Uniclass L7626	EPIC M231
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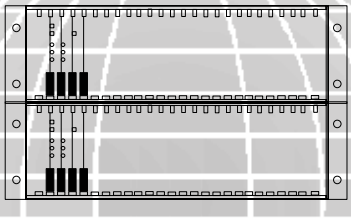
BEWATOR

PCCON3 Remote Control Protocol for Visilynx 3



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User Guide
INS00296 Issue **1**

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1 Introduction

1.1 Purpose and Scope

This document comprises the PCCON3 Remote Control Protocol User Guide for the Visilynx 3 CCTV matrix controller software. **PCCON3** stands for **PC Con**trol of Visilynx**3**.

The protocol is described in section 2, followed in section 3 by the details of each message carried by the protocol. Section 4 gives some general notes on using the protocol commands.

1.2 Overview

PCCON3 is a master-slave protocol, where a remote controller system is the master, and Visilynx 3 is the slave. It is entirely ASCII, allowing simple non-real-time control of Visilynx 3 functions by a remote controller such as a PC, or other serial controller, or even a dumb terminal.

PCCON3 is based on the PCCON2 protocol, which is used to allow a remote PC or other controller to control a Visilynx 2 CCTV rack as if the remote controller were a Visilynx 2 keyboard.

Most Visilynx 3 RS-232 and RS-422 serial interfaces can be configured to support PCCON3. The protocol itself is half-duplex, in that data only flows one way at a time.

The PCCON3 protocol contains certain extensions to PCCON2 for Visilynx 3, which is still compatible with most standard PCCON2 messages. The extensions include:

- Optional node addressing, to allow commands to be directed at nodes other than the one to which the remote controller is connected. Not all commands can be run on remote nodes.
- Optional message checksumming, for extra security where required.
- Extra commands to utilise Visilynx 3 functionality.

Certain changes to PCCON2 features have been made:

- Wider ranges of camera numbers (511) and user numbers (64).
- A user number, rather than a keyboard number, is associated with a PCCON3 port. This user number can be changed by logging on as a different user. This provides basic user login control, configurable access to cameras and external devices, and prioritised shared usage of camera telemetry. Keyboard-based configuration variables are not used by PCCON3 ports.

IMPORTANT: The PCCON3 protocol does not use flow control, except that which is provided by each command's response. This means that a new command will not be actioned until the response to the previous one has been sent from Visilynx 3.

Remote controllers sending PCCON3 commands should be programmed to wait for a complete response message before sending the next command, to prevent commands being lost.

2 Protocol

2.1 Message Types

The remote controller acts as a master, which sends a *Command* message to the Visilynx slave, which then replies with a *Response* message.

The Visilynx slave never sends response messages without first receiving a command message.

2.2 Message Format

All messages are formatted entirely in alphanumeric ASCII, using a comma character to separate fields, and terminated by a carriage return character denoted by <CR>.

All message data fields (shown symbolically as lower case letters in this document) are formatted as ASCII strings rather than binary bytes.

Uppercase letters, commas, semicolons and $, @ and # characters are sent as shown. [Brackets] surround an optional part of the message; the brackets themselves are not sent as part of the message.

No spaces, tabs or other characters are accepted between message characters.

2.3 Command Messages

2.3.1 Format 1 command messages

These use the same format as PCCON2 messages. An optional checksum field provides security (which is not PCCON2 compatible):

@c[,p1[,p2[,…]]][;cs]<CR>

Command field	Description	Values
c	Command number defined in section 3	"1" to "42"
p1	First optional command parameter defined in section 3	Alphanumeric
p2	Next optional command parameter defined in section 3	Alphanumeric
…	Other optional command parameters defined in section 3	Alphanumeric
cs	Optional message checksum (byte additive, modulo 256), covering all characters up to ";" inclusive	"0" to "255"

2.3.2 Format 2 command messages

These provide remote node addressing. An optional checksum field provides security:

$d,c[,p1[,p2[,…]]][;cs]<CR>

Command field	Description	Values
d	Destination node address (0 is the local connected node)	"0" to "127"
c	Command number defined in section 3	"1" to "42"
p1	First optional command parameter defined in section 3	Alphanumeric
p2	Next optional command parameter defined in section 3	Alphanumeric
…	Other optional command parameters defined in section 3	Alphanumeric
cs	Optional message checksum (byte additive, modulo 256), covering all characters up to ";" inclusive	"0" to "255"

2.4 Response Messages

2.4.1 Format 1 response

Replying to a format 1 command:

[!]rc[;cs]<CR>

or

[!]other response[;cs]<CR>

Response field	Description	Values
!	Optional flag character indicating that one or more alarms are active	"!"
Rc	Two-character response code	"OK" command received and executed ok "CS" checksum validation failed "ER" syntax error or field out of range "NC" no control allowed: command recognised but disallowed due to no configured access, or other source in control, or no current camera "NI" command not implemented
Other response	Optional response to certain commands as defined in section 3	Alphanumeric
Cs	Optional message checksum (byte additive, modulo 256), covering all characters up to ";" inclusive. Only added if command had a checksum.	"0" to "255"

2.4.2 Format 2 response

Replying to a format 2 command:

All the above for a format 1 response, plus the following.

