

Execution Times Ident-I System Q



The execution times have been measured with the Ident-I System Q read-/writeheads and tags, operation frequency 13,56 MHz, ref. to standard ISO 15693. The following simplified formulars are generated out of these measured values.

Execution Times Read-/Writehead Type IQH-..

Reading Fixcode (UID, all Chips ref. ISO 15693)

$t = 21 \text{ msec}$

Reading n Blocks (blocksize 4 Byte, all Chips)

$t = 10\text{ms} + n \times 5\text{ms}$

Writing n Blocks to IQC22 (Texas Instruments, TagIt HF-I)

$t = 2\text{ms} + n \times 21\text{ms}$

Writing n Blocks to IQC21 (NXP, I-Code SLI)

$t = 2\text{ms} + n \times 30\text{ms}$

Execution Times Read-/Writehead Type IQH1-..

Reading Fixcode (UID, all Chips)

$t = 10\text{ms}$

Reading n Blocks, 4 Byte each, from IQC21 + IQC22 (EEPROM-Memory)

$t = 10\text{ms} + n \times 2\text{ms}$

Writing n Blocks to IQC22

$t = 2\text{ms} + n \times 18\text{ms}$

Writing n Blocks to IQC21

$t = 2\text{ms} + n \times 21\text{ms}$

Reading n Blocks, blocksize 8 (!) Byte from IQC33 (FRAM-Memory)

$t = 16\text{ms} + n \times 14\text{ms}$

Writing n Blocks, 8 Byte each, to IQC33 (Fujitsu, MB89R118)

$t = 16\text{ms} + n \times 28\text{ms}$

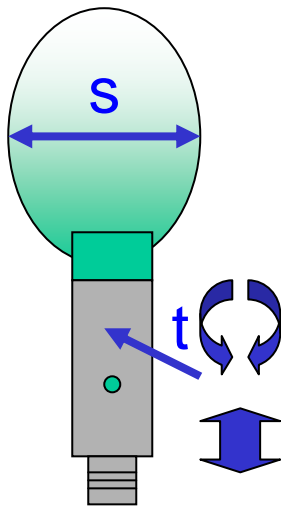
Reading n Blocks, blocksize 32 (!) Byte from IQC37 (FRAM-Memory)

$$t = 20\text{ms} + n \times 10\text{ms}$$

Writing n Blocks, 32 Byte each, to IQC37 (Fujitsu, MB89R112)

$$t = 20\text{ms} + n \times 20\text{ms}$$

Velocity – Max. Speed of tags passing the readhead



Regarding to the formular $v = s/t$ the possible maximum velocity is calculated out of the size of the reading field and the execution times of the operation (see above figures).

The reading field could be estimated as the size (diameter) of the readhead. The field has its widest range in about half of maximum reading distance.

Because in industrial environment the communication between readhead and tag may somewhen be distorted by EMC, there must be some time to repeat the operation. We recommend to put that time into the calculation in order to have a reliable system.

So for a reliable field installation we have the following formular:

$$V_{\text{max}} = \text{Diameter readhead} / (3 \times \text{Execution times})$$

For writing operations we recommend to have the tag standing still. If a tag travels out of the field during the writing operation, it may happen that some data blocks are already written with new data, while the remaining blocks still have the old data in the memory. Even if the IdentControl sends an error-message in that case, it may cause problems at the next location where the data is read.

Reading / Writing of large amount of data

Due to the fact, that the data telegram length of most fieldbuses is limited, it is necessary to cut the desired data in several telegrams. E.g. the Profibus-IdentControl from P+F has a maximum data size of 60 byte (user data, total size of telegram is 64 or 66 byte).

To read or write more memory, the max. no. of (4-byte) data blocks is 15 with tagtypes IQC21 and IQC22, because these chips have a blocksize of 4 byte.

To read or write the FRAM tags IQC33, the max. no. of blocks is only 7, because the blocksize is 8 byte ($7 \times 8 = 56$ byte).

For the calculation of the velocity it has to be considered not only the execution times of the readhead, but also the cycle times of the PLC which it needs to receive the responses from the IdentControl and sending the next command.