CYLON

Troubleshooting UEC Site Communications (PortHandler)

User Manual

UNITRON UC32

Building Management System

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Managing Site Commuinications (MAN0098 rev 5)

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Cylon Controls Ltd.
Clonshaugh Business and Technology Park
Clonshaugh
Dublin 17
Ireland

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Overview

The Unitron Engineering Centre co-ordinates all of its communications with Unitron Sites through a component called the “Port Handler”.

The Port Handler has an interface that allows users to analyse Comms traffic on their sites, which can be useful during troubleshooting.

This document describes aspects of the Port Handler operation during which errors may be generated, and how information relevant to those errors is displayed in the Port Handler interface.

Port Handler Operation

Because this document deals with troubleshooting, this section does not cover the full operation of Port Handler, but instead describes the the occasions under which error messages can arise, especially the autodetection procedure.

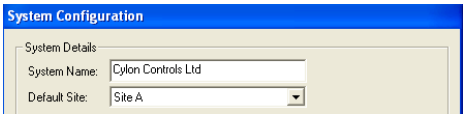
Auto Detection

Auto Detection is the process the Port Handler uses to determine which controller type it is connected to. Auto Detection is carried out when:

- The Port Handler is started
- The user connects to a new site (Change Site)
- A request that was sent to a controller times out and a retry attempt has exceeded.

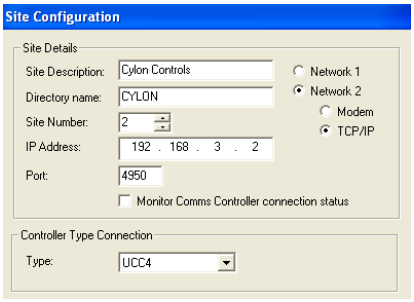
When the Port Handler starts, it will attempt to auto detect the controller that is configured for the default site.

The default site is configured using CCConfig:



The PortHandler attempts to connect to different controller types in the following order, and stops once a connection is established:

1. the Controller type specified for each site, maintained in CCConfig under ‘Controller Type Connection’



2. Comms controllers
3. UC32 Field Controllers
4. UC16-type Field Controllers (including UCU)

Note: The Port Handler will use the controller type information available from the configuration information for the first connection attempt.

If the Auto Detection is started as a result of a communication failure (time out), then the current controller type is tried first.

For example the Port Handler is connected to a UC16 controller on ‘SITE A’. If a communication failure causes the Port Handler to Auto Detect, it will start by trying to connect to a UC16-type Field Controller. If this detection fails, then the Port Handler will start the Auto Detection cycle again, beginning with Comms Controllers.

Auto Detection failure

If the Auto Detection fails, then the Port Handler assumes that communication with the site has failed, and in the case of a modem connection, will disconnect from the site.

The Port Handler will then attempt to reconnect to the **default** site. If the default site connection fails then a System Message is generated (stating the connection has failed).

Auto Detection success

If the Auto Detection is successful, then a System Message is generated, stating the controller type to which the Port Handler has connected.

Site Communications Failures

Failures occur when a communications operation cannot be performed, when an expected event does not occur, or when an operation cannot be completed.

Types of failures include:-

- Communication link failure – cannot find serial, TCP/IP or modem resource
- Connection failure – cannot connect to a controller
- Communication failure – cannot communicate with a connected controller

Communication link failure

When a Communication link Failure occurs, the Port Handler alerts the user that it cannot connect to the site using Serial, TCP/IP or Modem links.

Connection failure/Communication Failure (Request Time out)

When either a Connection Failure or a Communications Failure occurs, the Port Handler proceeds as follows:

1. Retry request (system message generated)
2. If retry succeeds then carry on receiving and processing requests from clients
3. If retry count has exceeded, due to retry failure then auto detect the connected controller (System message generated)
4. If auto detection succeeds then carry on to the next client request.
5. If auto detection fails (see Auto Detection section) then disconnect from the site and connect to the default site (system message generated)

NACK/Erroneous data

If a Negative Acknowledgement (NACK) or erroneous data is received from the controller, then the next client request is processed.

Errors

An “Error” arises when an invalid command is sent to controller, or when an invalid command response is returned from a controller.