Response field	Description	Values
Rc	Two-character response code	"OL" destination node is off line or command not allowed on remote node

2.5 Message Validation

2.5.1 Ignoring command errors

For simple applications, it may not be necessary to perform message validation. In this case, commands are sent and their responses can be ignored – **but the master remote controller must still wait for the end of the response before sending another command**. If no action occurred because of communications errors, the master has to send the command again.

However, to carry out automatic validation, the following details are needed.

2.5.2 Handling command errors occurring from master to rack

Visilynx 3 does not execute the command in any of these error scenarios.

Error	Response from rack	Action for master to take
Line interruption causes truncation	"ER"	Resend command up to 3 times
Line interference causes detectable corruption (no checksum field in command)	"ER"	Resend command up to 3 times
Line interference causes any corruption (checksum field present in command)	"CS"	Resend command up to 3 times
Line fault	None within 1s timeout period*	Resend command up to 3 times

*This period allows for the longest response message transmission time at 9k6 baud, timed from the end of the command message being sent to the end of the response message being received.

2.5.3 Handling response errors occurring from rack to master

Visilynx 3 will have executed the command in these error scenarios, so the master resending the command will cause its action to be repeated. But see note ** below.

Error	Condition at master	Action for master to take
Line interruption causes truncation	Incomplete response received	Request the last response**
Line interference causes detectable corruption (no checksum field in command)	Corrupted response	Request the last response**
Line interference causes any corruption (checksum field present in command)	Checksum fails	Request the last response**
Line fault (can't tell if command or response was lost)	None within 1s timeout period*	Resend command up to 3 times***

*This period corresponds to longer than the longest message transmission time at 9k6 baud.

**Use command @50 to request the last response, to avoid resending the original command and having the rack execute it again.

***Since a timeout may be due to either a lost command or a lost response. If only the response had been lost, sending the command again will cause its action to be repeated.

2.6 Remote Node Handling

Unlike a Visilynx 3 keyboard, a PCCON3 port does not have to log in to a remote node. Instead, there are two ways that commands can act on remote nodes:

- Certain commands support the Format 2 Message Format to specify the destination node that the command is directed at. *Commands that don't support Format 2 will return an "OL" (off line) error if directed at a remote node using Format 2 messages, and no action will occur.*
- Certain commands act on the currently selected camera's node, be it local or remote.

Those commands that can be used on remote nodes are identified in section 3 below.

There is no equivalent of the Trunk Control Menu used on Visilynx 3 keyboards to resolve inter-node trunk congestion. Instead, all PCCON3 ports behave as if their auto-steal option is set to Steal Own Oldest trunk.

2.7 Configuration Issues

The VisiPC configuration tool is used to configure each required Visilynx 3 serial port for use as a PCCON3 control port. Up to two ports may be configured for simultaneous PCCON3 operation.

In Communication Settings, the port function is set to PCCON3, and the line settings as set as required. The port user is set to a default user. This gives the PCCON3 port certain access rights and control priority, which may be changed later by using command 37 to log in a different user.

In User Settings, the port default user and any other users that are to log in to PCCON3 ports are set. Access flags for cameras, monitors and devices are set, together with control priority (for resolving camera control conflicts) and PIN number.

PIN numbers may be queried from a PCCON3 port by the master controller, and used to select a user number for use in a log in command.

2.8 Compatibility with PCCON2

PCCON3 messages are formatted as a superset of PCCON2 messages. Most PCCON2 messages can be understood directly by a Visilynx 3 port configured as PCCON3.

Zones do not currently support views or cameras on remote nodes.

Section 3 highlights any differences from PCCON2.

3 Message Set

Each command description shows:

- The command name.
- The message in format 1 style, with data fields as symbols and optional fields enclosed in [brackets]. All other characters are sent literally, but other protocol bytes defined above are excluded.
- The response returned.
- The size in {bytes} of command and response, excluding other protocol bytes defined above.
- The corresponding Molynx Data Protocol command number(s) below the command name.
- Whether the command is *New* to PCCON3 or has been *Modified* from PCCON2.
- A general description of what the command does.
- Whether the command can act on a remote node, using either Format 2 messages or by using the current camera's node (see above).

