Claims

1. A sensor unit for a fastener assembly, the sensor unit comprising:

a mounting arranged to rigidly attach the sensor unit to, or adjacent to, a fastener assembly;~~ and~~

an optical flow sensor, configured to sense movement of the fastener assembly~~.~~; and

~~2. A sensor unit according to claim 1, wherein the sensor unit further comprises~~

a processor arranged to process the output of the optical flow sensor to detect loosening of the fastener assembly and to output a signal representing the status of the fastener assembly.

~~3.~~2. ~~A~~The sensor unit according to ~~claim 2~~claim 1, wherein the sensor unit further comprises a wireless communication unit arranged to communicate the signal.

~~4.~~3. ~~A~~The sensor unit according to any one of the preceding claims, wherein the optical flow sensor is configured to sense angular rotation or axial movement of the fastener assembly with respect to an object which the fastener assembly fastens.

~~5.~~4. ~~A~~The sensor unit according to ~~any one of claims 1 to 3~~claim 1 or claim 2, wherein the optical flow sensor is configured to sense angular rotation or axial movement of parts of the fastener assembly with respect to each other.

~~6.~~5. ~~A~~The sensor unit according to any one of the preceding claims, wherein the mounting is arranged to rigidly attach the sensor unit to the fastener assembly, and the fastener assembly includes an engagement portion which engages an object which the fastener assembly fastens, and the mounting is arranged to rigidly attach the sensor unit to the engagement portion of the fastener assembly.

~~7.~~6. ~~A~~The sensor unit according to ~~claim 6~~claim 5, wherein the optical flow sensor is configured to sense angular rotation of the engagement portion with respect to the object.

~~8.~~7. ~~A~~The sensor unit according to ~~claim 7~~claim 6, wherein the fastener assembly comprises a bolt having a head and a nut rotatably supported on the bolt, the engagement

portion being the nut or the head of the bolt.

~~9.~~8. ~~A~~The sensor unit according to ~~claim 8~~claim 7, wherein the mounting is arranged to rigidly attach the sensor unit as a cap over the nut or the head of the bolt.

~~10.~~9. ~~A~~The sensor unit according to ~~claim 8~~claim 7, wherein the optical flow sensor is configured to sense angular rotation or axial movement of the engagement portion with respect to another part of the fastener assembly.

~~11.~~10. ~~A~~The sensor unit according to ~~claim 10~~claim 9, wherein the engagement portion is the nut and the other part of the fastener assembly is the bolt.

~~12.~~11. ~~A~~The sensor unit (10) according to ~~claim 11~~claim 10, wherein the other part of the fastener assembly is a thread of the bolt or an end of the bolt.

~~13.~~12. ~~A~~The sensor unit according to any one of the preceding claims, wherein the mounting permits retrofitting of the sensor unit to a fastener assembly or integrates the sensor unit with the fastener assembly.

~~14.~~13. ~~A~~The sensor unit according to ~~claim 2 or any claim dependent on claim 2~~any one of the preceding claims, further comprising an eddy current sensor configured to monitor the condition of the fastener assembly, the processor further being arranged to process the output of the eddy current sensor.

~~15.~~14. ~~A~~The sensor unit according to any one of the preceding claims in combination with a fastener assembly.