BLE, 802.15.4, LTE, LoRa, WiFi6 Modules and OpenSource Products



Selection Guides

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Matter Ready Modules and Gateways

- Matter Modules: <u>WT02C40C</u>, <u>WT02E40E</u>, Nordic nRF7002 and nRF5340 combo, quad-radio (5GHz WiFi6; 2.4 GHz WiFi 6, BLE 5.3, 802.15.4) modules.
- WM02C, WM02E: nRF7002 Companion 2.4GHz+5 GHz WiFi 6, IEEE 802.11 a/b/g/n/ac/ax.
- **Certified for BLE and 802.15.4**, used with a WiFi 6 companion module for matter applications.
 - BT840,BT840E,BT840F, nRF52840 modules.
 - BT840NE, BT840N (\$8.81 @ 1KPCS), NRF52840 + NRF21540 Modules.
 - <u>BT40,BT40E,BT40F</u>, nRF5340 modules. Dual core Cortex M33, up to 128 MHz.
 - BT40NE,BT40N (\$10.92@1K pcs), nRF5340 + nRF21540 for the longest range. Dual core Cortex M33, up to 128 MHz.
- OpenSource Matter/Medical Gateways,

Thread/BLE 5.3 to WiFi6, 4MB flash, a buzzer for audio alerting.

- MIG02C40F(\$28.45@1K pcs) BT40F+WM02C.
- <u>BLG840FB4</u>: Medical IoT, BLE 5.3 to LTE gateway with a buzzer for audio alerting, 4 MB or 16 flash memories.

nRF5340 Dongles

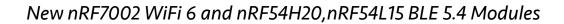
- nRF5340+PA USB dongle: <u>USB40F,USB40N</u>
- Wall mountable to reduce obstruction and maximize LE Audio broadcasting range, BU40NE.

Coming Soon!

- BT20F,BT20E: nRF54H20 Bluetooth 5.4 modules: Dual core Cortex M33, up to 320MHz; Dual core RISC-V, up to 320MHz; 2MB flash, 1MB RAM; +10dBm TX power, -100 dBm receiver sensitivity at 1Mbps; USB port at 480 Mbps, a CAN FD controller, 14-bit ADC, I3C interfaces; PSA level 3 security; Footprint upgradeable from BT840F or BT40F.
- BC20C (size 8.4x11.5mm),BC20M: nRF54H20 Bluetooth 5.4 compact modules: Footprint upgradeable from BC40C or BC40M.
- BM15,BM15E: nRF54L15 Bluetooth 5.4 modules, Cortex M33 at 128MHz; 1.5MB flash, 256KB RAM; +8 dBm TX power, -98 dBm receiver sensitivity at 1Mbps; PSA level 3 security; BM15 consumes lower power and costs less than BM840 (nRF52840, \$4.76@1K pcs).
- BC15C,BC15P: compact nRF54L15 modules; both 32M and 32K crystals embedded; size from 6x6mm.
- LWX1E02C: nRF91X1 and nRF7002/7000, LTE-WiFi combo module for WiFi location services. Optional GPS receiver antenna and amplifier.

Full Approtect Supports

 All BLE modules support approtect or has an approtect one in additional to the legacy version to prevent hacking. <u>Order free approtect module</u> <u>samples</u>.





Nordic nRF7002	WiFi 6 Companion M	odules. No external	component required.		
module	WM02C	WM02V	WM02E	WM02F	WM02P
Size, mm	12x20.0	12x25.2	12x16.2	12 (15.1) x 23.8	12x12.4
SoC	nRF7002	nRF7002	nRF7002	nRF7002	nRF7002
Antenna	Chip, horizontal	Chip, vertical	u.FL	High performance PCB	Pads
2.4GHzWiFi range	549 meters	505 meters	550 meters	493 meters	
5GHz WiFl range	413 meters	498 meters	510 meters	375 meters	
1K price, ea.	\$5.73	\$5.73	\$5.24	\$5.14	\$4.82

Nordic HRF/002 W	iFi 6 and nRF5340 BL	.E 5.3 Combo Modul	es. No external comp	oneni requirea.	
module	WT02E40E	WT02C40C	WT02V40V	WT02E40F	WT02P40P
W(antenna)xHxT, mm	14(21.8)x18	14(22.5)x18	14(31.8)x27.1	14(18.6)x27.8	14(14)x18
Engineering samples	WT02E40E-eng	WT02C40C-eng			
W(antenna)xHxT, mm	16(16)x28.2	16(26)x29.9			
SoC	nRF5340+7002	nRF5340+7002	nRF5340+7002	nRF5340+7002	nRF5340+7002
MCU/Flash/RAM	M33/256/64KB	M33/256/64KB	M33/256/64KB	M33/256/64KB	M33/256/64KB
MCU 2/Flash/RAM	M33/1024/512KB	M33/1024/512KB	M33/1024/512KB	M33/1024/512KB	M33/1024/512KB
NFC,802.15.4,USB,CryptoCell	Yes	Yes	Yes	Yes	Yes
GPIO pins	48, LGA	48, LGA	48, LGA/CAS	48, LGA/CAS	48, LGA/CAS
WiFi 6 frequencies	2.4GHz+5 GHz	2.4GHz+5 GHz	2.4GHz+5 GHz	2.4GHz+5 GHz	2.4GHz+5 GHz
Antenna	WiFi u.FL/BLE u.FL	WiFi chip/BLE chip	WiFi chip/BLE chip	WiFi u.FL/BLE PCB	WiFi pad BLE pad
Crystals	32M+32K+40M	32M+32K+40M	32M+32K+40M	32M+32K+40M	32M+32K+40M
1K price, ea.	\$13.11	\$13.81			

Nordic nRF54H20 Bluetoo	th 5.4 Modules. No external comp	oonent required.	
Module	BT20F	BT20	BT20E
Size, mm	15x21.4x2.0	14x16.2x2.0	14x16.5x2.0
SoC	54H20, dual core Cortex M33, up	to 320MHz; dual core RISC-V, up to 320	MHz
Memory	1120KB total RAM, 2MB flash		
Features	USB at 480Mbps; a CAN FD contr	oller; 14 bit ADC; I3C interfaces; PSA lev	el 3 security;
Features	NFC; Directional finding; Audio PLL	., 2 x TDM, PDM; High speed SPIS, SPIN	И, UART;
Features	SIMIF smart card interfaces;		
Embedded crystals	32M+32K	32M+32K	32M+32K
GPIO, pins	64 GPIOs; 82 hybrid LGA/CAS pins		
Antenna	High Perf. PCB Trace	PCB trace	u.FL
Range,1Mbps	1000 meters, est.	150 meter,est.	>1000 M, est.
Max TX, SoC	+10 dBm	10 dBm	+10 dBm
Receiver sensitivity, at 1Mbps	-100 dBm	-100 dBm	-100 dBm

Nordic nRF54L15 Bluetooth 5.4	Modules.	
Module	BM15	BM15E
Size, mm	10.9x15	10.9x15
Size, mm	nRF54L15, Cortex M33 at 128MHz;	1524KB flash, 256 KB RAM
Features	PSA level 3 security; NFC; directions	al finding
GPIOs	30 GPIOs; 36 LGA pins	
Embedded crystals	32M	32M
Antenna	PCB Trace	u.FL
Range,1Mbps	300 meters, est.	1000 M, est.
Max TX, SoC	+8 dBm	+8 dBm
Receiver sensitivity, at 1Mbps	-98 dBm	-98 dBm

Contact Fanstel





Dual Band WiFi 6 and BLE 5.3/WiFi 6 Combo Modules



Nordic nRF7002 supports IEEE 802.11 a/b/g/n/ac/ax in both 2.4 GHz and 5 GHz frequency bands.

