User Manual SMFP - SMFP2 RCS (Remote Control Software) V1.1

### **USER MANUAL V1.1**

# SMFP2 RCS (Remote Control Software)

🔜 SMFP2 0.4	- 520 / 1000 Mhz RCS	(Remote Control Softwa	re) by Jos Delissen			
File Settings	Info					
D Message	9	REE			Auto Run Type	Repeat
DE Signa	Conorator		BX Moosurement			
RF - Signa		Un			C Type [Tarret ]	
-40.0 dBm	145 0000 MHz		SN 12.0	-103 7 dBm	S/N	34.7 dBm
	145.0000 Min 12		SINAD 12.0	dBm	SINAD	dBm
	0.01250		BW - 6 DBm	kHz	Distortion 0.3 kHz	2.9 %
	0.01250		BW-Cen.Freq.Error	kHz	Distortion 0.5 kHz	2.4 %
Preset RF Power	Preset RF Freq. Step	Preset RF Frequency	Quieting	dBm	Distortion 1.0 kHz	3.4 %
	0 1000 MHz	0 145 0000 MHz	Squelch Low	dBm		
○ -80.0 dBm	0 1,000 MHz	435 0000 MHz	Hyst.	dBm		
Modulation			TV Magguramant			
	I Internal 1st	SEI Un		L AUIO	ENABLE ALL	
• EM	30 kHz		RF 1 - Frequency	MHz	RF 2 - Frequency	100.00204 MHz
			RF1-Power	dBm	RF 2 - Beat (Freq - RF)	H7
		External	RF1-Mod -	kH7	RF 2 - Mod -	kH7
O AM		0.0 KHZ	RF 1 - Mod (PK+PK)/2	kHz	RF 2 - Mod (PK+PK)/2	3.10 kHz
Preset FM	Preset QM	Preset AM	RF1-Mod +	kHz	RF 2 - Mod +	kHz
0 5.0 Khz	0 5.0 Rad	0 20.0 %	RF 1 - Demod Freq	kHz	RF 2 - Demod Freq	1.123 kHz
30.0 Khz	0 10.0 Rad	0 50.0 %	RF 1 - Mod. Sensitivity	mV	RF 2 - Mod. Sensitivity	mV
	l Conorator		Othor			
clevel		Un	External AF		C DC Measurement	
0 mV	1 000 kHz		Ext AE - Frequency	1.027 kHz		V
	+		Ext AF - Level	63.2 mV	DC - Ampere	mA
5.	0 100					
- Propert AE Lowel	- Preset AE Eren Star	- Project AE Employments				
O 1 mV	0.010 Khz	0.400 Khz	RF Probe			
O 10 mV	O 0.100 Khz	O 1.000 Khz	ln DB	dBm		
○ 100 mV	O 1.000 Khz	O 3.000 Khz	🔲 In Volt	V		
Logging	Max. 200	Logged 10	Total Processed	10	Show Device Settings	TXT CLR OFF
8 Feb 2012	22:02:16	1 1 TX2 D	eMod_Freq 1.1	123 kHz		
8 Feb 2012 8 Feb 2012	22:02:14 22:02:12	1 1 TX2_M 1 1 TX2_F	odMean 3 reg 100.000	.10 kHz 204 MHz		
8 Feb 2012 8 Feb 2012	22:01:23	1 1 AF_Le	v 6	3.2 mV		
8 Feb 2012	22:01:16	1 1 DIS10		3.4 %		
8 Feb 2012	22:01:13	1 1 DIS03		2.9 %		
8 Feb 2012	22:01:08	1 1 SN	3.	1.7 dBm		~

# A simple tool for complex Rohde & Schwarz Mobile Tester

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# 2. Introduction

The SMFP2 Remote Control Software (RCS) is designed to easily control the sophisticated SMFP/SMFP2 Mobile Testers from Rohde & Schwarz.

Using software to control these receivers enables

- Usage of these Mobile Testers in computer controlled test systems
- Easy graphical user interface instead of "key driven" complex measuring special functions
- Enhanced measurement capabilities
- Display measured data in Excel or download tot .txt file.
- Easy setup and running of multiple measurements within several ranges (e.g. frequency or modulation depth)

Another advantage is that there is no need for additional programming (e.g. Matlab etc). It is a ready to use program.

Its functionality is split in two parts. With its standard functionality you are able to check if the software is suitable to operate on your computer / OS / GPIB installation. If it works fine you may consider making a registration request to get access to the enhanced functionality.

Standard functionality

- Operating the straight forward Mobile Tester settings, such as

\* RF Frequency, Power and modulation depth (incl. 2<sup>nd</sup> modulator within SMFP2) \* AF Frequency and Level

Enhanced functionality (subject to registration )

- Making use of the available receiver measurements:

- \* SINAD, S/N and distortion
- \* SINAD (12dBm), S/N (12dBm)
- \* Bandwidth (-6dBm), Bandwidth Central frequency error
- \* Quieting and Squelch measurements
- or Transmitter measurements
  - \* Frequency and frequency-offset measurements
  - \* Modulation depth and demodulated frequency
  - \* Power measurements (including HF Probe)

- Making use of the automated measurement functionality, including single or continuous measurement.

### 3. How to get it & Installation

The SMFP2 RCS is a Click Once application. Simply stated, a ClickOnce application is any Windows Forms or console application published using the Microsoft ClickOnce technology. ClickOnce applications can be deployed to a computer from a Web location, a network share, or even from a file location such as a CD.

