dynamic perception

Motion Control for Photographers and Filmmakers

DIGITAL NMX CONTROLLER

Quick Start Guide

Bluetooth 3-axis Digital Stepper Controller
for the Photographer and Filmmaker Community

The following Apple mobile devices are Bluetooth LE compatible: iPhone (6 Plus, 6, 5s, 5c, 5 & 4s), iPad (Air, Mini, 3rd & 4th gen), iPod touch.

Android 4.3 (or higher) supports Bluetooth Low Energy

WELCOME TO DIGITAL MOTION

Congratulations on your purchase of a new NMX system. This 3-axis digital stepper controller is a flexible, networkable motion control platform that provides photographers and filmmakers with repeatable and intuitive creative control... tools that were once reserved for big budget productions requiring months of training are now in your hands ready to get to work immediatly.

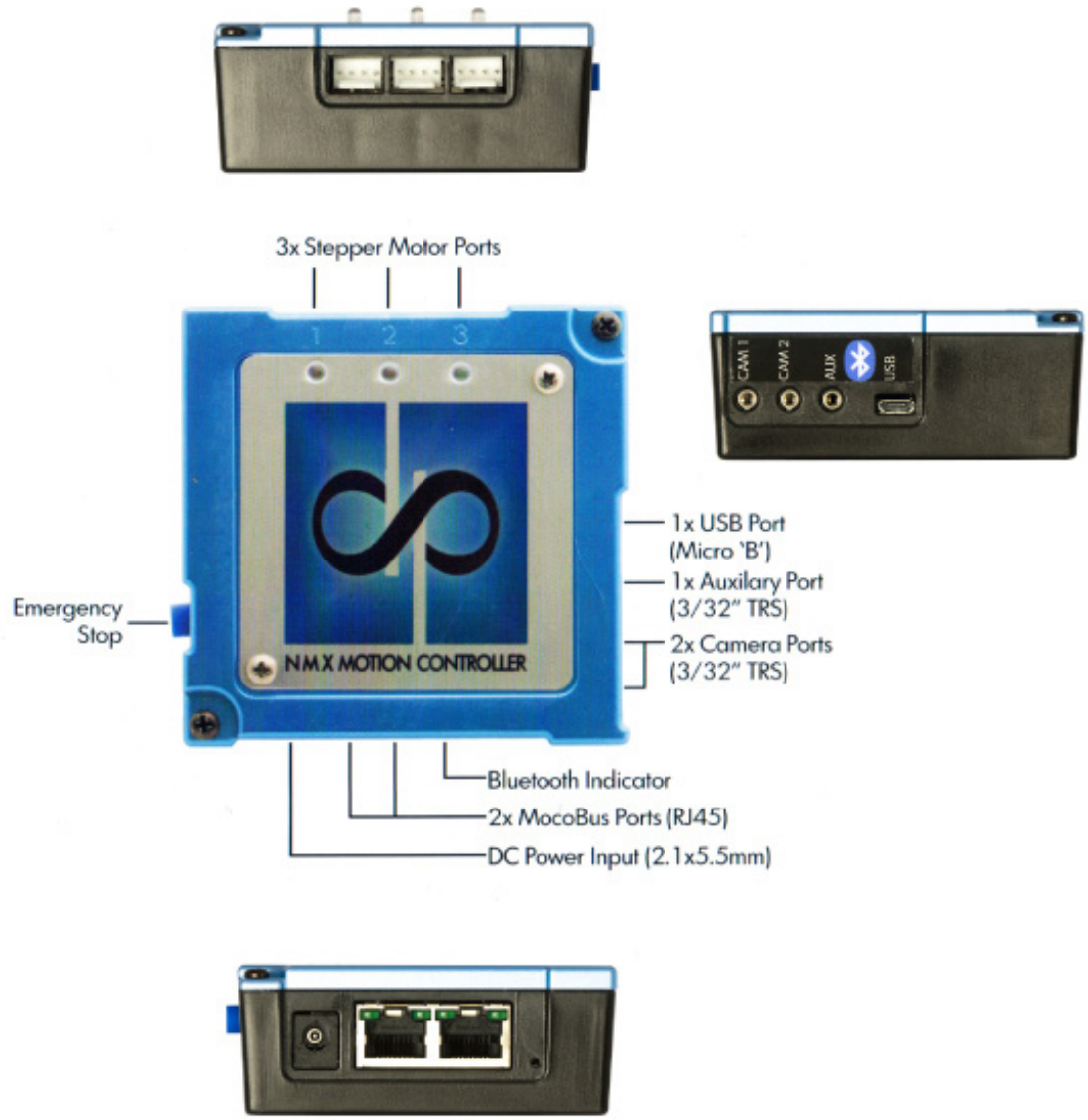
You'll have your new system moving in no time and we can't wait to see what you have in-store for the world. DP is on a mission to break down boundaries and help you unleash your creativity. It's also time to free up valuable budget for better camera equipment, better locations and more freedom to pursue your passion.

From all of us, thank you.

