

# UCON Profile for the Load Controls UPC-E

## Introduction

At the request of a customer Kepware has create a UCON Profile to gather data from a Load Controls UPC-E (Ethernet Enabled Universal Power Cell). The data coming from the UPC-E can be either solicited or unsolicited. We have created 3 Solicited Projects and 1 Unsolicited project to show all the ways that you can get data from the UPC-E.

## About the UPC-E

The UPC-uses UDP based communications. Because of that it can be configured to broadcast its data to any PC or Device that is listening for a UDP Message from it. The following information is taken from the Load Controls UPC-E manual.

## Home Page for the UPC-E

The UPC-E has a built in Web server so you can connect to it and configure it. The Default IP address from the factory is 192.168.123.3 with a subnet of 255.255.255.0. To connect to it on your local network your PC will have to have an IP in that subnet or you may need to multi-home your network card.

The screenshot displays the web interface for the Load Controls UPC-E. At the top left, it says "Load Controls Inc" and "Ethernet enabled Universal Power Cell". At the top right, it lists contact information: "Phone 888 600 3247", "Fax 508 347 2064", and "sales@loadcontrols.com". Below this is a horizontal line. Underneath the line are four menu items: "IP, MAC & Info", "UPC-E Setup", "UDP Setup", and "UPC-E Self Test". Below the menu items is a form with a label "Location:" and a text input field containing "Enter Location". Below the form is a table with two columns: "Present Output:" and "Full Scale:". The table contains the following data:

Present Output:	Full Scale:
HP: 000.02	100.0
KW: 00.01	
Counts: 0	4095
UDP is	Not Running

At the bottom of the table area, it says "Refresh Browser to update display".

## Change the IP of the UPC-E

Next, click on the IP, MAC & Info link to open the UPC-E's IP configuration page.

The screenshot shows the 'IP, MAC & Info' configuration page. At the top, there is a yellow header with the title 'IP, MAC & Info' and a 'Home' link. Below the header, there are several input fields and a 'Submit All' button. The 'Location' field is labeled 'Enter Location (16 Char Max)'. The 'UPC MAC Address' field is pre-filled with '00 . 03 . 75 . 0F . 67 . 70'. The 'UPC IP Address\*\*' field is pre-filled with '192 . 168 . 123 . 3'. Below these fields, there are three status indicators: 'Page Build: 88', 'Software Build: 90', and 'S/N: 89123R'. A note says '(Refresh browser if partial display)'. At the bottom, there is a section for 'IP Address\*\*' with the text 'Default IP or manually assigned IP address'.

The important setting on this page is the IP address for the UPC-E. Once the new IP is entered click on the submit button. You will have to reconnect to the UPC-E Home Page after changing the IP.

## Configure the UPD Settings

Next we will need to configure the UPC-E to send data out. Regardless of whether the UPC-E is set to send its data in solicited or un-solicited mode you need to configure the range of PC's that will receive the data.

The screenshot shows the 'UDP Setup' configuration page. At the top, there is a yellow header with the title 'UDP Setup' and a 'Home' link. Below the header, there are several sections of instructions and input fields. The first section is 'To send to a specific computer via UDP:' with two steps: '1. Set MAC address to computer's ethernet MAC address' and '2. Set IP address to the computer's IP address'. The second section is 'To broadcast to many computers:' with two steps: '1. Set MAC address to all FF's' and '2. Set IP to local network broadcast address (typically xxx.xxx.xxx.255)'. The third section is 'To broadcast on all logical local networks:' with two steps: '1. Set MAC to all FF's' and '2. Set IP to 255.255.255.255'. The fourth section is 'To send to a remote PC through a gateway:' with two steps: '1. Set MAC to the gateway's MAC address' and '2. Set IP to the address of the remote machine'. Below these sections, there are input fields for 'MAC:' (00 . 03 . 93 . C7 . 2A . 90) and 'IP:' (192 . 168 . 123 . 10). There are three radio buttons for 'Data to Send': 'HP', 'KW', and 'Counts', with 'Counts' selected. Below that, there is a 'Send packet every:' section with radio buttons for '50 ms', '100 ms', '200 ms', '500 ms', '1 sec', '2 sec', '5 sec', '10 sec', '20 sec', and '1 min'. There is also a 'To Port:' field with the value '2552'. At the bottom, there are three buttons: 'Run' (green), 'Stop' (red), and 'Not Running' (yellow), along with a 'Submit' button. A note says '(Refresh browser if partial display)'.

