Imatest Motorized BTS Calibration Kit

User Manual

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Safety

The Imatest Benchtop Test Stand Calibration Kit shall only be operated as described in this manual. Deviating from this manual and altering or not following the methods and instructions in this manual to attain the desired data may result in personal injury or death or damage to the fixture. The fixture is a tool and there is no guarantee that the data will be error free. Imatest LLC is not responsible for any personal injury or death or damage to the fixture.

While the fixture has been optimized for use with Imatest equipment, and software, it is the operator's responsibility to confirm that no collision between components or surroundings (including cables) occurs. Such collisions may damage components on the fixture or alter the results and make them inaccurate.

WARNINGS:
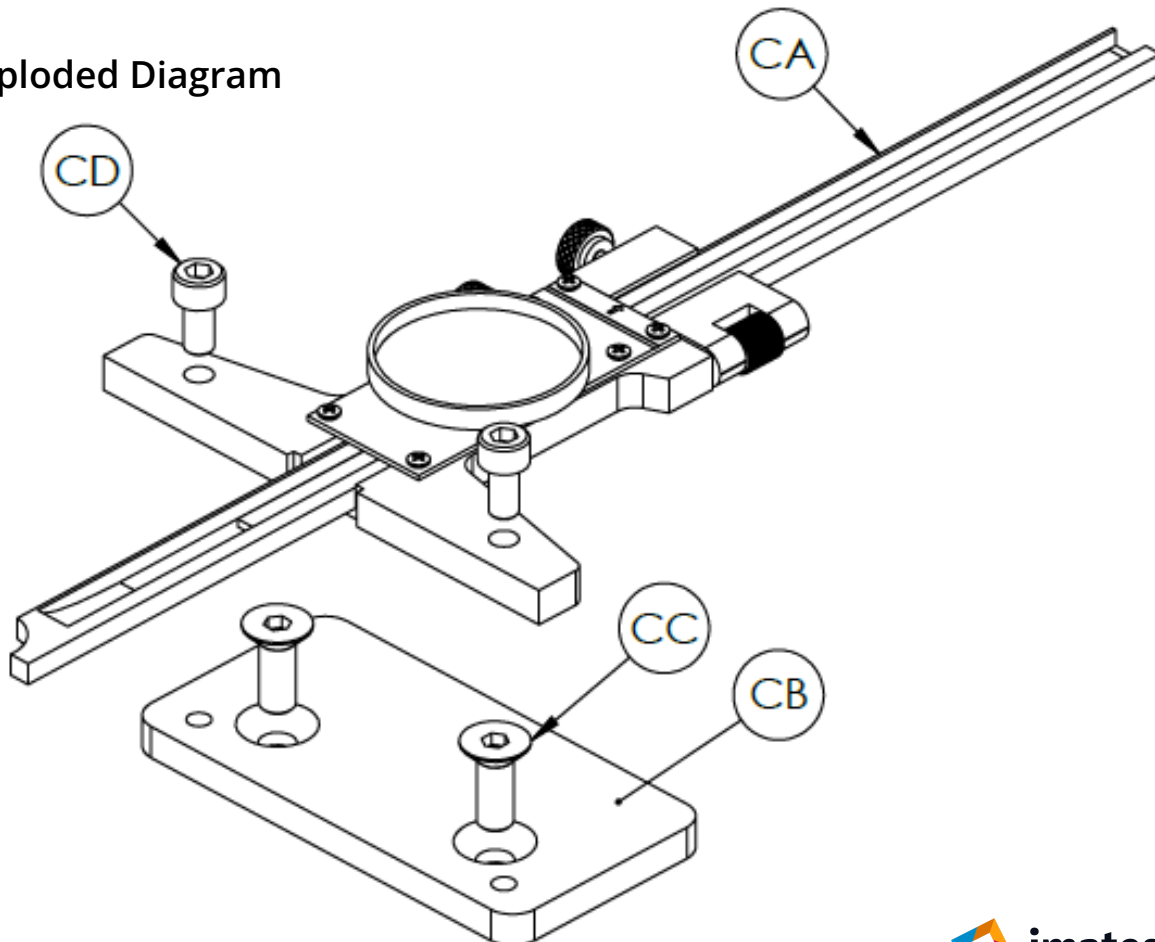* Do not place hands, fingers, or any parts of the body between any moving parts while the fixture is in operation.
* Fixture should be placed on a level surface.
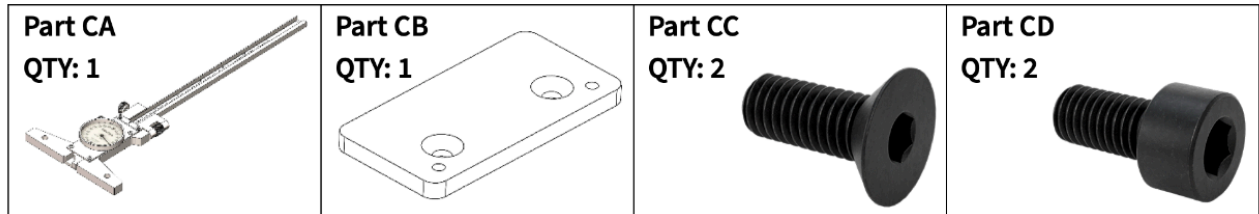
Z axis Calibration Kit