When an invalid command is sent to controller, the Port Handler receives a NACK identifying each invalid command sent to the controllerand the specific error that occurred.

Recovery

The Port Handler will always perform the same steps in an attempt to recover from an error or failure state. If a failure state cannot be recovered from, then the Port Handler will fail-safe.

The Port Handler System Tray Icon

When the Port Handler is running, an Icon is displayed in the Windows “System Tray” (usually at the bottom right-hand corner of the screen).

When a user right-clicks on this Icon, a menu opens, allowing access to the Port Handler interface and to the Urgent Message list

Show Port Handler

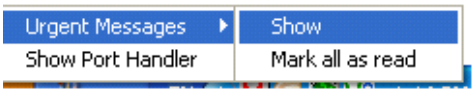
The Port Handler Interface is opened by right-clicking on the Port Handler System Tray Icon and selecting “Show Port Handler”.

Urgent Message Display

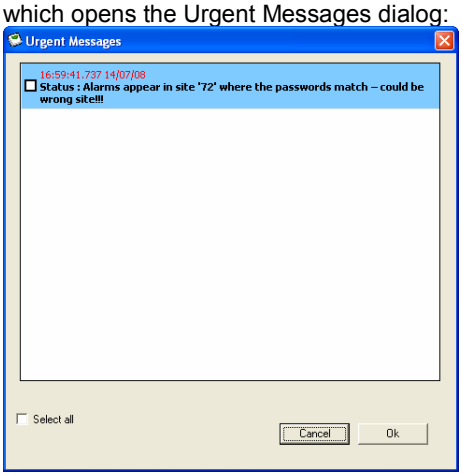
When the Port Handler needs to alert the user to urgent problems in the system (for example if password authentication fails when trying to connect to a site, or if there are conflicting Site IDs during Alarm Scanning) then the Port Handler will change its System Tray icon to an animation:



To view the reported issues, the user must right-click on the System Tray icon and select Urgent Messages > Show:



which opens the Urgent Messages dialog:



Each Urgent Message has a checkbox, which when selected removes the message from the list.

The messages can be marked as ‘read’ all at once by right-clicking on the System Tray icon and selecting Urgent Messages > Mark all as read.

When there are no items left, then the Port Handler icon in the System Tray will return to its static state.

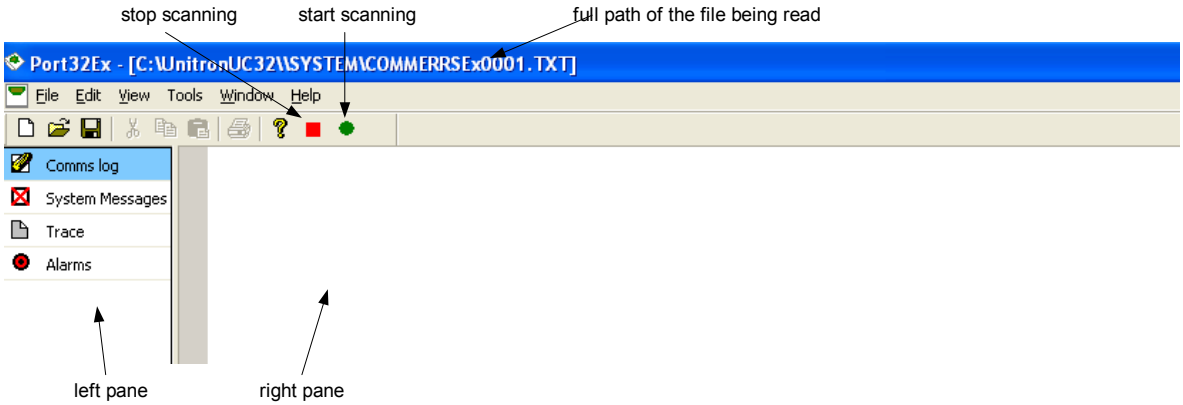
Port Handler Interface

The Port Handler has an interface that allows you to view the **Comms log** and **Systems Messages**.

The **Comms log** displays all the bytes that are sent to and received from controllers. It is stored in the COMMERSS0001.txt file.

System Messages record all recovery, error and failure events. They are in stored in the ERRORSEX0001.txt file.

