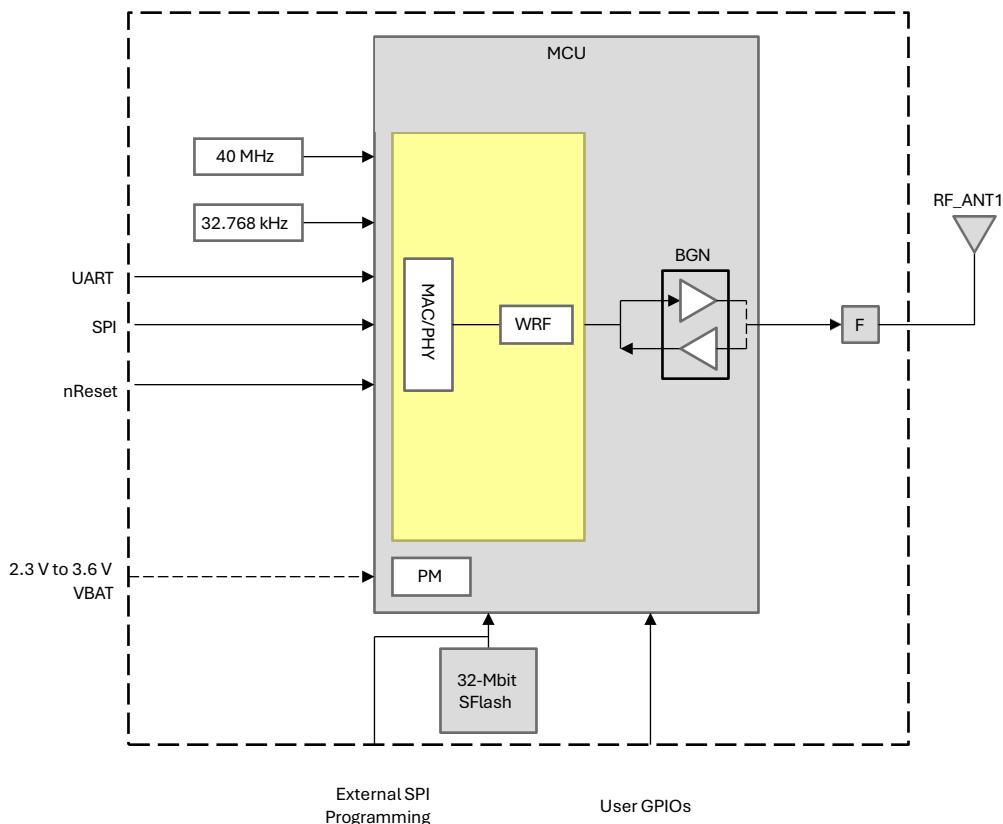


2BBFTDH100WF01 WiFi Module User Manual

DH100WF01 is a wireless MCU module consisting of SimpleLink™ Wi-Fi® single chip wireless MCU—the DH100WF01. The DH100WF01 is functionally equivalent to the Texas Instruments CC3220MODASF12MON. The DH100WF01 is a fully integrated, industrial temperature-grade, green modules including all required clocks, SPI Flash, and passives. The power-management subsystem includes integrated DC/DC converters that support a wide range of supply voltages. This subsystem enables low-power consumption modes for extended battery life, such as low-power deep sleep, hibernate with RTC (consuming only 5 μ A), and shutdown mode (consuming only 1 μ A). The module integrates the 40-MHz crystal, 32.768-kHz RTC clock, 32-Mb SPI serial Flash, RF filter, and passive components. The module includes a wide variety of peripherals, including a fast parallel camera interface, I2S, SD, UART, SPI, I2C, and a 4-channel ADC.

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Functional Block Diagram



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Specifications

Wi-Fi TX power:

- 18.0 dBm at 1 DSSS
- 14.5 dBm at 54 OFDM (for portable applications)

Wi-Fi RX sensitivity:

- -95.0 dBm at 1 DSSS
- -73.5 dBm at 54 OFDM
- Application Throughput:
 - UDP: 16 Mbps
 - TCP: 13 Mbps

Power-management subsystem:

- Integrated DC/DC converter with a wide-supply voltage
 - V_{BAT} : 2.3 to 3.6 V

Advanced low-power modes:

- Shutdown: 1 μ A
- Hibernate: 5 μ A
- Low-Power Deep Sleep (LPDS): 135 μ A

RX Traffic (MCU Active): 59 mA

TX Traffic (MCU Active): 223 mA

Idle connected (MCU in LPDS): 710 μ A

Power Supply:

- Minimum: 2.3 V
- Typical: 3.3 V
- Maximum: 3.6 V

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Module Receiver Characteristics

$T_A = 25^\circ\text{C}$, $V_{BAT} = 2.3\text{ V}$ to 3.6 V . Parameters measured at module pin on channel 6 (2437 MHz).

