

29. WIRELESS COMMUNICATION USING *BLUETOOTH* TECHNOLOGY

Bluetooth wireless technology allows the SET to communicate wirelessly with other *Bluetooth* devices.



- Wireless communication using *Bluetooth* technology is an optional function. For availability of this option in your country, and for further information regarding this technology, contact your local dealer.
- Use of this technology must be authorized according to telecommunications regulations of the country where the instrument is being used. Contact your local dealer in advance.
- A radio station license is not required.
- Sokkia Topcon Co., Ltd. is not liable for the content of any transmission nor any content related thereto. When communicating important data, run tests beforehand to ascertain that communication is operating normally.
- Do not divulge the content of any transmission to any third party.
- Before starting transmission, check that operation will not take place within the vicinity of portable premises radio equipment or specified low-power radio equipment.
- In the case that the instrument causes radio interference with portable premises radio equipment, terminate the connection immediately and take measures to prevent further interference (e.g. connect using an interface cable). In the case that the instrument causes radio interference with portable specified low-power radio equipment, contact your local dealer.
- When using other compatible *Bluetooth* devices, perform communication within a line-of-sight distance of approximately 2m. This distance becomes shorter when obstacles block the line of sight. Wood, glass and plastic will not impede communication. However, wood, glass and plastic containing metal frames, plates, foil and other heat shielding elements as well as coatings containing metallic powders may adversely affect *Bluetooth* communication and concrete, reinforced concrete, and metal will render it impossible. Use a vinyl or plastic cover to protect the instrument from rain and moisture.
- Perform communication at a distance of 3m or more from microwave ovens, which can cause significant interference. The SET should also not be used within proximity to televisions and radios. Even though there may be no adverse effects with regard to *Bluetooth* communication, moving a *Bluetooth* compatible SET closer to said equipment may result in electronic noise in sound or images, adversely affecting the signal reception of televisions and radios.
- Change location when proximity to a wireless device or broadcast station results in communication failure.
- When using the SET near IEEE802.11b or IEEE802.11g standard wireless LAN devices or other devices that operate on the 2.4GHz ISM band, interference

may result, causing transmission speed to slow or even disrupting the connection completely. Turn off all devices not being used.

- The radio waves used by the SET may be absorbed or scattered by rain, fog, and moisture from the human body with the limit of usable range becoming lower as a result. Similarly, usable range may also shorten when performing communication in wooded areas. Moreover, as wireless devices lose signal strength when close to the ground, perform communication at as high a position as possible.
- Sokkia Topcon Co., Ltd. cannot guarantee that the SET will operate properly with all *Bluetooth* devices on the market.



Frequency bands

Bluetooth communication with the SET uses the 2.4 GHz frequency band. This is the same band used by industrial, scientific, and medical (ISM) equipment such as microwaves, portable premises radio equipment (license required) and portable specified low-power radio equipment (license-exempt) used in factory production lines, and IEEE802.11b/IEEE802.11g standard wireless LAN devices.

Using the SET within proximity to the above devices may result in interference causing communication failure or reduction of transmission speed.

Televisions and radios use a different frequency band.

Even if the SET is used within proximity to the above equipment with no adverse effects with regard to transmission, moving a *Bluetooth* compatible device (including the SET) closer to said equipment may result in electronic noise in sound or images.

29.1 Necessary settings for *Bluetooth* communication

Bluetooth wireless communication settings are performed in "Comms setup" in Config Mode.

►PROCEDURE Basic Settings

1. Select "Comms setup" in Config mode

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2. Set "Wireless" to "Yes".

Wireless : **Yes**
Bluetooth setup
Link device list
My device info

3. Select "Bluetooth setup".



Wireless : Yes
Bluetooth setup
Link device list
My device info


4. Set "Mode" to either "Master" or "Slave".

  Bluetooth connections"

Mode : **Slave**
Authentication : No
Passkey
:****
Check sum : No

5. Set "Link".

Select a companion device from among the *Bluetooth* devices registered in the SET using {/
}.

 Registering devices:
"PROCEDURE Registering
Bluetooth companion devices"

Mode : Master
Link **DEVICE1**
Authentication : No
Passkey
:****
Check sum : No

- "Link" setting is not necessary when "Mode" is set to "Slave".

6. Set "Authentication". Select "Yes" or "No".

7. Set "Passkey". Set the same passkey as that for your *Bluetooth* device.

- Up to 16 numeral characters can be input. "0123" is the factory setting. Input characters will be displayed as asterisks (e.g. "*****").

- Set check sum setting.



- Even when "Authentication" is set to "No", a passkey is requested when authentication is set on the *Bluetooth* device being used.
- When "Wireless" is set to "Yes", communication settings will not be displayed. It is recommended that the check sum setting is set to correspond with those of the *Bluetooth* device.



Bluetooth connections

- Communication between a pair of *Bluetooth* devices requires one device to be set as the "Master" and the other as the "Slave". To initiate connections from the SET side, set the SET as the "Master" device. To initiate connections from the paired device side, set the SET as the "Slave" device.

►PROCEDURE Registering *Bluetooth* companion devices

- Select "Comms setup" in Config mode.
- Set "Wireless" to "Yes".
- Select "Link device list".
- Register your *Bluetooth* device(s).
Select a device and press **[EDIT]** to update related information.
 - Select a device and press **{←}** to show details.
Press **[PREV]/[NEXT]** to display details of the previous/next device.

