

**Tomix TNOS System**  
**Update 1 (2019-02) Notes and Comments in English**  
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Use alongside the Tomix Japanese document at  
[www.tomytec.co.jp/tomix/necst/5701tnos/images/update/tnosupdatamanual.pdf](http://www.tomytec.co.jp/tomix/necst/5701tnos/images/update/tnosupdatamanual.pdf)

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**TOMIX 5701 TNOS New Operation Control System**

The Tomix TNOS new control system will be updated with additional functions and layout plans. Please read the explanation carefully and understand it before using the product properly. At the same time, please also read the instructions that come with the Basic Set.

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**Functions added by this TNOS Control Unit Update**

- Setting of Forwarding Mode
- TCL (TNOS Command Language) function
- Layout Plan and new continuous rotation mode
- Layout Plan storage function

[in gray box on right] First, the TNOS Memory Card needs to be updated. Please update the Memory Card from the TNOS Update download page <http://www.tomytec.co.jp/tomix/necst/5701tnos/tnos-update.html>

[in wide box, left side]

**About the TNOS dedicated Memory Card (5701)**

The Memory Card included in the TNOS Basic Set is for the Control Unit T-CU01 only.

The Memory Card has a protect switch. When updating, unlock the protect switch to write the data to the Memory Card. [drawing shows UNLOCK position (up)]

To prevent writing of data to the Memory Card and to prevent accidental erasure, set this switch to the “LOCK” side. [drawing shows LOCK position (down)]

[in wide box, right side]

**Memory Card**

1. Do not put a heavy object on top. It may cause a malfunction.
2. Do not place the product in a place where it gets hot, such as inside a car that gets hot or in direct sunlight.
3. Do not disassemble or modify.
4. Do not subject to strong impact, bend, drop, or soak in water.
5. Do not touch the metal terminals with your hands or metal.
6. Do not put labels or stickers on the card.
7. Do not use in locations subject to static electricity or electrical noise. If the unit is affected by static electricity on the card and does not operate normally, remove the card from the Control Unit and then insert it again.
8. Do not place in a place where corrosive gas is generated.
- 10 Never format (initialize).
11. Do not insert or remove the card while the Control Unit is starting up.

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**About updating the TNOS Control Unit**

To update the Control Unit, it is first necessary to install the updated data on the dedicated Memory Card using the TNOS Update Tool [on the TNOS update page of the Tomix website]. After updating the Memory Card, then perform the update [to the Control Unit].

\* When updating, please disconnect the ND Hub, etc., and perform it with the Control Unit alone.

**Fig. 1-1** [in box]

1. With the Control Unit powered off, insert the dedicated Memory Card, which you have updated with the TNOS Update Tool, into the Control Unit.
2. While holding down the Setup button, turn the Control Unit power on.
3. Press the Select Layout Plan button
  - \* The currently version will be displayed.
  - \* The current product is displayed as “1.01.”
4. Use the dial to select the new version number.
  - \* Select “1.03” as the version this time.
5. Press the Enter button. The update will start.
6. When the update is completed, “1.03.” is displayed.
  - \* A decimal point appears after the “3”.
7. Turn the Control Unit off and then on again.
  - \* If you want to return the Control Unit to the original version, select “1.02” (“1.01” for the first version) by dial selection, referring to the above.

[bottom half, right side]

**Fig. 1-2** [in box]

If the update is not completed correctly, the screen will appear as shown to the right. Please update again.

[drawing shows “E.60.” error code; one of the additional error codes added with this TNOS update]

If there is no update file, the screen is displayed as shown on the right. Make sure the Memory Card update is completed correctly. [drawing shows “E.61.” error code]

• **Additional detailed Options in Forwarding Mode**

It is now possible to add detailed settings to Forwarding Mode. After setting a movement origin or movement destination sensor number in Forwarding Mode, you can set the operation to be executed in that sensor section by setting the following [optional] detailed settings. (For the basic settings of the Forwarding Mode, refer to the Forwarding Mode section in the manual that comes with the Basic Set.)

**Fig. 2-1** (in box)

- |              |   |
|--------------|---|
| 1. Stop:     | Stop for a specified time   |
| 2. Start F:  | Constant Lighting on (forward direction) + start after a specified time.    |
| 3. Start R:  | Constant Lighting on (reverse direction) + start after a specified time.    |
| 4. Return F: | Depart after the designated time + Constant Lighting on (forward direction) |
| 5. Return R: | Depart after the designated time + Constant Lighting on (reverse direction) |
| 6. End:      | After the designated time + Constant Lighting off                           |

\* Normal direction

The opposite direction in DC is determined by the orientation of the DC Feeder insertion direction.

[drawing description:

Upper track (Block 2) with DC Feeder inserted from top: Reverse direction is to the left; normal Forward direction is to the right.

Lower track (Block 1) with DC Feeder inserted from bottom: normal Forward direction is to the left; Reverse direction is to the right.]

\* For operation in Forwarding Mode, a Parameter Set must be assigned to Train 1 and it will be used.