Best of light,

Your controller at a glance

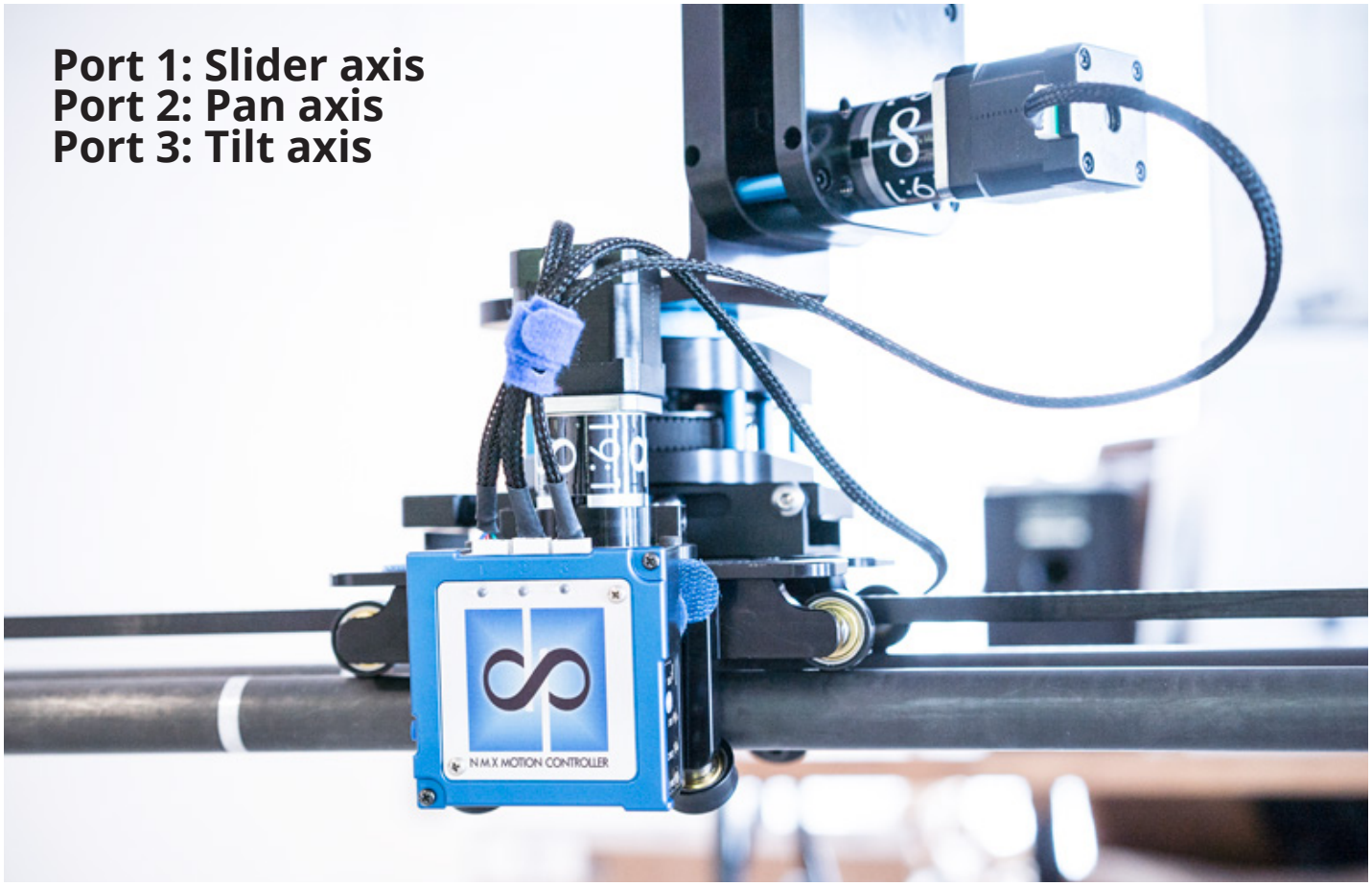
Just add creativity...



CONNECTING MOTORS

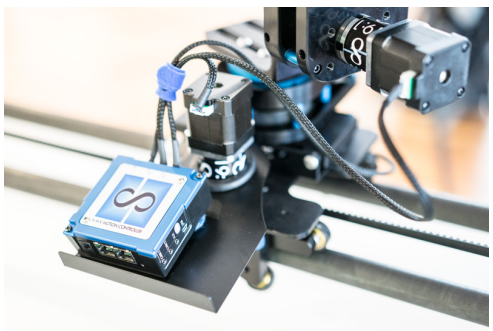
Connect Your Motors to the Correct Ports

- **Follow this motor connection profile**
  The virtual joystick inside the app is preset to provide intuitive graphical control when users connect the motors to the following motor ports:



- **Position cables etc... for freedom of movement**
  Set yourself up for success. Use good judgment to make sure your cables, rotary units, camera, motors etc. are positioned to allow you the freedom of movement you require for the shot you design. There are many ways to configure a multi-axis setup on a slider or a tripod. Looking for multi-axis example configurations? Head to our support site and watch the Stage R: Rotary system unboxing video for 15 different setups.

- **Where to place your controller/battery etc?**



Shooters usually attach the items to the cart itself or rest them on an extra accessory item we call “The Cart Buddy”.

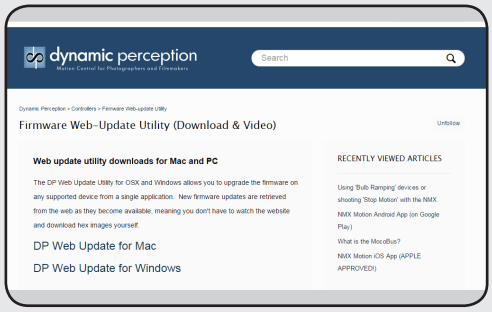
Use the included Velcro adhesive pack to affix the items to the cart side (pictured above), top, back of a rotary unit, or use the cart buddy for extra room (shown at left).

QUICK START GUIDE

Update to the Latest Firmware

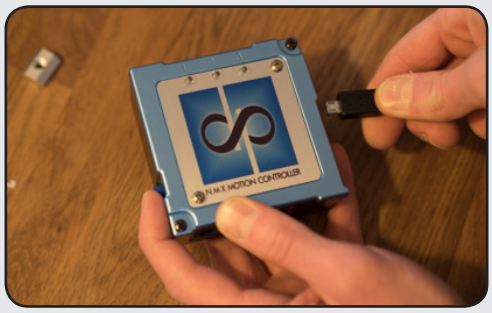
Important Step: Software changes are being made regularly as we push forward with exciting new control features and improvements. For proper operation it is imperative you are running the latest firmware version on the NMX Controller in addition to the latest app on your Android or iOS device..

