

# Portable Multi-view Smart Microscope - PMSM

## Introduction

Microscope is one of the most needed instruments for diagnostic evaluation in many diseases. Being second largest population in the world, India needs larger coverage of medical devices. Conventional microscopes are widely available and being used by medical experts for various diagnostic decision making. However, the constraint for such microscopes are limited field of view in any sample study and the expert need to move the sample to view multiple field of views before doing any subjective evaluation. Digital slide scanners are available to acquire whole slide image of the sample under study. However, cost of such system and maintenance limits the wide availability of such system. PMSM is a portable microscope that can acquire multiple field of views to create a bigger perspective of the sample under study. A slide-stage control system and suitable graphical user interface are developed for acquiring microscopic images at any location of the slide under observation.

## Features

- Portable – standalone device can be connected to any laptop or computer
- Completely automated stage motion and focusing as desired by user
- User interface for XY stage control and focusing
- Keyboard interface for XY stage motion and focusing
- Image stitching of different field of views from camera software
- Secondary camera for gross view of the sample under the microscope

## Specifications

- Objective lens : PLAN 4X, 10X, 20X (40X optional)
- Primary view image sensor : 3.1 MP Global shutter CMOS camera with stitching mode
- Scanning mode : Single plane in the selected region of the sample slide
- XYZ axis motion resolution : 5 micron
- XYZ motion control interface : GUI interface and keyboard control
- Slide Capacity : Single slide; Three slides (optional)
- Scanning and stitching time : 5 min for 5mm x 5mm region
- Secondary view : VGA camera
- Dimension : ~ 360 x 245 x 500 mm
- Weight : ~ 12 Kg

## Benefits

- Automated sample slide movement and stitching of images generate a larger field of view for diagnostics and reporting
- A large field of view of slide sample reduces the tedious, repetitive and prone to error steps by pathologists in manual moving of sample slide in reporting
- Digital images will help in repeatability and reproducibility of results

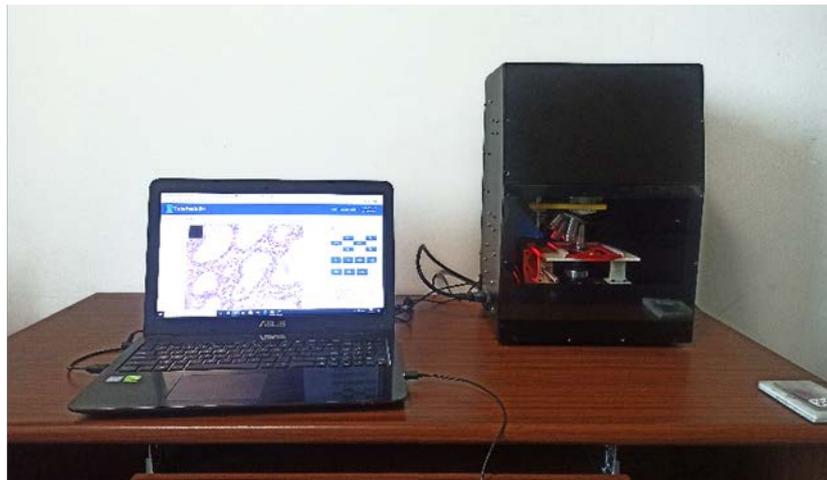
## Applications

For use in Pathology department of hospitals

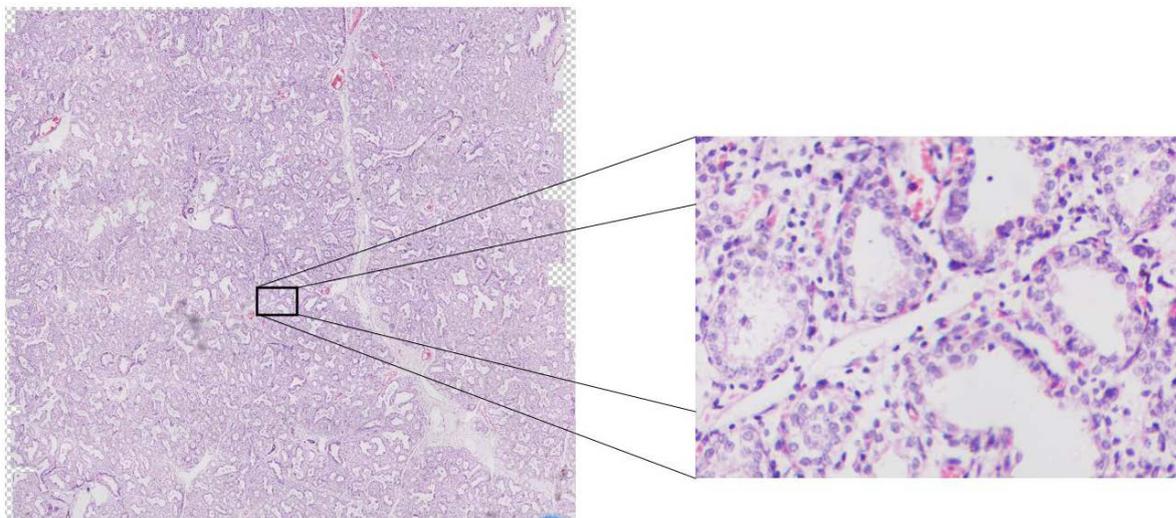
## Status

Present TRL Level – 6/7

### PMSM device



**Figure:** Current version of prototype fabricated at CSIR-CSIO Chandigarh and the prototype deployed at clinical site for validation



**Figure:** Stitched image and zoom region of interest for scanned area of 5mm x 5mm under 20X objective