# WAGO→I/O→SYSTEM 750

## Fieldbus Independent
## I/O Modules

## *Bluetooth*® RF Transceiver
## 750-644

## Quick Start

Version 1.0.1

WAGO
®
INNOVATIVE CONNECTIONS

Every conceivable measure has been taken to ensure the correctness and completeness of this documentation. However, as errors can never be fully excluded, we would appreciate any information or ideas at any time.

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# Content

# 1  Important Comments

To ensure fast installation and start-up of the units described in this manual, we strongly recommend that the following information and explanations are read carefully and followed.

## 1.1  Legal Principles

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### 1.1.2  Personnel Qualification

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### 1.1.3  Intended Use

For each individual application, the components supplied are to work with a dedicated hardware and software configuration. Modifications are only permitted within the framework of the possibilities documented in the manuals. All other changes to the hardware and/or software and the non-conforming use of the components entail the exclusion of liability on part of WAGO Kontakttechnik GmbH & Co. KG.

Please direct any requirements pertaining to a modified and/or new hardware or software configuration directly to WAGO Kontakttechnik GmbH & Co. KG.

## 1.2 Symbols

| | **Danger**<br>Always abide by this information to protect persons from injury. |
|---|---|

| | **Warning**<br>Always abide by this information to prevent damage to the device. |
|---|---|

| | **Attention**<br>Marginal conditions must always be observed to ensure smooth operation. |
|---|---|

| | **ESD (Electrostatic Discharge)**<br>Warning of damage to the components by electrostatic discharge. Observe precautionary measures for handling components at risk. |
|---|---|

| | **Note**<br>Routines or advice for efficient use of the device and software optimization. |
|---|---|

| | **Additional Information**<br>References for additional literature, manuals, data sheets and web pages. |
|---|---|

## 1.3 Number Notation

| Number Code | Example | Note |
|---|---|---|
| Decimal | 100 | normal notation |
| Hexadecimal | 0x64 | C notation |
| Binary | '100'<br>'0110.0100' | within inverted commas,<br>nibble separated with dots |

# 1.4  Safety Notes

⚠️ **Warning**
Switch-off the system prior to working on bus modules!

In the event of deformed contacts, the module in question is to be replaced, as its functionality can no longer be ensured on a long-term basis.

The components are not resistant against materials having seeping and insulating properties. Members of this group include: aerosols, silicones, triglycerides (found in some hand creams).

If it cannot determined that these materials appear in the component environment, then additional measures must be taken:
- install of the components in an appropriate enclosure
- handle components only with clean tools and materials.

⚠️ **Attention**
Soiled contacts may only be cleaned with ethyl alcohol and leather cloths. This helps ensure compliance with ESD information.

Do not use any contact spray. The spray may impair the functioning of the contact area.

The WAGO-I/O-SYSTEM 750 and its components are an open system. As such, the system and its components must be installed in appropriate housings, cabinets, enclosures or in electrical operation rooms. Access must only be provided via key or tool to authorized, qualified personnel.

The relevant valid and applicable standards and guidelines concerning the installation of switch boxes are to be observed.

**ESD (Electrostatic Discharge)**
The modules are equipped with electronic components that may be destroyed by electrostatic discharge. When handling the modules, ensure that the environment (persons, workplace and packing) is well grounded. Avoid touching conductive components; e.g., gold contacts.

# 1.5  Scope

These quick start instructions describe the first steps for configuring two *Bluetooth*® RF Transceivers 750-644. The contents of the instructions are only valid in connection with the manual "*Bluetooth*® RF Transceiver 750-644" and the manual for the software WAGO-I/O-CHECK.
You will find these documents on the CD "AUTOMATION Tools & Docs" (item no.: 0888-0412) and online at http://www.wago.com.

# 2 Quick Start

These quick start instructions explain, by means of an example, how to start-up and configure the *Bluetooth*® RF-Transceiver 750-644 (*Bluetooth*® module) via WAGO-I/O-CHECK.

