ICE 4 (BR 412)

What a moment: to finally write the manual after having gone through such a long development time of this extraordinary vehicle. Thank you for purchasing our new train. We have made every effort to create it and hope that you will enjoy your ride.

Your team at Trainworks, Railworks Austria and 3DZUG.

This manual provides all interesting and useful facts so that you can enjoy using the train without hindrance.

ATTENTION: It is crucial to look at the Quick Start section under point 4 ("Cab") in order to set the vehicle in motion!!!!

Contents:

1. Preface

„Can't you design an ICE" – no other request reached me as often as this request. Those who already know 3DZUG for a longer time, might remember that we announced the ICE Velaro two years ago. However, this train never found its way to reality.
What happened to the project? *The announcement was made prematurely as 3DZUG at that stage was not quite ready for the scale of this project yet. Although all models were almost finished and, in addition to that, also really good, the problem with the physics of driving as well as the scripts were not solvable at the time. We couldn't find a suitable partner.*
As a result, the project was eventually abandoned and time and effort were dedicated to other projects. The Orient-Express and the Rheingold along with many other trains saw the light of day and got better every time. Here at 3DZUG we always strive to constantly improve ourselves and to make more and more possible.
What will happen with the Velaro models? Probably nothing as they are technically very outdated.
The idea of designing a high-speed train, however, remained at the back of the head. When Trainz Railroad Simulator was announced in 2019, I saw a way to realise all of my ideas. That isn't really hard as I have more than a decade experience in that field.
The ETR 1000 „Frecciarossa" was designed and became the first fully accessible train of mine. Usually, passenger views are skilfully designed only for individual coaches, revealing only small glimpses of the rooms inside as these are very complex to create.
I went a different way with the Frecciarossa, the entire interior was created on the whole length. Why did I do that? Because it is possible and it excites me!
One day Railworks Austria got in touch to enquire whether I would like to create an ICE while they would be in charge of the scripts and technique. A resounding YES! The construction began. As the work steps were already fit for everyday use from the Frecciarossa and I wanted to build an ICE for Trainz anyway, the second attempt was easier.
However, I felt a little uneasy with the fact that I had to build a slimmed down train for the TS. I wanted to show all interiors and that better and more detailed than what was the case with the ETR 1000. But with 32 Byte that was impossible.
But with the announcement of the TS in 64 Byte, it was a completely different ball game. That is why you can look at every wagon and find everything that is in the original, even the toilets - all of them!
The TS, however, cannot render the complex lighting calculation of the interior any longer. Therefore, this had to be realised and simulated elaborately with textures.
It is due to Railworks Austria that this train drives in TS in the first place: without RWA the train would only look good, but wouldn't move an inch. Not to mention that without Trainworks it would be very quiet. Trainworks has created a brilliant sound for 3DZUG with which you can even set the volume of the air conditioning.
Together, we have realised some mind-blowing features. Every door is inscribed individually and the train destination signs are adjustable. In addition, all Christian names are included as well as, of course, the green ICE.
With this train our team of three, RWA, Trainworks and 3DZUG, would like to show the potential of our old Train simulator and what you can expect from us in the future. Because one thing is for sure: there is no going back!
At this point I would like to express my heartfelt thanks to the two teams. "Guys, we had an amazing time together!" And also to all the many supporters not mentioned by name who provided support and assistance.

Have fun in our best train of all time

Matthias Gose – Managing Director 3DZUG

2. Historic background

The ICE 4 is a kind of high-speed train Intercity-Express (ICE) of the Deutsche Bahn meant for the long-distance passenger service. Up until September 2015 the trains were operated under the project name ICx.

In 2011 Siemens Mobility was tasked with the development and construction of initially 170 trains. The series name for the railcar is 412, whereby the powerless middle carriage as well as the control trailer have the series name 812. A version consisting of a dozen pieces has been in regular operation since December 2017, a further seven-piece version is supposed to become operational in December 2020.

The first multiple unit with seven wagons has been in the approval process since February 2019.

The first trains are railcars (without engines) for passenger transport. Unlike the first two ICE series, they are driven by several wagons powered independently that are distributed along the entire train length. The inner and outer vehicle form should meet the ICE standard by and large. In contrast to all former ICE trains, the car bodies of the ICE 4 fleet are made of steel, exceeding them by 28 metres. In the process, laser welding is used for the first time for the rail vehicle construction with steel.