Assembly Diagram

Exploded Diagram

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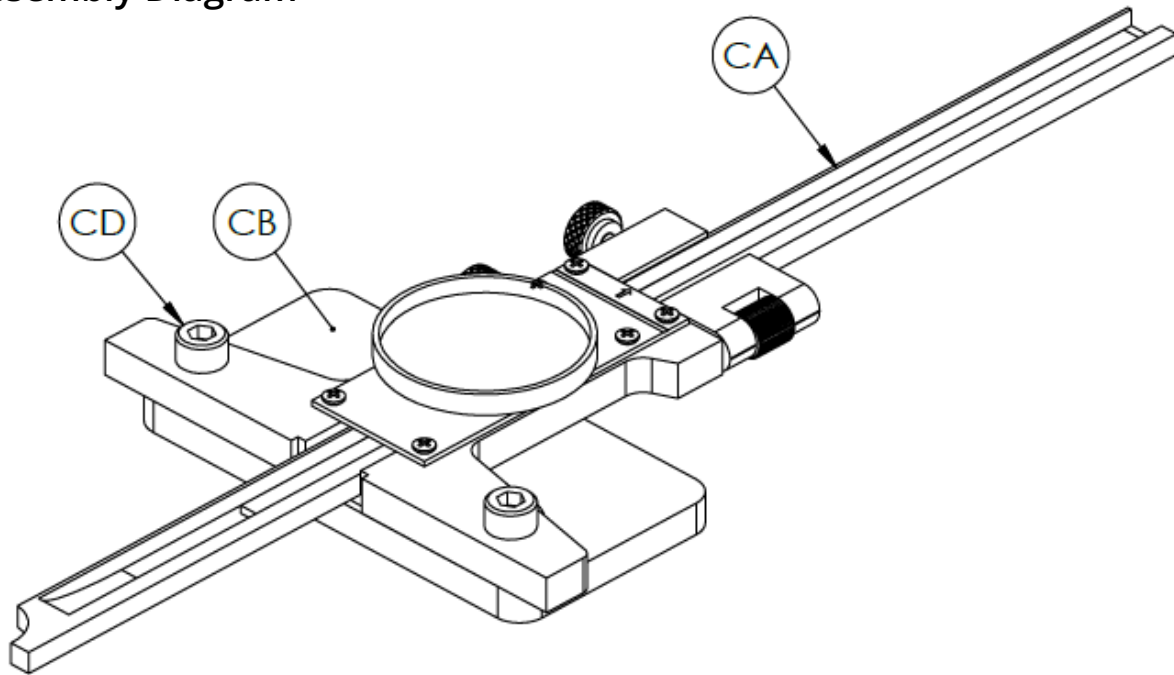
Assembly Diagram - Parts List

