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ETCS marker board definition

VERSIONS & MODIFICATIONS

Version No.	Date of Distribution	Comments on the modification	Responsible for The modification
0A	22-02-06	initial version	RD
0B	02-05-06	Reference to EN 12899-1 added. Comments Dominique Ligier added.	RD
0C	16-05-06	Small editorial changes	RD
1-	17-05-06	Release version	RD
1A	07-01-10	Colours and reflectivity included in general chapter. Editorial improvements.	RD
1B	18-01-10	Comments from ERA (DL)	RD
1C	02-02-10	Minor corrections	RD
2-	14-12-10	Release version (content unchanged)	RD

1   Table of contents

2   Introduction

2.1   Purpose of this document

2.1.1.1   This document defines the ETCS marker boards which shall be used in conjunction with ETCS/ERTMS.

2.2   References

2.2.1.1   The following references are used in this document:
[1]   TSI Operations and traffic management annex A: "ETCS and GSMR rules and principles"
[2]   EN 12899-1:2007 (E) Fixed traffic signs

3 ETCS marker board definitions

3.1 ETCS Stop Marker

3.1.1 Dimensions

3.1.1.1   The dimensions of the ETCS Stop Marker shall be as outlined in Figure 1.

3.1.1.2   The dimensions in figure 1 shall be used only as relative dimensions. The absolute size of the ETCS Stop Marker is not harmonised.

3.1.1.3   For practical manufacturing purposes the actual relative dimension may deviate slightly from the relative dimensions given in Figure 1. This tolerance shall not exceed 5%.
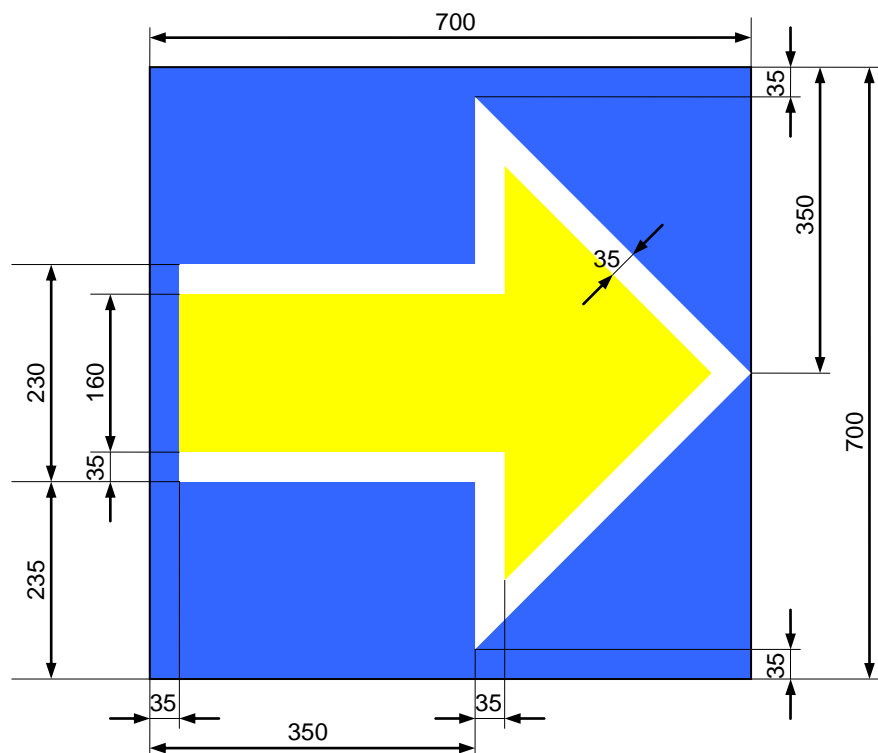

Figure 1 ETCS Stop Marker (left side)