3.1 Return Camera and Monitor Status

Return Camera and Monitor Status @ 1

{2 bytes}
Returns response {9-21 bytes}
[!] “M” m, s, “C” c, l [,n]
where
m = current monitor number (1-128)
s = monitor status (0-255)
bit 0 = sequence active on monitor
bit 1 = sequence reversed
bit 2 = sequence held
bit 3 = reserved
bit 4 = reserved
bit 5 = reserved
bit 6 = reserved
bit 7 = reserved
c = current camera number (1-511)
l = camera latched function status (0-255)
bit 0 = camera on/off
bit 1 = AUX1
bit 2 = wipe
bit 3 = auto iris
bit 4 = lamps
bit 5 = lens slow
bit 6 = auto focus
bit 7 = AUX3
n = remote camera node if not local node (1-127)*

MOLYNX 11H, 07H *Modified** This command can be used to determine the current monitor and current camera on which actions will be performed.

3.2 Select Monitor

Select Monitor @ 2, m

{4-6 bytes}
m = monitor number (1-128)

MOLYNX 04H Select the current monitor on which actions such as sequences will be performed. The current camera will change to that currently selected on this monitor. This monitor will remain the current monitor until a new one is selected.

3.3 Select Camera

Select Camera	@ 3, c	{4-6 bytes} c = camera number (1-511)
MOLYNX 06H	Select the current camera for actions such as camera control. This camera will remain the current one until a new one is selected or it is changed by, for example, a video sequence camera switch. *This command can use the Format 2 Command Message to specify the camera node.*	

3.4 Camera Reset

Camera Reset	@ 4	{2 bytes}
MOLYNX 27H	Reset the currently selected camera receiver. This will test the pan and tilt unit for limits and erase all programmed presets. *This command acts on a local or remote node according to the current camera.*	

3.5 Camera Function On

Camera Function On	@ 5, f	{4-5 bytes} f = function (1-24) 1 = home 2 = pan right 3 = pan left 4 = tilt up 5 = tilt down 6 = zoom in 7 = zoom out 8 = focus far 9 = focus near 10 = iris close 11 = iris open 12 = wash 13 = aux2 14 = reserved 15 = reserved 16 = reserved 17 = camera on/off 18 = aux1 19 = wipe 20 = auto iris 21 = lamps 22 = lens slow 23 = auto focus 24 = aux3
MOLYNX 0AH	Turn on the specified function on the currently selected camera. A Camera Speed command must be sent to vary the pan and tilt speeds. *This command acts on a local or remote node according to the current camera.*	

3.6 Camera Function Off

Camera Function Off	@ 6, f	{4-5 bytes} f = function (1-24)
MOLYNX 0AH	Turn off the specified function on the currently selected camera. Function numbers are as defined in @5 (Camera Function On). *This command acts on a local or remote node according to the current camera.*	

3.7 Camera Speed

Camera Speed	@ 7, p, t	{6-10 bytes} p = pan speed (0-100%) t = tilt speed (0-100%)

MOLYNX

0BH

Set the speed at which the pan and tilt functions will operate on the currently selected camera (variable speed receivers only). A command with both speeds at 0% will stop the camera.

If no speed command is sent, pan and tilt speeds of 100% are used.

This command is used in conjunction with the Camera Function On command, which must be sent to define the pan and tilt direction.

This command acts on a local or remote node according to the current camera.

3.8 Preset Recall

Preset Recall	@ 8, p	{4-5 bytes} p = preset number (1-99)

MOLYNX

12H

Move the currently selected camera to the specified preset position (preset receivers only).

This command acts on a local or remote node according to the current camera.

3.9 Preset Position Program

Preset Position Program	@ 9, p	{4-5 bytes} p = preset number (1-99)

MOLYNX

13H

Store the current position as a preset on the currently selected camera (preset receivers only).

This command acts on a local or remote node according to the current camera.

3.10 Preset Sequence Recall

Preset Sequence Recall	@ 10	{3 bytes}

MOLYNX

12H

Request the currently selected camera to perform a preset sequence (preset receivers only).

This command acts on a local or remote node according to the current camera.

3.11 Preset Sequence Program

Preset Sequence Program	@ 11, n, p_1, …, p_n, d	{11-58 bytes} n = number of positions (2-16) p_i = preset number (1-99) d = global dwell (1-255s)

MOLYNX

15H

Store the specified preset numbers on the currently selected camera as the set of positions to which to move during a preset sequence or a preset tour and the global dwell for each position in a preset sequence (preset receivers only).

NOTE: this command cannot be used with cameras on remote nodes.

3.12 Preset Tour Recall

Preset Tour Recall	@ 12	{3 bytes}
MOLYNX 12H	Request the currently selected camera to perform a preset tour (variable speed receivers only). *This command acts on a local or remote node according to the current camera.*	

3.13 Preset Tour Program

Preset Tour Program	@ 13, s_1, …, s_{16}, d_1, …, d_{16}	{67-131 bytes} s_i = speed to move (1-100%) d_i = dwell (1-255s)
MOLYNX 37H	Store on the currently selected camera the specified speeds as the those at which to move and the specified dwell for each position in a preset tour. The preset positions used for a preset tour are those programmed for the preset sequence. This command operates with variable speed receivers only. *NOTE: this command cannot be used with cameras on remote nodes.*	

3.14 Video Sequence Recall

Video Sequence Recall	@ 14, s	{5-6 bytes} s = sequence number (1-64)
MOLYNX 16H	Recall the specified video sequence on the current monitor.	

