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OPERATION MANUAL

Evve Long Range Camera System

MK-Series

2020

CONTENTS

ABOUT THIS DOCUMENT

This manual contains information on the operation and the different interfaces of the following Evve Long Range™ products:

2000HD - High Definition Camera System

The information in this manual is subject to change without notice. Please refer to our website for the latest information.

NOTE: *All graphics contained within this document, including screenshots and other displays, are for reference use only and are subject to change.*

ADDITIONAL INFORMATION & RELATED DOCUMENTS

For information on the camera installation, please see Installation Manual MK-Series. This manual is available from the Evve Long Range website at: **www.evvelongrange.com/downloads**

FFC COMPLIANCE

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications to this device void the warranty.

SUPPORT SERVICES

Please contact ELR for technical assistance: support@evvelongrange.com | +31 0 85 0441855 (NL).

SAFETY INSTRUCTIONS

1. Please read these instructions prior to use.
2. Please keep these instructions accessible.
3. Please heed all warnings.
4. Please follow all instructions.
5. Installation should be done only by qualified personnel and conform to all local codes.

   CAUTION: These servicing instructions are for use by qualified service personnel only.

   To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.
6. Use only mounting methods and materials capable of supporting at least four times the combined weight of the pan-tilt unit, mounted payloads, and cabling.
7. For outdoor use, use only corrosion resistant hardware to fasten the mount and payloads (e.g., stainless steel screws).
8. The unit should not be installed in environments that present conditions beyond the environmental specification of pan-tilt unit. Installation near heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) can exceed the unit's temperature ratings.
9. Refer all servicing to qualified service personnel. If the unit is damaged, remove power immediately, and contact ELR.
10. A readily accessible power disconnect shall be incorporated into the installation wiring.
11. Only use replacement parts recommended by ELR.

Installation should be done only by qualified installers and conform to all local codes.

- It is the users' responsibility to ensure that the mounting methods are safe and adequate for the location.
- Use only stainless steel hardware to fasten the mount to an outdoor surface.
- All servicing should be performed by qualified service personnel. Procedures in this manual do not require entry into the housing of the camera positioning system. The unit contains potential high voltage. It also contains sensitive devices that can be damaged by static discharge. To reduce the risk of electric shock and damage to the unit by static discharge do not perform any servicing other that described in these instructions. If the unit is defective, please contact the Customer Service Department for technical assistance.
- Liability: It is the sole responsibility of the installer to provide proper installation in compliance with all local codes and regulations.

The Evve Long Range products are part of the next generation of Long Range camera systems, ranging from high-definition (HD) to standard-definition (SD) camera positioning systems. The systems are IP (Internet Protocol) based with a full function built-in operating system. Operator functions features are controlled from the On Screen Display (OSD).

A drive system positioned within the MK-2000HD Series camera permits full 360° continuous pan and 90° tilt movements. The camera systems comply with MIL-STD-18F standards for temperature, shock, and vibration specifications. For environmental protection the camera systems use an IP67 camera head enclosure and IP66 positioner enclosure.

CLASS 3 (EYE & SPECULAR REFLECTION HAZARD):

- Never aim the laser at a person's eye or stare at the laser from within the beam.
- Keep the beam path above or below eye level for one seated or standing.
- Laser safety eyewear is needed if MPE (Maximum Permissible Exposure) is exceeded.
- Don't view beam directly with optical instruments unless a protective filter is used.
- Only experienced and authorized individuals are permitted to operate the laser.
- Secure the laser from operation by unauthorized personnel. A key switch should be used if unauthorized personnel may gain access to the laser.
- Always strive to enclose as much of the beam path as practical and to operate the laser in a controlled access area.
- During alignment, avoid placing one's eye near the axis of the beam path, where specular reflections are most likely to occur. Alignment eyewear should be considered.
- Unnecessary specular (i.e., mirror-like) reflecting objects should be removed from the beam path.
- Mount the laser on a firm support to ensure the beam travels along its intended path.
- Post laser hazard warning signs at entrances to laser use areas.

For more information on specifications and datasheets, please refer to specific product pages at Evve Long Range website: www.evvelongrange.com/downloads.

1. PROTOCOL

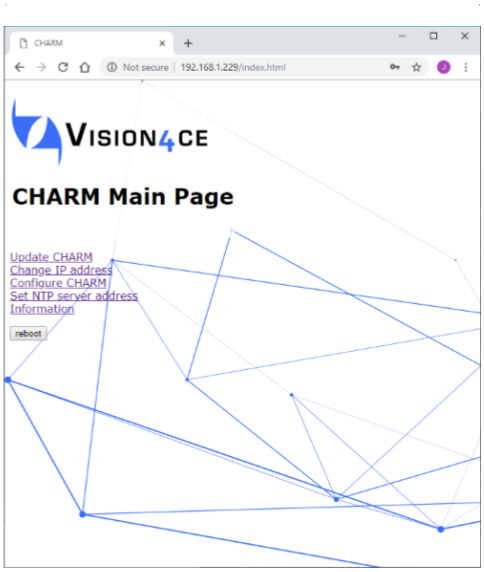
This MK-2000HD Series ELR camera has been adjusted to Pelco D 9600 Protocol.

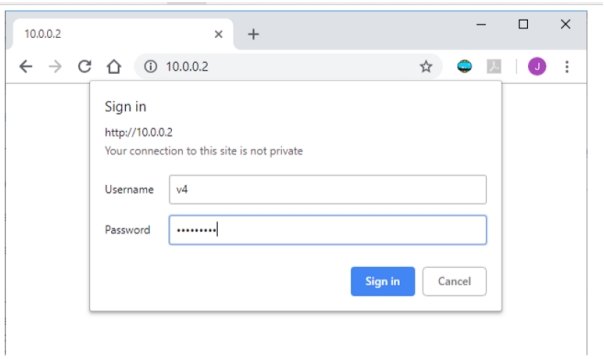
2. VIDEOSTREAMS THROUGH CHARM 10CE

2.1 CONNECTING TO THE CHARM

You need a computer with Ethernet connection to the CHARM, and a web browser. Furthermore, you need to know the IP address of the CHARM the default is 10.0.0.2.

Open the web browser and enter http://10.0.0.2 where 10.0.0.2 is the IP address of the CHARM. The username is “v4” and the password “vision4ce”.





