mks

XPS-RL

Universal High-Performance Motion Controller/Driver

ESP COMPATIBLE

RoHS Compliant

Newport®

Quick Start

Warranty

Newport Corporation warrants that this product will be free from defects in material and workmanship and will comply with Newport's published specifications at the time of sale for a period of one year from date of shipment. If found to be defective during the warranty period, the product will either be repaired or replaced at Newport's option.

To exercise this warranty, write or call your local Newport office or representative, or contact Newport headquarters in Irvine, California. You will be given prompt assistance and return instructions. Send the product, freight prepaid, to the indicated service facility. Repairs will be made and the instrument returned freight prepaid. Repaired products are warranted for the remainder of the original warranty period or 90 days, whichever comes first.

Limitation of Warranty

The above warranties do not apply to products which have been repaired or modified without Newport's written approval, or products subjected to unusual physical, thermal or electrical stress, improper installation, misuse, abuse, accident or negligence in use, storage, transportation or handling. This warranty also does not apply to fuses, batteries, or damage from battery leakage.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE. NEWPORT CORPORATION SHALL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM THE PURCHASE OR USE OF ITS PRODUCTS.

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Preface

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Service Information

The user should not attempt any maintenance or service of the XPS Series Controller/Driver system beyond the procedures outlined in this manual. Any problem that cannot be resolved should be referred to Newport Corporation. When calling Newport regarding a problem, please provide the Tech Support representative with the following information:

- Your contact information.
- System serial number or original order number.
- Description of problem.
- Environment in which the system is used.
- State of the system before the problem.
- Frequency and repeatability of problem.
- Can the product continue to operate with this problem?
- Can you identify anything that may have caused the problem?

Newport Corporation RMA Procedures

Any XPS-RL Series Controller/Driver being returned to Newport must be assigned an RMA number by Newport. Assignment of the RMA requires the item's serial number.

Packaging

XPS-RL Series Controller/Driver being returned under an RMA must be securely packaged for shipment. If possible, re-use the original packaging.

Universal High-Performance Motion Controller/Driver XPS-RL

1.0   Introduction

1.1   Scope of the Manual

From the XPS, the XPS-RL inherits the extremely high performance, high-speed communication through 10/100/1000 Base-T Ethernet, outstanding trajectory accuracy, and powerful programming functionality. It combines user-friendly web interfaces with advanced trajectory and synchronization features to precisely control from the most basic to the most complex motion sequences. Multiple digital and analog I/O's, triggers and supplemental encoder inputs provide users with additional data acquisition, synchronization and control features that can improve the most demanding motion applications.

The XPS-RL holds all of these features in a more compact and mobile package.

To maximize the value of the XPS-RL Controller/Driver system, it is important that users become thoroughly familiar with available documentation:

The **XPS-RL Quick Start** is delivered as a hard copy with the controller.

The XPS-RL User's Manual, Programmer's and Software Drivers manuals are PDF files accessible from the controller disk which can be downloaded from the controller website under the tab Documentation.

.NET assemblies and corresponding sources are available from the controller disk which can be downloaded from the controller website under the tab Documentation -> Drivers & Examples.

LabVIEW VIs with examples are also available to download from the Newport website.

The **Quick Start** is the getting-started part of the system. It serves as an introduction and as a reference. It includes:

1. Unpacking and Handling
2. Inspection for Damage
3. Packing List
4. System Setup
5. Connecting the XPS-RL

1.2 Definitions and Symbols

The following terms and symbols are used in this documentation and also appear on the XPS-RL Series Controller/Driver where safety-related issues occur.

1.2.1 General Warning or Caution

Figure 1: General warning or caution symbol.

The Exclamation Symbol in Figure 1 may appear in Warning and Caution tables in this document. This symbol designates an area where personal injury or damage to the equipment is possible.

1.2.2 Electric Shock

Figure 2: Electrical shock symbol.

The Electrical Shock Symbol in Figure 2 may appear on labels affixed to the XPS-RL Series Controller/Driver. This symbol indicates a hazard arising from dangerous voltages. Any mishandling could result in damage to the equipment, personal injury, or even death.

1.2.3 European Union CE Mark

Figure 3: CE mark.

The presence of the CE Mark on Newport Corporation equipment means that it has been designed, tested and certified to comply with all current and applicable European Union (CE) regulations and recommendations.

1.2.4 "ON" Symbol

Figure 4: "ON" symbol.

The "ON" Symbol in Figure 4 appears on the power switch of the XPS-RL Series Controller/Driver. This symbol represents the "Power On" condition.

1.2.5 "OFF" Symbol

Figure 5: "OFF" symbol.

The "Off" Symbol in Figure 5 appears on the power switch of the XPS-RL Series Controller/Driver. This symbol represents the "Power Off" condition.

1.3   Warnings and Cautions

The following are definitions of the Warnings, Cautions and Notes that may be used in this manual to call attention to important information regarding personal safety, safety and preservation of the equipment, or important tips.

WARNING

Situation has the potential to cause bodily harm or death.

CAUTION

Situation has the potential to cause damage to property or equipment.

WARNING

This product is equipped with a 3-wire grounding type plug. Any interruption of the grounding connection can create an electric shock hazard. If you are unable to insert the plug into your wall plug receptacle, contact an electrician to perform the necessary alterations to ensure that the green (green-yellow) wire is attached to earth ground.

System earthing must be of type earthed neutral (TN-) as defined by CEI60364.

NOTE

Additional information the user or operator should consider.

1.4   General Warnings and Cautions

The following general safety precautions must be observed during all phases of operation of this equipment.

Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and the intended use of the equipment.

- Heed all warnings on the unit and in the operating instructions.

- To prevent damage to the equipment, read the instructions in this manual for the selection of the proper input voltage.

- Only plug the Controller/Driver unit into a grounded power outlet.

- Ensure that the equipment is properly grounded to earth ground through the grounding lead of the AC power connector.

- Route power cords and cables where they are not likely to be damaged.

- **Use Proper Power Cord**
  Use only the power cord specified for this product and certified for the country of use.

- The system must be installed in such a way that the power switch and the power connector remain accessible to the user.

- Disconnect or do not plug-in the AC power cord under the following conditions:

  – If the AC power cord or any other attached cables are frayed or damaged.

  – If the power plug or receptacle is damaged.

  – If the unit is exposed to rain or excessive moisture, or liquids are spilled on it.

     – If the unit has been dropped or the case is damaged.

     – If the user suspects service or repair is required.

- Keep air vents free of dirt and dust and obstructions.

- Keep liquids away from unit.

- Do not expose equipment to excessive moisture (>85% humidity).

- Do not operate this equipment in an explosive atmosphere.

- Disconnect power before cleaning the Controller/Driver unit. Do not use liquid or aerosol cleaners.

- Do not open the XPS-RL Controller/Driver stand alone motion controller. There are no user-serviceable parts inside the XPS-RL Controller/Driver.

- Return equipment to Newport Corporation for service and repair.

- Dangerous voltages associated with the 100–240 VAC power supply are present inside Controller/Driver unit. To avoid injury, do not touch exposed connections or components while power is on.

- Follow precautions for static-sensitive devices when handling electronic circuits.

2.0   Getting Started

2.1   Unpacking and Handling

It is recommended that the XPS-RL Controller/Driver be unpacked in your lab or work site rather than at the receiving dock. Unpack the system carefully; small parts and cables are included with the equipment. Inspect the box carefully for loose parts before disposing of the packaging. You are urged to save the packaging material in case you need to ship your equipment.

2.2   Inspection for Damage

XPS-RL Controller/Driver has been carefully packaged at the factory to minimize the possibility of damage during shipping. Inspect the box for external signs of damage or mishandling. Inspect the contents for damage. If there is visible damage to the equipment upon receipt, inform the shipping company and Newport Corporation immediately.

WARNING

Do not attempt to operate this equipment if there is evidence of shipping damage or you suspect the unit is damaged. Damaged equipment may present additional personnel hazard. Contact Newport technical support for advice before attempting to plug in and operate damaged equipment.

2.3   Packing List

Included with each XPS-RL controller are the following items:

- XPS-RL Quick Start.
- XPS-RL controller.
- Cross-over cable, gray, 3 meters.
- Straight-through cable, black, 5 meters.
- Power cord.

If there are missing hardware or have questions about the hardware that were received, please contact Newport.

CAUTION

Before operating the XPS-RL controller, please read chapter 1.0 very carefully.

2.4   System Setup

This section guides the user through the proper set-up of the motion control system. If not already done, carefully unpack and visually inspect the controller and stages for any damage. Place all components on a flat and clean surface.

⚠️	**CAUTION**
	No cables should be connected to the controller at this point!

First, communication to the controller must be established before stages can be connected.