Part CA QTY: 1	Part CB QTY: 1	Part CC QTY: 2	Part CD QTY: 2

Recommended Tools & Resources

To make best use of this kit, it is recommended that you have the following common tools available to them:

- Metric hex key set
- Computer

Shipment Contents

Check that all the following parts have been included in the shipment:

- Part CA - Depth Gauge (Digital or Manual) (QTY: 1)
- Part CB - Depth Gauge Adapter Plate (QTY: 1)
- Part CC - M6 x 16mm Flat Head Screw (QTY: 2)
- Part CD - M5 x 10mm Socket Head Cap Screw (QTY: 2)

If any of the parts above are damaged or missing from the shipment, please inform Imatest LLC (hardware@imatest.com) within 30 days of delivery. Some charts may be shipped separately.

Initial Setup

Software Resources and Documentation

Download the appropriate master control api zip file for your operating system here: https://www.imatest.com/controlAPI

Follow the steps in the README document in the SDK folder to setup your development environment with python and the controlAPI.

Select the python script to run, BTSFraming_Calibration.py, for the BTS Calibration routine and edit the COM port number on line 10 in this file to the one determined previously. Save the file.
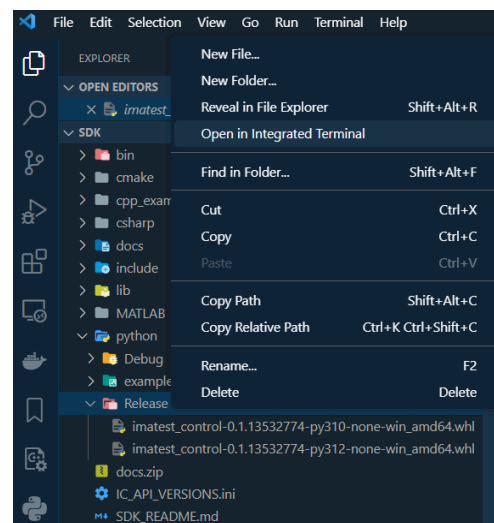
```python
 BTSFraming_Calibration.py ●        Extension: Python

sdk > python > examples >  BTSFraming_Calibration.py > ...
    1      from imatest import control as cntr
    2
    3      import time
    4
    5      #refer to BTS manual for pictures showing the Coordinate System.
    6
    7      frame = cntr.BTSFraming()
    8
    9      #specify zaber com port
   10      frame.zaberPort = "COM5"
   11
   12
   13      frame.initialize()
   14
   15      calibrationOffset = frame.doCalibrationAndValidation()
   16
   17
   18      frame.Home()
   19
   20
   21      frame.chartCenterFrame_Go_CameraCenterFrame(cntr.Vector3D(0,0,114))
   22
   23      frame.chartCenterFrame_CameraCenterFrame
```

To initialize and run the script right click the "sdk/python/Examples" folder and select "Open in Integrated Terminal." Then enter the following command with the file you wish to run, in this example we will run the BTS Calibration script, then hit "enter".
python filename.py   ->   python BTSFraming_Example.py

If the script runs successfully, then move to the next sections to mount the calibration kit hardware and calibrate the BTS using the BTSFraming_Example.py script.