At the InnoTrans 2012 the Deutsche Bahn exhibited a one-to-one model of a part of an ICE 4 end carriage. Since the end of 2013 a one-to-one model of an end carriage is displayed at the DB Museum Nuremberg.

In total up to 300 trains are supposed to be acquired.

The five to fourteen unit trains originate from five wagon types: powerless end carriages (control trailer), powered middle carriages (seating carriage, board bistro), not powered middle carriages (seating carriages, dining car and service car). Along with the basic configuration comprising of seven or twelve cars, 22 further configurations consisting of 5 to 14 carriages are intended by the producer. Two seven-piece multiple units can operate with double heading. Five-piece units should be formed with two powered wagons, six and seven-piece units with three, eight and nine-piece units with four, ten to twelve-piece units with five whereas thirteen and fourteen-piece units should be formed with six powered wagons. To begin with, four of these additional versions shall be approved. A fourteen-piece unit would be 400 metres in length. The train sets can be formed from five different wagon types. The second class middle carriages of the two versions are identical in construction. The first class middle carriage, solely used in the ten-piece train, is derived from this type.

The first class middle carriage, solely used in the ten-piece train, is derived from this type. With that they exceed most of the former Intercity wagons in length which are 26.4 metres long. Due to the extended wagons, a 200 metres train comprises of seven and not eight wagons. With equal train length the train has one gangway connection less, making room for five additional rows of seats. A modified seating concept, the omission of bigger electronics cabinets in the passenger compartment as well as a modified layout of function surfaces (e.g. bicycle compartments) shall create room for further seating rows.

Source: Wikipedia, requested March 8th, 2019

https://de.wikipedia.org/wiki/ICE_4

3. Configuration in the setup

The ICE can be configured additionally in the setup.

Options:

Texture quality:

Here you can adjust the quality of the texture. The setting "Ultra" installs the best resolution. The internal views require (a lot of 😌) memory. Should you encounter any problems, we recommend to reduce these settings to start off with.

The setting "Exterior Ultra / Interior Normal" reduces the memory requirements of the internal views considerably, whilst the external appearance as well as the cab remain unchanged.

The setting "Normal" reduces a few external textures in addition.

The train was designed to run in 64 Byte mode. It is not recommended to use the 32 Byte mode.

Male / Female driver

Here you can choose, if you want a male or female driver. If you have always dreamed of being driven through the countryside by a Ginger at 250 km/h, then this is your chance 😌.

4. Driver's cabin

1.   Initial train setup (Quick launch)

In order to drive the train a few steps are required:

1.   Flick the direction switch in the desired direction
2.   Release the spring-loaded break (underneath the pressure regulator on the right-hand side)
3.   Make sure that all doors are closed and all breaks have been released
4.   Unlock the controller (see below) and move into the Z-area
5.   The train should now set itself into motion.

2.   Unlocking the controller

Whenever the controller is in zero position, it has to be unlocked in order to return to drive position. This is done as follows:

1.   Flip the controller switch and hold (key "**E**")
2.   Move the controller out of the zero position (key "**A**")
3.   Let go of the controller switch

As soon as a traction lock is active, the controller has to be moved into zero position. This is done with the key "**D**", whereby a resistance can be perceived in zero position.

3.   Train control systems

The ICE 4 is equipped with a Zeit-SIFA, PZB90 and LZB. All train controls are disabled by standard. By pressing **Ctrl+Shift+A** (PZB), **Ctrl+Shift+S** (SIFA) and **Ctrl+Shift+D** (LZB) they can be enabled and disabled once again.

4.   Door control

The train features a door control which can be switched on/ off with Ctrl+Shift+T.

With the door control switched off, the door selection switch selects the right side automatically for the door release. After the door closing command, the switch is moved to the position "Both Shut".

With an active door control the procedure for releasing the doors is the same, the selection switch selects the correct side automatically. After the door-closing procedure has been initiated, the switch, however, remains in this position and has to be set to "Both Shut" by hand (key "**R**").

