Tokyo Commuter

Keihin Tohoku line & Utsunomiya line

User Manual



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1. Route information

1.1 Background information

Keihin-Tohoku line

The Keihin–Tōhoku Line or 京浜東北線 in Japaneses, is a passenger railway line which connects some of the most populated area like Saitama, Tokyo, and Yokohama. This route is part of Tokyo commuter railway network.

The line originally called Tokaido Electric Line and opened in 1914, connecting Shinagawa and Yokohama. Then renamed as Keihin Line. The Keihin Line wase extended north via the Tohoku Main line to Akabane station in 1928 and to Omiya in 1932. At this point the route connected Yokohama, Tokyo and Omiya and renamed as Keihin-Tohoku line later. Today the Keihin-Tōhoku Line officially follows portions of the Tōhoku Main Line and Tōkaidō Main Line. Between Ueno and Akabane stations the Keihin-Tohoku and Tohoku Main lines are physically separate and thus alternate routes.

JK is the ID of Keihin-Tohoku line.

Utsunomiya Line

Utsunomiya line is a suburban or regional passenger railway line link Tokyo and Kuroiso. This line is a name or train running system given to a 163.5km section of the Tohoku Main Line.

Services on the Utsunomiya Line are typically divided into 3 categories: train to or from Ueno, Shonan-Shinjuku Line service and Ueno-Tokyo line services. Between Ueno and Omiya, trains share the track with Takasaki line, Shonan-Shinju line will using the parallel freight tracks. All these train serve as the express services compared to the Keihin-Tohoku Line nearby.

JU is the ID of Utsunomiya line.

Low FPS Warning. Please set lower scenery details for Low configuration computers (especially with low CPU frequency).

Please set train control to Expert for this product, or some functions may not work.

1.2 Route map



1.3 ATS Safety system

ATS or automatic train stop is a system on a train that automatically stops a train if certain situations occur to prevent accidents. ATS installed on most Japanese trains and routes (apart from Shinkansen), are mostly transponder-based.

ATS-P is a system using a pattern renewal transponder. Unlike AWS, ATS-P will generate a speed curve you need follow once passing the first transponder. If your speed is 5 km/h over the speed limit, then system will kick-in to slow down the train. Detail patterns can be seen below.



There are usually 4 transponders installed in front of a home signal. When the train passes transponder **A**, it will get first ATS-P message while **B**, **C** and **D** will renew the message. **E** means the system monitor curve; **F** is the speed curve you should follow; **G** is the system kick-in curve once you fail to react.

If the home signal is red once you pass transponder **A**, a warning chain sound will remind you there is a red signal just 600m ahead. You need push the ATS confirm button quickly, or the train will apply an emergency brake after 5 seconds. Then there will be another caution sound; it will turn off automatically if signal changes to green or yellow once you are passing another transponder. You need apply the brake to slow down the train before the red signal, or system will kick-in to stop the train.



the transponder on the track

1.4 ATC system

The D-ATC is a digital ATC system that uses the track circuits to detect the presence of a train in the section which then transmits digital data from trackside equipment to the train on including the track circuit numbers, the number of clear sections (track circuits) to the next train ahead, and the platform that the train will arrive at. The received data is compared with data about track circuit numbers saved in the train on-board memory and the distance to the next train ahead is computed. The on-board memory also saves data on track gradients and the speed limits over curves and points. All this data forms the basis for ATC decisions when controlling the service brakes and stopping the train.

In a digital ATC system, the running pattern creates determines the braking curve to stop the train before it enters the next track section ahead occupied by another train. An alarm sounds when the train approaches the braking pattern, and the brakes are applied when the braking pattern is exceeded. The brakes are applied lightly first to ensure better ride comfort, and then more strongly until the optimum deceleration is attained. The brakes are applied more lightly when the train speed drops to a set speed below the speed limit. Regulating the braking force in this way permits the train to decelerate in accordance with the braking pattern, while ensuring ride comfort.

The performance on the E233 train will be explained in Rolling stock chapter.

1.5 Signaling

1.5.1 Basic Signals

3 and 4 aspect signals.				
3&4 Aspect Signal	Description	Instruction to Driver		
	Danger	Stop		
	Caution	Proceed: be prepared to stop at the next signal.		
	Clear	Proceed: The next signal is displaying a proceed aspect.		

