

# DIN EN 16186-2:2017-12 (E)

## Railway applications - Driver's cab - Part 2: Integration of displays, controls and indicators

---

<b>Contents</b>		<b>Page</b>
European foreword .....		5
Introduction .....		6
1	Scope .....	7
2	Normative references .....	7
3	Terms and definitions .....	8
4	Symbols and abbreviations .....	9
5	Driver's cab displays, controls and indicators for operational functions .....	10
5.1	General .....	10
5.2	Display or unit for train communication, monitoring and control .....	10
5.3	Controls .....	10
5.3.1	Controls for Intercom .....	10
5.3.2	Controls for external passenger access .....	10
5.3.3	Controls for driver's cab temperature .....	10
5.3.4	Controls for coupling and uncoupling of vehicles .....	11
5.3.5	Controls for auxiliary desk .....	11
5.4	Warnings .....	11
5.4.1	Alarm due to a safety system .....	11
5.4.2	Alarm due to emergency opening of one or more external doors .....	11
5.4.3	Driver interface with fire extinguishing system .....	12
5.4.4	Alarm due to speed reduction .....	12
6	Characteristics of displays, controls and indicators .....	12
6.1	General .....	12
6.1.1	Design principles .....	12
6.1.2	Reading zone .....	12
6.1.3	Resistance to damage from cleaning activity .....	12
6.1.4	Design to prevent the accumulation of dirt .....	12
6.1.5	Labelling .....	12
6.2	Characteristics of displays .....	13
6.2.1	Use of analogue and alphanumeric display .....	13
6.2.2	Requirements for arrays of display .....	13
6.2.3	Pointer and scale requirements .....	13
6.3	Characteristics of controls .....	13
6.3.1	General Principles .....	13
6.3.2	Design criteria .....	14
6.3.3	General characteristics of DAC, controls for external lights and remote control .....	15
6.4	Characteristics of indicators .....	15
6.4.1	Readability .....	15
6.4.2	Warning design principles .....	15
6.4.3	Audibility of driving related acoustic signals .....	16
6.4.4	Volume of the loudspeakers .....	16
7	Positioning of displays and controls .....	16
7.1	General rules for positioning .....	16
7.1.1	Driver's desk design .....	16

7.1.2	Human factors/ergonomic aspects .....	16
7.1.3	Devices positioning principle .....	17
7.1.4	Driving position at the side window .....	17
7.1.5	Space constraints .....	18
7.1.6	Positioning of elements deviating from this standard .....	18
7.2	Positioning of displays .....	18
7.2.1	Display location and orientation .....	18
7.2.2	Preferred fields of vision .....	18
7.2.3	Positioning ATP signalling information .....	18
7.2.4	Integration of heritage ATP systems .....	18
7.3	Positioning of controls .....	19
7.3.1	Reachability of controls on the driver's desk .....	19
7.3.2	Grouping of controls .....	19
7.3.3	Allocation to hands .....	20
7.3.4	Accessibility .....	20
7.3.5	Synchronous operation of elements .....	20
7.3.6	Risk of inadvertent activation .....	20
7.3.7	Position of specific controls .....	20
7.3.8	Controls used while driving, but not located on the driver's desk .....	21
7.3.9	Controls only operated during standstill .....	21
8	Lighting of cab, displays, controls and indicators .....	22
8.1	Cab lighting .....	22
8.2	Reading zone lighting .....	22
8.3	Instruments' lighting .....	22
8.4	Prevent disturbing the driver .....	22
8.5	No green lighting .....	22
9	Symbol and text definition .....	22
9.1	Symbol appearance .....	22
9.2	Harmonized symbols .....	22
9.2.1	General .....	22
9.2.2	Combinations of colours .....	23
9.2.3	Style of symbols .....	23
9.2.4	Location with respect to controls .....	23
9.2.5	Field for symbols .....	23
9.2.6	New symbols .....	23
9.3	Character type .....	23
Annex A (normative) Reach envelopes and fields of vision on the desk .....		24
Figure A.1 -- Reach envelopes for arms .....		24
Figure A.2 -- Optimum and preferred fields of vision in seated position .....		25
Annex B (informative) Examples of main driver's desk configurations - Functional allocation of operating elements and integration constraints at the driver's desk level .....		26
Figure B.1 -- Top view and front view of standardized driver's desk .....		27
Figure B.2 -- Top view and front view of optional standardized EMU/DMUs' central driver's desk .....		28
Table B.1 -- List of elements and their locations including function codes (in accordance with EN 15380-4) .....		29
Annex C (normative) Operating elements and relationship with symbols .....		46
Table C.1 -- Operating elements and relationship with symbols .....		46
Annex D (informative) Project specific symbols .....		61
Table D.1 -- Operating elements and relationship with symbols .....		61

**Annex E (informative) Links between requirements and the Functional Breakdown Structure (FBS) of EN 15380-4 ..... 65**

**Table E.1 -- Requirement management elements ..... 65**

**Annex F (informative) A-deviations ..... 69**

**Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2008/57/EC ..... 70**

**Bibliography ..... 71**