\* For the specified time, the setting value of Parameter 9 “Stop Time” of the Parameter Set is used.

\* When performing a reverse-direction operation using the above detailed settings, it is no longer necessary to press the “Enter” button in the conventional Forwarding Mode twice. [as earlier shown in the Basic Set manual]

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**Fig. 2-2**

- Example: Move Train 1, with Constant Lighting on, in Reverse direction and after Stop Time [specified by Parameter 9 of the Parameter Set] from origin block S1-1 to successive destination blocks S1-3 and then S1-4, stopping then for the specified Stop Time.

1. Set the origin block. In this case, you are in S1-1 so press the Enter button to confirm to “1.1.” [note the second decimal point is now lit]
  2. Set a detail option for S1-1, in this example Option 3 [Start in Reverse after Stop Time], then press the Enter button.
  3. Set a destination block, in this example S1-1 is followed by S1-3, so select “1.3”, then press the Enter button.
  4. Set a following destination block, in this example S1-3 [note: I have fixed an apparent typo “S1-4”] is followed by S1-4, so select “1-4”, then press the Enter button.
  5. Set a detail option for S1-4, in this example select Option 1 [Stop], then press the Enter button.
  6. Press the Run button.
- \* Train will operate 1.1 → 1-3 → 1.4 and stop.

#### • List of initial Train positions in new Automatic Operation sequences

In the following new Automatic Operation sequences, all trains placed at their initial positions will stop at each station, run 2 or 4 laps\*, return to their initial positions and finish, as per the sequence. For details on each Layout Plan, refer to the manual included with the Basic Set.

[There is a table for each Layout Plan whose number is the last character in a table title (1, 2, 3 and 8). The tables have columns for the added Automatic Operation sequence numbers with a very brief description, and then the block numbers (in circles). The cells contain Train numbers where those trains should be positioned to start. The bottom notes appear to say “\* If there are 2 trains, 2 laps will be operated / \* If there are 4 trains, 4 laps will be operated.”

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**New Layout Plan with wiring and Operation sequences** \*For Layout Plans, refer to the manual that came with the Basic Set.

The diagram of each Layout Plan is a reference diagram of the position of the sensors and the insertion direction of the DC Feeders.

The train length is based on the assumption that a 3-car train will be operated, so increase the number of track sections and adjust the distance between the sensors and the insulated block gaps for longer trains.

\* Each diagram is a general example.

\* Select the type of sensor according to the type of track being used.

\* Use insulating joiners or the 70mm Insulator Track G70-W (1671). Insulator track piece G70-W(F) can also be used. The number of gap joiners shown is the required number when gaps are installed on the branching end of a Point [track switch].

\* If the length of each cable is not sufficient, depending on the layout size and the location of each device, please use extension cables.

\* If using pre-made sensor track pieces, the straight lengths of the layouts will be increased by 70mm, so adjustment of the entire layout is necessary and the size is slightly larger. With PC Track and Wide Slab Track, where sensors that can be embedded in the track pieces, layout constraints can be reduced.

[in grey box]

Please use this product after fully understanding how to use it. It does not support layouts other than the product program. We cannot answer any questions when using it for your own layout. Also, please note that we cannot answer questions about combinations with other companies' products.

[Diagram and Automatic Operation sequences for new **Layout Plan 11** (requires 3 ND Hubs)]

[Table 1 is for when there is no station stop at Block 6. Table 2 is for when there is. Sequence 12 is the Test Operation using a single train. The note in the upper right of Table 1 says “Automatic Operation sequences 1 to 6 of Layout Plan 11 correspond to sequences 1-6 of Layout Plan 3. Please refer to Automatic Operation Table 1 of Layout Plan 3 (in the Basic Set manual) for how the trains move.” Similarly, the note in Table 2 on page 4 refers you to Automatic Operation Table 2 of Layout Plan 3 for sequences 7 to 11. The grid tables show the start positions for the trains for other Automatic Operation modes.]

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[top: continuation of new Layout Plan 11]

[Diagram for **Layout Plan 11 Development 1**, which adds Block 8, a passing siding parallel to Block 6. Additional Automatic Operation sequences are provided for this version, with a note that sequences 13 to 16 correspond to sequences 13 to 16 of Layout Plan 3.]

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[Diagram and some Automatic Operation sequence information for **Layout Plan 11 Development 2**, which adds a 5-track yard to Development 1.

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[Diagrams and some Automatic Operation sequence information for **Layout Plan 12 Reverse 1**, **Layout Plan 12 Reverse 2** and **Layout Plan 12 Reverse 3**. All run 1 train and require 1 ND Hub.]

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[top: Diagram and some Automatic Operation mode information for **Layout Plan 12 Reverse 4**, which also runs 1 train and requires 1 ND hub.

[Note: All 4 versions of Layout Plan 12 seem to contain the same comment: While a Test Operation sequence is shown, this plan has no normal Automatic Operation mode and is intended to be used in Forwarding Mode.]

[bottom; left side]

#### • **TCL (TNOS Command Language) function**

It is now possible to perform continuous automatic operation based on TCL, by selecting operations and setting parameters using a personal computer. In order to perform this function, it is necessary to create a TCL file (automatic operation program).

