

## **FLEXIBLE MASTER – SLAVE ROBOTIC ENDOSCOPY SYSTEM**

### **ABSTRACT**

A master – slave robotic endoscopy system includes a flexible primary endoscope probe  
5 having at least one tool channel for carrying a tendon-sheath driven robot arm and  
corresponding end effector, and a secondary endoscope probe channel for carrying an  
imaging endoscope. The imaging endoscope provides enhanced image capture range  
relative to a distal end of the primary endoscope probe by way of a secondary endoscope  
probe channel distal opening proximally offset from the primary endoscope probe distal  
10 end; a ramp structure distally carried by the primary endoscope probe; and/or one or more  
actuatable distal imaging endoscope regions. Robot arms can include joint primitives  
that enable robot arm / end effector manipulation in accordance with intended degrees of  
freedom. A set of quick connect / disconnect interfaces couple an actuation controller to  
one or more actuation assemblies insertable into the tool channel(s), where each actuation  
15 assembly includes tendon-sheath elements, a robot arm, and its corresponding end  
effector.

**FIG. 3A**