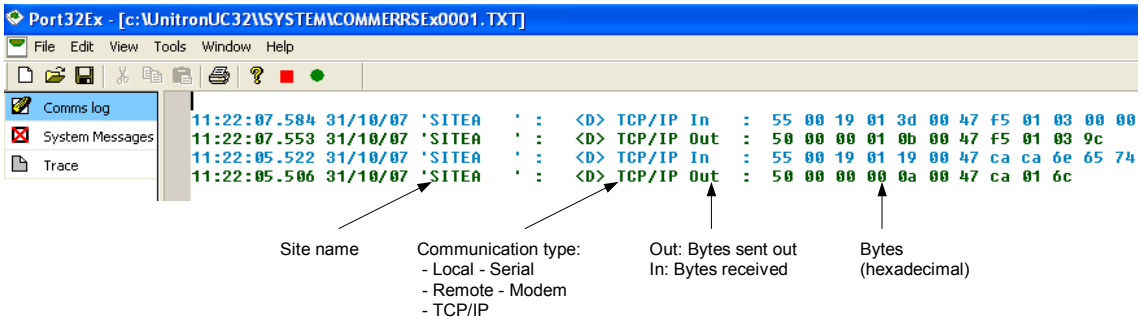
The Port handler main window consists of two panes:



- The **Left Pane** allows you to select which information to display – **Comms Log**, **System Messages**, **Trace** or **Alarms**
- The **Right Pane** displays information, depending on the selection from the left pane.
- The **Stop Updating** toolbar button allows the user to stop updating the right pane with data from the relevant text file (determined by the left pane option).
- The **Start Updating** toolbar button resumes updating data from the relevant text file, from the last point at which it was stopped at

Comms log

If you select **Comms log** in the left pane of the Port Handler interface, all of the bytes sent to and received from site controllers will be displayed in the right pane.



The Comms Log may be used to identify Communications failures by examining the protocol data, which is shown in hexadecimal format (base 16).

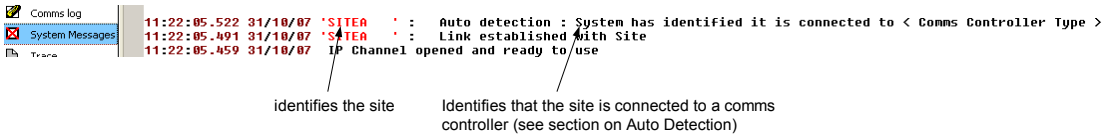
Note: This data is read from the COMMERSS0001.txt file.

System Messages

If you select **System Messages** in the left pane of the Port Handler interface, the right hand pane will display any occurrances of the following types of messages:

- Error Messages, including NACKs
- Failure message, time outs and connection failures
- Event messages, controller type detected.

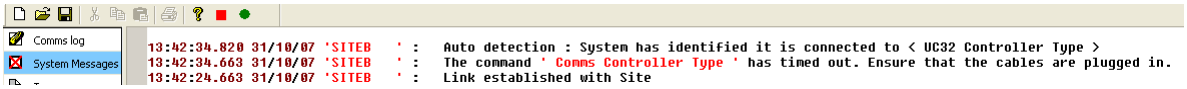
Note; These messages are read from the ERRORSEX0001.txt file.



System Messages are generated by the process of “Auto Detection”.

An illustration of Auto Detection

In the following illustration, the Port Handler attempted to Auto Detect a Comms Controller, which failed. On its attempt to detect the UC32 field controller it then succeeded.

