Safety-Related Application Conditions (SRACs)

Supplement to the HIMatrix *Safety Manual for Railway Applications* HI 800 437 E, Rev. 4.00.00

1 HIMatrix System

Requirements	Reference	Responsible
1. To ensure safety-related operation, approved fail-safe hardware and software components must be used. Approved HIMA components are listed in the HIMatrix version list. The latest versions can be found in the version list, which is maintained together with the test authority.	HIMatrix safety manual for railway applications Chapter 3.3.1	Engineering, maintenance
2. The operating requirements specified in this safety manual about EMC, mechanical, chemical and climatic influences must be observed.		
3. The HIMatrix systems are designed in accordance with the de-energize to trip principle. Thus, if faults occur, the de-energized state is adopted as the safe state for inputs and outputs.	HIMatrix safety manual for railway applications Chapter 2.1.1	Engineering
4. The HIMatrix systems can also be used in applications operating in accordance with the energize to trip principle. This must be implemented in the application.	HIMatrix safety manual for railway applications Chapter 2.1.2	
5. Only devices that are safely separated from the power supply may be connected to the system.	HIMatrix safety manual for railway applications Chapter 3.3.2	
6. The safe, electrically protective separation of the power supply must be guaranteed within the 24 V system supply. Only power supply units of type PELV or SELV may be used.		
7. In safety-relevant applications, ensure that the safety-relevant system parameters are properly configured.	HIMatrix safety manual for railway applications Chapter 3.3.3	
8. In particular, this applies to the system configuration, maximum cycle time and safety time.		

Requirements	Reference	Responsible
9. The SILworX programming tool must be used for programming.	HIMatrix safety manual for railway applications Chapter 3.3.4	Engineering, maintenance
10. Once the application has been created, the program must be compiled twice and the two resulting CRCs must be compared to ensure that the program was compiled properly.		
11. The proper implementation of the application specifications must be validated, verified and documented. A complete test of the logic must be performed by trial.		
12. The system response to faults in fail-safe input modules, output modules and remote I/Os must be defined in the user program in accordance with the system-specific safety-related conditions.		Engineering
13. When implementing safety-related communications between various devices, ensure that the overall response time of the system does not exceed the permitted worst case response time.	HIMatrix safety manual for railway applications Chapter 3.3.5	
14. Data transmission in Category 1 and Category 2 transmission systems in accordance with EN 50159 is possible with no additional measures.		
15. Transmission systems (Category 3) in accordance with EN 50159 may be used, if additional measures are taken to guarantee that the transmission channel is secure (e.g., firewalls or encryption).		
16. To comply with the protective provisions for electrical safety and grounding, the manufacturer of the specific application must ensure that proper measures are implemented for separating the indoor and outdoor equipment in accordance with EN 50122. This shall protect the HIMatrix systems against influences from the outdoor equipment in the overhead contact line zone or the pantograph zone, as well as against traction return currents. Power supply devices allowed for railway applications must be used.	HIMatrix safety manual for railway applications Chapter 3.3.2	
17. The worst case response time of the HIMatrix safety function must meet the requirements of the application. This must be demonstrated by the manufacturer of the application.	HIMatrix safety manual for railway applications Chapter 3.2 et seqq.	
18. The SILworX programming tool is provided with a feature that, after the user program or system configuration has changed, only displays the performed changes. The analysis of the changes (change impact analysis IA) must define the required test scope. This impact analysis must take the expected changes based on the performed modifications, the result of the SILworX comparison feature and the required regression tests into account.	HIMatrix safety manual for railway applications Chapter 3.3.4	

2 Operating Requirements

The standard variants of the HIMatrix system family are not approved for use on rolling stock in accordance with EN 50155.

Requirements	Reference	Responsible
1. The power supply must be designed in accordance with the HIMatrix safety manual for railway applications.	HIMatrix safety manual for railway applications Chapter 3.6.6	Planning Engineering, Maintenance
2. For the DO 8 01 module, the supply voltage limits must be met in accordance with the module-specific manual.	HIMatrix module manual F60 DO 8 01 (HI 800 207 E) Chapter 3.5	
3. The climatic requirements must be met in accordance with the HIMatrix safety manual for railway applications. The F2 DO 4 01, F2 DO 16 02 and DO 8 01 meet all the requirements for use in signaling applications, but they may only be used within an ambient temperature range of 0…+60 °C.	HIMatrix safety manual for railway applications Chapter 3.6.2	
4. The mechanical requirements must be met in accordance with the HIMatrix safety manual for railway applications.	HIMatrix safety manual for railway applications Chapter 3.6.3	
5. The EMC requirements must be met in accordance with the HIMatrix safety manual for railway applications.	HIMatrix safety manual for railway applications Chapter 3.6.4	
6. The ESD protective measures must be met in accordance with the HIMatrix safety manual for railway applications.	HIMatrix safety manual for railway applications Chapter 2.4	
7. With respect to the installation height, the classes must be met in accordance with the HIMatrix safety manual for railway applications.	HIMatrix safety manual for railway applications Chapter 3.6.1	