ClickOnce-deployed applications are considered 'low impact', in that they are installed per-user, not per-machine .The application is added to the user's Start menu and to the Add/Remove Programs group in the Control Panel. Unlike other deployment technologies, nothing is added to the Program Files folder and no administrative rights are required for installation.

The SMFP / SMFP2 RCS can be downloaded or launched from the site:

#### http://www.30dbm.com

The application requires needs .NET Framework. If the proper version is not available on the target system, it will automatically ask to download it during installation.

For using the enhanced functionality of the SMFP / SMFP2 RCS you need to be a registered user. A license key can be requested from:

http://www.30dbm.com/Request.aspx

Please make sure to enter the correct equipment used

## 4. License agreement & Set up

The SMFP / SMFP2 RCS is license protected. To enter a license key

🔡 SMFP2 0.4 -	520 /	1000 Mhz RCS	
File Settings	Info		
D Message	License		
DE Signa	1	About	
RI - Siyila	GOI		

To enter the license key, select the corresponding module and push on "EDIT".

	a Mari					
9000 8124	a Noy 168290164					
nstalk	ed Licenses					
	DESCRIPTION	LICENSEE EMAIL ADDRESS	LICENSE KEY	STATUS		
۶.	SMEP2			NOT OK		

Now the license key can easily be added to your licenses setup, and it will immediately be reflected in the license overview.

		_	83290168290164			
Product Key	83293168290164		Installed Licenses			
Product	SMFP2		DESCRIPTION SHEP2	ios.delissen#30dbm.com	F260CEAC978A0	STATU: OK
Licensee Email Address	jos.delissen@30dbm.com					
<u>L</u> icense Key	F26DCEAC978A0					
					E00	QK

# 5. Using the SMFP / SMFP2 RCS

### 5.1. Screen overview

ID Message					A to Run	Repeat
RE - Signal	Generator		RX Measurement			
Power	Frequency		Special [Target ]		Type [Target ] —	
-40.0 dBm	145.0000 MHz	$\bigcirc$	SN 12.0	-103.7 dBm	S/N	34.7 dBm
+	+	( C )	SINAD 12.0	dBm	SINAD	dBm
10.0 -	0.01250 -	$\smile$	BW - 6 DBm	kHz	Distortion 0.3 kHz	2.9 %
Preset RF Power	Preset RF Freq. Step	Preset RF Frequency	BW-Cen.Freq.Error	kHz	Distortion 0.5 kHz	2.4 %
🔘 10.0 dBm	O 0.0125 MHz	O 10.7000 MHz		dBm	Distortion 1.0 kHz	3.4 %
O 0.0 dBm	O 0.1000 MHz	O 145.0000 MHz	Squeicn Low	dBm dBm		
🔘 -80.0 dBm	1.0000 MHz	O 435.0000 MHz	Hysi.	dbm		
Modulation		SET On	TX Measurement	🗌 AUTO	ENABLE ALL	
Туре	Internal 1st	Internal 2nd	RF - Input		Freq.Meter - Input	
⊙ FM	3.0 kHz	0.0 kHz	RF 1 - Frequency	MHz	RF 2 - Frequency	100.00204 MHz
O QM	+	External	RF1-Power		RF 2 - Beat (Freq - RF)	Hz
○ AM	0.1 -	0.0 kHz	E RF I - Mod / PK+PK)/2	kHz	PE2 Mod (PK+PK)/2	2 10 kHz
Preset FM	Preset QM	Preset AM	BF 1 - Mod +		BE 2 - Mod +	3.10 KHz
0 3.0 Khz	0 1.0 Rad	0 10.0 %	RF 1 - Demod Freq	kHz	RF 2 - Demod Freg	1 123 kHz
0 5.0 Knz	0 5.0 Rad	0 50.0 %	RF 1 - Mod. Sensitivity	mV	RF 2 · Mod. Sensitivity	mV
	Concrator	10 30.0 %	Other			
clevel	Frequency	Un	External AF		DC Measurement	
0 mV	1.000 kHz		Ext AF - Frequency	1.027 kHz	DC - Valt	V
+	+		Ext AF - Level	63.2 mV	DC - Ampere	mA
5 -	0.100 •					
Preset AF Level	Preset AF Freq. Step	Preset AF Frequency	DE Proho			— ( F )
◯ 1 mV	O 0.010 Khz	O 0.400 Khz		dPm		$\cdot$
◯ 10 mV	O 0.100 Khz	1.000 Khz	In Volt	V		
○ 100 mV	○ 1,000 Kbz	○ 3,000 Kbz		· · ·		
Logging	Max. 200	Logged 10	Total Processed	10	Show Device Settings	TXT CLR OFF
8 Feb 2012 8 Feb 2012	22:02:16 22:02:14	1 1 TX2_D 1 1 TX2_M	eMod_Freq 1 odMean	.123 kHz 3.10 kHz	$\frown$	<u>^</u>
8 Feb 2012 8 Feb 2012	22:02:12 22:01:23	1 1 TX2_F 1 1 AF Le	neq 100.0 v	0204 MHz 63.2 mV	( G	
8 Feb 2012 8 Feb 2012	22:01:22 22:01:16	1 1 AF_Fr 1 1 DIS10	eq 1	.027 kHz 3.4 %		
8 Feb 2012 8 Feb 2012	22:01:13 22:01:10	1 1 DIS05		2.4 % 2.9 %		
8 Feb 2012	22:01:08	1 1 SN	140.0	34.7 dBm		<b>v</b>
8 Feb 2012	General m	enu section	, main functio	ons to star	t tool (GPIB)	■ and setup

