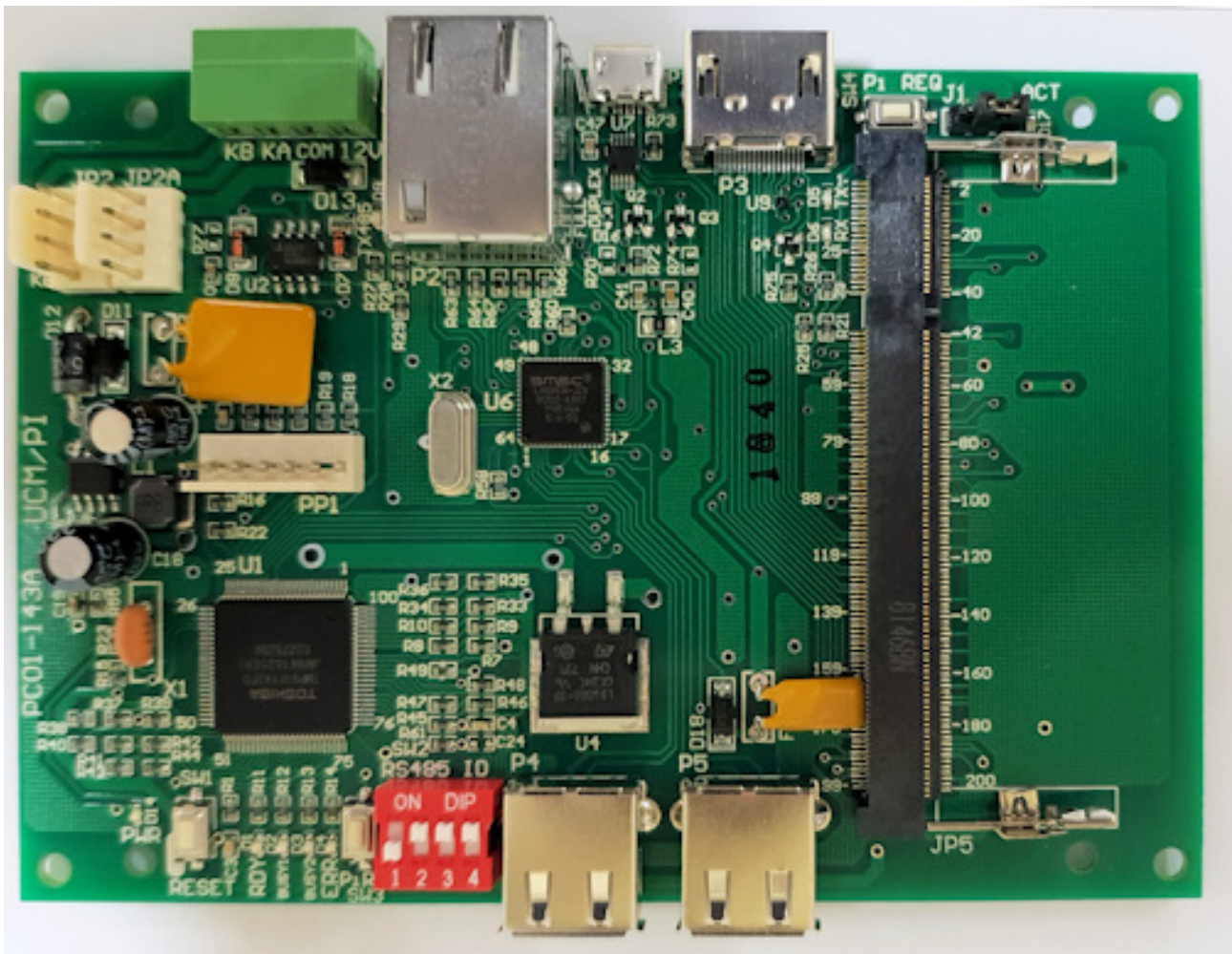


UCM/PI INSTALLATION MANUAL

The UCM/Pi is a host adapter, linking a Raspberry Pi Industrial Compute Module 3/3+ (CM3) or compatible single board computer to the Cytech Comfort range of products. Benefiting from the tight integration with the Comfort system, the CM3 has a direct serial interface to the UCM and includes an optional hardware watchdog. The UCM may be powered by the Comfort system where it benefits from the battery backed up power supply.