1.5.2 Junction Signals

Japanese railway usually using multi-head signal as junction signals, one head for one or two tracks. In this DLC, two head and three head signals are used. Below are examples of 2 head signal.

Signal Aspect	Description	Instruction to Driver	
	Both tracks blocked	Stop	
	Right side track clear	Proceed to right side track with speed restriction according to speed board before the junction.	

Right side track caution	Proceed to right side track and be prepared to stop at next signal. Obey speed restriction according to speed board before the junction.
Left side track clear	Proceed to left side track with speed restriction according to speed board before the junction.
Left side track caution	Proceed to left side track and be prepared to stop at next signal. Obey speed restriction according to speed board before the junction.

1.5.3 Repeater Signals

A repeating signal is linked to a home, starting or block signal with reduced visibility; the repeating signal repeats its relevant signal.

Signal Aspect Description		Instruction to Driver	
	Signal ahead Clear	Proceed at line speed limit.	
	Signal ahead display Caution aspect	Proceed at line speed limit, be prepared to stop at the signal after next home signal.	
	Signal ahead blocked	Proceed and slowdown, be prepared to stop at next signal.	

1.5.4 Shunting sign

A shunting sign is not a signal. It only care about track ahead is linked or not, so its diagonal indicator is not "go" but "open". Before passing a Shunting sign, first stop before it, press "Tab" and require sign to check the junction ahead is linked or not.

Aspect Description		Instruction to Driver	
	Junction ahead dis-link or not working now.	Press "Tab" to update the display.	
	Junction ahead linked.	Proceed under 25kph, prepared to stop at any time.	

1.5.5 Indicators

Aspect	Description	Instruction to Driver
	3-way route indicator, middle track open.	Proceed according to main signal, middle track will be used.
	3-way route indicator, left side track open.	Proceed according to main signal, left side track will be used with speed restriction according to speed board before the junction.
	3-way route indicator, right side track open.	Proceed according to main signal, right track will be used with speed restriction according to speed board before the junction.
	2-way route indicator, left side track open.	Proceed according to main signal, left side track will be used with speed restriction according to speed board before the junction.
	2-way route indicator, right side track open.	Proceed according to main signal, right track will be used with speed restriction according to speed board before the junction.

1.6 Route signs and train stop position.

Route Signs

Croced limit since				
Speed limit signs				
80	Normal speed limit sign. Used by default on the main line, indicates the speed limit ahead.			
80	The Speed limit of left track. Placed near junctions, indicates the speed limit of the track going left.			
80	Placed near junctions, indicates the speed limit of the track going right.			
Track gradient indicator	·			
Red boxes correspond to the t	train and yellow arrows correspond to the direction the train is going.			
	The track changes from being level to being a downwards slope.			
	Track ahead going down slope. Both sides are slopes.			
	Track ahead is going to level out. The track changes from being a downhill slope to being level.			

	Track ahead levelling out. The track changes from being an uphill slope to being level.
	Track ahead going up. Both directions go uphill.
	Track ahead going up. The track changes from being level to being an uphill slope.
Other signs	
15	Stop position for trains with 15 cars (JU/JS)
111	Stop position for trains with 11 cars (JY)
10	Stop position for trains with 10 cars (JK/JU/JS)
2	"Point of no return" sign. Installed on the platform of Keihin-Tohoku line and Yamanote line or their line with ATC system. If rear end of the train passed this sign, then the train is not allowed to push back to the platform. In fact, this sign function as an auto block signal.

2. Rolling stocks

2.1 E233-1000 series EMU

E233-1000 series is a variant type of the E233 series commuter EMU designed for Keihin-Tohoku line. A total number of 830 vehicles (83 sets) were produced between 2007 and 2010. 10 were scrapped from 2016 to 2018 due to a derailment accident happened in February 2014.

2007 - 2010
830 vehicles
20000 mm
2950 mm
3620 mm
120 km/h
1500V DC
10 cars/set, 6M4T
Digital ATC
1067mm



2.2 E233-3000 series EMU

E233-3000 sub-series are suburban type of E233 series EMU. It usually formed as ten-car sets with two double decker first class cars, some service will also contain 5 extra sets and formed 15 cars set train. These trains are allocated to Kozu and Oyama depots for use on Utsunomiya line, Takasaki line, Shonan-Shinjuku line system and Ueno-Tokyo line system.

In total 525 vehicles were produced between 2007 and 2017, first introduced in March 2008. 10 or 5 cars per set.

