Execution Times Ident-I System Q

PEPPERL+FUCHS
IDENT-I

These 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:

Execution Times Read-/Writehead Type IQH2-..

Reading Fixcode (UID, all Chips ref. to ISO14443)
t = 25 ms (regardless to the UID length of 7 Byte or 4 Byte)

Reading n Blocks from IQC41 (Mifare Ultralight, NXP, MF0 IC U1)
Block length is 4 Byte

t = 0,9ms * n + 32ms

Writing n Blocks to IQC41 (Mifare Ultralight, NXP, MF0 IC U1)
Block length is 4 Byte

t = 7,8ms * n + 28ms

Reading n Blocks, auf IQC42 (Mifare Standard 1k - NXP, MF1 IC S50)
or IQC43 (Mifare Standard 4k, NXP, MF1 IC S70), Block length = 16 Byte
t = 1,7ms * n + 31ms

Writing n Blocks to IQC42 (Mifare Standard 1k - NXP, MF1 IC S50)
or IQC43 (Mifare Standard 4k, NXP, MF1 IC S70), Block length = 16 Byte

t = 2,9ms * n + 30ms

Reading / Writing of large amount of data

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

PEPPERL+FUCHS

The IQC41 with 48 Byte of user data could be completely read or written with one access (12 blocks of 4 Byte).

For IQC42 and IQC43 only 48 Byte could be read or written with one command (3 data blocks of 16 Byte). For more data there must be send following commands with increased start address.

Examples for IQC42 (with 47 Data blocks in total), that means, with 3 blocks per command 16 commands are necessary ro read/write the full memory:

Reading complete memory of 752 Byte:
$t = 16 * (3 * 1,7ms + 31ms) = 578$ ms

Writing complete memory of 752 Byte:
$t = 16 * (3 * 2,9ms + 30) = 620$ ms

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. For the examples above that are the transmission times of 32 telegrams (16 commands and 16 responses).

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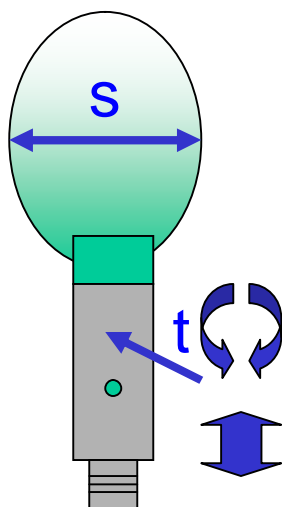
Regarding to the formular $v = s/t$ the possible maximum velocity is calculated out of the size of the reading field and the execution times of the operation (see above figures).

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 taking that time into the calculation in order to have a reliable system.

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

V_{max} = Diameter readhead / (2 x 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.

PEPPERL+FUCHS