TTX309 / PCCON2 Command Set

Introduction

This document defines the protocol for communications between a Visilynx II Serial Communications Card (PCBV309) fitted with PCCON2 firmware and a controlling device such as a PC.

The controlling device is able to perform most of the functions of a standard Visilynx II Keyboard by sending commands to the PCCON2 card and will obtain status responses from the card.

A subset of the commands can be used to control a TTX309 standalone interface which converts the commands into the standard Molynx Data Protocol, allowing the PC, etc. to control Molynx receivers directly. This is necessary since the Molynx Data Protocol is designed for high-speed, real-time communications and it may not be possible for the PC to meet the its required response times. The TTX309 communicates with the receivers via an RS485 network which allows multiple receivers to be connected to one TTX309 and controlled simultaneously.

The TTX309 can also control a Molynx 600-series, either by being the sole controller connected directly to a 640 video switching unit or by acting as a slave keyboard on an existing system. The slave keyboard address is selectable.

Associated Documents

This document replaces E0017S02 and provides information about the additional codes which have been added to utilise the extra functions available in Visilynx II. The original proposal for this protocol was set out in E0114P02, however a number of modifications have been made in the released version.

Command Format

The commands are sent in the format

@ C, [P_1, [P_2, [...]]] <CR>

where **C** is the command number and P_1 ... P_n are parameters, the number and range of which are defined by the command. Parameters are separated by commas (ASCII 2C hex). The final comma is optional. @ is ASCII 40 hex; <CR> is ASCII 0D hex. No spaces, tabs, etc are permitted between characters.

Response Format

The response from the PCCON2 card will be one of the following —

OK the command was received and executed successfully

ER the command contained a syntax error, or a number contained within it was out of range

NC the command was recognised correctly but control was disallowed (e.g. access was not permitted to a camera or monitor, an attempt was made to execute an alarm function when no alarm was present, control was disallowed while a sequence was running, etc.)

No response indicates a faulty communications link.

Those commands which are intended to produce a status response return a different message. Each of those is documented separately under the specific command.

All responses are terminated with a Carriage Return (ASCII 0D hex) character.

If there are any alarms for the keyboard which require processing the response will be preceded by an exclamation mark (“!”). This will be true of both the OK/ER/NC responses and the status responses. The user’s application should then send a request for alarm information. Note that if an immediate response to

alarms is required then a request status command should be sent periodically. The card will never send out data other than as a response to a request.

Commands

The commands available are as follows —

- Status Request
- Select Monitor
- Select Camera
- Camera Reset
- Camera Function On
- Camera Function Off
- Camera Speed
- Preset Recall
- Preset Position Program
- Preset Sequence Recall
- Preset Sequence Program
- Preset Tour Recall
- Preset Tour Program
- Video Sequence Recall
- Video Sequence Program
- Preset Recall (Variable Speed)
- Select View
- Return View Information
- Program View
- Select Zone
- Return Zone Information
- Program Zone
- Return Video Sequence Information
- Enhanced Video Sequence Program
- Sequence Hold / Skip / Reverse
- Return Relay Status
- Relay Control
- Return VCR Status
- VCR Control
- Return MPX Status
- MPX Control
- Return Alarm Status
- Alarm Accept / Unaccept / Cancel / Previous / Next / Enable / Disable
- Return Date/Time
- Program Date/Time
- Return PIN Information
- PIN Log on / Log off / Log new
- Return User Number
- Return Preset Sequence Information
- Return Preset Tour Information
- Camera Function All On
- Camera Function All Off

A detailed description of each command and its associated response is given below.

Return Camera / Monitor Status	@ 1	Returns "M" m, s, "C" c, l where m = current monitor number 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 l = camera latched function status (0 - 255) bit 0 = camera on/off bit 1 = AUX1 bit 2 = auto iris bit 3 = lamps bit 4 = lamps bit 5 = lens slow bit 6 = reserved bit 7 = reserved
TTX309 ✓ PCCON2 ✓	This command can be used to determine the current monitor and current camera on which actions will be performed.	
Select Monitor	@ 2, m	m = monitor number (1-256)
TTX309 ✓ PCCON2 ✓	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.	
Select Camera	@ 3, c	c = camera number (1-256)
TTX309 ✓ PCCON2 ✓	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.	
Camera Reset	@ 4	
TTX309 ✓ PCCON2 ✓	Reset the currently selected receiver. This will test the pan and tilt unit for limits and erase all programmed presets.	

