01.00 firmware and above support X10 function. User can remotely use web browsers to send On/Off/Bright/Dim commands to the lamp or appliances.

CAI WebControl PLC

Version: v03.01.00 IPAddress: 192.168.1.15 Name: WEBCONTROL1 04/15/2011 13:21:06

X10 Control

- System Status
- Output Control
- x10 Control**
- I/O Setup
- Email Setup
- Temperature Sensor Setup
- PLC Program
- General Setup
- Network Setup
- Help

House Code 0 - 15 <input style="width: 100%;" type="text"/>	Unit Code 0 - 15 <input style="width: 100%;" type="text"/>	On	Off	Bright	Dim
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x10 is enabled

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Please note the Bright and Dim function only working for X10 Lamp Module. Each time a Bright or Dim command sending out, only the last On/Off device in the same house code range being addressed, due to X10 RF spec.

2.2. PLC control of X10 Devices

The WebControl V3.01.00 firmware and above support X10 function in the PLC programming. A new keyword X10 is being added to this version of firmware in the format:

X10 H U C

Where H is House code, 0-F, U is Unit Code, 0-F, C is one of the four commands:

- 0 - off
- 1 - on
- 2 - bright
- 3 - dim

2.3. X10 Device Control over Command Line

The WebControl Allowing user to remotely turn on and off X10 controlled lamp or appliances by use wget command line from Linux or DOS. You can issue those commands through Linux script or DOS scripting language.

For format of the command is:

```
wget "http://webcontrol-ip/api/sendX10.cgi?hc=0&uc=0&cmd=1"
```

Where "hc" is House code, 0-F, "uc" is Unit Code, 0-F, "cmd" is one of the four commands:

- 0 - off
- 1 - on
- 2 - bright
- 3 - dim

The double quotes seem very important for both Linux and DOS when using wget.