User Manual Wlan Module

Project	:	**Brusa ICS**
Product description	:	**Wireless Power Transfer System (WPT-System)**
Project number	:	P0006 – 10281E
Manufacturer	:	**Zollner Elektronik AG**
address	:	Manfred-Zollner-Str. 1 93499 Zandt Germany
Applicant	:	**Brusa**
address	:	Neudorf 14 9466 Sennwald Schweiz
Date of issue	:	**21.12.2017**
Document number	:	**User_Manual_Wlan_Module_Brusa.docx**
Stages of Prototype	:	**D-Sample**
PMN	:	**W-LAN Card**
HVIN	:	**ICS1-WLAN-ATWILC-MU-D**

Created by:

Kai Lanzl, 12.03.2018
Name, Date

Contents

1 Change Index

Version	Author / Department	Comment	Date
1.0	Kai Lanzl, DRQ	Initial version, current version	24.03.2017
1.1	M. Binder, DRQ	FCC statement added	21.12.2017

Table 1: Change index

2 Acronyms and Abbreviations

Appellation	Description
CPM	Car pad module
DuT	Device under test
FOD	Foreign object detection
GPM	Ground pad module
HW	Hardware
ICS	Inductive charging system
LOD	Living object detection
SW	Software
WPT	Wireless power transfer

Table 2: List of abbreviations

3 Introduction

This document serves as a user manual for the Brusa Wlan module.

3.1 Product Description

The WLAN module is based on the Atmel ATWINC1000B_MUT chip. The special feature of this module is that it is capable of being exposed to operating temperatures up to 125°C. The module was developed by Brusa and Wepotec.

3.2 Theory of Operation

The WLAN module establishes the connection between CPM and GPM. The GPM module sends continuous beacons and if a CPM is in the radio range they start communicating. The ICS is separated into several parts (Energy transmission, positioning system, FOD / LOD) and each part uses WLAN to change information between CPM and GPM e.g. the charging process begins after the CPM has sent the charging command via WLAN to the GPM.

3.3 System Description

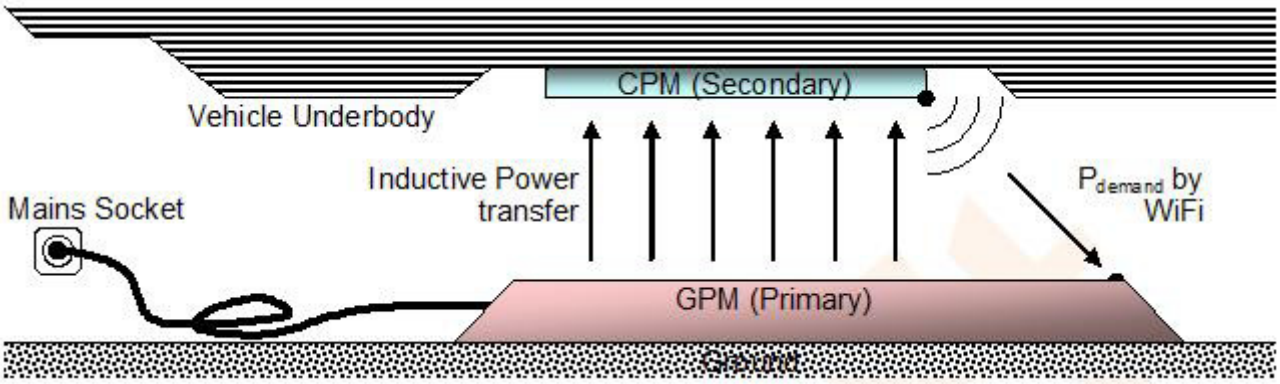

Figure 1: System description

3.4 Block Diagram

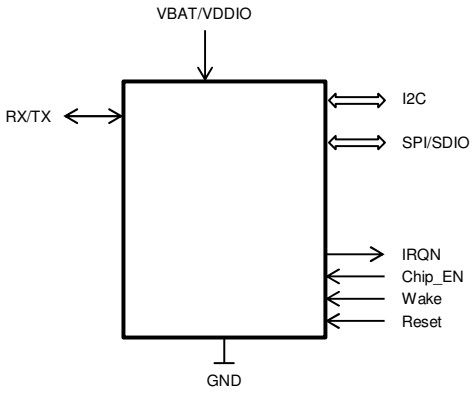

Figure 2: Block diagram ATWINC1000B_MUT

3.5 Module Drawings

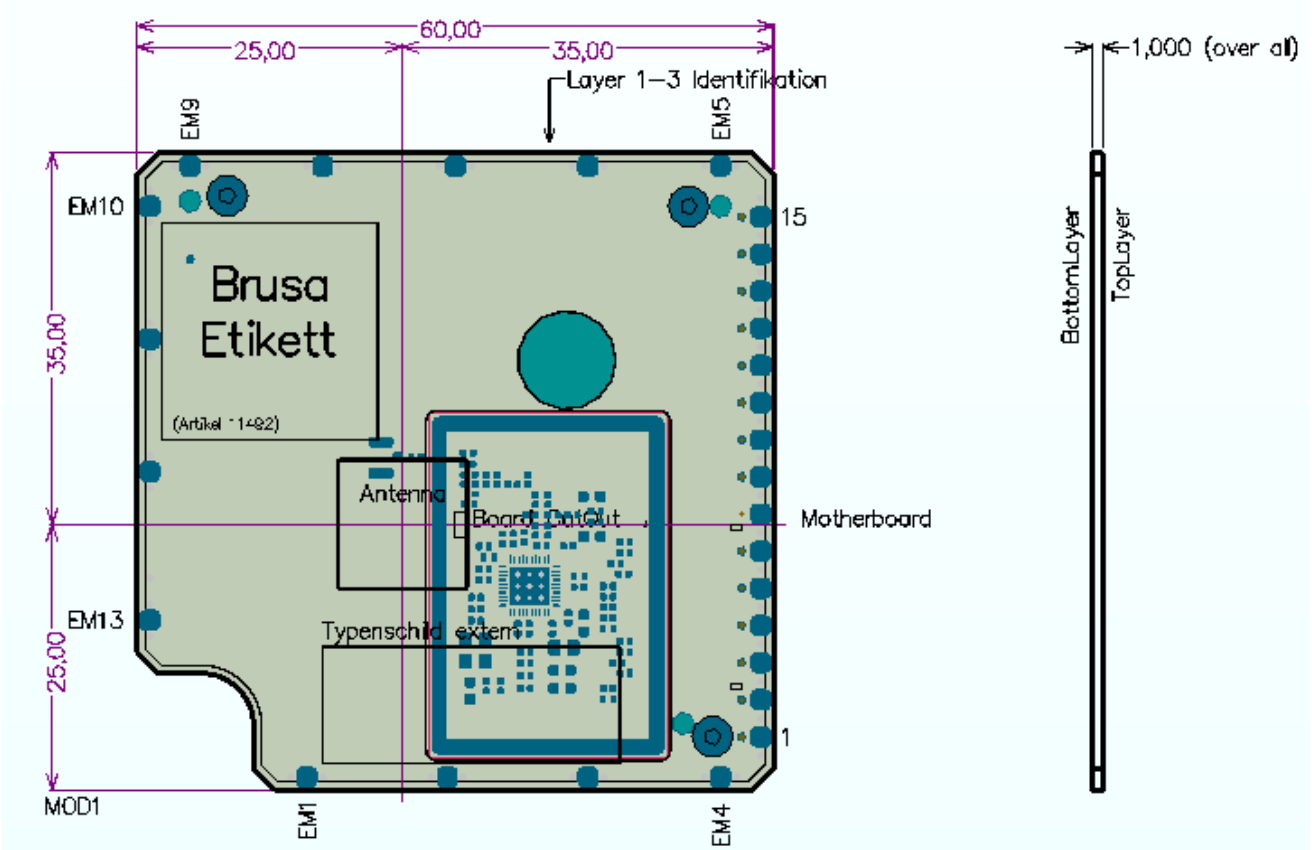

Figure 3: Wlan module top view

3.6 Module Pin Description

The pins are shown in Figure 3 on the right side of the module:

Pin	Description
1	VBATT
2	GND
3	I2C_SDA
4	I2C_SCL
5	Resetn
6	Chip_EN
7	GND
8	UART_RXD (SD_CLK)
9	SCK (SD_CMD)
10	TXD (SD_DAT0)
11	SSN_(SD_DAT1)
12	RXD (SD_DAT2)
13	UART_RXD (SD_DAT3)
14	IRQN (GPIO2)
15	HOST_WAKE (GPIO0)

Table 3: Module pin description

Note: Only pins with grey background are necessary for EMC tests!