The installer or user has the option of using software developed by alphaWerk which includes MQTT, Node-Red, OpenHab and HomeAssistant support or, with the technical documentation and operating system configuration provided, they may develop their own.



UCM/Pi without CM3

Hardware Specifications

Power Supply

- Power Supply: 12V.
- Current Required: Idle 300 mA, peak 600 mA
- 12V Battery on Comfort must be connected to provide intermittent high

current for UCM/Pi.

- External 12V power supply may be required if Comfort power supply is overloaded. This may cause UCM/Pi to reset.

Pushbuttons

- SW1 (RESET): This button resets the UCM/Pi (not CM3)
- SW3 (Pi RESET): Resets the CM3 (not UCM)
- SW4 (REQ): May be used to signal the CM3 and can be used to trigger functions, for example it activates the Finder tool at <https://uhai.alphawerk.co.uk/finder.html> when the alphaWerk Node-Red nodes are installed.

LED Indicators on UCM/Pi

- D1 “RDY” (Green) should be on at all times.
- D2 “BUSY1” (Red) for future use
- D3 “BUSY2” (Red) for future use
- D4 “ERR” (Red) Turns on if there is an Error on UCM/Pi
- D5 (Red) Serial Transmit Data to CM3
- D6 (Green) Serial Receive Data from CM3
- D9 (Red) RS485 Blinks when UCM/Pi transmits to Comfort
- D10 (Green) RS485 Blinks when UCM/Pi receives data from Comfort
- D14 (PWR) Green: Power applied to UCM/Pi
- D16 (Green): CM3 Ready
- D17 (Green): “ACT”. Blinks for normal operation of CM3

Connectors

- JP2, JP2A: Comfort RS485 Bus headers (12V, COM, KA, KB) Parallel with JP3
- JP3: 4 way Pluggable Terminal Block 12V, COM, KA, KB (parallel with JP2/JP2A)
- JP5 200 pin SODIMM socket for Raspberry Pi CM3
- P1: Micro USB connector (upstream)
- P2: RJ45 Network Connector (upstream)
- P3: HDMI Connector
- P4, P5: USB Type A connectors (downstream)
- PP3: connector for UCM Firmware Upgrade cable (not to be used in normal operation)

Shunts

- J1 3 position header: Plug in shunt on Pins 2-3 (“NORM”) position towards the “ACT” marking), or alternately remove shunt for Normal operation. J1 pins 1-2 are shunted (“BOOT” position) for USB Boot enable when flashing the CM3 image.

What is Included

The package includes

- UCM/Pi Module without CM3
- 4 way RS485 Cable
- This UCM/Pi Installation Manual

The UCM/Pi requires a Raspberry Pi Industrial Compute Module (CM3/CM3+) with embedded eMMC (not the 'Lite' models) which is not included.

Data sheets and resellers for these module may be found at <https://www.raspberrypi.org/products>.

Installation instructions for configuring the module following purchase can be found at https://github.com/alphawerk/UCMPi_Install, alternatively alphaWerk make pre-configured modules available for purchase, please see www.alphawerk.co.uk/modules for more information.

System Requirements

- Comfort II, firmware 7.xxx
- Configurator Version 3.12.12 and above

Set-up

UCM ID Settings by RS485 DIP Switch

SW2 DIP Switch (RS485 ID) - Comfort is able to support up to 8 UCMs. SW2 is a 4-way DIP Switch which determines the UCM ID, according to the table below:

ID	DIP - 1	DIP - 2	DIP - 3	DIP - 4
1	ON	ON	ON	ON
2	OFF	ON	ON	ON
3	ON	OFF	ON	ON
4	OFF	OFF	ON	ON
5	ON	ON	OFF	ON
6	OFF	ON	OFF	ON
7	ON	OFF	OFF	ON
8	OFF	OFF	OFF	ON

By convention, UCM ID=1 is used for Configurator. The UCM/Pi should be set to ID 2 or above so that any RS485 communications failure can be reported by Comfort. Press RESET on the UCM after changing the ID settings.