NOTE

The controller is delivered with slot 1 configured as a dummy stage, hence once communication to the controller is established the controller is usable. To access full functionality of the controller, stages must be connected.

2.4.1   Proper Ventilation

Figure 6: Installing driver cards.

Due to the high power of the XPS-RL controller (180 W for the CPU and 300 W for the drives), ventilation is very important.

To ensure a good level of heat dissipation, the following rules must be followed:

1. It is strictly forbidden to use the XPS-RL controller without the cover properly mounted on the chassis.

2. The surrounding ventilation holes at the sides and back of the XPS-RL unit must be free from obstructions that prevent the free flow of air.

2.4.2   Power ON

- Plug the AC line cord supplied with the XPS-RL into the AC power receptacle on the rear panel.

- Plug the AC line cord into the AC wall-outlet. Turn the Main Power Switch to ON (located on the Rear Panel).

- The system must be installed in such a way that power switch and power connector are accessible by the user.

- There is a beep about 50 seconds after power on when the controller has finished booting. If the controller boots properly, beep is happy-sounding, otherwise a sad-sounding beep is emitted.

- There is also an Inhibit switch with a BNC connector in the rear of the XPS-RL. The Inhibit switch is directly linked by hardware to cut off motor power supply.

2.5   Connecting to the XPS-RL

XPS-RL supports 10/100/1000 Mbps Ethernet networking:

1. Direct connection PC-to-XPS-RL.

The DHCP server active on the Ethernet plug identified "REMOTE" will automatically configure the connected computer to make it ready for communication with the XPS-RL controller.

2. Network connection.

The Ethernet plug identified "HOST" must be used to connect the XPS-RL controller to a Network. Before connection, the controller IP setting must be set by the Network administrator.

Two cables are provided with the motion controller:

- Cross-over cable – used when connecting the XPS-RL directly to a PC.

- Straight Ethernet cable – used when connecting the XPS-RL through an intranet.

2.5.1   Straight Through Cables (Black)

Standard Ethernet straight through cables are required when connecting the device to a standard network hub or switch.

Pin Assignments

1 ——— 1
2 ——— 2
3 ——— 3
6 ——— 6

1 – Orange/White
2 – Orange
3 – Green/White
4 – Blue (not used)
5 – Blue/White (not used)
6 – Green
7 – Brown/White (not used)
8 – Brown (not used)
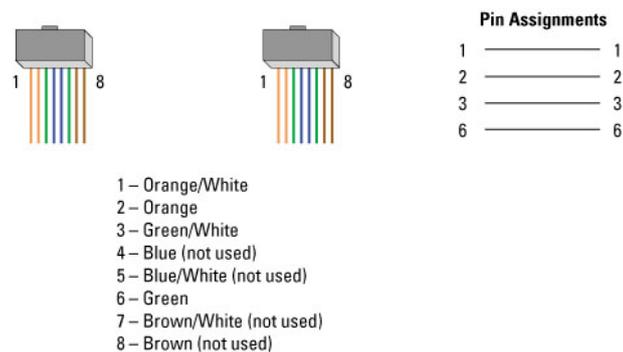
Figure 7: Straight through cables.

2.5.2   Cross-Over Cables (Gray)

Standard Ethernet cross over cables are required when connecting the device directly to the Ethernet port of a PC.

NOTE

Cross over cables are typically labeled (cross over or XO) at one or both ends.
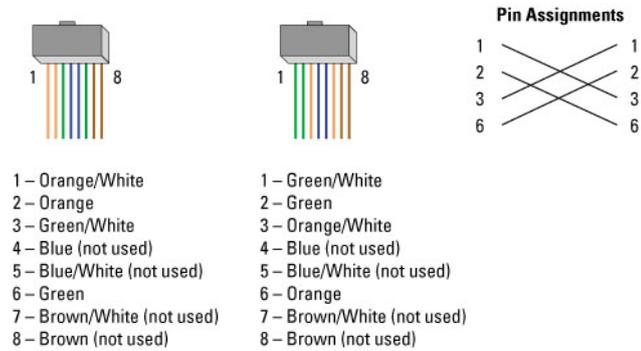
Figure 8: Ethernet cross over cables.

2.5.3   Direct Connection to the XPS-RL Controller

For a direct connection between a PC and the XPS-RL controller you need to use the crossover cable and the REMOTE connector at the back of the XPS-RL.

Figure 9: Direct connection to the XPS-RL using cross-over cable.

REMOTE Connection

The REMOTE plug has a DHCP server, which automatically assigns an IP address on the PC's Ethernet card. Ensure the Local Area Connection is set to Obtain an IP address automatically. After connecting the REMOTE connector on the back of the XPS-RL to the PC. Open Internet Browser and connect to http://192.168.254.254.

When the PC is connected to the XPS-RL, an Unidentified network will appear in your active networks found under Control Panel > Network and Sharing Center.
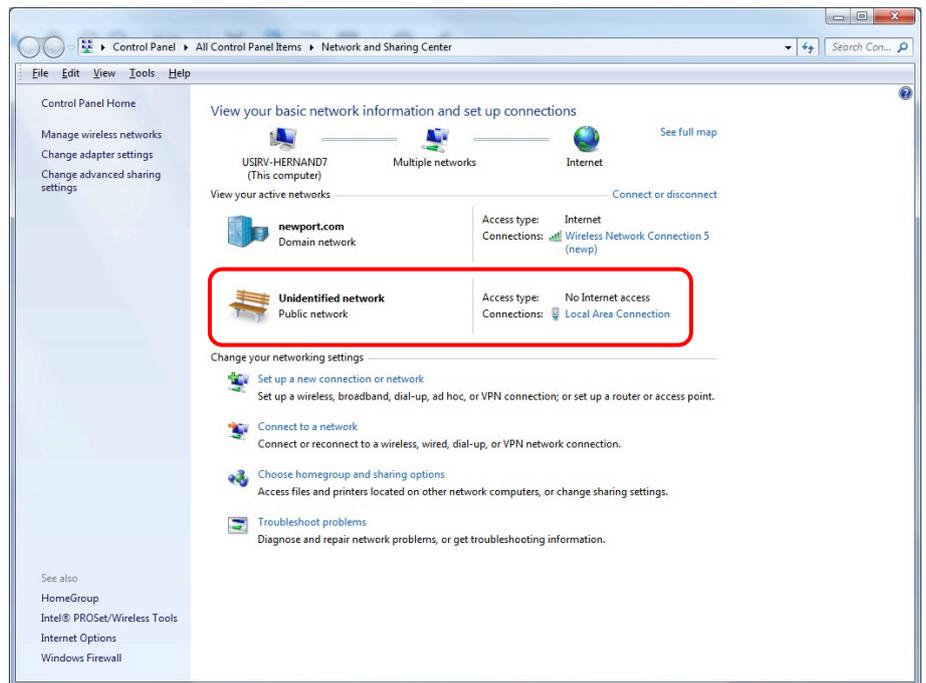
Following is the procedure to verify the Ethernet card address is set to Obtain an IP address automatically.

This procedure is for the Windows 7 operating system (almost similar process for Windows 8):

1. Start Button > Control Panel > Network and Sharing Center => Change adapter settings.

2. Right Click on Local Area Connection Icon and select Properties.
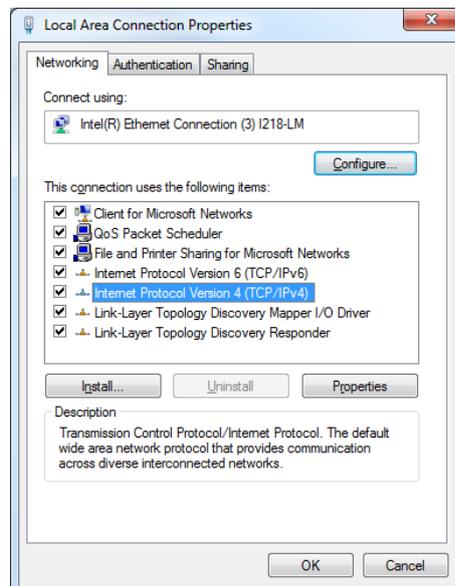
3. Highlight Internet Protocol Version (TCP/IP, TCP/IP4) and click on "Properties".
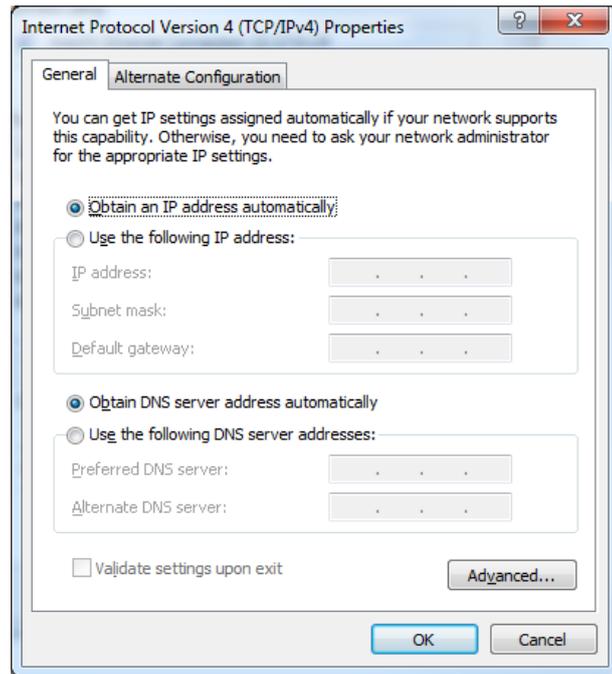
4. Verify Obtain an IP address automatically is selected and click "OK".

