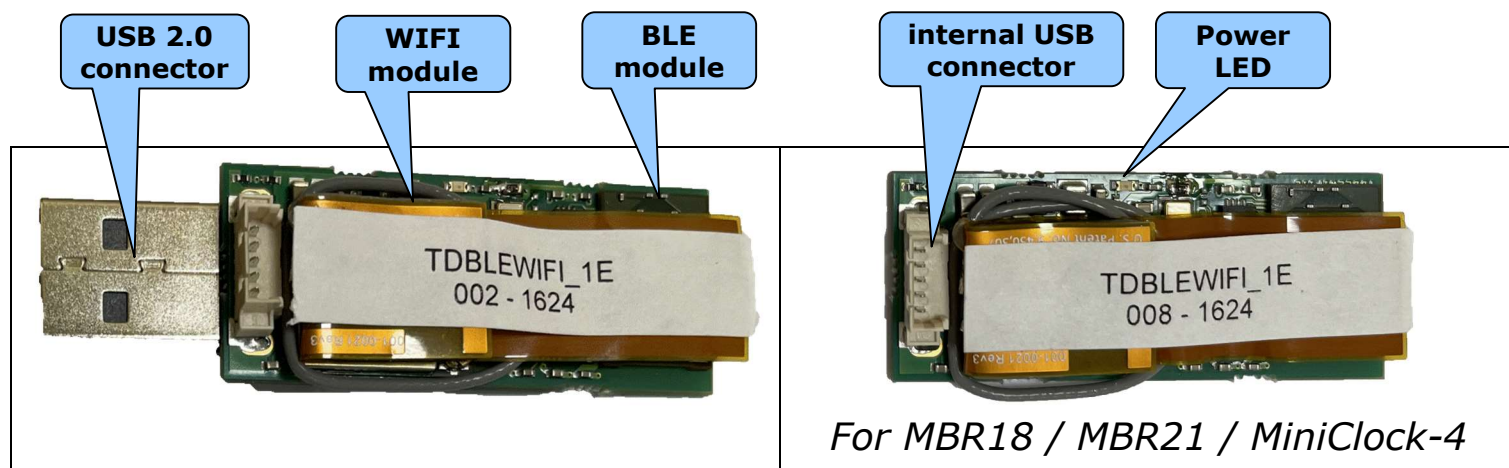


TDBLEWIFI-1E

WIFI (2.4/5GHz) + BLE (Bluetooth 5.1)
Technical Manual **rel 4**



USB connector:

USB 2.0 device connector

INTERNAL USB connector:

USB 2.0 device connector for MBR18, MBR21, MiniClock-4 devices.

POWER YELLOW led:

The power LED be used to judge whether the module is powered on or not. When the module is powered on and initialization is completed, the power yellow LED is ON, otherwise the LED OFF will be maintained all the time.

WIFI module:

Marvell 88W8997, IEEE 802.11 ac/a/b/g/n, Wi-Fi compliant, 2.4 / 5 GHz.

BLE module:

Bluetooth 5.1 low energy modules, 2.4 GHz.



Progettazione e Realizzazione Apparecchiature Elettroniche

BLE NON PAIRING mode 8 bytes ID:

1. APP connect to terminal
2. APP Read 16 bytes OTP code from terminal (*Characteristic 0x00000006*)
3. APP Create transit string (VSIIIIIIITTTTTRRRRRRRR)
4. APP crypt transit string with **EVP_aes_256_cbc**, IV=16 bytes OTP, KEY=32 bytes KEY
(default: 3031323334353637383941424344454630313233343536373839414243444546)
5. APP Write crypt transit string to terminal (*Characteristic 0x00000004*)
6. APP Read result string from terminal (*Characteristic 0x00000005*)

Characteristic 0x00000001-F032-4838-94A4-E60FECF7B0DB (SERVICE_UUID)

Characteristic 0x00000004-F032-4838-94A4-E60FECF7B0DB (WRITE)

VSIIIIIIITTTTTRRRRRRRR – **BEFORE CRYPT** transit string: 23 bytes

byte #0	V	1 byte	'0' stream version
byte #1	S	1 byte	transit sense: 'E' 'U' 'T'
byte #2	IIIIIII	8 byte	ID (used in Itcom.bdg)
byte #10	TTTT	4 byte	timestamp (not used)
byte #14	RRRRRRRRR	9 byte	reason code (right justified, e.g. 000000001)

Then crypt 32 bytes transit string with **EVP_aes_256_cbc**

Characteristic 0x00000005-F032-4838-94A4-E60FECF7B0DB (READ)

Return the ASCII string indicating the result of the transit.

Characteristic 0x00000006-F032-4838-94A4-E60FECF7B0DB (READ)

Read 16 bytes OTP code (for IV encrypt **EVP_aes_256_cbc**), valid 5 sec.