Camera Function On	@ 5, f	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 = reserved 24 = reserved
TTX309 ✓ PCCON2 ✓	Turn on the specified function on the currently selected camera.	

Camera Function Off	@ 6, f	f = function (1-24)
TTX309 ✓ PCCON2 ✓	Turn off the specified function on the currently selected camera. Function numbers are as defined in @5 (Camera Function On).	

Camera Speed	@ 7, p, t	p = pan speed (1-100%) t = tilt speed (1-100%)
TTX309 ✓ PCCON2 ✓	Set the speed at which the pan and tilt functions will operate on the currently selected camera (variable speed receivers only).	

Preset Recall	@ 8, p	p = preset number (1-99)
TTX309 ✓ PCCON2 ✓	Move the currently selected camera to the specified preset position (preset receivers only).	

Preset Position Program	@ 9, p	p = preset number (1-99)
TTX309 ✓ PCCON2 ✓	Store the current position as a preset on the currently selected camera (preset receivers only).	
Preset Sequence Recall	@ 10	
TTX309 ✓ PCCON2 ✓	Request the currently selected camera to perform a preset sequence (preset receivers only).	
Preset Sequence Program	@ 11, n, p_1, …, p_n, d	n = number of positions (2-16) p_i = preset number (1-99) d = global dwell (1-99s)
TTX309 ✓ PCCON2 ✓	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).	
Preset Tour Recall	@ 12	
TTX309 ✓ PCCON2 ✓	Request the currently selected camera to perform a preset tour (variable speed receivers only).	
Preset Tour Program	@ 13, s_1, …, s_{16}, d_1, …, d_{16}	s_i = speed to move (1-100%) d_i = dwell (1-99s)
TTX309 ✓ PCCON2 ✓	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.	
Video Sequence Recall	@ 14, s	s = sequence number (1-64)
TTX309 ✓ PCCON2 ✓	Recall the specified video sequence on the current monitor. On the TTX309 s must be in the range 1 to 4.	

Video Sequence Program	@ 15, s, n, c_1, …, c_n, d	s = sequence number (1-4) n = number of cameras in sequence (1-16) c_i = camera number d = dwell (1-99s)
TTX309 ✓ PCCON2 ✗	Store the specified video sequence. The number of c_i parameters must be equal to n. d is a global dwell for all positions. See command @24 for an enhanced version of this command for use with PCCON2.	
Preset Recall (Variable Speed)	@ 16, p, s	p = preset number (1-99) s = speed (1-100%)
TTX309 ✗ PCCON2 ✔	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).	
Select View	@ 17, v	v = view number (1-256)
TTX309 ✗ PCCON2 ✓	Select the specified view on the current monitor.	
Return View Information	@ 18, v	v = view number (1-256) Returns "W" v, c, p where v = view number c = camera number p = preset number
TTX309 ✗ PCCON2 ✓	Returns the camera and preset number associated with the specified view.	
Program View	@ 19, v, c, p	v = view number (1-256) c = camera number (1-256) p = preset number (1-99)
TTX309 ✗ PCCON2 ✓	Store the camera and preset number as those associated with the specified view.	
Select Zone	@ 20, z	z = zone number (1-256)
TTX309 ✗ PCCON2 ✓	Select the specified zone on the zone monitors for the keyboard. If no zone monitors are assigned to the keyboard an error message will be returned.	

