This paper addresses a difficult problem of velocity-free uncertain attenuation control for a class of nonlinear systems with external disturbance and multiple actuator faults. With only the output measurement available for feedback, a sliding-mode observer (SMO) is proposed to reconstruct the full states. The reconstructed signal can approximate the true value to any accuracy. An adaptive version of the observer is further presented to handle a class of structured uncertainties in the system. Together with the system output feedback, the reconstructed state is used to synthesize a velocity-free controller. All states in the closed-loop system are guaranteed to be uniformly ultimately bounded (UUB). System uncertainty and external disturbances are attenuated. Actuator fault is accommodated. An example with application the approach to satellite attitude stabilization maneuver is presented to verify the effectiveness of the proposed scheme.