Type	TM4875A、TM5317A
	TM4875B、TM5317B

Wireless VIM for Software Writing

Operation Manual

Rev 1.0.2

Toyota Technical Development Corporation

FA Technology Dept.

Customer Business Div.

Revision history

Revised page		Revised details	Date	Created
		Newly created.	Aug 25, 2020	Mizuno
⚠ 1		Additional notes on FCC Additional notes on North American specifications		

Introduction

Thank you for purchasing wireless VIM stations and wireless VIM terminals.

This manual is describing on the operation of this product and safety precautions.

Read this manual to end surely to understand the function of this product and use effectively.

- This product is for 12V vehicle only.
- Save this manual for the user to see at any time.
- Do not use this products at purpose except for the original intended use.

Cautions on radio wave

●These products use 2.4GHz. In this frequency, electronic appliance such as microwave oven, equipment for science institution or medical, other radio wave station (Bluetooth、Wireless LAN), licensed internal radio wave station to recognize moving device at plant manufacturing line, special small power radio wave station without license or ham operation (They are defined as [Other radio stations].) are operated by this frequency.

●Before use these products, confirm that [Other radio stations] is not operated near these products.

●If these products interfere [Other radio stations], change the location to use, or stop to the other equipment operation immediately.(Stop the wave transmission)

●Communication with other products of 2.4GHz cannot be performed.

●Do not use the 5GHz band outdoors.

●TM4875A(TM4611-01) is inspected by construction design certification as specific radio equipment

　⊖Ⓡ 001-P00519

●TM4875A(TM4611-01) corresponds to China [信部无[2005]423 号　微功率(短距离)无线电设].

●TM5317A(TM5317-21) is inspected by construction design certification as specific radio equipment.

　⊖Ⓡ 008-200362

FCC CAUTION ⚠ 1

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.

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.

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 has very low levels of RF energy that is deemed to comply without maximum permissive exposure evaluation (MPE).

IC CAUTION ⚠ 1

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 present appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisee aux deux conditions suivantes :

1) l'appareil ne doit pas produire de brouillage;

2) l'utilisateur de l'appareil doit accepter tout brouillage radioelectrique subi, meme si le brouillage est susceptible d'en compromettre le fonctionnement.

This radio transmitter (21131-TM4969) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Antenna type: chip antenna Gain:0.5dBi

Antenna type: patch antenna1 Gain:8.1dBi

Antenna type: patch antenna2 Gain:8.1dBi

Le présent émetteur radio (21131-TM4969) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste,et dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Type d'antenne: antenne à puce Gain: 0.5dBi

Type d'antenne: antenne patch1 Gain: 8.1dBi

Type d'antenne: antenne patch2 Gain: 8.1dBi

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 equipement est conforme aux limites d'exposition aux rayonnements enoncees pour un environnement non controle et respecte les regles d'exposition aux frequences radioelectriques (RF) CNR-102 de l'IC. Cet equipement doit etre installe et utilise en gardant une distance de 20 cm ou plus entre le radiateur et le corps humain.

Safety Precautions

This section contains important information that is necessary for using the products safely.
Please be sure to read this safety precaution before using the product.

<Level of risk and injury>

Indicators		Explanation
⚠	WARNING	This symbol indicates that could result in serious injury or detath.
⚠	CAUTION	This symbol indicates that could result in injury or property damage.

<Explanation of picture indicators>

⚠	**General caution**
⚡	**Risk of electric shock** ●This indicates the possibility of an electric shock under specific conditions.
🚫	**General prohibition** ●This indicates actions that are prohibited when operating this product.
🚫	**Wet hands prohibited** ●This indicates the possibility of an electric shock if the product is operated while the user's hands are wet.
🚫	**Disassembly prohibited** ●This indicates the possibility of an electric shock or other injury occurring due to disassembly of the product.
🚫	**Exposure to water prohibited** ●This indicates the possibility of a short circuit, electric shock, a fire, or other problem occurring due to exposure to water.
❗	**General instruction**
🔌	**Remove the power plug from the power outlet.**

	⚠ WARNING	
🚫	**Do not insert items inside of the housing.** ●There is a risk of electric shock or fire and this may also cause malfunctions.	
	Do not use with a power source other than the specified power source. ●There is a risk of electric shock or fire and this may also cause malfunctions.	
🚫	**Do not operate with wet hands.** ●This may cause an electric shock.	
🚫	**Do not disassemble or modify the product.** ●There is a risk of electric shock or fire and this may also cause malfunctions.	
❗	**Securely insert the power plug into the power outlet completely up to its base.** ●This may cause a fire due to electric shock and generation of heat.	
	Regularly wipe dust off of the power plug. ●Dust may cause a fire. Please remove the power plug from the outlet and wipe it with a dry cloth.	

⚠CAUTION	
🚫	**Use of non-specified parts is prohibited.** ●There is a risk of fire and this may also cause malfunctions.
	Connection to non-specified devices and cables is prohibited. ●There is a risk of fire and this may also cause malfunctions.
	Do not use the product when the cable is in a pinched or bundled condition. ●There is a risk of fire and electric shock as well as malfunctions due to cable damage or heat generation.
	Do not place other items on top of the product. ●This may cause a fire due to warping or damage to the case.
	Do not get the product wet or allow water or solvents to get on it. ●There is a risk of electric shock or fire and this may also cause malfunctions.
	Do not use the product in a tightly enclosed place or place a cover on it. ●This may cause the generation of heat or a fire.
🚫	**Do not use the product in a place where it may get wet.** ●There is a risk of electric shock or fire and this may also cause malfunctions.
🔌	**Remove the power plug from the outlet before conducting maintenance or leaving the product unused for a long period.** ●There is a risk of electric shock or fire and this may also cause malfunctions.
	Turn the power off when attaching and removing the power plug. ●There is a risk of electric shock or fire and this may also cause malfunctions.
	Immediately turn the power off when abnormal noise, abnormal smell, or smoke is produced. ●If the product continues to be used in this state, it may cause an electric shock or fire due to a short circuit.

A request	
Please do not peel off or stain the safety-related indicators. ●This may cause improper use.	
🗑	**This product complies with the WEEE Directive (2002/96/EC) marking requirement.** **Do not dispose in domestic household waste.**

Table of contents

1. Product outline

1.1 Uses

This product is the interface (Shown as I/F) to perform diag communication between TVECSIII and the vehicle by radio wave.
It is composed by wireless VIM station (Shown as wireless ST) connected to TVECSIII and wireless VIM terminal (Shown as wireless terminal) connected to the vehicle .

1.2 Functions

Diag communication function
・Vehicle communication (High speed CAN communication) supported by diag CAN prococol (ISO15765).
・Vehicle communication (ISO9141 K line) supported by KWP2000 diag protocol (ISO14230).
・Vehicle communication supported by diag ehter protocol.
・Vehicle communication compliant with the Diag Ether protocol.
・Setting to radio wave frequency, ID and power of transmittion.
・Prevent the miss reading of the vehicle by BodyNo during radio wave connection.
・CAN-FD (*CAN FD is equipped with only hardware functions.)

ECU reprogramming
・The ECU is reprogrammed using the ECU reprogramming data (.cuw) stored

in the main microcomputer.

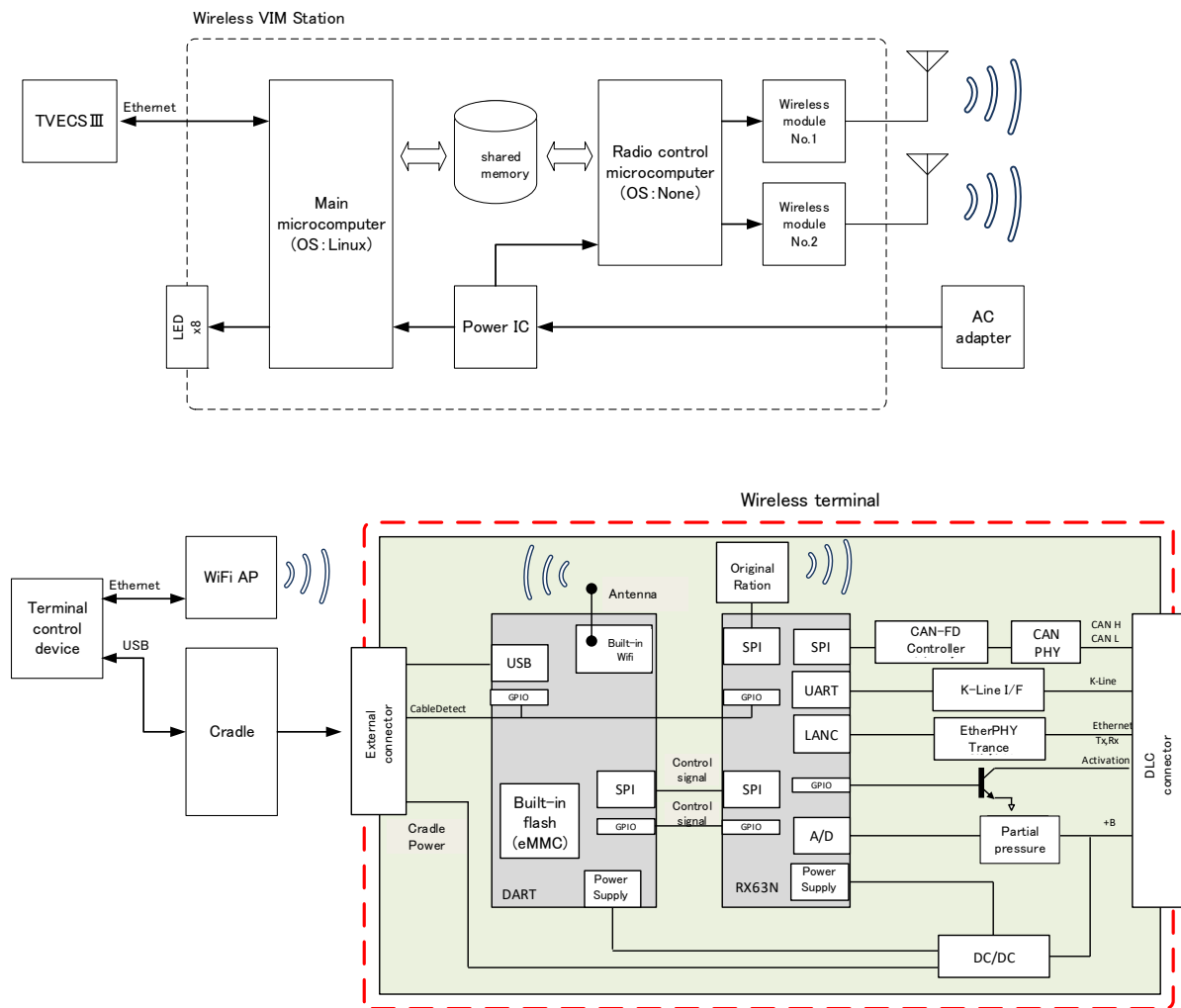Supported communication: CAN, CAN FD (scheduled to be released)

Figure 1 System configuration

1.3 Operation Environment

This product is connected with TVECSIII.