Return Zone Information	@ 21, z	z = zone number (1-256) Returns "Z" z, w, t_1, t_2, …, t_w, c_1, c_2, …, c_w where z = zone number w = zone width t_i = type (camera (0) or view (1)) c_i = camera / view number
TTX309 ✗ PCCON2 ✓	Returns the camera / view numbers associated with the specified zone. The zone width is the number of cameras assigned to the zone monitors on any one zone switch.	
Program Zone	@ 22, z, t_1, …, t_n, c_1, …, c_n	z = zone number (1-256) t_i = type (camera (0) or view (1)) c_i = camera / view number (1-256) (n from 1 to zone width)
TTX309 ✗ PCCON2 ✓	Store the cameras / views as those associated with the specified zone.	
Return Enhanced Video Sequence Information	@ 23, q	q = sequence number (1-64) Returns "S", q, n, t_1, …, t_n, c_1, …, c_n, p_1, …, p_n, s_1, …, s_n, d_1, …, d_n where q = sequence number n = number of positions in sequence t_i = position type (camera (0) or view (1)) c_i = camera / view number p_i = preset number s_i = speed to move this position d_i = dwell
TTX309 ✗ PCCON2 ✓	Returns the information about the specified sequence.	

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	q = sequence number (1-64) n = number of positions (2-32) t_i = position type (camera(0) or view(1)) c_i = camera / view number (1-256) 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)
TTX309 ✗ PCCON2 ✓	Store the specified video sequence. The number of each of the parameters must be equal to n.	
Sequence Function	@ 25, f	f = function : 0 = hold off 1 = hold on 2 = reverse off (forward) 3 = reverse 4 = skip
TTX309 ✗ PCCON2 ✓	Perform the action on a sequence running on the current monitor.	
Relay Status	@ 26, r	r = relay number (1-128) Returns "R" r, s where r = relay number s = status (open (0) or closed (1))
TTX309 ✗ PCCON2 ✓	Returns the status of the specified relay. ***This command is not implemented in the first release and a status of 0 will be returned.***	
Relay Control	@ 27, r, f	r = relay number (1-128) f = function : 0 = off 1 = on
TTX309 ✗ PCCON2 ✓	Turn the specified relay on or off.	

VCR Status	@ 28, v	v = VCR number (1-32) Returns "V" v, s where v = VCR number s = status (to be defined)
TTX309 ✗ PCCON2 ✓	Returns the status of the specified VCR. ***This command is not implemented in the first release and a status of 0 will be returned.***	
VCR Control	@ 29, v, f	v = VCR number (1-32) f = function : 0 = stop 1 = play 2 = record 3 = pause 4 = fast forward 5 = rewind
TTX309 ✗ PCCON2 ✓	Put the VCR into the mode specified by the function parameter.	
MPX Status	@ 30, m	m = multiplexer number (1-32) Returns "X" m, s where m = multiplexer number s = status (to be defined)
TTX309 ✗ PCCON2 ✓	Returns the status of the specified multiplexer. ***This command is not implemented in the first release and a status of 0 will be returned.***	
MPX Control	@ 31, m, f [, c]	m = multiplexer number (1-32) f = function : 0 = live 1 = decode (uses c parameter) 2 = encode 3 = camera (uses c parameter) 4 = multi c = multiplexer camera number (1-16)
TTX309 ✗ PCCON2 ✓	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.	

Alarm Status	@ 32	Returns "A" n, m, a_1, a_2, …, a_n where n = number of alarms on stack m = 1 if alarm accepted, otherwise 0 a_i = alarm numbers
TTX309 ✗ PCCON2 ✓	Returns the alarm status. If no alarms are active in the system the message "A0" will be returned. m will be set to 1 if an alarm is currently accepted. The current alarm (that alarm which will be acted on by the @33 command) is designated by a '#' after it. Its position in the stack will depend on whether LIFO or FIFO alarm mode is selected.	
Alarm Function	@ 33, f [,a]	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 (1-1024)
TTX309 ✗ PCCON2 ✓	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.	
Return Date / Time	@ 34	Returns "D" h, m, s, d, n, y, w where h = current hours m = current minutes s = current seconds d = current date n = current month y = current year w = day of week (0 = Sun, …, 6 = Sat)
TTX309 ✗ PCCON2 ✓	Returns the current system date, time and day of week.	