Hardware Mounting Instructions
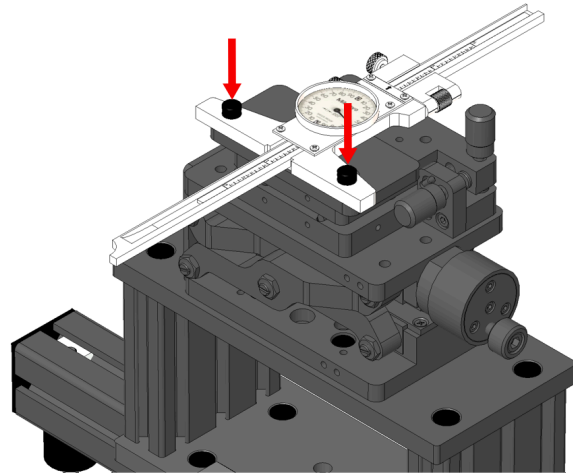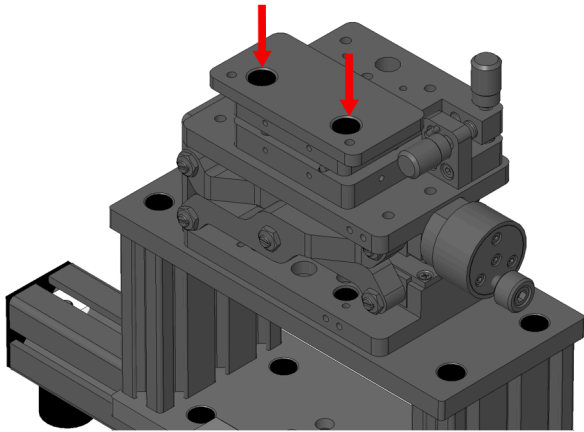
1. Mount the Depth Gauge Adapter Plate (Part CB) to the Camera podium of the BTS. On either the Tilt & Rotation Platform (Part AE of BTS) or the Lab Jack (Part AG of BTS) using two M6 x 16mm Flat Head Screws (Part CC), as shown.

2. Next secure the Depth Gauge (Part CA) to the Depth Gauge Adapter Plate (Part CB) with two M5 x 10mm Socket Head Cap Screw (Part CD).
   a. Ensure that the Depth Gauge (Part CA) is not locked and can move freely.

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Operations Guide

Overview

The Imatest Motorized BTS Calibration Kit allows one to easily calibrate the Z axis of the motorized BTS. This kit and method allows you to know the offset to the camera mounting center so you can reliably move the target to the correct distance from the camera.

BTS Calibration Instructions


```python
BTSFraming_Calibration.py  ●      Extension: Python

sdk > python > examples >  BTSFraming_Calibration.py > ...
  1    from imatest import control as cntr
  2
  3    import time
  4
  5    #refer to BTS manual for pictures showing the Coordinate System.
  6
  7    frame = cntr.BTSFraming()
  8
  9    #specify zaber com port
 10    frame.zaberPort = "COM5"
```
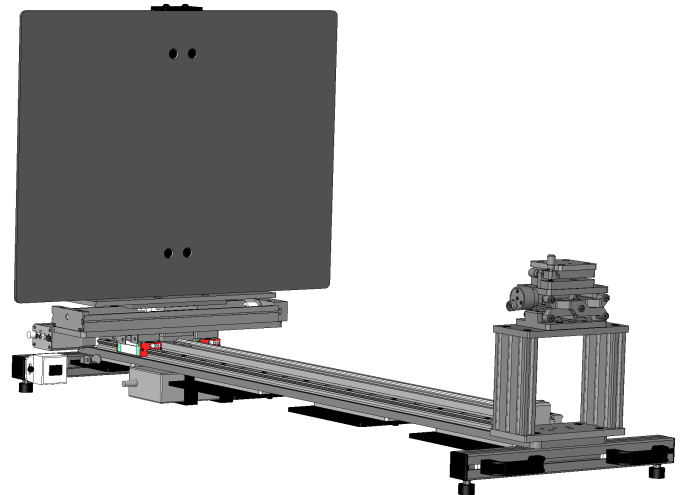
1. Complete the controlAPI SDK setup by following the README Guide in https://www.imatest.com/controlAPI.
2. Open the python editor of your choice and the BTSFraming_Calibration.py script.
3. Ensure you are connected to the Zaber stages via USB and the stages are powered on. Ensure correct COM port on line 10, frame.zaberPort = "COM#", of the BTSFraming_Calibration.py script. Outlined how to determine COM port in the Communication Ports section above.

