Your Torque Partner
TOHNICHI

Protocol Converter
Model TPC

Operating Instruction

To use this product properly and safely, please read this operating instruction carefully before use. If you have any question about the product and its operations, please contact your nearest distributor or Tohnichi Mfg. Co., Ltd.

Safety Precautions

Please read this operating instruction carefully before use. For any questions, contact a Tohnichi authorized distributor or Tohnichi office. Keep this instruction for future use.

Safety symbol

This symbol indicates attention is required for your safety. When this symbol appears in this instruction, pay particular attention for your safety concerns. Take preventative measures according to the written message for appropriate operation and management.

Signal Words

A signal word accompanies the safety symbol, which indicates the level of cautions on safety of people and the appropriate use of the equipment. Signal words are classified into 3 levels: "danger", "warning " and "caution" by the degree of risk.

" **Danger"**: Imminent danger which may cause serious damage

" **Warning"**: Potential danger which may cause serious damage

" **Caution"**: Potential danger which hinder ordinary operation but may not lead to serious damage.

Warning

- This product can be operated only with the power voltage of DC18V to 36V.
- Do not drop water or oil on this instrument. Do not use this instrument in an atmosphere of flammable gas and steam. Use in such an atmosphere may result in fire.
- Avoid shock or vibration to this instrument. It may cause a damage or failure.
- Before use, make a pre-operation inspection and check the settings.

Should this instrument give out abnormal smell or catch fire during use, stop using it immediately and disconnect the power from the power supply. Then, move the instrument to a safe place and contact Tohnichi Mfg. Co., Ltd.

- Disconnect the power supply if unused for long periods of time.
- Avoid using the instrument in a place where there are metal structures around it.
- Avoid using the instrument near welding machines, electric discharge machines or machines producing electromagnetic noise such as PC.
- Before wiring, check that the power of the device to be connected to the receiver is in the OFF position.

Contents

1 Outline

TPC, Tohnichi Protocol Converter is a protocol interface device that can change output formats of Tohnichi serial devices to variety of protocols in your network.

2 Feature

a. Protocol converter function

Available 4 different protocols, Atlas Copco Open Protocols (Serial and Socket communication), STANLEY and an extra space for a custom made protocol.

b. Custom made protocol

With specify the specification for your protocol, corresponds custom made upon request.

* To use custom made protocol function, required prior consult.

c. Timestamp function

Tag timestamps on tightening data by build-in clock.

d. VIN information management

Integrate tightening management into VIN by connecting a barcode reader

e. Connectable 2 different Tohnichi device at once

TPC has tow COM port for concurrent connection for 2 units of Tohnichi device simultaneously.

f. RS232C to Ethernet conversion function

Without protocol convertion function is also available as standard Ethernet converter.

g. Attachable on DIN rail

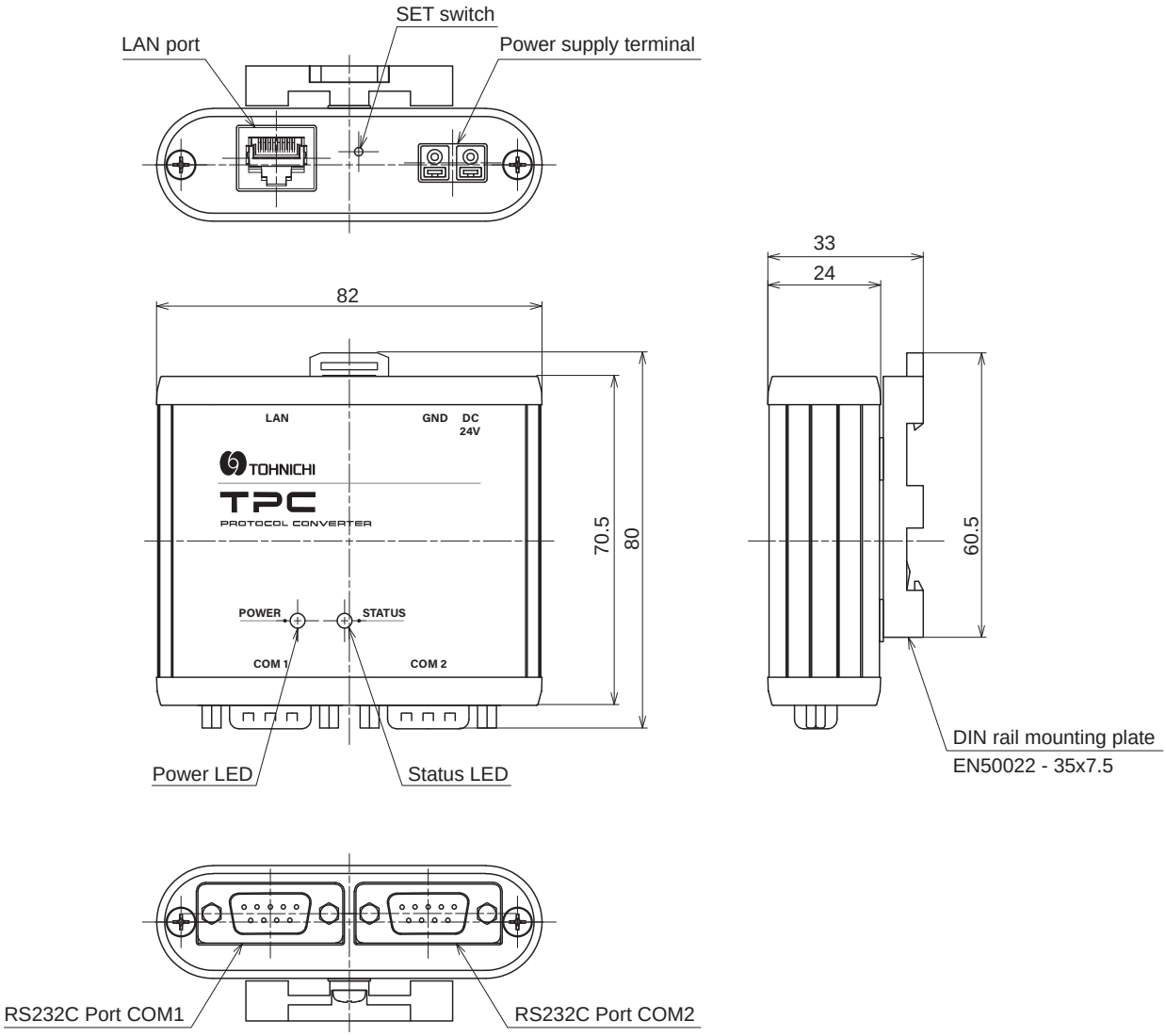
Easily settable on DIN 35x7.5 rail with the rear mounting plate on the body.

2 Specifications

Model	TPC
Input/Output	LAN x 1, RS232C x 2
Power source	DC24V 18V to 38V
Body materials	Body: Aluminum, Panel: Resin
Display	Power status LED x 1 Communication status LED x 1
Operating temperature	0 to 40℃

* Optional AC adapter for AC100V to 240V condition is available.

4 View and Parts Name



[Power LED]	Turns on when the power on.
[Status LED]	Turns on while data communication or setting mode.
[RS232C Port]	Connect an external device, such as Tohnichi devices, PC, and PLC by RS232C cable or change the settings with accessory software on a PC.
[LAN port]	Connect a LAN cable to communicate with external devices or change the settings with accessory software on a PC.
[Power supply terminal]	Be sure to connect DC24V power supply. Be careful to avoid mistake of polarity of DC24V and GND.
[DIN rail mounting plate]	Available to attach on DIN EN 50022 - 35x7.5 rail.

4-1 RS232C Pin Asgin

PIN #	Signal Name	Detail	Direction
1			
2	RXD	Received data signal	←
3	TXD	Transmitted data signal	→
4			
5	GND	Ground	
6			
7	RTS	Request to send signal	→
8	CTS	Clear to send signal	←
9			

4-2 RS232C Connecting Example

Use RS232C standard accessory cable comes with Tohnichi product or an appropriate for the device.

* Select a market cable which has the connector width less than 33mm.

TPC-Tohnichi Receiver

TPC			Tohnichi Receiver Devices		
PIN #	Signal Name	Detail	PIN #	Signal Name	Detail
1			1		
2	RXD	Received data signal	2	TXD	Transmitted data signal
3	TXD	Transmitted data signal	3	RXD	Received data signal
4			4		
5	GND	Ground	5	GND	Ground
6			6		
7	RTS	Request to send signal	7	CTS	Clear to send signal
8	CTS	Clear to send signal	8	RTS	Request to send signal
9			9		
Flame	Sealed		Flame	Sealed	

* Standard D-Sub 9 pin (female) straight cable is compatible.

TPC-Tohnichi Tester

TPC			PC/PCL/Tohnichi Tester		
PIN #	Signal Name	Detail	PIN #	Signal Name	Detail
1			1		
2	RXD	Received data signal	2	RXD	Received data signal
3	TXD	Transmitted data signal	3	TXD	Transmitted data signal
4			4		
5	GND	Ground	5	GND	Ground
6			6		
7	RTS	Request to send signal	7	RTS	Request to send signal
8	CTS	Clear to send signal	8	CTS	Clear to send signal
9			9		
Flame	Sealed		Flame	Sealed	

* Standard D-Sub 9 pin (female) serial cross cable is compatible.

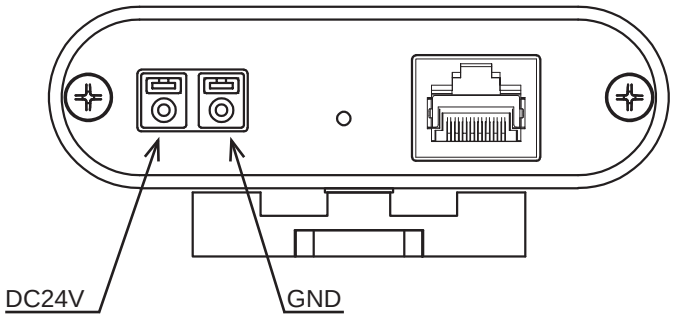
5 Caution of Use

5-1 Power Supply

"⚠ Caution"

Be sure to connect DC24V power supply.

Be careful to avoid mistake of polarity of DC24V and GND.



5-2 How to Connect to Terminals

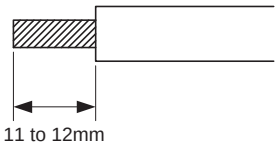
TPC applies clamp style terminal for the power supply for simple and easy connection.

Step 1. Skin off 11 to 12 mm the tip of wire and twist it together.

Step 2. Push in the convex part of the terminal and insert the tip of the wire into the terminal.

Step 3. Release the convex part.

Step 4. Pull the cable gently and check it is clamped securely.



Applicable wire size is as follows

Single wire: Φ 0.4mm to 1.0mm (AWG26-18)

Twisted wire: Φ 0.3mm to 0.75mm (AWG22-20)

A wire in the cable should be more than Φ 0.18mm

6 How to Use

6-1 Instruction for Use

a. When power on TPC, turns on the power LED in red and status LED in blue.

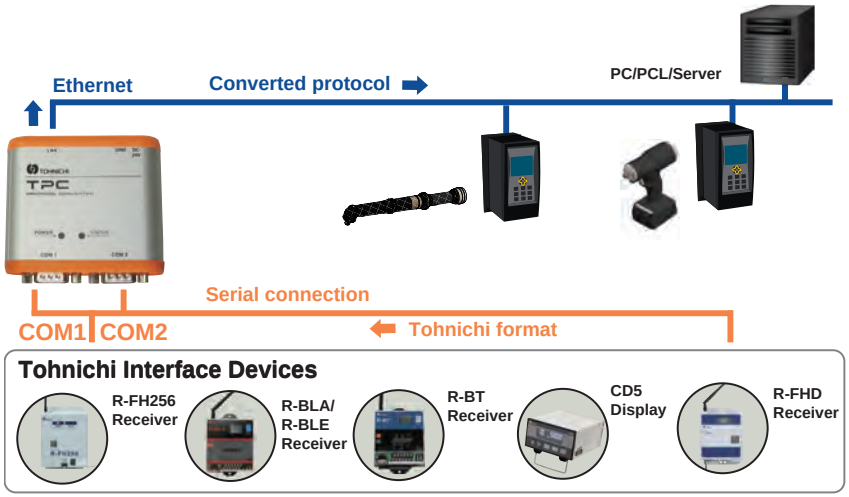
b. After 1 second passing, status LED turns off and TPC become standby mode.

c. Transmit data to TPC when it confirmed standby mode.

* Refer to 7-1 Setting Items for settings.

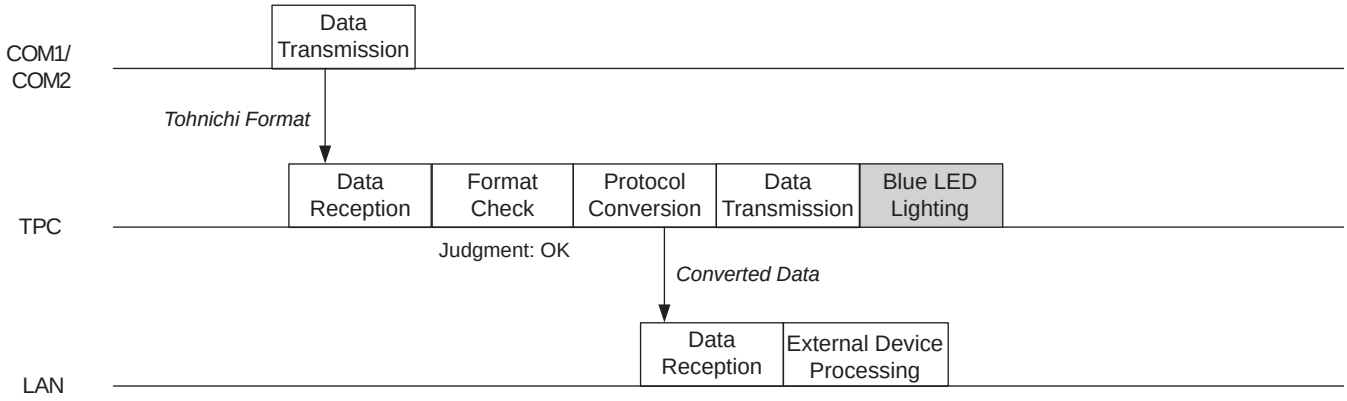
* To change the setting of the connected Tohnichi devices by command input, use the dedicated command of each device.

6-1-1 COM1/COM2 - Ethernet Communication

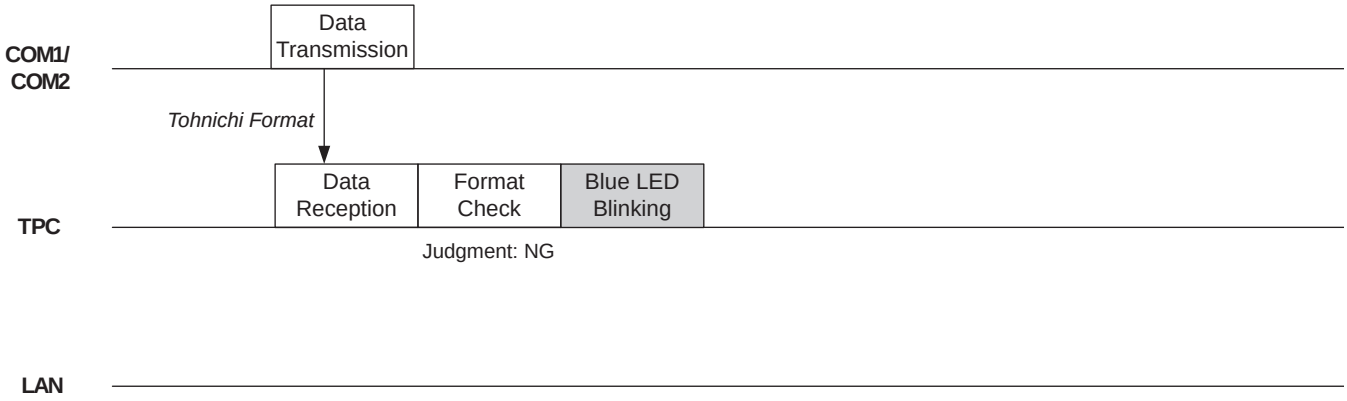


Receive data through COM1/COM2 and send to LAN

1. When the received data is correct, TPC converts it to the selected protocol and sends it to LAN.
   The status LED lights in blue for about 1 second.



2. When the received data is error, TPC will not send data and the status LED blinks in blue twice.



Receives data through LAN and separates the data to COM1/COM2

To send data to either COM1 or COM2, assign "C1," for COM1, "C2 for COM2" at the end of the data format.

* If not added, data will be sent to COM1.

1. Refer to following sample format for changing device setting by a command data through LAN to COM1.

• Example format of changing 3-digit ID to "001" in R-FHD256 receiver.