The DP Web Update Utility for OSX and Windows allows you to upgrade the firmware on any supported device from a single application. New firmware updates are retrieved from the web as they become available. Here's how to quickly download, connect and update your NMX system firmware:



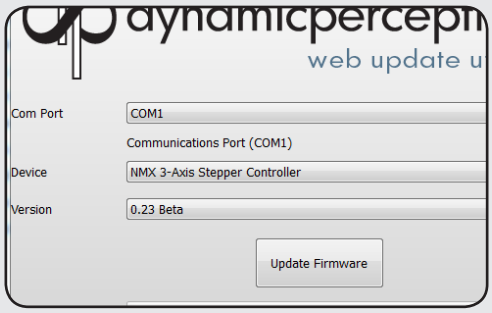
1. Download Web Update Utility

Navigate to support.dynamicperception.com, choose the controllers category then the Firmware Web-update Utility. Download the Windows or OSX version of the application and unzip.



2. Hold Blue Button and Connect

Locate a USB to Micro B USB cable (commonly used for smartphones/peripherals). Hold the blue button while connecting your computer to the NMX via USB to enter 'Update Mode'.



3. Launch Utility and Update

Run the web-update utility. Choose the COM port where your NMX is attached. Choose 'NMX 3-axis Stepper Controller' as the 'Device'. For 'Version' select the latest version available. Click 'Update Firmware'.

QUICK START GUIDE

Download the NMX Motion App

The NMX Motion App allows photographers and filmmakers to connect to the NMX Controller and easily set up motion control time-lapse and video moves via Bluetooth LE capable iOS and Android devices.

Download is FREE and Installation is quick and easy. Follow the links below or open your respective Apple or Google app store. Search terms such as “NMX Motion” or “Dynamic Perception” should bring the app to the top of your results.

Android Devices

Link: dynamicperception.com/android

Your Android device must support Bluetooth Smart (also known as Low Energy (LE) or 4.0 (or higher)). Android 4.3 (or higher) supports Bluetooth Low Energy

iOS Devices

Link: dynamicperception.com/ios

The following Apple mobile devices are Bluetooth LE compatible: iPhone (6 Plus, 6, 5s, 5c, 5 & 4s), iPad (Air, Mini, 3rd & 4th gen), iPod touch.

Full Users Guide/Tutorial Videos Online

To provide the most up-to-date and detailed product information the NMX Controller Full Users Guide, along with tutorial videos, information about all our products and contact information can be found on our dedicated support site: support.dynamicperception.com

USING THE NMX MOTION APP

Don’t attempt to pair the devices

Hold on partner - Only the NMX Motion app has the ability to communicate properly with the NMX. If paired, the OS will block the NMX Motion app from connecting!

OOPS! I’ve already tried to pair my device via Bluetooth:
No worries, all can still be right with the world. If you do happen to try and pair the NMX with your phone/tablet make sure it’s completely unpaired before you connect with the NMX Motion app, in the worst case your mobile device may endlessly and automatically try and re-connect and block you from connecting through the app. Unpair, close the app fully (follow instructions below) and relaunch the app.

The App Stack: How to Properly Close the App

It’s important to fully understand how to shut down/restart the app. In some cases if you’ve attempted to pair the devices directly or if uncommon interference is received a simple (and often prompted by the app itself) relaunch is all that is required. A proper relaunch is done by accessing your device’s app stack, or list of currently running apps in the background, and swiping away the NMX Motion app. Remember if you ever lose communication it’s never a big deal, once you have told the system to begin it is **fully autonomous** and does not require your device to remain connected, nearby or even powered. Take a look at the Android and iOS examples below for a refresh on fully closing the app:

With Android devices use the button that looks like a stack of rectangles and swipe left/right/up on the app to close (for Samsung devices hold the main button to view the app stack)

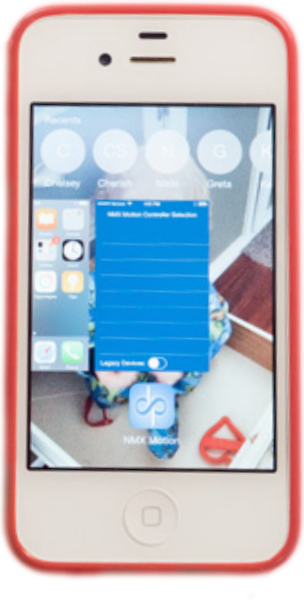
1. First tap the ‘app stack’ button

2. Swipe up or left/right to fully close the app

With Apple devices this is done by double clicking the main button at the bottom of the screen, then swipe the app up to close.

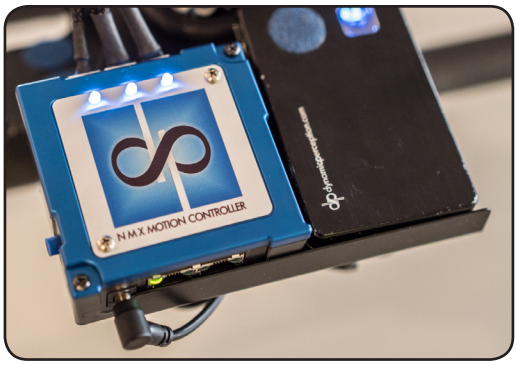
1. First double tap the main ‘home’ button