For operation environment, confirm the condition of TVECSIII operation.

1.4 Diag Communication Specification

Diag communication specification for this product is based on following specification by TMC.

・Phase3 Diag communication specification Ver.P1.13　（Issued 22th Feb, 2002）

・Phase4 Diag communication specification Ver.2.15-c　(Issued 13th Jan, 2012)

・Phase5 Diag communication specification

・Phase5 Diag ether communication specification

Word explanation

●Operation mode of wireless ST

Status	Contents
Search Mode	Initial status after start. Search wireless terminal (Initial mode, Parameter writing wait mode) by wireless.
Inspection Mode	Perform diag communication with the vehicle through wireless terminal (Inspection mode).
Parameters Write Mode	Write parameter for wireless terminal (Parameter write mode). Write BodyNo mainly.
Maintenance Mode	Change wireless ST parameter (Through wired LAN)。 No wireless communication at this mode.

●Operation mode of wireless terminal

Status	Contents
Initial Mode	Initials status after start in BodyNo wireless registered terminals. Wait for test mode transition instruction from wireless ST.
Inspection Mode	Diag communication is performed. According to wireless ST instruction, Diagnostic program communication with vehicle is performed, and send communication results to wireless ST. Mode to confirm write completion result.
Software Write Mode	Mode that downloads software write data and performs write.
Parameter Write Wait Mode	Status of start at BodyNo delete. Wait receiving shift instruction to parameter write mode.
Parameter Write Mode	Register (write) BodyNo that was instructed by wireless ST register.
Sleep Mode	Modes that is running on power savings. Shift to sleep mode if set time by initial or parameter write mode is passed.

●[Radio frequency]

Communication is performed out in setting frequency. it is necessary to match the radio frequency of wireless ST and wireless terminals for communication.

●[Wireless ID]

Only if wireless ID is matched, it is functioned as receive filter.

Transmitted data from wireless VIM station are identified by wireless terminals in the same radio frequency or adjacent frequencies.

However, if it was sent in same frequency, it is impossible to communicate normally because of interference.

(Specials function for being identified by wireless terminals near line)

Keep wireless ID for inspection mode as ID for parameter write wait mode when BodyNO delete so that next line is not identified incorrectly when Diag when disconnection confirmation after Diag inspection.

(Example)

Mode	Inspection mode	(BodyNo delete)	Parameter write wait mode
Wireless ID	01	→	01

2.Product composition

2.1 Component parts

<Main body>
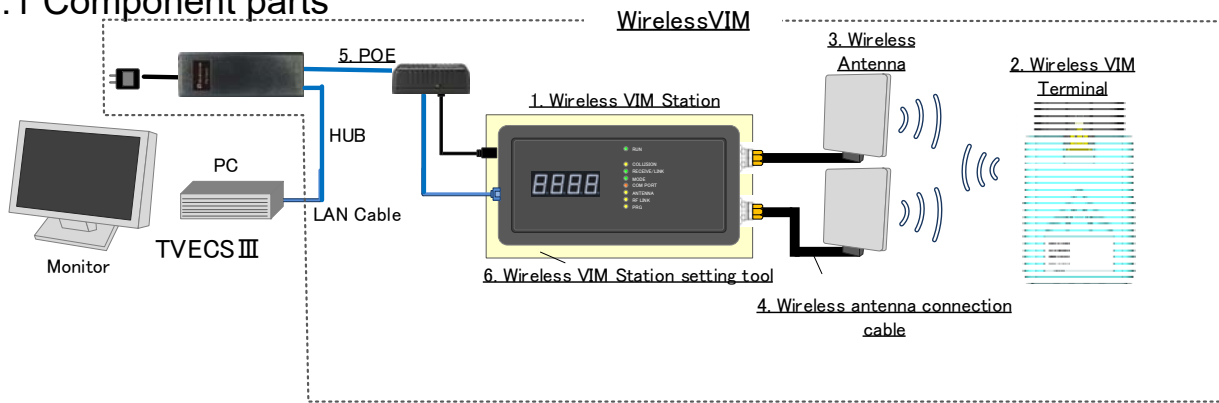
| N0.	Item name	Type	Remarks
1	Wireless VIM Station	TM4875A/TM4875B	TM4875B：For USA / Canada
2	Wireless VIM Terminal	TM5317A/TM5317B	TM5317B：For USA / Canada

<Option>

N0.	Item name	Type	Remarks
3	Wireless antenna	PA2409S	Manufacturer: NATEC
4	Wireless antenna connection cable	C5SFAL-SPP-EXT10MF	Manufacturer: Antenna Technology Wire: 5D-SFA-LITE Connector: SMAP-SMAP
5	POE Splitter POE Injector	POS-1002 POI-2002-V3	Manufacturer: LevelOne Input: 100-240V AC Output: DC12V
6	Wireless VIM station setting tool	TM3523-07	Use to install wireless VIM station

* For No.3 wireless antenna, not use except for "PA2409S".

2.2 Part names

《No.1　Wireless ST》

171 [mm]

40 [mm]

85 [mm]
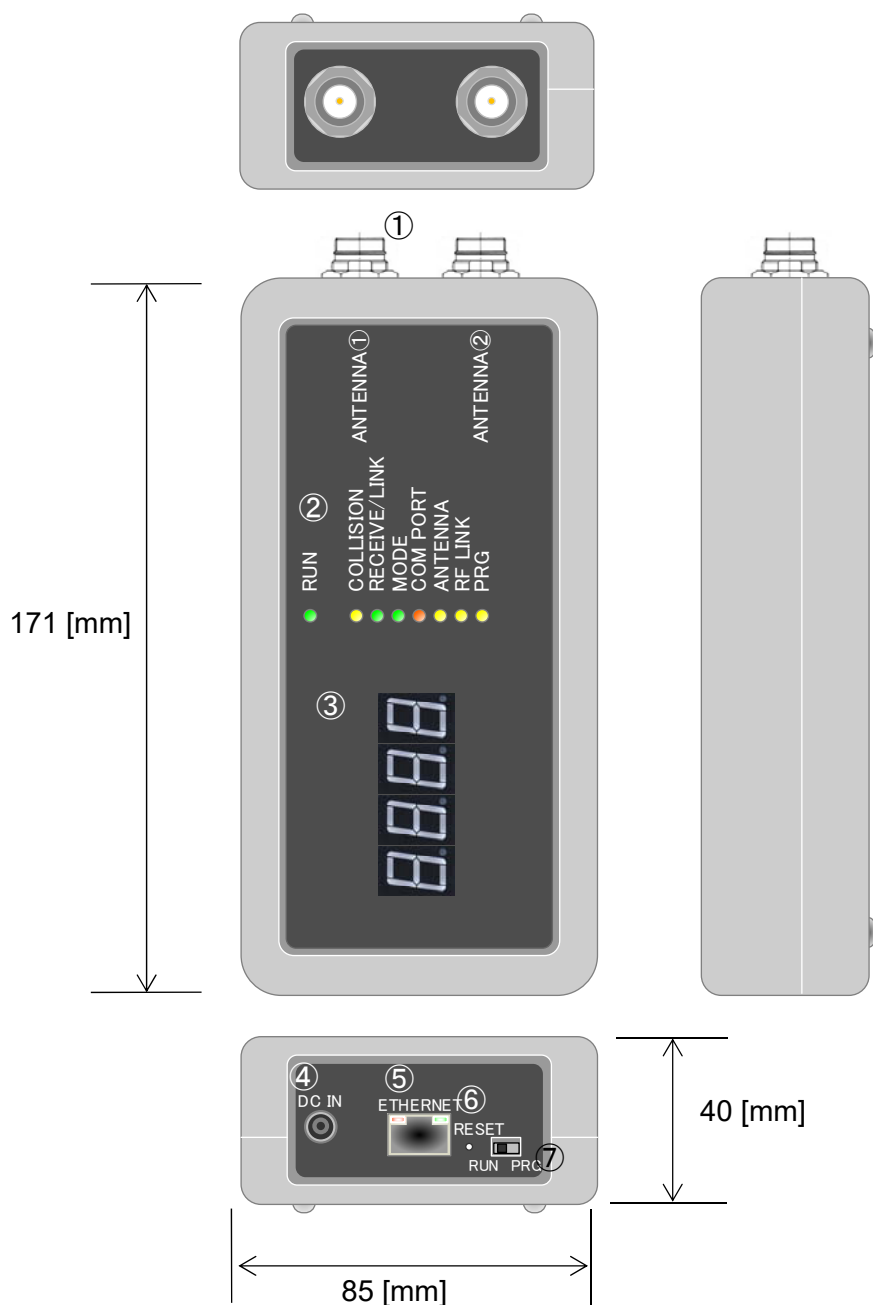
◇Function name

| No.	Names	Marks	Purpose
①	SMA jack for wireless antenna	-	Wireless antenna connection
②	Status LED	-	Wireless ST status display (Referto next content）
③	Status (7 segment)	-	Radio frequency display (Refer to next content)
④	DC jack	DC IN	Power supply connection
⑤	Ethernet connector (RJ-45)	ETHERNET	PC communication
⑥	Reset switch	RESET	Wireless ST reset
⑦	Switch for progralm write	RUN、PRG	Internal program rewriting

◇Status LEDs function

Name	Color	Contents
RUN	Green	**Wireless ST start status** On: Starting（Just after power is supplied） Blink: Running（Blink 2 sec approximately） Off: Device power is OFF.
COLLISION	Yellow	**Ethernet collision detection** On: Data collision Off: Normal * With RJ-45 connector（COLLISION）
RECEIVE/LINK	Green	**Ethernet link** On: Connection status is good. Blink: Data communication Off: Connection is not performed or confirmed. * With RJ-45 connector（RECEIVE/LINK）
MODE	Green	**Operation status** On: Inspection mode Blink: Parameter write mode Off: Search mode
COM PORT	Orange	**Wireless ST diag communication status** On: Communicating Off: Without communication
ANTENNA	Green	**Antenna** On: ANTENNA 1 is used Off: ANTENNA 2 is used
RF LINK	Green	**Communication status between wireless terminals** On: Communicating Off: Without communication
PRG	Green	**Program rewriting mode** On: Program rewriting mode Off: Normal operation mode

◇Status (7 segmentLED) function
Display frequency set for Wireless module.
[----] is displayed when wireless communication is stopped.