[in gray box] This function is intended for advanced users, so be sure to understand how to use it before using. To use this function, use a computer to access the data on the Memory Card. We recommend that you back up the original data on the Memory Card to your computer before working. We cannot answer any questions when using it for your own layout. In addition, we cannot answer any questions about using it in combination with the products of other companies.

#### • **How to create a TCL File**

Open a text editor (such as Windows Notepad). The file should be named "cXXXxxx.txt (where XXX is a 3-digit Layout Plan number, for example 001, and xxx is a 3-digit TCL file number, for example 101. The file defines an automatic operation program using a sequence of the following commands.

\* The TCL file must have a ".txt" extension. Create it with an application that can save files with the extension ".txt".

#### **Basic commands**

Command/Argument	Function
SA n	Set automatic operation mode n (n is the operation mode number of your choice)
RN	Run (start running)

Example: If Automatic Operations 1 and 2 are to be performed one after the other, the program sequence is as shown to the right.

* [For Japanese language:] Please write all program commands other than a comment (which starts with ";") in single-byte alphanumeric characters. If full-width [Japanese] characters are used, including spaces, an error will occur.	SA 1 RN SA 2 RN 
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\* Be sure to add a line break (computer "Enter" key) at the end of the program file. ↑

#### • **Running a TCL File**

1. Store the created TCL file in the corresponding Layout Plan folder on the Memory Card.

\* For example, insert the file "c003001.txt" corresponding to Layout 3 into folder "L003 Folder for Layout Plan 3)" on the Memory Card.

2. Insert the Memory Card into the Control Unit, then press the Select Layout Plan button to select the layout to be operated. Then press the Display Speed button, and turn the dial to select the TCL file number.

\* While this operation is in progress, the Control Unit will blink.

3. Press the Enter button to start the operation sequence.

\* Example: To run “c003001”, set “3” as the Layout Plan selection and then set the TCL file number to “1”.

\* Up to 250 TCL files, numbered from 001 to 250, can be created for each Layout Plan.

[bottom; right side]

### **TCL Commands**

[For a more complete table of TCL commands in English, see my separate “**Tomix TNOS Command Language (TCL) Notes**” document.]

\* When the program is waiting for the Start button to be pressed, the Control Unit will blink.

\* Command arguments are alphanumeric characters only, but you can enter a comment in Japanese (double-byte character or double-byte spaces) by inserting “;” after the Command/Argument. [You can add explanatory comments in English, too, after a semicolon.]

\* When using the SM command, first set operation mode to 0 with the SA command.

\* “.”, “J” (half-width space) are recognized as the same character [in Japanese].

\* In a sensor number “-” is described by “.” (example: “1-1” is written “1.1”).

\* Tomix has placed one sample TCL program in each Layout Plan folder for L001 to L003. (c001250.txt, c002250.txt and c003250.txt). Please refer to these as descriptive examples. [I have created translated versions.]

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### **• TCL related Error Codes**

When an error occurs, one of the following is displayed. If an error code is displayed, turn off the Control Unit power, correct the Automatic Operation program, referring to the following explanation, and then re-execute.

Number	Error Description	Number	Error Description
100	No Layout Plan folder found	107	Undefined command
101	No TCL file	108	Argument number error
103-104	TCL file cannot be read	109	Argument value error
105	Execution interrupted	110	Forwarding instruction error
106	Undefined	111	Command execution error

### **How to deal with individual Error Codes**

100	The layout folder does not exist or the layout setting is incomplete. Store the TCL file in the corresponding layout folder and set again.
101	The specified TCL file cannot be found in the layout folder. Specify the correct TCL number again or store the TCL file in the corresponding layout folder and set again.
103	The TCL file cannot be read correctly; the file may be corrupted. Check the TCL file and store it in the corresponding layout.
104	Basically the same as Error Code 103.
105	TCL execution was interrupted, by pressing the Stop key or by a system error. Please set again.
106	There are undefined characters in the TCL file. There may be double byte characters and double-byte spaces in the TCL file [in Japanese] in addition to the “;” comment. Check the file and rewrite it.
107	There is an undefined command in the TCL file. In the command, the first two characters of the line must be specified in half-width [applies to files in Japanese] capital letters. Refer to the command table and re-write in the correct format.
108	The number of arguments is invalid. You have specified too many or too few arguments for a particular command. Enter the correct number, in the correct range.
109	The argument value is invalid. The number is outside of the allowable range, either too large or too small. Enter the correct number within the correct range.
110	The forwarding specification is invalid. The block section specified in the Set Movement (SM) or the detail option may be incorrect. Please rewrite the specification correctly.
111	An error was detected when executing the TCL command, and the command could not be executed correctly. Check the TCL file and set it again.

**Advice on identifying the location of the error**

Divide the program in the TCL file at the location where the error is suspected, then run it. Please insert a command, etc., then run it and judge from the display how correctly it was executed. Also, it is recommended that you make a short program to start with, check its execution, and gradually add commands while rechecking.

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