

## Application Story

# Ogura Micro Clutch Used in Door Locks

**A** company in Japan has started to use Ogura's MC single disc micro clutches in a new door locking mechanism. The deadbolt is controlled by a motor for both locking and unlocking. There are several methods that can be used to control the lock. A magnetic card, bio-identification, integrated circuit card, and even a smart phone can be used to activate the lock. Who knows... maybe sometime in the future, an embedded chip under a person's skin will be used as an identifier.

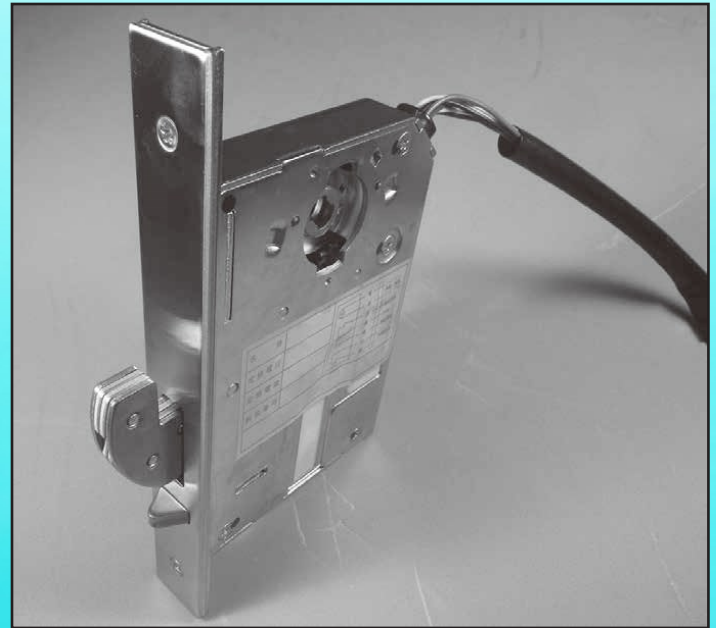
The advantage with an electronic control for the locks is that the door can be controlled remotely. For high security areas, the lock along with a camera and intercom allows the lock to be controlled from a remote location. This remote control ability makes the locking mechanisms ideal for hospitals and assisted living centers, so in the case of an emergency, all doors could be unlocked at once. The lock can also be fitted with a sensor, which if left unlocked, could trigger an alarm.

In order to fit in the door lock mechanism, a custom micro clutch was created. The clutch diameter had to be extremely small, so to achieve the torque requested, the body of the clutch was lengthened to hold the coil needed to generate the torque. The lead wire was also changed to exit from the back of the coil assembly. The clutch is controlled by a 24v supply and when engaged, the armature turns the output gear. When disengaged, the gear is free to turn.

The clutch rotor is mounted directly on the shaft of the electric motor. With the clutch engaged, the motor can turn clockwise or counterclockwise and drive the gear that is attached to the clutch armature to turn the locking mechanism. When there is no power going to the motor in the clutch, the mechanism can be controlled manually, so when someone goes into their room, they would simply close and lock the door themselves. In case of a power outage, the clutch disengages from the motor and the lock is controlled manually with a key or a thumb turn.



*Custom Ogura micro clutch*



*Integrated door lock mechanism with clutch and motor*

The Ogura clutch is also used as a torque limiter to protect the motor from excessive load. Sometimes, doors can become misaligned or not closed all the way and the lock could become stuck. Therefore, rather than causing the motor to go into an overload condition, the clutch friction surfaces would slip protecting the motor, at the same time triggering a sensor showing the door was not locked.

Besides this new door lock application, Ogura clutches and brakes have been used in various types of vehicle and personnel security gate opening and closing mechanisms. ●