The technique of Image Assisted Total Stations (IATS) has been studied for over ten years and is composed of two major parts: one is the calibration procedure which combines the relationship between the camera system and the theodolite system; the other is the automatic target detection on the image by various methods of photogrammetry or computer vision. Several calibration methods have been developed, mostly using prototypes with an add-on camera rigidly mounted on the total station. However, these prototypes are not commercially available. This paper proposes a calibration method based on Leica MS50 which has two built-in cameras each with a resolution of 2560 × 1920 px: an overview camera and a telescope (on-axis) camera. Our work in this paper is based on the on-axis camera which uses the 30-times magnification of the telescope. The calibration consists of 7 parameters to estimate. We use coded targets, which are common tools in photogrammetry for orientation, to detect different targets in IATS images instead of prisms and traditional ATR functions. We test and verify the efficiency and stability of this monitoring method with multi-target.