Once Obtain an IP address automatically is selected, you are ready to connect to the XPS-RL controller.

Following is the procedure for connecting to the controller:

5. Open Internet Browser and connect to http://192.168.254.254

Login:

Username:	**Administrator**
Password:	**Administrator** (Please see the picture below).
Role:	**Administrator**

NOTE

Please note that the login text is case sensitive.
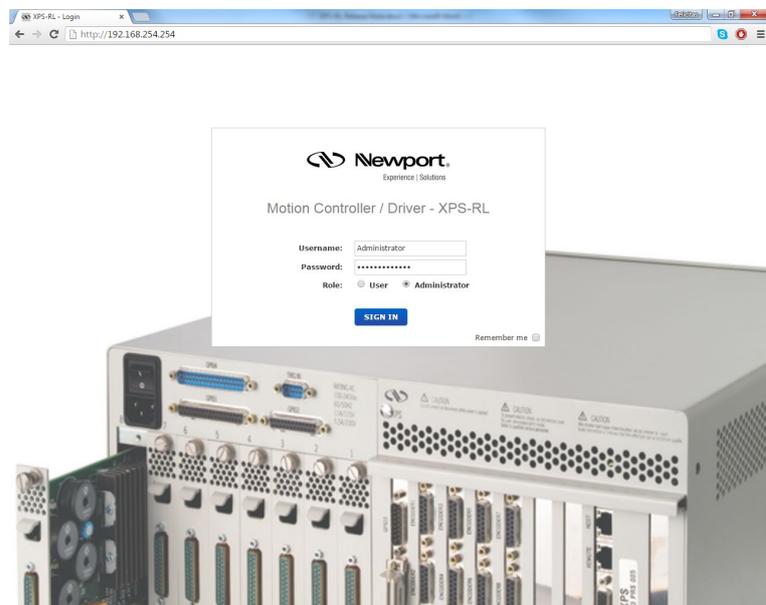
Once logged in, the XPS-RL has established a direct connection to the local computer.

If you don't want to connect the XPS-RL controller through a Corporate Network you may skip to Section 2.6: "Configuring the Controller".

NOTE

If you want to change the IP address of the XPS-RL controller, follow the explanation in the next section. It is necessary to keep using the gray cross-over Ethernet cable to connect the XPS-RL controller directly to the PC.

2.5.4   **Connecting the XPS-RL to a Corporate Network using Static IP Configuration**

Once you are logged in using the previously described steps for direct connection, you can change the IP configuration of the controller in order to connect the XPS-RL over a Network. Select "**Controller**" of the web-site and select the sub-menu "**IP management**".
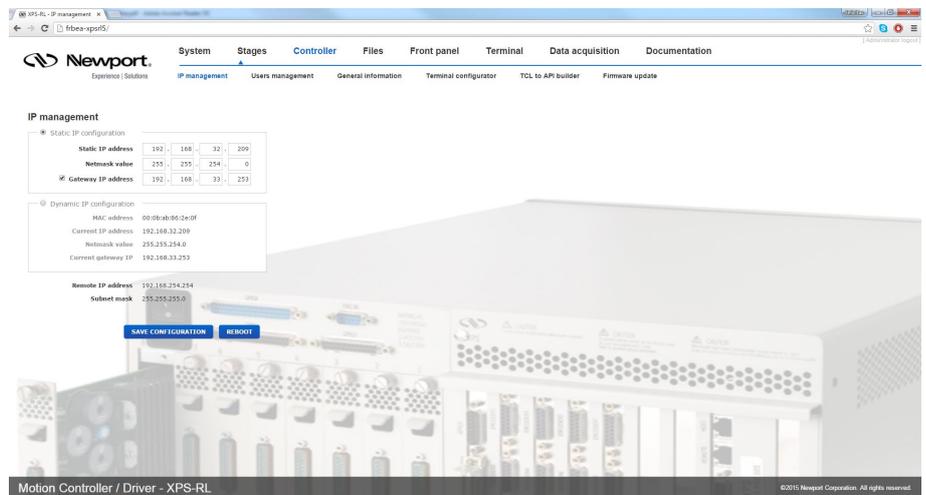
The Static IP address, the Netmask value and the Gateway IP address must be provided by your Network Administrator to avoid network conflicts. Once you have these addresses, you can input them in the IP configuration window as shown above. The above shown addresses are only examples.

NOTE

To avoid conflict with the REMOTE Ethernet plug, the IP address must be different from 192.168.254.

NOTE

For the majority of Networks, the setting above for the Netmask value will work. However, for larger networks (200 computers or more), the Netmask value address must be verified with the IT department. In most cases and for larger networks, the Netmask value is set to 255.255.0.0.

Once the appropriate addresses for the Static IP configuration are set, click on "**SAVE CONFIGURATION**" and the following screen appears:

Click "**OK**" and reboot the controller by clicking "**REBOOT**".

A pop-up windows appears showing the "**REBOOT IN PROGRESS**". When the boot sequence is complete, the user is redirected to the login page. The time to reboot is about 50 seconds.

Connect the CAT-5 network cable (black) to the HOST connector of the XPS-RL controller and to your network.

After restarting the controller, open the Internet browser and connect using your given Static IP address.

If you don't want to connect directly to the Corporate Network using the Dynamic IP Configuration, skip to Section 2.6: "Configuring the Controller".

2.5.5   Configuring the XPS-RL for Connection to a Corporate Network Using Dynamic IP Configuration

It is recommended to ask your IT department to configure the XPS-RL to your network to avoid any issue with your network policies and rules.

- Connect to the XPS-RL as described in Section 2.5.3: "Direct Connection to the XPS-RL Controller".
- Connect the host plug to your network using a direct cable.
- Get to **Controller → IP management** web page
- Select dynamic IP as shown below:
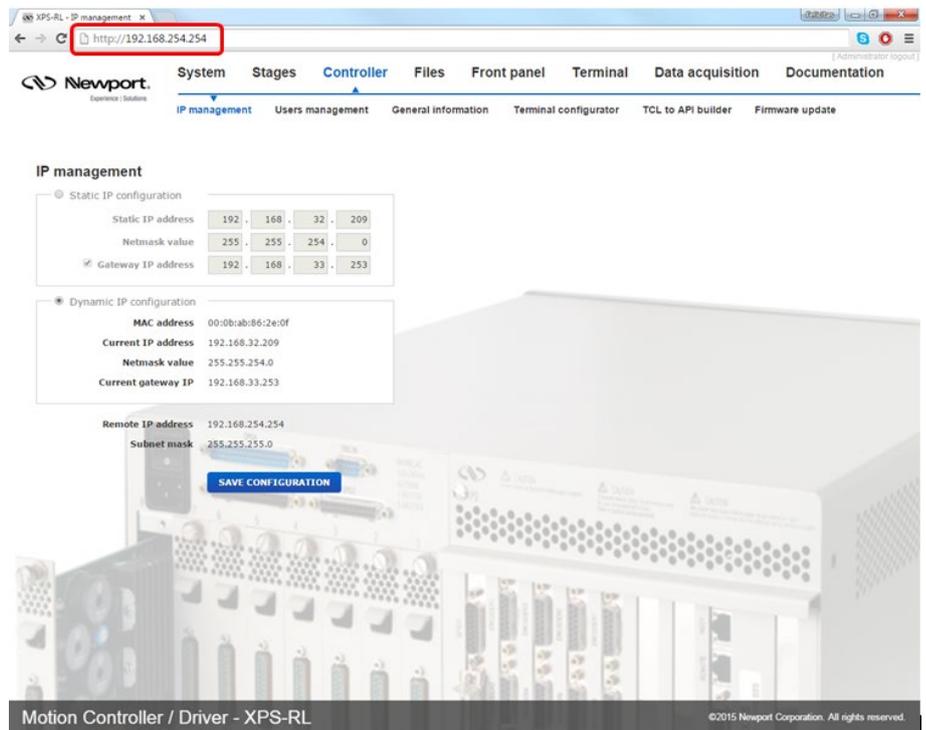
NOTE

It is needed to connected the controller to the network using the HOST plug before Reboot. If not, the controller will wait for the network DHCP and a timeout will happen.

