

# Plus-X 300

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*Installation and Operation Manual*



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## Introduction

The Plus-X 300 works in conjunction with the Burk Technology ARC Plus transmitter remote control to provide eight inputs and eight outputs for remote monitoring and control. Metering and status inputs are sent from the Plus-X 300 to the ARC Plus via Ethernet. The ARC Plus then reports these values as independent metering and status channels. The relay outputs on the Plus-X 300 are controlled by the ARC Plus via commands and macros.

The Plus-X 300 has eight (8) inputs, each configurable as metering or status. Eight (8) output relays allow control of site equipment. Relays may be activated independently or operated in pairs for mutually-exclusive output.

## Compatibility

Before installing the Plus- X 300, please verify that the ARC Plus firmware, AutoPilot software and AutoLoad Plus software versions are current. Updates are available at [www.burk.com/downloads](http://www.burk.com/downloads).

The following are minimum software and firmware requirements:

<i>Software</i>	<i>Version</i>
<b>ARC Plus firmware</b>	2.0 or higher
<b>AutoLoad Plus software</b>	2.0 or higher
<b>AutoPilot® software</b>	2.6 or higher

## Installation

The Plus-X 300 ships with the following parts, which are required for installation:

- (1) Ethernet cable
- (1) 15V wall adapter
- (1) 2-pin Phoenix-type connector (for power connection)
- (1) 9-pin Phoenix-type connector (for input channels)
- (2) 12-pin Phoenix-type connectors (for relay outputs)
- (4) Rubber feet (for optional horizontal mounting)

For wall mounting, secure the Plus-X 300 using #8 hardware (not included) and chassis cutouts. Alternatively, the Plus-X 300 may be mounted flat on top of an equipment rack, shelf or another suitable location.

## Input Wiring

Metering and status channels are wired to the Plus-X 300 using the included 9-pin connector block. To connect metering and status inputs, loosen the screws on the connector block and connect voltage wiring from the site equipment to the Phoenix connector inputs to align with the

1-8 numbering on the chassis. Insert a common ground reference to the Phoenix connector to align with the ground symbol on the chassis. Tighten the set screws.

### Relay Output Wiring

Command output wiring is facilitated by the two 12-pin connector blocks. Each relay 1-8 has Common (C), Normally Open (NO) and Normally Closed (NC) connections labeled on the rear panel. Loosen the set screws on the Phoenix connectors and make wiring connections according to the requirements of the site equipment under control. Tighten the set screws.

When finished making equipment connections, disconnect the Phoenix connectors from the Plus-X 300 until configuration is complete.

### Power & Ethernet Connections

Apply power to the Plus-X 300 by connecting the 2-pin power connector to the rear-panel input marked POWER. The power connector is pre-wired to the 15V wall adapter. Plug the power adapter into a standard 120V outlet. The POWER LED will illuminate.

Finally, connect the included Ethernet cable to your network switch.

### Important!

The Plus-X 300 must be addressable by the ARC Plus to which it will communicate. Consult your IT department prior to configuration to resolve any IP address or firewall conflicts.

### Configuration

Configuring the Plus-X 300 involves establishing the network settings, setting up channel parameters, setting the password, and then adding the newly configured Plus-X channels to the ARC Plus system.

To configure the Plus-X 300, open a web browser and enter the unit's IP address in the address bar. Prior to network configuration, the Plus-X 300 operates on a default IP address of 192.168.0.100. When the login screen appears, enter the user name and password for the unit. The user name is **admin** and the default password is **password**.

## Network Settings

After logging in, the first page you will see is the Network Settings page. Enter the network settings where prompted. Note that the default Plus-X port of 45000 will work in most installations. However, if you have changed the Plus-X port during ARC Plus configuration the Plus-X port you enter here should match that setting. The ARC Plus IP address field calls for the IP address of the ARC Plus that will host the metering, status and command channels of the Plus-X 300.

Press the **Update Settings** button when you are finished.

**Burk Technology Plus-X 300**  
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Network Settings	
IP Address:	192.168.1.100
Subnet:	255.255.255.0
Gateway:	192.168.1.1
Plus-X Port:	45000
HTTP Port:	8080
ARC Plus IP Address:	192.168.1.211

ARC Plus Link: [Link Down](#)

[Logout](#)

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Ver 0.0.0.6

## Channel Settings

The Channels page is where you configure high and low status thresholds for up to eight status channels, as well as relay behavior for each of eight relay outputs.

In the Status Thresholds table, enter the input values that will trigger status changes from low to high and vice versa. The **Lower** threshold is the value below which a voltage sample must decrease in order to change the status from high to low. The **Upper** threshold is the value above which a voltage sample must increase in order to change the status from low to high.