- Combo module integrates an nRF5340 to support 4 radio interfaces, 5GHz WiFi 6, 2.4 GHz WiFi 6, BLE 5.3 and 802.15.4.
- WT02C40C, WT02E40E, WT02E40F are footprint upgradeable from BLE modules BT40F and BT40N.
- Companion module WM02C and WM02E are managed by a host MCU through SPI interface.
- For low cost applications, uses a BM840@\$4.76, or a BT40@\$7.65 each at 1K pcs.
- For long range applications, use a BT40N with an nRF21540, \$10.92 each at 1K pcs.

- The sizes and prices of WiFi modules will be finalized when certified.
- WiFi ranges are the average of 12 measurements with an iPhone 14. Module antenna points to the sky and is rotated by 30 degrees after each measurement.
- WM Series WiFi ranges are measured with Nordic SDK 2.50, default settings.
- We are improving WT02C40C Series dual antenna design, limited samples in 2023. We will continue ship WT02C40C-eng and WT02E40E-eng.

Nordic hRF/002 W	iFi 6 Companion Mod	ules. No external	component required.		
module	WM02C	WM02V	WM02E	WM02F	WM02P
Size, mm	12x20.0	12x25.2	12x16.2	12 (15.1) x 23.8	12x12.4
SoC	nRF7002	nRF7002	nRF7002	nRF7002	nRF7002
Antenna	Chip, horizontal	Chip, vertical	u.FL	High performance PCB	Pads
2.4GHzWiFi range	549 meters	505 meters	550 meters	493 meters	
5GHz WiFl range	413 meters	498 meters	510 meters	375 meters	
Operating temp.	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
Certifications (11/2023)	(FCC, ISED, CE, TELEC	C, RCM, NCC, KCC, Al	NATEL)		
Eval board	EV-WM02C	EV-WM02V	EV-WM02E	EV-WM02F	EV-WM02P
1K price, ea.	\$5.73	\$5.73	\$5.24	\$5.14	\$4.82
Availability	Samples	Samples	Samples	Samples	Samples

Nordic nRF7002 WiF	i 6 and nRF5340 BL	E 5.3 Combo Modul	les. No external com	oonent required.	
module	WT02E40E	WT02C40C	WT02V40V	WT02E40F	WT02P40P
W(antenna)xHxT, mm	14(21.8)x18	14(22.5)x18	14(31.8)x27.1	14(18.6)x27.8	14(14)x18
Engineering samples	WT02E40E-eng	WT02C40C-eng			
W(antenna)xHxT, mm	16(16)x28.2	16(26)x29.9			
SoC	nRF5340+7002	nRF5340+7002	nRF5340+7002	nRF5340+7002	nRF5340+7002
MCU/Flash/RAM	M33/256/64KB	M33/256/64KB	M33/256/64KB	M33/256/64KB	M33/256/64KB
MCU 2/Flash/RAM	M33/1024/512KB	M33/1024/512KB	M33/1024/512KB	M33/1024/512KB	M33/1024/512KB
NFC,802.15.4,USB,CryptoCell	Yes	Yes	Yes	Yes	Yes
GPIO pins	48, LGA	48, LGA	48, LGA/CAS	48, LGA/CAS	48, LGA/CAS
WiFi 6 frequencies	2.4GHz+5 GHz	2.4GHz+5 GHz	2.4GHz+5 GHz	2.4GHz+5 GHz	2.4GHz+5 GHz
Antenna	WiFi u.FL/BLE u.FL	WiFi chip/BLE chip	WiFi chip/BLE chip	WiFi u.FL/BLE PCB	WiFi pad BLE pad
2.4 GHz WiFl range					
5GHz WiFi range					
BLE range at 1Mbps					
Operating temp.	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
DCDC inductors, power switch	Integrated	Integrated	Integrated	Integrated	Integrated
Crystals	32M+32K+40M	32M+32K+40M	32M+32K+40M	32M+32K+40M	32M+32K+40M
Certifications(Q1,2024)	(FCC,IC,CE,JP,RCM)	(FCC,IC,CE,JP,RCM)	(FCC,IC,CE,JP,RCM)	(FCC,IC,CE,JP,RCM)	(FCC,IC,CE,JP,RCM)
Eval board	EV-WT02E40E	EV-WT02C40C	EV-WT02V40V	EV-WT02E40F	EV-WT02P40P
1K price, ea.	\$13.11	\$13.81			
Availability	Eng. Samples	Eng. Samples			

nRF54H20 BLE 5.4, 802.15.4 Modules

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- No external component required. It uses minimum host PCB area. Both 32 MHz and 32.768 kHz crystals embedded.
- Compact nRF54H20 modules: BC20C, BC20M,BC20P;

- Long Range nRF54H20 modules: BT20,BT20F,BT20E.
- Will be certified for BLE and 802.15.4
- nRF54H20 with a power amplifier: planned.

Module	BT20F	BT20	BT20E
Size, mm	15x21.4x2.0	14x16.2x2.0	14x16.5x2.0
SoC	54H20, dual core Cortex M33, u	up to 320MHz; dual core RISC-V,	up to 320 MHz
Memory	1120KB total RAM, 2MB flash		
eatures	USB at 480Mbps; a CAN FD co	ntroller; 14 bit ADC; I3C interface	es; PSA level 3 security;
eatures	NFC; Directional finding; Audio F	PLL, 2 x TDM, PDM; High speed	SPIS, SPIM, UART;
eatures	SIMIF smart card interfaces;		
mbedded crystals	32M+32K	32M+32K	32M+32K
PIO, pins	64 GPIOs; 82 hybrid LGA/CAS pins		
ntenna	High Perf. PCB Trace	PCB trace	u.FL
ange,1Mbps	1000 meters, est.	150 meter,est.	>1000 M, est.
ax TX, SoC	+10 dBm	10 dBm	+10 dBm
eceiver sensitivity, at 1Mbps	-100 dBm	-100 dBm	-100 dBm
perating temp.	-40°C to +105°C	-40°C to +105°C	-40°C to +105°C
eak current RX			
ertifications			
val board	EV-BT20F	EV-BT20	EV-BT20E
K price, ea.			

Module	BC20C	BC20M	BC20P
Size, mm	8.4x11.5	8.4(10.1)x12.7	8.4x9.0
SoC	54H20, dual core Cortex M33, u	up to 320MHz; dual core RISC-V,	up to 320 MHz
Memory	1120KB total RAM, 2MB flash		
Features	USB at 480Mbps; a CAN FD co	ntroller; 14 bit ADC; I3C interface	es; PSA level 3 security;
Features	NFC; Directional finding; Audio F	PLL, 2 x TDM, PDM; High speed	SPIS, SPIM, UART;
Features	SIMIF smart card interfaces;		
Embedded crystals	32M+32K	32M+32K	32M+32K
GPIO, pins	48 GPIOs; ?? LGA pins		
Antenna	High Perf. PCB Trace	PCB trace	u.FL
Range,1Mbps	100 meters, est.	150 meter,est.	>1000 M, est.
Max TX, SoC	+10 dBm	10 dBm	+10 dBm
Receiver sensitivity, at 1Mbps	-100 dBm	-100 dBm	-100 dBm
Operating temp.	-40°C to +105°C	-40°C to +105°C	-40°C to +105°C
peak current RX			
Certifications			
Eval board	EV-BC20C	EV-BC20M	EV-BC20P
1K price, ea.			

nRF54L15 BLE 5.4, 802.15.4 Modules



- nRF54L15 has more flash memories, higher processor speed, better receiver sensitivity, lower power consumption, and better security supports than nRF52840.
- The cost of BM15 will be lower than BM840 (nRF52840, \$4.76 @ 1Kpcs).
- BM15 is not footprint compatible with BM840.
- BM15 Series modules will be certified for both Bluetooth and 802.15.4.