Click the "**SAVE CONFIGURATION**" button and the following screen appears:

Click "**OK**" and reboot the controller by clicking "**REBOOT**".

Wait for controller to reboot, open the internet browser and connect to REMOTE

You can see the dynamic IP address in **Controller → General**.

The IP address delivered by your DHCP is displayed above.

In case the XPS-RL cannot negotiate an IP address from the DHCP the displayed address will be 0.0.0.0. In that case contact your IT department.

Remove the REMOTE cable and, if needed, configure your PC back to its original Ethernet configuration, you have saved before modification.

Make sure that the standard CAT-5 network cable (black) is connected to the HOST connector of the XPS-RL controller and to your network.

Open your internet browser and use the dynamic IP address.
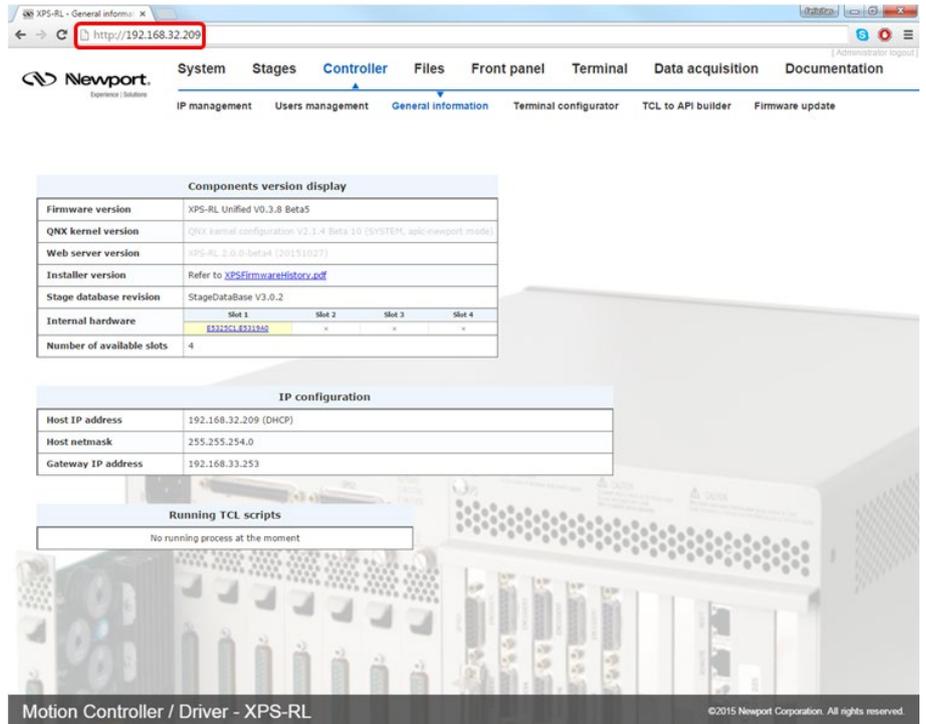
Check with your IT department that the lease time set at the DHCP is longer than the time you plan to leave the XPS-RL switched off otherwise you will lose your dynamic address and will need to connect to the REMOTE to know the new assigned one by the DHCP.

NOTE

Do not use Dynamic IP configuration if your DHCP server uses Windows NT 4.0

2.5.6   Recovering a lost IP configuration

If you want to recover a lost IP configuration, you need to connect the PC directly to the REMOTE connector at the back of the XPS-RL with the gray cross-over cable.

Figure 10: Direct connection to the XPS-RL
using a cross-over cable and the REMOTE connector.

First, the IP address on the PC's Ethernet card must be set to Obtain IP Address Automatically.

1. Open Internet Browser and connect to **http://192.168.254.254**

Login:

Username: **Administrator**

Password: **Administrator** (Please see the picture below).

Role: **Administrator**

NOTE

Please note that the login text is case sensitive.
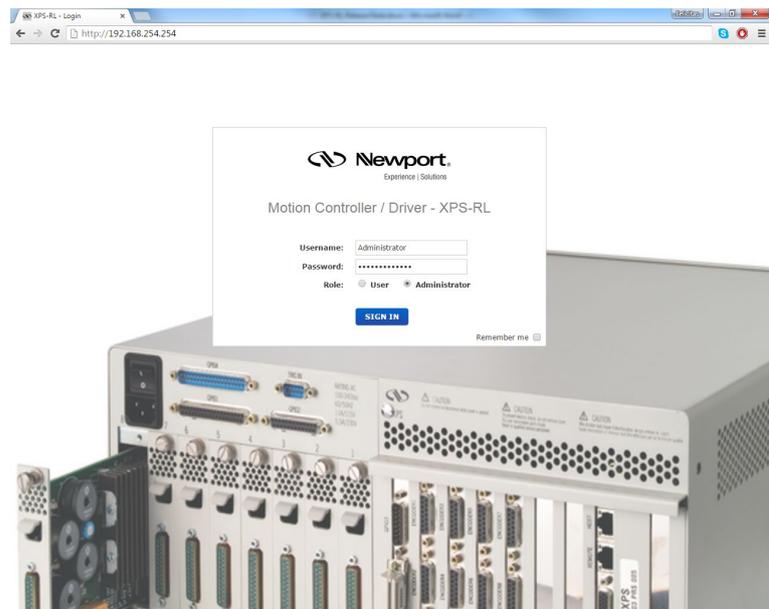
Once you are logged in, you can change the IP configuration by following the steps described in section 2.5.4 or 2.5.5 depending on your configuration.

NOTE

If you want to reset the IP address to the default factory setting, follow the section 2.5.4 to set the IP address back to 192.168.0.254.

2.6   Configuring the Controller

When the IP address is configured, the controller can be configured for the stages:

- Switch off the XPS-RL controller.

- Install driver boards inserting from left (driver 1) to right (driver 4) when looking at the rear of the controller.

- If less than four driver boards are used, the remaining slots must be disabled with the appropriate slot covers that were delivered with the controller.

- Connect the stages or motion devices.

- Switch on the XPS-RL controller and wait for the end of the boot sequence (approximately 50 seconds).

- Open an internet browser and connect to http://<your fixed IP address> (if connected to REMOTE plug, address is http://192.168.254.254)
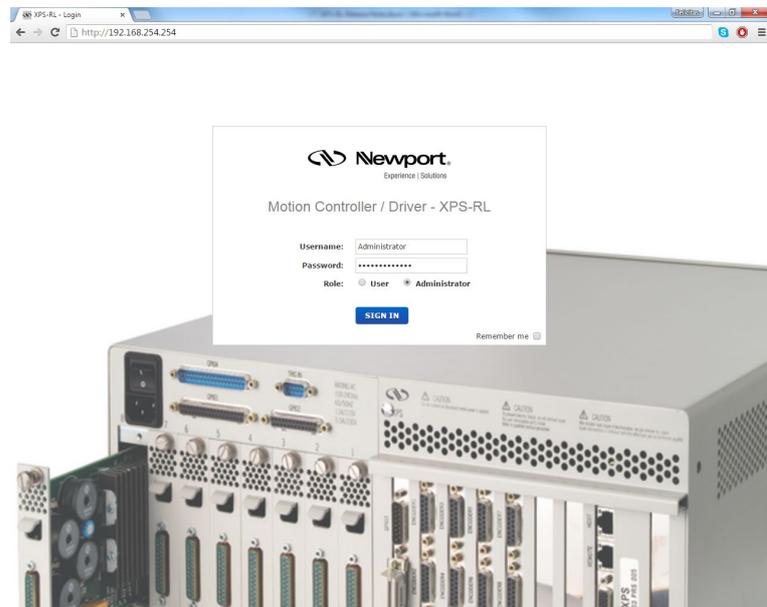
Login:

Username: **Administrator**

Password: **Administrator**

Role: **Administrator**

There are three possibilities to configure the controller: Default configuration, quick configuration and manual configuration. Default configuration is the simplest method to configure the controller, but has some limitations:

- Default configuration works only with Newport ESP compatible positioners.

- Default configuration configures all detected positioners as single axis groups. However, single axis groups provide limited functionality (no synchronized motion, no trajectories, no XY or XYZ compensation). To take full benefit of the capabilities of the XPS-RL controller, a manual configuration is needed.

- For non-Newport stages or very old Newport stages, manual configuration is required. See chapter Appendix F: "Configuration Wizard" in the XPS-RL User's Manual.

