



AGCO NT01 Terminal

WLAN / Bluetooth Module

AW-GH321 / Bluemod B20

User's Manual



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2 Scope

This manual is a reference to handle the WLAN part of the AGCO WLAN / Bluetooth – Module and getting started with it.

2.1 Limitations

As the AGCO WLAN / Bluetooth Module is delivered fully assembled, we can only give a limited handling manual.

This module may only operate with the assembled antenna and antenna connector. There is no guarantee for proper operation with different antenna and antenna connectors.

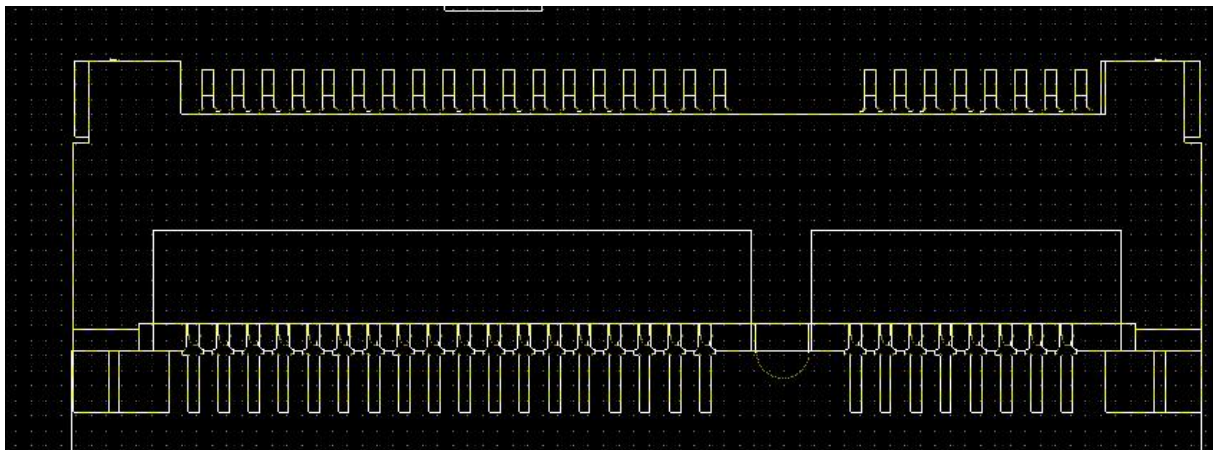
Further, all software-issues are done by the customer itself; MSC does only have a limited description of the software-handling of this module.

3 Hardware Reference

The core items for WLAN of the AGCO WLAN / Bluetooth Module's is Azurewave's AW-GH321 WLAN chip and Stollmann's Bluemod B20 Bluetooth module. For details refer to the corresponding datasheets.

3.1 Connector

The main connector to the baseboard is a 52 pin edge connector.



1 connector

Pin	Signal	Usage
1	NC	
2	VCC_3V3	Power
3	NC	
4	GND	Ground
5	NC	
6	BT_Reset	BTH Reset
7	NC	
8	BT_SPI_MISO	BTH SPI MISO (for BTH firmware update)
9	GND	Ground
10	BT_SPI_CS#	BTH SPI CS# (for BTH firmware update)
11	NC	
12	BT_SPI_CLK	BTH SPI Clock (for BTH firmware update)
13	NC	
14	BT_SPI_MOSI	BTH SPI MOSI (for BTH firmware update)
15	GND	Ground
16	NC	
17	NC	
18	GND	Ground
19	NC	
20	WLAN_EN	Enable WLAN Power
21	GND	Ground
22	WLAN_Reset#	Reset WLAN
23	CPLD_TCK	JTAG CPLD
24	USB_V+	USB supply voltage
25	CPLD_TMS	JTAG CPLD



26	GND	Ground
27	GND	Ground
28	Reserve1	not used
29	GND	Ground
30	NC	
31	CPLD_TDO	JTAG CPLD
32	NC	
33	CPLD_TDI	JTAG CPLD
34	GND	Ground
35	GND	Ground
36	USB_DN	USB data-
37	WLAN_RTR#	Handshake for Master – active when WLAN enabled
38	USB_DP	USB data+
39	WLAN_SSEL#	SPI-Slave-Select
40	GND	Ground
41	WLAN_MOSI	SPI-Master-Out-Slave-In
42	WLAN_Wake	WLAN-Wake
43	WLAN_MISO	SPI-Master-In-Slave-Out
44	WLAN_IRQ#	Interrupt from WLAN
45	WLAN_SCK	SPI-Clock
46	NC	
47	GND	Ground
48	NC	
49	BT_EN	Bluetooth enable
50	GND	Ground
51	NC	
52	VCC_3V3	Power

2 connector pinout

3.2 Communication WLAN chip AW-GH321

The WLAN module communicates with the main CPU via SPI.