3.7 Photo Documentation

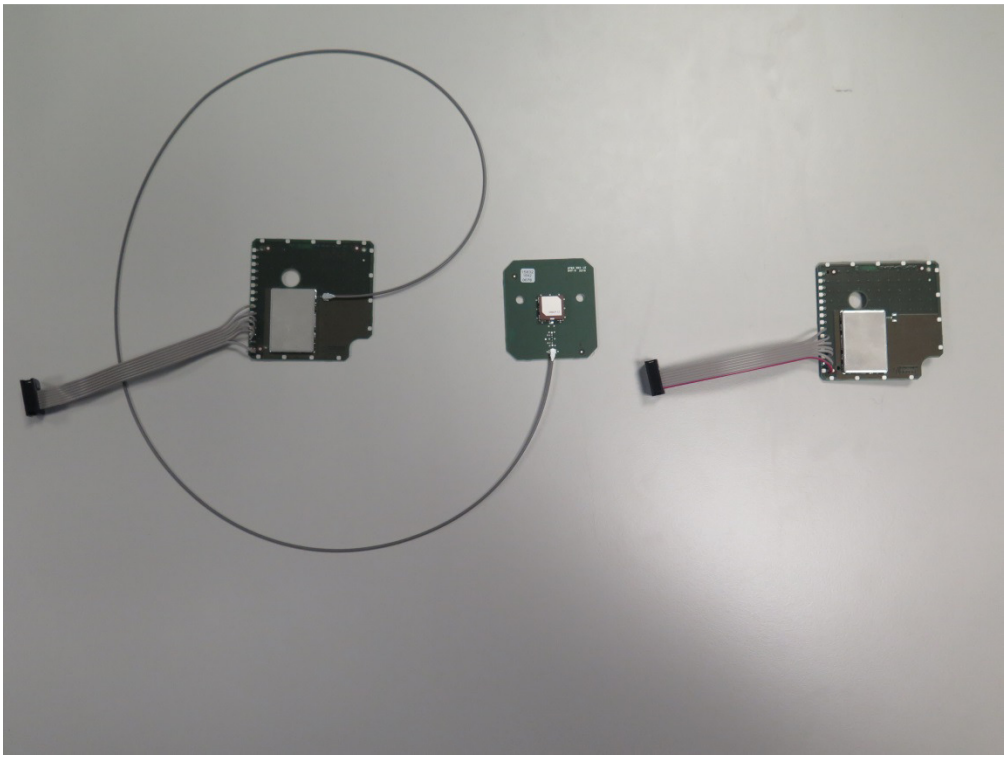

Figure 4: Wlan modules top view

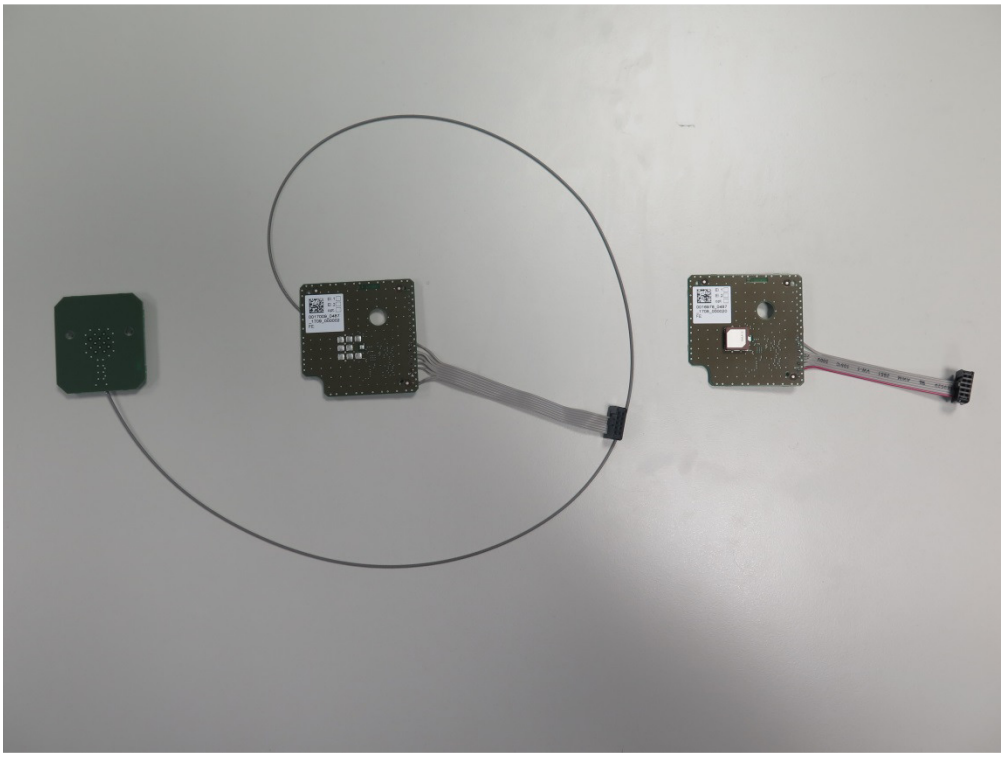

Figure 5: Wlan modules bottom view

3.8 Dimensions

Width (mm) ►	60	Depth (mm) ►	1	Hight (mm) ►	60

3.9 DuT Configuration and Test Setup

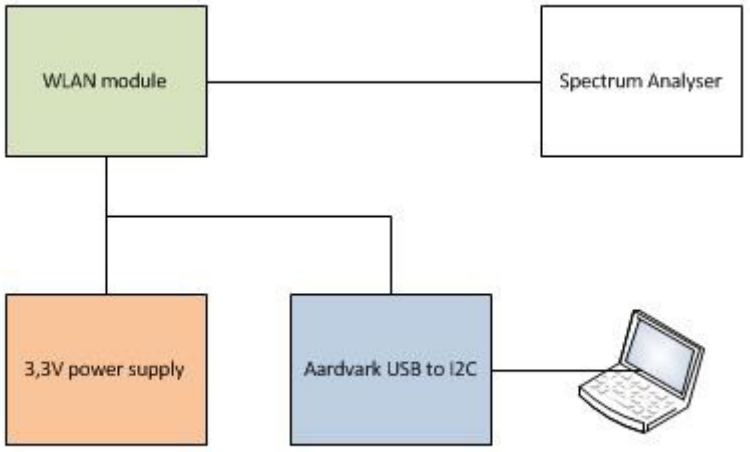

Figure 6: DuT test setup

The following peripheral devices and interface cables will be connected during the measurements:

- Power supply Model: n.a.
- I^2C adapter Model: Aardvark.
- Laptop Model: n.a.
- Spectrum Analyser Model: n.a.
- WLAN module Model: n.a.
- Adapter board Model: n.a.

4 Requirements

4.1 Power Supply System utilized

Normal test conditions:

Object	Power supply voltage	Temperature	Humidity
WLAN module	3,4V	+15°C to +35°C	20% to 75%

Table 4: Normal test conditions

Extreme test conditions:

Object	U_{max}	U_{min}	T_{max}	T_{min}
WLAN module	3,6V	3,1V	125°C	-40°C

Table 5: Extreme test conditions

4.2 Modulations

The used WLAN module is based on the ATWILC1000B-MU-T chip (IEEE802.11b/g/n). It supports following modulations:

- 802.11b: DSSS-CCK (1, 2, 5.5, 11 Mbps)
- 802.11g: OFDM (6, 9, 12, 18, 24, 36, 48, 54 Mbps)
- 802.11n: HT modulations (MCS0-7, 20 MHz, 800 and 400 ns guard interval; 6.5, 7.2, 13.0, 14.4, 19.5, 21.7, 26.0, 28.9, 39.0, 43.3, 52.0, 57.8, 58.5, 65.0, 72.2 Mbps)

4.3 Operation Frequency and Channel Plan

The operating frequency is 2412MHz to 2483,5MHz. *(Channel 12-14 not used in US.)*

Channel	Frequency in MHz
1	2412
2	2417
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452
10	2457
11	2462
12	2467
13	2472

Table 6: Channel plan WLAN standard 802.11b/g/n

5 User Manual

5.1 Test Software

A special Atmel GUI is used to control the WLAN module. The I^2C adapter establishes the connection between Laptop and the module. The WILC1000/WINC1500 Software allows the user to configure the WLAN module according to test specific settings.

