

# Dynamixel Tutorial

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# Dynamixel hardware setup

## U2D2 PHB set

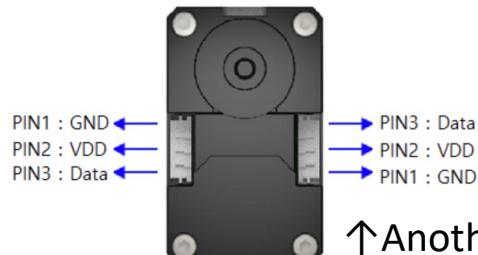
- Operating voltage: 3.5 V ~ 24.0 V
- Maximum current: 10.0 A
- TTL/RS485-based DYNAMIXEL



## XL330-M288

(Dynamixel Protocol 2.0)

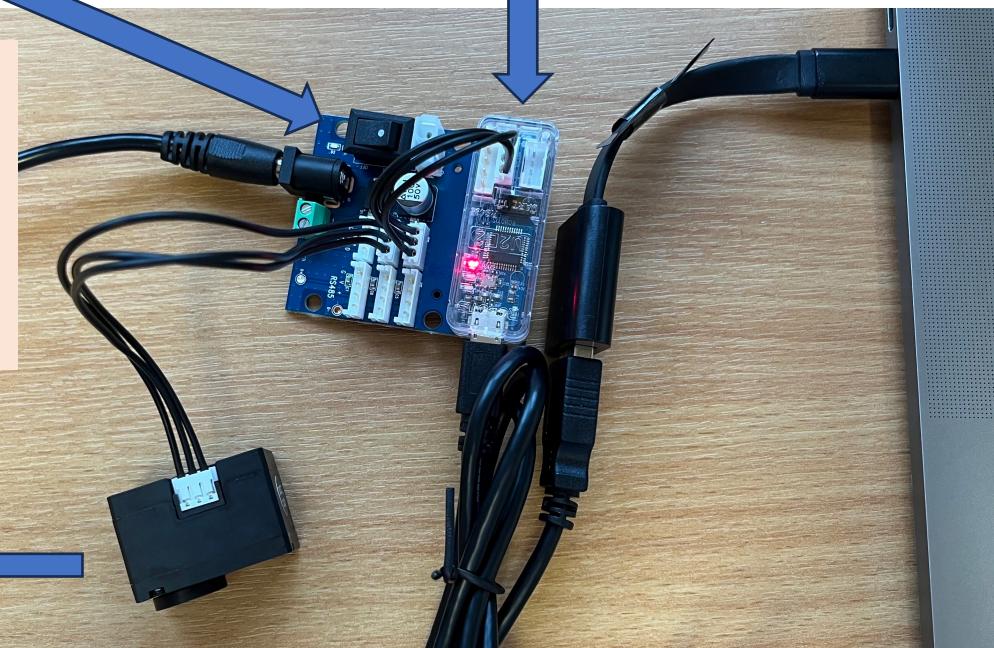
Input: 5.0 V recommended



↑Another option is directly supply power here  
(Without using the PHB Set)

## U2D2

- USB-DYNAMIXEL signal converter
- Driver available for Windows/Linux



# Download SDK (library)

[Download here](#)

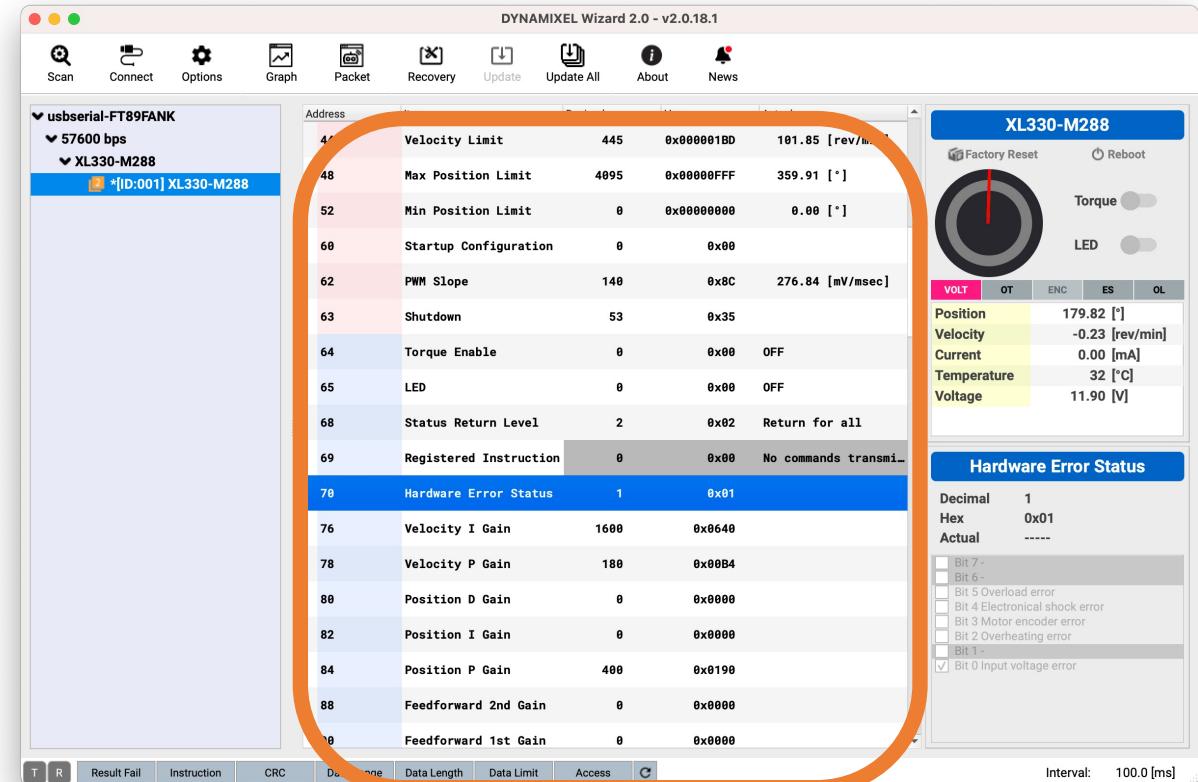
- DYNAMIXEL SDK 3.7.31.zip for ROS1, Python, C, C++, C#, MATLAB, LabView, Java
- DYNAMIXEL SDK 3.7.30.zip for ROS2
- ROS library (C++ library and Python module)

