Plus-X IIU

Installation and Operation Manual

BURK TECHNOLOGY

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Introduction

The Plus-X Integrated Input Unit is used to connect site equipment to the ARC Plus. Each Plus-X IIU connects up to 16 metering and 32 status channels. 16 inputs are dedicated to status. 16 inputs may be used as meter or status, for a total of up to 32 status channels. Plus-X IIU units are connected to the ARC Plus via LAN or WAN. Up to 32 Plus-X devices can be connected to each ARC Plus.

Front Panel Indicators

Front panel of the Plus-X IIU

Indicator	State	Description
Power LED	Off	Power is off
Power LED	Green	Power is on
Power LED	Amber	No firmware loaded (contact Technical Support)
Power LED	Red	Resetting to factory default settings
Link LED	Green	Connected to ARC Plus
Link LED	Red	No connection to ARC Plus

Rear Panel Features

Rear panel of the Plus-X IIU

The Plus-X IIU accepts 16 metering or status channels (left side of panel) and 16 status channels (right side of panel). Ethernet and AC power connections and the Master Init button are also located on the rear panel.

Network Settings

Each Plus-X IIU must be assigned a static IP address for communication with the ARC Plus remote control system. However, using a dynamic IP address assigned by Dynamic Host Configuration Protocol (DHCP) is an easy way to do initial setup of the Plus-X IIU. This document describes the procedure for establishing initial communications with a Plus-X IIU in a network that supports DHCP and in a network that does not.

The table below lists the firmware version in which DHCP functionality was introduced for the Plus-X IIU. The table also specifies the default hostname that must be used for initial connection to the Plus-X IIU when it is installed on a network that supports DHCP.

Plus-X Unit	DHCP Firmware Revision	Hostname*
Plus-X IIU	1.1.3	PLUSXIIU

    * Hostnames can be used in either upper or lower case.

Initial Connection Using DHCP

Connect the Plus-X IIU to your LAN and apply power. If this is the first power-up for a new unit or the first network connection after execution of a master-initialization, the Plus-X IIU will issue a DHCP request for an IP address. If the network supports DHCP functionality, a dynamic IP address will be assigned to the unit. To access the unit, launch a web browser and enter the hostname from the table above in the browser's address field, followed by the forward-slash symbol as follows: PLUSXIIU/

The login screen shown below will be displayed.

Select and confirm a password for the admin account and click the Save button.

Note: If the page above is not displayed or the browser indicates that the page cannot be found, it is possible the connected network does not support DHCP. In this case follow the steps outlined in "Initial Connection Without DHCP". Otherwise, log in as shown below and continue to "Set a Static IP Address".

Use the credentials confirmed above to log in when the following screen is displayed.

Initial Connection Without DHCP

If your network does not support the DHCP protocol, the Plus-X IIU's request for a dynamic IP address will fail. If this happens, the Plus-X IIU will assign itself the default static IP address of 192.168.0.100. To access the unit, it will be necessary to connect your PC directly to the Plus-X device using a crossover LAN cable or using a simple Ethernet switch.

In addition, your PC's internal network interface must be set to a static IP address of the form 192.168.0.x. In the Windows Control Panel, search for *Change Ethernet Settings*, then select *Change adapter options* then *Local Area Connection.* Navigate to the Internet Protocol Version 4 (TCP/IPv4) Properties dialog box as displayed below.
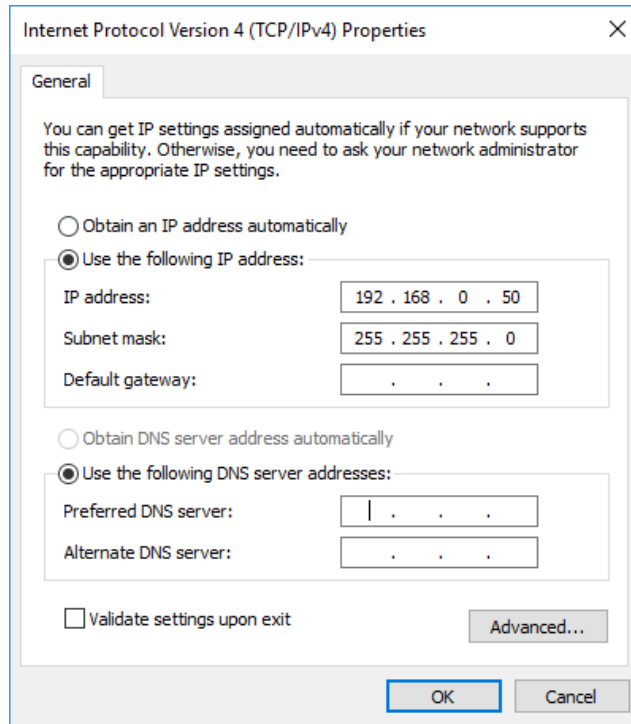
Select "Use the following IP address:" and enter an address of the form 192.168.0.x, where x is any value between 1 and 255 except 100 which is the Plus-X default IP address. Also set the subnet mask to 255.255.255.0 as shown above. Check the box "validate settings upon exit" then click *OK*.