- Manual configuration is also required for some vacuum compatible stages (no ESP chip) and for stages with adjustable home position (-1, 0, +1), if the home position is changed from the standard position 0 to -1 or +1. The positions +1 and -1 require different settings in the stage data base, as the home switch position is not recognized by the ESP chip.

2.6.1   Default Configuration

When logged in as Administrator, select "**System**" then **"Default configuration"**. The following screen appears:
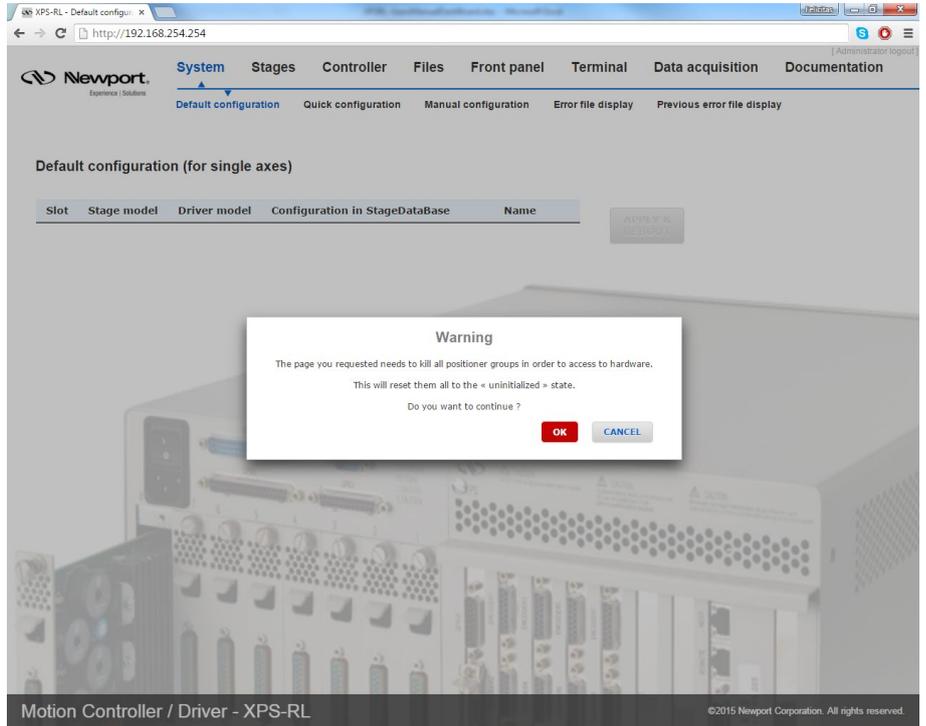
If you want to continue, click the "**OK**" button and the following page appears:
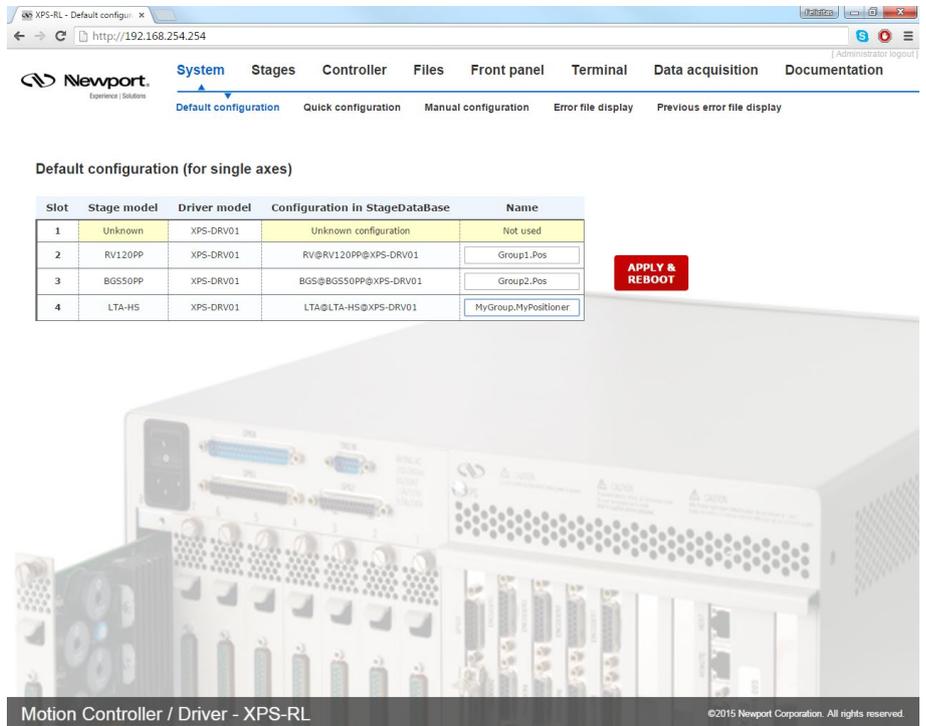
Check, if all connected stages are recognized by the system. To change the Group name type in desired name under the Name column. If all connected stages are recognized, click "**APPLY & REBOOT**".

When the controller has finished booting login, select "**Front panel**", and then select "**Move**". The following screen appears:

Click "**INITIALIZE**". The State number changes from 0 to 42 and the Action button changes from "**INITIALIZE**" to "**HOME**". Click "**HOME**". The stage starts moving to find its reference position. When done, the state number is 11 and the action button changes to disable. Enter an allowed position value in the "**Absolute move 1**" field and click "**GO**". The stage moves to this absolute position.

Your system is now ready to use. For more advanced functions, please read the XPS-RL User's Manual.

NOTE

In "DEFAULT-CONFIGURATION" the default group type is set as SingleAxis. To set the positioners to a different group type, use manual configuration.

2.6.2   Quick Configuration for Newport Positioners

Before using Quick Configuration, it is needed to populate the stages.ini file with the needed configurations, using "**Add, remove or edit**" stages under the main tab "**Stages**" (see chapter 2.6.3).

When logged in as Administrator, select "**System**", then "**Quick configuration**". The following screen appears:
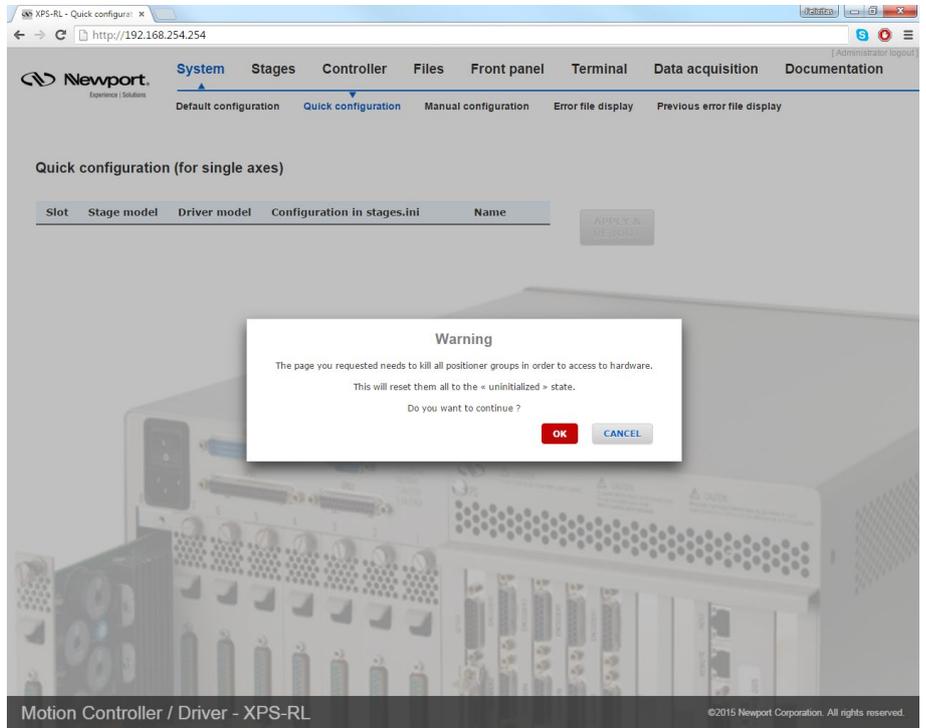
If you want to continue, click the "**OK**" button and the following page appears:
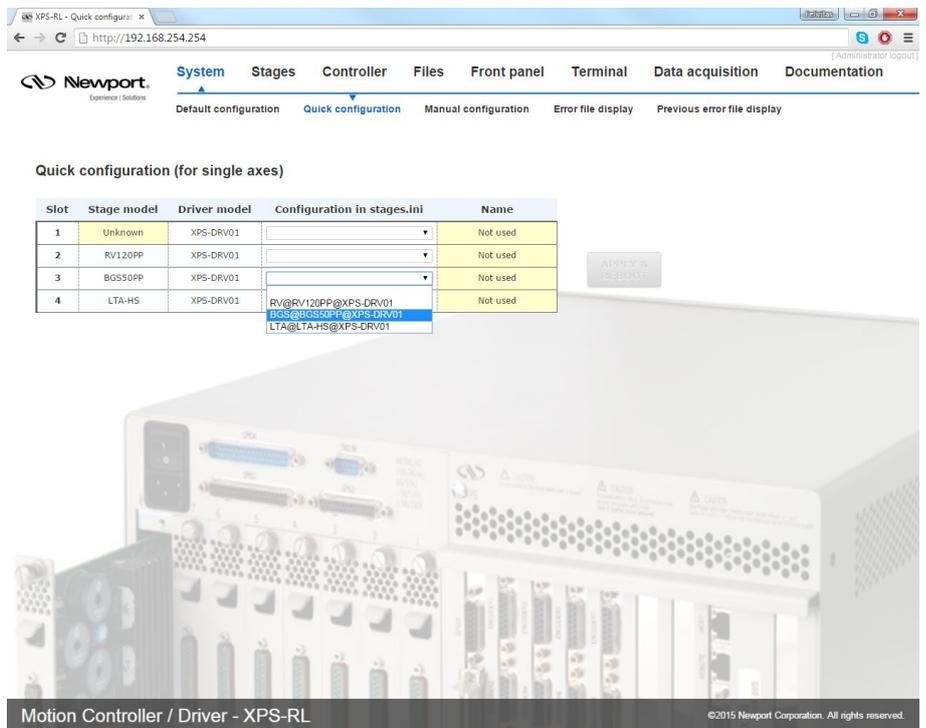
Check, if all connected stages are recognized by the system under Stage model. Use the drop down menu to select the stage configuration for the selected axis. The drop down menu lists stage configuration(s) available from the stages.ini file stored on the XPS-RL controller. To add stage parameters to the stages.ini file click on "**Stages**" then click "**Add, remove or edit stages**".