《No.2 Wireless terminal》
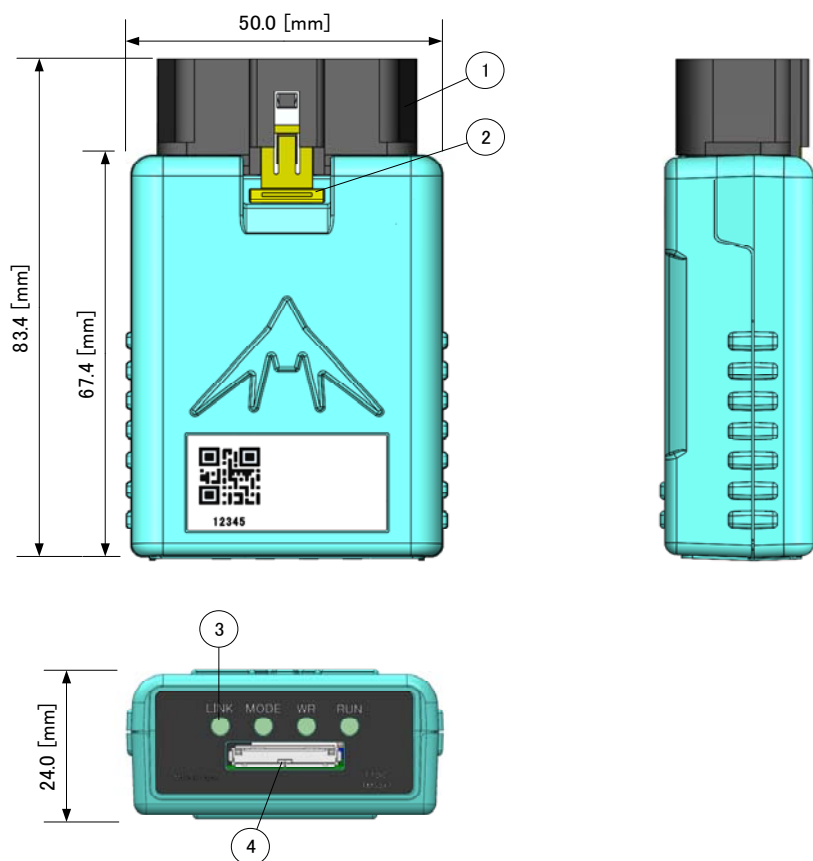
◇Function name

No.	Name	Purpose
①	DLC3 connector	Vehicle connection
②	Disconnection prevention lock	Wireless terminals disconnection prevention
③	Status LED	Wireless terminals status display （Refer to followings）
④	FLASH connector	For cradle connection

◇Status LED function

Name	Color	Contents
LINK	Orange	**Communication status between Wireless ST** On: Communicating Off: Without communication
MODE	Orange	**Operation state** On: Initial mode（BodyNo is registered） Blink: Inspection mode（Cycle Approx. 2 sec） Parameter write mode（Cycle Approx. 1 sec） Off: Parameter write wait mode（BodyNo is not registered.）
RUN	White	**Wireless terminal starting status** On: Starting（Just after power supply） Blink:: Operation normally（Cycle Approx. 2 sec） Off: Device power is off or sleep
WR	Green	**Software write result** On: Software writing success Blink: Software writing fail (Cycle Approx. 500 msec) Software writing processing (Cycle Approx. 2 sec) Off: Software writing is not processed

◇Pin configuration

| Signal names	Marks	DLC3 Vehicle connector
(N.C)	-	1
(N.C)	-	2
RX+(Ether)	RX+	3
Chassis GND	CG	4
Signal GND	SG	5
CAN High	CAN_H	6
ISO9141 K-Line	SIL	7
Activation(Ether)	ACT	8
(N.C)	-	9
(N.C)	-	10
RX-(Ether)	RX-	11
TX+(Ether)	TX+	12
TX-(Ether)	TX-	13
CAN Low	CAN_L	14
(N.C)	-	15
Vechicle Battery	VB	16

3.How to operate

3.1 Mode shift

This system performs diag communication, frequency control for BodyNo delete/write process and judgment to perform process for each stations. So mode control is performed at wireless station and wireless VIM.
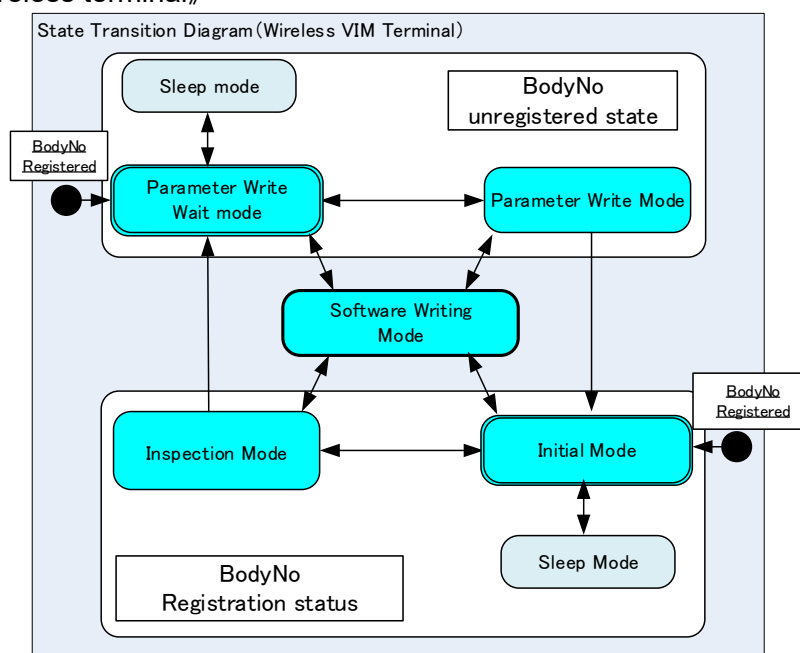
Wireless ST and wireless terminal perform mode transitions by TVECSIII command.
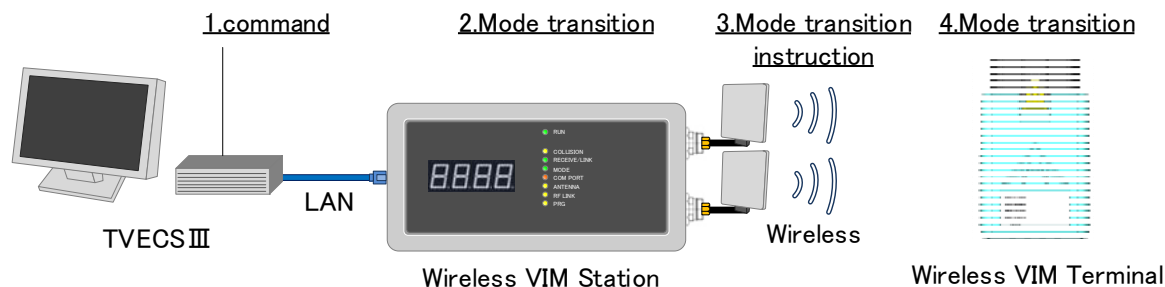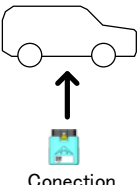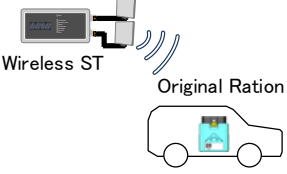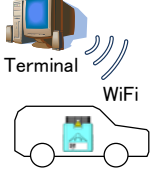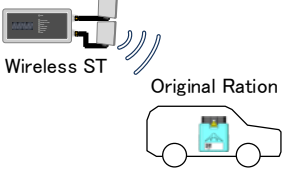

