## The QuoTrax® System

The QuoTrax® System works both with passive UHF transponders as well as with special semi-active transponders. The basic functionality of the QuoTrax® System is similar in both types of transponders. Both transponders collect data from the “first mile” to the “last mile”.

- **“First mile”**
  Post-boxes in the street can be equipped with a small passive identification transponder. With a handheld reader, a study participant can, first of all, record the location of the post-box. Afterwards, the participant scans the test letters with the enclosed QuoTrax® transponders. The data transmission will be done by a mobile data connection. By doing this, location and time information are stored at a central server.

- **Sorting centre**
  Antennas can be installed above the entrances in the sorting centres which receive a signal when a transponder enters the sorting centre. This works for both passive and semi-active transponders. The collected data will be transferred via internet/intranet to a central server.

- **“Last mile”**
  The receivers of the test letters have a QuoTrax® box installed in their post-boxes. The QuoTrax® box is a battery powered RFID reader which can perceive the chosen transponder type. When a test letter is delivered, the box stores the time of the delivery and the time at which the post-box was emptied. Afterwards the collected data will be transferred via internet/intranet to a central server.

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By and large, the QuoTrax® System is comprised of up to 4 components:

| Component | Active | Passive |
|---|---|---|
| 1. Transponder type | semi-active transponder | passive UHF transponder |
| 2. “Last mile” | QuoTrax® Box for semi-active transponders | QuoTrax® Box for passive UHF transponders |
| 3. “First mile” | QuoTrax® handheld reader for semi-active transponders | QuoTrax® handheld reader for passive UHF transponders |
| 4. Post-box identification transponder | passive post-box identification transponder (HF or UHF) | |

The resulting data streams are equal and correspond to the following chart:

| Component | semi-active transponder | passive UHF transponder |
|---|---|---|
| “First mile” | • Time and location of the letter drop | • Time and location of the letter drop |
| Sorting centre A | • Entry into sorting centre<br>• Possible other stations<br>• Exit from sorting centre | • Entry into sorting centre<br>• Possible other stations<br>• Exit from sorting centre |
| Sorting centre B | • Entry into sorting centre<br>• Possible other stations<br>• Exit from sorting centre | • Entry into sorting centre<br>• Possible other stations<br>• Exit from sorting centre |
| “Last mile” | • Time and location of delivery<br>• Time at which the post-box is emptied by the participant | • Time and location of delivery<br>• Time at which the post-box is emptied by the participant |

The following diagram illustrates by way of example the resulting data stream.