Nordic nRF54L15 Bluetooth 5.4	4 Modules. No external component required.	
Module	BM15	BM15E
Size, mm	10.9x15	10.9x15
Size, mm	nRF54L15, Cortex M33 at 128MHz; 1524KB flash	n, 256 KB RAM
Features	PSA level 3 security; NFC; directional finding	
GPIOs	30 GPIOs; 36 LGA pins	
Embedded crystals	32M	32M
Antenna	PCB Trace	u.FL
Range,1Mbps	300 meters, est.	1000 M, est.
Max TX, SoC	+8 dBm	+8 dBm
Receiver sensitivity, at 1Mbps	-98 dBm	-98 dBm
Operating temp.	-40°C to +105°C	-40°C to +105°C
peak current RX		
Certifications		
Eval board	EV-BM15 in stock	EV-BM15E in stock
1K price, ea.		

nRF5340 BLE 5.3 Modules



- No external component required. It uses minimum host PCB area. Both 32 MHz and 32.768 kHz crystals embedded. DCDC converter inductors are embedded.
- Compact nRF5340 modules: <u>BC40C</u>, <u>BC40M</u>, <u>BC40P</u>;

- Long Range nRF5340 modules: <u>BT40,BT40F,BT40E</u>, BLE certified, 802.15.4 certifications to be added.
- nRF5340 with nRF21540 power amplifier: BT40N, BT40NE, to be certified for BLE and 802.15.4.
- **AP**protect: All nRF5340 modules support approtect.

Nordic nRF53 Bluetooth 5.3 Modules. No external component required. Certified for both BLE and 802.15.4.

Module	BT40	BT40F	BT40E	BT40N	BT40NE
AP protect	BT40	BT40F	BT40E	BT40N	BT40NE
Size, mm	14x16x2.0	15x21x2.0	14x16x2.0	15x29.9x2.0	15x29.9x2.0
SoC	nRF5340	nRF5340	nRF5340	nRF5340+21540	nRF5340+21540
MCU/Flash/RAM	M33/256/64KB	M33/256/64KB	M33/256/64KB	M33/256/64KB	M33/256/64KB
MCU 2/Flash/RAM	M33/1024/512KB	M33/1024/512KB	M33/1024/512KB	M33/1024/512KB	M33/1024/512KB
NFC,802.15.4,USB	Yes	Yes	Yes	Yes	Yes
Directional Finding	Yes	Yes	Yes	Yes	Yes
CryptoCell-312	Yes	Yes	Yes	Yes	Yes
GPIO, pins	48, LGA/CAS	48, LGA/CAS	48, LGA/CAS	48, LGA/CAS	48, LGA/CAS
Antenna	PCB Trace/u.FL	High Perf. Trace	PCB Trace/u.FL	PA+PCB	PA+PCB+u.FL
Range,1Mbps	100 M, est.	700 meters, est.	1000 M, est.	>1100 meters	>1100 meters
Max TX, conducted, FCC	+3.4 dBm	+3.4 dBm	+3.4 dBm	+19.1 dBm	+19.1 dBm
Max TX, radiated, FCC	0 dBm	+4.3 dBm	+9.4 dBm	+20.0 dBm	+25.1 dBm
Operating temp.	-40°C to +105°C	-40°C to +105°C	-40°C to +105°C	-40°C to +105°C	-40°C to +105°C
peak current RX	2.6 mA	2.6 mA	2.6 mA		
peak current TX	3.2 mA, 0dBm	3.2 mA, 0 dBm	3.2 mA, 0dBm		
DCDC inductors VDD, VDDH	Integrated	Integrated	Integrated	Integrated	Integrated
32.768kHz crystal	Integrated	Integrated	Integrated	Integrated	Integrated
Certifications	FCC, ISED, CE, RCM	TELEC (BLE+ 802.15.4), QDID	FCC,ISED,CE,RCM,TEL	EC (BLE+ 802.15.4), QDI
Eval board	EV-BT40	EV-BT40F	EV-BT40E	EV-BT40NE	EV-BT40NE
1K price, ea.	\$7.65	\$9.02	\$8.68	\$10.92	\$12.24
AP Availability	Production	Production	Production	Production	Production

Module	BC40C	BC40M	BC40P
AP protect	BT40C	BC40M	BC40P
Size, mm	8.4x11.5x1.6	8.4(10.1)x12.7x1.6	8.4x9x1.6
SoC	nRF5340	nRF5340	nRF5340
MCU/Flash/RAM	M33/256/64KB	M33/256/64KB	M33/256/64KB
MCU 2/Flash/RAM	M33/1024/512KB	M33/1024/512KB	M33/1024/512KB
NFC,802.15.4,USB	Yes	Yes	Yes
Directional Finding	Yes	Yes	Yes
CryptoCell-312	Yes	Yes	Yes
GPIO pins	48, LGA	48, LGA	48, LGA
Antenna	Chip	PCB	Pads for external
Range,1Mbps			
Max. TX power, FCC	+3.60 dBm	+3.60 dBm	+3.60 dBm
Operating temp.	-40°C to +105°C	-40°C to +105°C	-40°C to +105°C
peak current RX	2.6 mA	2.6 mA	2.6 mA
peak current TX	3.2mA, +0dBm	3.2mA, +0dBm	3.2mA, +0dBm
DCDC inductors VDD,VDDH	Integrated	Integrated	Integrated
32.768kHz crystal	Integrated	Integrated	Integrated
Certifications	FCC,IC,CE,JP,AU,QDID	FCC,IC,CE,JP,AU,QDID	FCC,IC,CE,JP,AU,QDID
Eval board	EV-BC40C	EV-BC40M	EV-BC40P
1K price, ea.	\$10.10	\$9.02	\$8.97
AP Availability	Production	Production	Production

nRF52 Mini and Compact BLE-802.15.4 Modules



BM840/P begins production with approtect.

1K price, ea.

AP Availability

\$4.80

Production

\$5.73

Production

AP availability: The initial date of approtect module.