Voltages between the lower and upper thresholds do not cause a status change on the ARC Plus. For example, if a voltage sample increases beyond the Lower threshold, but does not reach the Upper threshold, the status indicated on the ARC Plus does not change.

Status Thresholds			
Input	Lower (mV)	Upper (mV)	Update
1	<input type="text" value="1000"/>	<input type="text" value="1000"/>	<input type="button" value="Update"/>
2	<input type="text" value="1000"/>	<input type="text" value="2500"/>	<input type="button" value="Update"/>
3	<input type="text" value="1000"/>	<input type="text" value="2500"/>	<input type="button" value="Update"/>
4	<input type="text" value="1000"/>	<input type="text" value="2500"/>	<input type="button" value="Update"/>
5	<input type="text" value="1000"/>	<input type="text" value="2500"/>	<input type="button" value="Update"/>
6	<input type="text" value="1000"/>	<input type="text" value="2500"/>	<input type="button" value="Update"/>
7	<input type="text" value="1000"/>	<input type="text" value="2500"/>	<input type="button" value="Update"/>
8	<input type="text" value="1000"/>	<input type="text" value="2500"/>	<input type="button" value="Update"/>

Note that each input may be used as a metering channel, status channel or both. In other words, an analog temperature reading may also drive “high temp” and “low temp” status alarms.

Next, define the behavior for each of eight relay outputs. Each relay may be set for momentary or latching output. Check the **Pair Relay Channels** box in order for the relays to act as mutually exclusive pairs. When this box is checked, a command to one relay will cause the second relay to de-energize.

	Relay 1	Relay 2
Type	<input checked="" type="radio"/> Latching <input type="radio"/> Momentary	<input checked="" type="radio"/> Latching <input type="radio"/> Momentary
<input type="checkbox"/> Pair Relay Channels		
<input type="button" value="Update Relay 1 &amp; 2"/>		

*Note: When the **Pair Relay Channels** box is checked, it is recommended to configure the two paired relays with the same behavior (Latching / Latching or Momentary / Momentary). If one relay is configured as Latching and the other as Momentary, a command to the momentary relay will de-energize the latching relay. After the momentary command is finished, both relays will remain de-energized until a new command is issued to one of the relays.*

## Security

Navigate to the Security page to set the password for the Plus-X 300. This password is used only to access the Plus-X configuration screens. ARC Plus user names and passwords are set up using AutoLoad Plus software.

The Plus-X 300 user name is always **admin**.

**Plus-X 300**

[Network](#)
[Channels](#)
[Security](#)
[Diagnostics](#)
[Refresh](#)

Password	<input type="password" value="••••••••"/>
Re-type Password	<input type="password" value="••••••••"/>
<input type="button" value="Update"/>	

## Adding Plus-X Channels to the ARC Plus

Now that you have configured the input and output channels on the Plus-X 300, these channels may be added to the ARC Plus site using AutoLoad Plus. To add Plus-X 300 channels to the ARC Plus:

1. Launch AutoLoad Plus and connect to the ARC Plus site to which the Plus-X 300 is linked.
2. From the **Edit** menu, select **Plus-X Devices...** and click **New**.
3. When the Plus-X Settings window appears, select Plus-X 300 from the device type drop-down. Enter a description of the Plus-X 300 for your own reference, followed by the IP address and Plus-X port, both of which are already configured on the Plus-X 300.
4. Check the box marked **Map Default Set of Channels** to add all eight inputs and eight relays to the ARC Plus. If you are not using all Plus-X 300 channels or if you do not wish for them to appear in sequential order, you will need to manually map these channels later. In this case, leave the **Map Default Set of Channels** box unchecked.
5. Press **OK** to close the Plus-X Settings window. Press **OK** to close the Plus-X Devices window.
6. To manually map Plus-X 300 channels to the ARC Plus, click the Metering, Status or Commands tabs, as appropriate. Locate an unused channel and click the [...] button in the Source column. This will bring up the Source dialog box. Click the **Plus-X** button and choose the Plus-X 300 channel you wish to use. At least one meter channel and one

command channel on the Plus-X 300 must be configured within the ARC Plus for the Plus-X device to register as online in the ARC Plus system.