2.2 OPERATING IN MULTICAST

Looking at the start screen, towards the middle, you can see the option to ‘Edit’ the template.xml file. Click the Edit button, and then follow the instructions in the file to:

- Copy to another file.
- Edit the copied file to:
  - Remove the lower case x from the xStreamRTSPCfg0 entry.
  - Change the bUseUnicast=”true” to bUseUnicast=”false”.
- Save the file.
- Ensure that the new file is ‘selected’ in the WebUpdater interface.

2.3 RTSP VIDEOSTREAM

To obtain a direct RTSP VideoStream of the charm, use the following URL:

10.0.0.2:8001/charmstream

in which 10.0.0.2 is the IP address of the CHARM10CE.

To get a VideoStream in RTSP, you can a media player like for example VLC.

2.4 UPDATING SOFTWARE

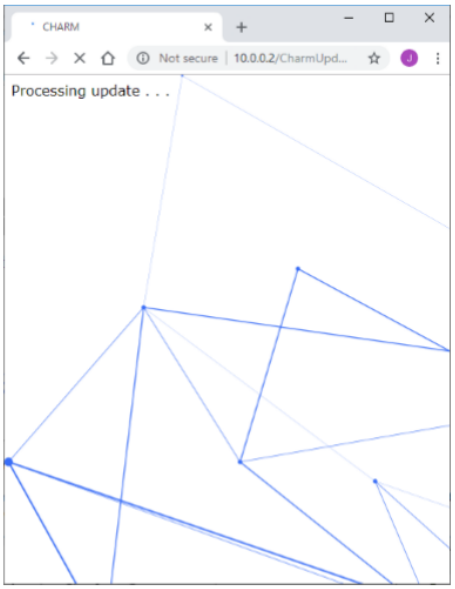
The following instrucitons are for updating the tracker software on a CHARM with Ethernet connection. Operating system and tracker sofware update over serial connection are not covered here.

PRE-REQUISITES

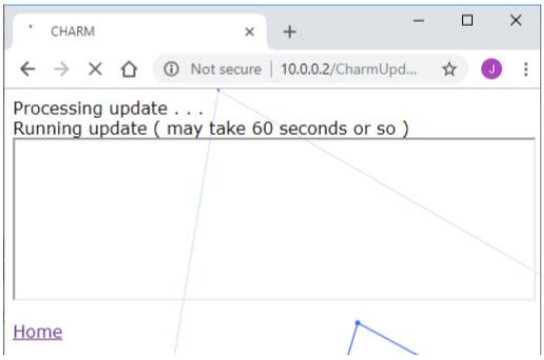
You will need a computer with Ethernet connection to the CHARM, an update file and a web browser. You will need to know the IP address of the CHARM (the default is 10.0.0.2).

PERFORMING AN UPDATE

Choose “Update CHARM” from the CHARM Main Page then click on the “Choose file” button and navigate to the update file.

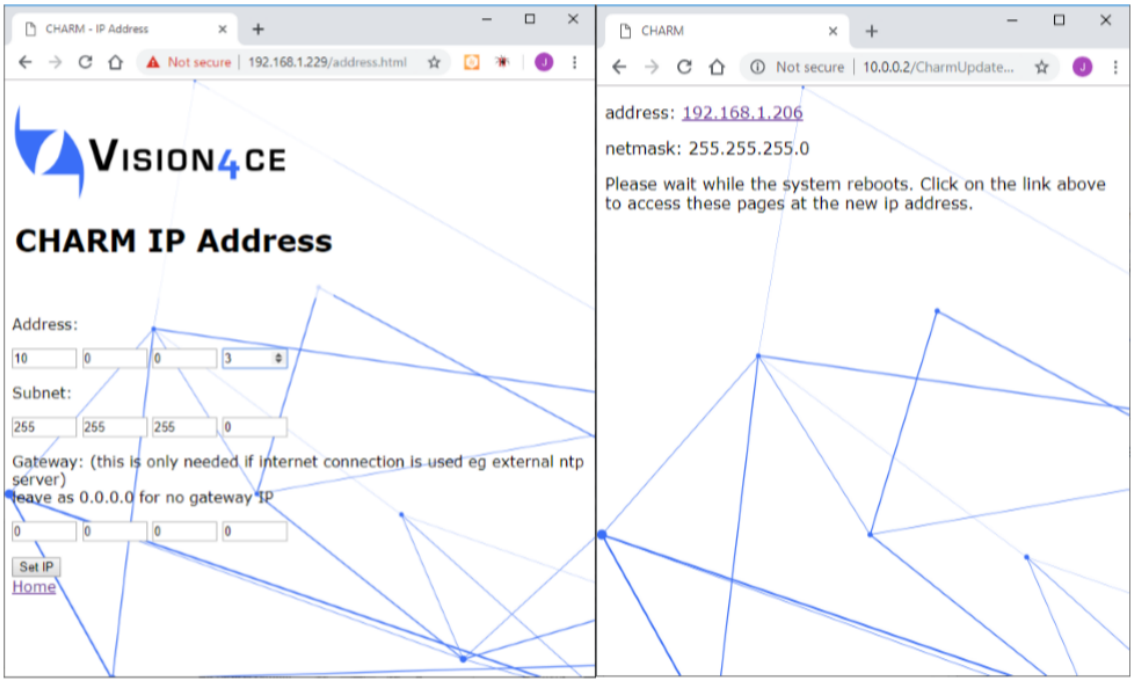


Once it has finished uploading you will see “Processing update …” for a few seconds then “Running update” and finally the installer output in the box below or a “connection lost” message when the CHARM reboots itself after installation.