Constructed:	2007 - 2018
Number built:	525 vehicles
Car length:	20000 mm
Width:	2950 mm
Height:	3620 mm
Maximum speed	120 km/h
Electric system:	1500V DC
Consist:	10 cars/set, 6M4T; 5 cars/set, 3M2T.
Safety systems:	ATS-P
Track gauge:	1067mm



2.3 The Cab & Controls

2.3.1 Cab controls



- 1 Startup key/button
- 3 Combined handle
- 5 Emergency brake button
- 7 Pocket watch
- 9 TIMS Screen

- 2 Reverser
- 4 MON Screen
- 6 Door state light, illumined when door closed
- 8 Constant speed control button
- 10 ATS Confirm button



11 Headlamp dimmer

12 Cab light

14 Emergency brake reset ①

15 Left MON screen

Wiper

13

①when the button is illuminated means train emergency brake locked, please set your Reverser at neutral position, Combined handle at Emergency brake notch, and press & hold this button until the light is off, then the emergency brake will release.

You may need to reset the Emergency brake at the beginning of scenarios.

2.3.2 Left MON Screen



- 1 Low-voltage voltmeter
- 3 Constant speed display
- 5 Brake handle notch display
- 7 Main reservoir pressure
- 9 ATC Speed limit display ①
- 11 Digital speedo meter
- 13 ATC EB display ①

- 2 High-voltage voltmeter
- 4 Emergency brake state display
- 6 Brake cylinder pressure②
- 8 ATC Speed pattern curve approach ①
- 10 Speedometer
- 12 Shunting mode display(1)

① These functions only present on ATC train, ATS train will not have these function.

② A red bar will flashing at 200 when train speed at 0 and the pressure is lower than 200. When train stands the combined handle should be at B5 or higher brake notch.

2.3.3 TIMS Screen (ATC)



- 1 Digital clock
- 3 Train ID (Non-Functional now)
- 5 Train location & travel direction ①
- 7 Destination
- 8 Passenger door state, illumined when doors open.
- 9 White arrow, your travel direction.
- 10 Pantograph state. > means pantograph up, _ means pantograph down.

6

- 11 Power & brake state display. Blue means power output, yellow means brake force output.
- 12 Error message.

(1) This will only work with career scenarios.

- 2 Digital speedometer
- 4 Operation plan (Non-Functional now)
 - Current station & stations followed 1

2.3.4 MON right screen (ATC)



- 1 Illumined when ATC apply normal brake.
- 2 Illumined when ATC apply Emergency brake.

2.3.5 MON right screen (ATS)



- 1 Digit clock
- 2 Digit speedometer
- 3 Train ID (Non-Functional now)
- 4 Next station and stations followed (including the stations passing though).
- 5 Next station needs to stop.
- 6 Door state, illumined when doors open.
- 7 White arrow, your travel direction.
- 8 Pantograph state. > means pantograph up, _ means pantograph down.
- 9 Power & brake state display. Blue means power output, yellow means brake force output.

As E233-3000 has 10 cars and 15 cars consist, screen above will display 10 or 15 cars for 6 to 9.

2.3.6 MON right screen (ATS)



- 1 Illumined when approach ATS braking curve.
- 2 Illumined when ATS apply normal brake.
- 3 Illumined when ATS apply Emergency brake.

2.4 Brake Control Unit (BCU)

E233 series is equipped with two sets of braking systems, air brake (or Pneumatic brake) and dynamic brake. These two systems adopt the principle of " dynamic brake first, air brake complement". As the dynamic brake is greatly affected by the vehicle speed and often has a certain delay, the BCU is required to distribute the air braking and dynamic braking forces automatically according to the brake notch of the combined handle, vehicle speed and other conditions.

The BCU function in this simulator has the following characteristics:

1. At the initial stage of brake application or brake level increase, use air brake to supplement the dynamic braking force that cannot respond immediately due to delay.

2. When the vehicle at higher speed, air brake is used to supplement the dynamic braking force that cannot meet the requirements due to the reduction of efficiency.

3. During braking application, system will keep certain air braking value to avoid frequent release.

4. In case of emergency braking, the dynamic braking will be disabled, and the braking force will be completely provided by the air brake.