2. Swipe up to fully close the app



CONNECTION

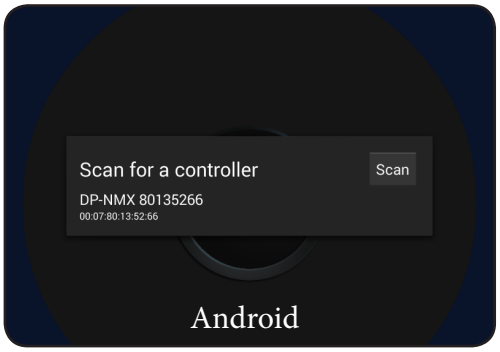
How to Connect for the First Time

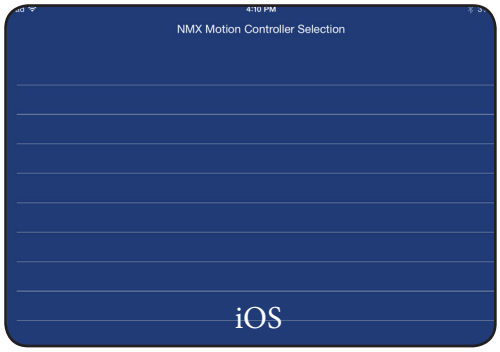


1. Power the Controller

Connect the battery to the controller and power it on (with the DP mini-battery double-tap the power button). Three motor lights will illuminate as the default setting places motors into powered idle with 'power save' mode set to 'OFF'. (page 9 covers power save mode)

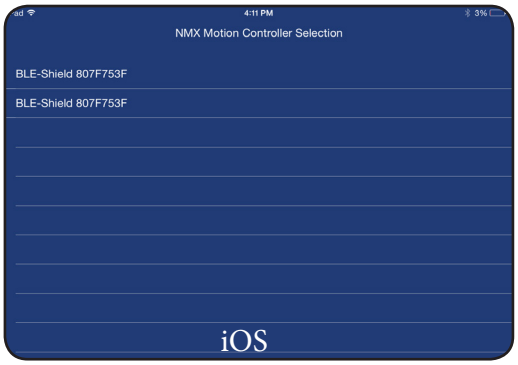
2. Launch NMX Motion App





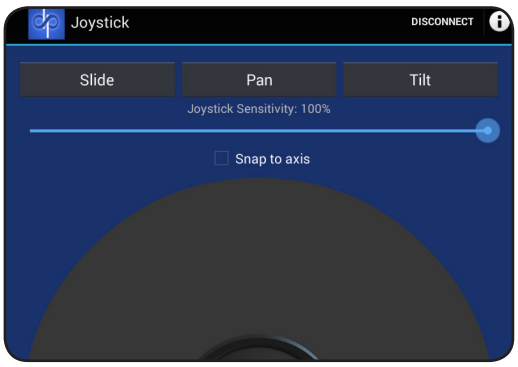
Launch the app on your device.

You'll notive you are taken to a scan/connect screen.



3. Select Your Controller

If Bluetooth is ON and the NMX is powered the app will scan and list your controller's unique identifier on the select screen. Select your identifier from the list (ignore the duplicate on iOS devices) to connect and remember this controller for next time. Next time the app will likely skip this screen and connect directly.



4. Make Magic Happen

After your device and NMX have established connectivity you will immediately be taken to the NMX motion LIVE 3-axis virtual joystick. This is where you have full control over the position and location of all connected axes. We take a closer look at this screen on the next page.

Connection tips
Before you attempt to connect check the Bluetooth light on the NMX, it should be OFF. If the Bluetooth light is ON the NMX is already connected to a device, therefore it must be disconnected from the first device before it will allow a new connection.