3.15 Video Sequence Program

Video Sequence Program	@ 15, s, n, c_1, …, c_n, d	{13-265 bytes} s = sequence number (1-64) n = number of cameras in sequence (2-63) c_i = camera number (1-511) d = dwell (1-255s)
MOLYNX 19H	Store the specified video sequence. The number of c_i parameters must be equal to n. d is a global dwell for all positions. All cameras are taken from the local node. *See command @24 for an enhanced version of this command for using remote node cameras.*	

3.16 Preset Recall (Variable Speed)

Preset Recall (Variable Speed)	@ 16, p, s	{7-10 bytes} p = preset number (1-99) s = speed (1-100%)
MOLYNX 10H	This command is identical to the @8 (Preset Recall) command except that the camera will move to the camera at the specified speed rather than full speed. (Variable speed receivers only). *This command acts on a local or remote node according to the current camera.*	

3.17 Select View

Select View	@ 17, v	{5-7 bytes} v = view number (1-255)
MOLYNX	Select the specified view on the current monitor.	
5EH		

3.18 Return View Information

Return View Information	@ 18, v	{5-7 bytes} v = view number (1-255) Returns response {8-15 bytes} [!] "W" v, c, p, n where v = view number (1-255) c = camera number (1-511) p = preset number (1-99) n = camera node number (0-127)*
MOLYNX *Modified**	Returns the camera, node and preset number associated with the specified view.	
2FH	*The camera can be on the local node (0) or a remote node.**	

3.19 Program View

Program View	@ 19, v, c, p, n	{11-18 bytes} v = view number (1-255) c = camera number (1-511) p = preset number (1-99) n = camera node number (0-127)*
MOLYNX *Modified**	Store the camera and preset number as those associated with the specified view.	
2FH	*The camera can be on the local node (0) or a remote node.**	

3.20 Select Zone

Select Zone	@ 20, z	{5-7 bytes} z = zone number (1-255)
MOLYNX 5AH	Zones programmed from VisiPC or PCCON3: switch each zone camera to the corresponding zone monitor. These zones only contain cameras, not views. Zones programmed from a keyboard: these zones do not include the monitors as well as the cameras. Since a PCCON3 port is not configured with zone monitors, these zones can not be selected, and an "NC" error is returned.	

3.21 Return Zone Information

Return Zone Information	@ 21, z	{5-7 bytes} z = zone number (1-255) Returns response {68-441 bytes} [!] "Z" z, w, c_1, …, c_w, m_1, …, m_w where z = zone number (1-255) w = zone width (1-31) c_i = camera number (1-511) m_i = monitor number (1-128)*

MOLYNX 33H *Modified** Returns the camera number and monitor number pairs associated with the specified zone. The zone width is the number of cameras assigned to monitors on any one zone switch. Zones programmed from a keyboard have zero monitor numbers and will return an "NC" error.

Monitor numbers are included, but no camera/view types are returned (views are not supported).*

3.22 Program Zone

Program Zone

@ 22, z, w, c_1, …, c_w, m_1, …, m_w

{71-444 bytes}
z = zone number (1-255)
w = zone width (1-31)
c_i = camera number (1-511)
m_i = monitor number (1-128)*

MOLYNX 33H *Modified** Store the cameras (on the local node only) as those associated with the specified zone. Monitor numbers must be included, but no camera/view types are programmed (views are not supported).*

3.23 Return Enhanced Video Sequence Information

Return Enhanced Video Sequence Information

@ 23, q

{5-6 bytes}
q = sequence number (1-64)
Returns response {28-1329}
[!] "S" q, n, t_1, …, t_n, c_1, …, c_n, p_1, …, p_n, s_1, …, s_n, d_1, …, d_n, n_1, …, n_w
where
q = sequence number (1-64)
n = number of positions in sequence (2-63)
t_i = position type (camera (0) or view (1))
c_i = camera / view number (1-511/1-255)
p_i = preset number (0-99)
s_i = speed to move this position (1-100%)
d_i = dwell (1-255s)
n_i = camera node number (0-127, 0 = local node)*

MOLYNX 35H *Modified** Returns the information about the specified sequence.

*Cameras can be on the local node (0) or a remote node.**

3.24 Enhanced Video Sequence Program

Enhanced Video Sequence Program

@ 24, q, n, t_1, …, t_n, c_1, …, c_n, p_1, …, p_n, s_1, …, s_n, d_1, …, d_n, n_1, …, n_w

{31-1332 bytes}
q = sequence number (1-64)
n = number of positions (2-63)
t_i = position type (camera(0) or view(1))
c_i = camera / view number (1-511/1-255)
p_i = preset number (0-99, 0=do not move)
s_i = speed to move to this position (1-100%)
d_i = dwell (0-255s)
n_i = camera node number (0-127, 0 = local node)*

MOLYNX 35H *Modified** Store the specified video sequence. The number of each of the parameters must be equal to n.

