

READOUT OF STORED SENSOR DATA

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COMPANY CONFIDENTIAL



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Firmware assumptions

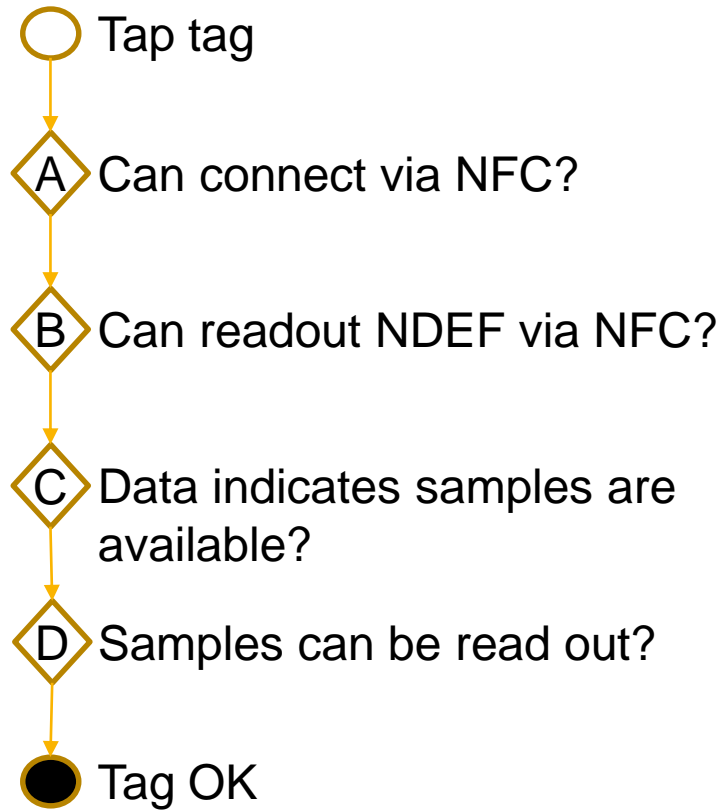
- Extensive use of the **SDK 12.3** or newer
- Firmware application similar to NHS3100 temperature logger demo
 - Use of `ndef_t2t` module
for generation of NDEF messages and bi-directional communication via NFC
 - Use of `msg` module
for command/response exchange of information
 - Use of `storage` module
for optimized data storage with recovery mechanisms after power failure and memory corruption

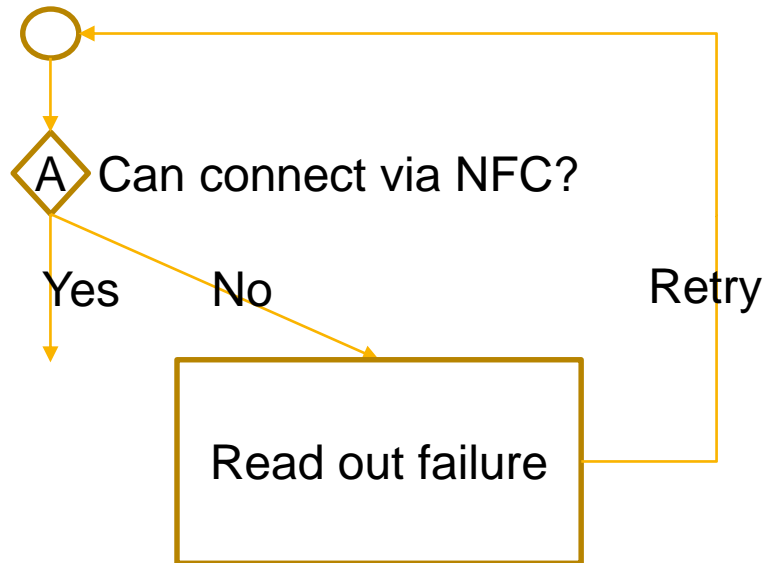
New storage features since SDK 12.3

- Reduced EEPROM writes
 - Using registers to group sensor data, writing multiple samples in a one write operation.
 - Improved caching reducing EEPROM writes in a single active session.
- Reduced impact of EEPROM corruption
 - Added EEPROM memory corruption detection mechanisms
 - Added internal recovery mechanisms
 - Customizable settings allowing application-specific trade-off between data recovery and 10k write endurance, minimizing data loss
- Reduced impact of FLASH corruption
 - Verification of contents after each FLASH write
 - Reduced storage capacity but no sample loss
- Backwards API compatible with SDK 12.1 and SDK 12.2
Straightforward upgrade from SDK 9.1 and up