no devices connected

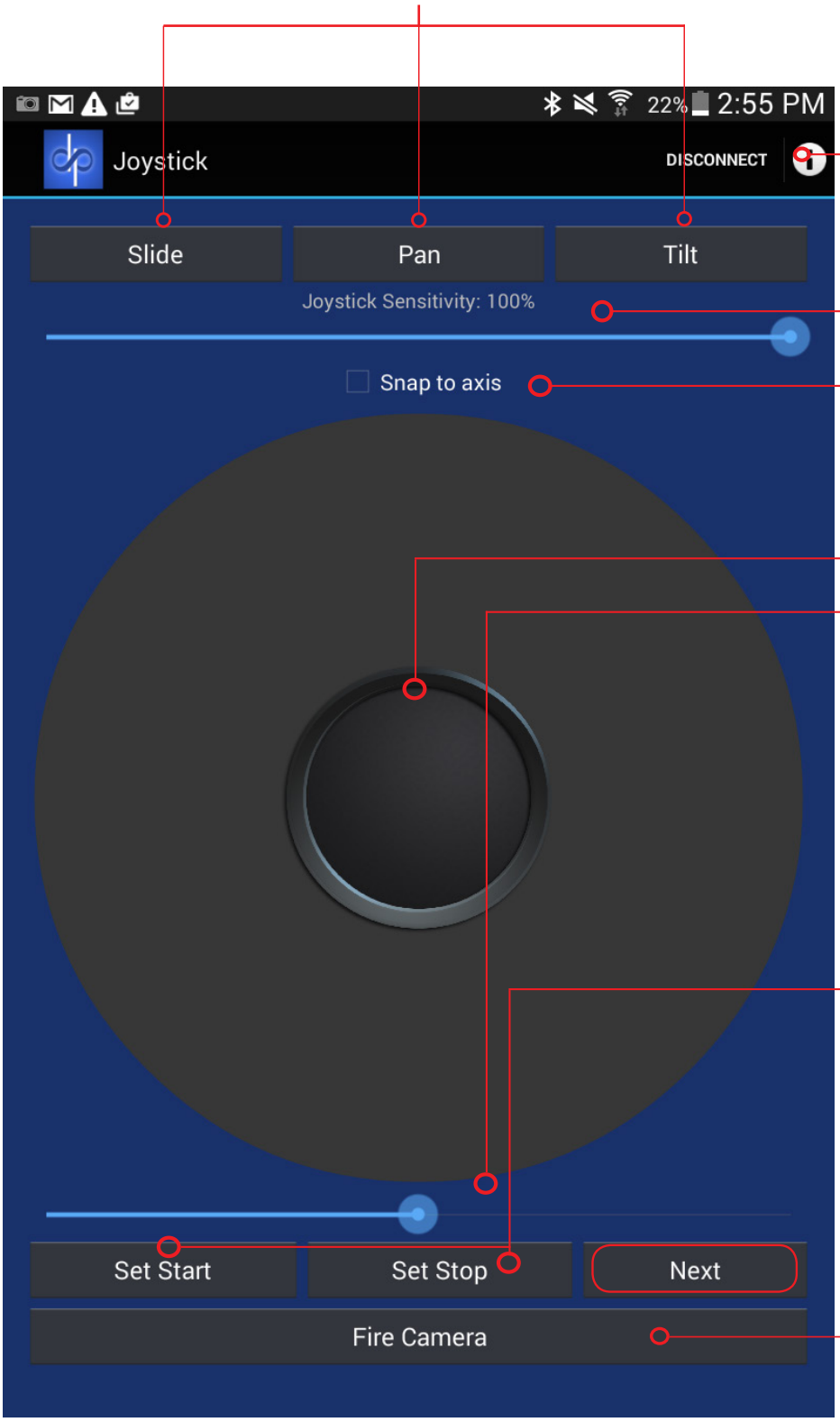

device connected

THE NMX MOTION APP

Introducing the Joystick

Welcome to the LIVE 3-axis capable virtual joystick. This is where you can interact with each motorized axis and set your perfect starting and ending keyframes.

Axis and motor options buttons: Select an axis to configure details such as micro-stepping, directional orientation and power save mode. Options discussed in detail on the next page.



Software Version Information: View which version of NMX firmware and Android or iOS app is currently running.

Sensitivity slider: Change how sensitive the joystick is to your interaction. Less sensitive means slower more finely controlled motion.

Snap to axis: Isolate panning and tilting. Moves that are primarily left and right will pan only and moves primarily up and down will tilt only. Otherwise movements will pan and tilt simultaneously.

Pan and tilt axes joystick control!

Slider axis control! Drag left and right.

Set Key-frames

Set the beginning and ending key frame positions: Once you've positioned all axes for the perfect shot start point press 'Set Start'. Reposition the axes down the rails etc, to the perfect end point and select 'Set Stop'. The NMX remembers your precise positions.

When you are happy with your start and stop points select 'Next' to proceed to the 'Plan Move' screen.

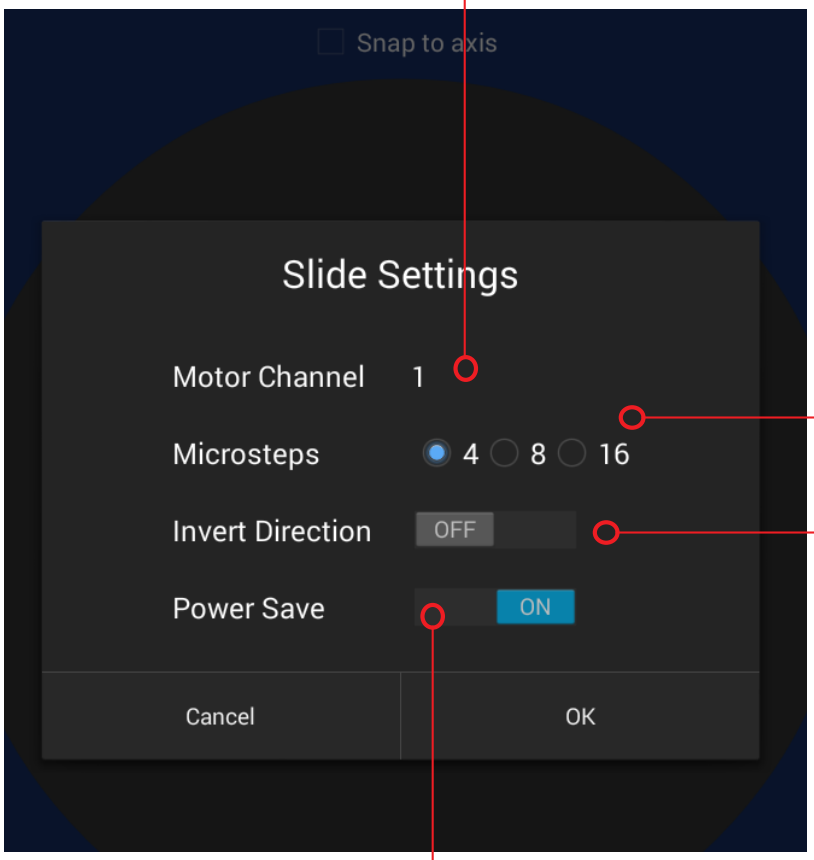
Want to check your composition, exposure etc. Press fire camera to fire one shot.

THE NMX MOTION APP

The Joystick: Advanced Motor Control

The motor settings screen is accessed by pressing the 'Slide', 'Pan' or 'Tilt' buttons at the top of the joystick screen.

Motor Channel: The labeled motor port that these configuration options apply to.



Micro-stepping: Fine or course motor control can be selected to help you set the perfect start and end points during setup. 4 is considered course or faster movement. 16 is considered fine or more precise slower movement (better for detailed panning and tilting).

At the time of shooting the NMX automatically selects the best step size for accurate results during runtime.

Invert Direction: Depending how you are positioned in relation to your system you can use invert direction to flip the way the joystick controls the axis. For example dragging the slider control to the right would now move the slider to the right in relation to how you are facing.