5. Driver's cabin
5.1. Left-hand side
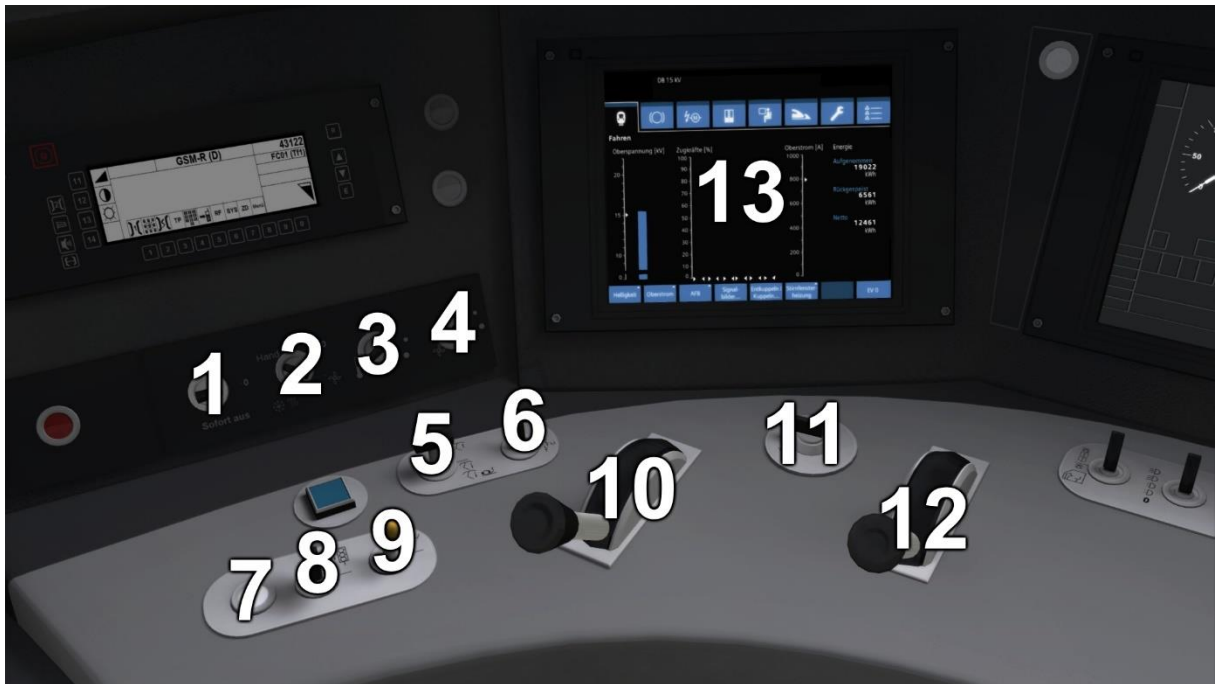
1	Air conditioning off immediately		8	PZB Free
2	Air conditioning Manual/Auto		9	PZB Alert
3	Air conditioning temperature		10	AFB Vsoll-regulator
4	Air conditioning power		11	Direction switch
5	Collector raise/lower		12	Controller
6	Main switch on/off		13	Display with high tension/power, train/brake forces and energy values
7	PZB Command			

5.2. Front

1	Speedometer	5	Instrument/cabin light
2	Tractive/braking forces	6	Headlight switch
3	PZB signal lamps	7	Sander
4	Signal lamp main switch, door, SIFA and emergency brake	8	Train horn high/low
		9	EBuLa on/off

5.3. Right-hand side

1	Brake lever	5	Brake cylinder pressure
2	Switch for door selection	6	Release the spring-loaded brake
3	Wiper switch	7	Engage spring-loaded brake
4	Brake status (MG brake, E-brake, direct or spring-loaded brake)		

5.4. Rear panel

1	SIFA disabling switch	3	PZB disabling switch
2	LZB disabling switch		

6. Instructions for task developers

Please do **only** make changes to the number on wagon 1. This wagon will then send the number to all remaining wagons so that these will select the right number.

The provider "3DZUG" and the add-on "3dz_IVE4" has to be enabled. Wagons with the ending "KI" are meant for oncoming trains.

The same applies to train destinations. It is sufficient to enter the code for wagon 1, as the wagon will send the ZZA code to the remaining wagons.

Please note: do not panic, if the ZZA should not be visible in the editor immediately! It will be switched to active shortly after the scenario start.

Please use the prefabricated trains. These have already been lined up correctly.