- D Receiver (RX) measurement section.
- E Transmitter (TX) measurement section.
- F Receiver (RX) measurement section.
- G Logging of measurements done

### 5.2. General menu section

🔜 SMFP2 0.4 - 520 / 1000 M	hz RCS (Remote Contro	Software) by Jos Delissen
File Settings Info		, , ,
28 Message GPIB channel has been suc	cessfully opened	
REF	Overview of all speci	al functions with possibility to sent them to device
PRINT	Print the screen to a	printer
GPIB	Start / Stop the comr activated it is possibl equipment. When pu state.	nunication to the device. Only when is button is e to use this software with your measuring shed the device is cleared and set to its initial
SET	Go to Setup screen of frequency range to b	of automatic measurements and select e.g. the eused to do the measurements
STOP	Stops directly any on measurements done download.	going measurement and internal processes. Any are stored and can still be used for Excel of
	Hold function (For us temporarily interrupts Click it again to proce	age in automatic or single measurement run) : the measurement run(button becomes green). eed measuring (button becomes red again)
>>) >>	Starts the automatic when the automatic r is completed the butt	measurement. Button becomes green (>>>>) neasurement is active. When the measurement on >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>

#### 5.3. Progress information bar



to change the RF power or Frequency

### 5.4. Main settings for RF / AF Signal Generator

### 5.4.1. Main settings for RF Power and Frequency

RF - Signal	Generator			On
Power	Frequency			
-40.0 dBm	145.0000	MHz		
+		+		
10.0 -	0.0005	•		
Preset RF Power	Preset RF Freq.	Step Pr	eset RF Frequ	lency
10.0 dBm	0.0125	MHz 🔘	10.7000	MHz
0.0 dBm	0.1000	MHz 🔘	145.0000	MHz
🔘 -80.0 dBm	0 1.0000	MHz 🔘	435.0000	MHz
Click on the blue p characteristic of th step value ( as list by clicking on it.	ne RF signal. U ted in the blue b	dBm or fre Jse the + box) . This pr	equency and bredefined v	145.00 uttons to alue car
E.g. RF Pow. step size (dBm)	Cancel         0.0005           OK         0.0125	step size (MHz)	Cancel OK	
	On button ba	s heen activ	ated com	nand ar

Modulatio	n	SET On
Туре	Internal 1st	Internal 2nd
● FM	3.0 kHz	2.00 kHz
O QM	+	External
O AM	0.1 -	0.0 %
Preset FM	Preset QM	Preset AM
O 3.0 Khz	1.0 Rad	0 10.0 %
5.0 Khz	5.0 Rad	0 20.0 %
O 30.0 Khz	O 100 D 1	O 500 %

#### 5.4.1. Main settings for RF Modulation

Only when the button has been activated, command are set to the SMFP2, enabling you to change the Modulation.

Three modulation types are available, and 2 internal (SMFP2 only) and 1 external modulator



This modulation "Type" setting determines

- For RX measurements, the type of modulation which is used in the generated RF signal or
   For TX measurements, the
- demodulation type (FM / QM / AM)

The "1<sup>st</sup> modular" value can be set directly from the screen. Depending on the selected modulation type (FM / QM / AM) , the corresponding unit is displayed (kHz / Rad / %)

Internal 2nd       2.00       kHz       External       0.0       %	For two tone measurements (SMFP2 only) a second internal modulator can be activated (400 Hz or 1000 Hz). When activated, its modulation value is displayed in green on the screen.
Other Modulation       Image: Constraint of the second secon	Click on SET to get to the "Other modulation" screen. Apart from the 2nd internal modulator, also the external modulation type and value can be set. Please note, that the type depends of the modulation type of the 1st modulator (not all combinations
Type O FM O QM O AM 10 Close	are possible)

# 5.4.2. Main settings for AF Frequency and Level



#### 5.5. Measurement selection area

Three sections (RX / TX / OT) are available for doing measurements.

<u>Single</u> Measurement Run: all selected measurements are run only once.

<u>Continuous</u> Measurement Run: all selected measurements are run sequentially and continuously.

<u>Automatic</u> Measurement run All selected measurements wil be performed for a whole range of variations (e.g. a predefined frequency range)

Only in case of a fully automated measurement run all measurement sections can run sequentially for the desired range (selected by "AUTO-ENABLE"

Note: Only one single or continuous measurement run can be active at the time.

CCITT

ALL

CLR

0

If any continuous measurement run is being

processed it is not possible to start any other measurement run (single, continuous or automatic)

(De)activates the CCITT filter as used on receiver test measurements

(De)selects all measurements available in the relevant section.

Clears all measurements done in the relevant section. Any measurement remains on the screen, unless cleared or overwritten by a new measurement.

(De) activates a continuous measurement run. This means that all selected measurements (with checkbox selected), will be execute sequentially and continuously in the relevant section. It only stops, when it is de-activated again.

Please note that after de-activating it , the last measurement run will first be fully completed.

Only when stop in the general menu section is pressed, all measurements will be immediately aborted.

If in the general menu section is pressed to

. It will hold the measurement (as indicated by) until the button is pushed again to resume.