2.5 Hotkeys

Headlight (1)	Н	Headlight shift down (1)	Shift+H
Headlight Dimmer	Ctrl+H	Reverser	W/S
Combined handle increase	А	Combined handle decrease	D
Emergency brake	Backspace	Electric Horn	Space
Wiper	V	Cab light	L
ATS Confirm	Q	Кеу	Z
Handbrake	Slash	Constant function (2)	В
Air Horn	Ν	Turn on/off ATP system (4)	Х
Train Class increase	E	Train Class decrease	F
Train destination increase		Train destination decrease	0
Emergency brake reset (3)	R		

- (1) Headlight will turn on automatically when train startup.
- (2) Constant speed function only works as following two scenarios:A. Normal operation: 1. Speed above 55 km/h and 2. Combined handle at notch 5.B. Train wash mode: 1. Speed below 10km/h and 2. Combined handle at notch 1.
- (3) To reset Emergency brake, press and hold R key until the EB button light off. Please make sure Reverser handle at neutral position, Combined handle at Emergency brake notch.
- (4) If you wish to pass a red signal or using these train in other Non-ATS/ATC route, you can press X to turn off the ATP system. After turning off the ATP, press R to reset Emergency brake if EB button light is on.

2.6 Drive the train.

- 1. If the train hasn't been started, press the startup button/key to start the train.
- 2. Once the train started, the Pantograph will rise automatically.
- 3. Press and hold the Emergency brake reset until the green lights are off.
- 4. Move the reverser forward or backward.
- 5. Check doors are closed and locked, pull the Throttle & Brake handle backwards to release the brake and apply power, the train will start to move.

2.7 AI Trains

To improve game performance and increase visual richness, we provide three different AI train consists. In addition to the E233 series you can drive, there are also the E231-500 series AI trains on the Yamato Line. At present, you cannot drive the E231-500 series now, we will make it drivable with future extension pack.



3. Scenarios

3.1 Quick drive scenario

This product features Quick Drive scenarios, you can create your own journeys by clicking on the Quick Drive menu.

Note: station name with **[JK]** prefix in Depart section stands for Keihin-Tohoku line platform, **[JU]** is Utsunomiya line and Takasaki line, **[JS]** is Shōnan–Shinjuku Line. <u>15 cars consist will not fit with</u> Keihin-Tohoku line platforms.

*If you wish better FPS performance, please make sure that the "Player Train Only" is selected.



3.2 Career scenarios

- 01. [JK] 04:30 Ueno to Omiya Local
- 02. [JK] 05:28 Omiya to Ueno Local
- 03. [JK] 07:22 Ueno to Minami-Urawa Local
- 04. [JK] 08:23 Minami-Urawa to Ueno Local
- 05. [JK] 09:19 Ueno to Akabane Local
- 06. [JK] 10:08 Akabane to Ueno Rapid
- 07. [JK] 11:24 Ueno to Minami-Urawa Rapid
- 08. [JK] 12:26 Minami-Urawa to Ueno Rapid
- 09. [JK] 14:18 Akabane to Minami-Urawa Local
- 10. [JK] 15:09 Ueno to Higashi-Jujo Rapid
- 11. [JK] 15:18 Akabane to Ueno Rapid
- 12. [JK] 17:22 Omiya to Minamai-Urawa Local
- 13. [JK] 18:12 Kawaguchi to Tabata Local
- 14. [JK] 20:44 Minami-Urawa to Ueno Local
- 15. [JU] 05:10 Ueno to Omiya Local
- 16. [JU] 12: 23 Omiya to Ueno Local
- 17. [JS] 14:25 Akabane to Omiya Rapid
- 18. [JU] 18:29 Ueno to Omiya Rapid

19. [JS] 20:34 Omiya to Akabane Rapid

- [JK]: Scenario runs on Keihin-Tohoku line tracks.
- [JU]: Scenario runs on Utsunomiya line tracks.
- [JS]: Scenario runs on Tohoku/Yamanote freight line tracks.

3.3 Information for Scenario creator

3.3.1 Onboard announcement

E233-1000 equipped with automatic announcement trigger by control value in career scenarios. E233-3000 currently not have automatic announcement.

3.3.2 Al train time gap

You need to add a "stop at" assignment for at least 5 seconds after pick-up passenger task for Al trains, or the train will be leaving the platform while doors still open.

3.3.3 Train Destination Sign

You can use scenario script or hotkey to active the Train destination sign for both E233-1000 and E233-3000.There are two control value for the sign, Trainclass and Traindest. Trainclass define what type of train is, and Traindest is the destination for the train.