The instructions demonstrate how to start the module up with minimal configuration, and therefore do not describe the entire range of functions. The objective of these instructions is to configure a simple peer-to-peer communication between two *Bluetooth*® modules. One module will function as a master, the other as a slave.

## 2.1 Network Structure

1. Construct two identical bus nodes as shown in Figure 1.

- 750-841 Ethernet Controller
- 750-644 *Bluetooth*® RF Transceiver
- 750-600 End Module

2. Connect one of the controllers to a free serial port of your PC using a WAGO communication cable (750-920).

3. Connect the second controller in the same manner to another PC serial port.

**Attention**
Do not form a fieldbus connection (e.g., by using an ETHERNET cable); otherwise, access to the process data within WAGO-I/O-CHECK is not possible.

4. Connect both nodes on the system and field sides with a 24-volt power supply.

5. Switch the power supply on.

**Additional information**
Each serial PC port is operated by its own WAGO-I/O-CHECK software. Depending on port availability, use one or two PCs for configuring the modules.
If you are using one PC with two ports, the WAGO-I/O-CHECK software can be started several times. You can select the proper COM ports using the "F8" key on your keyboard. If using only one port or one WAGO-I/O-CHECK, the configuration of master and slaves is rather time-consuming.
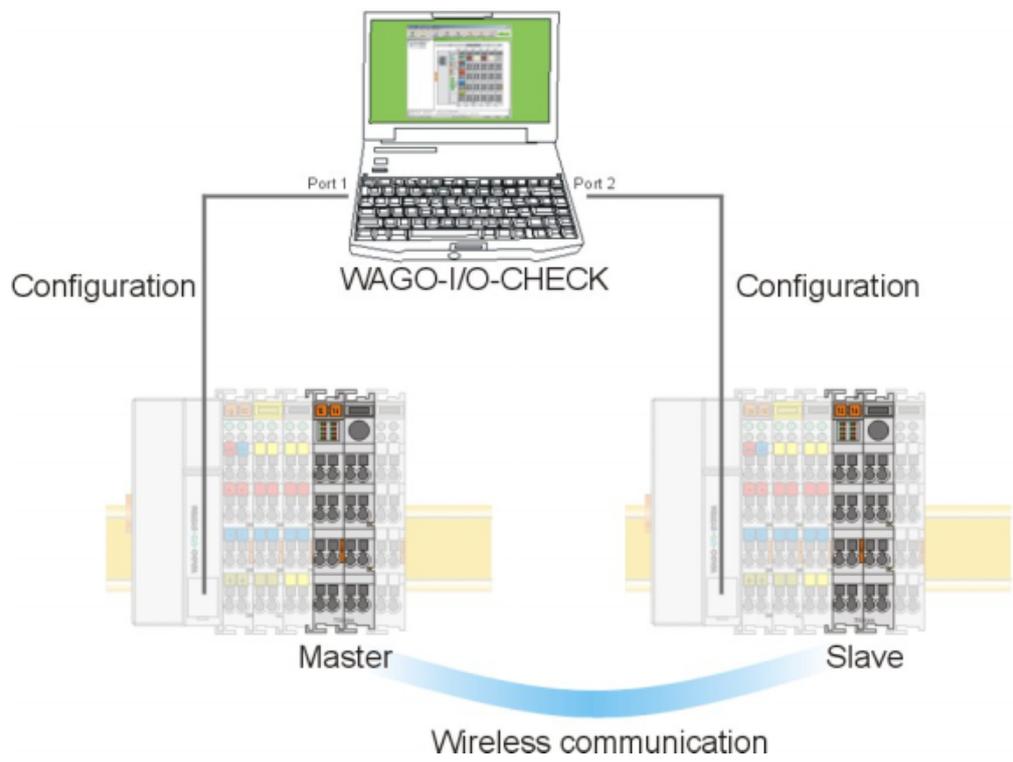
Figure 1: Hardware configuration                                    g064461e