2.5 ADJUSTING IP ADDRESS

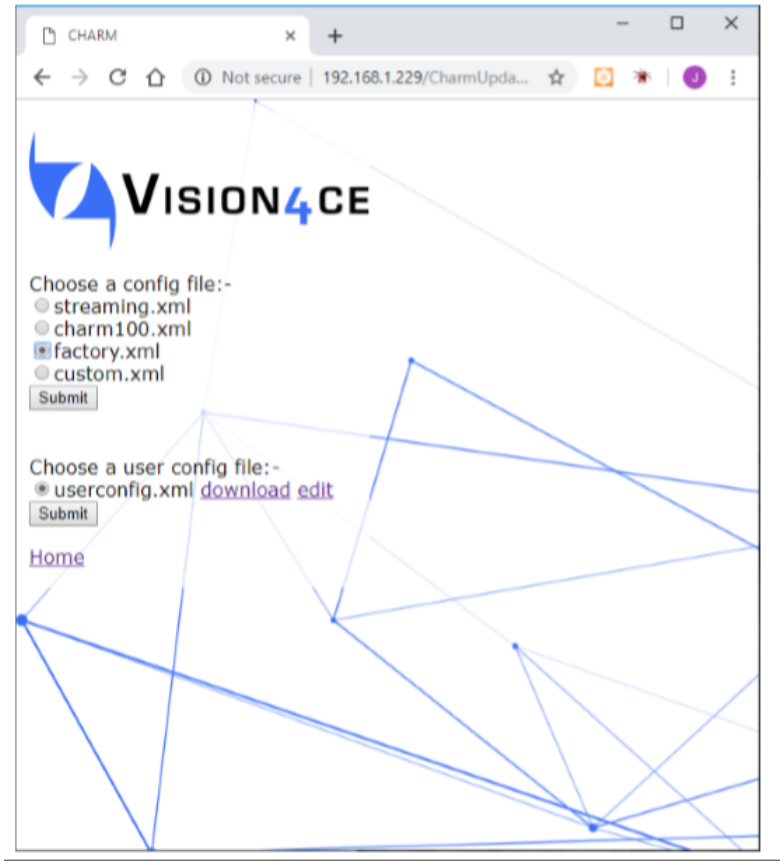
To change the IP address click on the “Change IP address link” from the CHARM Main Page. Enter the new IP address and subnet mask. For IP addresses in the 10.0.0.x range the subnet mask should be 255.0.0.0 and for IP addresses in the 192.168.1.x range the subnet mask should be 255.255.255.0.



You can optionally add a gateway address if you need the CHARM to connect to the internet, to get internet (NTP) time for instance.
Upon pressing the submit / Set IP button the IP address will be changed and the CHARM rebooted. To view the CHARM Web Updater again you will need to log in again at the new IP address.

2.6 CONFIGURING THE CHARM

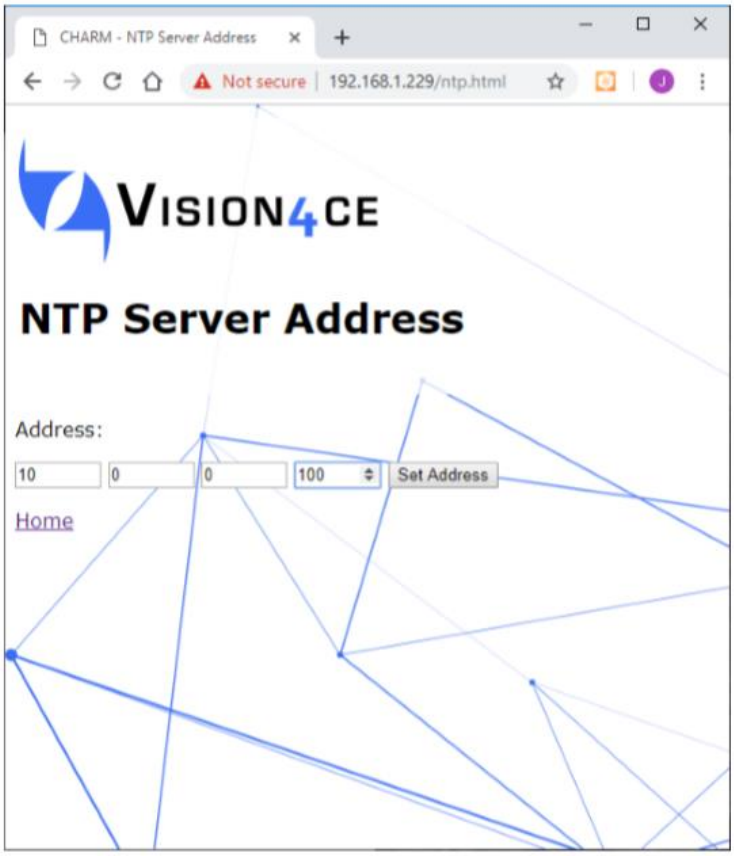
If you have been provided with additional configuration files by Vision4ce you can select which one is loaded by the CHARM software.



Select the required configuration file and press the submit / “Set config” button. If the CHARM has secondary user config files you can also select these. The selected files will be used next time the CHARM is rebooted. There is a reboot button on the home page.

2.7 NTP SERVER ADDRESS

If you need the time and date on your CHARM you can set up an NTP server.



Enter the server address and press “Set Address”. After the CHARM boots it can take around 3 minutes for the time to synchronise.
If you wish to use an NTP server on the internet you will need to set the gateway address in the IP address page.

3. PASSTRHOUGH PORT MOXA

3.1 INSTALLING NPORT ADMINISTRATOR

Locate and run the setup program on the NPort Document & Software CD. Look for a file named Npadm_Setup_[Version]_Build_[DateTime].exe
(e.g., “Npadm_Setup_Ver1.8_ Build_07041316.exe”).

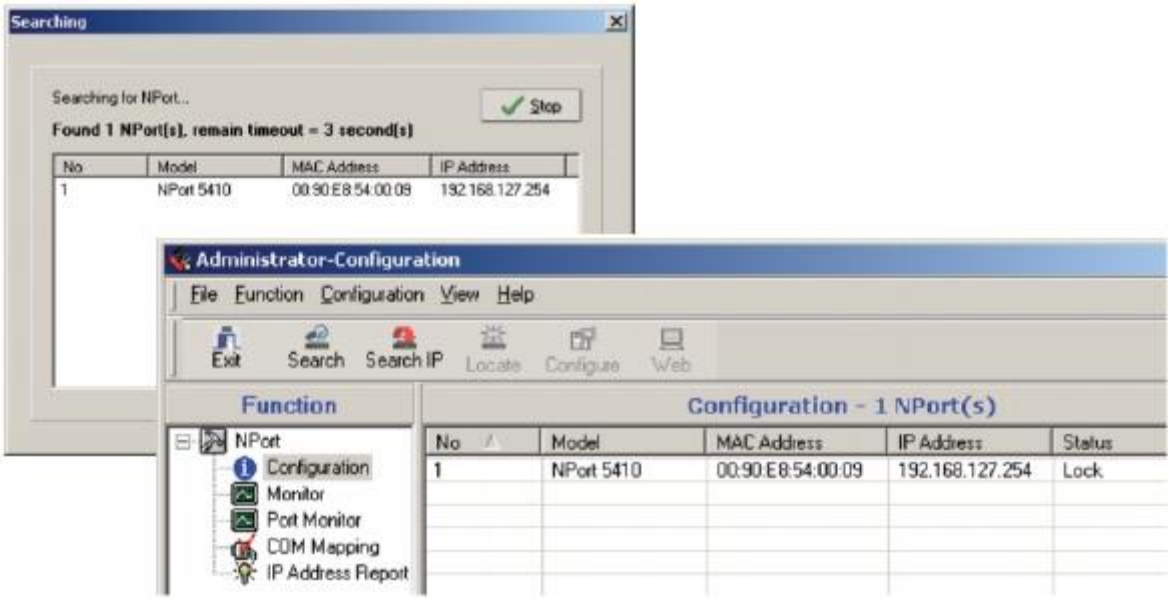
You may also download the latest version of NPort Administrator from Moxa’s website at:
http://www.moxa.com/support/download.aspx?d_id=1317

Run NPort Administrator when the installation is complete.

