

Project description

PRODUCT / VERSION: -
CUSTOMER: tbd
APPLICATION: Reader Mobile Maintenance
BASIC PRODUCT: iID® PENSolid / iID® POCKETwork
PRODUCT CODE: -
STATUS: SPC DataTrigger implementation for iID® PENSolid HF /
iID® POCKETwork HF

Rev.1.0	2017-06-15	S.Jäger	S.Jäger
Review	Date	Author	Product / Project Manager

Revision History	Description	Date
Review 01	SPC Trigger protocol description	2019-12-09

	<i>Name / Position</i>	<i>Date / Signature</i>
Edited:	/	/
Checked:	/	/

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1. Introduction

In some projects different RFID read/write devices with Bluetooth™ interface will be used with tablet PCs. The goal is the optimization of the reader communication to improve the workflow, avoid instabilities in the system and implement a battery efficient control of the system. The implementation includes the control from software side and the functionality of the reader itself.

The new generation readers support the triggered read of data over the SCAN key and output of data as Bluetooth keyboard, but for bidirectional communication and improved control on the application side, a more complex approach is needed.

2. Concept

2.1. PENSolid/POCKETwork in SPC mode

The RFID reader will be provided with a script, that scans and reads an initialized transponder (ISO15693), interprets the data and sends it back to the host device.

The data will be sent with data identifiers, to be able to perform the correct reaction when receiving the data on the application side.

The application opens and closes the communication to the reader, receives the incoming data over the SPP profile and triggers the write process to the transponder.

If the reader receives a write transponder command, it tries to perform the write process and sends the result back to the application.

3. Implementation

3.1. Introduction

The implementation of the new SPC functionality and its linked reader control requires a restructuring of the reader communication on the application side.

3.2. Script communication protocol

The communication between reader and application occurs over the Bluetooth SPP profile. Following tables show a proposal for the construction of communication strings.

Read a transponder (Equipment or Personal)			
Comment	<p>The read process of a transponder can be triggered by a press into the SCAN key, or by the application.</p> <p>The read process will be performed for a maximum of 5 seconds. The data will be sent to the application when read. If an error occurs (or when the maximum time is reached) an error code will be sent to the application.</p>		
Application → Reader			
Field	SOH	~	Identifier of command to the reader
	Data-ID	T	Transponder read request
	Data	-	-
	EOF	<CR>	-
Example	~T <CR>		
RFID Reader → Application (Op. SUCCESSFULL)			
Field	SOH	-	-
	Data-ID	T	Transponder data follows
	Data	ASCII	TID of the transponder (HEX-String) + Data of the transponder (Address 0..92) : - Fixed data (Address 0..15) - Variable data (Address 16..92)
	EOF	<CR>	-
Example	T"001122334455667791LLLLLLL+25472" <CR>		
RFID Reader → Application (Op. ERROR)			
Field	SOH	-	-
	Data-ID	RT	Transponder read result follows
	Data	ASCII (error code in HEX)	Operation result
	EOF	<CR>	-
Example	RT"24" <CR>		

Write a transponder (Request by application)

Comment	<p>The write of a transponder will be requested by the application and will be acknowledged and started by key press in RFID reader.</p> <p>The reader will wait for 5 seconds for the key press after the write request is received. The write process will be performed for a maximum of 5 seconds. A result code (OK or error) will be sent back to the application. The length of the data to be written is fixed in the script and will be written independently on how many bytes are sent in the request.</p> <p><i>Warning: the transmission of the TID is implemented and reserved for future use. The transmitted TID is in current script implementations not checked/compared with the found transponder.</i></p>
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Application → Reader

		Content	Remark
Field	SOH	~	Identifier of command to the reader
	Data-ID	W	TID and data to write to the transponder follows
	Data	ASCII	TID and Variable data (Address 16..92)
	EOF	<CR>	-
Example	~W"00112233445566771234567890ABCDEF..." <CR>		

Reader → Application

		Content	Remark
Field	SOH	-	-
	Data-ID	RW	Transponder write result follows
	Data	ASCII (error code in HEX)	Operation result
	EOF	<CR>	-
Example	RW"00" <CR> RW"24" <CR>		00=successful, otherwise error code (for example 0x24 = "No TAG found")

Cyclical message of the RFID interface (approx. each 2 sec, if no activity)

Comment Hardware data (Reader-ID) as well as battery status will be sent to the application. This data will be provided after each triggered process or each approx. 2 seconds if no activity.

