iID®
software
tools

Product documentation

iID® software tools

SPC mode

iID® script generator

Introduction

Microsensys RFID interfaces can be operated in DOC (Direct Online Communication) or SPC (Script Programmed Communication) operating modes.

This document describes the various possibilities of the SPC mode for the different available microsensys® RFID interfaces.
SPC mode allows training in the processes for your RFID interface for better handling and easier system integration. To this end processes (scripts) are created and loaded into the RFID interface. Once created, scripts can be stored and distributed on multiple interfaces; an RFID interface can receive completely different functionalities through various scripts.
SPC mode is not supported by all microsensys RFID interfaces. Please refer to your hardware manual or contact the microsensys support department for further queries.

What does SPC mode allow me to do?

- Programming of menu-driven workflows on display devices (e.g. iID® POCKETwork)
- Filter data and automatic data output through the RFID interface in batch applications (e.g. iID® INDUSTRY 0906)
- Collect data in MPC mode for devices with a built-in memory and clock (e.g. iID® POCKETwork)
- Automatic data output through the RFID interface without desktop environment software (e.g. iID® PEN USBmini & HID Converter)
- Measurement conversion for different iID TELID® sensors.

In addition, this document describes:

- the instruction set and possibilities of SPC mode
- the use of the software tool iID® script generator
- uploading and activating scripts on your iID® RFID interface
- some examples of scripts

Contents

Instruction set

The instruction set for SPC mode is described below. Please note that the use of the individual commands is device-dependent, and this document can only give an overview of the instruction set.

Command groups

The following table contains instruction categories as well as rough information on availability in SPC devices.

Command group	Description	Availability in SPC devices
Script	Contains jump instructions, conditions and register operations	●[1]
Output	Output commands for host interface, buzzer, LED, display and menus	❍[2]
HF commands	RFID interface commands for communicating with RF transponders and HF TELID® Sensors	❍ (only in HF devices)
UHF commands	RFID interface commands for communicating with UHF transponders and UHF TELID® Sensors	❍ (only in UHF devices)
Reader commands	Commands for general communication with the RFID interface (reading the Reader-ID, trigger, antenna selection, etc)	●
MPC commands	Commands for storing data in the device's MPC memory	❍
Others	Other commands, free command inputs	●

[1] Available for all SPC devices

[2] (partially) available for selected SPC devices

Commands

SPC commands are shown and described below.

The full instruction set is available in the current version of iID® script generator or through consultation with the microsensys support department.

Group command: Script			
Instruction name	**Description**	**Parameter**	**Comment**
Branch	performs a jump to the specified address	Jump address or Register	
If Branch	performs a conditional jump to a predetermined alternative address	Comparison, jump addresses or Register	Used to evaluate functional results
Wait	Delays the program execution for a certain period of time	Waiting time in 10msec	
Set Register	Sets a value in a register	Value	
Modify Register	Changes the value in a register	Inc, Dec	e.g., increases or decreases a counter
Stack Buffer	buffering of operating results	dates	
Convert	Converts data for output (e.g., appearance on the display)	Data source, data target	Supports decoding of TELID® Sensor values , ASCII and 6bit coding
Separator	Places a separator at defined positions of a target string	Data source, data target, interval, separator, length	e.g., placement of spaces between bytes of a TID before host output
Replace	Replaces data of following instruction (max. 32 bytes)	Data source, offset, length	e.g. placement of data for following RF WRITE instruction
Find & Replace	Searches and replaces data	Data source, data target, search value, replacement	
BT iOS Eject	Sends iOS Eject command via Host Output	-	Enables on demand show and hide of on screen keyboard for iOS devices
Stop Script	Stops the script execution		Changes the interface in DOC mode

Command group: Output

Instruction name	Description	Parameter	Comment
Display	Provides data on the integrated device display	Data, font size, etc.	-
Set Buzzer	Activates the buzzer integrated in a device	Time in 10msec	-
Host Output	Outputs data via the device's host interface	Data, Format	For direct scanning and serial or HID output
Menu	Displays a menu on the device's integrated display	Items, jump addresses	Will be possible 4 entry option to configure
Set Menu Index	Selects a menu item	Number of entry	-
Set Output	Sets an output	Output, status, delay	-
Set LED	Switches a LED	LED output, status, delay	-