3.2 SEARCHING FOR DEVICE SERVERS OVER A LAN

The **Broadcast Search** function is used to locate all NPort 5400 device servers that are connected to the same LAN as your computer. Since the **Broadcast Search** function searches by MAC address and not IP address, all NPorts connected to the LAN will be located, regardless of whether or not they are part of the same subnet as the host.

In NPort Administrator, click **Search** to search your LAN for NPort device servers. When your unit appears in the search results, you may click **Stop** to end the search. You may also wait a few more moments for the search to complete.



The **Configuration** screen will list the NPort device servers that were found on the LAN. If your unit cannot be found, you may have a network problem. Check all cables and verify that your PC and device server are on the same LAN. If you still have problems, try connecting the device server directly to your PC.

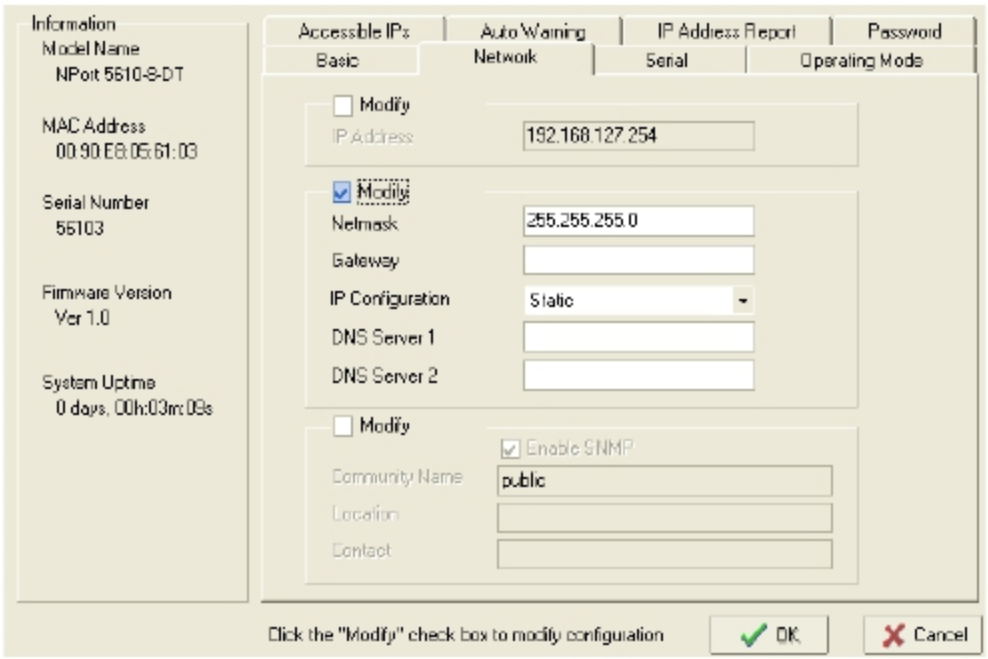
Before configuration the Nport, you will need to unlock the Nport first. Right-click the unit in the configuration screen and select **Unlock** in the pop-up menu.
The default login is:

- Username: **admin**
- Password: **moxa**

3.3 ADJUSTING GENERAL SETTINGS

Right-click your unit in the Configuration screen and select **Configure** in the pop-up menu. If your device server is password protected (the default password is **moxa**), first select **Unlock** in the pop-up menu, and then click the **Network** tab in the configuration window. Select the **Modify** checkbox for items you would like to modify. The device server must be assigned a unique IP address that is valid for your network. Both fixed and dynamic IP addresses are supported. Consult with your network administrator if you are not sure how to set these parameters.

When you are ready to restart the device server with the new settings, click **OK**.