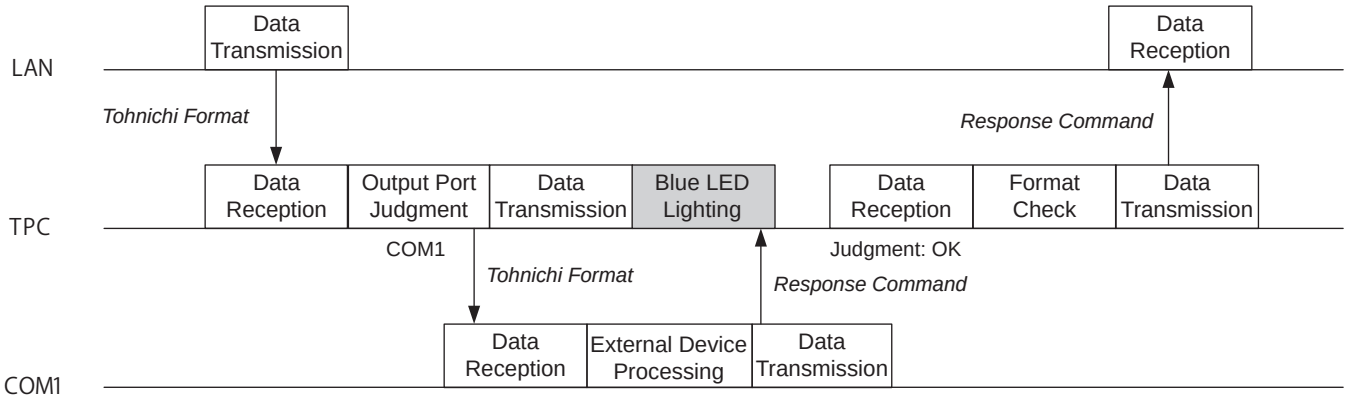
A	R	0	3	,	C	1	,	0	0	1	CR	LF

Delimiter

• Example format of sending a command to output one count of the data in CD5 display.

M	1	,	C	1	CR	LF

Delimiter



2. Refer sending data through LAN to COM2.

• Example format of changing 3-digit ID to "001" in R-FHD256 receiver.

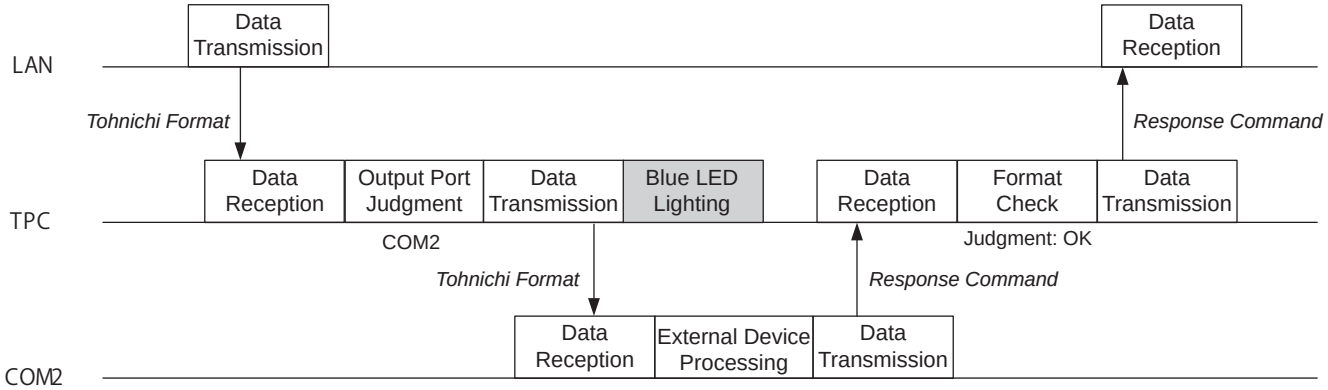
A	R	0	3	,	C	2	,	0	0	1	CR	LF

Delimiter

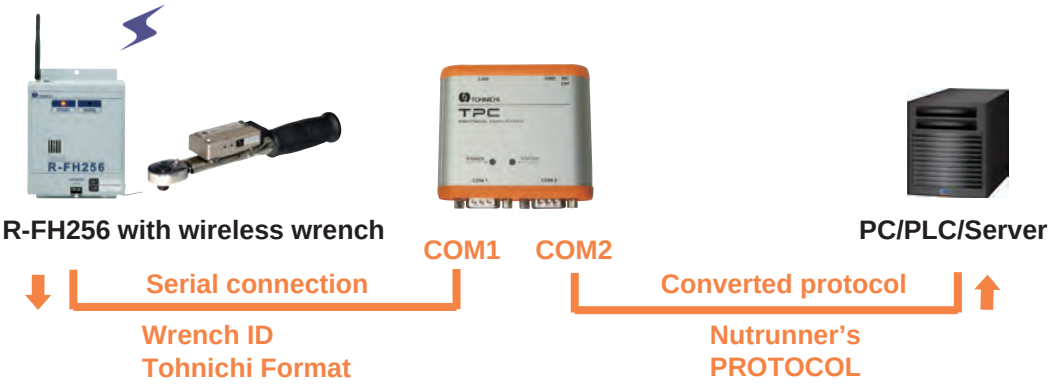
• Example format of sending a command to output one count of the data in CD5 display.

M	1	,	C	2	CR	LF

Delimiter

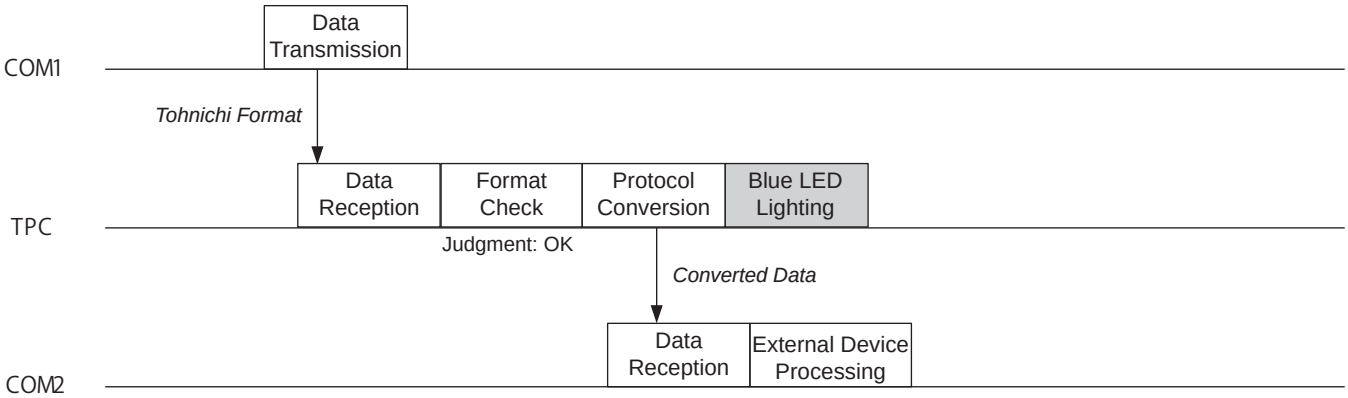


6-1-2 COM1 to COM2 Communication

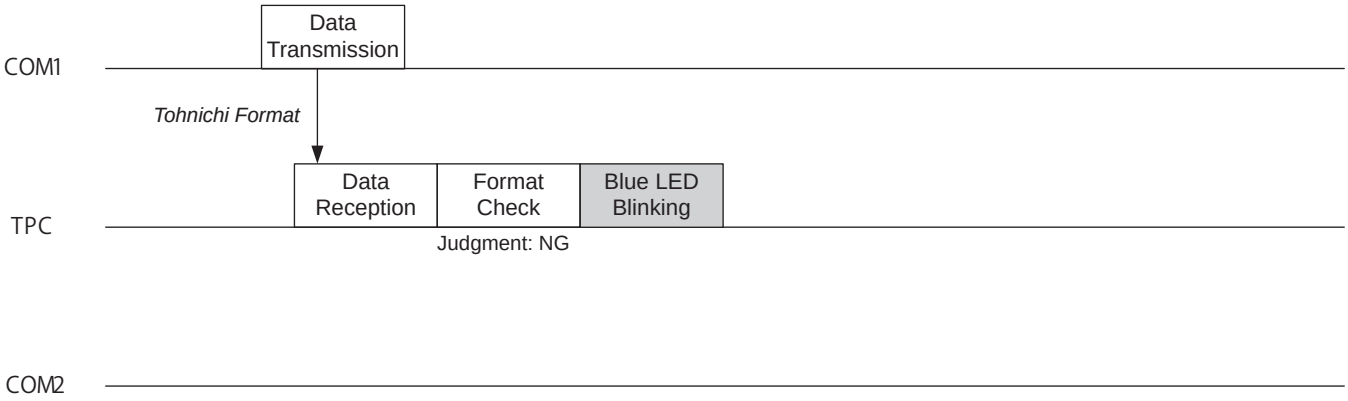


* Should be connect Tohnichi interface devices to COM1 and PC/PLC/Server to COM2.
* To change the setting of TPC with PC and setting software, link the TPC and PC with LAN.

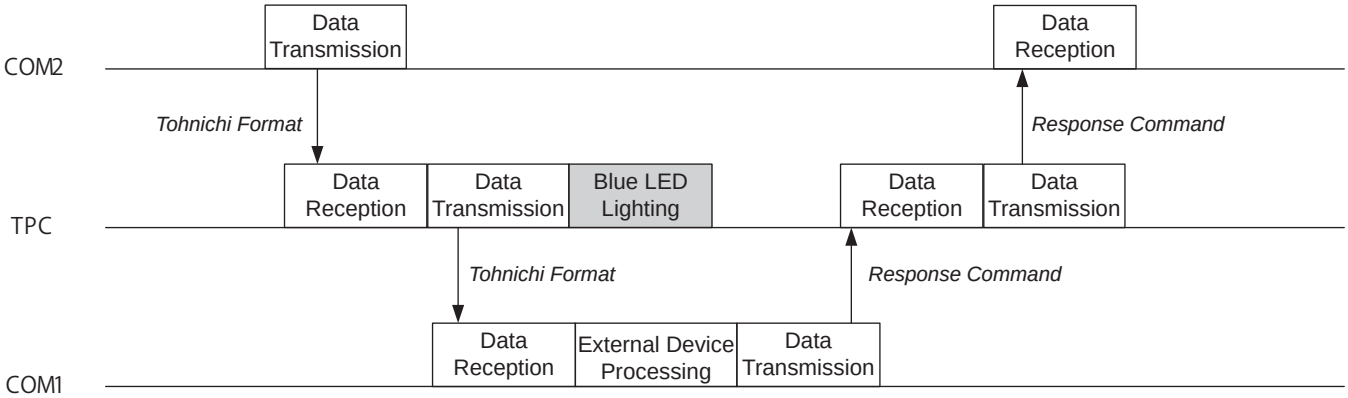
1. For incoming data through COM1, TPC converts it to the selected protocol and sends it to COM2.
   The status LED lights in blue for about 1 second.



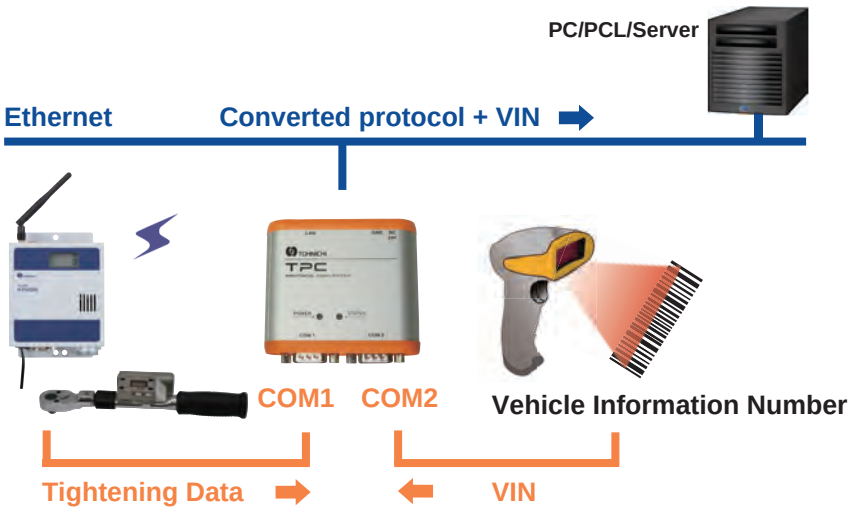
2. For incoming data through COM1 was error, TPC will not output data and the status LED blinks in blue twice.



3. When the TPC received data through COM2, the data will not be converted and TPC outputs data through COM1
   and then LED turns in blue for 1 second.

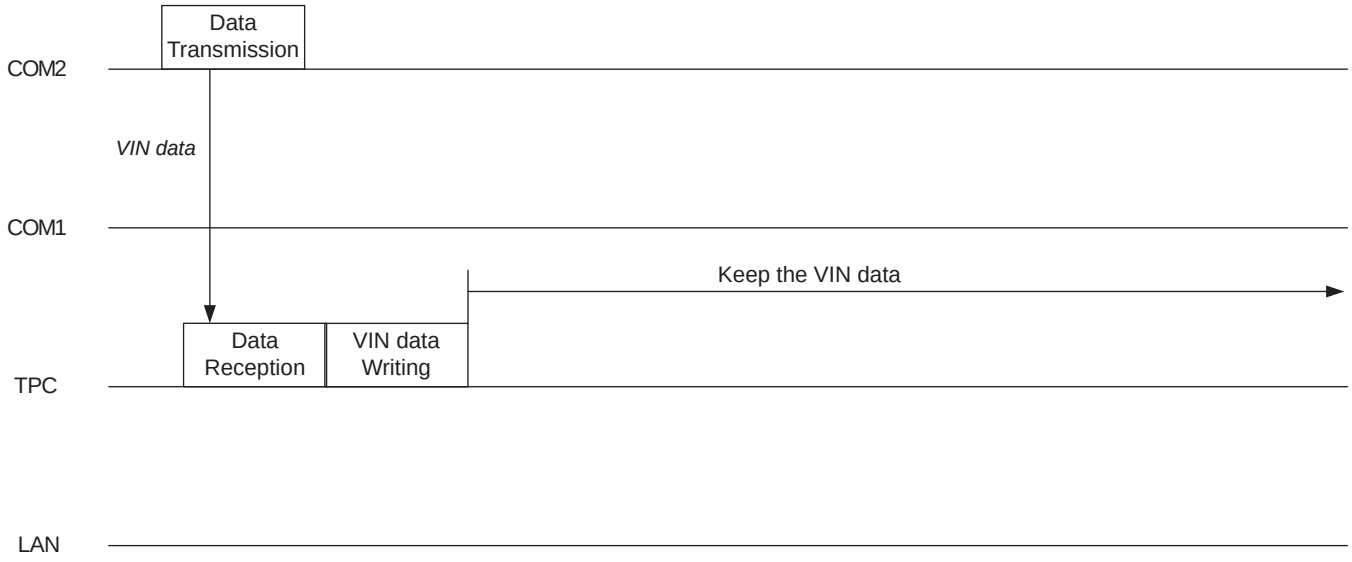


6-1-3 Incorporate VIN by a Barcode Reader

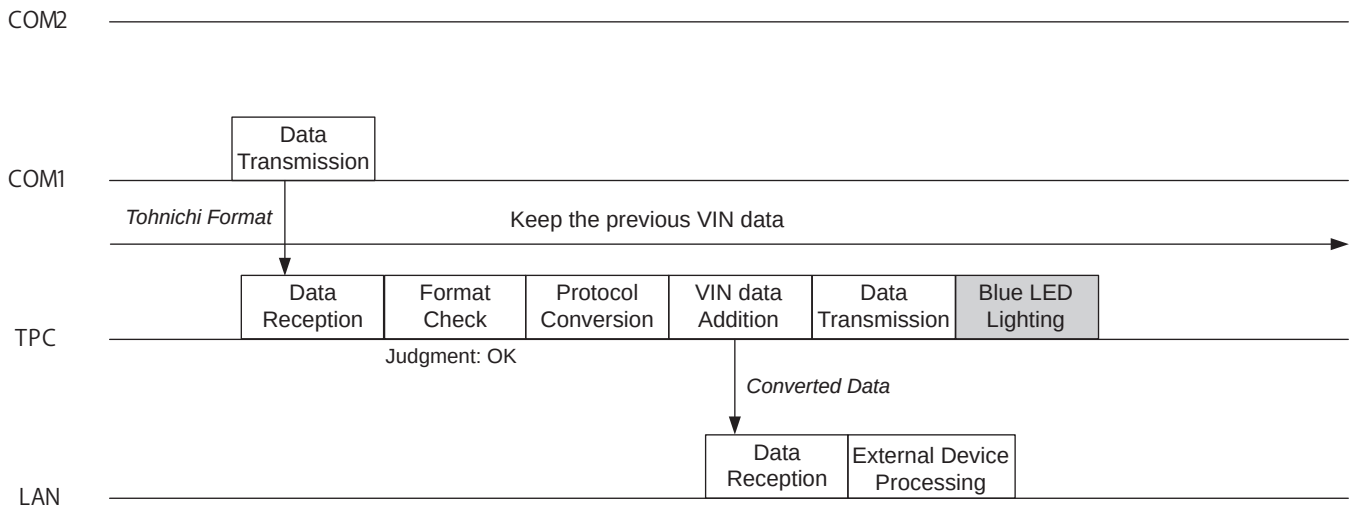


* Should be connect Tohnichi interface devices to COM1 and a barcode reader to COM2.
* Not available COM1 to COM2 communication with barcode reader.
* Be sure to insert a line feed code (CR + LF) when scanning a barcode.