*Cameras can be on the local node (0) or a remote node.**

3.25 Sequence Function

Sequence Function @ 25, f

{5 bytes}
f = function :
0 = hold off
1 = hold on
2 = reverse off (forward)
3 = reverse
4 = skip

MOLYNX
17H

Perform the action on a sequence running on the current monitor. If no sequence is running on the current monitor, an "NC" error is returned.

3.26 Relay Status

Relay Status @ 26, r

{5-7 bytes}
r = relay number (1-255)
Returns response {4-6 bytes}
[!] "R" r, s
where
r = relay number (1-255)
s = status (open (0) or closed (1))

MOLYNX
-

Returns the status of the specified relay. *Note that this command was present but not implemented in Visilynx 2.*

3.27 Relay Control

Relay Control @ 27, r, f

{7—9 bytes}
r = relay number (1-255)
f = function :
0 = off
1 = on

MOLYNX
1CH,
47H

Turn the specified relay on or off.

3.28 VCR Status

VCR Status @ 28, v

{5-6 bytes}
v = VCR number (1-32)
Returns response {4-7 bytes}
[!] "V" v, s
where
v = VCR number (1-32)
s = status (0-255, see below)

MOLYNX
-

Returns the status of the specified VCR as 8 bitflags. *Note that this command was present but not implemented in Visilynx 2.*

Status bitflags (if Offline=1, the other flags are to be ignored):

7	6	5	4	3	2	1	0
Offline	Standby	Busy	Search failed*	Media full	Media present	Front panel	Self-test

Bit	Values	Description
Self-test	0	Last self test passed
	1	Last self test failed
Front panel	0	Disabled
	1	Enabled
Media loaded	0	No media present
	1	Media loaded
Media full	0	Media OK
	1	Media is full
Search failed*	0	Last search was OK
	1	Last search failed
Busy	0	OK
	1	VCR is executing an action that prevents a status report. Re-try until busy bit not set
Standby	0	The VCR is in operating mode ("active")
	1	The VCR is "standby" mode
Offline	0	The VCR is "Online"
	1	There was no response from the VCR - it is "Offline" or disconnected

* The search status is reset by any new search command. Until a new search is carried out, the status reflects the last search results.

3.29 VCR Control

VCR Control @ 29, v, f

{7-8 bytes}
v = VCR number (1-32)
f = function :
0 = stop
1 = play
2 = record
3 = pause
4 = fast forward
5 = rewind
6 = time lapse
7 = real time

MOLYNX 1CH

Put the VCR into the mode specified by the function parameter. More functions are available in command @51, Extended VCR Control.

This command acts on a VCR connected to the current camera's node.

3.30 MPX Status

MPX Status @ 30, m

{5-6 bytes}
m = multiplexer number (1-32)
Returns response {4-7 bytes}
[!] "X" m, s
where
m = multiplexer number (1-32)
s = status (0-255, see below)

MOLYNX 3BH

Returns the status of the specified multiplexer as 8 bitflags. *Note that this command was present but not implemented in Visilynx 2.*

Status bitflags (if Offline=1, the other flags are to be ignored):

7	6	5	4	3	2	1	0
Offline	Standby	Busy	Invalid parameter	Invalid CMD	Front panel		Self-test

Bit	Values	Description
self-test:	0	OK
	1	Failed
front panel	0	Unlocked
	1	Locked by remote CMD
	2	Locked by front panel
	3	undefined
Invalid CMD	0	Last CMD was OK
	1	Last CMD was invalid
Invalid parameter	0	Last CMD had valid parameters
	1	Invalid parameter in last CMD
Busy	0	OK
	1	MPX is executing an action that prevents a status report. Re-try until busy bit not set
Standby	0	The MPX is in operating mode ("active")
	1	The MPX is "standby" mode
Offline	0	The Multiplexer is "Online"
	1	There was no response from the MPX - it is "Offline" or disconnected

3.31 MPX Control

MPX Control @ 31, m, f [, c] {7-11 bytes}
m = multiplexer number (1-32)
f = function :
0 = live
1 = decode (uses c parameter)
2 = encode
3 = camera (uses c parameter)
4 = multi
5 = freeze
6 = unfreeze
7 = zoom in
8 = zoom out
9 = pan left (if zoomed in)
10 = pan right (if zoomed in)
11 = tilt up (if zoomed in)
12 = tilt down (if zoomed in)
c = multiplexer camera number (1-32)

MOLYNX 3AH

Put the multiplexer into the mode specified by the function parameter. The multi mode will cycle through those multi-screen formats available each time it is executed. The pan and tilt commands only operate if a zoom-in command has previously been issued.