Wireless : Yes
Bluetooth setup
Link device list
My device info

Link device list
DEVICE1
DEVICE2
DEVICE3
DEVICE4
[EDIT] **[DEL]**

Device (Details)
Name:
DEVICE2
BD_ADDR:
0123456789AB
[PREV] **[NEXT]**

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- Press **[DEL]** to delete information for the selected device.

DEVICE1
deletion
Confirm?

NO **YES**

5. Input "Name" (device name) and "BD ADDR" (address) and press **[REG]**.

Device registration
Name:
DEVICE1
BD_ADDR:

0123456789AB
INQ **REG**

- 12 hexadecimal digits can be input.
- By pressing **[INQ]**, it is also possible to inquire about devices in the immediate vicinity and register their address. Select an address from the list of devices discovered and press **[OK]**. The address is displayed "BD ADDR". (If SET cannot find any devices within 30 sec., the inquiry will be canceled.)

Inquiry...

0123456789AB
123456789ABC
23456789ABCD
3456789ABCDE

STOP **OK**

►PROCEDURE Displaying *Bluetooth* information for the SET

- Select "Comms setup" in Config mode.
- Set "Wireless" to "Yes" .
- Select "My device info".
The *Bluetooth* information for the SET is displayed. The "BD ADDR" for the SET must be registered on your *Bluetooth* device.

Wireless : Yes
Bluetooth setup
Link device list
My device info

Bluetooth ID:B02706
Firmware:VerX.X.X

BD_ADDR:
ABCDEF012345





Bluetooth Device Address

This is a number unique to one particular *Bluetooth* device used to identify devices during communication. This number consists of 12 characters


(numbers 0 to 9 and letters from A to F). Some devices may be referred to by their *Bluetooth* device address.


29.2 Establishing a connection between the SET and paired *Bluetooth* device

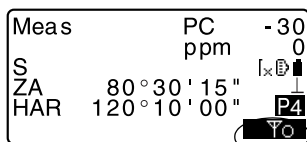
When "Wireless" is set to "Yes" in "Comms setup" in Config mode [] / [] is displayed in Meas mode.

► PROCEDURE


1. Complete the necessary settings for *Bluetooth* communication.

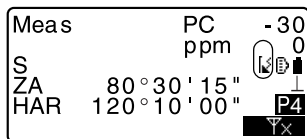
 "29.1 Necessary settings for Bluetooth communication"



2. Press [] in the fourth page of Meas mode screen. The *Bluetooth* module in the SET powers on and connection starts.



The *Bluetooth* icon indicates communication status.

 "5.2 Display Functions"



- When "Mode" in "*Bluetooth* setup" is set to "Slave", the establishing of a connection can only be initiated from the "Master" *Bluetooth* device.
- When "Mode" in "*Bluetooth* setup" is set to "Master", SET will attempt to establish a connection with the designated *Bluetooth* device (specified in "Link" in "*Bluetooth* setup").
- Softkeys (in Meas mode and <Aiming>)
 - []: Press to enter waiting status ("Mode" is set to "Slave")/establish a connection ("Mode" is set to "Master")
 - []: Press to cancel the connection/exit waiting status ("Mode" is set to "Slave")/stop establishing or cancel a connection ("Mode" is set to "Master")

- Audio tones

(While connecting/disconnecting)

Start paging/waiting:	short beep
Connection successfully established:	long beep
Connection canceled/being canceled:	two short beeps
Paging failed/waiting time out:	two short beeps



(While inquiring about other *Bluetooth* devices)

New device discovered:	short beep
Inquiry complete:	long beep

29.3 Measurement using *Bluetooth* communication

Data collectors can also be set as companion devices for wireless communication and can be used to initiate measurement.

► PROCEDURE Performing measurement using a data collector

1. Complete the necessary settings for *Bluetooth* communication.
 "29.1 Necessary settings for Bluetooth communication"
2. Verify the current connection status by checking the *Bluetooth* icon in the Meas mode screen.
 "29.2 Establishing a connection between the SET and paired Bluetooth device"
3. Initiate measurement using your *Bluetooth* device (e.g. a data collector). SET will respond and measurement will start. Measured values are then displayed in the Meas mode screen.

29.4 Registering/Outputting data using *Bluetooth* communication

It is possible to set a computer as the companion device and register known point data or output JOB data via wireless communication.

►PROCEDURE Entering known point coordinate data from an external instrument

1. Complete the necessary settings for *Bluetooth* communication.
☞ "29.1 Necessary settings for Bluetooth communication"
2. Verify the current connection status by checking the *Bluetooth* icon in the Meas mode screen.
☞ "29.2 Establishing a connection between the SET and paired Bluetooth device"
3. Register known point data in Memory mode.
☞ "25.1 Registering/Deleting Known Point Data
PROCEDURE Entering known point coordinate data from an external instrument"
Coordinate data starts being entered from the external instrument.
 - If a connection has not yet been established, the screen at right is displayed. (Screens differ depending on the "Mode" setting. The displayed screen appears when "Mode" is set to "Slave".)
After a connection has been established, the data is entered.

Comms input
Waiting for
connection...