Command group: Reader

Instruction name	Description	Parameter	Comment
Read Reader-ID, Get HW Info	Reads data from the RFID interface		e.g. ID number of the device
Get Trigger	Gives the status of a trigger for subsequent evaluation	Trigger	Triggers can be buttons, inputs, incoming host data or other integrated sensors
SPC Trigger			
Select Antenna	Selects the reader-antenna to be used	Antenna number	
Bluetooth	Enables/disables the built-in wireless interface	Status	
Soft Reset	Reboots the device		
DateTime	Retrieves the current device time		Stored for further use in the internal buffer

Command group: MPC

This command consists of the subcommands Start_Dataset, Write_Data and End_Dataset, which should only be used together. Improper use of this command results in unusable data storage in the device and can lead to undefined behaviour of the RFID interface.

Instruction name	Description	Parameter	Comment
Write MPC	Sets a data set in the built-in MPC-memory of the device	Function, type, data	-

Command group: HF

The following commands provide an example of the HF RF frontend instruction set. In principle, the entire DOC instruction set for the RFID interface is available using “Free command”.

Instruction name	Description	Parameter	Comment
READ_ISO15693_TID	Reads the transponder ID from the RF interface according to ISO15693	-	Suitable for HF RFID interfaces
READ_ISO15693_BLOCK	Reads a transponder data block according to ISO15693	Block address	Suitable for HF RFID interfaces
WRITE_ISO15693_BLOCK	Writes a data block of a transponder according to ISO15693	Block address, data	Suitable for HF RFID interfaces
READ_ISO14443A_TID	Reads the transponder ID using the RF interface according to ISO14443A	-	Suitable for HF RFID interfaces
READ_ ISO14443B_TID	Reads the transponder ID using the RF interface according to ISO14443B	-	Suitable for HF RFID interfaces
SET_OPTION	Set the Flag Option for the read/write commands	Tag Type (SLI,SLIX,MyD…)	Suitable for HF RFID interfaces
READ_iID-L_ROCode	Uses the RF interface to read the ID of a TELID® Transponder type iID®-L	-	Suitable for HF RFID interfaces
IID L_Get_Sensor	Uses the RF interface to read the sensor data from a TELID® Transponder type iID®-L	-	Suitable for HF RFID interfaces
READ_iID-G_TID	Reads the iID-G type transponder’s ID from RF interface	-	Suitable for HF RFID interfaces
READ_iID-G_RO-Code	Reads the iID-G type transponder’s RO-Code from RF interface	-	Suitable for HF RFID interfaces
READ_BLOCK16_iID-G, WRITE_BLOCK16_iID-G	Reads/writes data block of iID-G type transponders	Block address, (data)	Suitable for HF RFID interfaces

Command group: UHF			
The following commands provide an example of the UHF RF frontend instruction set. In principle, the entire DOC instruction set for the RFID interface is available using “Free command”.			
Instruction name	**Description**	**Parameter**	**Comment**
READ_EPC	Reads the transponder UID using a RF interface according to ISO18000-6C	Options Flags: AntNr, PC,…	Suitable for UHF RFID interfaces
READ_WORDS_ISO18000-6C	Reads data from ISO18000-6C transponders	Page, block address, datacount	Suitable for UHF RFID interfaces
WRITE_WORD_ISO18000-6C	Writes data to ISO18000-6C transponders	Page, block address, data	Suitable for UHF RFID interfaces
READ_TEMPERATURE	Uses the RF interface to read the temperature of a TELID® Transponder according to ISO18000-6C	-	Suitable for UHF RFID interfaces
GET_SENSOR	This command receive the information of the sensor	Type	Used for getting measurements of TELID®41x