Program Date / Time	@ 35, h, m, s, d, n, y, w	h = current hours (00-23) m = current minutes (00-59) s = current seconds (00-59) d = current date (1-31) n = current month (1-12) y = current year (00-99) w = day of week (0 = Sun, …, 6 = Sat)
TTX309 ✗ PCCON2 ✓	Sets the system date, time and day of week to that specified.	
Return PIN Information	@ 36	Returns "N" p_1, …, p_u where p_i = PIN number (100000 - 999999) (for users 1 to 'number of users')
TTX309 ✗ PCCON2 ✓	Returns the PIN numbers required to log a user on or off the system. This command allows the PINs to be verified externally and the @37 (PIN log on / off) command to be sent if verification is successful. On a keyboard where PINs are not enabled this command is not required and an error message will be returned.	
PIN Logon / Logoff / Log On New	@ 37, u, f	u = user number (1-32) f = function 0 = log off 1 = log on 2 = log on new (higher priority) user
TTX309 ✗ PCCON2 ✓	Log a user on or off the system on a PIN enabled keyboard. The 'Log On New' command allows a higher priority user to be logged on to a keyboard where another (lower priority) user is already logged on. The @36 command may be used to obtain PIN information for verification or the user's application may handle it independently. On a keyboard where PINs are not enabled this command is not required and an error message will be returned.	
Return User Number	@ 38	Returns "U" u where u = user number
TTX309 ✗ PCCON2 ✓	If PINs are enabled this command will return the number of the user currently logged on to this keyboard. If PINs are not enabled the keyboard number will be returned.	

Return Preset Sequence Information	@ 39	Returns "P" p_1, … , p_{16}, d where p_i = preset position number (255 if position not programmed) d = dwell
TTX309 ✗ PCCON2 ✓	Returns preset sequence information for the currently selected camera	
Return Preset Tour Information	@ 40	Returns "T" s_1, … , s_{16}, d_1, … , d_{16} where s_i = speed (% full speed) d_i = dwell (seconds)
TTX309 ✗ PCCON2 ✓	Returns preset tour information for the currently selected camera (variable speed receivers only).	
Camera Function All On	@ 41, f	f = function (1-7) 1 = wash 2 = camera on/off 3 = aux1 4 = wipe 5 = auto iris 6 = lamps 7 = lens slow
TTX309 ✗ PCCON2 ✓	Turn on the specified function on all cameras to which the keyboard has control access.	
Camera Function All Off	@ 42, f	f = function (1-7) 1 = reserved 2 = camera on/off 3 = aux1 4 = wipe 5 = auto iris 6 = lamps 7 = lens slow
TTX309 ✗ PCCON2 ✓	Turn off the specified function on all cameras to which the keyboard has control access.	

RS232 Interface to PC

Settings: 9600 baud,
1 start bit,
8 data bits,
even parity,
1 stop bit,
DTR-CTS handshaking,
full duplex.

Connector: 9 way male 'D' type.

Pins:

1	No Connection
2	RX
3	TX
4	DTR
5	GND
6	No Connection
7	No Connection
8	CTS
9	No Connection

Connections to a PC

The table below shows the connection information for a TTX309 or a PCCON2 (309) card to communicate with a standard PC serial (COM) port.

9 Way Connector on PC			**25 Way Connector on PC**		
TTX309 / PCCON2		**PC**	**TTX309 / PCCON2**		**PC**
2 RX	—	3 TX	2 RX	—	2 TX
3 TX	—	2 RX	3 TX	—	3 RX
4 DTR	—	8 CTS	4 DTR	—	5 CTS
5 GND	—	5 GND	5 GND	—	7 GND
8 CTS	—	4 DTR	8 CTS	—	20 DTR

Operation with a PC

To communicate with the TTX309 / PCCON2 card it is necessary to run a terminal emulation program on the PC. A number of different programs are suitable, including HyperTerminal for Windows 95, ProComm, ProComm Plus and DataTalk. The comms interface should be set up as above on the desired COM port.

Alternatively, a specific applications program can be written which communicates with the card. Again the comms interface should be set up in this application as above.