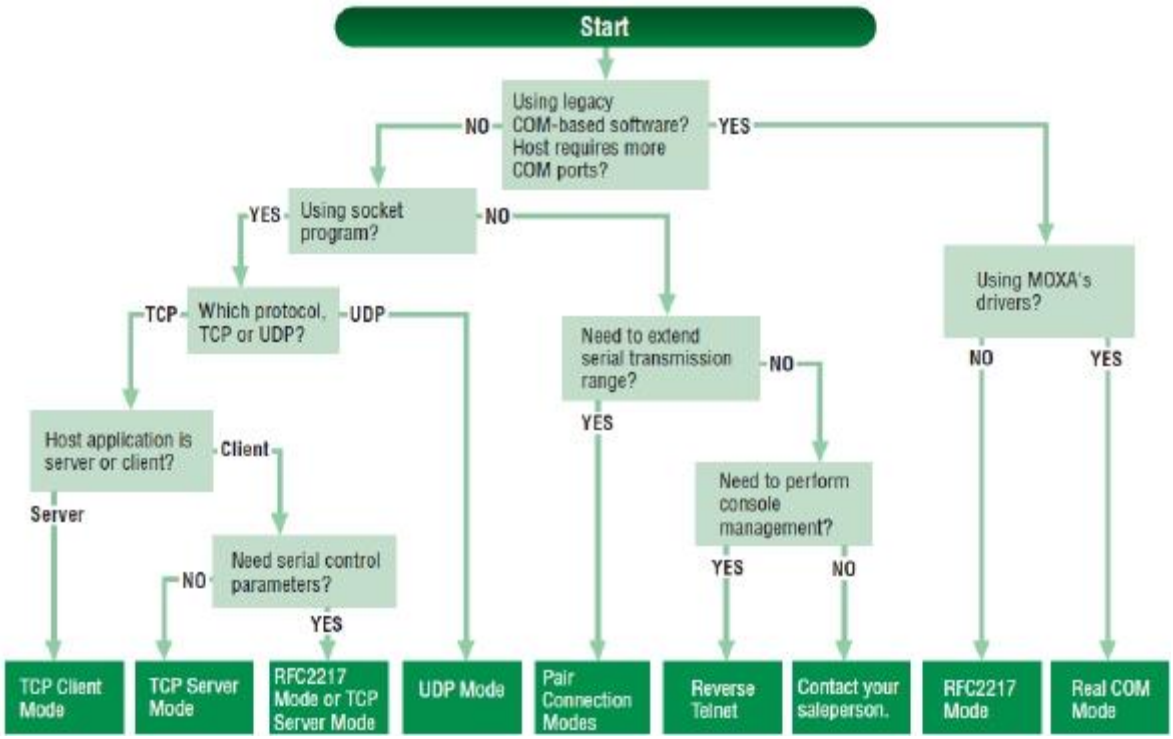
STATIC IP ADDRESSES

For most applications, you will assign a fixed IP address to the device server. To assign a static (fixed) IP address, the **IP Configuration** parameter must be set to **Static**, which is the default setting. You may then modify the **IP Address** and **Netmask** parameters.

The operation mode parameters for each device port can be configured through NPort Administrator. Open your device server's configuration window using the same method you used to adjust the network parameters. On the **Operating Mode** screen, select the **Modify** check box and then select the device port that you wish to configure. Click **Settings** to configure the selected device port.

Set the operating mode and associated parameters as needed. Refer to: https://www.moxa.com/Moxa/media/PDIM/S100000213/moxa-nport-ia5000-series-manual-v4.0.pdf for additional information on operating modes and advanced settings.
When you are ready to restart the device server with the new settings, click **OK**.

OPERATION MODE SELECTION CHART



3.4 CONFIGURING SERIAL COMMUNICATION PARAMETERS

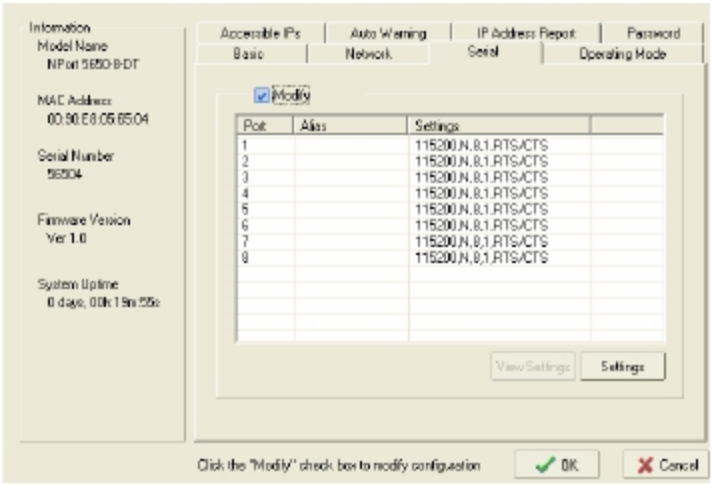
This section covers the configuration of each device port's serial communication parameters: baudrate, stop bit, etc.

SERIAL PARAMETER REVIEW

The following parameters need to be set correctly on the device port to ensure proper communication with your device. Refer to your device's documentation for the appropriate settings.

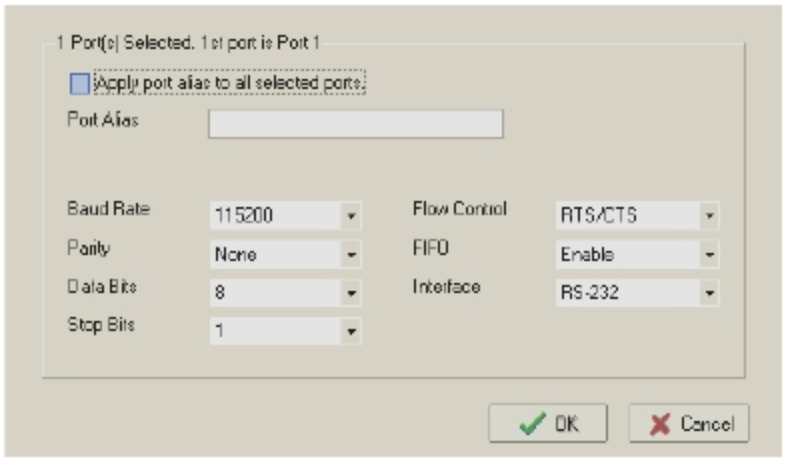
PARAMETER	SETTING	FACTORY DEFAULT	DESCRIPTION	NECESSITY
Baudrate	Support standard baudrates (bps): 50/ 75/ 110/ 134/ 150/ 300/ 600/ 1200 1800/ 2400/ 4800/ 7200/ 9600/ 19200/ 38400/ 57600/ 115200/ 230.4k/ 460.8k/ 921.6k * The NPort 5210/5230/5232I Series, and IA 5000 Series are up to 230.4 kbps	115200 bps	The data transmission rate to and from the attached serial device.	**Need to 9600**
Data bits	5, 6, 7, 8	8	The size of each data character.	**8**
Stop bits	1, 1.5, 2	1	The size of the stop character.	**1**
Parity	None, Even, Odd, Space, Mark	None	The parity that will be used. Even and Odd parity provide rudimentary error-checking; Space and Mark parity are rarely used.	**None**
Flow control	None, RTS/CTS, DTR/DSR, Xon/Xoff	RTS/CTS	The method used to suspend and resume data transmission to ensure that data is not lost. RTS/CTS (hardware) flow control is recommended.	Required
FIFO	Enable, Disable	Enable	Controls whether the device port's buil-In 128-byte FIFO buffer is used. When enabled, the FIFO helps reduce data loss regardless of direction.	Required
Interface	RS-232 RS-422 2-wire RS-485 4-wire RS-485	RS-232	The serial interface that will be used. The options that are available depend on the specific model of device server.	**Set to 422**

ADJUSTING SERIAL PARAMETERS



The serial communication parameters for each device port can be configured through NPort Administrator. Open your device server's configuration window, using the same method you used to configure network parameters. On the **Serial** screen, select the **Modify** check box and then select the device port that you wish to configure. Click **Settings** to configure the selected device port.

Modify the parameters as needed. When you are ready to restart the device server with the new settings, click **OK**.