《Wireless ST》
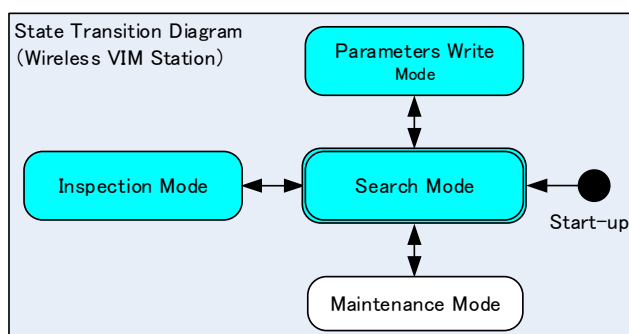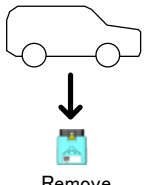
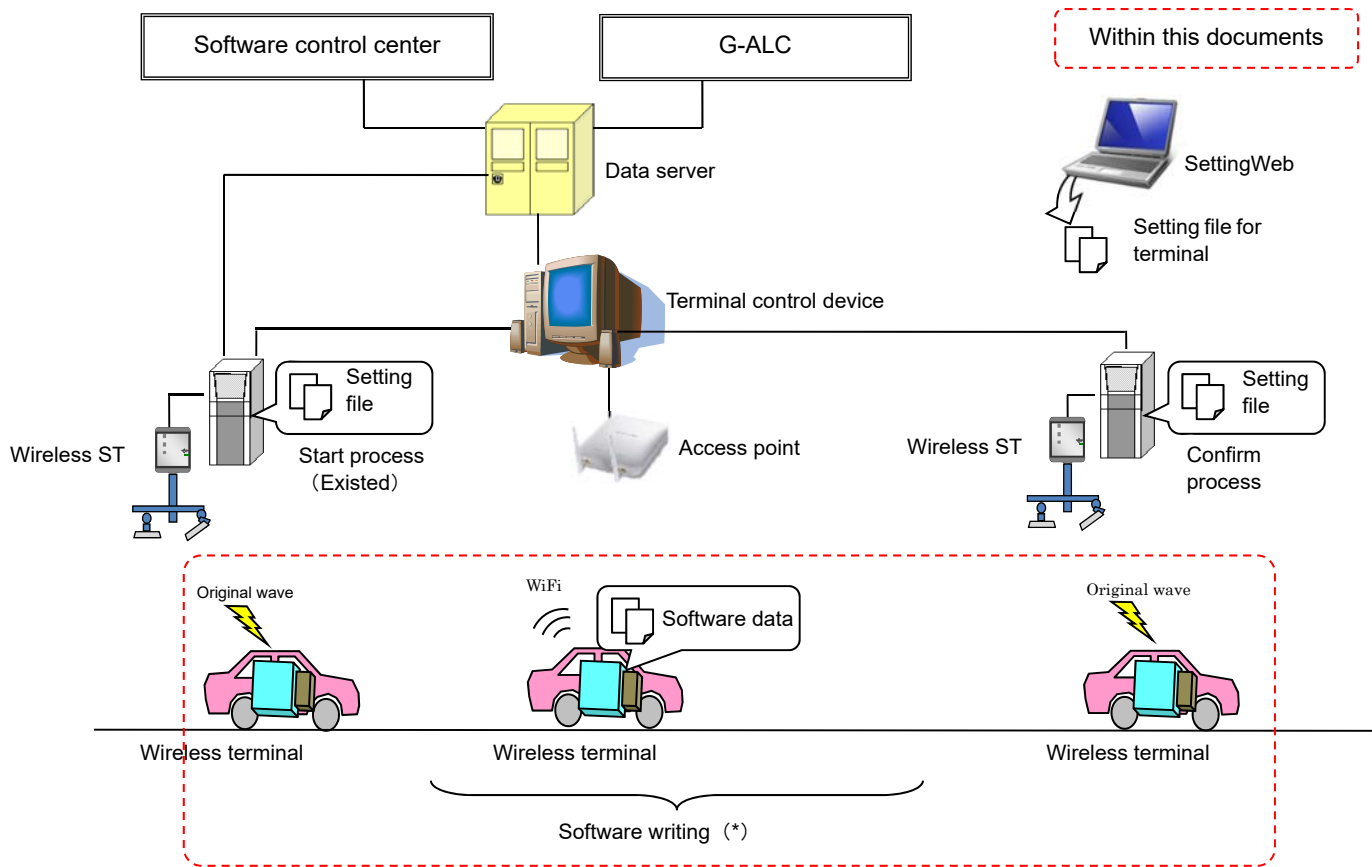《Wireless terminal》

3.2 Mode shift flow outline (By wireless)

<u>Example of process</u>

Implementation timing	Before inspection		VinNo writing	Software writing	Completion confirmation	After inspection	
Communication content	None	①BodyNo writing	②Diag communication	③Software writing （DL、VinNo verification）	④Write completion ⑤Diag communication	⑥BodyNo Deletion	None
Wireless VIM terminal Installed condition	Conection	Wireless ST / Original Ration		Terminal / WiFi	Wireless ST / Original Ration		Remove

3.4 Software writing specifiation

＜Plant outline＞

* Software writing is performed by autonomous wireless terminal.（Estimated within 180 sec）
  ⇒ Operating on main conver and terminal is not joined at writing.

＜Device explanation＞

Device		Contents
Data server		Save various data from upper system
SettingWeb		Set terminal operation
Terminal control device		Display software data transformation to wireless terminal and status of software writing
Terminal	Start process	Process to prepare for softwarewriting Instruct to start software writing to wireless terminal
	Confirm process	Process to confirm if software writing is completed normaly

＜Restriction＞

・VIN No is required to registered to vehicle before software writing is started.

⇒ Conrirm if VIN NO of vehicle is same as from terminal control device for Wireless terminal.

・Vehicle is always IG-ON when software writing.

・Wireless terminal cannot be disconnected from start process to confirmation process.

・Original wireless system of wireless terminal and WiFi cannot be used same time.

⇒ Inspection by diag communication cannot be performed when software writing.

・If software data is large size, writing maybe not completed by required time.

Software data (.cuw) size is estimated to 1-2MB.（Size of 1 file）

If there are multiple software data (.cuw), file summary is maximum 10MB.

・Caution of WiFi(Wireless terminal) usage

This product cannot be used by 5GHz range outdoor.

If this product is used outdoor, use 2.4GHz range.

・If many WiFi device are used or radio wave condition is not good,

Writing cannot be completed within estimated period because of communication

error/communication speed reduction.

⇒ Perform WiFi condition control / maintenance by customer after deriverly of this products.

・Caution of access point (WiFi router) usage

Use by access point mode (Bridge mode). (Router function is OFF）
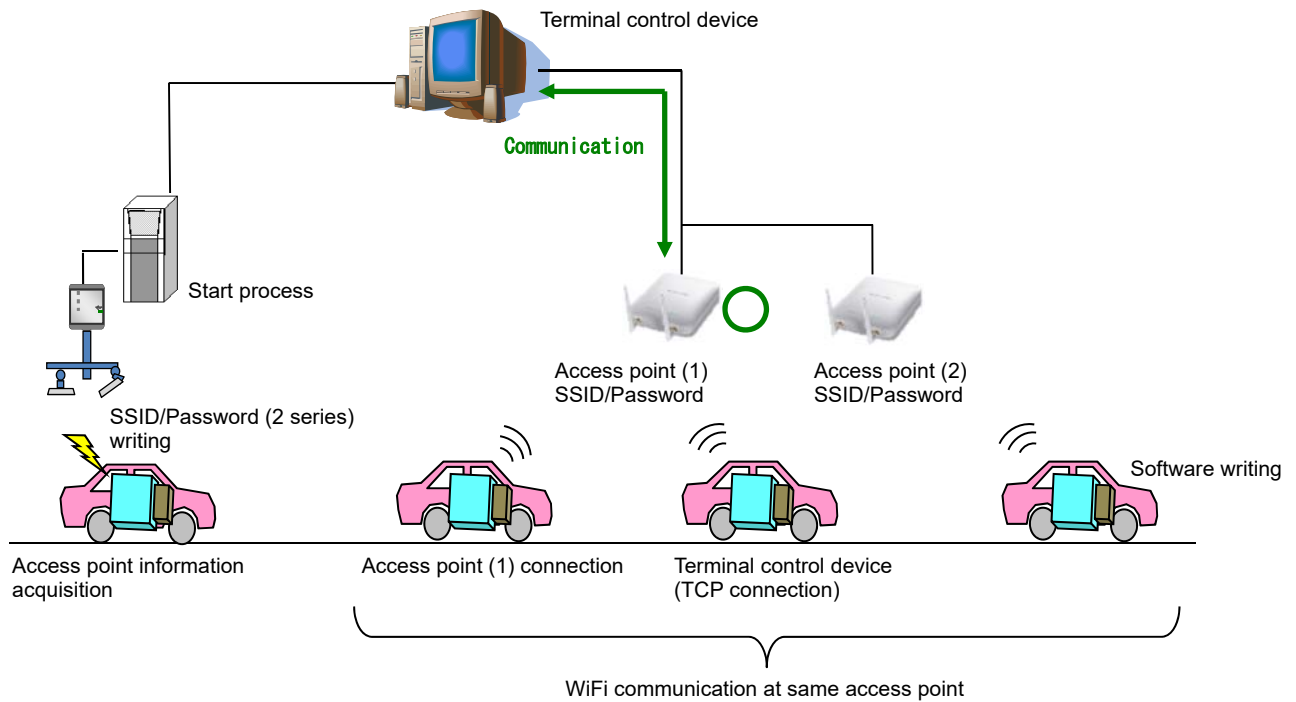
3.4.5 WiFi access point connection

Connect to access point by access point SSID and password (2 series) acquired from terminal (Wireless station).

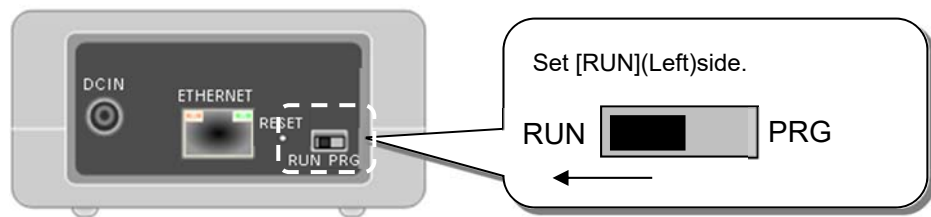Connect order is from access point (1).

If connection to access point (1) is failed, connect to access point (2).

1) If it tries to access point (1) and connection is succeeded, WiFi communication is performed by access point (1).

3.5 Preparation

①　Confirm if the below switch of wireless ST for program write is [RUN] side.

Set [RUN](Left)side.