Now launch a browser and enter 192.168.0.100 in the address field. You will be prompted as shown in the previous section to provide a password for the admin account, and then to log in to the admin account using the newly assigned password.

Set a Static IP Address

The first screen displayed after initial login is the *Settings* page, as shown below.
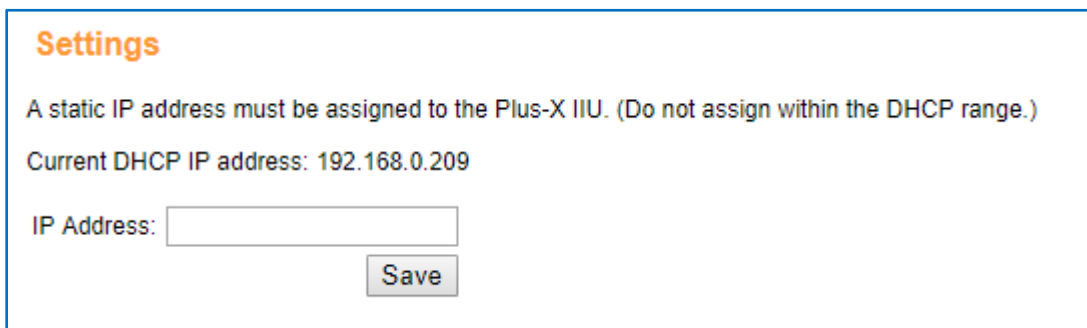
Enter a static IP address for this unit as assigned by your network administrator in the *IP Address* box and click *Save*.
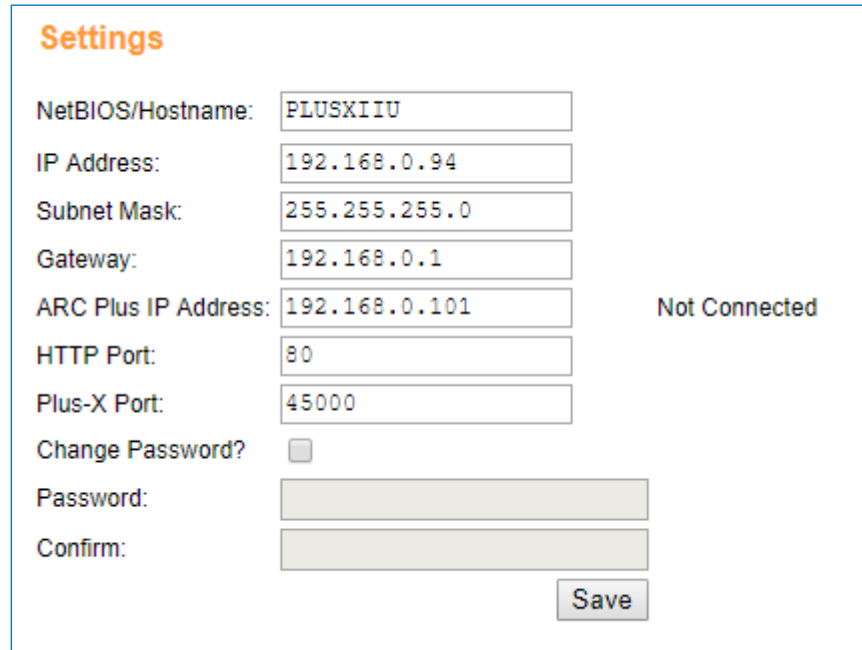
Note: *It is important that the assigned static IP address be outside the DHCP address range used by the router to avoid potential conflicts with other DHCP devices.*

If your initial connection was made without DHCP, your PC should now be restored to its prior network settings, and both the PC and the Plus-X device should be connected to the normal LAN.