3.5 MAPPING COM PORT TO DEVICE

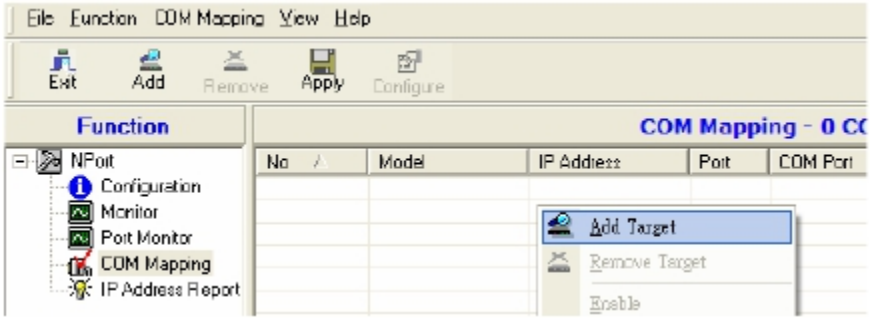
Only required when operation mode is set to Real COM or RFC2217)

This section covers how to map the COM ports on a Windows PC to NPort device ports. The mapping will allow Windows software to access serial devices over the network as if they were local COM devices, providing instant device networking without software migration. COM mapping is supported in Real COM and RFC2217 modes only.

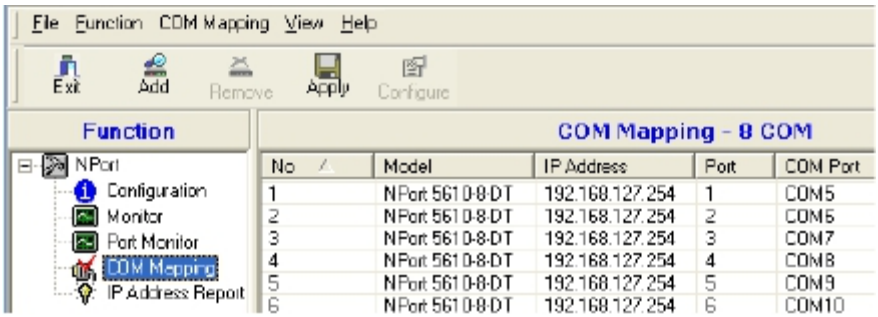
The following instructions are for device ports operating in Real COM mode. For device ports operating in RFC2217 mode, follow the instructions for your particular driver. Real COM mode also supports TTY port mapping on Linux and UNIX systems.

SPECIFYING THE TARGET DEVICE SERVER

In NPort Administrator, click **COM Mapping** in the **Function** panel to open the COM Mapping window. Right-click on an empty line in the COM Mapping window. Select **Add Target** in the pop-up menu to assign your device server as the mapping target.

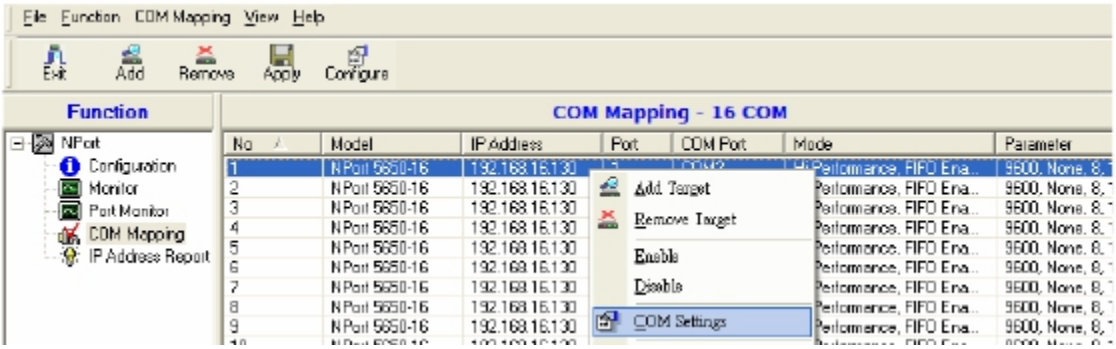


A list of NPort device servers that have been found by NPort Administrator will appear. Select your device server and click **Finish**.

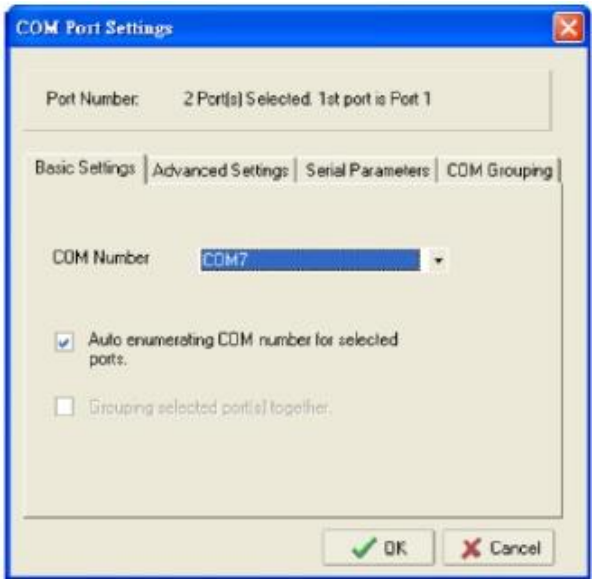


ASSIGNING COM PORT NUMBER TO DEVICE PORT

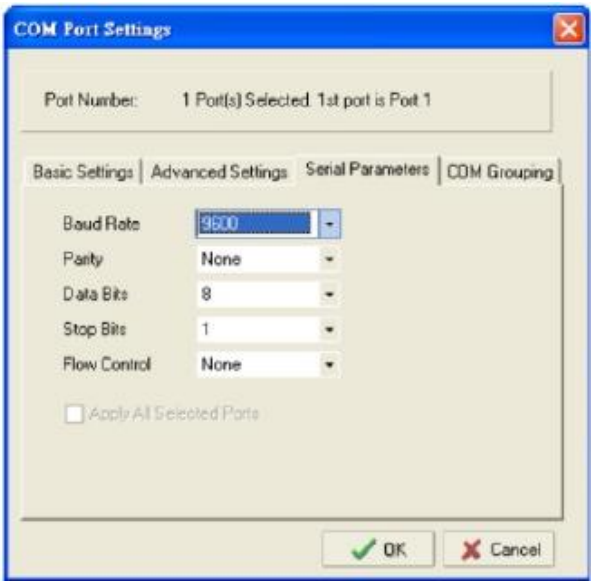
The **COM Mapping** screen shows a list of available device ports on the network. Right-click the target device port and select **COM Settings** in the pop-up menu.