DIVIO40/F Degi	ilis production with	αρρισιέσι.	• AF avalla	Dility. The Itiliai date (or approtect module
		Compatible Footprint			
Modules	BM833A	BM833AF	BM832A	BM832	BM832E
AP protect	ВМ833А-р	BM833AF-p	ВМ832А-р	ВМ832-р	ВМ832Е-р
Sizes, mm	10.2x15x1.9	15x20.8x1.9	10.2x15x1.9	10.2x15x1.9	10.2x15x1.9
SoC	nRF52811	nRF52811	nRF52810	nRF52832	nRF52832
Flash/RAM	192KB/24KB	192KB/24KB	192KB/24KB	512KB/64KB	512KB/64KB
NFC/802.15.4	No	No	No	Yes	Yes
GPIO pins	32	32	32	32	32
Pins	LGA	LGA	47, LGA	47, LGA	47, LGA
Antenna	PCB Trace	PCB Trace	PCB trace	PCB trace	PCB u.FL
Range,125kbps	680M, est.	1400M, est.	340 meters	340 meters	
Ant at 1.52 m			270 meters	270 meters	
Max. TX power, FCC	+4.77 dBm	+4.77 dBm	+3.98 dBm	+3.98 dBm	+3.98 dBm
peak current RX	4.6mA	4.6mA	5.4 mA	5.4 mA	5.4 mA
peak current TX	4.6mA, +0dBm	4.6mA, +0dBm	7.5mA, +4dBm	7.5mA, +4dBm	7.5mA, +4dBm
DCDC inductors	Integrated	Integrated	Integrated	Integrated	Integrated
32.768kHz crystal	Ext.	Ext.	Ext.	Ext.	Ext.
Certifications	FCC,IC,CE,JP,AU,QDID	FCC,IC,CE,JP,AU,QDID	FCC,IC,CE,JP,AU,KR,QDID	FCC,IC,CE,JP,AU,KR,QDID	FCC,IC,CE,JP,AU,KR,QDID
Eval board	EV-BM833A	EV-BM833AF	EV-BM832A	EV-BM832	EV-BM832E
1K price, ea.	\$3.32	\$3.67	\$3.00	\$3.92	\$4.08
AP Availability	Production	Production	Production	Production	Production
Nerdie pDEE2 DM	— Carias I avy Cast (Composible Footovins			
		Compatible Footprint		DM040	DM040D
Modules	BM833	BM833E	BM833F	BM840	BM840P
AP protect	BM833-p	BM833E-p	BM833F-p	BM840	BM840P
Sizes, mm	10.2x15x1.9	10.2x15x1.9	15x20.6x1.9	10.2x15x1.9	10.2x15x1.9
SoC	nRF52833	nRF52833	nRF52833	nRF52840	nRF52840
Flash/RAM	512KB/128KB	512KB/128KB	512KB/128KB	1MB/256KB	1MB/256KB
NFC/IEEE 802.15.4	Yes	Yes 42	Yes	Yes	Yes 30
GPIO pins	42		42	30	
Pins	LGA	LGA	LGA	LGA	LGA
Antenna	PCB	u.FL	PCB Trace	PCB trace	pads
Range,125kbps	1400/3400M,est.	1400/3400M,est.	2300M, est.		
Ant at 1.52 m	0.40 IF	0.40.15	0.40.15	0.0 15	0.0.15
Max. TX power, FCC	+8.13 dBm	+8.13 dBm	+8.13 dBm	+8.0 dBm	+8.0 dBm
peak current RX	4.6mA	4.6mA	4.6mA	4.6 mA	4.6 mA
peak current TX	4.8mA, +0dBm	4.8mA, +0dBm	4.8 mA, +0 dBm	4.8 mA at +0dBm	4.8 mA at +0dBm
DCDC inductors	Integrated	Integrated	Integrated	Integrated	Integrated
32.768kHz crystal	Ext.	Ext.	Ext.	Ext	Ext
Certifications	FCC,IC,CE,JP,AU,QDID	FCC,IC,CE,JP,AU,QDID	FCC,IC,CE,JP,AU,QDID	FCC,IC,CE,JP,AU,QDID	FCC,IC,CE,JP,AU,QDID
Eval board	EV-BM833	EV-BM833E	EV-BM833F	EV-BM840	EV-BM840P

Modules	BC832	BC840	BC840M	BC840E	BC805M	BC833M	BC833E
AP protect	BC833-p	BC840-p	BC840M-p	BC840E-p	BC805M-p	ВС833М-р	BC833E-p
Sizes, mm	7.8x8.8x1.3	7.1x9.2x1.5	7(10)x12.2x1.5	7.0x12.2x1.8	10x14.3x1.9	10x14.3x1.9	10x14.3x1.9
SoC	nRF52832	nRF52840	nRF52840	nRF52840	nRF52805	nRF52833	nRF52833
Flash/RAM	512KB/64KB	1MB/256KB	1MB/256KB	1MB/256KB	192KB/24KB	512KB/128KB	512KB/128KB
NFC	Yes	Yes	Yes	Yes	No	Yes	Yes
IEEE 802.15.4	No	Yes	Yes	Yes	No	Yes	Yes
GPIO pins	30	48	48	48	10	18	18
Pins	36, CAS/LGA	64, LGA	64, LGA	64, LGA	Castellated	28 LGA	28 LGA
Antenna	chip	PCB Trace	PCB Trace	u.FL	PCB trace	PCB trace	u.FL
Range,1Mbps	50 meters			1150 meters	200M, est.	1400/3400,est	1400/3400,est
Ant at 1.52 m		4 meters	135 meters	850 meters			
Max. TX power,	+2.55 dBm	+8.55 dBm	+8.55 dBm	+8.55 dBm	+5.19 dBm	+8.74 dBm	+8.74 dBm
peak current RX	5.4 mA	6.4 mA	6.4 mA	6.4 mA	4.6mA	4.7mA	4.7mA
peak current TX	7.5mA,+4dBm	13.6mA+8dBm	13.6mA+8dBm	13.6mA+8dBm	4.6mA, +0dBm	4.9mA, +0dBm	4.9mA, +0dBm
DCDC inductors	Ext.	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
32.768kHz crysta	Ext.	Ext.	Ext.	Ext.	Ext.	Integrated	Integrated
Certifications	FCC,IC,CE,JP,QDID	FCC,IC,CE,JP,AU,QDID	FCC,IC,CE,JP,AU,QDID	FCC,IC,CE,JP,AU,QDID	FCC,IC,CE,JP,AU,QDID	FCC,IC,CE,JP,AU,QDID	FCC,IC,CE,JP,AU,QDIE
Eval board	EV-BC832	EV-BC840	EV-BC840M	EV-BC840M	EV-BC805M	EV-BC833M	EV-BC833E
1K price, ea.	\$5.74	\$6.30	\$7.39	\$7.32	\$2.21	\$4.33	\$4.72
AP Availability	Production	Production	Production	Production	Production	Production	Production

\$5.77

Production

\$4.76

Production

\$4.76

Production

nRF52 BT Series, Long Range, Full Size with nRF21540 Modules



BT Series modules are full size with Bluetooth range up to 4500 meters. All BT modules have compatible footprint. An nRF52 module can be upgraded to an nRF53 module with a power amplifier or a BLE 5.3-WiFi 6 combo. BT modules are widely used in Fanstel pre-certified, market ready M.2 modules, basic, battery-powered, and PoE gateways.

- M.2 modules: nRF9160 + BT840F: <u>LN60E840F</u>.
- **IP67 Battery-powered** BLE-LTE-LoRa gateways SL40F6.

- Medical IoT gateways: <u>BLG840FB4</u>.
- IP65 BLE-LoRa to LTE, WiFi, PoE gateways LEWR840F6P.
- BLE to WiFi 6 matter gateways: BWG02C40F.
- Certified for both BLE and Thread, BT840F and BT840N Series are ready for Matter applications.
- AP availability: The initial production date of approtect version.