Application → Reader

-

Reader → Application

		Content	Remark
Field	Data-ID	H	Hardware data follows
	Data	ASCII (Hex. String)	Reader-ID (8 Bytes) + Battery status (4 Bytes), - 2 Byte IS value in mV, - 2 Byte SHOULD value in mV (3700)
Example	<i>H"B48E01B924F300800F80E74"<CR></i>		Reader-ID: B48E01B924F30080 Battery: 100C0E74 - 0x0C10 = 3.968 V (IS value) - 0x0E74 = 3,700 V (SHOULD)

3.3. Error codes

Following table contains error codes used when using the system with script and PENsolid/POCKETwork.

Fehler Code	Beschreibung
V4 Protocol Error Code	
RW00	Operation successful
RT24 / RW24	No transponder found or error

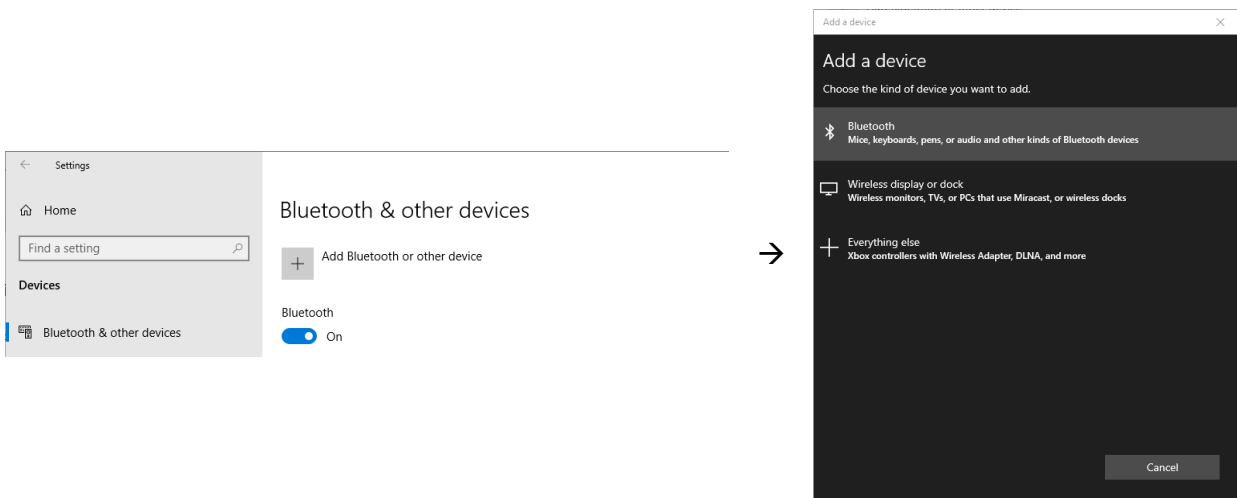
3.4. Sample Software Description

Following chapter is a description of how the communication using the described protocol can be implemented. For this, the C# sample code provided by microsensys will be used for the test and will be described below.

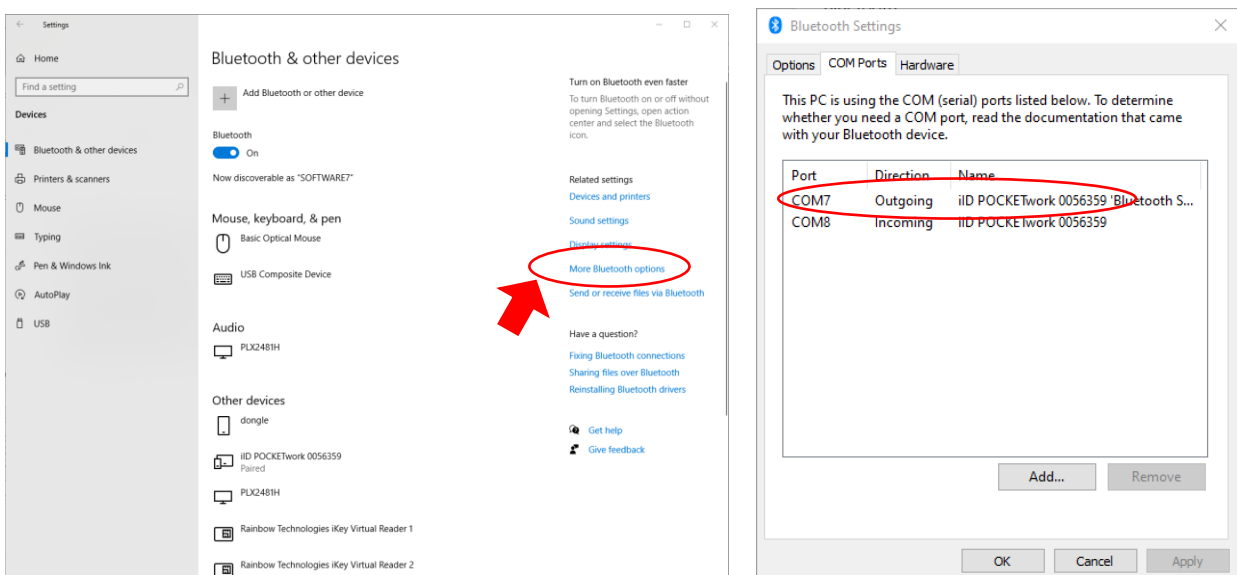
First, the script should be loaded into the reader (for more information please check "iID® Interface Configuration Tool" Start guide). For this description script *PsHF_DTrigSPP_v2* for iID®PENsolid Reader and *PwHF_DTrigSPP_v2* for iID® POCKETwork will be used.