S/N

SINAD

Distortion 0.3 kHz

Distortion 0.5 kHz

Distortion 1.0 kHz

If any single measurement run is being processed it is not possible to start any other measurement run (single, continuous or automatic)

dBm

dBm

%

%

%

2.5

2.2

3.1

Will trigger a single measurement run for all measurements selected measurements. When finished, its color comes red again and other measurements can be selected again.

Select a measurement, by selecting the relevant "checkbox". Only if selected it is subject to a measurement

Note : New device setting are only activated when a measurement cycle has been fully completed (even you could manually change a setting, it will not be considered in the measurements done, as the relevant device setting will be re-send (unless not setup in the "Auto Setup" screen (settings -> Auto Setup)

Setup Automatic A	leasurement
Type Max Steps 999	Resend all device settings at each measurement cycle

For setup and starting an automatic measurement run see section 5.6

#### 5.6. Setup of Automatic Measurements

Select the "Settings -> Auto Setup" from the menu bar. The following screen will appear.

999	From	levice settings at To	step Size	Delay (s)		
<ul> <li>RF Frequency (MHz)</li> </ul>	144.9940	145.0060	0.0005	0		
O RF Power (dBm)	-120.0	-50.0	2.0	0		
RF Modulation	0	3.0	0.1	0		
O AF Frequency (kHz)	0.300	3.000	0.050	C		
O AF Level (mV)	0	200	2	0		
○ Time Steps (s) S/N, SINAD, BW : → ⊂ E	Duration 120 Demodulation	RF-Test D	iode — Mo	d/AF Rej. Filter		
<ul> <li>○ 15 Samples</li> <li>○ 50 Samples</li> <li>○ 150 Samples</li> </ul>	) Auto ) Peak ) RMS	⊙ On ○ Off	0 ©	) On ) Off		
Device Options Restrict RF Frequent 60 W Power Meter (	cy to max 520 Mi instead of 30 W)	Hz				

Five different variations can be selected, however only one variant can be active:

- RF Frequency (e.g. useful in sensitivity measurements)
- RF Power
- RF modulation
- AF Frequency
- AF Level

Alternatively it is also possible to select a "time range". This way, variations over time can be measured (e.g. 1 measurement run each minute over a period of 1 hour)

	Duration	Step Size	
<ul> <li>Time Steps (s)</li> </ul>	3600		60

### Using the SMFP / SMFP2 RCS 16

Max Steps 999	Can be used to restrict (as safeguard) the maximum number of runs (e.g. when step size is taken too small)
From         To         Step Size           21.0000         21.4500         0.0010	Any blue value can be adjusted by clicking on it.
Resend all device settings at each measurement cycle	New device setting are only activated when a measurement cycle has been fully completed (even you could manually change a setting, it will not be considered in the measurements done, as the relevant device setting will be resend (unless not setup in the "Auto Setup" screen (settings -> Auto Setup)
S/N, SINAD, BW :       Demodulation         15 Samples       Auto         50 Samples       Peak         150 Samples       RMS         RF-Test Diode       Mod/AF Rej. Filter         On       Off	Some SMFP/SMFP2 related settings can be influenced. Please read it's manual for further explaination.
Device Options Restrict RF Frequency to max 520 MHz 60 W Power Meter (instead of 30 W)	Use these setting to align the software, with the actual device options. Supported are: SMFP-B2 1 Ghz Frequency Extension SMFP2B3 60 W Power Meter (instead of 30 W)

#### 5.7. Running an Automatic Measurements Run

For an automatic measurements run only those sections are relevant for which the "AUTO-ENABLE" check box is selected.



# 5.8. Logging Section

Logging	Max.	200	Logged	7	Total Processed		7	Show Device	Settings	TXT CLR OFF		
9 Feb 2012 9 Feb 2012	20:47:27 20:47:22 20:47:20 20:47:18 20:47:11 20:47:07 20:47:04		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	AF_Lev TX2_DeMo TX2_ModM TX2_Freq DIS10 DIS05 DIS03	d_Freq ean	89.9 1.001 3.12 123.00000 3.4 2.1 2.1	mV kHz kHz MHz % %					
The logging function enables logging of all measurements. This could be any measurements part of an automated measurement run, single or continuous measurement .The maximum number of possible logging events is restricted (max. 999). The actual number of logged measurements and the total of processed measurements (since last clearing) is also visible in the header line.												
	RF Frequency (MHz) / RF Power (dBm) / Modulation Type / Modulation Depth (khz/Rad/%) / AF Frequency (kHz) and Level (mV)											
			12	2	Show Dev	ice Settings	TXT	CLR OFF				
			145.0000 145.0000 145.0000		-40.0 -40.0 -40.0	FM FM		3.0 3.0 3.0	1.0 1.0 1.0	000 120.0 000 0 000 0		
TXT			This button triggers the download of the whole logging to a file of your choice (.txt format)									
CLR			Clears t	he who	le logging							
ON	OFF		Activate	s or de	activates	the loggi	ng					

### 5.9. Entering new values

All the **<u>blue</u>** values can be edited. For example it is possible to change the step size and to save it into your own configuration file

Frequency         145.0000       MHz         +       0.01250         0.0125       -         Preset RF Freq. Step       0.0125         0.0125       MHz         0       0.1000         MHz       1.0000	<u>Click</u> with your cursor on the (blue) text
RF Freq. Step Preset 1 (MHz)         0.0125       Cancel         0.0250       OK         Frequency         145.0000       MHz         +       0.01250         Preset RF Freq. Step       0.0250         0.0250       MHz         0.1000       MHz         0       0.1000         MHz       1.0000	Enter the new value. Click on Ok (or push enter on the Key Board). A check on maximum and minimum values is performed. If all ok the value will be updated in the screen
SMFP2 : Information       The minimum value is 0.0001       OK	On error a message like here could occur.