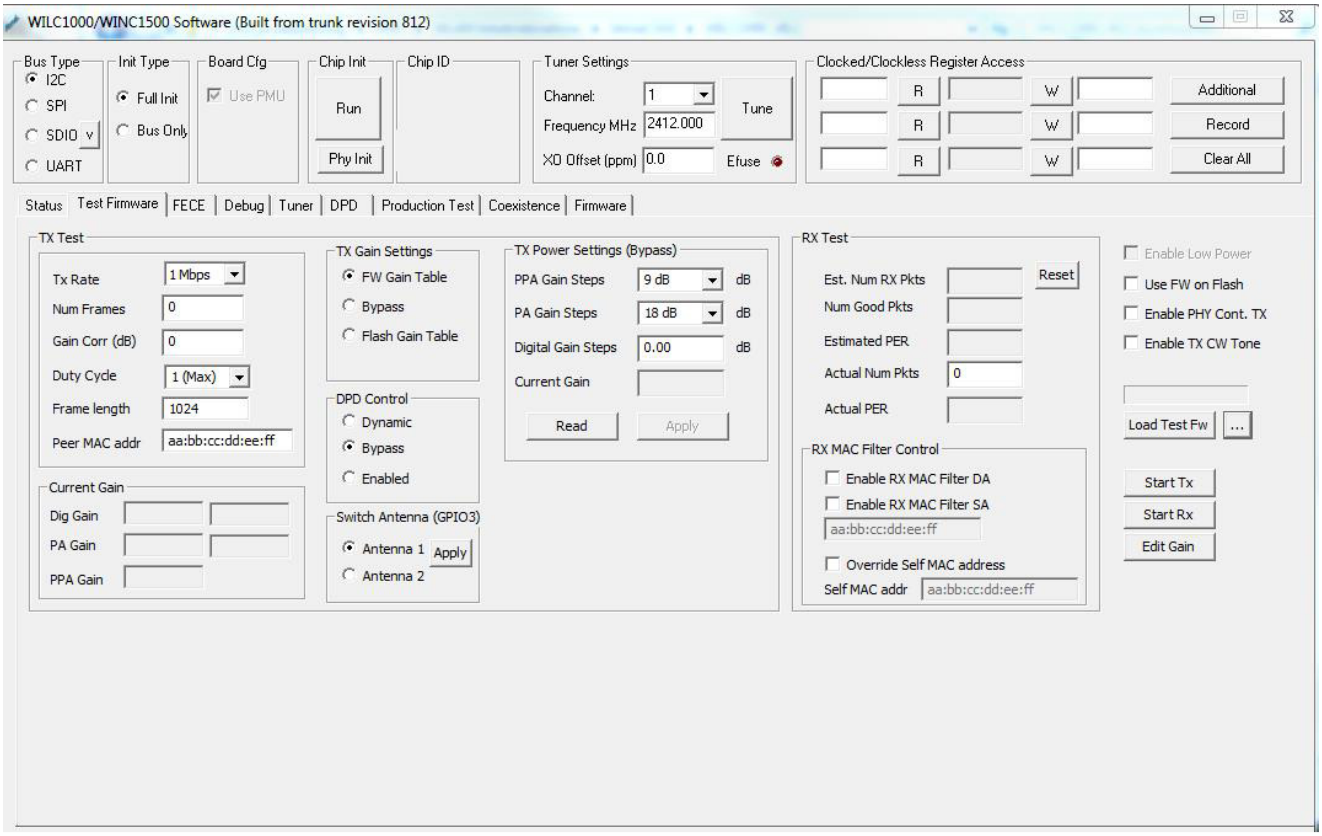

Figure 7: Atmel GUI

Figure 8: Aardvark I2C adapter

5.2 Module Configuration

Following pins from the WLAN module (Figure 3 right side) must be connected to Aardvark I2C adapter or power supply.

Pin	Description	Termination
1	VBATT	3,4V
2	GND	GND (Aardvark)
3	I2C_SDA	I2C_SDA (Aardvark)
4	I2C_SCL	I2C_SCL (Aardvark)
5	Resetn	None / 3,4V
6	Chip_EN	3,4V
7	GND	GND

Table 7: Module Configuration

5.3 Aardvark Adapter

The configuration of the Aardvark Adapter connector is shown in Figure 9:

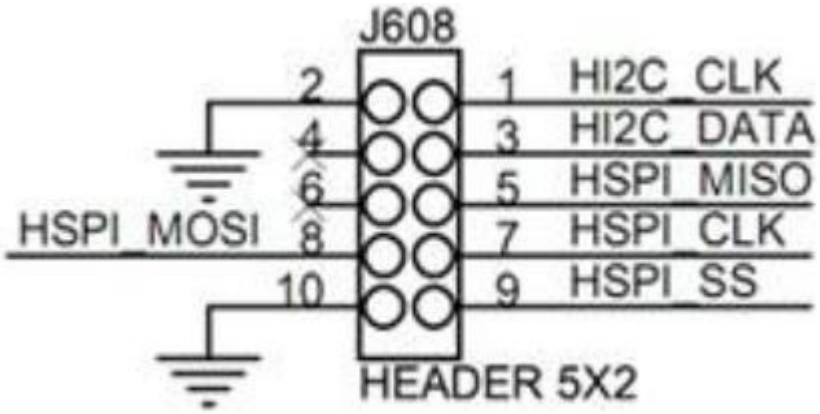

Figure 9: Aardvark Adapter Connector

5.4 Adapter Board

Use the adapter board to connect the Wlan Module to the I2C adapter shown in Figure 10:

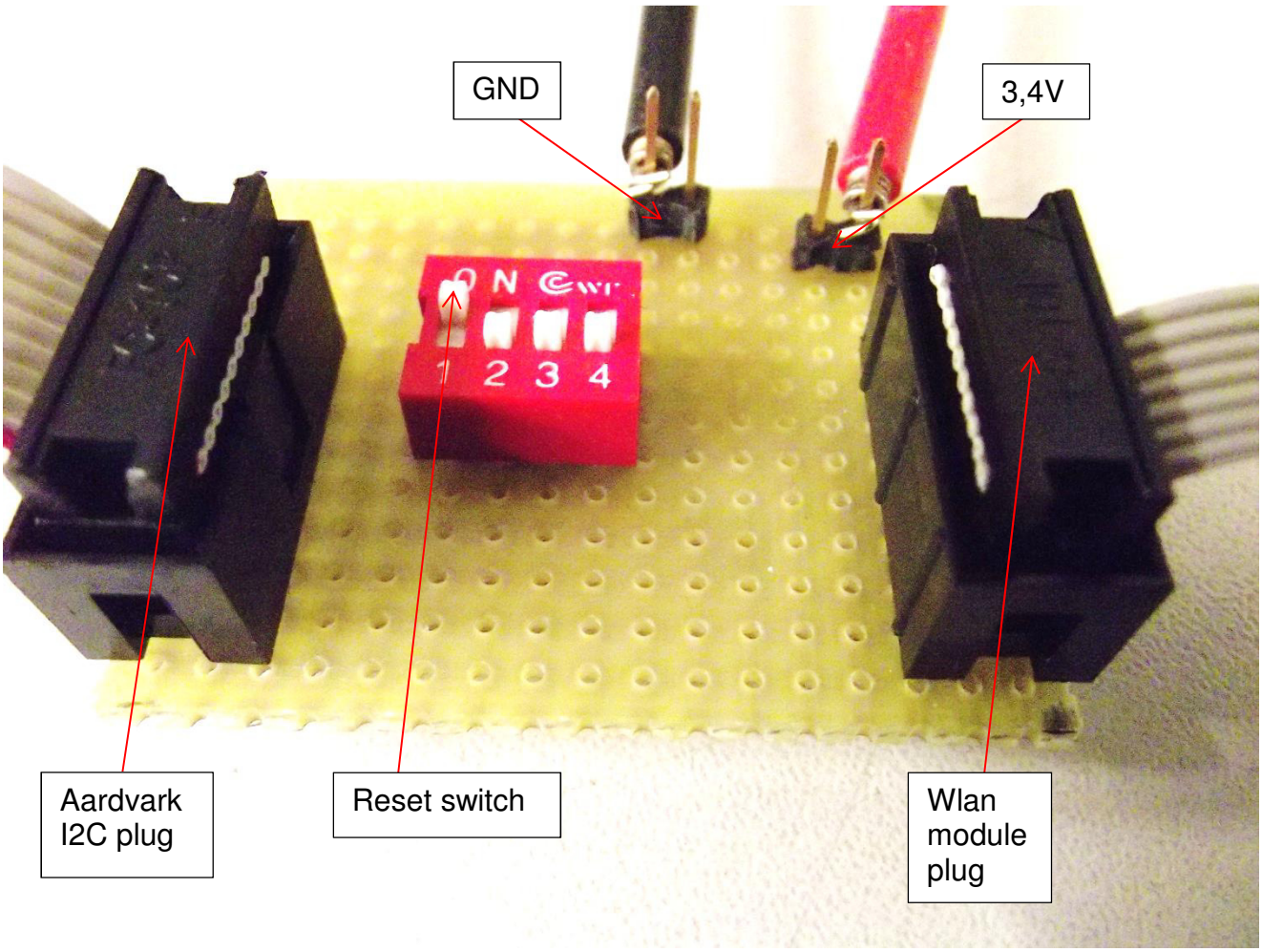

Figure 10: Adapter board

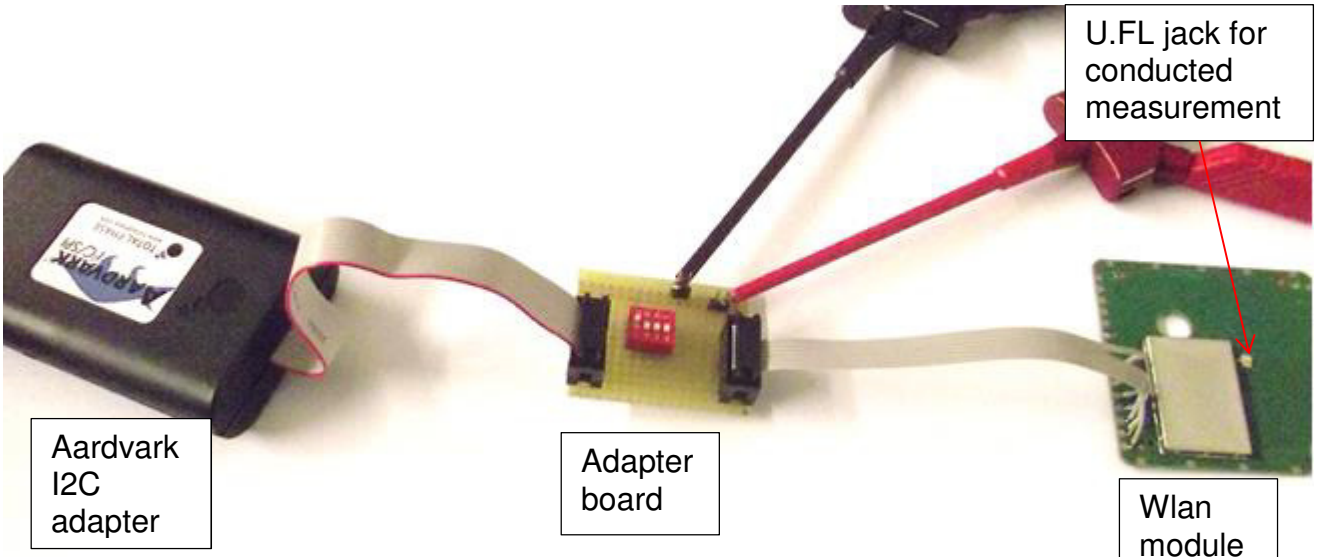

Figure 11: Photo documentation of Test Setup

5.5 Initial Startup

5.5.1 Hardware Steps

- Connect the module via Aardvark adapter and adapter board to the Laptop (see Figure 11)
- Turn the reset switch in position “ON” (Reset inactiv) (see Figure 10)

5.5.2 Software Steps

- Install TotalPhaseUSB-v2.12.exe
- Open the file ***nmiSampleApp.exe*** from the Atmel GUI ***WILC1000_r812***
- Activate the communication between Wlan module and GUI by pressing the ***RUN*** button (see Figure 12 step 1). The chip ID should appear. Current consumption should be I=0,06A
  If an error occurs the reset switch from Figure 10 must be switched “OFF” (Reset activ) and “ON” again. Press ***RUN*** again and the chip ID should appear.
- Select Firmware ***burst_tx_firmware.bin*** and press ***Load Test Fw*** (see Figure 12 step 2). Current consumption should be I=0,10A.

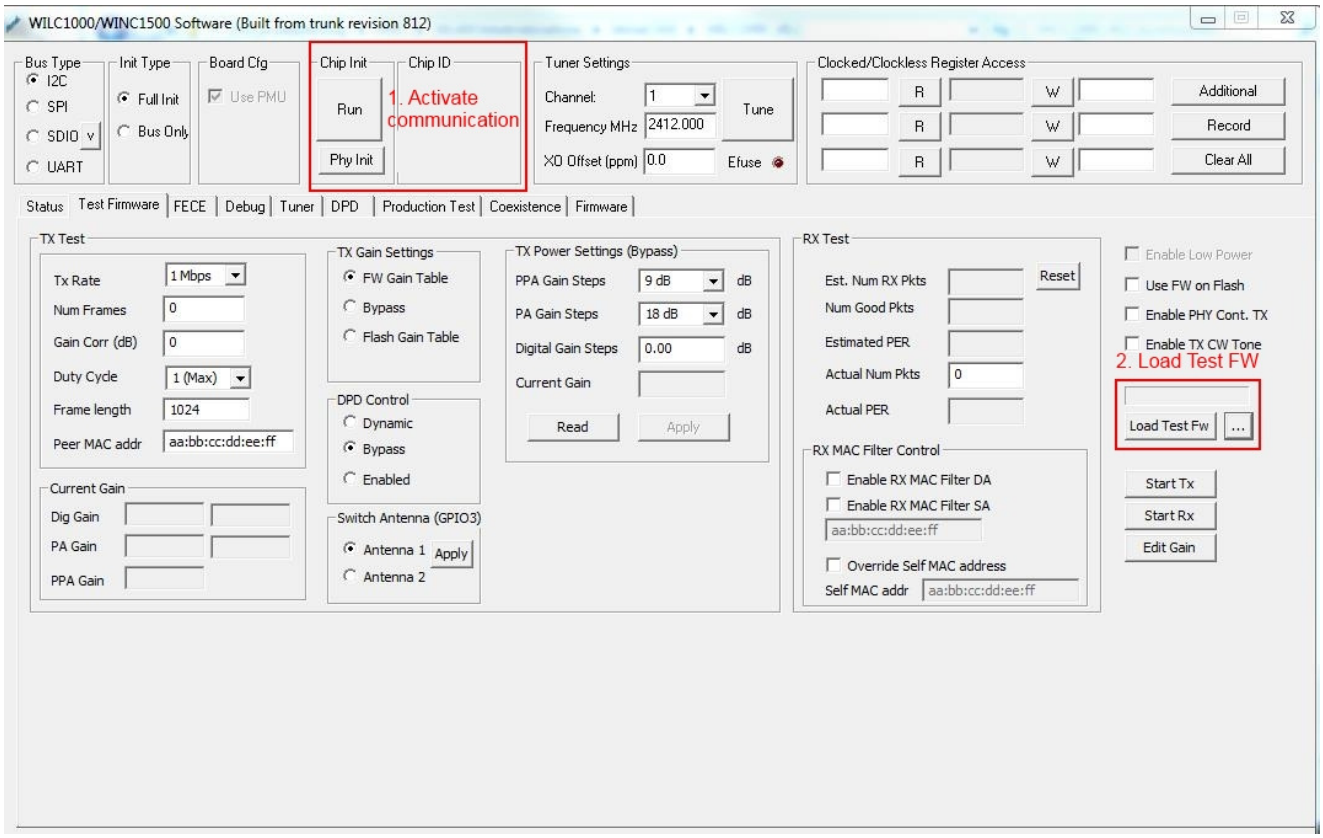

Figure 12: Atmel GUI first steps

5.6 Transmitting and Receiving

The instructions from chapter 5.5 must be completed to start TX or RX sequence.

5.6.1 TX-Sequence

- Select the channel in the ***Tuner Settings*** (Ch.1 – Ch. 14). (see Figure 14)
- Select Tx rate in ***TX Test*** (see Figure 14, Figure 15, Figure 16). Tx rate can be configured between 1 Mbps – 54 Mbps (IEEE 802.11b/g) and between MCS0 – MCS 7 (IEEE 802.11n). Transmitter performance is described in Figure 13.

Table 7-2. Transmitter Performance

Parameter	Description	Min.	Typ.	Max.	Unit
Frequency		2,412		2,484	MHz
Output Power (1), ON_Transmit	802.11b 1Mbps		19.5		dBm
	802.11b 11Mbps		20.5		
	802.11g 6Mbps		19.5		
	802.11g 54Mbps		17.5		
	802.11n MCS 0		18.0		
	802.11n MCS 7		15.5		
TX Power Accuracy			±1.5 (2)		dB
Carrier Suppression			30.0		dBc
Harmonic Output Power	2nd		-33		dBm/MHz
	3rd		-38		

Notes: 1. Measured at 802.11 spec compliant EVM/Spectral Mask.
2. Measured at RF Pin assuming 50Ω differential.

Figure 13: Transmitter Performance

- Select Output Power in ***Tx Power Settings*** (seeFigure 14). ***Bypass*** mode shall be selected in ***TX Gain Settings***. Only the ***Digital Gain Steps*** are allowed to be changed. According to 802.11 b, g, n different values must be choosen (see Figure 14, Figure 15, Figure 16). ***PPA Gain Steps*** (6dB) and ***PA Gain Steps*** (18dB) must not be changed because these are fixed values from Atmel Firmware. By pressing ***apply*** and ***read*** current power settings are confirmed.

- By pressing ***Start Tx*** (see Figure 14) the module is transmitting data according to the settings made before.

If the TX test runs, the test has to be stopped by ***Stop Tx Button*** (Figure 14) before it is allowed to change any TX-Settings.