4. Mount the target holder you plan to use for testing on the BTS; BTS-R-KIT, ILP-A, ILP-B, or ILB-B. (BTS-R-KIT shown)
5. Ensure the path is clear for the stages to move without interference.
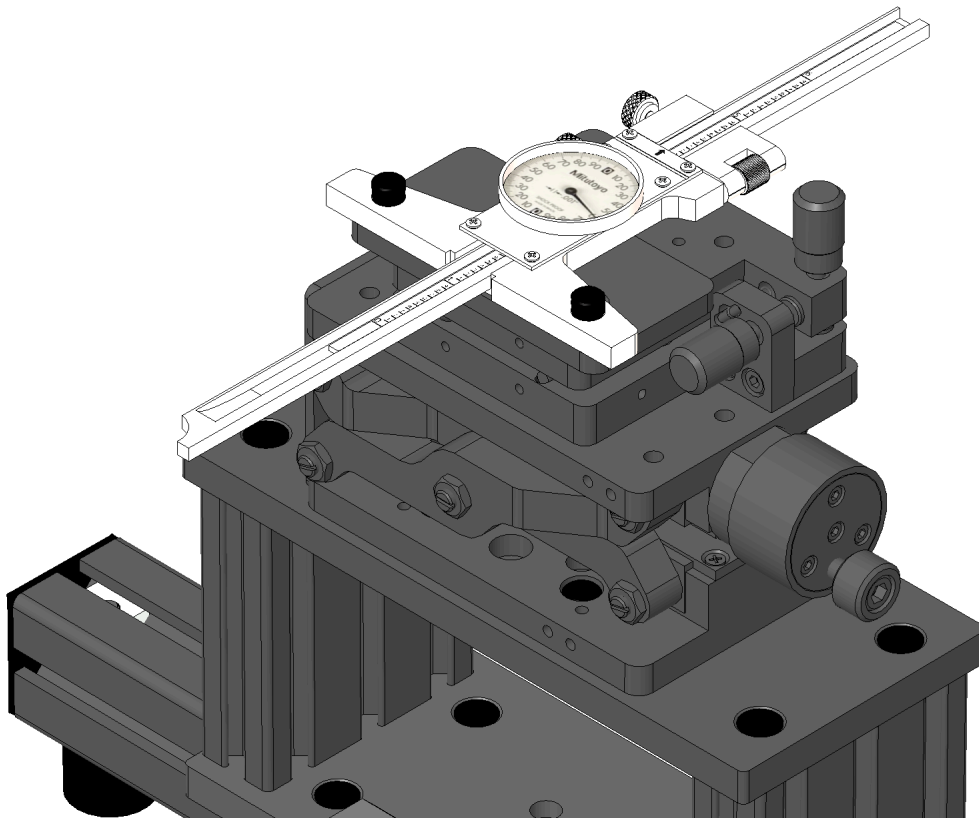
6. Extend the Gauge to 4" and run the BTSFraming_Calibration.py script.
    a. The program will Home the Zaber stages first, then move them forward into position and guide the user through the calibration steps.
    b. To run the script right click the "sdk/python/Examples" folder and select "Open in Integrated Terminal."
    c. Enter the following command:
        python BTSFraming_Calibration.py
    d. Hit "enter".