Understanding Power Save

Let's chat about power consumption. Stepper motors consume small amounts of power as they move to their next position either during a SMS (shoot-move-shoot) sequence or a smooth real time video motion. When you set an interval for an SMS timelapse shot there are short (or sometimes long) periods of time when the motors are 'waiting' until the next interval expires to move. Power Save Mode applies to how the motors act during these pauses.

When power save is 'ON': The motor powers off or essentially goes into neutral during the pause. This mode is great when that particular axis is light and level, for example a simple horizontal slide or a simple pan - little forces are acting upon the motor once it has moved to its new position and it's safe to go to 'sleep' as the motors have moderate holding abilities even when powered off.

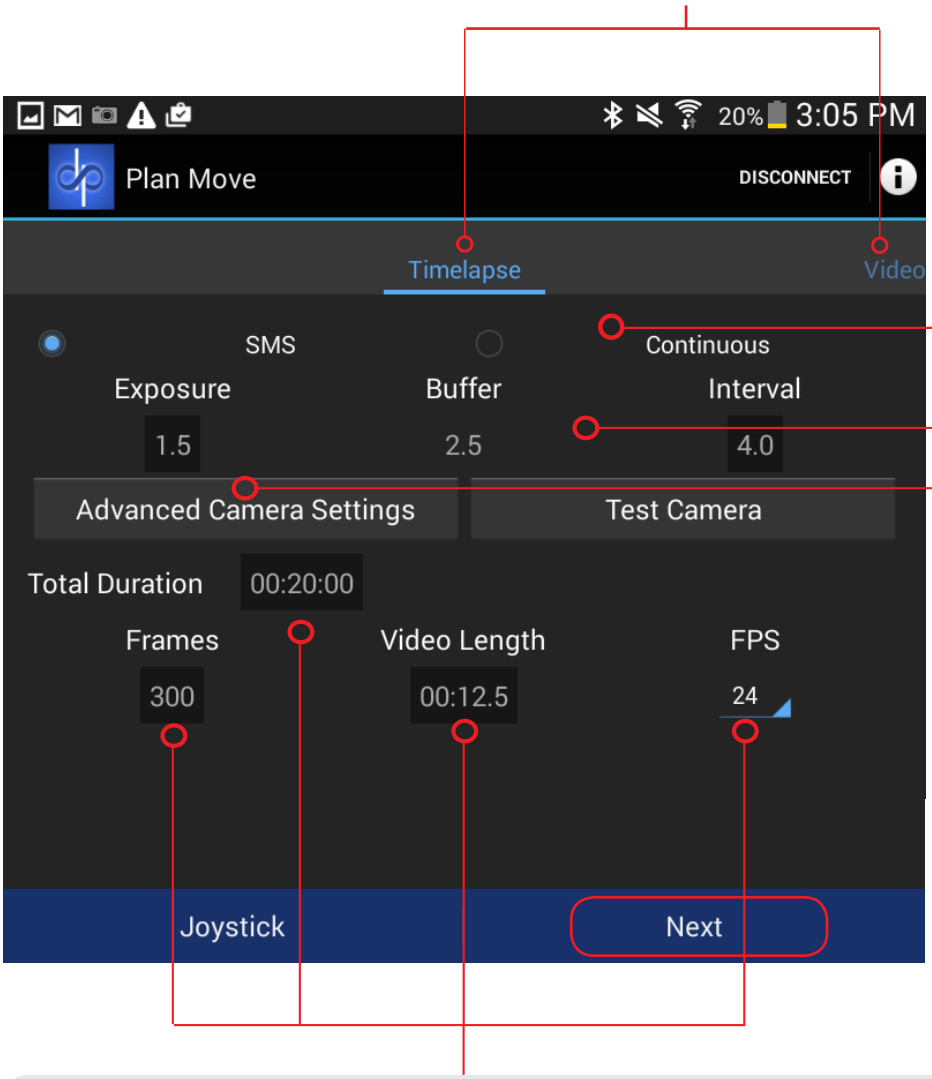
When power save if 'OFF': The motor is powered on at all times essentially idling and staying 'awake'. This is the most secure method of operation best in an angled or vertical lift situation or an orientation where it would make sense to give the motor driving that axis maximum strength to hold its position during pauses. Of course an idling motor consumes more power.

THE NMX MOTION APP

The Plan Move Screen: Timelapse

Now that you've set your perfect start and end points it's time to creatively configure the motion timing and camera triggering characteristics of your shot. (Android screenshots are shown however the iOS layout is very similar)

Two main shooting modes exist: Timelapse and Video.
Timelapse mode (shown below) provides advanced control over shutter triggering via the NMX's two camera ports synchronizing camera firing and movement. **Video mode** allows simple set up of smooth video moves.



Inside timelapse mode you have a choice of **SMS** (shoot-move-shoot) or **Continuous** motor movement. Most timelapse work is done in SMS mode but slow continuous movement is sometimes used as a creative preference.

There are two ways you can **set your interval timing variables:** Basic and Advanced. **Basic** interval timing allows quick editing by tapping 'Exposure', 'Buffer' or 'Interval' directly. '**Advanced** Camera Settings' (covered on the next page) allows for more detailed control.

Remember interval variables work together to create the perfect creative look (changing one alters others in the formula): **Exposure Time (mirroring what you manually select on your camera) + Buffer = Total Interval**

Once your timing is set hit 'Next' to proceed to the 'Bgein' and shot summary screen.

Understanding shot and duration variables

'**Frames**' (or number of shots) as well as '**Video Length**', '**Total Duration**' and '**FPS**' (Frames Per Second) all work together to help you determine how long your shot will run or how many frames you'd need to shoot at the selected interval to cover the amount of time you want to cover.

