

WTB cabling and connections

Abstract

This document describes basic rules for WTB bus railway vehicle cabling and connections and also connection of AMiT WTB units into the railway vehicle cabling.

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Appendix

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Revision history

Version	Date	Author of change	Changes
001	20. 7. 2017	Roman Hajda	New document

Related documentation

1. **UIC code 558** 1 st edition, 1.1.96, Remote control and data cable Standard technical features for the equipping of RIC coaches
2. **IEC 61375-1 Ed.2 Electric railway equipment** – Train bus – Part 1:Train communication network
3. **IEC 61375-2-1 Ed.1 Electronic railway equipment** – Train communication network (TCN) – Part 2-1: Wire Train Bus (WTB)
4. **AMiT WTB gateway datasheet** – see the RRU-WE/1001 datasheet as and example file: rru-we1001_d_en_102.pdf
5. **Data cable** Huber-Suhner Radox Databus 120ohm EN 85004176, 2 x 0.5 datasheet.
web:
<https://literature.hubersuhner.com/Marketsegments/Transportation/RailRADOXDATABUS120OHMEN/>

Introduction

This document provides an overview of WTB cabling and connections offered by the AMiT company.

Additionally, some more technical aspects of the system are discussed and basic guide how to choose an appropriate solution is provided.

How to read this document

The document should allow you to safely jump to any chapter you need to consult.

Terminology

Common abbreviations

WTB

Wire Train Bus

UIC

International Union of Railways, the international railways operators association

TCN

Train Communication Network

Definition of used terms

none

Vehicle Connection Drawing

Typical layout of UIC compliant vehicle is shown on the Figure 1 below. Please note redundant electrical connection between vehicles using flexible cables and sockets.