Nordic nRF52 BT Series, compatible footprint, upgradeable features and range

BLE 5 modules	BT832	BT832F	BT832A	BT832AF
AP protect	ВТ832-р	BT832F-p	ВТ832А-р	BT832AF-p
Sizes, mm	14x16x1.9	15x20.8x1.9	14x16x1.9	15x20.8x1.9
SoC	nRF52832	nRF52832	nRF52810	nRF52810
Flash/RAM	512KB/64KB	512KB/64KB	192KB/24KB	192KB/24KB
NFC	Yes	Yes	No	No
GPIO pins	32	32	32	32
Pins	40, CAS/LGA	40, CAS/LGA	40, CAS/LGA	40, CAS/LGA
Antenna	PCB trace	PCB trace	PCB trace	PCB trace
Range, 1 Mbps	100 meters	760 meters	100 meters	760 meters
Ant. at, 1.52m		390 meters		390 meters
Max. TX power, FCC	+2.55 dBm	+2.55 dBm	+2.55 dBm	+2.55 dBm
peak current RX	5.4 mA	5.4 mA	5.4 mA	5.4 mA
peak current TX	7.5mA, +4dBm	7.5mA, +4dBm	7.5mA, +4dBm	7.5mA, +4dBm
DCDC inductors	Integrated	Integrated	Integrated	Integrated
32.768kHz crystal	Ext.	Ext.	Ext.	Ext.
Certifications	FCC,IC,CE,JP,AU,QDID	FCC,IC,CE,JP,AU,QDID	FCC,IC,CE,JP,AU,QDID	FCC,IC,CE,JP,AU,QDID
Eval board	EV-BT832	EV-BT832F	EV-BT832A	EV-BT832AF
1K price, ea.	\$4.46	\$4.93	\$3.43	\$3.79
AP Availability	Production	Production	Production	Production

BLE 5 modules	BT840F	BT840	BT840E	BT840N	BT840NE
AP protect	BT840F-p	ВТ840-р	ВТ840Е-р	BT840N	BT840NE
Sizes, mm	15x20.8x1.9	14x16x1.9	14x16x1.9	15x29.9x1.9	15x29.9x1.9
SoC	nRF52840	nRF52840	nRF52840	nRF52840+21540	nRF52840+21540
MCU/flash/RAM	M4F/1MB/256KB	M4F/1MB/256KB	M4F/1MB/256KB	M4F/1MB/256KB	M4F/1MB/256KB
CryptoCell 310	Yes	Yes	Yes	Yes	Yes
IEEE 802.15.4,USB,NFC	Yes	Yes	Yes	Yes	Yes
GPIO pins	48	48	48	39	39
Pins	61, CAS/LGA	61, CAS/LGA	61, CAS/LGA	61, CAS/LGA	61, CAS/LGA
Antenna	PCB trace	PCB trace	u.FL	PA + PCB	PA + PCB+u.FL
Range, 1 Mbps	1000 meters	150 meters	>1000 meters, est.	1170 meters	>1100 meters, est.
Ant. at, 1.52m	390 meters	120 meters			
Range,125Kbps	2300 meters	320 meters	>2300 meters, est.	>4500 M, est.	>4500 M, est.
Ant at 1.52m	640 meters	210 meters			
Max. TX power, conducted	+8.49 dBm	+8.49 dBm	+8.49 dBm	+20.6 dBm	+20.6 dBm
Max. TX power, radiated	+9.4 dBm	+5.0 dBm	+14.5 dBm	+21.5 dBm	+26.6 dBm
peak current RX	4.6 mA	4.6 mA	4.6 mA		
peak current TX	13.6mA +8dBm	13.6mA +8dBm	13.6mA +8dBm		
DCDC inductors	Integrated	Integrated	Integrated	Integrated	Integrated
32.768kHz crystal	Ext.	Ext.	Ext.	Integrated	Integrated
Certifications	FCC,ISED,CE,RCM,TELEC	(BLE+ 802.15.4), KCC, NCC	, Anatel, QDID	FCC,ISED,CE,RCM,TELEC	(BLE+ 802.15.4), QDID
Eval board	EV-BT840F	EV-BT840	EV-BT840E	EV-BT840NE	EV-BT840NE
1K price, ea.	\$7.17	\$6.09	\$6.90	\$8.81	\$9.91
AP Availability	Production	Production	Production	Production	Production

Modules with Skyworks PA, Semtech LoRa, Expressif WiFi



Modules with Skyworks PA

- nRF52832, nRF52840 with Skyworks power amplifier.
- **AP** Availability: The initial production date of approtect versions.

Semtech LoRa Module

- LR62E: SX1262 LoRa module.
- **LR62XE**, SX1262 + PA, max. TX: +29.2 dBm.

Expressif WiFi Modules

ESP32M4 is a Clone of ESP32-WROOM-32D with improved RF circuit and operating temperature -40°C to +105°C.

Nordic nRF52 BT Ser	ries, compatible footpr	int, upgradeable feature	s and range	
BLE 5 modules	BT832X	BT832XE	BT840X	BT840XE
AP protect	BT832X-p	BT832XE-p	BT840X-p	BT840XE-p
Sizes, mm	15x28x1.9	15x28x1.9	15x28x1.9	15x28x1.9
SoC	nRF52832+SKY66112	nRF52832+SKY66112	nRF52840+SKY66112	nRF52840+SKY66112
Flash	512KB	512KB	1MB	1MB
RAM	64KB	64KB	256KB	256KB
CryptoCell 310			Yes	Yes
IEEE 802.15.4, USB			Yes	Yes
NFC	Yes	Yes	Yes	Yes
GPIO pins	29	29	45	45
Pins	40, CAS/LGA	40, CAS/LGA	61, CAS/LGA	61, CAS/LGA
Antenna	PCB trace	u.FL	PCB Trace	u.FL
Range, 1 Mbps	1140 meters	1140 meters	1170 meters	1170 meters
Ant. at, 1.52m	1120 meters	1120 meters	900 meters	900 meters
Range,125Kbps			>4500 M	>4500 M
Ant at 1.52m			1240 meters	>1240M
Max. TX power, conducted	+18.75 dBm	+18.75 dBm	+21.0 dBm	+21 dBm
Max.TX power, radiated		+24.75 dBm		+27 dBm
peak current RX				
peak current TX	95mA,+20dBm	95mA,+20dBm		
DCDC inductors	Integrated	Integrated	Integrated	Integrated
32.768kHz crystal	Integrated	Integrated	Integrated	Integrated
Certifications	FCC,IC,QDID	FCC,IC,QDID	FCC,IC,CE,AU,QDID	FCC,IC,CE,AU,QDID
Eval board	EV-BT832X	EV-BT832XE	EV-BT840X	EV-BT840XE
1K price, ea.	\$9.69	\$9.87	\$12.50	\$12.75
AP Availability	Production	Production	Production	Production

	Expressif WiFi Modules	3	Semtech LoRa Mo	odules
Modules	ESP32M4	ESP32M16/E16	LR62E	LR62XE
Sizes, mm	18x25.5	18x25.5	10.2x15x1.9	10 (14) x22.3
SoC	ESP32-D0WD	ESP32-D0WD	SX1262	SX1262 + PA
Flash/RAM/ROM	4MB/520/448KB	16MB/520/448KB		
Max. TX power	+23.98 dBm	+23.98 dBm	+20.3 dBm	+29.2 dBm
Antenna	PCB Trace	PCB Trace/u.FL	u.FL	u.FL
Certifications	FCC, IC,CE,RCM,TELEC,KCC	FCC, IC,CE,RCM,TELEC,KCC	FCC,IC,RCM	FCC, IC,RCM
Operating temp.	-40°C to +105°C	-40°C to +105°C	-40°C to +85°C	-40°C to +85°C
Eval board			EV-LR62E	EV-LN60G
1K price, ea.	\$3.87	\$5.30/\$5.49	\$7.32	\$13.81
Availability	Production	Production	Production	Production

LTE,BLE,802.15.4,WiFi 6,LoRa Modules, M.2 Connector



LN60E840F Series LTE-BLE/802.15.4 Combo Modules

nRF52840 or nRF5340 module integrated with nRF9160 module. Bluetooth range can be > 4500 meters or 2.8 miles. An u.FL connector for external LTE antenna. A nano SIM card connector on board and SIM interface for external eSIM. GPS with integrated antenna and receiver amplifier, or an u.FL for external GPS antenna.