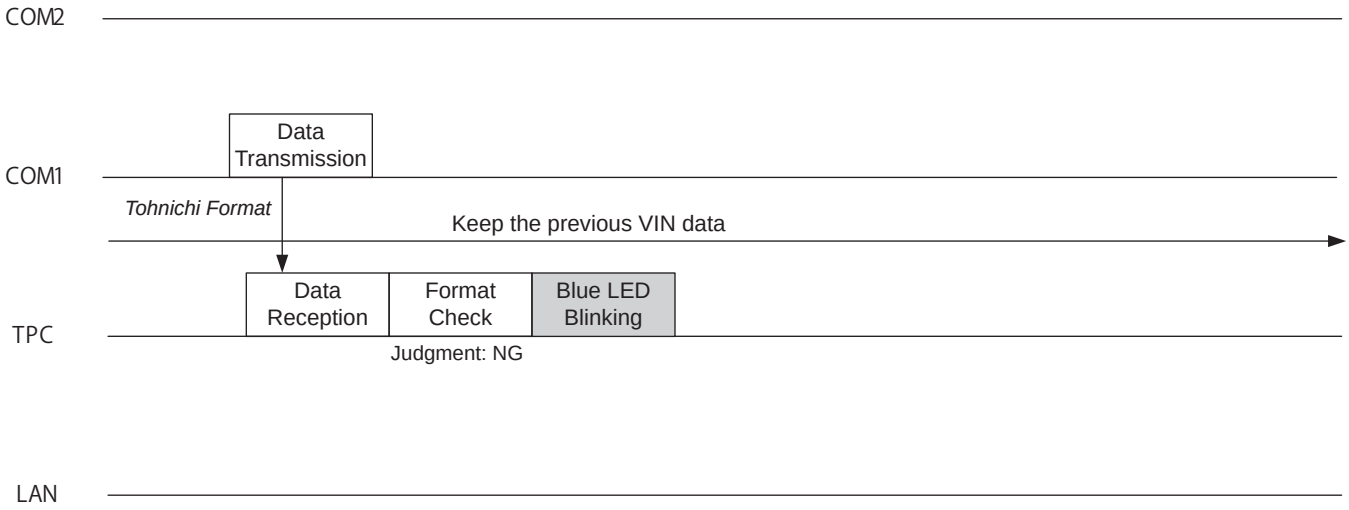
1. Receive a VIN data with the barcode reader connected to COM2and hold it



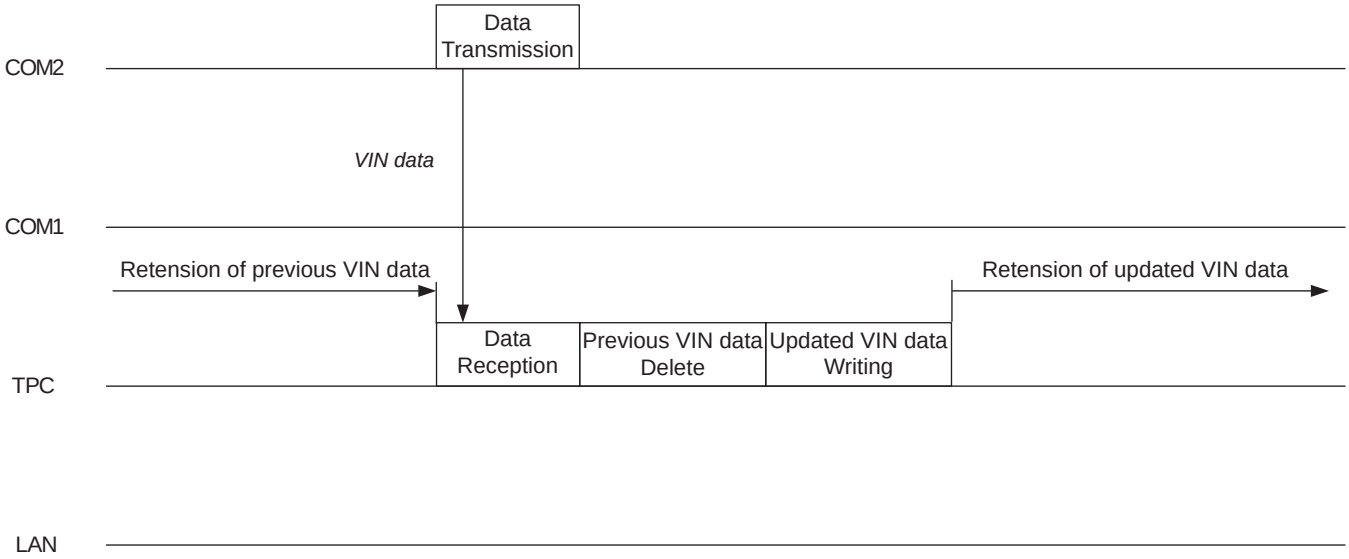
2. Combines the incoming data from COM1 with VIN data that has been held in the body and outputs it through LAN. Then the status LED lights in blue for 1 second.



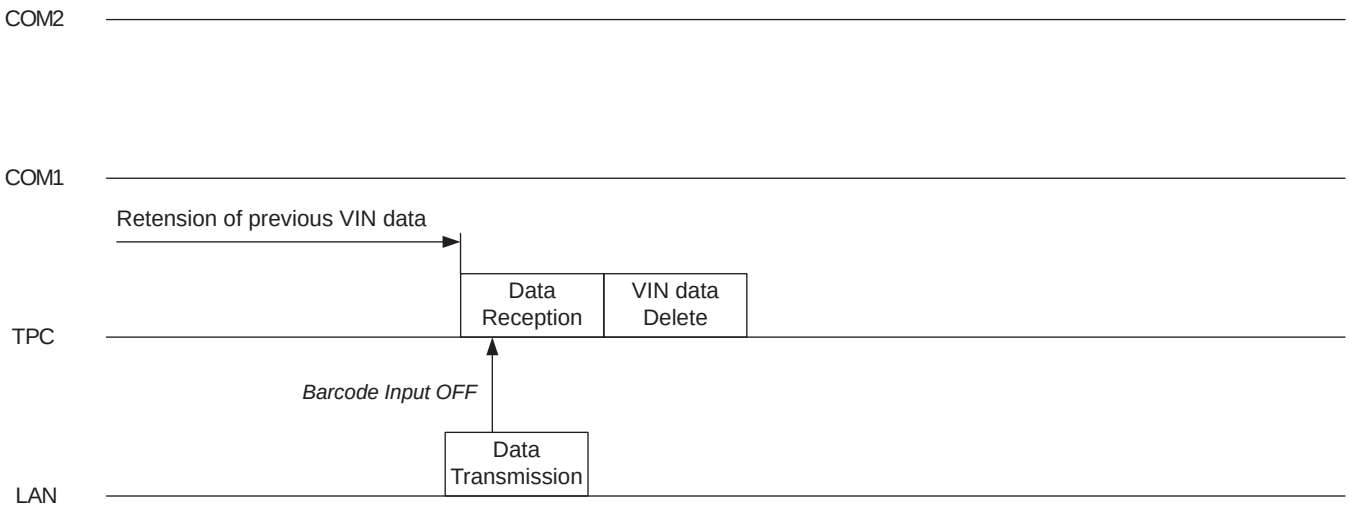
3. For incoming data through COM1 was error, TPC will not output data and the status LED blinks in blue twice.



4. When get new VIN data through COM 2, the previous VIN data held in the body is erased and rewritten the new VIN data and holds it.



5. When the barcode input setting is turned OFF, the holding VIN data will be deleted.

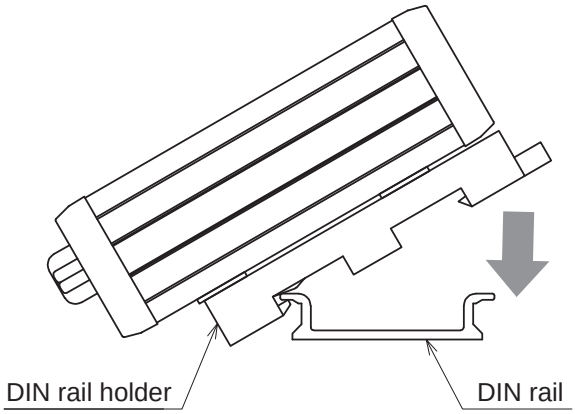


6-2 Mounting/Demounting DIN Rail

6-2-1 Mounting Method

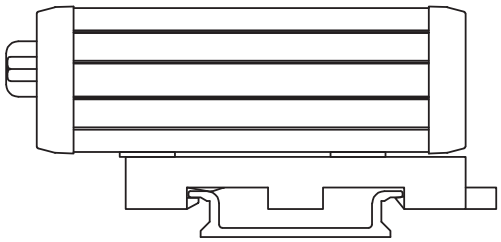
Preparation

35mm DIN Rail



#1

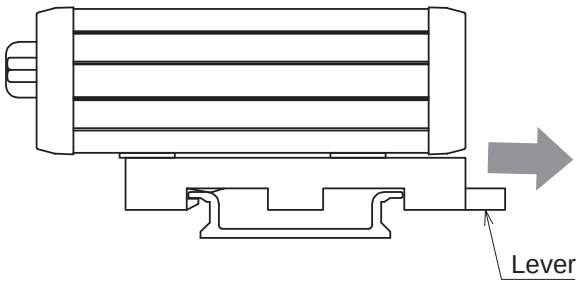
Insert one side of DIN rail between board and jaw of installation board, and push TPC itself.



#2

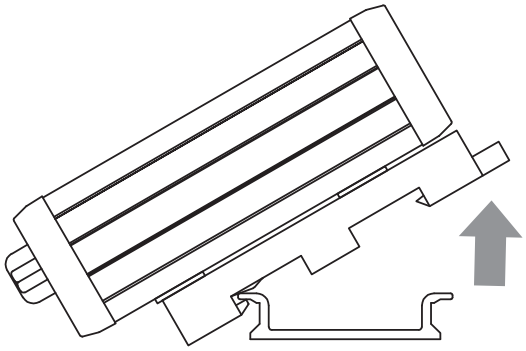
Make sure both sides of DIN rail are mounted.

6-2-2 Demounting DIN Rail



#1

Pull the white color lever.



#2

DIN rail comes off.

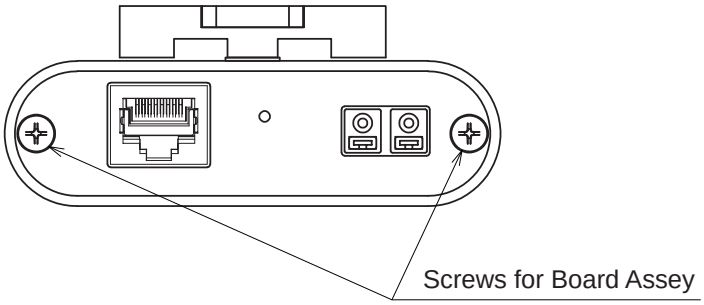
6-3 Replacement Battery

There is a battery inside TPC for keeping present time.

When five years passed from first use or when time is not displayed definitely, replace the battery.

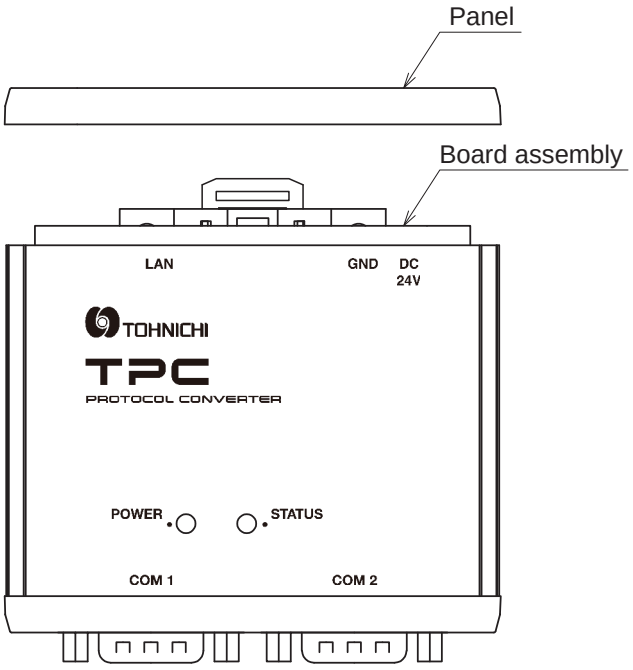
Preparation

Torque Driver w/31.5cN.m and #2 Phillips bit

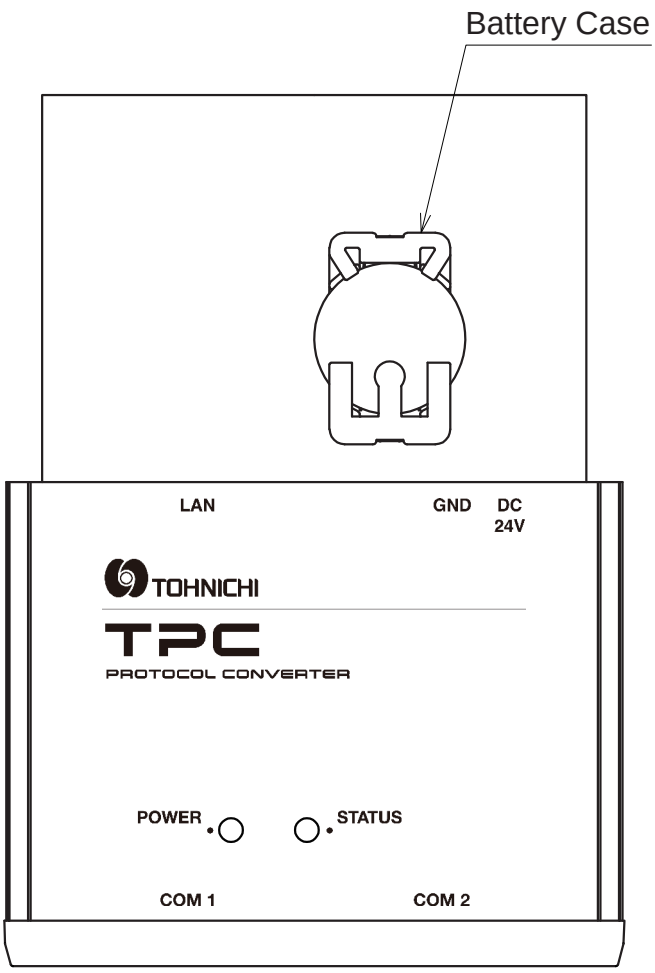


#1

#1 TPC must be turned off. Remove two screws of top of panel.

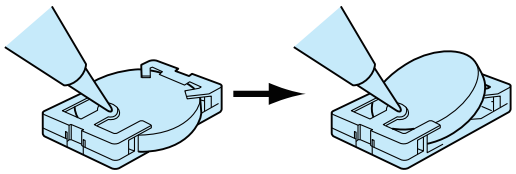


#2 Take the panel off, and pull the mail board.



#3 Replace the battery

* Remove the battery by pushing TAB of the case with your finger or tip of pen lightly.
* Recommendation : Panasonic Coin Type Lithium Battery CR2032.



#4 Put back the main board to its original position, and tighten screws after the top panel on.
Tightening Torque 31.5 cNm

#5 Set the time using TPC setting software.

6-4 Initialization

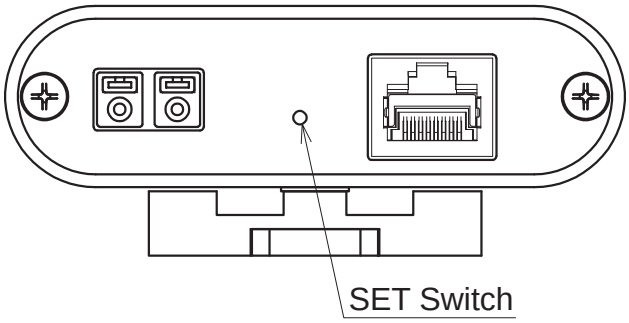
How to reset the product to the factory default setting.

#1 Turn on TPC switch during "SET" button pressed.

#2 Release "SET" button when Power LED begins blinking.

#3 The initialization is completed when blinking stopped.

Refer #7-1-4 for TPC initial setting points.



6-5 Error Message

The LED display indicates error status, refer to the following instructions.

LED Display		Status	Solution
#1	Power LED: lights in red  Status LED: blinks 2 times in blue  0.4 sec. interval	Communication error	Caused by incompatible data format or the data deformation. Check the proper condition of the connecting cable and data format. Check if the flow control setting was set same for the connected devices .
#2	Power LED: lights in red  Status LED: blinks 3 times in blue  0.4 sec. interval	Flow control error	CTS signal is undetected. - Check if the flow control setting was set same for the connected devices . - Check if the connector cable is properly connected.
#3	Status LED: blinks in red  0.5 sec. interval	Memory error	The set value is wrong. Conduct re-setting with PC setting software. If it does not recover, repairing is necessary.

7 Setting

7-1 Setting Items

7-1-1 Common Setting

#1 Protocol

Select one protocol. There are Tohnichi, ACOP, Stanley and custom made.

Tohnichi: Tohnichi direct format. Can be used as RS232 Serial to Ethernet converter.

ACOP: Atlas Copco Open Protocol

Stanley: Stanley Protocol

Custom Made: Your own format

#2 Communication

Select "COM1/COM2-Ethernet" or "COM1-COM2"

"COM1/COM2-Ethernet" for LAN cable. Two COM ports can be connected.

"COM1-COM2" for RS232C cable. COM1 to Tohnichi and COM2 to computer device.

#3 Input Barcode

Connecting Barcode Reader to COM2 and Tohnichi device to COM1. Set ON.

Communication route, COM1 to COM2 is not available when using COM2 as Barcode Reader.