Connection Procedure

- Before connecting the UCM to Comfort, set the UCM/Pi ID to the ID of the UCM according to the instructions in the previous section.
- The UCM is connected to Comfort via the supplied 4-way white cable from 4-pin header JP2 to Comfort's header J15. This supplies power to the UCM, as well as allowing communications between Comfort and the UCM. It is not

necessary to switch off the power to Comfort before plugging in this connection. Note: A separate 12V Power Supply 1 Amps may be needed if the Comfort PCB is unable to supply the required current due to other peripherals.

- D14 Green LED indicates power is supplied to UCM/Pi
- The Green RDY led on the UCM (D1) should light up and remain on.
- The LEDs D9 (red) and D10 (green) should blink rapidly showing that RS485 communications has been established between Comfort and the UCM. D9 (green) flashing shows that it is receiving communications from Comfort (poll). D10 (red) comes on when the UCM responds to a poll from Comfort.
- LEDs D1 and D14 should be on steady.
- Connect a network cable from P2 RJ45 connector to a switch or router on the network.

Flashing the Raspberry CM3

Note that this procedure is needed to flash the operating system image, if the CM3 was not supplied with a working image. A Windows, Mac or Linux PC, USB keyboard and HDMI monitor is required for this process.

The following instructions are for Windows, instructions for other platforms may be found here

<https://www.raspberrypi.org/documentation/hardware/computemodule/cm-emmc-flashing.md>

- 1) Install the required drivers which can be downloaded from here:
<https://www.raspberrypi.org/documentation/hardware/computemodule/cm-emmc-flashing.md>
- 2) Power off the UCM/Pi and place the shunt on J1 between pins 1 & 2 (closest to the reset button) and connect the UCM to the PC using a micro-USB cable to a USB socket on the PC.
- 3) Provide power to the UCM (note, it does not need to be connected to a Comfort system - just requires 12v & GND). Windows will start to install drivers.
- 4) Once the drivers have installed, now start rpiboot which can be found in the start menu.
- 5) Other drivers will be loaded at this time.
 - a) You may ignore any request to format the drive, this may be because the device isn't initialised or has a linux file system on it.
- 6) Download and install Etcher from <https://etcher.io>
- 7) Download a reference image from
https://downloads.raspberrypi.org/raspbian_lite_latest
- 8) Start Etcher and select the image downloaded in step 7 and flash to module.
- 9) Once flashed, eject and unplug the USB from the UCM and remove power from UCM/Pi
 - a) Windows may again suggest formatting the disk, please ignore this request.
- 10) When power is applied to UCM/Pi it should boot up.
- 11) If you plug in a computer monitor to the HDMI port and a keyboard into a USB port, it should display bootup into linux - username is pi and the password is raspberry.

12) If connected to a network, It should connect and obtain an IP address from a DHCP server.

Installing the alphaWerk components

Follow the instructions at https://github.com/alphawerk/UCMPi_Install to install the alphaWerk components

Accessing the alphaWerk components

If you have installed the alphaWerk components, you may find the UCM/Pi on your network using their tools.

Open an Internet Browser and go to <https://uhai.alphawerk.co.uk/finder.html> Press the REQ button as instructed. The IP address of the UCM/Pi on the local network will be displayed in the window as shown below;



Looking for devices on your local network

Please power up (and wait about 1 minute) or press the request [REQ] button on your UCM/Pi for about 1 second.

This will initiate a process to identify that UCM on your local network, which if successful, will be listed below with links to the Management page.

Your UCM will not be exposed to the internet and only devices on the same network as you will be displayed.

The button can be found circled red in the image below.

```
0000000051219ae4_1dXrFSnscw8AbMalFD4ve5Wb-gY
eth0 [10.0.0.210] : Management Node-Red Node-Red Dashboard
```



Click on the the management page (highlighted link on the finder page) or using `http://<ip_address>:1080`

On this page, create your admin user and assign a site name, and accept the terms to continue.