On the **Basic Settings** screen, select the COM port number that will be mapped to the device port. You can map multiple COM ports at the same time by selecting the **Auto Enumerating** check box to number the COM ports automatically.



On the **Serial Parameters** screen, adjust the settings to match your device. These settings, which are only used for serial printers, must also match the settings on the device port. Click **OK** when you are satisfied with your changes.



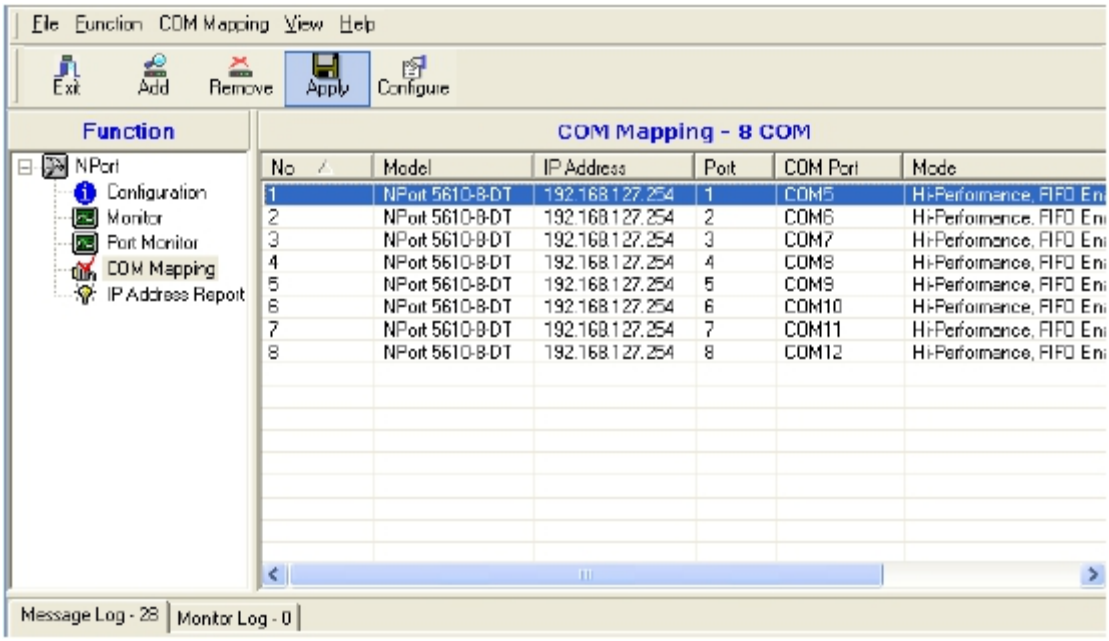
ADVANCED SETTINGS

(See https://www.moxa.com/Moxa/media/PDIM/S100000213/moxa-nport-ia5000-series-manual-v4.0.pdf for detailed information about NPort Administrator's Advanced Settings.)

- **Tx Mode**: In Hi-Performance mode, the driver immediately issues a "Tx Empty" response to the program after sending data to the NPort. In Classical mode, the driver sends the "Tx Empty" response after confirmation is received from the NPort. Classical mode is recommended if you want to ensure that all data is sent out before further processing.
- **FIFO**: Tells the driver whether or not to use FIFO transmission.
- **Network Timeout**: Specifies when an open, close, or serial parameter change operation will time out.
- **Fast Flush**: When enabled, the driver flushes only the local buffer on the host for a Win32 PurgeComm() function call. When disabled, both the local and remote buffers are flushed. If your application uses PurgeComm() and it performance seems sluggish, try enabling Fast Flush.
- **Always Accept Open Requests**: Even if the driver cannot establish a connection with the NPort, the user's software will still be able to open the mapped COM port, the same as with an onboard COM port.
- **Ignore TX Purge**: The application can use Win32 API PurgeComm to clear the output buffer and terminate outstanding overlapped write operations. Select **Ignore TX Purge** if you do not want the output buffer to be purged.

APPLY CHANGE

Right-click **COM Mapping** in the **Function** panel. Select **Apply Change** in the pop-up menu to save the current COM mapping settings. Your application will now be able to access the target serial device using the COM port.

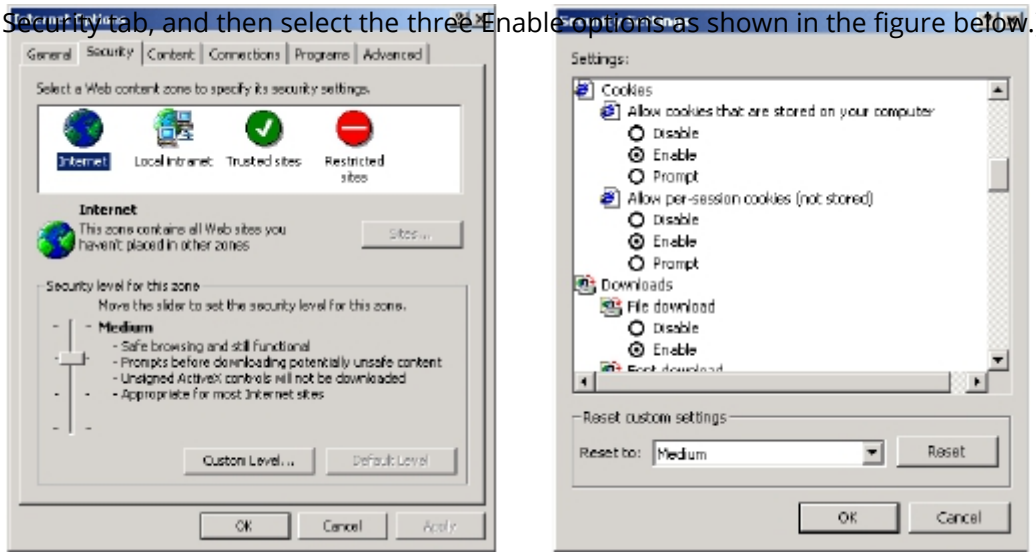


3.6 CONFIGURATION BY WEB CONSOLE

The Web Console is the most user-friendly way to configure NPort products. In this section, we cover a device server's general settings.

OPENING YOUR BROWSER

1. Open your browser with the cookie functionality enabled. (To enable your browser for cookies, right-click on your desktop's Internet Explorer icon, select Properties, click on the Security tab, and then select the three Enable options as shown in the figure below.)