#4 Date and Time

Data and time information are available. When actual time is error, reset time using TPC setting software.

7-1-2 Communication Settings

Both COM1 and COM2 are set individually.

#1 Baud rate

2400/4800/9600/19200/38400/115200 bps

#2 Parity

None/Odd/Even

#3 Data Length

7/8 bit

#4 Stop Bit

1/2 bit

#5 Flow Control

CTS/RTS

7-1-3 IP Address Settings

"IP address", "Subnet", "Gateway", "DNS" and "Port Number" can be set.

Both socket and serial Communication methods are available to change IP address, and IP address acquisition is only done by serial Communication.

7-1-4 Default Settings

Common Setting

Mode	Communication Route	Barcode Input	Date and Time
TOHNICHI	COM1/COM2 to Ethernet	OFF	2017/12/31 (YYY/MM/DD) 23:59:30 (TT:MM:SS)

Communication Setting

Port	Baud Rate	Parity	Data Length	Stop Bit	Flow Control
COM1	9600	None	8bit	1bit	OFF
COM2	9600	None	8bit	1bit	OFF

IP Address Setting

IP Address	Sub Net	Gateway	DNS	Port Number
192.168.11.2	255.255.255.0	192.168.11.1	0.0.0.0	5000

7-2 TPC Settings

Available setting software on PC through LAN cable connection between PC to TPC.

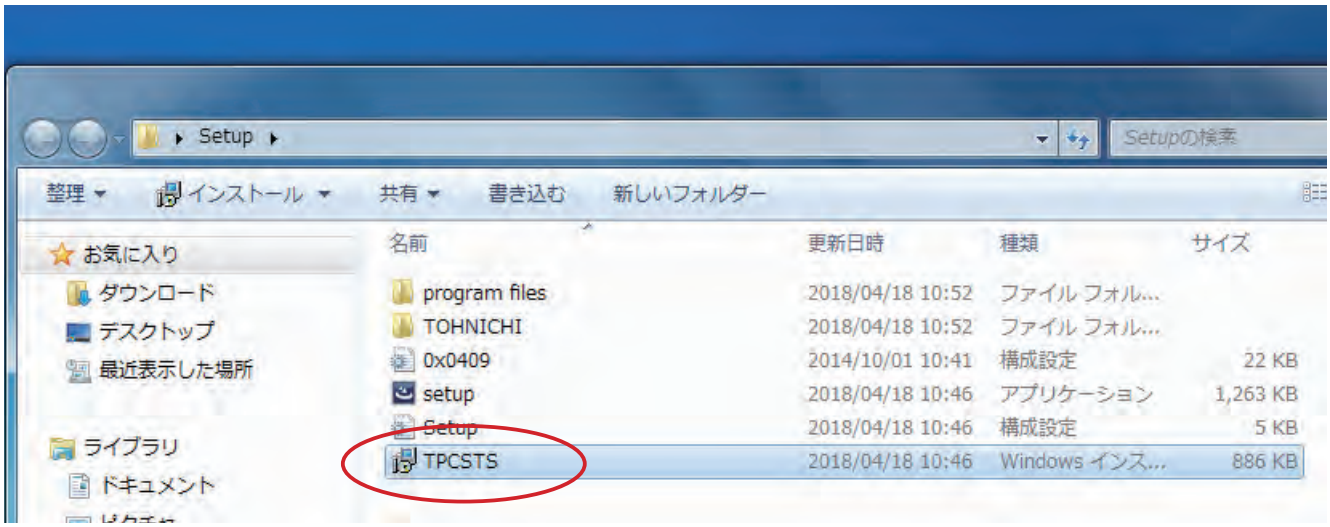
OS: Windows 7 or latest version.

Requirement: Microsoft .NET Framework 4.0 or latest version.

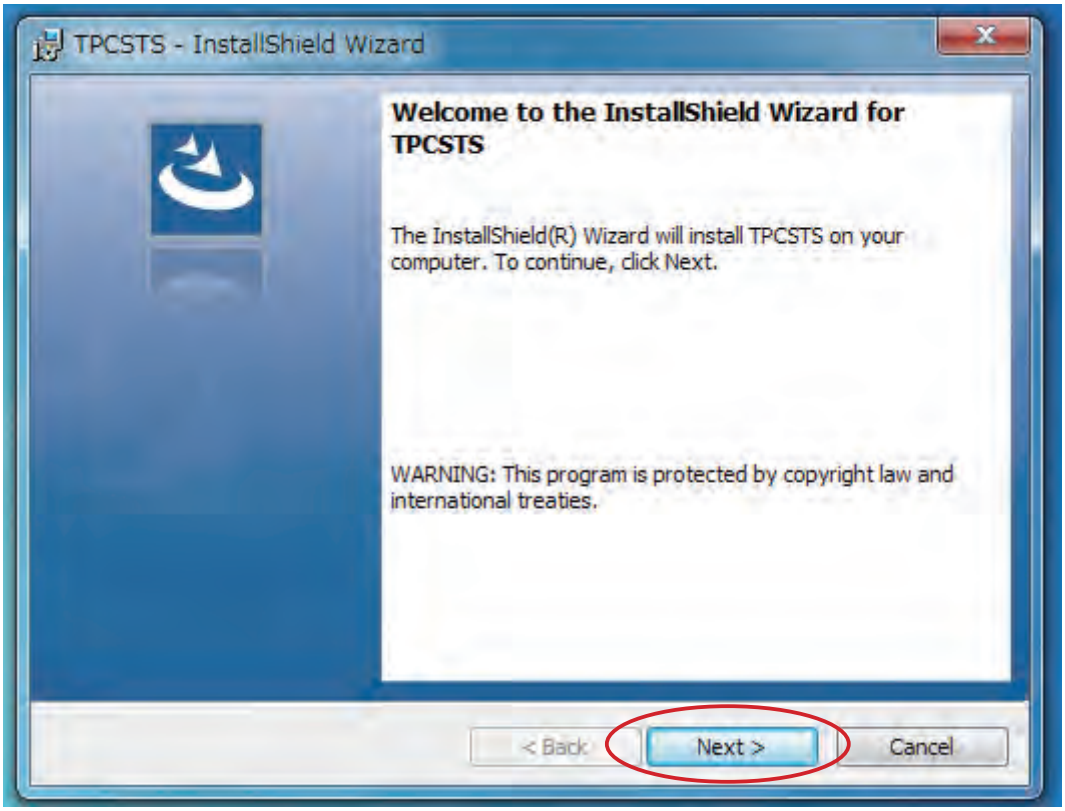
Install Microsoft .NET Framework 4.0 or later before use.

7-2-1 Installation (Windows 7)

1. Download TPC setting software from Tohnichi site or ask to distributors.
2. Double click "TPCSTS" in the Setup folder.

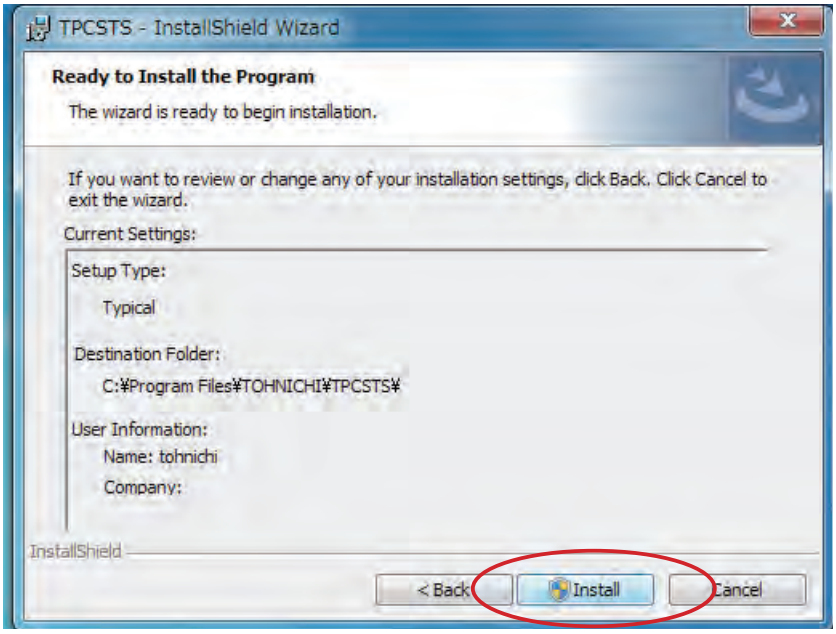


3. Click "Next" to proceed to installation or "Cancel" to exit

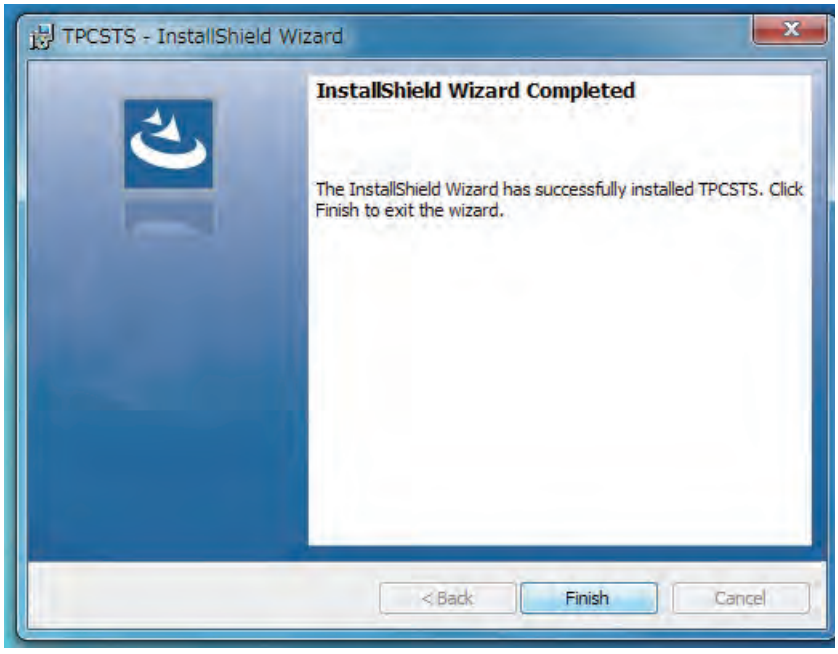


4. To install, click "Install".

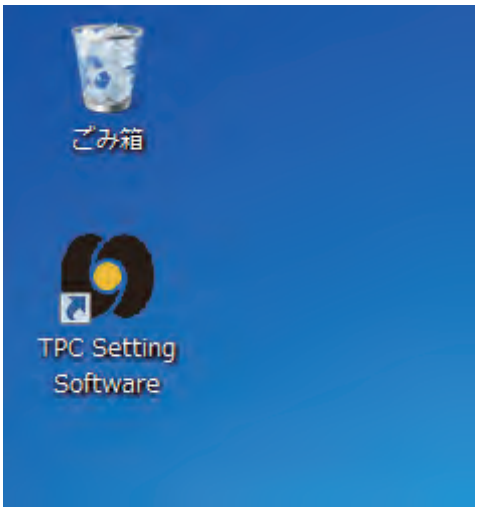
Depending on your OS system, message shows "Do you want to allow the following program from an unknown publisher to make changes to this computer", click "Yes" to install.

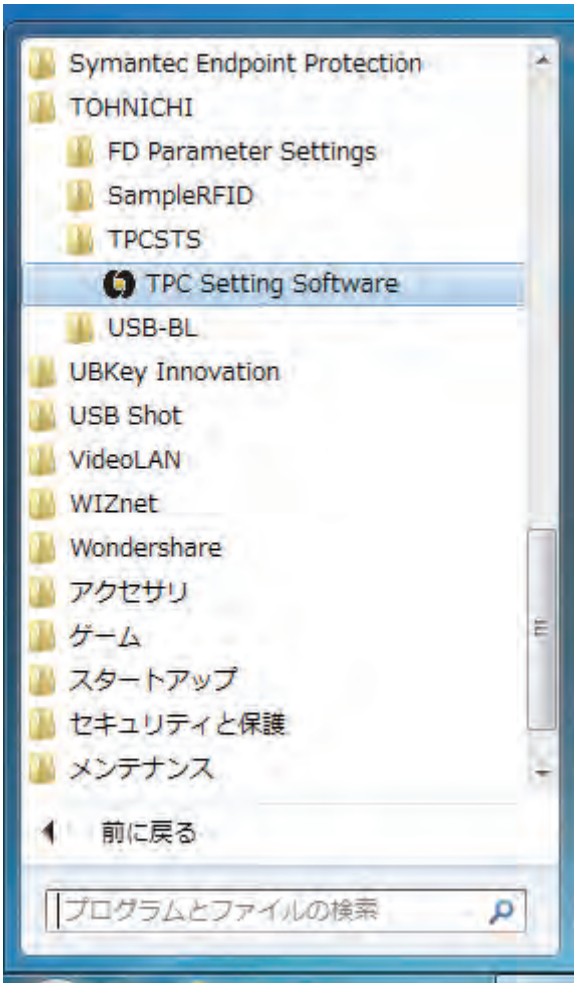


5. Installation has been completed.



6. After installation is completed, "TPC Setting Software" short cut will be created on the desktop and start menu.





7-2-2 Settng Software

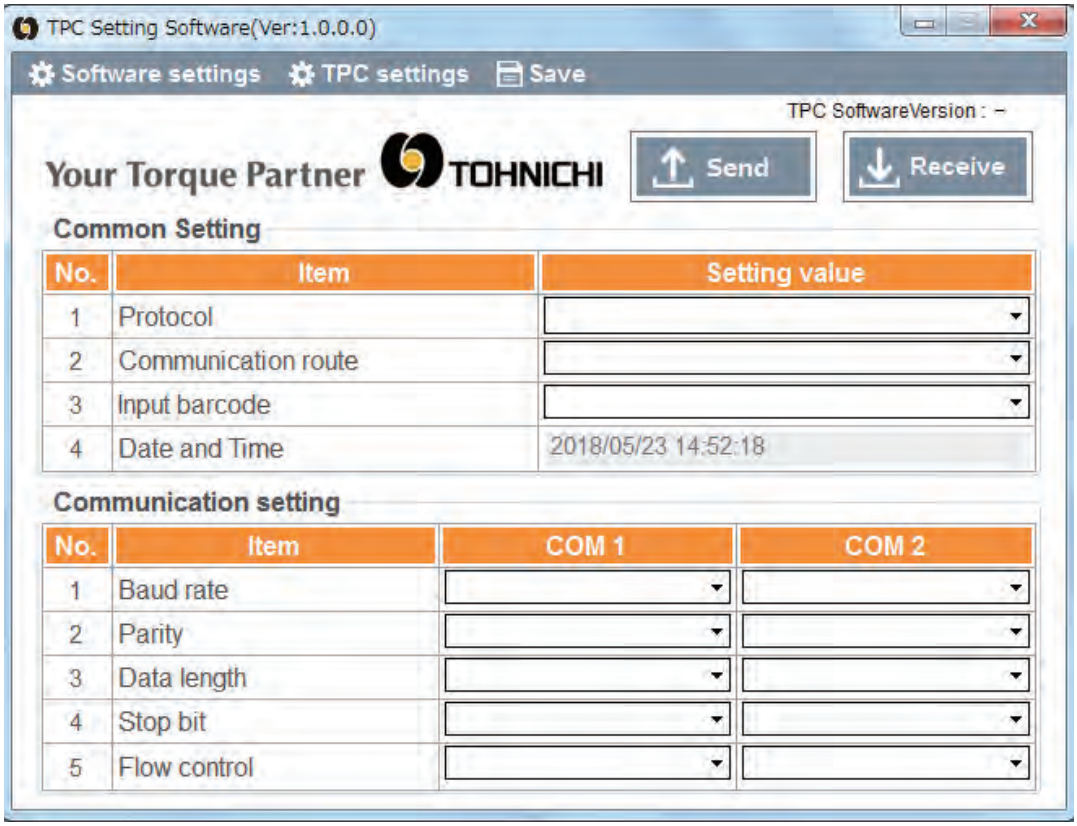
Setting software is available on PC. Connect TPC with PC through LAN cable.

OS: Windows 7 or latest version.