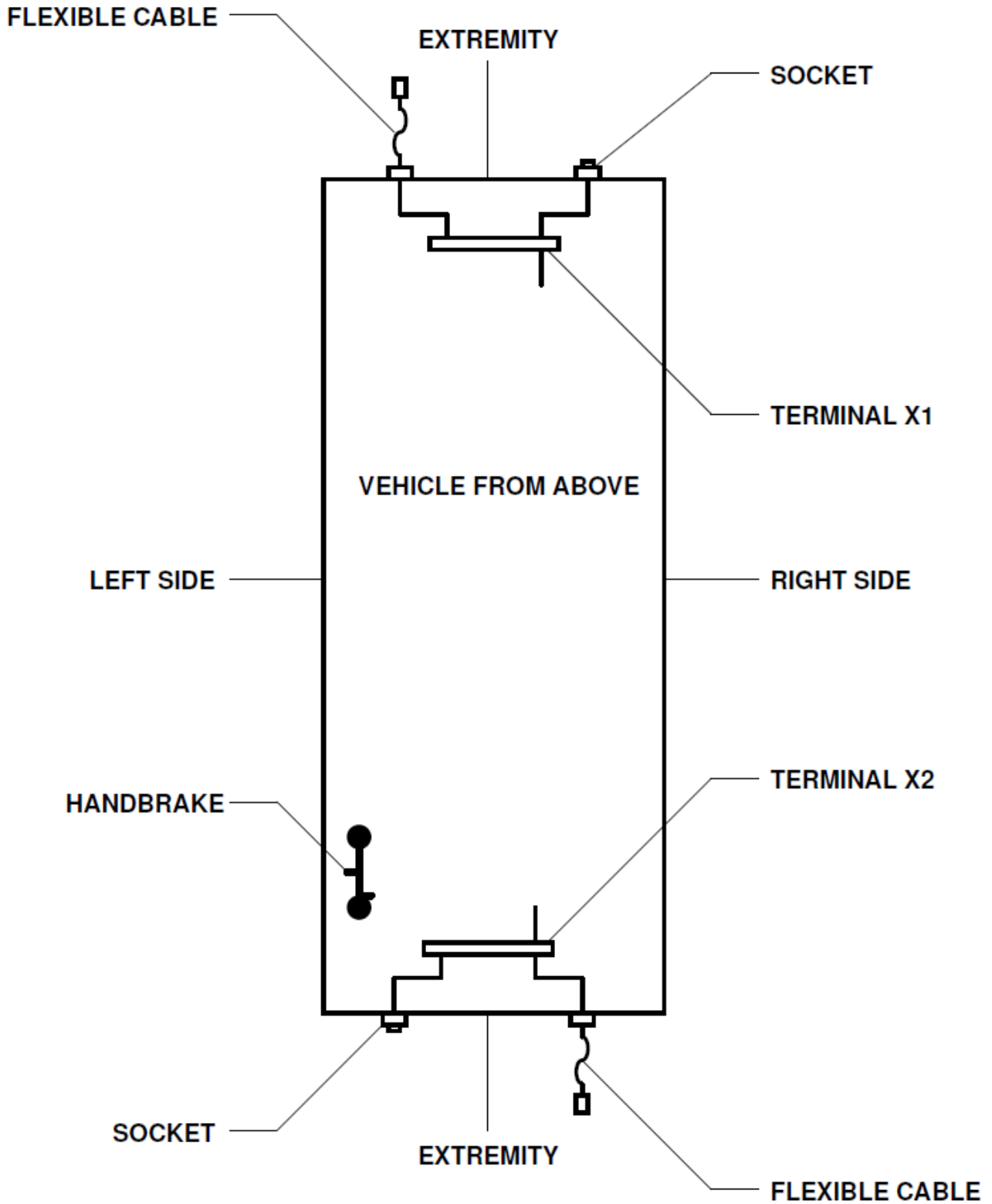


Fig. 1 - Connection layout

Cabling

Vehicle Internal Cabling

The WTB standard [3] recognizes direct and indirect node attachment arrangements. AMiT WTB units support indirect node attachment. This practically means that four connectors are used in a double-line attachment, as shown in Figure 2.

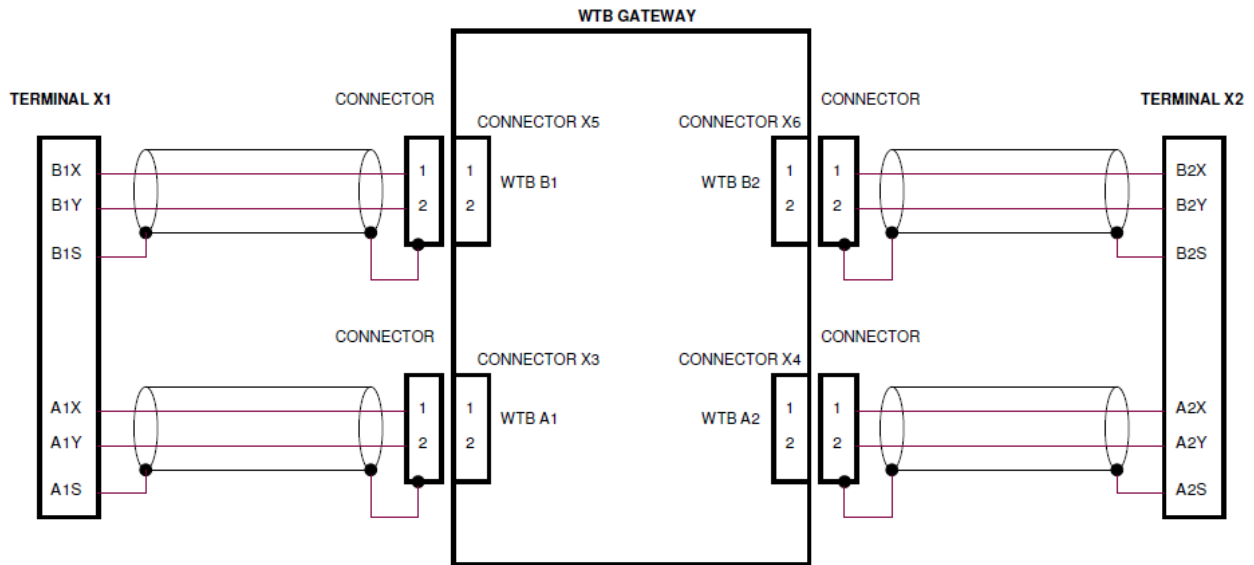


Fig. 2 - Indirect attachment

Vehicle Interconnection – Shielding Concept

To satisfy different applications, two shielding concepts are specified:

- Grounded Shield Concept (preferred method)
- Floating Shield Concept

Please note that only the Grounded Shield Concept is compliant with the UIC558 requirements. AMiT WTB units, when used exactly according to their technical documentation, support the Grounded Shield Concept only.

Grounded Shield Concept

When applying the Grounded Shield Concept:

- The shields shall be connected directly to the node ground at each node;
- The jumper cables shall not establish shield continuity between vehicles, as shown in Figure 3. The shielding must lead into the connector housing and here it must be left open. See the UIC558 plate 8 for detail interconnection drawing.

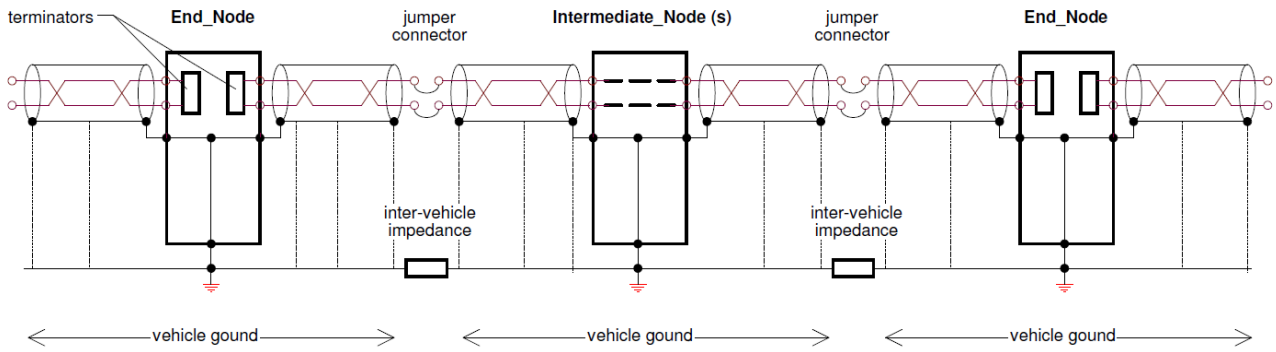


Fig. 3 - Grounded Shield Concept – Compliant with the UIC558 requirements

Floating Shield Concept

When applying the Floating Shield Concept:

- The shield shall be isolated from the ground when not connected to a node;
- The shield shall be connected on each node to the node ground by an RC circuit, consisting of a resistor of value $R_s = 47\text{ k}\Omega \pm 5\%$ in parallel with a capacitor $C_s = 100\text{ nF} \pm 10\%$, 750 V, as shown in Figure 4.