3.32 Alarm Status

Alarm Status @ 32

{3 bytes}
Returns response {2-644 bytes}
"A0"
or
[!]"A" t, m, a_1 [, an_1] [#], a_2 [, an_2], …, a_t [, an_t] [#]
where
t = number of active alarms (limited to 1-128)
m = alarm acceptance flag (0-1)
a_i = alarm numbers (1-1189)
ani = optional alarm node numbers (0-127) *
# = indicates current alarm

MOLYNX - *Modified** Returns the active alarms status. If no alarms are active in the system the message "A0" will be returned. m will be set to 1 if the current alarm has been accepted. The current alarm (that alarm which will be acted on by the @33 command) is designated by a '#' after it. It is the first alarm in the list if FIFO alarm mode has been selected, otherwise it is the last one in the list for LIFO mode.

*The originating node of each alarm is returned only if networking has been configured (total nodes > 1). **

3.33 Alarm Function

Alarm Function @ 33, f [, a]

{5-10 bytes}
f = function :
0 = accept
1 = unaccept
2 = cancel
3 = previous alarm on stack
4 = next alarm on stack
5 = disable (requires 'a' parameter)
6 = enable (requires 'a' parameter)
a = alarm number (1-1189)

MOLYNX - Perform the specified function on the current alarm. The current alarm may be obtained by using the @32 (Alarm Status) command and is signified in the status message by a '#' symbol. Functions 5 and 6 (enable and disable) require an additional parameter, namely the alarm number.

3.34 Return Date / Time

Return Date / Time @ 34

{3 bytes}
Returns response {17-22 bytes}
[!] "D" h, m, s, d, n, y, w
where
h = current hours (0-23)
m = current minutes (0-59)
s = current seconds (0-59)
d = current date (1-31)
n = current month (1-12)
y = current year (1999-2098)*
w = day of week (0 = Sun, …, 6 = Sat)

MOLYNX 26H *Modified** Returns the current system date, time and day of week. The year includes the century.*

3.35 Program Date / Time

Program Date / Time	@ 35, h, m, s, d, n, y, w	{20-25 bytes} h = current hours (0-23) m = current minutes (0-59) s = current seconds (0-59) d = current date (1-31) n = current month (1-12) y = current year (1999-2098)* w = day of week (0 = Sun, …, 6 = Sat)

MOLYNX *Modified** Sets the system date, time and day of week to that specified. The year includes the century.*

26H

3.36 Return PIN Information

Return PIN Information	@ 36	{3 bytes} Returns response {9-451 bytes} [!] "N" u, p_1, …, p_u where u = number of users (1-64) p_i = PIN number (0, 100000 - 999999) (for users 1 to u)

MOLYNX Returns the PIN numbers required to log a user on or off the system. A PIN of 0 is undefined and not usable. This command allows the PINs to be verified externally and the @37 (PIN log on / off) command to be sent if verification is successful.

39H

3.37 PIN Logon / Logoff / Log On New

PIN Logon / Logoff / Log On New	@ 37, u, f	{7-8 bytes} u = user number (1-64) f = function 0 = log off 1 = log on 2 = log on new (higher priority) user

MOLYNX Log a user on or off the system on a PCCON3 port. The 'Log On New' command allows a higher priority user to be logged on to a PCCON3 port where another (lower priority) user is already logged on, without first logging off.

1FH

The @36 command may be used to obtain PIN information for verification, in order to obtain a user number for this command to use; or else the remote controller's application may implement PIN verification independently.

3.38 Return User Number

Return User Number	@ 38	{3 bytes} Returns response {2-3 bytes} [!] "U" u where u = user number (1-64)

MOLYNX This command will return the number of the user currently logged on to this port. If no user has logged on using the @37 command, the user number returned will be the one configured for the PCCON3 port.

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3.39 Return Preset Sequence Information

Return Preset Sequence Information	@ 39	{3 bytes} Returns response {34-68 bytes} [!] "P" p_1, … , p_{16}, d where p_i = preset number (1-99) (255 if position not programmed) d = dwell (1-255s)
MOLYNX 15H	Returns preset sequence information for the currently selected camera.	

3.40 Return Preset Tour Information

Return Preset Tour Information	@ 40	{3 bytes} Returns response {64-128 bytes} [!] "T" s_1, … , s_{16}, d_1, … , d_{16} where s_i = speed (1-100% full speed) d_i = dwell (1-255s)
MOLYNX 37H	Returns preset tour information for the currently selected camera (variable speed receivers only).	

3.41 Camera Function All On

Camera Function All On	@ 41, f	{5 bytes} f = function 1 = wash 2 = camera on/off 3 = aux1 4 = wipe 5 = auto iris 6 = lamps 7 = lens slow 8 = auto focus 9 = aux3
MOLYNX 0CH	Turn on the specified function on all cameras to which the port user has control access. *This command acts on all cameras connected to the current camera's node.*	

3.42 Camera Function All Off

Camera Function All Off	@ 42, f	{5 bytes} f = function 1 = reserved 2 = camera on/off 3 = aux1 4 = wipe 5 = auto iris 6 = lamps 7 = lens slow 8 = auto focus 9 = aux3

MOLYNX 0DH

Turn off the specified function on all cameras to which the port user has control access.