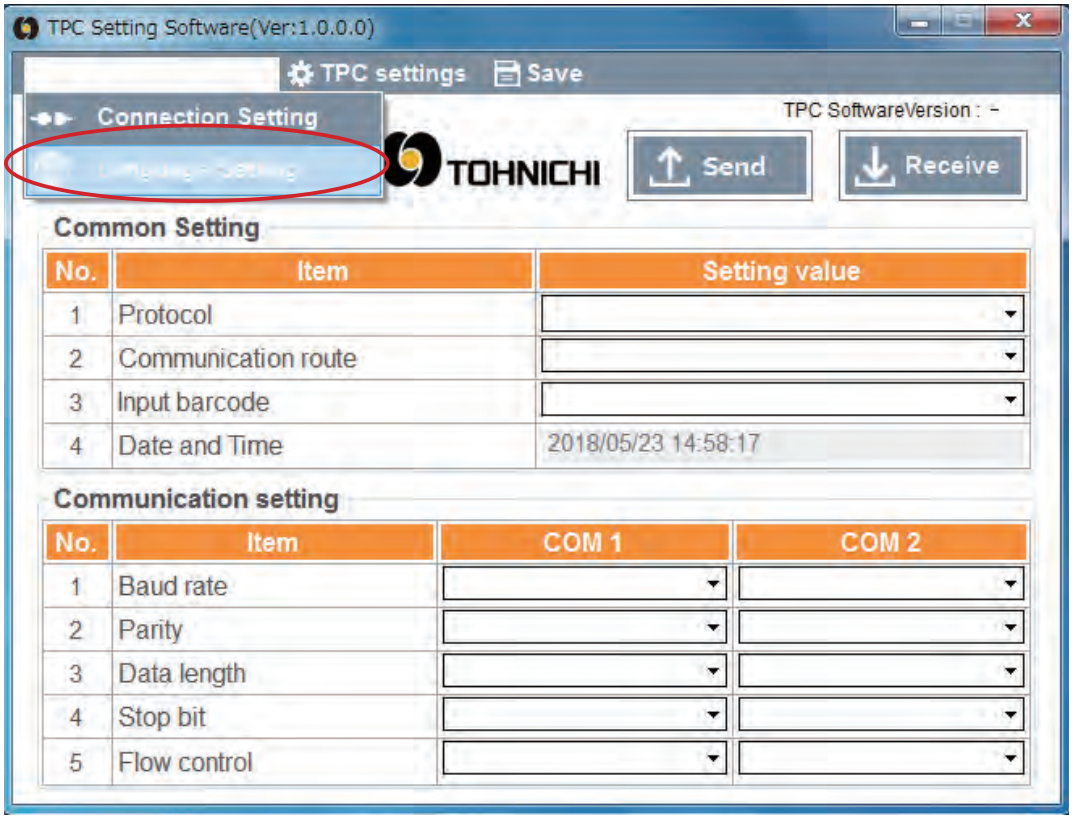
Refer to 7-1 for setting items.

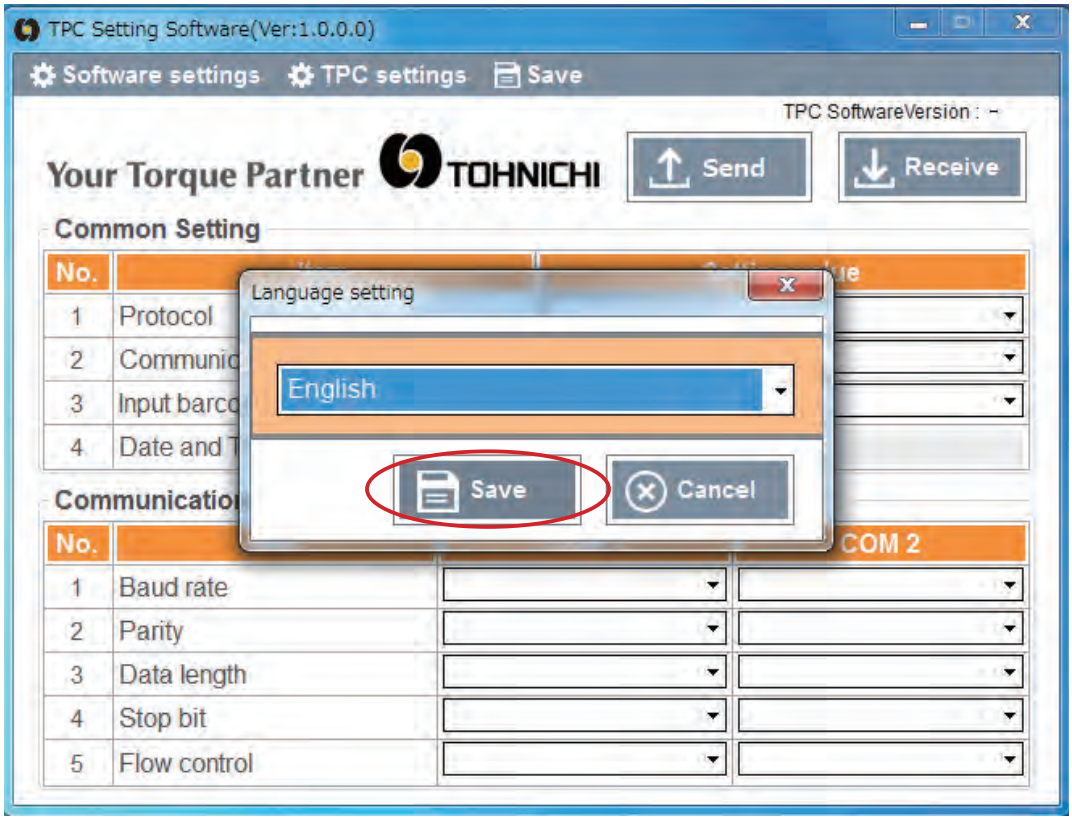
1. Connect TPC and PC which installed setting software.

2. Start up setting software.

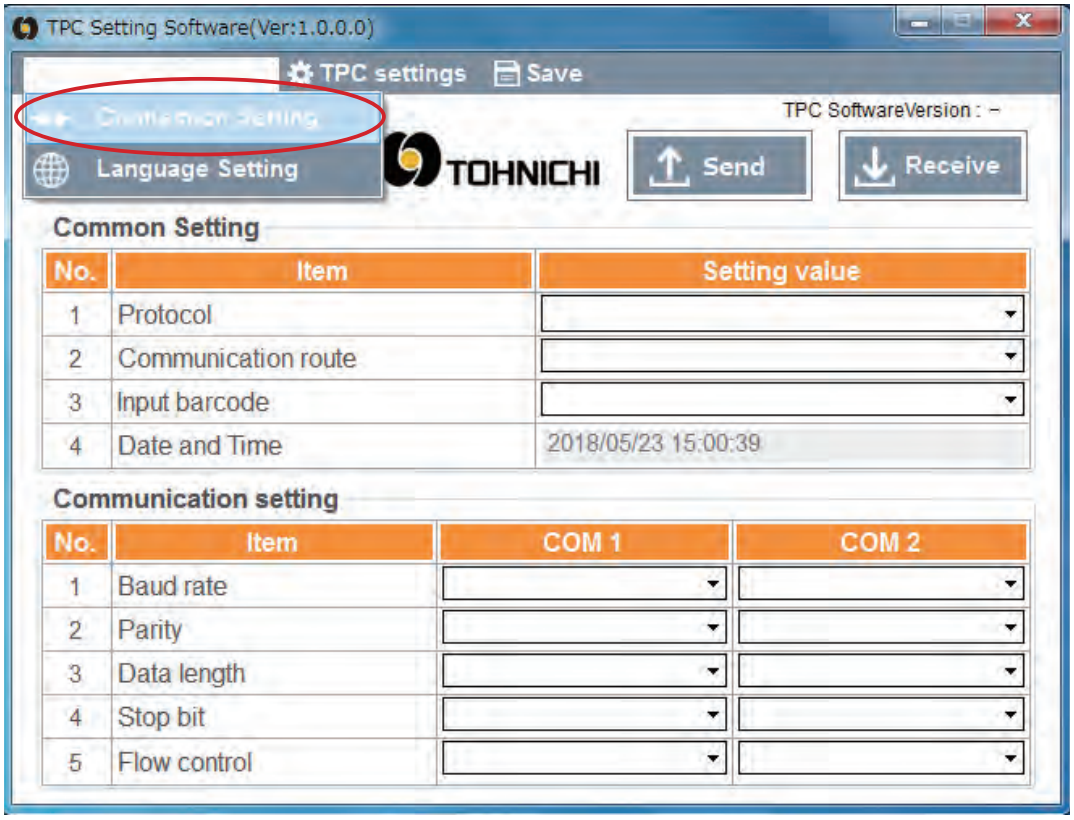


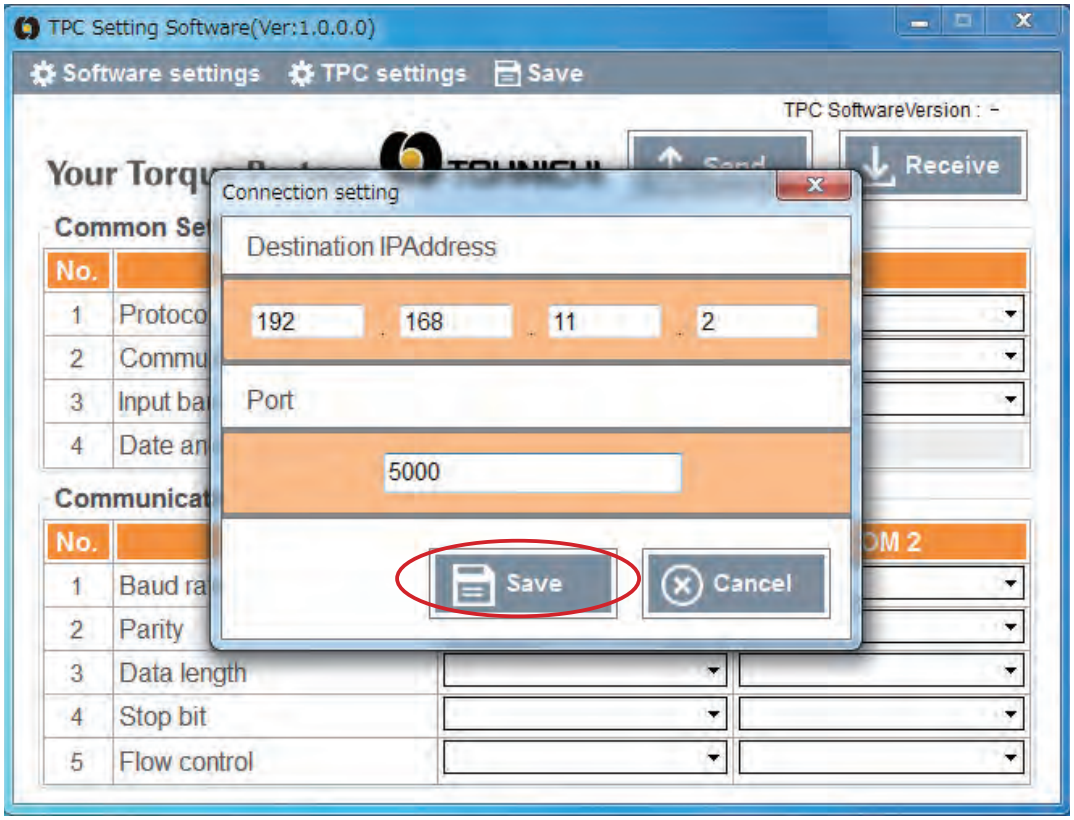
3. Click "Software Settings" - "Language Setting" and select language.
   Press "Save" to keep the setting.



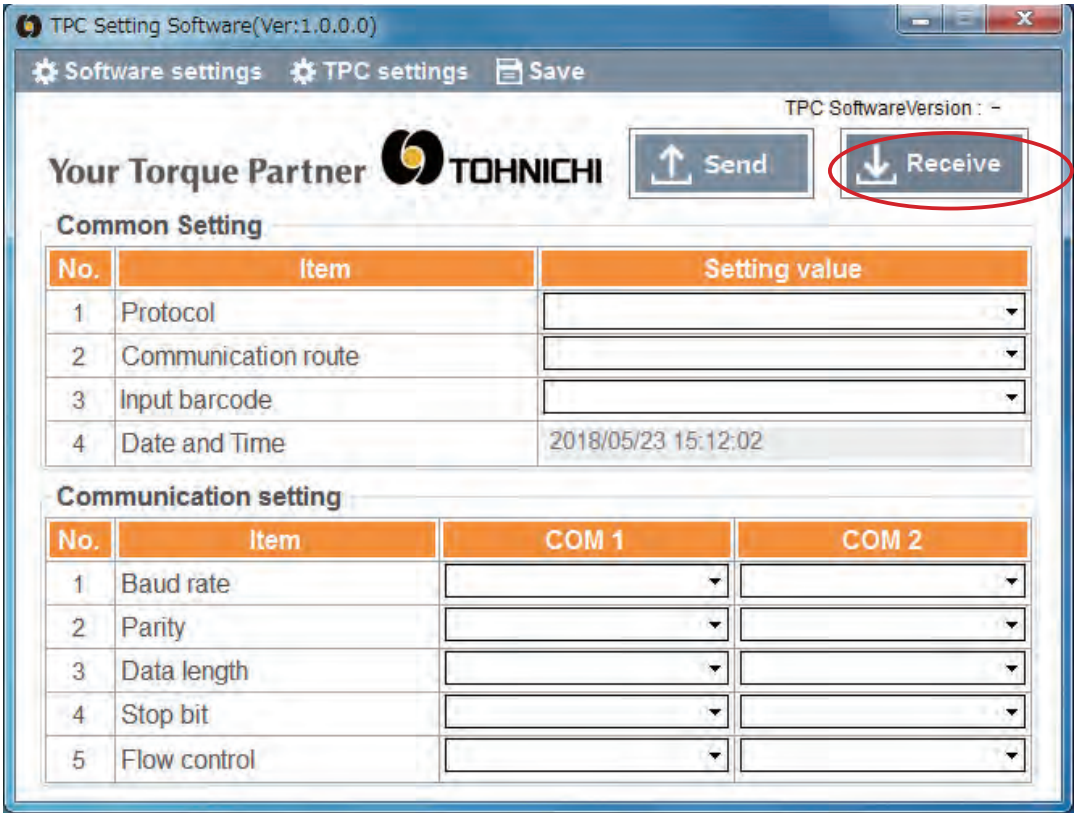


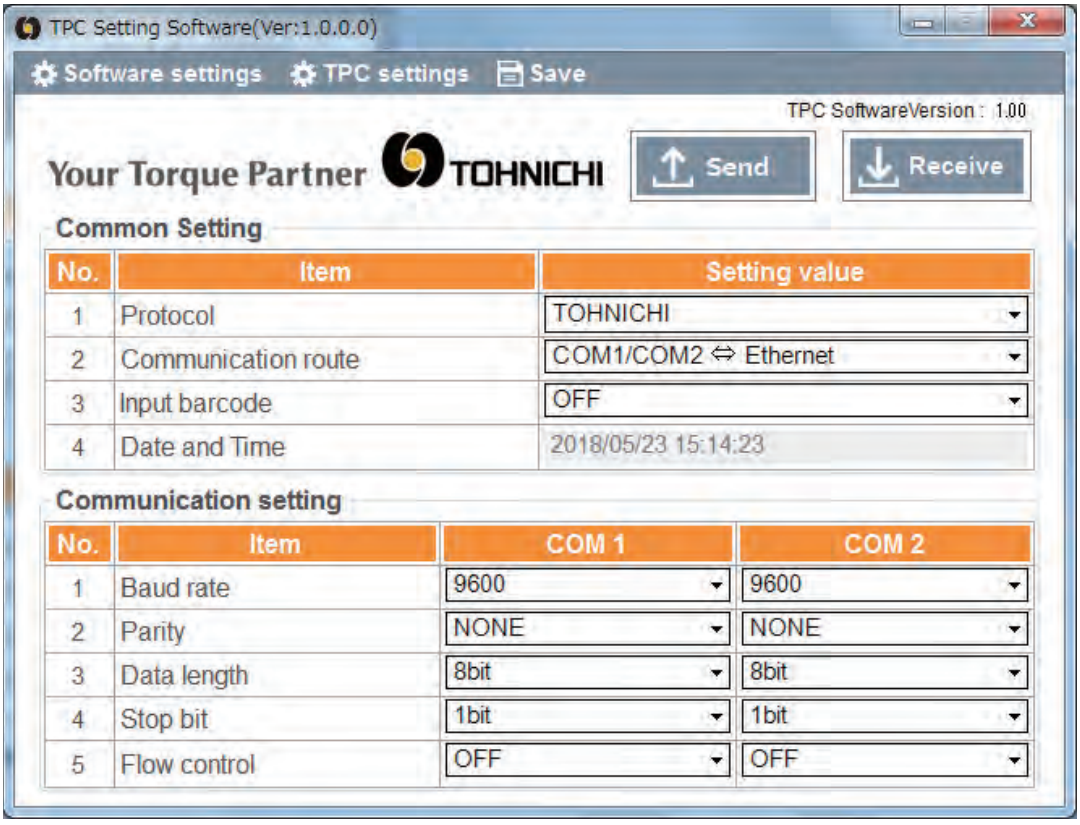
4. Click "Software Settings" - "Connection Setting" then Connection setting" window will be opened.
   Input IP address and Port number and save the setting.
   Refer to 7-1-4. for default settings.