Once this has been done, you can login and use the management console to upload a configuration file (.cclx) and do other tasks.

Register



Create Admin User

Username

Enter your Username

Email

Enter your email address

Password

Enter password

Confirm Password

Enter password again

Cloud Access

Device not registered, enter friendly name below

Name

00000000b0339cbd_VVf5G_YofRm1pX78L9l7KcErTp

Serial Number

00000000b0339cbd_VVf5G_YofRm1pX78L9l7KcErTpcc

UUID

fo_cZVc5oochWAMnN9DLHfW-LlBWwIPHmMzTYq6nAqpZ-eQDnw

Beta License

alphaWerk Limited grants you a revocable, nonexclusive, nontransferable, limited license to use the Application solely for your personal, noncommercial purposes strictly in accordance with the terms of this Agreement.

Restrictions

This license not for sale and will not transfer without license to 3rd Parties

☐ Accept License terms of the Beta Test

Sign Up

Admin Page

Go to <IP Address> Port 1080 to open the admin page

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UCM PI - System Info

←

→

↺

🏠

10.0.0.210:1080/pi

...

🔒

☆

🔍 Search

📑

📄

🌐

⚙️ Most Visited  Cytech.biz  Comfort Forum  Webmail - Login  Control Panel :: Login ...  Cytech Admin

 **alphaWerk**

Main

 Dashboards

 Node-Red

 Admin

^

Pi

Comfort

Users

Cloud Services

 Diagnostics

▼

 Resources

▼

☰

UCM/Pi System Info and Settings

System Info and Settings

Server: ● Online

Load: ● 0.15

Disk Free: ● 2.0G

Memory Free: ● 559M

SSH Enabled: ● False

Serial Number: 0000000051219ae4_1dXrFSnscw8AbMalFD4ve5Wb-gY

Uptime: 0 days, 0 hrs, 7 mins, 17 secs

Flush Logs

Enable SSH

Disable SSH

☒ UCM Eth Emulation [2001]

☒ UCM Human Text Inferface [2002]

☒ UCM Trace [2003]

Change pi user password

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Watchdog

The Pi gives out a heartbeat signal on the Output Pin, which the Comfort system watch
Comfort will reboot the Pi.