READOUT

Different steps during readout





Possible reasons

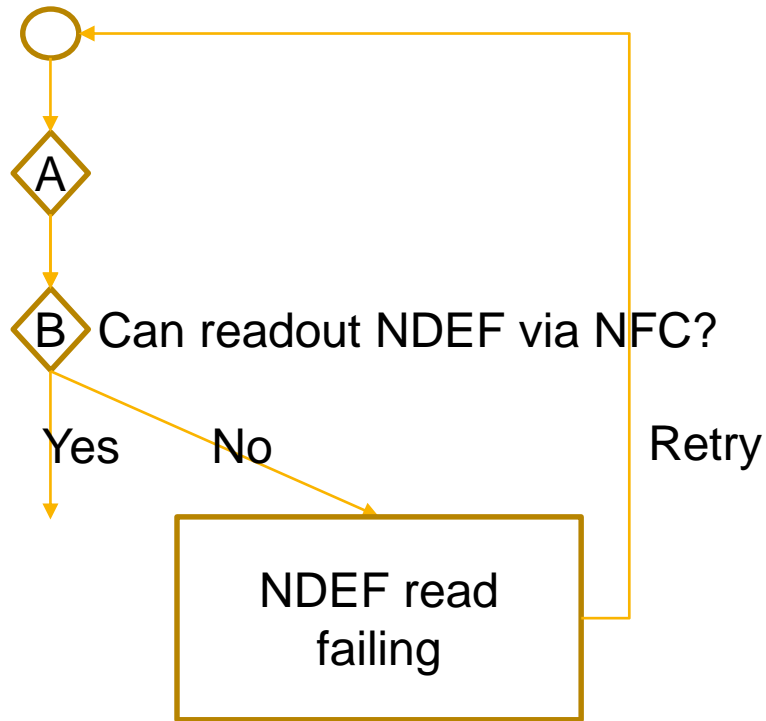
- Battery impedance too high *
 - Due to (freezing) temperature
 - Due to near end-of-life **
- Bad RFiD coupling

Mitigation actions

- Bring the tag to room temperature
- Disconnect the battery or cut the battery connection
- Check NFC antenna position on the phone

* Battery behavior is type and manufacturer specific. Consult your battery supplier for battery discharge profiles and battery impedance information, given the temperature range for your use case.

** When a battery is end-of-life, the NHS31xx IC will automatically switch to a fully passive operation, running on NFC harvested energy. The short period before that may cause reading failures: when a sufficiently high voltage can be provided when the load is low, but which cannot be maintained when the IC starts up.