If all stages are recognized and after selecting the stage parameters, click "**APPLY & REBOOT**" and the following page appears:
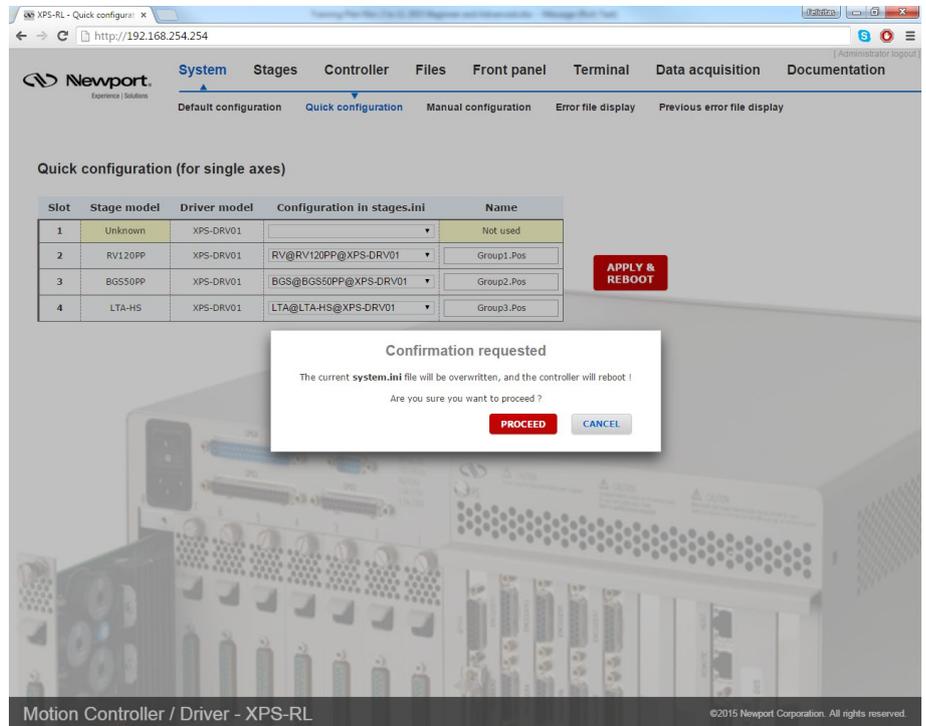
To configure the XPS-RL click "**PROCEED**". The controller reboots and the Login screen appears (this may take about 50 seconds).

When the controller has finished booting, Login, select "**Front panel**", and then select "**Move**". The following screen appears:

Click "**INITIALIZE**". The State number changes from 0 to 42 and the Action button changes from "**INITIALIZE**" to "**HOME**". Click "**HOME**". The stage starts moving to find its reference position. When done, the state number is 11 and the action button changes to disable. Enter an allowed position value in the "Absolute move 1" field and click "**GO**". The stage moves to this absolute position.

Your system is now ready to use. For more advanced functions, please read the XPS-RL User's Manual.

NOTE

In "Quick-configuration" the default group type is SingleAxis. To set the positioners to a different group type, use "Manual configuration".

2.6.3   **Manual Configuration for Newport Positioners**

Manual configuration provides users access to all capabilities of the XPS-RL controller.

For manual configuration, users first need to build the stage data base using the web tool "**Add, remove or edit stages**" under the main tab "**Stages**". When adding a new stage from this web tool, the controller copies the parameters from its internal database (which contains parameters for all Newport stages) and stores these parameters in a file called stages.ini. Hence, the stages.ini file contains the parameters for only a subset of stages as defined by the user. Users can assign any name for their stages. The default name is the Newport part number, but in some cases it makes sense to use a different name. This way, for instance, it is possible to add the same set of parameters several times in the stage data base under different stage names. Later, you can modify certain parameters, like travel ranges or PID settings, to optimize the stage for different applications.

All stage parameters can be modified using the Web Tool "**Add, remove or edit stages**" under the main tab "**Stages**". Click on a stage to duplicate, rename, modify or delete it. Another Web Tool for modifying stage parameter can be found under "**Files**" → "**Configuration files**" using the text editor (see chapter 4.31 of the User's Manual for details). Alternatively, the stage parameters can be modified directly in the stages.ini file using a text editor. The stages.ini file is located in the Config folder of the XPS-RL controller. This folder is accessible via ftp.

When all stages are added to the stages.ini file, build the system using the web tool "**Manual Configuration**" under the main tab "**System**". In this tool, the stages get assigned to positioners and the positioners get assigned to motion groups. Please refer to chapter 6.3 (in the XPS-RL User's Manual) for details on the different motion groups and their specific features. The group name and positioner name can be any user given name. Once the system has been built, all system information is stored in a file called system.ini. Also, the system.ini file is located in the Config folder of the XPS-RL controller and can be viewed or edited from the Web Tool text editor under "**Files**" → "**Configuration files**".

The following describes the different steps needed to add a stage, to modify the stage parameters and to build a manual configuration. Chapter 4.0 in the XPS-RL User's Manual provides further information about some of the steps described here.

Once you are logged in as Administrator, click on "**Stages**" and then click on "**Add, remove or edit stages**".

1. The following screen appears:
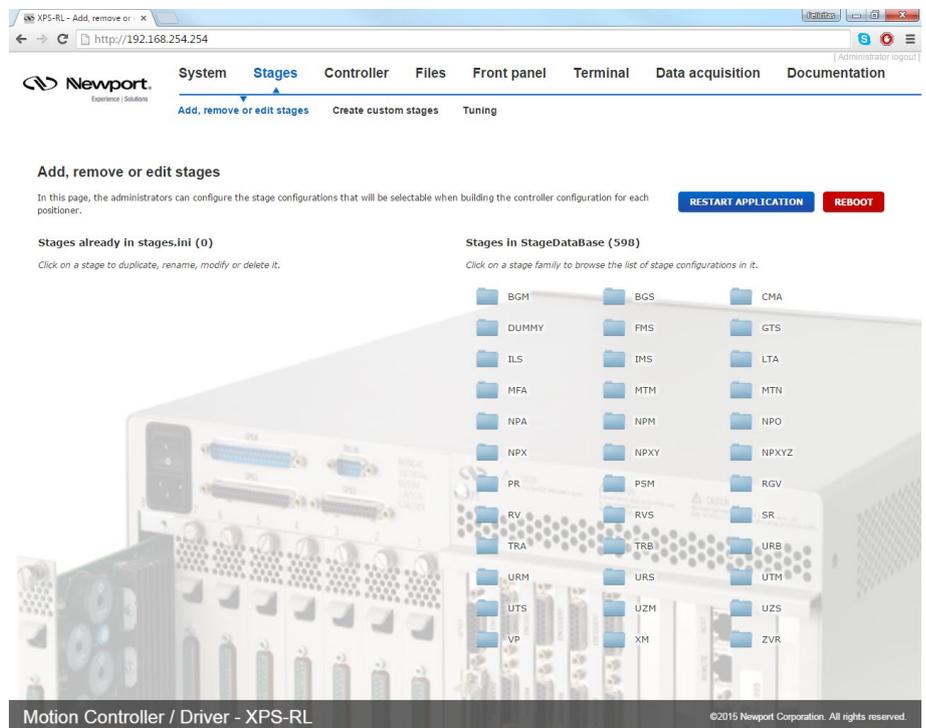
2. Click on the family name from the Stages in StageDataBase list and a pop up window appears.