## 2.2  Starting up the *Bluetooth*® Modules

1.  Determine which *Bluetooth*® module will function as the master and which module will function as the slave.

2.  Write down the MAC address of the slave:   0 0 : 0 6 : C 6 : _ _ : _ _ : _ _
    Write down the MAC address of the master: 0 0 : 0 6 : C 6 : _ _ : _ _ : _ _

### 2.2.1  Configuration of the *Bluetooth*® Slave Using "Net Forming"

1.  Start the WAGO-I/O-CHECK software (Version 3 or later).

2.  Click on the **[Identify]** button.

Your node configuration is graphically displayed (see Figure 2).
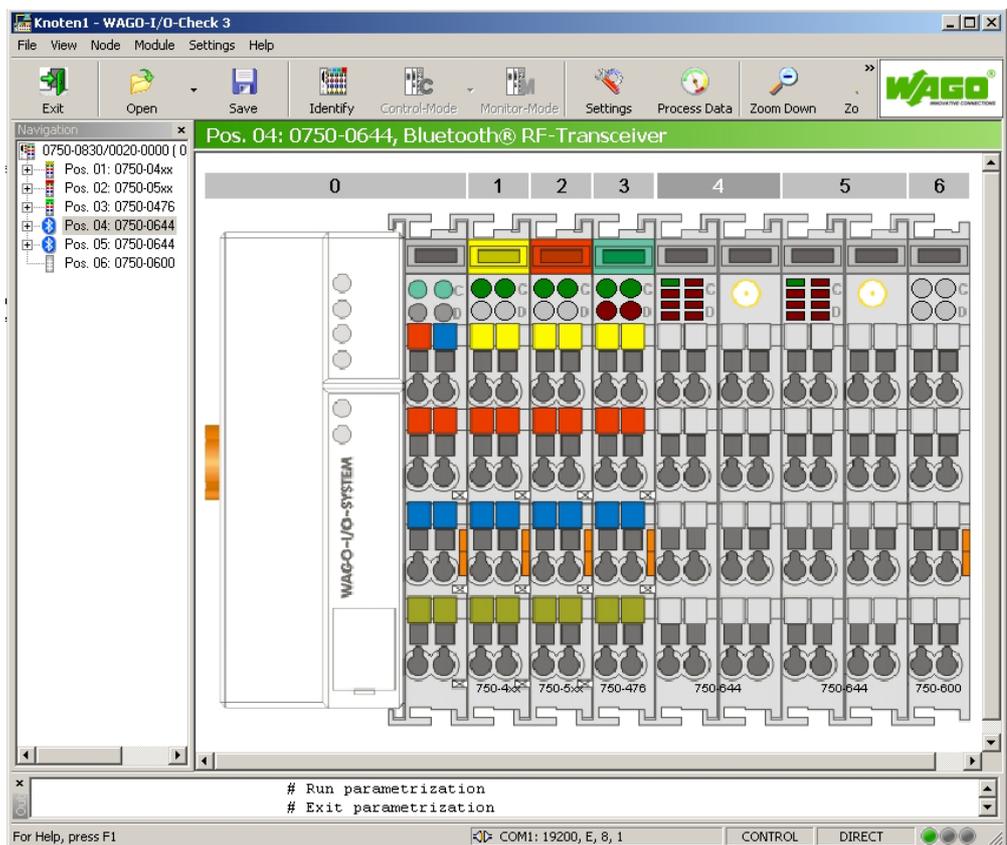


Figure 2: Identify your node configuration                                g064462e