We configured the UPC used for testing to send its data to a specific PC. To do this you need to know the MAC address and IP address of the PC that the UCON will be running on. To get this information you can use IPConfig from the command Prompt.

### *Getting the MAC address with IPCONFIG.exe*

```
C:\>ipconfig -all

Windows IP Configuration

    Host Name . . . . . : Workstation1

    Primary Dns Suffix . . . . . : Mydomain.local

    Node Type . . . . . : Hybrid

    IP Routing Enabled. . . . . : No

    WINS Proxy Enabled. . . . . : No

    DNS Suffix Search List. . . . . : Mydomain.local

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix . :

    Description . . . . . : Broadcom NetXtreme 57xx Gigabit Controller

    Physical Address. . . . . : 00-18-8B-B9-AC-F0

    Dhcp Enabled. . . . . : No

    IP Address. . . . . : 25.25.50.5

    Subnet Mask . . . . . : 255.255.0.0

    Default Gateway . . . . . : 25.25.2.1

    DNS Servers . . . . . : 25.25.2.30

C:\>
```

The Physical Address is the MAC address.

### **Sending Unsolicited data from the UPC-E**

First select which of the 3 pieces of data the UPC will send. They are all formatted the same so the UCON project will not care.

Next select the UDP port that they UPC-E will send data to. This is the Port that the UCON profile will be listening for UDP broadcasts on. The default is 2552 and this is what the UCON project is set to.

For the Unsolicited Project you will need to select the rate at which the UPC-E will send data.

Next in order for any UDP processing to occur you need to click on Run radio button and then click Submit All to submit your changes.

At this point if you are using the UPC-E\_Unsolicited.opf project that we created you should start getting data from your UPC-E.

The Data tag in the Unsolicited project is configure to read Hex data sent in HiLo byte format. The UPC-E sends a data packet with only these 2 bytes. All data is sent as raw unsigned integers so an HP (Horse Power) of 10.5 would be sent as a raw value of 105 (hex 69 00).

### Soliciting Data from the UPC-E

There are 3 Solicited UPC-E projects. To solicit data from the UPC-E you need to stop sending packets so you will set the Send Packet setting to None. UDP must still be running though. UPD commands are sent to UDP Port 26482 on the UPC-E but the response is still sent to the UDP Port configure in the UPC-E. This is different than most devices that the UCON driver is used with so they UPC-E\_Solicited\_Manual.opf and UPC-E\_Solicited\_Auto1.opf projects have a slave and a master device in them assuming that the UDP port in the UPC-E is left at its default port. The master is configure with 3 tags Trigger\_UDP, Set\_Full\_Scale, and Set\_Response.

In the UPC-E\_Solicited\_Manual.opf project writing any value to the Trigger\_UDP tag will send the command to trigger the UDP output to be sent. In the UPC-E\_Solicited\_Auto1.opf project this command is sent at the OPC update rate specified by the connecting OPC Client.

The Set\_Full\_Scale tag, in all projects, takes a value range of 0-1000 which is raw FS Value Scale.

The Set\_Response tag, in all projects, expects a specific parameter (See the Response Value Table).

In Project UPC-E\_Solicited\_Auto2.opf the Trigger\_UDP tag is replaced with a Data tag. In the UPCE set the port to which the UPC-E will send data to 26482. This project should send the UPD trigger command and receive the response form the UPC-E and update the Data tag.

### Response Value Table

50 ms = 1	100 ms = 2	200 ms = 4	400 ms = 8	800 ms = 16
1 sec = 257	2 sec = 258	4 sec = 260	8 sec = 264	16 sec = 272

## Summary

You should be able to view the UCON transaction profiles of all of these projects in demo mode of the UCON Protocol server or UCON driver. If you have any questions about the projects contact your Kepware Representative or contact technical support at [Technical.Support@kepware.com](mailto:Technical.Support@kepware.com) or phone is us at 1-888-537-9273 x211.