This command acts on all cameras connected to the current camera's node.

3.43 Evolution MPX Status

Intended for external multiplexer devices. Not implemented in PCCON3.

3.44 Evolution MPX Control

Intended for external multiplexer devices. Not implemented in PCCON3.

3.45 Quad Status

Intended for external quad devices. Not implemented in PCCON3.

3.46 Quad Control

Intended for external quad devices. Not implemented in PCCON3.

3.47 Camera Setup

Camera Setup	@ 47, f	{5 bytes} f = function 0 = set 1 = cursor up 2 = cursor down 3 = cursor right 4 = cursor left 5 = menu

MOLYNX 1CH

Sends the specified camera setup command to the current camera. Cameras which do not support remote setup will ignore this command.

This command acts on a local or remote node according to the current camera.

3.48 Multiplexer Setup

Intended for external multiplexer devices. Not implemented in PCCON3.

3.49 Quad Setup

Intended for external quad devices. Not implemented in PCCON3.

3.50 Return Last Response

Return Last Response	@ 50	{3 bytes} Repeats last response sent to master. If no previous command, "OK" is returned.

MOLYNX *New*

Used as part of protocol fault recovery.

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3.51 Extended VCR Control

Extended VCR Control	@ 51, v, f [,c] [,r] [,a]	{7-19 bytes} v = VCR number (1-32) f = function : 0 = stop channel c (0=all channels) 1 = play channel c 2 = record channel c (0=all channels) 3 = pause channel c 4 = fast forward channel c at rate r 5 = rewind channel c at rate r 6 = shuttle forward channel c at rate r 7 = shuttle back channel c at rate r 8 = lock panel 9 = unlock panel 10 = go to previous alarm a event on channel c 11 = go to next alarm a event on channel c 12 = go to first alarm a event on channel c 13 = go to last alarm a event on channel c 14 = set record rate to r c = channel (0-6, 0=all channels) r = rate, picture per minute (1-1500) a = alarm number (0-32 , 0=any alarm)

MOLYNX *New*

47H

Put the VCR into the mode specified by the function parameter. This command offers more functions than command @29.

This command acts on a VCR connected to the current camera's node.

3.52 Switch Quad Camera

Switch Quad Camera	@ 52, q, c, p	{9-12 bytes} q = quad number (1-32) c = camera (1-511) p = screen position: 1 = upper left 2 = upper right 3 = lower left 4 = lower right

MOLYNX *New*

4AH

Switch the specified camera to the specified quad screen position.

This command can use the Format 2 Command Message to specify the camera node.

3.53 Quad Function

Quad Function	@ 53, q, f, p	{9-10 bytes} q = quad number (1-32) f = function: 1 = full screen 2 = quad 3 = freeze 4 = unfreeze p = screen position: 1 = upper left 2 = upper right 3 = lower left 4 = lower right
MOLYNX *New* 4BH	Set the specified quad function at the specified screen position.	

3.54 Quad Information

Quad Information	@ 54, q	{5-6 bytes} q = quad number (1-32) Returns response {20-36 bytes} [!] "Q" q, m, c_1, …, c_4, n_1, …, n_4 where q = quad number m = monitor number of top left position (1-127) c_i = camera number on each position (0-511) n_i = camera node on each position (0-127)
MOLYNX *New* 5DH	Return the specified quad status information. *Cameras can be on the local node (0) or a remote node.**	

3.55 Software Versions

Software Versions	@ 55	{3 bytes} Returns response {16-24 bytes} [!] "F" r1, r2, c1, c2, f1, f2, b1, b2 where r1 = rack controller major version r2 = rack controller minor version c1 = rack configuration major version c2 = rack configuration minor version f1 = CPU FPGA major version f2 = CPU FPGA minor version b1 = CPU boot loader major version b2 = CPU boot loader minor version
MOLYNX *New* 54H	Return versions of all software components. A version number normally displayed as 1.23 would have major version 1 and minor version 23.	

3.56 Initialise All Monitors

Initialise All Monitors	@ 56,1,3,2,4	{11 bytes}
MOLYNX *New* -	Unswitches all cameras from monitors and quads. The parameters are required but not used, to add a measure of security to prevent accidental initialisation.	

3.57 Default All Monitors

Default All Monitors	@ 57,1,3,2,4	{11 bytes}
MOLYNX *New* -	Switches default cameras to all monitors and quads. The parameters are required but not used, to add a measure of security to prevent accidental defaulting.	