3.  Click with the right mouse button on the *Bluetooth*® module that you would like to configure as a slave.

4. In the module's context menu, choose **Settings.** This opens the *Bluetooth*®-specific parameterization dialog of the module (see Figure 3).
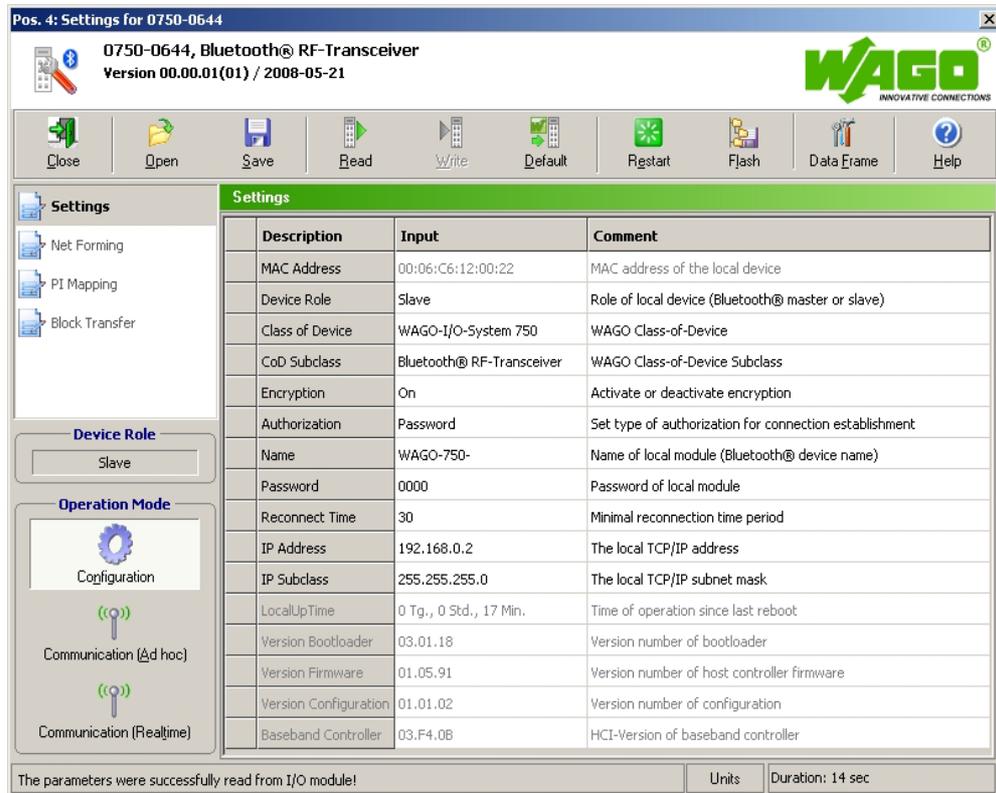


Figure 3: *Bluetooth*®-specific parameter area                                  g064418e

> **Attention**
> For the following, the *Bluetooth*® module's must remain intact; i.e., no configuration attempts have been attempted. If this is not the case, click on the **[Default]** button to restore the module to factory default settings.

5. Click on **[Data Frame]** in the toolbar.

6. Enter (if not already set) a process image size of 48 bytes and a mailbox size of 12 bytes (see Figure 4).
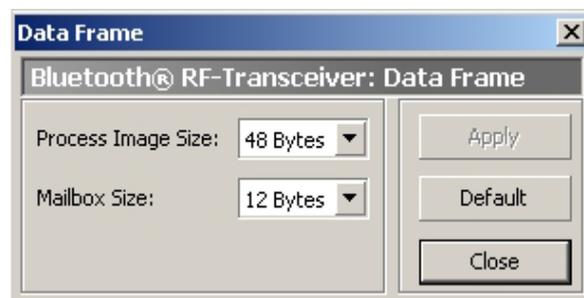


Figure 4: Data structure                                                         g064444e

7. Click on the **[Read]** button in the toolbar to update the view of the configuration in the module.

8.  Choose **Net Forming** in the navigation bar.

9.  Choose the option **All** in the area **Search for accessible devices** and click on the **[Search]** button to search the network for *Bluetooth*® devices in the environment. To limit the search results to WAGO devices of the 750 series, choose **WAGO 750**.