Status: ● Running

Output Pin: ● Low ⓘ

Input Pin: ● High ⓘ

Run

Pause

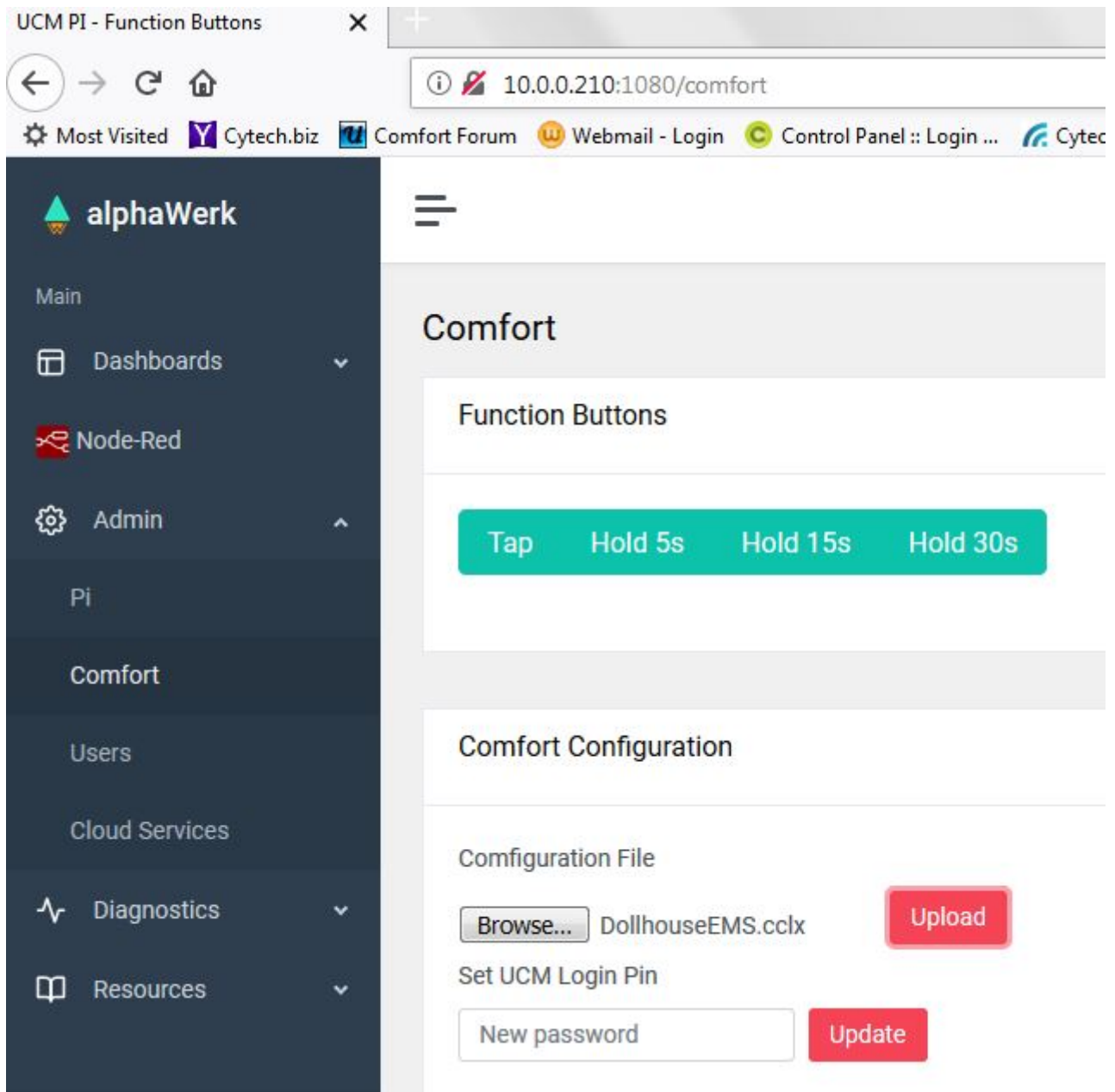
Reboot

Execute Script

Location of script (URL)

<https://uhai.alphawerk.co.uk/>

Run

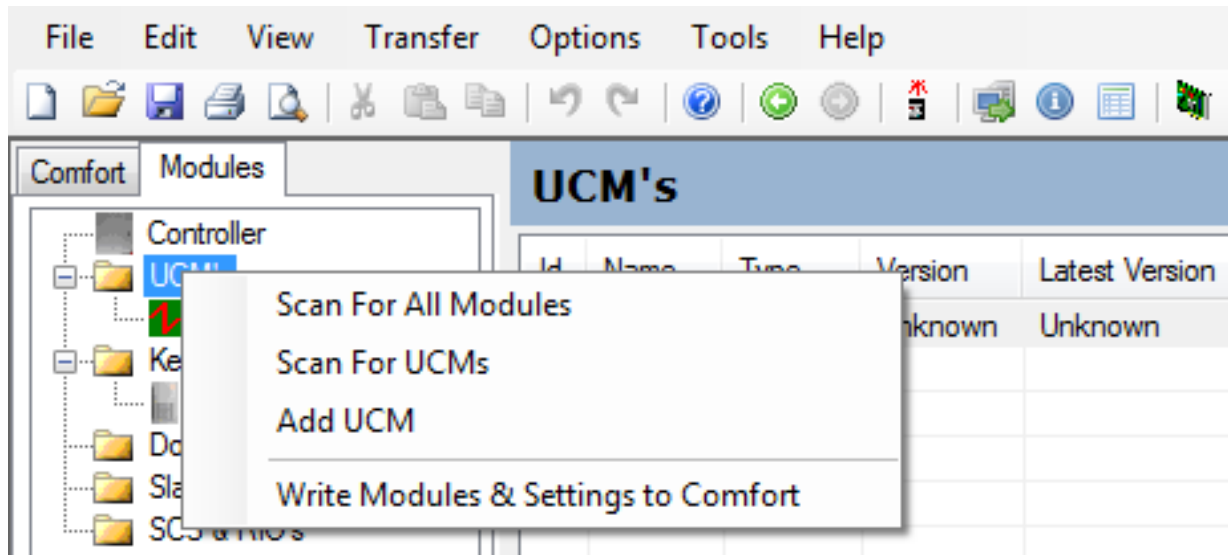


Using Comfigurator

Use the Comfigurator software version 3.12.12 or above. The software can be downloaded from <http://www.cytech.biz/comfigurator.html>