LW60E02E40E Series: 6-radios combo supporting Cat-M, NB-IoT, 5 GHz WiFi 6, 2.4 GHz WiFi 6-BLE 5.3-802.15.4. An nRF9160, nRF5340 and nRF7002 combo module.

M262X840XE Series LoRa-BLE 5 Combo Module

nRF52840 and Semtech SX1262 combo module supporting BLE 5.2 and Long Range LoRa.

M.2 Connector

B key, 67 pins.







LN Modules S	Supporting LTE and	d BLE/802.15.4				
Module	LN60E40F	LN60E40NE	LN60E840E	LN60E840F	LN60E840XE	LN60E
BLE module	BT40F	BT40NE	BT840E	BT840F	BT840XE	
BLE antenna	Integrated	u.FL+PCB+PA	u.FL	Integrated	PA + u.FL	
BLE TX power	+3.4 dBm		+8.5 dBm	+8.5 dBm	+21.0 dBm	
LTE module	nRF9160 SICA	nRF9160 SICA	nRF9160 SICA	nRF9160 SICA	nRF9160 SICA	nRF9160 SICA
LTE antenna	u.FL	u.FL	u.FL	u.FL	u.FL	u.FL
GPS antenna	u.FL	u.FL	u.FL	u.FL	u.FL	u.FL
Flash memory	16MB	16MB	None	None	None	None
Certifications	FCC,IC,TELEC (CE,RCM)		FCC,IC,TELEC (CE,RCM)	FCC,IC,TELEC (CE,RCM)	FCC,IC,(CE,RCM)	FCC,IC,TELEC (CE,RCM)
QDID	119517		108621	108621	108621	
1K price, each	\$49.48		\$40.56	\$40.56	\$57.11	\$32.75
Availability	Production		Production	Production	Production	Production

M2 Modules Support	ing WiFi 6/LTE and BL	.E/802.15.4		
Module	LW60E02E40E	LW60E02C40C	LW02E40NE	LW02C40F
WiFi-BLE module	WT02E40E	WT02C40C	BT40NE	BT40F
WiFI/BLE antenna	u.FL/u.FL	Chip/Chip	PCB + u.FL	PCB
BLE TX power				
LTE -WiFi module	nRF9160 SICA	nRF9160 SICA	WM02E	WM02C
WiFi antenna	u.FL	u.FL	u.FL	Chip
Certifications				
QDID	119517	119517		
1K price, each				
Availability				

M2 Module Supp	orting BLE/802.15.	4-LoRa			
Module	M262840F	M262X840XE	M2840XE	M240E	M262X840F
BLE module/TX	BT840F/+8.5dBm	BT840XE/+21dBm	BT840XE/+21dBm	BT40E	BT840F/+8.5dBm
BLE antenna	Integrated	PA + u.FL	PA + u.FL	u.FL	Integrated
LoRa module/TX	LR62E/+20.3dBm	LR62XE/+29.2dBm			LR62XE/+29.2dBm
LoRa antenna	u.FL	u.FL			u.FL
Certifications	FCC,IC,RCM	FCC,IC,RCM	FCC,IC,CE,RCM	FCC,IC,CE,RCM,TELEC	FCC,IC,RCM
QDID	108621	108621	108621	119517	108621
1K price, each	\$19.64	\$44.86			\$32.49
Availability	Production	Production	Non stock	Non stock	Production

Battery Powered IP67 BLE 5.3,LTE,LoRa Gateway/Sensor



SL60F6 Series IP67 BLE-LTE-LoRa Gateways

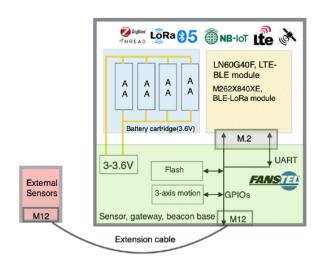
This sensor is available in IP67 (yellow) or IP51 (black).

• The battery cartridge can accommodate 4 x AA, 3.6 volts lithium batteries with 30 watts power.



- The IP67 enclosure can have an optional 8-pins, M12 connector for external sensors.
- The IP51 enclosure can have an optional 8-pins RJ45 connector for external sensors.
- The host board has an M.2 connector for an LTE module, a BLE module, an <u>LN LTE-BLE module</u> or an <u>M2 BLE-LoRa module</u>.
- <u>SL40F6</u> can be used as a sensor or a battery powered BLE to LTE gateway.

- M12 connector for external sensor
- Use 1 4 AA, 3.6V Lithium batteries. Max. 30 Amp-



hours.

	LTE-BLE gateway	LTE-BLE gateway	LTE-BLE gateway	LoRa-BLE bridge	LTE-GPS beacon
	SL840F5R	SL40E6M	SL40F6N	SR840F6N	SLG6N
Ingress Protect/Color	IP51/black	IP67/yellow	IP67/yellow	IP67/yellow	IP67/yellow
Radios	BLE5.3	BLE5.3,LTE	BLE5.3,LTE	BLE5.3,LoRa	LTE
LN, M2 module	LN60E840F	LN60E40E	LN60E40F	M262840F	LN60G1
Sensors	LIS3DH, 3-axis motion				
External antenna	0	1	0	1	0
Ext.sensor conn.	RJ45	M12	None	None	None
Power, not included	4AA, 3.6V Lithium				
Max operating temp	-40°C to +80°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
Mounting	Wall or pole mount				
Certifications					
1K price, each	\$79.29	\$105.78	\$86.81	\$53.20	
Availability	Samples	Samples	Samples		

BLE-LoRa to LTE-WiFi-PoE Ethernet Gateways



IP67 Industrial Multiple Network Gateways

Basic edge computing industrial IoT gateways: IP67/IP65 <u>LEW40E6P</u> (PoE), or IP51 LEW40E5P (PoE).
 BLE, 802.15.4 to LTE, WiFi, PoE gateways with dual core Cortex M33 processors up to 128 MHz. The PoE



gateway enclosure is IP67 rated. A silicone shield for the cable RJ45 plug is required for IP67 rated gateway.

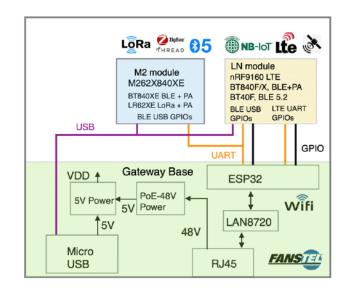
IP51 Industrial Multiple Network Gateways

- Basic Bluetooth to WiFi, Ethernet gateway:
 <u>EW840F5P</u> (PoE) or EW840F5N (Non-PoE). IP51 for indoor applications.
- Multiple radio protocols, BLE/IEEE 802.15.4, LoRa to WiFi, Ethernet, LTE gateway: LEWR840E5P.