The MAC addresses of all found *Bluetooth*® devices are displayed in the list of devices within range (see Figure 5).
The MAC address of the slave itself is not displayed in this dialog.
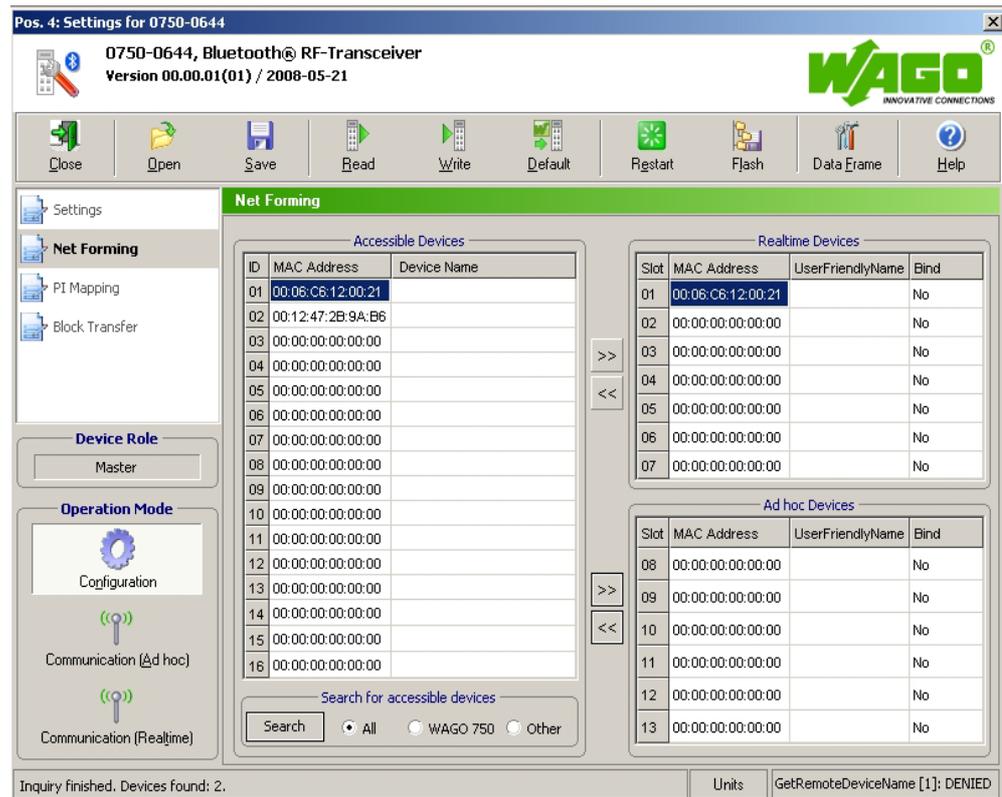


Figure 5: Net forming                                                                          g064463e

10. Search in the list for the MAC address of the master that you wrote down in 2.2 so that you can then connect this master to your slave.

**Note**

At this point, the master must be in the configuration mode (factory setting).

11. Mark the found MAC address of the master with a mouse click.

12. Click on the **[>>]** button to transfer the marked MAC address to the list of real-time devices (or, alternatively, ad hoc devices) for this slave.

The MAC address of the master is entered in the first line (slot 1).

13. Give the device a name (UserFriendlyName); e.g., "MyMaster".

14. Mark the MAC address and choose the value "Yes" in the dropdown field **Bind** (see Figure 6).

| Slot | MAC Address | UserFriendlyName | Bind |
|------|-------------|------------------|------|
| 01 | 00:06:C6:12:00:21 | MyMaster | Yes ▼ |
| | | | No |
| | | | Yes |

Figure 6: Bind device                                                          g064464e

15. Click on the **[Write]** button in the toolbar to write the altered configuration in the module.

You have now allocated a master to the *Bluetooth*® slave (<u>Slave → Master</u>).