Possible reasons

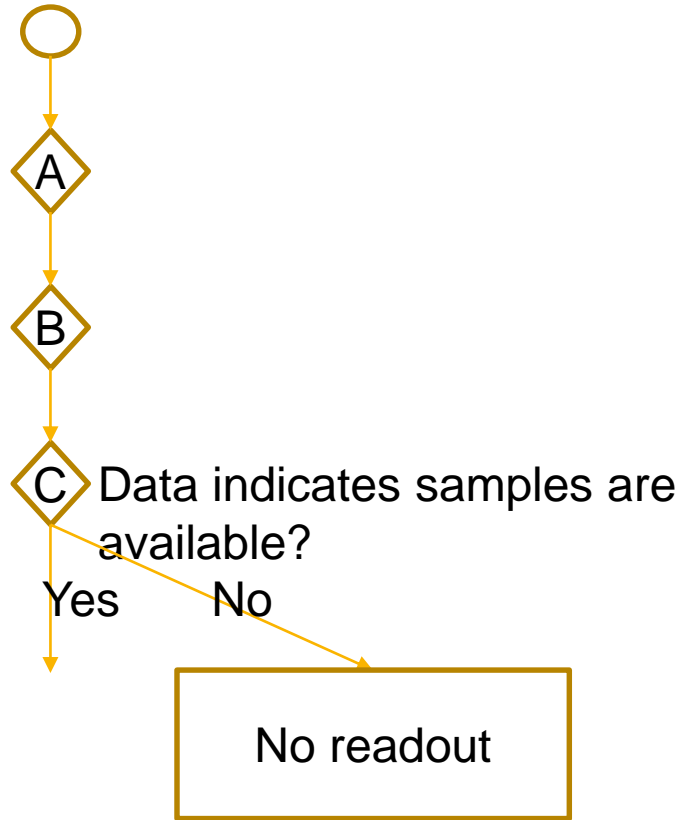
- Battery impedance too high *
 - Due to near end-of-life **
- Unstable RFiD coupling

Mitigation actions

- Maintain a good and stable position of the phone relative the tag
- Disconnect the battery or cut the battery connection

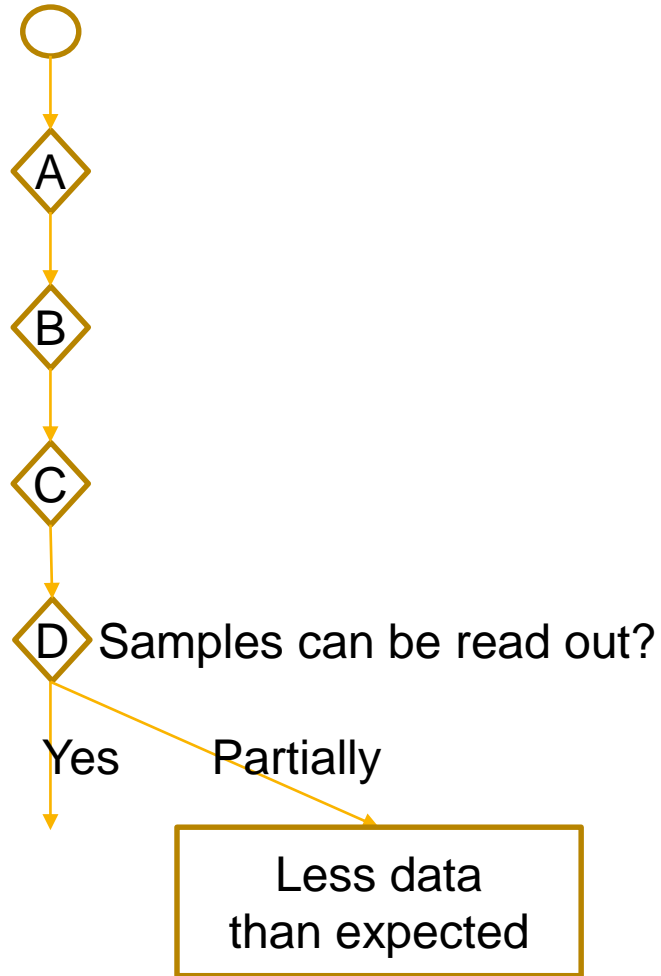
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Possible reasons

- Tag is not configured
- Battery was depleted from the start



Possible reasons

- Reduced storage capacity due to FLASH memory corruption *
- Premature stop of monitoring after a battery failure **

* The storage module will never discard older measurements. When all available memory is completely filled or marked as corrupt, no more measurements can be made.

** An unexpected HW IC reset (e.g. due to a battery failure) can cause a few of the last measured data to be lost. The exact amount can be customized on an application basis. After a reset, no new measurements will be made (as is the choice made in the firmware application of the NHS3100 temperature logger demo).



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