Registers

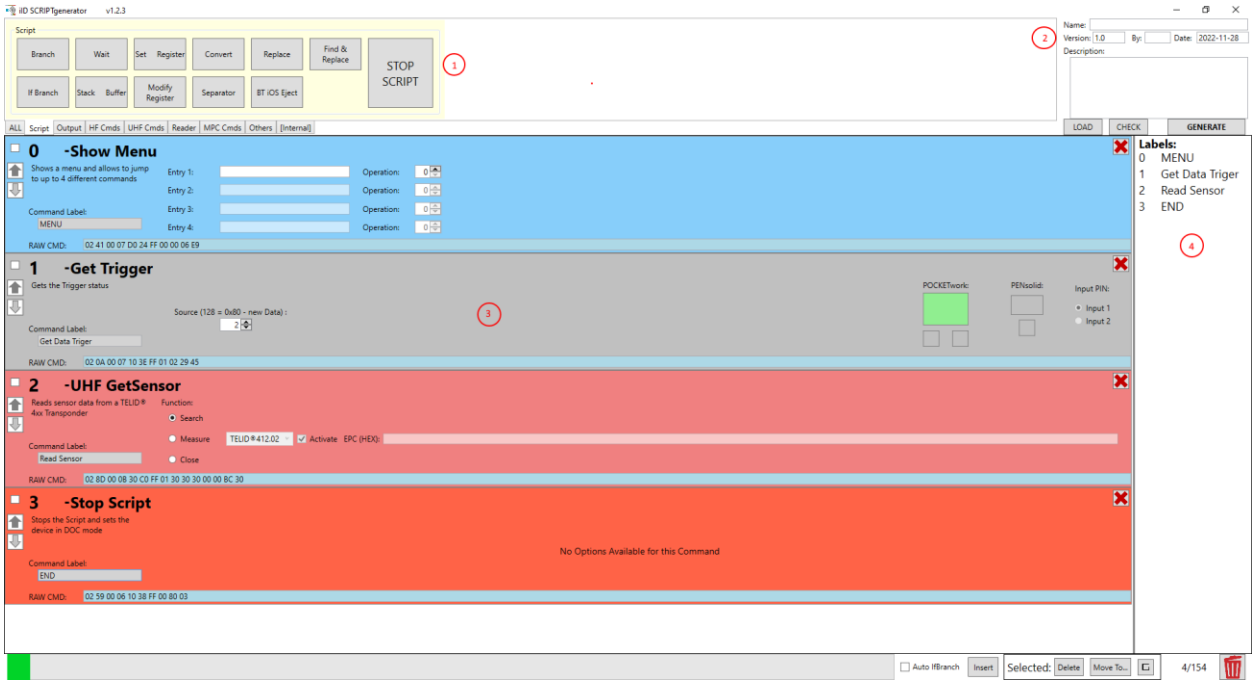
Some of above commands use run time generated data from registers or buffers. Following table provides a short overview of registers.

Name	**Description**
W1, W2	W registers can be used for counters, jumps or pointers at script run time
Internal buffer	Internal buffer is filled automatically with data content by reader firmware when handling data commands (e.g., reading a transponder). This content may be used by following script commands.
Stack buffer	Stack buffer may be use for temporary data storage and handling during script run time. Stack buffer is not corrupted by firmware internal command execution. Stack buffer size is 256 bytes for current firmware releases.

iID® script generator

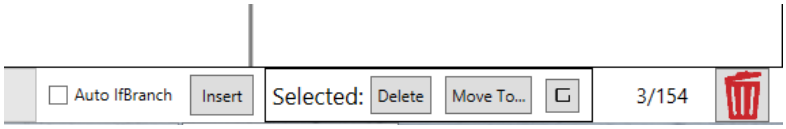
iID® script generator allows the creation of application-specific scripts that are executed on SPC-enabled devices. The design and development of scripts should only be carried out by experienced users who have programming experience and knowledge of microsensys RFID interfaces.

iID® script generator is available in our download section's developer area using the following link:
https://www.microsensys.de/downloads/DevSamples/iID%c2%ae%20script%20generator%20executable.zip
The software runs on Microsoft Windows XP to Windows 8 32bit and 64bit (in 32-bit mode). To execute, it requires the Microsoft .Net Framework Version 4 Client Profile.