Complete the Network Settings

In most cases your browser will be redirected to the login page after the static IP address has been set. If this does not happen automatically, enter the static IP address assigned above in the browser's address field. Log in to the Plus-X IIU using the admin account.

On this second login, a different *Settings* page is displayed as shown below.

Settings

NetBIOS/Hostname:	PLUSXIIU
IP Address:	192.168.0.94
Subnet Mask:	255.255.255.0
Gateway:	192.168.0.1
ARC Plus IP Address:	192.168.0.101 Not Connected
HTTP Port:	80
Plus-X Port:	45000
Change Password?	☐
Password:	
Confirm:	

Save

You will see the IP address you previously assigned. Additional fields must now be completed. It may be necessary to obtain the Subnet Mask and Gateway IP address from your network administrator. It is also necessary to assign the IP address of the ARC Plus unit that will be controlling the Plus-X IIU.

It is also a good idea to change the hostname from the default value so conflicts will not occur if multiple Plus-X devices of the same model are installed on the network. The default values for HTTP Port and Plus-X Port can most often be accepted.

Click the *Save* button to activate these settings.

Connecting the Plus-X IIU to the ARC Plus

If you have not already done so, install the Plus-X IIU in the equipment rack. If you wish, you may distribute Plus-X units in multiple racks, or at different locations. To add the channels from the Plus-X IIU to the ARC Plus:

1. Launch AutoLoad Plus and connect to the ARC Plus site to which the Plus-X unit will be linked.
2. From the Edit menu, selected Plus-X Devices… and click Add.
3. When the Plus-X Device window appears, select Plus-X IIU from the device type drop-down. Enter a description of the Plus-X unit for your own reference, followed by the IP address and Port, as already configured on the Plus-X IIU.
4. Check the box marked Map Default Set of Channels to add all channels for this Plus-X unit to the ARC Plus and enter a starting channel number for assignment of these channels in the ARC Plus. If you are not using all channels, or if you do not wish for them to appear in sequential order, you will need to manually map the channels. In this case, leave this checkbox 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 channels to the ARC Plus, click the Meter, Status, or Command tabs, as appropriate. Locate an unused channel and click the […] button in the Source column. This will bring up the Source dialog. Click the Plus-X channel button and choose the Plus-X device and channel you wish to use.
7. Configure labels, limits, and alarms for the newly added Plus-X channels.
8. Lastly, you will need to calibrate the metering channels. If you have not already connected the input connector blocks, do so now. Then click the Calibration icon at the far right of the Source column in the AutoLoad Plus Meter Channels tab to complete the calibration process.
9. Select File>Save to save the changes to the ARC Plus.

Connecting Analog and Status Inputs

Each Plus-X IIU connects up to 16 metering inputs (±10VDC) and 16 status inputs (0-28VDC or switch closure). Meter inputs may be used as status channels by setting the high and low voltage thresholds (see below). Metering channels 1-8 are the top left bank of pins and 9-16 are the bottom left bank of pins. Status channels 1-8 are the top right bank and 9-16 are the bottom right bank:
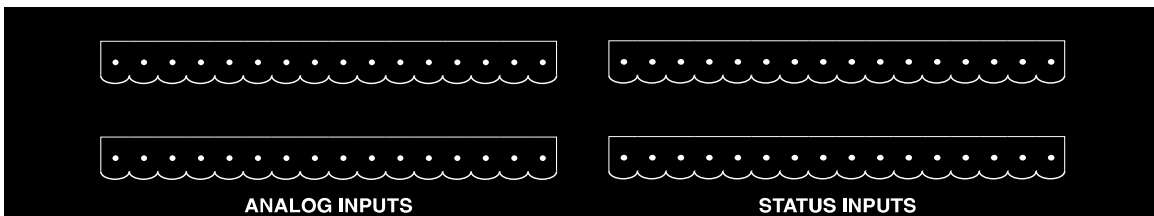
Each channel has a pin for common ground (left) and a pin for the signal voltage (right), as shown in the table below.