Settings according to 802.11b, g, n Standard:

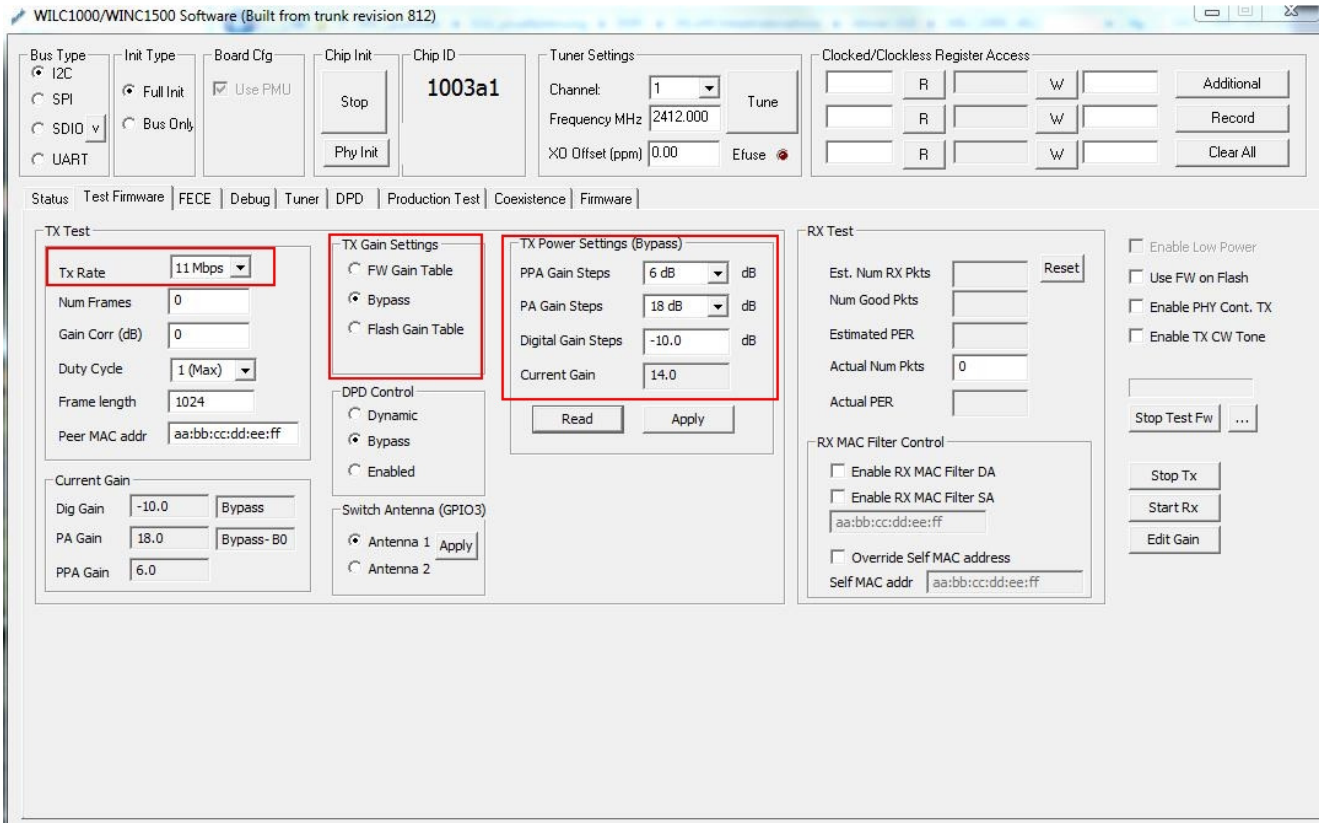

Figure 14: 802.11b (Tx Rate 11Mbps worst case)

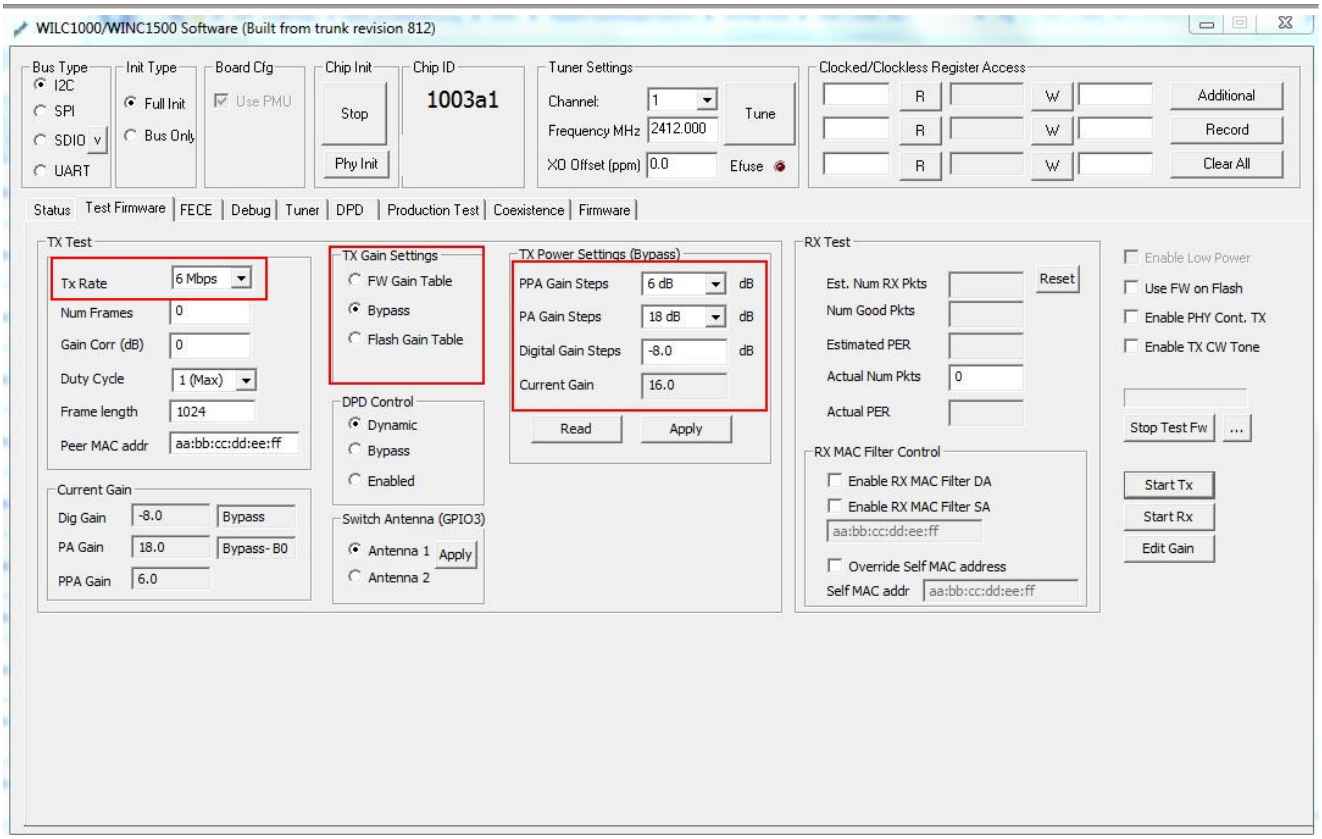

Figure 15: 802.11g (Tx Rate 6Mbps worst case)

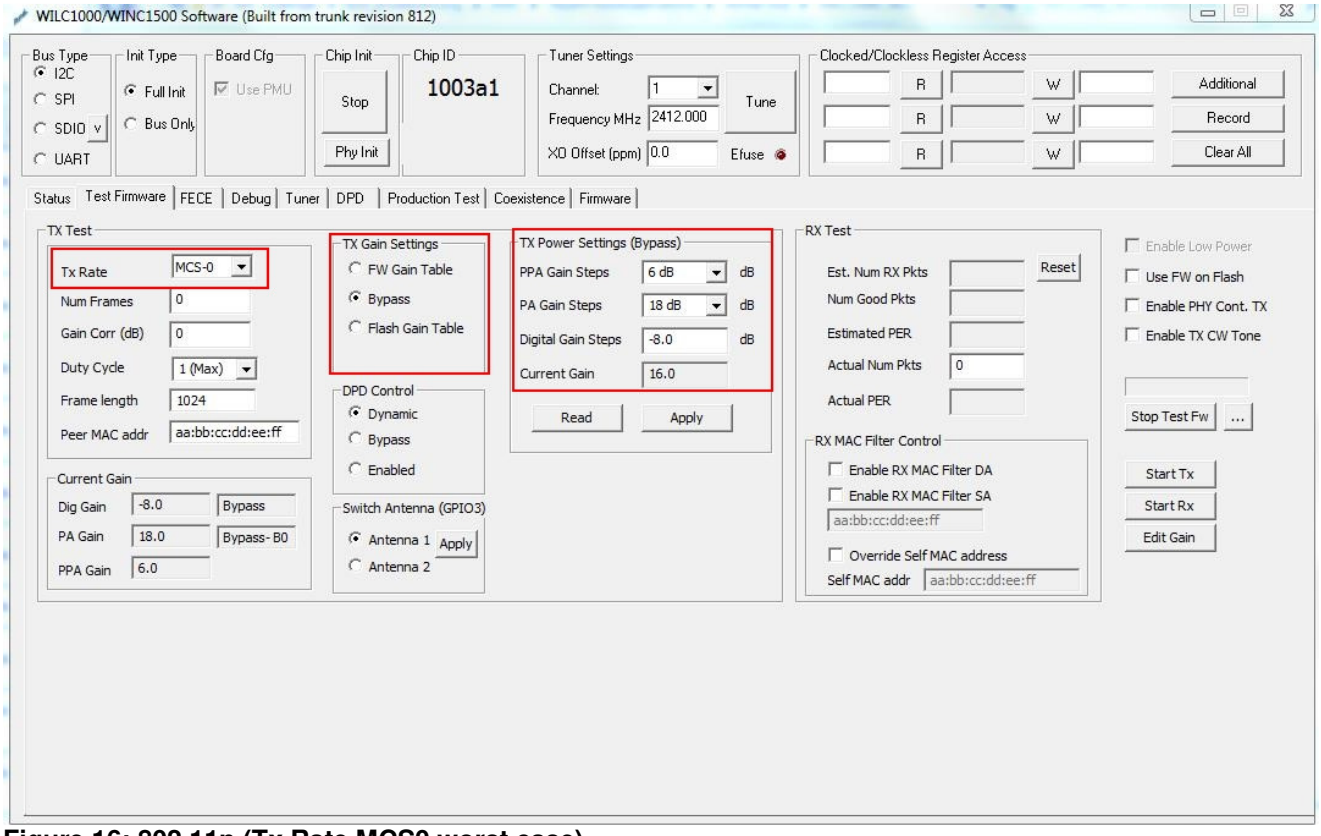

Figure 16: 802.11n (Tx Rate MCS0 worst case)