3. Click the part number corresponding to your hardware.

4. Select the driver (corresponding to your hardware) and configuration.

For all continuous rotation stages, you can choose between a "regular" stage configuration and a "Spindle" configuration. A Spindle is a specific rotary device (no indexing) with a periodic position reset at 360° (by default), meaning 360° equals 0°. When defining the stage as Spindle in the stages.ini, you must assign this stage also to a Spindle group in the system configuration and vice versa. For details about Spindles, please refer to section 6.3 in the XPS-RL User's Manual.

For some stages, you can choose between "regular" initialization or LMI (Large Move Initialization). The LMI method produces a larger movement of the stage for commutation and could be used if "regular" initialization fails.

5. The box "**Use ESP Compatibility for Hardware detection**" is checked by default. If your stage has an ESP chip inside (see the ESP-compatible sticker on the stage)

this box should remain checked. Otherwise, with vacuum compatible stages or with old Newport stages, or with non-Newport stages, uncheck this box.

6. Click on "**ADD**" to add the stage to the stages.ini file.

Once all stages have been added to the stages.ini file, you can review or modify these parameters from the screen "**Add, remove or edit stages**" under the main tab "**Stages**" by clicking on the stage name icon. A pop up windows appears which allows the user to make changes.

NOTE

From this screen, you have access to all stage parameters. Only experienced users should modify these parameters. For the exact meaning of the different parameters, please refer to Appendix F: "Configuration Wizard" in the XPS-RL User's Manual.

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7. When all stages have been added to the stages.ini file, click on "**Manual configuration**" under "**System**". The following screen appears:

8. Click on one of the "**Group families**".

For example, if you are setting up two ILS stages, you can set them up as two "**Single axis groups**", one "**XY axes groups**" or one or two "**Muliple axes groups**".

9. Click on "**Create a new group**" and the following pop up window appears:
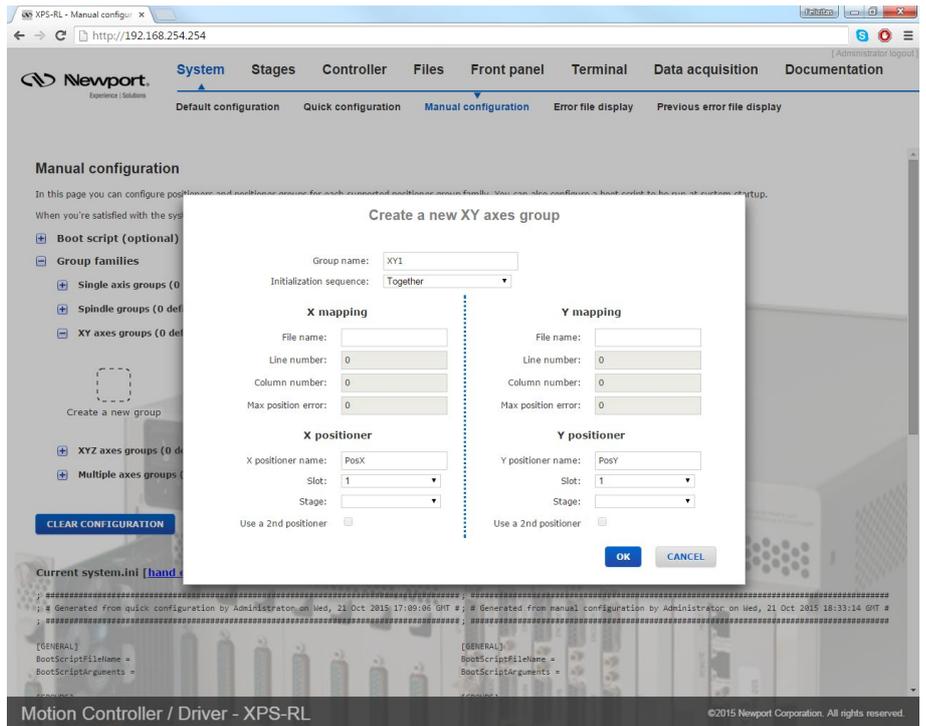
10. Enter the group name as well as the positioner names.

   Any group name and any positioner name can be used. In this example the group name is TRB_XY and the X positioner name is TRB25_X. The home sequence can be either "**Together**" or "**X then Y**".

   The other fields refer to the error compensation (mapping) of the XPS-RL controller, see chapter 10.0 for details. For the first configuration, don't enter anything in these fields.

11. Enter the appropriate Slot number. The Slot number is the axis number where the stage is physically connected to the XPS-RL controller. Looking at the rear of the controller, plug number 1 is the first plug on the left and the number increases to the right.
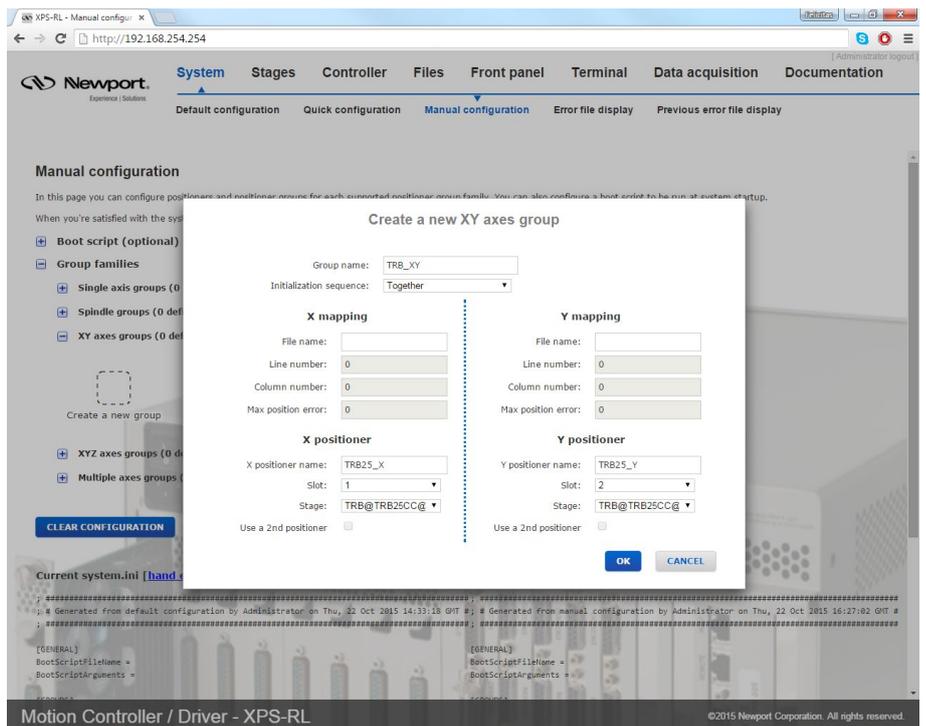
12. Select the Stage Name from the list of stages. These stage names refer to the stages defined with the Web Tool "Stage Management".

13. Click on "**OK**" to return to the initial screen.
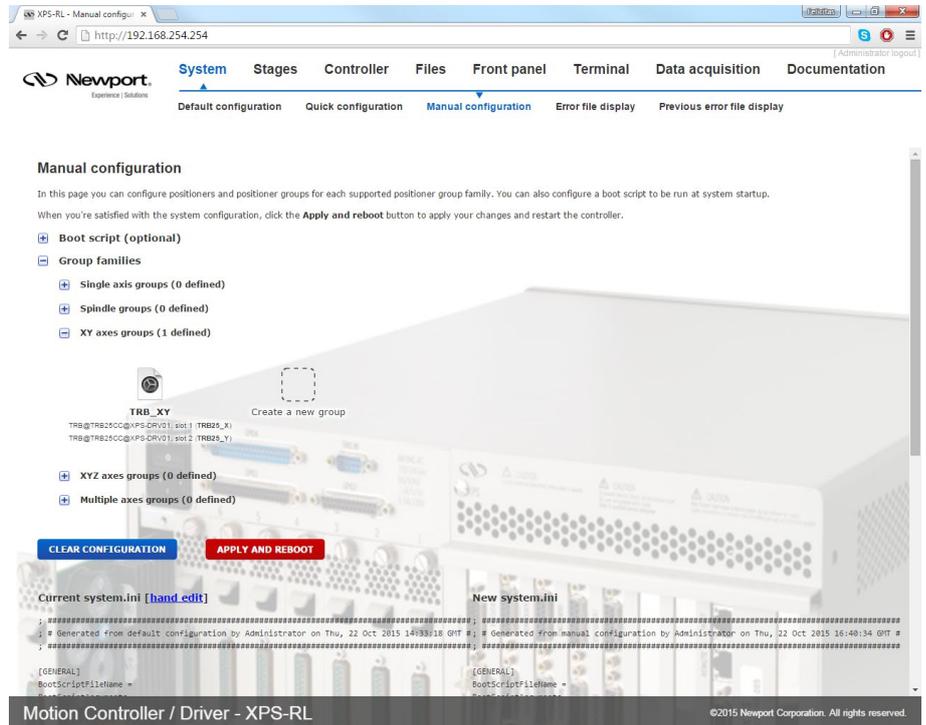
14. Continue the same way with the other motion groups.