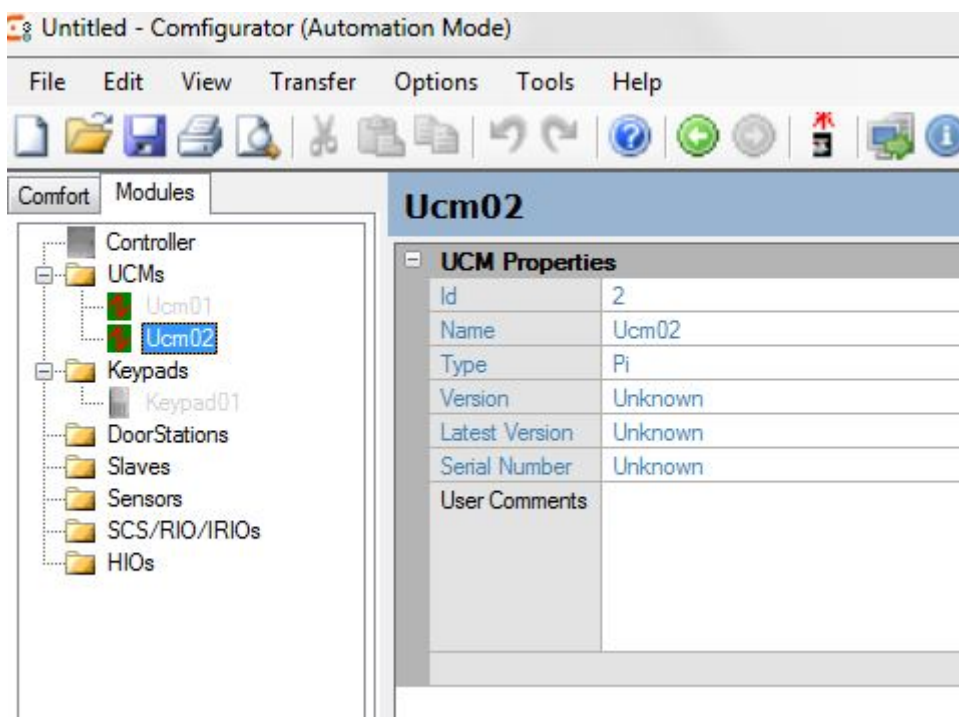
The UCM/Pi can be used to program Comfort using Comfigurator, as it can take the place of a UCM/USB or UCM/Ethernet

Run Comfigurator, go to the Modules Tab and right-click on UCMs folder symbol as shown below.



“Scan for All Modules” or “Scan for UCMs” will automatically detect all UCMs including the UCM/Pi if the ID is set correctly without any conflict with other UCMs.

The result of scanning for modules is shown below for UCM Id 2.