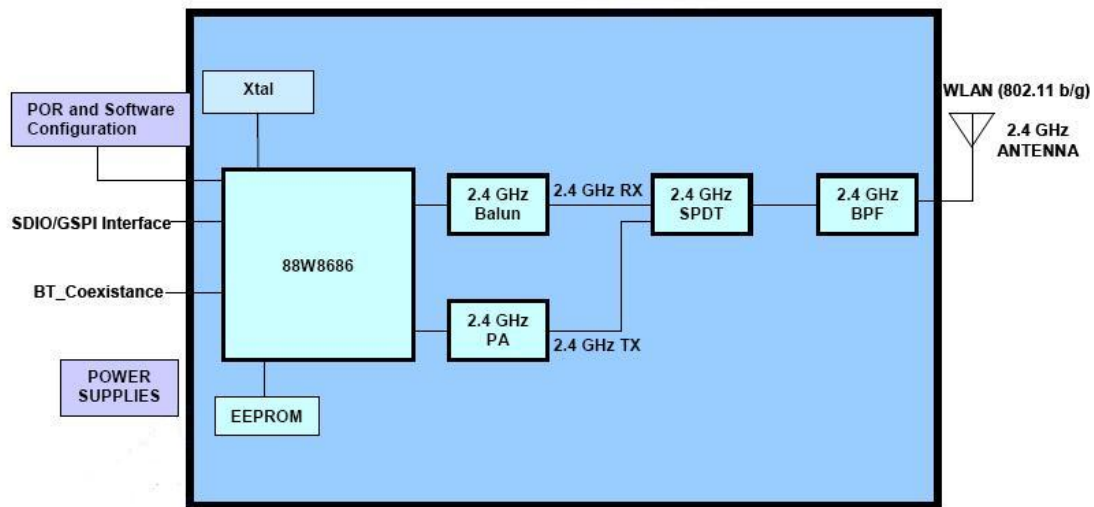
3.3 Communication Bluetooth chip Bluemod B20

The bluetooth module communicates with the main CPU via USB.

3.4 CPLD

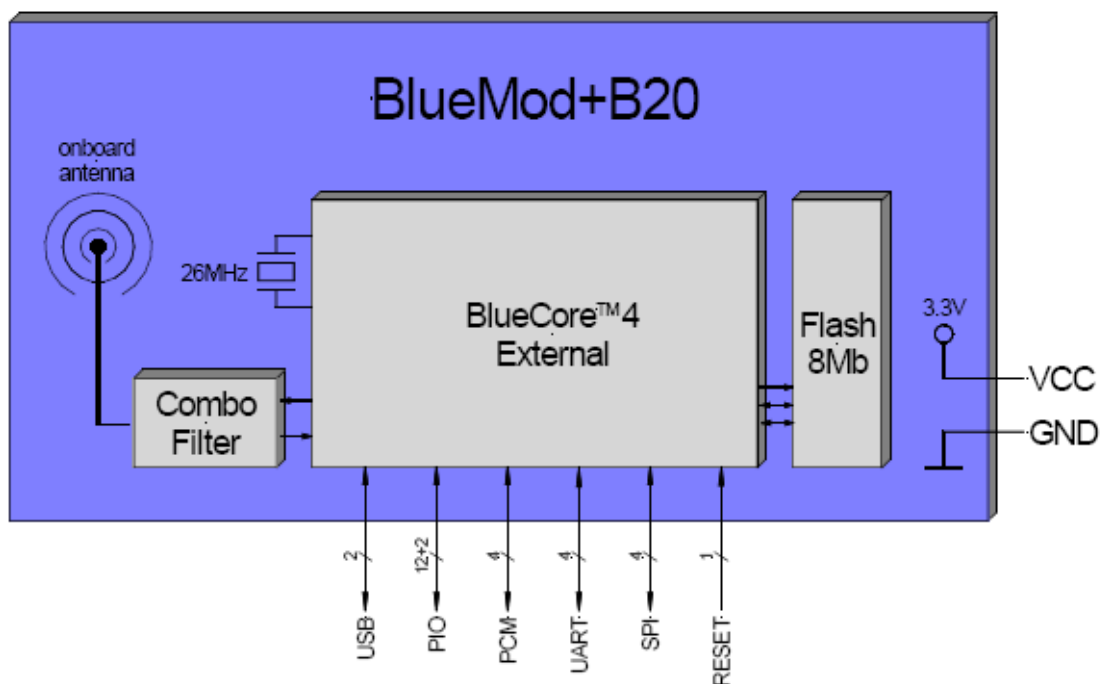
The CPLD on the AGCO WLAN – Module AW-GH321 is used for a few logical operations. It's the connecting part of the WLAN chip to the mainboard.

