Claims

1. A computer-implemented method for determining an absolute transit time of a signal, comprising

receiving a signal sequence (100), the signal sequence (100) comprising:

a first signal (10) having a first signal frequency and a first number of periods of the first signal (10) having the first signal frequency, and

a second signal (20) following the first signal and having a second signal frequency, wherein the second signal frequency is different from the first signal frequency;

determining a time of a signal transition (101) from the received first signal (10) to the received second signal (20); and

determining the absolute transit time of the first signal (10) since a start time assigned to the signal sequence (100) using the determined time for the signal transition (101) from the received first signal (10) to the received second signal (20) and the number of periods of the first signal (10).

2. The method of claim 1, wherein determining the time of the signal transition (101) from the received first signal to the received second signal comprises:

for each period of at least a portion of the received first signal (10) and a portion of the received second signal (20), determining a transit time of the period since the start time for the signal sequence (100);

determining differences of the determined transit times of consecutive periods of the first signal (10) and the second signal (20);

determining the time of the signal transition (101) from the received first signal (10) to the received second signal (20) based on determining the time at which the determined differences of the determined transit times of consecutive periods switches between the period duration of the first signal (10) and the period duration of the second signal (20).

3. The method of claim 1 or 2, wherein the absolute transit time of the first signal (10) since the start time of the signal sequence (100) is determined by the determined time for the signal transition (101) from the first signal (10) to the second signal (20), corrected by a first temporal correction term that is based on the number of periods of the first signal (10).

4. The method of claim 3, wherein the first correction term comprises the product of the number of periods of the first signal (10) and the period duration of the first signal (10).

5. The method of claim 1, further comprising amplifying the received signal sequence (100) before determining the time of the signal transition (101) from the received first signal (10) to the received second signal (20).

6. The method of claim 5, further comprising converting the amplified signal sequence (100) into a binary signal, wherein the converting is performed by means of a comparator (7).

7. The method of claim 5 or 6, wherein determining the transit time of each period since the start time is performed by means of an edge of the respective binary signal in a predetermined direction.

8. The method of claim 1, wherein the signal sequence (100) further comprises a third signal (30) following the second signal (20) and having a third signal frequency, wherein the third signal frequency is different from the second signal frequency, and wherein the method further comprises:
determining a time of a signal transition (102) from the received second signal (20) to the received third signal (30); and
determining the absolute transit time of the second signal (20) since the start time for the signal sequence (100) using the determined time for the signal transition (102) from the received second signal (20) to the received third signal (30) and a number of periods of the second signal (20).

9. The method of claim 8, wherein determining the time of the signal transition (102) from the received second signal (20) to the received third signal (30) comprises:
for each period of at least a portion of the received second signal (20) and a portion of the received third signal, determining a transit time of the period since the start time for the signal sequence (100);
determining differences of the determined transit times of consecutive periods of the second signal (20) and the third signal;
determining the time of the signal transition (102) from the received second signal (20) to the received third signal based on determining the time at which the determined

differences of the determined transit times of consecutive periods switches between the period duration of the second signal (20) and the period duration of the third signal.

10. The method of claim 8 or 9, wherein the absolute transit time of the second signal (20) since the start time of the signal sequence (100) is determined by the determined time for the signal transition (102) from the second signal (20) to the third signal, corrected by a second temporal correction term that is based on the number of periods of the second signal (20).

11. The method of claim 10, wherein the second correction term comprises the product of the number of periods of the second signal (20) and the period duration of the second signal (20).

12. The method of claim 3, wherein the first and/or second correction term further comprises one or more further temporal corrections given by the start time and/or the transition (101, 102) of the respective signals (10, 20, 30).

13. The method of claim 2, wherein determining the transit time of each period since the start time is performed at the time of a zero crossing of the respective signal in a predetermined direction of the signal switching.

14. A system (1) for data processing, comprising means for performing the method of claim 1.

15. A computer program comprising instructions which, when the program is executed by a computer, cause the computer to carry out the method of claim 1.

16. A computer readable medium comprising instructions which, when the program is executed by a computer, cause the computer to carry out the method of claim 1.