15. When done, click on "**APPLY AND REBOOT**" to complete the system configuration. The controller re-boots and the following message appears:
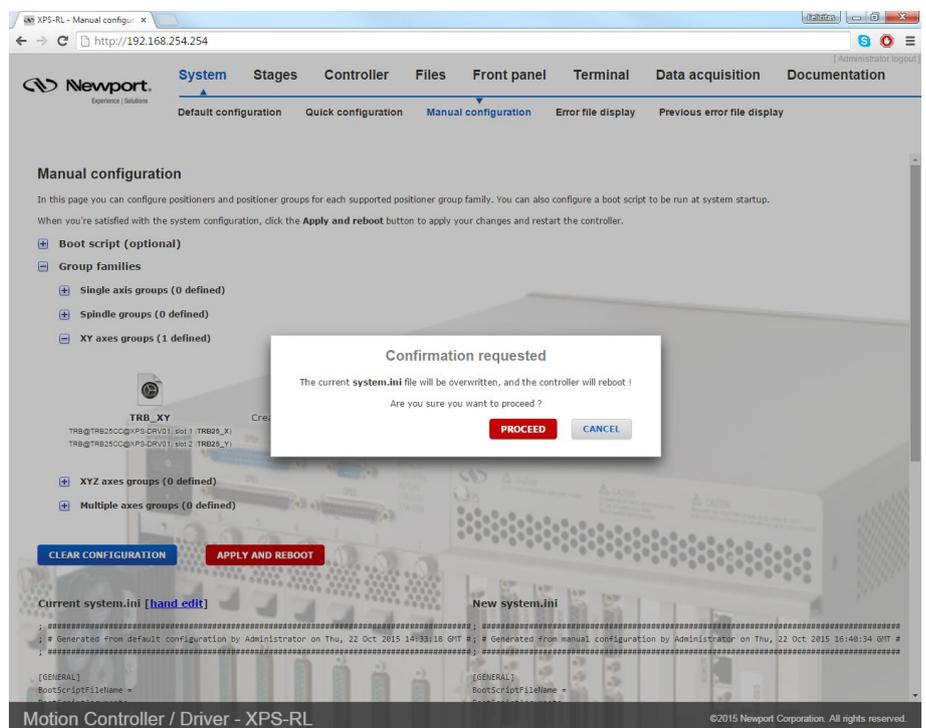
Click on "**PROCEED**".

When the controller has finished booting (this may take about 50 seconds), you are redirected to the login page. Login then select "**Front panel**", then select "**Move**". The following screen appears (Group names will be different according to your definition):
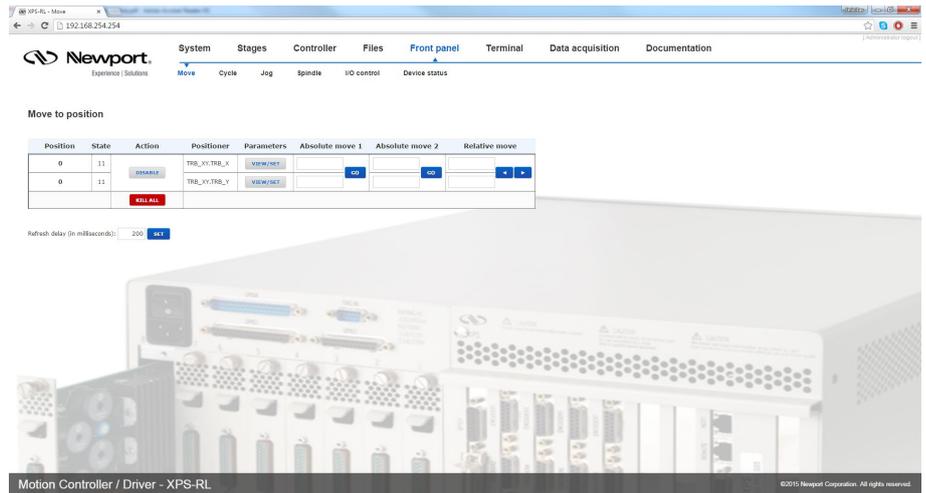
Click "**INITIALIZE**". The State number changes from 0 to 42 and the Action button changes from "**INITIALIZE**" to "**HOME**". Click "**HOME**". The stage starts moving to find its reference position. When done, the state number is 11 and the action button is "**DISABLE**". Enter an allowed position value in the "**Absolute move 1**" field and click "**GO**". The stage moves to this absolute position.

Your system is now ready to use. For more advanced functions, please read the rest of this manual.

2.6.4   Manual Configuration for non Newport stages

To configure the XPS-RL controller to stages or positioning devices not made by Newport, use the tool "**Create custom stages**" under the main tab "**Stages**". For detailed information about this tool, please refer to Appendix F: "Configuration Wizard" in the XPS-RL User's Manual.

2.7   System Shut-Down

To shut down the system entirely, perform the following procedure:

Wait for the stage(s) to complete their moves and come to a stop.

Turn off the power using the power switch located above the power cord at the back of the controller.

3.0   XPS-RL Controller/Driver Documentation

To maximize the value of the XPS-RL Controller/Driver system, it is important that users become thoroughly familiar with available documentation:

The User's Manual & Motion Tutorial

This book contains the majority of the information about the XPS-RL system. This reference manual also provides an exhaustive overview of the XPS-RL architecture, and a complete description of its features and capabilities. It contains the following sections:

- System overview (Hardware, front and rear panels descriptions, Ethernet connection, programming).
- Getting started guide (unpacking, inspection, system set up, connection, configuration).
- Software tools description (web site interface).
- FTP (File Transfer Protocol) Connection.
- Maintenance and service (cleaning, service, troubleshooting).
- Explanations of XPS-RL architecture (state diagrams, motion groups, units).
- Motion modes (move, jog, master slave, analog tracking).
- Trajectories (line-arc, splines, PVT, PT, conventions, mathematical explanations).
- Compensation (backlash, linear error correction, positioner/XY/XYZ mapping).
- Event triggers (event, actions, examples).
- Data gathering (internal and external).
- Triggers (position compare output, position capture).
- Control loops (XPS-RL servo loops, filtering and limitation, feed forward loops and servo tuning).
- Analog encoder calibration.
- Introduction to XPS-RL Programming.
- Appendices: hardware, general I/O description, power inhibit connector, GPIO connectors, PCO connector, motor driver boards pinning diagrams, and analog encoder connector.

The Programmer's Manual

This book is the general programmer's guide for the experienced user. It provides explanations of all functions and a list of all API's with complete syntax (TCL and DLL prototypes), parameters, errors, and short descriptions. It refers to the motion tutorial for more thorough explanations on some features. It details:

- TCP/IP communication explanations and functions.
- Firmware features and list of API's by groups: General features, Positioners, Single Axis groups, XY groups, XYZ groups, Multiple Axes groups, analog and digital I/O's, gathering, events and actions, TCL programming, version).
- Examples of motion processes.

The Software Drivers Manual

This book provides all information about software tools and drivers shipped with the XPS-RL:

- . NET assemblies (32 & 64 bits).
- Examples for common languages.

Downloading Documentation

In order to provide user's access to the most actual documentation, the User's Manual, Programmer's Manual, and the Software Drivers Manual are only supplied as software copies. They can get accessed from the XPS web site:

1. Follow directions on Section 2.5: Connecting to the XPS-RL

2. After logging in, click on the "Documentation" tab

Newport®

Service Form

Your Local Representative

Tel.: _____

Fax:_____

Name: _____

Company:_____

Address: _____

Country: _____

P.O. Number: _____

Item(s) Being Returned:_____

Model#: _____

Return authorization #: _____
(Please obtain prior to return of item)

Date: _____

Phone Number: _____

Fax Number: _____

Serial #: _____

Description: _____

Reasons of return of goods (please list any specific problems): _____

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