16. Under navigation in the **Operation Mode** field, choose the real-time mode using the **[Communication (Realtime)]** button.

17. Proceed as in section 2.2.2 to create a link from the side of the master as well (<u>Master → Slave</u>).

## 2.2.2   Configuration of the *Bluetooth*® Master Using "Net Forming"

1.  Start the WAGO-I/O-CHECK software (Version 3 or later).

2.  Click on the button **[Identify]**.

Your node configuration is graphically displayed.

3.  Click with the right mouse button on the *Bluetooth*® module that you would like to configure as a master.

4.  Choose **Settings** in the context menu. This opens a new window for the configuration of the module.

⚠ **Attention**
For the following, the *Bluetooth*® module must remain intact; i.e., no configuration attempts have been attempted. If this is not the case, click on the **[Default]**, button to reset the module's configuration.

5.  Click on **[Data Frame]** in the toolbar.

6.  Enter (if not already set) a process image size of 48 bytes and a mailbox size of 12 bytes (see Figure 7).
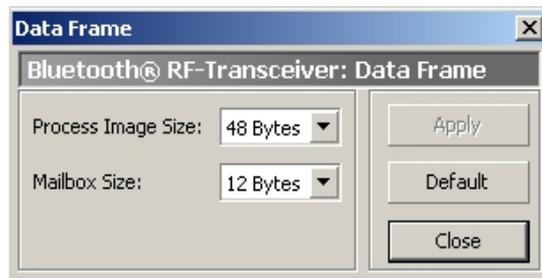
Figure 7: Data structure                                                g064444e

7.  Click on the **[Read]** button in the toolbar to update the view of the configuration in the module.

8.  In the list on the right side, assign the role of master to the module by choosing "Master" under **Device Role**.

9.  Choose the menu item **Net Forming** in the navigation bar.

The following section describes how to select the devices required to establish connection to the master. Devices that are visible for search requests can first be searched for in a similar way to slave's configuration (see Section 2.2.1, steps 9-12). They may then be stored using "Drag & Drop", for example, from the search results into the list of authorized devices (slots 1…13). However, for safety reasons, WAGO devices are hidden for search request in communication operating mode; they may also be entered like other hidden devices or inaccessible devices:

10. Enter the listed MAC address of the slave, which is already set in the communication operating mode, manually in the allocated field. The following steps assume that you are using slot 1.

11. Give the newly added device a name (UserFriendlyName); e.g., "Slave_01". This makes the overview easier for you.

12. Mark the slot with the entered MAC address and choose the value "Yes" in the dropdown field **Bind.**

13. Click on the **[Write]** button in the toolbar to write the altered configuration in the module.

Master and slave are now assigned to each other. The master is still in configuration mode.

## 2.2.3   Process Data Allocation

Start with point 3 while the *Bluetooth*® configuration window (see Figure 8) is still open.

1.  Click with the right mouse button on the *Bluetooth*® module (master)

2.  Choose **Settings** in the context menu. This opens a new window for the configuration of the module.

3.  In the navigation, choose the menu item **PI Mapping.**

The process data allocation is loaded from the module and graphically displayed in WAGO-I/O-CHECK.

