

The QuoTrax[®] System

The QuoTrax[®] System works both with passive UHF transponders of type class 1 gen. II as well as with semi-active transponders of type PT30, PT23, PT23E (Multiponders[®]), PT21, 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”**

In the QuoTrax[®] System there are two application possibilities for the automated measurement of the first mile.

1. All street post-boxes can be equipped with small passive identification transponders. Using a special QuoTrax[®] handheld reader device, the panellist records the post-box location. Afterwards, he scans the transponder equipped test letters. Location and time information are either stored inside the transponder (only with Multiponder[®] of type PT23E) or transferred to a data centre via GSM/SMS (all transponder types).
2. The panellist locates the street post-box using GPS inside a special QuoTrax[®] handheld reader device. Afterwards, the participant scans the transponder equipped test letters. Finally location and time information are automatically transferred to a data centre via GSM/SMS. The data centre can be located anywhere. This approach works with passive UHF transponders of type class 1 gen. II.

- **Sorting centre**

Whenever test letters with transponders arrive at a sorting centre, antennas installed above the entrance will receive signals from the transponders. These signals encode among other things the unique ID from the transponders. Using this ID the signal can be matched with a specific test letter. The type of antenna to be installed in the sorting centres depends on the used transponders. Semi-active transponders like the PT30, PT23 or PT23E will be detected from Lyngsoe antennas. For the widely-used standardized passive UHF transponders of type class 1 gen. II there are numerous different gates available on the market. An appropriate gate can also be purchased from Quotas.

- **“Last mile”**

The test letter receivers have a QuoTrax[®] box installed in their post-boxes. The QuoTrax[®] box stores the time of the delivery and the time when the post-box is emptied. Once a day the box sends the collected data via GSM/SMS to a data centre which can be located at any place.

At the data centre, the collected data will be summarized and merged with the data of the corresponding test letters.

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By and large, the QuoTrax[®] System is comprised of up to four components:

Component	Semi-active	Passive
1. Transponder type	PT30, PT23, Multiponder [®] PT23E	UHF transponders class 1 gen. II
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	passive post-box identification transponder	location of the post-box via GPS

Data is collected at different locations in the logistic pipeline:

Location	Semi-active / Passive
"First mile"	<ul style="list-style-type: none"> • Time and location of the letter drop
Sorting centre A	<ul style="list-style-type: none"> • Entry into sorting centre • Possible other stations • Exit from sorting centre
Sorting centre B	<ul style="list-style-type: none"> • Entry into sorting centre • Possible other stations • Exit from sorting centre
"Last mile"	<ul style="list-style-type: none"> • Time and location of delivery • Time at which the post-box is emptied by the participant

The following diagram illustrates the data stream for the example of a UHF transponder.

Test letter with UHF transponder