RUN ▮ PRG

②　Install wireless antenna to communicate with wireless terminal and connect wireless antenna cable to SMA jack on wireless ST.
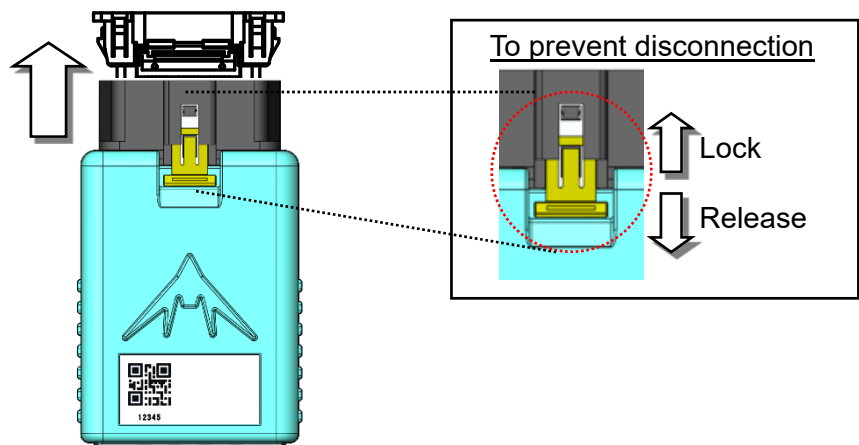
ANTENNA 1

ANTENNA 2
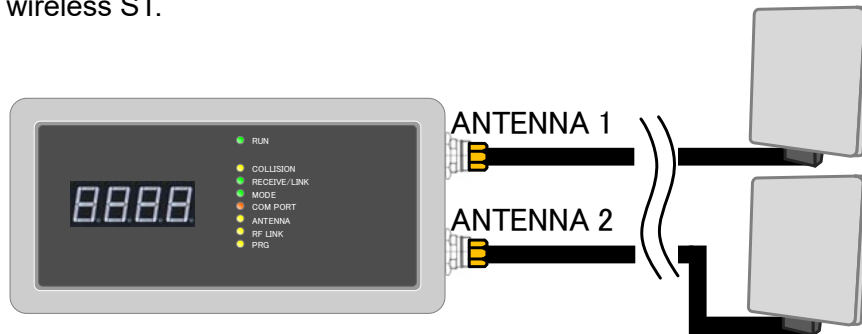
③　Connect between wireless ST and TVECSIII by LAN cable.

Connect LAN cable into [ETHERNET] connector of wireless ST.
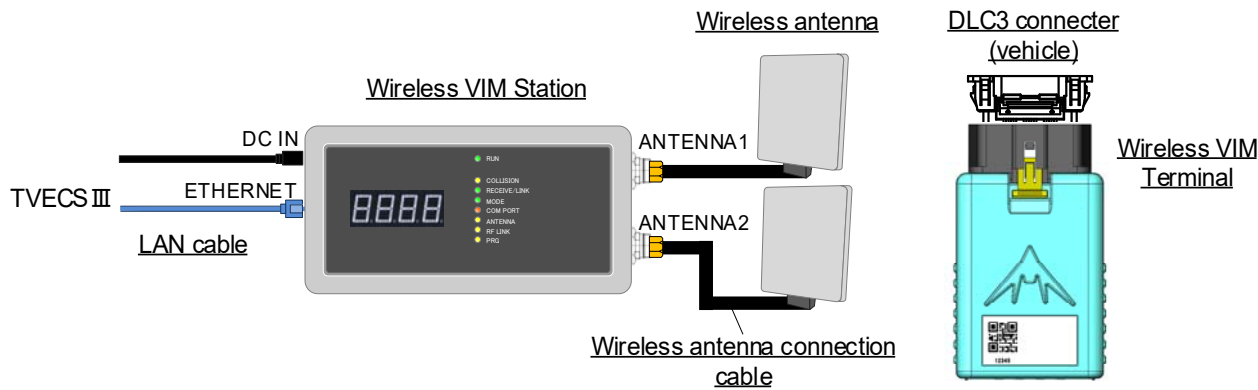LAN cables can be used straight/crosses cables both.
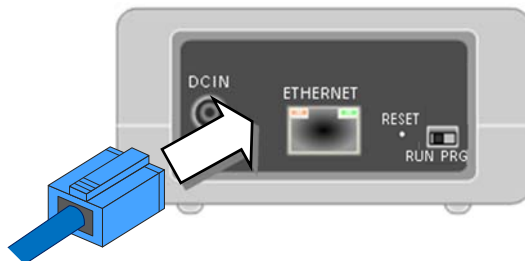
④　Connect POE to wireless ST.

Connect POE into DC jack [DC IN] of wireless terminal, connect to AC plug and enter power supply.
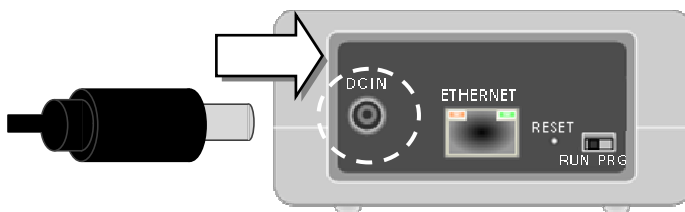
⑤ Connect wireless terminal to DLC3 connector on vehicle.

Release disconnect prevention lock and connect a connector deeply.

To prevent disconnection

Lock

Release

After ①-⑤ are performed, connection are as followings.

Wireless antenna

DLC3 connecter
(vehicle)

Wireless VIM Station

DC IN

ETHERNET

TVECSⅢ

LAN cable

ANTENNA1

ANTENNA2

Wireless VIM
Terminal

● RUN
● COLLISION
● RECEIVE/LINK
● MODE
● COM PORT
● ANTENNA
● RF LINK
● PRG

Wireless antenna connection
cable

⚠ WARNING

	Securely insert the power plug into the power outlet completely up to its base. ●This may cause a fire due to electric shock and generation of heat.

⚠ CAUTION

|	**Use of non-specified parts is prohibited.** ●There is a risk of fire and this may also cause malfunctions.
	Connection to non-specified devices and cables is prohibited. ●There is a risk of fire and this may also cause malfunctions.
	Do not use the product when the cable is in a pinched or bundled condition. ●There is a risk of fire and electric shock as well as malfunctions due to cable damage or heat generation.

3.6 Operation

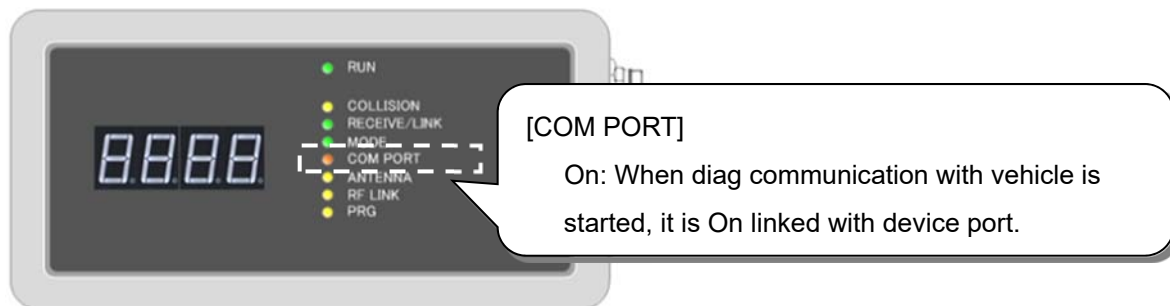《Wireless ST》

①　If wireless ST is supplied power, [RUN] LED lights.

　　It lights when starting and flash by 2 sec cycle (0.5Hz) after start is completed.

[RUN]

　　On: starting

　　Blink: After start completion
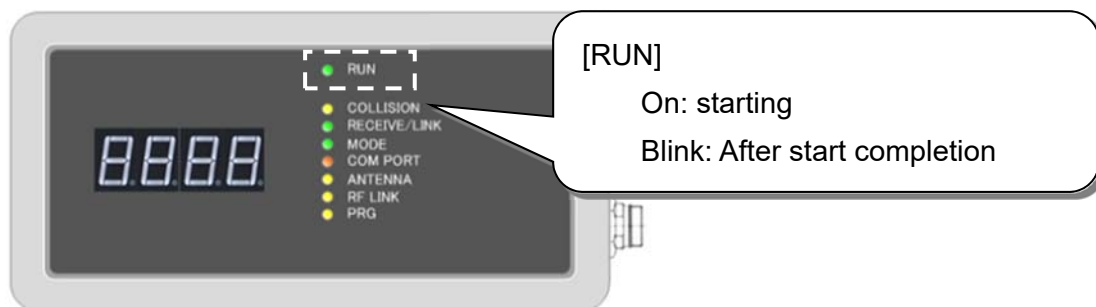
②　If data packet of Ethernet is recognized, [RECEIVE/LINK] LED is lighting/flashing.
If data collision occurs, [COLLISION] LED is light/flashing. These 2 LEDs is linked to　　Ethernet connector LED.

[COLLISION]

　　On: LAN data collision

[RECEIVE/LINK]

　　On: Normal Ethernet connection

　　Blink: Flash at data communication
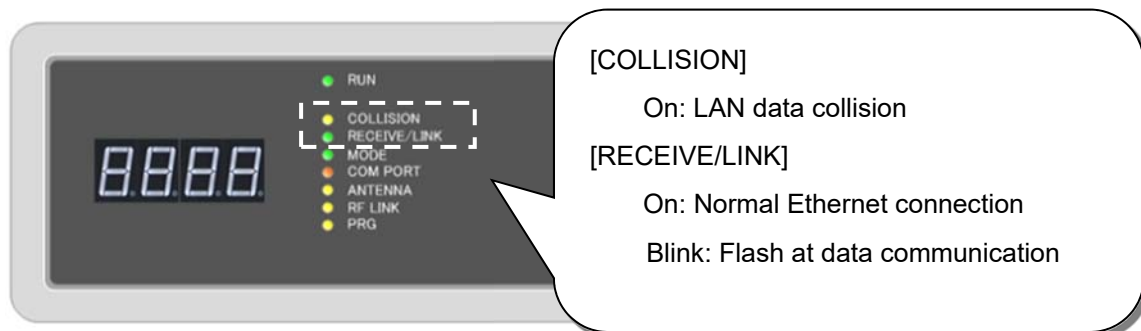
③　When diag communication is started, [COM PORT] LED us lighting linked communication port control.

[COM PORT]

　　On: When diag communication with vehicle is

　　started, it is On linked with device port.