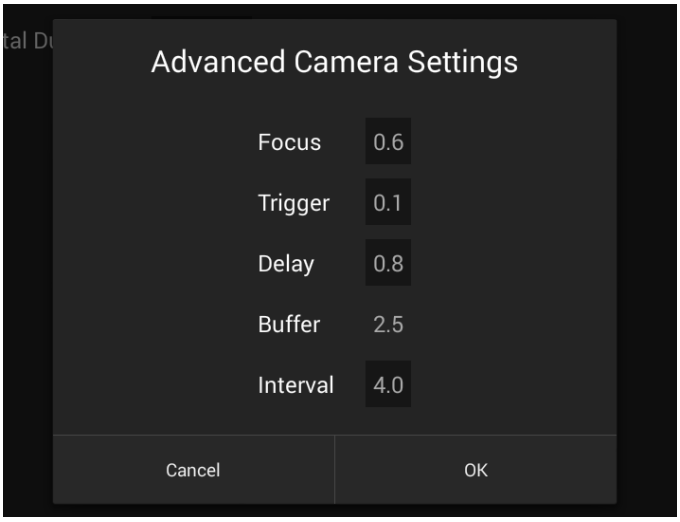
For example 300 frames at a 4 second interval results in a 20 minute long NMX motion control shot. 300 frames compiled later at 24 fps creates a 12.5 second timelapse clip. Depending on how you are approaching your shot creatively all these variables can be adjusted to provide the perfect setup. Learn more about timelapse theory, shooting and even rendering tips at our dedicated support website - support.dynamicperception.com (general time-lapse section).

THE NMX MOTION APP

Timelapse: Advanced Camera Settings

To fully understand how the NMX controls your camera, it is important to know the activities that occur during an interval cycle. These activities always occur on an interval cycle, so if one part is changed the interval or buffer time will adjust automatically to the sum of all parts.

Focus Time -> Trigger Time -> Delay -> Motor Movement -> Buffer (Repeat)

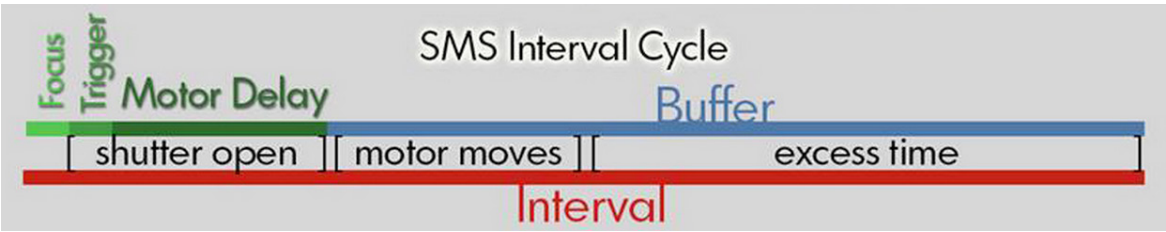


Focus Time activates the focus line of the camera, similar to a half button press and holds it activated for the period of time specified. If no focus control is configured, this takes no time.

Trigger Time activates the shutter line of the camera, and holds it active for the period of time specified.

Delay means no activity will occur on the NMX during this period (unless in continuous motion mode - the motors will be moving). This prevents actions from happening during the exposure.

At this point in the event loop if the NMX is in SMS mode, **Motor Movement** occurs. The sum of all four parameters above becomes the minimum **Interval** time. If there is any excess time left in the interval cycle it will cycle after the motor movement and be labeled as **Buffer** time.



Advanced Options for Bulb Ramping / Stop Motion

There are cases where you might want to utilize an external device to set the timing between moves (or shots) in SMS mode. This is important when using external 'Bulb-Ramping' devices as the exposure time may gradually get longer or when shooting 'Stop-Motion' where you are adjusting a scene and then triggering the next shot/move elsewhere.


Normal Mode


Slave Mode Enabled

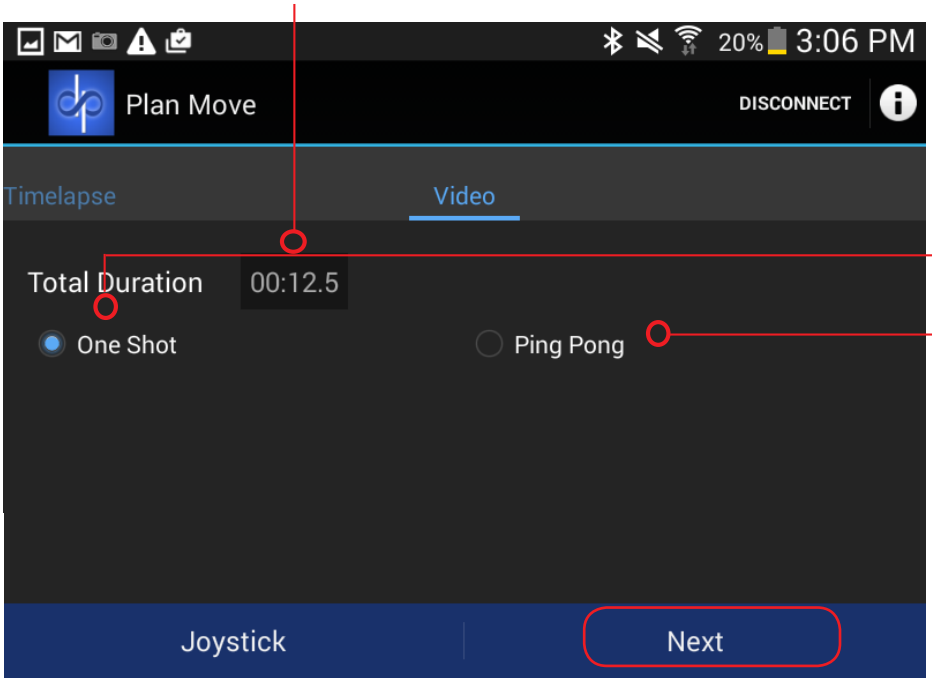
Setup on the NMX is very simple, the firmware has a 'toggle' to switch to this mode on/off using the Emergency Stop button. After booting the NMX TRIPLE CLICK the stop button and the far right light on the mocobus ports will light up indicating that the NMX is in 'Slave Mode' for Stop Motion or Bulb Ramping. Learn more about external triggering at support.dynamicperception.com