PARAMETER	RATE	MIN	TYP	MAX	UNIT
Sensitivity (8% PER for 11b rates, 10% PER for 11g or 11n rates) (10% PER) ⁽¹⁾	1 DSSS	-95.0			dBm
	2 DSSS	-93.0			
	11 CCK	-87.0			
	6 OFDM	-89.5			
	9 OFDM	-89.0			
	18 OFDM	-85.5			
	36 OFDM	-79.5			
	54 OFDM	-73.5			
	MCS7 (mixed mode)	-69.5			
Maximum input level (10% PER)	802.11b	-3.0			dBm
	802.11g	-9.0			

(1) Sensitivity is 1-dB worse on channel 13 (2472 MHz).

Module Transmitter Characteristics

$T_A = 25^\circ\text{C}$, $V_{BAT} = 2.3\text{ V}$ to 3.6 V . Parameters measured at module pin on channel 6 (2437 MHz) ^{(1) (2)}.

PARAMETER	RATE	MIN	TYP	MAX	UNIT
Max RMS Output Power measured at 1 dB from IEEE spectral mask or EVM	1 DSSS	17.0			dBm
	2 DSSS	17.0			
	11 CCK	17.3			
	6 OFDM	16.3			
	9 OFDM	16.3			
	18 OFDM	16			
	36 OFDM	15			
	54 OFDM	13.5			
	MCS7 (mixed mode)	12			
Transmit center frequency accuracy		-20		20	ppm

(1) The edge channels (2412 MHz and 2462 MHz) have reduced TX power to meet FCC emission limits.

Power of 802.11b rates is reduced to meet ETSI requirements

The maximum permissible portable transmission power is 14.5dBm, which has been set by the Data Hub firmware and can only be changed by GI Bionics. There are no provisions for setting the transmit power via the Fecotracker App. The only way it can be changed is by modifying the source code and breaking the tamper evident seal on the Data Hub body to expose the necessary connectors on the Data Hub circuit board. In addition, the source code is not publicly available and is controlled by GI Bionics, LLC. The mobile power transmission power for the module is 20dBm, but that application is outside the scope of the Data Hub device and it's CC3220 module.

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Applicable Transmitter Rules

USA: FCC 15.247

Conditions for Use and FCC 15.19 Certification and Statement

FCC certification valid for integrated antenna implementation only.

- 1) FCC certification meets portable RF exposure exemption requirements; integration is approved for only Fecobionics DH-100 Data Hub specific portable host configuration.
- 2) Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- 3) This module is not authorized for collocation with other radios when operating simultaneously and in *portable* RF exposure configurations.

Contains FCC ID: 2BBFTDH100WF01

- 1) The DH100WF01 module is certified for the FCC as a single-modular transmitter. The module is a FCC-certified radio module that carries a modular grant.
- 2) You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. 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 any interference that may cause undesired operation.

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4) **Approved Antenna Information**

This radio transmitter is approved to operate with the module integrated antenna alone. The module does not require Micro-Strip or traces on the DH-100 Data Hub PCB. All traces and antenna are contained on the module PCB.

Testing Requirements

This modular transmitter is only authorized for the specific rule parts (i.e., FCC transmitter rules) listed above. GI Bionics is responsible for compliance to any other rules that apply to the host not covered by the modular transmitter grant of certification. GI Bionics is responsible for testing the final host product to applicable requirements for the combined product including host and module. US 47 CFR Part 15 Subpart B compliance testing is required with the modular transmitter installed.

GI Bionics is responsible for verifying emissions of this modular transmitter in the host do not exceed applicable requirements. For additional requirements, see FCC KDB 996369 D04 Module Integration Guide.

The recommended test mode is to utilize the radio test mode software development kit, which is available to enable test mode on this module. For additional details on use of this SDK, contact GI Bionics.

GI Bionics is recommended to use FCC KDB 996369 D04 Module Integration Guide recommending as "best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional non-compliant limits due to module placement to host components or properties. For standalone mode, reference the guidance in D04 Module Integration Guide and for simultaneous mode; see D02 Module Q&A Question 12, which permits the host manufacturer to confirm compliance.