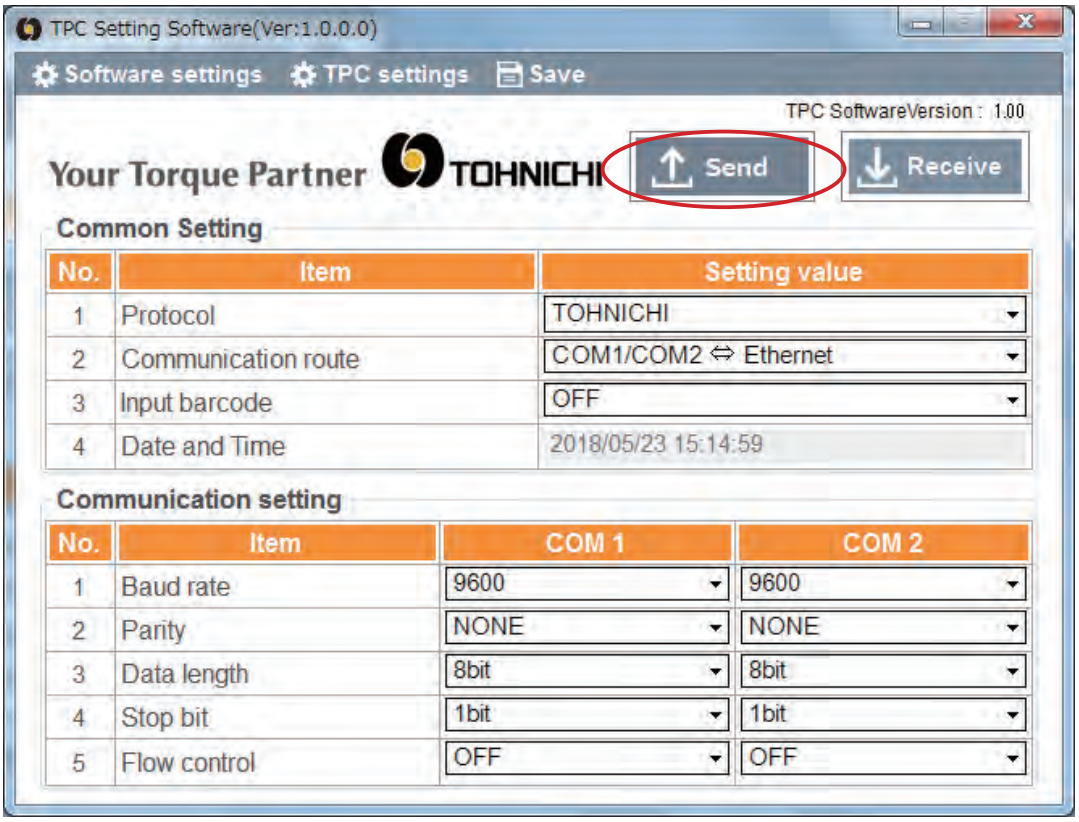


5. Click "Receive" to display current settings.
   Refer to 7-1 for Setting Items for details.



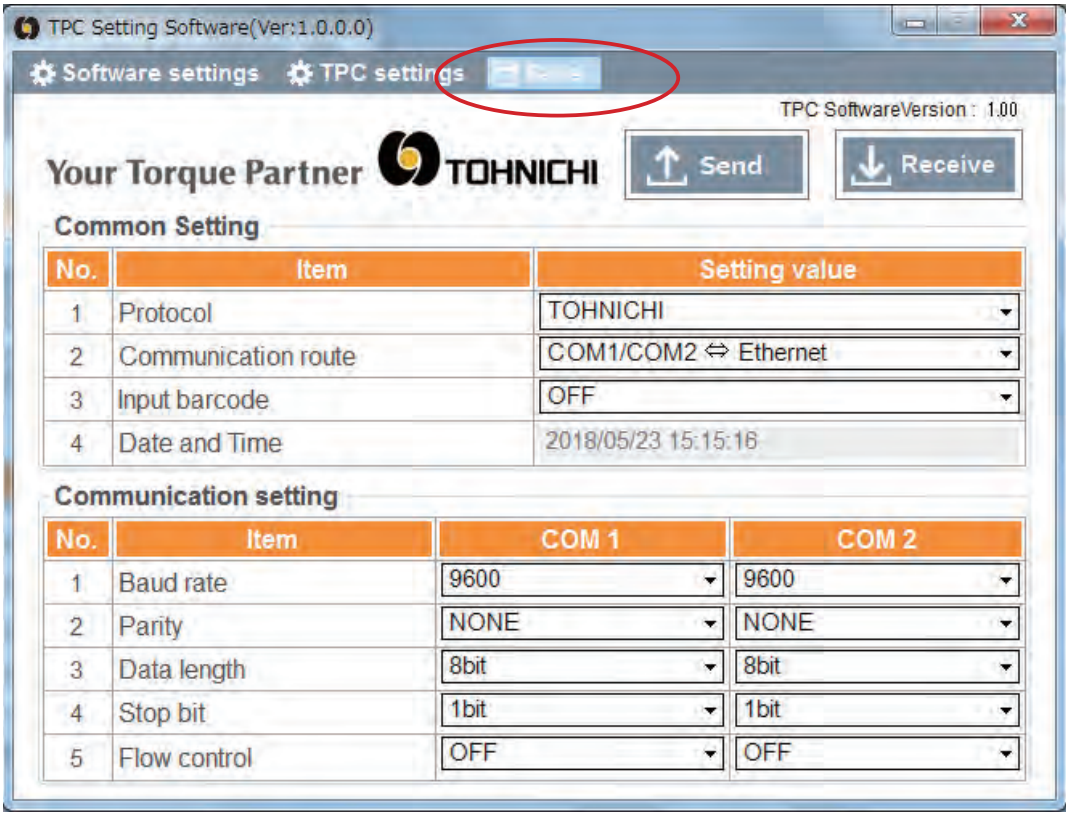


6. Select a setting item and click "Save" to change the setting.



7. Click "Save" to keep the selected setting.

   Once the setting saved, the saved setting items will be displayed when start up without pressing "Receive"



8. Setting is completed.

   Conduct communication test in your environment.

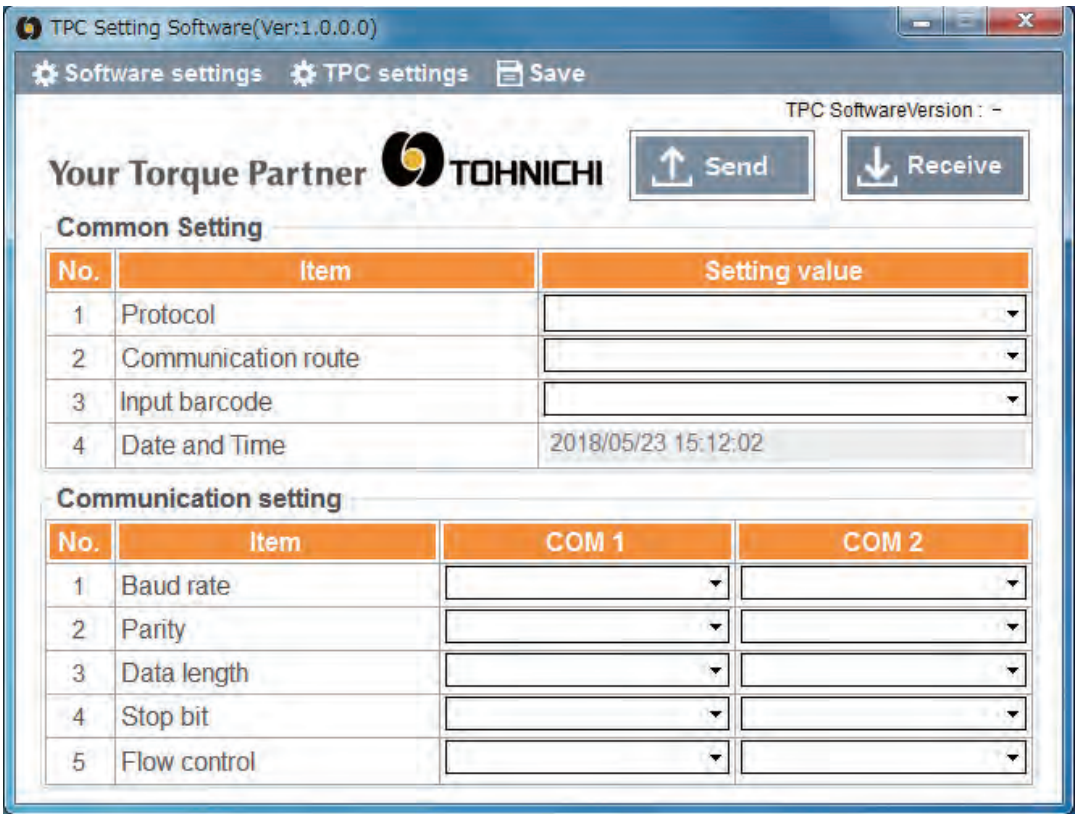
7-2-3 IP Address Setting through LAN

For IP address setting, setting software is available. Connect TPC with PC through LAN cable.

* Current IP address are unable to obtain while LAN connection. To get current IP address setting refer to 7-2-4 IP Address Setting through RS232C.

1. Connect TPC and PC which installed setting software.

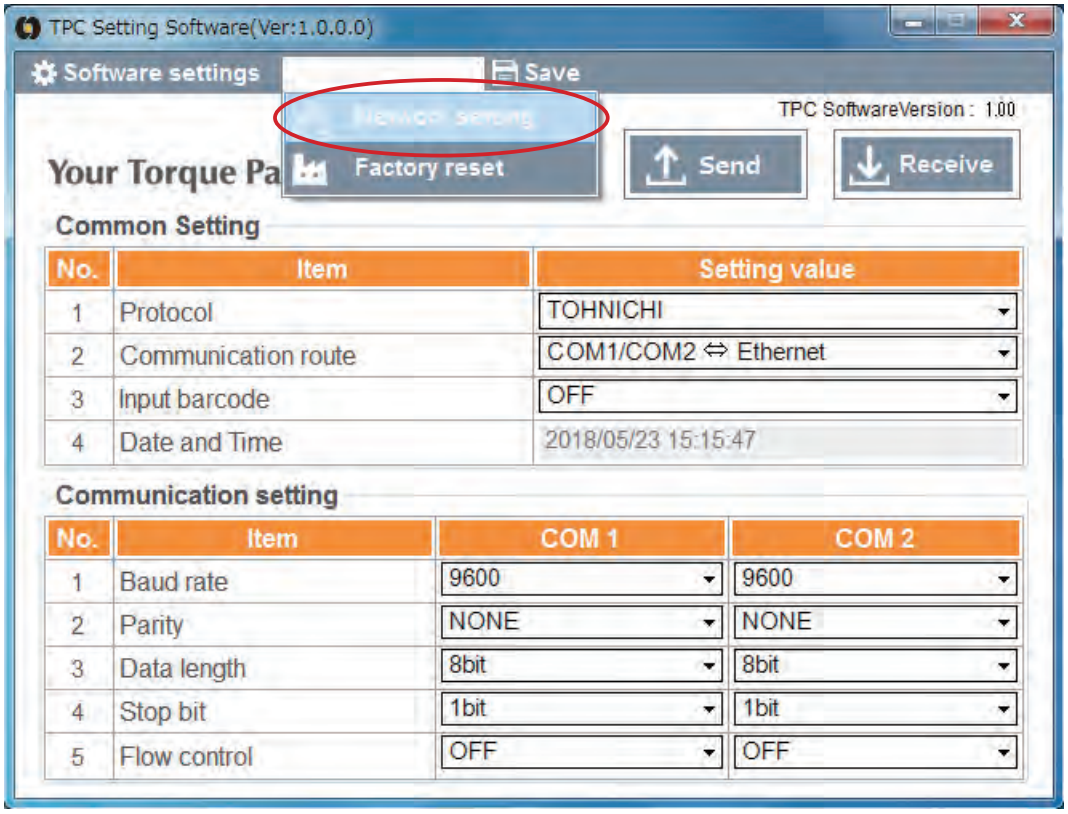
2. Start up setting software.

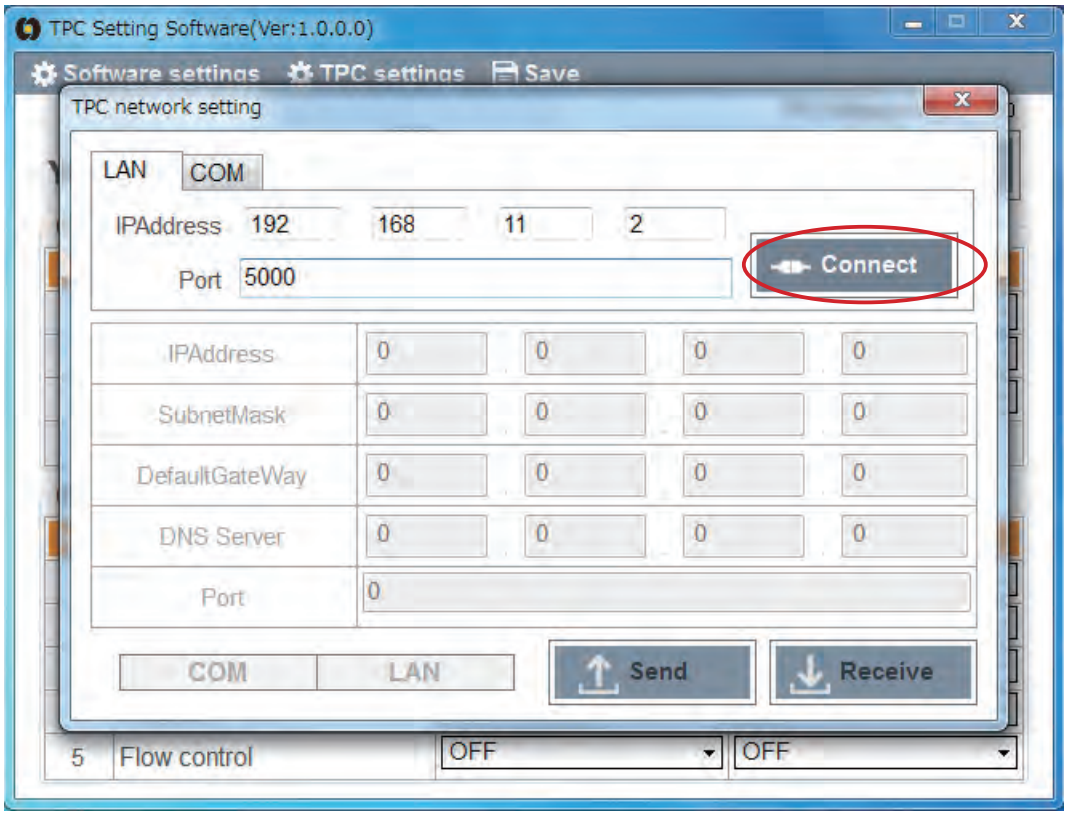


3. Click "TPC settings" - "Network setting" then "TPC network setting" window will be opened.

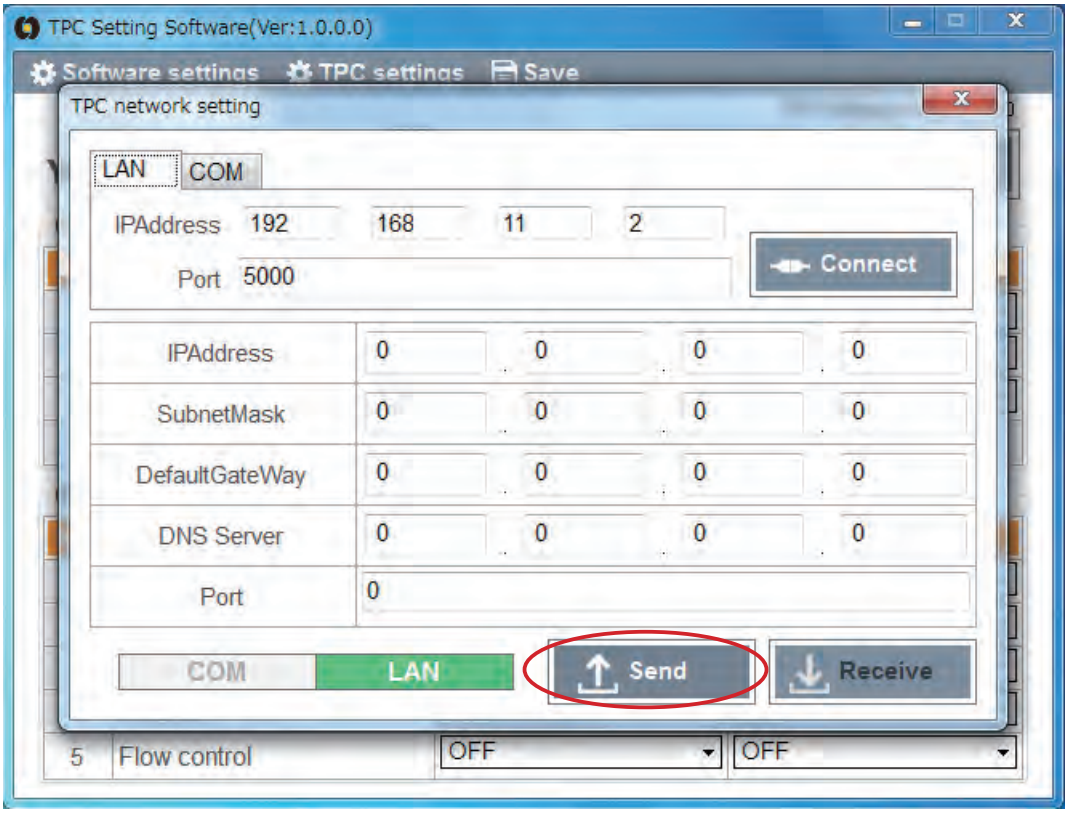
Input IP address, Port number and click "Connection".