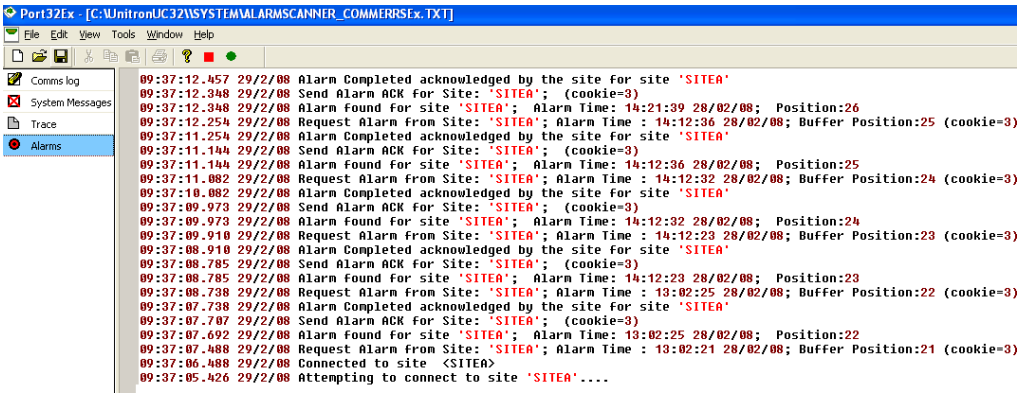


Trace

Used by Cylon Controls Technical Support.

Alarms

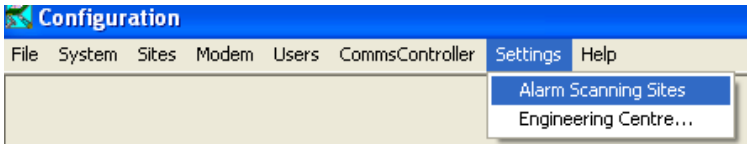
If you select **Alarms** in the left pane of the Port Handler interface, the right hand pane will display the requested and received Alarms from connected sites.



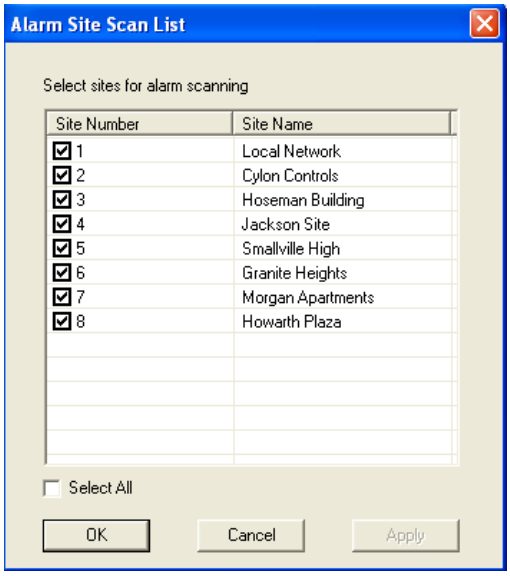
Selecting the sites to be included in Alarm scanning

To reduce or increase the amount of Alarms messages received by the system, you can select or deselect TCP/IP sites to be included in Alarm scanning.

Select 'Alarm Scanning Sites' from the settings menu.



Only TCP/IP sites and the default site are displayed



- The Apply button only becomes enabled when a change is made.
- The OK button acts like the Apply Button, although it is always active it will only enact a change to the list of the list of sites has been modified.
- 'Select All' tick box allows the user to select/deselect all the sites for alarm scanning.

Modem Support

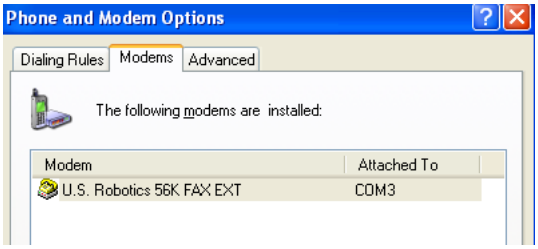
In UECv6.60, Modem support was completely revised, using the Telephony Application Programming Interface (TAPI) to provide a more reliable communication link. TAPI is a Microsoft Windows API that provides computer telephony integration and enables PCs running Microsoft Windows to use telephone services.

Versions of the Port Handler prior to v6.60 managed modem initialisation strings and handshaking. This led to issues supporting particular modem models and types. The new Port Handler uses TAPI version 2, which is inbuilt in the MSWindows Operating Systems, and supports all modem types.

TAPI allows the modem driver to be installed in a standard way, and allows the modem to be configured using Phone and Modem Options in the Control Panel.