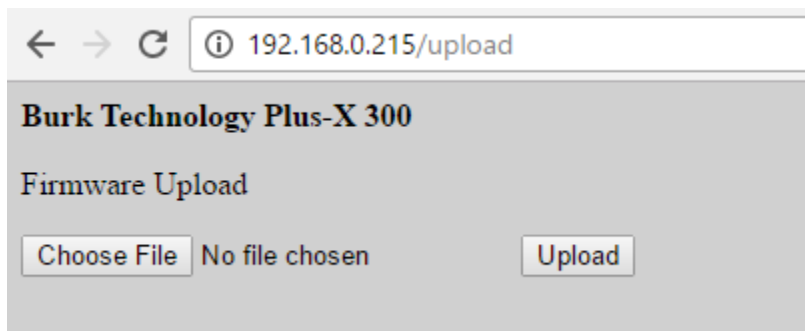
7. Configure labels, limits and alarms for the newly added Plus-X 300 channels in the same way as you would configure labels, limits and alarms for normal ARC Plus channels.
8. Lastly, you will need to calibrate the Plus-X 300 channels. If you have not already connected the input connector blocks, do so now. Then click the **Calibration** icon in the AutoLoad Plus toolbar to complete the calibration process.

## Restoring Factory Configuration

To reset the unit to its default configuration, press the front panel **Config** button three times. The Power LED will blink to confirm the configuration has been reset. Note that the restoring default configuration will reset the unit's password to **password** and revert the IP address to 192.168.0.100.

## Uploading New Firmware

After logging into the Plus-X 300 web interface, edit the URL in your web browser to [address]/upload, where [address] is the IP address assigned to the Plus-X 300. This will take you to the upload page.



Click the Choose File button to select the firmware file, then click Upload to load the new firmware. The Plus-X 300 will reboot after the firmware upload is complete.

## Operation

### Taking Readings & Issuing Commands

Once you have added Plus-X 300 channels to the ARC Plus, they appear on the ARC Plus front panel, AutoPilot software, Web Interface and RSI speech interface just as any other ARC Plus channel. They can be used in macros and custom views. The Plus-X 300 is responsible for reporting the raw sample values to the ARC Plus, while the ARC Plus applies the calibration constant, limits and alarm settings.

### Maintenance Mode

Maintenance Mode is a safety feature that prevents command execution while personnel are performing work at the remote site. Maintenance Mode on the Plus-X 300 can be activated by

two means: 1) placing the ARC Plus in maintenance mode using the ARC Plus front panel menus; and 2) placing the Plus-X 300 in maintenance mode using the Plus-X front panel MAINT button.

When the ARC Plus is in maintenance mode, it will not issue commands or macros to any ARC Plus channels, including Plus-X 300 channels. It is still possible to issue test commands via the Plus-X 300 diagnostics page (see page 6).

When the Plus-X 300 is in maintenance mode, the ARC Plus can issue commands and macros to other channels, but Plus-X 300 commands are disabled.

Maintenance mode must be toggled from the respective front panels. For safety reasons, it cannot be enabled or disabled by any remote means.

## Diagnostics

The Plus-X 300 has a diagnostics page built in to the configuration web pages. This allows administrators to verify raw input voltage readings against real-world measurements and to test relay behavior; it is not intended for routine monitoring and control of equipment.

To access the diagnostics page, open a web browser and enter the IP address of the Plus-X 300. After logging in, use the links at the top of the screen to navigate to the Diagnostics page.

## Getting Help

For technical support, please email [support@burk.com](mailto:support@burk.com) or call our direct technical support line at 978-486-3711. We will be glad to assist you. The technical support office is open Monday – Friday, 9AM to 5PM Eastern time.

## Warranty

Burk Technology, Inc. warrants the Plus-X 600 to be free of defects in materials and workmanship for a period of 24 months from the date of purchase. Equipment will be repaired or replaced at the option of Burk Technology and returned freight prepaid to the customer. Damage due to abuse or improper operation or installation of the equipment or caused by fire or flood or harsh environment is not to be covered by this warranty. Damage in shipping is not the responsibility of Burk Technology. A return authorization must be obtained before returning any equipment. Materials returned under this warranty must be shipped freight prepaid and insured in the original shipping carton or suitable substitute to Burk Technology, Inc., 7 Beaver Brook Road, Littleton, MA 01460. Repairs not covered under this warranty will be made at prevailing shop rates established by Burk Technology.

THE WARRANTY SET FORTH ABOVE IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. BURK TECHNOLOGY, INC. SHALL NOT BE LIABLE TO ANY PARTY FOR ANY INCIDENTAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OF THIS EQUIPMENT.



## Appendix A: Specifications

### Dimensions:

1.35" (3.43cm) H

9.2" (23.4cm) W

3.85" (9.78cm) D

### Operating Temperature:

0° to 50°C

0 to 95% RH, non-condensing

### Power Requirements:

15VDC at 0.5A (power adapter included)

### Metering Inputs:

>0 to 10VDC, 10mV resolution

### Status Inputs:

>0 to 28VDC or switch closure

### Relay Outputs:

5A, 240VAC, form C relay outputs, (C, NO, NC), each user-configurable for momentary or latching output

### Hysteresis:

User-configurable set points per input channel

### Mounting:

Keyhole slots for surface mounting; Available RMA300 rack mount adapter.