0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn
n=0..9 A..F

From the second attempt to Read, OTP return :

0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00



Progettazione e Realizzazione Apparecchiature Elettroniche

BLE NON PAIRING mode 24 bytes BADGE:

1. APP connect to terminal
2. APP Read 16 bytes OTP code from terminal (*Characteristic 0x00000006*)
3. APP Create transit string (VSIIIIIIIIIIIIIIIIIIIIITTTTTRRRRRRRRR)
4. APP crypt transit string with **EVP_aes_256_cbc**, IV=16 bytes OTP, KEY=32 bytes KEY
(default: 3031323334353637383941424344454630313233343536373839414243444546)
5. APP Write crypt transit string to terminal (*Characteristic 0x00000004*)
6. APP Read result string from terminal (*Characteristic 0x00000005*)

Characteristic 0x00000001-F032-4838-94A4-E60FECF7B0DB (SERVICE_UUID)

Characteristic 0x00000004-F032-4838-94A4-E60FECF7B0DB (WRITE)

VSIIIIIIIIIIIIIIIIIIIIITTTTTRRRRRRRRR - **BEFORE CRYPT** transit string: 39 bytes

byte #0	V	1	byte '2' stream version
byte #1	S	1	byte transit sense: 'E' 'U' 'T'
byte #2	IIIIIIIIIIIIIIIIIIII	24	byte pure BADGE number
byte #26	TTTT	4	byte timestamp (not used)
byte #30	RRRRRRRRR	9	byte reason code (right justified, e.g. 00000001)

Then crypt 32 bytes transit string with **EVP_aes_256_cbc**

Characteristic 0x00000005-F032-4838-94A4-E60FECF7B0DB (READ)

Return the ASCII string indicating the result of the transit.

Characteristic 0x00000006-F032-4838-94A4-E60FECF7B0DB (READ)

Read 16 bytes OTP code (for IV encrypt **EVP_aes_256_cbc**), valid 5 sec.

0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn 0xnn
n=0..9 A..F

From the second attempt to Read, OTP return :

0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00 0x00

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Sede Legale : Via E.Ferrari, 7 20010 Arluno (MI)

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Progettazione e Realizzazione Apparecchiature Elettroniche

BLE PAIRING mode 8 bytes ID:

1. APP pair with terminal
2. APP connect to terminal
3. APP Create transit string (VSIIIIIIITTTTTRRRRRRRRR)
4. APP Write transit string to terminal (*Characteristic 0x00000002*)
5. APP Read result string from terminal (*Characteristic 0x00000003*)

Characteristic 0x00000001-F032-4838-94A4-E60FECF7B0DB (*SERVICE_UUID*)

Characteristic 0x00000002-F032-4838-94A4-E60FECF7B0DB (*WRITE*)

VSIIIIIIITTTTTRRRRRRRRR – transit string: 23 bytes

byte #0	V	1 byte	'0' stream version
byte #1	S	1 byte	transit sense: 'E' 'U' 'T'
byte #2	IIIIIII	8 byte	ID (used in Itcom.bdg)
byte #10	TTTT	4 byte	timestamp (not used)
byte #14	RRRRRRRRR	9 byte	reason code (right justified, e.g. 000000001)

Characteristic 0x00000003-F032-4838-94A4-E60FECF7B0DB (*READ*)

Return the ASCII string indicating the result of the transit.

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Progettazione e Realizzazione Apparecchiature Elettroniche

KEY management:

Default KEY =

0x30 0x31 0x32 0x33 0x34 0x35 0x36 0x37 0x38 0x39 0x41 0x42 0x43 0x44 0x45 0x46

0x30 0x31 0x32 0x33 0x34 0x35 0x36 0x37 0x38 0x39 0x41 0x42 0x43 0x44 0x45 0x46

Command to VERIFY the default KEY in the terminal:

OPT=C2 Data="AesVerBle 3031323334353637383941424344454630313233343536373839414243444546"

Command to WRITE the KEY in the terminal:

OPT=C2 Data="AesKeyBle 00010203040506070809aabbccddeeffaabbccddaabbccddeeffaabbccddaabb"

Command to VERIFY the KEY in the terminal:

OPT=C2 Data="AesVerBle 00010203040506070809aabbccddeeffaabbccddaabbccddeeffaabbccddaabb"

Command to RESET the KEY in the terminal:

OPT=C2 Data="AesClearBle"

Restore KEY =

0x30 0x31 0x32 0x33 0x34 0x35 0x36 0x37 0x38 0x39 0x41 0x42 0x43 0x44 0x45 0x46 0x30 0x31 0x32

0x33 0x34 0x35 0x36 0x37 0x38 0x39 0x41 0x42 0x43 0x44 0x45 0x46

Technical characteristics:

- *BLE ENGINE* *NINA-B416 2.4GHz*
- *WIFI ENGINE* *Marvell 88W8997 2.4 / 5 GHz*
- *ANTENNA* *Build in antenna*
- *USB* *2.0 from HOST*
- *LED* *1 led indicator*
- *SUPPLY* *5Vdc from USB connector*
- *POWER* *1,94W max*
- *DIMENSIONS* *(W x H x D) mm 19 x 44 x 7*
- *WEIGHT* *10g*

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