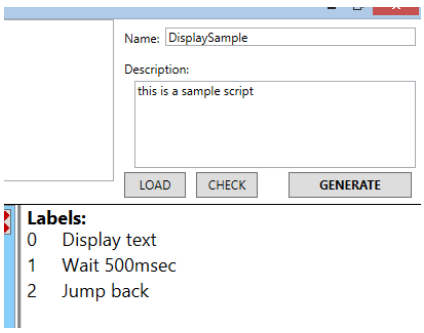


After starting the software, the programming screen is shown. In field (1) there is an overview of the command groups, through selecting the various tabs the commands contained in each are shown. Selecting a command places, it at the end of the command list in field (3).

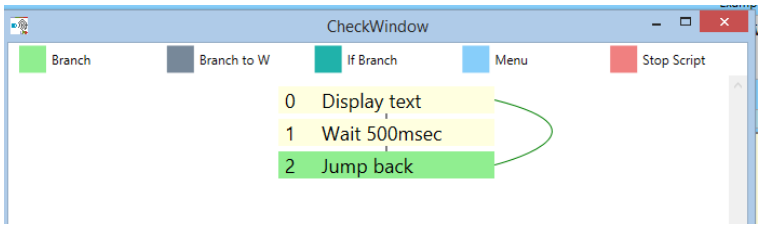
Within the command list, the parameters of the command can be set, and a preview is displayed based on the selected options.
The command can be selected, removed and moved up and down within the list by the push buttons. Within the "Command label" field, a description of the program steps can be entered for a better overview, which is displayed in field (4) on the right.



In the lower right corner of the screen, there are buttons to insert commands into an already existing command list and to delete or move several previously selected commands. All the commands removed from the list are sent to the recycle bin.



If a program sequence is created, it can be examined and saved via the buttons in field (2).



"Check" displays a jump diagram, which shows the programming flowchart based on the defined "Command Label" and jump addresses for verification.

To save the program, a script name and a brief description should be entered in the appropriate fields. An informative description will be shown to users of the script when loading via the iID® interface configuration tool.

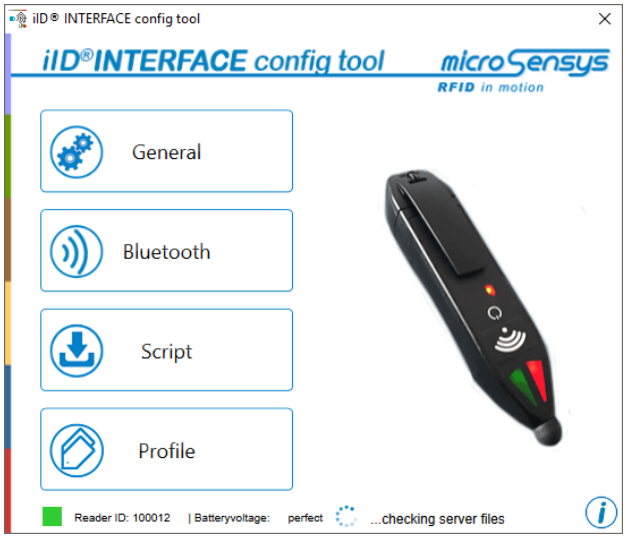
In the description, enter brief statement on the script content and the intended device; this will help your users!

By pressing "Generate", the jump graph is displayed again and then the path and filename for the resulting script file can be set.
This script file can be used later within the iID® interface configuration tool with any scripts loaded and activated on your SPC-compatible device (see next section or documentation for iID® interface configuration tool).
In addition, stored scripts can load and adjusted again.