OpenSource Supports

- Mongoose OS OpenSource codes for connecting to Fanstel, AWS, MicroSoft, or Google Cloud platforms.
- Firmware for BLE, WiFi, LTE modules.
- · Android OS apps.
- Link to download document and source codes:

http://www.fanstel.com/download-opensource/



MultiNetwork, Multi	Protocol Gateways	with Ingress Protection				
Ingress protect/color	IP51/black	IP51/black	IP51/black	IP51/black	IP65/yellow	IP65/yellow
Gateway	EW840F5N	EW840F5P	LEWR840E5P	LEW40E5P	LEW40F6P	LEWRX840XE6P
WiFi/Ethernet	ESP32M16	ESP32M16	ESP32M16	ESP32M16	ESP32M16	ESP32M16
LN Module			LN60E	LN60E40E	LN60E40F	
M2 Module	M2840F	M2840F	M262840E			
External antenna	0	0	3	2	0	3
GPS				Need ext. antenna	Need ext. antenna	
Power supply	AC adapter	PoE	PoE	PoE	PoE	PoE
Operating temp.	0°C to +40°C	-40°C to +80°C	-40°C to +80°C	-40°C to +80°C	-40°C to +85°C	-40°C to +85°C
Certifications						
QDID	108621	108621	108621	119517	119517	108621
1K price, each	\$61.35	\$66.51	\$117.00	\$109.89	\$130.39	\$161.14
Programming Kit	PK-LEW840X	PK-LEW840X	PK-LEW840X	PK-LEW840X	PK-LEW840X	PK-LEW840X
Availability	Production	Production	Production	Production	Production	Production

BLE to WiFi, LTE, or LoRa Single Network Gateways



Bluetooth to WiFi Gateways

The size of this enclosure is 60x60x22mm. It is available with no external antenna, one external antenna, or 2 external antennas.

- <u>BWG832F</u>: low cost gateway for home or small mesh.
- **BWG832X**(+18dBm TX) can penetrate multiple walls.
- **BWG840F** BLE 5.2 secure gateway, long range
- <u>BWG840XE</u>, +21 dBm TX power. Preloaded with Works With Wiliot codes for battery less Bluetooth



tags (not open source). Fanstel open source codes available.

Bluetooth to LTE Gateways

- **BLG840F**, LTE-M/NB-IoT, long range BLE 5.2.
- BLG840XE, +21 dBm BLE to LTE-M/NB-IoT gateway.
- <u>BLG40F</u> Basic edge computing IoT gateway with dual core Cortex M33 up to 128MHz, 16 MB flash memory for local storage.

Bluetooth to LoRa Gateways

- BR840F, LTE-M/NB-IoT, long range BLE 5.2.
- BRX840XE, +21 dBm TX power BLE to +29.2 dBm TX power LoRa gateway.

Remote USB Dongle

- <u>BU840XE</u>, remote dongle includes a 2-meters long USB cable, a wall mount bracket, an external antenna to maximize range by wall mounting to reduce obstruction.
- BU40NE, remote dongle includes a 2-meters long USB cable, a wall mount bracket, an external antenna to maximize LE audio broadcasting range by wall mounting to reduce obstruction.

OpenSource Supports

- Mongoose OS OpenSource codes for connecting to Fanstel, AWS, MicroSoft, or Google Cloud platforms.
- Firmware for BLE, WiFi, LTE modules.
- Android OS apps.

BLE to WiFi Gateways witho	ut Ingress Protection. Size, 60x	x60x22mm.		
Gateway	BWG832F	BWG832X	BWG840F	BWG840XE
WiFi Module	ESP 8266	ESP 8266	ESP 32	ESP 32
BLE Module	BT832F	BT832X	BT840F	BT840XE
BT range,1Mbps	760 meters	1140 meters	1000 meters	
BT range,125 Kbps			2300 meters	>4500 meters
Mounting	Desk, wall	Desk, wall	Desk, wall	Desk, wall
Certifications	FCC,IC	FCC,IC	FCC,IC,CE,RCM,TELEC	FCC,IC,CE,RCM
QDID	97989	97989	108621	108621
1K price, each	\$22.49	\$36.65	\$31.14	\$49.40
Development Kit	DK-BWG832F	DK-BWG832X	PK-BWG840XE	PK-BWG840XE
Availability	Production	Production	Production	Production

BLE to LTE Gatew	ays without Ingress I	Protection. Size, 60x	k60x22mm.	BLE-LoRa Bridge		Remote Dongle	
	BLG840F	BLG840XE	BLG40F	BRX840XE	BR840F	BU840XE	BU40NE
M.2 module	LN60G840F	LN60G840XE	LN60G40F	M262X840XE	M262840F	M2840XE	M240NE
LTE module	nRF9160 SICA	nRF9160 SICA	nRF9160 SICA				
LoRa module/TX pow	/er			LR62XE,+29.2 dBm	LR62E,+20.3 dBm		
BLE module/TX powe	BT840F/+8.5 dBm	BT840XE/+21.0dBm	BT40F/+3.4 dBm	BT840XE/+21.0 dBm	BT840F/+8.5 dBm	BT840XE/+21.0 dBm	BT40NE/+19 dBm
Ext. flash memory	None	None	16MB	None	None	None	None
Certifications	FCC, IC,TELEC,CE,RCM	FCC, IC,CE,RCM	FCC, IC,TELEC,CE	FCC,IC,RCM	FCC,IC,RCM	FCC,IC,CE	
QDID	108621	108621	119517	108621	108621	108621	
1K price, each	\$63.98	\$79.55	\$70.53	\$64.33	\$34.89	\$33.33	
Programming Kit	PK-BLG840F	PK-BLG840F	PK-BLG840F	PK-BLG840F	PK-BLG840F	PK-BLG840F	
	Production	Production	Production	Production	Production	Production	

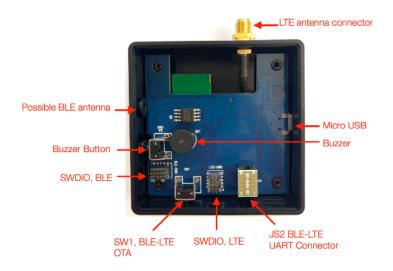
Open Source Medical and Matter IoT Gateways



Optimized for Remote Patient Monitoring

Features for remote patient monitoring:

- Flash memory to store patient data and forward to cloud upon LTE reconnection.
- A buzzer for audio alerting and a control button.



Bluetooth to LTE Gateways

 BLG840FB4,BLG840FB16, Basic LTE-M/NB-IoT to BLE 5.3/802.15.4 gateways with 4MB or 16MB flash for local storage. <u>BLG40FB16</u> Edge computing medical IoT gateway with dual core Cortex M33 up to 128MHz, 16 MB flash memory for local storage..

BLE 5.3/Thread to WiFi 6 Gateways

- MIG02C40F, WiFi 6 to BLE 5.3/Thread gateway for Matter applications, 4MB flash for local storage.
- **MIG02V40NE**, a PA and external antennas for long range BLE 5.3/Thread to long range WiFi 6 gateway for Matter applications, 16MB flash for local storage.
- **MIG02C840F**, Low cost WiFi 6 to BLE 5.3/Thread gateways, 4MB flash for local storage. Not recommended for Matter applications.

