



## **ETCS deployment in the PKP Polskie Linie Kolejowe S.A. network**

# Sections with an installed ERTMS/ETCS system put into operation

No	Line	Section	ETCS Level	Section length	Completion date	TEN-T Network
1	4	Grodzisk Mazowiecki – Zawiercie	1	224 km	2014	YES
2	64	Kozłów – Starzyny	1	33 km	2016	NO
3	356	Poznań Wschód - Wągrowiec	1 LS	51 km	2018	NO
4	275, 282, 295,	Legnica – Węglińiec (DE)	2	84 km	2017	YES
5	9, 202	Warszawa – Gdynia	2	332 km	2020	YES
6	132, 275,	Legnica - Opole	2	130 km	2020	YES
		<b>TOTAL</b>		<b>854 km</b>		

# Line sections with ERTMS/ETCS system development projects currently in progress

No	Line №	Section	ETCS Level	Section length	Completion date	TEN-T Network
1	7	Otwock – Lublin	2	150 km	2022	YES* (comprehensive)
2	1,17	Warszawa – Łódź	2	120 km	2022	YES
3	91	Podłęże - Rzeszów	2	140 km	2023	YES
4	226	Pruszcz Gd. – Gdańsk Port	1	16 km	2022	YES
5	278	Węglińiec – Zgorzelec	2	26 km	2023	YES
6	2	Warszawa – Terespol	2	188 km	2023	YES
7	3	Warszawa – Kunowice (DE)	2	450 km	2023	YES
8	271	Wrocław – Poznań	2	160 km	2023	YES
9	4	Szeligi – Zawiercie	2	200 km	2023	YES
10	6	Warszawa – Czyżew	2	172 km	2023	YES
11	8	Warszawa – Radom	2	96 km	2023	YES* (comprehensive)
		<b>Implementation in progress</b>		<b>1 718 km</b>	<b>2021-2023</b>	
		<b>TOTAL – THE WHOLE NETWORK</b>		<b>2 572 km</b>	<b>Until 2023</b>	

# Line sections with operational and currently implemented ERTMS/ ETCS system

- **2020** - date of ETCS start/planned start-up on the section
- **Dark blue** - ETCS operational
- **Bright blue** - ETCS under construction



# Sections of the line with ERTMS/ETCS development projects planned for implementation after 2023

No	Line No	Section	ETCS Level	Section length	Completion date	TEN-T Network
1	6	Czyżew – Białystok	2	71 km	2026	YES
2	11,12	Łowicz - Łuków	2	160 km	2027	YES
3	7	Warszawa – Otwock	2	25 km	2027	YES* (comprehensive)
4	550	Łódź Fabryczna – Łódź Kaliska	2	15 km	2027	YES
5	38	Białystok - Elk	2	100 km	2027	YES
6	E75	Elk – Trakiszki (LT)	2	95 km	2027	YES
7	351	Poznań – Szczecin	2	195 km	2030	YES
8	1,2,3,	Warszawa – Węzeł	2	100 km	2030	YES
9	E30	Wrocław – Węzeł	2	100 km	2030	YES
10	E30	Rzeszów – Przemyśl	2	99 km	2030	YES
11	E30	Opole – Kraków	2	220 km	2030	YES
12	E65	Zawiercie – Zebrzydowice (CZ)	2	122 km	2030	YES
13	CE65	Chorzów – Tczew	2	495 km	2030	YES
14	CE59	Szczecin – Węzeł	2	50 km	2030	YES
15	CE59	Szczecin – Świnoujście	2	97 km	2030	YES
16	CE59	Wrocław – Chałupki	2	176 km	2030	YES
17	8	Kozłów - Kraków	2	57 km	2030	YES
18	139	Czechowice – Zwardoń (SK)	2	69 km	2030	YES
19	204	Malbork – Braniewo (RUS)	2	85 km	2030	YES
20	14	Łódź – Zduńska Wola	1	42 km	2030	YES
		<b>Planned for implementation</b>		<b>2 373 km</b>	<b>2025 - 2030</b>	
		<b>TOTAL – THE WHOLE NETWORK</b>		<b>4 945 km</b>	<b>until 2030</b>	