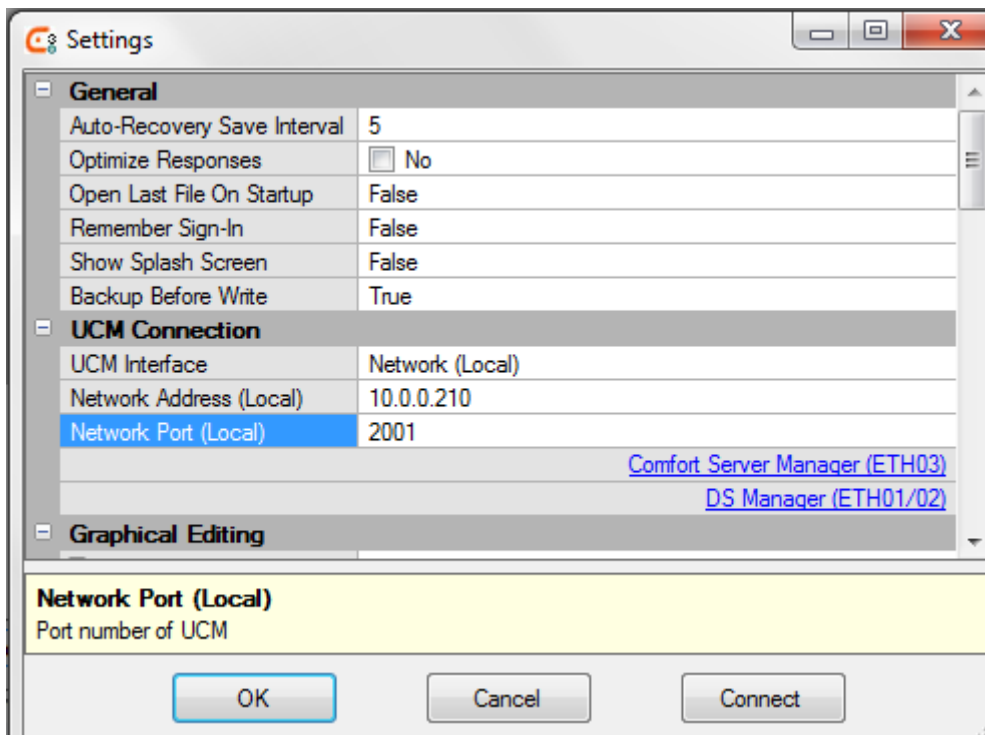


- “Name” is any text description for the UCM used to Identify it and serves no other function.
- “Type” is the UCM Type which is “Pi” for UCM/Pi
- “Version” is the UCM/Pi firmware version which in this example shows 7.117. If the UCM/Pi was manually added instead of being scanned, the firmware information will not appear.
- “Latest Version” is the latest release version available when internet connection is present.
- “Status” shows the status of UCM/Pi. It is ‘Polled’ when the UCM/Pi is

detected and matched the number of UCMs programmed. 'Not Polled' will be displayed when the UCM is detected by scanning but the number of UCMs programmed is less than the UCM Id. 'Not Found' is shown when the UCM is not connected to Comfort when scanning is done.

If the Pi is running the alphaWerk software, the UCM/Pi port 2001 can be used for programming by Comfigurator.

To set up the IP address and Port, go to Options Menu > Settings as shown below. The IP address and port are entered in the UCM Connections area. Do not use Comfort Server Manager (which is for UCM/ETH03) or DS Manager (for UCM/ETH02) to discover the IP address and port.



Click the "Connect" button to connect to Comfort via UCM/Pi

Upgrading the UCM/Pi Firmware

To upgrade the UCM/Pi firmware (not the Raspberry Pi CM3), use another UCM/ETH03 or UCM/USB. The methods of upgrading the firmware are;

- Log in on the UCM/ETH03 or UCM/USB, right click on the UCM/PI in the Modules Tab and select Check for Upgrades, see <http://www.comfortforums.com/forum92/3400.html>
- By UCM Firmware programming Cable connected to UCM/USB or UCM/ETH03, see <http://www.comfortforums.com/forum4/1782.html> If you use this method, please disconnect the UCM/PI from Comfort, remove the CM3 from the DIMM socket and connect the UCM/Pi to the other UCM via the PP1 6 way cable only.

Do not upgrade the UCM/Pi firmware by using the same UCM/Pi for firmware 7.118 and below otherwise this will corrupt the firmware. Self upgrade will be possible for UCM/Pi 7.125 and above

Vocabulary Upgrade by UCM/Pi

Do NOT attempt to upgrade Comfort vocabulary using the UCM/Pi as this will cause the vocabulary to be corrupted. Please use another UCM for this

Document History

2 February 2019 – Initial Draft

9 July 2019 – Revised to include image build instructions and other details.

18 July 2019 – Minor revision to correct spelling and formatting.

14 August 2019 – Warning about upgrading firmware and vocabulary with UCM/Pi