Modem Software Driver installation

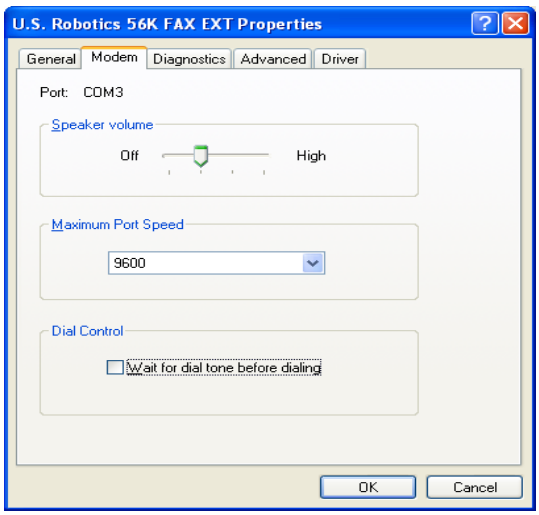
The modem software driver must be installed and assigned to a COM port so that the Port Handler can use it. Failure to install the driver software will result in the Port Handler not detecting the modem. Please refer to the modem vendors' installation guide. The modem driver installation can be viewed in Control Panel->Phone and Modem Options.



Note: It has been reported that the modem profile can under certain circumstances be lost by the TAPI system. If you experience problems with modem communications, please verify that the modem is listed in the Phone and Modem Options dialog. If it is not there, re-install the modem

Modem Properties

Remove the “wait for dial tone before dialing” option in the modems’ properties Dialog box. This will ensure that the modem will dial whether it detects the telephone line or not.



Modem Baud Rate

When attempting to dial into a site, it is possible that either

- the modem may fail to connect or
- when a connection is made no commands are received by the controller,

causing command Time Outs to occur.

If Time Outs occur on a modem connection, you can work around it as follows:

1. Check that the modems baud rate is set to 9600. If a different baud rate is required, make the change and the reboot the PC.

2. If the ID Code command is failing, then run CCConfig and set the ‘Password’ command Time Out value to its highest value.*

3. If the ‘Get Block’ command is failing, then run CCConfig and set the ‘Password command Time Out value to its highest value.*

Note *: You can then reduce the time out values to optimise the commands to find a balance.

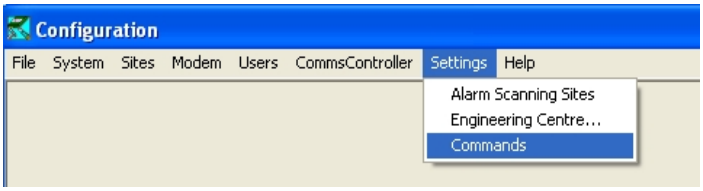
Adjusting PortHandler Commands

The commands that the Port Handler uses to communicate with UnitronUC32 controllers can be adjusted from the Configuration utility (CCConfig).

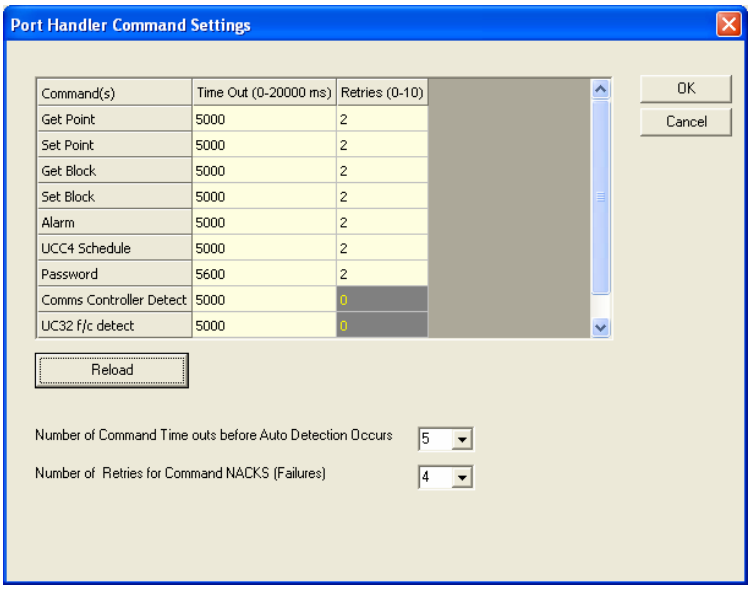
This can be useful in troubleshooting connection failures – for example with Modem connections. It can be useful to tell the Port Handler to give the connection more time to become established.