DYNAMIXEL SDK 3.7.31: Because all languages are included, import the language specific dynamixel\_sdk (import python/src/dynamixel\_sdk directory if using python)

# Convinient software: Wizard 2.0

- Install [here](#)

1. In options, select scan range.
2. Click Scan to find connected device.
3. Read information from “control table”. Check details on dynamixel model page ([XL330-M288-T](#))



Control table

# Test the Dynamixel

- Test codes available in Dynamixel SDK. (in DynamixelSDK-3.7.31/python/tests/ protocol\*)
  - Check your dynamixel model's protocol on [ROBOTIS e-Manual website](#).

## 1. Import dynamixel\_sdk from the appropriate source

```
os.sys.path.append('./DynamixelSDK-3.7.31/python/src')          # Path setting
from dynamixel_sdk import *                                       # Uses Dynamixel SDK library
```

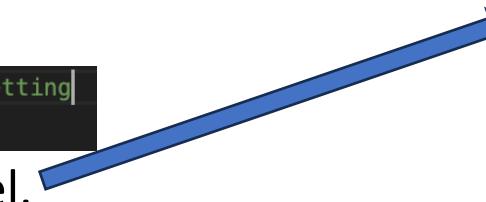
## 2. Check all information matches your Dynamixel model.

Check which port is used by Dynamixel and change the DEVICENAME.

- On mac, use: ls /dev/tty\* to check connections. Easiest: plug in and out to see which is the Dynamixel connection.

```
# Default setting
DXL_ID                = 1                      # Dynamixel ID : 1
BAUDRATE              = 57600                  # Dynamixel default baudrate : 57600
DEVICENAME            = '/dev/tty.usbserial-FT89FANK'    # Check which port is being used on your controller
# ex) Windows: "COM1"    Linux: "/dev/ttyUSB0" Mac: "/dev/tty.usbserial-*"
```

## 3. Run the code! [Sample code explaination here](#)



```
# Control table address
ADDR_PRO_TORQUE_ENABLE      = 64                  # Control table address is different in Dynamixel model
ADDR_PRO_GOAL_POSITION      = 116
ADDR_PRO_PRESENT_POSITION   = 132

# Protocol version
PROTOCOL_VERSION             = 2.0                # See which protocol version is used in the Dynamixel

# Default setting
DXL_ID                      = 1                  # Dynamixel ID : 1
BAUDRATE                     = 57600              # Dynamixel default baudrate : 57600
DEVICENAME                   = '/dev/tty.usbserial-FT89FANK'    # Check which port is being used on your controller
# ex) Windows: "COM1"    Linux: "/dev/ttyUSB0" Mac: "/dev/tty.usbserial-*"

TORQUE_ENABLE                = 1                  # Value for enabling the torque
TORQUE_DISABLE               = 0                  # Value for disabling the torque
DXL_MINIMUM_POSITION_VALUE  = 10                 # Dynamixel will rotate between this value
DXL_MAXIMUM_POSITION_VALUE  = 4095              # and this value (note that the Dynamixel would not move when the position value is out of this range)
DXL_MOVING_STATUS_THRESHOLD = 10                 # Dynamixel moving status threshold

index = 0
dxl_goal_position = [DXL_MINIMUM_POSITION_VALUE, DXL_MAXIMUM_POSITION_VALUE]           # Goal position
```