OpenSource Supports

- OpenSource codes for connecting to Fanstel, AWS, MicroSoft, or Google Cloud platforms.
- Firmware for BLE, WiFi, LTE modules.
- · Android OS apps.
- Link to download document and source codes:

http://www.fanstel.com/download-opensource/

Medical IoT Gateway for Rem	note Patient Monitoring, Bluetooth to LTE		
	BLG840FB4	BLG840FB16	BLG40FB16
LTE module	nRF9160 SICA	nRF9160 SICA	nRF9160 SICA
BLE module/TX power	BT840F/+8.5 dBm	BT840F/+8.5dBm	BT40F/+3.4 dBm
Ext. flash memory	4MB	16MB	16MB
Certifications	FCC, ISED	FCC, ISED	FCC, ISED
QDID	108621, 182626	108621, 182626	119517, 182626
1K price, each	\$63.98	\$65.98	\$70.53
Programming Kit	PK-BLG840F	PK-BLG840F	PK-BLG840F
Availability	Production	Non stock	Production

	Matter IoT Gateway	Long Range Matter Application	LE Audio Broadcasting	BLE to WiFi 6 gateway	
	MIG02C40F	MIG02V40NE	BU40NE	MIG02C840F	
WiFi 6 module	WM02C, 2.4GHz + 5 GHz	WM02V, 2.4GHz+5GHz	None	WM02C, 2.4GHz+5GHz	
BLE/TX power/External antenna	BT40F/+3.4 dBm	BT40NE/+19.1 dBm/ANT000	BT40NE/+19.1 dBm/ANT000	BT840F/+8.5 dBm	
Ext. flash memory	4MB	16MB	0	0	
Certifications					
QDID					
1K price, each	\$28.93	\$40.15	\$31.14	\$25.34	
Programming Kit					
Availability	samples				

OpenSource BLE 5.3-LoRa Sensors/Beacons/Dongles



SE Series BLE 5, LoRa Sensors

- <u>SE832AF-210</u>, <u>SE840F-210</u>, <u>SE840X-210</u>: BLE temperature, humidity sensors.
- <u>SE6233</u>: BLE-LoRa temperature, humidity, motion sensor.

SC Series BLE 5.3 Compact Sensor, Beacon

- Preloaded with iBeacon and Eddystone codes
- **SC833AF** beacon.
- **SC833F** temperature, humidity, motion sensors

nRF52840 USB Dongles

- Preloaded with Nordic USB CDC ACM secure DFU boot loader, USB dongle can be booted and firmware updated from a PC.
- <u>USB840F and USB840X</u> have pads for Tag-Connect cable TC2050-IDC-NL-050-ALL for programming nRF52840.
- Use USB840F to develop codes for **USB840M**.
- USB840F and USB840X with vertical antenna for near omni-directional range coverage.

 <u>BU840XE</u> remote dongle includes a 2-meters long USB cable, a wall mount bracket, an external antenna to maximize range by wall mounting to reduce obstruction.

nRF5340 USB Dongles

- Preloaded with Nordic USB CDC ACM secure DFU boot loader, USB dongle can be booted and firmware updated from a PC.
- <u>USB40F and USB40N</u> have pads for Tag-Connect cable TC2050-IDC-NL-050-ALL for programming nRF5340.
- USB40F and USB40N with vertical antenna for near omni-directional range coverage.
- <u>BU40NE</u> remote dongle includes a 2-meters long USB cable, a wall mount bracket, an external antenna to maximize range by wall mounting to reduce obstruction.

Wireless Sensor/E	Beacon, no Ingress	s Protection.					
	SE832AF-210	SE840F-210	SE840X-210	SC805M	SC833AF	SC833F	SE6233
BLE Module	BT832AF	BT840F	BT840X	BC805M	BM833AF, BLE	BM833F, BLE 5.1	LoRa+BLE5.1
Size, mm	60x60x22	60x60x22	60x60x22	30x31x10	30x31x10	30x31x10	60x60x22
Humidity, temp	ENS210	ENS210	ENS210			ENS210	ENS210
Motion sensor						LIS3DH	LIS3DH
Power, not included	2 AAA	2 AAA/micro USB	Micro USB, included	CR2032	CR2032	CR2032	2AAA/micro USB
Mounting	Desk, wall	Desk, wall	Desk, wall	Hook, 2 sided tape	Hook, 2 sided tape	Hook, 2 sided tape	Desk, wall
Certifications	FCC,IC	FCC,IC	FCC,IC				
QDID	97989	108621	108621	138610	138767	138767	138767
1K price, each	\$11.31	\$15.54	\$25.20	\$4.44	\$7.37	\$12.97	\$30.47
Availability	Production	Production	Production	Sample	Sample	Sample	Sample

nRF52840 Bluetooth 5.3	USB Dongle			Remote USB Dongle
	USB840F	USB840M	USB840X	BU840XE
BLE Module	BT840F	BC840M	BT840X	BT840XE + ANT000
Size	52x21x21mm	26x15x6.0mm	52x21x21mm	60x60x22mm
LED indicators	2	1	2	2
Tag Connect pads	Yes	No	Yes	Connector
Certifications	FCC,IC,CE,RCM,TELEC,QDID	FCC,IC,CE,RCM,TELEC,QDID	FCC,IC,CE,RCM,QDID	FCC,IC,CE,RCM,QDID
1K price, each	\$10.67	\$10.67	\$19.99	\$33.33
Availability	Production	Production	Production	Production

nRF5340 Bluetooth 5.3 US	B Dongle		Remote USB Dongle
	USB40F	USB40N	BU40NE
BLE Module	BT40F	BT40N	BT40NE + ANT000
Size	52x21x21mm	52x21x21mm	60x60x22mm
LED indicators	2	2	2
Tag Connect pads	Yes	Yes	Connector
Certifications	FCC,IC,CE,RCM,TELEC,QDID		
1K price, each	\$13.59	\$19.99	\$31.14
Availability			

Antennas and Accessories



Bluetooth, LoRa, and LTE Antennas

- Most antennas include a 100 mm long u.FL to SMA adapter cable. SMA connector with panel mounting hardware.
- ANT032 uses a P822602, globally certified with nRF9160, includes a 2-sided tape for mounting inside an enclosure.

• ANT032E uses a P822601, globally certified with nRF9160, includes panel mounting hardware.

Panel mou	ntable antenna wit	h 100 mm	n long SMA to u.FL	adapter cable	
Antenna	Band	Length	Ingress Protection	Certified with	1K price
ANT000	BLE, 2.4 GHz	50mm	IP67	FCC: BT840XE; CE/RCM/TELEC, BC833E, BM833E, BT840E	\$2.63
ANT020	BLE, 2.4 GHz	30mm		FCC/CE/RCM/TELEC: BM832E	\$2.63
ANT025	LoRa, 915MHz			FCC: LR62E, LR62XE	\$3.68
ANT025P	LoRa, 915MHz	198mm	IP67	FCC: LR62XE	\$3.68
ANT032	LTE, multiple	52mm		Uses a P822601, certified with nRF9160 globally. Glued to internal wall of enclosure.	\$5.03
ANT032E	LTE, multiple	78mm		Uses a P822601, certified with nRF9160 globally. Panel mountable, external antenna	\$7.42
ANT060	BLE, 2.4 GHz	195mm		FCC: BC833E, BM833E, BT840E, BT832XE. All: BT40E	\$3.15
ANT060P	BLE, 2.4 GHz		IP67		\$3.68







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