3.5 Block diagram WLAN



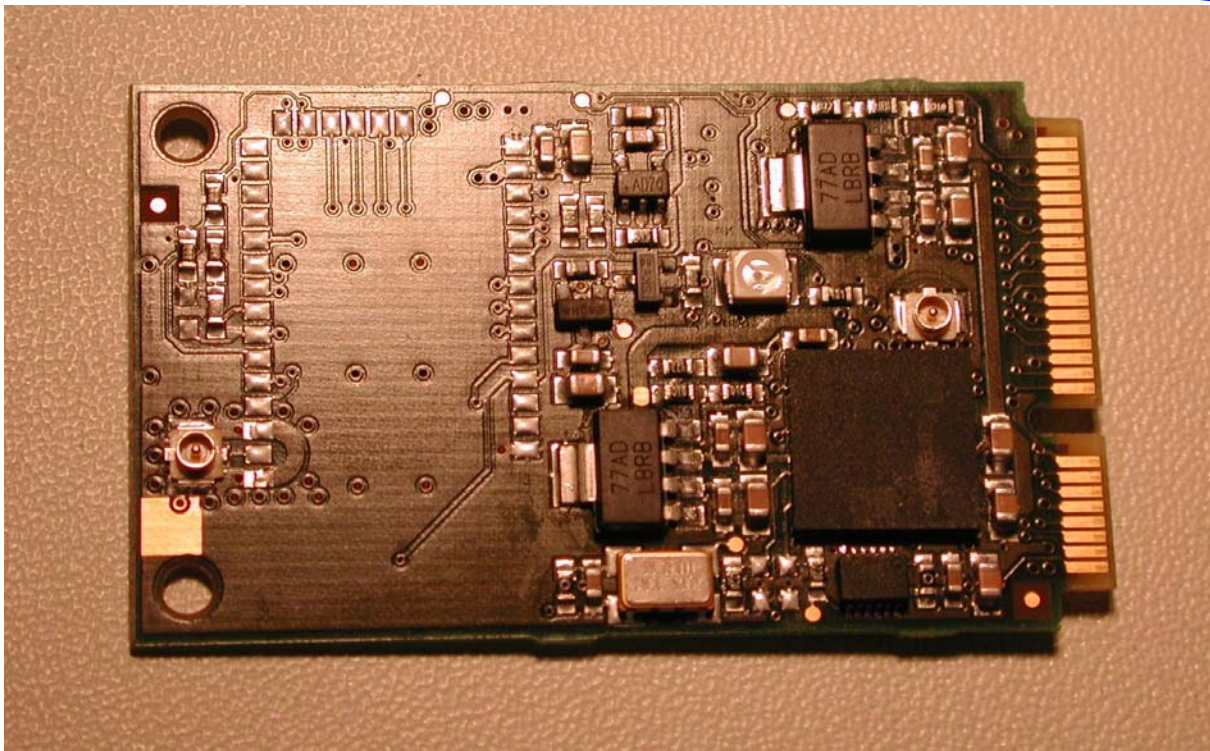
3 Block diagramm AW-GH321

3.6 Block diagram Bluetooth



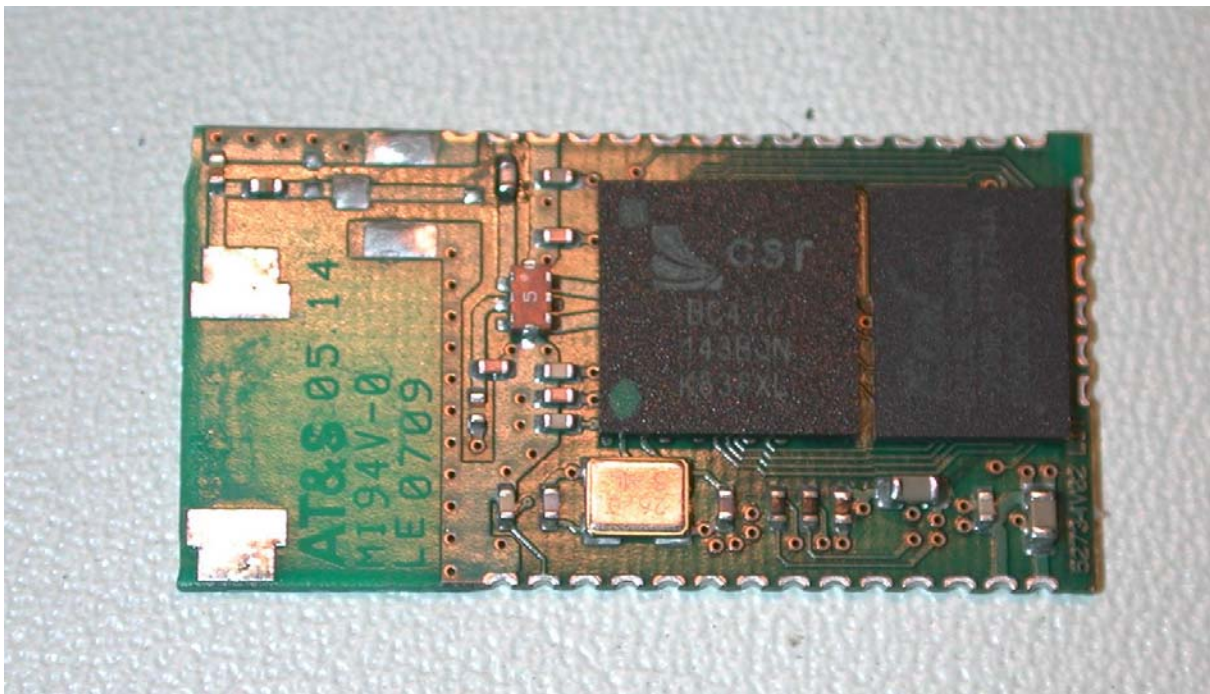
4 Block diagramm Bluemod B20

3.7 Top-View of WLAN-module



5 WLAN module - top view

3.8 Top-View of Bluetooth-module



6 Bluetooth module - top view



4 Software

4.1 Linux driver WLAN

The WLAN chip of the AGCO WLAN / Bluetooth – Module, AW-GH321, is controlled by the following linux-drivers:

- libertas
- libertas_spi

When the driver detects the WLAN chip, first the firmware must be uploaded. The current version of firmware is fw 9.70.3p37. The corresponding files (spi8686.bin and spi8686_helper.bin) must be situated in the filesystem in /lib/firmware/libertas.

When set up, linux will bring up an eth-device. Now the standard-linux items can be used for communications.

4.2 Linux driver Bluetooth

The Bluetooth-Chip of the AGO WLAN / Bluetooth Module, Bluemod B20, ist controlled by the following linux-drivers:

- standard USB driver
- NXP-ISP1760 driver (USB hub)
- Generic Bluetooth USB driver ver 0.4

The device is enumerated by the standard- and ISP1760-USB drivers. All following accesses to this chip are done with standard-linux-tools for USB (e.g. hcitool) via the Generic Bluetooth USB driver ver 0.4.

5 Housing Guidelines

The individual case must be checked to decide whether a specific housing is suitable for the use of the dedicated antenna. A plastic housing must at least fulfill the following requirements:

- Non-conductive material, non-RF-blocking plastics
- No metallic coating
- ABS is suggested



6 Power supply

The module requires a power supply with following characteristics:

3,3V \pm 0,1V low noise (\leq 10mV)

Due to the technological requirements and the pulsed radio transmission the supply needs to be fed by an ultra fast (response time 20 μ s) linear regulator.

NOTE: You must ensure that during operation the supply voltage never drops below 3.0 V. Otherwise the flash contents (firmware and/or configuration data) can get lost.

6 Attachment

Federal Communication Commission Interference Statement

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 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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IEEE 802.11b or 802.11g operation of this product in the U.S.A. is firmware-limited to channels 1 through 11.

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This device is intended only for OEM integrators under the following conditions:

- 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 (except Bluetooth module B2029 FCC ID: YM6-B2029),
- 3) For all products market in US, OEM has to limit the operation channels in CH1 to CH11 for 2.4G band by supplied firmware programming tool. OEM shall not supply any tool or info to the end-user regarding to Regulatory Domain change.

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 (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions can not 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 can not 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 labelled in a visible area with the following:

- "Contains TX FCC ID: YM6-AWGH321 and FCC ID: YM6-B2029"

or

- "Contains TX FCC ID: YM6-AWGH321
Contains TX FCC ID: YM6-B2029"

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.

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