7. Read the measurements on the depth gauge once the Zaber stages have stopped moving and the prompt prints the numbers for verification. Enter the measurement in inches when prompted. After entering the measurement - press ENTER to advance through the prompt- it will ask for a second measurement. Again, enter the measurement in inches.
8. After the second measurement and verification - the prompt will print the Calibration Offset Vector. Write that number down for later use.
9. Replace numbers as the offset in script BTSFraming_Example.py on line 14 as the last variable show below as #:
    frame.applyCalibrationMeasure(cntr.Vector3D(0,0,#))
10. Rerun to confirm calibration offset within 0.01".
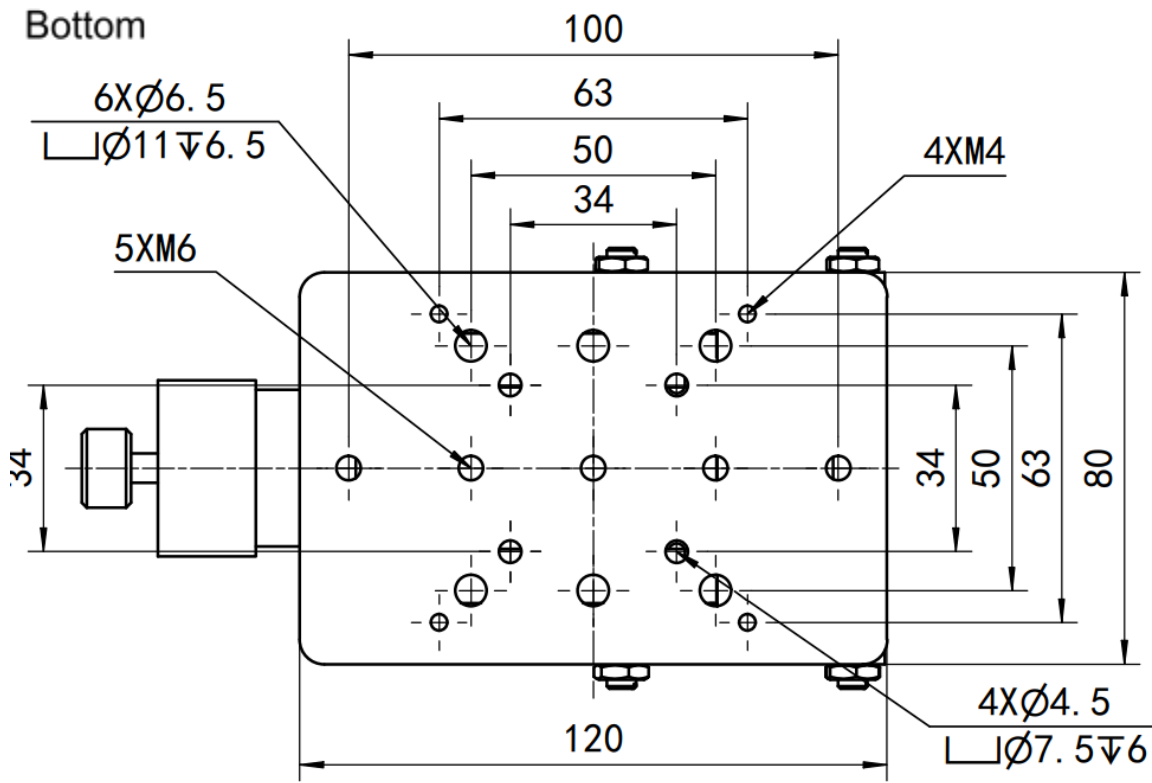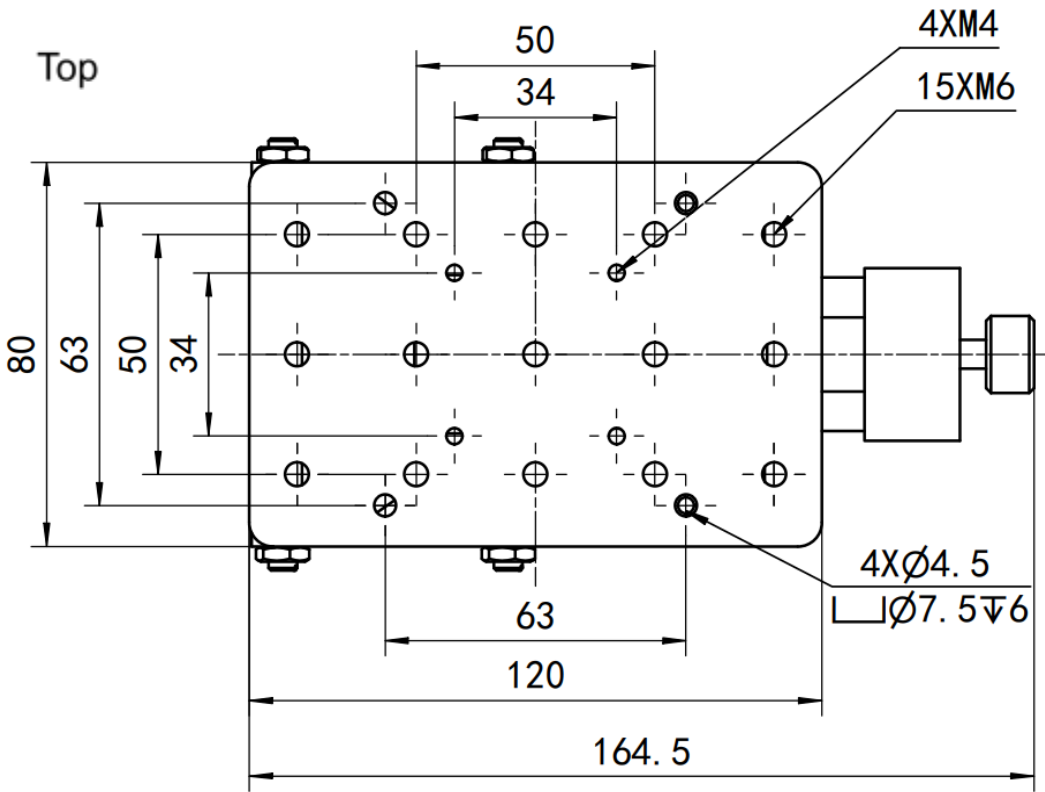
Part Dimensions & Specifications