On the other hand, if you have a reliable fast connection – for example TCP/IP – it can be of more benefit to reduce the time taken to establish connections, and so increase the speed and responsiveness of the system.

To adjust the Port Handler commands, select 'Commands' from CCConfig's Settings menu:



This opens the Port Handler Command Settings dialog:



Each command has two attributes, "Timeout" and "Retries", which depending on the command may or may not be enabled for modification. Values that cannot be edited are shown with a grey background.

- **Time Out** is the length of time (in milliseconds) that the Port handler will wait for a response from a controller after a command is sent.

- **Retries** is the number times a command will be resent to a controller following a Time Out failure.

To edit a value, double-click on it in the Port Handler Command Settings dialog.

Clicking the 'Reload' button will cause all of the values to revert to their previous settings, and any changes made will be lost.

There are also two settings that affect all of the commands equally:

- **Number of Command Timeouts before Auto Detection Occurs**

  Autodetection will not be carried out until a command has Timed Out this many times. For lower values, Autodetection may occur frequently, which can cause delays in the system. For higher values, this will cause Auto detection to become infrequent, which may delay detection of offline controllers.

- **Number of Retries for Command NACKs (failures)**

  The retries in the main list apply to Timeouts, where no response is received. This parameter sets the number of retries when a response is recieived, and the response is NACK, indicating a failure.

When the OK button is pressed, each edited value is checked to see if it is valid.

If a command Time Out is greater than 20000 ms then it will be reduced to 2000 ms, and if a Time Out value is less than zero ms, then zero ms will be used. A message box is displayed to alert the user that this has happened:



If a command Retries value is greater than 10 then it will be set to 10, and if a Retries value is less than zero then it will be set to Zero. A message box is displayed to alert the user that this has happened:



Profiles:

The following profiles provide advisory settings that maybe helpful when failures arise from manipulation of data from a site and its controllers, or from UnitronUC32 application requests.

GSM Modem Profile:

Command	Time Out	Retry
Get Point	5000	2
Set Point	5000	2
Get Block	5000	4
Set Block	5000	4
Get Alarm	5000	2
UCC4 Schedule	5000	2
Password	5000	2
Comms Controller Detect	5000	0
UC32 f/c detect	5000	0
UCxx f/c detect	5000	0
Number of Command time-outs before auto detection occurs		10
Number of retries for Command NACKS		4

PSTN Profile:

Command	Time Out	Retry
Get Point	3000	2
Set Point	3000	2
Get Block	3000	2
Set Block	3000	2
Get Alarm	3000	2
UCC4 Schedule	3000	2
Password	3000	2
Comms Controller Detect	4000	0
UC32 f/c detect	4000	0
UCxx f/c detect	4000	0
Number of Command time-outs before auto detection occurs		10
Number of retries for Command NACKS		3

TCP/IP Profile:

Command	Time Out	Retry
Get Point	2000	1
Set Point	2000	1
Get Block	2000	1
Set Block	2000	1
Get Alarm	2000	1
UCC4 Schedule	2000	1
Password	0	0
Comms Controller Detect	2000	0
UC32 f/c detect	2000	0
UCxx f/c detect	2000	0
Number of Command time-outs before auto detection occurs		10
Number of retries for Command NACKS		2

Terminal Server Profile:

Command	Time Out	Retry
Get Point	20000	4
Set Point	20000	4
Get Block	20000	4
Set Block	20000	4
Get Alarm	20000	4
UCC4 Schedule	20000	4
Password	0	0
Comms Controller Detect	20000	0
UC32 f/c detect	20000	0
UCxx f/c detect	20000	0
Number of Command time-outs before auto detection occurs		10
Number of retries for Command NACKS		4

Default Profile:

Command	Time Out	Retry
Get Point	2000	0
Set Point	2000	0
Get Block	2000	0
Set Block	2000	0
Get Alarm	2000	0
UCC4 Schedule	2000	0
Password	0	0
Comms Controller Detect	10000	0
UC32 f/c detect	10000	0
UCxx f/c detect	10000	0
Number of Command time-outs before auto detection occurs		10
Number of retries for Command NACKS		2