Train destinations:

The following destinations can be shown in combination with the wagon number:

A	Hamburg-Munich
B	Munich-Hamburg
C	Munich-Berlin
D	Berlin-Munich
E	Berlin-Cologne
F	Cologne-Berlin

G	Special train
H	Train destination display without contents
I	Stuttgart – Hann. Hamburg
J	Hamburg – Hann. Stuttgart
K	Berlin – Leipzig
L	Leipzig - Berlin
M	Not yet implemented
N	Not yet implemented

Train numbers:

0017A

0025A

0033A

0041A

0058A

0066A **Martin Luther**

0074A

0082A

0090A

0108A

0116A

0124A

0132A

0140A

0157A

0165A

0173A

0181A

0199A **Free State of Bavaria**

0207A

0215A

0223A

0231A

0249A

0256A **North Rhine-Westphalia**

0264A

7. Keyboard layout

Function	Key assignment
Collector up / down	P / Strg+Shift+P
Main switch on / off	Z / Strg+Z
Direction switch	W / S
Controller	A / D
Controller switch	E
Brake lever	**Ö / Ü**
AFB Vsoll-regulator	Y / C
Headlight	H / Shift+H
Wiper	V / Shift+V
Train horn	B / N / Q
PZB Free / Command/ Alert	End / Remove / Page down
Sifapedal	Space key
PZB train type scale up / down	Shift+6 / Shift+7
Cabin / Instrument light	L / Shift+L
PZB disabling switch	Strg+Shift+A
LZB disabling switch	Strg+Shift+D
SIFA disabling switch	Strg+Shift+S
Sander	X
AFB on / off	Shift+A
Door control on / off	Strg+Shift+T
Door selection switch on "Both shut"	R
Release passenger-emergency brake	Backspace

5. The cars at a glance

The wagons 8 and 13 are not part of the train.

WON 1

The second class end carriage with bicycle and multi-purpose compartment, powerless. This carriage has to be used in order to configure the train destination display and is equipped with an electromagnetic rail brake.

WON 2, 3, 5, 6

Powered second class middle carriage.

WON 4

Powerless middle carriage with collector and electromagnetic rail brake.

WON 9

Powered second class middle carriage. Contains the family compartment and is barrier-free.

WON 10

Restaurant car featuring the bar and first class. Powerless with electromagnetic rail brake.

WON 11

Powered first class middle carriage.

WON 12

Powerless first class middle carriage with electromagnetic rail brake.

WON 14

Powerless first class end carriage with electromagnetic rail brake.

The green ICE is a marketing campaign launched by the Deutsche Bahn. The campaign's objective is to communicate that the ICE trains are powered with green power. This train can be selected separately. The respective vehicle number can vary. Hence, all can be selected.

6. Fully accessible

Do you want to see the entire train at last? 3DZUG has had this on its mind for quite a while. We were able to realise our brandnew feature with the ICE 4 for the very first time.
This means for you that you can move in every carriage. More than 20 prefabricated camera positions guide you through the entire carriage.
You can rotate the camera 360°. It is well worth taking a close look at every wagon.

You can change the camera position with the arrow keys on the keyboard. You can change between the carriages via the menu (see image).

Restrictions:

At the time the Train Simulator was developed, nobody could have imagined that interior views of 28 metres in length would be developed one day. This is why some areas do not function properly or only with restriction.

- The gangway connections do not always sit flush in curves.
- It rains in the distance in the interior view.
- The doors inside are always shut and cannot be opened.
- In some resolutions the 360 degree view can "cut off" parts of the interior decoration.

7. **Known issues**

   The interior designs are the most elaborate part and require a lot of memory. As this varies in relevance, the graphics can be reduced in the setup without altering the exterior model. Should you encounter problems, this step is recommended.

8. **Acknowledgement**

   This project is the result of many different people and I would like to express my thanks to them. This also goes out to you for supporting our idea.
   I would also like to say thank you to Railworks Austria and Trainworks for the productive cooperation. Never have I experienced such relaxed working on a project with several teams.

   Furthermore, my thanks go out to the numerious helpers who provided valuable information on the ICE 4. Without this information we would never have managed to realise the train as realistic as it is now.

   Finally, I would like to thank Jens Haupert from ZusiDisplay for licensing his radio texture in the driver's cabin for us.

9. **The ball is in your court**

   This is it – 5 years of 3DZUG. You can expect this from us and we hope that you will have a lot of pleasure with out train. As special as this train is, as different are the views on it.

   And now enjoy the ride!

   Your Team at Railworks Austria, Trainworks and 3DZUG

   Buxtehude March 9th, 2019
   Matthias Gose