# 6. GPIB Setup

GPIB_Channel	
Channel SetUpBoard0Prim. GPIB Address30Sec. GPIB Address0Time Out12EOT1EOS13	SRQ - Handshake         SRQ Add. Pollings       5         SRQ Add. Time (ms)       20         Message Delay (ms)       20         Display all messages
Channel SetUpBoard0Prim. GPIB Address28Sec. GPIB Address0Time Out13EOT1EOS13	Adjust the cannel setting of your GPIB device. The address is according to device default specifications of SMFP2 is (primary address SMFP2 = 30). See your NI GPIB card for further information. Some relevant Time Out values are $12 = 3 \sec$ $13 = 10 \sec$ .
SRQ Add. Pollings 10 Message GPIB-SRQ Check ( 5/70) (5 checks of maximum 70 have been executed)	After sending a measurement command, the RCS will check for the Service Request Signal of the SMFP2 to come high. For this it will check the SRQ line periodically (serial polling). Internally some maximum number of checks (polling's) has been setup per measurement (e.g. a Bandwidth measurement can take up to 4060 sec, as compared to a AF level, which completes in just a second). The progress can be displayed in the message bar (if "display all messages is selected"). If the maximum number is exceeded, the RCS will try to proceed with the next measurement.
SRQ Add. Pollings 5	If these default values are set too tight (e.g. in case of time taking bandwidth measurements), they can be increased. For this, increase the number of additional Service Request ("SRQ Add.Pollings").
SRQ Add. Time (ms) 100	Another way of increasing the time to wait for a measurement to finish is to increase the time between two checks. Here the additional time can be entered (in ms). When taken too long, it dramatically can influence performance.
	Enjov Remote Measurements

Message Delay (ms)	20	Any activity on the GPIB channel will be displayed in the message bar. This can go very fast. For testing purposes
		it is possible to delay the messages (say to $500 \text{ ms} - 1000 \text{ ms}$ ) so that they can be easily read. However, this will of course delay the measurements at hand.
Display all messages		If selected, more information will be given in message bar (e.g. number of serial polls being executed)

Channel Actions	
OPEN CLOSE	CLEAR STOP
Manual GPIB Message	
Read Max. Char.	20
OPEN	Open GPIB communication with device. Device is reset to initial state and software setting is aligned as much as possible with the device.
CLOSE	Close GPIB communication with device
CLEAR	Clear device, channel remains open
RESET	Not really a GPIB action, but resets all measurements being executed. Needed to reset software when it is in unexpected or uncontrollable state.
TX TX + RX	Used to manually sent a command to the device (TX no need to wait for answer, or TX when a measurements needs to be made). E.g. TX+RX is used here to measure the level. Manual GPIB Message AT,AF Read Max. Char. 20
	The received value is displayed in the relevant section of the main screen. Message GPIB TX = 'AT,AF' ; RX = ' AF12300000E-5 ' ; STATUS =
	When processing the service request line it is checked if the address of the device triggering the command is the right device. Especially in a multi device setup it should be set to check the SRQ address.
RX Max Char Count 20	A maximum number of characters can be defined, to ready values back from the device. The value of 20 should normally not be changed, but might be useful for a specific manual measurement (or testing purposes)

### 7. Downloading Measurement & Logging Data

#### 7.1. Download (last) measurement to Excel

Setup Excel / Data Download	×
Excel options - Automatic Run  Automatically create Excel File	List Format
Excel options - Single Run Automatically create Excel File	✓ List Format
Excel options - Manual Download	✓ List Format
Event Chest Tree (forece list tree )	
Excel Chart Type (for non list type )     Scatter Smooth	
Column senarator for TXT download —	
⊙ "." ○ ":" ○ "Tab" ○ Oth	ner ->
Data directory	
C:\Data\SMFP2	
Change	
	OK Cancel

Excel can also be manually started by selecting:

File	Settings Info
	Load New Configuration
	Save Configuration As
	Load Default Configuration
	Save Configuration as default
	Save (Last) Measurement run to Excel
	Save (Last) Measurement run to .txt file
	Save Logging to .txt file
	Restore to factory defaults

Excel can be started automatically in two cases

- A) After a having done a single run / or ending a continuous run. In case of a continuous run only the last full measurement cycle will be downloaded (automatically create of Excel not recommended)
- B) After a fully automatic measurement run (recommended, unless you do not have Excel)

There are two formats available

- 1. List Format (one measurement per line)
- 2. Table (set of measurements per run)

In case of a table, automatically a chart in Excel will be created (two options available)

Only the last measurement run is downloaded into Excel. This can be a single measurement, the last full continuous measurement or a fully automated measurement run.

Each automatic or manual generated Excel file is saved with a fixed file name. A warning is issued when the file name already exists. Then it is possible to change the name.