# Sections with ERTMS/ETCS development projects planned for implementation after 2023

- **2030** - date of the planned start of the operation of the ETCS system on the section
- **Dark Blue** - ETCS operational in 2023
- **Light blue** - ETCS installation after 2023



## Summary of activities of PKP Polskie Linie Kolejowe S.A. in the field of ETCS implementation

- At the end of the KPK (NRP) implementation, it is planned that approx. 2,572 km of the railway network managed by PKP Polskie Linie Kolejowe S.A. will be equipped with the ETCS/ERTMS system, including:
  - approx. 1,600 km of lines on the main freight corridors, along with comprehensive equipment for corridor E20/C-E20 on the section Kunowice - Terespol
  - over 2,000 km of lines on the main corridors used for passenger traffic
- PKP Polskie Linie Kolejowe S.A. agree with neighbouring infrastructure managers how to implement the ERTMS/ETCS system on sections of cross-border lines, i.e. PL-DE border in Kunowice (2023 - without interconnection of systems and 2030 interconnection of ETCS L1 systems) and in Zgorzelec (2023 - no ERTMS/ETCS system on the German side). The next sections are planned for development by the end of the next perspective, i.e.: PL-DE in Tantow (2026); PL-CZ in Zebrzydowice (2026), Chałupki (2026), Międzyzylesie (2030); PL-SK in Zwardoń (2026); PL-LT in Trakiszki (2030)

## Summary of activities of PKP Polskie Linie Kolejowe S.A. in the field of ETCS implementation

- Activities planned by PKP Polskie Linie Kolejowe S.A. will also allow the ERTMS/ETCS system to reach the border of non-EU countries, i.e.: PL-RU in Braniewo (2030), PL-BY in Terespol (2023), PL-BY in Kuźnica Białostocka (2030) and PL- UA in Medyka (2026)
- The planned development of ETCS covers the most important railway nodes in Poland
- In the currently implemented projects, the system is installed according the version 2.3.0d (SRS 2.3.0d), in projects planned to be implemented, i.e. investment tasks planned to be implemented after the completion of the KPK (NRP, the so-called New Perspective), the possibility of implementing the system according to the version 3.6.0 (SRS 3.6.0) is analysed
- Financing ERTMS / ETCS projects is done in two ways:
  - As part of the CEF funds, a dedicated ETCS implementation project (e.g. on the E20 line)
  - As part of individual (linear) investment projects financed by CEF, OPI&E, ROP



## Summary of activities of PKP Polskie Linie Kolejowe S.A. in the field of ETCS implementation

- The current NIP TSI CCS does not force the installation of ERTMS/ETCS OBU on non-equipped rolling stock, nor does it prohibit the entry of not equipped vehicles to lines equipped with ERTMS/ETCS
- PKP PLK sees the need to take decisions binding on the owners of the rolling stock on the implementation plan of the on-board equipment on the existing rolling stock at the level of the national regulator
- An obstacle for RUs in the implementation of such measures are the high costs of assembling OBU. These costs are currently borne only by RUs without the possibility of obtaining financial support
- If such a situation persists with simultaneous activities related to the decommissioning of class B systems, the use of rolling stock not equipped with OBU will be abandoned, which will be a significant problem in the RUs



# ETCS implementation on PKP Polskie Linie Kolejowe S.A. network

October 4-6, 2021

# Technical aspects ETCS levels – choice criteria

## Technical Specification for Interoperability „Control-Command and Signalling” National Implementation Plan

Ministry of Infrastructure and Construction of the Republic of Poland, Warsaw, June 2017

### Factors:

- Cost of the implementation (ETCS and interlocking)
- Line speed – 130/160/200 km/h
- Capacity
- Train traffic safety
- Type of traffic (passenger/freight)