Example scenario script, this means local service to Ofuna (E233-1000) Or Local service to Tokyo (E233-3000):

SysCall ("PlayerEngine:SetControlValue", "Trainclass", 0, 1); SysCall ("PlayerEngine:SetControlValue", "Traindest", 0, 1);

Please see following table for control value and its meaning:

E233-1000

Trainclass

Control value	Meaning	Control value	Meaning
1	Local service	2	Rapid service
3	Not in service	4	Temporary train
5	Test run	6	Reserved train
0	All LED off		

Traindest

Control value	Meaning	Control value	Meaning
1	Ōfuna	2	lsogo
3	Sakuragichō	4	Kamata
5	Akabane	6	Minami-Urawa
7	Ōmiya	0	LED Off

E233-3000

Trainclass

Control value	Meaning	Control value	Meaning
0	All LED off	1	Local service
2	Rapid service	3	Rapid Urban service
4	Rapid Rabbit service	5	Special rapid service
6	Commuter rapid service	7	Not in service
8	Temporary train	9	Test run
10	Reserved train		

Traindest				
Control value	Meaning	Control value	Meaning	
0	LED Off	1	Tokyo	
2	Shinjuku	3	Ueno	
4	Ueno	5	Кода	
6	Koga	7	Koganei	
8	Koganei	9	Utsunomiya	
10	Utsunomiya	11	Utsunomiya	
12	Kuroiso	13	Kuroiso	
14	Kagohara	15	Kagohara	
16	Takasaki	17	Takasaki	
18	Kōzu	19	Kōzu	
20	Odawara	21	Odawara	
22	Atami	23	Atami	
24	Numazu	25	Numazu	
26	Zushi	27	Zushi	
White: Utsunomiya/Takasaki line though service to Ueno-Tokyo line and Tokkaido line.				
Green: Utsunomiya line service start or terminate at Ueno station.				

Orange: Though service via Shōnan–Shinjuku Line

3.3.4 Reference timetable for Scenario creators

Station Name	Arr.	Dep.	Dur.
Tōkyō	:	:	:
Kanda	:	:	:
Akihabara	:	:	:
Okachimachi	:	:	:
Ueno	:	12:00:35	:
			1:35
Uguisudani	12:02:10	12:02:45	
			1:25
Nippori	12:04:10	12:04:45	
			1:05
Nishi-Nippori	12:05:50	12:06:25	
			0:50
Tabata	12:07:45	12:08:20	
			2:15
Kami-Nakazato	12:10:25	12:11:00	
			1:20
Ōji	12:12:20	12:12:50	
			2:00
Higashi-Jūjō	12:14:50	12:15:20	
			2:00
Akabane	12:17:20	12:17:50	
			2:35
Kawaguchi	12:20:25	12:21:00	
			1:55
Nishi-Kawaguchi	12:22:55	12:23:30	
			1:55
Warabi	12:25:25	12:25:55	
			3:40
Minami-Urawa	12:28:35	12:29:10	
			1:55
Urawa	12:30:55	12:31:25	
			1:55
Kita-Urawa	12:33:20	12:33:50	
			1:45
Yono	12:35:35	12:36:05	
			1:25
Saitama-Shintoshin	12:37:30	12:38:05	
			2:00
Ōmiya	12:40:05		

Appendix A: known issue & trouble shooting

1. Train shake and vibrate at particular circumstances.

This usually happen at train apply brake while at curved track with higher brake force output especially at higher speed. We suspect that the cause of this problem is dynamic brake. Sometimes the train may shake while apply large amounts of dynamic brake force output, using smaller brake notch at first will improve this issue.

2. Low FPS.

This route will need lots of small house, building and AI trains. According to our experiment of FPS, the number of textures and shaders has greater impact to FPS. For low performance PCs it is recommended to lower scenery density display and set "Player Train Only" for Quick Drive.

3. Game lag at particular point, and then back to normal.

This caused by game loading tiles. If the tiles with lots of scenery and objects with it, it will need longer time for game to load.

Tokyo Commuter: Keihin Tohoku line & Utsunomiya line

Staff

Train Models	CNAurora	T9Express	
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	TOE		
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Special thanks	Dovetail Games 3 rd party team Dovetail Games Beta testing team		

* Listed above in no particular order



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