Once the script is load to the reader and is running:

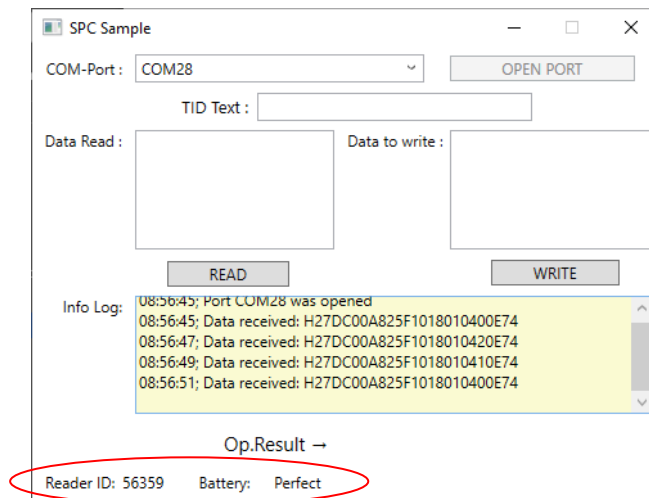
1. Pair RFID reader (in SPP mode configured) over Bluetooth to the host device.



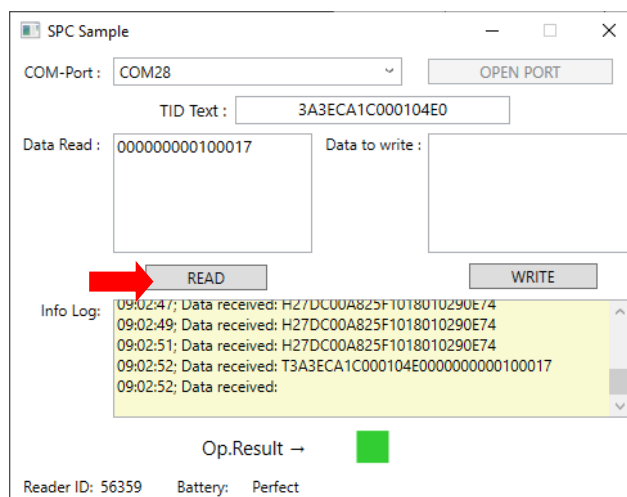
2. Once device is paired, find the COM Port information.



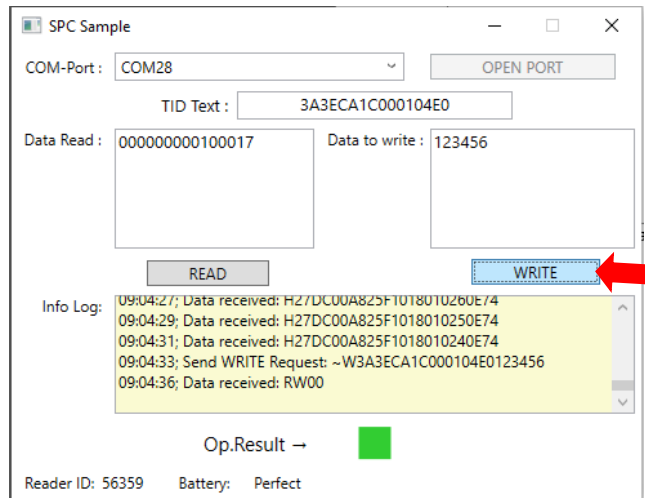
3. Start Sample application and select the outgoing COM port (see Bluetooth Settings window). Then click "OPEN PORT". The host device will connect to the RFID reader, and the heartbeat information will be received and decoded.



4. Once the first heartbeat is received, a read process can be started (with SCAN key on RFID reader or with "READ" button in the application)



- To write data to the transponder, the "WRITE" button can be used, then confirm using SCAN key on RFID reader.



4. Literature

Not applicable