4.  Move the ruler for the first slave to the right so that the first slave is assigned the maximum possible number of bytes in the master's process image (see Figure 8).
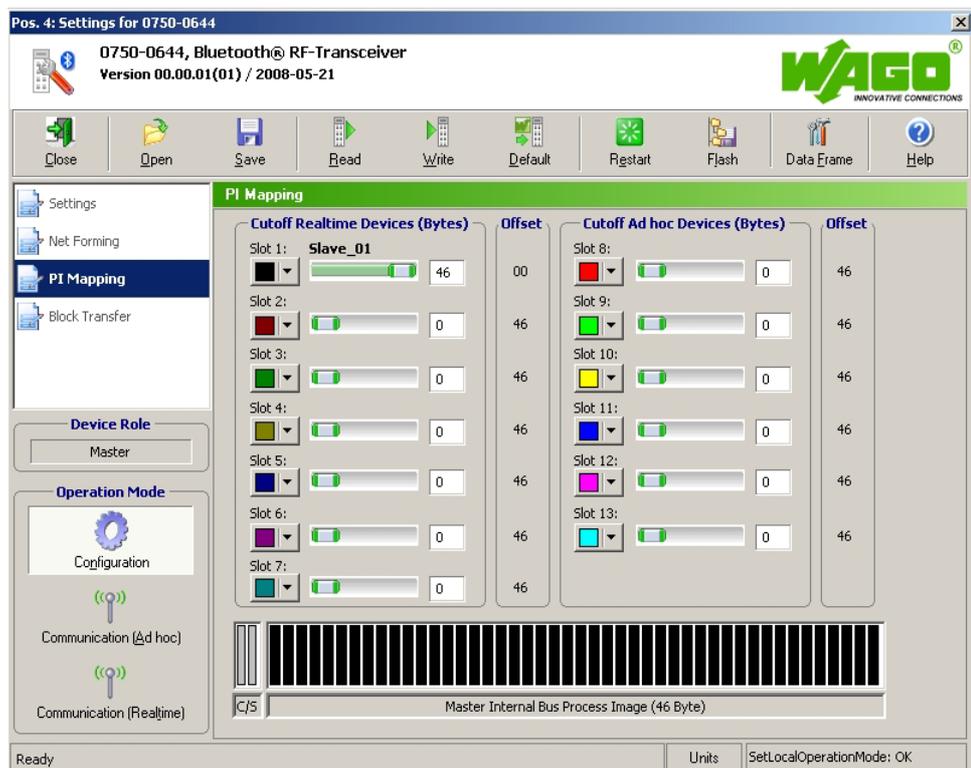


Figure 8: PI mapping                                                    g064465e

5.  Click on the **[Write]** button in the toolbar to write the altered configuration in the module.

6.  Under navigation in the **Operation Mode** field, choose the real-time field using the **[Communication (Realtime)]** button.

The example configuration is completed.

## 2.3 Testing the Process Data Exchange

Proper configuration of the *Bluetooth*® device (see sections 2.2.1 through 2.2.3) is a prerequisite for successful testing of the process data exchange. The constant green blinking of LED 2 (top right of *Bluetooth*® master) indicates a *Bluetooth*® master and slave connection.

1.  Close the *Bluetooth*® parameterization dialog.

2.  Right click on master and slave, one after the other.

3.  Choose **Process data** in the context menu.

The process data dialog opens so that you can view the raw data.

4.  Click with the right mouse button on the word "Input" in the dialog of the master.

You have the choices **Input**, **Output** and **Reset**. From now on, you can switch between the displays for input and output data using this menu (see Figure 9).
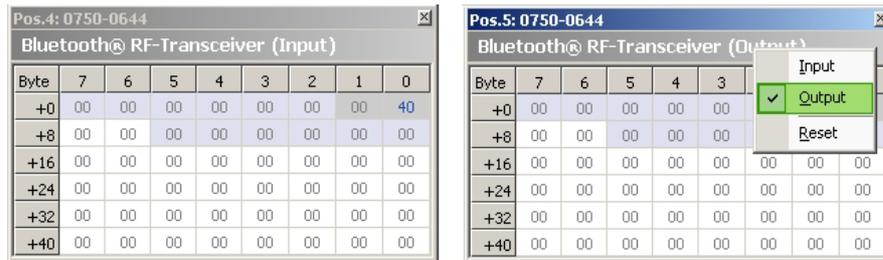


Figure 9: View of the process data                                   g064466e

5.  Enter any data in the "Output" dialog:
    in the process image of slave and master beginning with offset + 2 (bytes 0 and 1 are reserved for status information)

6.  Test whether the input data of the one *Bluetooth*® module lead to the correct output data of the second *Bluetooth*® module.