THE NMX MOTION APP

Plan Move Screen: Video Mode

For quick setup of smooth video moves you may bypass timelapse settings and choose the 'Video' option at the top of the Plan Move screen. Here's how to set a smooth planned video move:

Total Duration a is the total amount of time all motors will take to complete their moves from start to end. To increase or decrease the speed of the motors or to directly set a desired shot duration edit the number of seconds displayed here.



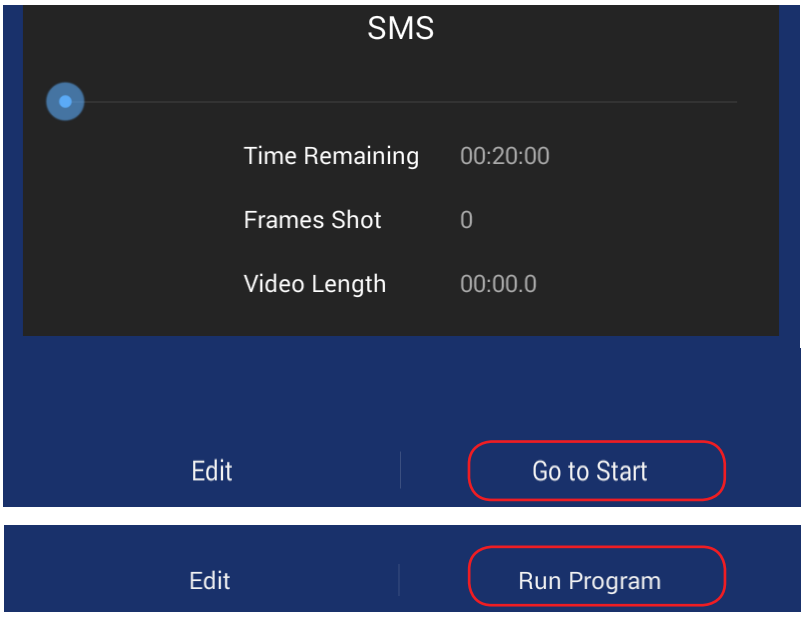
One Shot means the NMX will execute a single start to end move based on your key frame positions and the duration time.

Ping Pong great for interviews, the NMX will execute a move to the end point then reverse directions pingponging back and forth until you pause or stop the system.

Once your timing and mode is set hit 'Next' to proceed to the begin / shot summary screen.

Begin / Shot Summary Screen

The final screen is your shot summary display. When you are ready to begin your move tap **Go To Start** and all axes will move to the precise start position you set and stand-by for your command to begin programmed move execution.



Tapping **Run Program** will begin your creative timelapse or video motion controlled sequence!

You now have a **FULLY AUTONOMOUS MOTION SYSTEM!**

You are free to close the app (properly), turn off your device or walk away. Relaunching the app will return you to this status screen for an update.

FAQ'S

Additional full support documents, tutorials and articles can be found at support.dynamicperception.com

Tell me more about Power Save. Is it dangerous to turn it off?
Not really, you'll notice our standard 19:1 motors have decent holding power even when the motor driver is off. The motors will not simply 'release and spin freely' when the motor driver is off. You can test this out and get a feel for it by disconnecting the motor and pushing on the rotary axis or slider cart to see how much force it takes to move it.. You'll find that it's possible to move but not that easy.. worse case scenario the rig will slowly creep along or slump, it would never 'free fall'.

So again, If the motor can hold it's position with Power Save On I'm good to go?
Not always, if you are doing very small SMS timelapse incremental moves against gravity with say a heavy lens or a heavy dolly cart what can happen is the driver will move the motor a tiny bit to the next position but when the motor driver turns off it can potentially slump back a bit. It's a difficult line to draw the line when this will happen and when it will not so if in doubt keep the Power Save OFF. If the motor can hold the load and your moving WITH gravity (say down hill on a slider) it's safe to say Power Save ON is a-OK!

The NMX is getting warm with the motor drivers on! Should I panic?
This is normal. When the motor driver is on it does give off some heat. The motor drivers are thermally bonded to the aluminum top of the NMX which acts as a heat sink. It's not uncommon for the top of the NMX to reach temps up to 95 degrees with all three motor drivers running. Although this feels quite warm it's not enough to harm you or the NMX.

What's that faint noise that sounds like an old TV?
It could be an old TV, but if none are around this is normal. When the motor driver is on and holding a load in place there is some harmonic frequency output by the motor driver. It will vary based on the motors position in tone but it's nothing to be concerned about.

I'm having trouble connecting to the NMX.
Sometimes an NMX/app on/off cycle may do wonders.. After the first solid connection the app will usually re-connect very quickly but sometimes that initial handshake between app and NMX can be a little finicky. The first thing to try is simply shut down/restart the app fully. (refer to page 6 regarding the app stack and closing properly. Strangely, it seems that Android is happier when the NMX is on before the app is launched and Apple is happier when the app is on before the NMX.

I'm still having trouble connecting to the NMX. Help me!
This is not normal. We've tested dozens and dozens of compatible devices with no issue. If these tips do not solve your issues, please contact us at support@dynamicperception.com or give us a call and we'll work on getting you back up and running asap!

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