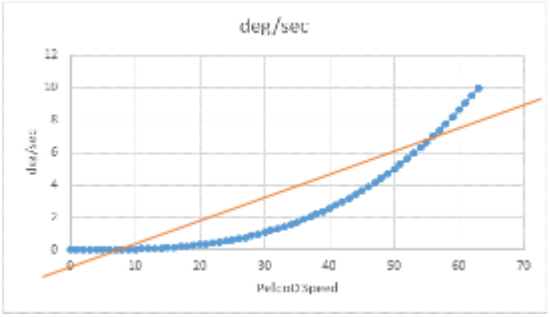
2. Type 192.168.127.254 in the **Address** input box (use the correct IP address if different from the default), and then press **Enter**.
3. You will be prompted to enter the password to access the NPort web console. (The default password for NPort is **moxa**.)

4. OPERATING THE CAMERA WITH KEY-BOARD KBD300A

4.1 USE THE DIFFERENT SPEEDS

- For all directions the same.
- When you joggle the joystick one time to the direction, it's ultra slow.
- You can speed this up by joggling the joystick into the same direction as before. The speed will go from > to >>, >>> and >>>>.

Joggling joystick control retained to allow fine control of large lens extension command with bits 5 and 6 set in byte 3 allow 254 speeds ie ff 01 60 02 70 00 d3, speed 0x70 pan right etc. This is a linear function. We expect speeds below 0x06 don't produce movement because of stiction.



4.2 SET OR CHANGE END STOPS

SET END STOPS

	COMMAND:
Set Left	91 PRESET
Set Right	92 PRESET
Set Up	93 PRESET
Set Down	94 PRESET

REMOVE END STOPS

	COMMAND:
Release Left	95 PRESET
Release Right	96 PRESET
Release Up	97 PRESET
Release Down	98 PRESET

4.3 ABSOLUTE CONTROLS

Level elevation and north position for absolute control.

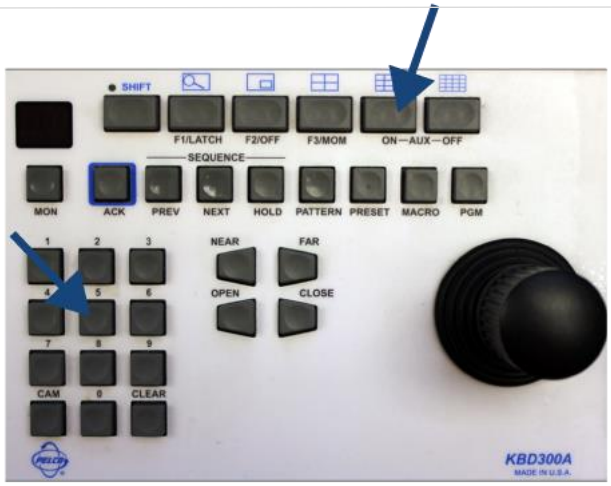
	COMMAND:
Absolute Control	99 PRESET

5. CAMERA OPERATING COMMANDS

5.1 CAMERA COMMANDS

STARTING UP

- To enter the camera menu, press **5 AUX ON**
- When you enter the camera settings, the camera movement will be blocked. Getting out of the camera menu will unblock the camera movement again.



OPERATING COMMANDS

	COMMAND:
Enter camera menu	88 PRESET
Save menu	89 PRESET
Exit menu	90 PRESET

Use the joystick to move through the menu.

To exit the camera settings, press
5 AUX OFF

5.2 LENS COMMANDS

LENS FUNCTIONS

Press selected numbers and PRESET

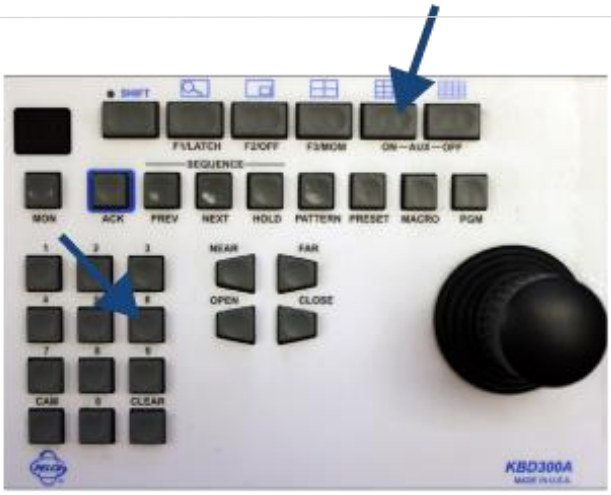
COMMAND:	FUNCTION:
70 PRESET	active_filter = 0xcf; // ir cut filter ACTIVE
71 PRESET	remove cut filter
74 PRESET	x2 on
75 PRESET	x2 off
76 PRESET	Autofocus one shot, cleared after sending command Autofocus works as a command 0x2b etc., which allows data bytes 0x01,0x02,0x03 and are passed on to the lens: ff 01 00 2b 00 01 2c ff 01 00 2b 00 02 2d ff 01 00 2b 00 03 2e

6. LASER OPERATING COMMANDS

To operate the lens, you can give direct commands. The laser is standard off and with no power.

STARTING UP

- To start the laser, press 6 AUX ON (laser initialization).
- To activate the laser, press 3 AUX ON
- The laser is on but there is no active laser beam yet (see operating commands)



OPERATING COMMANDS LASER BEAM

	COMMAND:
Start laser	6 AUX ON
Activate power	3 AUX ON
Less power by 10% each step	OPEN
Power up by 10% each step	CLOSE
Deactivate power	3 AUX OFF
Switch laser off	6 AUX OFF

- You can zoom in and out with the laser beam and adjust power by using these commands.
- The general reponse alarm byte is altered to show the state of Aux 6 and the state of the laser unit, as supplied to Rx by laser controller
    - bit 6 (alarm 7) shows state of Aux 6
    - ie 0x40 means Aux 6 active
    - bit 5 (alarm 6) is the state of the laser controller 0x20 is laser on 0x60 would be laser on and aux 6 active
    - 0x40 Aux 6 active
    - 0x20 laser active
    - 0x00 neither active

  Note the Rx knows the percentage power applied 0 -100 percent shown on the OSD, the percentage power is not at present supplied in the general response byte. It is possible to have the laser active 0x20 etc. with zero percent power!

evve
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