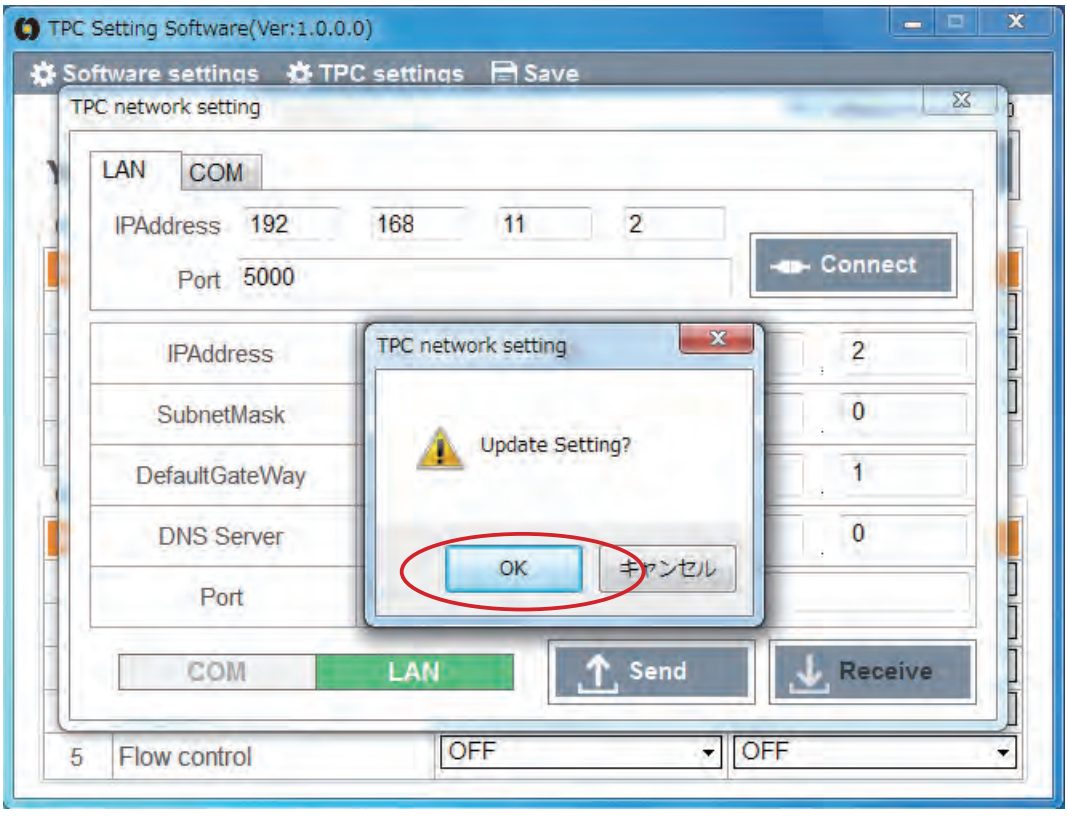
Refer to 7-1-4. for default settings.





4. When connection is completed, each setting items will be ready to input.
Fill in each setting items and click "Send" then message shows "Update Setting?",
click "Yes" to save the inputted IP address.



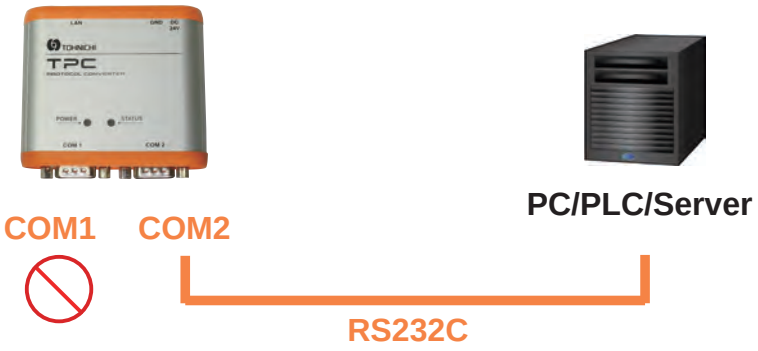


5. Setting is completed.
Conduct communication test in your environment.

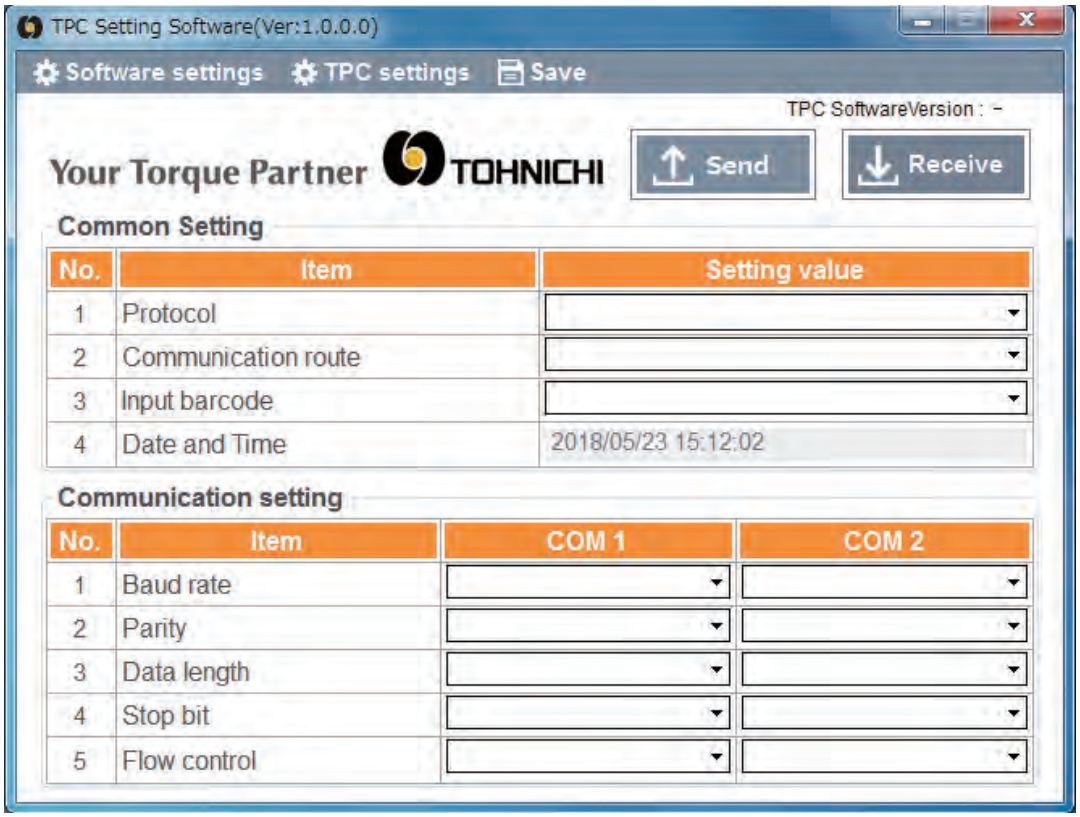
7-2-4 IP Address Settng through RS232C

For IP address setting, setting software is available. Connect TPC with PC through RS2322LAN cable to change the setting or get the current setting value.

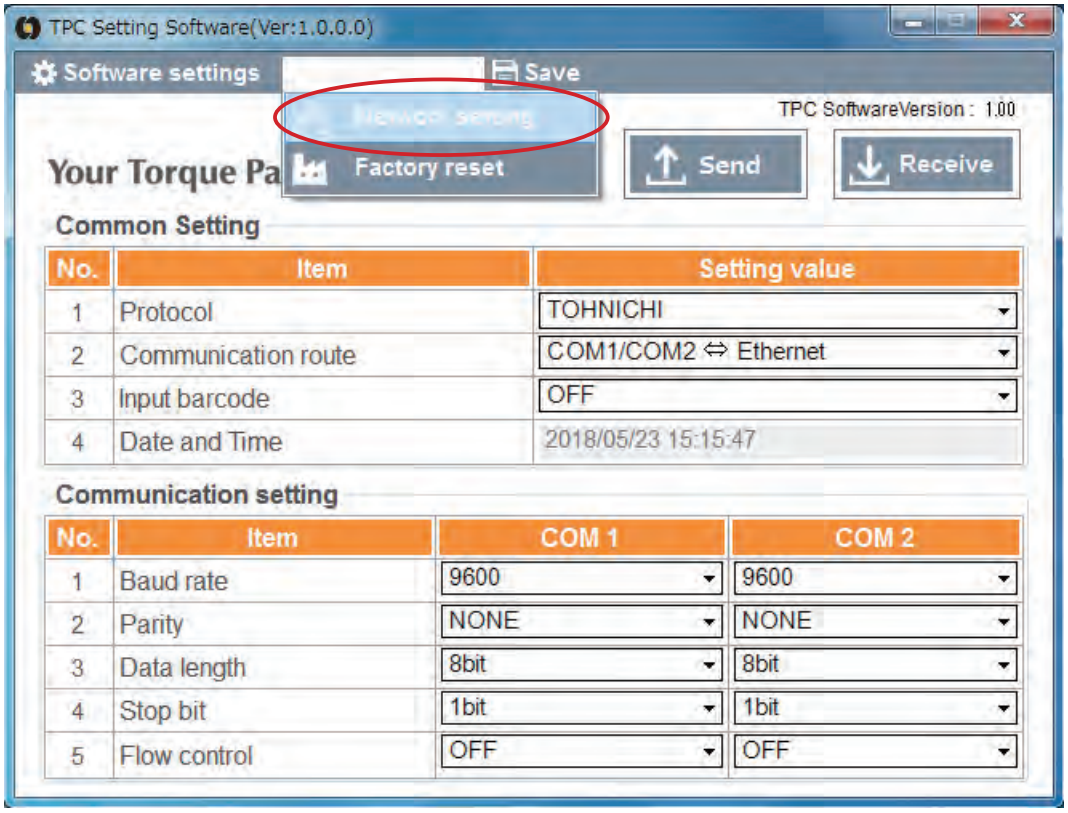
1. Connect RS232C able on the COM2 of TPC and PC which installed setting software.
   * Not available to use COM1.

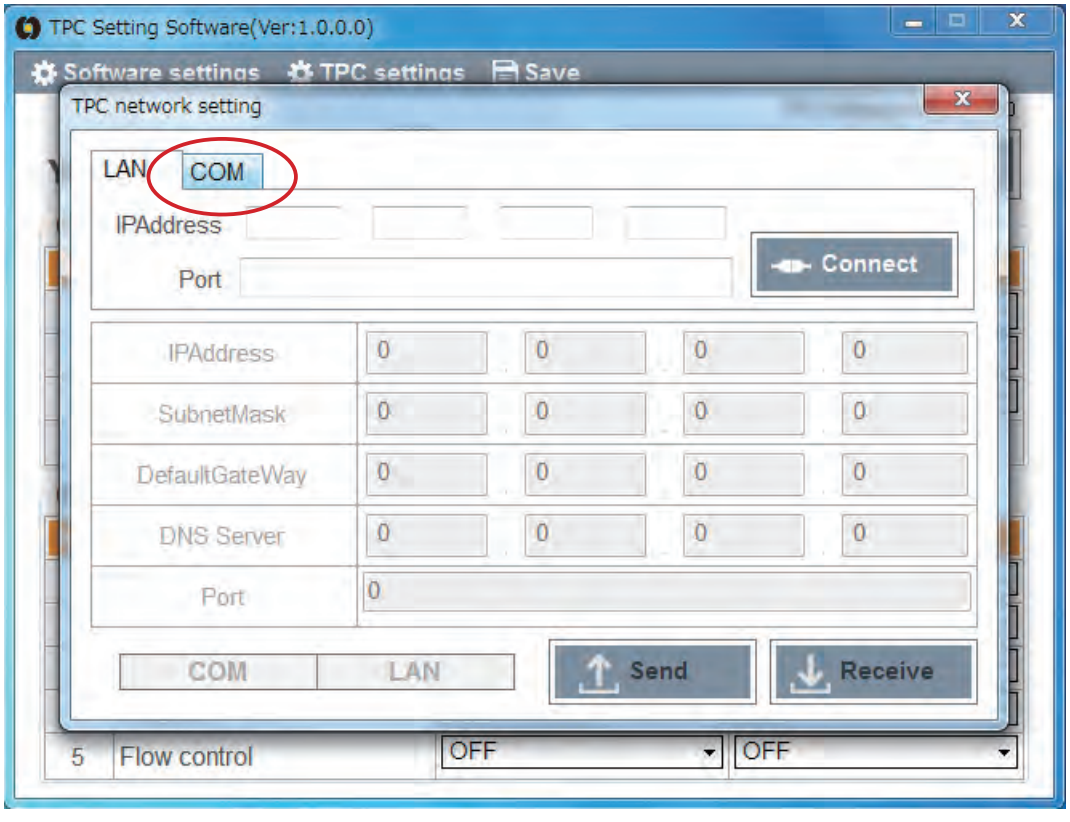


2. Start up setting software.

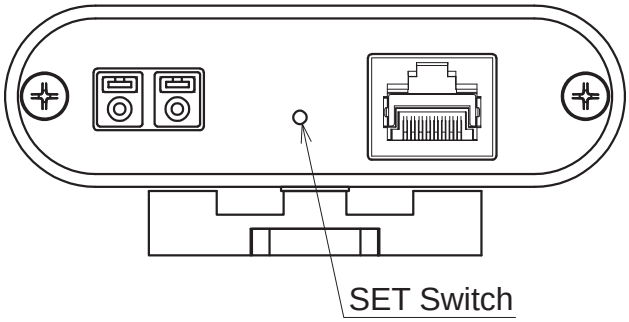


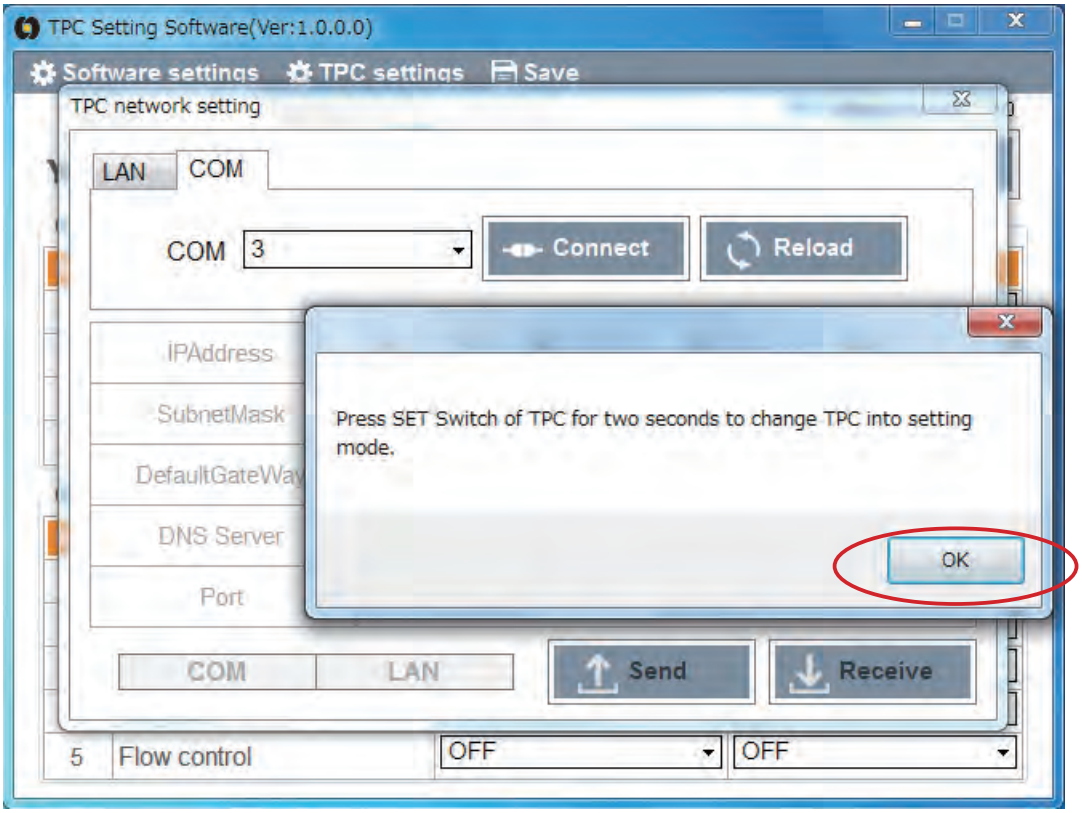
3. Click "TPC settings" - "Network setting" then "TPC network setting" window will be opened.
   Click "COM" tab.