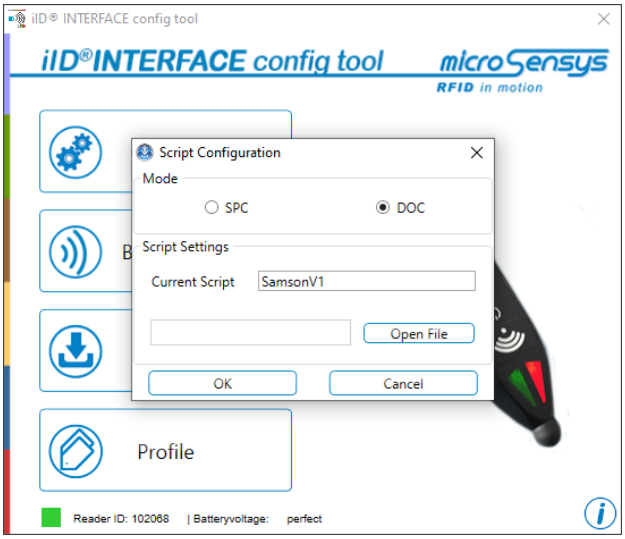
Uploading and activating scripts

Uploading and activating scripts through the iID® interface configuration tool. For more information on the installation and functionality see the documentation "iID® interface configuration tool".

If your microsensys® RFID interface allows you to upload and activate scripts, an additional "Script" button appears on the Welcome screen.

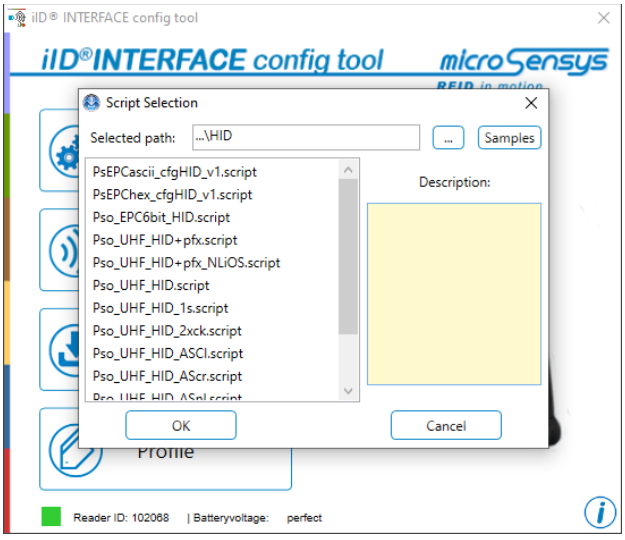


The iID® interface configuration tool allows loading of scripts into the reader as well as switching between DOC (Direct Online Communication) and SPC (Script Programming Communication) modes.
To activate script mode, please select "SPC" in the dialogue box shown; to disable script mode select "DOC".



The script currently loaded in the RFID interface is displayed.

If you want to change the loaded script, select "Open File". You now have the option to select a new script. When you click on a script file, a brief description is displayed in the window on the right. Select the desired script file by clicking on "OK".



Once configured, your RFID interface restarts after closing the program. The operating mode is now active.

Examples of Use

Below are two application examples representing the functionalities your RFID interface can have in SPC mode.

iID® POCKETwork as a data collector

By using SPC mode, the iID® POCKETwork can be used as a data collector. With this, the user can use menus `[Display Menu]`, scan transponder and sensor data `[iID-L Get Sensor]`, display data `[Display]` and store data in the memory of the MPC device `[Write MPC]`. This data can at a later stage, using iID® MPC DATAload, could be read from the memory of the device and be used with other applications.

iID® PEN-USBmini as an input device

By using the SPC mode, it is possible to use your microsensys RFID interface as an input device. For this, a script should be generated, which searches for transponders in the reception area `[Read_ISO15693_TID]` and the read data by means of command `[Host Output]` (with optional prefix and suffix) is sent directly to the host device. This eliminates software programming, which implements this functionality on the host device.
With the optional USB HID Converter, this data can be transmitted as keyboard input to the host device and thus be used without programming within your existing software infrastructure.

For your notice

Any questions? Contact us:

microsensys GmbH
Office Park im GVZ
In der Hochstedter Ecke 2
D-99098 Erfurt, Germany
Email: info@microsensys.de
Tel: +49 361 59874 0
fax: +49 361 59874 17