3.1.1.4   The colours blue, white and yellow shall be used for the ETCS Stop Marker as outlined in Figure 1.

3.1.2 Track reference

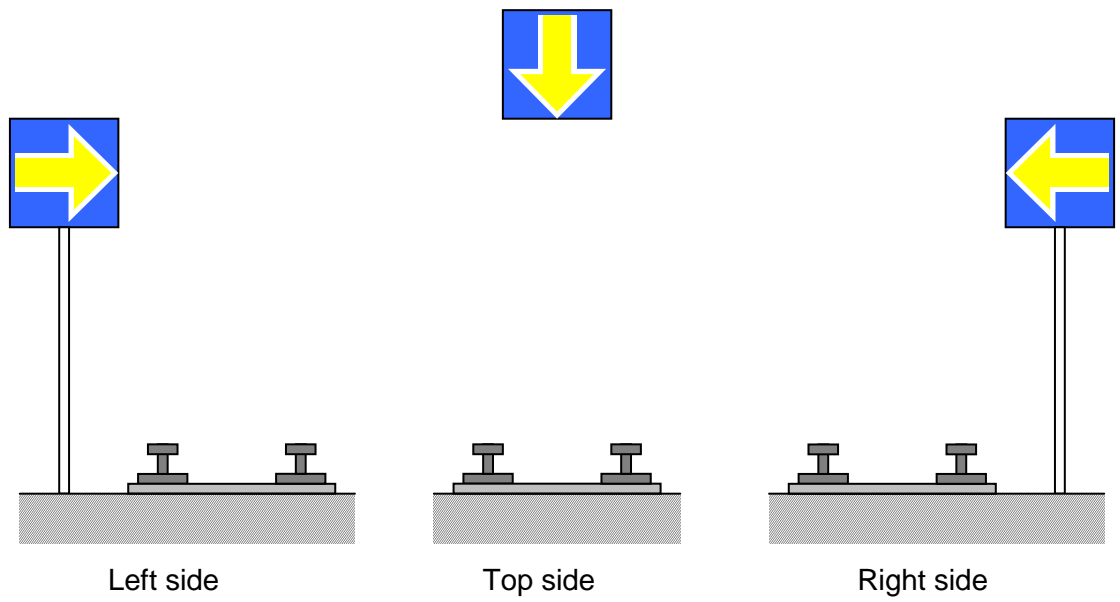3.1.2.1   The ETCS Stop Marker shall refer to the track to which it belongs as indicated in Figure 2.

Left side   Top side   Right side

Figure 2 Reference of ETCS Stop Marker to track

# 4	General requirements

## 4.1	Operational use

4.1.1.1	The operational use of the ETCS marker boards is defined in [1].

4.1.1.2	In order to enable the driver to refer to a specific marker board each ETCS marker board shall be provided with a clearly visible and unambiguous identification.

## 4.2	Colours

4.2.1.1	The colours of the ETCS marker boards shall be implemented according to Table 1.

Colour	1		2		3		4		Luminance factor β
	x	y	x	y	x	y	x	y	
White	0,305	0,315	0,335	0,345	0,325	0,355	0,295	0,325	≥ 0,27
Yellow	0,494	0,505	0,470	0,480	0,513	0,437	0,545	0,454	≥ 0,16
Red	0,735	0,265	0,700	0,250	0,610	0,340	0,660	0,340	≥ 0,03
Blue	0,130	0,090	0,160	0,090	0,160	0,140	0,130	0,140	≥ 0,01
Green	0,110	0,415	0,170	0,415	0,170	0,500	0,110	0,500	≥ 0,03
Dark green	0,190	0,580	0,190	0,520	0,230	0,580	0,230	0,520	0,01 ≤ β ≤ 0,07
Brown	0,455	0,397	0,523	0,429	0,479	0,373	0,558	0,394	0,03 ≤ β ≤ 0,09
Grey	0,305	0,315	0,335	0,345	0,325	0,355	0,295	0,325	0,12 ≤ β ≤ 0,18

Table 1 Colour and luminance factors

4.2.1.1.1	Note: Table 1 is consistent with the daylight chromaticity and luminance factors class CR2 and with the coefficient of retroreflection class RA2, both as defined in [2].

## 4.3	Reflectivity

4.3.1.1	The retroreflectivity of the ETCS marker boards shall be implemented according to Table 2.

Geometry of measurements		Colour								
α	β1 (β2=0)	White	Yellow	Red	Green	Dark green	Blue	Brown	Orange	Grey
12'	+5°	250	170	45	45	20	20	12	100	125
	+30°	150	100	25	25	15	11	8,5	60	75
	+40°	110	70	15	12	6	8	5	29	55
20'	+5°	180	120	25	21	14	14	8	65	90
	+30°	100	70	14	12	11	8	5	40	50
	+40°	95	60	13	11	5	7	3	20	47
2°	+5°	5	3	1	0,5	0,5	0,2	0,2	1,5	2,5
	+30°	2,5	1,5	0,4	0,3	0,3	#	#	1	1,2
	+40°	1,5	1	0,3	0,2	0,2	#	#	#	0,7
# Indicates "Value greater than zero but not significant or applicable".										

Table 2 Coefficient of retroreflection R_A (cd/lx/m$_2$)

4.3.1.1.1 Note: Table 2 is consistent with the coefficient of retroreflection class RA2 as defined in [2].