④　If communication with wireless terminal is started, [RF LINK] LED is lighting linked with communication port control.
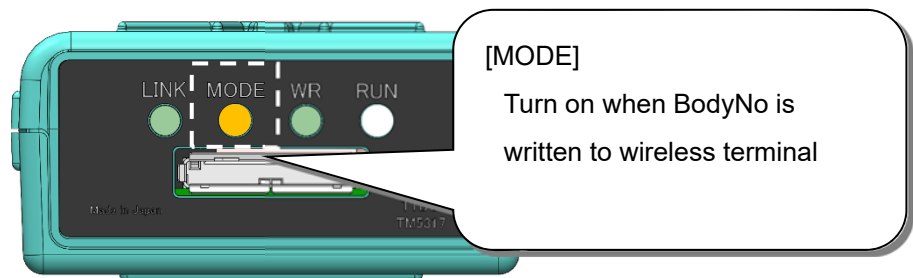
[RF LINK]

　　On: Communicating with wireless terminal.
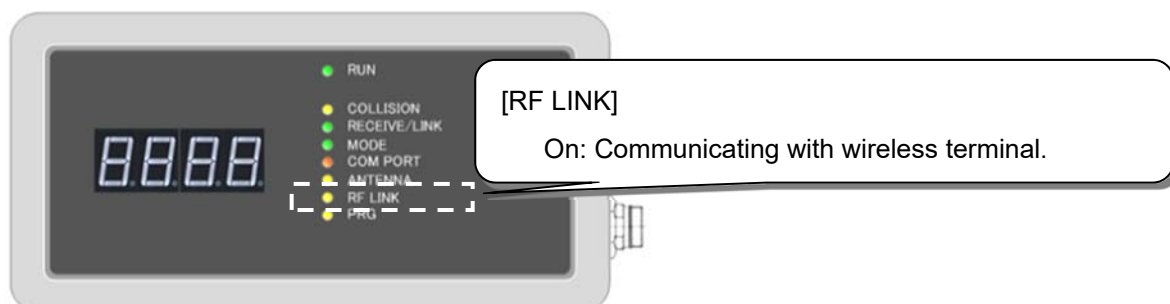
《Wireless terminal》

① When wireless terminals are connected to DLC3 connector of vehicles, [RUN] LED flashes 1 sec cycle
　　(1Hz).
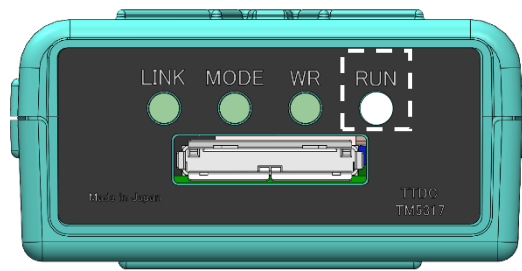
② If BodyNo is written to wireless terminals (at initial mode), [MODE] LED is turned on.

[MODE]
　Turn on when BodyNo is
　written to wireless terminal

③ When communication with wireless ST is started, [LINK] LED is turned on linked with communication
　　port control.

[LINK]
　Turn on when communicating with
　wireless ST.
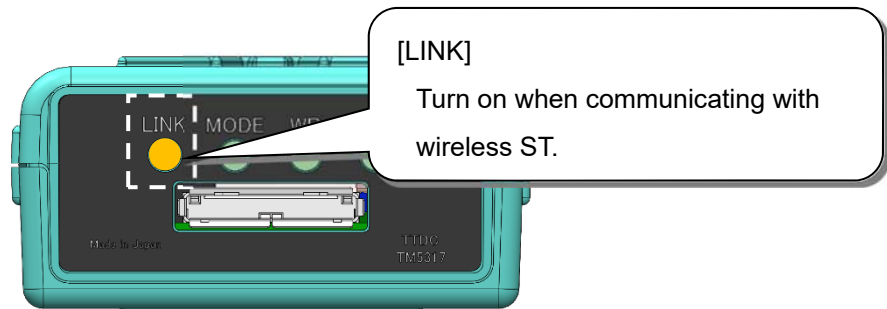
④ When Initial /Parameter write wait mode, it is shifted to sleep mode after set time is passed.
　　 (This time, [RUN] LED is turned off.)
　　If it is returned from sleep mode, send mode shift instruction from wireless ST, or insert/remove
　　　wireless terminal with vehicle DLC3 connector(Restart wireless terminal).

Mode transition instructions are transmitted by Wireless VIM Station

Wireless VIM Terminal
Restart
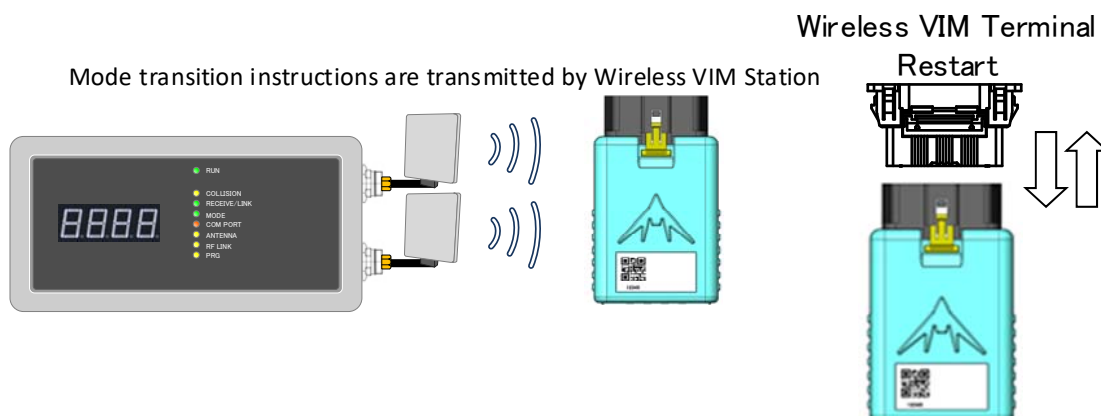
## 3.7 Rewriting Program

Refer to the "Firmware programming manual" for the reprogramming procedure of wireless ST reprograming.

<Operation of the VIM reprogram switch>

Slide the switch using a small screw driver (minus), etc.

Reprogram switch is [PRG] side.

RUN PRG

Small screw driver (Minus type)
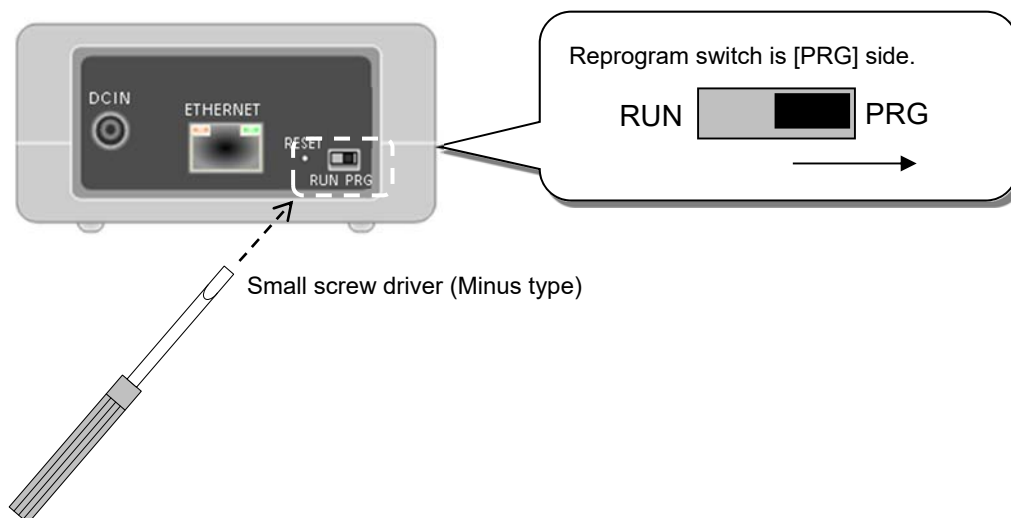
After program rewriting is completed, Shift switch option to [Run] (Left) by screwdriver (Minus type).

Rreprogram switch is [RUN] side.

RUN PRG
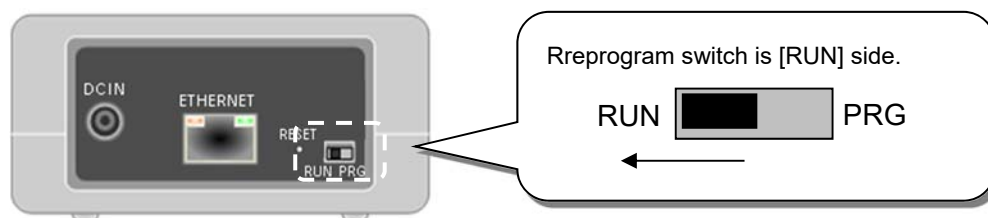
⚠CAUTION

| 🚫 | **Handle the switch carefully.** |
| | ●There is a possibility that the sharp portion causes injury. |

4.Maintenance

4.1 Inspection

Please regularly conduct the following inspection in order to ensure safety.

(1) Inspection of the AC/DC adapter

When the AC/DC adapter cable has a crack or damage, please replace it with a new AC/DC adapter.

There is a risk of electric shock or fire and this may also cause malfunctions.

<table>
<tr><td colspan="2" align="center">⚠ CAUTION</td></tr>
<tr><td>🔌</td><td>Remove the power plug from the outlet before conducting maintenance or leaving the product unused for a long period.
●There is a risk of electric shock or fire and this may also cause malfunctions.</td></tr>
</table>

(2) Inspection of wireless terminal

If wireless terminal is damaged, replace new device.

If damaged, vehicle may be damaged or diag communication malfunction may occur because of connection failure.

 * Refer to [7.Warranty] for connector.

(3) Inspection of Wireless ST

Confirm if each LED turns on by this procedure.

If LED dose not turn on despite of procedure, hardware may be failed.

Consumable

No	Name
1	DLC3 connector

4.2 Troubleshooting

《Wireless ST》

No	Phenomenon	Possible cause	Countermeasure
1	Even though power is supplied, RUN LED is not blink.	AC adapter Connection error	AC adapter cable may be disconnected. Confirm if it is connected to power receptacle of wireless ST.
2		AC malfunction	Replace AC adapter to spare part and confirm if power is supplied.
3		AC power is not supplied	AC primary power may not be supplied. Confirm if power is supplied.
4		Program rewriting mode	Program rewriting switch may be [PRG] side. Change [RUN] side.
5		Hardware error	Hardware may be error. Replace to spare and contact us.
6	RECEIVE/LINK LED is not Off.	LAN connection failure	LAN cable may be disconnected. Confirm if cable is connected. Or, LAN cable may be open. As damaged LAN cable may cause connection failure, do not use.
7		Hardware error	Hardware may be error. Replace to spare and contact us.
8	COLLISION LED is On.	Ethernet communication error	Communication between PC and Ethernet may not be correct. Confirm all device connection if multiple wireless ST is connected to the same TVECSII.
9		Hardware error	Hardware may be error. Replace to spare and contact us.
10	PRG LED is On.	Hardware error	Hardware may be error. Replace to spare and contact us.
11	ANTENNA LED is blink.	Wireless antenna cable error	Wireless antenna cable connection may be error such as open or uneven. Confirm condition of cable connection.
12		Ratio strength is low level.	Because of location of wireless antenna and terminal, radio strength may be low level. Adjust wireless antenna location.
13	Wireless VIM error occurs.	Wireless connection cannot be performed.	Radio frequency and ID setting may not be correct. Modify frequency and ID by wireless ST and terminal.
14		Cable connection malfunction	Confirm if COMPORT LED is On. If Off, LAN cable may be damaged.