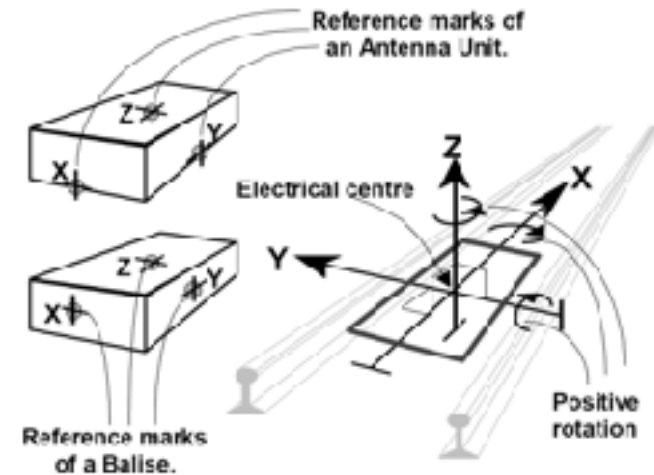
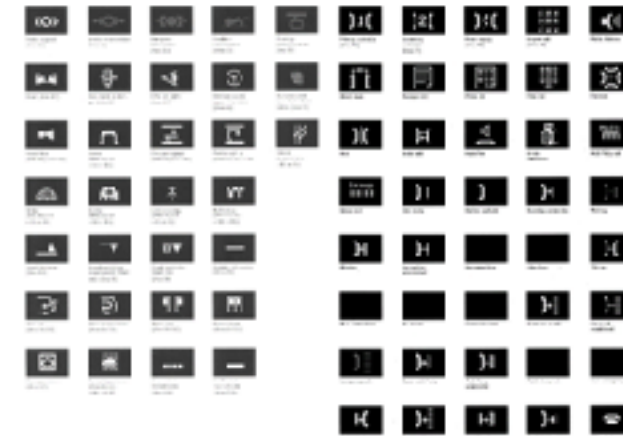
### Ready to implement:

- Type of interlocking (relays, computer based)
- Type of signalling (light signals)
- Type of interface (CBI-CBR)
- Rail traffic control centralisation
- GSM-R (network implementation)



## Assumptions and guidelines for the ERTMS/ETCS level selection

- Main corridor lines (especially TEN-T core network)
- on lines with centralized rail traffic control (on lines with Remote Control Centres) it is recommended to install ERTMS/ETCS **level 2**
- GSM-R system is required (QoS)
- in other cases, it is recommended to install ERTMS/ETCS **level 1**
- in special cases, it is possible to install ERTMS/ETCS **level 1 LS** (especially where it is expected to maintain a line block with single block section or other railway traffic form without use of more than one section block)





Project of interlockings for low traffic lines - assumptions

- 12-15 trains per day
- 2 trains per 1h
- No more 5 trains on whole line
- 80-100 km/h
- No ETCS

ETCS

Issues defined by UTK (Polish NSA)

Reducing the number of incidents related to signal passed at danger (SPAD), passing the location where the train should stop, or starting a train without the required permission (B04, C44, other potentially dangerous situations)

Main goals:

Preventing unauthorized passing the signal with „Stop” aspect





## ESC

- Procedure for the ETCS Compatibility Check (ESC)

[https://www.plk-sa.pl/files/public/user\\_upload/pdf/Akty\\_prawne\\_i\\_przepisy/Instrukcje/Wydruk/le/le-128\\_Procedura\\_przeprowadzania\\_kontroli\\_kompatybilnosci\\_systemu\\_ETCS\\_ESC\\_.pdf](https://www.plk-sa.pl/files/public/user_upload/pdf/Akty_prawne_i_przepisy/Instrukcje/Wydruk/le/le-128_Procedura_przeprowadzania_kontroli_kompatybilnosci_systemu_ETCS_ESC_.pdf)

„Guide for the application of the CCS TSI” GUI/CCS TSI/2020 wersja 7.1 z dnia 07.05.

- Sets of ESC Tests

<https://www.era.europa.eu/content/pl>

- ESC Types

## Interface IL – RBC

- Euroradio+/Subset-098
- SIL 4
- Sets of specifications (3 doc.)
  - CBI-CBR Interface. Top Level Specification
  - ERTMS Level 2 in Poland. Interface Specification CBI – CBR Interface, Application layer
  - EGO Protocol. Interface Specification

## Towards to Baseline 3 (SRS 3.6.0)

- Operational Scenarios
- Operational Rules – TSI OPE
- Architecture and Functionality
- Bugs fix
- CR's

## We consider:

- ETCS LS
- ETCS L3/L3 Hybrid
- ATO
- FRMCS





*Thank you for your  
kind attention*

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