Link to FCC modular transmitter requirements:

<https://apps.fcc.gov/oetcf/kdb/forms/FTSSearchResultPage.cfm?switch=P&id=44637>

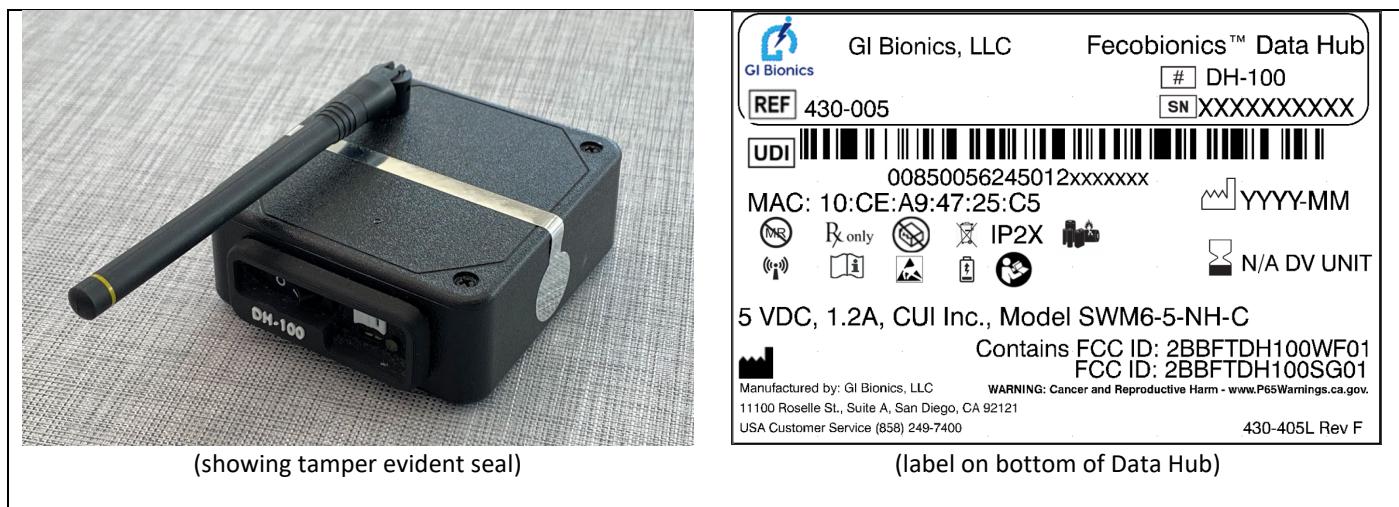
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How to authorize changes to this module

Module use is restricted to Gi Bionics inFecobionics configuration only. Gi Bionics will not authorize change requests made by third parties.

Fecobionic Data Hub Labelling Requirements

The Gi Bionics DH-100 Data Hub hosting the WiFi module shall include a physical label with the following language: "Contains FCC ID: 2BBFTDH100FW01".



Fecobionics **Users' Manual Requirements**

The Fecobionics product user manual shall include the following required legal statements:

FCC Required Statements:

When to include:	Statement to include:
Always	<i>Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.</i>
Always	<i>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)</i>

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	<p><i>this device must accept any interference received, including interference that may cause undesired operation.</i></p>
15.109 Class B hosts only.	<p><i>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:</i></p> <ul style="list-style-type: none"> —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.
15.109 Class A hosts only	<p><i>Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.</i></p>

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Module Certification and Integration

You are cautioned that changes or modifications not expressly approved by GI Bionics the party responsible for compliance could void the user's authority to operate the equipment.

The DH100WF01 is certified by the FCC as a single-modular transmitter for portable applications. The module is an FCC-certified radio module that carries a modular grant. The module DH100WF01 is certified for integration into the GI Bionics DH-100 Data Hub in Bud Industries plastic enclosure, Part# 377-1978-ND. No changes to this module are allowed without express written permission of GI Bionics LLC. This DH100WF01 module is not offered for commercial sale.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation of the device.

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.

How to contact us:

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Approvals:

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Name / Title	Signature / Date:
Project Engineer:	 7-18-25
Quality Designee:	 07-21-2025
Project Manager:	 7-18-25

Rev	Description	Originator	CO #	Release Date
A	Initial Release	W Combs		9/4/24
B	Fixing typos and formatting	W Combs	2024-090	10/28/24
C	Added requested FCC information	W Combs	2025-003	3/21/25
D				
E	Changes based on input from FCC certification consultant CKC through F2Labs	W Combs	2025-037	6/11/25
F	Changes to Tx power language based on input from FCC certification consultant CKC via F2Labs	W. Combs, F.Field	2025-039	7/18/25