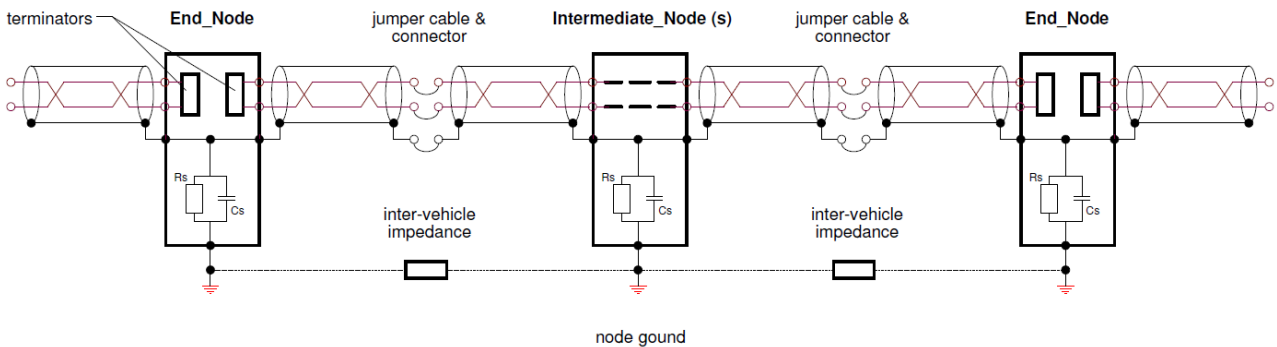


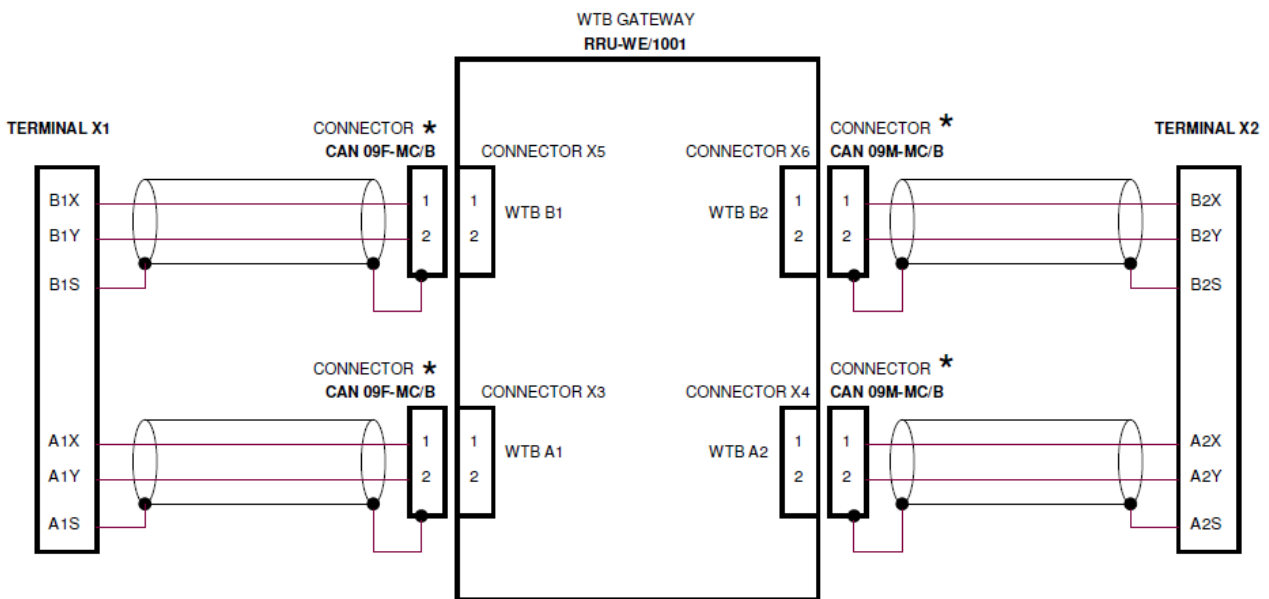
Fig. 4 - Floating Shield Soncept – No UIC558 compliant installations

Recommended Use of AMiT Components

Example connection of WTB gateway is shown at Figure 5 and List of material you may see at the table below.

List of material

Description	Designation	Vendor	Note
WTB Gateway	RRU-WE/1001	AMiT	–
Connector Male	CAN 09M-MC/B	AMiT	–
Connector Female	CAN 09F-MC/B	AMiT	–
Data cable	EN 85004176	AMiT	Huber-Suhner Radox Databus 120 Ω 2 x 0,5 mm ²



*

The shield is connected to the metal cover of the connector and does not lead to any pin of the connector

Fig. 5 - Example connection WTB gateway

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