3.58 Return Nodes List

Return Nodes List	@ 58	{3 bytes} Returns response {2-512 bytes} [!] "L" t [, n [, n_1, …, n_t]] where t = total remote nodes on line n = local node address (1-127) n_i = remote node address (1-127)
MOLYNX *New*	Return the local node address and the list of all online remote nodes.	
-	*If the local node address is zero, or if remote node networking is not configured (total nodes < 2), "L0" is returned.*	

3.59 Switcher Setup

Intended for 6000-series TX-PC. Not implemented in PCCON3.

3.60 Set Alarm Monitor

Intended for 6000-series TX-PC. Not implemented in PCCON3.

3.61 Return Alarm Monitor

Intended for 6000-series TX-PC. Not implemented in PCCON3.

4 Command Usage Notes

4.1 Flow Control

IMPORTANT: The PCCON3 protocol does not use flow control, except that which is provided by each command's response. This means that a new command will not be actioned until the response to the previous one has been sent from Visilynx 3.

Remote controllers sending PCCON3 commands should be programmed to wait for a complete response message before sending the next command, to prevent commands being lost.

4.2 Logging On

4.2.1 Operation without logging on

- Each PCCON serial port can be configured with a default user number using the VisiPC configuration software.
- Each user can have different access to cameras and external devices.
- Each user has a priority, which is only used to resolve attempts by different users to control the same camera at the same time. It is not used to prevent cameras from being switched – only the View and Control access flags apply there.

4.2.2 Changing the logged on user

- Send the Return PIN Information to get the list of user PIN numbers.
- Send a PIN Logon command to log on as a user other than the PCCON port's default user.
- Send a PIN Logoff command to end that user's control session.
- Or, send a PIN Logon New command to log on a higher-priority user without first logging off.

4.3 Switching Cameras

4.3.1 Switching to a monitor

- Send the Select Monitor command to set the current monitor (note that quad segments also have monitor numbers). If the logged on user has no access to the monitor, an "NC" error is returned.
- Send the Select Camera command to switch a camera to the current monitor. If the logged on user has no access to the camera, an "NC" error is returned.

4.3.2 Switching to a quad segment

Using a quad card number instead of a quad segment's monitor number:

- Send a Switch Quad Camera command to switch a camera to a quad segment. If the logged on user has no access to the camera, an "NC" error is returned.
- If required, send a Quad Function command to freeze a segment or set it to full screen.

4.3.3 Querying Matrix Switch Status

- Send a Return Camera And Monitor Status command to find out what camera is switched to a monitor.
- Send a Quad Information command to find out what cameras are switched to each segment.

4.4 Controlling Cameras

4.4.1 Moving pan and tilt

- Send a Camera Speed command to set the speed in each axis (variable speed receivers only). If this command is not used, speeds of 100% are used. If the logged on user has no access to the camera, an "NC" error is returned.

- Send a Camera Function On command to specify the pan and/or tilt direction. If the logged on user has no access to the camera, an "NC" error is returned.
- The camera will continue smoothly in the set direction for 2 seconds. If no further Camera Function On or Off commands are sent, the camera will then stop.
- To continue camera movement, send the Camera Function On command about once a second. The Camera speed command can also be used to change the speed of either axis.
- To stop the camera, send a Camera Function Off command.
- After stopping, the camera will remain under the PCCON user's control until the User Control Timeout (set in configuration for the logged in user) has expired. During this time, lower-priority users can not control the camera.

4.4.2 Using camera functions

- Send a Camera Function On command to activate other camera functions such as wash or wipe.
- Send a Camera Function Off command to stop the function.

4.4.3 Controlling all cameras at once

- Send a Camera Function All On command to set a function on all cameras at once. If the logged on user has no access to the camera, an "NC" error is returned.
- Send a Camera Function All Off command to reset a function on all cameras at once. If the logged on user has no access to the camera, an "NC" error is returned.

4.4.4 Using camera presets

- A preset is a snapshot of a camera's pan, tilt, zoom, iris and focus settings.
- Presets are used by themselves, or as part of Preset Sequences and Tours, Camera Sequences, Views or Zones.
- Send the Preset Position Program command to store the current settings as a preset number. If the logged on user has no access to the camera, an "NC" error is returned.
- Send the Preset Recall command to move a camera to a preset position at full speed. If the logged on user has no access to the camera, an "NC" error is returned.
- Send the Preset Recall (Variable Speed) command to move a camera to a preset position at a set speed (variable speed receivers only). If the logged on user has no access to the camera, an "NC" error is returned.
- Send other commands relating to Preset Sequences and Tours, Camera Sequences, Views or Zones. This is in order to program them, to select or recall them, or to return their information.
- If one of these objects exists and has to be modified, send the command to return its information, modify its contents, and send a command to program it.

4.5 Monitoring Alarms

4.5.1 Remote controller polls for alarms

- Send the Alarm Status command (32) periodically to request the list of all active alarms.

4.5.2 Master sees alarm flag in other responses

As an alternative to polling:

- Send any command.
- Check for the presence of the alarm flag "!" at the start of the response.
- If present, send the Alarm Status command (32) to request the list of active alarms.