Following digital gains steps shall be applied:

Standard	Data Rate	Channel	Digital Gain Steps
802.11b	1 Mbps - 11Mbps	1-14	-10
802.11g	6Mbps – 54 Mbps	1-14	-8
802.11n	MCS0 – MCS7	1-14	-8

Table 8: Digital Gain Steps

For continuous unmodulated signal transmission use following settings:

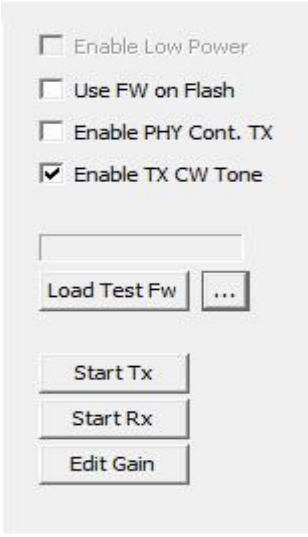

Figure 17: CW Settings

5.6.2 RX-Sequence

One module can transmit data while another is receiving.

- Select the channel in the ***Tuner Settings*** (Ch.1 – Ch. 14).
- Select Tx rate and Duty Cycle in ***TX Test***
- The quality of transmission is shown in ***RX Test***. Loss of data is shown.
- By pressing ***Start Rx*** the module is receiving data according to the settings made before.

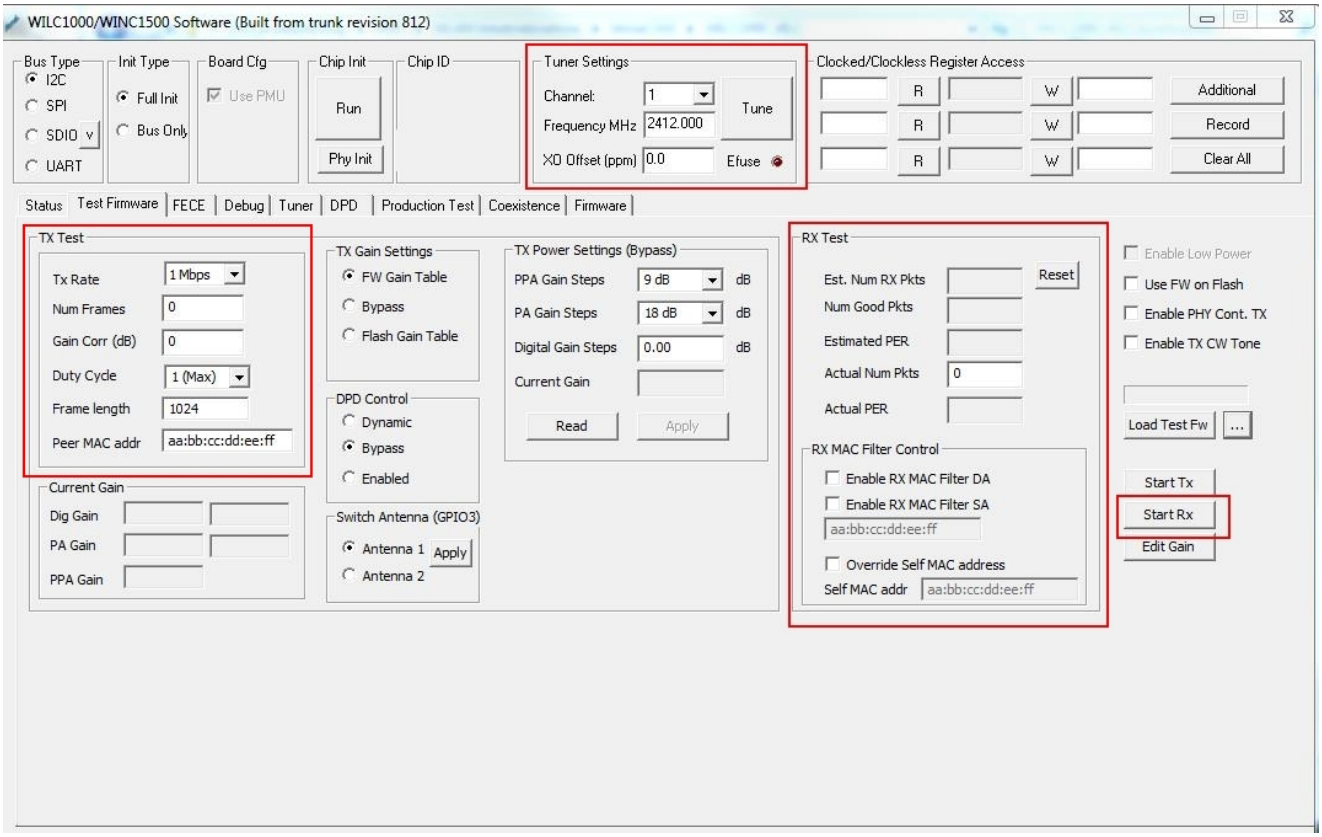

Figure 18: RX - Sequence

If the RX test runs, the test has to be stopped by ***Stop Rx Button*** (see Figure 16 *Start Rx Button*) before it is allowed to change any TX-Setting.

5.7 Adaptivity Testing

If the test is applicable use following setup:

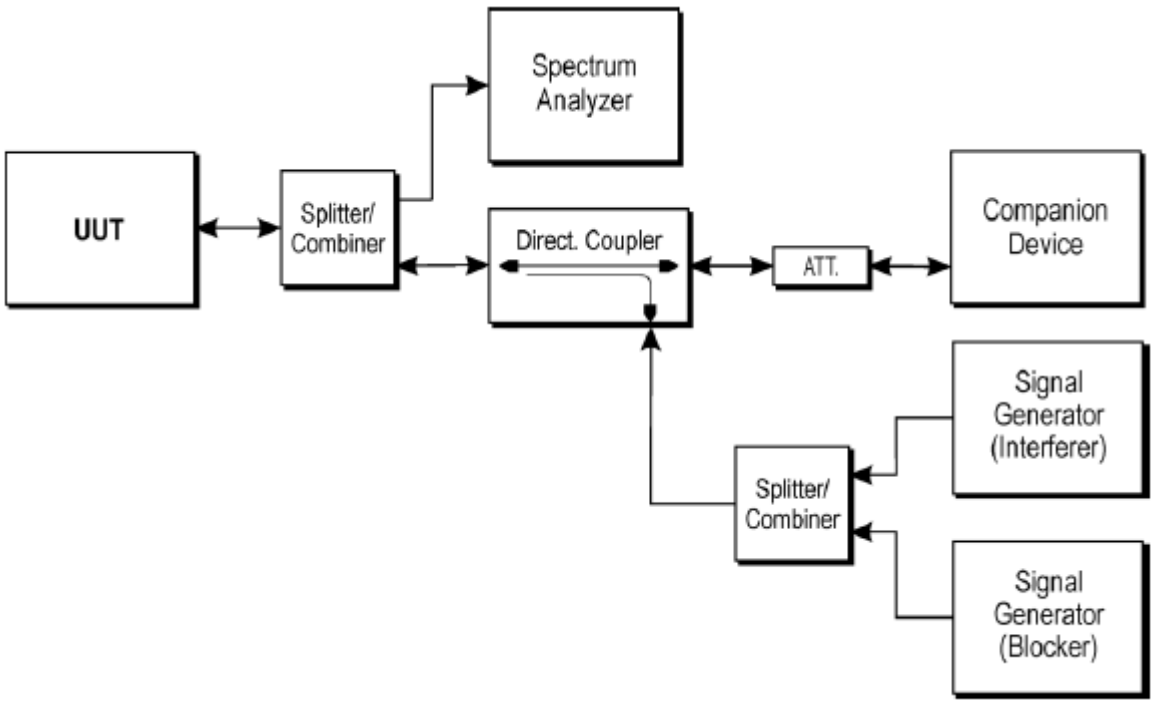

Figure 19: Adaptivity Test Set-up example from ETSI en 300328

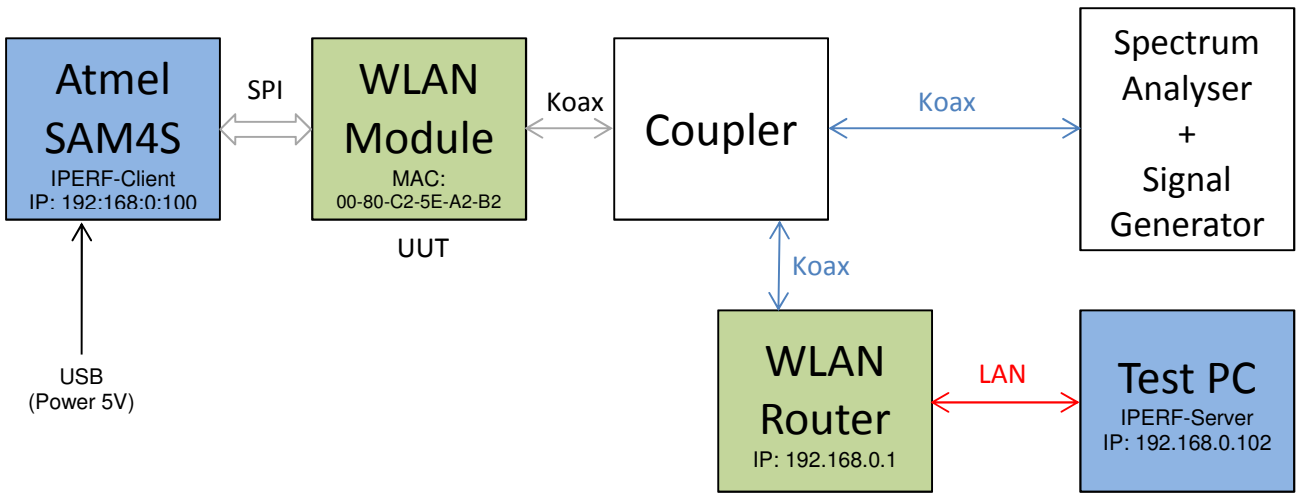

Figure 20: Adaptivity Test Set-up used for Certification Block Diagramm

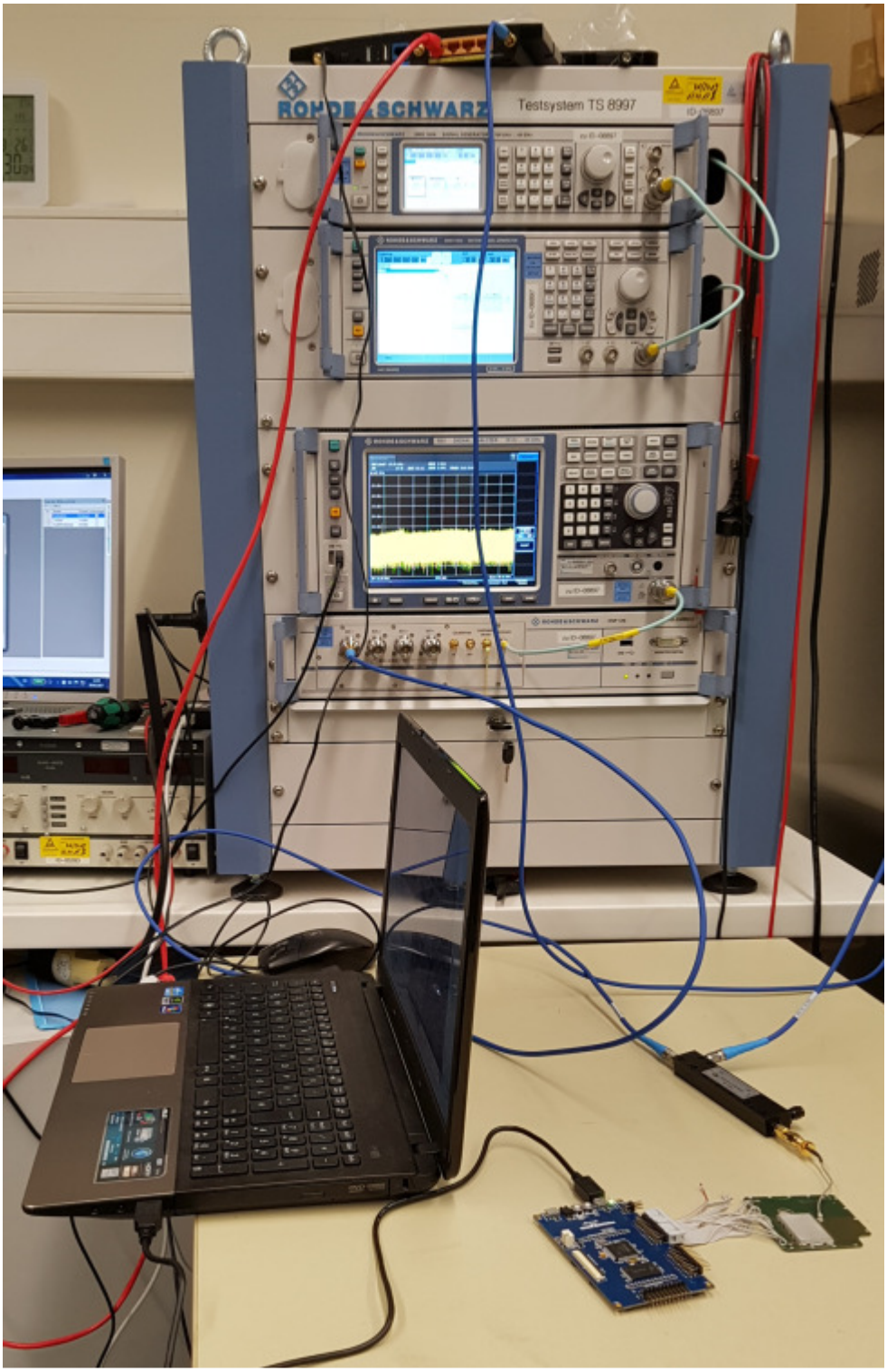

Figure 21: Adaptivity Test Set-up used for Certification

5.7.1 UUT

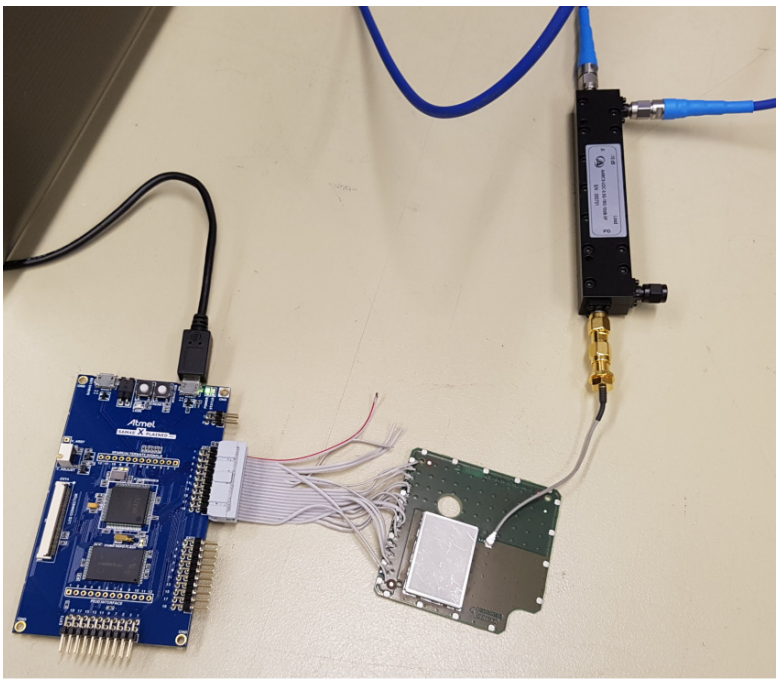

Figure 22: Connection of DUT

Connections:

- UUT (WLAN Module) is connected to the SAM4S Connector EXT1 via 20Pin IDE Cable (gray).
- U.FL Connector of DUT is connected to the Coupler via Coax Cable (gray).
  Be carefully with the µ-FL connector!
- SAM4S is supplied with power (5V) via the Debug USB Connector. In our Set-up one side of an USB Cabel (black) connected this Debug USB of the SAM4S and the other side to the Test-PC.

5.7.2 Router

Figure 23: Connection of Router

Connections:

- One Antenna of the Router is connected to the Coupler via Coax Cable (blue).
- One LAN interface of the Router is connected to the LAN interface of the Test-PC via Ethernet cable (red).

Configuration:
Activate WLAN on the Router (Switch)

Dual Band Selection:
x only work in 2.4GHz (802.11 a,b,g,n)
Wireless 2.4GHz:
Wireless Setting:
Network Name: atwinc1500
Region: *Your Land* (Germany)
Mode: 11bgn mixed
Channel with: 20 MHz
Channel: 1
x Enable SSID Broadcast
Wireless Security:
Version: WPA2-PSK
Encryption: AES
PSK Password:12345678

IP & Mac Binding:
Binding Settings:
ARP Binding: disable
00-80-C2-5E-A2-B2 to IP-address 192.168.0.100
00-22-33-44-55-66 to IP-address 192.168.0.101
MAC of Test-PC-Lan to IP-address 192.168.0.102

5.7.3 Test-PC

Connections:

- The LAN interface of the Test-PC is connected to one LAN interface of the Router via Ethernet cable (red).
- In our Set-up an USB port of the Test-PC is connected to the Debug USB of the SAM4S via USB Cabel (black) to provide the power for the SAM4S and the UUT.