CH 1		CH 2		CH 3		CH 4		CH 5		CH 6		CH 7		CH 8	
-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+
CH 9		CH 10		CH 11		CH 12		CH 13		CH 14		CH 15		CH 16	

Plus-X IIU Rear Panel Connector Pinouts

Analog and status pinouts are identical. Channels numbers are for reference on this unit only. ARC Plus channel numbers are assigned when the Plus-X IIU is added to the ARC Plus (see above).

Four 16-pin connector blocks are included to facilitate equipment wiring, two blocks for the Analog inputs, and two for the Status inputs. The connectors blocks are pre-labeled with input numbers. Two connectors are labeled for channels 1 through 8. These should be used for the upper row of Analog and Status inputs. The remaining two connectors are labeled for channels 9 through 16. These should be used for the lower row of Analog and Status inputs.

Once you have identified the connector blocks for your input channels, attach wiring for each remote control channel to the connector block using the connector labels as a guide. Secure the wiring using the built-in set screws before attaching the connector block to the appropriate rear panel connector.

Using Metering Inputs for Additional Status

Each of the 16 metering inputs on the Plus-X IIU can be used as a status input (either as an alternative to the metering input or in addition to it). To configure the metering input behavior, use a web browser to connect to the Plus-X IIU. Click on the Configuration link in the menu bar then click on Meter Channels from the sidebar.

Meter Channel Status Override Settings

Any meter channel can be used as a status input. Enter the voltage at which the channel should indicate a change of state.

	Low Threshold	High Threshold
Meter/Status 1	0.700	1.000
Meter/Status 2	0.700	1.000
Meter/Status 3	0.700	1.000
Meter/Status 4	0.700	1.000
Meter/Status 5	0.700	1.000

Assign the low and high threshold (in Volts) for each channel that will be used as a status input. These inputs can be assigned to status channels on the ARC Plus using AutoLoad Plus. If desired, one input can be used for both metering and status on the ARC Plus. In this case, the

metering channel will show the analog value read on the input, and the status channel will show the status using the low and high thresholds defined here.

Meter inputs 1 through 16 on the Plus-X IIU are identified as status inputs 17 through 32. For example, to map meter input 1 on the Plus-X IIU to a status channel on the ARC Plus, select Plus-X IIU status input 17 from the source selector drop-down box in AutoLoad Plus.

Input Diagnostics

The Channel Values link in the menu bar displays the actual voltage read for each metering input (not its calibrated value), its associated status (applicable only where metering channels are used for status), and the state of each status input.

Meter Values			Status Values	
Meter Channel	Voltage	State	Status Channel	State
Meter 1	-0.001	On	Status 1	Off
Meter 2	0.000	On	Status 2	Off
Meter 3	0.000	On	Status 3	Off
Meter 4	0.000	On	Status 4	Off

This page is provided for diagnostic purposes and may be useful during initial setup or troubleshooting. The values on this page are not updated in real time and should not be used for daily operation.

Restoring Factory Configuration

To reset the unit to its default configuration, press and hold the MASTER INIT button for three seconds. The Power LED will turn red to confirm the configuration has been reset. Note that restoring the default configuration will reset the unit's password and IP address, requiring the initial configuration steps to be repeated as described at the beginning of this document.

Uploading New Firmware

Refer to the Burk Firmware Loader Manual for detailed instructions on uploading firmware to the Plus-X IIU.

Getting Help

For technical support, please email 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 IIU 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:
1.75" (4.45cm) H
19" (48.26cm) W
12" (30.48cm) D

Operating Temperature:
0° to 40° C;

Humidity:
5 to 85% RH

Power Requirements:
100 to 240VAC, 47–63Hz, 1A;
Power entry module with standard, grounded power cord supplied;
1A fuse protection

Connectivity:
Ethernet connection to ARC Plus

Channel Capacity:
16 metering and 16 status inputs per unit;
Metering channels may be used as status inputs for a total of 32 status channels.

Metering Input Range:
-10 to +10VDC

Metering Input Accuracy:
> 99.75% accuracy, full scale

Status Input Range:
> 0 to +28VDC or switch closure