Ahlecsonyc - Projector Protocol Document

Device Summary:

The Ahlecsonyc Projector is a 4K, Laser Projector with a maximum Projector Life of 120,000 hours. It is controlled via TCP/IP and requires the following connection information:

IP Address – 127.0.0.1 (Loaded to another Room on VC-4 or another slot on 4-Series Processor)
Port Number – 55555

Protocol Definition

TX – Command Structure for Commands Sent to Device

<STX>	[01]	[00]	[00]	Command			[00]	[00]	[00]	<ETX>
1	2	3	4	5	6	7	8	9	10	11

The format of the command to send to the projector will consist of a start byte <STX> and a delimiter of <ETX>.

Bytes 5, 6, and 7, are the bytes used for sending a specific command to the projector. All commands are defined by three ASCII bytes and listed below:

Command	Command Description
PON	Turn on the Projector
POF	Turn off the Projector
HD1	Switch to HDMI Input 1
HD2	Switch to HDMI Input 2
HD3	Switch to HDMI Input 3
VG1	Switch to VGA Input
RST	Reset Projector Error
LH?	Request Lamp Hours
FH?	Request Filter Hours
POL	Poll Projector for
NR?	Request Projector's Native Resolution
LS?	Request Lens Projector is Utilizing

Rx – Command Structure for Responses from Device

Standard Responses:

When a request is made to the projector, an echo or NAK response may be sent from the projector.

After most valid commands are sent to the Projector, the first command that the projector will return is an echo of the command sent, and will have the following format:

<STX>	Command Echo			<ETX>
1	2	3	4	5

A NAK will be returned if the projector received a command that it does not recognize.

<STX>	N	A	K	<ETX>
1	2	3	4	5

Power ON/OFF Response:

When a power change requests are made to the Projector, the first command that the projector will return will either be WRM or COL based on PON or POF being sent. This will be followed by an echo of the original command sent. Both messages will have the following format:

<STX>	Command			<ETX>
1	2	3	4	5

Timing of the responses may not be immediate so provisions in the connecting client will need to be made to deal with the delayed responses.

Lamp Hours Response:

When the LH? request is made to the Projector it will respond with an echo of the command including the ASCII representation of the Runtime Hours. Ex. 123 hours would require 3 bytes. The response will be variable in length and value.

<STX>	Command Echo			Runtime Hours			<ETX>
1	2	3	4	5	?	?	?

Error State Response:

When the ERR request is made to the Projector it will respond with an echo of the command including a single additional byte containing error information:

<STX>	Command Echo			Error	<ETX>
1	2	3	4	5	6

Error Byte Decode (multiple errors can occur at once)

0x01 = Over Temp Error
0x02 = Lamp Hours Error
0x04 = Fan Error
0x08 = Shutter Error

Native Resolution Response:

When the NR? request is made to the Projector it will respond with an echo of the command including 5 bytes of additional data containing the current resolution encoded as follows:

<STX>	Command Echo			HB1	HB2	'x'	VB1	VB2	<ETX>
1	2	3	4	5	6	7	8	9	10

When a resolution request is made, data returned will provide the following information:

Byte	Valid Values	Description
HB1	Based on current resolution	First two digits of horizontal resolution*
RB2	Based on current resolution	Last two digits of horizontal resolution
'x'	ASCII character 'x'	'x'
VB1	Based on current resolution	First two digits of vertical resolution*
VB2	Based on current resolution	Last two digits of vertical resolution

**number is padded with leading 0's if component is less than 4 digits*

If the current resolution is 1200x800, the response returned will have the following data:

<STX>	'N'	'R'	'?'	[12]	[00]	'x'	[08]	[00]	<ETX>
1	2	3	4	5	6	7	8	9	10

Poll Response

When the POL request is made to the Projector it will respond with a message containing a combination of the Error State, Lamp Hours and Native Resolution responses as a single string. The incoming command will not be echoed back in the response.

Expected response (each individual response does not have it's own STX/ETX, only the whole message):

<STX>	Error Response	Lamp Hours Response	Native Resolution Response	<ETX>
1	2 – 5 (4 bytes)	6 – ? (variable length)	? - ? (8 bytes)	?

Completion of Lab Communication Exercise

In order to complete the lab exercise you need to send 3 successful commands to the projector. After the 3rd command is successfully received by the projector it will send the following message to the client:

"Enter first and last name."

The client will then need to enter their name using the following format for credit in the lab. Message length is variable but the message bust be wrapped in STX/ETX and have 0xFF as the 2nd byte.

<STX>	[FF]	Name of Attendee			<ETX>
1	2	3	?	?	?

The client will then receive the following message:

"<Name of Attendee> has won the challenge!"

At this point the lab is completed.