《Wireless terminal》

No	Phenomenon	Possible cause	Countermeasure
1	RUN LED is not blink	DLC3 connection error	Wireless terminal may not be connected to DLC3 connector. Confirm if it is inserted correctly.
2		Sleep mode	Disconnect and connect wireless terminal with DLC3 connector and supply power again.
3		Hardware error	Hardware may be malfunction. Replace it to sub unit and contact us.
4	Wireless VIM error occurs	Vehicle ignition OFF or ACC	Turn ON vehicle ignition. Some ECU cannot communicate if vehicle ignition is OFF or ACC.

5.Specification

5.1 Wireless VIM station

Electrical specification

TM4875A

Function		Contents
Wireless I/F	wireless standard	JAPAN(ARIB STD T-66)
	antenna	Attaching externally (SMA Jack)
	Radio frequency	2402-2480MHz(1MHz Interval)
	transmission output	-21dBm～+5dBm
Ethernet		1ch (10BASE-T、100BASE-TX)
size		171×85×40mm
Power supply		Rating 12V (8V～16V)
Consumption electric current (power supply 12V time)		180mA
Weight		255.8g
Movement environment		Temperature / humidity range 0～50℃/20～85%RH
Preservation environment		Temperature / humidity range -20～70℃/20～85%RH

TM4875B

Function		Contents
Wireless I/F	wireless standard	JAPAN(ARIB STD T-66)
	antenna	Attaching externally (SMA Jack)
	Radio frequency	2402-2479MHz(1MHz Interval)
	transmission output	-21dBm～+4dBm
Ethernet		1ch (10BASE-T,100BASE-TX)
size		171×85×40mm
Power supply		Rating 12V (8V～16V)
Consumption electric current (power supply 12V time)		180mA
Weight		255.8g
Movement environment		Temperature / humidity range 0～50℃/20～85%RH
Preservation environment		Temperature / humidity range -20～70℃/20～85%RH

Parameter for wireless　(For details, refer to [6.Parameter explanation].)

Item		Default setting	Setting range
Initial Mode	Radio frequency	2453MHz (Ch52)	2402MHz(Ch1)～2480MHz(Ch79)
	Wireless ID	52	0～255
	Wireless output	-1dBm	-21dBm～+5dBm
Inspection Mode	Radio frequency	2456MHz (Ch55)	2402MHz(Ch1)～2480MHz(Ch79)
	Wireless ID	0	0～255
	Wireless output	+2dBm	-21dBm～+5dBm
	Wireless output (For wireless terminal)	+2dBm	-21dBm～+5dBm
Parameter Write Wait Mode	Radio frequency	2480MHz(Ch79)	2402MHz(Ch1)～2480MHz(Ch79)
	Wireless ID	0	0～255
	Wireless output	-1dBm	-21dBm～+5dBm
Parameter Write Mode	Radio frequency	2456MHz(Ch55)	2402MHz(Ch1)～2480MHz(Ch79)
	Wireless ID	55	0～255
	Wireless output	+2dBm	-21dBm～+5dBm
	Wireless output (For wireless terminal)	+2dBm	-21dBm～+5dBm
All Mode	Effective/Disable setting	ON	ON(Effective)/OFF(Disable)
	Antenna change judgment interval	20msec	5msec～65535msec
	Antenna change judgment Wireless receive stop rate	50.00%	0.01%～100%
	Single direction communication Number of antenna change judgment	1 time	1 time – 65535 times

Mode shift parameter　(Refer to [6.Parameter explanation])

Item		Default setting	Setting range
Mode processing timeout	Initial mode shift process	1000msec	100msec～65535msec
	Inspection mode shift process		
	Diag communication process		
	BodyNo delete process		
	Parameter write mode shift process		

	Parameter write process		
	Parameter write mode completion process		
	Parameter write mode chancel process		
Number of mode shift transmission instructions	Inspection mode shift instruction	80 times	1 time – 65535 times
	Parameter write mode shift instruction		
Wireless cut down timeout	Inspection mode	1000msec	100msec～65535msec
	Parameter write mode		

\<TM4875B specifications\>

In the United States and Canada, use of 2480 MHz and + 5 dBm is restricted to correspond to FCC / IC.

If 2480 MHz is set, the wireless module automatically changes to 2479 MHz.

If a value greater than +4 dBm is set, the wireless module will automatically change to +4 dBm.

In other countries, there is no use restrictions on frequency and output.

5.2 Wireless VIM terminal

Electrical specification

TM5317A

Function		Contents
Wireless I/F	wireless standard	JAPAN(ARIB STD T-66)
	antenna	Built-in antenna
	Radio frequency	2402-2480MHz(1MHz Interval)
	transmission output	-21dBm～+5dBm
I/O	CAN	CAN(ISO11898) 1ch
	K-Line	K-Line(9600/10400bps) 1ch ISO14230/ISO9141
	DoIP	1ch
WLAN	2.4GHz RF frequency	2400-2472MHz
	5GHz RF frequency	5180-5835MHz
	Data rate	IEEE 802.11a,802.11b,802.11g,802.11n, 802.11ac
size		50×68×25mm (remove a DLC3 connector part)
Power supply		Rating 12V (8V～16V)
Weight		81g
Movement environment		Temperature / humidity range 0～50℃/20～85%RH
Preservation environment		Temperature / humidity range -20～70℃/20～85%RH

TM5317B

Function		Contents
Wireless I/F	wireless standard	JAPAN(ARIB STD T-66)
	antenna	Built-in antenna
	Radio frequency	2402-2479MHz(1MHz Interval)
	transmission output	-21dBm～+3dBm
I/O	CAN	CAN(ISO11898) 1ch
	K-Line	K-Line(9600/10400bps) 1ch ISO14230/ISO9141
	DoIP	1ch
WLAN	2.4GHz RF frequency	2400-2472MHz
	5GHz RF frequency	5180-5835MHz
	Data rate	IEEE 802.11a,802.11b,802.11g,802.11n, 802.11ac
size		50×68×25mm (remove a DLC3 connector part)
Power supply		Rating 12V (8V～16V)
Weight		81g
Movement environment		Temperature / humidity range 0～50℃/20～85%RH
Preservation environment		Temperature / humidity range -20～70℃/20～85%RH

Wireless parameter (For details, refer to [6.Parameter explanation].)

Item		Default setting	Setting range
Initial mode	Wireless frequency	2453MHz (Ch52)	2402MHz(Ch1)-2480MHz(Ch79)
	Wireless ID	52	0-255
Parameter write waiting mode	Radio frequency	2480MHz (Ch79)	2402MHz(Ch1)-2480MHz(Ch79)
	Wireless ID	0	0-255

* Inspection mode and parameter write mode is run on parameter that is set at wireless ST side.

Mode shift parameter (For details, refer to [6.Parameter explanation].)

Item		Default setting	Setting range
Wireless cut down timeout	Inspection mode	1000msec	100msec-65535msec
	Parameter write mode		
Sleep shift wait time		3600sec	60sec-65535sec
Sleep release time		80msec	30msec-65535msec
Sleep time		730msec	345msec-65535msec

<TM5317B specifications>

In the United States and Canada, use of 2480 MHz and + 5 dBm is restricted to correspond to FCC / IC.

If 2480 MHz is set, the wireless module automatically changes to 2479 MHz.

If a value greater than +3dBm is set, the wireless module will automatically change to +3 dBm.

In other countries, there is no use restrictions on frequency and output.

6.Parameter explanation

For parameter setting, refer to [Wireless maintenance tool instruction].

●Radio frequency

Interval of frequency setting among wireless VIM stations shall be at least 3MHz.

Example of wireless VIM ST

① Process for BodyNo write, Diag inspection (BodyNo is not deleted)

Process for Diag inspection (BodyNo write, BodyNo delete is not performed)

Wireless VIM station setting			Purpose explanation
Initial mode	Wireless frequency	2453MHz(Ch52)	Same frequency as wireless VIM is required.
	Wireless ID	52	
Inspection mode	Wireless frequency	2459MHz (Ch58)	Frequency setting for process
	Wireless ID	58	
Parameter writing wait mode	Wireless frequency	2480MHz(Ch79)	Same frequency as wireless VIM terminal is required.
	Wireless ID	0	
Parameter writing mode	Wireless frequency	2459MHz(Ch58)	Frequency setting for process
	Wireless ID	58	

② Process for Diag inspection, BodyNo delete (BodyNo write is not performed)

Wireless VIM station setting			Purpose explanation
Initial mode	Wireless frequency	2453MHz(Ch52)	Same frequency as wireless VIM is required.
	Wireless ID	52	
Inspection mode	Wireless frequency	2465MHz (Ch64)	Frequency settings for process
	Wireless ID	64	
Parameter writing waiting mode	Wireless frequency	2480MHz(Ch79)	Same frequency as wireless VIM is required.
	Wireless ID	64	Same ID as inspection mode is required.
Parameter writing mode	Wireless frequency	2465MHz(Ch64)	Frequency settings for process
	Wireless ID	64	

* If setting (2), BodyNo write cannot be performed because ID of parameter write waiting mode is different from Wireless VIM terminal.

This function is required when disconnection is confirmed after diag inspection by TVECSIII.