5.7.4 Test Description

1. Remove USB-Cable from the PC.
2. Remove LAN-Cable from the PC
3. Start PC and read out Ethernet-Adapter LAN Connection MAC-address with the command *ipconfig –all* in a command window.
4. Start the WLAN Router and wait until it is running.
5. Connect the PC via WLAN with the Router (AccessPoint atwinc1500 or TPLINK…)
6. Open internet explorer with addess 192.168.0.1.
7. Log into the router with User: **admin** and Password: **admin**.
8. Configure Router as given above.
9. Reboot the Router.
10. Disable WLAN on the PC.
11. Connect the LAN Cable from the PC.
12. Check Router settings.
13. Read out Ethernet-Adapter LAN Connection IP-address on the PC with the command *ipconfig –all* in the command window. It must be 192.168.0.102.
14. Start the SAM4S with the UUT by connecting the USB-Cable to the PC.
15. Ping the UUT with the command *ping 192.168.0.100*.
16. Ping must be successful.
17. Disconnect the USB-Cable.
18. Ping the UUT with the command *ping 192.168.0.100*.
19. Ping must fail.
20. Connect the USB-Cable.
21. Ping the UUT with the command *ping 192.168.0.100*.
22. Ping must be successful.
23. Ping the PC with the command *ping 192.168.0.102*.
24. Ping must be successful.
25. Start Iperf server on the PC:
    - Open Command window
    - Switch to directory, where Iperf 2.0.5 is resided
    - Start the server with the command *iperf –s –i -t*
26. Disconnect the USB-Cable.
27. Connect the USB-Cable.
28. Packets must be transferred. This can be observed in the comand window of the Test-PC where the Iperf server was started.

Set standard, which should actual be tested, in the Router (Mode: 11b only / 11g only / 11n only).
Reboot Router.
Restart UUT (disconnect and reconnect USB cable)
Perform adaptivity Test.

If packet transfer does not work after the test, restart the UUT and perfom the test again.

6 General Remarks

Once a module is configured to transmit or receive data it can be disconnected from the Aardvark adapter. This allows to configure several modules with only one laptop and one ATMEL GUI.
Note: The modules must be connected to power supply during the oberservation period!

7 Attachment

FCC and ISED Declarations

Compliance statement (part 15.19)
This device complies with part 15 of the FCC Rules and to RSS of Industry Canada.
Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Warning (part 15.21)
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Information to the User (Part 15.105 (b))
Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
--Reorient or relocate the receiving antenna.
--Increase the separation between the equipment and receiver.
--Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
--Consult the dealer or an experienced radio/TV technician for help.

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de Classe B est conforme à la norme Canadienne ICES-003.

Installation Manual (FCC)

FCC ID of this module is as follows;

FCC ID:	2AK2AICS1WLAN

This Module has been certified to operate in the system as described in Chapter 3. The module has been approved for fixed and mobile applications, with antenna distance >20 cm to any human body or any other transmitter.

Antenna
This Module has been tested for FCC /ISED compliance with the antennas as described in this document. The 2.4-2.5 GHz patch antenna used is either mounted on the PCB of the Module or extended via 50 Ohm impendence cable. Maximum antenna gain is 2dBi.
Antenna Type: Taoglas SWLP.2450.12.4.B.02

- Please refer to KDB 996369
- Please perform the antenna design that followed the specifications of the antenna.

Fine tuning of return loss etc. can be performed using a matching network.
However, it is required to check "Class1 change" and "Class2 change" which the authorities define then.

The concrete contents of a check are the following three points.
1) It is the same type as the antenna type of antenna specifications.
2) An antenna gain is lower than a gain given in antenna specifications.
3) The emission level is not getting worse.

Notice
For OEM integration only – device cannot be sold to general public.
The final product will include the following statements required by FCC/IC on the product and in the Installation manual Notice.

Contains FCC ID: 2AK2AICS1WLAN
●Please describe the following warning to the manual.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
FCC CAUTION Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.
※When the product is small, as for these words mentioned above, the posting to a manual is possible.

●When installing it in a mobile equipment. Please describe the following warning to the manual.
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines. This equipment should be installed and operated keeping the radiator at least 20cm or more away from person's body.

RF Exposure requirements are met when installed in mobile equipment.
This module cannot be installed in portable equipment without further testing and a change to FCC's grant of authorization.

Note)
Portable equipment : Equipment for which the spaces between human body and antenna are used within 20cm.
Mobile equipment : Equipment used at position in which the spaces between human body and antenna exceeded 20cm.

This device is intended only for OEM integrators under the following conditions:
The antenna must be installed such that 20 cm is maintained between the antenna and users, and
1) The transmitter module may not be co-located with any other transmitter or antenna.
2) The use of an antenna with gain less than 2 dBi
As long as 3 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed

IMPORTANT NOTE: In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling
This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: “Contains FCC ID: 2AK2AICS1WLAN”. The grantee's FCC ID can be used only when all FCC compliance requirements are met.

Manual Information To the End User
The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user’s manual of the end product which integrates this module.
The end user manual shall include all required regulatory information/warning as show in this manual.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Installation Manual (IC)

IC No. of this device is as follows;

IC:	**22375-ICS1WLAN**

For OEM integration only – device cannot be sold to general public.
Therefore, we will ask OEM to include the following statements required by IC on the product and in the installation manual Notice.

Contents
1) Theory of operation
2) Antenna
3) Notice

1. Theory of operation

Frequency of operation			Scan	Ad-hoc mode
2.4GHz	802.11b/g/n-HT20	2412MHz – 2462MHz (ch1 – ch11)	Active	Yes

Data transmission is always initiated by software, which is the passed down through the MAC, through the digital and analog baseband, and finally to the RF chip. Several special packets are initiated by the MAC. These are the only ways the digital baseband portion will turn on the RF transmitter, which it then turns off at the end of the packet. Therefore, the transmitter will be on only while one of the aforementioned packets is being transmitted. In other words, this device automatically discontinue transmission in case of either absence of information to transmit or operational failure.
La transmission des données est toujours initiée par le logiciel, puis les données sont transmises par 'intermédiaire du MAC, par la bande de base numérique et analogique et, enfin, à la puce RF. Plusieurs paquets spéciaux sont initiés par le MAC. Ce sont les seuls moyens pour qu'une partie de la bande de base numérique active l'émetteur RF, puis désactive celui-ci à la fin du paquet. En conséquence, l'émetteur reste uniquement activé lors de la transmission d'un des paquets susmentionnés. En d'autres termes, ce dispositif interrompt automatiquement toute transmission en cas d'absence d'information à transmettre ou de défaillance.

End users cannot modify the software because F/W & driver are installed in device.

Antenna
- Please refer to KDB 996369
- Please perform the antenna design that followed the specifications of the antenna.

Antenna Type: Taoglas SWLP.2450.12.4.B.02

Fine tuning of return loss etc. can be performed using a matching network.
However, it is required to check "Class1 change" and "Class2 change" which the authorities define then.

The concrete contents of a check are the following three points.
1) It is the same type as the antenna type of antenna specifications.
2) An antenna gain is lower than a gain given in antenna specifications.
3) The emission level is not getting worse.

Notice
For OEM integration only – device cannot be sold to general public.
Therefore we will ask OEM to include the following statements required by FCC/IC on the product and in the Installation manual Notice.
Please describe the following warning on the final product which contains this module.

Contains IC: 22375-ICS1WLAN

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions: (1) This device may not cause interference; and (2) This device must accept any interference, including interference that may cause undesired operation of the device.
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage; (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

*When the product is small, as for these words mentioned above, the posting to a manual is possible.

●When installing it in a mobile equipment. Please describe the following warning to the manual.

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment and meets RSS-102 of the IC radio frequency (RF) Exposure rules. This equipment should be installed and operated keeping the radiator at least 20cm or more away from person's body.
Cet équipement est conforme aux limites d'exposition aux rayonnements énoncées pour un environnement non contrôlé et respecte les règles d'exposition aux fréquences radioélectriques (RF) CNR-102 de l'IC. Cet équipement doit être installé et utilisé en gardant une distance de 20 cm ou plus entre le radiateur et le corps humain.

RF Exposure requirements are met when installed in mobile equipment.
This module cannot be installed in portable equipment without further testing and a change to FCC's grant of authorization.

Note)
Portable equipment : Equipment for which the spaces between human body and antenna are used within 20cm.
Mobile equipment : Equipment used at position in which the spaces between human body and antenna exceeded 20cm.

This device is intended only for OEM integrators under the following conditions: (For module device use) 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and 2) The transmitter module may not be co-located with any other transmitter or antenna. 3) The use of an antenna with gain less than 2dBi(2.4GHz)

As long as 3 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes: (Pour utilisation de dispositif module) 1) L'antenne doit être installée de telle sorte qu'une distance de 20 cm est respectée entre l'antenne et les utilisateurs, et 2) Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

IMPORTANT NOTE:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.

NOTE IMPORTANTE:
Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et 'obtention d'une autorisation distincte au Canada.

End Product Labeling
This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: “Contains IC: **-** ”.

Plaque signalétique du produit final
Ce module émetteur est autorisé uniquement pour une utilisation dans un dispositif où l'antenne peut être installée de telle sorte qu'une distance de 20cm peut être maintenue entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante:
"Contient des IC: **-** ”.

Manual Information To the End User
The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user’s manual of the end product which integrates this module.
The end user manual shall include all required regulatory information/warning as show in this manual.
Manuel
d'information à l'utilisateur final
L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.
Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

8 List of Figures

9 List of Tables