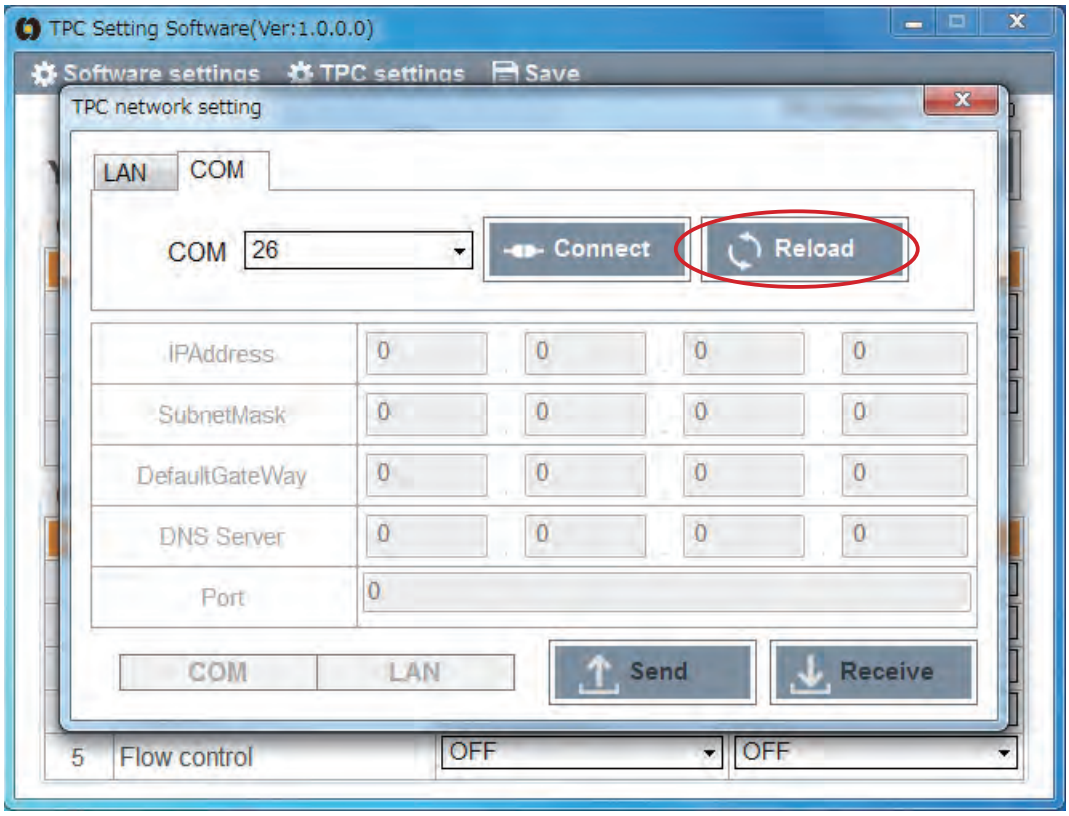


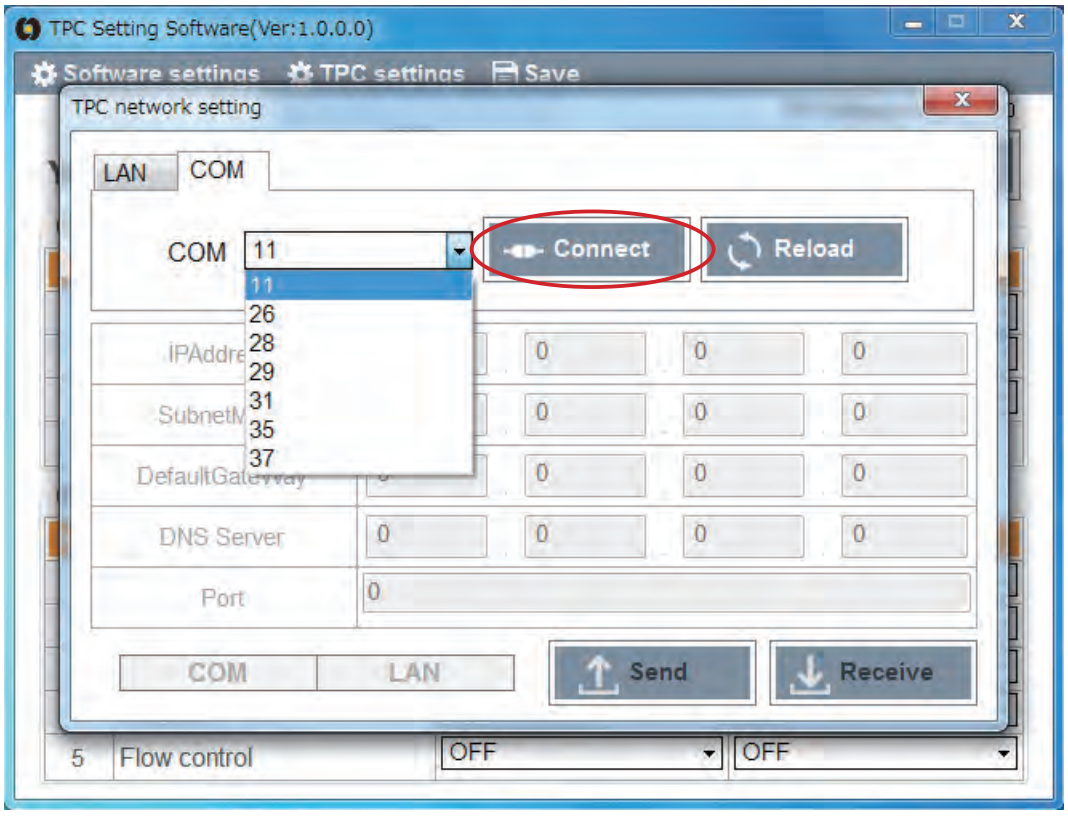
4. Message appears "Press SET Switch" of TPC for two seconds to change TPC into setting mode.", push SET Switch for 2 seconds.
   When the Status LED blinks in blue, click "OK",



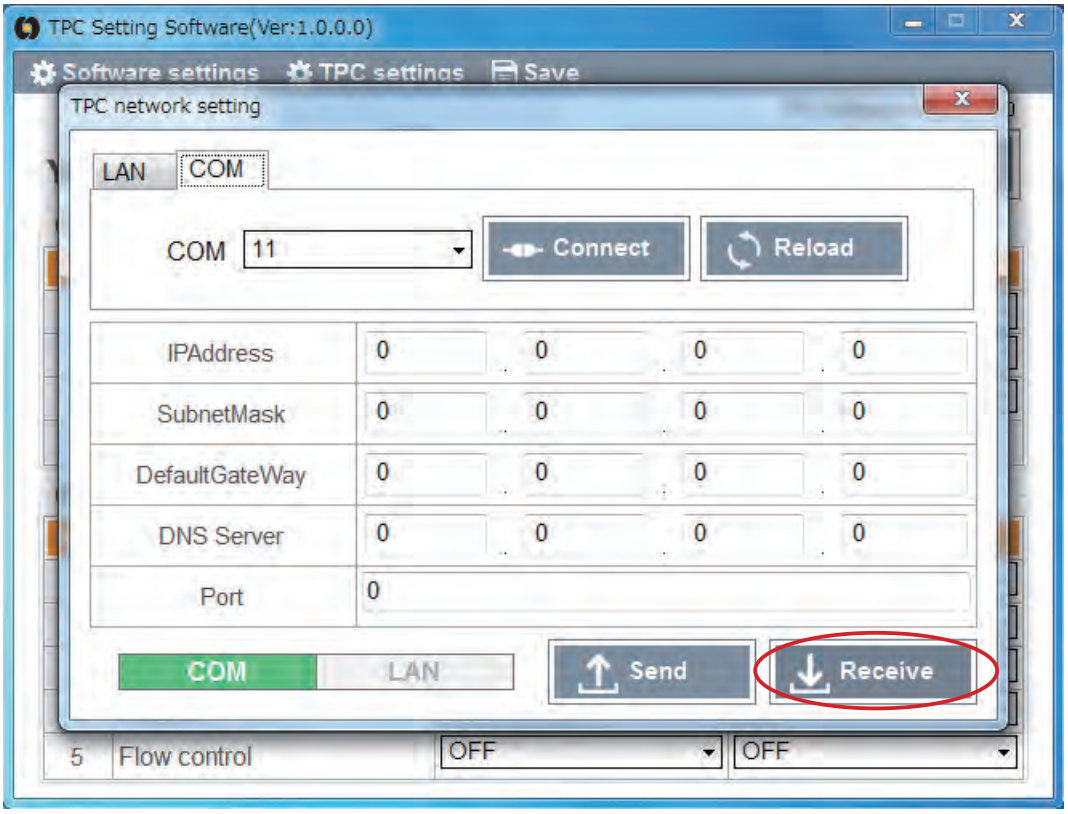


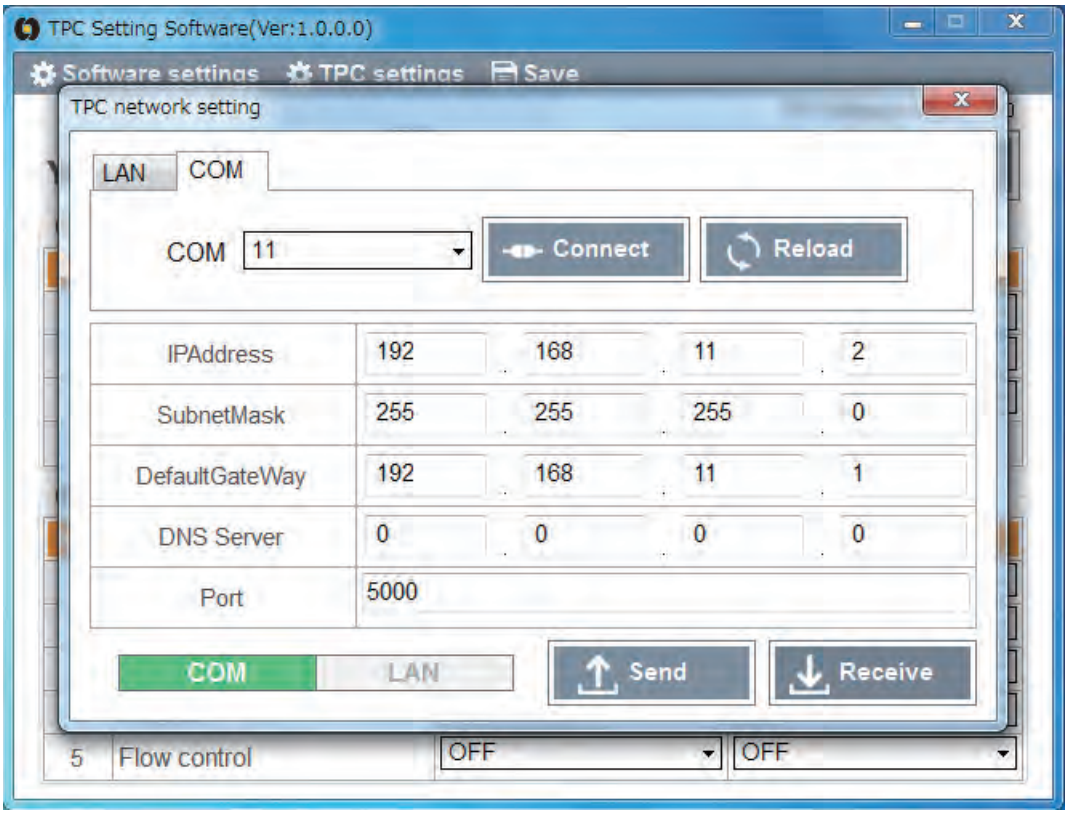
5. If TPC is connected to the PC with RS232C cable during setting mode, it will automatically proceed to process 6.
   If it is not connected automatically, confirm the connection of PC and COM2 of TPC or whether TPC is set on setting mode and click "Reload" and "Connect"



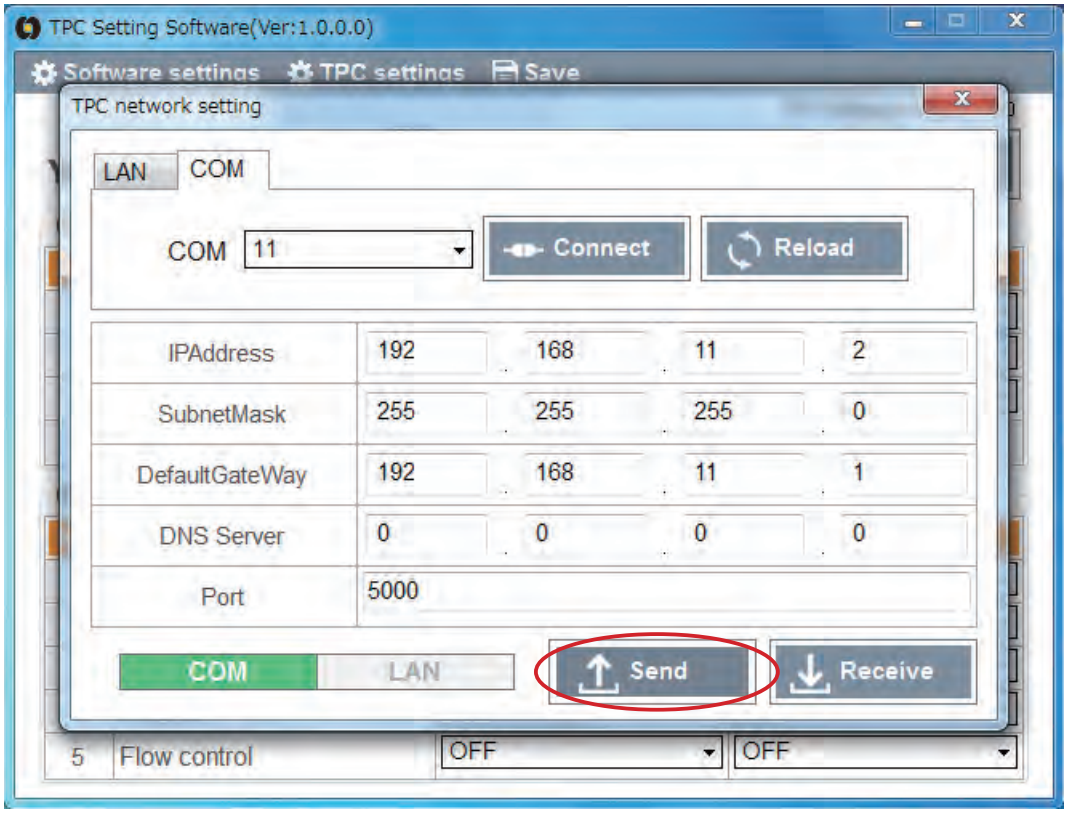


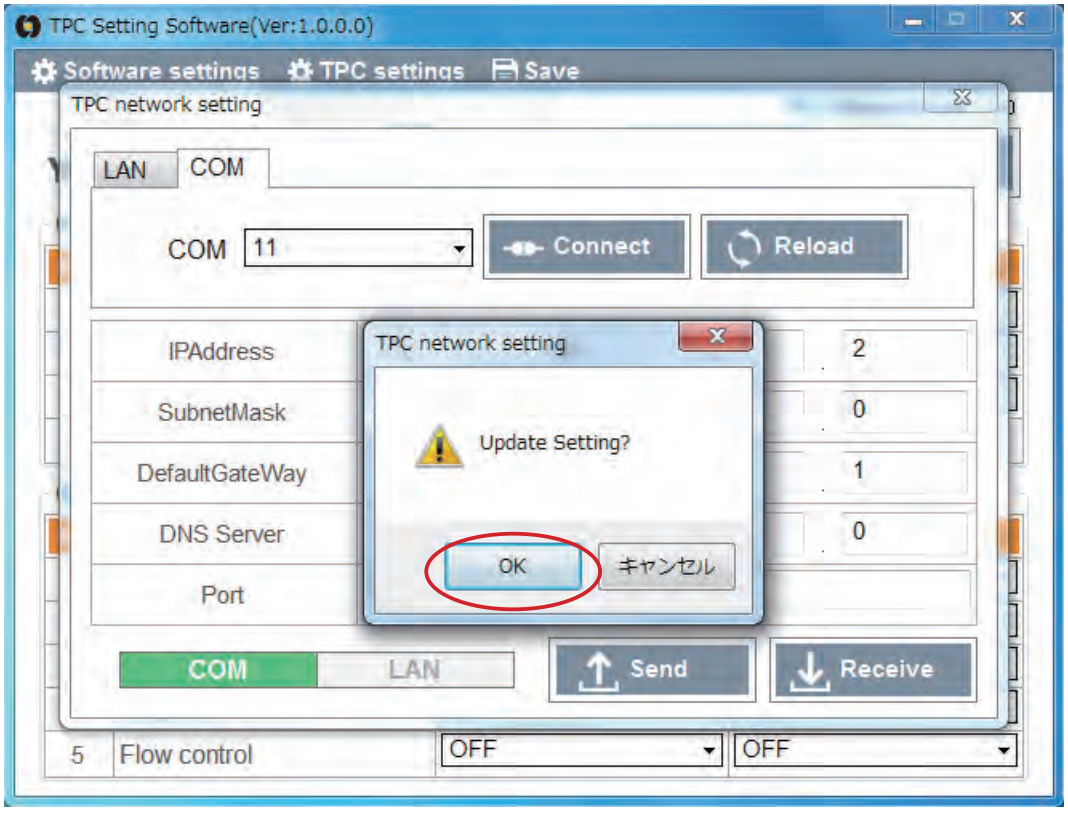
6. When connection is completed, each setting items will be ready to input.
   Click ""Receive" to show current settings.





7. Fill in each setting items and click "Send" then message shows "Update Setting?".
   Click "Yes" to overwrite the inputted IP address.





8. Setting is completed.
   Press SET Switch for 2 second to exit from setting mode. Confirm the Status LED stops blinking.
   Conduct communication test in your environment.

8 Trouble Shooting

When the operation is abnormal, refer to the following instructions.

If it is not settle, contact to distributor or Tohnichi.

Status	Causes	Solutions
Data is not output	IP address is not match with the connecting devices	Match the IP address of TPC and connecting devices.
	Communication setting is not match with the connecting devices	Match the connunication settings of TPC and connecting devices.
	Selected a wrong protocol	Select the correct protocol with using PC setting software.
	Set the barcode input ON	When the barcode input is ON, inputted data through COM2 will not be transmitted. OFF the barcode input function.
	Disconnection of cable	Confirm the connection of TPC with external devices.
	Power is not supplied	Connect TPC to power supply to turn on.
Abnormal output data	Selected a wrong protocol	Select the correct protocol with using PC setting software.
	Format changed due to upgrade of the protocol	Update is required. Contact to distributor or Tohnichi.
Cannot change settings with PC setting software	Wrong IP address	Match the IP address of TPC and connecting devices.
	Disconnection of cable	Confirm the connection of TPC with external devices.
	Power is not supplied	Connect TPC to power supply to turn on.

* Periodically check the output/input status.

* If you have questions, contact to distributor or Tohnichi.

Designs and specifications are subject to change without notice.

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