③ Process for BodyNo write, Diag inspection, BodyNo delete

Wireless VIM station setting			Purpose explanation
Initial mode	Wireless frequency	2453MHz(Ch52)	Same frequency as wireless VIM is required.
	Wireless ID	52	
Inspection mode	Wireless frequency	2456MHz (Ch55)	Frequency settings for process
	Wireless ID	0	Same ID as parameter write waiting mode is required.
Parameter writing waiting mode	Wireless frequency	2480MHz(Ch79)	Same frequency as wireless VIM is required.
	Wireless ID	0	
Parameter writing mode	Wireless frequency	2456MHz(Ch55)	Frequency settings for process
	Wireless ID	55	

* ③ is set when it is delivered.

< TM4875B /TM5317B specifications>

In the United States and Canada, use of 2480 MHz is restricted to correspond to FCC / IC.

If 2480 MHz is set, the wireless module automatically changes to 2479 MHz.

In other countries, there is no use restrictions on frequency.

6.1 Parameter for Wireless ST

●Enable/Disable setting

ON・・・Wireless communication is performed with output antenna changing between ANTENNA1 and ANNTENA2 based on parameter.

・Interval of antenna changing judgment

・Rate of receiving stop for antenna changing judgment

・Number of times for antenna changing of single direction communication

OFF・・・Only ANTENNA1 performs wireless communication as output antenna.
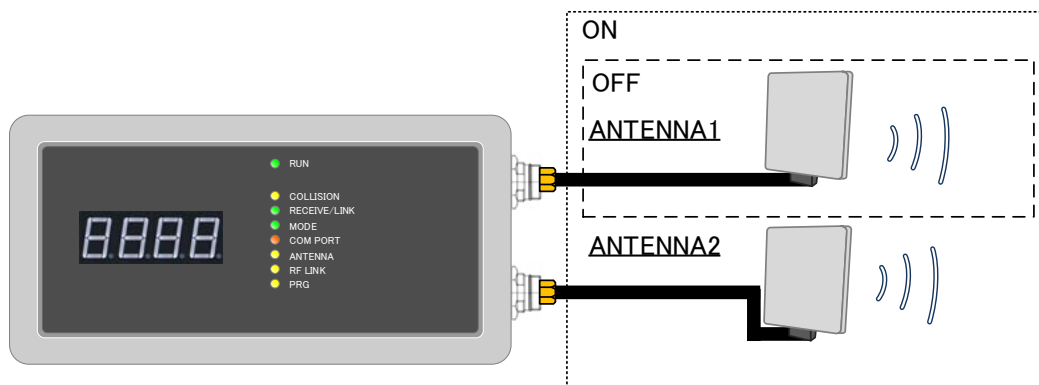
●Interval of antenna changing judgment

●Rate of receiving stop for antenna changing judgment

Communication status with wireless terminal is checked per [Interval of antenna changing judgment]. If receiving is stopped longer than [Rate of receiving stop for antenna changing judgment], antenna is changed.

●Number of times for antenna changing of single direction communication

Timing for output antenna changing when mode shift is send to wireless terminal.

Example

Setting value	1st send	2nd send	3rd send	4th send	5th send
1 time	ANTENNA 1	ANTENNA 2	ANTENNA 1	ANTENNA 2	ANTENNA 1
2 times	ANTENNA 1	ANTENNA 1	ANTENNA 2	ANTENNA 2	ANTENNA 1
3 times	ANTENNA 1	ANTENNA 1	ANTENNA 1	ANTENNA 2	ANTENNA 2

●Mode process time out

It is time to wait the response from wireless terminal after process command as mode shift instruction is send to terminal.

If response is not sent from terminal by setting time, error is sent from wireless ST to TVECSIII.

●Number of time to send mode shift instruction

Number of time to send [Mode shift instruction] from wireless ST to terminal.

●Wireless disconnection time out

Time to wait the response from wireless terminal inspection mode when communication is performed between wireless ST and terminal by inspection or parameter write mode.

If there is not response from terminal by setting time, wireless ST shifts to search mode.
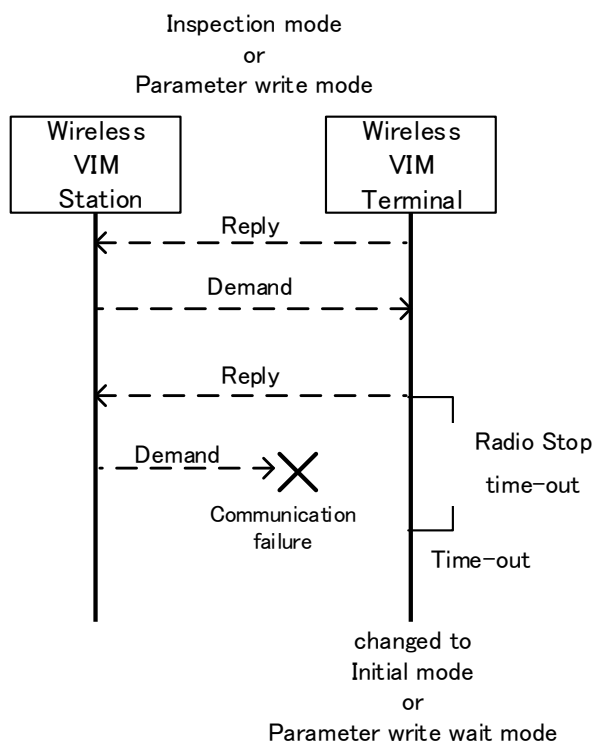
6.2 Parameter for wireless terminal

●Wireless disconnection time out

Time to wait the request from wireless ST when communication is performed between wireless ST and terminal by inspection or parameter write mode.

If there is not request from wireless ST by setting time, wireless terminal shifts initial or parameter write waiting mode.
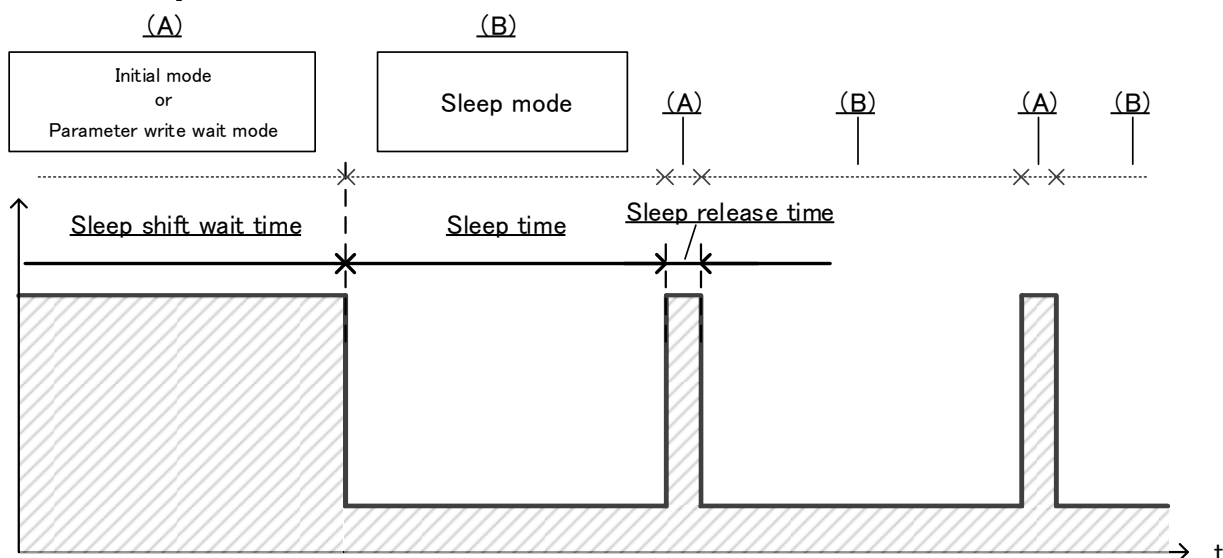

●Sleep shift waiting time

If wireless communication is not performed longer than setting time (Sleep shift waiting time) at initial or parameter write waiting mode, it shifts to sleep mode (Power save operation).

●Sleep release time

●Sleep time

During sleep mode, shift and release for sleep mode is repeated based on [Sleep time] and [Sleep release time].

7. Warranty

The warranty on the product, excluding expendable items, shall, in principle, be valid for 1 year from the date of receipt and inspection.

A malfunction that is covered by the scope of the warranty stipulated by our company that occurs less than 1 year after the date of receipt and inspection shall be repaired quickly and free of charge or a replacement product shall be delivered.

However, please note that there are cases where the following exceptions will apply.

● Products purchased directly from the manufacturer will be subject to the standards in the warranty as stipulated by the manufacturer.

 (There are cases where this will be less than the manufacturer's warranty period due to The development period.)

● In the case where repairs are made within the warranty period, then the warranty period after the repairs shall be as follows。

Parts or other items replaced within the warranty period.	3 months after the repairs (Or until the end of the original warranty period in the case where the original warranty period has not expired.)
Parts not related to the repairs	1 year after the date of receipt and inspection (Not 1 year from the date of the repairs)

● In the case where the cause of the malfunction is not the responsibility of our company, then this shall not be covered under the warranty.

● Consumables such as DLC3 or FLASH connector shall not be covered under the warranty.

● Malfunctions or damage that occur due to fire, storm and flood damage, earthquakes, lightning strikes, or other natural disasters shall not be covered under the warranty.

●Any parts, apparatus, and accessories supplied by or specified by the consumer and their attendant work shall not be covered under the warranty.

● In the case where the product has been modified at the request of the consumer, then the warranty period after the modifications shall be as follows.

Parts and components that were modified	1 year after the date of receipt and inspection of the modifications
Parts not related to the modifications	1 year after the date of receipt and inspection (Not 1 year from the date of the modifications)

Consumables

1	DLC3 connector	10,000 times (Recommended to replacement. Not for warranty.)
2	FLASH connector	10,000 times (Recommended to replacement. Not for warranty.)

8. After-sales service

For any inquiries about the product, please contact us via the information provided below.

TOYOTA TECHNICAL DEVELOPMENT CORPORATION

[Information desk: Product related inquires]

Sales & Product Technology Dept.

Customer Business Div.

1-9 Imae Hanamoto-cho Toyota Aichi Japan

Zip code: 470-0334

TEL：(0565)50-6418

FAX：(0565)50-6400

Inquiry Time: Weekday 9:00 to 17:00 (JST)