Depth Gauge Adapter Plate

Tilt & Rotation Platform

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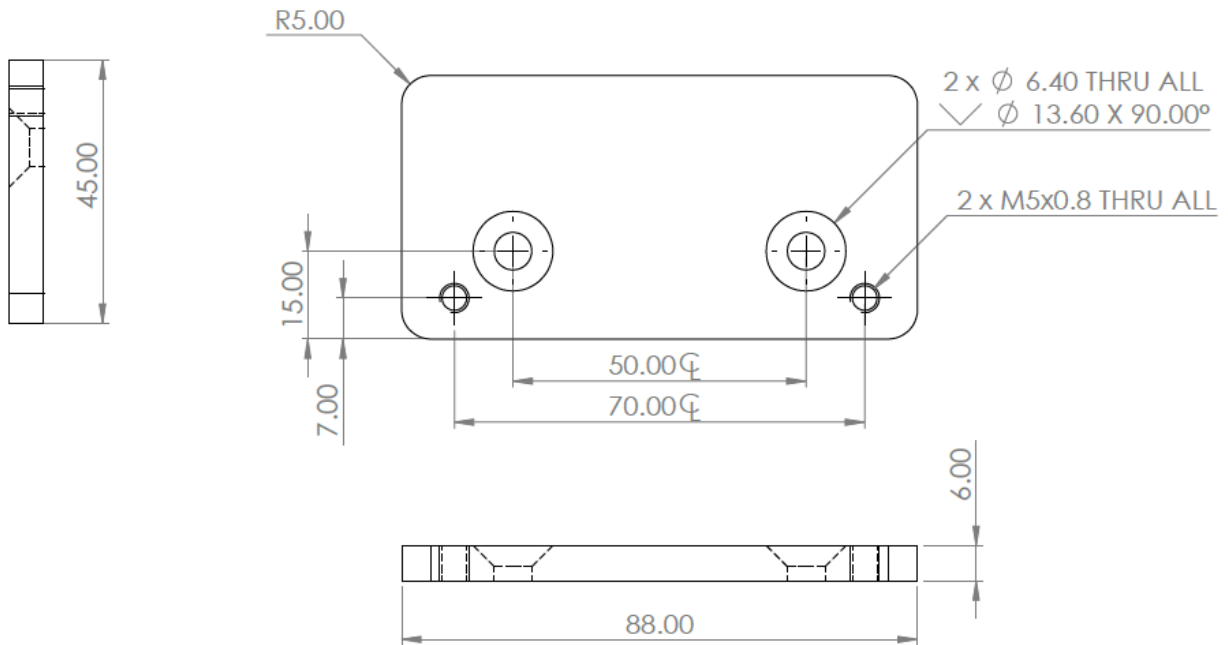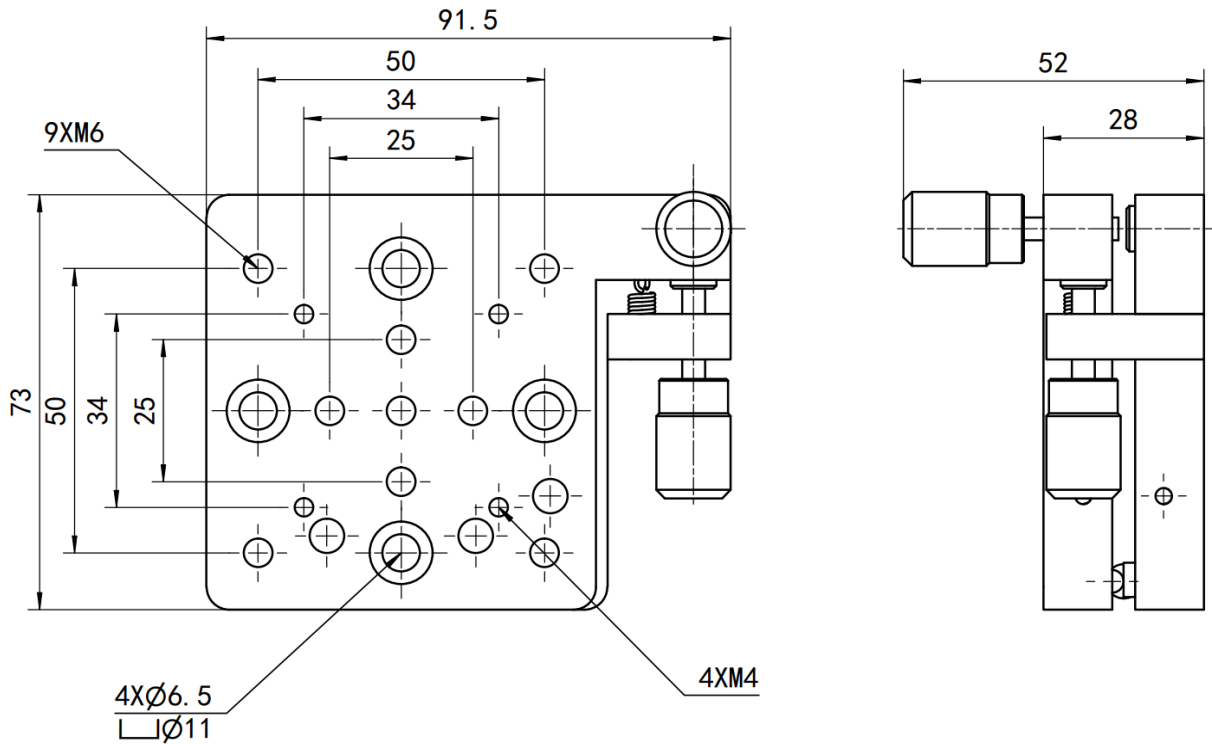
Lab Jack -60mm (dimensions [mm])

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Troubleshooting

For additional information about the Imatest Benchtop Test Stand, and for Zaber troubleshooting tips, please refer to the Motorized BTS user manual at the following URLs:

BTS-MOTXZ: https://www.imatest.com/wp-content/uploads/2023/12/BTS-MOTXZ-User-Guide.pdf

BTS-MOTZ: https://www.imatest.com/wp-content/uploads/2024/02/BTS-MOTZ-User-Guide.pdf

User Manual QR Code