#### List Format :

	A	В	С	D	E F		F G		H I		H I			K	L	N
1	DATE 💌	TIME 💌	RUNID 💌	RPTID 💌	RF_Freq •	RF_Pow 💌	MOD_Ty 💌	MOD_Ine	MOD_Fr	AF_Leve	* N	Measur( 💌	Value 💌	UoM		
2	****	22:00:21	1	1	144.994	-40	FM	3	1		0 5	SN	44.1	dBm		
3	****	22:00:24	1	1	144.994	-40	FM	3	1		0 5	SINAD	10.8	dBm		
4	****	22:00:27	1	1	144.994	-40	FM	3	1		0 0	DIS03	60.7	%		
5	*****	22:00:31	1	1	144.994	-40	FM	3	1		0 0	DIS05	40.1	%		
6	*****	22:00:34	1	1	144.994	-40	FM	3	1		0 0	DIS10	28.7	%		
7	*****	22:00:38	2	1	144.9945	-40	FM	3	1		0 5	SN	43.8	dBm		
8	*****	22:00:41	2	1	144.9945	-40	FM	3	1		0 5	SINAD	11.3	dBm		
9	#########	22:00:44	2	1	144.9945	-40	FM	3	1		0 0	DIS03	47	%		
10	*****	22:00:48	2	1	144.9945	-40	FM	3	1		0 0	DIS05	31.6	%		
11	*****	22:00:51	2	1	144.9945	-40	FM	3	1		0 0	DIS10	26.7	%		
12	#########	22:00:55	3	1	144.995	-40	FM	3	1		0 5	SN	44.4	dBm		
13	######################################	22:00:58	3	1	144.995	-40	FM	3	1		0 5	SINAD	4.4	dBm		
14	#########	22:01:01	3	1	144.995	-40	FM	3	1		0 0	DIS03	36.2	%		
15	<del></del>	22:01:04	3	1	144.995	-40	FM	3	1		0 0	DIS05	25.6	%		
16	****	22:01:08	3	1	144.995	-40	FM	3	1	1	0 0	DIS10	60.7	%		

#### Table Format :

DATE 💌	TIME 💌	RUNID 💌	RPTID 💌	RF_Freq 💌	RF_Pow 💌	MOD_Ty 💌	MOD_Inc 💌	MOD_Fr 💌 AF	<mark>_Leve</mark> ▼	SN (dBm 💌	SINAD (c 💌	DIS03 (% 💌	DIS05 (% 💌	DIS10 (% 💌
*****	22:00:21	1	1	144.994	-40	FM	3	1	(	44.1	10.8	60.7	40.1	28.7
*****	22:00:38	2	1	144.9945	-40	FM	3	1	(	43.8	11.3	47	31.6	26.7
*****	22:00:55	3	1	144.995	-40	FM	3	1	(	44.4	4.4	36.2	25.6	60.7
*****	22:01:12	4	1	144.9955	-40	FM	3	1	(	48.6	9.4	32.5	40.7	34.2
*****	22:01:29	5	1	144.996	-40	FM	3	1	(	48.5	12.7	20.7	19.8	22.9
*****	22:01:47	6	1	144.9965	-40	FM	3	1	(	48.1	13.5	14.9	14.6	21.2
*****	22:02:05	7	1	144.997	-40	FM	3	1	(	) 49	15.9	10.7	11	16
*****	22:02:21	8	1	144.9975	-40	FM	3	1	(	48.8	16.9	7.4	8.2	14
*****	22:02:37	9	1	144.998	-40	FM	3	1	(	48.8	18.9	5.2	6.1	11.4
*****	22:02:52	10	1	144.9985	-40	FM	3	1	(	48.6	21.2	3.9	4.8	8.6

Only the Table format can be used for automatic graphics creation. E.g.



### 7.2. Download (last) measurement to .txt file



The file will be column separated, with column headers. The column separator can be manually selected from the Excel setup screen (in this case ",")

 SMFP2 Measurements 20120209 101745.txt - Kladblok

 Bestand Bewerken Opmaak Beeld Help

 DATE, TIME, RUNID, RPTID, RF\_Freq (MH2), RF\_POW (dBm), MOD\_Type, MOD\_Index (kH2), AF\_Freq (kHz), AF\_Level\_out (mV), Measurement, Value, UoM 9 Feb 2012, 22:16:13, 11, 145.0000, -40.0, FM, 3.0, 1.000, 0, SN.49, 1.dBm

 9 Feb 2012, 22:16:13, 11, 145.0000, -40.0, FM, 3.0, 1.000, 0, DISNAD, 29, 4, dBm

 9 Feb 2012, 22:16:17, 11, 145.0000, -40.0, FM, 3.0, 1.000, 0, DISO3, 1.6, %

 9 Feb 2012, 22:16:12, 11, 145.0000, -40.0, FM, 3.0, 1.000, 0, DISO3, 1.6, %

 9 Feb 2012, 22:16:23, 11, 145.0000, -40.0, FM, 3.0, 1.000, 0, DISO3, 1.6, %

 9 Feb 2012, 22:16:23, 1, 1, 145.0000, -40.0, FM, 3.0, 1.000, 0, DISO3, 2.0, %

 9 Feb 2012, 22:16:23, 1, 1, 145.0000, -40.0, FM, 3.0, 1.000, 0, DISO3, 2.0, %

 9 Feb 2012, 22:16:23, 1, 1, 145.0000, -40.0, FM, 3.0, 1.000, 0, DISO3, 3.3, %

It is possible to adjust the column separator, with your own desired character. This is done in the Excel setup menu (see previous Excel section). In the below example "Tab" separated.

O "." O ":	" 💿 "Tab" 🔿	Other ->											
SMEPZ Measure	ments 20120209 10	1940.DXL - I	MadDlok										
Bestand Bewerken (	Opmaak Beeld Help												
DATE TIME 9 Feb 2012 9 Feb 2012 9 Feb 2012 9 Feb 2012 9 Feb 2012 9 Feb 2012	RUNID RPTID 22:16:10 22:16:13 22:16:17 22:16:20 22:16:23	RF_Freq 1 1 1 1 1	(MHZ) 1 1 1 1 1	RF_Pow (dBm) 145.0000 145.0000 145.0000 145.0000 145.0000	MOD_Typ -40.0 -40.0 -40.0 -40.0 -40.0	FM FM FM FM FM FM	MOD_In 3.0 3.0 3.0 3.0 3.0 3.0	dex (kHz) 1.000 1.000 1.000 1.000 1.000 1.000	AF_Freq 0 0 0 0 0	(kHz) SN SINAD DIS03 DIS05 DIS10	AF_Leve 49.1 29.4 1.6 2.0 3.3	el_Out ( dBm dBm % % %	(m∨)

Note : It is not possible to save an empty Excel file (so without any measurement done)

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### 7.3. Download of logging section



Will save the logging to a user selectable .txt file. The column separator is <u>not used</u> here. The logging will be saved in the same format as displayed in the screen.

E.a.

Logging	Max.	200	Logged		5	Total Processed		5
9 Feb 2012 9 Feb 2012 9 Feb 2012 9 Feb 2012 9 Feb 2012 9 Feb 2012	22:21:54 22:21:51 22:21:47 22:21:44 22:21:44	1		1 1 1 1	DIS10 DIS05 DIS03 SINAD SN		3.2 2.0 1.6 29.7 48.7	% % dBm dBm

Will be shown	in the	.txt file as	
---------------	--------	--------------	--

SMFP2 Log 20	)120209 102207.txt - H	ladblok				
Bestand Bewerken	Opmaak Beeld Help					
9 Feb 2012	22:21:54	1	1	DIS10	3.2	%
9 Feb 2012	22:21:51	1	1	DIS05	2.0	%
9 Feb 2012	22:21:47	1	1	DIS03	1.6	%
9 Feb 2012	22:21:44	1	1	SINAD	29.7	dBm
9 Feb 2012	22:21:41	1	1	SN	48.7	dBm

Note : It is not possible to save as empty log.

# 8. Saving and using configuration files

File         Settings         Info           Load New Configuration	All the configuration settings can be saved and opened again. Saving will be done in a user selectable directory.
Load New Configuration	Opens a configuration file, previously saved.
Save Configuration As	Saves the configuration file, but file will not be used as default. Used to save and manage several configuration files
Load Default Configuration	Opens the default configuration file ( = file used at startup)
Save Configuration as default	Saves the configuration file as default file. The file specified here will also used during startup of the tool.
Restore to factory defaults	Restores all values to initial values, including GPIB channel setup.

## 9. Appendix – Quick Start Guide

1. First of all make sure the GPIB connection to device is activated.

Push on **GPIB**. If everything is ok it becomes green. If it does not become green check the connection to the device, its GPIB address setting or the mandatory NI GPIB card drivers.

Make sure the proper GPIB hand-shake configuration is made (see Chapter 6). To start we recommend to use



#### 9.1. Perform a single measurement run.

For example: perform a Noise measurement for a receiver (RX Measurement)

RX Measurement	
Special [Target]	Type [Target ]
SN 12.0	dBm S/N dBm
SINAD 12.0	dBm SINAD dBm
BW - 6 DBm	kHz Distortion 0.3 kHz %
BW-Cen.Freq.Error	kHz ✓ Dstortion 0.5 kHz %
Quieting	dBm 🗹 Distortion 1.0 kHz %
Squelch Low	dBm
Hyst.	dBm

1. Select one or more measurements

2. Press "	measurement run
------------	-----------------

RX Measurement		ENABLE CCITT ALL	5 🔿
Special [Target]		Type [Target ]	
SN 12.0	dBm	S/N	dBm
SINAD 12.0	dBm	SINAD	dBm
BW - 6 DBm	kHz	Distortion 0.3 kHz	%
BW-Cen.Freq.Error	kHz	Distortion 0.5 kHz	%
Quieting	dBm	Distortion 1.0 kHz	%
Squelch Low	dBm		
Hyst.	dBm		
	-		

3. All measurements will take place. As soon as a measurement is completed its value will be shown.

RX Measurement	AUTO.	ENABLE	ссіп	ALL CLR	) <b>∪</b> 🔿
Special [Target]		_ Туре	[Target ]		
SN 12.0	dBm	S/N			dBm
SINAD 12.0	dBm	SINAD			dBm
BW - 6 DBm	kHz	Distorti	on 0.3 kHz		1.6 %
BW-Cen.Freq.Error	kHz	Distortio	on 0.5 kHz		%
Quieting	dBm	Distorti	on 1.0 kHz		%
Squelch Low	dBm				
Hyst.	dBm				

Note: To continuously repeat the same measurement click on \_\_\_\_\_, then the same measurement will repeat itself. Any device changes (frequency, demodulation mode etc) will be effective as soon as a cycle of all selected measurements has finished. This is done to prevent disturbance of any ongoing measurements.

RX Measurement	📃 AUTO	ENABLE			⇒ (
Special [Target]		Туре	[Target ]		
SN 12.0	dBm	S/N			dBm
SINAD 12.0	dBm	SINAD			dBm
BW - 6 DBm	kHz	Distortion	on 0.3 kHz	1.5	%
BW-Cen.Freq.Error	kHz	Distortion	on 0.5 kHz	1.9	%
Quieting	dBm	Distortion	on 1.0 kHz	3.3	%
Squelch Low	dBm				
Hyst.	dBm				
	_				

### 9.2. To make <u>automated run</u> of measurements

1. Select the requested measurement and enable the section (AUTO.ENABLE)

RX Measurement		२ 🖸 🗢
Special [Target ]	Type [Target ]	
SN 12.0	dBm 🗌 S/N	dBm
SINAD 12.0	dBmSINAD	dBm
BW - 6 DBm	kHz 🔽 Distortion 0.3 kHz	%
BW-Cen.Freq.Error	kHz ☑ D stortion 0.5 kHz	%
Quieting	dBm 🔽 D stortion 1.0 kHz	%
Squelch Low	dBm	
Hyst.	dBm	

2. Make the required selection of frequency range (or Time Range). This can be done manually or using a predefined frequency range (or even a time range). For predefined ranges select the **SET** Button

1D Message 28 Ready	SET	STOP II >> Auto Rui	1 Type DIS10	Repeat 0 / 1
		-		

3. Make the required selection of frequency range (or Time Range). E.g.

Setup Automatic Meas	urement			×	
Type         Max Steps         999         Image: Steps ste					
	From	То	Step Size	Delay (s)	
RF Frequency (MHz)	144.9940	145.0060	0.0005	0	
O RF Power (dBm)	-120.0	-50.0	2.0	0	
RF Modulation	0	3.0	0.1	0	
O AF Frequency (kHz)	0.300	3.000	0.050	0	
O AF Level (mV)	0	200	2	0	
O Time Steps (s)	Duration 120	Step Size			
S/N, SINAD, BW : 15 Samples 50 Samples 150 Samples	) Auto ) Auto ) Peak ) RMS	RF-Test D On Off	iode Mo O O	d/AF Rej. Filter On Off	
Device Options          Restrict RF Frequency to max 520 MHz         60 W Power Meter (instead of 30 W)					

(now 25 measurement runs will be calculated (145.006 - 144994) / 0.0005 + 1))

4. Close the screen and press Button

set into its initial state.

/ ID -> / Message			uto Run —	Type	Repeat
28 Ready	REF PRINT GPIB SET STOP	>>	0 /	1 DIS10	0 / 1

5. Now the whole measurements starts (the current measurement run is displayed in the screen as well as the total number of measurement runs planned)

28 TX = 'ED ' RF - Signal (	Generator	REF	PRINT GPIB SET STO RX Measurement	PII Auto Run pe 4 / 25 t S03	Repeat 1 / 1 CLR ◯ ➡
Power	Frequency		Special [Target]	Type [Target]	dBm
-40.0 UDIII +	+		SINAD 12.0	dBm SINAD	dBm
10.0 -	0.0005 -		BW - 6 DBm	kHz ✓ Distortion 0.3 kHz	36.7 %
Preset RF Power	Preset RF Freq. Step	Preset RF Frequency	Quieting	dBm	60.2 %
10.0 dBm	O 0.0125 MHz	O 10.7000 MHz	Squelch Low		00.2
0.0 dBm	O 0.1000 MHz	145.0000 MHz	Hvet	dBm	
○ -80.0 dBm	O 1.0000 MHz	O 435.0000 MHz	Пуы.		

6. The measurement can be temporarily stopped and restarted by the button. With the "STOP" button, all measurements will be stopped. The GPIB channel will be closed down and the software will be

7. Depending on the Excel settings, Excel will start automatically to display all the measure values in one sheet, including a graphical representation.



SMFP2 ( 09/02/2012 ) , RF\_POW=-40.0 , MOD\_Type=FM , MOD\_IND=3.0 , AF\_Freq=1.000 , AF\_Lev=0

#### 9.3. How to enter values in a box and save them?

All the **blue** values can be edited. For example it is possible to change the step size and to save it into your own configuration file

1. <u>Click with your cursor on the (blue) text</u>



2. Enter the new value.

RF Freq. Step Preset 1 (MHz)	
0.0125	Cancel
0.0250	ОК

3. Click on Ok. A check on maximum and minimum values is performed. If all ok the value will be updated in the screen

Frequency	
145.0060	MHz
	+
0.0005	·
Preset RF Freq.	Step
0.0250	MHz
0.1000	MHz
0 1.0000	MHz

On error a message like below could occur.

SMFP2 : Information	
The minimum value is 0.0001	
	ОК

4. To save your configuration. You can use the save buttons (e.g. save as your default configuration).



When using the first time you need to select an directory/filename. E.g.

Opslaan als		? 🗙
Op <u>s</u> laan in:	: 🗁 SMFP2 🔮 🤔 😥 🖽 -	
Onlangs geopend Onlangs Bureaublad	Test SMFP2_Default_Config - 26.txt SMFP2_Default_Config - 28.txt SMFP2_Default_Config - 30.txt	
Mijn documenten		
Deze computer		
<b></b>	Bestandsnaam: SMFP2_Default_Config - 28.bt	aan
Mijn netwerklocaties	Opsiaan als type: bt files (*.bd)	leren

The file name and directory will be remembered for next usage.